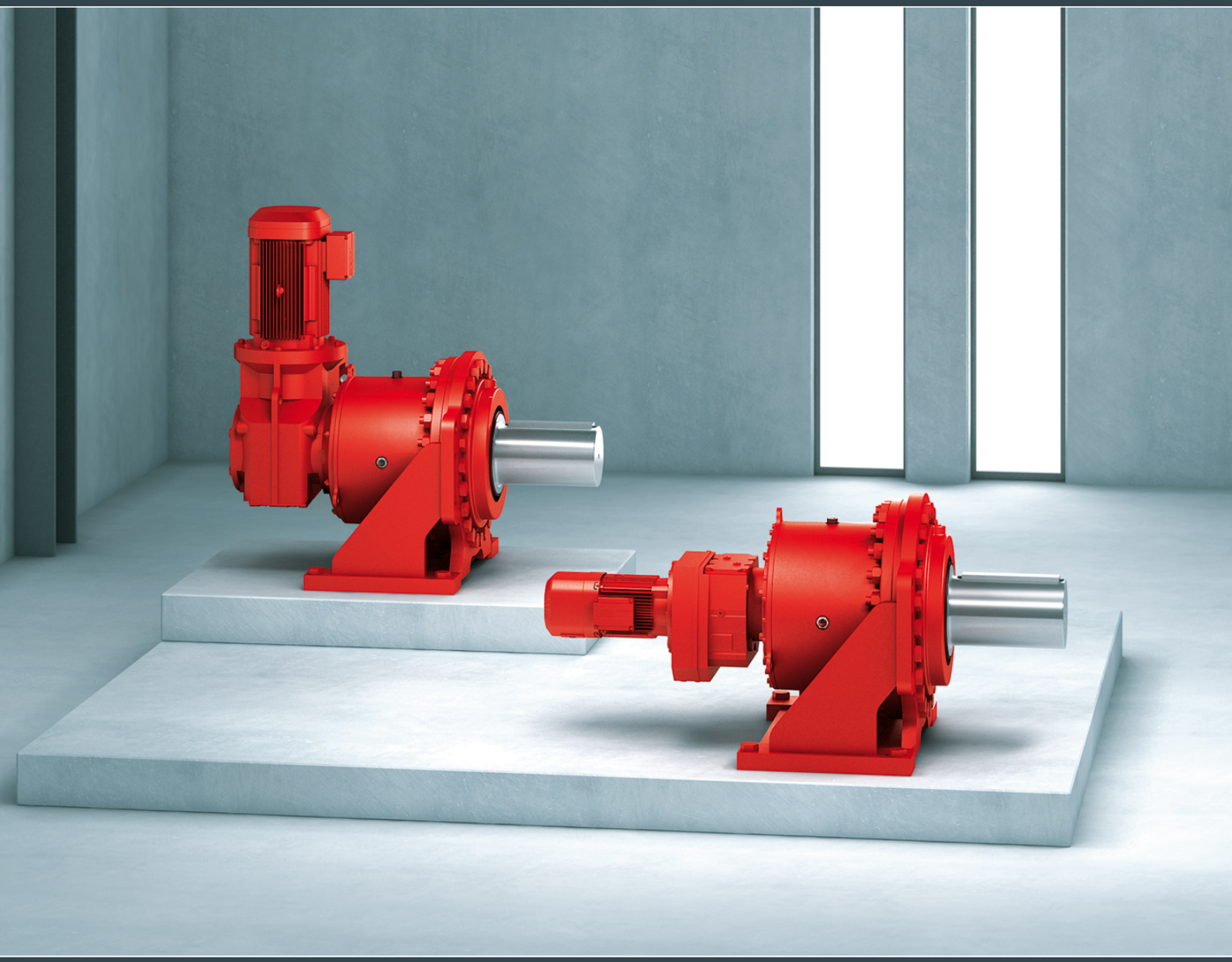
SEW EURODRIVE

Catalog



Industrial Gear Units

P.002 – P.102 Series Planetary Gearmotors (60 Hz)

Torque Classes from 24 – 631 kNm

Edition 02/2017

23488859/EN



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1 Introduction

1.1 The SEW-EURODRIVE group of companies

1.1.1 Global presence

Driving the world – with innovative drive solutions for all industries and for every application. Products and systems from SEW-EURODRIVE are used all over the world. Be it in the automotive, building materials, food and beverage or metal-processing industry – the decision to use drive technology "made by SEW-EURODRIVE" stands for reliability for both functionality and investment.

We are represented in the most important branches of industry all over the world: with 15 manufacturing plants and 77 Drive Technology Centers worldwide as well as our customer support, which we consider an integrative service that continues our commitment to outstanding quality.

1.1.2 Always the right drive

The SEW-EURODRIVE modular concept offers millions of combinations. This wide selection enables you to choose the correct drive for all applications, each based on the required speed and torque range, available space, and ambient conditions. Gear units and gearmotors offering a unique and finely tuned performance range and the best economic prerequisites to meet your drive requirements.

The modular DR.. motor series includes the energy-efficient motor types IE1 to IE4 and was designed and constructed with all worldwide requirements for energy efficiency classes in mind. The DR.. motor easily meets the requirements for approval and certification in all relevant countries. The energy-efficient drives achieve the highest efficiency in combination with SEW-EURODRIVE gear units.

The gearmotors are electronically enhanced by MOVITRAC® frequency inverters, MOVIDRIVE® drive inverters, and MOVIAXIS® multi-axis servo inverters – a combination that blends perfectly with the existing SEW-EURODRIVE program. As is the case with the mechanical systems, all development, production, and assembly is carried out entirely by SEW-EURODRIVE. In combination with our drive electronics, these drives provide the utmost in flexibility.

Products of the servo drive system, such as low backlash servo gear units, compact servomotors, or MOVIAXIS® multi-axis servo inverters ensure precision and dynamics. From single-axis or multi-axis applications to synchronized process sequences, servo drive systems from SEW-EURODRIVE enable flexible and customized implementation of your applications.

For economical, decentralized installations, SEW-EURODRIVE offers components from its decentralized drive system, such as MOVIMOT®, the gearmotor with integrated frequency inverter, or MOVI-SWITCH®, the gearmotor with integrated switching and protection function. SEW-EURODRIVE has developed hybrid cables to provide cost-effective functional solutions, irrespective of the system philosophy or scope. The latest developments from SEW-EURODRIVE: DRC.. electronic motor, MOVIGEAR® mechatronic drive system, MOVIFIT® decentralized drive controller, MOVIPRO® decentralized drive, positioning, and application controller, as well as MOVITRANS® system components for contactless energy transfer.

Power, quality, and robustness combined in a single standard product: with SEW-EURODRIVE, powerful movements are delivered by industrial gear units with high torques. The modular concept once again ensures optimum adaptation of industrial gear units to meet a wide range of different applications.

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1.1.3 Your ideal partner

Its global presence, extensive product range and broad spectrum of services make SEW-EURODRIVE the ideal partner for the machinery and plant construction industry when it comes to providing drive systems for demanding drive tasks in all industries and applications.

1.2 Products and systems from SEW-EURODRIVE

The products and systems by SEW-EURODRIVE are divided into the following product groups:

- Industrial gear units
- Gearmotors and frequency inverters
- Servo drive systems
- Decentralized drive systems
- MAXOLUTION®

Products and systems used in applications of several groups are listed in a separate group entitled "products and systems covering several product groups". The following tables indicate the products and systems included in the respective product group:

Industrial gear units
• X, MC, ML series helical and bevel-helical gear units • P002 – 102 series planetary gear units • XP130 – 250 series planetary gear units • P-X series planetary bevel-helical gear units • Application solutions with connections – Girth gears – Swing base – Gearmotor – Motor – Coupling – Brake – Lubrication system For conveyor drives, bucket conveyors, agitators, cooling towers, crane systems, and much more

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Gearmotors and frequency inverters		
Gear units/gearmotors	**Motors**	**Frequency inverter**
• Helical gear units / helical gearmotors • Parallel-shaft helical gear units / parallel-shaft helical gearmotors • Helical-bevel gear units / helical-bevel gearmotors • Helical-worm gear units / helical-worm gearmotors • SPIROPLAN® right-angle gearmotors • EMS drives • Geared torque motors • Pole-changing gearmotors • Variable speed gear units/variable speed gearmotors • Aseptic gearmotors • Explosion-proof gear units / gearmotors • Explosion-proof variable-speed gear units / variable-speed gearmotors	• Asynchronous AC motors / AC brakemotors • Pole-changing AC motors / AC brakemotors • Energy-efficient motors • Explosion-proof AC motors/AC brakemotors • Torque motors • Single-phase motors / Single-phase brakemotors • Asynchronous linear motors	• MOVITRAC® frequency inverters • MOVI4R-U® frequency inverters • MOVIDRIVE® drive inverters • Control, technology and communication options for inverters

Servo drive systems		
Servo gear units / servo gearmotors	**Servomotors**	**Servo drive inverters / servo inverters**
• Low backlash planetary servo gear units / planetary servo gearmotors • Low backlash helical-bevel servo gear units / helical-bevel servo gearmotors • R, F, K, S, W gear units / R, F, K, S, W gearmotors • Explosion-proof servo gear units / servo gearmotors	• Asynchronous servomotors / servo brakemotors • Synchronous servomotors / servo brakemotors • Explosion-proof servomotors / servo brakemotors • Synchronous linear motors	• MOVIDRIVE® servo drive inverters • MOVIAXIS® multi-axis servo inverter • Control, technology and communication options for servo drive inverters and servo inverters

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Decentralized drive systems		
Decentralized drives	**Communication and installation**	**Contactless energy transfer system**
• DRC.. electronic motor / MOVIGEAR® mechatronic drive system – DBC – Direct Binary Communication – DAC - Direct AS-Interface Communication – DSC - Direct SBus Communication – SNI – Single Line Network Installation • MOVIMOT® gearmotors with integrated frequency inverter • MOVIMOT® motors / brakemotors with integrated frequency inverter • MOVI-SWITCH® gearmotors with integrated switching and protection functions • MOVI-SWITCH® motors and brake motors with integrated switching and protection functions • Explosion-proof MOVIMOT® and MOVI-SWITCH® gearmotors	• Fieldbus interfaces • Field distributors for decentralized installation • MOVIFIT® product range – MOVIFIT® FDC for controlling MOVIGEAR® and DRC.. drive units – MOVIFIT® MC for controlling MOVIMOT® drives – MOVIFIT® SC with integrated electronic motor switch – MOVIFIT® FC with integrated frequency inverter • MOVIPRO® product range – MOVIPRO® SDC decentralized drive and positioning control	• MOVITRANS® system – Stationary components for energy supply – Mobile components for energy consumption – Line cables and installation material

MAXOLUTION®
• MAXOLUTION® packages for predefined application solutions • MAXOLUTION® systems for customer-specific system solutions and plants

Products and systems covering several product groups
• Operator panels • MOVI-PLC® drive-based control system • Components of the type "functional safety" • Diagnostic units

In addition to its products and systems, SEW-EURODRIVE offers a comprehensive range of services. These include:

- Technical consulting
- User software
- Seminars and training
- Extensive technical documentation
- Worldwide customer service

Visit our website at

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→ **www.sew-eurodrive.com**

The website provides comprehensive information and services.

1.3 Product names and trademarks

All product names included in this documentation are trademarks or registered trademarks of the respective titleholders.

1.4 Copyright notice

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2 Product description and overview of types

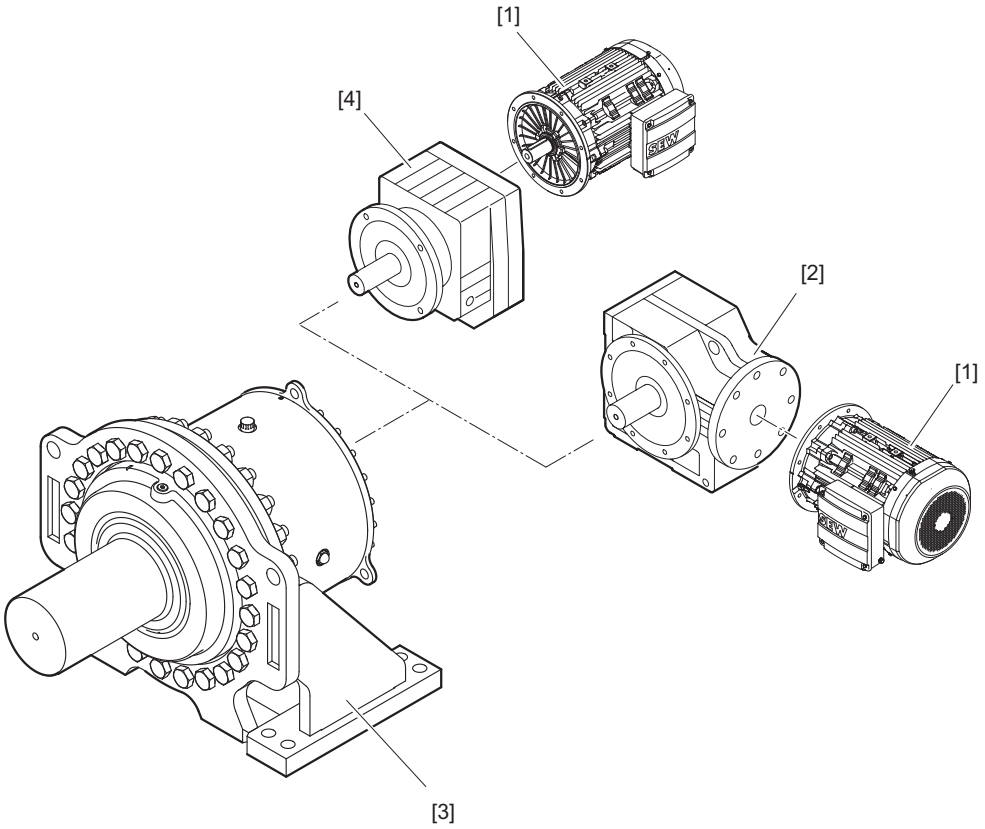
Planetary gearmotors are a combination of the following:

- P.. planetary gear unit output stage
- KF../K.. or RF.. primary gear unit
- Mount-on components: Motor, coupling, adapter, and backstop

There are 11 sizes of planetary gear units with rated torques from 24830 Nm to 631300 Nm.

The load distribution to several planet wheels results in a significantly higher power density and consequently in smaller dimensions compared to helical and bevel-helical gear units.

The following figure shows a sample combination of a planetary gear unit, a primary gear unit and a motor.



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[1] Motor
[2] KF../K.. Helical-bevel gear unit (flange-mounted design)
[3] P.. Planetary gear unit
[4] RF.. Helical gear unit (flange-mounted design)

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2.1 Design features

Planetary gear units ...

- can transmit high torques
- are very compact
- offer a high degree of torsional rigidity

Primary gearmotors ...

- offer a large variance on the input side
- are variable in the gear reduction range
- can be combined with the planetary gear unit in helical or bevel designs

2.2 Overview of advantages

- Perfectly matched units (gear unit and motor)
- Large range of options thanks to the SEW-EURODRIVE modular concept
- Short, compact design because there is no need for couplings and adapter flanges
- Standardized units, which means excellent price/performance ratio and short delivery times

2.3 Application areas

Planetary gearmotors are mainly used in applications where low output speeds and high torques are required.

For example:

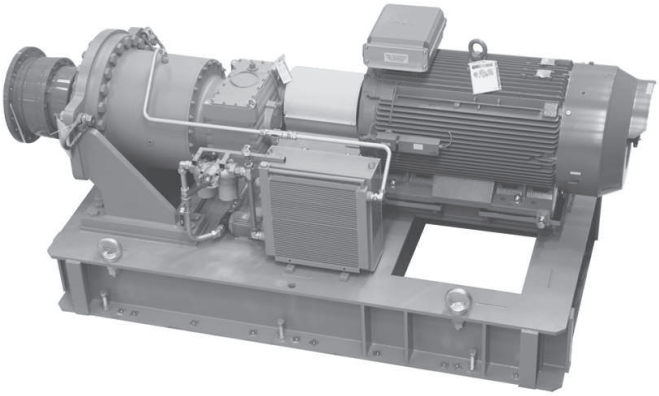
- For drying processes in the construction materials industry
- For filling processes in the cement industry
- For slow-running material processing systems, e.g. mixers, rotary filters
- For all branches of industry with similar requirements
- For conveyor belts, e.g. apron conveyors
- In the food industry

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2.4 Customer-specific application solutions

The following examples show application-specific solutions.

- Complete drive package consisting of
  - 2-stage planetary gear unit including helical preliminary stage
  - Motor with coupling
  - Oil-air cooling system



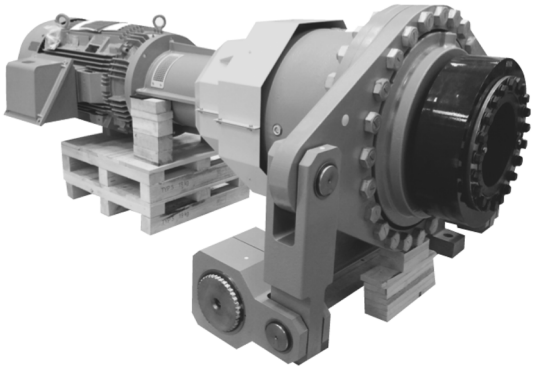
- SEW-EURODRIVE slewing gear drive: P.RF planetary gear unit with extended output shaft with pinion



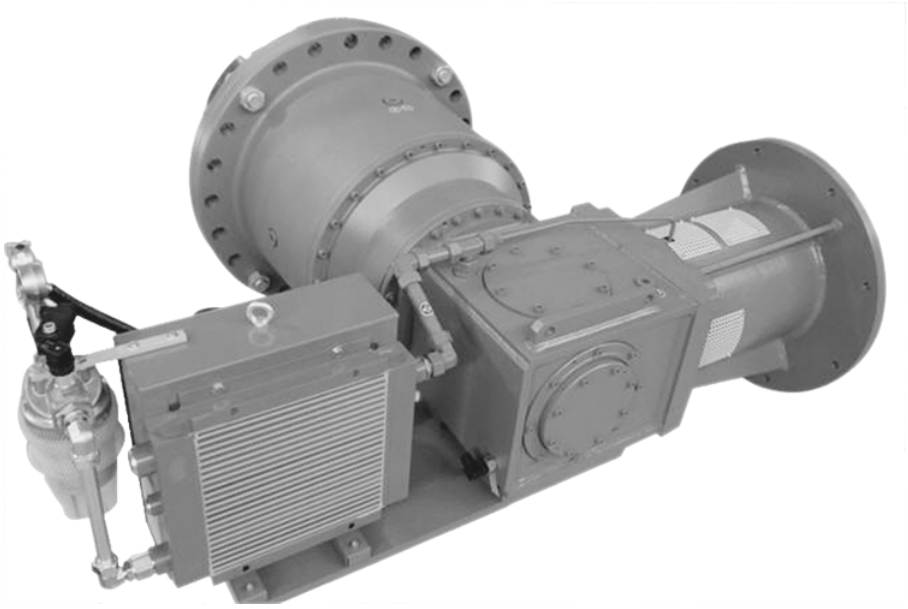
- 3-stage planetary gear unit with:

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– Hollow shaft and shrink disk connection
– Torque arm including torsion bar
– Axial fan
– Motor adapter with direct mounted motor



- Planetary gear unit including helical-bevel gear unit with:
  – Hollow shaft and shrink disk connection
  – Oil-air cooling system
  – Motor adapter suitable for direct mounting of an IEC motor



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2.5 General information

2.5.1 Important information

Note the following points:

INFORMATION

- The illustrations in the catalog are examples. Final dimensions are available from SEW-EURODRIVE on request.
- The specified lubricant quantities are guide values only. Use the marks on the oil dipstick or oil level glass to determine the oil level.
- On delivery, the planetary gear units are ready for operation, but not filled with oil. However, it is possible to have the gear units delivered filled with oil. The RF../ KF../K.. primary gear units are filled with lubricant at the factory depending on the mounting position.
- Oil viscosity and grade must comply with those specified on the nameplate.
- The specified weights are guide values. The exact gear unit weight is given in the order-specific dimension sheet. The nameplate shows the weight of the basic gear unit including all mounted gear unit options.
- The buyer must provide protection against unintentional contact with moving parts. The applicable safety regulations of the country in which the unit will be used are to be followed.

2.5.2 Power and torque

The power and torque values listed in the catalogs apply to standard design and standard lubrication of the gearmotors under normal ambient conditions.

Please note that the motor power shown in the selection tables for gearmotors is subject to selection. However, the output torque and the desired output speed are essential for the application and need to be checked.

2.5.3 Speeds

The quoted output speeds of the gearmotors are recommended values. You can calculate the rated output speed based on the rated motor speed and the gear unit ratio. Please note that the actual output speed depends on the motor load and the supply system conditions.

2.5.4 Noise

The noise levels of all gearmotors and motors (brakemotors) are well within the maximum permitted noise levels set forth in ISO 8579-1 for gear units and EN 60034 for motors.

2.5.5 Paint

Gearmotors and motors (brakemotors) are painted in "blue gray"/RAL 7031 as per DIN 1843 as standard. Special paint coatings are available on request.

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2.5.6 Weight information

INFORMATION

Please note that all weights shown in the catalog exclude the oil fill because the lubricant fill quantity depends on the mounting position.

2.5.7 Air admission and accessibility

The gearmotors/brakemotors must be mounted on the driven machine in such a way that both axially and radially there is enough space left for unimpeded air admission and for the purposes of maintenance of the brake. Also refer to the notes in the motor dimension sheets.

2.5.8 Primary gearmotor

All the possibilities and restrictions specified in the SEW-EURODRIVE "Gearmotors" catalog apply.

2.5.9 Brakemotors

On request, motors and gearmotors can be supplied with an integrated mechanical brake. The SEW-EURODRIVE brake is an electromagnetic disk brake with a DC coil that releases electrically and brakes using spring force. Due to its operating principle, the brake is applied if the power fails. It meets the basic safety requirements. The brake can also be released mechanically if equipped with manual brake release. For this purpose, the brake is supplied with either a hand lever with automatic reset or an adjustable set screw. The brake is controlled by a brake controller that is either installed in the motor wiring space or in the control cabinet.

A characteristic feature of the brakes is their extremely short design. The brake endshield is a part of both the motor and the brake. The integrated construction of the SEW-EURODRIVE brakemotor permits particularly compact and sturdy solutions.

2.5.10 International markets

Upon request, we deliver motors with connection requirements according to CSA and NEMA guidelines (UL listed).

For the Japanese market, we offer motors conforming to JIS standard. Contact your sales representative to assist you in such cases.

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2.6 Sizes, torque ratings

In addition to the already known gear unit project planning with infinite fatigue strength (referring to gearing according to DIN 3990), it is now also possible to select a gear unit with defined service life. This results in a size-specific torque increase. For gear units in explosion-proof design only a gear unit project planning with infinite fatigue strength is possible.

The nominal output torque ratings are listed in the table below.

The fields marked in gray indicate ranges in which project planning with defined service life is not possible.

Size	Service life factor f_{LC}											$M_{N2\ Lim}$ Nm
	≤ 7.5	≤ 15	≤ 25	≤ 30	≤ 35	≤ 45	≤ 52.5	≤ 70	≤ 95	≤ 107.5	> 107,5[1]	
	M_{N2}											
P.002	29 200	26 300									24 830	49 660
P.012	46 200	41 600	38 500								36 810	73 620
P.022	64 200	60 100	55 600	54 200	54 200	54 200	54 200	54 200	54 200		51 190	102 380
P.032	86 800	84 900	78 600	76 600	76 600	76 600	76 600	76 600	76 400	73 700	69 620	139 240
P.042	111 000	111 000	103 200								100 170	200 340
P.052	140 600	134 500									124 060	248 120
P.062	209 100	201 400									185 660	371 320
P.072	274 600	274 600	264 500	257 300	256 400	256 400	256 400				245 660	491 320
P.082	397 100	397 100	397 100	383 500							359 400	718 800
P.092	513 900	513 900	488 900	476 200	476 200	446 300					423 000	846 000
P.102	631 300	630 800	572 300	541 800	517 300						500 000	1 000 000

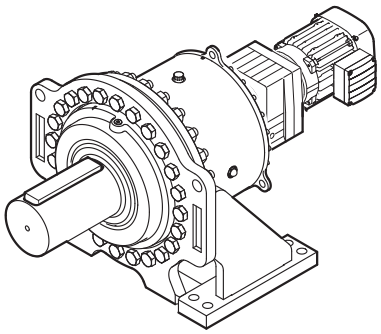
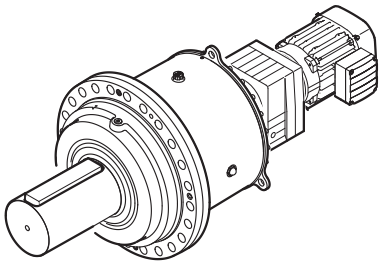
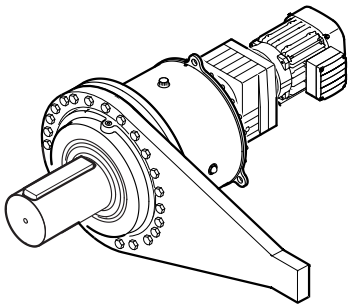
1) Gearing with infinite fatigue strength (referring to DIN 3990)

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2.7 Basic designs of planetary gearmotors

2.7.1 P..RF.. helical-planetary gearmotors

Planetary gearmotors are available in 3 mounting types. Foot-mounted design, flange-mounted design, and design with torque arm:

	**P..RF.. DR..** Helical-planetary gearmotor in foot-mounted design
	**PF..RF.. DR..** Helical-planetary gearmotor in flange-mounted design
	**PF..RF.. DR..** Helical-planetary gearmotor in flange-mounted design with torque arm

INFORMATION

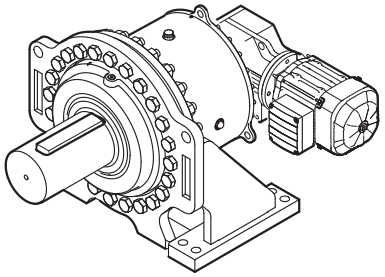
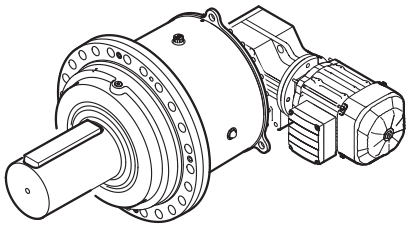
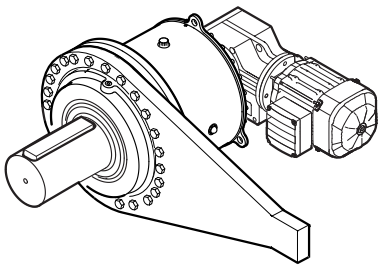
The various mounting types can be combined with the available output shaft types.

For information on the available output shaft types, refer to chapter "Output shaft variants" (→ 🗎 20). The mounting design "torque arm" can be combined with the output shaft type "hollow shaft with shrink disk" as standard. Please contact SEW-EURODRIVE for information on deviating combinations.

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2.7.2 P..KF../P..K.. bevel-planetary gearmotors

Planetary gearmotors are available in 3 gear unit designs. Foot-mounted design, flange-mounted design, and design with torque arm:

	**P..KF.. DR../P..K.. DR..** Bevel-planetary gearmotor in foot-mounted design
	**PF..KF.. DR../PF..K.. DR..** Bevel-planetary gearmotor in flange-mounted design
	**PF..KF.. DR../PF..K.. DR..** Bevel-planetary gearmotor in flange-mounted design

INFORMATION

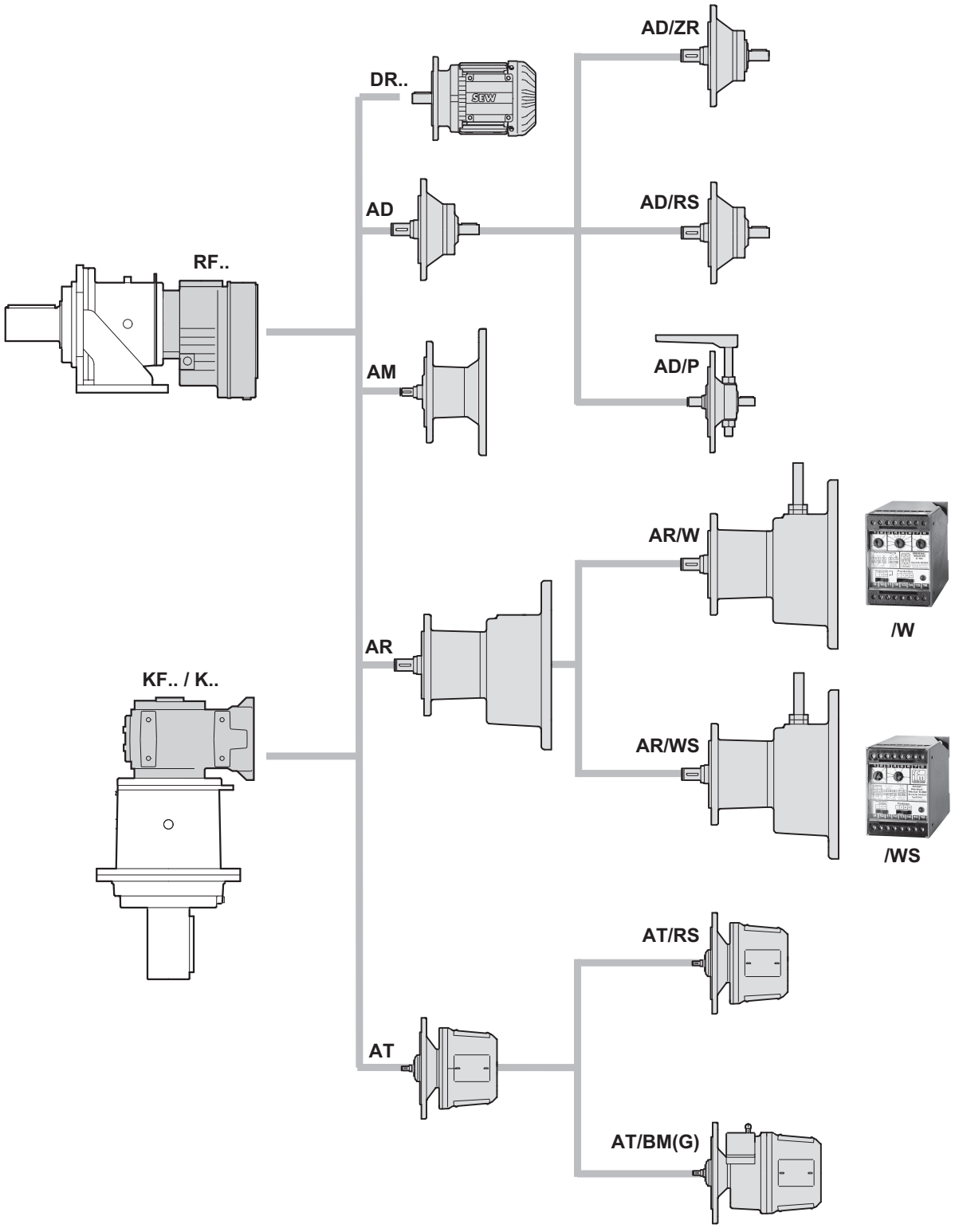
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For information on the available output shaft types, refer to chapter "Output shaft variants" (→ 🗎 20). The mounting design "torque arm" can be combined with the output shaft type "hollow shaft with shrink disk" as standard. Please contact SEW-EURODRIVE for information on deviating combinations.

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2.7.3 Components on the input side

The following figure shows the components on the input side.

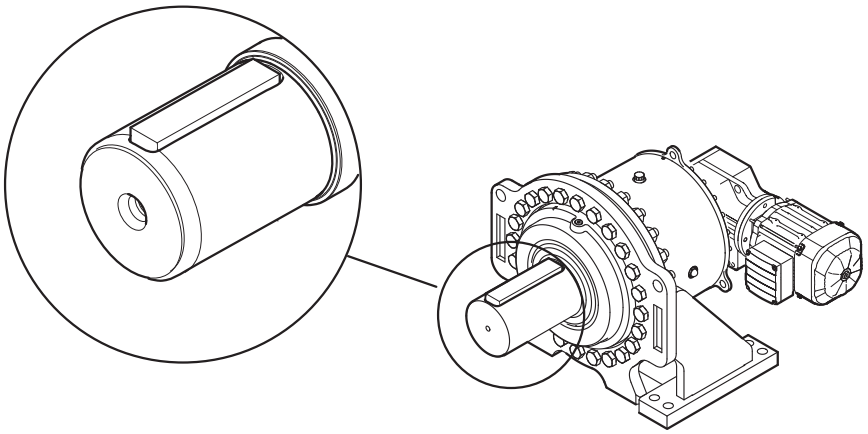


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2.7.4 Output shaft variants

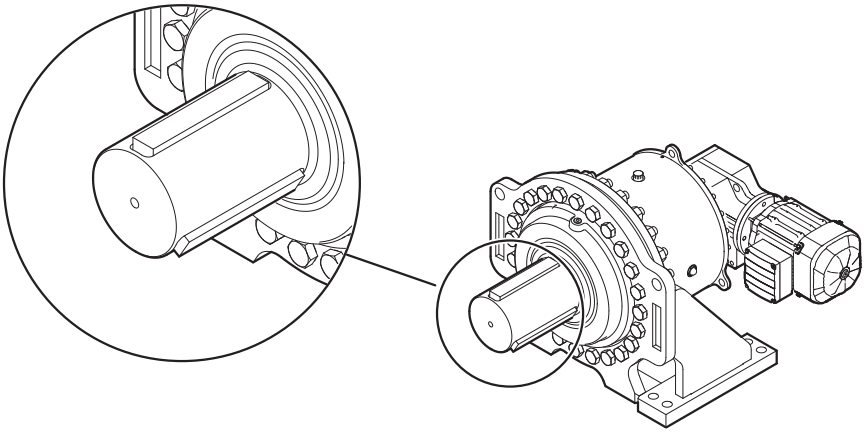
The [LSS] output shaft of the planetary gearmotor can have the following design as standard:

P.. Solid shaft with key



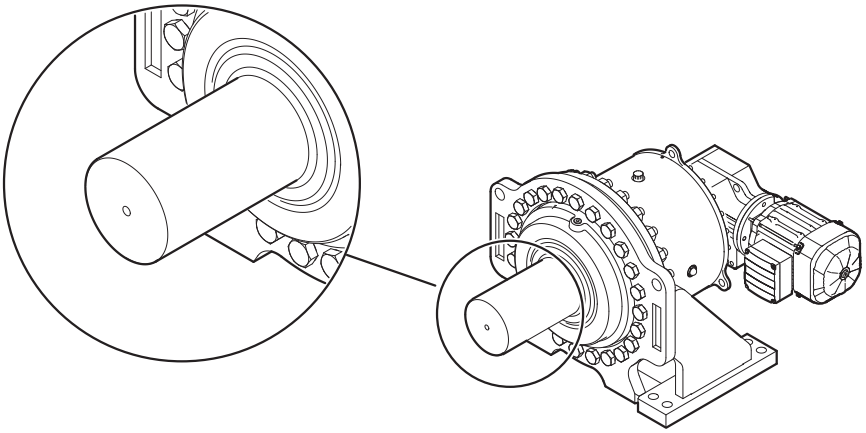
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P.. Solid shaft with 2 keys



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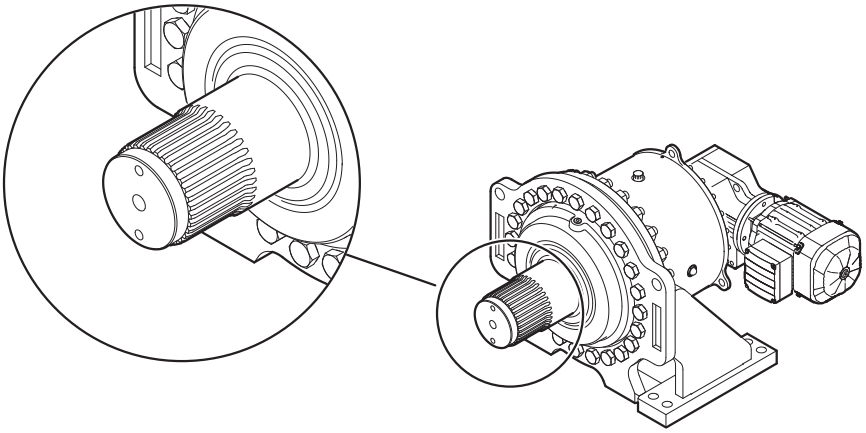
PR.. Smooth solid shaft



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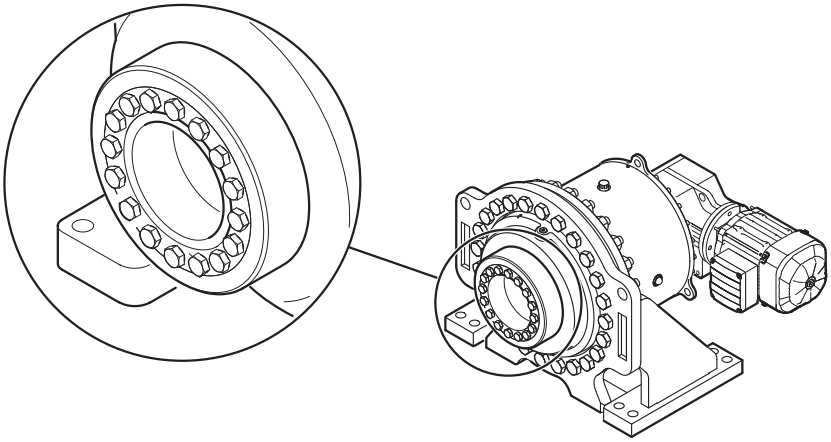
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PL.. Splined solid shaft



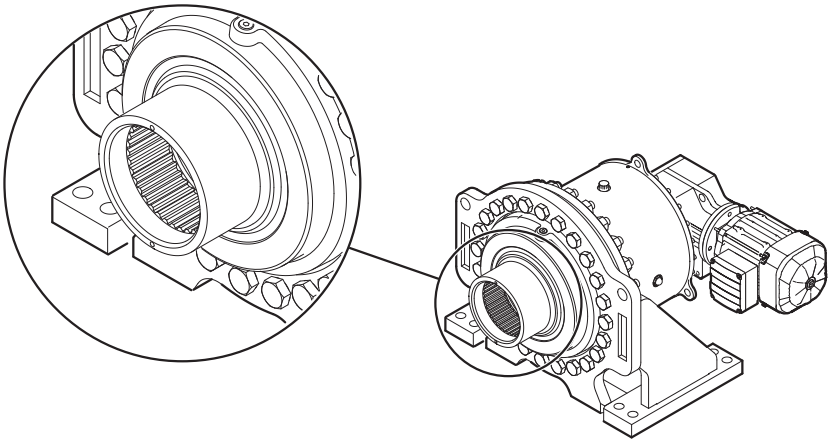
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PH.. Hollow shaft with shrink disk



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PV.. Splined hollow shaft



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2.8 Type designations for gear units and options

2.8.1 P..RF.. helical-planetary gear units

Gear unit design	Abbreviation	Meaning
Foot-mounted design (solid shaft)	**P..RF..**	• Solid shaft with key • Solid shaft with 2 keys (optional)
	PR..RF..	Smooth solid shaft
	PL..RF..	Splined solid shaft
Flange-mounted design (solid shaft)	**PF..RF..**	• Solid shaft with key • Solid shaft with 2 keys (optional)
	PRF..RF..	Smooth solid shaft
	PLF..RF..	Splined solid shaft
Foot-mounted design (hollow shaft)	**PH..RF..**	Hollow shaft with shrink disk
	PV..RF..	Splined hollow shaft
Flange-mounted design (hollow shaft)	**PHF..RF..**	Hollow shaft with shrink disk
	PVF..RF	Splined hollow shaft

2.8.2 P..KF../P..K.. bevel-planetary gear unit

Gear unit design	Abbreviation	Meaning
Foot-mounted design (solid shaft)	**P..KF../ P..K..**	• Solid shaft with key • Solid shaft with 2 keys (optional)
	PR..KF../ PR..K..	Smooth solid shaft
	PL..KF../ PL..K..	Splined solid shaft
Flange-mounted design (solid shaft)	**PF..KF../ PF..K..**	• Solid shaft with key • Solid shaft with 2 keys (optional)
	PRF..KF../ PRF..K..	Smooth solid shaft
	PLF..KF../ PLF..K..	Splined solid shaft
Foot-mounted design (hollow shaft)	**PH..KF../ PH..K..**	Hollow shaft with shrink disk
	PV..KF../ PV..K..	Splined hollow shaft
Flange-mounted design (hollow shaft)	**PHF..KF../ PHF..K..**	Hollow shaft with shrink disk
	PVF..KF../ PVF..K..	Splined hollow shaft

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2.8.3 Additional features of gear units

Designation	
/T	With torque arm

2.8.4 Input shaft assembly

Designation	
AD	Input shaft assembly
.../P	With motor platform
.../RS	With backstop
.../ZR	With centering shoulder

2.8.5 Adapters

Designation	
AM	Adapter for mounting IEC/NEMA motors
AQ	Adapter for mounting servomotors
AT	Adapter with hydraulic start-up coupling
.../RS	And backstop
.../BM(G)	And disk brake
.../HF	With manual brake release, lockable
.../HR	With manual brake release with automatic re-engaging function

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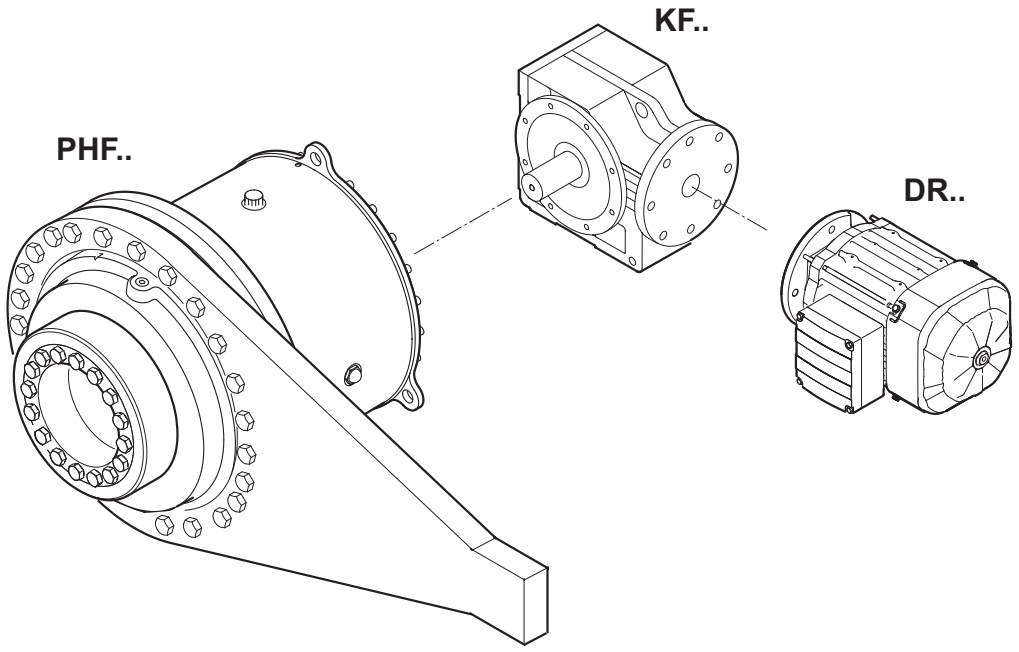
2.9 Type designation

The type designation of the gearmotor starts from the component on the output end.

2.9.1 Example: Type designation for a PHF.. planetary gear unit with KF.. primary gear unit

The type designation of the gear unit is structured as follows:

Example: PHF012/T KF77 DRN112M4		
Planetary gear unit	P	Gear unit type
	H	Hollow shaft
	F	Flange-mounted design
	012	Gear unit size
	/T	Torque arm
Primary gear unit	KF	Series
	77	Gear unit size
Motor	DRN..	Series
	112M4	Size + number of poles



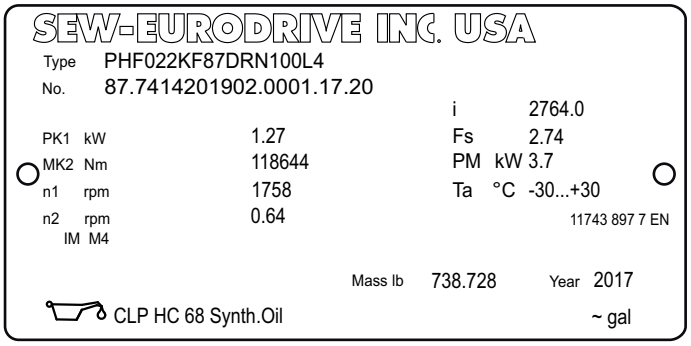
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2.10 Nameplate

2.10.1 Planetary gear units

The following example shows the structure of the nameplate.



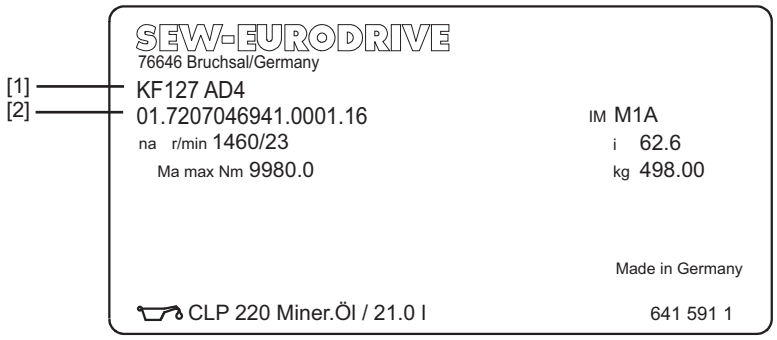
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Type		Type designation
No.		Production number
PK1	kW	Operating power on the input shaft (HSS)
MK2	Nm	Gear unit output torque
n1	min^{-1}	Input speed (HSS)
n2	min^{-1}	Output speed (LSS)
Min.		Operating point at minimum speed
Standard		Normal operating point
Max.		Operating point at maximum speed
i		Exact gear unit ratio
Fs		Service factor
PM	kW	Nominal motor power
Ta	°C	Deviation from standard temperature range (−20 °C – +40 °C)
Mass	lb	Gear unit weight
Greasing points		Number of regreasing points
		Oil grade and viscosity class/approx. oil quantity
Year		Year of manufacture
IM		Mounting position and mounting surface

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2.10.2 KF.. primary gear units

The following example shows the structure of the nameplate.



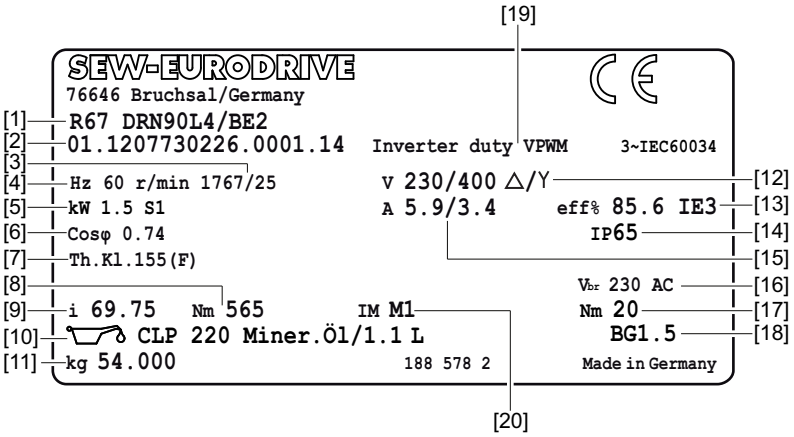
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Type		Type designation
[1]		Type designation
[2]		Serial number of primary gear unit
Pe	kW	Input power of the gear unit
Ma max	Nm	Output speed
na	rpm	Input/output speed
IM		Mounting position
i		Gear ratio
kg	kg	Weight

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2.10.3 Primary gearmotor

The following figure shows an example of the nameplate of a DRN.. gearmotor.



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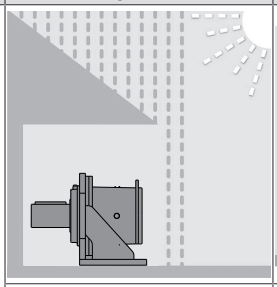
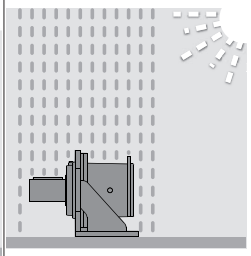
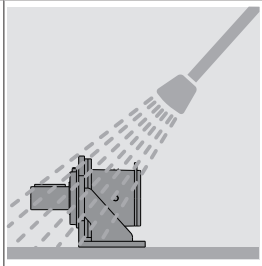
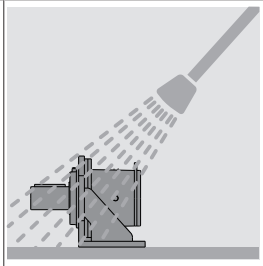
[1]		Type designation gearmotor
[2]		Serial number
[3]	min^{-1}	Rated speed of the motor / speed of the gear unit output shaft
[4]	Hz	Nominal frequency
[5]	kW	Rated power/operating mode
[6]		Power factor
[7]		Thermal class
[8]	Nm	Output torque
[9]		Gear unit ratio
[10]		Oil type and oil fill volume
[11]	kg	Weight
[12]	V	Nominal voltage
[13]		Efficiency and energy efficiency class
[14]		Degree of protection according to IEC 60034-5
[15]		Rated current
[16]	V	Brake voltage
[17]	Nm	Nominal braking torque
[18]		Brake control
[19]		Suitability for inverter operation
[20]		Mounting position

2.11 Corrosion and surface protection

2.11.1 OS surface protection

Gear units are available with surface protection OS1, OS2, OS3, and OS4.

The following table provides an overview of coating and surface protection systems.

SEW-EURODRIVE design	OS1 Low environmental impact	OS2 Medium environmental impact	OS3 High environmental impact	OS4 High environmental impact
Used as surface protection with typical ambient conditions Corrosivity categories DIN EN ISO 12944-2				
	Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as outdoor applications under roof or with protection, unheated buildings where condensation can build up: According to corrosivity category: C2 (low)	Suited for environments with high humidity or moderate atmospheric contamination, such as applications outdoors subject to direct weathering. According to corrosivity category: C3 (moderate)	Suitable for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasionally acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. According to corrosivity category: C4 (high)	Suitable for environments with permanent humidity or severe atmospheric or chemical contamination. Regular acidic and caustic wet cleaning, also with chemical cleaning agents. According to corrosivity category: C5 (very high)
Sample applications	• Systems in saw mills • Agitators and mixers	• Applications in gravel plants • Cableways	• Port cranes • Sewage treatment plants • Mining applications	• Drives in malting plants • Wet areas in the beverage industry • Conveyor belts in the food industry
Condensation test ISO 6270	120 h	120 h	240 h	360 h
Salt spray test ISO 7253	–	240 h	480 h	600 h
Top coat color[1)]	RAL 7031	RAL 7031	RAL 7031	RAL 7031
Color according to RAL	Yes	Yes	Yes	Yes
Uncoated parts shaft end/flanges	Water and hand perspiration repelling anticorrosion agent applied at the factory for external preservation			

1) Standard color, can deviate depending on the order, see order documents.

INFORMATION

Sheet metal parts (e.g. protection covers) are painted in RAL 1003.

Special surface protection is also available, please contact SEW-EURODRIVE.

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2.12 Storage and transport conditions

The gear units can be provided with the following protection and packaging types depending on the storage and transport conditions.

2.12.1 Internal conservation

Standard corrosion protection

After the test run of the gear unit at the factory, the gear unit is protected against corrosion for a limited time.

Long-term corrosion protection

After the test run of the gear unit at the factory, a phase inhibitor is filled into the gear unit to protect it against corrosion for a limited time. The breather filter is replaced by a screw plug and enclosed with the gear unit.

2.12.2 Exterior corrosion protection

The following measures are taken for exterior corrosion protection:

- Anti-corrosion agent is applied to bare, non-painted functional surfaces of shafts, flanges, mounting and foot surfaces of the housing. The anti-corrosion agent must be removed with a suitable solvent that does not damage the oil seal.
- Small spare parts and loose pieces, such as bolts, nuts, etc., are packed in corrosion protection plastic bags (VCI corrosion protection bags).
- Threaded holes and blind holes are covered by plastic plugs.
- If the gear unit is stored longer than 6 months, regularly check the protective coating of unpainted areas as well as the paint coating. Areas in which the protective coating and/or painting has been damaged may have to be repainted.

2.12.3 Packaging

Standard packaging

The gear unit is delivered on a pallet, securely attached and without cover.

Use: Land transport

Long-term packaging

The gear unit is delivered in a wooden box that is also appropriate for sea transport.

Use: Sea transport and/or for extended storage

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2.12.4 Storage conditions

NOTICE

Improper storage may result in damages to the gear unit.

Possible damage to property.

- During storage up to startup, the gear unit must be stored in a shock-free manner to prevent damage to the rolling bearing raceways.
- The output shaft must be rotated at least one full rotation every 6 months so that the position of the rolling elements in the bearings of the input and output shafts changes.

INFORMATION

The gear units are delivered without oil as standard; different protection systems are required depending on the storage period and storage conditions as shown in the following table.

Corrosion protection + packaging	Storage location	Storage duration
Standard corrosion protection + Standard packaging	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks.	Max. 6 months with intact surface protection.
Long-term corrosion protection + Standard packaging	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation of the storage location with filter (free from dust and dirt). No aggressive vapors, no shocks.	Max. 3 years with regular inspection and checking for intactness.
Long-term corrosion protection + Long-term packaging	With roof, protected against rain and shocks.	Max. 3 years with regular inspection and checking for intactness.

INFORMATION

If stored in tropical zones, provide for sufficient protection against insect damage. Contact SEW-EURODRIVE for differing requirements.

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2.13 DR.. series primary gearmotors

The motors of the DR.. series comply with all international standards and meet the new requirements of the IEC motor standard already today.

The following table describes the energy-efficient motor IE3. If required, the planetary gear unit can also be combined with other energy-efficient motors (IE1, IE2).

IE3 motor standard: Premium Efficiency
• Extremely high levels of efficiency
• **DRN..**-type AC motors (energy-efficient motors)
• Aluminum die-cast rotor cage

Observe the following information:

INFORMATION

- As the auxiliary drive is typically not used for continuous duty, the motor is stamped with S2 cyclic duration factor according to the intended use. This means that an IE1 motor can also be used in countries where an IE1 motor in S1 operation is no longer permitted due to efficiency regulations. Please contact SEW-EURODRIVE in such cases.
- The SEW website (www.sew-eurodrive.com) provides further information regarding the DR.. motor series. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.
- The DRN.. motor combinations with the planetary gear unit are listed in the selection tables, see chapter "P.RF.." (→ 🗎 101)." Helical planetary gearmotors" (→ 🗎 101) and "P.KF.. Bevel planetary gearmotors" (→ 🗎 201).
- For dimensions for the DRN.. motor series, refer to the dimension sheets, see chapters Dimension sheets [mm] and Dimension sheets [mm].

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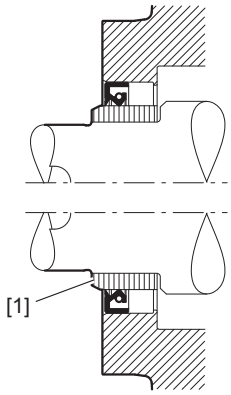
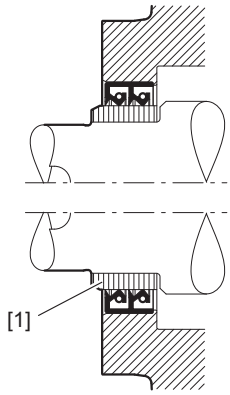
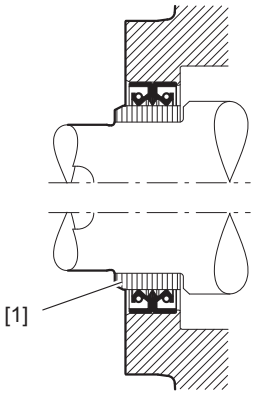
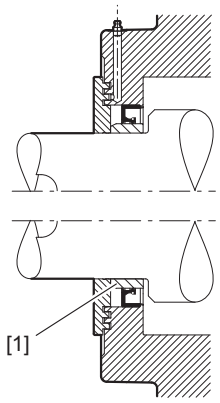
2.14 Output sealing system

As standard, radial oil seals according to DIN 3770 with AS shape (with dust lip) are used in planetary gearmotors.

If high demands are placed on the sealing system, e.g. high dust load with abrasive particles at the place of operation, a labyrinth seal is used to protect the radial oil seal.

In this sealing variant, only one radial oil seal is used irrespective of the mounting position. The grease-filled labyrinth protects the oil seal from dirt.

The following tables show the standard input sealing system for horizontal and vertical mounting positions.

Standard for mounting positions M1/M3/M5/M6	**Standard for mounting position M4 (Optional for mounting positions M1/M3/M5/M6)**	**Standard for mounting position M2 (Optional for mounting positions M1/M3/M5/M6)**	**Radial labyrinth seal** **Regreasable for mounting positions M1/M2/ M3/M4/M5/M6**
Single oil seal, inside sealing with dust protection lip on a hardened sleeve [1]	2 oil seals, inside sealing on a hardened sleeve [1]	1 oil seal, inside sealing, and 1 oil seal, outside sealing, on a hardened sleeve [1]	Single oil seal with radial labyrinth seal on a hardened sleeve [1]
• Normal environment	• **Medium** dust load with abrasive particles	• **High** dust load with abrasive particles and splash water load	• **Very high** dust load with abrasive particles
			

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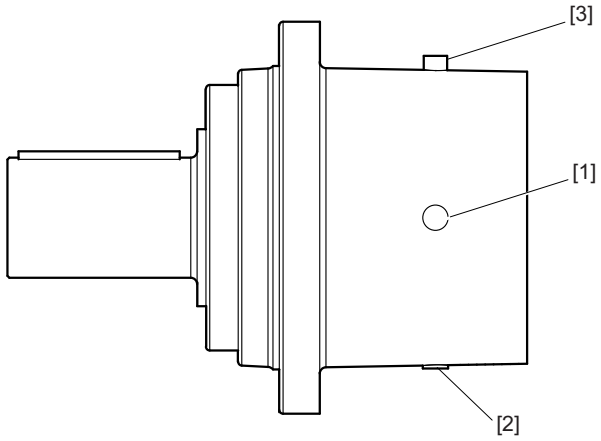
2.15 Lubrication types

There are two lubrication types that are described on the following pages.

- **Splash lubrication** for gear units in horizontal mounting positions (M1/M3/M5/M6)
- **Oil bath lubrication** for gear units in vertical mounting positions (M2/M4)

2.15.1 Splash lubrication for horizontal mounting positions (M1/M3/M5/M6):

The gear unit is half filled with oil. Gearing and bearing parts that are not immersed in the oil bath are lubricated by splashing oil. The oil level is checked at the oil sight glass [1] on the housing gear rim. Oil is filled in via the breather valve [3].



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[1] Oil sight glass
[2] Oil drain plug
[3] Breather valve

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2.15.2 Oil drain valve option for horizontal mounting positions (M1/M3/M5/M6)

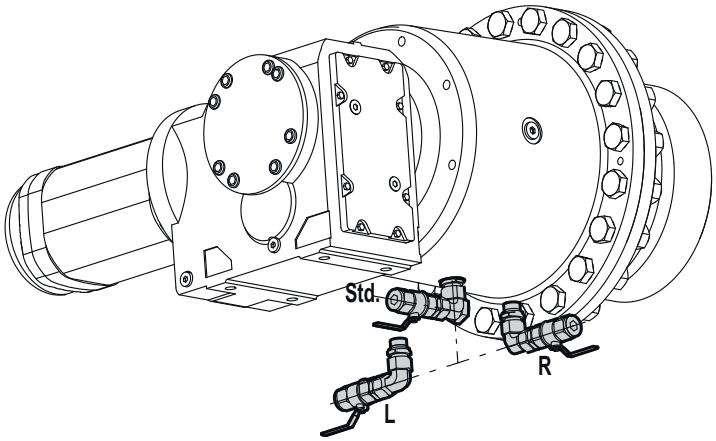
In addition to the standard oil drain plug, SEW-EURODRIVE offers the oil drain valve option. Observe the variants that are described below.

INFORMATION

For some small foot-mounted gear unit sizes, the installation of an oil drain valve is not possible, or is only possible with restrictions due to limited space. Please contact SEW-EURODRIVE.

Position of the oil drain valve

The following figure shows the installation options of the oil drain valve.

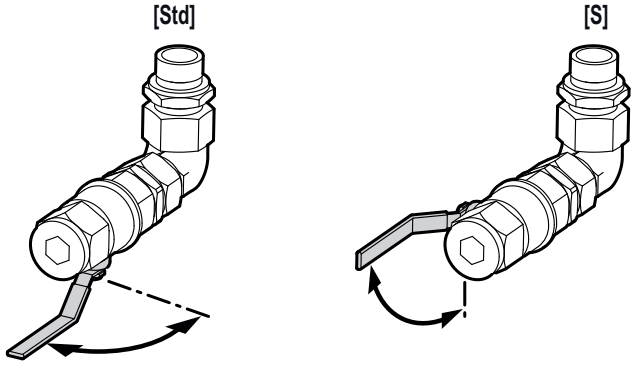


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Std = Standard
R = Right
L = Left

Position of the lever

The following figure shows the possible positions of the lever.



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Std = Standard
S = On the side

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2.15.3 Oil bath lubrication for vertical mounting positions (M2/M4)

The gear unit is (almost completely) filled with oil. All tooth engagement or bearing points are immersed in the oil bath completely or partly.

INFORMATION

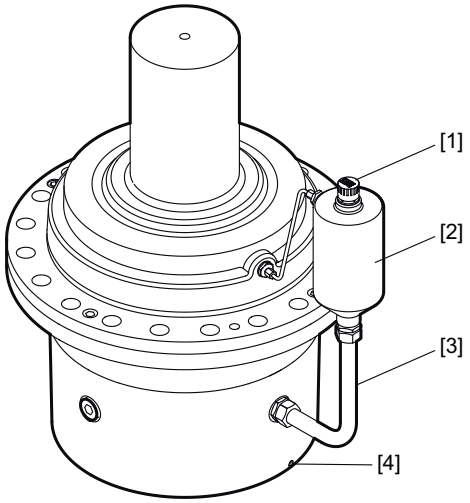
- Any deviations from the standard mounting positions, standard temperature ranges or standard primary gear units must be clarified with SEW-EURODRIVE first.
- If there is little space available for installing the oil expansion tank (M2 mounting position) or the oil riser pipes (M4 mounting positions), you can request an order-specific dimension drawing from SEW-EURODRIVE.
- See chapters 10.4/10.5 and 11.4/11.5 for detailed dimensions of the oil expansion tank/oil riser pipe.

Mounting position M2

Gear units with oil expansion tank have the following characteristics:

- The oil expansion tank [2] serves as volume compensation.
- The oil level is checked by means of a combined oil dipstick with breather valve [1].
- Oil is filled in via the oil expansion tank.

Sizes **P.002 - P.082**:

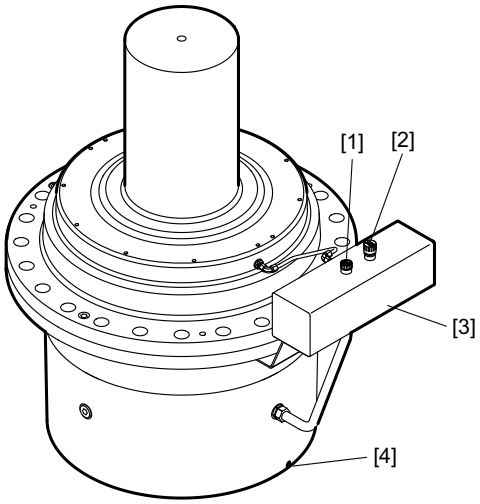


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[1] Oil dipstick with breather plug
[2] Oil expansion tank
[3] Riser pipe
[4] Oil drain plug

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Sizes **P.092 - P.102**:



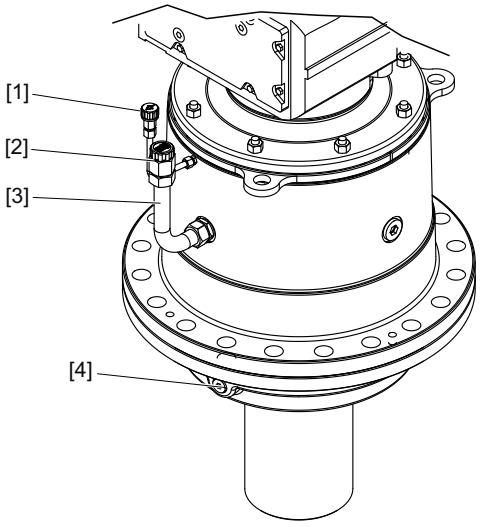
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[1] Oil dipstick
[2] Breather plug
[3] Oil expansion tank
[4] Oil drain plug

Mounting position M4

Gear units without oil expansion tank have the following characteristics:

- The oil level is checked with an oil dipstick [2].
- A separate breather valve [1] is used.
- Oil is filled in via the riser pipe [3].



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[1] Breather valve
[2] Oil dipstick
[3] Riser pipe
[4] Oil drain plug

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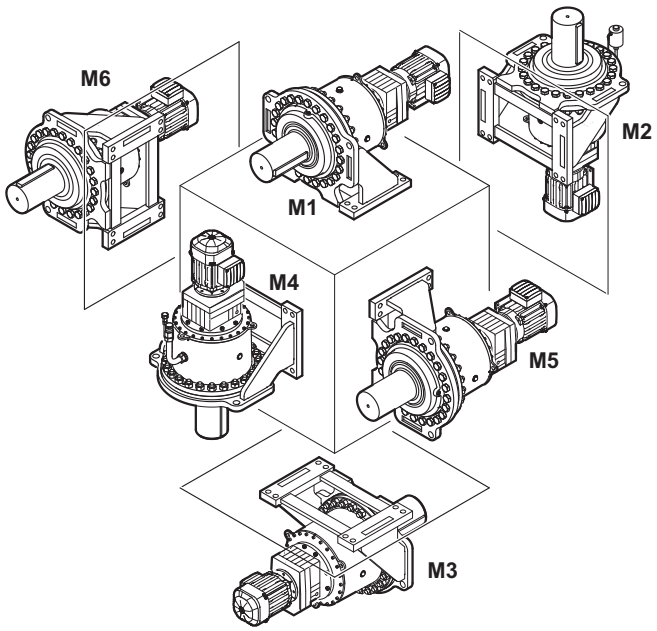
3 Mounting positions

3.1 Standard mounting position

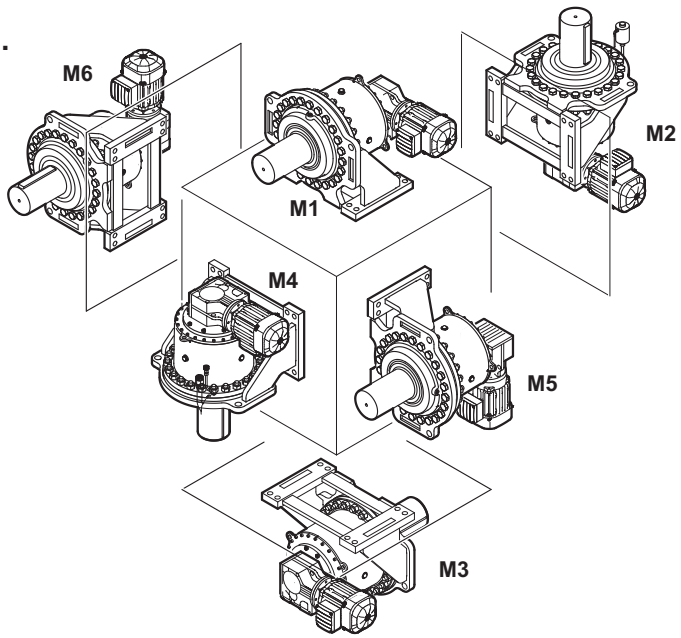
The mounting position defines the spatial orientation of the gear unit housing and is designated **M1...M6**. The mounting positions apply to planetary gear units with solid shafts and hollow shafts.

For mounting position M2, an oil expansion tank is necessary. Mounting position M4 requires a riser pipe. For dimensions, refer to the dimension sheets in chapters 10.3 and 11.3.

P..RF..



P..KF..



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3.2 Pivoted mounting position: Fixed and variable mounting positions

Mounting positions deviating from the standard are distinguished as **fixed** or **variable** pivoted mounting position.

Gear units with fixed pivoted mounting position have a fixed mounting position that differs from the standard. This means the gear unit does not change its mounting position during operation.

Gear units with variable pivoted mounting position can change the mounting position **variably** during operation within the specified max./min. range.

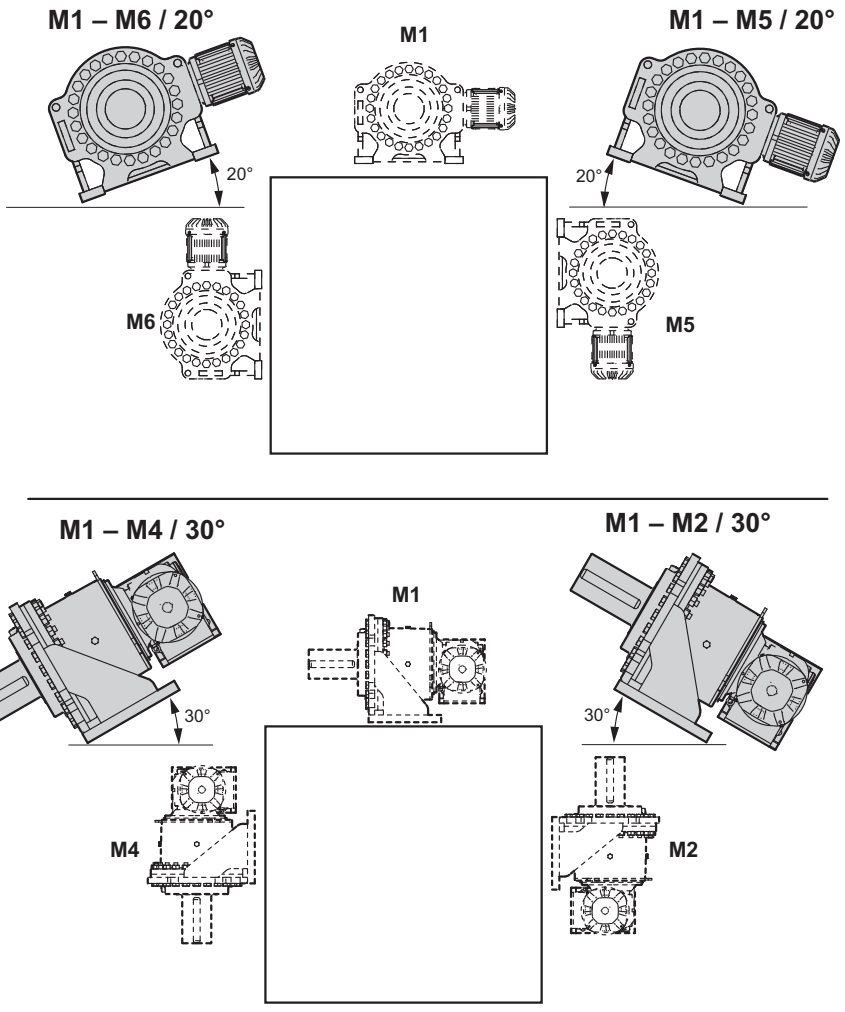
The designation of pivoted and variable mounting positions is set up as follows:

M1 - M2/20°/V
[1] [2] [3] [4]

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[1]	Initial mounting position	[3]	Pivoting angle
[2]	Required mounting position	[4]	F = Fixed final position; V = Variable final position

The following figure shows examples:



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All final positions have to be specified if the mounting position of the gear unit deviates from standard mounting positions in several directions. Fixed and variable final positions can be combined.

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Example of a gear unit based on mounting position M1 that is tilted by ±20° around the output shaft during operation and is mounted in a fixed angle of 30° around the longitudinal axis:

M1 - M2/20°/V - M4/20°/V - M5/30°/F

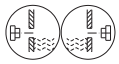
INFORMATION

Pivoted mounting positions may involve restrictions for accessories and technical data and possibly longer delivery times. Contact SEW-EURODRIVE.

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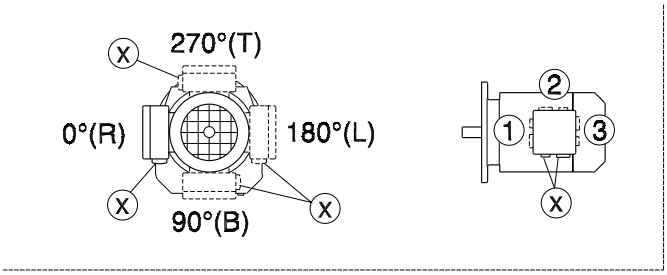
3.3 Mounting position sheets

The following table shows the icons used in the mounting position sheets and their meaning:

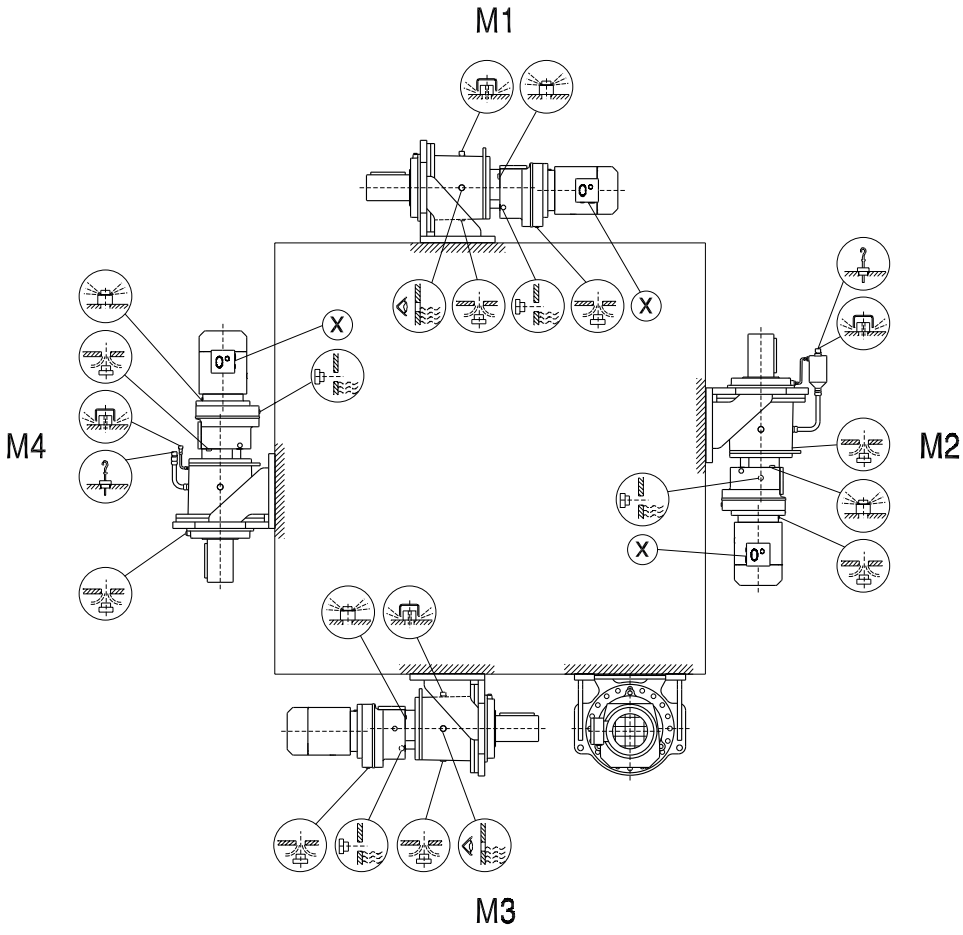
Icon	Meaning
	Breather plug
	Oil level plug
	Oil drain plug
	Breather
	Oil dipstick
	Oil sight glass

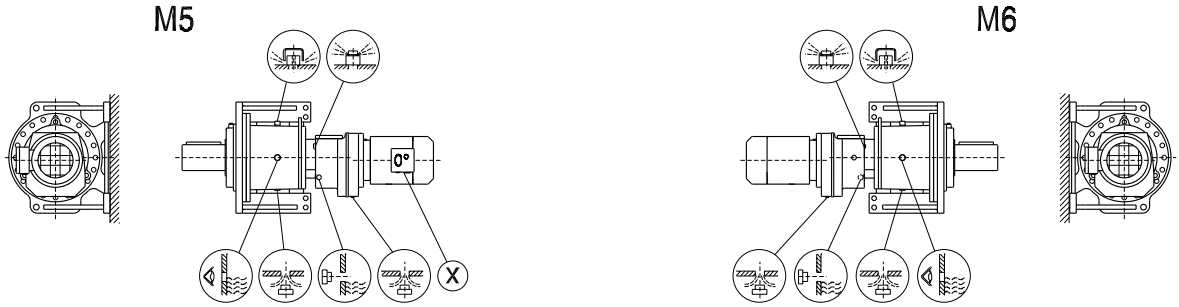
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3.3.1 P..RF..



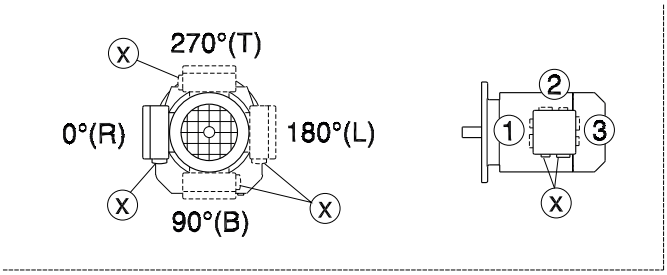
45 129 00 08



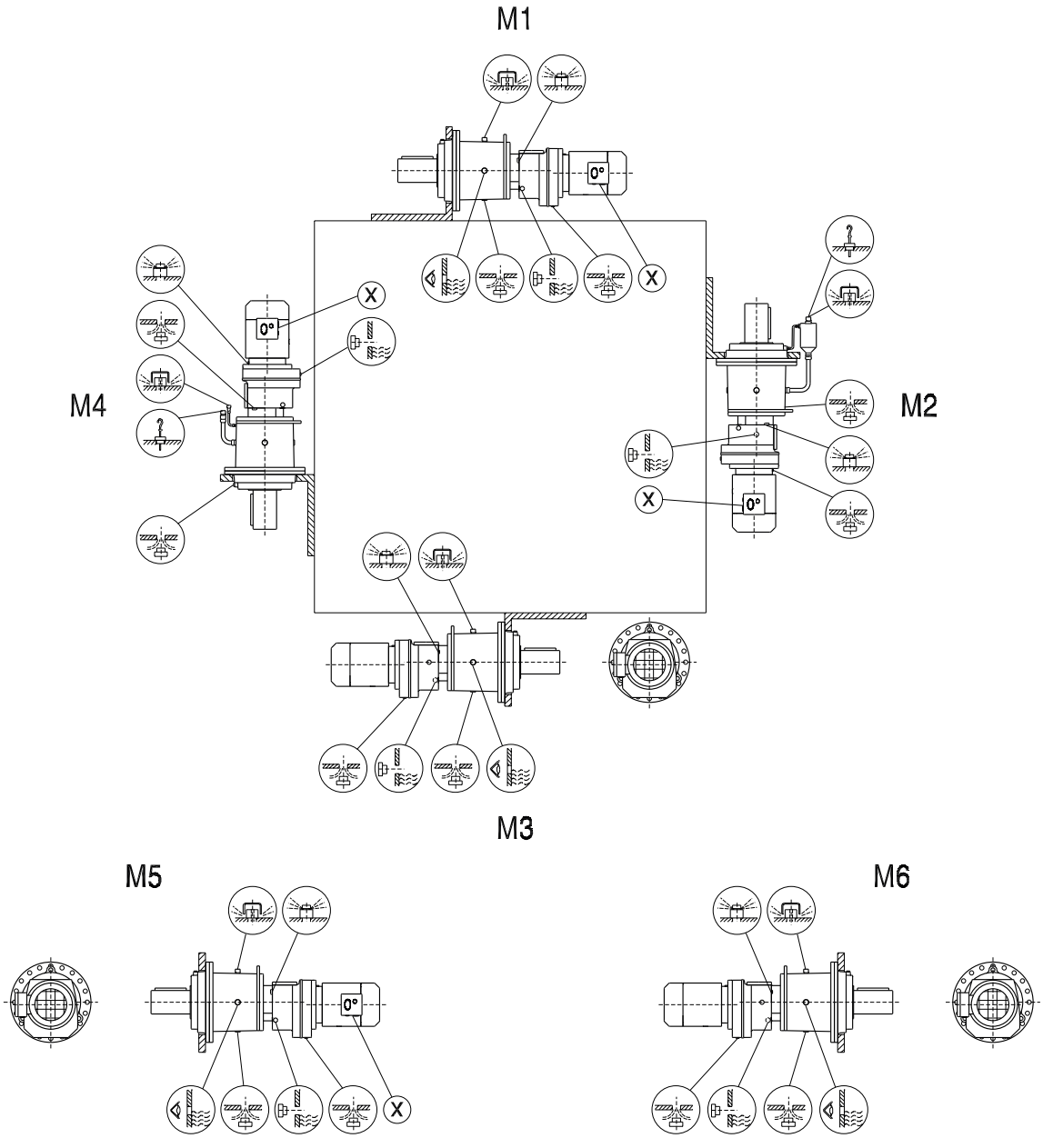


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3.3.2 PF..RF..

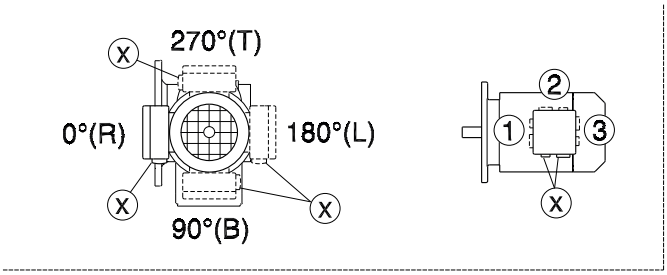


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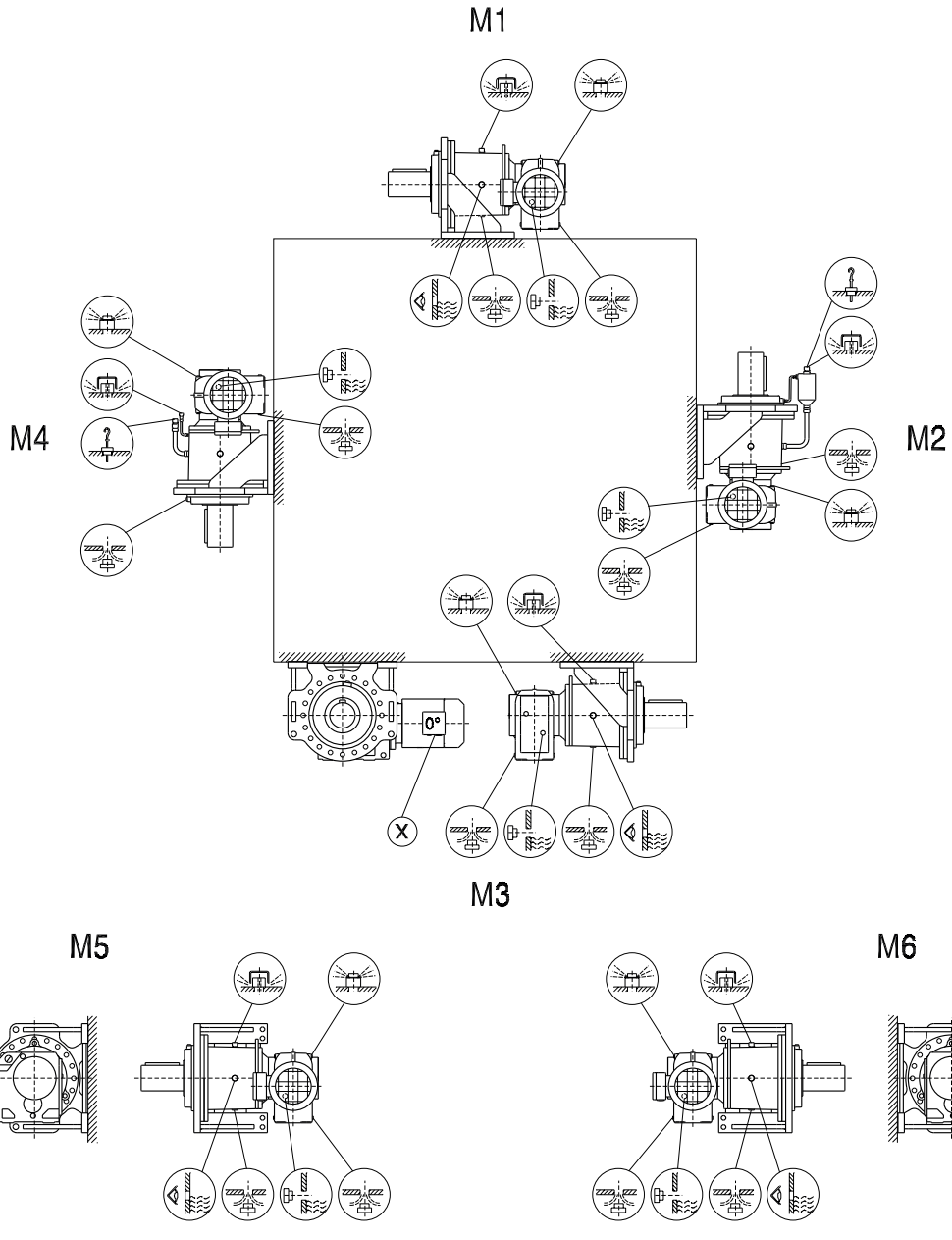


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3.3.3 P..KF../K..

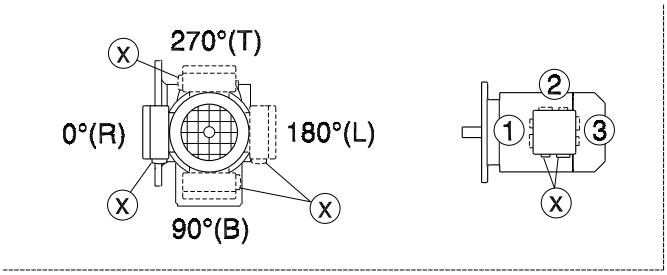


45 131 00 08

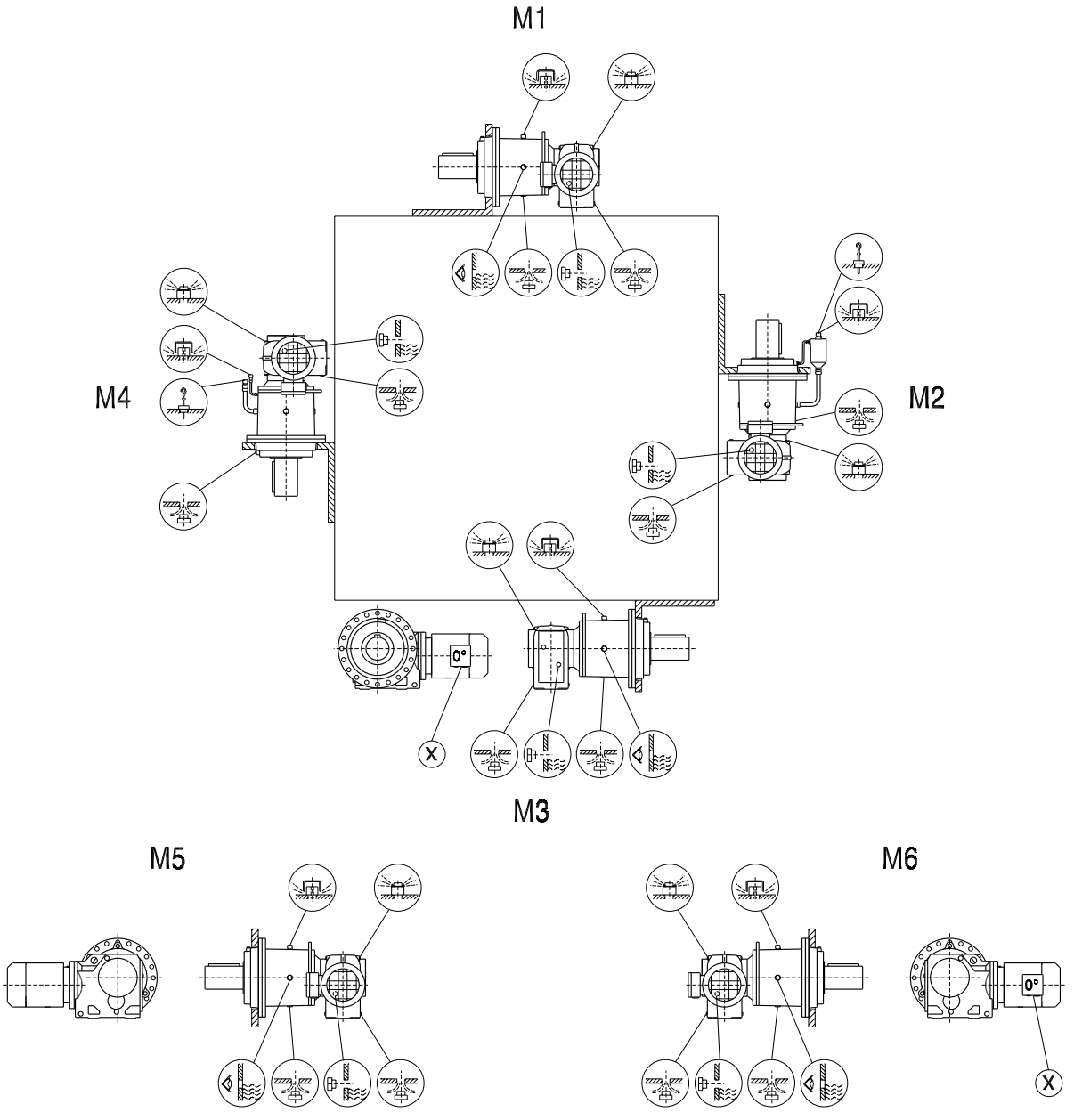


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3.3.4 PF.KF../K..



45 132 00 08



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4 Important order information

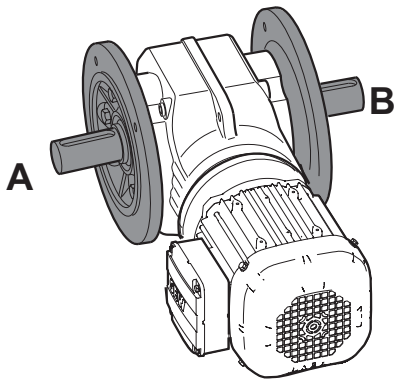
4.1 For all gearmotors

The following order information is required for planetary gearmotors in addition to the mounting position for an accurate configuration of the drive.

4.2 Mounting positions of KF.. bevel-helical primary gear units

For the primary bevel gear units KF.., the positions **0°**, **90°**, **180°** or **270°** must be defined.

Also define the position of the mounting flange on the **A** or **B** side.



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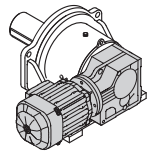
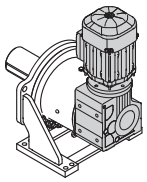
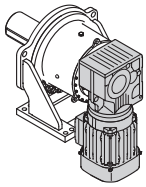
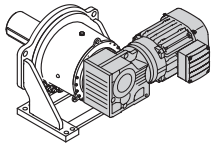
To reduce the churning losses in the primary gear unit to a minimum, SEW-EURODRIVE recommends that you choose one of the standard mounting positions shown below.

INFORMATION

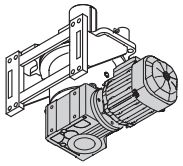
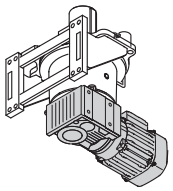
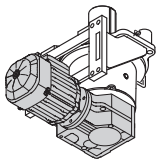
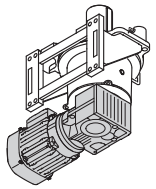
Contact SEW-EURODRIVE in case of deviating mounting conditions.

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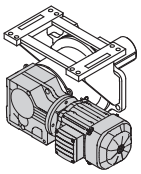
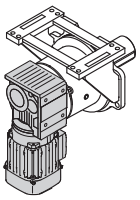
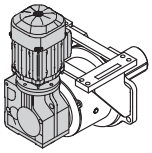
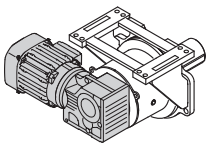
M1

0° A	270° A
	
90° A	**180° B**
	

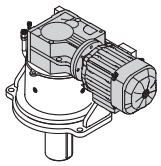
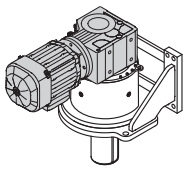
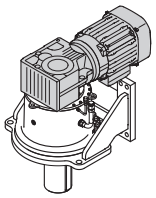
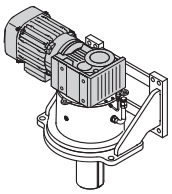
M2

0° A	270° A
	
90° A	**180° A**
	

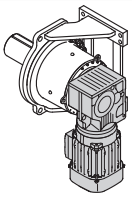
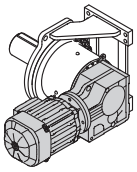
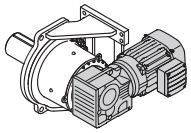
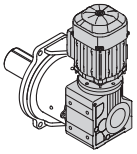
M3

0° B	270° A
	
90° A	**180° A**
	

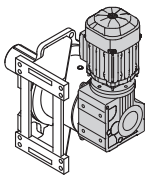
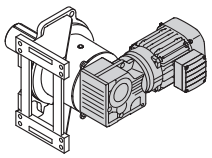
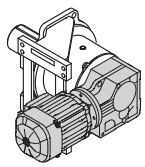
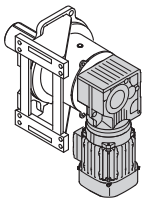
M4 [1)]

0° A	270° A
	
90° A	**180° A**
	

M5

0° A	270° A
	
90° B	**180° A**
	

M6

0° A	270° B
	
90° A	**180° A**
	

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M1 to M6 = Mounting positions of planetary gear units
0° to 270° = Mounting positions of primary bevel gear units
A/B = Position of the mounting flange at the KF.. primary gear unit
1) Example position; the position of the piping deviates from the figure.

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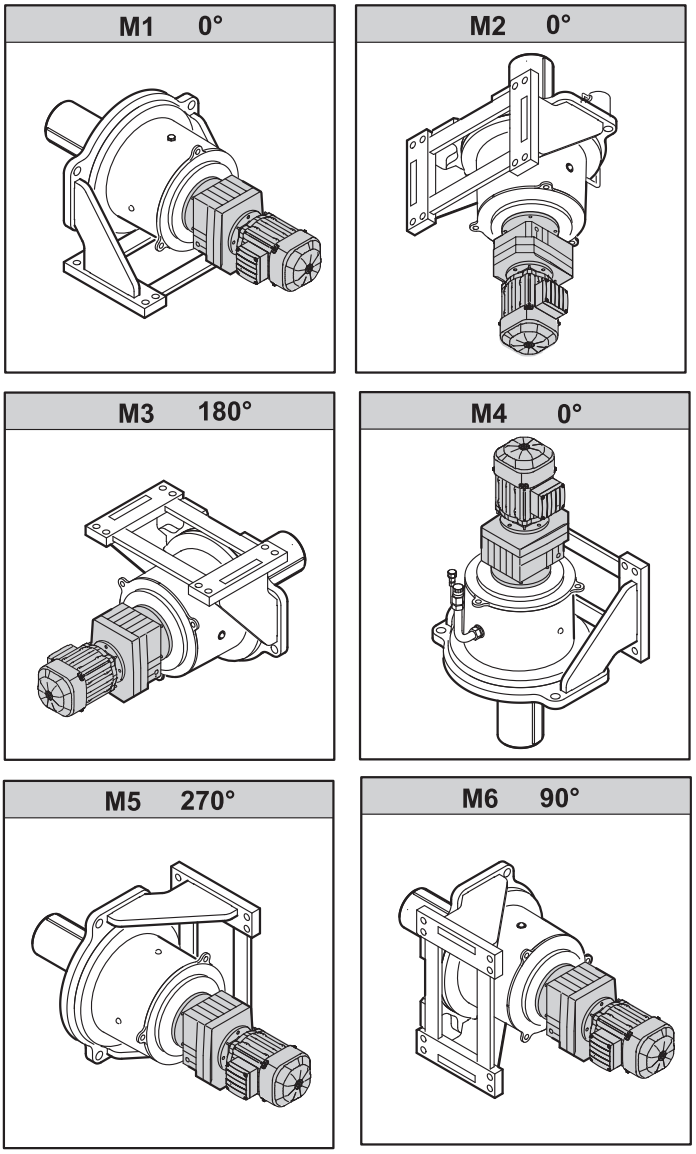
4.3 Mounting positions of RF.. primary helical gear units

For the primary helical gear units RF.., the position **0°**, **90°**, **180°** or **270°** must be defined.

To reduce the churning losses in the primary gear unit to a minimum, SEW-EURODRIVE recommends that you choose one of the standard mounting positions shown below.

INFORMATION

Contact SEW-EURODRIVE in case of deviating mounting conditions.



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M1 to M6 = Mounting positions of planetary gear units
0° to 270° = Mounting position of primary helical gear unit

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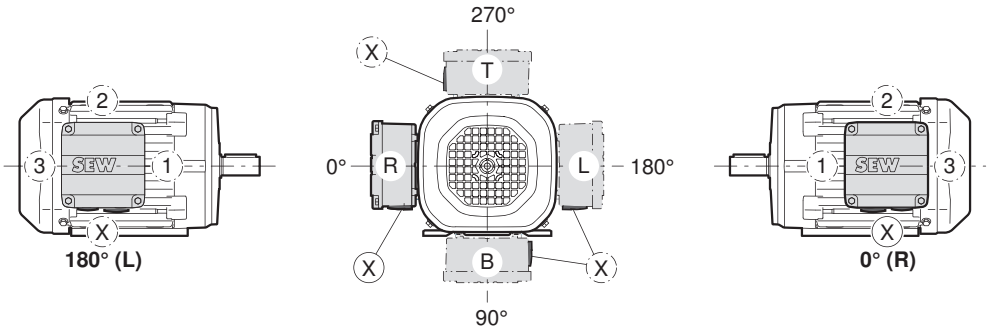
4.4 Position of motor terminal box and cable entry

The position of the motor terminal box has so far been indicated with 0°, 90°, 180° or 270° as viewed onto the fan guard (see figure below). A change in the product standard EN 60034 specifies that the following designations will have to be used for terminal box positions for foot-mounted motors in the future:

- As viewed onto the output shaft = A-end
- Designation as R (right), B (bottom), L (left) and T (top)

This new designation applies to foot-mounted motors without a gear unit in mounting position B3 (= M1). For gearmotors, the previous designation is retained. The following figure shows both designations. If the mounting position of the motor changes, R, B, L and T are rotated accordingly.

The position of the cable entry can be selected as well. Available positions are "X" (= standard position), "1", "2" or "3" (see the following figure).



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Unless other information is given regarding the terminal box, the 0° type (R) with "X" cable entry will be supplied.

INFORMATION

When the terminal box is in the 90° (B) position, check to see if the planetary gearmotor has to be supported.

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4.5 Torque arm

The torque arm can be enclosed in the delivery or can be mounted according to customer requirements.

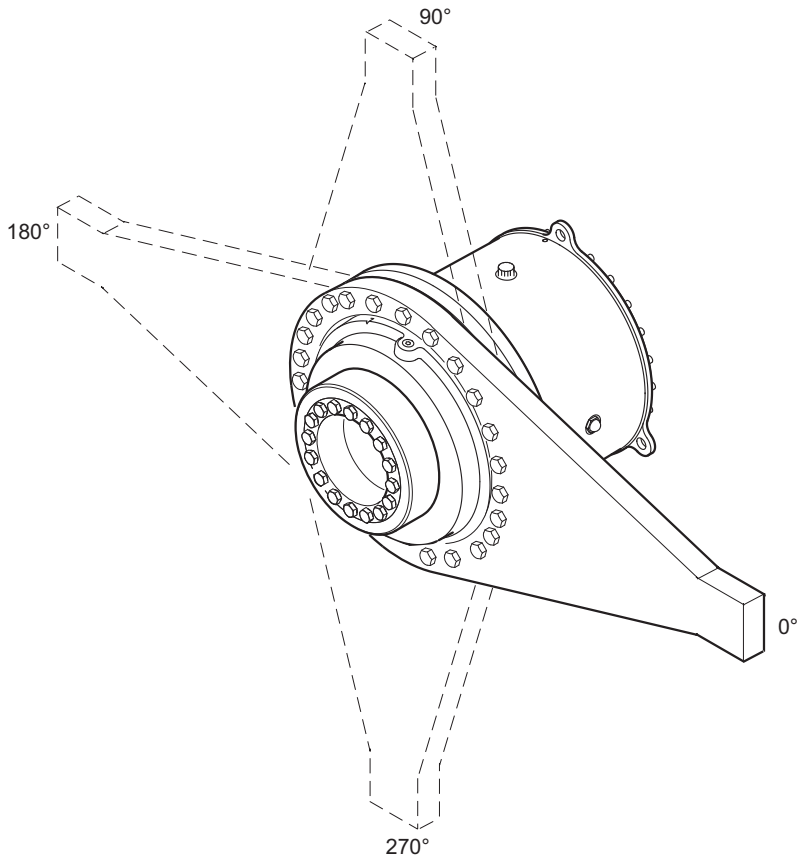
The retaining screws are included in the delivery.

The position of the torque arm is determined as looking onto the output shaft (mounting position **0°, 90°, 180°, 270°**).

INFORMATION

Different mounting positions are possible depending on the angle division (number of retaining screws).

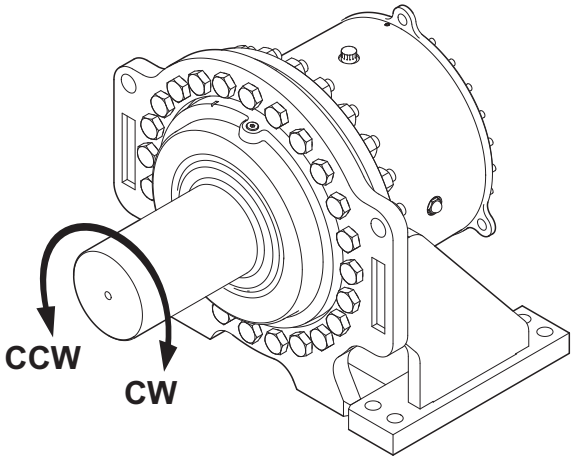
The following figure shows an example of the mounting position of the torque arm.



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4.6 Output direction of rotation with backstop

With planetary gear units, specify the required direction of rotation of the output shaft. The direction of rotation is specified as viewed onto the output shaft.



6301005579

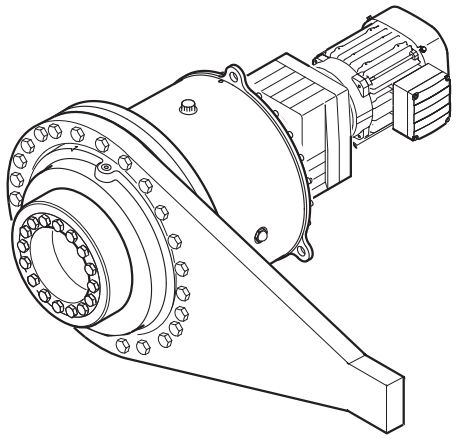
As viewed at the output shaft: Clockwise rotation **(CW)** = Rotating clockwise
Counterclockwise rotation **(CCW)** = Rotating counterclockwise

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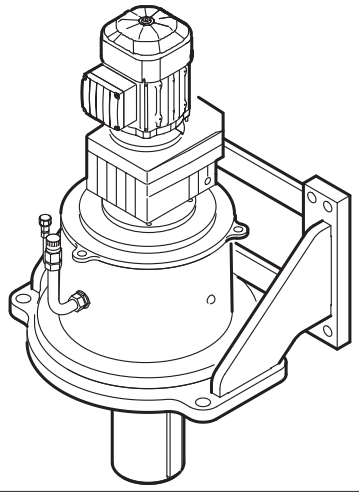
4.7 Sample orders

The following order examples show a combination of a planetary gear unit, a primary gear unit and a motor.

Type	Mounting position of planetary gear unit	Mounting position					Additional feature
		Primary gear unit	Mounting flange	Terminal box	Cable entry	Torque arm	
PHF042/T RF107DRN100L4	M1	0°	-	0°	X	0°	LSS labyrinth seal

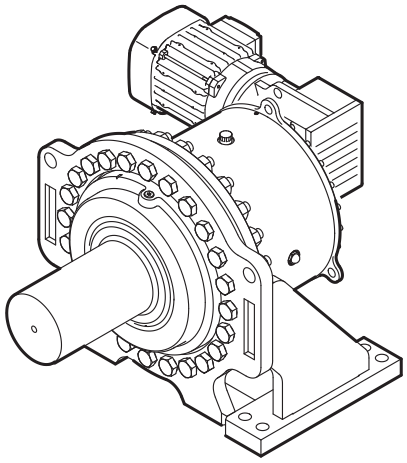


Type	Mounting position of planetary gear unit	Mounting position					Additional feature
		Primary gear unit	Mounting flange	Terminal box	Cable entry	Torque arm	
P032 RF97DRN100L4	M4	0°	–	270°	X		



Type	Mounting position of planetary gear unit	Mounting position					Additional feature
		Primary gear unit	Mounting flange	Terminal box	Cable entry	Torque arm	
P082 KF157DRN180M4	M1	180°	B	180°	X		

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Type	Mounting position of planetary gear unit	Mounting position					Additional feature
		Primary gear unit	Mounting flange	Terminal box	Cable entry	Torque arm	
							

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5 Project planning for gear units

5.1 Additional documentation

In addition to the information in this catalog, SEW-EURODRIVE offers extensive documentation covering the entire topic of electrical drive engineering. This is primarily documentation from the "Drive Engineering – Practical Implementation" series. You can order the latest documentation from SEW-EURODRIVE. The documentation can also be downloaded in PDF format from the SEW-EURODRIVE homepage (http://www.sew-eurodrive.de).

5.1.1 Drive Engineering – Practical Implementation

The publication "Drive Engineering – Practical Implementation – Drive Arrangements with SEW-EURODRIVE Gearmotors" features extensive information on characteristics, different features and application areas of SEW-EURODRIVE drives. A comprehensive collection and assignment of the most important formulae for drive calculation as well as detailed examples for the most frequently used applications make this documentation an important tool for project planning and an essential addition to SEW-EURODRIVE product catalogs.

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5.2 Project planning procedure

INFORMATION

For gear units in explosion-proof design only a gear unit project planning with infinite fatigue strength is possible.

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5.2.1 Step 1: Drive selection data

1.0 Machine on LSS (normally the driven machine)

Key: [...] = fill in values
[X] = make your selections by ☒

1.1 Field of application/industry [...]

1.2 Application [...]

1.3 Ambient temperature [°C] [...]

normal | min. | max.

1.4 Altitude [m] [...]

1.5 Installation [X]

☐ small rooms ($v_a \geq 0.5$ m/s)
☐ large rooms and halls ($v_a \geq 1.4$ m/s)
☐ outdoors with protection from the sun ($v_a \geq 3$ m/s)

1.6 Ambient conditions [X]

☐ normal ☐ corrosive
☐ dusty ☐ dry
☐ moist

2.0 Load characteristics

2.1 Required speed n_2 [min^{-1}] [...]

normal | min. | max.

2.2 Operating power on HSS P_{K1} [kW] [...]

normal | min. | max.

2.3 Operating torque on LSS M_{K2} [Nm] [...]

normal | min. | max.

2.4 Frequency of peak load ($M_{K2\ max.}$ or $P_{K1\ max.}$) [...]

per hour

2.5 Number of starts per hour [...]

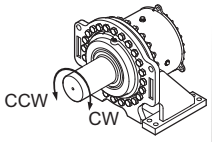
starts

2.6 Service life [X]

☐ Infinite fatigue strength (gearing to DIN 3990)
☐ Defined service life [h]

2.7 Rotation direction under load (LSS) [X]

☐ clockwise (CW)
☐ counter-clockwise (CCW)
☐ both directions
☐ reversible



2.8 Operating period/day [X]

☐ ≤ 3 hours
☐ 3 ... 10 hours
☐ > 10 hours

2.9 Backstop required in gear unit [X]

☐ No
☐ Yes

2.10 Exact load cycle attached [X]

☐ No
☐ Yes

3.0 Machine on HSS (normally the drive machine)

3.1 Type: [X]

☐ AC motor ☐ AC motor/inverter ☐ DC motor
☐ Hydraulic motor ☐ Servomotor

3.2 Motor power P_M [kW] [...]

normal | min. | max.

3.3 Motor speed n_M [min^{-1}] [...]

normal | min. | max.

3.4 Motor torque M_M [Nm] [...]

normal | min. | max.

3.5 Input speed n_1 [min^{-1}] [...]

normal | min. | max.

3.6 If electric motor: [X] [...]

☐ IEC
☐ NEMA
Motor size (IEC- or NEMA code):

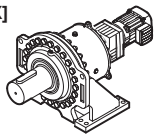
3.7 Mounting of motor [X] [...]

☐ B3
☐ B5
☐ V1
☐ other:

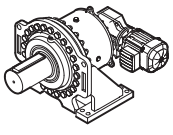
4.0 Gear unit requirements

4.1 Gear Unit Type [X]

☐ Helical gear unit P.. RF..

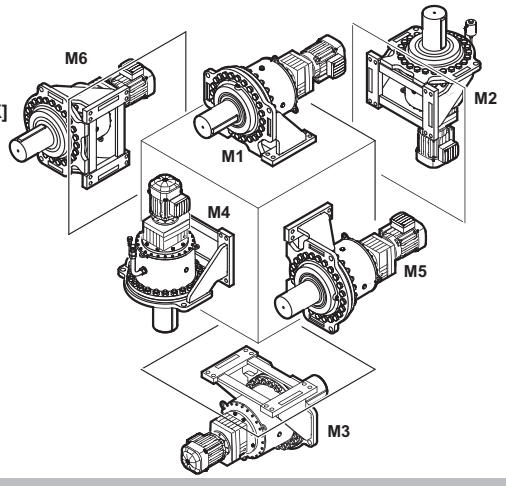


☐ Bevel-helical gear unit P..KF..



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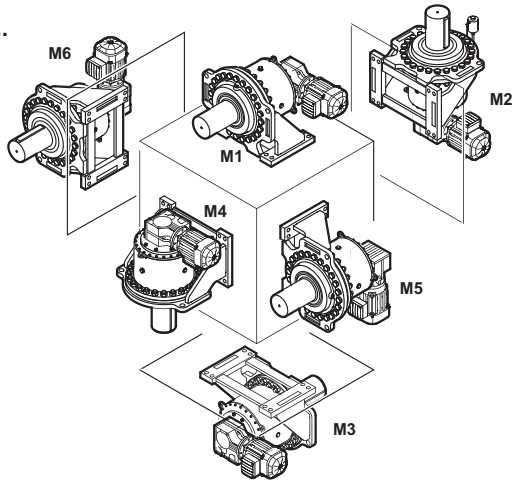
P..RF..



4.2 Mounting position [X]

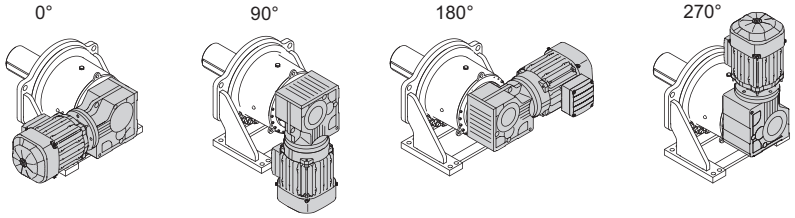
- ☐ M1
- ☐ M2
- ☐ M3
- ☐ M4
- ☐ M5
- ☐ M6

P..KF..



4.3 Mounting positions for RF / KF gearmotor preliminary stage [X]

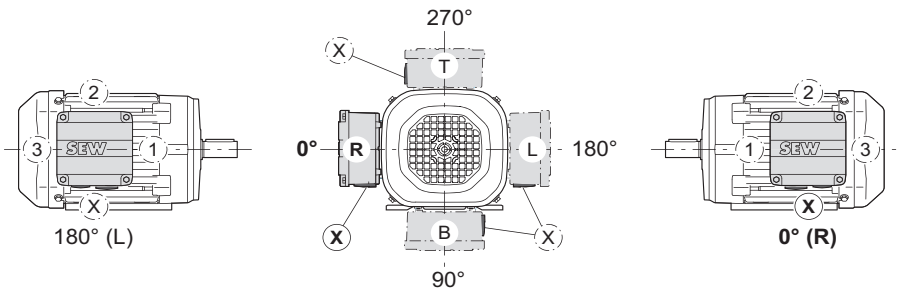
- ☐ 0°
- ☐ 90°
- ☐ 180°
- ☐ 270°



4.4 Position of motor terminal box and cable entry [X]

- ☐ 0° (R)
- ☐ 90° (B)
- ☐ 180° (L)
- ☐ 270° (T)

- ☐ X
- ☐ 1
- ☐ 2
- ☐ 3



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4.6 Application-specific operating factor $F_{S\ min.}$ [X] [...]

☐ In relation to motor power P_M / motor torque M_M

☐ Operating power at LSS P_{K2} / operating torque at LSS M_{K2}

4.7 Required bearing service life $L_{h\ min}$ [...]

hours

4.8 Mounting of gear unit housing [X]

☐ Foot
☐ Flange
☐ Torque arm

4.9 LSS connection to customer machine shaft [X] [...]

☐ Elastic clutch (claw or bolt coupling)
☐ Flexible coupling
☐ Rigid flange coupling
☐ Barrel coupling
☐ Sprocket
☐ Pinion

☐ Hollow shaft – torque arm
☐ Hollow shaft – foot-mounting
☐ Hollow shaft – flange-mounting
☐ Other

4.10 LSS gear unit design [X] [...]

LSS design (if with solid shaft)

☐ Solid shaft with keyway
☐ Solid shaft with 2 keyways
☐ Smotth solid shaft
☐ Solid shaft with splined hollow shaft DIN 5480
☐ Other

LSS design (if with hollow shaft)

☐ Hollow shaft for shrink disk connection, including shrink disk
☐ Splined hollow shaft DIN 5480
☐ Other

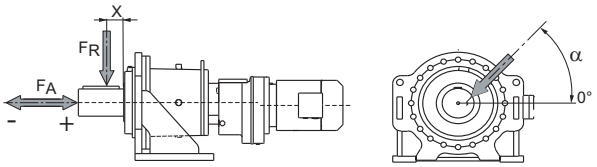
4.11 HSS connection to motor [X]

☐ Customer installation (base frame)
☐ Motor adapter with elastic coupling
☐ Swing base / base frame
☐ Motor bracket with V-belt drive
☐ Motor scoop
☐ Other, see sketch

4.12 Machine shaft bearings

☐ 2 bearings, gear unit transmits only the torque
☐ 1 bearing opposite the gear unit, gear unit acts as a point of support
☐ 1 bearing right at the gear unit, gear unit acts as a point of support

4.13 Forces at the LSS [X] [...]



	normal	min.	max.
Axial force F_{A2} [N]			
Radial force F_{R2} [N]			
Distance from shaft shoulder X [mm]			

Application angle of radial force α [°]

or rotating ☐

4.15 Electric power supply [X] [...]

	AC 3-phase	AC 1-phase	DC		
Line voltage V_{line}	☐	☐	☐	V	HZ
Auxiliary voltage V_{aux}	☐	☐	☐	V	HZ

Degree of protection: IP

Explosion protection required: ☐ Yes ☐ No

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5.2.2 Step 2: Calculation of basic data – M_{K2}, n_2, i, η

Constant torque	$M_{K2} = \frac{P_{K1} \times 9550 \times \eta}{n_2} Nm$ Note: If P_{K1} unknown → $P_{K1} = P_M$ M_{K2} = Operating torque on LSS in Nm P_{K1} = Required operating power at HSS in kW n_2 = Output speed (LSS) in min^{-1}
Gear ratio	$i = \frac{n_1}{n_2}$ n_1 = Input speed (HSS) in min^{-1} n_2 = Output speed (LSS) in min^{-1}
Efficiency – η	η = f (i; gear unit type) The efficiency of the gear unit is mainly determined by the gearing and bearing friction as well by churning losses. For the calculation, a guide value of 96% is used.

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5.2.3 Step 3: Selecting application factors

Application-specific service factor	$F_{S\ min}$
Peak load factor	F_F (→ 🗎 62)
Startup factor	F_{Start} (→ 🗎 62)
Service life factor	f_{LC}"" (→ 🗎 63)

$F_{S\ min}$ - application-specific service factor

The application-specific service factor F_s considers the typical load behavior with regard to the driven machine.

Recommended values with reference to

- Area of application
- Type of driven machine
- Operating hours/day

are listed in the table below.

INFORMATION

These tables apply only to gear units driven by electric motors. For other types of drive motors, the following correction values apply:

Consequences

- Combustion engines with four or more cylinders:
  - $F_{S\ min}$ (selection table) +0.25
- Combustion engines with one to three cylinders:
  - $F_{S\ min}$ (selection table) +0.5

INFORMATION

In the event of deviations from the typical load behavior, please contact SEW-EURODRIVE.

Area of application	Type of application (driven machine)	Application-specific service factor $F_{S\ min}$ Operating hours/day			
		Gearing with infinite fatigue strength (referring to DIN 3990)			Defined Service life
		< 3 h	3-10 h	> 10 h	
Waste water treatment	Impeller aerator	-	1.80	2.00	1.80
	Thickeners	1.15	1.25	1.50	1.15
	Vacuum filters	1.15	1.30	1.50	1.15
	Collector	1.15	1.25	1.50	1.15
	Screw pump	-	1.30	1.50	1.30
	Brush aerators	-	-	2.00	2.00
Mining	Crushers	1.55	1.75	2.00	1.55
	Screens and shakers	1.55	1.75	2.00	1.55
	Slewing drives	-	1.55	1.80	1.55
	Bucket-wheel excavator	1)	1)	1)	1)
Energy	Frequency inverters	-	1.80	2.00	1.80
	Water wheels (low speed)	-	-	1.70	1.70
	Water turbines	-	-	1)	-

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Conveyors	Bucket elevators	-	1.40	1.50	1.40
	Vertical conveyors – other	-	1.50	1.80	1.50
	Belt conveyors ≤ 100 kW	1.15	1.25	1.40	1.15
	Belt conveyors > 100 kW	1.15	1.30	1.50	1.15
	Apron feeders	-	1.25	1.50	1.25
	Screw feeders	1.15	1.25	1.50	1.15
	Shakers, screens	1.55	1.75	2.00	1.55
	Escalators	1.25	1.25	1.50	1.25
	Passenger elevators	1)	1)	1)	1)
Rubber and plastic industry	Extruders (plastic)	-	1.40	1.60	1.40
	Extruders (rubber)	-	1.50	1.80	1.50
	Rubber rollers (2 in a row)	1.55	1.75	2.00	1.55
	Rubber rollers (3 in a row)	-	1.50	1.75	1.50
	Heating rollers	1.35	1.50	1.75	1.35
	Calender	-	1.65	1.65	1.65
	Mills	1.55	1.75	2.00	1.55
	Mixing rollers	1)	1)	1)	1)
	Slab rollers	1.55	1.75	2.00	1.55
	Refiners	1.55	1.75	2.00	1.55
	Tire machines	1)	1)	1)	1)
Timber industry	Timber industry	1)	1)	1)	1)
Cranes	Cranes and hoists	2)	2)	2)	2)
Food industry	Crushers and mills	-	-	1.75	1.75
	Beet slicers	-	1.25	1.50	1.25
	Drying drums	-	1.25	1.50	1.25

1) Contact SEW-EURODRIVE

2) Please contact SEW-EURODRIVE; dimensioning according to FEM1001

Area of application	**Type of application (driven machine)**	**Application-specific service factor $F_{S\,min}$ Operating period / day**			
		Gearing with infinite fatigue strength (referring to DIN 3990)			**Defined Service life**
		< 3 h	**3-10 h**	**> 10 h**	
Metal production and processing	Winder	-	1.60	1.75	1.60
	Cutting rollers	1.55	1.75	2.00	1.55
	Table conveyors, single drives	1)	1)	1)	1)
	Table conveyors, group drives	1)	1)	1)	1)
	Table conveyors, reciprocating	1)	1)	1)	1)
	Wire drawing machines	1.35	1.50	1.75	1.35
	Rollers	1)	1)	1)	1)
Mills and drums	Cooling and drying drums	-	1.50	1.60	1.50
	Rotary kilns	-	-	2.00	2.00
	Ball mills	-	-	2.00	2.00
	Coal mills	-	1.50	1.75	1.50
Pulp and paper industry	Debarking drums and machines	1.55	1.80	-	1.55
	Rolls (pick-up, wire drive, wire suction)	-	1.80	2.00	1.80
	Drying cylinders (rolling bearings)	-	1.80	2.00	1.80
	Calenders (rolling bearings)	-	1.80	2.00	1.80
	Filters (pressure and vacuum)	-	1.80	2.00	1.80
	Beaters and chippers	1.55	1.75	2.00	1.55
	Jordan mills	-	1.50	1.75	1.50
	Presses (bark, felt, glue, suction)	-	-	1.75	1.75
	Reels	-	-	1.75	1.75
	Pulpers	1)	1)	1)	1)
	Washer filters	-	-	1.50	1.50
	Yankee cylinders (dryers)	1)	1)	1)	1)

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Pumps	Centrifugal pumps	1.15	1.35	1.45	1.15
	Reciprocating pumps (single-cylinder)	1.35	1.50	1.80	1.35
	Reciprocating pumps (multi-cylinder)	1.20	1.40	1.50	1.20
	Screw pumps	-	1.25	1.50	1.25
	Rotary pumps (gear pump, vane pump)	-	-	1.25	1.25
Agitators and mixers	Agitators for liquids	1.00	1.25	1.50	1.00
	Agitators for liquids (variable density)	1.20	1.50	1.65	1.20
	Agitators for solids (non-uniform material)	1.40	1.60	1.70	1.40
	Agitators for solids (uniform material)	-	1.35	1.40	1.35
	Concrete mixers	-	1.50	1.50	1.50
Cable cars	Material ropeways	-	1.40	1.50	1.40
	Aerial tramways	-	1)	1)	1)
	Surface lifts	1)	1)	1)	1)
	Continuous aerial tramways	1)	1)	1)	1)
	Funicular railways	1)	1)	1)	1)
Fans	Heat exchangers	1.50	1.50	1.50	1.50
	Dry cooling tower	-	-	2.00	2.00
	Wet cooling towers	2.00	2.00	2.00	2.00
	Blowers (axial and radial)	1.50	1.50	1.50	1.50
Compressors	Reciprocating compressors	-	1.80	1.90	1.80
	Radial compressors	-	1.40	1.50	1.40
	Screw-type compressors	-	1.50	1.75	1.50

1) Contact SEW-EURODRIVE

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Peak load factor – F_F

The peak load factor F_F takes account of the overload capacity of the gearing and the torque-transmitting parts.

Planetary gear unit type/size	Peak load factor – F_F					
	Peak load frequency per hour					
	1...5	6...20	21...40	41...80	81...160	> 160
Output shaft as solid shaft P.002 – P.102	1	1.2	1.3	1.5	1.75	2.0
Hollow shaft with shrink disk connection P.002	1.25	1.25	1.3	1.5	1.75	2.0
Hollow shaft with shrink disk connection P.002 – P.102	1.1	1.2	1.3	1.5	1.75	2.0

Startup factor – F_{start}

The startup factor F_{start} takes account of the overload caused by startup.

Startup mode	Startup factor – F_{start}
Direct	3.0
Soft start	1.8
Frequency inverter	1.5 to 2.0[1)]
Star/delta	1.3
Hydraulic coupling without delay chamber	2.0
Hydraulic coupling with delay chamber	1.6

1) Depending on settings

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Service life factor – f_{LC}

For applications with defined service life

$$f_{LC} = \frac{L_h \times n_2}{1000}$$

f_{LC} = Service life factor
L_h = Required service life h
n_2 = Speed at output shaft in min^{-1}

For applications with infinite fatigue strength according to DIN 3990

$f_{LC} > 107.5$

5.2.4 Step 4: Calculation of the required nominal gear unit torque M_{N2}

Constant load direction – constant torque:

$$M_{N2} \geq M_{K2} \times F_{S\min} Nm$$

M_{N2} = Nominal gear unit torque in Nm
M_{K2} = Operating torque at LSS in Nm
$F_{S\ min}$ = Application-specific service factor

Reversing load direction – constant torque:

$$M_{N2} \geq M_{K2} \times F_{S\min} \times 1.43 Nm$$

M_{N2} = Nominal gear unit torque in Nm
M_{K2} = Operating torque at LSS in Nm
$F_{S\ min}$ = Application-specific service factor

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5.2.5 Step 5: Selection of nominal gear unit torque M_{N2}

Size	Service life factor f_{LC}											$M_{N2\ Lim}$ Nm
	≤ 7.5	≤ 15	≤ 25	≤ 30	≤ 35	≤ 45	≤ 52.5	≤ 70	≤ 95	≤ 107.5	> 107,5[1]	
	M_{N2}											
P.002	29 200	26 300									24 830	49 660
P.012	46 200	41 600	38 500								36 810	73 620
P.022	64 200	60 100	55 600	54 200	54 200	54 200	54 200	54 200	54 200		51 190	102 380
P.032	86 800	84 900	78 600	76 600	76 600	76 600	76 600	76 600	76 400	73 700	69 620	139 240
P.042	111 000	111 000	103 200								100 170	200 340
P.052	140 600	134 500									124 060	248 120
P.062	209 100	201 400									185 660	371 320
P.072	274 600	274 600	264 500	257 300	256 400	256 400	256 400				245 660	491 320
P.082	397 100	397 100	397 100	383 500							359 400	718 800
P.092	513 900	513 900	488 900	476 200	476 200	446 300					423 000	846 000
P.102	631 300	630 800	572 300	541 800	517 300						500 000	1 000 000

1) Gearing with infinite fatigue strength (referring to DIN 3990)

5.2.6 Step 6: Selecting the nominal motor power P_M

$$P_M \geq P_{K1} = \frac{P_{K2}}{\eta}\ kW$$

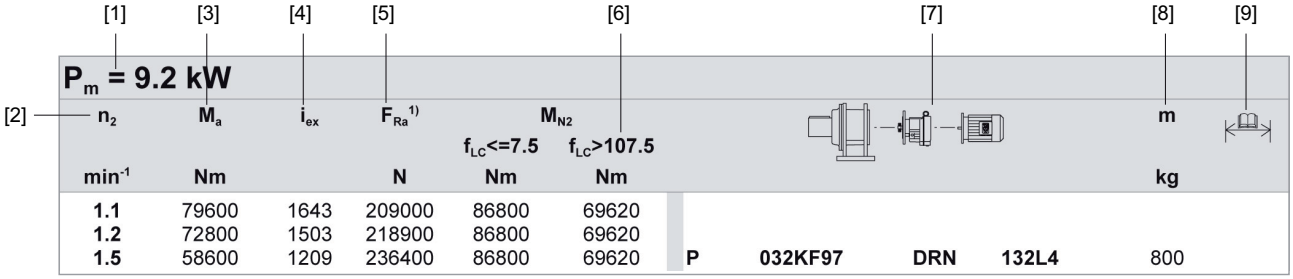
P_M = Nominal motor power in kW
P_{K1} = Operating power at HSS in kW
P_{K2} = Operating power at LSS in kW
η = Efficiency

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5.2.7 Step 7: Selecting the combination with gearmotor for project planning with defined service life

The following figure shows the structure of the selection tables.

Input speed: 1800 min^{-1}



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[1] Nominal motor power
[2] Output speed
[3] Output torque in relation to nominal motor power
[4] Gear unit ratio
[5] Permitted radial load at LSS
1) Overhung load for foot-mounted gear units with solid shaft; overhung loads for other gear unit types upon request
[6] Nominal gear unit torque for project planning with defined service life for $f_{LC} \leq 7.5$
[7] Nominal gear unit torque for project planning with gearing with infinite fatigue strength referring to DIN 3990 ($f_{LC} > 107.5$)
[8] Gear unit type
[9] Weight
[10] Page number dimension sheet

After selecting the gearmotor combination, checking of output torque: $M_a > M_{k2}$

5.2.8 Step 8: Checking the peak load conditions – $M_{K2\ per} < M_{K2\ max}$

Constant load direction:

$$M_{K2per} = \frac{M_{N2Lim}}{F_F} Nm$$

$M_{K2\ per}$ = Permitted peak output torque in Nm
M_{N2Lim} = Nominal gear unit torque in Nm
F_F = Peak load factor

Reversing load direction:

$$M_{K2per} = \frac{M_{N2Lim}}{F_F} \times 0.7Nm$$

$M_{K2\ per}$ = Permitted peak output torque in Nm
M_{N2Lim} = Nominal gear unit torque in Nm
F_F = Peak load factor

Calculating the peak load $M_{K2\ max}$:

$$M_{K2\max} = M_a \times F_{start}^{*} Nm$$

$M_{K2\ max}$ = Peak output torque in Nm
M_a = Output torque in relation to nominal motor power in Nm
F_{start} = Startup factor

* If F_{start} is not specified, take the startup factors from the table on "Startup factor – F_{start}".

Checking the gear unit selection:

$$M_{K2\max} \leq M_{K2per}$$

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5.2.9 Step 9: Checking external additional forces

Influences and dependencies:

The permitted additional forces depend on the following factors:

- Existing service factor of the gear unit with respect to the selection data
- Required bearing service life
- Direction of the axial force (from or towards gear unit)
- Application angle of the radial load (rotating or at a specific position)
- Point of force application
- Ratio between radial and axial load
- Gear unit mounting

Determining the overhung load

If no overhung loads are specified, they can be determined by approximation as follows. When determining the resulting overhung load, the type of transmission element mounted on the shaft end must be considered. The following transmission element factors f_Z must be considered for various transmission elements.

Transmission element	Transmission element factor f_Z	Comments
Gears	1.15	< 17 teeth
Sprockets	1.40	< 13 teeth
Sprockets	1.25	< 20 teeth
Narrow V-belt pulleys	1.75	Influence of pre-tensioning
Flat belt pulleys	2.50	Influence of pre-tensioning
Toothed belt pulleys	1.50	Influence of pre-tensioning

The overhung load exerted on the motor or gear shaft is calculated as follows:

$$F_R = \frac{M_d \times 2000}{d_0} \times f_z N$$

F_R = Overhung load in N
M_d = Torque in Nm
d_0 = Mean diameter of the installed transmission element in mm
f_Z = Transmission element factor

Permitted overhung load

The basis for determining the permitted overhung loads in the roller bearing calculation is the nominal bearing service life L_{10h} (according to ISO 281).

For special operating conditions, the permitted overhung loads can be determined on the basis of the modified service life L_{nmh} on request.

For applications with defined service life, the permitted overhung loads have been calculated based on an adapted shaft safety. The values can therefore be reduced.

Overhung load on output

The permitted overhung loads $F_{R\,per}$ for solid shaft gear units can be calculated exactly. The force values relate to the force application in the center of the shaft end for solid shafts and to the gear unit flange contact point for hollow shafts. In planetary gear units, the force application angle and direction of rotation do not influence the permitted values as there are no inner forces from the gear unit acting on the output bearing.

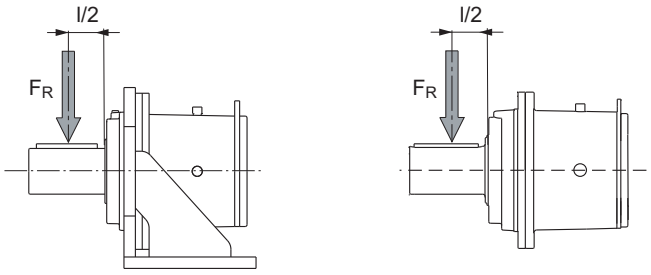
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Permitted overhung loads and axial loads on the input

All the possibilities and restrictions specified in the SEW-EURODRIVE "Gearmotors" catalog apply.

Checking the permitted overhung load on the output

The permitted overhung load F_R on the center of the shaft end is checked according to the following table. The load is permitted if $F_{R\,per} \geq F_R$.



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Permitted overhung loads $F_{R\,per}$ for solid shafts (Project planning with infinite fatigue strength):

The values apply to force application to the center of the shaft end and an output speed of n = 10 min^{-1}.

Size	P.002	P.012	P.022	P.032	P.042	P.052	P.062	P.072	P.082	P.092	P.102
$F_{R\,per}$ kN	96	134	183	194	249	280	364	403	526	580	680

Calculation of $F_{R\,perl}$ N for different output speeds n* 1/min (project planning with infinite fatigue strength):

$$F_{Rper}{}^{*} = F_{Rper} \times (\frac{10}{n^{*}})^{(\frac{1}{3.33})} \leq F_{R\max} N$$

$F_{R\,per}$* = Permitted overhung load in N for different output speed
$F_{R\,per}$ = Permitted overhung load in N
$F_{R\,max}$ = Maximum overhung load in N (see following table)
n* = Differing output speed in 1/min

Size	P.002	P.012	P.022	P.032	P.042	P.052	P.062	P.072	P.082	P.092	P.102
$F_{R\,max}$ kN	124	156	197	252	323	364	473	523	683	720	850

INFORMATION

Contact SEW-EURODRIVE regarding the permitted radial load.

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Permitted overhung loads for solid shafts (project planning with defined service life):

The values apply to force application to the center of the shaft end and an output speed up to n = 10 min^{-1}.

For project planning with defined service life:

Size	P.002	P.012	P.022	P.032	P.042	P.052	P.062	P.072	P.082	P.092	P.102
$F_{R\,per} = F_{R\,max}$ kNm	78	119	162	171	177	192	252	315	285	575	680

INFORMATION

Contact SEW-EURODRIVE regarding the permitted radial load.

Calculation of $F_{R\,per}$ (N) for output speeds n* > 10 min^{-1} (project planning with defined service life):

$$F_{Rper}^{*} = F_{Rper} \times \left(\frac{10}{n^{*}}\right)^{\left(\frac{1}{3.33}\right)} \leq F_{R\max} N$$

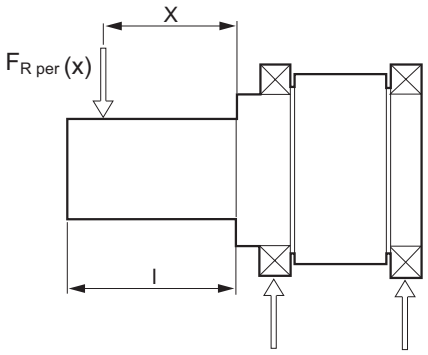
$F_{R\,per}$* = Permitted overhung load in N for different output speed
$F_{R\,per}$ = Permitted overhung load in N, see previous table (defined service life)
$F_{R\,max}$ = Maximum overhung load in N, see previous table (defined service life)
n* = Differing output speed in min^{-1}

Comment

$F_R \leq F_{R\,per}^{*} \leq F_{R\,max}$

However, if $F_{R\,per}^{*} > F_{R\,max}$, you will have to check: $F_R \leq F_{R\,max}$

Conversion of permitted overhung load on the output for force application away from the middle of the shaft end



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Size	a	b	l
P.002	173	163	200
P.012	188.5	177	220
P.022	211	179	220
P.032	231.5	194	250
P.042	268	229	300
P.052	283	260	350
P.062	308	287	400
P.072	334	291	400
P.082	377	321	450
P.092	445	343	450

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Size	a	b	l
P.102	473	375	550

Calculating off-center force application:

$$F_{Rper}(x) = F_{Rper} \times \frac{(a+b)}{(a+b^{*})} \leq F_{R\max} N$$

b* = (b - l/2) + x mm
$F_{R\ perm}(x)$ = Permitted overhung load N of the off-center force application
$F_{R\ per}$ = Permitted overhung load N
$F_{R\ max}$ = Maximum overhung load N

Comment

$F_R \leq F_{R\ per}(x) \leq F_{R\ max}$
However, if $F_{R\ per}(x) > F_{R\ max}$, you will have to check: $F_R \leq F_{R\ max}$

Permitted axial force

For applications with axial loads, consult SEW-EURODRIVE.

INFORMATION

- Consult SEW-EURODRIVE if you use the PH.. design in combination with overhung forces, or the PHF.. variant with flange mounting.
- Contact SEW-EURODRIVE if a purely axial force is applied.

5.2.10 Step 10: Check of the thermal rating/heating

INFORMATION

Contact SEW-EURODRIVE for the following operating conditions:

- High ambient temperatures (over 45 °C)
- Vertical mounting position and/or motor speed over 1800 min^{-1}

5.2.11 Step 11: Selecting the lubricant

Lubricants can be chosen according to the lubricant table.

For output speeds $n_2 < 3.0\ min^{-1}$, contact SEW-EURODRIVE.

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5.2.12 Step 12: Technical specifications

Example: PHF012/T KF77 DRN112M4		
Planetary gear unit	P	Gear unit type
	H	Hollow shaft
	F	Flange-mounted design
	012	Gear unit size
	/T	Torque arm
Primary gear unit	KF	Series
	77	Gear unit size
Motor	DRN..	Series
	112M4	Size + number of poles

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5.3 Dimensioning example – project planning with defined service life

5.3.1 Step 1: Drive selection data

- Use: Belt conveyor
- Bevel-helical-planetary gear unit
- Hollow shaft with shrink disk and torque arm
- Required service life: 15 000 hours
- Required output speed n_2 = 1.5 min^{-1}
- Required operating power at LSS P_{K2} = 10.5 kW
- 4-pole motor / frequency inverter operation
- Input speed n_1 = 1750 min^{-1}
- Operating time: 12 hours per day
- Cyclic duration factor: 100 % cdf, 10 starts per hour
- Direction of rotation under load: CW rotation
- Outdoors, dusty environment
- Ambient temperature = 0 °C...40 °C
- Installation altitude H = 10 m
- Horizontal mounting position
- No axial or radial forces acting on the output shaft

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5.3.2 Step 2: Calculation of basic data M_{K2}, i, η

Operating torque on LSS

$$M_{K2} = \frac{P_{K2} \times 9550}{n_2} Nm$$

M_{K2} = Operating torque at LSS in Nm
P_{K2} = Operating power at LSS in kW
n_2 = Output speed (LSS) in min^{-1}

$$M_{K2} = \frac{10.5kW \times 9550}{1.5\,min^{-1}} = 66850Nm$$

Required gear ratio

$$i = \frac{n_1}{n_2} = \frac{1750\,min^{-1}}{1.5\,min^{-1}} = 1167$$

n_1 = Input speed (HSS) in min^{-1}
n_2 = Output speed (LSS) in min^{-1}

Efficiency:

η = 0.98

5.3.3 Step 3: Selecting the application factors $F_{S\,min}$, F_F, F_{Start}, f_{LC}

Application-specific service factor $F_{S\,min}$

Application: Belt conveyors ≤ 100 kW

t = Defined service life → $F_{S\,min}$ = 1,15

Peak load factor F_F

Hollow shaft with shrink disk

Load per hour = 6...20 → F_F = 1.2

Startup factor F_{start}

Motor in frequency inverter operation → F_{start} = 1.5

Service life factor f_{LC}

For applications with defined service life

$$f_{LC} = \frac{L_h \times n_2}{1000} = \frac{15000h \times 1.5\,min^{-1}}{1000} = 22.5$$

f_{LC} = Service life factor
L_h = Required service life h
n_2 = Speed at output shaft in min^{-1}
t = Daily operating period

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5.3.4 Step 4: Calculating the required nominal output torque M_{N2}

Constant direction of the load – constant torque:

$$M_{N2} \geq M_{K2} \times F_{S\min} = 66850Nm \times 1.15 = 76878Nm$$

M_{N2} = Nominal torque in Nm
M_{K2} = Operating torque at LSS in Nm
$F_{S\ min}$ = Application-specific service factor

5.3.5 Step 5: Selecting the planetary gear unit size M_{N2}

Size	Service life factor f_{LC}											$M_{N2\ Lim}$ Nm
	≤ 7.5	≤ 15	≤ 25	≤ 30	≤ 35	≤ 45	≤ 52.5	≤ 70	≤ 95	≤ 107.5	> 107,5[1)]	
	M_{N2}											
P.002	29 200	26 300									24 830	49 660
P.012	46 200	41 600	38 500								36 810	73 620
P.022	64 200	60 100	55 600	54 200	54 200	54 200	54 200	54 200	54 200		51 190	102 380
P.032	86 800	84 900	**78 600**	76 600	76 600	76 600	76 600	76 600	76 400	73 700	69 620	139 240
P.042	111 000	111 000	103 200								100 170	200 340
P.052	140 600	134 500									124 060	248 120
P.062	209 100	201 400									185 660	371 320
P.072	274 600	274 600	264 500	257 300	256 400	256 400	256 400				245 660	491 320
P.082	397 100	397 100	397 100	383 500							359 400	718 800
P.092	513 900	513 900	488 900	476 200	476 200	446 300					423 000	846 000
P.102	631 300	630 800	572 300	541 800	517 300						500 000	1 000 000

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1) Gearing with infinite fatigue strength (referring to DIN 3990)

→ Project planning with defined service life is possible

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5.3.6 Step 6: Selecting the motor power P_M

$$P_M \geq P_{K1} = \frac{P_{K2}}{\eta} = \frac{10.5kW}{0.98} = 10.7kW$$

P_M = Nominal motor power in kW
P_{K1} = Operating power on the input shaft (HSS) in kW
P_{K2} = Operating power at LSS in kW

Motor selection → P_M = 11 kW

5.3.7 Step 7: Selection of gearmotor combination

P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m
				f_{LC}<=7.5	f_{LC}>107.5					
min^{-1}	Nm		N	Nm	Nm					kg
1.5	70000	1209	222700	86800	69620					
1.6	63400	1095	231000	86800	69620	**P**	**032KF97**	**DRN**	**160M4**	840
1.8	56200	971	239000	86800	69620	**PF**	**032KF97**	**DRN**	**160M4**	720
2.0	50800	878	244400	86800	69620	**PH**	**032KF97**	**DRN**	**160M4**	860
2.4	43100	744	251300	86800	69620	**PHF**	**032KF97**	**DRN**	**160M4**	740
2.7	37600	650	252000	86800	69620					

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Selected combination:	PHF032 KF97 DRN160M4
Output torque check:	M_a = 70000 Nm > M_{K2} = 66 850 Nm → ok
Exact gear ratio:	i_{ex} = 1209 (required = 1167 → ok)

5.3.8 Step 8: Checking the peak load conditions $M_{K2\ max} < M_{K2\ per}$

Permitted peak output torque $M_{K2\ per}$ →

Constant direction of the load – constant torque:

$$M_{K2per} = \frac{M_{N2Lim}}{F_F} = \frac{139240Nm}{1.2} = 116033Nm$$

$M_{K2\ per}$ = Permitted peak output torque in Nm
$M_{N2\ Lim}$ = Limited nominal gear unit torque in Nm
F_F = Peak load factor

Calculating the peak load $M_{K2\ max}$:

$$M_{K2max} = M_a \times F_{Start} = 70000Nm \times 1.5 = 105000Nm$$

$M_{K2\ max}$ = Peak output torque in Nm
M_a = Output torque in relation to the motor power in Nm
F_{Start} = Startup factor

Checking the gear unit selection:

$M_{K2\ max} < M_{K2\ per}$ → OK

$M_{K2\ max}$ = Peak output torque
$M_{K2\ per}$ = Permitted peak output torque

5.3.9 Step 9: Checking the external additional forces

There are no overhung loads or axial forces in this case → OK.

5.3.10 Step 10: Check of the thermal rating/heating

The ambient temperature is below 45 °C

Horizontal mounting position

→ Thermal rating is OK.

5.3.11 Step 11: Selecting the lubricant

As n_2 = 1.5 min^{-1} (n_2 < 3.0 min^{-1}) contact SEW-EURODRIVE.

5.3.12 Step 12: Technical specification

Example: PHF032/T KF97 DRN160M4		
Planetary gear unit	P	Gear unit type
	H	Hollow shaft
	F	Flange-mounted design
	032	Gear unit size
	/T	Torque arm
Primary gear unit	KF	Series
	97	Gear unit size
Motor	DRN..	Series
	160M4	Size + number of poles

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5.4 Dimensioning example – Project planning with infinite fatigue strength (gearing according to DIN 3990)

5.4.1 Step 1: Drive selection data

- Use: Apron feeders
- Bevel-helical planetary gear unit
- Hollow shaft with shrink disk and torque arm
- Required output speed n_2 = 1.5 min^{-1}
- Required operating power at LSS P_{K2} = 10 kW
- Motor 4-pole/60 Hz in star/delta connection
- Input speed n_1 = 1750 min^{-1}
- Operating time: 24 hours per day
- Cyclic duration factor: 100 % cdf, 10 starts per hour
- Direction of rotation under load: CW rotation
- Outdoors, dusty environment
- Ambient temperature = 0 °C...40 °C
- Installation altitude H = 10 m
- No axial or radial forces acting on the output shaft

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5.4.2 Step 2: Calculation of basic data M_{K2}, i, η

Operating torque on LSS:

$$M_{K2} = \frac{P_{K2} \times 9550}{n_2} Nm$$

M_{K2} = Operating torque at LSS in Nm
P_{K2} = Operating power at LSS in kW
n_2 = Output speed (LSS) in min^{-1}

$$M_{K2} = \frac{10kW \times 9550}{1.5\,\text{min}^{-1}} = 63667Nm$$

Required gear ratio:

$$i = \frac{n_1}{n_2} = \frac{1750\,\text{min}^{-1}}{1.5\,\text{min}^{-1}} = 1167$$

n_1 = Input speed (HSS) in min^{-1}
n_2 = Output speed (LSS) in min^{-1}

Efficiency:

η = 0.98

5.4.3 Step 3: Selecting the application factors $F_{S\,min}$, F_F, F_{Start}

Application-specific service factor $F_{S\,min}$

Application: Apron feeder t > 10 h → $F_{S\,min}$ = 1.5

Peak load factor F_F

Hollow shaft with shrink disk

Load per hour = 6...20 → F_F = 1.2

Startup factor F_{start}

Motor in star/delta → F_{Start} = 1.3

t = Daily operating period

5.4.4 Step 4: Calculating the required nominal output torque M_{N2}

Constant direction of the load – constant torque:

$$M_{N2} \geq M_{K2} \times F_{S\min} = 63667Nm \times 1.5 = 95500Nm$$

M_{N2} = Nominal torque in Nm
M_{K2} = Operating torque at LSS in Nm
$F_{S\,min}$ = Application-specific service factor

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5.4.5 Step 5: Selecting the planetary gear unit size M_{N2}

PHF 042 → M_{N2} = 100 170 Nm

Size	Service life factor f_{LC}											$M_{N2\ Lim}$ [Nm]
	≤ 7.5	≤ 15	≤ 25	≤ 30	≤ 35	≤ 45	≤ 52.5	≤ 70	≤ 95	≤ 107.5	> 107.5[1]	
	M_{N2}											
P.002	29 200	26 300									24 830	49 660
P.012	46 200	41 600	38 500								36 810	73 620
P.022	64 200	60 100	55 600	54 200	54 200	54 200	54 200	54 200	54 200		51 190	102 380
P.032	86 800	84 900	78 600	76 600	76 600	76 600	76 600	76 600	76 400	73 700	69 620	139 240
P.042	111 000	111 000	103 200								**100 170**	200 340
P.052	140 600	134 500									124 060	248 120
P.062	209 100	201 400									185 660	371 320
P.072	274 600	274 600	264 500	257 300	256 400	256 400	256 400				245 660	491 320
P.082	397 100	397 100	397 100	383 500							359 400	718 800
P.092	513 900	513 900	488 900	476 200	476 200	446 300					423 000	846 000
P.102	631 300	630 800	572 300	541 800	517 300						500 000	1 000 000

1) Gearing with infinite fatigue strength (referring to DIN 3990)

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5.4.6 Step 6: Selecting the motor power P_M

$$P_M \geq P_{K1} = \frac{P_{K2}}{\eta} = \frac{10kW}{0.98} = 10.2kW$$

P_M = Nominal motor power in kW
P_{K1} = Operating power on the input shaft (HSS) in kW
P_{K2} = Operating power at LSS in kW

Motor selection → P_M = 11 kW

5.4.7 Step 7: Selection of gearmotor combination

P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra}[1]	M_{N2}							m
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm						kg
0.94	109000	1880	286100	111000	100170	**P**	**042KF97**	**DRN**	**160M4**	1080
1.5	70000	1209	321800	111000	100170	**PF**	**042KF97**	**DRN**	**160M4**	890
1.8	56200	971	323000	111000	100170	**PH**	**042KF97**	**DRN**	**160M4**	1090
2.0	50800	878	323000	111000	100170	**PHF**	**042KF97**	**DRN**	**160M4**	900

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Selecting a combination: PHF042 KF97 DRN160M4
Checking the output torque: M_a = 70000 Nm > M_{K2} = 63 667 Nm → ok
Exact gear ratio: i_{ex} = 1167 (required = 1209 → ok)

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5.4.8 Step 8: Checking the peak load conditions $M_{K2\ max} < M_{K2\ per}$

Permitted peak output torque $M_{K2\ per}$ →

Constant direction of the load – constant torque:

$$M_{K2per} = \frac{M_{N2Lim}}{F_F} = \frac{200340Nm}{1.3} = 154108Nm$$

$M_{K2\ per}$ = Permitted peak output torque in Nm
$M_{N2\ Lim}$ = Limited nominal gear unit torque in Nm
F_F = Peak load factor

Calculating the peak load $M_{K2\ max}$:

$$M_{K2max} = M_a \times F_{Start} = 70000Nm \times 1.5 = 105000$$

$M_{K2\ max}$ = Peak output torque in Nm
M_a = Output torque in relation to the motor power in Nm
F_{Start} = Startup factor

Checking the gear unit selection:

$M_{K2\ max} < M_{K2\ per}$ → OK

$M_{K2\ max}$ = Peak output torque
$M_{K2\ per}$ = Permitted peak output torque

5.4.9 Step 9: Checking the external additional forces

There are no overhung loads or axial forces in this case → OK.

5.4.10 Step 10: Checking the thermal rating/heating

The ambient temperature is below 45 °C

Horizontal mounting position

→ Thermal rating is OK

5.4.11 Step 11: Selecting the lubricant

As n_2 = 1.5 min^{-1} (n_2 < 3.0 min^{-1}) contact SEW-EURODRIVE.

5.4.12 Step 12: Technical specification

Example: PHF042/T KF97 DRN160M4		
Planetary gear unit	P	Gear unit type
	H	Hollow shaft
	F	Flange-mounted design
	042	Gear unit size
	/T	Torque arm
Primary gear unit	KF	Series
	97	Gear unit size
Motor	DRN..	Series
	160M4	Size + number of poles

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6 Lubricants

6.1 Guidelines for lubricant selection

SEW-EURODRIVE delivers the planetary gear units without oil and the primary gear units filled with oil.

Generally it is possible to have the planetary gear unit delivered with oil.

INFORMATION

- The oil viscosity and type (mineral/synthetic) to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate. You must contact SEW-EURODRIVE in case of a deviation from this specification. This lubricant recommendation in chapter "Lubricant table" in no way represents a guarantee as to the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of its product.
- Ensure that the planetary gear units and primary gear units are filled with the correct oil grade and volume before startup. You can obtain the corresponding information from the gear unit nameplate and the lubricant table on the following pages.
- Do not mix different synthetic lubricants and do not mix synthetic with mineral lubricants.
- Check the compatibility of the used greases and oils.

6.2 General

The lubricant table on the following page shows the permitted lubricants for planetary gear units with output speeds ≥ 1.0 rpm. Observe the following key to the lubricant table.

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6.3 Permitted lubricants

This chapter describes the permitted lubricants and the permitted temperatures for industrial gear units from SEW-EURODRIVE.

INFORMATION

- The standard for viscosity and oil grade is the type of oil that is specified by SEW-EURODRIVE in the order (see order confirmation and nameplate).
- Contact SEW-EURODRIVE if you use bio and food grade lubricants or polyglycol oils.
- Check the compatibility of the greases and oils used.
- The tables contain the lubricants approved by SEW-EURODRIVE.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimum permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The minimum permitted oil bath temperatures depend on the lubrication type used. These temperatures are specified in the lubricant tables. The values correspond to the maximum viscosity of the individual lubricants.
- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants are subject to dynamic change on the part of the lubricant manufacturers. For the latest information about the lubricants, visit: www.sew-eurodrive.de/lubricants

6.3.1 Lubricant selection

Note the following when selecting the lubricants.

NOTICE

Selecting improper lubricants may damage the gear unit.

Possible damage to property.

- Observe the following notes.

- The oil viscosity and type (mineral/synthetic) to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate.

  If other lubricants are used in the gear units and/or in other temperature ranges as those recommended, the right to claim under warranty will become invalid. Exceptions are application-specific approvals that have to be confirmed by SEW-EURODRIVE in written form.

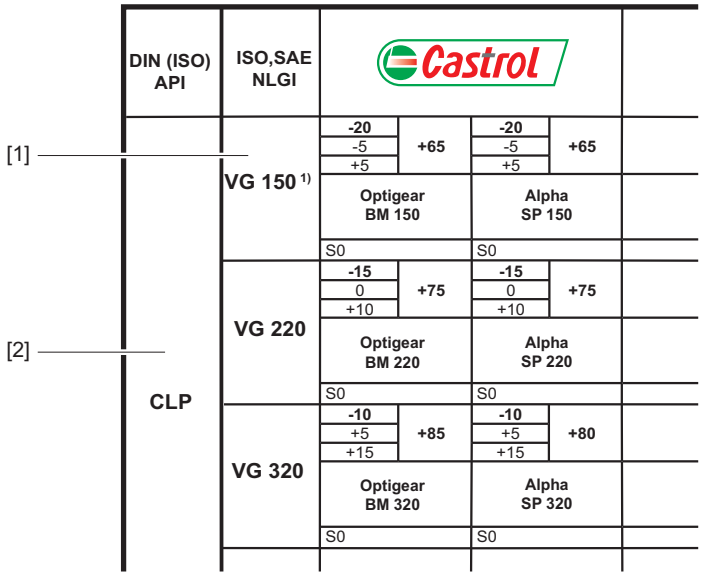
  The lubricant recommendation in the lubricant table in no way represents a guarantee regarding the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of its product.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimum permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The minimum permitted oil bath temperatures depend on the lubrication type used. These temperatures are specified in the lubricant tables. The values correspond to the maximum viscosity of the individual lubricants.

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- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants are subject to dynamic change on the part of the lubricant manufacturers. For up-to-date information about the lubricants, visit:

  www.sew-eurodrive.de/lubricants
- Before startup, ensure that the planetary gear unit and the primary gear unit are filled with the correct oil grade and quantity. You can obtain the corresponding information from the gear unit nameplate and the lubricant table on the following page.
- As standard, planetary gear units and primary gear units have separate oil chambers. With separate oil chambers, the planetary gear unit is delivered without oil, the primary gear unit is delivered with oil.
- The lubricant fill quantity and viscosity of planetary gearmotors with common oil chamber depend only on the information on the nameplate of the planetary gear unit. Planetary gear units and primary gear units with a common oil chamber are delivered without oil fill as standard.
- Do not mix different synthetic lubricants and do not mix synthetic with mineral lubricants.
- Check the compatibility of the greases and oils used.
- Observe the safety notes in the individual chapters.

6.3.2 Structure of the tables and abbreviations



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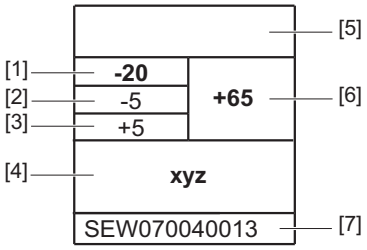
[1] Viscosity class
[2] Lubricant type

Abbreviations

Icons	Designation
CLP	= Mineral oil
CLP HC	= Synthetic polyalphaolefin (PAO)
E	= Ester-based oil

Icons	Designation
	= Mineral lubricant
	= Synthetic lubricant
	= Lubricant for the food industry (**NSF H1**-compliant)
	= Biodegradable oil (lubricant for agriculture, forestry, and water management)
1)	= Lubricants may only be used if service factor $F_s \geq 1.3$

6.3.3 Explanation of the various lubricants



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[1] Lowest cold start temperature in °C for splash lubrication*
[2] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 5000 cSt*
[3] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 2000 cSt*
[4] Trade name
[5] Manufacturer
[6] Highest oil bath temperature in °C. MUST NOT BE EXCEEDED.
[7] Approvals

*In case of low temperatures, the oil must be heated to the specified minimum temperature, for example by using an oil heater. The maximally permitted oil viscosity per pump type is specified in the following chapter.

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6.3.4 Lubricant tables

This lubricant table is valid when the document is published. Please refer to www.sew-eurodrive.de/lubricants for the latest version of the table.

DIN (ISO) API	ISO,SAE NLGI	Castrol				FUCHS				Mobil®				KLÜBER LUBRICATION				Shell				TEXACO				TOTAL			
CLP	VG 150 [1]	-20 -5 +5	+65	-20 -5 +5	+65	-20 -5 +5	+65	-20 -5 +5	+65	-20 -5 +5	+65			-20 -5 +5	+65							-20 -5 +5	+65						
		Optigear BM 150		Alpha SP 150		Renolin CLP 150 Plus		Renolin HighGear 150		Mobilgear 600 XP 150				Klüberoil GEM 1-150 N								Meropa 150							
		S0		S0		S0		S0		SEW070030013				S0								S0							
	VG 220	-15 0 +10	+75	-15 0 +10	+75	-15 0 +10	+75	-15 0 +10	+75	-15 0 +10	+75			-15 0 +10	+75			-15 0 +10	+75			-15 0 +10	+75			-15 0 +10	+75		
		Optigear BM 220		Alpha SP 220		Renolin CLP 220 Plus		Renolin HighGear 220		Mobilgear 600 XP 220				Klüberoil GEM 1-220 N				Shell Omala Oil F 220				Meropa 220				Carter EP 220			
		S0		S0		S0		S0		SEW070030013				S0				S0				S0				S0			
	VG 320	-10 +5 +15	+85	-10 +5 +15	+80	-10 +5 +15	+80	-10 +5 +15	+80	-10 +5 +15	+80			-10 +5 +15	+80			-10 +5 +15	+80			-10 +5 +15	+80			-10 +5 +15	+80		
		Optigear BM 320		Alpha SP 320		Renolin CLP 320 Plus		Renolin HighGear 320		Mobilgear 600 XP 320				Klüberoil GEM 1-320 N				Shell Omala Oil F 320				Meropa 320				Carter EP 320			
		S0		S0		S0		S0		SEW070030013				S0				S0				S0				S0			
	VG 460	-5 +10 +20	+90	-5 +10 +20	+90	-5 +10 +20	+90	-5 +10 +20	+90	-5 +10 +20	+90			-5 +10 +20	+90			-5 +10 +20	+90			-5 +10 +20	+90			-5 +10 +20	+90		
		Optigear BM 460		Alpha SP 460		Renolin CLP 460 Plus		Renolin HighGear 460		Mobilgear 600 XP 460				Klüberoil GEM 1-460 N				Shell Omala Oil F 460				Meropa 460				Carter EP 460			
		S0		S0		S0		S0		SEW070030013				S0				S0				S0				S0			
	VG 680	0 +15 +25	+90	0 +15 +25	+90	0 +15 +25	+90	0 +15 +25	+90	0 +15 +25	+90			0 +15 +25	+90							0 +15 +25	+90			0 +15 +25	+90		
		Optigear BM 680		Alpha SP 680		Renolin CLP 680 Plus		Renolin HighGear 680		Mobilgear 600 XP 680				Klüberoil GEM 1-680 N								Meropa 680				Carter EP 680			
		S0		S0		S0		S0		SEW070030013				S0								S0				S0			
	VG 1000	+5 +20 +30	+90																										
		Optigear BM 1000																											
		S0																											

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DIN (ISO) API	ISO,SAE NLGI	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
CLP HC	VG 32 [1]			-40 -30 -25 +30 SHC 624				
	VG 68 [1]		-35 -20 -10 +50 Renolin Unisyn CLP 68	-40 -25 -15 +50 SHC 626	-35 -20 -10 +50 Klübersynth GEM 4-68 N	-40 -20 -10 +50 Omala S4 GX 68		
	VG 150 [1]	-25 -10 0 +70 Alphasyn EP 150	-30 -10 0 +70 Renolin Unisyn CLP 150	-30 -10 0 +75 SHC 629	-25 -10 0 70 Klübersynth GEM 4-150 N	-30 -10 0 +75 Omala S4 GX 150	-25 -10 0 +70 Pinnacle EP 150	-35 -15 -5 +75 Carter SH 150
	VG 220	-25 -5 +5 +80 Alphasyn EP 220	-25 -5 +5 +80 Renolin Unisyn CLP 220	-20 0 +10 +75 HighGear Synth 220	-25 -5 +5 +80 Klübersynth GEM 4-220 N	-25 -5 +5 +85 Omala S4 GX 220	-25 -5 +5 +80 Pinnacle EP 220	-25 -5 +5 +80 Carter SH 220
	VG 320	-20 0 +10 +90 Alphasyn EP 320	-20 0 +10 +90 Renolin Unisyn CLP 320	-15 0 +15 +85 HighGear Synth 320	-20 -5 +10 +95 Klübersynth GEM 4-320 N	-20 0 +10 +95 Omala S4 GX 320	-20 0 +10 +90 Pinnacle EP 320	-20 0 +10 +90 Carter SH 320
	VG 460	-15 +5 +15 +100 Alphasyn EP 460	-15 +5 +15 +100 Renolin Unisyn CLP 460	-10 +5 +20 +95 HighGear Synth 460	-15 +5 +20 +105 Klübersynth GEM 4-460 N	-15 +5 +15 +105 Omala S4 GX 460	-15 +5 +15 +100 Pinnacle EP 460	-15 +5 +15 +100 Carter SH 460
	VG 680		-10 +10 +25 +110 Renolin Unisyn CLP 680	-5 +10 +25 +110 HighGear Synth 680	-10 +10 +25 +110 Klübersynth GEM 4-680 N	-10 +10 +25 +110 Omala S4 GX 680		-10 +10 +25 +110 Carter SH 680
	VG 1000				0 +20 +30 +110 Klübersynth EG4-1000			

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DIN (ISO) API	ISO,SAE NLGI	bremer & leguil				Castrol				FUCHS				KLÜBER LUBRICATION			
CLP HC NSF H1	VG 68 [1]	-35 -20 -10	+45	Cassida Fluid HF 68	S0	-40 -25 -15	+45	Optileb HY 68	S0					-35 -20 -10	+45	Klüberoil 4UH1-68 N	S0
	VG 220 [1]	-20 -5 +5	+75	Cassida Fluid GL 220	S0	-25 -5 +5	+75	Optileb GT 220	S0					-25 -5 +5	+75	Klüberoil 4UH1-220 N	S0
	VG 460 [1]	-15 +5 +20	+90	Cassida Fluid GL 460	S0	-15 +5 +20	+95	Optileb GT 460	S0					-15 +5 +15	+95	Klüberoil 4UH1-460 N	S0
E	VG 460									-15 +5 +15	+95	Plantogear 460 S	S0	-15 +5 +15	+95	Klüberbio CA2-460	S0

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6.4 Lubricant fill quantities

The specified lubricant fill quantities are **guide values** and apply only to the gear unit without mount-on components such as the oil supply system. The precise value varies depending on the gear ratio and the number of stages.

INFORMATION

- The oil chambers of the primary gear unit and the planetary gear unit are separated for standard designs.
- Planetary gear units are supplied without lubricant!
- RF.., KF.., and K.. gear units are filled with lubricant at the factory depending on the mounting position.
- For pivoted mounting positions adhere to the lubricant fill quantity on the nameplates.

6.4.1 Planetary gear units

The following table shows the lubricant fill quantities.

Size	Mounting position					
	M1	M2	M3	M4	M5	M6
	Liters l					
P.002	5	9	5	7	5	5
P.012	7	12	7	10	7	7
P.022	9	18	9	11	9	9
P.032	12	21	12	18	12	12
P.042	16	30	16	25	16	16
P.052	20	36	20	30	20	20
P.062	28	54	28	49	28	28
P.072	35	67	35	59	35	35
P.082	49	94	49	81	49	49
P.092	62	134	62	103	62	62
P.102	71	153	71	121	71	71

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6.4.2 Helical (RF) primary gear units

INFORMATION

The lubricant fill quantity depends on the mounting position of the planetary gear unit and the mounting position of the RF primary gear unit. For notes on the mounting positions of RF primary gear units, see chapter 4.3.

The following table shows the lubricant fill quantities.

Size	Fill quantities in liters					
	M1	M2	M3	M4	M5	M6
	0°	0°	180°	0°	270°	90°
RF77	1.2	3.10	3.30	3.60	2.40	3.00
RF87	2.4	6.4	7.1	7.2	6.3	6.4
RF97	5.1	11.9	11.2	14.0	11.2	11.8
RF107	6.3	15.9	17.0	19.2	13.1	15.9
RF137	9.5	27.0	29.0	32.5	25.0	25.0
RF147	16.4	47.0	48.0	52.0	42.0	42.0
RF167	26.0	82.0	78.0	88.0	65.0	71.0

M1/M2/M3/M4/M5/M6 = Mounting position of planetary gear unit

0°/90°/180°/270° = Mounting position of helical (RF) primary gear unit

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6.4.3 Bevel (KF/K) primary gear units

INFORMATION

The lubricant fill quantity depends on the mounting position of the planetary gear unit and the mounting position of the KF and K primary gearmotor. For notes on the mounting positions of KF and K primary gear units, see chapter 4.2.

The table below shows the lubricant fill quantities.

Size	Fill quantities in liters											
	M1				M2				M3			
	0° A	90 ° A	180° B	270 ° A	0° A	90 ° A	180 ° A	270 ° A	0 ° B	90 ° A	180 ° A	270 ° A
KF67	1.1	2.4	1.1	3.7	2.7	2.7	2.7	2.7	1.1	3.7	1.1	2.4
KF77	2.1	4.1	2.1	5.9	4.5	4.5	4.5	4.5	2.1	5.9	2.1	4.1
KF87	3.7	8.2	3.7	11.9	8.4	8.4	8.4	8.4	3.7	11.9	3.7	8.2
KF97	7	14.7	7	21.5	16.5	16.5	16.5	16.5	7	21.5	7	14.7
KF107	10	21.8	10	35.1	25.2	25.2	25.2	25.2	10	35.1	10	21.8
KF127	21	41.5	21	55	41	41	41	41	21	55	21	41.5
KF157	31	62	31	92	62	62	62	62	31	92	31	66
K167	33	95	33	123	95	95	95	95	105	33	105	85
K187	53	152	53	200	152	152	152	152	167	53	167	143

Size	Fill quantities in liters											
	M4				M5				M6			
	0° A	90 ° A	180° B	270 ° A	0° A	90 ° B	180 ° A	270 ° A	0 ° B	90 ° A	180 ° A	270 ° B
KF67	2.7	2.7	2.7	2.7	2.4	1.1	3.7	1.1	3.7	1.1	2.4	1.1
KF77	4.5	4.5	4.5	4.5	4.1	2.1	5.9	2.1	5.9	2.1	4.1	2.1
KF87	8.4	8.4	8.4	8.4	8.2	3.7	11.9	3.7	11.9	3.7	8.2	3.7
KF97	15.7	15.7	15.7	15.7	14.7	7.0	21.5	7	21.5	7.0	14.7	7
KF107	25.2	25.2	25.2	25.2	21.8	10	35.1	10	35.1	10	21.8	10
KF127	41	41	41	41	41.5	21	55	21	55	21	41.5	21
KF157	62	62	62	62	66	31	90	31	92	31	66	31
K167	123	123	123	123	85	33	123	33	84	33	95	33
K187	200	200	200	200	143	53	200	53	143	53	152	53

M1/M2/M3/M4/M5/M6 = Mounting position of planetary gear unit
0°/90°/180°/270° = Mounting position of bevel (KF/K) primary gear unit
A/B = Position of the mounting flange at the primary bevel gear unit

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6.5 Sealing greases/rolling bearing greases

The table shows the grease types recommended by SEW-EURODRIVE for operating temperatures from -40 °C to 100 °C.

	Manufacturer	Grease
Default	Fuchs	**Renolit CX TOM 15 OEM**[1)]
	Castrol	Spheerol EPL 2
	Klüber	Petamo GHY 133 N
	Shell	Gadus S2 V220 2
	Texaco	Mulifak EP2
	Total	Multis EP 2
	Bremer & Leguil	Cassida Grease GTS2[1)]
	Fuchs	**Plantogel 2**[1)]

1) Grease used by the factory should be preferred.

INFORMATION

- The greases may only be interchanged within the same group. It is not permitted to mix different groups.
- If a customer wants to use a grease that is not listed in the table, the customer has to make sure that it is suitable for the intended application.

6.6 Comments

6.6.1 Planetary gearmotor with common oil chamber (special design)

INFORMATION

Lubricant fill quantity and viscosity depend on the data given on the nameplate of the planetary gear unit. The planetary gear unit and the primary gear unit will be delivered without oil fill.

6.6.2 Selecting the viscosity when using mineral oil

INFORMATION

If surface temperatures exceed 100 °C, contact SEW-EURODRIVE.

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7 Options

The following additional options are available. Contact SEW-EURODRIVE if you require options.

- ATEX design
- Double-sided torque arm
- Output shaft types
  - Solid shaft with key
  - Solid shaft with 2 keys
  - Smooth solid shaft
  - Splined hollow shaft to DIN 5480
  - Splined solid shaft to DIN 5480
- Output shaft (LSS) sealing system
  - Labyrinth seal
  - 2 oil seals, inside sealing on a hardened sleeve (optional for M1/M3/M5/M6 mounting position)
  - 1 oil seal, inside sealing and 1 oil seal outside sealing on a hardened sleeve (optional for M1/M3/M5/M6 mounting position)

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7.1 Torque arm

7.1.1 Single-sided torque arm

The reaction torque to the gear unit output torque is absorbed by the torque arm fixture via lever arm A. The illustration shows an example of absorption in a welded construction with design dimensions. Two supporting plates with the suggested dimensions are welded onto the customer's structure. Once the gear unit has been mounted, a connecting cover plate is welded onto the two supporting plates. The force acting on the support is the gear unit torque divided by the length of the lever arm A. The reaction force acts on the gear unit and customer bearings. See chapters 10.3 and 11.3 for detailed dimensions of the torque arm.

NOTICE

Mounting elements may be damaged by to high impacts.

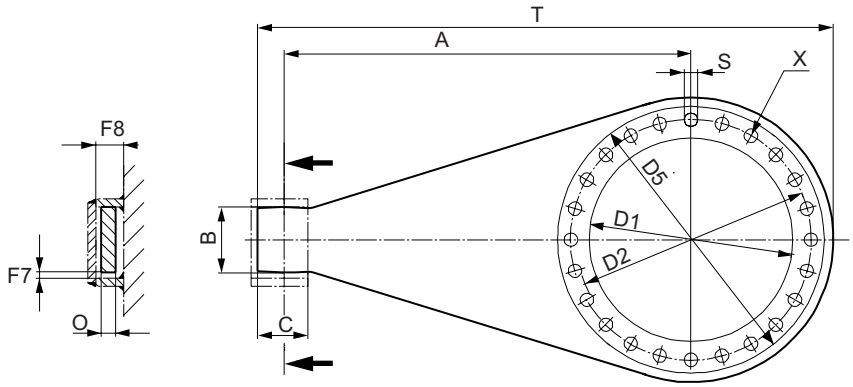
Possible damage to property

- Limit the maximum clearance for the torque arm bearing according to F7 and F8 in the following table.

INFORMATION

The torque arm bearing must be sufficiently dimensioned by the user.

The following figure shows a sample torque arm with dimensions.



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Dimensions

Size	Dimensions in mm										Number	Weight
	A	B	C	D1	D2	O	F7	F8	S	T	X	kg
P.002	650	60	50	334	370	25	2	50	22	880	16	25
P.012	700	70	60	374	410	30	2	60	22	955	20	35
P.022	750	90	70	414	460	35	2	70	22	1035	24	48
P.032	800	110	90	464	510	35	2	70	26	1125	20	58
P.042	900	150	120	484	560	40	2	80	33	1270	20	93
P.052	1000	160	130	534	590	40	2	80	33	1390	24	102
P.062	1200	180	150	614	690	50	2	100	39	1655	24	183
P.072	1500	230	200	694	770	60	2	120	39	2020	24	317
P.082	1600	230	200	754	840	70	2	140	45	2160	24	420
P.092	1650	250	220	804	870	70	2	140	45	2235	24	440
P.102	1700	250	220	854	960	70	2	140	45	2335	24	510

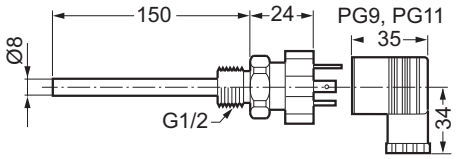
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7.2 PT100 Temperature sensor

The PT100 temperature sensor can be used to measure the temperature of the gear unit oil.

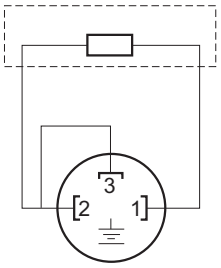
The temperature sensor is located in the oil sump of the gear unit. The exact position depends on the gear unit variant.

7.2.1 Dimensions



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7.2.2 Electrical connection



[1] / [2] Resistor element connection

7.2.3 Technical data

- Design with thermowell and changeable measuring insert
- Sensor tolerance K ± (0.3 +0.005 × T), (corresponds to DIN IEC 751 class B),

  T = Oil temperature °C
- Plug connector DIN 43650 PG9 (IP65)
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm.

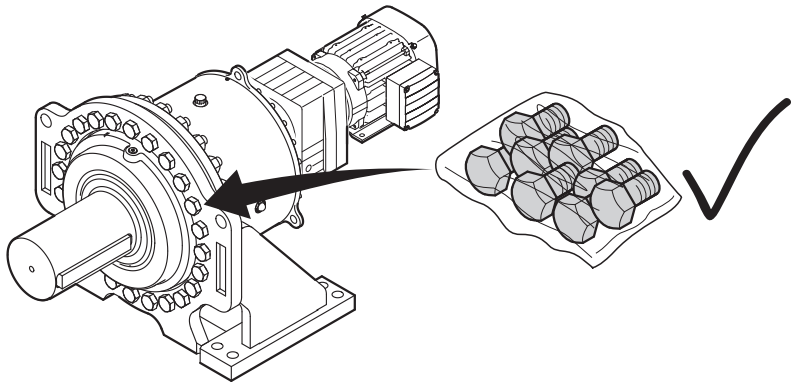
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8 Design and operating notes

8.1 Screws included in the delivery

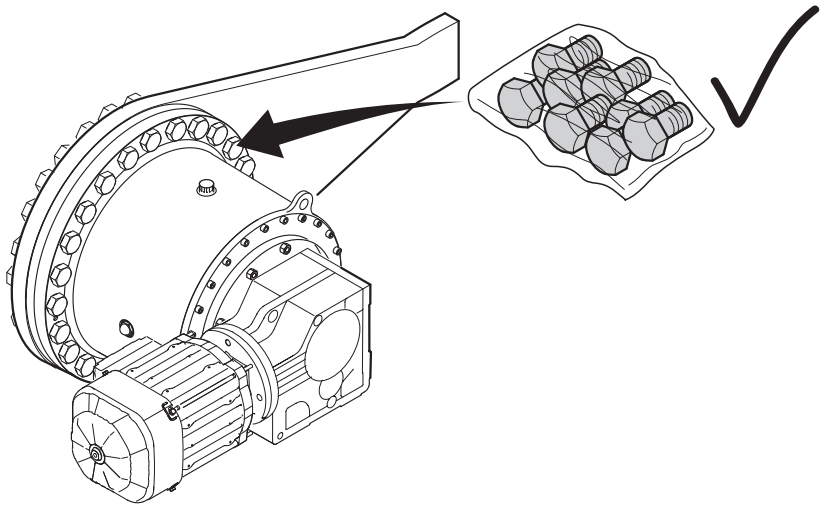
For the following gear unit variants, the screws are included in the **scope of delivery**:

- Foot-mounted gear unit



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- Gear unit with torque arm

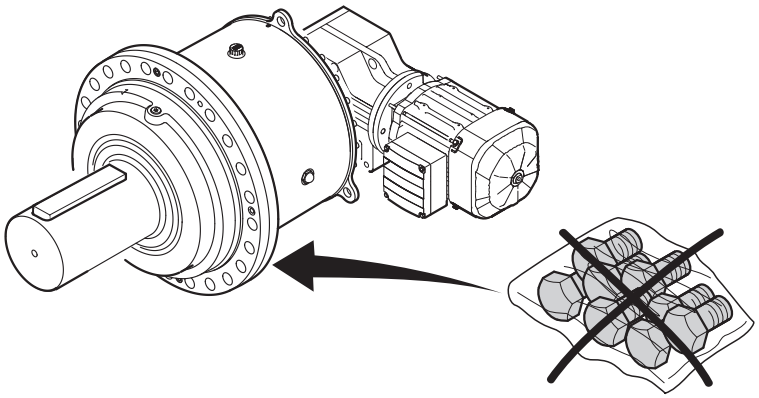


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Not included in the delivery:

- Set of wrenches
- Torque wrench
- Mounting device
- Compensation elements (washers, spacing rings), if necessary
- Fasteners for input and output elements
- Lubricant e.g. NOCO® fluid from SEW-EURODRIVE
- Aids for assembly/disassembly onto the machine shaft
- Fasteners for the gear unit base
- Connection screws for flange-mounted gear units

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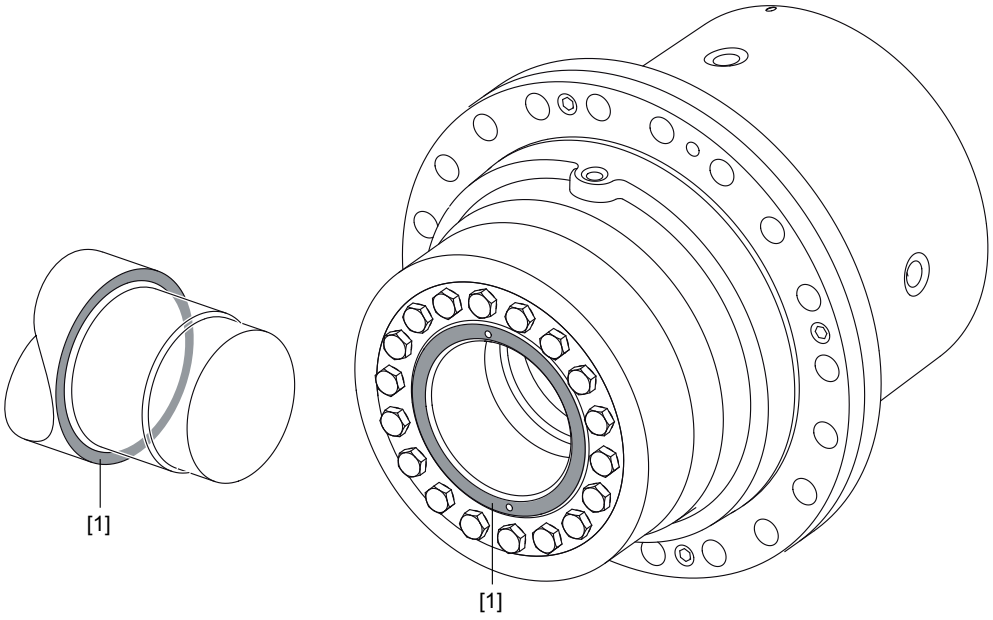


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8.2 Output shaft as hollow shaft with shrink disk

To guarantee a complete torque transmission from the gear unit to the machine shaft, observe the following procedure during construction and assembly.

Push the gear unit onto the machine shaft until the contact surfaces [1] touch.



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9 Important information on selection tables and dimension drawings

The following pages contain important information for chapters 10 and 11.

INFORMATION

Unless specified otherwise, all dimensions are given in **mm**.

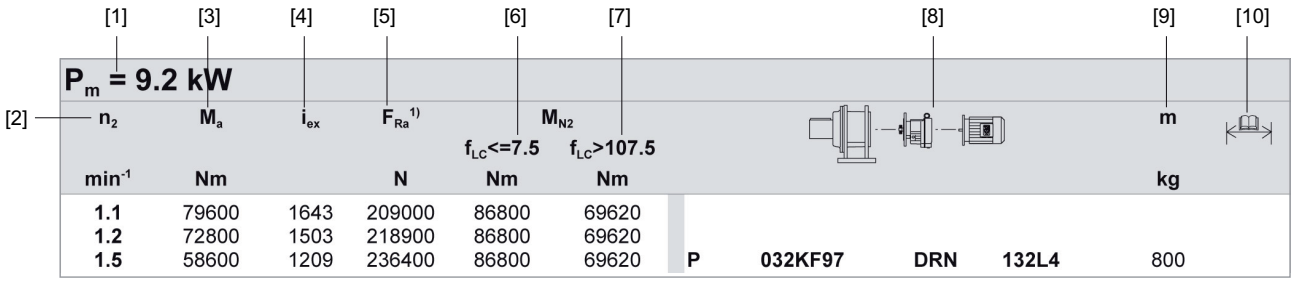
9.1 Selection tables

INFORMATION

The selection tables show possible gear unit combinations. Different gear ratio ranges and options are possible. X.. series gear units are used as primary gear unit in this case. Contact SEW-EURODRIVE.

The following figure shows the structure of the selection tables.

Input speed: 1800min^{-1}



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[1] Nominal motor power
[2] Output speed
[3] Output torque in relation to motor power
[4] Gear unit ratio
[5] Permitted radial load at LSS
1) Overhung load for foot-mounted gear units with solid shaft; overhung loads for other gear unit types upon request
[6] Nominal gear unit torque for project planning with defined service life for $f_{LC} \leq 7.5$
[7] Nominal gear unit torque for project planning with gearing with infinite fatigue strength referring to DIN 3990 ($f_{LC} > 107.5$)
[8] Gear unit type
[9] Weight
[10] Page number dimension sheet

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9.2 Dimension sheets

9.2.1 Scope of delivery



= Standard parts supplied by SEW-EURODRIVE.



= Standard parts not supplied by SEW-EURODRIVE.

9.2.2 Tolerances

Keys

Keys: according to DIN 6885 (domed type A)

Spline

Splined shaft according to DIN 5480

9.2.3 Foot-mounted design

With the following combinations of foot-mounted planetary gear units with primary gear unit RF../KF../K.., the primary gear unit might protrude under the mounting surface.

INFORMATION

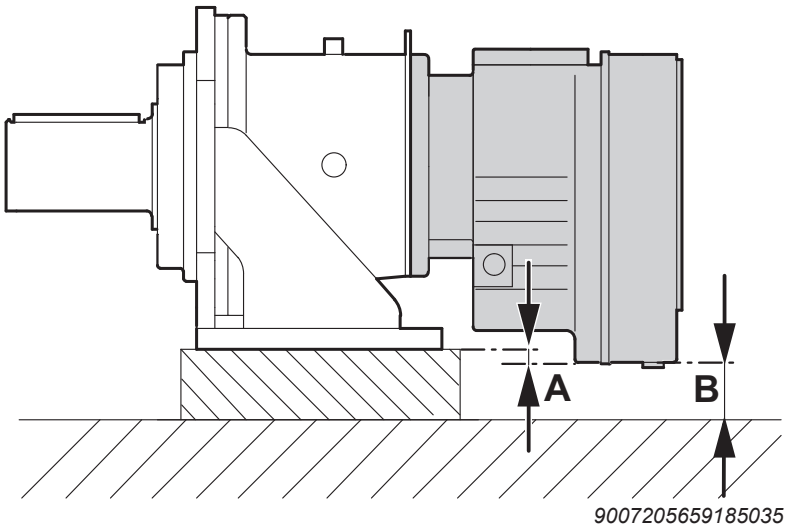
For the following gear unit combinations, take account of **dimension A**. The customer base construction must be prepared accordingly. In addition, you need enough room to perform an oil change. The customer has to specify a **dimension B** for this purpose.

Sizes/combinations			Dimension A (mm)
	RF..	KF../K..	
P.002	-	97	10
P.012	-	107	32.5
P.022	-	107	2.5
P.022	137	-	7.5
P.032	147	-	18.5

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Sizes/combinations			Dimension A (mm)
	RF..	KF../K..	
P.092	-	187	15

The following figure shows an example of a planetary gear unit with RF.. primary gear unit.



9.2.4 Oil expansion tank/oil riser pipe

In mounting position M2, there is an oil expansion tank mounted on the gear unit and in mounting position M4, an oil riser pipe is fitted. The dimensions specified in chapters 10.6/10.7 and 11.6/11.7 are guide values. Please contact SEW-EURODRIVE if there is little space available for installing.

9.2.5 Dimensions of motors and planetary gear units

Motor options

The motor dimensions can change when installing motor options. Refer to the dimension drawings of the motor options.

Special designs

The dimensions of the terminal box of special designs such as KS, CSA, VIK, extra-low voltage or voltage changeover may deviate from the standard dimensions.

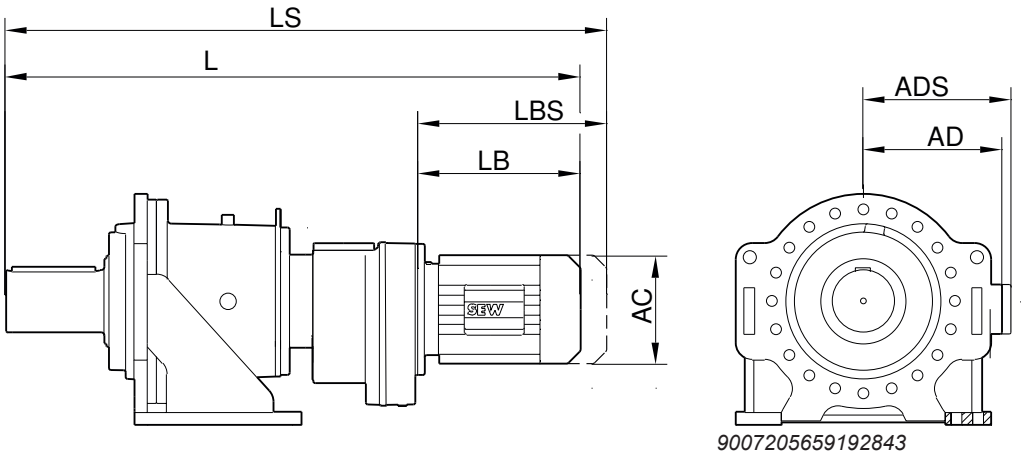
EN 50347

European standard EN 50347 became effective in August 2001. This standard adopts the dimension designations for three-phase AC motors for sizes 56 to 315M and flange sizes 65 to 740 from the IEC 72-1 standard.

The new dimension designations given in EN 50347 / IEC 72-1 are used for the dimensions in question in the dimension tables of the dimensions sheets.

Dimension designations

The dimensions of the planetary gearmotor are described below. They are specified in chapters 10.3 and 11.3.



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L = Total length of the planetary gearmotor
LS = Total length of planetary gearmotor including brake
LB = Length of the motor
LBS = Length of the brakemotor
AC = Diameter of the motor
AD = Distance between the center of the motor shaft and the top part of the terminal box
ADS = Distance between the center of the brakemotor shaft and the top part of the terminal box

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10 P.RF.. helical planetary gearmotors

10.1 Guide to the dimension sheets

10.1.1 P.. foot-mounted gear units

Size	Dimension sheet/page number						
	RF77	RF87	RF97	RF107	RF137	RF147	RF167
P002	132	134	136	138	-	-	-
P012	140	142	144	146	-	-	-
P022	-	148	150	152	154	-	-
P032	-	-	156	158	160	162	-
P042	-	-	-	164	166	168	-
P052	-	-	-	170	172	174	-
P062	-	-	-	-	176	178	-
P072	-	-	-	-	-	180	182
P082	-	-	-	-	-	184	186
P092	-	-	-	-	-	-	188
P102	-	-	-	-	-	-	190

10.1.2 PF.. flange-mounted gear units

Size	Dimension sheet/page number						
	RF77	RF87	RF97	RF107	RF137	RF147	RF167
PF002	133	135	137	139	-	-	-
PF012	141	143	145	147	-	-	-
PF022	-	149	151	153	155	-	-
PF032	-	-	157	159	161	163	-
PF042	-	-	-	165	167	169	-
PF052	-	-	-	171	173	175	-
PF062	-	-	-	-	177	179	-
PF072	-	-	-	-	-	181	183
PF082	-	-	-	-	-	185	187
PF092	-	-	-	-	-	-	189
PF102	-	-	-	-	-	-	191

10.1.3 Motor adapters

	Dimension sheet/page number						
	RF77	RF87	RF97	RF107	RF137	RF147	RF167
Adapter for mounting IEC motors P..RF..AM..	193	193	193	194	194	194	194
Adapter for mounting NEMA motors P..RF..AM..	195	195	196	196	196	196	197
Input shaft assembly P..RF..AD..	198	198	198	198	198	198	198
AQA motor adapter	199	199	200	200	200	200	-

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10.2 Selection tables R.. (60 Hz)

P_m = 0.75 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
0.43	16300	4066	156000	46200	36810	**P**	**012RF87**	**DRN**	**80M4**		400	142
0.48	14600	3663	156000	46200	36810	**PF**	**012RF87**	**DRN**	**80M4**		330	143
0.54	12800	3214	156000	46200	36810	**PH**	**012RF87**	**DRN**	**80M4**		410	142
0.62	11400	2847	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**80M4**		340	143
0.55	12800	3209	156000	-	31500	**P**	**012RF77**	**DRN**	**80M4**		370	140
0.58	12100	3030	156000	-	31500	**PF**	**012RF77**	**DRN**	**80M4**		300	141
						PH	**012RF77**	**DRN**	**80M4**		385	140
						PHF	**012RF77**	**DRN**	**80M4**		315	141
0.43	16200	4051	124000	29200	24830	**P**	**002RF87**	**DRN**	**80M4**		320	134
0.48	14600	3649	124000	29200	24830	**PF**	**002RF87**	**DRN**	**80M4**		260	135
						PH	**002RF87**	**DRN**	**80M4**		320	134
						PHF	**002RF87**	**DRN**	**80M4**		265	135
0.55	12800	3197	124000	-	24830							
0.58	12100	3018	124000	-	24830							
0.68	10300	2570	124000	29200	24830	**P**	**002RF77**	**DRN**	**80M4**		290	132
0.78	9030	2254	124000	29200	24830	**PF**	**002RF77**	**DRN**	**80M4**		230	133
0.86	8150	2035	124000	29200	24830	**PH**	**002RF77**	**DRN**	**80M4**		295	132
0.98	7170	1790	124000	29200	24830	**PHF**	**002RF77**	**DRN**	**80M4**		235	133
1.0	6770	1691	124000	29200	24830							
1.2	5770	1439	124000	29200	24830							

P_m = 1.1 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
0.43	23700	4066	197000	-	51190	**P**	**022RF87**	**DRN**	**90S4**		550	148
0.48	21400	3663	197000	-	51190	**PF**	**022RF87**	**DRN**	**90S4**		450	149
						PH	**022RF87**	**DRN**	**90S4**		570	148
						PHF	**022RF87**	**DRN**	**90S4**		465	149
0.43	23700	4066	156000	46200	36810							
0.48	21400	3663	156000	46200	36810							
0.55	18700	3214	156000	46200	36810	**P**	**012RF87**	**DRN**	**90S4**		405	142
0.62	16600	2847	156000	46200	36810	**PF**	**012RF87**	**DRN**	**90S4**		335	143
0.71	14500	2498	156000	46200	36810	**PH**	**012RF87**	**DRN**	**90S4**		415	142
0.74	13800	2368	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**90S4**		345	143
0.85	12100	2072	156000	46200	36810							
0.78	13200	2263	156000	-	31500	**P**	**012RF77**	**DRN**	**90S4**		375	140
0.86	11900	2043	156000	-	31500	**PF**	**012RF77**	**DRN**	**90S4**		305	141
						PH	**012RF77**	**DRN**	**90S4**		390	140
						PHF	**012RF77**	**DRN**	**90S4**		320	141
0.55	18700	3201	123300	29200	24830	**P**	**002RF87**	**DRN**	**90S4**		325	134
0.62	16500	2836	124000	29200	24830	**PF**	**002RF87**	**DRN**	**90S4**		265	135
0.71	14500	2489	124000	29200	24830	**PH**	**002RF87**	**DRN**	**90S4**		325	134
						PHF	**002RF87**	**DRN**	**90S4**		270	135
0.78	13100	2254	124000	29200	24830							
0.87	11800	2035	124000	29200	24830							
0.98	10400	1790	124000	29200	24830	**P**	**002RF77**	**DRN**	**90S4**		295	132
1.0	9870	1691	124000	29200	24830	**PF**	**002RF77**	**DRN**	**90S4**		235	133
1.2	8410	1439	124000	29200	24830	**PH**	**002RF77**	**DRN**	**90S4**		300	132
1.4	7640	1308	124000	29200	24830	**PHF**	**002RF77**	**DRN**	**90S4**		240	133
1.6	6620	1133	124000	29200	24830							
1.8	5760	986	124000	29200	24830							

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P_m = 1.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.44	32200	4058	197000	-	51190	**P**	**022RF97**	**DRN**	**90L4**	610	150
0.49	28800	3628	197000	-	51190	**PF**	**022RF97**	**DRN**	**90L4**	500	151
						PH	**022RF97**	**DRN**	**90L4**	620	150
						PHF	**022RF97**	**DRN**	**90L4**	520	151
0.55	25500	3214	197000	-	51190	**P**	**022RF87**	**DRN**	**90L4**	550	148
0.62	22600	2847	197000	-	51190	**PF**	**022RF87**	**DRN**	**90L4**	450	149
0.71	19800	2498	197000	-	51190	**PH**	**022RF87**	**DRN**	**90L4**	570	148
						PHF	**022RF87**	**DRN**	**90L4**	465	149
0.44	32200	4058	156000	46200	36810	**P**	**012RF97**	**DRN**	**90L4**	460	144
						PF	**012RF97**	**DRN**	**90L4**	390	145
						PH	**012RF97**	**DRN**	**90L4**	475	144
						PHF	**012RF97**	**DRN**	**90L4**	405	145
0.48	29100	3663	156000	46200	36810						
0.55	25500	3214	156000	46200	36810						
0.62	22600	2847	156000	46200	36810	**P**	**012RF87**	**DRN**	**90L4**	405	142
0.71	19800	2498	156000	46200	36810	**PF**	**012RF87**	**DRN**	**90L4**	335	143
0.75	18800	2368	156000	46200	36810	**PH**	**012RF87**	**DRN**	**90L4**	420	142
0.85	16400	2072	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**90L4**	350	143
0.95	14800	1867	156000	46200	36810						
1.1	13000	1637	156000	46200	36810						
1.0	13400	1697	156000	-	31500	**P**	**012RF77**	**DRN**	**90L4**	375	140
1.2	11400	1445	156000	-	31500	**PF**	**012RF77**	**DRN**	**90L4**	305	141
						PH	**012RF77**	**DRN**	**90L4**	390	140
						PHF	**012RF77**	**DRN**	**90L4**	320	141
0.48	28900	3649	111000	29200	24830	**P**	**002RF87**	**DRN**	**90L4**	325	134
0.55	25400	3201	116800	29200	24830	**PF**	**002RF87**	**DRN**	**90L4**	270	135
0.75	18700	2358	123300	29200	24830	**PH**	**002RF87**	**DRN**	**90L4**	330	134
0.86	16300	2064	124000	29200	24830	**PHF**	**002RF87**	**DRN**	**90L4**	270	135
0.99	14200	1790	124000	29200	24830						
1.1	13400	1691	124000	29200	24830	**P**	**002RF77**	**DRN**	**90L4**	295	132
1.2	11400	1439	124000	29200	24830	**PF**	**002RF77**	**DRN**	**90L4**	240	133
1.4	10300	1308	124000	29200	24830	**PH**	**002RF77**	**DRN**	**90L4**	300	132
1.6	9000	1133	124000	29200	24830	**PHF**	**002RF77**	**DRN**	**90L4**	245	133
1.8	7830	986	124000	29200	24830						
1.9	7250	913	124000	-	24830	**P**	**002RF77**	**DRN**	**90L4**	295	132
2.1	6650	837	124000	-	24830	**PF**	**002RF77**	**DRN**	**90L4**	240	133
2.4	5830	735	124000	-	24830	**PH**	**002RF77**	**DRN**	**90L4**	300	132
						PHF	**002RF77**	**DRN**	**90L4**	240	133

P_m = 2.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.44	46900	4022	323000	111000	100170	**P**	**042RF107**	**DRN**	**100L4**	990	164
0.49	42400	3637	323000	111000	100170	**PF**	**042RF107**	**DRN**	**100L4**	800	165
						PH	**042RF107**	**DRN**	**100L4**	1000	164
						PHF	**042RF107**	**DRN**	**100L4**	810	165
0.44	46900	4022	248000	86800	69620	**P**	**032RF107**	**DRN**	**100L4**	750	158
0.49	42400	3637	251900	86800	69620	**PF**	**032RF107**	**DRN**	**100L4**	630	159
0.57	35900	3082	252000	86800	69620	**PH**	**032RF107**	**DRN**	**100L4**	770	158
0.62	33300	2859	252000	86800	69620	**PHF**	**032RF107**	**DRN**	**100L4**	650	159
0.54	38000	3262	252000	-	69620	**P**	**032RF97**	**DRN**	**100L4**	700	156
0.69	29800	2558	252000	-	69620	**PF**	**032RF97**	**DRN**	**100L4**	580	157
						PH	**032RF97**	**DRN**	**100L4**	720	156
						PHF	**032RF97**	**DRN**	**100L4**	600	157
0.43	47300	4058	196300	-	51190						
0.49	42300	3628	197000	-	51190						
0.54	38000	3262	197000	-	51190	**P**	**022RF97**	**DRN**	**100L4**	620	150
0.62	33000	2831	197000	-	51190	**PF**	**022RF97**	**DRN**	**100L4**	520	151
0.69	29800	2558	197000	-	51190	**PH**	**022RF97**	**DRN**	**100L4**	630	150
0.75	27400	2351	197000	-	51190	**PHF**	**022RF97**	**DRN**	**100L4**	530	151
0.85	24300	2087	197000	-	51190						

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P_m = 2.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.85	24100	2072	197000	-	51190	**P**	**022RF87**	**DRN**	**100L4**	570	148
						PF	**022RF87**	**DRN**	**100L4**	465	149
						PH	**022RF87**	**DRN**	**100L4**	580	148
						PHF	**022RF87**	**DRN**	**100L4**	480	149
0.62	33000	2831	156000	46200	36810	**P**	**012RF97**	**DRN**	**100L4**	470	144
0.85	24300	2087	156000	46200	36810	**PF**	**012RF97**	**DRN**	**100L4**	400	145
						PH	**012RF97**	**DRN**	**100L4**	485	144
						PHF	**012RF97**	**DRN**	**100L4**	415	145
0.48	42700	3663	156000	46200	36810						
0.55	37400	3214	156000	46200	36810						
0.71	29100	2498	156000	46200	36810						
0.75	27600	2368	156000	46200	36810	**P**	**012RF87**	**DRN**	**100L4**	420	142
0.85	24100	2072	156000	46200	36810	**PF**	**012RF87**	**DRN**	**100L4**	350	143
0.95	21700	1867	156000	46200	36810	**PH**	**012RF87**	**DRN**	**100L4**	430	142
1.1	19100	1637	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**100L4**	360	143
1.2	16800	1445	156000	-	36810						
1.4	14900	1281	156000	46200	36810						
1.6	12700	1094	156000	46200	36810						
1.6	13200	1138	156000	-	31500	**P**	**012RF77**	**DRN**	**100L4**	390	140
1.8	11500	990	156000	-	29900	**PF**	**012RF77**	**DRN**	**100L4**	320	141
						PH	**012RF77**	**DRN**	**100L4**	400	140
						PHF	**012RF77**	**DRN**	**100L4**	330	141
0.71	29000	2489	110900	29200	24830						
0.75	27500	2358	113500	29200	24830	**P**	**002RF87**	**DRN**	**100L4**	340	134
1.1	19000	1631	123100	29200	24830	**PF**	**002RF87**	**DRN**	**100L4**	280	135
1.2	16700	1440	124000	29200	24830	**PH**	**002RF87**	**DRN**	**100L4**	340	134
1.4	14800	1276	124000	29200	24830	**PHF**	**002RF87**	**DRN**	**100L4**	285	135
0.78	26200	2254	115500	29200	24830	**P**	**002RF77**	**DRN**	**100L4**	310	132
1.6	13200	1133	124000	29200	24830	**PF**	**002RF77**	**DRN**	**100L4**	250	133
1.8	11500	986	124000	29200	24830	**PH**	**002RF77**	**DRN**	**100L4**	310	132
						PHF	**002RF77**	**DRN**	**100L4**	255	133
1.9	10600	913	124000	-	24830						
2.1	9760	837	124000	-	24830	**P**	**002RF77**	**DRN**	**100L4**	305	132
2.4	8570	735	124000	-	24830	**PF**	**002RF77**	**DRN**	**100L4**	250	133
2.9	7110	610	124000	-	24830	**PH**	**002RF77**	**DRN**	**100L4**	310	132
3.2	6400	549	124000	-	24830	**PHF**	**002RF77**	**DRN**	**100L4**	255	133
3.7	5610	482	124000	-	24830						

P_m = 3.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.44	64000	4022	364000	140600	124060	**P**	**052RF107**	**DRN**	**100L4**	1140	170
0.48	57900	3637	364000	140600	124060	**PF**	**052RF107**	**DRN**	**100L4**	940	171
						PH	**052RF107**	**DRN**	**100L4**	1130	170
						PHF	**052RF107**	**DRN**	**100L4**	930	171
0.44	64000	4022	323000	111000	100170						
0.48	57900	3637	323000	111000	100170	**P**	**042RF107**	**DRN**	**100L4**	990	164
0.57	49000	3082	323000	111000	100170	**PF**	**042RF107**	**DRN**	**100L4**	800	165
0.62	45500	2859	323000	111000	100170	**PH**	**042RF107**	**DRN**	**100L4**	1000	164
0.68	40900	2573	323000	111000	100170	**PHF**	**042RF107**	**DRN**	**100L4**	810	165
0.44	64000	4022	230200	86800	69620						
0.48	57900	3637	237200	86800	69620	**P**	**032RF107**	**DRN**	**100L4**	750	158
0.57	49000	3082	246000	86800	69620	**PF**	**032RF107**	**DRN**	**100L4**	630	159
0.62	45500	2859	249200	86800	69620	**PH**	**032RF107**	**DRN**	**100L4**	770	158
0.76	37100	2331	252000	86800	69620	**PHF**	**032RF107**	**DRN**	**100L4**	650	159
0.85	32900	2067	252000	86800	69620						
0.54	51900	3262	243300	-	69620						
0.62	45000	2831	249600	-	69620	**P**	**032RF97**	**DRN**	**100L4**	700	156
0.69	40700	2558	252000	-	69620	**PF**	**032RF97**	**DRN**	**100L4**	580	157
0.75	37400	2351	252000	-	69620	**PH**	**032RF97**	**DRN**	**100L4**	720	156
0.84	33200	2087	252000	-	69620	**PHF**	**032RF97**	**DRN**	**100L4**	600	157
0.94	29700	1867	252000	-	69620						

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P_m = 3.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.62	45000	2831	197000	-	51190						
0.69	40700	2558	197000	-	51190						
0.75	37400	2351	197000	-	51190	**P**	**022RF97**	**DRN**	**100L4**	620	150
0.84	33200	2087	197000	-	51190	**PF**	**022RF97**	**DRN**	**100L4**	520	151
0.94	29700	1867	197000	-	51190	**PH**	**022RF97**	**DRN**	**100L4**	630	150
1.1	26700	1678	197000	-	51190	**PHF**	**022RF97**	**DRN**	**100L4**	530	151
1.2	23100	1457	197000	-	51190						
1.4	20700	1304	197000	-	51190						
1.1	26000	1637	197000	-	51190	**P**	**022RF87**	**DRN**	**100L4**	570	148
1.2	23000	1445	197000	-	51190	**PF**	**022RF87**	**DRN**	**100L4**	465	149
						PH	**022RF87**	**DRN**	**100L4**	580	148
						PHF	**022RF87**	**DRN**	**100L4**	480	149
1.3	21400	1350	197000	-	51190	**P**	**022RF87**	**DRN**	**100L4**	560	148
						PF	**022RF87**	**DRN**	**100L4**	460	149
						PH	**022RF87**	**DRN**	**100L4**	580	148
						PHF	**022RF87**	**DRN**	**100L4**	475	149
0.62	45000	2831	156000	46200	36810	**P**	**012RF97**	**DRN**	**100L4**	470	144
0.84	33200	2087	156000	46200	36810	**PF**	**012RF97**	**DRN**	**100L4**	400	145
1.6	17200	1082	156000	46200	36810	**PH**	**012RF97**	**DRN**	**100L4**	485	144
						PHF	**012RF97**	**DRN**	**100L4**	415	145
1.8	15600	982	156000	46200	36810	**P**	**012RF97**	**DRN**	**100L4**	465	144
						PF	**012RF97**	**DRN**	**100L4**	395	145
						PH	**012RF97**	**DRN**	**100L4**	480	144
						PHF	**012RF97**	**DRN**	**100L4**	410	145
0.62	45300	2847	156000	46200	36810						
0.71	39700	2498	156000	46200	36810						
0.74	37700	2368	156000	46200	36810	**P**	**012RF87**	**DRN**	**100L4**	420	142
0.94	29700	1867	156000	46200	36810	**PF**	**012RF87**	**DRN**	**100L4**	350	143
1.1	26000	1637	156000	46200	36810	**PH**	**012RF87**	**DRN**	**100L4**	430	142
1.2	23000	1445	156000	-	36810	**PHF**	**012RF87**	**DRN**	**100L4**	360	143
1.4	20400	1281	156000	46200	36810						
1.4	19600	1232	156000	46200	36810						
1.6	17300	1092	156000	46200	36810	**P**	**012RF87**	**DRN**	**100L4**	415	142
1.9	14600	918	156000	46200	36810	**PF**	**012RF87**	**DRN**	**100L4**	345	143
2.1	13400	844	156000	46200	36810	**PH**	**012RF87**	**DRN**	**100L4**	430	142
2.4	11900	749	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**100L4**	360	143
1.1	25900	1631	116000	29200	24830	**P**	**002RF87**	**DRN**	**100L4**	340	134
1.6	17300	1090	124000	29200	24830	**PF**	**002RF87**	**DRN**	**100L4**	280	135
						PH	**002RF87**	**DRN**	**100L4**	340	134
						PHF	**002RF87**	**DRN**	**100L4**	285	135
1.9	14500	914	124000	29200	24830	**P**	**002RF87**	**DRN**	**100L4**	335	134
2.6	10600	667	124000	29200	24830	**PF**	**002RF87**	**DRN**	**100L4**	280	135
						PH	**002RF87**	**DRN**	**100L4**	340	134
						PHF	**002RF87**	**DRN**	**100L4**	280	135
0.98	28500	1790	111800	29200	24830	**P**	**002RF77**	**DRN**	**100L4**	310	132
1.0	26900	1691	114500	29200	24830	**PF**	**002RF77**	**DRN**	**100L4**	250	133
						PH	**002RF77**	**DRN**	**100L4**	310	132
						PHF	**002RF77**	**DRN**	**100L4**	255	133
2.1	13300	837	124000	-	24830						
2.4	11700	735	124000	-	24830						
2.9	9700	610	124000	-	24830	**P**	**002RF77**	**DRN**	**100L4**	305	132
3.2	8740	549	124000	-	24830	**PF**	**002RF77**	**DRN**	**100L4**	250	133
3.7	7670	482	124000	-	24830	**PH**	**002RF77**	**DRN**	**100L4**	310	132
4.2	6760	425	124000	-	24830	**PHF**	**002RF77**	**DRN**	**100L4**	255	133
4.7	6000	377	124000	-	24100						
5.2	5340	336	124000	-	24100						

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P_m = 4.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.62	60500	2859	364000	140600	124060	**P**	**052RF107**	**DRN**	**112M4**	1150	170
0.69	54400	2573	364000	140600	124060	**PF**	**052RF107**	**DRN**	**112M4**	950	171
						PH	**052RF107**	**DRN**	**112M4**	1140	170
						PHF	**052RF107**	**DRN**	**112M4**	940	171
0.44	85100	4022	309800	111000	100170	**P**	**042RF107**	**DRN**	**112M4**	1000	164
0.49	76900	3637	316500	111000	100170	**PF**	**042RF107**	**DRN**	**112M4**	810	165
0.86	43700	2067	323000	111000	100170	**PH**	**042RF107**	**DRN**	**112M4**	1010	164
0.95	39500	1869	323000	111000	100170	**PHF**	**042RF107**	**DRN**	**112M4**	820	165
0.44	85100	4022	200200	86800	69620						
0.49	76900	3637	213100	86800	69620	**P**	**032RF107**	**DRN**	**112M4**	760	158
0.57	65200	3082	228800	86800	69620	**PF**	**032RF107**	**DRN**	**112M4**	630	159
0.62	60500	2859	234400	86800	69620	**PH**	**032RF107**	**DRN**	**112M4**	780	158
1.1	33500	1584	252000	86800	69620	**PHF**	**032RF107**	**DRN**	**112M4**	660	159
0.69	54100	2558	241200	-	69620	**P**	**032RF97**	**DRN**	**112M4**	710	156
1.1	35500	1678	252000	-	69620	**PF**	**032RF97**	**DRN**	**112M4**	590	157
1.2	30800	1457	252000	-	69620	**PH**	**032RF97**	**DRN**	**112M4**	730	156
						PHF	**032RF97**	**DRN**	**112M4**	610	157
1.5	25500	1207	197000	64200	51190	**P**	**022RF107**	**DRN**	**112M4**	670	152
						PF	**022RF107**	**DRN**	**112M4**	570	153
						PH	**022RF107**	**DRN**	**112M4**	680	152
						PHF	**022RF107**	**DRN**	**112M4**	580	153
0.75	49700	2351	192900	-	51190						
0.85	44100	2087	197000	-	51190	**P**	**022RF97**	**DRN**	**112M4**	630	150
0.95	39500	1867	197000	-	51190	**PF**	**022RF97**	**DRN**	**112M4**	520	151
1.1	35500	1678	197000	-	51190	**PH**	**022RF97**	**DRN**	**112M4**	640	150
1.4	27600	1304	197000	-	51190	**PHF**	**022RF97**	**DRN**	**112M4**	540	151
1.6	22800	1082	197000	-	51190						
1.8	20700	982	197000	64200	51190	**P**	**022RF97**	**DRN**	**112M4**	620	150
2.0	18500	878	197000	64200	51190	**PF**	**022RF97**	**DRN**	**112M4**	520	151
						PH	**022RF97**	**DRN**	**112M4**	640	150
						PHF	**022RF97**	**DRN**	**112M4**	540	151
1.4	26000	1232	197000	-	51190	**P**	**022RF87**	**DRN**	**112M4**	570	148
1.6	23100	1092	197000	-	51190	**PF**	**022RF87**	**DRN**	**112M4**	470	149
1.9	19400	918	197000	-	51190	**PH**	**022RF87**	**DRN**	**112M4**	590	148
						PHF	**022RF87**	**DRN**	**112M4**	485	149
0.85	44100	2087	156000	46200	36810	**P**	**012RF97**	**DRN**	**112M4**	480	144
1.2	30800	1457	156000	46200	36810	**PF**	**012RF97**	**DRN**	**112M4**	410	145
						PH	**012RF97**	**DRN**	**112M4**	495	144
						PHF	**012RF97**	**DRN**	**112M4**	425	145
2.2	16700	790	156000	46200	36810	**P**	**012RF97**	**DRN**	**112M4**	475	144
2.5	15100	716	156000	46200	36810	**PF**	**012RF97**	**DRN**	**112M4**	405	145
2.8	13400	634	156000	46200	36810	**PH**	**012RF97**	**DRN**	**112M4**	490	144
						PHF	**012RF97**	**DRN**	**112M4**	420	145
0.85	43800	2072	156000	46200	36810	**P**	**012RF87**	**DRN**	**112M4**	425	142
0.95	39500	1867	156000	46200	36810	**PF**	**012RF87**	**DRN**	**112M4**	355	143
1.4	27100	1281	156000	46200	36810	**PH**	**012RF87**	**DRN**	**112M4**	440	142
1.6	23100	1094	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**112M4**	370	143
2.1	17800	844	156000	46200	36810						
2.4	15800	749	156000	46200	36810	**P**	**012RF87**	**DRN**	**112M4**	425	142
2.6	14100	670	156000	46200	36810	**PF**	**012RF87**	**DRN**	**112M4**	355	143
2.9	12700	602	156000	46200	36810	**PH**	**012RF87**	**DRN**	**112M4**	440	142
3.4	11000	523	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**112M4**	370	143
3.2	11600	551	156000	-	27600	**P**	**012RF77**	**DRN**	**112M4**	395	140
						PF	**012RF77**	**DRN**	**112M4**	325	141
						PH	**012RF77**	**DRN**	**112M4**	410	140
						PHF	**012RF77**	**DRN**	**112M4**	340	141
1.4	27000	1276	114300	29200	24830	**P**	**002RF87**	**DRN**	**112M4**	345	134
						PF	**002RF87**	**DRN**	**112M4**	290	135
						PH	**002RF87**	**DRN**	**112M4**	350	134
						PHF	**002RF87**	**DRN**	**112M4**	295	135

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P_m = 4.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.9	19300	914	122900	29200	24830	**P**	**002RF87**	**DRN**	**112M4**	345	134
2.1	17700	841	123900	29200	24830	**PF**	**002RF87**	**DRN**	**112M4**	290	135
2.4	15700	746	124000	29200	24830	**PH**	**002RF87**	**DRN**	**112M4**	350	134
2.6	14100	667	124000	29200	24830	**PHF**	**002RF87**	**DRN**	**112M4**	290	135
1.4	27600	1308	113200	29200	24830	**P**	**002RF77**	**DRN**	**112M4**	315	132
						PF	**002RF77**	**DRN**	**112M4**	260	133
						PH	**002RF77**	**DRN**	**112M4**	320	132
						PHF	**002RF77**	**DRN**	**112M4**	265	133
2.9	12800	610	124000	-	24830						
3.2	11600	549	124000	-	24830						
3.7	10100	482	124000	-	24830	**P**	**002RF77**	**DRN**	**112M4**	315	132
4.2	8990	425	124000	-	24830	**PF**	**002RF77**	**DRN**	**112M4**	260	133
4.7	7970	377	124000	-	24100	**PH**	**002RF77**	**DRN**	**112M4**	320	132
5.3	7100	336	124000	-	24100	**PHF**	**002RF77**	**DRN**	**112M4**	260	133
5.8	6400	302	124000	-	23300						
6.7	5610	265	119800	-	22200						

P_m = 5.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.44	117800	4049	473000	209100	185660	**P**	**062RF137**	**DRN**	**132S4**	1750	176
0.51	101300	3480	473000	209100	185660	**PF**	**062RF137**	**DRN**	**132S4**	1390	177
0.56	92400	3174	473000	209100	185660	**PH**	**062RF137**	**DRN**	**132S4**	1740	176
						PHF	**062RF137**	**DRN**	**132S4**	1380	177
0.44	117800	4049	361300	140600	124060	**P**	**052RF137**	**DRN**	**132S4**	1270	172
0.51	101300	3480	364000	140600	124060	**PF**	**052RF137**	**DRN**	**132S4**	1070	173
0.61	83900	2883	364000	140600	124060	**PH**	**052RF137**	**DRN**	**132S4**	1260	172
0.69	74400	2558	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**132S4**	1060	173
0.62	83200	2859	364000	140600	124060	**P**	**052RF107**	**DRN**	**132S4**	1160	170
0.69	74900	2573	364000	140600	124060	**PF**	**052RF107**	**DRN**	**132S4**	960	171
						PH	**052RF107**	**DRN**	**132S4**	1150	170
						PHF	**052RF107**	**DRN**	**132S4**	950	171
0.56	92400	3174	303200	111000	100170	**P**	**042RF137**	**DRN**	**132S4**	1120	166
0.76	67500	2321	323000	111000	100170	**PF**	**042RF137**	**DRN**	**132S4**	930	167
						PH	**042RF137**	**DRN**	**132S4**	1130	166
						PHF	**042RF137**	**DRN**	**132S4**	940	167
0.49	105800	3637	289600	111000	100170						
0.62	83200	2859	311400	111000	100170	**P**	**042RF107**	**DRN**	**132S4**	1010	164
0.69	74900	2573	318100	111000	100170	**PF**	**042RF107**	**DRN**	**132S4**	820	165
0.76	67800	2331	323000	111000	100170	**PH**	**042RF107**	**DRN**	**132S4**	1020	164
0.86	60100	2067	323000	111000	100170	**PHF**	**042RF107**	**DRN**	**132S4**	830	165
0.95	54400	1869	323000	111000	100170						
0.62	83200	2859	203300	86800	69620						
0.76	67800	2331	225500	86800	69620	**P**	**032RF107**	**DRN**	**132S4**	770	158
0.86	60100	2067	234700	86800	69620	**PF**	**032RF107**	**DRN**	**132S4**	650	159
1.1	46100	1584	248700	86800	69620	**PH**	**032RF107**	**DRN**	**132S4**	790	158
1.3	40200	1383	252000	86800	69620	**PHF**	**032RF107**	**DRN**	**132S4**	670	159
1.5	35100	1207	252000	86800	69620	**P**	**032RF107**	**DRN**	**132S4**	760	158
						PF	**032RF107**	**DRN**	**132S4**	640	159
						PH	**032RF107**	**DRN**	**132S4**	780	158
						PHF	**032RF107**	**DRN**	**132S4**	660	159
0.95	54300	1867	240900	-	69620	**P**	**032RF97**	**DRN**	**132S4**	720	156
1.1	48800	1678	246300	-	69620	**PF**	**032RF97**	**DRN**	**132S4**	600	157
1.2	42400	1457	251900	-	69620	**PH**	**032RF97**	**DRN**	**132S4**	740	156
1.6	31500	1082	252000	86800	69620	**PHF**	**032RF97**	**DRN**	**132S4**	620	157
1.4	36600	1257	252000	-	69620	**P**	**032RF97**	**DRN**	**132S4**	720	156
						PF	**032RF97**	**DRN**	**132S4**	590	157
						PH	**032RF97**	**DRN**	**132S4**	740	156
						PHF	**032RF97**	**DRN**	**132S4**	620	157

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P_m = 5.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
1.1	48800	1678	194200	-	51190	**P**	**022RF97**	**DRN**	**132S4**		640	150
1.2	42400	1457	197000	-	51190	**PF**	**022RF97**	**DRN**	**132S4**		540	151
1.4	37900	1304	197000	-	51190	**PH**	**022RF97**	**DRN**	**132S4**		650	150
						PHF	**022RF97**	**DRN**	**132S4**		550	151
1.8	28500	982	197000	64200	51190	**P**	**022RF97**	**DRN**	**132S4**		640	150
2.0	25500	878	197000	64200	51190	**PF**	**022RF97**	**DRN**	**132S4**		530	151
						PH	**022RF97**	**DRN**	**132S4**		650	150
						PHF	**022RF97**	**DRN**	**132S4**		550	151
1.9	26700	918	197000	-	51190	**P**	**022RF87**	**DRN**	**132S4**		580	148
						PF	**022RF87**	**DRN**	**132S4**		485	149
						PH	**022RF87**	**DRN**	**132S4**		600	148
						PHF	**022RF87**	**DRN**	**132S4**		500	149
1.2	42400	1457	156000	46200	36810	**P**	**012RF97**	**DRN**	**132S4**		490	144
1.6	31500	1082	156000	46200	36810	**PF**	**012RF97**	**DRN**	**132S4**		420	145
						PH	**012RF97**	**DRN**	**132S4**		500	144
						PHF	**012RF97**	**DRN**	**132S4**		435	145
1.8	28500	982	156000	46200	36810	**P**	**012RF97**	**DRN**	**132S4**		485	144
2.2	23000	790	156000	46200	36810	**PF**	**012RF97**	**DRN**	**132S4**		415	145
2.5	20800	716	156000	46200	36810	**PH**	**012RF97**	**DRN**	**132S4**		500	144
2.8	18400	634	156000	46200	36810	**PHF**	**012RF97**	**DRN**	**132S4**		430	145
1.4	37300	1281	156000	46200	36810	**P**	**012RF87**	**DRN**	**132S4**		440	142
						PF	**012RF87**	**DRN**	**132S4**		370	143
						PH	**012RF87**	**DRN**	**132S4**		450	142
						PHF	**012RF87**	**DRN**	**132S4**		380	143
1.9	26700	918	156000	46200	36810							
2.1	24500	844	156000	46200	36810	**P**	**012RF87**	**DRN**	**132S4**		435	142
2.4	21800	749	156000	46200	36810	**PF**	**012RF87**	**DRN**	**132S4**		365	143
2.6	19500	670	156000	46200	36810	**PH**	**012RF87**	**DRN**	**132S4**		450	142
2.9	17500	602	156000	46200	36810	**PHF**	**012RF87**	**DRN**	**132S4**		380	143
3.4	15200	523	156000	46200	36810							
1.9	26600	914	114900	29200	24830							
2.6	19400	667	122900	29200	24830							
3.0	17400	600	124000	29200	24830							
3.4	15100	521	124000	29200	24830							
3.8	13500	466	124000	29200	24830	**P**	**002RF87**	**DRN**	**132S4**		355	134
4.6	11200	387	124000	29200	24830	**PF**	**002RF87**	**DRN**	**132S4**		300	135
5.0	10400	357	124000	29200	24830	**PH**	**002RF87**	**DRN**	**132S4**		360	134
5.5	9350	321	124000	29200	24830	**PHF**	**002RF87**	**DRN**	**132S4**		305	135
6.3	8110	279	121600	29200	24830							
6.8	7570	260	119100	-	24400							
7.6	6780	233	115200	-	23500							
1.8	28700	986	111500	29200	24830	**P**	**002RF77**	**DRN**	**132S4**		330	132
						PF	**002RF77**	**DRN**	**132S4**		270	133
						PH	**002RF77**	**DRN**	**132S4**		335	132
						PHF	**002RF77**	**DRN**	**132S4**		275	133
9.4	5480	188	108100	-	12000	**P**	**002RF77**	**DRN**	**132S4**		330	132
11	4880	168	104400	-	12000	**PF**	**002RF77**	**DRN**	**132S4**		270	133
						PH	**002RF77**	**DRN**	**132S4**		330	132
						PHF	**002RF77**	**DRN**	**132S4**		275	133

P_m = 7.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
0.51	137700	3480	470400	209100	185660							
0.56	125500	3174	473000	209100	185660	**P**	**062RF137**	**DRN**	**132M4**		1770	176
0.62	114000	2883	473000	209100	185660	**PF**	**062RF137**	**DRN**	**132M4**		1400	177
0.69	101200	2558	473000	209100	185660	**PH**	**062RF137**	**DRN**	**132M4**		1760	176
0.76	91800	2321	473000	209100	185660	**PHF**	**062RF137**	**DRN**	**132M4**		1390	177

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P_m = 7.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
0.51	137700	3480	344600	140600	124060	**P**	**052RF137**	**DRN**	**132M4**		1280	172
0.62	114000	2883	364000	140600	124060	**PF**	**052RF137**	**DRN**	**132M4**		1080	173
0.69	101200	2558	364000	140600	124060	**PH**	**052RF137**	**DRN**	**132M4**		1280	172
0.89	78900	1995	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**132M4**		1080	173
1.0	68900	1741	364000	140600	124060							
0.95	73900	1869	364000	140600	124060	**P**	**052RF107**	**DRN**	**132M4**		1180	170
						PF	**052RF107**	**DRN**	**132M4**		980	171
						PH	**052RF107**	**DRN**	**132M4**		1170	170
						PHF	**052RF107**	**DRN**	**132M4**		970	171
0.76	91800	2321	303700	111000	100170	**P**	**042RF137**	**DRN**	**132M4**		1140	166
1.2	58400	1477	323000	111000	100170	**PF**	**042RF137**	**DRN**	**132M4**		950	167
						PH	**042RF137**	**DRN**	**132M4**		1140	166
						PHF	**042RF137**	**DRN**	**132M4**		950	167
0.69	101800	2573	293900	111000	100170							
0.86	81700	2067	312600	111000	100170	**P**	**042RF107**	**DRN**	**132M4**		1030	164
0.95	73900	1869	318900	111000	100170	**PF**	**042RF107**	**DRN**	**132M4**		840	165
1.1	62600	1584	323000	111000	100170	**PH**	**042RF107**	**DRN**	**132M4**		1040	164
1.3	54700	1383	323000	111000	100170	**PHF**	**042RF107**	**DRN**	**132M4**		850	165
1.5	47700	1207	323000	111000	100170	**P**	**042RF107**	**DRN**	**132M4**		1030	164
						PF	**042RF107**	**DRN**	**132M4**		840	165
						PH	**042RF107**	**DRN**	**132M4**		1030	164
						PHF	**042RF107**	**DRN**	**132M4**		840	165
0.86	81700	2067	205700	86800	69620	**P**	**032RF107**	**DRN**	**132M4**		790	158
1.1	62600	1584	231900	86800	69620	**PF**	**032RF107**	**DRN**	**132M4**		660	159
1.3	54700	1383	240500	86800	69620	**PH**	**032RF107**	**DRN**	**132M4**		810	158
						PHF	**032RF107**	**DRN**	**132M4**		690	159
1.6	42800	1082	251600	86800	69620	**P**	**032RF107**	**DRN**	**132M4**		780	158
1.8	38600	977	252000	86800	69620	**PF**	**032RF107**	**DRN**	**132M4**		660	159
						PH	**032RF107**	**DRN**	**132M4**		800	158
						PHF	**032RF107**	**DRN**	**132M4**		680	159
1.7	42200	1067	252000	-	69620	**P**	**032RF97**	**DRN**	**132M4**		730	156
1.8	38800	982	252000	-	69620	**PF**	**032RF97**	**DRN**	**132M4**		610	157
2.0	34700	878	252000	-	69620	**PH**	**032RF97**	**DRN**	**132M4**		750	156
						PHF	**032RF97**	**DRN**	**132M4**		630	157
1.5	47700	1207	195700	64200	51190	**P**	**022RF107**	**DRN**	**132M4**		700	152
						PF	**022RF107**	**DRN**	**132M4**		600	153
						PH	**022RF107**	**DRN**	**132M4**		710	152
						PHF	**022RF107**	**DRN**	**132M4**		610	153
1.6	42800	1082	197000	-	51190	**P**	**022RF97**	**DRN**	**132M4**		660	150
						PF	**022RF97**	**DRN**	**132M4**		550	151
						PH	**022RF97**	**DRN**	**132M4**		670	150
						PHF	**022RF97**	**DRN**	**132M4**		570	151
1.8	38800	982	197000	64200	51190							
2.0	34700	878	197000	64200	51190	**P**	**022RF97**	**DRN**	**132M4**		650	150
2.2	31200	790	197000	64200	51190	**PF**	**022RF97**	**DRN**	**132M4**		550	151
2.5	28300	716	197000	64200	51190	**PH**	**022RF97**	**DRN**	**132M4**		670	150
2.8	25100	634	197000	64200	51190	**PHF**	**022RF97**	**DRN**	**132M4**		570	151
1.6	42800	1082	156000	46200	36810	**P**	**012RF97**	**DRN**	**132M4**		510	144
						PF	**012RF97**	**DRN**	**132M4**		440	145
						PH	**012RF97**	**DRN**	**132M4**		520	144
						PHF	**012RF97**	**DRN**	**132M4**		450	145
1.8	38800	982	156000	46200	36810							
2.2	31200	790	156000	46200	36810							
2.5	28300	716	156000	46200	36810	**P**	**012RF97**	**DRN**	**132M4**		510	144
2.8	25100	634	156000	46200	36810	**PF**	**012RF97**	**DRN**	**132M4**		435	145
3.1	22700	574	156000	46200	36810	**PH**	**012RF97**	**DRN**	**132M4**		520	144
3.6	19200	486	156000	46200	36810	**PHF**	**012RF97**	**DRN**	**132M4**		450	145
4.2	16800	425	156000	46200	36810							
1.6	43200	1094	156000	46200	36810	**P**	**012RF87**	**DRN**	**132M4**		455	142
						PF	**012RF87**	**DRN**	**132M4**		385	143
						PH	**012RF87**	**DRN**	**132M4**		470	142
						PHF	**012RF87**	**DRN**	**132M4**		400	143

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P_m = 7.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.6	43200	1092	156000	46200	36810						
2.9	23800	602	156000	46200	36810						
3.4	20600	523	156000	46200	36810	**P**	**012RF87**	**DRN**	**132M4**	455	142
3.8	18500	468	156000	46200	36810	**PF**	**012RF87**	**DRN**	**132M4**	385	143
4.6	15300	388	156000	46200	36810	**PH**	**012RF87**	**DRN**	**132M4**	470	142
5.0	14100	359	156000	-	36810	**PHF**	**012RF87**	**DRN**	**132M4**	400	143
5.5	12700	322	156000	46200	36810						
2.7	26400	667	115300	29200	24830						
3.8	18400	466	123500	29200	24830						
4.6	15300	387	124000	29200	24830						
5.0	14100	357	124000	29200	24830						
5.5	12700	321	124000	29200	24830						
6.4	11000	279	121500	29200	24830	**P**	**002RF87**	**DRN**	**132M4**	375	134
6.8	10200	260	119000	-	24400	**PF**	**002RF87**	**DRN**	**132M4**	315	135
7.6	9220	233	115100	-	23500	**PH**	**002RF87**	**DRN**	**132M4**	380	134
9.2	7640	193	108800	-	22500	**PHF**	**002RF87**	**DRN**	**132M4**	320	135
9.9	7060	178	106300	-	23100						
11	6350	161	102900	-	22200						
13	5510	139	98700	-	20400						
14	4930	125	95400	-	19500						
17	4090	104	90200	-	17400						

P_m = 9.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.49	175000	3608	850000	631300	500000	**P**	**102RF167**	**DRN**	**132L4**	4590	190
0.55	155700	3210	850000	631300	500000	**PF**	**102RF167**	**DRN**	**132L4**	3630	191
0.62	138400	2854	850000	-	500000	**PH**	**102RF167**	**DRN**	**132L4**	4650	190
0.78	110100	2271	850000	-	500000	**PHF**	**102RF167**	**DRN**	**132L4**	3690	191
0.49	177300	3656	720000	513900	423000						
0.55	157700	3253	720000	513900	423000	**P**	**092RF167**	**DRN**	**132L4**	3730	188
0.61	140200	2891	720000	-	423000	**PF**	**092RF167**	**DRN**	**132L4**	3040	189
0.77	111600	2301	720000	-	423000	**PH**	**092RF167**	**DRN**	**132L4**	3750	188
0.87	98400	2031	720000	-	423000	**PHF**	**092RF167**	**DRN**	**132L4**	3050	189
0.98	87500	1805	720000	513900	423000	**P**	**092RF167**	**DRN**	**132L4**	3730	188
						PF	**092RF167**	**DRN**	**132L4**	3030	189
						PH	**092RF167**	**DRN**	**132L4**	3740	188
						PHF	**092RF167**	**DRN**	**132L4**	3040	189
0.43	201900	4165	523000	-	245660	**P**	**072RF147**	**DRN**	**132L4**	2320	180
0.65	133200	2747	523000	-	245660	**PF**	**072RF147**	**DRN**	**132L4**	1830	181
0.70	123700	2552	523000	-	245660	**PH**	**072RF147**	**DRN**	**132L4**	2370	180
0.76	112900	2328	523000	-	245660	**PHF**	**072RF147**	**DRN**	**132L4**	1880	181
0.48	180000	3711	442900	209100	185660	**P**	**062RF147**	**DRN**	**132L4**	1900	178
0.54	158800	3275	457500	209100	185660	**PF**	**062RF147**	**DRN**	**132L4**	1530	179
0.86	100600	2074	473000	209100	185660	**PH**	**062RF147**	**DRN**	**132L4**	1890	178
						PHF	**062RF147**	**DRN**	**132L4**	1520	179
0.44	196400	4049	430300	209100	185660	**P**	**062RF137**	**DRN**	**132L4**	1780	176
0.62	139800	2883	469100	209100	185660	**PF**	**062RF137**	**DRN**	**132L4**	1410	177
1.0	84400	1741	473000	209100	185660	**PH**	**062RF137**	**DRN**	**132L4**	1770	176
						PHF	**062RF137**	**DRN**	**132L4**	1400	177
0.62	139800	2883	342600	140600	124060						
0.69	124000	2558	356300	140600	124060	**P**	**052RF137**	**DRN**	**132L4**	1290	172
0.76	112600	2321	364000	140600	124060	**PF**	**052RF137**	**DRN**	**132L4**	1090	173
1.2	71600	1477	364000	140600	124060	**PH**	**052RF137**	**DRN**	**132L4**	1280	172
1.4	62600	1291	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**132L4**	1080	173
0.62	138600	2859	343600	140600	124060	**P**	**052RF107**	**DRN**	**132L4**	1190	170
0.69	124800	2573	355700	140600	124060	**PF**	**052RF107**	**DRN**	**132L4**	990	171
1.3	67100	1383	364000	140600	124060	**PH**	**052RF107**	**DRN**	**132L4**	1180	170
						PHF	**052RF107**	**DRN**	**132L4**	980	171

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P_m = 9.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.5	58500	1207	364000	140600	124060	**P**	**052RF107**	**DRN**	**132L4**	1180	170
						PF	**052RF107**	**DRN**	**132L4**	980	171
						PH	**052RF107**	**DRN**	**132L4**	1170	170
						PHF	**052RF107**	**DRN**	**132L4**	970	171
0.89	96700	1995	299000	111000	100170	**P**	**042RF137**	**DRN**	**132L4**	1150	166
1.0	84400	1741	310300	111000	100170	**PF**	**042RF137**	**DRN**	**132L4**	960	167
1.6	52900	1092	323000	111000	100170	**PH**	**042RF137**	**DRN**	**132L4**	1150	166
						PHF	**042RF137**	**DRN**	**132L4**	960	167
1.1	76800	1584	316600	111000	100170	**P**	**042RF107**	**DRN**	**132L4**	1040	164
1.3	67100	1383	323000	111000	100170	**PF**	**042RF107**	**DRN**	**132L4**	850	165
						PH	**042RF107**	**DRN**	**132L4**	1040	164
						PHF	**042RF107**	**DRN**	**132L4**	850	165
1.6	52400	1082	323000	111000	100170	**P**	**042RF107**	**DRN**	**132L4**	1030	164
1.8	47300	977	323000	111000	100170	**PF**	**042RF107**	**DRN**	**132L4**	840	165
2.0	43000	887	323000	111000	100170	**PH**	**042RF107**	**DRN**	**132L4**	1040	164
						PHF	**042RF107**	**DRN**	**132L4**	850	165
1.1	76800	1584	213300	86800	69620	**P**	**032RF107**	**DRN**	**132L4**	790	158
						PF	**032RF107**	**DRN**	**132L4**	670	159
						PH	**032RF107**	**DRN**	**132L4**	810	158
						PHF	**032RF107**	**DRN**	**132L4**	690	159
1.5	58500	1207	236500	86800	69620	**P**	**032RF107**	**DRN**	**132L4**	790	158
1.6	52400	1082	242800	86800	69620	**PF**	**032RF107**	**DRN**	**132L4**	670	159
2.2	38100	787	252000	86800	69620	**PH**	**032RF107**	**DRN**	**132L4**	810	158
2.5	34600	714	252000	86800	69620	**PHF**	**032RF107**	**DRN**	**132L4**	690	159
2.5	34700	716	252000	-	69620	**P**	**032RF97**	**DRN**	**132L4**	740	156
2.8	30700	634	252000	-	69620	**PF**	**032RF97**	**DRN**	**132L4**	620	157
						PH	**032RF97**	**DRN**	**132L4**	760	156
						PHF	**032RF97**	**DRN**	**132L4**	640	157
1.5	58500	1207	178900	64200	51190	**P**	**022RF107**	**DRN**	**132L4**	710	152
2.9	29700	614	197000	64200	51190	**PF**	**022RF107**	**DRN**	**132L4**	610	153
3.3	25900	536	197000	64200	51190	**PH**	**022RF107**	**DRN**	**132L4**	720	152
						PHF	**022RF107**	**DRN**	**132L4**	620	153
1.8	47600	982	195900	64200	51190						
2.0	42500	878	197000	64200	51190	**P**	**022RF97**	**DRN**	**132L4**	660	150
2.2	38300	790	197000	64200	51190	**PF**	**022RF97**	**DRN**	**132L4**	560	151
2.5	34700	716	197000	64200	51190	**PH**	**022RF97**	**DRN**	**132L4**	680	150
3.1	27800	574	197000	64200	51190	**PHF**	**022RF97**	**DRN**	**132L4**	570	151
3.6	23500	486	197000	64200	51190						
4.6	18800	388	197000	-	45300	**P**	**022RF87**	**DRN**	**132L4**	610	148
						PF	**022RF87**	**DRN**	**132L4**	510	149
						PH	**022RF87**	**DRN**	**132L4**	630	148
						PHF	**022RF87**	**DRN**	**132L4**	520	149
2.2	38300	790	156000	46200	36810						
2.8	30700	634	156000	46200	36810						
3.1	27800	574	156000	46200	36810	**P**	**012RF97**	**DRN**	**132L4**	510	144
3.6	23500	486	156000	46200	36810	**PF**	**012RF97**	**DRN**	**132L4**	445	145
4.2	20600	425	156000	46200	36810	**PH**	**012RF97**	**DRN**	**132L4**	530	144
4.9	17600	364	156000	46200	36810	**PHF**	**012RF97**	**DRN**	**132L4**	460	145
5.4	15900	329	156000	46200	36810						
6.4	13500	279	150100	46200	36810						
2.1	40900	844	156000	46200	36810	**P**	**012RF87**	**DRN**	**132L4**	465	142
5.0	17300	359	156000	-	36810	**PF**	**012RF87**	**DRN**	**132L4**	395	143
5.5	15600	322	156000	46200	36810	**PH**	**012RF87**	**DRN**	**132L4**	475	142
6.3	13500	280	150200	-	36810	**PHF**	**012RF87**	**DRN**	**132L4**	405	143
7.3	11700	243	116500	29200	24830	**P**	**002RF97**	**DRN**	**132L4**	435	136
						PF	**002RF97**	**DRN**	**132L4**	375	137
						PH	**002RF97**	**DRN**	**132L4**	440	136
						PHF	**002RF97**	**DRN**	**132L4**	380	137

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P_m = 9.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.0	29100	600	110800	29200	24830						
3.4	25200	521	117000	29200	24830						
4.6	18700	387	123300	29200	24830						
5.0	17300	357	124000	29200	24830						
5.5	15500	321	124000	29200	24830						
6.4	13500	279	121400	29200	24830	**P**	**002RF87**	**DRN**	**132L4**	385	134
7.1	12100	250	117500	29200	24830	**PF**	**002RF87**	**DRN**	**132L4**	325	135
8.6	10000	207	111100	29200	24830	**PH**	**002RF87**	**DRN**	**132L4**	385	134
9.2	9370	193	108800	-	22500	**PHF**	**002RF87**	**DRN**	**132L4**	330	135
9.9	8660	178	106300	-	23100						
11	7780	161	102900	-	22200						
13	6750	139	98600	-	20400						
14	6050	125	95400	-	19500						
17	5020	104	90200	-	17400						

P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.49	209100	3608	850000	631300	500000	**P**	**102RF167**	**DRN**	**160M4**	4620	190
0.55	186100	3210	850000	631300	500000	**PF**	**102RF167**	**DRN**	**160M4**	3660	191
0.62	165400	2854	850000	-	500000	**PH**	**102RF167**	**DRN**	**160M4**	4680	190
0.78	131600	2271	850000	-	500000	**PHF**	**102RF167**	**DRN**	**160M4**	3720	191
0.89	116100	2004	850000	-	500000						
1.0	103200	1781	850000	631300	500000	**P**	**102RF167**	**DRN**	**160M4**	4610	190
						PF	**102RF167**	**DRN**	**160M4**	3660	191
						PH	**102RF167**	**DRN**	**160M4**	4670	190
						PHF	**102RF167**	**DRN**	**160M4**	3720	191
0.49	211900	3656	720000	513900	423000						
0.55	188500	3253	720000	513900	423000	**P**	**092RF167**	**DRN**	**160M4**	3760	188
0.61	167600	2891	720000	-	423000	**PF**	**092RF167**	**DRN**	**160M4**	3070	189
0.77	133300	2301	720000	-	423000	**PH**	**092RF167**	**DRN**	**160M4**	3780	188
0.87	117700	2031	720000	-	423000	**PHF**	**092RF167**	**DRN**	**160M4**	3080	189
1.1	90700	1566	720000	-	423000						
0.98	104600	1805	720000	513900	423000	**P**	**092RF167**	**DRN**	**160M4**	3760	188
						PF	**092RF167**	**DRN**	**160M4**	3060	189
						PH	**092RF167**	**DRN**	**160M4**	3770	188
						PHF	**092RF167**	**DRN**	**160M4**	3070	189
0.44	233800	4034	683000	397100	359400	**P**	**082RF167**	**DRN**	**160M4**	3270	186
0.51	202700	3497	683000	397100	359400	**PF**	**082RF167**	**DRN**	**160M4**	2620	187
						PH	**082RF167**	**DRN**	**160M4**	3260	186
						PHF	**082RF167**	**DRN**	**160M4**	2610	187
0.56	183000	3159	523000	274600	245660	**P**	**072RF167**	**DRN**	**160M4**	2610	182
						PF	**072RF167**	**DRN**	**160M4**	2120	183
						PH	**072RF167**	**DRN**	**160M4**	2660	182
						PHF	**072RF167**	**DRN**	**160M4**	2170	183
0.43	241300	4165	523000	-	245660						
0.49	208900	3604	523000	-	245660	**P**	**072RF147**	**DRN**	**160M4**	2350	180
0.56	184300	3180	523000	-	245660	**PF**	**072RF147**	**DRN**	**160M4**	1860	181
0.65	159100	2747	523000	-	245660	**PH**	**072RF147**	**DRN**	**160M4**	2400	180
0.70	147900	2552	523000	-	245660	**PHF**	**072RF147**	**DRN**	**160M4**	1910	181
0.76	134900	2328	523000	-	245660						
0.54	189800	3275	435500	209100	185660	**P**	**062RF147**	**DRN**	**160M4**	1930	178
0.63	163900	2828	454100	209100	185660	**PF**	**062RF147**	**DRN**	**160M4**	1560	179
0.86	120200	2074	473000	209100	185660	**PH**	**062RF147**	**DRN**	**160M4**	1920	178
						PHF	**062RF147**	**DRN**	**160M4**	1550	179
0.51	201700	3480	426000	209100	185660						
0.69	148200	2558	464100	209100	185660	**P**	**062RF137**	**DRN**	**160M4**	1810	176
0.77	134500	2321	472200	209100	185660	**PF**	**062RF137**	**DRN**	**160M4**	1440	177
0.89	115600	1995	473000	209100	185660	**PH**	**062RF137**	**DRN**	**160M4**	1800	176
1.0	100900	1741	473000	209100	185660	**PHF**	**062RF137**	**DRN**	**160M4**	1430	177

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P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.77	134500	2321	347400	140600	124060						
0.89	115600	1995	363000	140600	124060	**P**	**052RF137**	**DRN**	**160M4**	1320	172
1.0	100900	1741	364000	140600	124060	**PF**	**052RF137**	**DRN**	**160M4**	1120	173
1.2	85600	1477	364000	140600	124060	**PH**	**052RF137**	**DRN**	**160M4**	1320	172
1.4	74800	1291	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**160M4**	1120	173
1.0	100900	1741	294800	111000	100170	**P**	**042RF137**	**DRN**	**160M4**	1180	166
1.2	85600	1477	309300	111000	100170	**PF**	**042RF137**	**DRN**	**160M4**	990	167
1.6	63200	1092	323000	111000	100170	**PH**	**042RF137**	**DRN**	**160M4**	1180	166
						PHF	**042RF137**	**DRN**	**160M4**	990	167
0.95	108300	1869	286900	111000	100170	**P**	**042RF107**	**DRN**	**160M4**	1070	164
1.3	80100	1383	313900	111000	100170	**PF**	**042RF107**	**DRN**	**160M4**	880	165
						PH	**042RF107**	**DRN**	**160M4**	1080	164
						PHF	**042RF107**	**DRN**	**160M4**	890	165
1.5	69900	1207	321900	111000	100170	**P**	**042RF107**	**DRN**	**160M4**	1070	164
1.6	62700	1082	323000	111000	100170	**PF**	**042RF107**	**DRN**	**160M4**	880	165
1.8	56600	977	323000	111000	100170	**PH**	**042RF107**	**DRN**	**160M4**	1070	164
2.0	51400	887	323000	111000	100170	**PHF**	**042RF107**	**DRN**	**160M4**	880	165
1.3	80100	1383	208200	86800	69620	**P**	**032RF107**	**DRN**	**160M4**	830	158
						PF	**032RF107**	**DRN**	**160M4**	710	159
						PH	**032RF107**	**DRN**	**160M4**	850	158
						PHF	**032RF107**	**DRN**	**160M4**	730	159
1.5	69900	1207	222800	86800	69620						
1.6	62700	1082	231800	86800	69620	**P**	**032RF107**	**DRN**	**160M4**	820	158
1.8	56600	977	238600	86800	69620	**PF**	**032RF107**	**DRN**	**160M4**	700	159
2.3	45600	787	249200	86800	69620	**PH**	**032RF107**	**DRN**	**160M4**	840	158
2.5	41400	714	252000	86800	69620	**PHF**	**032RF107**	**DRN**	**160M4**	720	159
2.0	50800	878	244400	-	69620	**P**	**032RF97**	**DRN**	**160M4**	770	156
						PF	**032RF97**	**DRN**	**160M4**	650	157
						PH	**032RF97**	**DRN**	**160M4**	800	156
						PHF	**032RF97**	**DRN**	**160M4**	670	157
2.9	35500	614	197000	64200	51190	**P**	**022RF107**	**DRN**	**160M4**	740	152
3.3	31000	536	197000	64200	51190	**PF**	**022RF107**	**DRN**	**160M4**	640	153
						PH	**022RF107**	**DRN**	**160M4**	760	152
						PHF	**022RF107**	**DRN**	**160M4**	650	153
1.8	56900	982	181700	64200	51190						
2.2	45800	790	197000	64200	51190	**P**	**022RF97**	**DRN**	**160M4**	690	150
2.5	41400	716	197000	64200	51190	**PF**	**022RF97**	**DRN**	**160M4**	590	151
2.8	36700	634	197000	64200	51190	**PH**	**022RF97**	**DRN**	**160M4**	710	150
3.1	33200	574	197000	64200	51190	**PHF**	**022RF97**	**DRN**	**160M4**	610	151
3.6	28100	486	197000	64200	51190						
2.2	45800	790	156000	46200	36810						
2.5	41400	716	156000	46200	36810						
3.1	33200	574	156000	46200	36810						
3.6	28100	486	156000	46200	36810	**P**	**012RF97**	**DRN**	**160M4**	550	144
4.2	24600	425	156000	46200	36810	**PF**	**012RF97**	**DRN**	**160M4**	475	145
4.9	21100	364	156000	46200	36810	**PH**	**012RF97**	**DRN**	**160M4**	560	144
5.4	19000	329	156000	46200	36810	**PHF**	**012RF97**	**DRN**	**160M4**	490	145
6.4	16100	279	150100	46200	36810						
7.3	14100	244	144100	46200	36810						
8.7	11800	204	136600	46200	36810						
2.4	43400	749	156000	46200	36810						
2.6	38800	670	156000	46200	36810						
4.6	22500	388	156000	46200	36810	**P**	**012RF87**	**DRN**	**160M4**	495	142
5.0	20700	359	156000	-	36810	**PF**	**012RF87**	**DRN**	**160M4**	425	143
5.5	18600	322	156000	46200	36810	**PH**	**012RF87**	**DRN**	**160M4**	510	142
6.3	16200	280	150200	-	36810	**PHF**	**012RF87**	**DRN**	**160M4**	440	143
7.1	14500	251	145300	-	36810						
8.5	12000	208	137400	-	34900						

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P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.8	27000	466	114300	29200	24830						
5.5	18600	321	123400	29200	24830						
6.4	16100	279	121400	29200	24830						
7.1	14400	250	117500	29200	24830	**P**	**002RF87**	**DRN**	**160M4**	415	134
8.6	12000	207	111100	29200	24830	**PF**	**002RF87**	**DRN**	**160M4**	355	135
9.2	11200	193	108800	-	22500	**PH**	**002RF87**	**DRN**	**160M4**	420	134
9.9	10300	178	106200	-	23100	**PHF**	**002RF87**	**DRN**	**160M4**	360	135
11	9300	161	102900	-	22200						
13	8070	139	98600	-	20400						
14	7230	125	95400	-	19500						
17	5990	104	90200	-	17400						

P_m = 15.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.49	285000	3608	850000	631300	500000						
0.55	253600	3210	850000	631300	500000						
0.62	225400	2854	850000	-	500000	**P**	**102RF167**	**DRN**	**160L4**	4630	190
0.78	179400	2271	850000	-	500000	**PF**	**102RF167**	**DRN**	**160L4**	3680	191
0.89	158300	2004	850000	-	500000	**PH**	**102RF167**	**DRN**	**160L4**	4690	190
1.1	122100	1546	850000	-	500000	**PHF**	**102RF167**	**DRN**	**160L4**	3740	191
1.3	105200	1332	850000	-	500000						
1.0	140700	1781	850000	631300	500000	**P**	**102RF167**	**DRN**	**160L4**	4630	190
						PF	**102RF167**	**DRN**	**160L4**	3670	191
						PH	**102RF167**	**DRN**	**160L4**	4690	190
						PHF	**102RF167**	**DRN**	**160L4**	3730	191
0.49	288800	3656	720000	513900	423000						
0.55	256900	3253	720000	513900	423000						
0.61	228400	2891	720000	-	423000	**P**	**092RF167**	**DRN**	**160L4**	3780	188
0.77	181700	2301	720000	-	423000	**PF**	**092RF167**	**DRN**	**160L4**	3080	189
0.88	160400	2031	720000	-	423000	**PH**	**092RF167**	**DRN**	**160L4**	3790	188
1.1	123700	1566	720000	-	423000	**PHF**	**092RF167**	**DRN**	**160L4**	3090	189
1.3	106600	1350	720000	-	423000						
0.98	142500	1805	720000	513900	423000	**P**	**092RF167**	**DRN**	**160L4**	3770	188
1.5	95100	1205	720000	513900	423000	**PF**	**092RF167**	**DRN**	**160L4**	3080	189
						PH	**092RF167**	**DRN**	**160L4**	3790	188
						PHF	**092RF167**	**DRN**	**160L4**	3090	189
0.44	318700	4034	683000	397100	359400						
0.51	276300	3497	683000	397100	359400	**P**	**082RF167**	**DRN**	**160L4**	3280	186
0.57	245800	3112	683000	397100	359400	**PF**	**082RF167**	**DRN**	**160L4**	2630	187
0.64	218500	2766	683000	397100	359400	**PH**	**082RF167**	**DRN**	**160L4**	3270	186
0.70	199800	2530	683000	397100	359400	**PHF**	**082RF167**	**DRN**	**160L4**	2620	187
0.77	181100	2293	683000	-	359400	**P**	**082RF147**	**DRN**	**160L4**	3020	184
						PF	**082RF147**	**DRN**	**160L4**	2370	185
						PH	**082RF147**	**DRN**	**160L4**	3020	184
						PHF	**082RF147**	**DRN**	**160L4**	2370	185
0.56	249500	3159	523000	274600	245660	**P**	**072RF167**	**DRN**	**160L4**	2620	182
0.69	202800	2568	523000	274600	245660	**PF**	**072RF167**	**DRN**	**160L4**	2130	183
						PH	**072RF167**	**DRN**	**160L4**	2680	182
						PHF	**072RF167**	**DRN**	**160L4**	2190	183
0.65	216900	2747	523000	-	245660						
0.70	201600	2552	523000	-	245660	**P**	**072RF147**	**DRN**	**160L4**	2370	180
0.76	183800	2328	523000	-	245660	**PF**	**072RF147**	**DRN**	**160L4**	1880	181
0.88	159100	2014	523000	-	245660	**PH**	**072RF147**	**DRN**	**160L4**	2420	180
1.0	140400	1777	523000	-	245660	**PHF**	**072RF147**	**DRN**	**160L4**	1930	181
0.86	163800	2074	454200	209100	185660						
0.97	144600	1830	466300	209100	185660	**P**	**062RF147**	**DRN**	**160L4**	1940	178
1.1	124800	1581	473000	209100	185660	**PF**	**062RF147**	**DRN**	**160L4**	1580	179
1.3	110400	1398	473000	209100	185660	**PH**	**062RF147**	**DRN**	**160L4**	1930	178
1.5	92800	1175	473000	209100	185660	**PHF**	**062RF147**	**DRN**	**160L4**	1570	179

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P_m = 15.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.69	202000	2558	425700	209100	185660						
1.0	137500	1741	470400	209100	185660	**P**	**062RF137**	**DRN**	**160L4**	1820	176
1.2	116700	1477	473000	209100	185660	**PF**	**062RF137**	**DRN**	**160L4**	1460	177
1.4	102000	1291	473000	209100	185660	**PH**	**062RF137**	**DRN**	**160L4**	1810	176
1.6	86200	1092	473000	209100	185660	**PHF**	**062RF137**	**DRN**	**160L4**	1450	177
1.5	91600	1160	473000	209100	185660	**P**	**062RF137**	**DRN**	**160L4**	1810	176
						PF	**062RF137**	**DRN**	**160L4**	1450	177
						PH	**062RF137**	**DRN**	**160L4**	1800	176
						PHF	**062RF137**	**DRN**	**160L4**	1440	177
1.0	137500	1741	344700	140600	124060	**P**	**052RF137**	**DRN**	**160L4**	1340	172
1.2	116700	1477	362200	140600	124060	**PF**	**052RF137**	**DRN**	**160L4**	1140	173
1.4	102000	1291	364000	140600	124060	**PH**	**052RF137**	**DRN**	**160L4**	1330	172
1.6	86200	1092	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**160L4**	1130	173
1.9	74700	946	364000	140600	124060	**P**	**052RF137**	**DRN**	**160L4**	1330	172
2.1	68100	863	364000	140600	124060	**PF**	**052RF137**	**DRN**	**160L4**	1130	173
						PH	**052RF137**	**DRN**	**160L4**	1320	172
						PHF	**052RF137**	**DRN**	**160L4**	1120	173
1.6	86200	1092	308800	111000	100170	**P**	**042RF137**	**DRN**	**160L4**	1200	166
						PF	**042RF137**	**DRN**	**160L4**	1010	167
						PH	**042RF137**	**DRN**	**160L4**	1200	166
						PHF	**042RF137**	**DRN**	**160L4**	1010	167
1.9	74700	946	318300	111000	100170	**P**	**042RF137**	**DRN**	**160L4**	1190	166
2.1	68100	863	323000	111000	100170	**PF**	**042RF137**	**DRN**	**160L4**	1000	167
2.4	59000	747	323000	111000	100170	**PH**	**042RF137**	**DRN**	**160L4**	1190	166
						PHF	**042RF137**	**DRN**	**160L4**	1000	167
1.3	109200	1383	285800	111000	100170	**P**	**042RF107**	**DRN**	**160L4**	1090	164
						PF	**042RF107**	**DRN**	**160L4**	900	165
						PH	**042RF107**	**DRN**	**160L4**	1090	164
						PHF	**042RF107**	**DRN**	**160L4**	900	165
1.8	77100	977	316400	111000	100170						
2.0	70000	887	321800	111000	100170	**P**	**042RF107**	**DRN**	**160L4**	1080	164
2.3	62100	787	323000	111000	100170	**PF**	**042RF107**	**DRN**	**160L4**	890	165
2.5	56400	714	323000	111000	100170	**PH**	**042RF107**	**DRN**	**160L4**	1090	164
2.9	48500	614	323000	111000	100170	**PHF**	**042RF107**	**DRN**	**160L4**	900	165
1.6	85400	1082	199600	86800	69620						
1.8	77100	977	212800	86800	69620						
2.3	62100	787	232400	86800	69620	**P**	**032RF107**	**DRN**	**160L4**	840	158
2.5	56400	714	238800	86800	69620	**PF**	**032RF107**	**DRN**	**160L4**	710	159
2.9	48500	614	246600	86800	69620	**PH**	**032RF107**	**DRN**	**160L4**	860	158
3.3	42300	536	251900	86800	69620	**PHF**	**032RF107**	**DRN**	**160L4**	740	159
3.9	35900	455	252000	86800	69620						
1.6	85400	1082	199600	86800	69620	**P**	**032RF97**	**DRN**	**160L4**	790	156
						PF	**032RF97**	**DRN**	**160L4**	670	157
						PH	**032RF97**	**DRN**	**160L4**	810	156
						PHF	**032RF97**	**DRN**	**160L4**	690	157
3.6	38400	486	252000	-	69620	**P**	**032RF97**	**DRN**	**160L4**	790	156
						PF	**032RF97**	**DRN**	**160L4**	670	157
						PH	**032RF97**	**DRN**	**160L4**	810	156
						PHF	**032RF97**	**DRN**	**160L4**	690	157
2.9	48500	614	194700	64200	51190						
3.3	42300	536	197000	64200	51190	**P**	**022RF107**	**DRN**	**160L4**	760	152
3.9	35900	455	197000	64200	51190	**PF**	**022RF107**	**DRN**	**160L4**	650	153
4.5	31300	397	197000	64200	51190	**PH**	**022RF107**	**DRN**	**160L4**	770	152
5.3	26500	336	197000	64200	51190	**PHF**	**022RF107**	**DRN**	**160L4**	670	153
2.2	62400	790	171800	64200	51190						
2.5	56500	716	182400	64200	51190						
3.6	38400	486	197000	64200	51190	**P**	**022RF97**	**DRN**	**160L4**	710	150
4.2	33500	425	197000	64200	51190	**PF**	**022RF97**	**DRN**	**160L4**	610	151
4.9	28700	364	197000	-	51190	**PH**	**022RF97**	**DRN**	**160L4**	730	150
5.4	26000	329	197000	-	51190	**PHF**	**022RF97**	**DRN**	**160L4**	620	151
6.4	22000	279	197000	-	51190						

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P_m = 15.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.1	45300	574	156000	46200	36810						
3.6	38400	486	156000	46200	36810						
4.2	33500	425	156000	46200	36810						
4.9	28700	364	156000	46200	36810						
5.4	26000	329	156000	46200	36810						
6.4	22000	279	150000	46200	36810	**P**	**012RF97**	**DRN**	**160L4**	560	144
7.3	19200	244	144100	46200	36810	**PF**	**012RF97**	**DRN**	**160L4**	490	145
8.7	16100	204	136600	46200	36810	**PH**	**012RF97**	**DRN**	**160L4**	580	144
10	13900	177	130800	46200	36810	**PHF**	**012RF97**	**DRN**	**160L4**	510	145
11	13300	169	129000	-	36810						
12	11300	143	122800	-	36810						
14	9870	125	117900	-	36810						
17	8250	105	111800	-	35000						
3.4	41300	523	156000	46200	36810	**P**	**012RF87**	**DRN**	**160L4**	510	142
						PF	**012RF87**	**DRN**	**160L4**	440	143
						PH	**012RF87**	**DRN**	**160L4**	530	142
						PHF	**012RF87**	**DRN**	**160L4**	455	143
7.3	19100	243	116500	29200	24830						
8.8	16000	203	110400	29200	24830						
9.8	14300	181	106700	29200	24830						
10	13800	176	105800	29200	24830	**P**	**002RF97**	**DRN**	**160L4**	480	136
11	12900	164	103500	29200	24830	**PF**	**002RF97**	**DRN**	**160L4**	425	137
13	10900	139	98500	29200	24830	**PH**	**002RF97**	**DRN**	**160L4**	485	136
15	9580	121	94600	29200	24830	**PHF**	**002RF97**	**DRN**	**160L4**	430	137
18	8010	102	89700	29200	24830						
20	6940	88	85900	29200	24830						
5.0	28200	357	112300	29200	24830	**P**	**002RF87**	**DRN**	**160L4**	430	134
5.5	25300	321	116900	29200	24830	**PF**	**002RF87**	**DRN**	**160L4**	375	135
17	8170	104	90200	-	17400	**PH**	**002RF87**	**DRN**	**160L4**	435	134
						PHF	**002RF87**	**DRN**	**160L4**	375	135

P_m = 18.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.55	312100	3210	850000	631300	500000						
0.62	277400	2854	850000	-	500000	**P**	**102RF167**	**DRN**	**180M4**	4660	190
0.78	220700	2271	850000	-	500000	**PF**	**102RF167**	**DRN**	**180M4**	3700	191
0.89	194800	2004	850000	-	500000	**PH**	**102RF167**	**DRN**	**180M4**	4720	190
1.1	150200	1546	850000	-	500000	**PHF**	**102RF167**	**DRN**	**180M4**	3760	191
1.3	129500	1332	850000	-	500000						
1.5	115600	1189	850000	631300	500000	**P**	**102RF167**	**DRN**	**180M4**	4650	190
						PF	**102RF167**	**DRN**	**180M4**	3700	191
						PH	**102RF167**	**DRN**	**180M4**	4710	190
						PHF	**102RF167**	**DRN**	**180M4**	3760	191
0.55	316200	3253	720000	513900	423000						
0.62	281000	2891	720000	-	423000	**P**	**092RF167**	**DRN**	**180M4**	3800	188
0.77	223600	2301	720000	-	423000	**PF**	**092RF167**	**DRN**	**180M4**	3110	189
0.88	197300	2031	720000	-	423000	**PH**	**092RF167**	**DRN**	**180M4**	3820	188
1.1	152200	1566	720000	-	423000	**PHF**	**092RF167**	**DRN**	**180M4**	3120	189
1.3	131200	1350	720000	-	423000						
1.5	117100	1205	720000	513900	423000	**P**	**092RF167**	**DRN**	**180M4**	3800	188
1.9	93600	964	720000	513900	423000	**PF**	**092RF167**	**DRN**	**180M4**	3100	189
						PH	**092RF167**	**DRN**	**180M4**	3810	188
						PHF	**092RF167**	**DRN**	**180M4**	3110	189
0.44	392200	4034	623500	397100	359400						
0.51	340000	3497	671200	397100	359400						
0.57	302500	3112	683000	397100	359400	**P**	**082RF167**	**DRN**	**180M4**	3310	186
0.64	268900	2766	683000	397100	359400	**PF**	**082RF167**	**DRN**	**180M4**	2660	187
0.70	245900	2530	683000	397100	359400	**PH**	**082RF167**	**DRN**	**180M4**	3300	186
0.81	214000	2201	683000	397100	359400	**PHF**	**082RF167**	**DRN**	**180M4**	2650	187
0.92	188800	1943	683000	397100	359400						
1.1	163700	1684	683000	397100	359400						

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P_m = 18.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.78	222900	2293	683000	-	359400	**P**	**082RF147**	**DRN**	**180M4**	3050	184
						PF	**082RF147**	**DRN**	**180M4**	2400	185
						PH	**082RF147**	**DRN**	**180M4**	3040	184
						PHF	**082RF147**	**DRN**	**180M4**	2390	185
0.69	249600	2568	523000	274600	245660	**P**	**072RF167**	**DRN**	**180M4**	2650	182
1.2	147800	1521	523000	274600	245660	**PF**	**072RF167**	**DRN**	**180M4**	2160	183
						PH	**072RF167**	**DRN**	**180M4**	2700	182
						PHF	**072RF167**	**DRN**	**180M4**	2210	183
0.77	226200	2328	523000	-	245660						
0.88	195800	2014	523000	-	245660	**P**	**072RF147**	**DRN**	**180M4**	2390	180
1.0	172700	1777	523000	-	245660	**PF**	**072RF147**	**DRN**	**180M4**	1900	181
1.2	149200	1535	523000	-	245660	**PH**	**072RF147**	**DRN**	**180M4**	2440	180
1.3	131900	1358	523000	-	245660	**PHF**	**072RF147**	**DRN**	**180M4**	1950	181
1.6	110900	1141	523000	-	245660						
0.86	201600	2074	426100	209100	185660						
0.97	177900	1830	444400	209100	185660	**P**	**062RF147**	**DRN**	**180M4**	1970	178
1.1	153600	1581	460800	209100	185660	**PF**	**062RF147**	**DRN**	**180M4**	1600	179
1.3	135900	1398	471400	209100	185660	**PH**	**062RF147**	**DRN**	**180M4**	1960	178
1.5	114200	1175	473000	209100	185660	**PHF**	**062RF147**	**DRN**	**180M4**	1590	179
1.9	92200	949	473000	209100	185660						
0.89	193900	1995	432300	209100	185660	**P**	**062RF137**	**DRN**	**180M4**	1850	176
1.2	143600	1477	466900	209100	185660	**PF**	**062RF137**	**DRN**	**180M4**	1480	177
1.4	125500	1291	473000	209100	185660	**PH**	**062RF137**	**DRN**	**180M4**	1840	176
1.6	106100	1092	473000	209100	185660	**PHF**	**062RF137**	**DRN**	**180M4**	1470	177
1.5	112700	1160	473000	209100	185660	**P**	**062RF137**	**DRN**	**180M4**	1840	176
1.9	92000	946	473000	209100	185660	**PF**	**062RF137**	**DRN**	**180M4**	1470	177
2.1	83900	863	473000	209100	185660	**PH**	**062RF137**	**DRN**	**180M4**	1830	176
						PHF	**062RF137**	**DRN**	**180M4**	1460	177
1.4	125500	1291	355100	140600	124060	**P**	**052RF137**	**DRN**	**180M4**	1360	172
1.6	106100	1092	364000	140600	124060	**PF**	**052RF137**	**DRN**	**180M4**	1160	173
						PH	**052RF137**	**DRN**	**180M4**	1360	172
						PHF	**052RF137**	**DRN**	**180M4**	1160	173
1.9	92000	946	364000	140600	124060	**P**	**052RF137**	**DRN**	**180M4**	1350	172
2.1	83900	863	364000	140600	124060	**PF**	**052RF137**	**DRN**	**180M4**	1150	173
2.4	72600	747	364000	140600	124060	**PH**	**052RF137**	**DRN**	**180M4**	1350	172
2.7	64000	659	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**180M4**	1150	173
1.3	134400	1383	347400	140600	124060	**P**	**052RF107**	**DRN**	**180M4**	1260	170
						PF	**052RF107**	**DRN**	**180M4**	1060	171
						PH	**052RF107**	**DRN**	**180M4**	1250	170
						PHF	**052RF107**	**DRN**	**180M4**	1050	171
2.5	69400	714	364000	140600	124060	**P**	**052RF107**	**DRN**	**180M4**	1250	170
2.9	59600	614	364000	140600	124060	**PF**	**052RF107**	**DRN**	**180M4**	1050	171
						PH	**052RF107**	**DRN**	**180M4**	1240	170
						PHF	**052RF107**	**DRN**	**180M4**	1040	171
1.6	106100	1092	289300	111000	100170	**P**	**042RF137**	**DRN**	**180M4**	1220	166
						PF	**042RF137**	**DRN**	**180M4**	1030	167
						PH	**042RF137**	**DRN**	**180M4**	1220	166
						PHF	**042RF137**	**DRN**	**180M4**	1030	167
1.9	92000	946	303600	111000	100170	**P**	**042RF137**	**DRN**	**180M4**	1210	166
2.1	83900	863	310800	111000	100170	**PF**	**042RF137**	**DRN**	**180M4**	1020	167
2.4	72600	747	319900	111000	100170	**PH**	**042RF137**	**DRN**	**180M4**	1210	166
3.1	55300	569	323000	111000	100170	**PHF**	**042RF137**	**DRN**	**180M4**	1020	167
2.3	76500	787	316900	111000	100170						
2.5	69400	714	322200	111000	100170	**P**	**042RF107**	**DRN**	**180M4**	1100	164
2.9	59600	614	323000	111000	100170	**PF**	**042RF107**	**DRN**	**180M4**	910	165
3.3	52100	536	323000	111000	100170	**PH**	**042RF107**	**DRN**	**180M4**	1110	164
3.9	44100	455	317900	111000	100170	**PHF**	**042RF107**	**DRN**	**180M4**	920	165
2.3	76500	787	213700	86800	69620						
2.9	59600	614	235300	86800	69620	**P**	**032RF107**	**DRN**	**180M4**	860	158
3.3	52100	536	243200	86800	69620	**PF**	**032RF107**	**DRN**	**180M4**	740	159
3.9	44100	455	250400	86800	69620	**PH**	**032RF107**	**DRN**	**180M4**	880	158
4.5	38600	397	247300	86800	69620	**PHF**	**032RF107**	**DRN**	**180M4**	760	159
5.3	32600	336	235100	86800	69620						

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P_m = 18.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
5.4	32000	329	233600	-	69620	**P**	**032RF97**	**DRN**	**180M4**	810	156
6.4	27100	279	222400	-	69620	**PF**	**032RF97**	**DRN**	**180M4**	690	157
						PH	**032RF97**	**DRN**	**180M4**	830	156
						PHF	**032RF97**	**DRN**	**180M4**	710	157
2.9	59600	614	176900	64200	51190						
3.3	52100	536	189400	64200	51190						
3.9	44100	455	197000	64200	51190						
4.5	38600	397	197000	64200	51190	**P**	**022RF107**	**DRN**	**180M4**	780	152
5.3	32600	336	197000	64200	51190	**PF**	**022RF107**	**DRN**	**180M4**	680	153
5.8	29900	308	197000	64200	51190	**PH**	**022RF107**	**DRN**	**180M4**	790	152
6.8	25400	261	197000	64200	51190	**PHF**	**022RF107**	**DRN**	**180M4**	690	153
7.8	22200	228	197000	64200	51190						
9.2	18700	193	197000	64200	51190						
2.8	61600	634	173200	64200	51190						
3.1	55700	574	183600	64200	51190						
4.9	35400	364	197000	-	51190						
5.4	32000	329	197000	-	51190	**P**	**022RF97**	**DRN**	**180M4**	730	150
6.4	27100	279	197000	-	51190	**PF**	**022RF97**	**DRN**	**180M4**	630	151
7.3	23700	244	197000	-	51190	**PH**	**022RF97**	**DRN**	**180M4**	750	150
8.7	19800	204	197000	-	51190	**PHF**	**022RF97**	**DRN**	**180M4**	650	151
10	17100	177	197000	-	51190						
11	16400	169	197000	-	40000						
10	16700	172	129700	46200	36810	**P**	**012RF107**	**DRN**	**180M4**	630	146
11	15300	158	126400	46200	36810	**PF**	**012RF107**	**DRN**	**180M4**	560	147
13	13000	134	120300	46200	36810	**PH**	**012RF107**	**DRN**	**180M4**	640	146
15	11300	117	115600	46200	36810	**PHF**	**012RF107**	**DRN**	**180M4**	570	147
4.2	41200	425	156000	46200	36810						
5.4	32000	329	156000	46200	36810						
6.4	27100	279	150000	46200	36810						
7.3	23700	244	144000	46200	36810						
8.7	19800	204	136500	46200	36810	**P**	**012RF97**	**DRN**	**180M4**	580	144
10	17100	177	130700	46200	36810	**PF**	**012RF97**	**DRN**	**180M4**	510	145
11	16400	169	129000	-	36810	**PH**	**012RF97**	**DRN**	**180M4**	600	144
12	13900	143	122700	-	36810	**PHF**	**012RF97**	**DRN**	**180M4**	530	145
14	12100	125	117800	-	36810						
17	10100	105	111700	-	35000						
20	8790	91	107000	-	32100						
3.8	45500	468	156000	46200	36810	**P**	**012RF87**	**DRN**	**180M4**	530	142
4.6	37700	388	156000	46200	36810	**PF**	**012RF87**	**DRN**	**180M4**	465	143
						PH	**012RF87**	**DRN**	**180M4**	550	142
						PHF	**012RF87**	**DRN**	**180M4**	475	143
8.8	19700	203	110300	29200	24830						
10	17000	176	105700	29200	24830						
11	15900	164	103500	29200	24830	**P**	**002RF97**	**DRN**	**180M4**	500	136
13	13500	139	98400	29200	24830	**PF**	**002RF97**	**DRN**	**180M4**	445	137
15	11700	121	94500	29200	24830	**PH**	**002RF97**	**DRN**	**180M4**	510	136
18	9860	102	89600	29200	24830	**PHF**	**002RF97**	**DRN**	**180M4**	450	137
20	8540	88	85800	29200	24830						
6.4	27100	279	114200	29200	24830	**P**	**002RF87**	**DRN**	**180M4**	455	134
						PF	**002RF87**	**DRN**	**180M4**	395	135
						PH	**002RF87**	**DRN**	**180M4**	455	134
						PHF	**002RF87**	**DRN**	**180M4**	400	135

P_m = 22 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.55	371100	3210	850000	631300	500000						
0.62	329900	2854	850000	-	500000	**P**	**102RF167**	**DRN**	**180L4**	4670	190
0.78	262500	2271	850000	-	500000	**PF**	**102RF167**	**DRN**	**180L4**	3720	191
0.89	231600	2004	850000	-	500000	**PH**	**102RF167**	**DRN**	**180L4**	4730	190
1.1	178700	1546	850000	-	500000	**PHF**	**102RF167**	**DRN**	**180L4**	3780	191
1.3	154000	1332	850000	-	500000						

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P_m = 22 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.5	137400	1189	850000	631300	500000	**P**	**102RF167**	**DRN**	**180L4**	4670	190
1.9	109900	951	850000	631300	500000	**PF**	**102RF167**	**DRN**	**180L4**	3710	191
						PH	**102RF167**	**DRN**	**180L4**	4730	190
						PHF	**102RF167**	**DRN**	**180L4**	3770	191
0.55	376000	3253	720000	513900	423000						
0.62	334200	2891	720000	-	423000	**P**	**092RF167**	**DRN**	**180L4**	3820	188
0.77	266000	2301	720000	-	423000	**PF**	**092RF167**	**DRN**	**180L4**	3120	189
0.88	234700	2031	720000	-	423000	**PH**	**092RF167**	**DRN**	**180L4**	3830	188
1.1	181000	1566	720000	-	423000	**PHF**	**092RF167**	**DRN**	**180L4**	3130	189
1.3	156000	1350	720000	-	423000						
1.5	139200	1205	720000	513900	423000	**P**	**092RF167**	**DRN**	**180L4**	3810	188
1.9	111400	964	720000	513900	423000	**PF**	**092RF167**	**DRN**	**180L4**	3120	189
2.1	99000	857	720000	513900	423000	**PH**	**092RF167**	**DRN**	**180L4**	3830	188
2.4	86300	747	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**180L4**	3130	189
0.64	319800	2766	683000	397100	359400						
0.70	292400	2530	683000	397100	359400						
0.81	254400	2201	683000	397100	359400	**P**	**082RF167**	**DRN**	**180L4**	3320	186
0.92	224500	1943	683000	397100	359400	**PF**	**082RF167**	**DRN**	**180L4**	2670	187
1.1	194700	1684	683000	397100	359400	**PH**	**082RF167**	**DRN**	**180L4**	3310	186
1.2	173200	1498	683000	397100	359400	**PHF**	**082RF167**	**DRN**	**180L4**	2660	187
1.4	149300	1291	683000	397100	359400						
0.78	265100	2293	683000	-	359400						
1.0	202400	1751	683000	-	359400	**P**	**082RF147**	**DRN**	**180L4**	3060	184
1.2	174800	1512	683000	-	359400	**PF**	**082RF147**	**DRN**	**180L4**	2410	185
1.3	154600	1338	683000	-	359400	**PH**	**082RF147**	**DRN**	**180L4**	3050	184
1.6	129900	1141	683000	-	359400	**PHF**	**082RF147**	**DRN**	**180L4**	2400	185
1.2	175800	1521	523000	274600	245660	**P**	**072RF167**	**DRN**	**180L4**	2660	182
1.7	123100	1065	523000	274600	245660	**PF**	**072RF167**	**DRN**	**180L4**	2170	183
						PH	**072RF167**	**DRN**	**180L4**	2720	182
						PHF	**072RF167**	**DRN**	**180L4**	2230	183
0.88	232800	2014	523000	-	245660						
1.0	205400	1777	523000	-	245660	**P**	**072RF147**	**DRN**	**180L4**	2400	180
1.3	156900	1358	523000	-	245660	**PF**	**072RF147**	**DRN**	**180L4**	1910	181
1.6	131900	1141	523000	-	245660	**PH**	**072RF147**	**DRN**	**180L4**	2460	180
1.9	106500	922	523000	-	245660	**PHF**	**072RF147**	**DRN**	**180L4**	1970	181
1.1	182700	1581	440900	209100	185660	**P**	**062RF147**	**DRN**	**180L4**	1980	178
1.3	161600	1398	455600	209100	185660	**PF**	**062RF147**	**DRN**	**180L4**	1620	179
1.5	135800	1175	471400	209100	185660	**PH**	**062RF147**	**DRN**	**180L4**	1970	178
1.9	109700	949	473000	209100	185660	**PHF**	**062RF147**	**DRN**	**180L4**	1610	179
2.2	92600	802	473000	209100	185660	**P**	**062RF147**	**DRN**	**180L4**	1970	178
						PF	**062RF147**	**DRN**	**180L4**	1600	179
						PH	**062RF147**	**DRN**	**180L4**	1960	178
						PHF	**062RF147**	**DRN**	**180L4**	1590	179
1.0	201300	1741	426300	209100	185660	**P**	**062RF137**	**DRN**	**180L4**	1860	176
1.6	126200	1092	473000	209100	185660	**PF**	**062RF137**	**DRN**	**180L4**	1500	177
						PH	**062RF137**	**DRN**	**180L4**	1850	176
						PHF	**062RF137**	**DRN**	**180L4**	1490	177
2.1	99700	863	473000	209100	185660	**P**	**062RF137**	**DRN**	**180L4**	1850	176
2.4	86300	747	473000	209100	185660	**PF**	**062RF137**	**DRN**	**180L4**	1490	177
2.7	76100	659	473000	209100	185660	**PH**	**062RF137**	**DRN**	**180L4**	1840	176
						PHF	**062RF137**	**DRN**	**180L4**	1480	177
1.6	126200	1092	354600	140600	124060	**P**	**052RF137**	**DRN**	**180L4**	1380	172
						PF	**052RF137**	**DRN**	**180L4**	1180	173
						PH	**052RF137**	**DRN**	**180L4**	1370	172
						PHF	**052RF137**	**DRN**	**180L4**	1170	173
1.9	109400	946	364000	140600	124060						
2.1	99700	863	364000	140600	124060	**P**	**052RF137**	**DRN**	**180L4**	1370	172
2.4	86300	747	364000	140600	124060	**PF**	**052RF137**	**DRN**	**180L4**	1170	173
2.7	76100	659	364000	140600	124060	**PH**	**052RF137**	**DRN**	**180L4**	1360	172
3.1	65800	569	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**180L4**	1160	173
3.5	58200	503	364000	140600	124060						

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P_m = 22 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.3	61900	536	364000	140600	124060	**P**	**052RF107**	**DRN**	**180L4**	1260	170
3.9	52500	455	364000	140600	124060	**PF**	**052RF107**	**DRN**	**180L4**	1060	171
						PH	**052RF107**	**DRN**	**180L4**	1260	170
						PHF	**052RF107**	**DRN**	**180L4**	1060	171
1.9	109400	946	285700	111000	100170	**P**	**042RF137**	**DRN**	**180L4**	1220	166
2.4	86300	747	308700	111000	100170	**PF**	**042RF137**	**DRN**	**180L4**	1030	167
3.1	65800	569	323000	111000	100170	**PH**	**042RF137**	**DRN**	**180L4**	1230	166
4.2	48900	423	311200	111000	100170	**PHF**	**042RF137**	**DRN**	**180L4**	1040	167
2.0	102500	887	293100	111000	100170						
2.5	82500	714	311900	111000	100170	**P**	**042RF107**	**DRN**	**180L4**	1120	164
2.9	70900	614	321100	111000	100170	**PF**	**042RF107**	**DRN**	**180L4**	930	165
3.3	61900	536	323000	111000	100170	**PH**	**042RF107**	**DRN**	**180L4**	1120	164
3.9	52500	455	317900	111000	100170	**PHF**	**042RF107**	**DRN**	**180L4**	930	165
4.5	45900	397	305400	111000	100170						
2.5	82500	714	204400	86800	69620						
2.9	70900	614	221500	86800	69620						
3.3	61900	536	232700	86800	69620						
3.9	52500	455	242700	86800	69620	**P**	**032RF107**	**DRN**	**180L4**	870	158
4.5	45900	397	247300	86800	69620	**PF**	**032RF107**	**DRN**	**180L4**	750	159
5.3	38800	336	235100	86800	69620	**PH**	**032RF107**	**DRN**	**180L4**	890	158
5.8	35600	308	229100	86800	69620	**PHF**	**032RF107**	**DRN**	**180L4**	770	159
6.8	30200	261	218100	86800	69620						
7.8	26400	228	209400	86800	69620						
3.3	61900	536	172700	64200	51190						
3.9	52500	455	188700	64200	51190						
4.5	45900	397	197000	64200	51190						
5.3	38800	336	197000	64200	51190	**P**	**022RF107**	**DRN**	**180L4**	790	152
5.8	35600	308	197000	64200	51190	**PF**	**022RF107**	**DRN**	**180L4**	690	153
6.8	30200	261	197000	64200	51190	**PH**	**022RF107**	**DRN**	**180L4**	810	152
7.8	26400	228	197000	64200	51190	**PHF**	**022RF107**	**DRN**	**180L4**	710	153
9.2	22300	193	197000	64200	51190						
10	19900	172	197000	64200	51190						
11	18200	158	197000	64200	51190						
3.7	56200	486	182900	64200	51190						
5.4	38000	329	197000	-	51190	**P**	**022RF97**	**DRN**	**180L4**	750	150
6.4	32200	279	197000	-	51190	**PF**	**022RF97**	**DRN**	**180L4**	650	151
7.3	28100	244	197000	-	51190	**PH**	**022RF97**	**DRN**	**180L4**	760	150
8.7	23500	204	197000	-	51190	**PHF**	**022RF97**	**DRN**	**180L4**	660	151
10	20400	177	197000	-	51190						
10	19900	172	129700	46200	36810						
11	18200	158	126400	46200	36810	**P**	**012RF107**	**DRN**	**180L4**	640	146
13	15400	134	120300	46200	36810	**PF**	**012RF107**	**DRN**	**180L4**	570	147
15	13500	117	115600	46200	36810	**PH**	**012RF107**	**DRN**	**180L4**	660	146
18	11400	99	109900	46200	36810	**PHF**	**012RF107**	**DRN**	**180L4**	590	147
4.9	42100	364	156000	46200	36810						
5.4	38000	329	156000	46200	36810						
7.3	28100	244	144000	46200	36810						
8.7	23500	204	136500	46200	36810	**P**	**012RF97**	**DRN**	**180L4**	600	144
10	20400	177	130700	46200	36810	**PF**	**012RF97**	**DRN**	**180L4**	530	145
11	19500	169	129000	-	36810	**PH**	**012RF97**	**DRN**	**180L4**	610	144
12	16500	143	122700	-	36810	**PHF**	**012RF97**	**DRN**	**180L4**	540	145
14	14400	125	117800	-	36810						
17	12000	105	111700	-	35000						
20	10400	91	107000	-	32100						
4.6	44900	388	156000	46200	36810	**P**	**012RF87**	**DRN**	**180L4**	550	142
5.5	37200	322	156000	46200	36810	**PF**	**012RF87**	**DRN**	**180L4**	480	143
						PH	**012RF87**	**DRN**	**180L4**	560	142
						PHF	**012RF87**	**DRN**	**180L4**	490	143
7.3	28000	243	112600	29200	24830						
11	18900	164	103500	29200	24830	**P**	**002RF97**	**DRN**	**180L4**	520	136
13	16000	139	98400	29200	24830	**PF**	**002RF97**	**DRN**	**180L4**	460	137
15	14000	121	94500	29200	24830	**PH**	**002RF97**	**DRN**	**180L4**	520	136
18	11700	102	89600	29200	24830	**PHF**	**002RF97**	**DRN**	**180L4**	465	137
20	10100	88	85800	29200	24830						

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P_m = 22 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
7.1	28800	250	111200	29200	24830	P	002RF87	DRN	180L4	470	134
						PF	002RF87	DRN	180L4	410	135
						PH	002RF87	DRN	180L4	470	134
						PHF	002RF87	DRN	180L4	415	135

P_m = 30 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.49	568200	3608	836400	631300	500000						
0.56	505500	3210	850000	631300	500000						
0.62	449400	2854	850000	-	500000	P	102RF167	DRN	200L4	4780	190
0.79	357600	2271	850000	-	500000	PF	102RF167	DRN	200L4	3830	191
0.89	315500	2004	850000	-	500000	PH	102RF167	DRN	200L4	4840	190
1.1	243400	1546	850000	-	500000	PHF	102RF167	DRN	200L4	3890	191
1.3	209800	1332	850000	-	500000						
1.5	187200	1189	850000	631300	500000						
1.9	149800	951	850000	631300	500000	P	102RF167	DRN	200L4	4770	190
2.1	133200	846	850000	631300	500000	PF	102RF167	DRN	200L4	3820	191
2.4	116000	737	850000	631300	500000	PH	102RF167	DRN	200L4	4840	190
2.7	103500	657	850000	631300	500000	PHF	102RF167	DRN	200L4	3880	191
0.55	512200	3253	667100	513900	423000						
0.77	362300	2301	720000	-	423000	P	092RF167	DRN	200L4	3930	188
0.88	319700	2031	720000	-	423000	PF	092RF167	DRN	200L4	3230	189
1.1	246600	1566	720000	-	423000	PH	092RF167	DRN	200L4	3940	188
1.3	212500	1350	720000	-	423000	PHF	092RF167	DRN	200L4	3240	189
1.5	189700	1205	720000	513900	423000						
1.9	151700	964	720000	513900	423000	P	092RF167	DRN	200L4	3920	188
2.1	134900	857	720000	513900	423000	PF	092RF167	DRN	200L4	3220	189
2.4	117500	747	720000	513900	423000	PH	092RF167	DRN	200L4	3930	188
2.7	104900	666	720000	513900	423000	PHF	092RF167	DRN	200L4	3240	189
3.1	89400	568	720000	513900	423000						
0.81	346600	2201	665600	397100	359400						
0.92	305900	1943	683000	397100	359400	P	082RF167	DRN	200L4	3430	186
1.1	265200	1684	683000	397100	359400	PF	082RF167	DRN	200L4	2780	187
1.2	235900	1498	683000	397100	359400	PH	082RF167	DRN	200L4	3420	186
1.4	203300	1291	683000	397100	359400	PHF	082RF167	DRN	200L4	2770	187
1.7	165200	1049	683000	397100	359400						
1.2	239400	1521	523000	274600	245660	P	072RF167	DRN	200L4	2770	182
1.7	167700	1065	523000	274600	245660	PF	072RF167	DRN	200L4	2280	183
						PH	072RF167	DRN	200L4	2820	182
						PHF	072RF167	DRN	200L4	2330	183
1.3	213700	1358	523000	-	245660	P	072RF147	DRN	200L4	2510	180
1.6	179600	1141	523000	-	245660	PF	072RF147	DRN	200L4	2020	181
1.9	145100	922	523000	-	245660	PH	072RF147	DRN	200L4	2570	180
						PHF	072RF147	DRN	200L4	2080	181
2.3	122600	779	523000	274600	245660	P	072RF147	DRN	200L4	2500	180
						PF	072RF147	DRN	200L4	2010	181
						PH	072RF147	DRN	200L4	2550	180
						PHF	072RF147	DRN	200L4	2060	181
1.9	149400	949	463400	209100	185660	P	062RF147	DRN	200L4	2090	178
						PF	062RF147	DRN	200L4	1730	179
						PH	062RF147	DRN	200L4	2080	178
						PHF	062RF147	DRN	200L4	1720	179
2.2	126200	802	473000	209100	185660	P	062RF147	DRN	200L4	2080	178
2.5	111400	708	473000	209100	185660	PF	062RF147	DRN	200L4	1710	179
2.9	96600	614	473000	209100	185660	PH	062RF147	DRN	200L4	2070	178
						PHF	062RF147	DRN	200L4	1700	179
1.4	203300	1291	424700	209100	185660	P	062RF137	DRN	200L4	1970	176
						PF	062RF137	DRN	200L4	1610	177
						PH	062RF137	DRN	200L4	1960	176
						PHF	062RF137	DRN	200L4	1600	177

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P_m = 30 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
2.1	135900	863	471400	209100	185660						
2.4	117600	747	473000	209100	185660	**P**	**062RF137**	**DRN**	**200L4**	1960	176
2.7	103700	659	473000	209100	185660	**PF**	**062RF137**	**DRN**	**200L4**	1600	177
3.1	89600	569	473000	209100	185660	**PH**	**062RF137**	**DRN**	**200L4**	1950	176
3.5	79200	503	472600	209100	185660	**PHF**	**062RF137**	**DRN**	**200L4**	1590	177
2.1	135900	863	346200	140600	124060						
2.4	117600	747	361500	140600	124060	**P**	**052RF137**	**DRN**	**200L4**	1480	172
2.7	103700	659	364000	140600	124060	**PF**	**052RF137**	**DRN**	**200L4**	1280	173
3.1	89600	569	364000	140600	124060	**PH**	**052RF137**	**DRN**	**200L4**	1470	172
3.5	79200	503	364000	140600	124060	**PHF**	**052RF137**	**DRN**	**200L4**	1270	173
4.2	66600	423	358900	140600	124060						
3.1	89600	569	305800	111000	100170						
4.2	66600	423	311200	111000	100170	**P**	**042RF137**	**DRN**	**200L4**	1330	166
5.2	53800	342	291800	111000	100170	**PF**	**042RF137**	**DRN**	**200L4**	1140	167
6.0	46800	298	280000	111000	100170	**PH**	**042RF137**	**DRN**	**200L4**	1340	166
7.1	39400	250	265800	111000	100170	**PHF**	**042RF137**	**DRN**	**200L4**	1150	167
3.3	84400	536	310400	111000	100170						
3.9	71500	455	317900	111000	100170	**P**	**042RF107**	**DRN**	**200L4**	1230	164
4.5	62500	397	305200	111000	100170	**PF**	**042RF107**	**DRN**	**200L4**	1040	165
5.3	52900	336	290300	111000	100170	**PH**	**042RF107**	**DRN**	**200L4**	1230	164
5.8	48500	308	282800	111000	100170	**PHF**	**042RF107**	**DRN**	**200L4**	1040	165
6.8	41100	261	269300	111000	100170						
3.3	84400	536	201400	86800	69620						
3.9	71500	455	220700	86800	69620						
4.5	62500	397	232000	86800	69620						
5.3	52900	336	235000	86800	69620						
5.8	48500	308	228900	86800	69620						
6.8	41100	261	218000	86800	69620	**P**	**032RF107**	**DRN**	**200L4**	980	158
7.8	35900	228	209400	86800	69620	**PF**	**032RF107**	**DRN**	**200L4**	860	159
9.2	30400	193	199100	86800	69620	**PH**	**032RF107**	**DRN**	**200L4**	1000	158
10	27100	172	192300	-	69620	**PHF**	**032RF107**	**DRN**	**200L4**	880	159
11	24800	158	187400	-	58500						
13	21100	134	178300	-	58500						
15	18400	117	171300	-	58500						
18	15500	99	162900	-	57100						
20	14200	91	158600	-	32100	**P**	**032RF97**	**DRN**	**200L4**	940	156
						PF	**032RF97**	**DRN**	**200L4**	820	157
						PH	**032RF97**	**DRN**	**200L4**	960	156
						PHF	**032RF97**	**DRN**	**200L4**	840	157
4.5	62500	397	171500	64200	51190						
5.3	52900	336	188200	64200	51190						
5.8	48500	308	194700	64200	51190	**P**	**022RF107**	**DRN**	**200L4**	900	152
6.8	41100	261	197000	64200	51190	**PF**	**022RF107**	**DRN**	**200L4**	800	153
7.8	35900	228	197000	64200	51190	**PH**	**022RF107**	**DRN**	**200L4**	920	152
9.2	30400	193	197000	64200	51190	**PHF**	**022RF107**	**DRN**	**200L4**	820	153
10	27100	172	197000	64200	51190						
11	24800	158	197000	64200	51190						
10	27100	172	129700	46200	36810						
11	24800	158	126400	46200	36810	**P**	**012RF107**	**DRN**	**200L4**	750	146
13	21100	134	120300	46200	36810	**PF**	**012RF107**	**DRN**	**200L4**	680	147
15	18400	117	115500	46200	36810	**PH**	**012RF107**	**DRN**	**200L4**	770	146
18	15500	99	109900	46200	36810	**PHF**	**012RF107**	**DRN**	**200L4**	700	147
6.4	43900	279	149900	46200	36810	**P**	**012RF97**	**DRN**	**200L4**	710	144
7.3	38300	244	144000	46200	36810	**PF**	**012RF97**	**DRN**	**200L4**	640	145
20	14200	91	106900	-	32100	**PH**	**012RF97**	**DRN**	**200L4**	720	144
						PHF	**012RF97**	**DRN**	**200L4**	650	145
14	20400	130	96500	29200	24830	**P**	**002RF107**	**DRN**	**200L4**	670	138
16	17900	114	92700	29200	24830	**PF**	**002RF107**	**DRN**	**200L4**	620	139
19	15100	96	88100	29200	24830	**PH**	**002RF107**	**DRN**	**200L4**	680	138
						PHF	**002RF107**	**DRN**	**200L4**	620	139
9.8	28500	181	106600	29200	24830	**P**	**002RF97**	**DRN**	**200L4**	630	136
10	27600	176	105600	29200	24830	**PF**	**002RF97**	**DRN**	**200L4**	570	137
11	25800	164	103400	29200	24830	**PH**	**002RF97**	**DRN**	**200L4**	630	136
20	13800	88	85800	29200	24830	**PHF**	**002RF97**	**DRN**	**200L4**	570	137

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P_m = 37 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.56	622800	3210	794600	631300	500000						
0.79	440500	2271	850000	-	500000	**P**	**102RF167**	**DRN**	**225S4**	4810	190
0.89	388700	2004	850000	-	500000	**PF**	**102RF167**	**DRN**	**225S4**	3860	191
1.1	299800	1546	850000	-	500000	**PH**	**102RF167**	**DRN**	**225S4**	4870	190
1.3	258400	1332	850000	-	500000	**PHF**	**102RF167**	**DRN**	**225S4**	3920	191
1.5	230600	1189	850000	631300	500000						
1.9	184500	951	850000	631300	500000	**P**	**102RF167**	**DRN**	**225S4**	4810	190
2.1	164100	846	850000	631300	500000	**PF**	**102RF167**	**DRN**	**225S4**	3850	191
2.4	142900	737	850000	631300	500000	**PH**	**102RF167**	**DRN**	**225S4**	4870	190
2.7	127500	657	850000	631300	500000	**PHF**	**102RF167**	**DRN**	**225S4**	3910	191
3.2	108700	561	850000	631300	500000						
0.88	393900	2031	720000	-	423000	**P**	**092RF167**	**DRN**	**225S4**	3960	188
1.1	303800	1566	720000	-	423000	**PF**	**092RF167**	**DRN**	**225S4**	3260	189
1.3	261800	1350	720000	-	423000	**PH**	**092RF167**	**DRN**	**225S4**	3970	188
						PHF	**092RF167**	**DRN**	**225S4**	3270	189
1.5	233700	1205	720000	513900	423000						
1.9	186900	964	720000	513900	423000						
2.1	166200	857	720000	513900	423000	**P**	**092RF167**	**DRN**	**225S4**	3950	188
2.4	144800	747	720000	513900	423000	**PF**	**092RF167**	**DRN**	**225S4**	3250	189
2.7	129200	666	720000	513900	423000	**PH**	**092RF167**	**DRN**	**225S4**	3960	188
3.1	110100	568	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**225S4**	3270	189
3.8	91200	470	720000	513900	423000						
0.92	376800	1943	638400	397100	359400						
1.1	326700	1684	681000	397100	359400	**P**	**082RF167**	**DRN**	**225S4**	3460	186
1.2	290600	1498	683000	397100	359400	**PF**	**082RF167**	**DRN**	**225S4**	2810	187
1.4	250500	1291	683000	397100	359400	**PH**	**082RF167**	**DRN**	**225S4**	3450	186
1.7	203500	1049	683000	397100	359400	**PHF**	**082RF167**	**DRN**	**225S4**	2800	187
2.0	172600	890	683000	397100	359400						
2.2	159000	820	683000	397100	359400	**P**	**082RF167**	**DRN**	**225S4**	3450	186
						PF	**082RF167**	**DRN**	**225S4**	2800	187
						PH	**082RF167**	**DRN**	**225S4**	3450	186
						PHF	**082RF167**	**DRN**	**225S4**	2800	187
1.7	206600	1065	523000	274600	245660	**P**	**072RF167**	**DRN**	**225S4**	2800	182
						PF	**072RF167**	**DRN**	**225S4**	2310	183
						PH	**072RF167**	**DRN**	**225S4**	2860	182
						PHF	**072RF167**	**DRN**	**225S4**	2360	183
1.9	178700	922	523000	-	245660	**P**	**072RF147**	**DRN**	**225S4**	2550	180
						PF	**072RF147**	**DRN**	**225S4**	2050	181
						PH	**072RF147**	**DRN**	**225S4**	2600	180
						PHF	**072RF147**	**DRN**	**225S4**	2110	181
2.3	151000	779	523000	274600	245660	**P**	**072RF147**	**DRN**	**225S4**	2530	180
2.6	133200	687	523000	274600	245660	**PF**	**072RF147**	**DRN**	**225S4**	2040	181
						PH	**072RF147**	**DRN**	**225S4**	2590	180
						PHF	**072RF147**	**DRN**	**225S4**	2090	181
2.2	155500	802	459600	209100	185660	**P**	**062RF147**	**DRN**	**225S4**	2110	178
2.5	137200	708	470600	209100	185660	**PF**	**062RF147**	**DRN**	**225S4**	1750	179
2.9	119000	614	473000	209100	185660	**PH**	**062RF147**	**DRN**	**225S4**	2100	178
3.3	105800	546	473000	209100	185660	**PHF**	**062RF147**	**DRN**	**225S4**	1730	179
2.4	144900	747	466200	209100	185660						
2.7	127800	659	473000	209100	185660	**P**	**062RF137**	**DRN**	**225S4**	1990	176
3.1	110400	569	473000	209100	185660	**PF**	**062RF137**	**DRN**	**225S4**	1630	177
3.5	97600	503	472200	209100	185660	**PH**	**062RF137**	**DRN**	**225S4**	1980	176
4.2	82000	423	448300	209100	185660	**PHF**	**062RF137**	**DRN**	**225S4**	1620	177
2.7	127800	659	353200	140600	124060						
3.1	110400	569	364000	140600	124060	**P**	**052RF137**	**DRN**	**225S4**	1510	172
3.5	97600	503	364000	140600	124060	**PF**	**052RF137**	**DRN**	**225S4**	1310	173
4.2	82000	423	358600	140600	124060	**PH**	**052RF137**	**DRN**	**225S4**	1500	172
5.2	66300	342	336500	140600	124060	**PHF**	**052RF137**	**DRN**	**225S4**	1300	173
2.5	138500	714	343700	140600	124060	**P**	**052RF107**	**DRN**	**225S4**	1410	170
						PF	**052RF107**	**DRN**	**225S4**	1210	171
						PH	**052RF107**	**DRN**	**225S4**	1400	170
						PHF	**052RF107**	**DRN**	**225S4**	1200	171

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P_m = 37 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.1	110400	569	284500	111000	100170						
4.2	82000	423	311000	111000	100170	**P**	**042RF137**	**DRN**	**225S4**	1360	166
5.2	66300	342	291800	111000	100170	**PF**	**042RF137**	**DRN**	**225S4**	1170	167
6.0	57700	298	280000	111000	100170	**PH**	**042RF137**	**DRN**	**225S4**	1370	166
7.1	48500	250	265700	111000	100170	**PHF**	**042RF137**	**DRN**	**225S4**	1180	167
8.8	39200	202	249200	111000	100170						
3.3	103900	536	291600	111000	100170	**P**	**042RF107**	**DRN**	**225S4**	1260	164
4.5	77000	397	305200	111000	100170	**PF**	**042RF107**	**DRN**	**225S4**	1070	165
5.3	65100	336	290300	111000	100170	**PH**	**042RF107**	**DRN**	**225S4**	1260	164
						PHF	**042RF107**	**DRN**	**225S4**	1070	165
10	33900	175	193200	86800	69620	**P**	**032RF137**	**DRN**	**225S4**	1120	160
12	29600	153	185400	86800	69620	**PF**	**032RF137**	**DRN**	**225S4**	990	161
						PH	**032RF137**	**DRN**	**225S4**	1140	160
						PHF	**032RF137**	**DRN**	**225S4**	1020	161
4.5	77000	397	212900	86800	69620						
5.3	65100	336	228900	86800	69620						
5.8	59700	308	228900	86800	69620						
6.8	50700	261	217900	86800	69620	**P**	**032RF107**	**DRN**	**225S4**	1010	158
7.8	44300	228	209300	86800	69620	**PF**	**032RF107**	**DRN**	**225S4**	890	159
9.2	37400	193	199000	86800	69620	**PH**	**032RF107**	**DRN**	**225S4**	1030	158
13	25900	134	178300	-	58500	**PHF**	**032RF107**	**DRN**	**225S4**	910	159
15	22700	117	171200	-	58500						
18	19200	99	162900	-	57100						
5.8	59700	308	176700	64200	51190	**P**	**022RF107**	**DRN**	**225S4**	930	152
9.2	37400	193	197000	64200	51190	**PF**	**022RF107**	**DRN**	**225S4**	830	153
10	33400	172	197000	64200	51190	**PH**	**022RF107**	**DRN**	**225S4**	950	152
11	30600	158	197000	64200	51190	**PHF**	**022RF107**	**DRN**	**225S4**	850	153
13	25900	134	120200	46200	36810	**P**	**012RF107**	**DRN**	**225S4**	790	146
15	22700	117	115500	46200	36810	**PF**	**012RF107**	**DRN**	**225S4**	720	147
18	19200	99	109800	46200	36810	**PH**	**012RF107**	**DRN**	**225S4**	800	146
						PHF	**012RF107**	**DRN**	**225S4**	730	147
8.8	39500	204	136400	46200	36810	**P**	**012RF97**	**DRN**	**225S4**	740	144
						PF	**012RF97**	**DRN**	**225S4**	670	145
						PH	**012RF97**	**DRN**	**225S4**	750	144
						PHF	**012RF97**	**DRN**	**225S4**	680	145
14	25200	130	96500	29200	24830	**P**	**002RF107**	**DRN**	**225S4**	710	138
						PF	**002RF107**	**DRN**	**225S4**	650	139
						PH	**002RF107**	**DRN**	**225S4**	710	138
						PHF	**002RF107**	**DRN**	**225S4**	650	139
13	26900	139	98400	29200	24830	**P**	**002RF97**	**DRN**	**225S4**	660	136
						PF	**002RF97**	**DRN**	**225S4**	600	137
						PH	**002RF97**	**DRN**	**225S4**	660	136
						PHF	**002RF97**	**DRN**	**225S4**	610	137

P_m = 45 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.89	472800	2004	850000	-	500000	**P**	**102RF167**	**DRN**	**225M4**	4810	190
1.1	364700	1546	850000	-	500000	**PF**	**102RF167**	**DRN**	**225M4**	3860	191
1.3	314300	1332	850000	-	500000	**PH**	**102RF167**	**DRN**	**225M4**	4870	190
						PHF	**102RF167**	**DRN**	**225M4**	3920	191
1.5	280500	1189	850000	631300	500000						
1.9	224400	951	850000	631300	500000						
2.1	199600	846	850000	631300	500000	**P**	**102RF167**	**DRN**	**225M4**	4810	190
2.4	173900	737	850000	631300	500000	**PF**	**102RF167**	**DRN**	**225M4**	3850	191
2.7	155100	657	850000	631300	500000	**PH**	**102RF167**	**DRN**	**225M4**	4870	190
3.2	132200	561	850000	631300	500000	**PHF**	**102RF167**	**DRN**	**225M4**	3910	191
3.8	109500	464	850000	631300	500000						

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P_m = 45 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.1	369500	1566	720000	-	423000	**P**	**092RF167**	**DRN**	**225M4**	3960	188
1.3	318500	1350	720000	-	423000	**PF**	**092RF167**	**DRN**	**225M4**	3260	189
						PH	**092RF167**	**DRN**	**225M4**	3970	188
						PHF	**092RF167**	**DRN**	**225M4**	3270	189
1.5	284200	1205	720000	513900	423000						
1.9	227400	964	720000	513900	423000						
2.1	202200	857	720000	513900	423000	**P**	**092RF167**	**DRN**	**225M4**	3950	188
2.4	176100	747	720000	513900	423000	**PF**	**092RF167**	**DRN**	**225M4**	3250	189
2.7	157200	666	720000	513900	423000	**PH**	**092RF167**	**DRN**	**225M4**	3960	188
3.1	133900	568	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**225M4**	3270	189
3.8	111000	470	720000	513900	423000						
4.4	94700	402	720000	513900	423000						
1.4	304700	1291	683000	397100	359400	**P**	**082RF167**	**DRN**	**225M4**	3460	186
1.7	247500	1049	683000	397100	359400	**PF**	**082RF167**	**DRN**	**225M4**	2810	187
2.0	209900	890	683000	397100	359400	**PH**	**082RF167**	**DRN**	**225M4**	3450	186
						PHF	**082RF167**	**DRN**	**225M4**	2800	187
2.2	193400	820	683000	397100	359400	**P**	**082RF167**	**DRN**	**225M4**	3450	186
2.5	168500	714	683000	397100	359400	**PF**	**082RF167**	**DRN**	**225M4**	2800	187
2.8	150300	637	683000	397100	359400	**PH**	**082RF167**	**DRN**	**225M4**	3450	186
						PHF	**082RF167**	**DRN**	**225M4**	2800	187
1.7	251300	1065	523000	274600	245660	**P**	**072RF167**	**DRN**	**225M4**	2800	182
						PF	**072RF167**	**DRN**	**225M4**	2310	183
						PH	**072RF167**	**DRN**	**225M4**	2860	182
						PHF	**072RF167**	**DRN**	**225M4**	2360	183
1.9	217400	922	523000	-	245660	**P**	**072RF147**	**DRN**	**225M4**	2550	180
						PF	**072RF147**	**DRN**	**225M4**	2050	181
						PH	**072RF147**	**DRN**	**225M4**	2600	180
						PHF	**072RF147**	**DRN**	**225M4**	2110	181
2.3	183700	779	523000	274600	245660	**P**	**072RF147**	**DRN**	**225M4**	2530	180
2.6	162100	687	523000	274600	245660	**PF**	**072RF147**	**DRN**	**225M4**	2040	181
3.4	125000	530	523000	274600	245660	**PH**	**072RF147**	**DRN**	**225M4**	2590	180
3.9	107700	457	523000	274600	245660	**PHF**	**072RF147**	**DRN**	**225M4**	2090	181
2.2	189100	802	436000	209100	185660						
2.5	166900	708	452100	209100	185660						
2.9	144700	614	466300	209100	185660	**P**	**062RF147**	**DRN**	**225M4**	2110	178
3.3	128700	546	473000	209100	185660	**PF**	**062RF147**	**DRN**	**225M4**	1750	179
4.7	90100	382	434900	209100	185660	**PH**	**062RF147**	**DRN**	**225M4**	2100	178
5.5	76400	324	413800	209100	185660	**PHF**	**062RF147**	**DRN**	**225M4**	1730	179
6.3	67100	284	397900	209100	185660						
2.1	203600	863	424400	209100	185660	**P**	**062RF137**	**DRN**	**225M4**	1990	176
3.1	134300	569	472300	209100	185660	**PF**	**062RF137**	**DRN**	**225M4**	1630	177
3.5	118700	503	472200	209100	185660	**PH**	**062RF137**	**DRN**	**225M4**	1980	176
4.2	99800	423	448300	209100	185660	**PHF**	**062RF137**	**DRN**	**225M4**	1620	177
7.7	54500	231	299200	140600	124060	**P**	**052RF147**	**DRN**	**225M4**	1630	174
						PF	**052RF147**	**DRN**	**225M4**	1430	175
						PH	**052RF147**	**DRN**	**225M4**	1620	174
						PHF	**052RF147**	**DRN**	**225M4**	1420	175
3.1	134300	569	347600	140600	124060	**P**	**052RF137**	**DRN**	**225M4**	1510	172
4.2	99800	423	358600	140600	124060	**PF**	**052RF137**	**DRN**	**225M4**	1310	173
5.2	80600	342	336500	140600	124060	**PH**	**052RF137**	**DRN**	**225M4**	1500	172
						PHF	**052RF137**	**DRN**	**225M4**	1300	173
3.3	126400	536	354400	140600	124060	**P**	**052RF107**	**DRN**	**225M4**	1410	170
						PF	**052RF107**	**DRN**	**225M4**	1210	171
						PH	**052RF107**	**DRN**	**225M4**	1400	170
						PHF	**052RF107**	**DRN**	**225M4**	1200	171
9.1	46200	196	246900	111000	100170	**P**	**042RF147**	**DRN**	**225M4**	1480	168
						PF	**042RF147**	**DRN**	**225M4**	1290	169
						PH	**042RF147**	**DRN**	**225M4**	1480	168
						PHF	**042RF147**	**DRN**	**225M4**	1290	169
5.2	80600	342	291800	111000	100170	**P**	**042RF137**	**DRN**	**225M4**	1360	166
6.0	70200	298	280000	111000	100170	**PF**	**042RF137**	**DRN**	**225M4**	1170	167
7.1	59000	250	265700	111000	100170	**PH**	**042RF137**	**DRN**	**225M4**	1370	166
8.8	47600	202	249200	111000	100170	**PHF**	**042RF137**	**DRN**	**225M4**	1180	167

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P_m = 45 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.9	107200	455	288100	111000	100170	**P**	**042RF107**	**DRN**	**225M4**	1260	164
						PF	**042RF107**	**DRN**	**225M4**	1070	165
						PH	**042RF107**	**DRN**	**225M4**	1260	164
						PHF	**042RF107**	**DRN**	**225M4**	1070	165
7.1	59000	250	215100	86800	69620						
8.8	47600	202	201700	86800	69620	**P**	**032RF137**	**DRN**	**225M4**	1120	160
10	41300	175	193200	86800	69620	**PF**	**032RF137**	**DRN**	**225M4**	990	161
12	36000	153	185400	86800	69620	**PH**	**032RF137**	**DRN**	**225M4**	1140	160
14	30200	128	176000	86800	69620	**PHF**	**032RF137**	**DRN**	**225M4**	1020	161
17	24400	104	165100	86800	69620						
5.3	79200	336	209600	86800	69620	**P**	**032RF107**	**DRN**	**225M4**	1010	158
5.8	72700	308	219100	86800	69620	**PF**	**032RF107**	**DRN**	**225M4**	890	159
7.8	53900	228	209300	86800	69620	**PH**	**032RF107**	**DRN**	**225M4**	1030	158
9.2	45500	193	199000	86800	69620	**PHF**	**032RF107**	**DRN**	**225M4**	910	159
10	41300	175	197000	64200	51190	**P**	**022RF137**	**DRN**	**225M4**	1040	154
12	36000	153	196300	64200	51190	**PF**	**022RF137**	**DRN**	**225M4**	930	155
14	30200	128	186300	64200	51190	**PH**	**022RF137**	**DRN**	**225M4**	1050	154
						PHF	**022RF137**	**DRN**	**225M4**	950	155
6.8	61600	261	173200	64200	51190	**P**	**022RF107**	**DRN**	**225M4**	930	152
7.8	53900	228	186600	64200	51190	**PF**	**022RF107**	**DRN**	**225M4**	830	153
15	27600	117	181300	-	51190	**PH**	**022RF107**	**DRN**	**225M4**	950	152
18	23300	99	172400	-	51190	**PHF**	**022RF107**	**DRN**	**225M4**	850	153
10	40600	172	129700	46200	36810	**P**	**012RF107**	**DRN**	**225M4**	790	146
11	37200	158	126300	46200	36810	**PF**	**012RF107**	**DRN**	**225M4**	720	147
15	27600	117	115500	46200	36810	**PH**	**012RF107**	**DRN**	**225M4**	800	146
18	23300	99	109800	46200	36810	**PHF**	**012RF107**	**DRN**	**225M4**	730	147
16	26800	114	92600	29200	24830	**P**	**002RF107**	**DRN**	**225M4**	710	138
						PF	**002RF107**	**DRN**	**225M4**	650	139
						PH	**002RF107**	**DRN**	**225M4**	710	138
						PHF	**002RF107**	**DRN**	**225M4**	650	139

P_m = 55 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.1	445700	1546	850000	-	500000	**P**	**102RF167**	**DRN**	**250ME4**	5010	190
1.3	384200	1332	850000	-	500000	**PF**	**102RF167**	**DRN**	**250ME4**	4060	191
						PH	**102RF167**	**DRN**	**250ME4**	5070	190
						PHF	**102RF167**	**DRN**	**250ME4**	4120	191
1.9	274300	951	850000	631300	500000						
2.1	243900	846	850000	631300	500000						
2.4	212500	737	850000	631300	500000	**P**	**102RF167**	**DRN**	**250ME4**	5000	190
2.7	189600	657	850000	631300	500000	**PF**	**102RF167**	**DRN**	**250ME4**	4050	191
3.2	161600	561	850000	631300	500000	**PH**	**102RF167**	**DRN**	**250ME4**	5060	190
3.8	133900	464	850000	631300	500000	**PHF**	**102RF167**	**DRN**	**250ME4**	4110	191
4.5	114300	396	850000	631300	500000						
1.3	389300	1350	720000	-	423000	**P**	**092RF167**	**DRN**	**250ME4**	4160	188
						PF	**092RF167**	**DRN**	**250ME4**	3460	189
						PH	**092RF167**	**DRN**	**250ME4**	4170	188
						PHF	**092RF167**	**DRN**	**250ME4**	3470	189
1.9	277900	964	720000	513900	423000						
2.1	247100	857	720000	513900	423000						
2.4	215300	747	720000	513900	423000	**P**	**092RF167**	**DRN**	**250ME4**	4150	188
2.7	192100	666	720000	513900	423000	**PF**	**092RF167**	**DRN**	**250ME4**	3450	189
3.1	163700	568	720000	513900	423000	**PH**	**092RF167**	**DRN**	**250ME4**	4160	188
3.8	135600	470	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**250ME4**	3460	189
4.4	115800	402	720000	513900	423000						
1.4	372400	1291	642600	397100	359400	**P**	**082RF167**	**DRN**	**250ME4**	3660	186
1.7	302600	1049	683000	397100	359400	**PF**	**082RF167**	**DRN**	**250ME4**	3010	187
2.0	256600	890	683000	397100	359400	**PH**	**082RF167**	**DRN**	**250ME4**	3650	186
						PHF	**082RF167**	**DRN**	**250ME4**	3000	187

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P_m = 55 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
2.2	236400	820	683000	397100	359400	**P**	**082RF167**	**DRN**	**250ME4**	3650	186
2.5	206000	714	683000	397100	359400	**PF**	**082RF167**	**DRN**	**250ME4**	3000	187
2.8	183800	637	683000	397100	359400	**PH**	**082RF167**	**DRN**	**250ME4**	3640	186
3.3	156600	543	683000	397100	359400	**PHF**	**082RF167**	**DRN**	**250ME4**	2990	187
3.0	169200	587	683000	397100	359400	**P**	**082RF147**	**DRN**	**250ME4**	3390	184
3.4	150500	522	683000	397100	359400	**PF**	**082RF147**	**DRN**	**250ME4**	2740	185
						PH	**082RF147**	**DRN**	**250ME4**	3380	184
						PHF	**082RF147**	**DRN**	**250ME4**	2730	185
2.3	224500	779	523000	274600	245660						
2.6	198100	687	523000	274600	245660	**P**	**072RF147**	**DRN**	**250ME4**	2730	180
3.4	152800	530	523000	274600	245660	**PF**	**072RF147**	**DRN**	**250ME4**	2240	181
3.9	131700	457	523000	274600	245660	**PH**	**072RF147**	**DRN**	**250ME4**	2780	180
4.8	107000	371	499200	274600	245660	**PHF**	**072RF147**	**DRN**	**250ME4**	2290	181
2.5	204000	708	424100	209100	185660						
2.9	176900	614	445100	209100	185660						
3.3	157300	546	458400	209100	185660	**P**	**062RF147**	**DRN**	**250ME4**	2310	178
4.7	110200	382	434900	209100	185660	**PF**	**062RF147**	**DRN**	**250ME4**	1940	179
5.5	93400	324	413800	209100	185660	**PH**	**062RF147**	**DRN**	**250ME4**	2290	178
6.3	82000	284	397900	209100	185660	**PHF**	**062RF147**	**DRN**	**250ME4**	1930	179
7.7	66600	231	374000	209100	185660						
2.7	190000	659	435300	209100	185660						
3.5	145100	503	466000	209100	185660	**P**	**062RF137**	**DRN**	**250ME4**	2190	176
4.2	122000	423	448300	209100	185660	**PF**	**062RF137**	**DRN**	**250ME4**	1830	177
5.2	98500	342	420600	209100	185660	**PH**	**062RF137**	**DRN**	**250ME4**	2180	176
6.0	85800	298	403600	-	185660	**PHF**	**062RF137**	**DRN**	**250ME4**	1810	177
7.7	66600	231	299200	140600	124060	**P**	**052RF147**	**DRN**	**250ME4**	1820	174
9.1	56500	196	284700	140600	124060	**PF**	**052RF147**	**DRN**	**250ME4**	1620	175
						PH	**052RF147**	**DRN**	**250ME4**	1810	174
						PHF	**052RF147**	**DRN**	**250ME4**	1610	175
5.2	98500	342	336500	140600	124060						
6.0	85800	298	322900	140600	124060	**P**	**052RF137**	**DRN**	**250ME4**	1710	172
7.1	72100	250	306400	140600	124060	**PF**	**052RF137**	**DRN**	**250ME4**	1510	173
8.2	62500	217	293500	-	124060	**PH**	**052RF137**	**DRN**	**250ME4**	1700	172
8.8	58200	202	287400	140600	124060	**PHF**	**052RF137**	**DRN**	**250ME4**	1500	173
3.9	131100	455	350400	140600	124060	**P**	**052RF107**	**DRN**	**250ME4**	1600	170
						PF	**052RF107**	**DRN**	**250ME4**	1400	171
						PH	**052RF107**	**DRN**	**250ME4**	1590	170
						PHF	**052RF107**	**DRN**	**250ME4**	1390	171
9.1	56500	196	246900	111000	100170						
11	47900	166	235000	111000	100170	**P**	**042RF147**	**DRN**	**250ME4**	1680	168
12	42000	146	225900	111000	100170	**PF**	**042RF147**	**DRN**	**250ME4**	1490	169
15	34100	118	212300	111000	100170	**PH**	**042RF147**	**DRN**	**250ME4**	1680	168
18	28900	101	202000	111000	100170	**PHF**	**042RF147**	**DRN**	**250ME4**	1490	169
6.0	85800	298	280000	111000	100170						
7.1	72100	250	265700	111000	100170						
8.8	58200	202	249200	111000	100170	**P**	**042RF137**	**DRN**	**250ME4**	1560	166
10	50500	175	238700	111000	100170	**PF**	**042RF137**	**DRN**	**250ME4**	1370	167
12	44000	153	229100	-	100170	**PH**	**042RF137**	**DRN**	**250ME4**	1560	166
14	36900	128	217400	-	100170	**PHF**	**042RF137**	**DRN**	**250ME4**	1370	167
17	29800	104	203900	-	90600						
7.1	72100	250	215100	86800	69620	**P**	**032RF137**	**DRN**	**250ME4**	1310	160
10	50500	175	193200	86800	69620	**PF**	**032RF137**	**DRN**	**250ME4**	1190	161
12	44000	153	185400	86800	69620	**PH**	**032RF137**	**DRN**	**250ME4**	1330	160
						PHF	**032RF137**	**DRN**	**250ME4**	1210	161
6.8	75300	261	215400	86800	69620	**P**	**032RF107**	**DRN**	**250ME4**	1210	158
						PF	**032RF107**	**DRN**	**250ME4**	1090	159
						PH	**032RF107**	**DRN**	**250ME4**	1230	158
						PHF	**032RF107**	**DRN**	**250ME4**	1110	159
14	36900	128	186300	64200	51190	**P**	**022RF137**	**DRN**	**250ME4**	1230	154
17	29800	104	174700	64200	51190	**PF**	**022RF137**	**DRN**	**250ME4**	1130	155
						PH	**022RF137**	**DRN**	**250ME4**	1250	154
						PHF	**022RF137**	**DRN**	**250ME4**	1150	155

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P_m = 55 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
9.2	55700	193	183700	64200	51190	**P**	**022RF107**	**DRN**	**250ME4**	1130	152
						PF	**022RF107**	**DRN**	**250ME4**	1030	153
						PH	**022RF107**	**DRN**	**250ME4**	1140	152
						PHF	**022RF107**	**DRN**	**250ME4**	1040	153
11	45500	158	126300	46200	36810	**P**	**012RF107**	**DRN**	**250ME4**	980	146
13	38600	134	120200	46200	36810	**PF**	**012RF107**	**DRN**	**250ME4**	910	147
						PH	**012RF107**	**DRN**	**250ME4**	1000	146
						PHF	**012RF107**	**DRN**	**250ME4**	930	147
19	27700	96	88100	29200	24830	**P**	**002RF107**	**DRN**	**250ME4**	900	138
						PF	**002RF107**	**DRN**	**250ME4**	840	139
						PH	**002RF107**	**DRN**	**250ME4**	910	138
						PHF	**002RF107**	**DRN**	**250ME4**	850	139

P_m = 75 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.9	374000	951	850000	631300	500000						
2.1	332600	846	850000	631300	500000						
2.4	289800	737	850000	631300	500000	**P**	**102RF167**	**DRN**	**280S4**	5010	190
2.7	258600	657	850000	631300	500000	**PF**	**102RF167**	**DRN**	**280S4**	4050	191
3.2	220400	561	850000	631300	500000	**PH**	**102RF167**	**DRN**	**280S4**	5070	190
3.8	182600	464	850000	631300	500000	**PHF**	**102RF167**	**DRN**	**280S4**	4110	191
4.5	155800	396	850000	631300	500000						
1.9	379000	964	720000	513900	423000						
2.1	337000	857	720000	513900	423000						
2.4	293600	747	720000	513900	423000	**P**	**092RF167**	**DRN**	**280S4**	4150	188
2.7	262000	666	720000	513900	423000	**PF**	**092RF167**	**DRN**	**280S4**	3450	189
3.1	223300	568	720000	513900	423000	**PH**	**092RF167**	**DRN**	**280S4**	4160	188
3.8	185000	470	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**280S4**	3470	189
4.4	157900	402	720000	513900	423000						
2.5	280900	714	683000	397100	359400	**P**	**082RF167**	**DRN**	**280S4**	3650	186
2.8	250600	637	683000	397100	359400	**PF**	**082RF167**	**DRN**	**280S4**	3000	187
3.3	213600	543	683000	397100	359400	**PH**	**082RF167**	**DRN**	**280S4**	3650	186
						PHF	**082RF167**	**DRN**	**280S4**	3000	187
2.6	270100	687	520900	274600	245660	**P**	**072RF147**	**DRN**	**280S4**	2730	180
3.4	208400	530	523000	274600	245660	**PF**	**072RF147**	**DRN**	**280S4**	2240	181
3.9	179600	457	523000	274600	245660	**PH**	**072RF147**	**DRN**	**280S4**	2780	180
4.8	145900	371	499200	274600	245660	**PHF**	**072RF147**	**DRN**	**280S4**	2290	181
4.7	150300	382	434900	209100	185660	**P**	**062RF147**	**DRN**	**280S4**	2310	178
5.5	127400	324	413800	209100	185660	**PF**	**062RF147**	**DRN**	**280S4**	1940	179
6.3	111800	284	397900	209100	185660	**PH**	**062RF147**	**DRN**	**280S4**	2300	178
7.7	90800	231	374000	209100	185660	**PHF**	**062RF147**	**DRN**	**280S4**	1930	179
3.5	197900	503	429100	209100	185660	**P**	**062RF137**	**DRN**	**280S4**	2190	176
						PF	**062RF137**	**DRN**	**280S4**	1830	177
						PH	**062RF137**	**DRN**	**280S4**	2180	176
						PHF	**062RF137**	**DRN**	**280S4**	1820	177
7.7	90800	231	299200	140600	124060	**P**	**052RF147**	**DRN**	**280S4**	1820	174
9.1	77000	196	284700	140600	124060	**PF**	**052RF147**	**DRN**	**280S4**	1620	175
11	65300	166	271000	140600	124060	**PH**	**052RF147**	**DRN**	**280S4**	1820	174
						PHF	**052RF147**	**DRN**	**280S4**	1620	175
5.2	134300	342	336500	140600	124060	**P**	**052RF137**	**DRN**	**280S4**	1710	172
						PF	**052RF137**	**DRN**	**280S4**	1510	173
						PH	**052RF137**	**DRN**	**280S4**	1700	172
						PHF	**052RF137**	**DRN**	**280S4**	1500	173
9.1	77000	196	246900	111000	100170						
11	65300	166	235000	111000	100170	**P**	**042RF147**	**DRN**	**280S4**	1680	168
12	57300	146	225900	111000	100170	**PF**	**042RF147**	**DRN**	**280S4**	1490	169
15	46500	118	212300	111000	100170	**PH**	**042RF147**	**DRN**	**280S4**	1680	168
18	39500	101	202000	111000	100170	**PHF**	**042RF147**	**DRN**	**280S4**	1490	169

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P_m = 75 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
12	57300	146	182900	86800	69620	**P**	**032RF147**	**DRN**	**280S4**	1430	162
15	46500	118	171800	86800	69620	**PF**	**032RF147**	**DRN**	**280S4**	1310	163
18	39500	101	163500	86800	69620	**PH**	**032RF147**	**DRN**	**280S4**	1450	162
						PHF	**032RF147**	**DRN**	**280S4**	1330	163
8.8	79400	202	201700	86800	69620	**P**	**032RF137**	**DRN**	**280S4**	1320	160
						PF	**032RF137**	**DRN**	**280S4**	1190	161
						PH	**032RF137**	**DRN**	**280S4**	1340	160
						PHF	**032RF137**	**DRN**	**280S4**	1220	161
12	60000	153	176200	64200	51190	**P**	**022RF137**	**DRN**	**280S4**	1240	154
						PF	**022RF137**	**DRN**	**280S4**	1130	155
						PH	**022RF137**	**DRN**	**280S4**	1250	154
						PHF	**022RF137**	**DRN**	**280S4**	1150	155

P_m = 90 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.9	449100	951	850000	631300	500000						
2.1	399400	846	850000	631300	500000						
2.4	348000	737	850000	631300	500000	**P**	**102RF167**	**DRN**	**280M4**	5120	190
2.7	310400	657	850000	631300	500000	**PF**	**102RF167**	**DRN**	**280M4**	4170	191
3.2	264600	561	850000	631300	500000	**PH**	**102RF167**	**DRN**	**280M4**	5180	190
3.8	219200	464	850000	631300	500000	**PHF**	**102RF167**	**DRN**	**280M4**	4230	191
4.5	187100	396	850000	631300	500000						
1.9	455000	964	720000	513900	423000						
2.1	404700	857	720000	513900	423000						
2.4	352500	747	720000	513900	423000	**P**	**092RF167**	**DRN**	**280M4**	4270	188
2.7	314500	666	720000	513900	423000	**PF**	**092RF167**	**DRN**	**280M4**	3570	189
3.1	268100	568	720000	513900	423000	**PH**	**092RF167**	**DRN**	**280M4**	4280	188
3.8	222100	470	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**280M4**	3580	189
4.4	189600	402	720000	513900	423000						
2.2	387100	820	628500	397100	359400	**P**	**082RF167**	**DRN**	**280M4**	3770	186
2.8	300900	637	683000	397100	359400	**PF**	**082RF167**	**DRN**	**280M4**	3120	187
3.3	256500	543	683000	397100	359400	**PH**	**082RF167**	**DRN**	**280M4**	3760	186
						PHF	**082RF167**	**DRN**	**280M4**	3110	187
3.4	250200	530	523000	274600	245660	**P**	**072RF147**	**DRN**	**280M4**	2840	180
3.9	215600	457	523000	274600	245660	**PF**	**072RF147**	**DRN**	**280M4**	2350	181
4.8	175200	371	499200	274600	245660	**PH**	**072RF147**	**DRN**	**280M4**	2900	180
						PHF	**072RF147**	**DRN**	**280M4**	2410	181
5.5	153000	324	414100	209100	185660	**P**	**062RF147**	**DRN**	**280M4**	2420	178
6.3	134300	284	398100	209100	185660	**PF**	**062RF147**	**DRN**	**280M4**	2060	179
7.7	109100	231	374000	209100	185660	**PH**	**062RF147**	**DRN**	**280M4**	2410	178
						PHF	**062RF147**	**DRN**	**280M4**	2050	179
4.2	199700	423	427600	209100	185660	**P**	**062RF137**	**DRN**	**280M4**	2310	176
						PF	**062RF137**	**DRN**	**280M4**	1940	177
						PH	**062RF137**	**DRN**	**280M4**	2290	176
						PHF	**062RF137**	**DRN**	**280M4**	1930	177
9.1	92500	196	284800	140600	124060	**P**	**052RF147**	**DRN**	**280M4**	1940	174
						PF	**052RF147**	**DRN**	**280M4**	1740	175
						PH	**052RF147**	**DRN**	**280M4**	1930	174
						PHF	**052RF147**	**DRN**	**280M4**	1730	175
11	78400	166	235000	111000	100170	**P**	**042RF147**	**DRN**	**280M4**	1790	168
12	68800	146	226000	111000	100170	**PF**	**042RF147**	**DRN**	**280M4**	1600	169
15	55900	118	212300	111000	100170	**PH**	**042RF147**	**DRN**	**280M4**	1800	168
18	47400	101	202100	111000	100170	**PHF**	**042RF147**	**DRN**	**280M4**	1610	169
18	47400	101	163600	86800	69620	**P**	**032RF147**	**DRN**	**280M4**	1550	162
						PF	**032RF147**	**DRN**	**280M4**	1420	163
						PH	**032RF147**	**DRN**	**280M4**	1570	162
						PHF	**032RF147**	**DRN**	**280M4**	1450	163

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P_m = 90 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
10	82700	175	193300	86800	69620	**P**	**032RF137**	**DRN**	**280M4**		1430	160
12	72000	153	185400	86800	69620	**PF**	**032RF137**	**DRN**	**280M4**		1310	161
						PH	**032RF137**	**DRN**	**280M4**		1450	160
						PHF	**032RF137**	**DRN**	**280M4**		1330	161
14	60500	128	175200	64200	51190	**P**	**022RF137**	**DRN**	**280M4**		1350	154
						PF	**022RF137**	**DRN**	**280M4**		1250	155
						PH	**022RF137**	**DRN**	**280M4**		1360	154
						PHF	**022RF137**	**DRN**	**280M4**		1260	155

P_m = 110 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
2.4	423900	737	850000	631300	500000	**P**	**102RF167**	**DRN**	**315S4**		5360	190
2.7	378200	657	850000	631300	500000	**PF**	**102RF167**	**DRN**	**315S4**		4410	191
3.2	322300	561	850000	631300	500000	**PH**	**102RF167**	**DRN**	**315S4**		5430	190
3.9	267100	464	850000	631300	500000	**PHF**	**102RF167**	**DRN**	**315S4**		4470	191
4.5	227900	396	850000	631300	500000							
2.4	429400	747	720000	513900	423000	**P**	**092RF167**	**DRN**	**315S4**		4510	188
2.7	383200	666	720000	513900	423000	**PF**	**092RF167**	**DRN**	**315S4**		3810	189
3.1	326600	568	720000	513900	423000	**PH**	**092RF167**	**DRN**	**315S4**		4520	188
3.8	270600	470	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**315S4**		3830	189
4.5	230900	402	720000	513900	423000							
2.8	366600	637	648000	397100	359400	**P**	**082RF167**	**DRN**	**315S4**		4010	186
						PF	**082RF167**	**DRN**	**315S4**		3360	187
						PH	**082RF167**	**DRN**	**315S4**		4010	186
						PHF	**082RF167**	**DRN**	**315S4**		3360	187
3.9	262700	457	523000	274600	245660	**P**	**072RF147**	**DRN**	**315S4**		3090	180
						PF	**072RF147**	**DRN**	**315S4**		2600	181
						PH	**072RF147**	**DRN**	**315S4**		3140	180
						PHF	**072RF147**	**DRN**	**315S4**		2650	181
7.7	132900	231	299000	140600	124060	**P**	**052RF147**	**DRN**	**315S4**		2180	174
						PF	**052RF147**	**DRN**	**315S4**		1980	175
						PH	**052RF147**	**DRN**	**315S4**		2170	174
						PHF	**052RF147**	**DRN**	**315S4**		1970	175
12	83800	146	182700	86800	69620	**P**	**032RF147**	**DRN**	**315S4**		1790	162
						PF	**032RF147**	**DRN**	**315S4**		1670	163
						PH	**032RF147**	**DRN**	**315S4**		1810	162
						PHF	**032RF147**	**DRN**	**315S4**		1690	163

P_m = 132 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
2.4	508400	737	850000	631300	500000	**P**	**102RF167**	**DRN**	**315ME4**		5490	190
2.7	453600	657	850000	631300	500000	**PF**	**102RF167**	**DRN**	**315ME4**		4540	191
3.2	386600	561	850000	631300	500000	**PH**	**102RF167**	**DRN**	**315ME4**		5550	190
3.9	320300	464	850000	631300	500000	**PHF**	**102RF167**	**DRN**	**315ME4**		4600	191
4.5	273400	396	850000	631300	500000							
2.7	459500	666	720000	513900	423000	**P**	**092RF167**	**DRN**	**315ME4**		4640	188
3.1	391700	568	720000	513900	423000	**PF**	**092RF167**	**DRN**	**315ME4**		3940	189
3.8	324500	470	720000	513900	423000	**PH**	**092RF167**	**DRN**	**315ME4**		4650	188
4.5	277000	402	720000	513900	423000	**PHF**	**092RF167**	**DRN**	**315ME4**		3950	189
3.3	374700	543	640400	397100	359400	**P**	**082RF167**	**DRN**	**315ME4**		4140	186
						PF	**082RF167**	**DRN**	**315ME4**		3490	187
						PH	**082RF167**	**DRN**	**315ME4**		4130	186
						PHF	**082RF167**	**DRN**	**315ME4**		3480	187

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P_m = 160 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.2	469400	561	850000	631300	500000	**P**	**102RF167**	**DRN**	**315L4**	5520	190
3.9	388900	464	850000	631300	500000	**PF**	**102RF167**	**DRN**	**315L4**	4560	191
4.5	331900	396	850000	631300	500000	**PH**	**102RF167**	**DRN**	**315L4**	5580	190
						PHF	**102RF167**	**DRN**	**315L4**	4620	191
3.1	475600	568	706700	513900	423000	**P**	**092RF167**	**DRN**	**315L4**	4660	188
3.8	394000	470	720000	513900	423000	**PF**	**092RF167**	**DRN**	**315L4**	3970	189
4.5	336300	402	720000	513900	423000	**PH**	**092RF167**	**DRN**	**315L4**	4680	188
						PHF	**092RF167**	**DRN**	**315L4**	3980	189

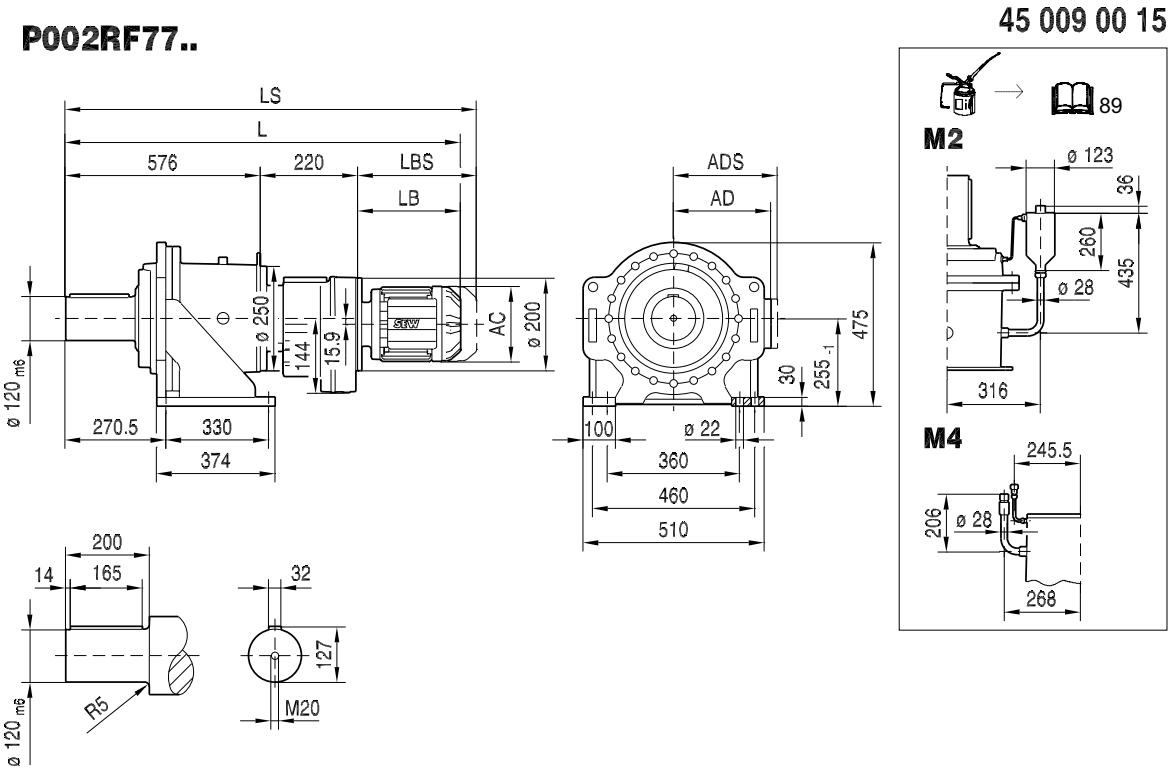
P_m = 200 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
3.2	585800	561	823500	631300	500000	**P**	**102RF167**	**DRN**	**315H4**	5630	190
3.9	485300	464	850000	631300	500000	**PF**	**102RF167**	**DRN**	**315H4**	4680	191
4.5	414200	396	850000	631300	500000	**PH**	**102RF167**	**DRN**	**315H4**	5700	190
						PHF	**102RF167**	**DRN**	**315H4**	4740	191
3.8	491700	470	689700	513900	423000	**P**	**092RF167**	**DRN**	**315H4**	4780	188
4.5	419700	402	720000	513900	423000	**PF**	**092RF167**	**DRN**	**315H4**	4080	189
						PH	**092RF167**	**DRN**	**315H4**	4790	188
						PHF	**092RF167**	**DRN**	**315H4**	4100	189

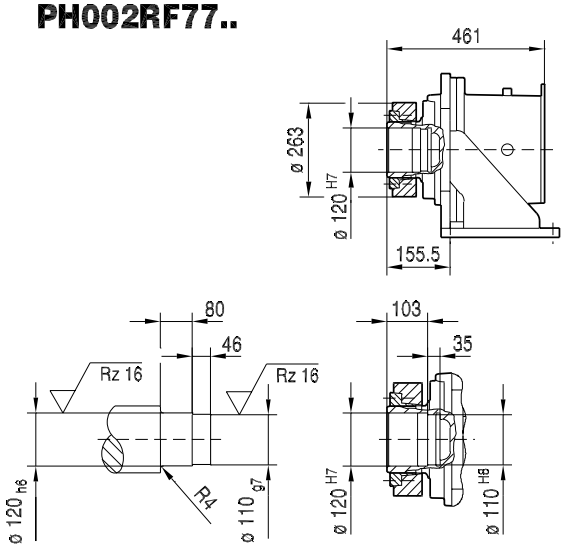
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10.3 Dimension sheets [mm]

P002RF77..



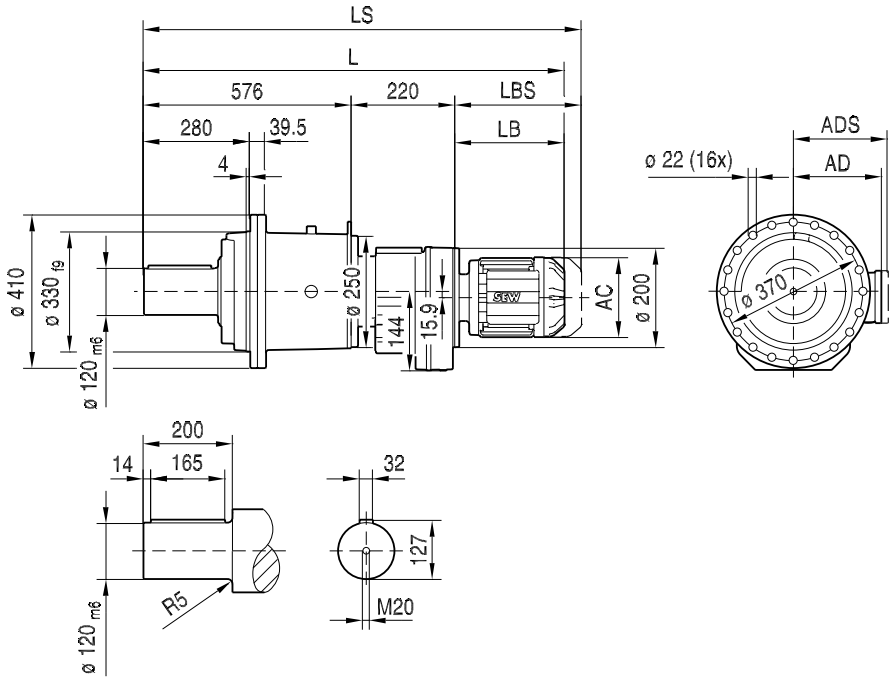
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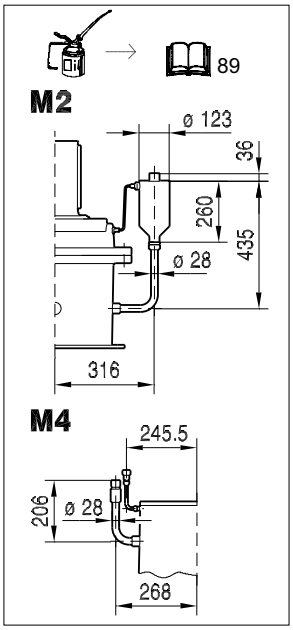
(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	1066	1098	1094	1144	1175	1225	1243	1269	1335	1335
LS	1159	1191	1188	1238	1287	1337	1381	1406	1524	1524
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

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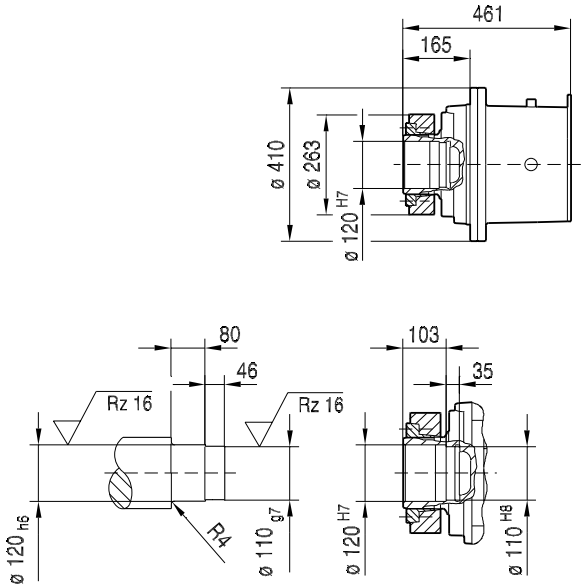
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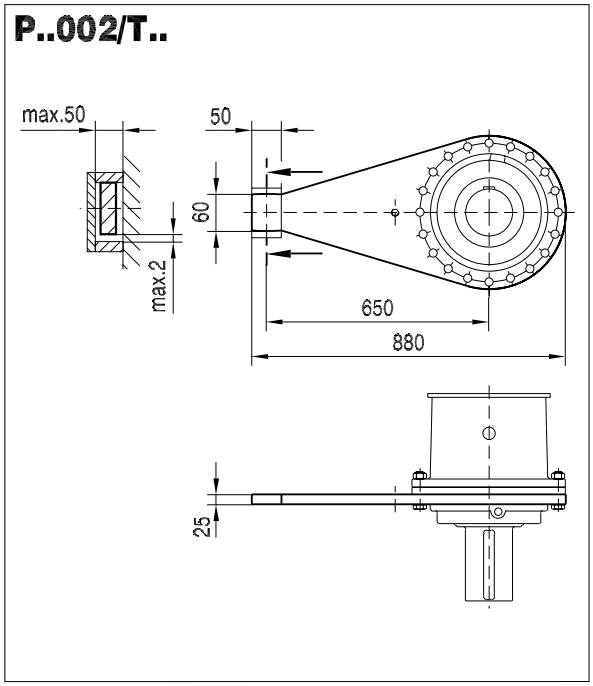
45 010 00 15



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P..002/T..

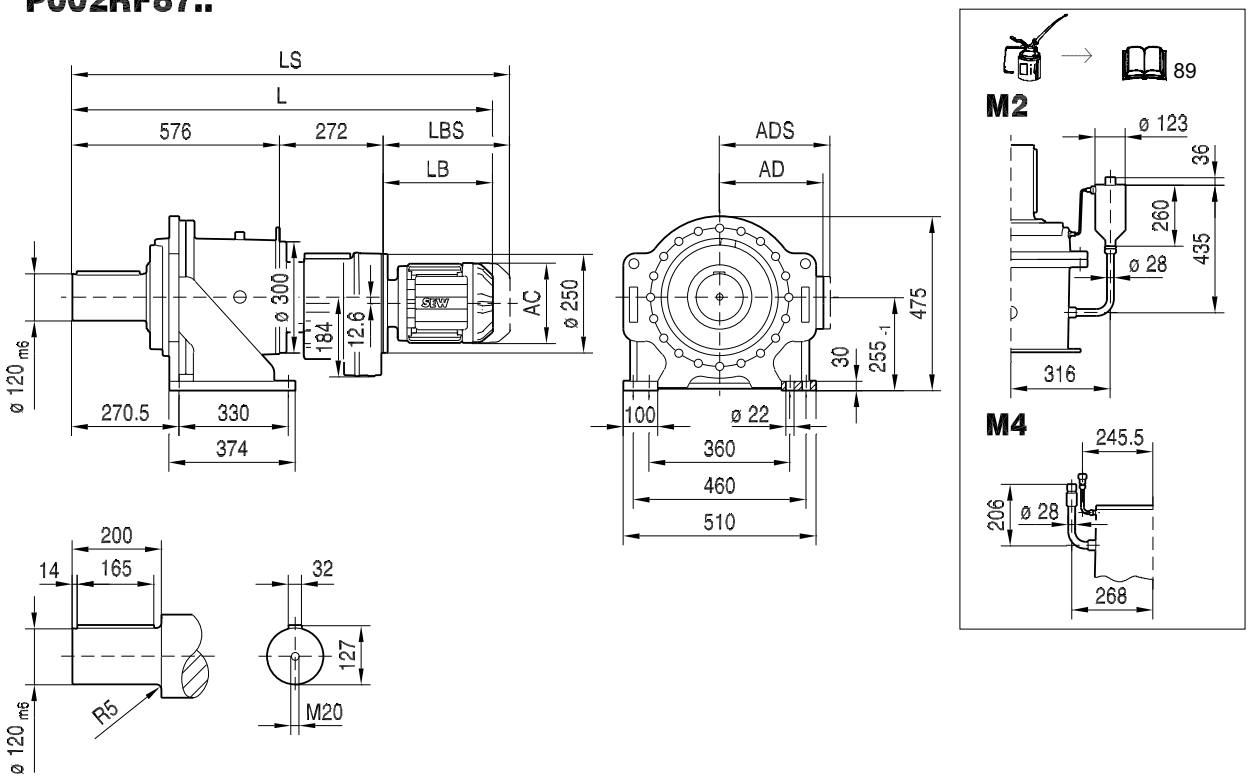


(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	1066	1098	1094	1144	1175	1225	1243	1269	1335	1335
LS	1159	1191	1188	1238	1287	1337	1381	1406	1524	1524
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

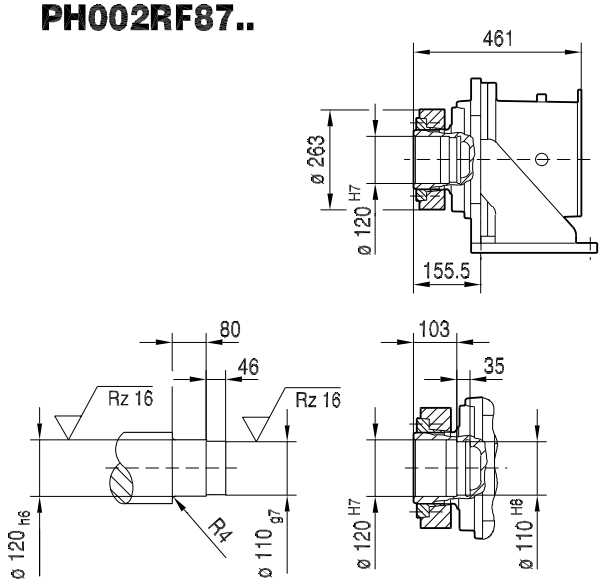
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P002RF87..

45 011 00 15



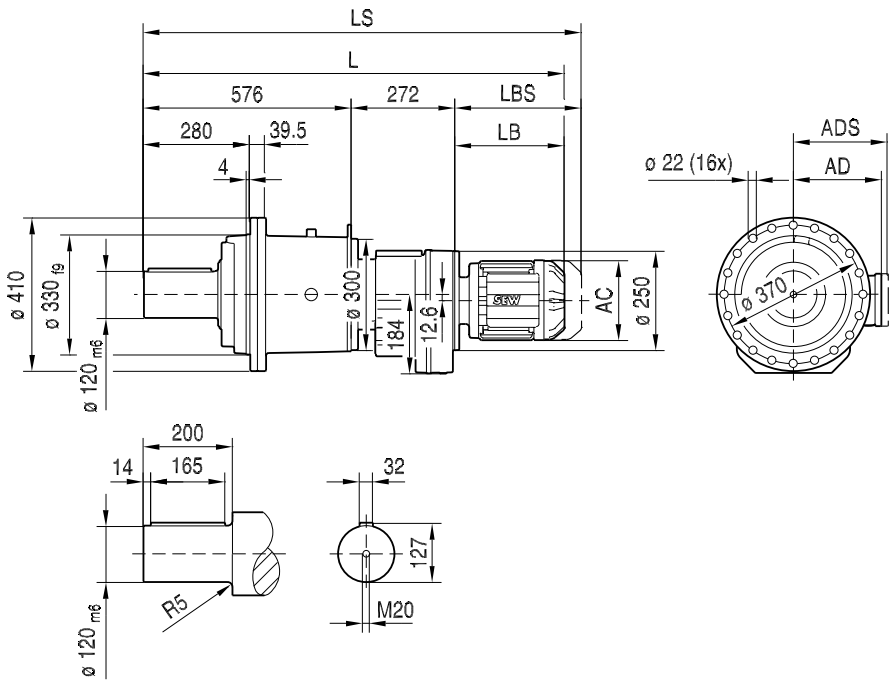
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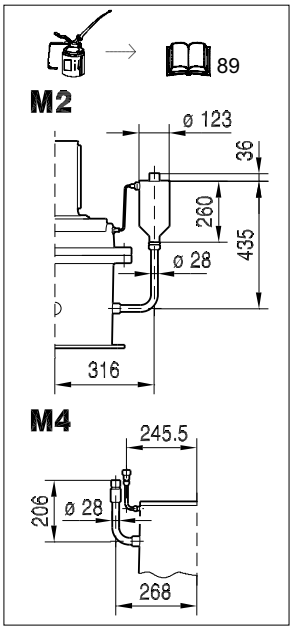
(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	1141	1191	1222	1272	1290	1316	1382	1382	1405	1515
LS	1235	1285	1334	1384	1428	1453	1571	1571	1594	1720
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

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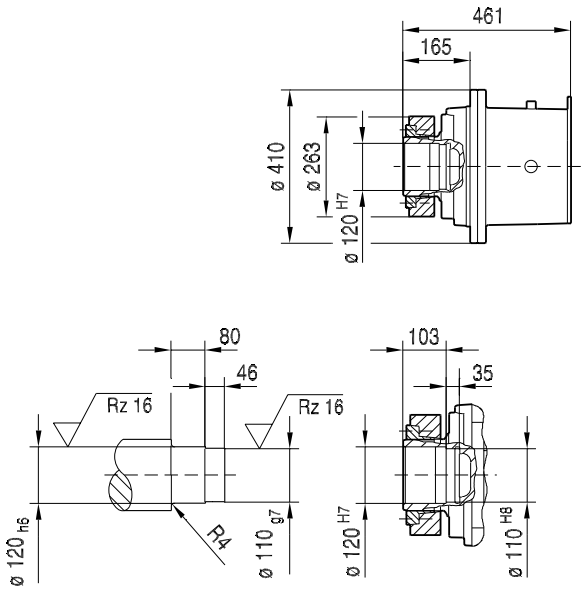
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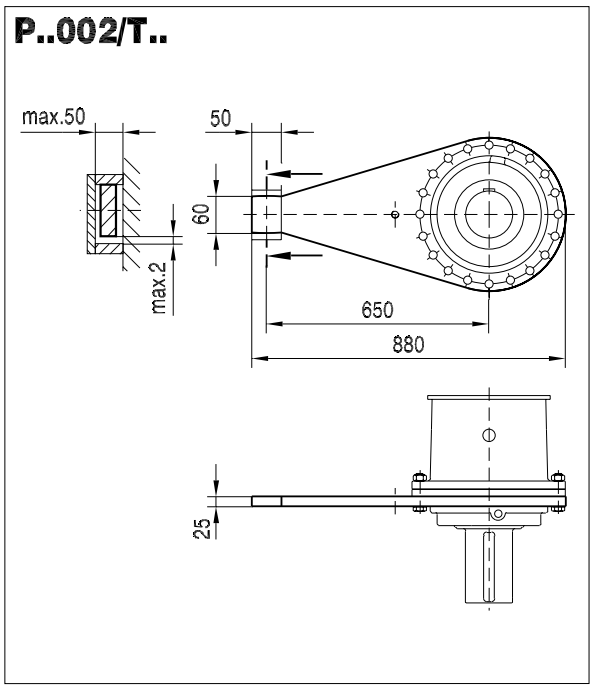
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P..002/T..

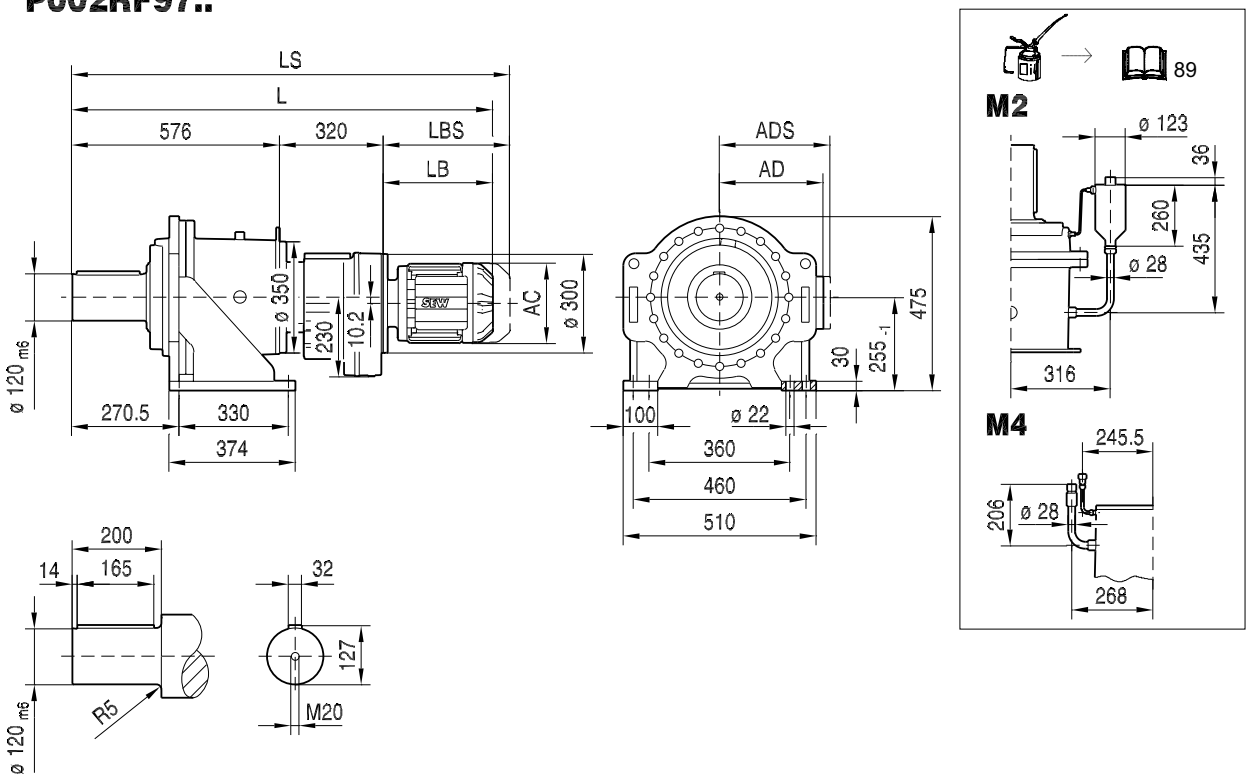


(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	1141	1191	1222	1272	1290	1316	1382	1382	1405	1515
LS	1235	1285	1334	1384	1428	1453	1571	1571	1594	1720
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

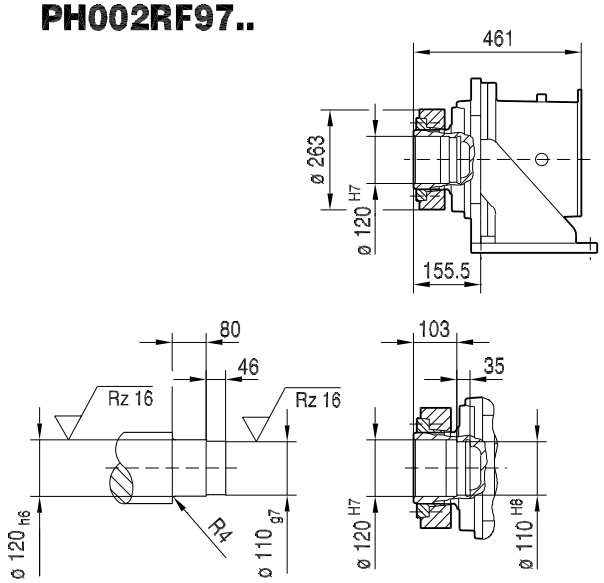
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P002RF97..

45 013 00 15



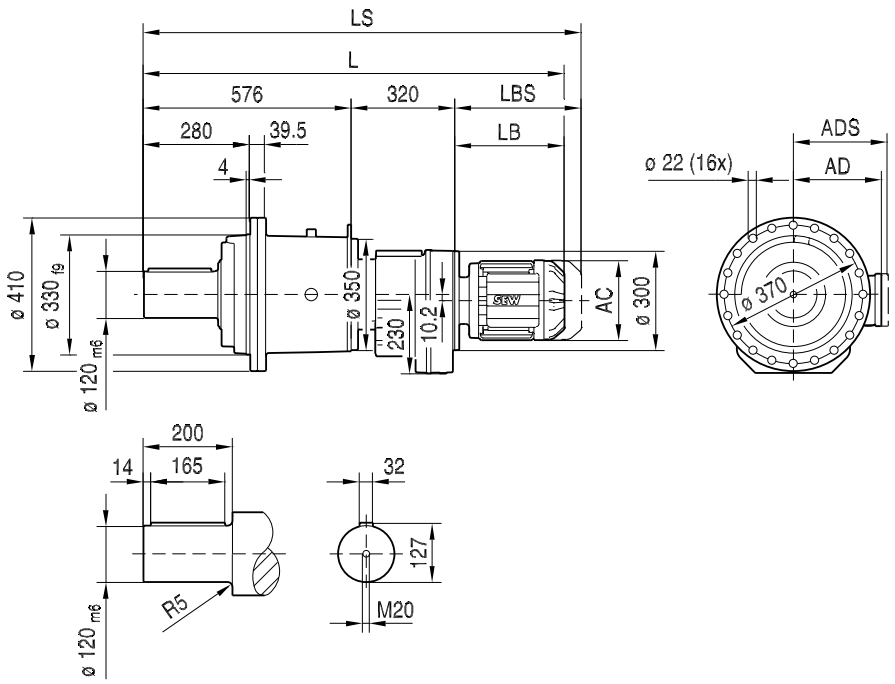
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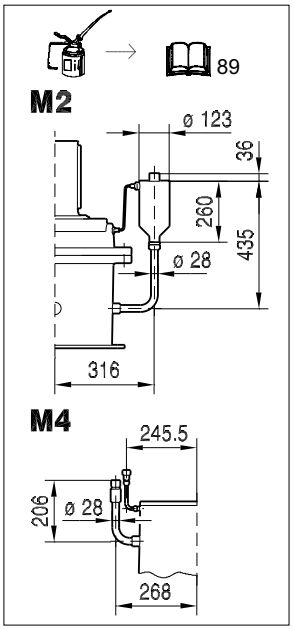
(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1234	1265	1315	1333	1359	1425	1425	1448	1558	1532
LS	1328	1377	1427	1471	1496	1614	1614	1637	1763	1737
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

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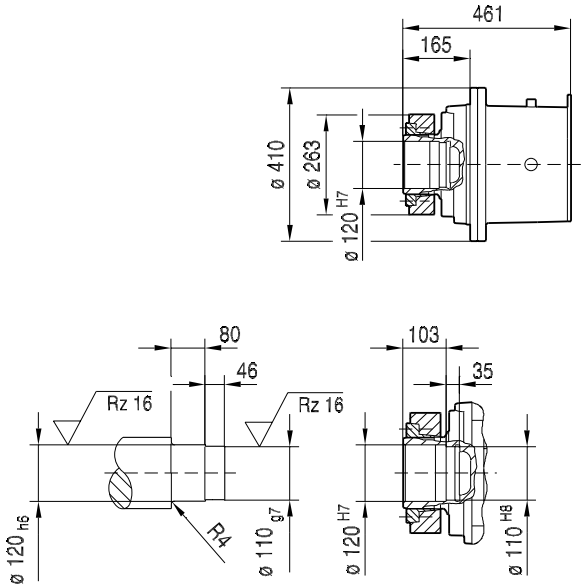
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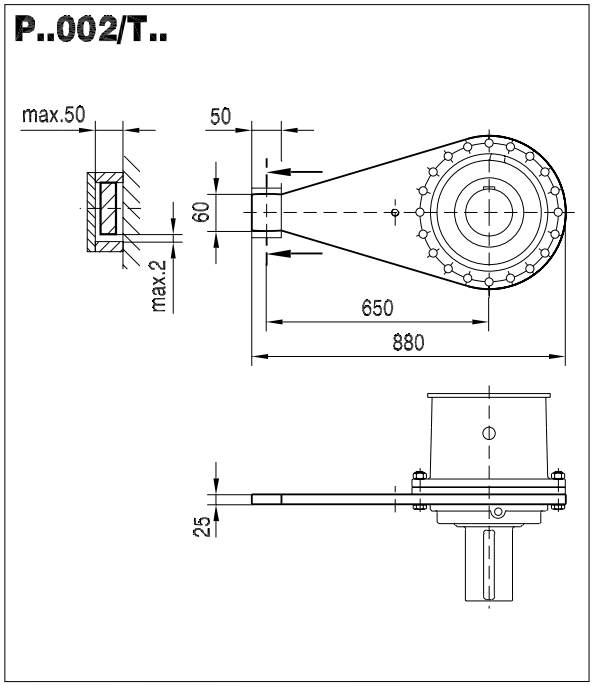
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PHF002RF97..



P..002/T..

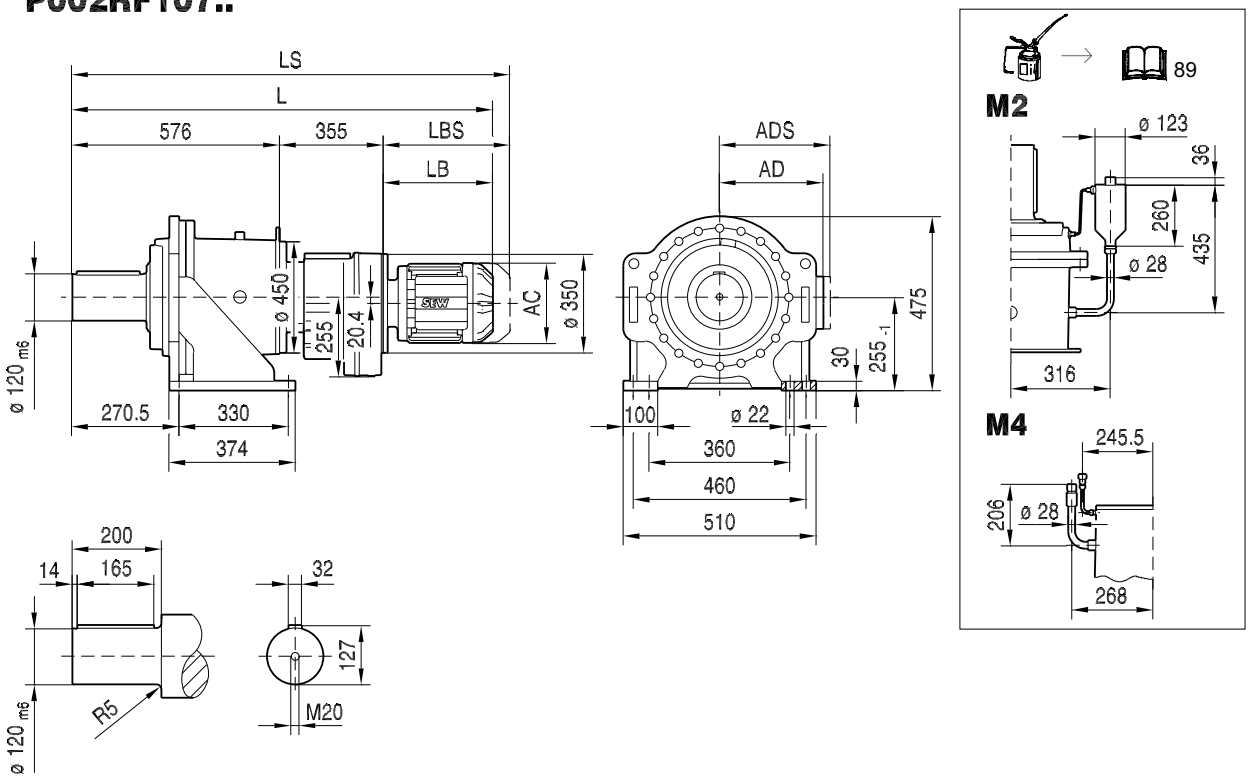


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1234	1265	1315	1333	1359	1425	1425	1448	1558	1532
LS	1328	1377	1427	1471	1496	1614	1614	1637	1763	1737
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

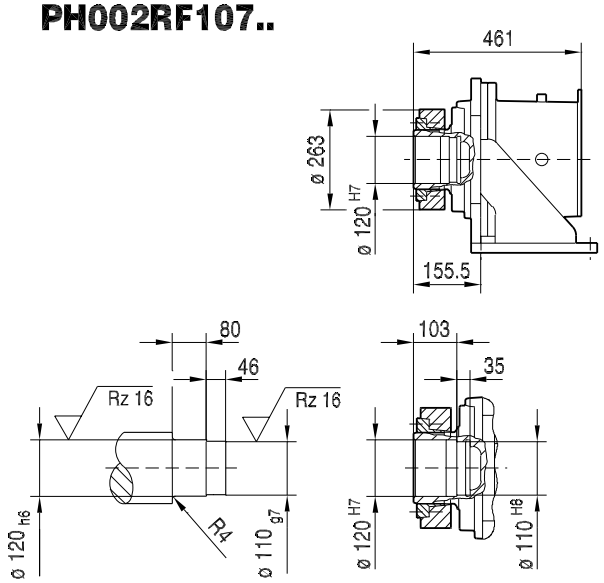
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P002RF107..

45 015 00 15



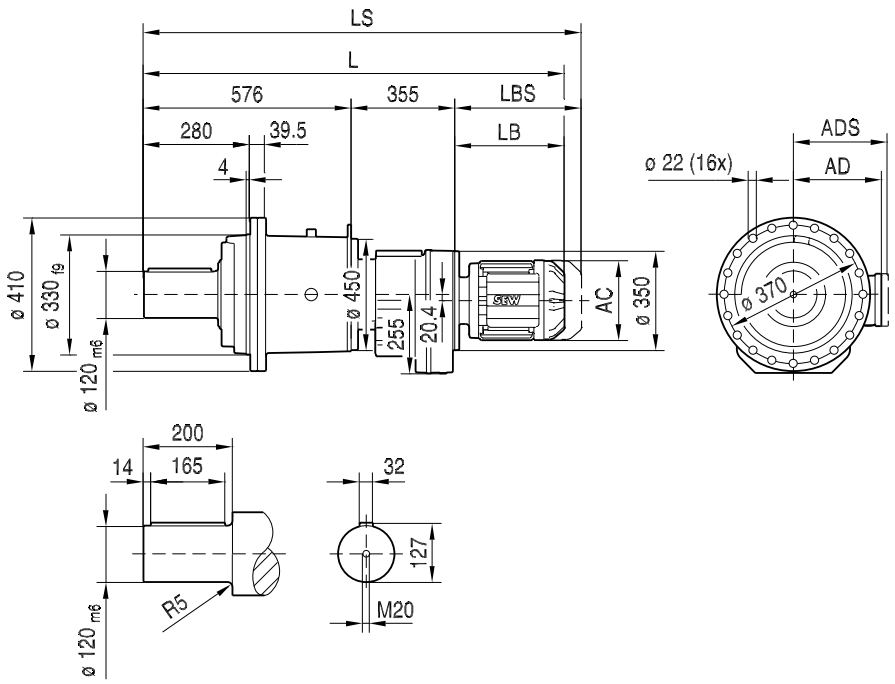
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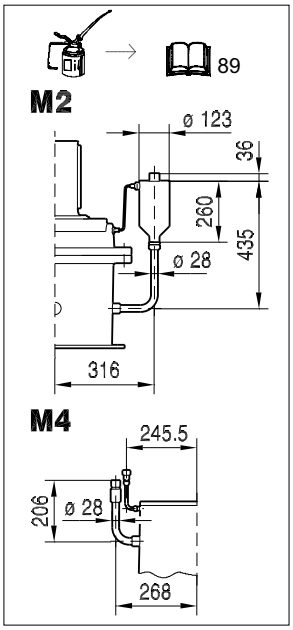
(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	1344	1362	1388	1454	1454	1477	1587	1561	1698
LS	1456	1500	1525	1643	1643	1666	1792	1766	1938
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

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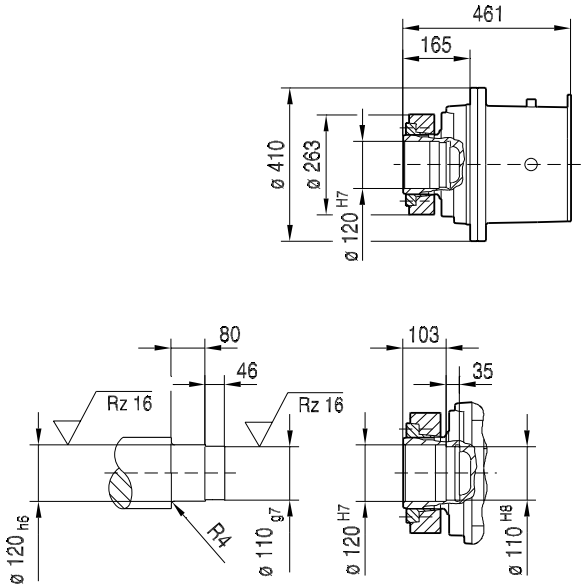
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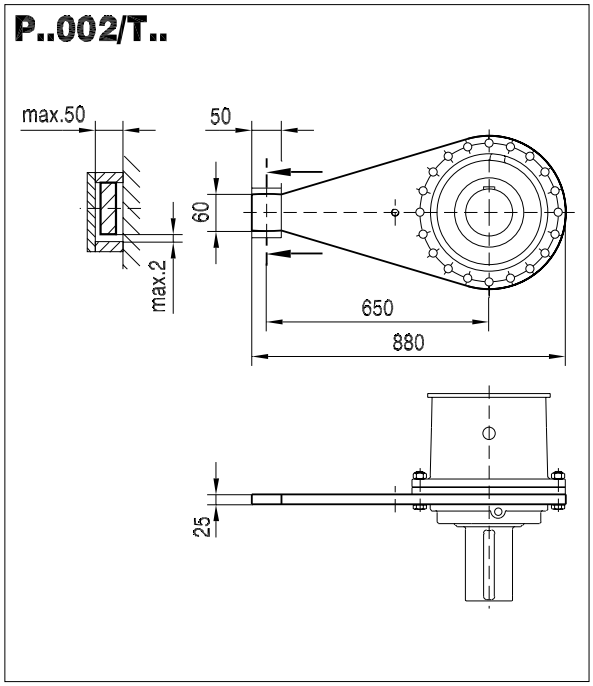
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PHF002RF107..



P..002/T..

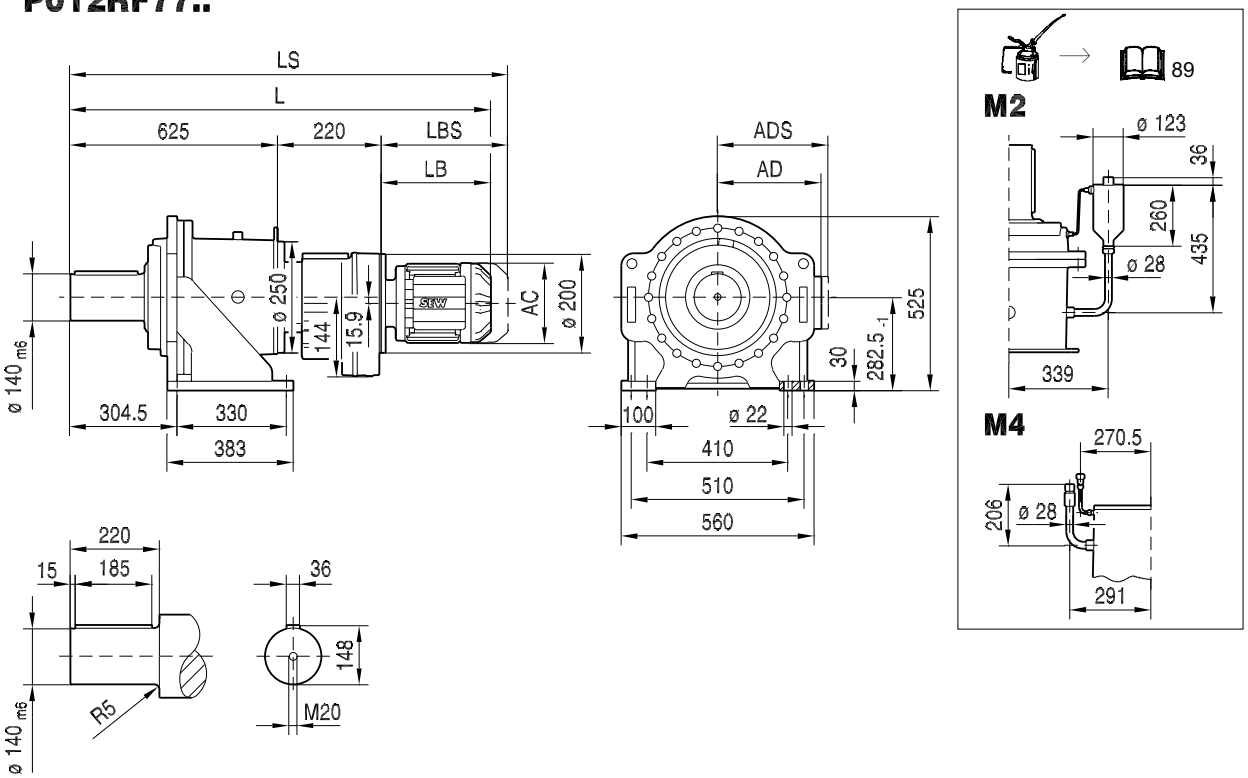


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	1344	1362	1388	1454	1454	1477	1587	1561	1698
LS	1456	1500	1525	1643	1643	1666	1792	1766	1938
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

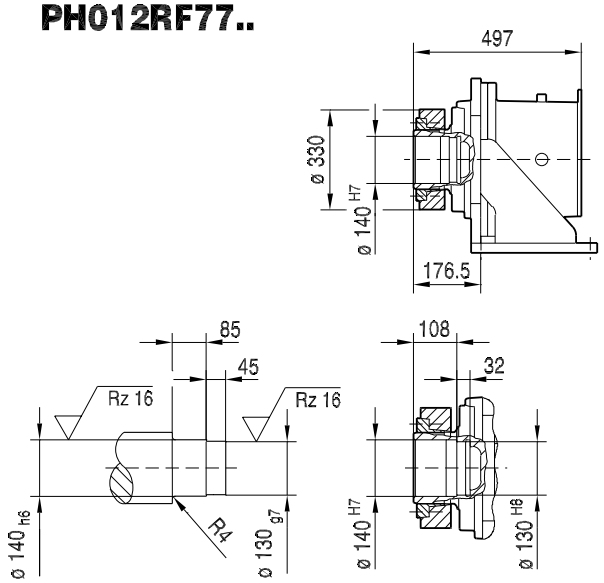
23488859/EN – 02/2017

P012RF77..

45 017 00 15



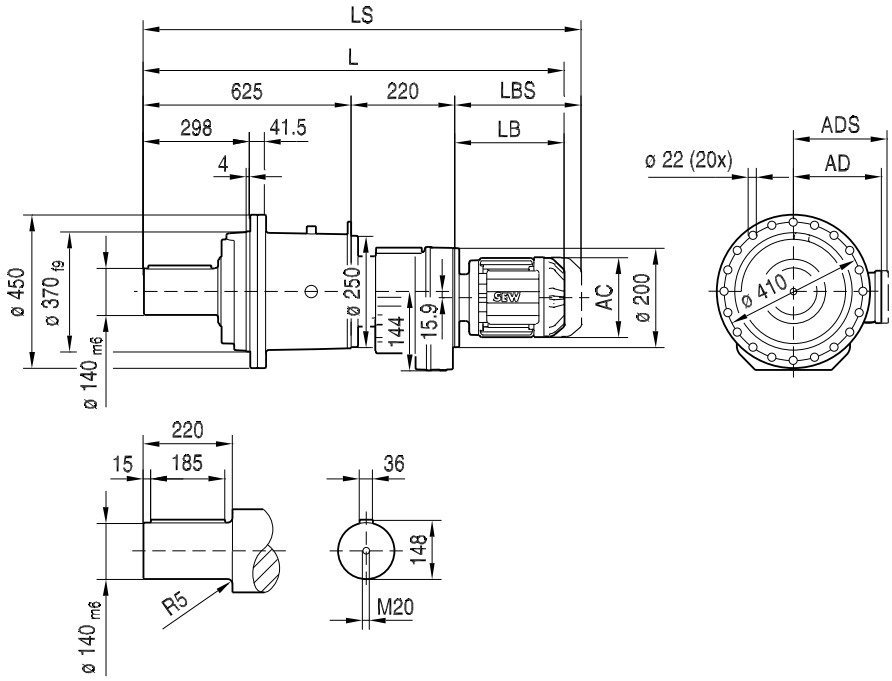
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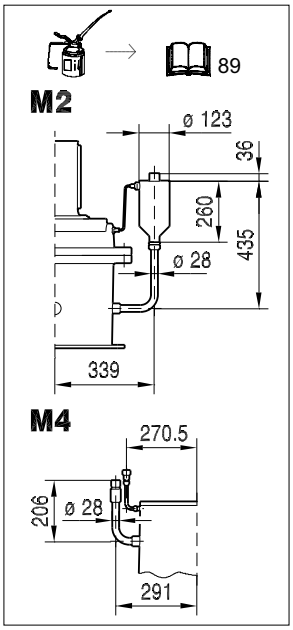
(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	1115	1147	1143	1193	1224	1274	1292	1318	1384	1384
LS	1208	1240	1237	1287	1336	1386	1430	1455	1573	1573
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

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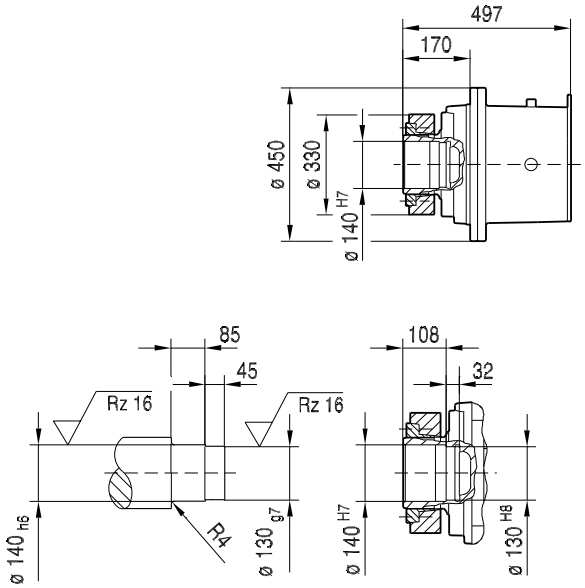
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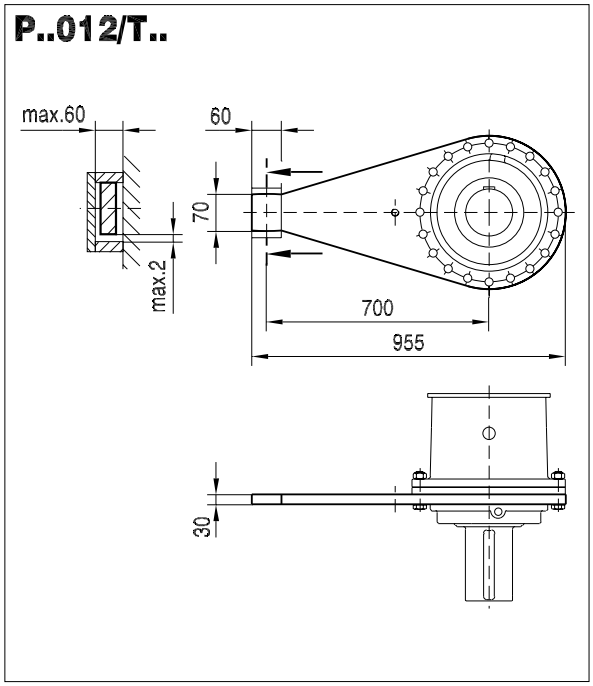
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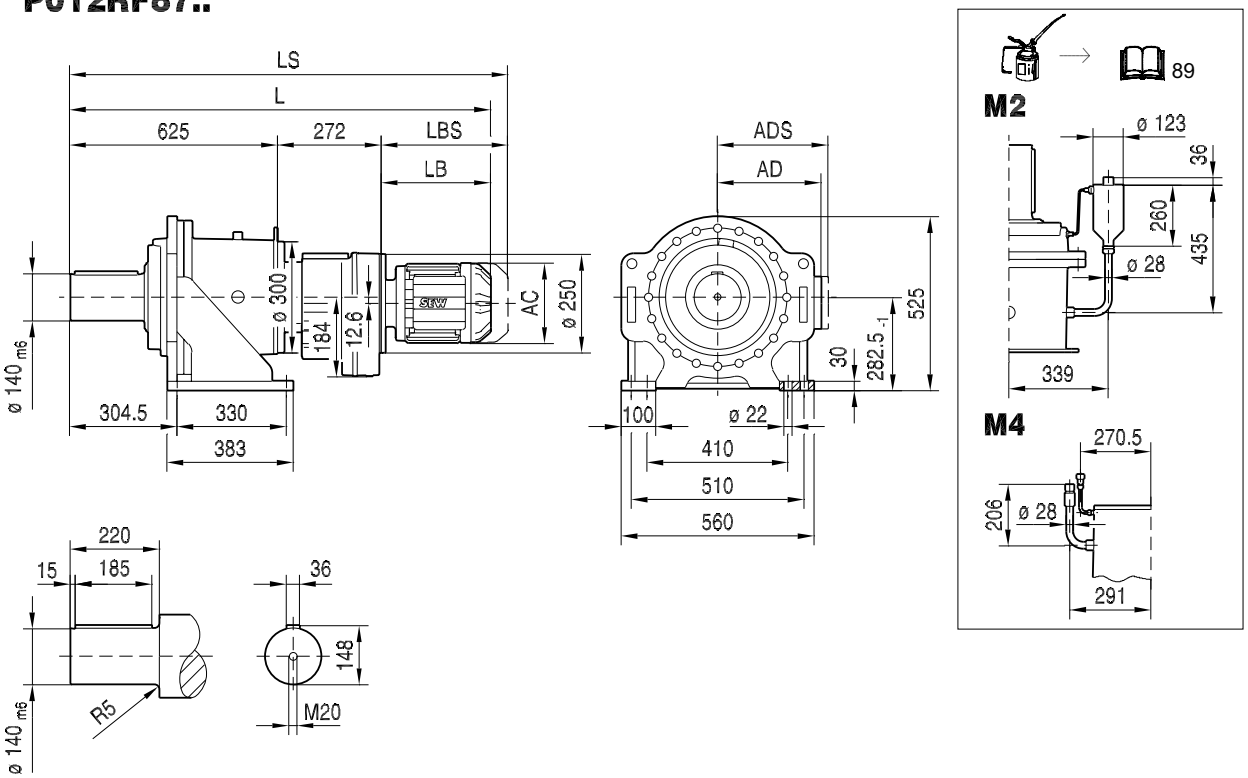


(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	1115	1147	1143	1193	1224	1274	1292	1318	1384	1384
LS	1208	1240	1237	1287	1336	1386	1430	1455	1573	1573
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

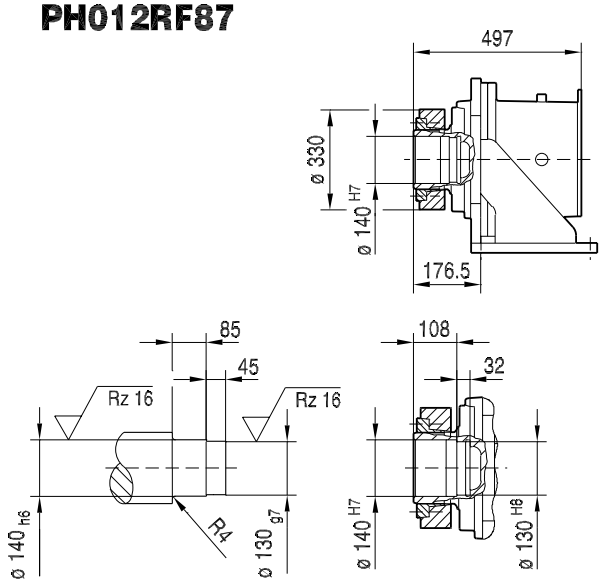
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45 019 00 15



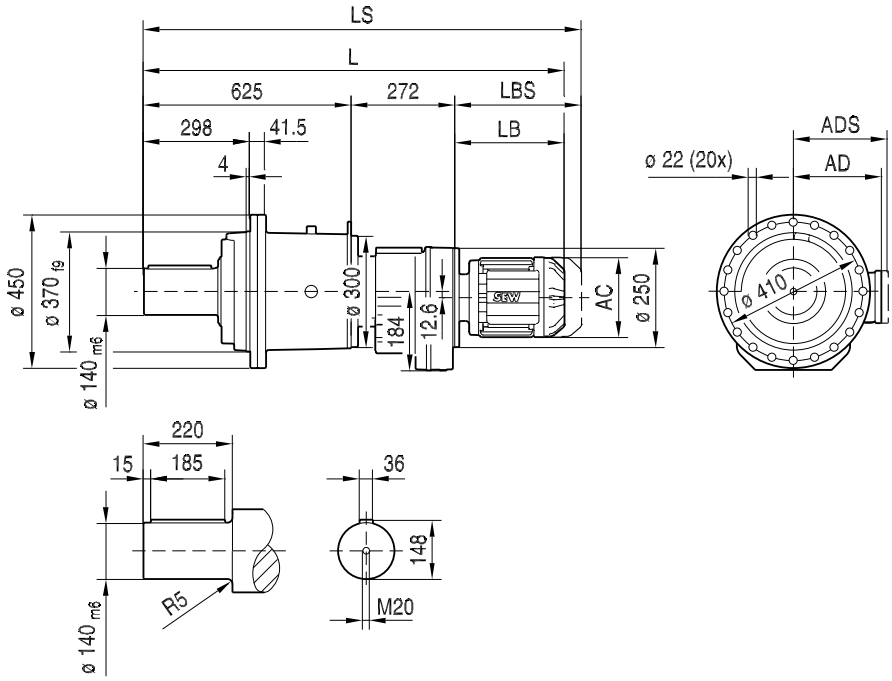
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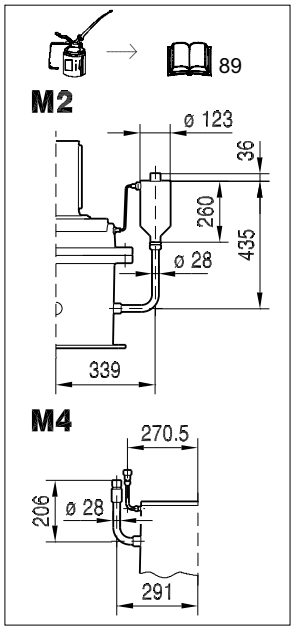
(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	1190	1240	1271	1321	1339	1365	1431	1431	1454	1564
LS	1284	1334	1383	1433	1477	1502	1620	1620	1643	1769
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

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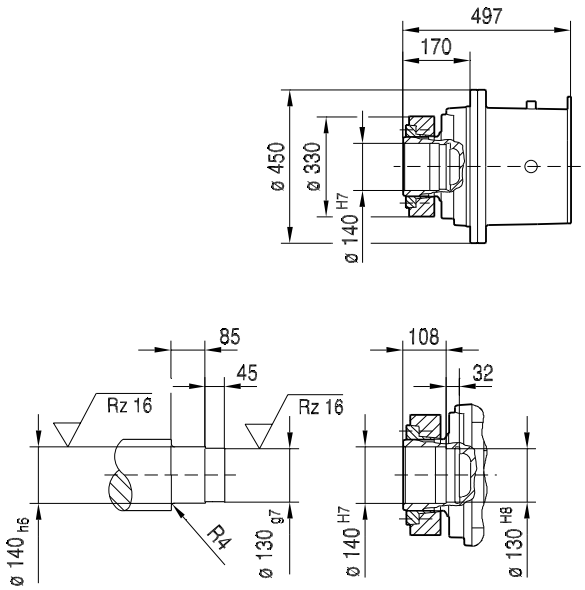
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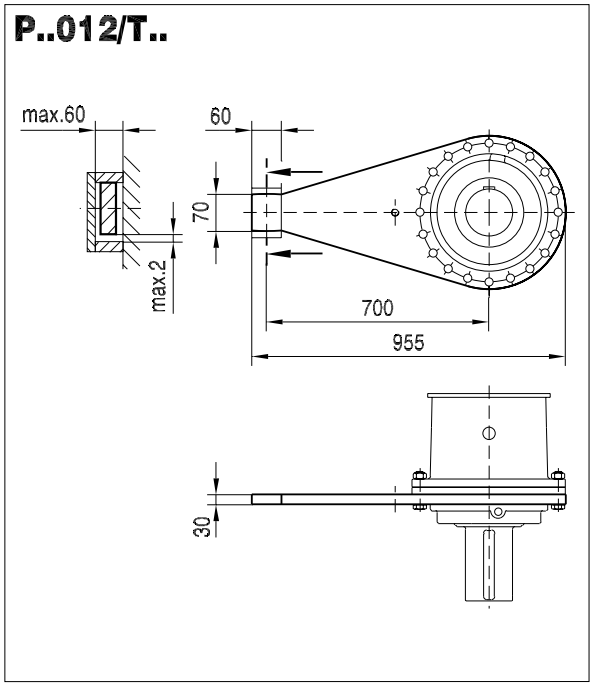
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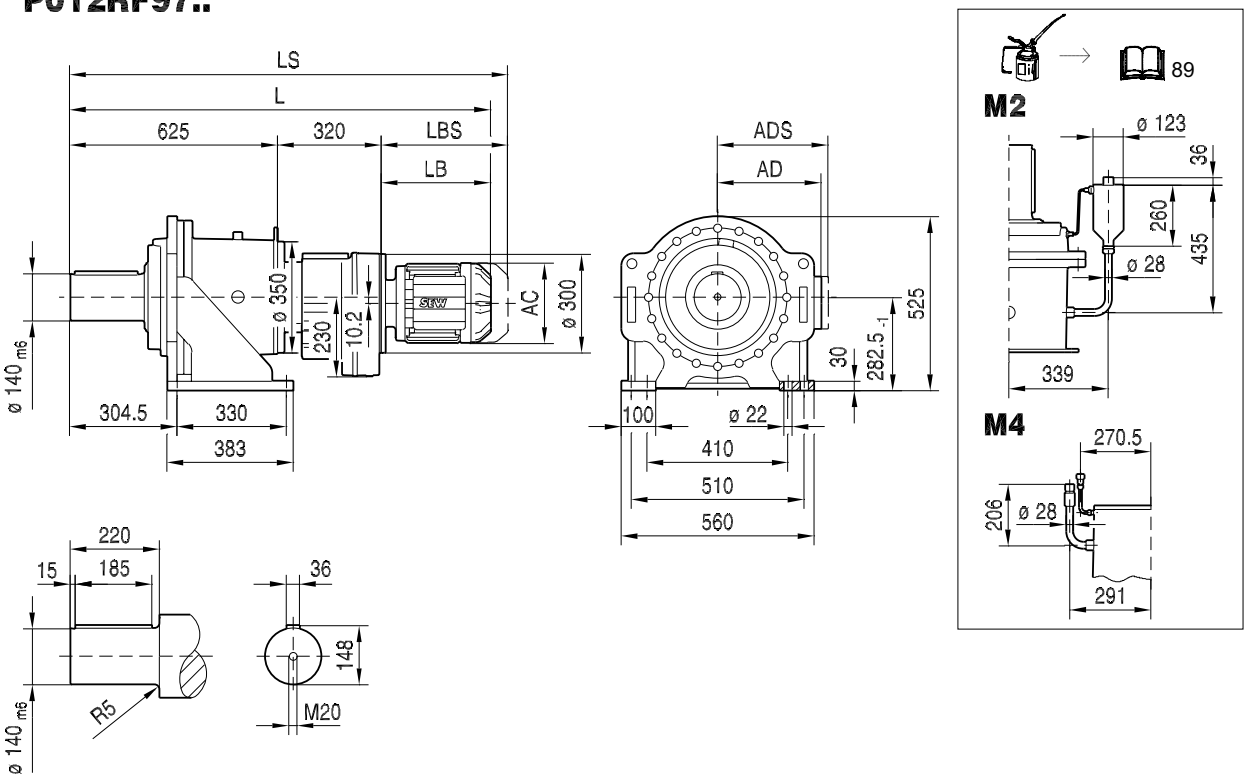
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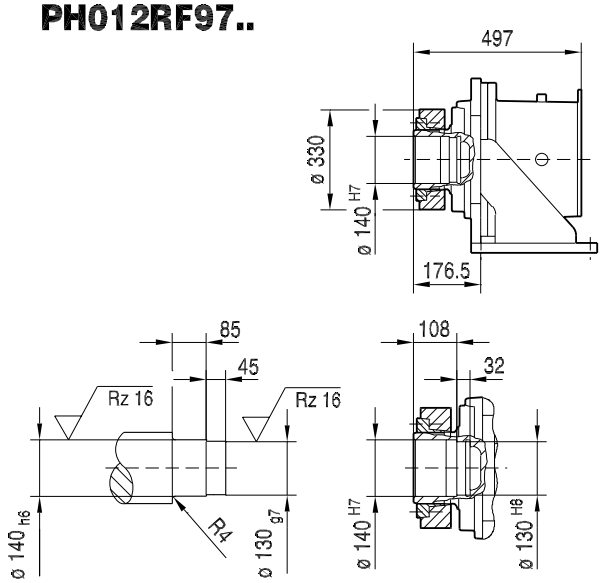
(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	1190	1240	1271	1321	1339	1365	1431	1431	1454	1564
LS	1284	1334	1383	1433	1477	1502	1620	1620	1643	1769
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

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45 021 00 15



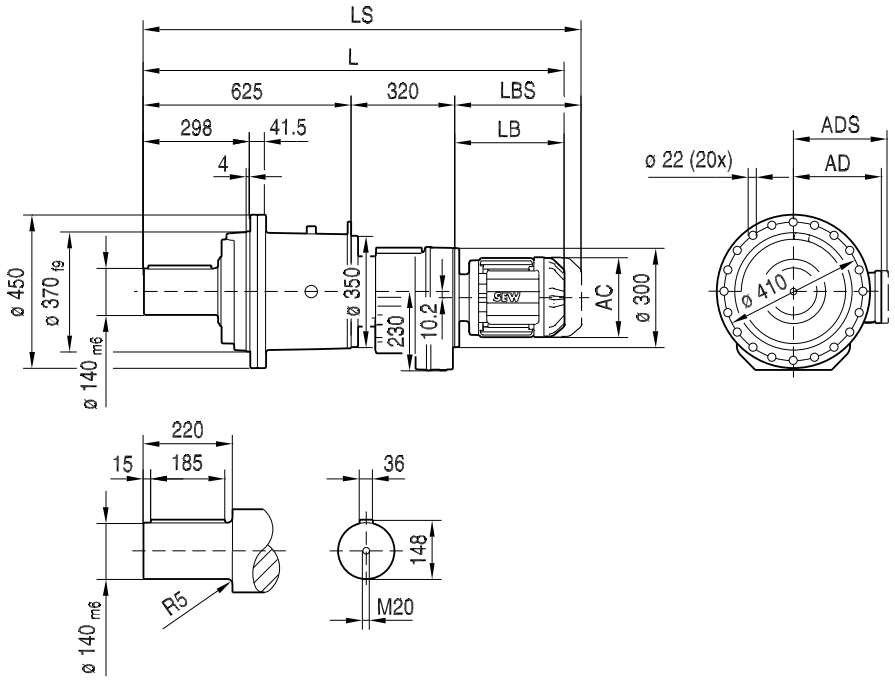
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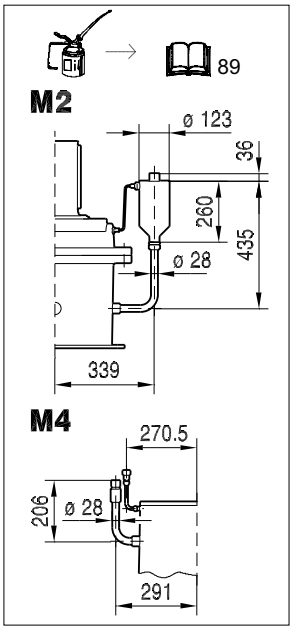
(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1283	1314	1364	1382	1408	1474	1474	1497	1607	1581
LS	1377	1426	1476	1520	1545	1663	1663	1686	1812	1786
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

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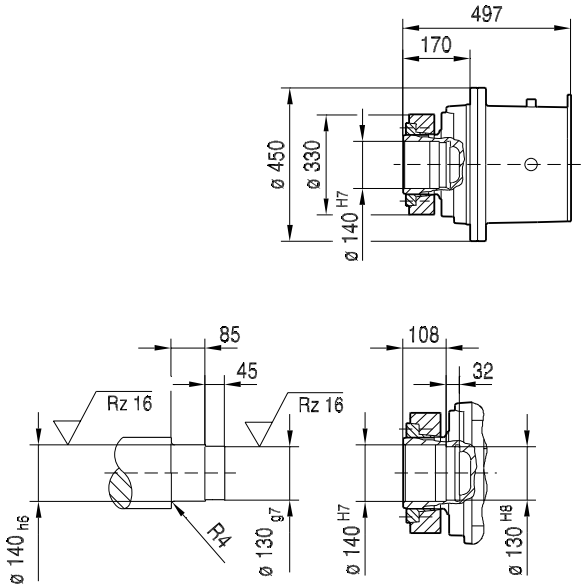
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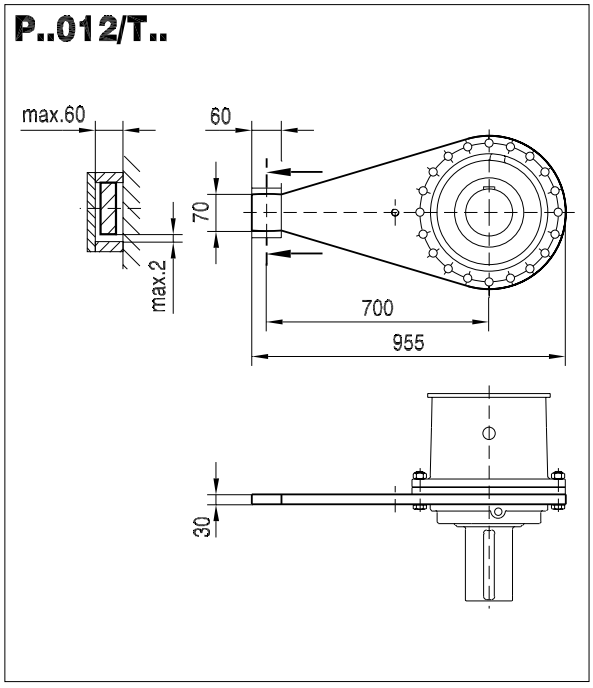
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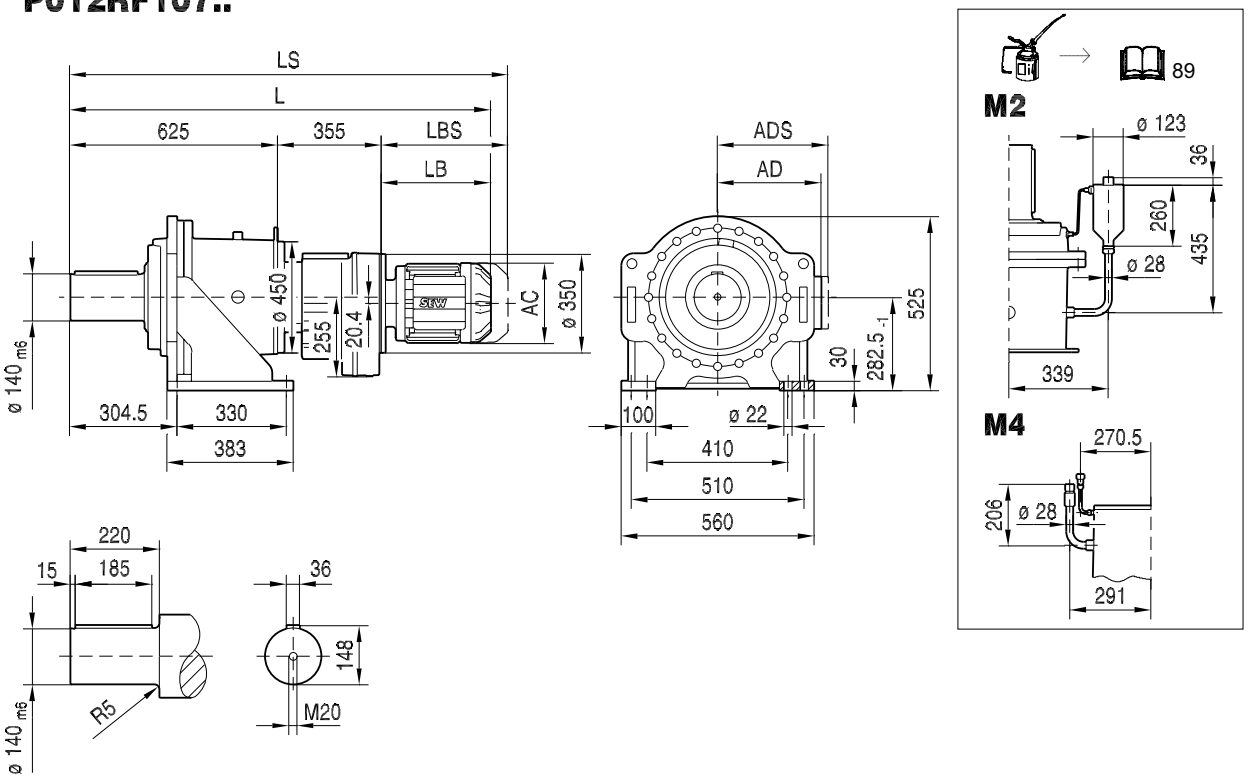


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1283	1314	1364	1382	1408	1474	1474	1497	1607	1581
LS	1377	1426	1476	1520	1545	1663	1663	1686	1812	1786
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

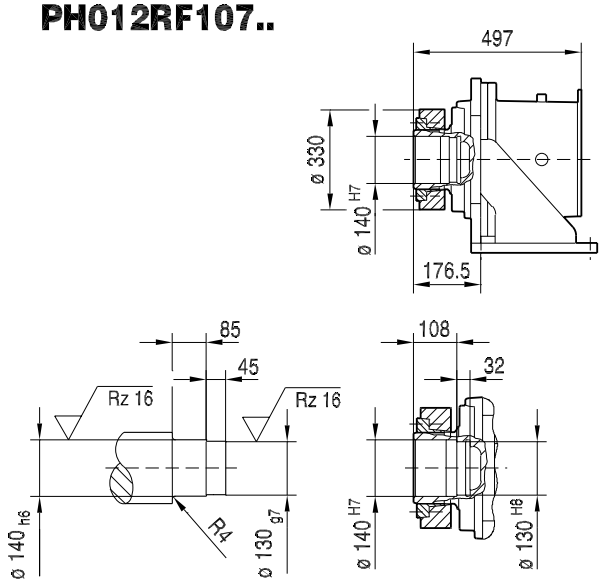
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45 023 00 15



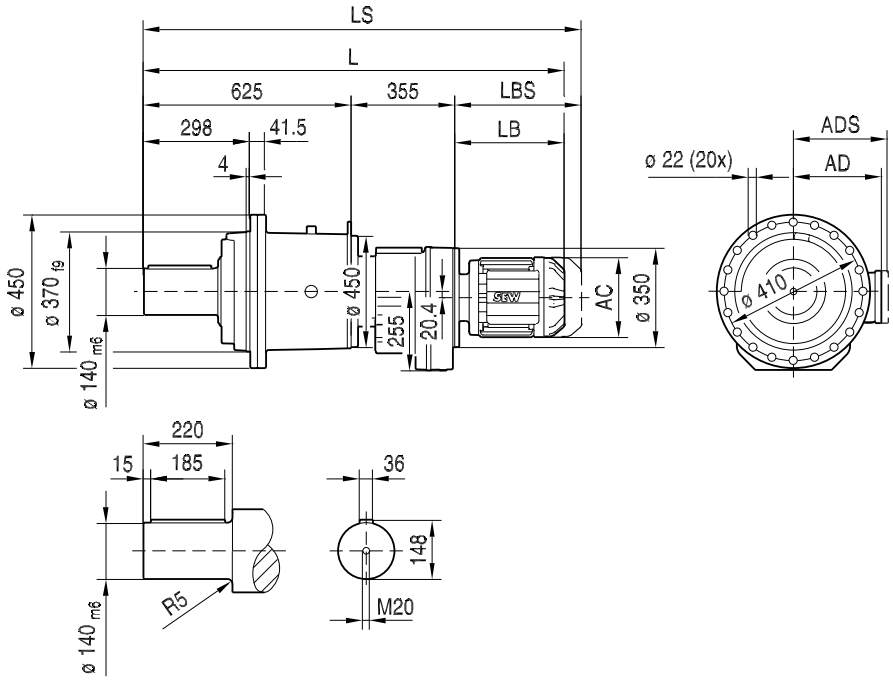
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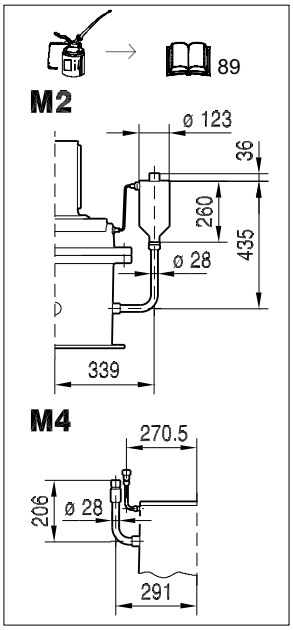
(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	1393	1411	1437	1503	1503	1526	1636	1610	1747
LS	1505	1549	1574	1692	1692	1715	1841	1815	1987
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

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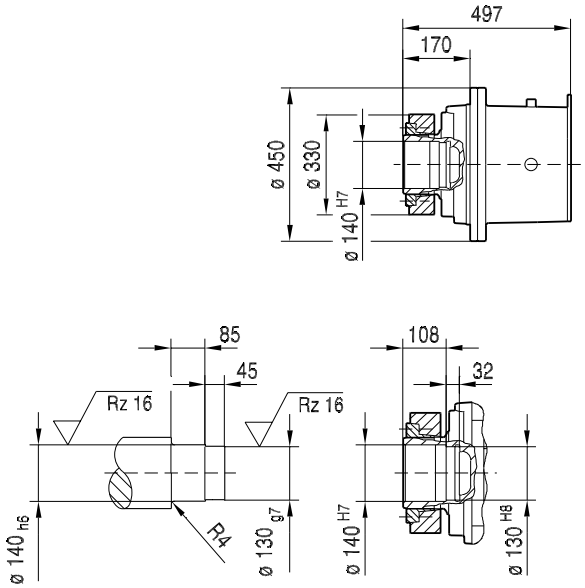
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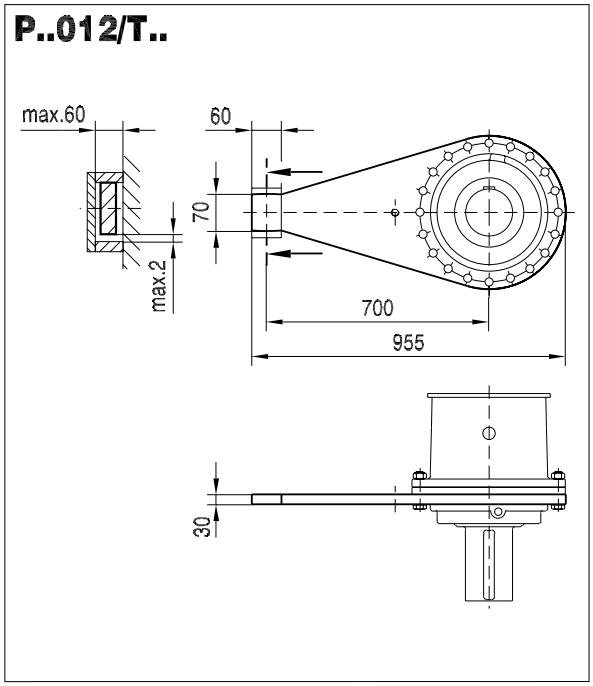
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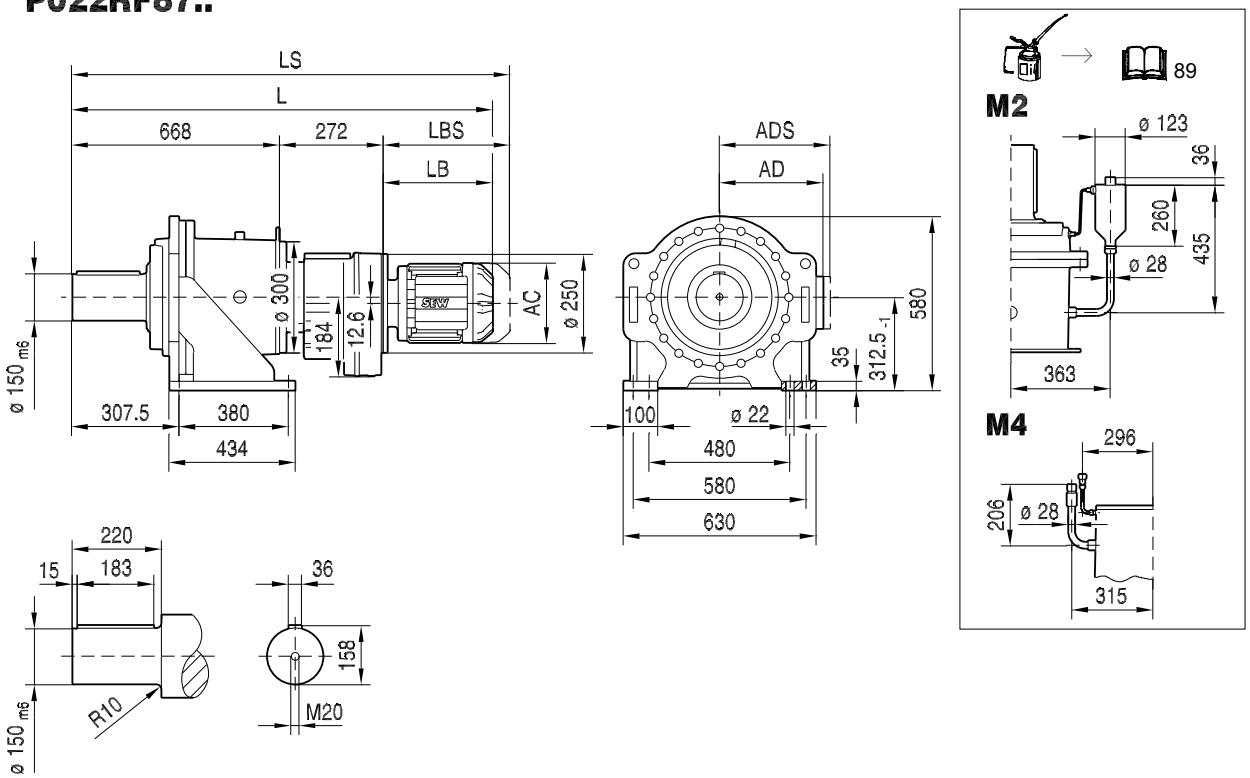


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	1393	1411	1437	1503	1503	1526	1636	1610	1747
LS	1505	1549	1574	1692	1692	1715	1841	1815	1987
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

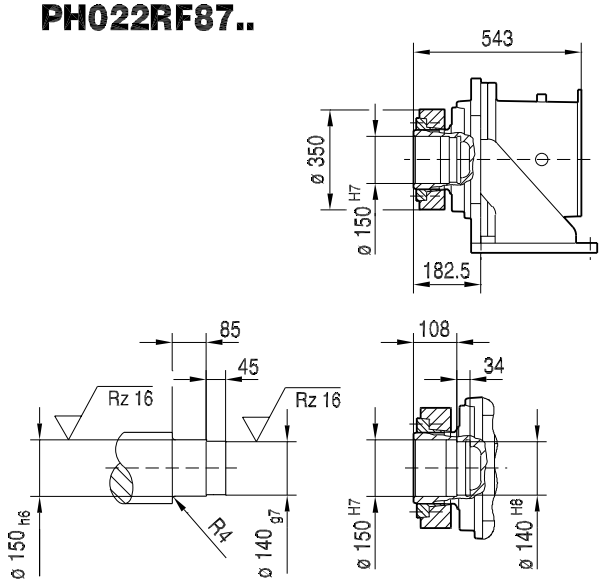
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45 025 00 15



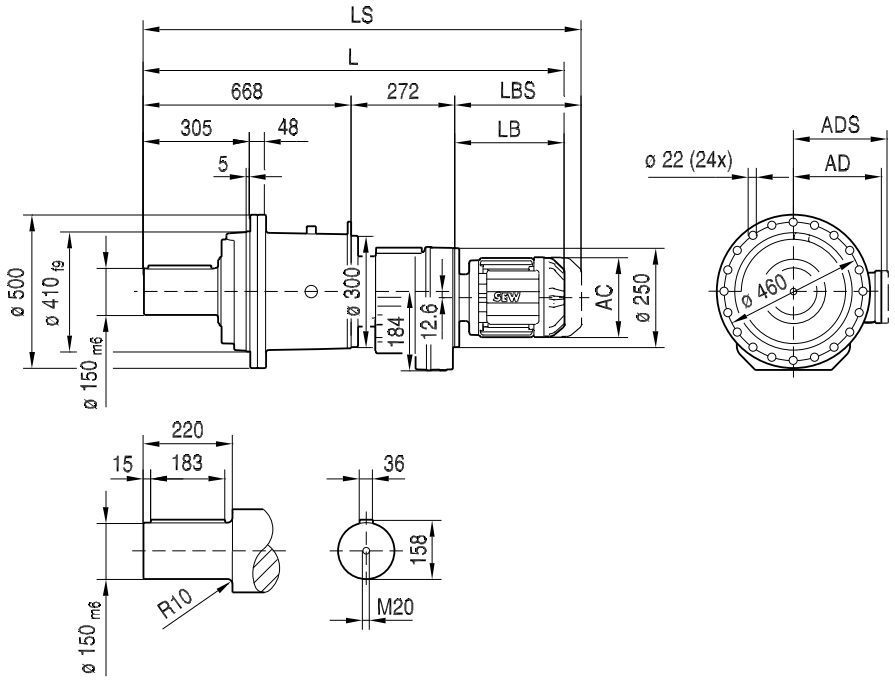
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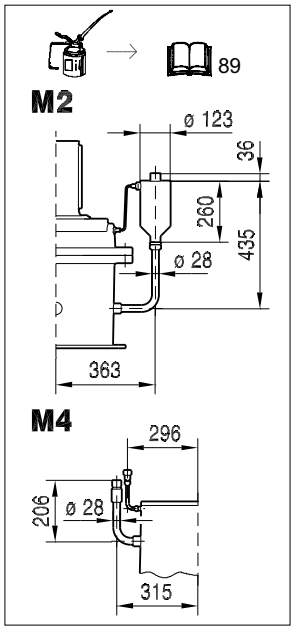
(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	1233	1283	1314	1364	1382	1408	1474	1474	1497	1607
LS	1327	1377	1426	1476	1520	1545	1663	1663	1686	1812
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

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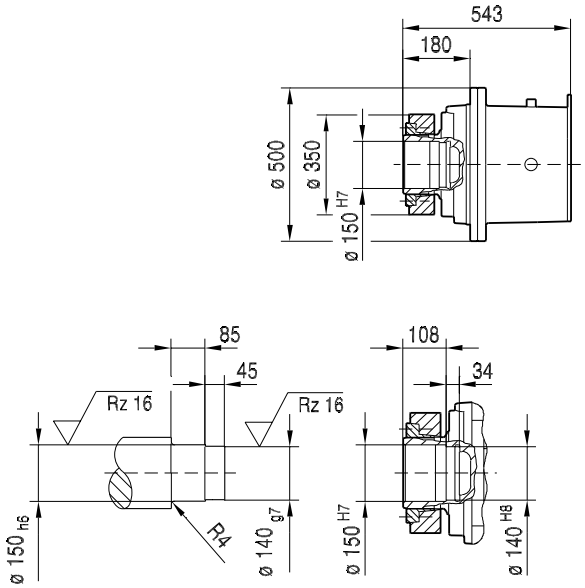
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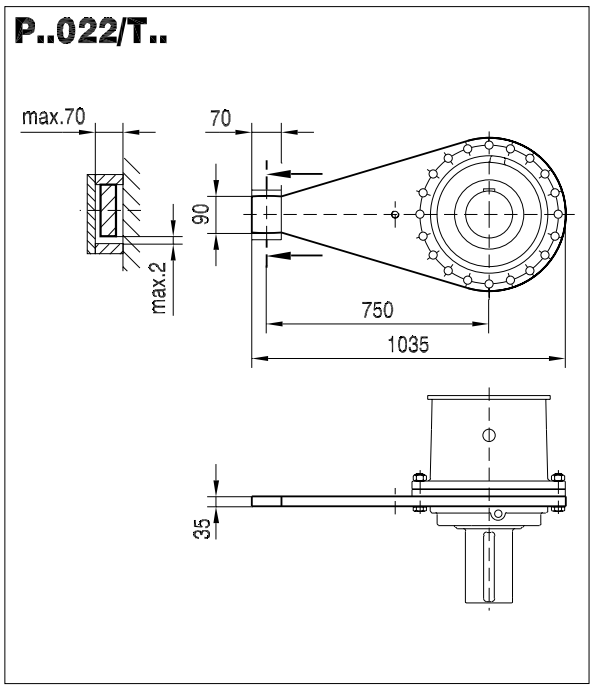
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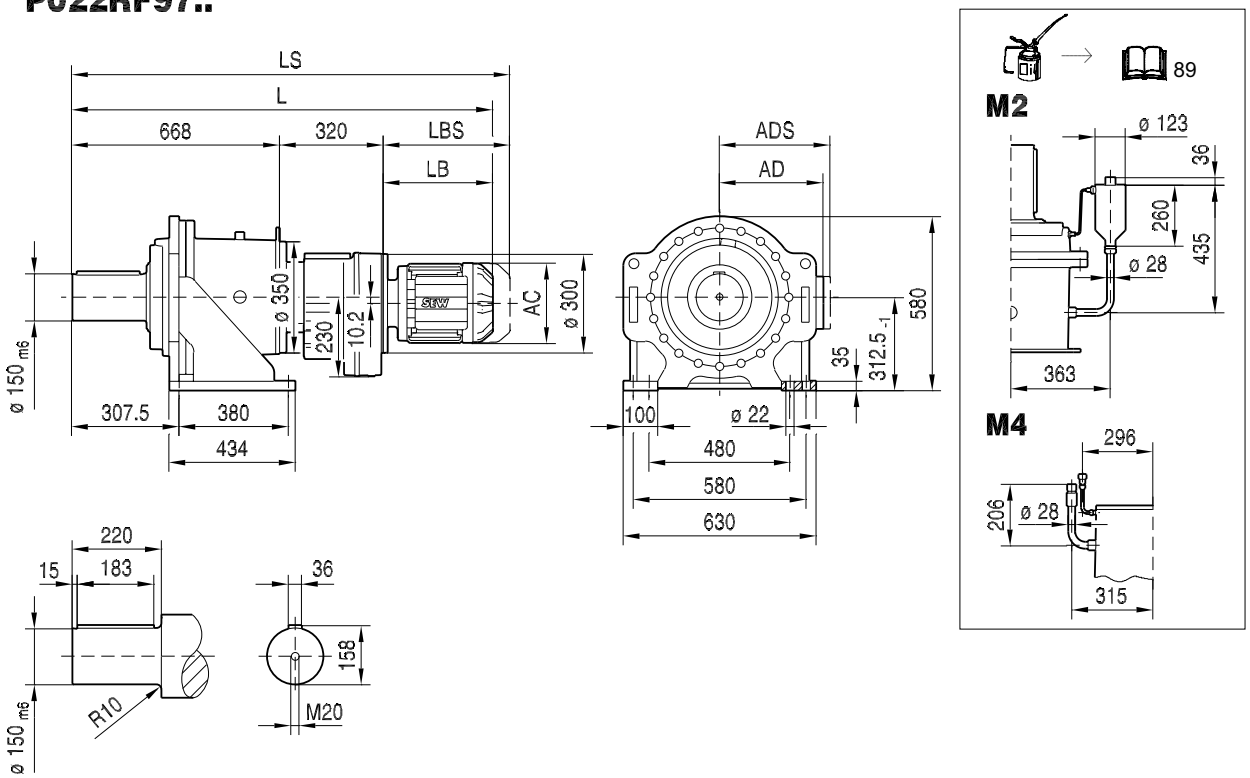


(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	1233	1283	1314	1364	1382	1408	1474	1474	1497	1607
LS	1327	1377	1426	1476	1520	1545	1663	1663	1686	1812
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

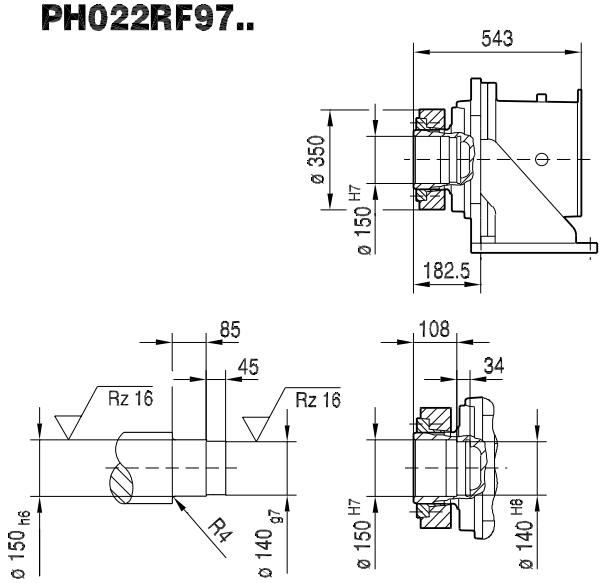
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45 027 00 15



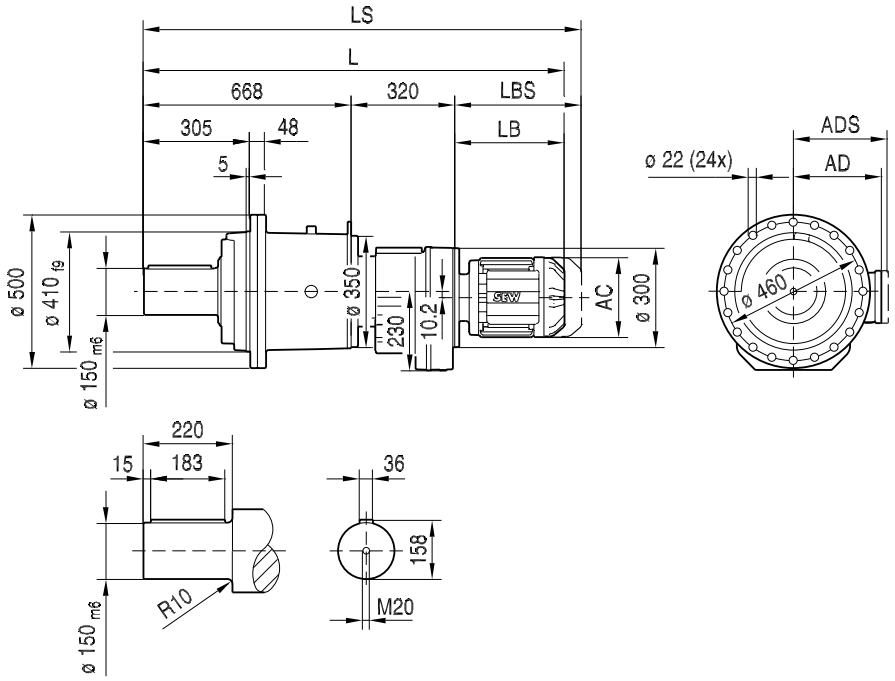
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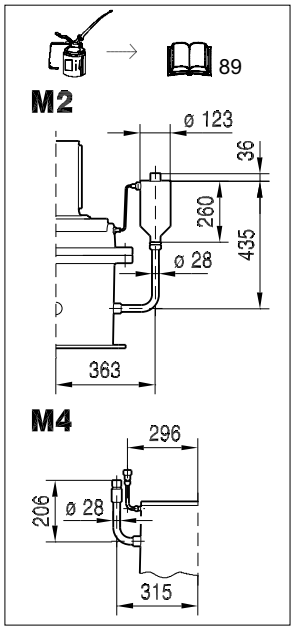
(→ 🗎 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1326	1357	1407	1425	1451	1517	1517	1540	1650	1624
LS	1420	1469	1519	1563	1588	1706	1706	1729	1855	1829
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

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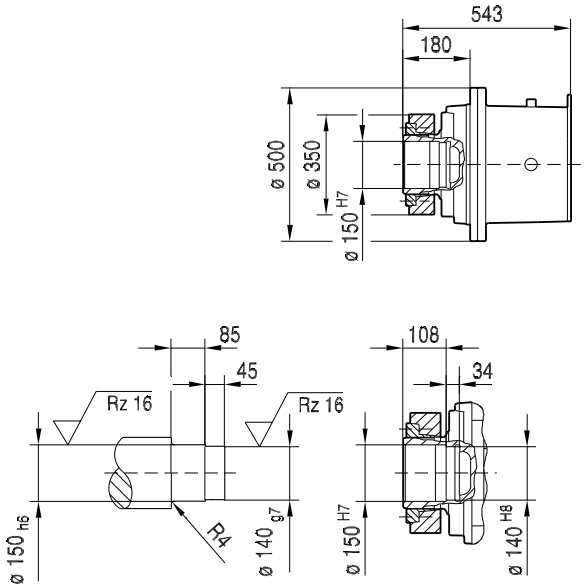
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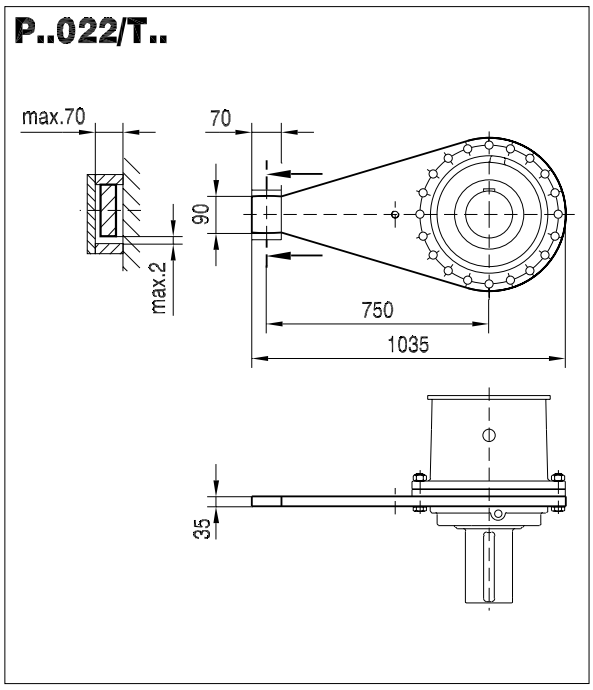
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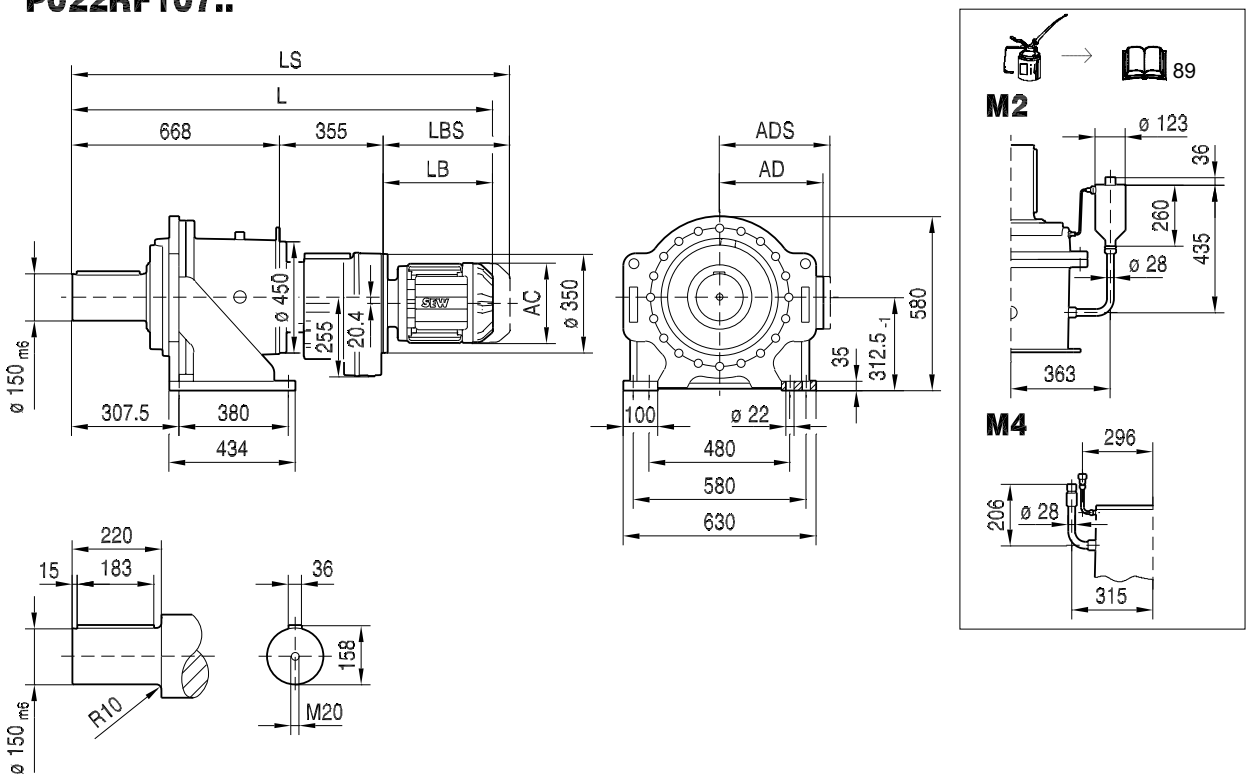


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1326	1357	1407	1425	1451	1517	1517	1540	1650	1624
LS	1420	1469	1519	1563	1588	1706	1706	1729	1855	1829
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

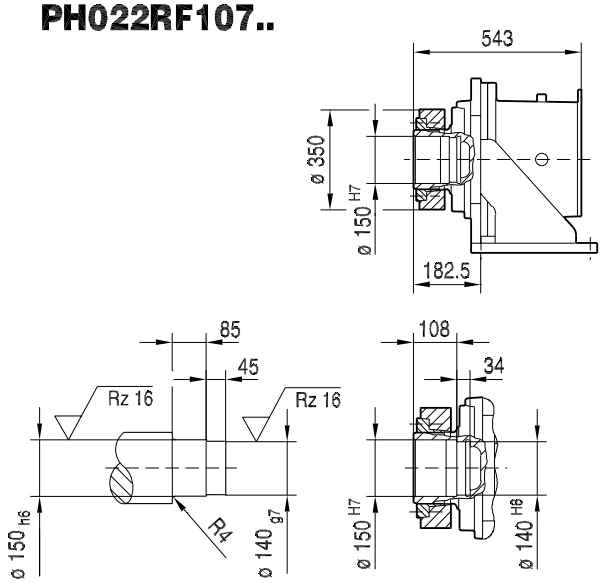
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45 029 00 15



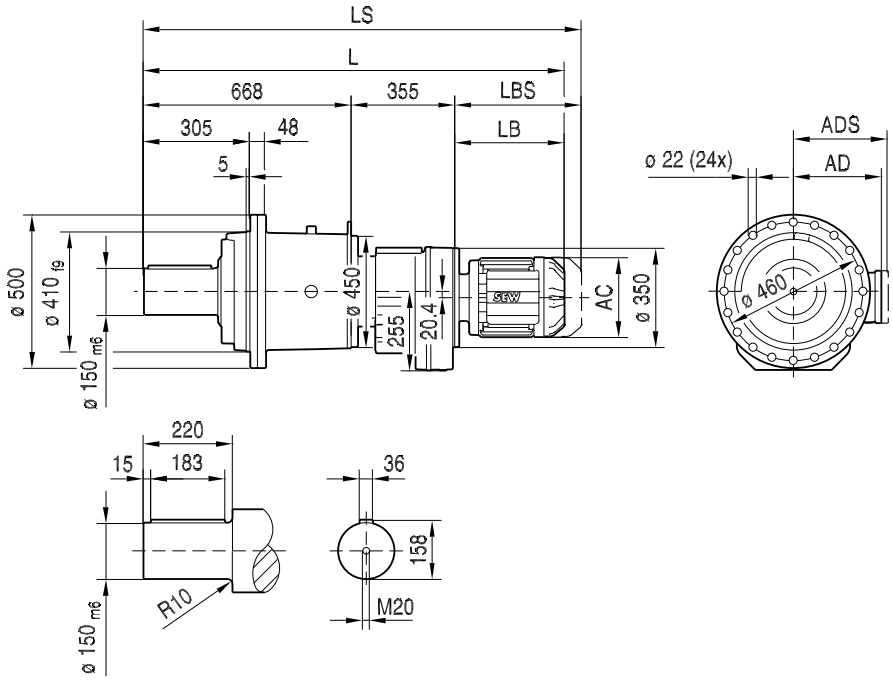
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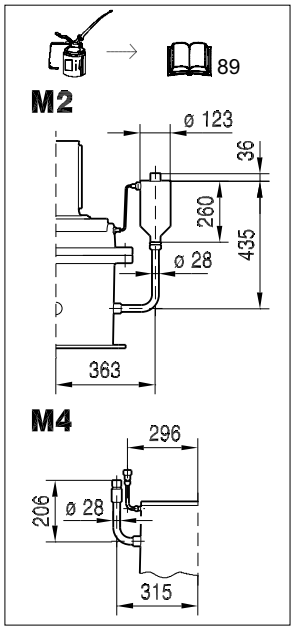
(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1386	1436	1454	1480	1546	1546	1569	1679	1653	1790
LS	1498	1548	1592	1617	1735	1735	1758	1884	1858	2030
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

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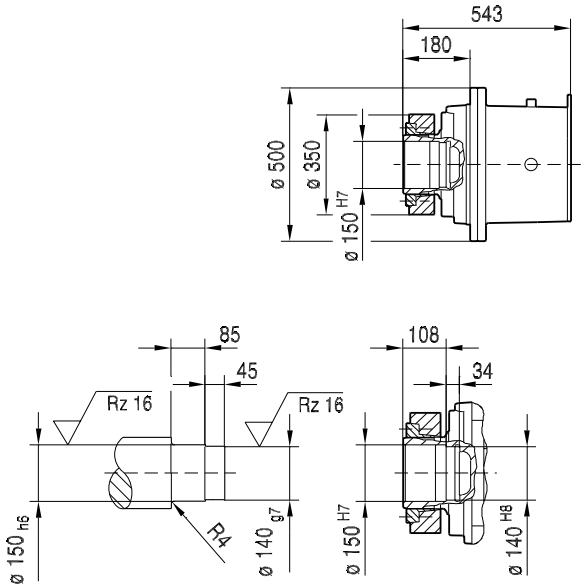
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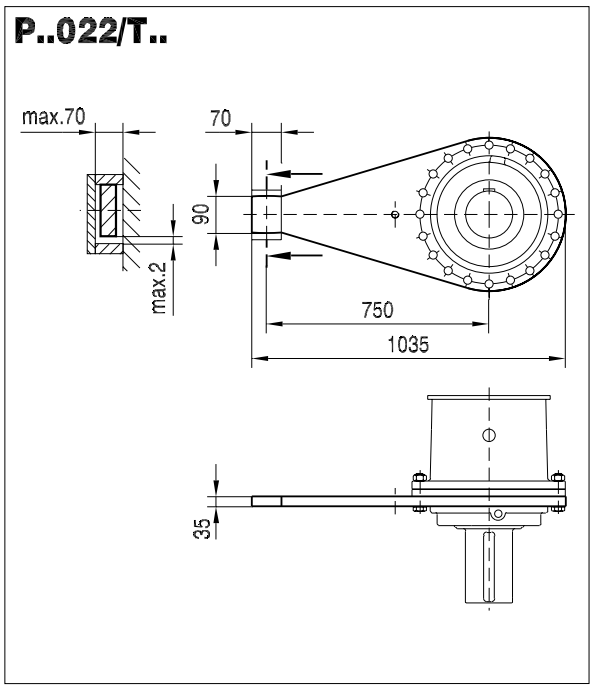
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PHF022RF107..



P..022/T..

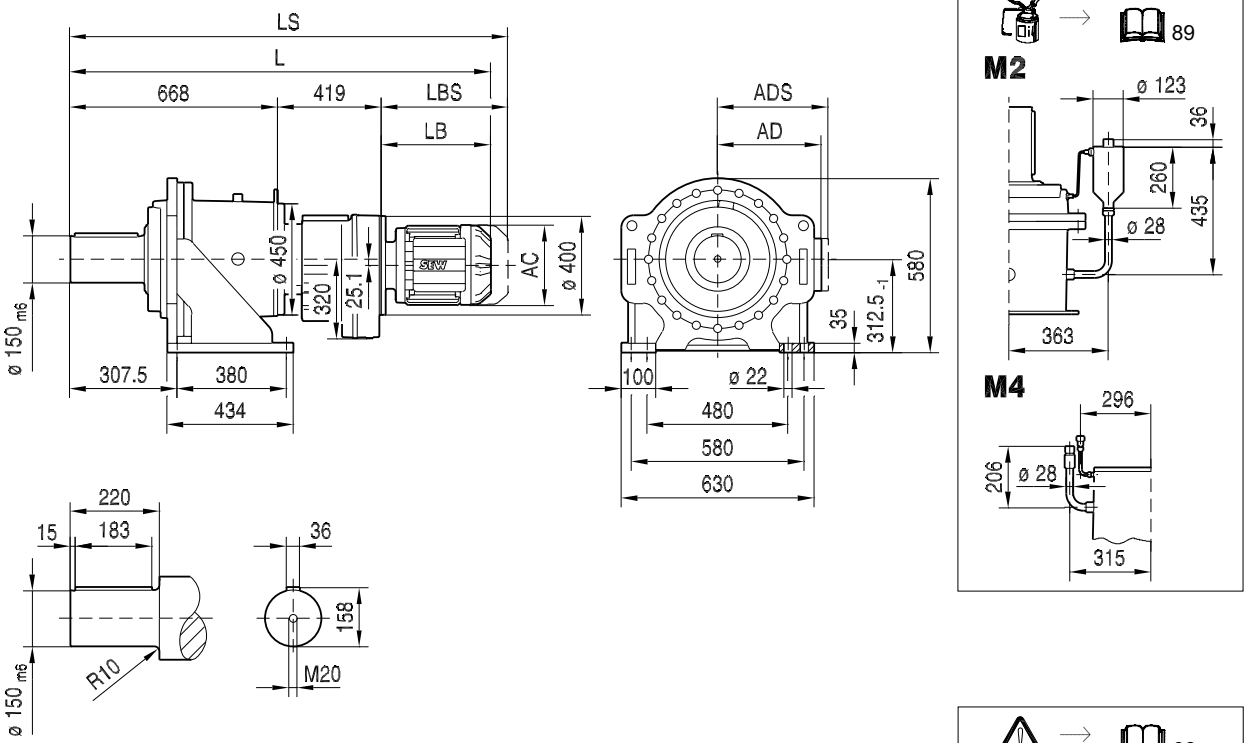


(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1386	1436	1454	1480	1546	1546	1569	1679	1653	1790
LS	1498	1548	1592	1617	1735	1735	1758	1884	1858	2030
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

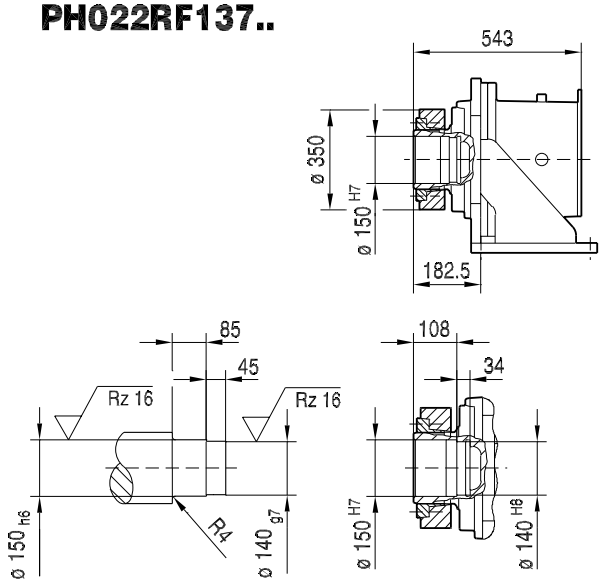
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P022RF137..

45 031 00 15



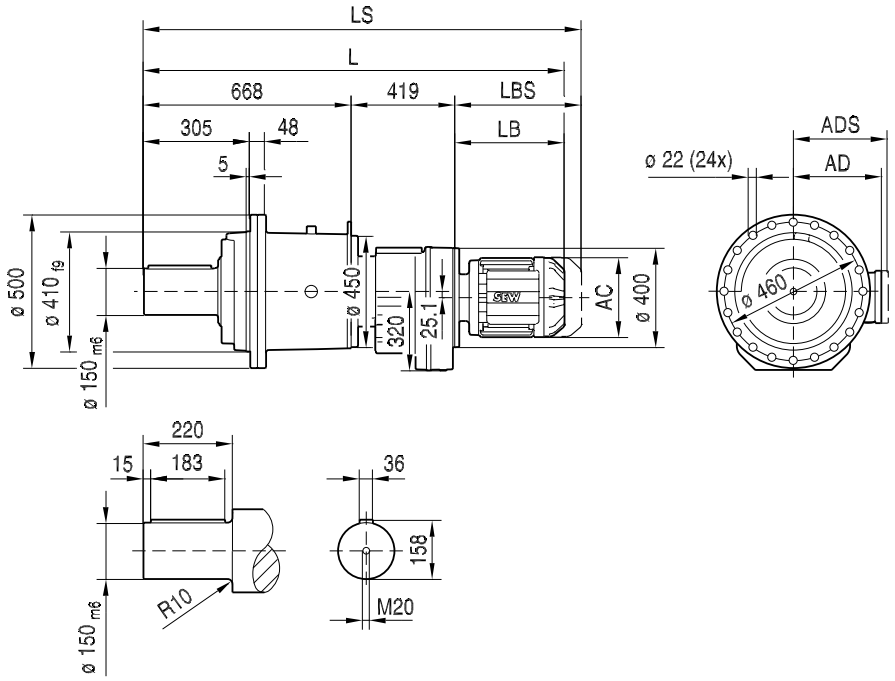
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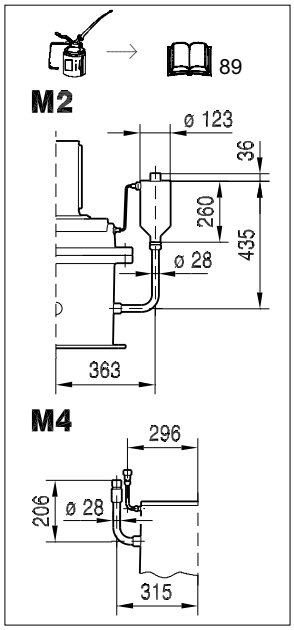
(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1511	1537	1603	1603	1626	1736	1710	1847	1847	1942
LS	1649	1674	1792	1792	1815	1941	1915	2087	2087	2182
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

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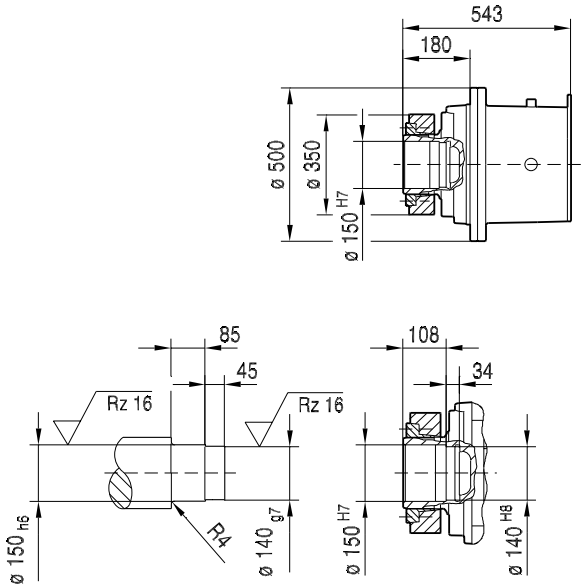
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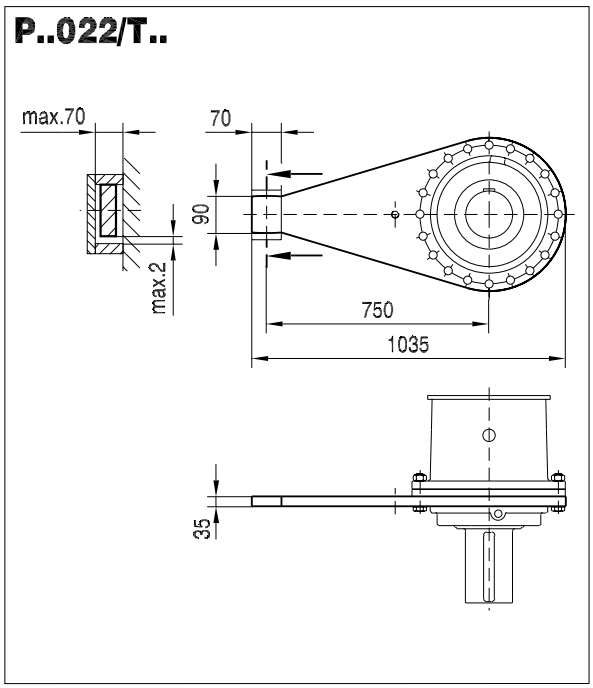
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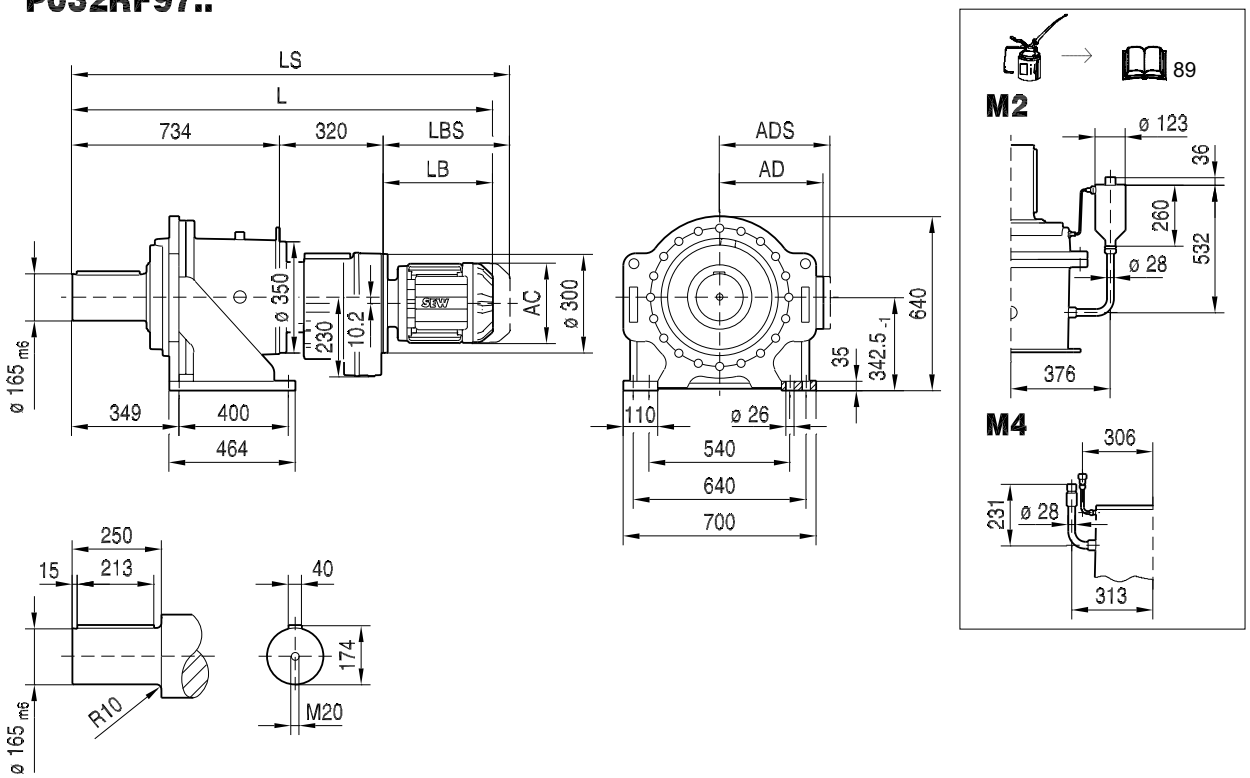


(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1511	1537	1603	1603	1626	1736	1710	1847	1847	1942
LS	1649	1674	1792	1792	1815	1941	1915	2087	2087	2182
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

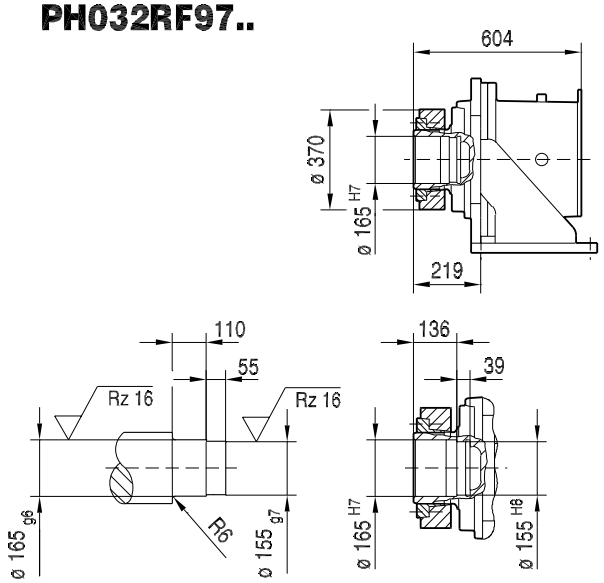
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P032RF97..

45 033 00 15



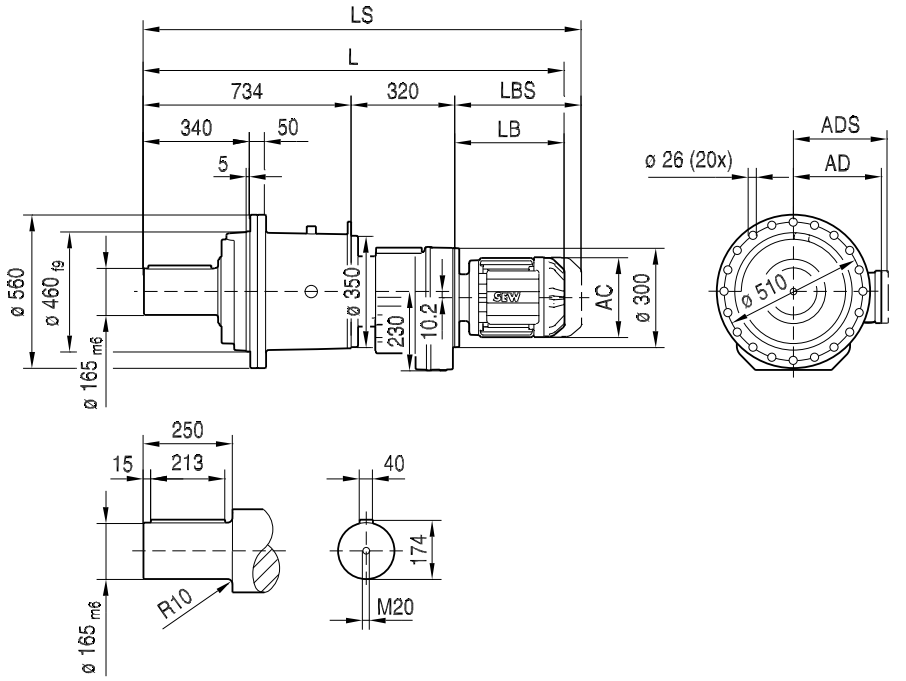
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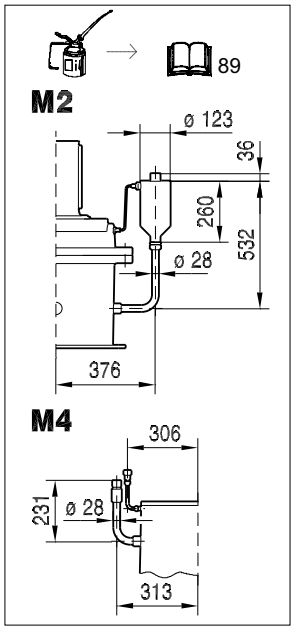
(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1392	1423	1473	1491	1517	1583	1583	1606	1716	1690
LS	1486	1535	1585	1629	1654	1772	1772	1795	1921	1895
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

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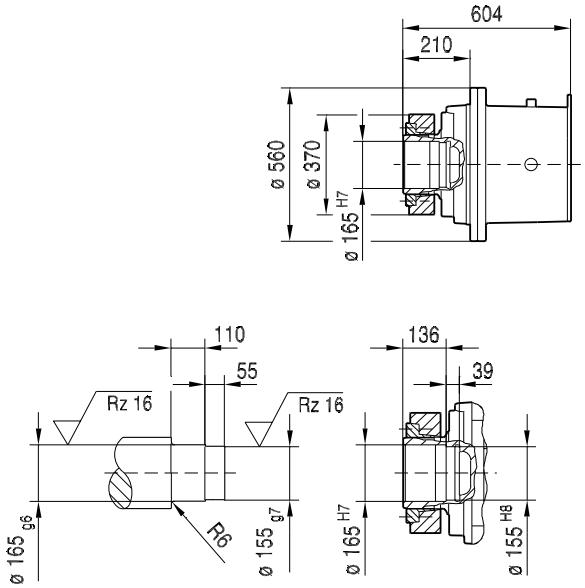
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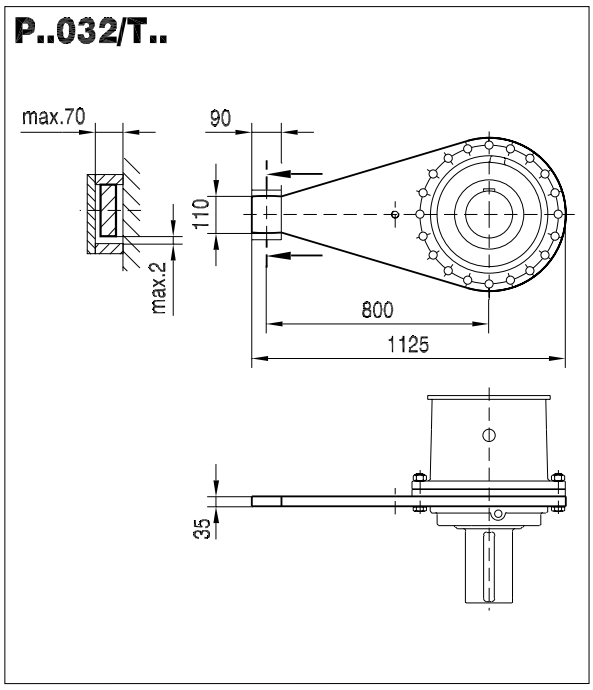
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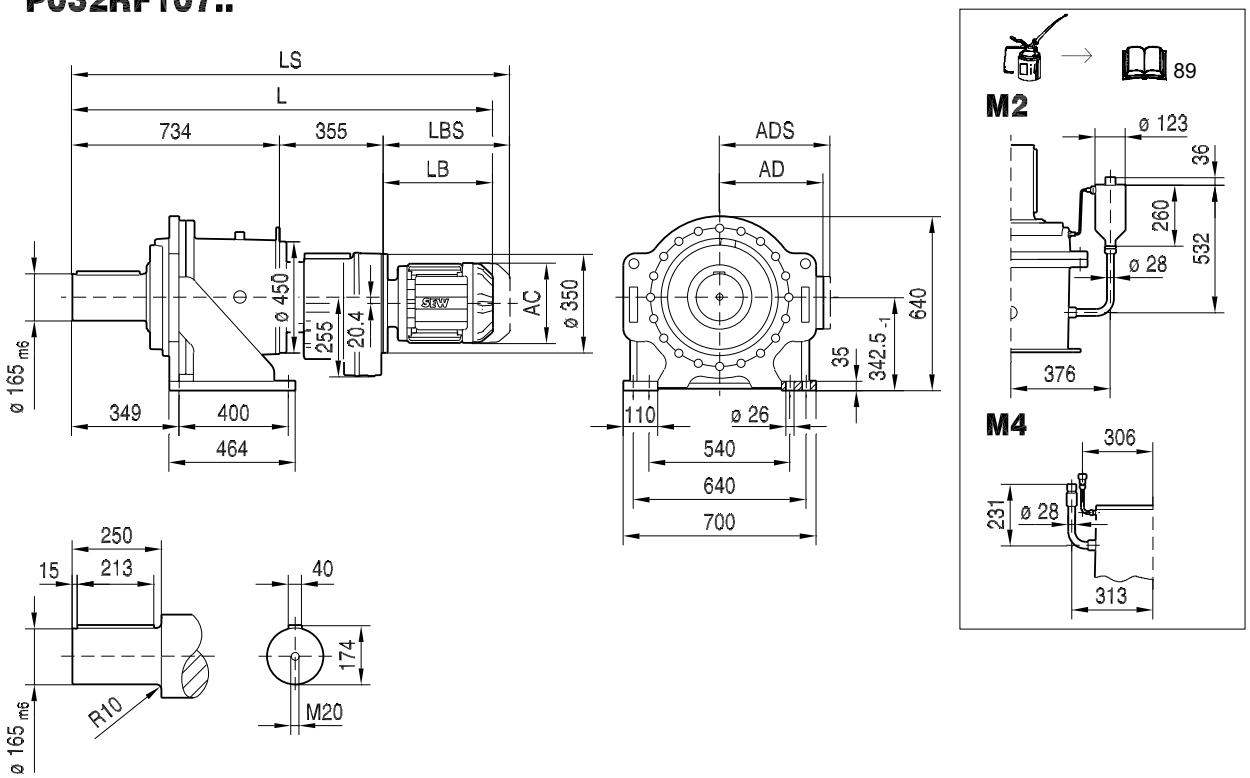


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1392	1423	1473	1491	1517	1583	1583	1606	1716	1690
LS	1486	1535	1585	1629	1654	1772	1772	1795	1921	1895
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

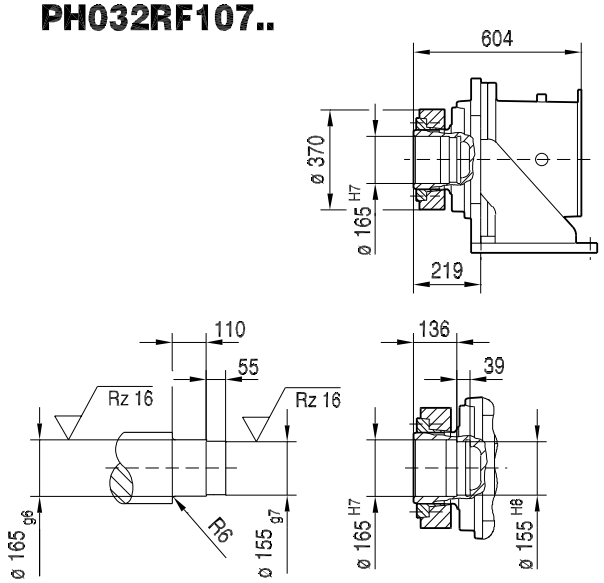
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45 035 00 15



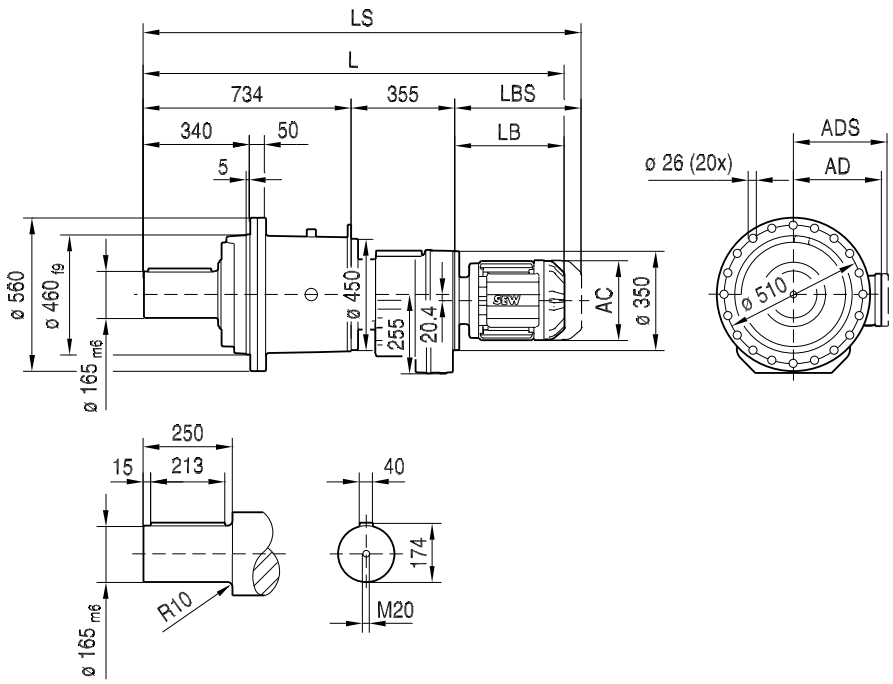
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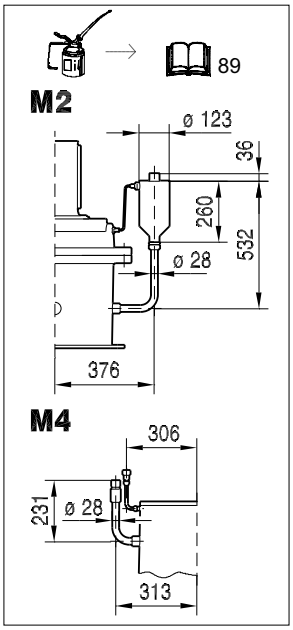
(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1452	1502	1520	1546	1612	1612	1635	1745	1719	1856
LS	1564	1614	1658	1683	1801	1801	1824	1950	1924	2096
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

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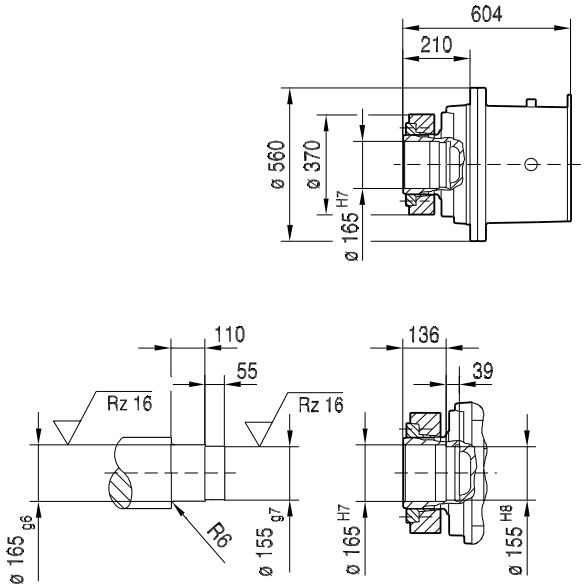
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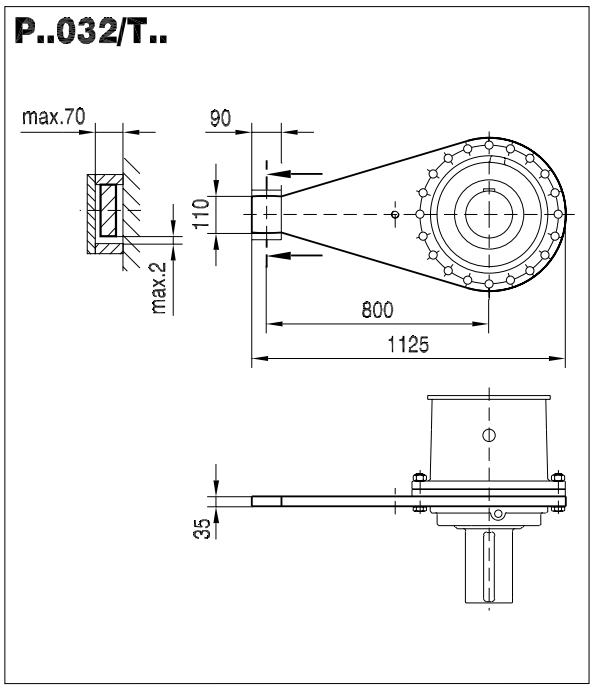
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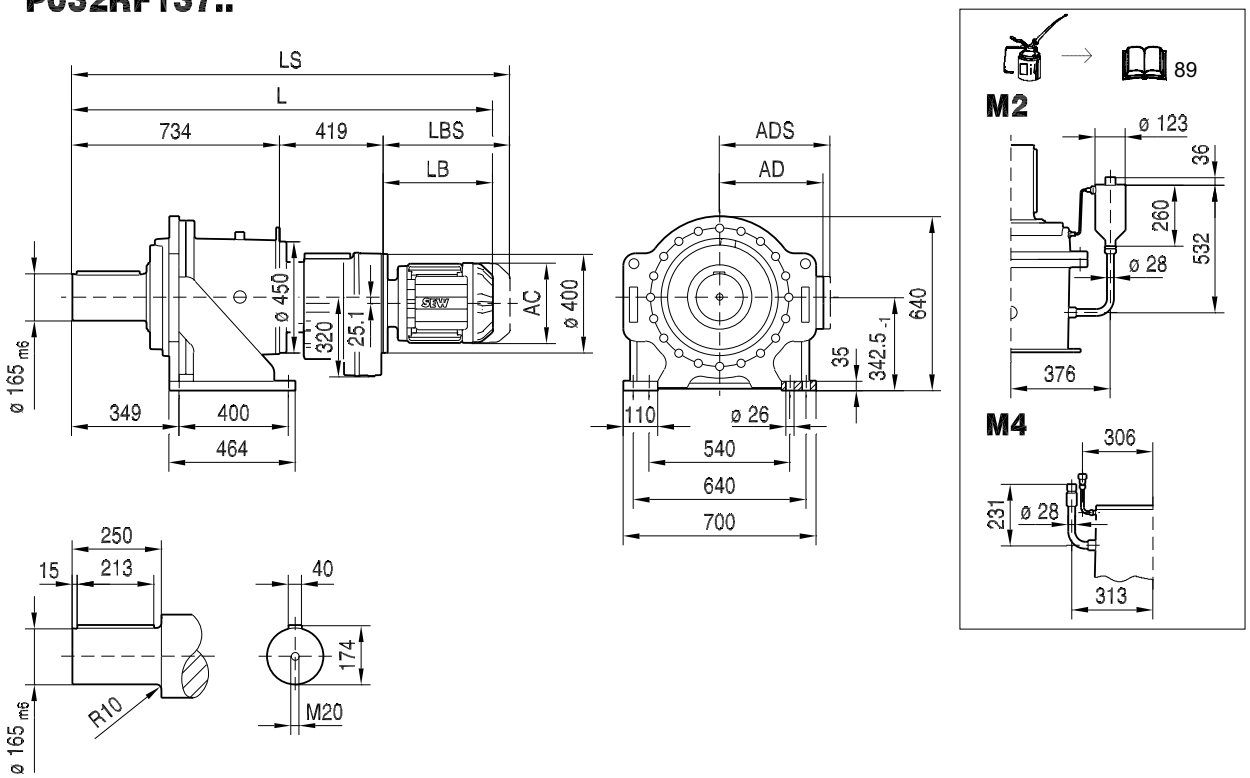


(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1452	1502	1520	1546	1612	1612	1635	1745	1719	1856
LS	1564	1614	1658	1683	1801	1801	1824	1950	1924	2096
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

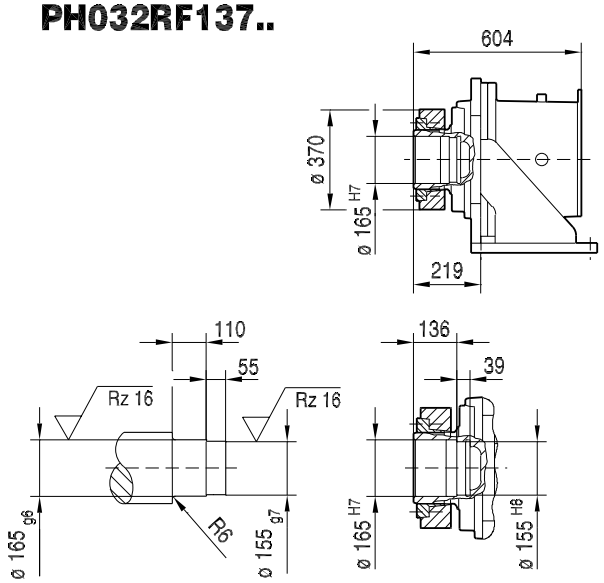
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45 037 00 15



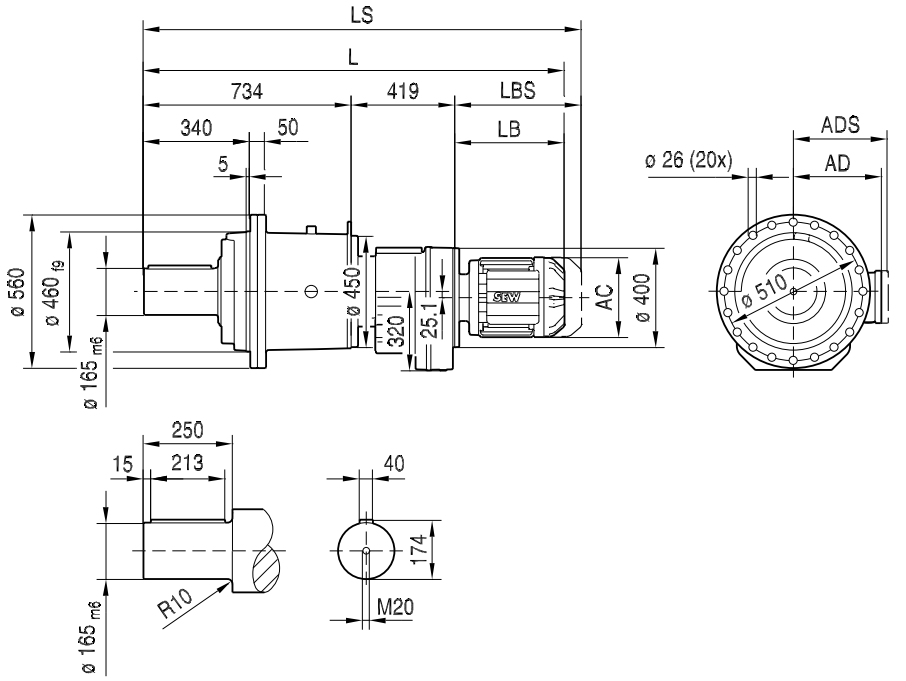
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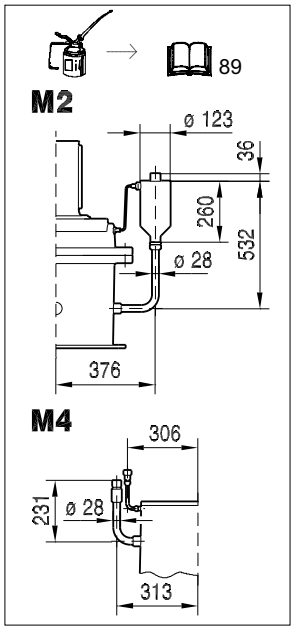
(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1577	1603	1669	1669	1692	1802	1776	1913	1913	2008
LS	1715	1740	1858	1858	1881	2007	1981	2153	2153	2248
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

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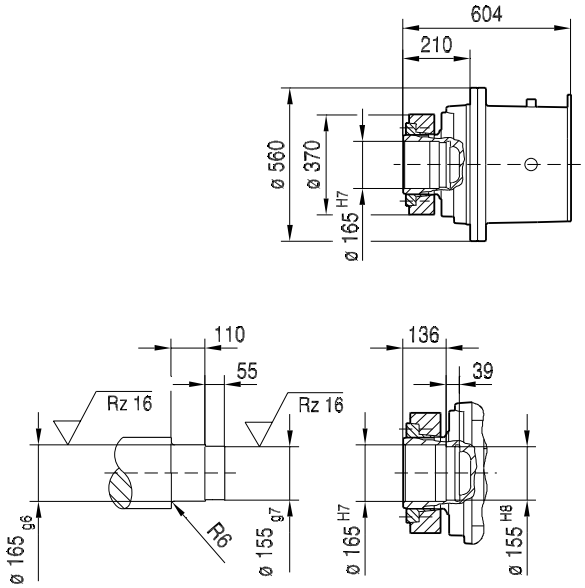
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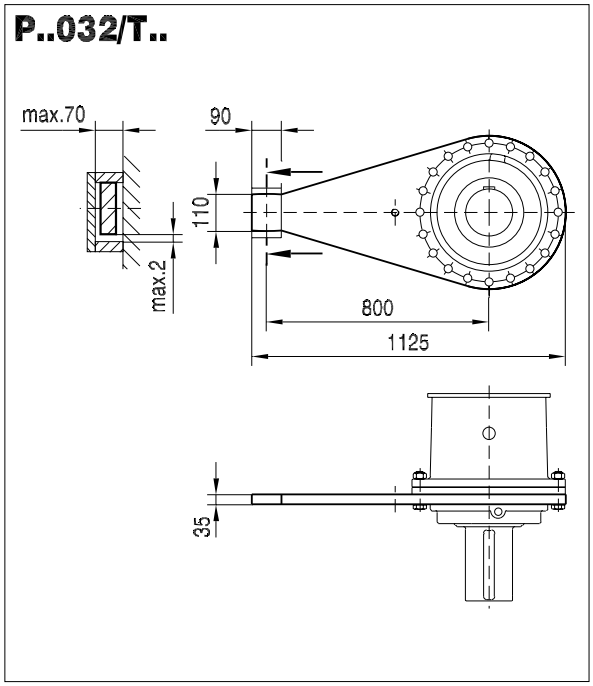
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PHF032RF137..



P..032/T..

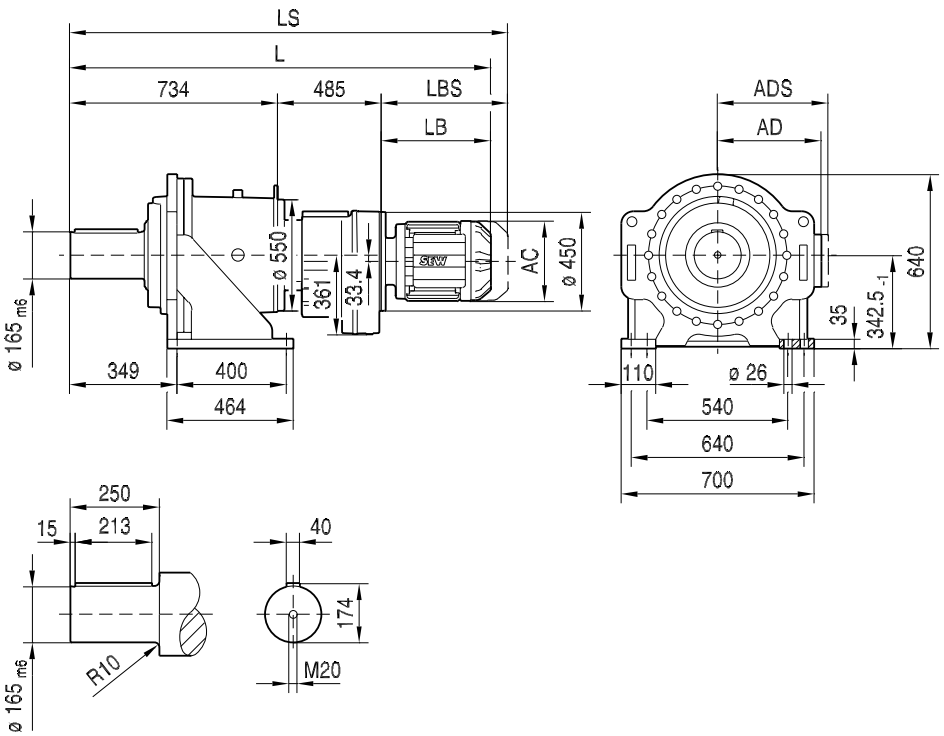


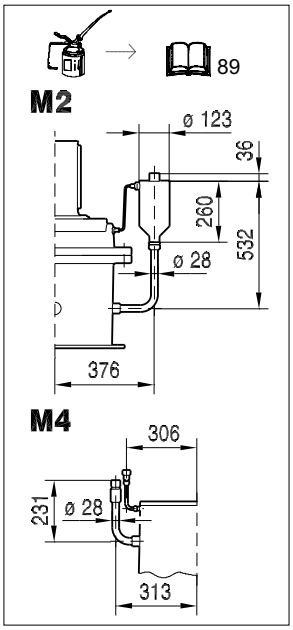
(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1577	1603	1669	1669	1692	1802	1776	1913	1913	2008
LS	1715	1740	1858	1858	1881	2007	1981	2153	2153	2248
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

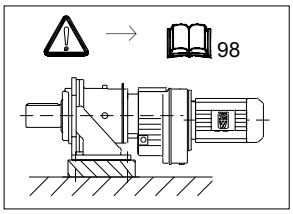
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P032RF147..

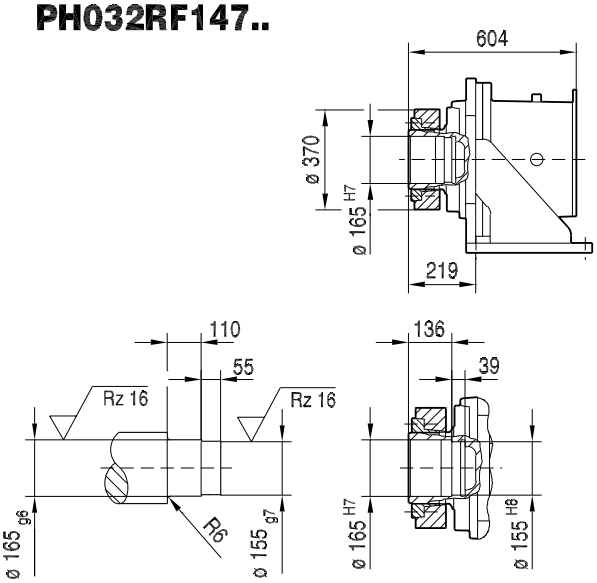
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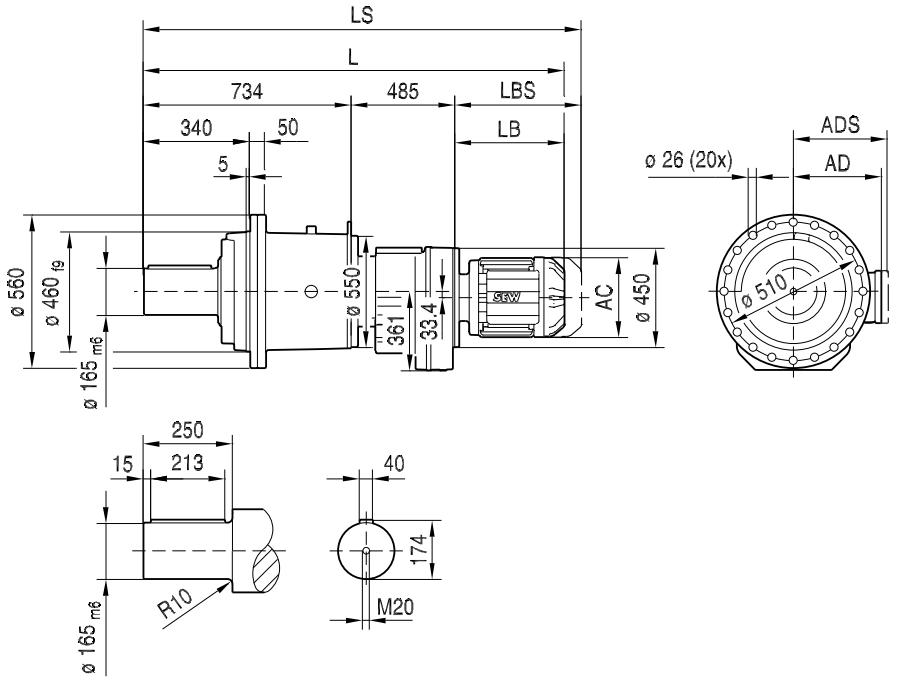
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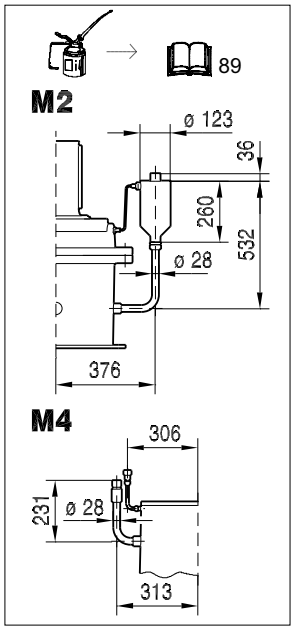
(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1661	1727	1727	1750	1860	1834	1971	1971	2066	2168
LS	1798	1916	1916	1939	2065	2039	2211	2211	2306	2419
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

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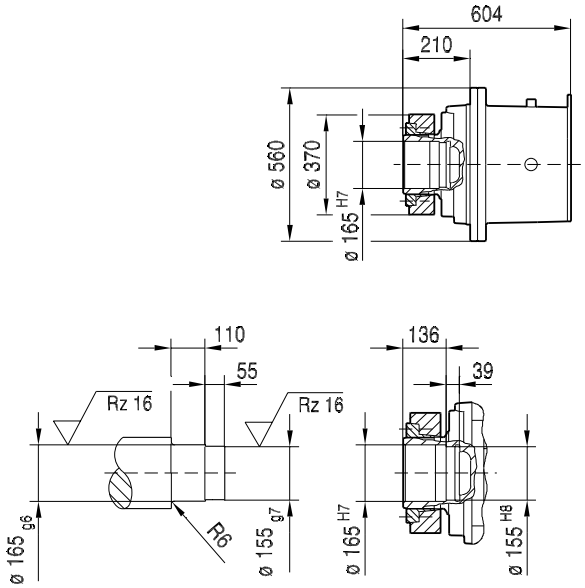
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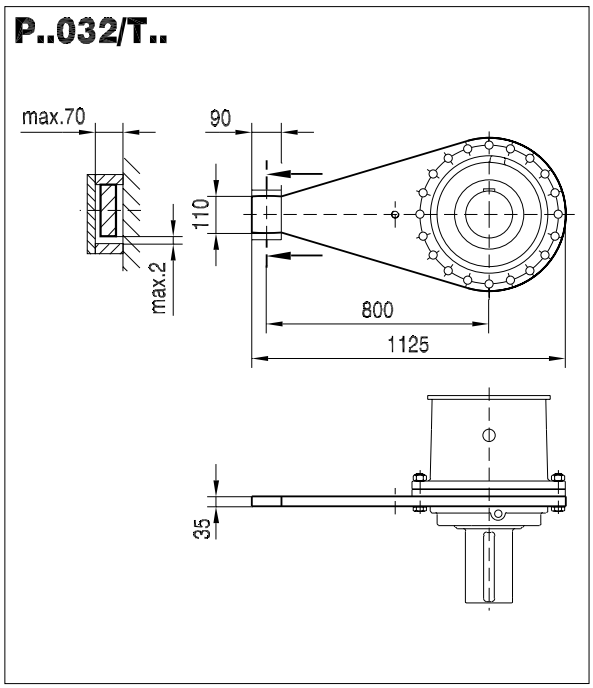
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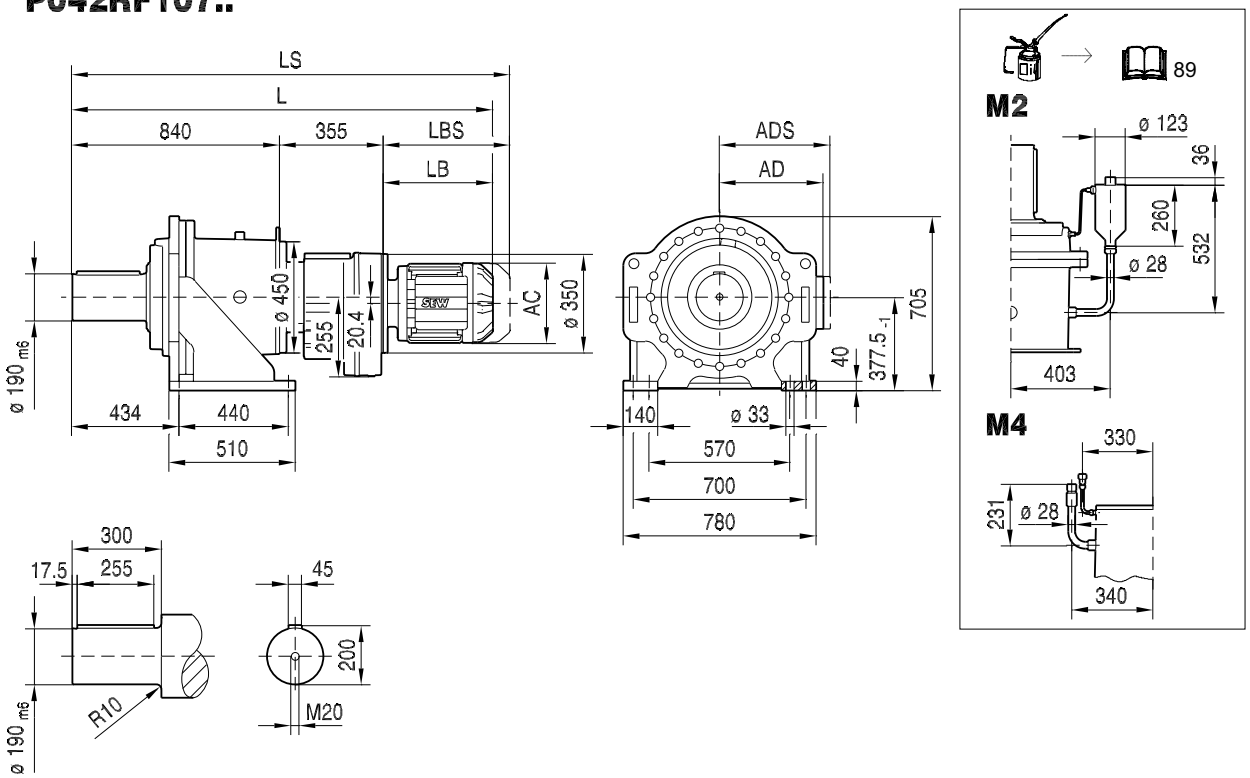


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1661	1727	1727	1750	1860	1834	1971	1971	2066	2168
LS	1798	1916	1916	1939	2065	2039	2211	2211	2306	2419
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

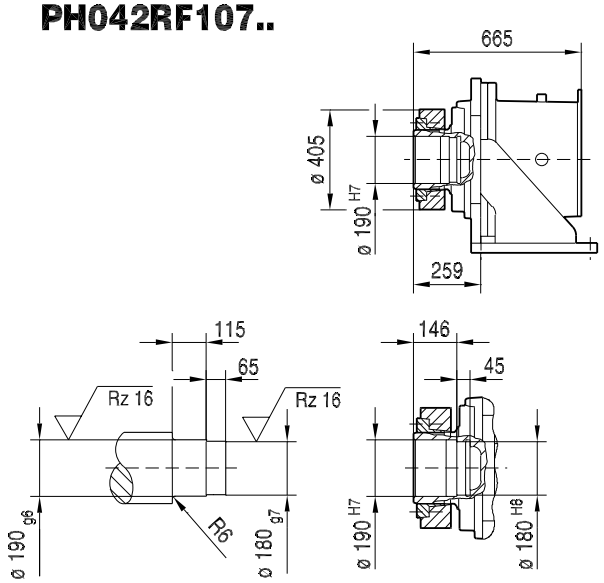
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45 041 00 15



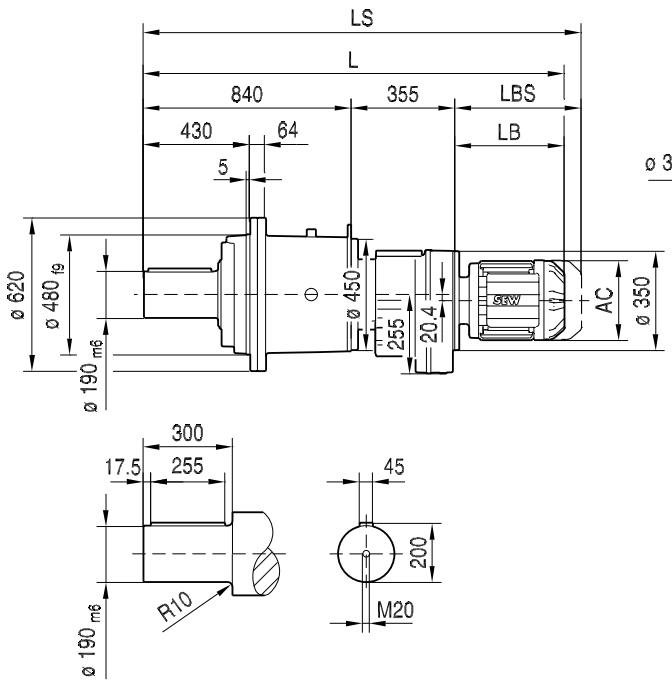
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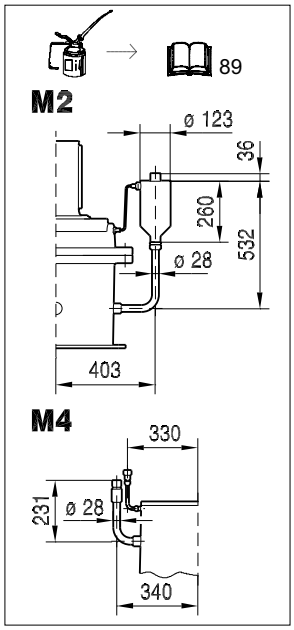
(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1558	1608	1626	1652	1718	1718	1741	1851	1825	1962
LS	1670	1720	1764	1789	1907	1907	1930	2056	2030	2202
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

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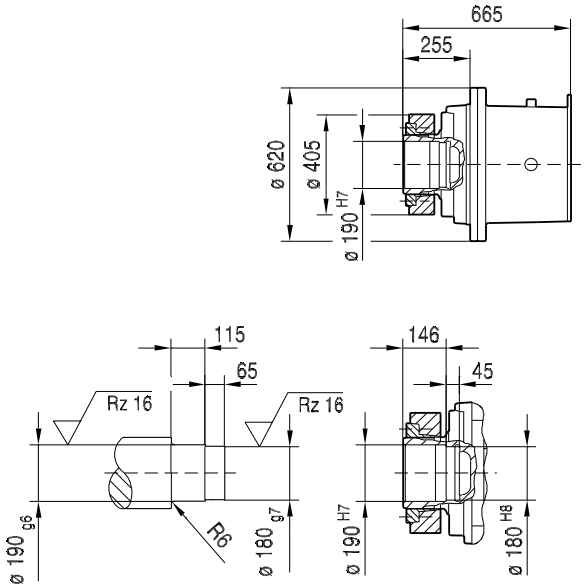
PF042RF107..



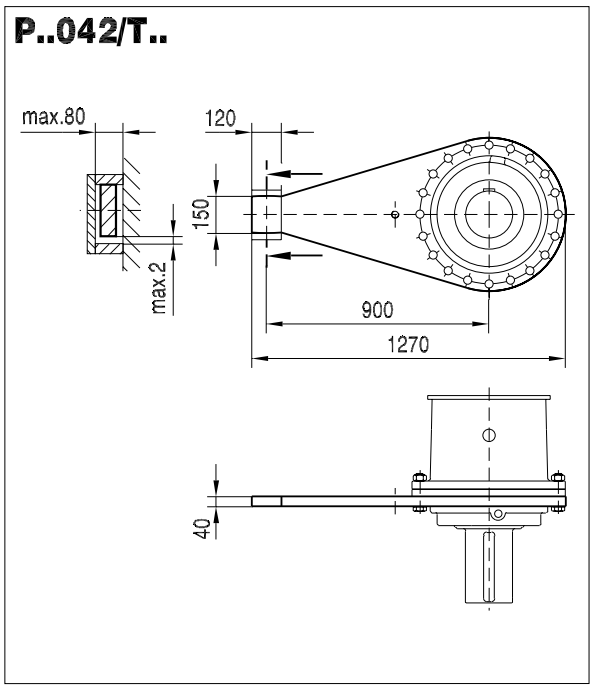
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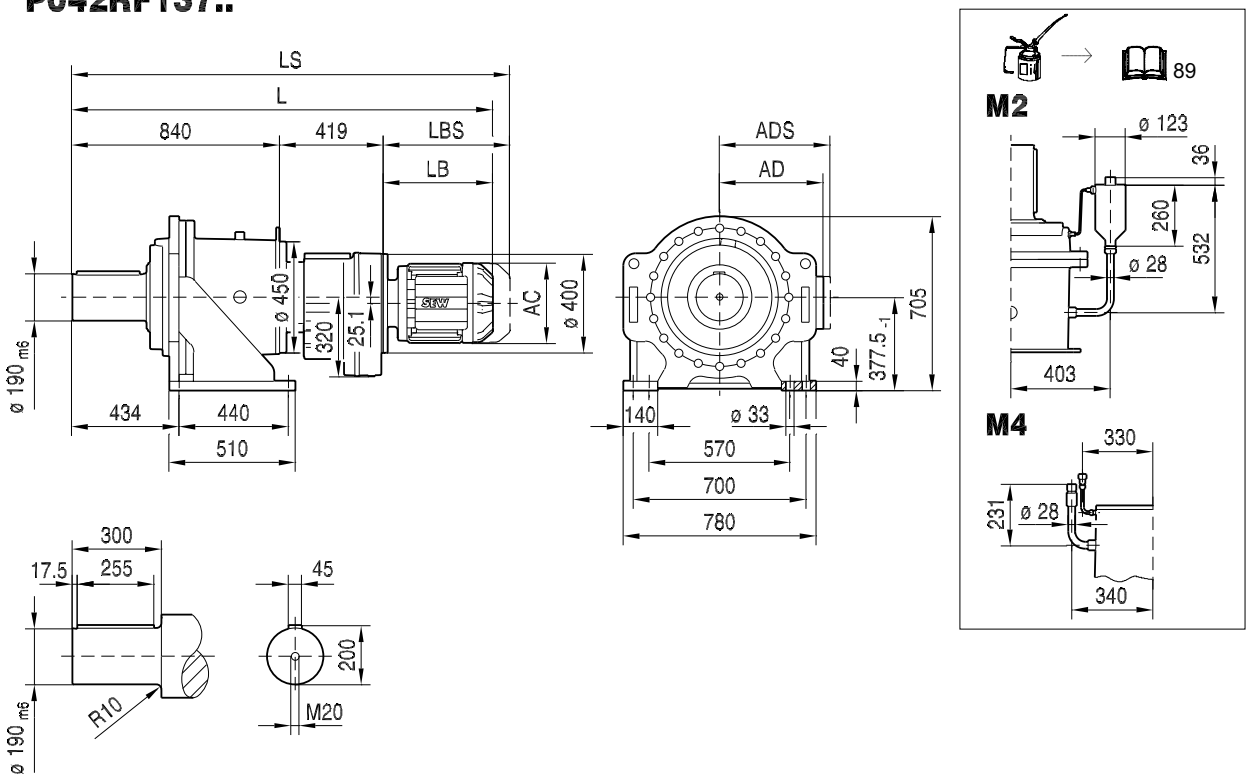
P..042/T..



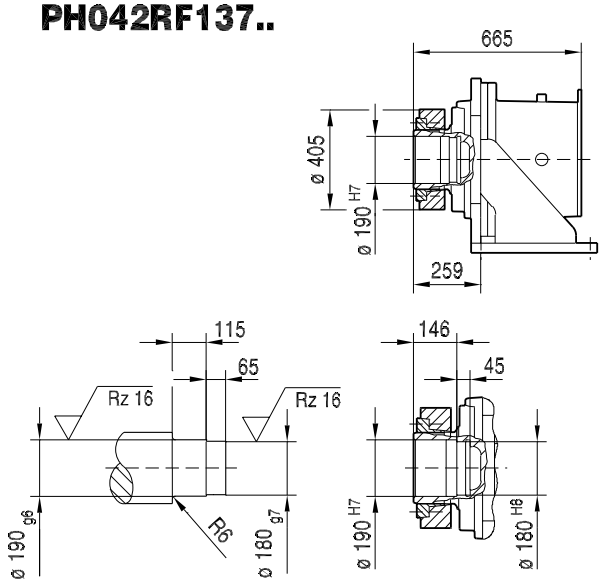
(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1558	1608	1626	1652	1718	1718	1741	1851	1825	1962
LS	1670	1720	1764	1789	1907	1907	1930	2056	2030	2202
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

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45 043 00 15



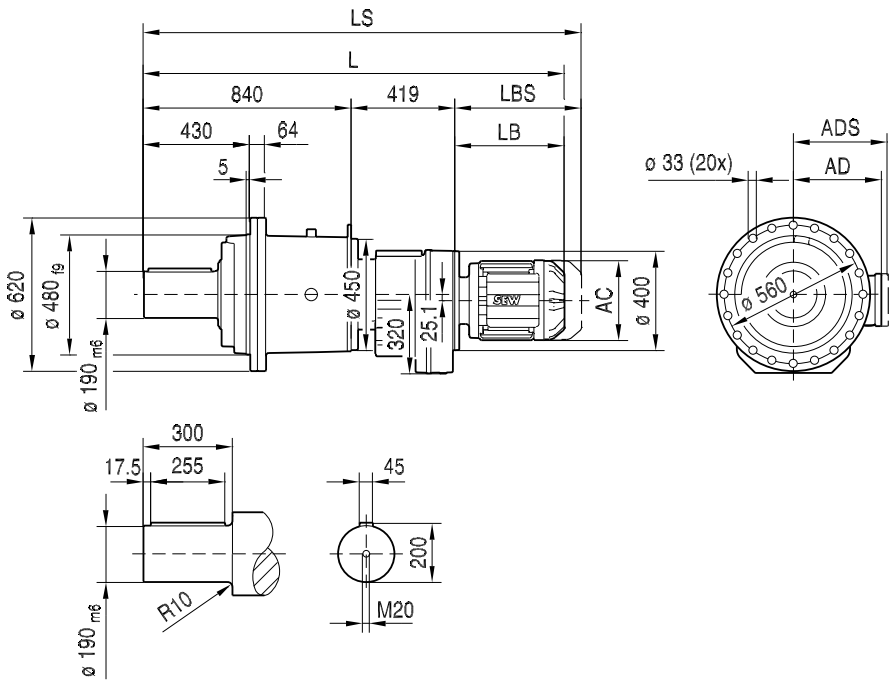
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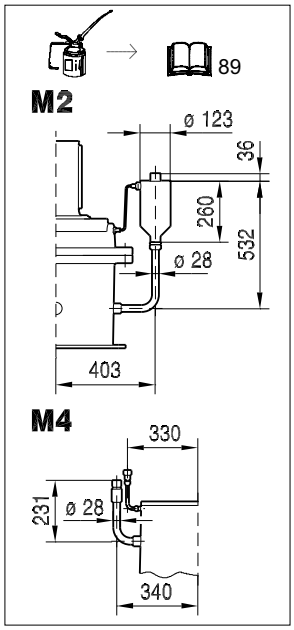
(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1683	1709	1775	1775	1798	1908	1882	2019	2019	2114
LS	1821	1846	1964	1964	1987	2113	2087	2259	2259	2354
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

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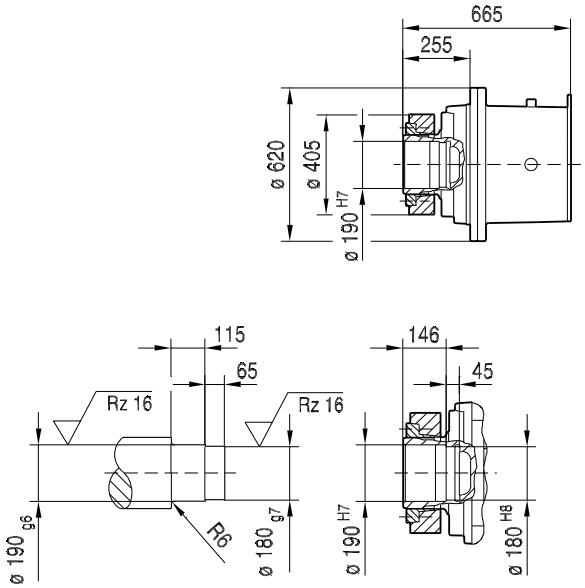
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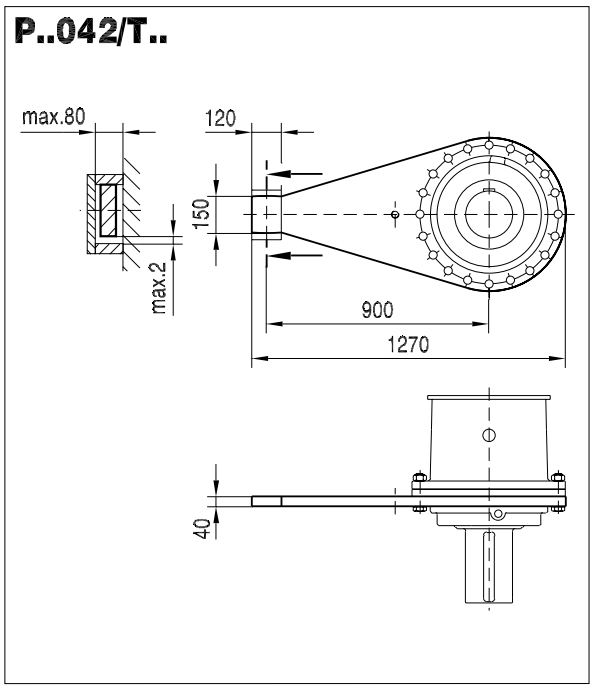
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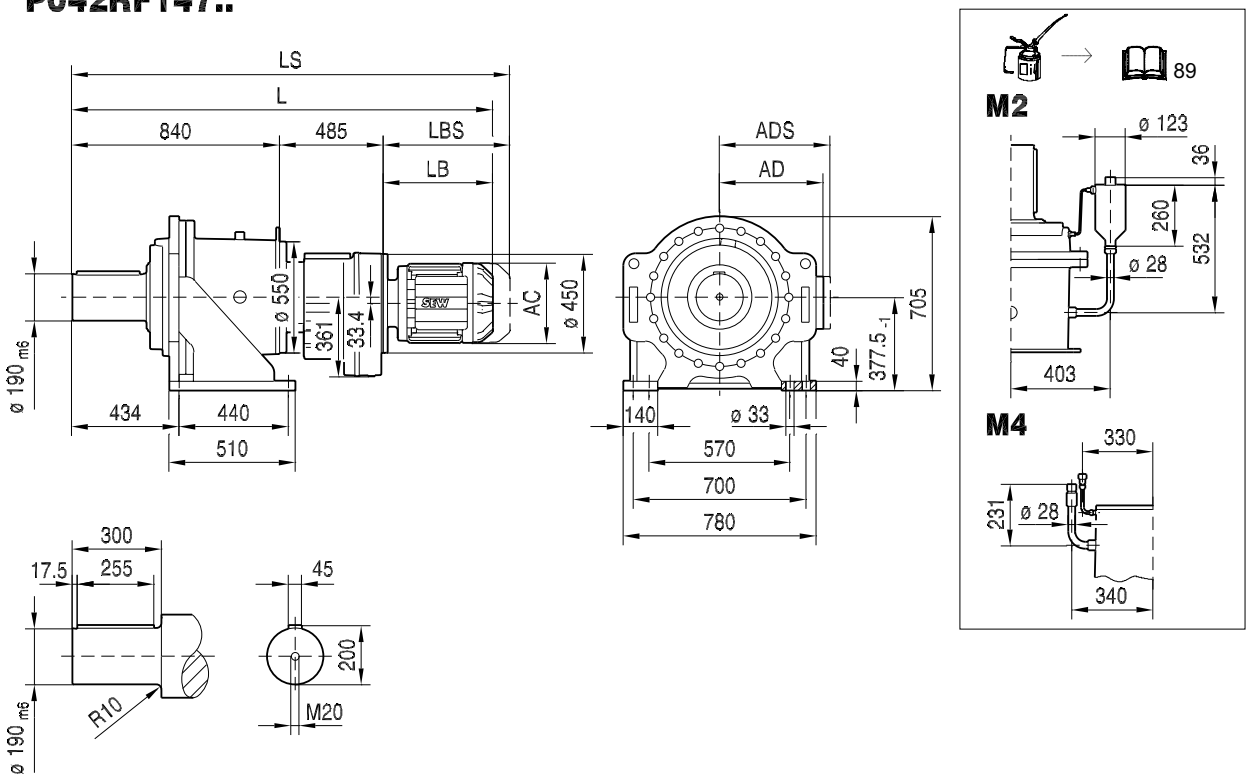


(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1683	1709	1775	1775	1798	1908	1882	2019	2019	2114
LS	1821	1846	1964	1964	1987	2113	2087	2259	2259	2354
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

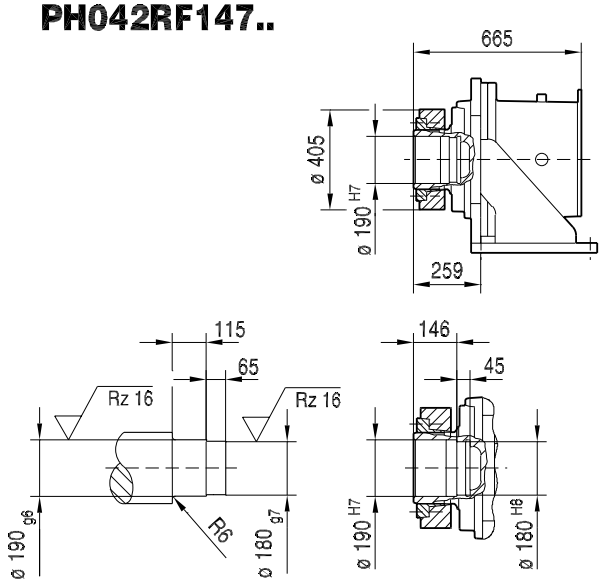
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45 045 00 15



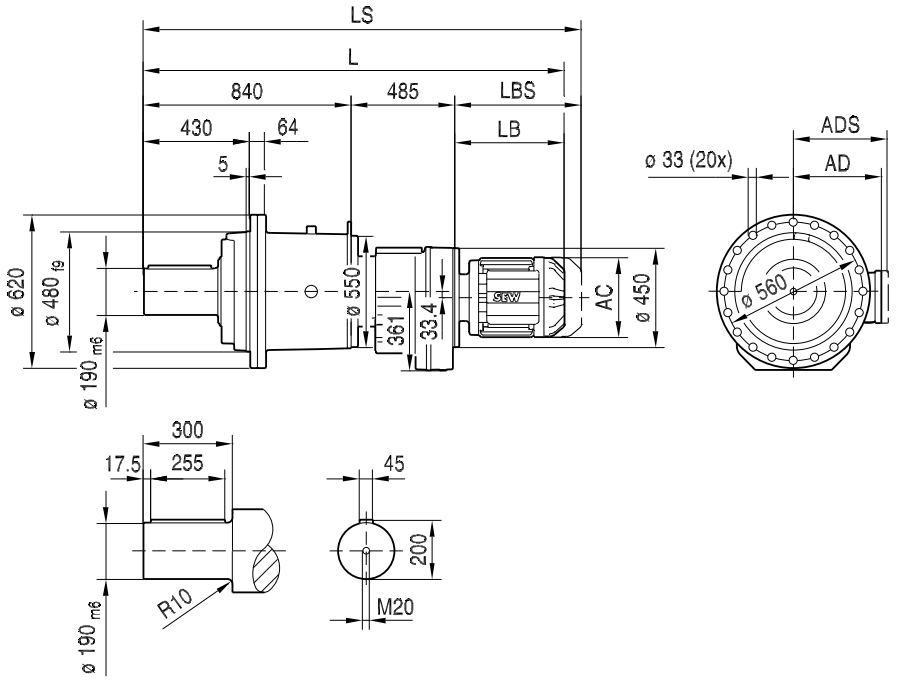
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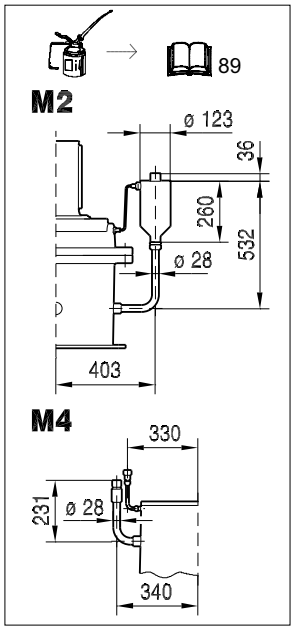
(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1767	1833	1833	1856	1966	1940	2077	2077	2172	2274
LS	1904	2022	2022	2045	2171	2145	2317	2317	2412	2525
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

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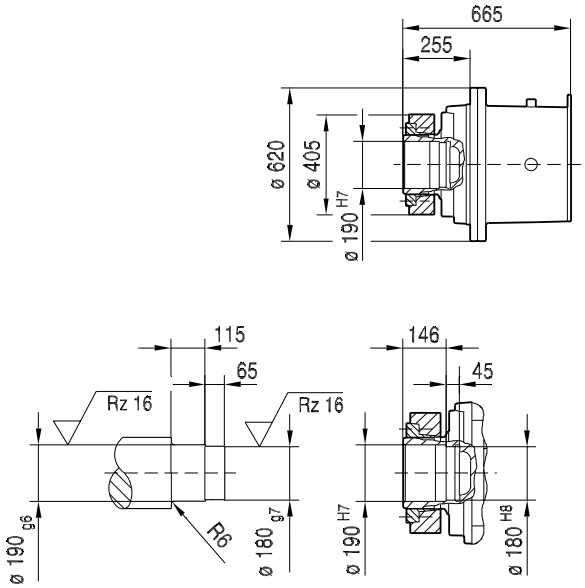
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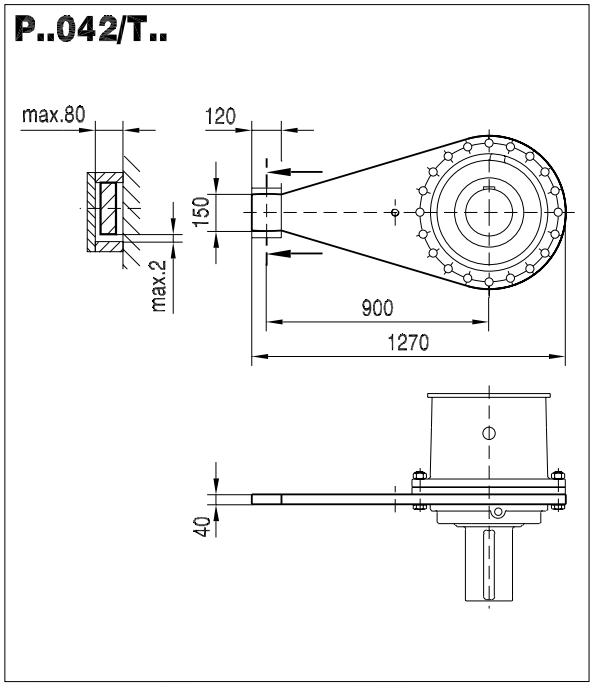
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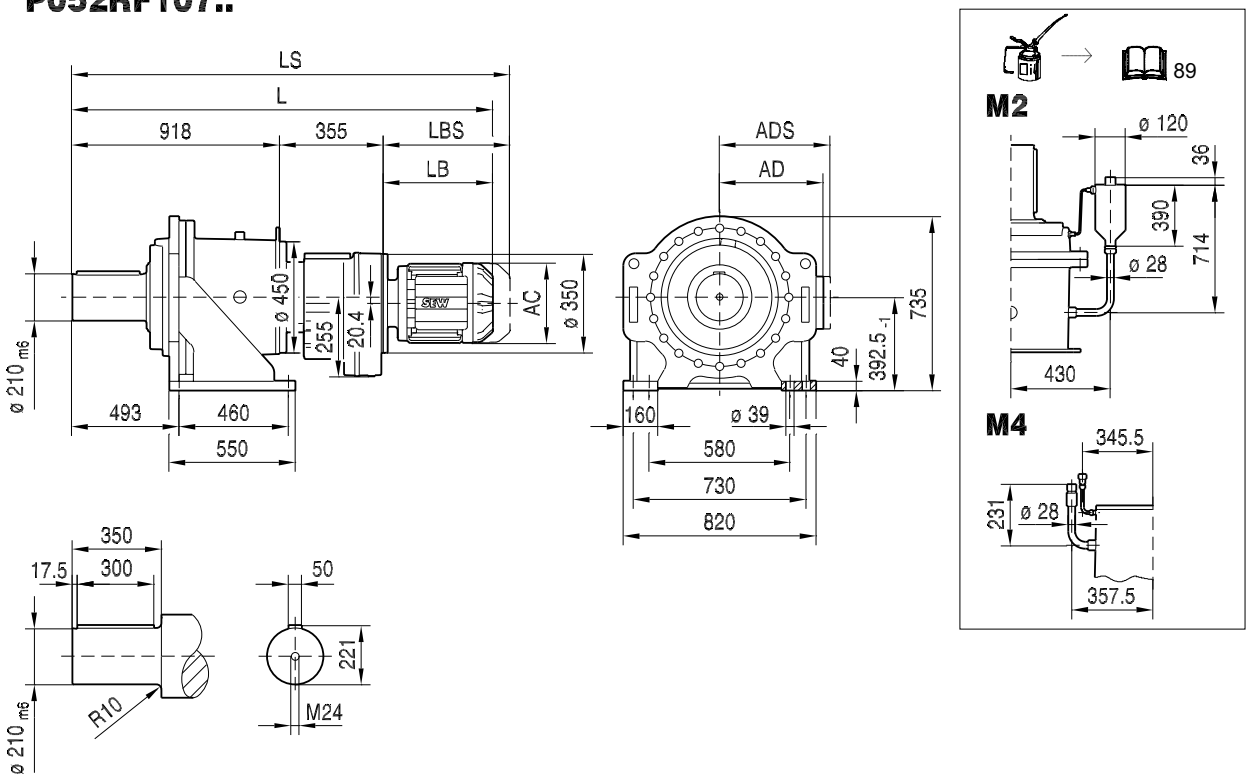


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1767	1833	1833	1856	1966	1940	2077	2077	2172	2274
LS	1904	2022	2022	2045	2171	2145	2317	2317	2412	2525
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

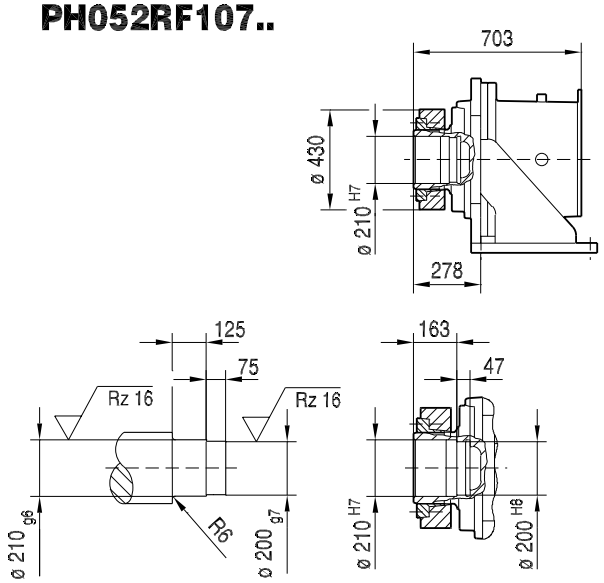
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45 047 00 15



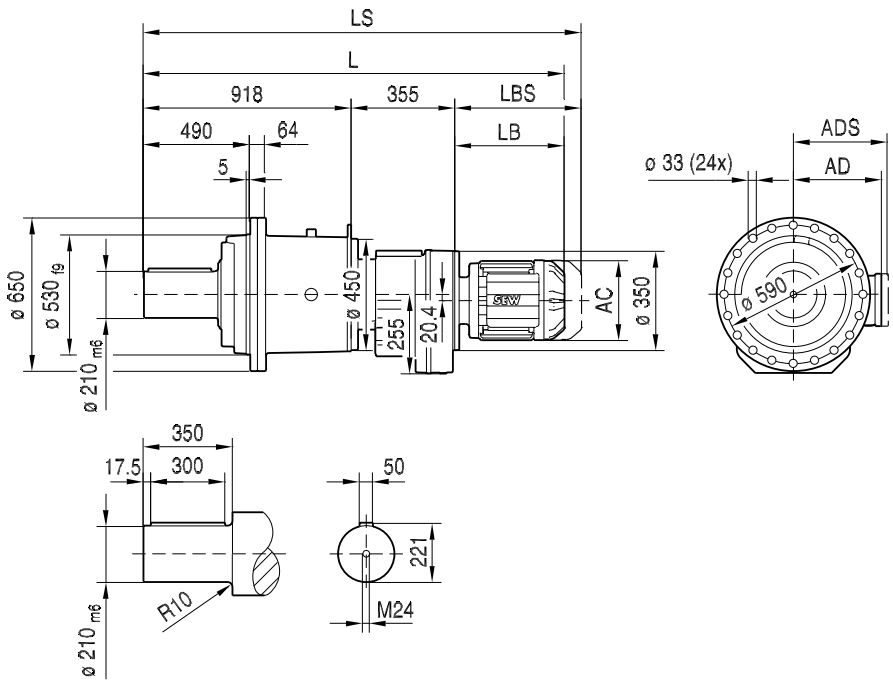
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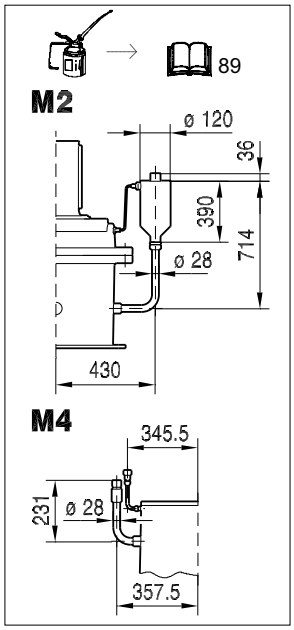
(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1636	1686	1704	1730	1796	1796	1819	1929	1903	2040
LS	1748	1798	1842	1867	1985	1985	2008	2134	2108	2280
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

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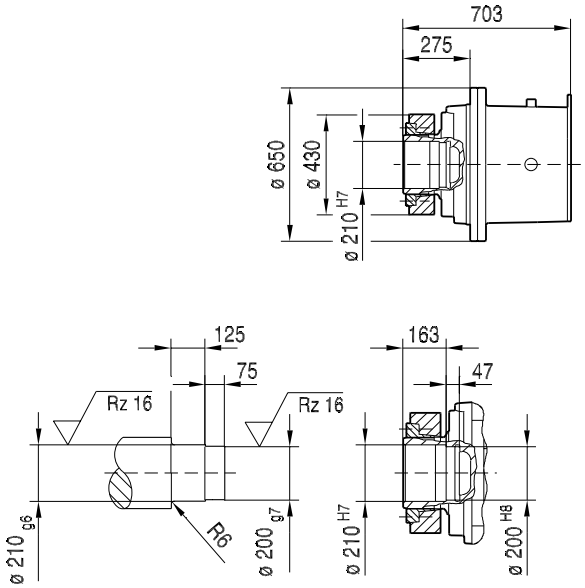
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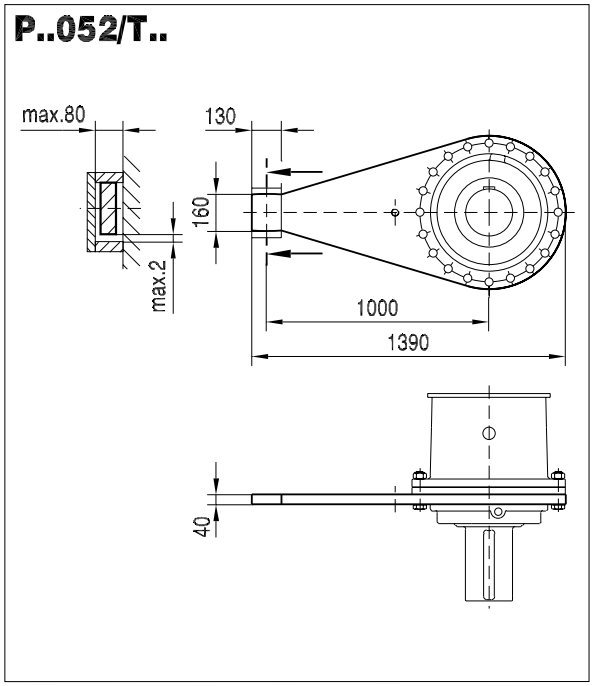
45 048 00 15



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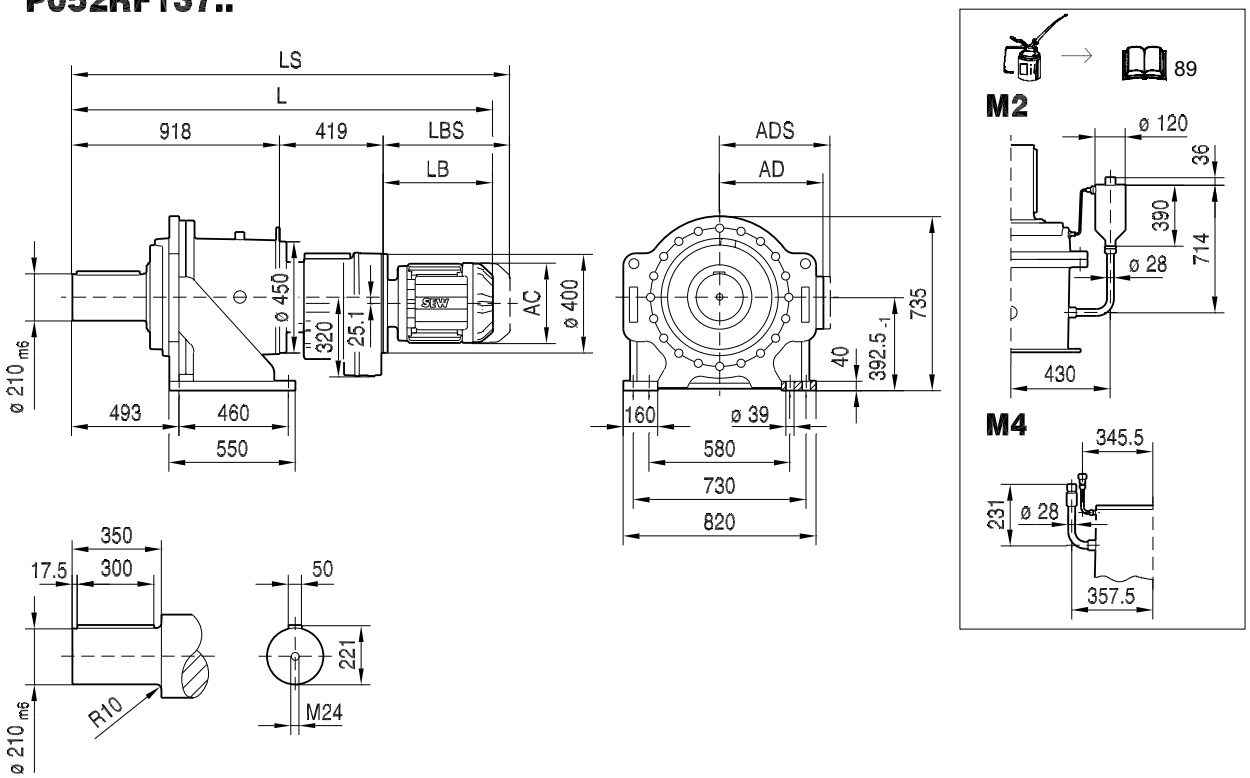


(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1636	1686	1704	1730	1796	1796	1819	1929	1903	2040
LS	1748	1798	1842	1867	1985	1985	2008	2134	2108	2280
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

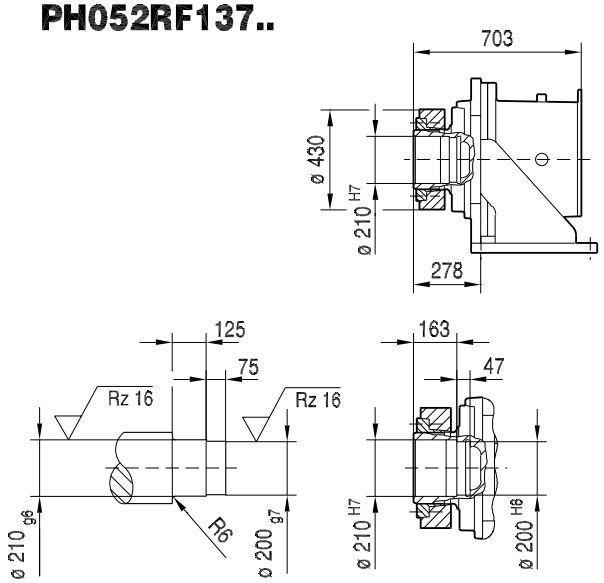
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45 049 00 15



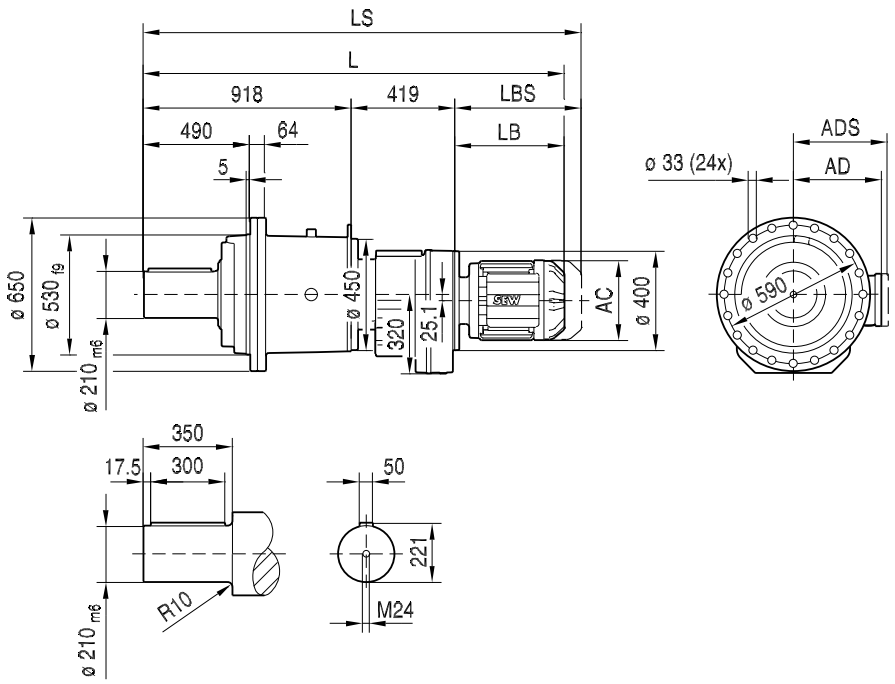
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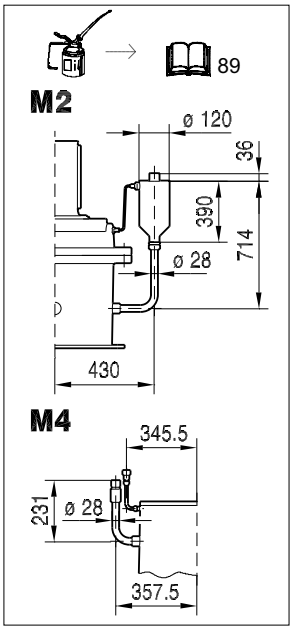
(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1761	1787	1853	1853	1876	1986	1960	2097	2097	2192
LS	1899	1924	2042	2042	2065	2191	2165	2337	2337	2432
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

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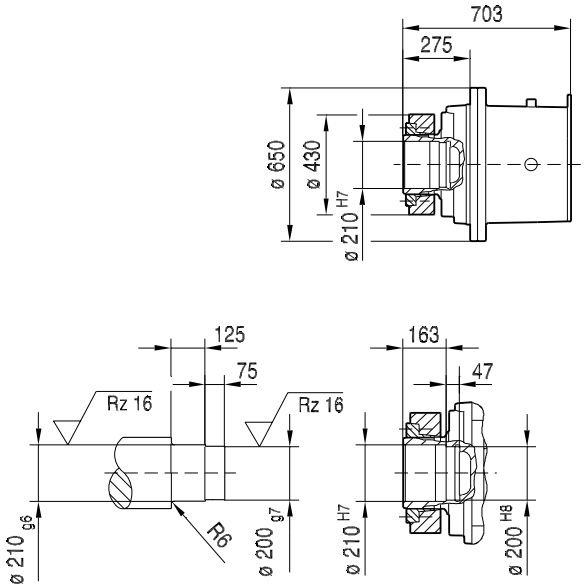
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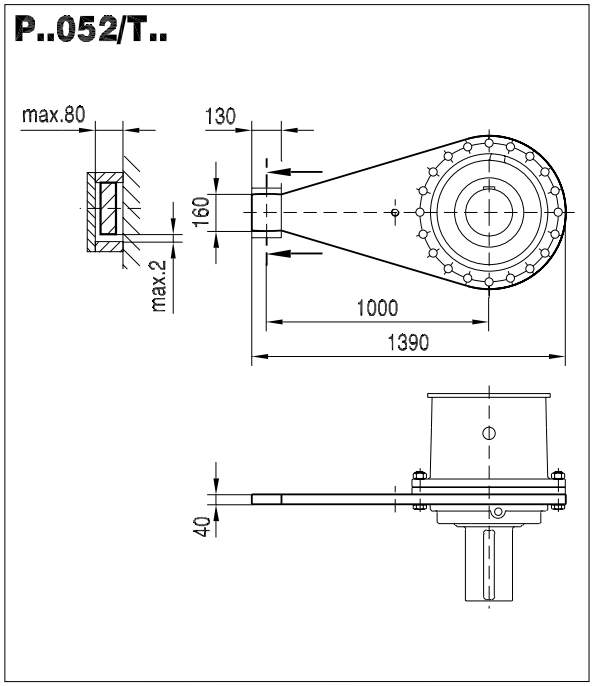
45 050 00 15



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P..052/T..

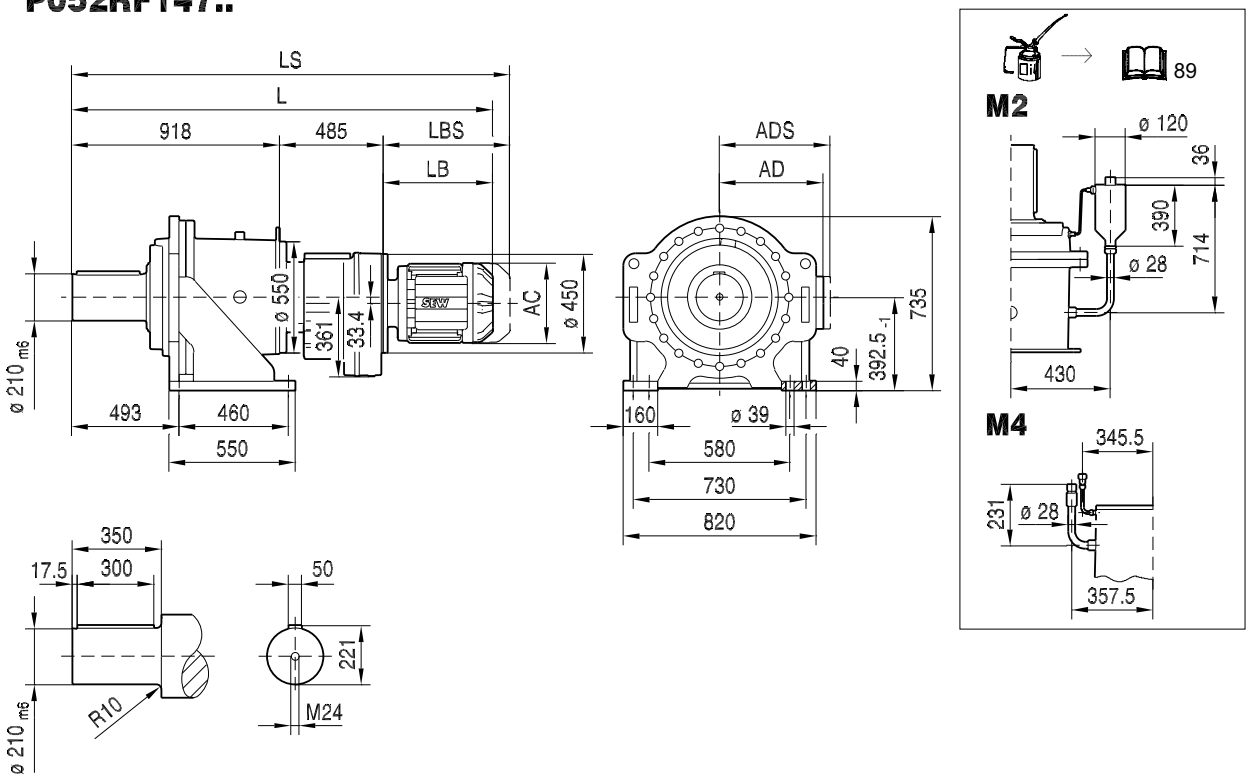


(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1761	1787	1853	1853	1876	1986	1960	2097	2097	2192
LS	1899	1924	2042	2042	2065	2191	2165	2337	2337	2432
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

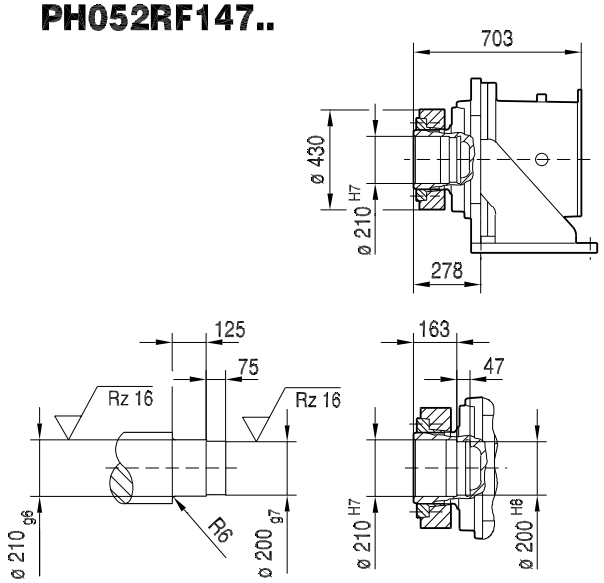
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45 051 00 15



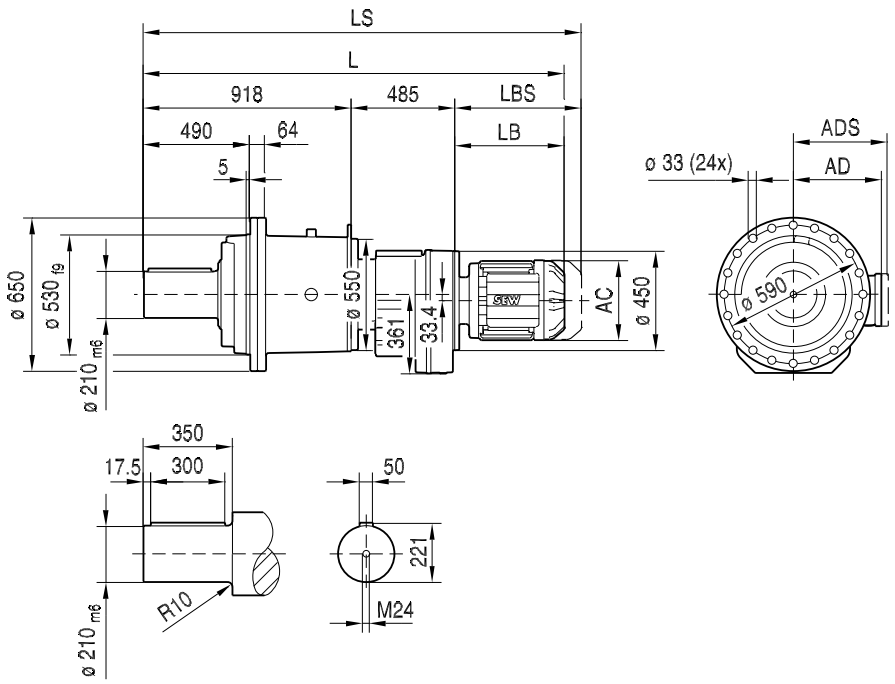
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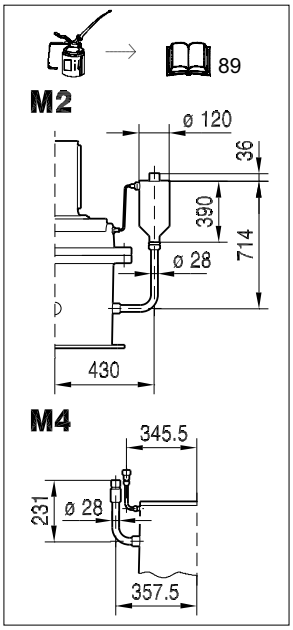
(→ 100)	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	
AC	357	394	434	495	495	495	624	
AD	268	283	305	394	394	394	506	
ADS	268	283	305	394	394	394	506	
L	1934	2044	2018	2155	2155	2250	2352	
LS	2123	2249	2223	2395	2395	2490	2603	
LB	531	641	615	752	752	847	949	
LBS	720	846	820	992	992	1087	1200	

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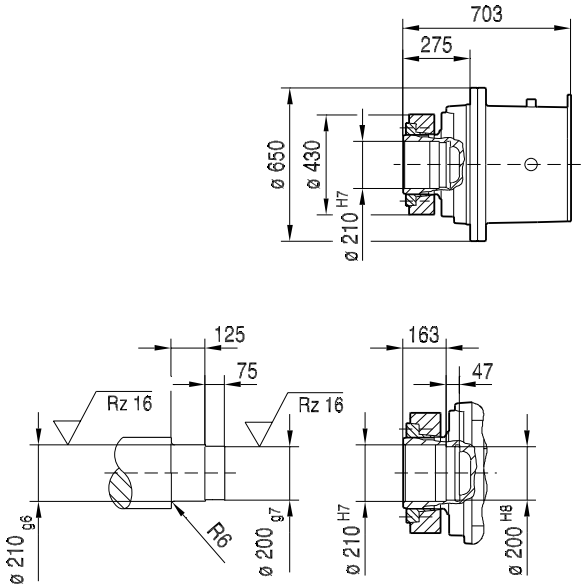
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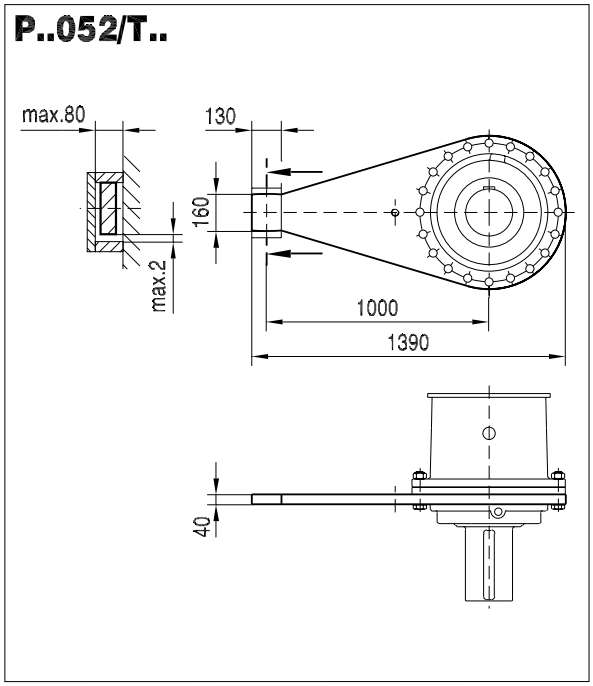
45 052 00 15



PHF052RF147..



P..052/T..

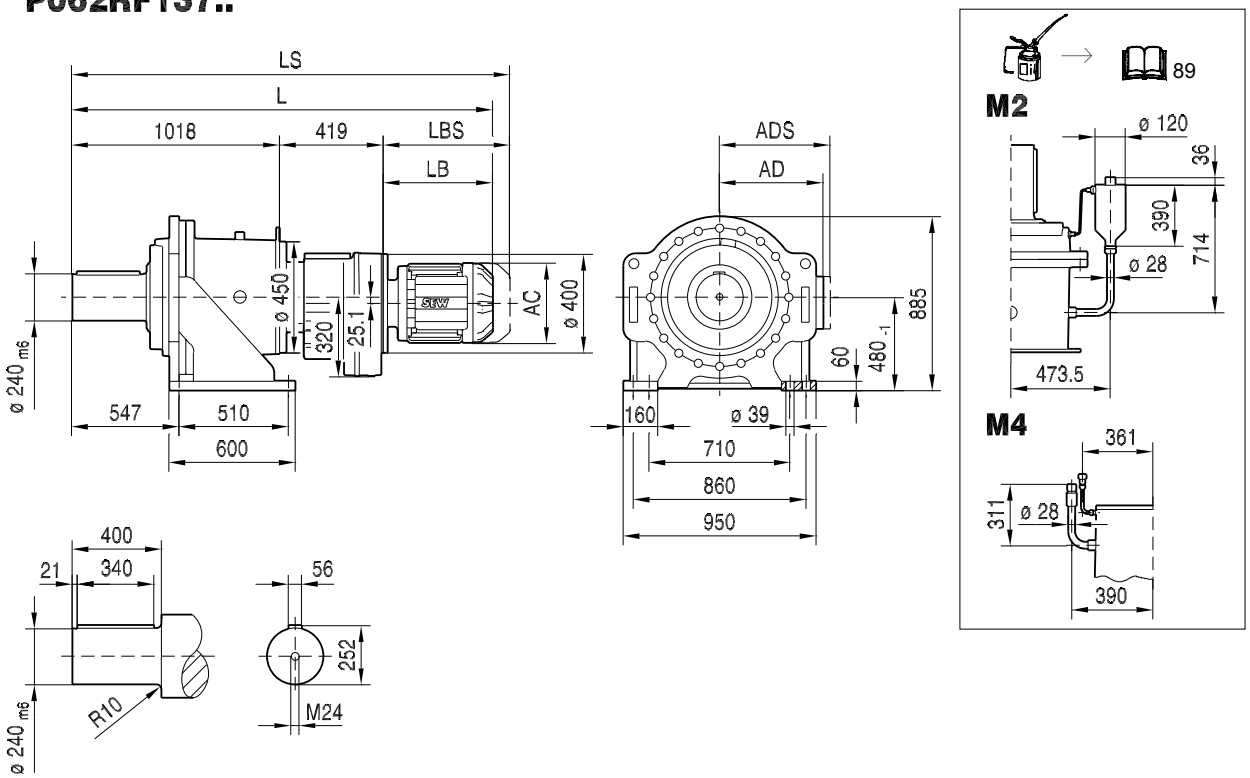


(→ 100)	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	
AC	357	394	434	495	495	495	624	
AD	268	283	305	394	394	394	506	
ADS	268	283	305	394	394	394	506	
L	1934	2044	2018	2155	2155	2250	2352	
LS	2123	2249	2223	2395	2395	2490	2603	
LB	531	641	615	752	752	847	949	
LBS	720	846	820	992	992	1087	1200	

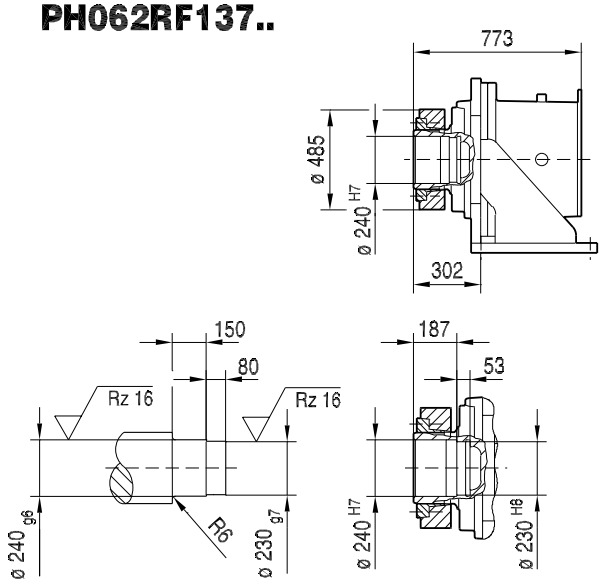
23488859/EN – 02/2017

P062RF137..

45 053 00 15



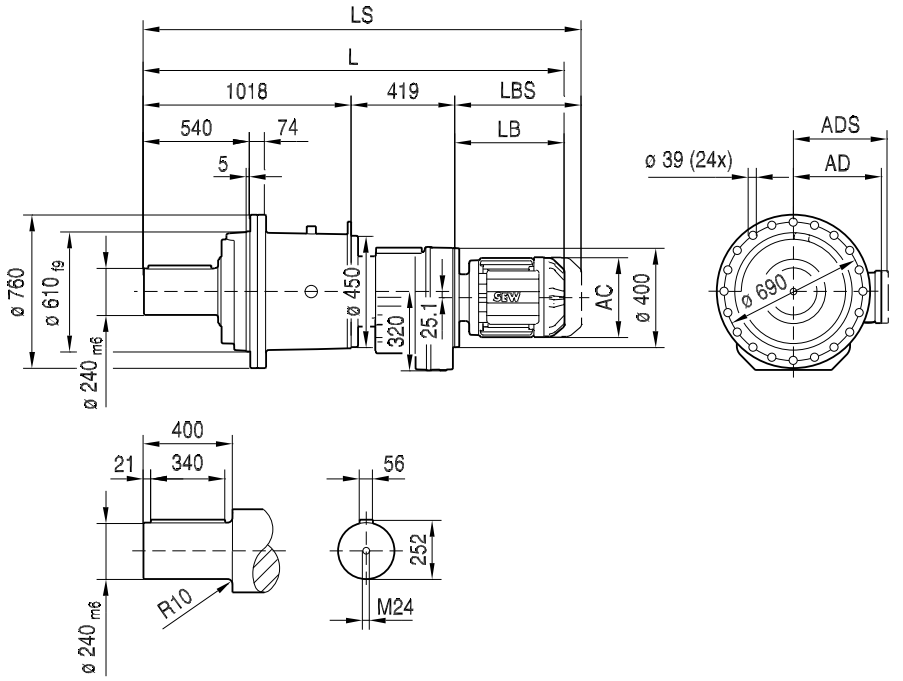
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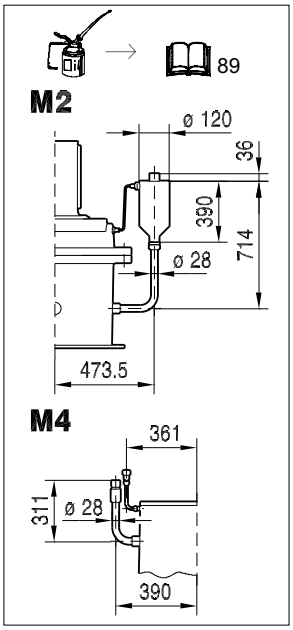
(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1861	1887	1953	1953	1976	2086	2060	2197	2197	2292
LS	1999	2024	2142	2142	2165	2291	2265	2437	2437	2532
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

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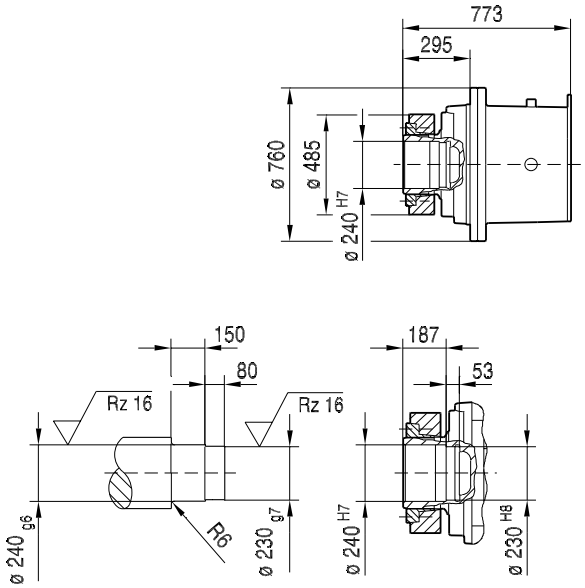
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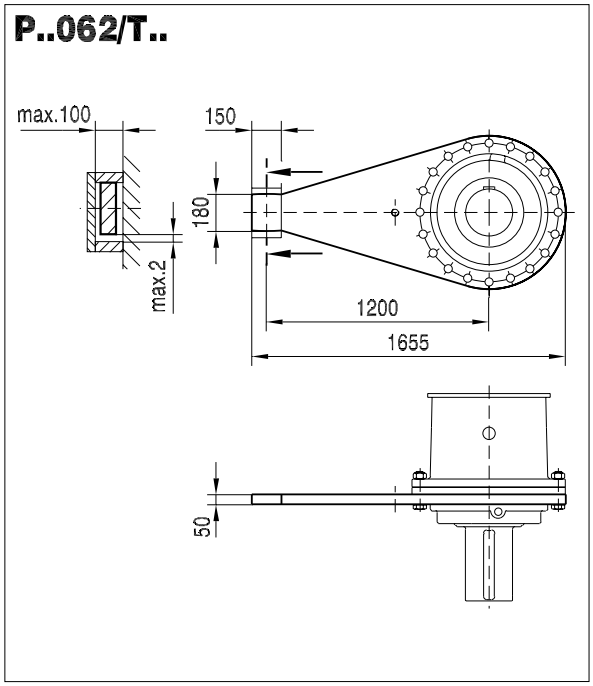
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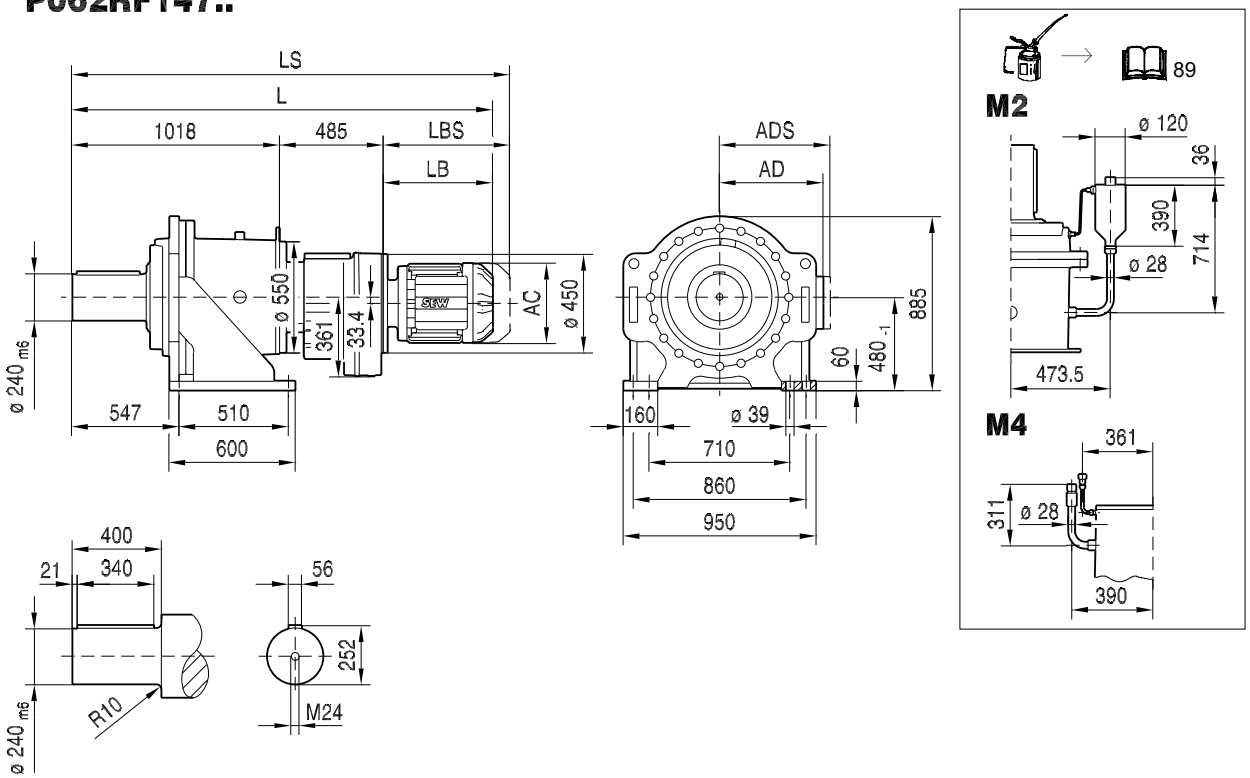


(→ 100)	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M
AC	261	261	314	314	357	394	434	495	495	495
AD	228	228	253	253	268	283	305	394	394	394
ADS	228	228	253	253	268	283	305	394	394	394
L	1861	1887	1953	1953	1976	2086	2060	2197	2197	2292
LS	1999	2024	2142	2142	2165	2291	2265	2437	2437	2532
LB	424	450	516	516	539	649	623	760	760	855
LBS	562	587	705	705	728	854	828	1000	1000	1095

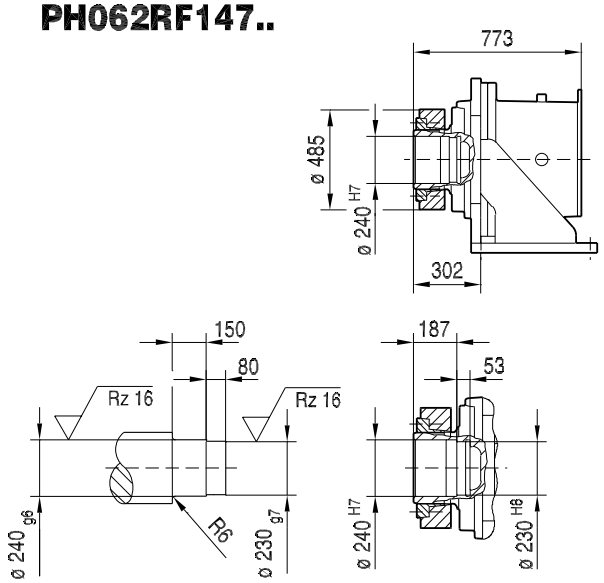
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45 055 00 15



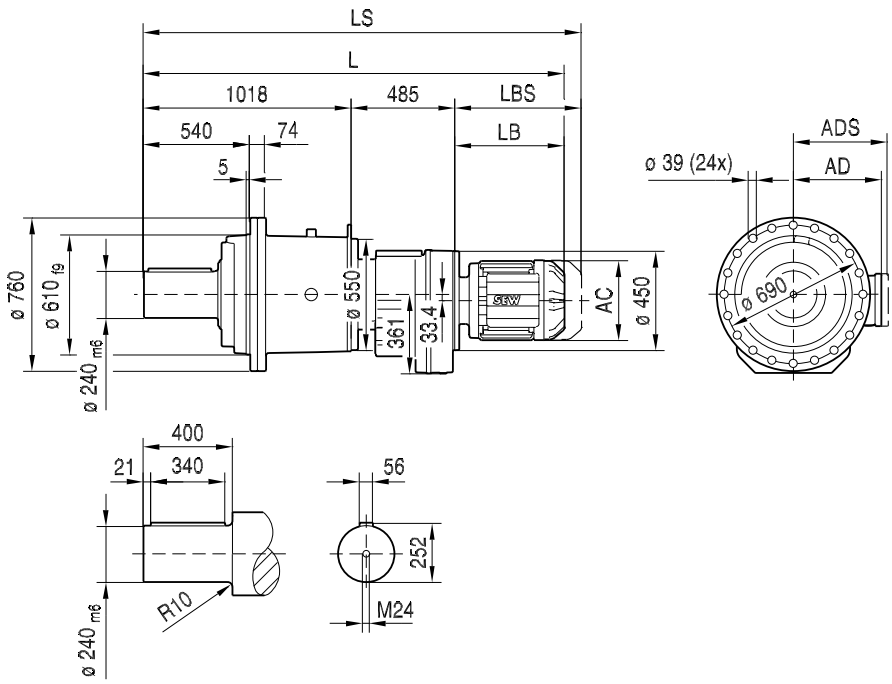
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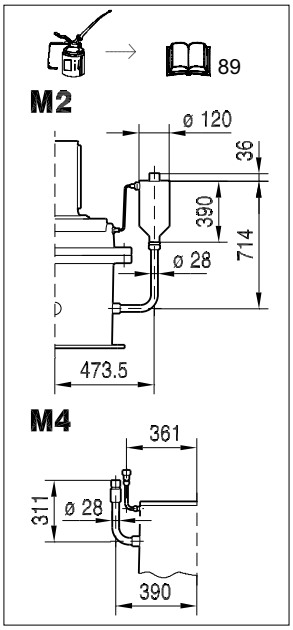
(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1945	2011	2011	2034	2144	2118	2255	2255	2350	2452
LS	2082	2200	2200	2223	2349	2323	2495	2495	2590	2703
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

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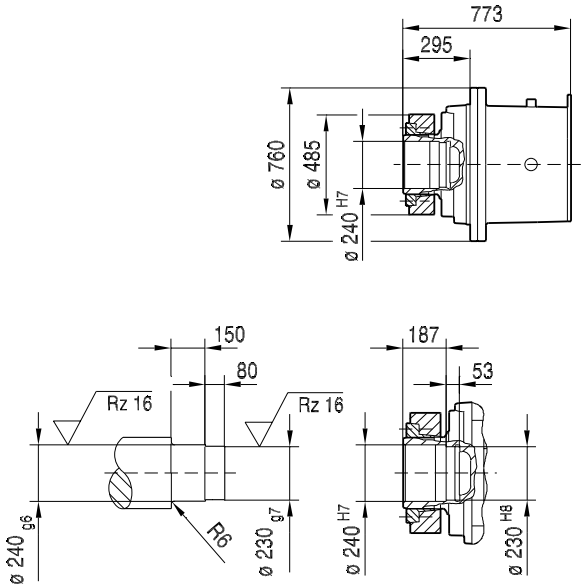
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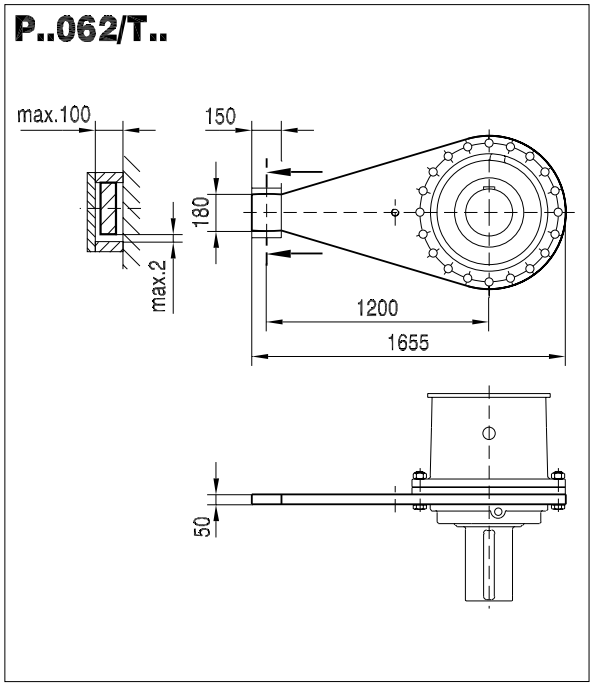
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P..062/T..

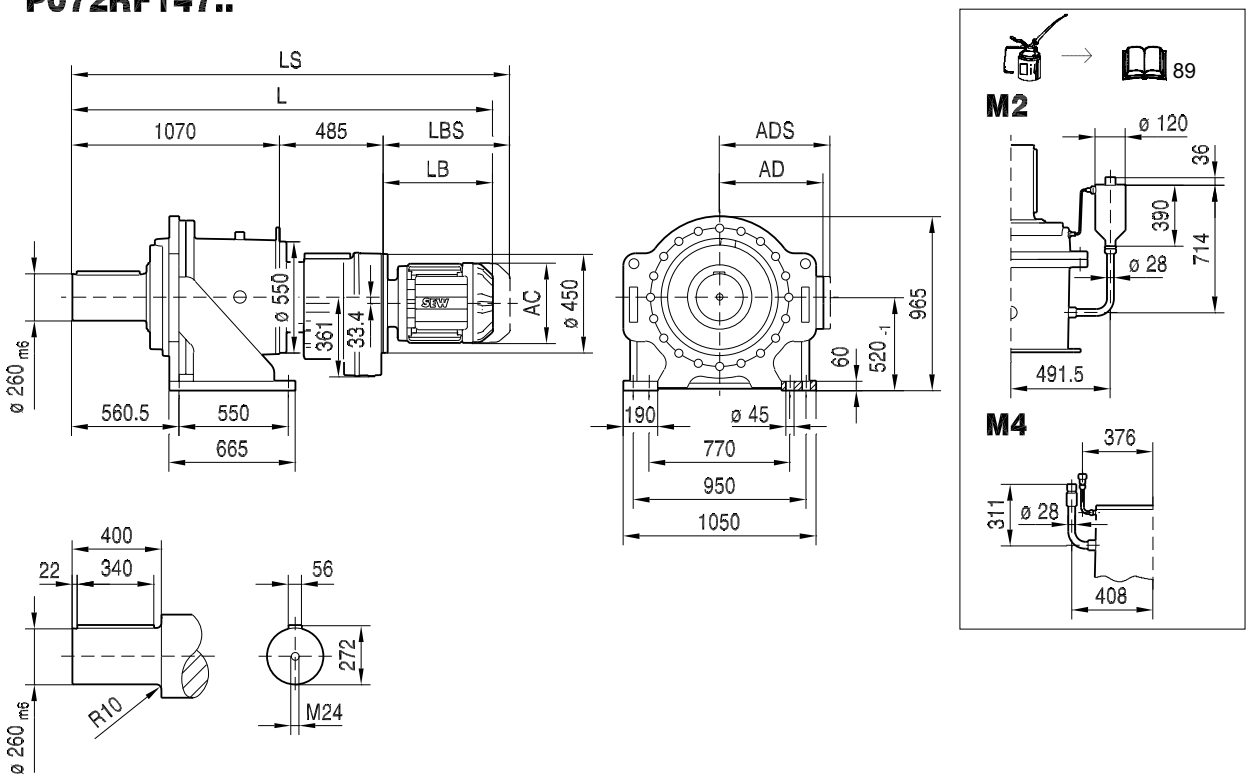


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1945	2011	2011	2034	2144	2118	2255	2255	2350	2452
LS	2082	2200	2200	2223	2349	2323	2495	2495	2590	2703
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

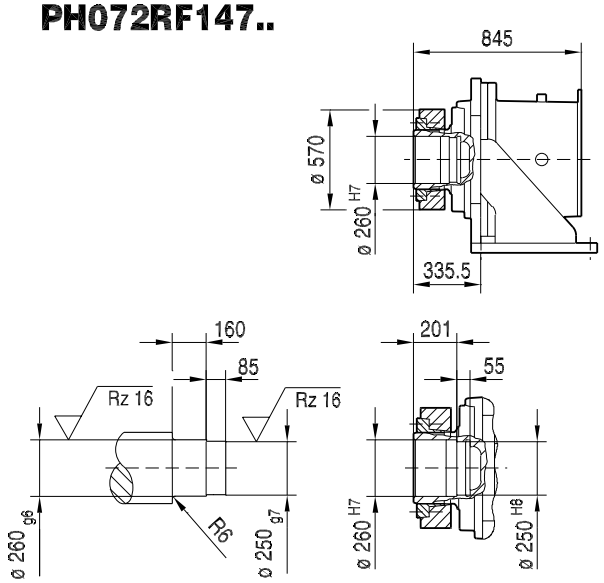
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45 057 00 15



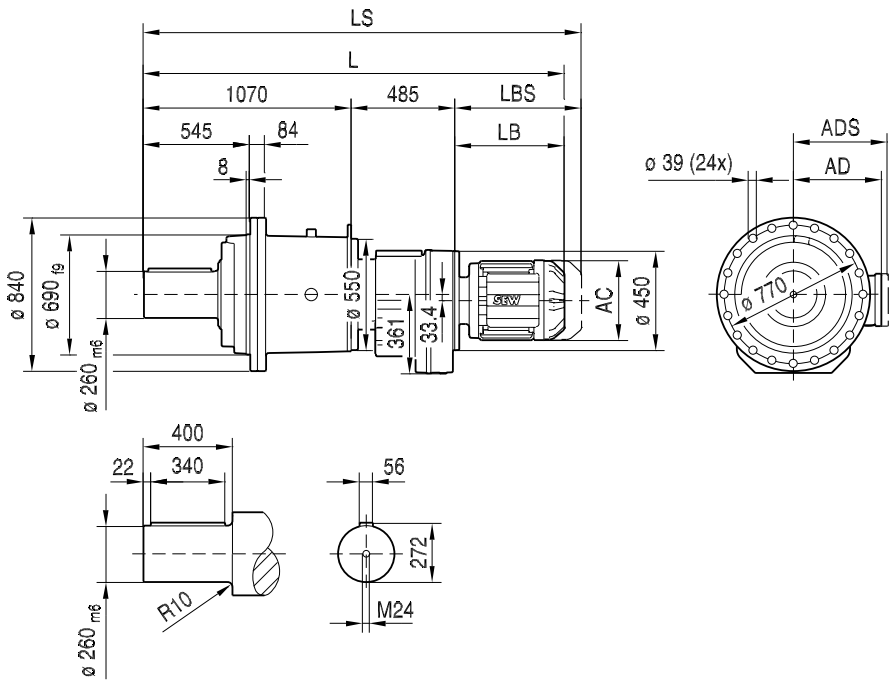
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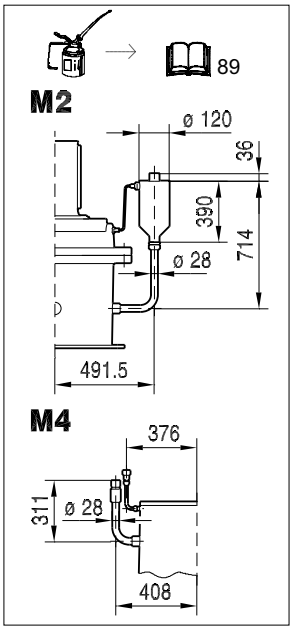
(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1997	2063	2063	2086	2196	2170	2307	2307	2402	2504
LS	2134	2252	2252	2275	2401	2375	2547	2547	2642	2755
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

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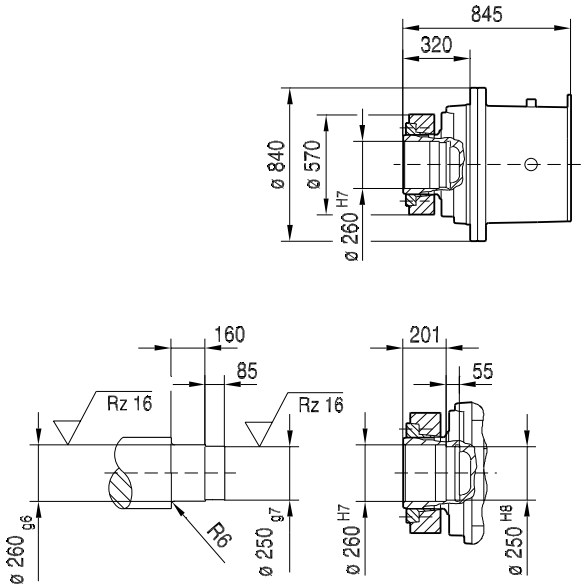
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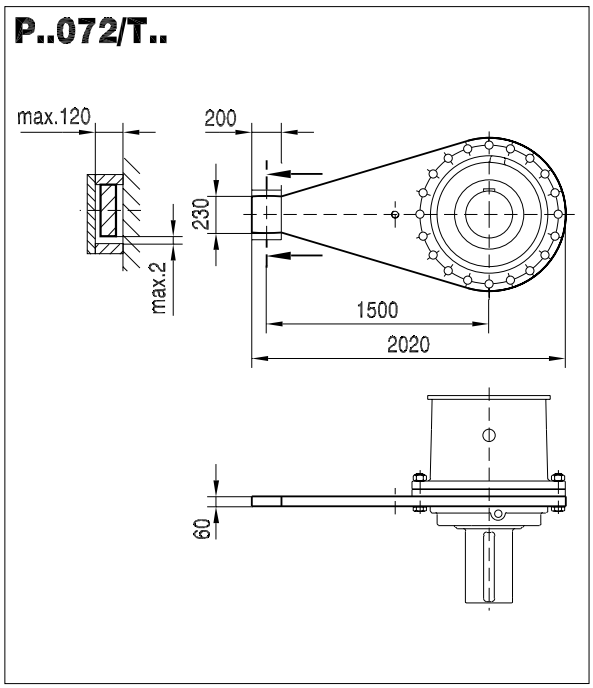
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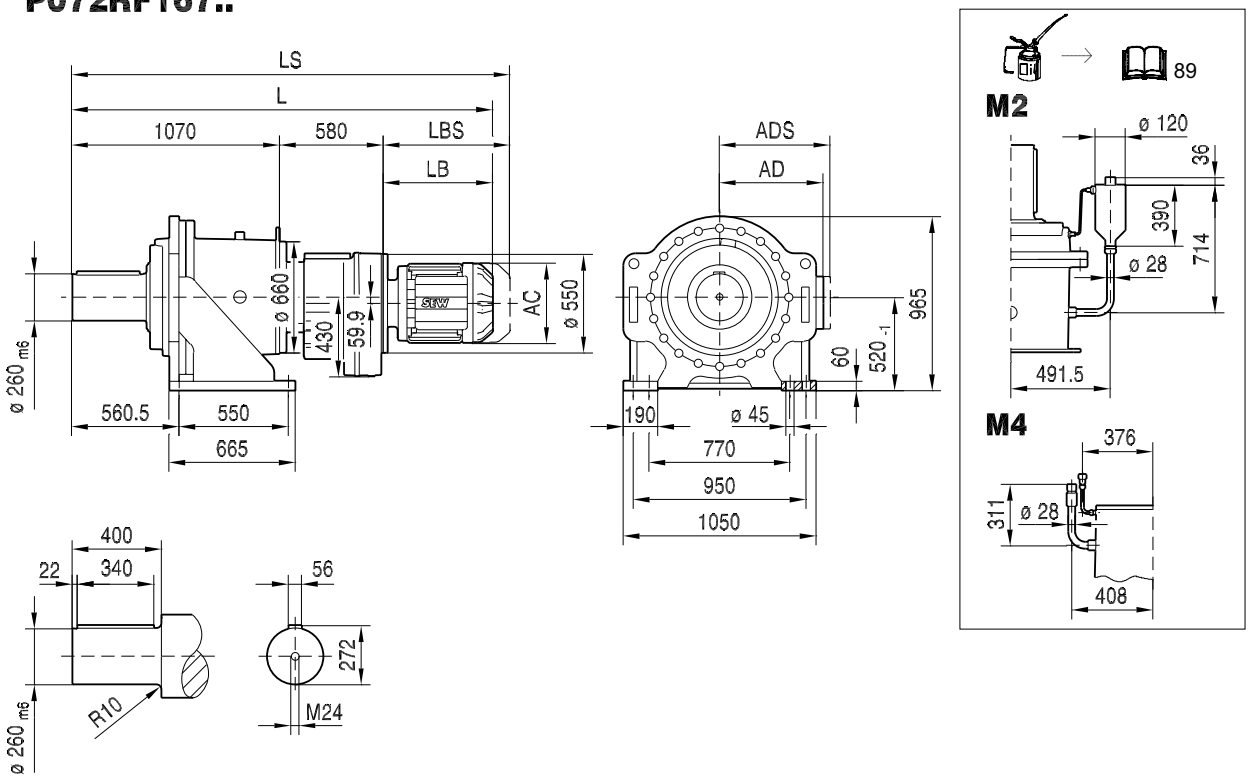


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1997	2063	2063	2086	2196	2170	2307	2307	2402	2504
LS	2134	2252	2252	2275	2401	2375	2547	2547	2642	2755
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

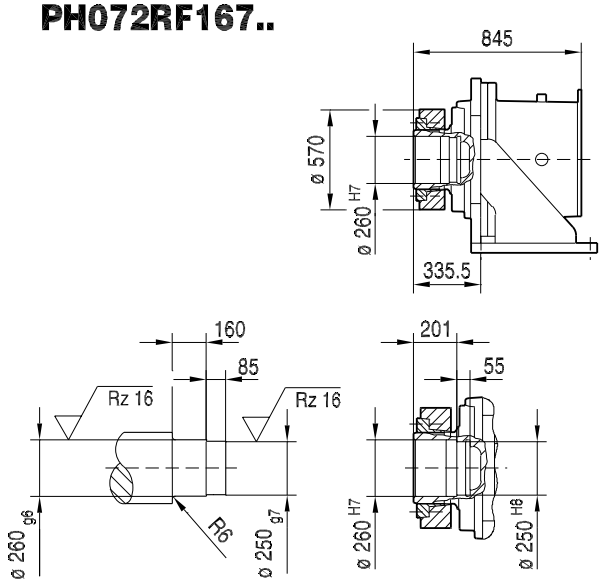
23488859/EN – 02/2017

P072RF167..

45 059 00 15



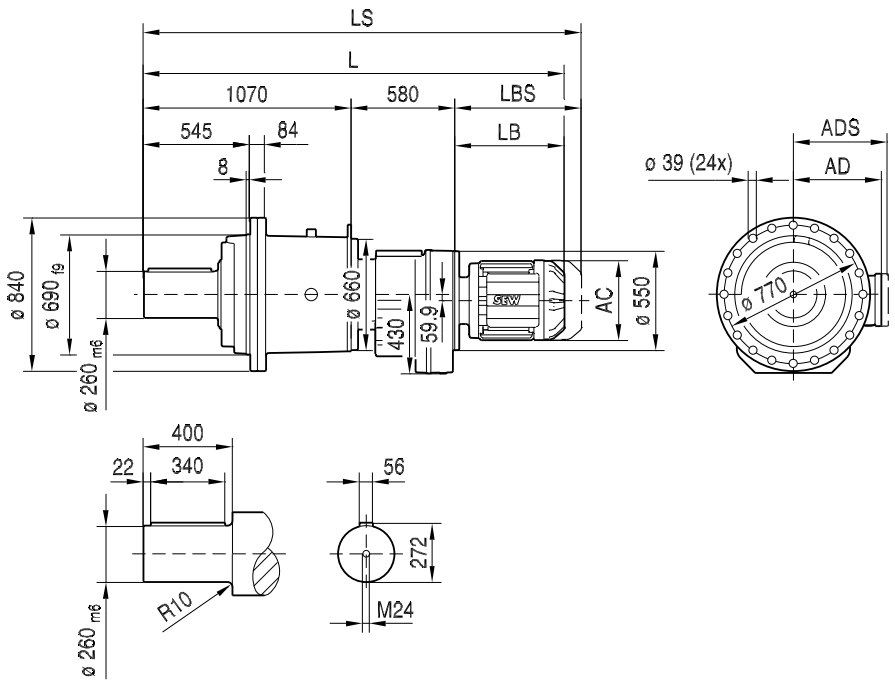
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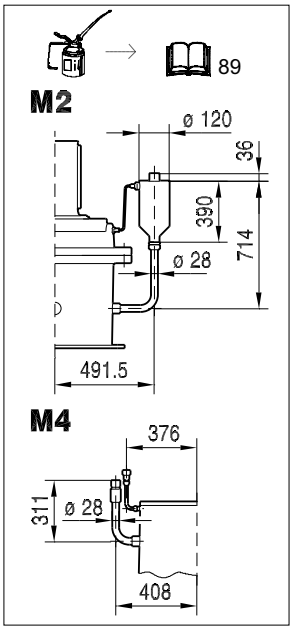
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2150	2173	2283	2257	2394	2394	2489	2591	2721
LS	2339	2362	2488	2462	2634	2634	2729	2842	2972
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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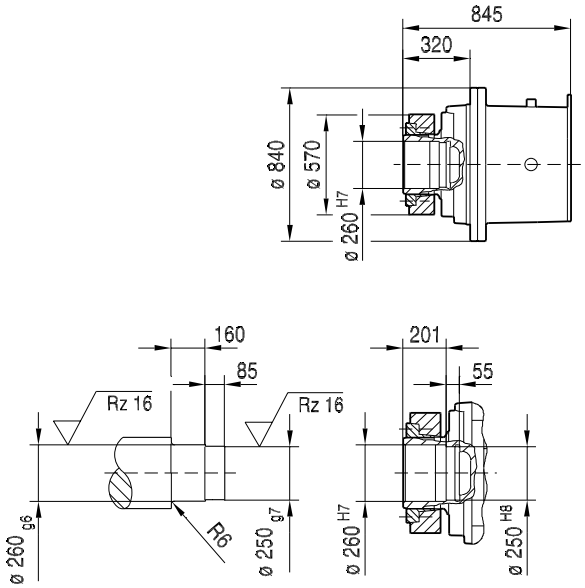
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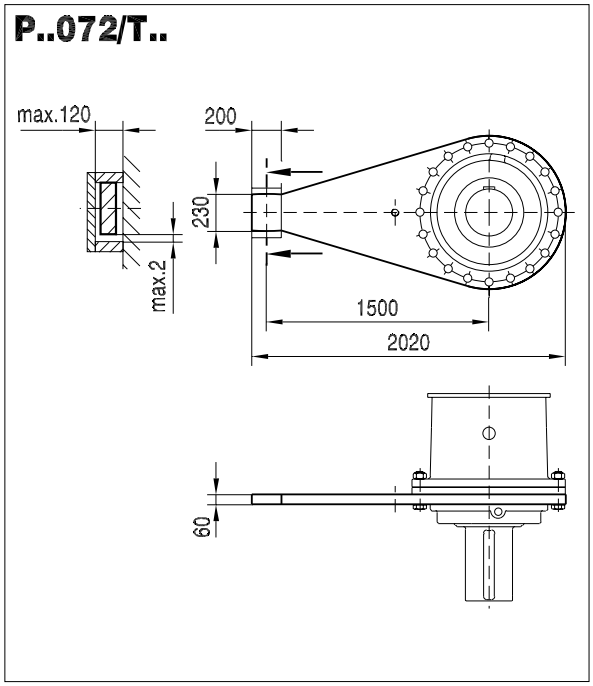
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PHF072RF167..



P..072/T..

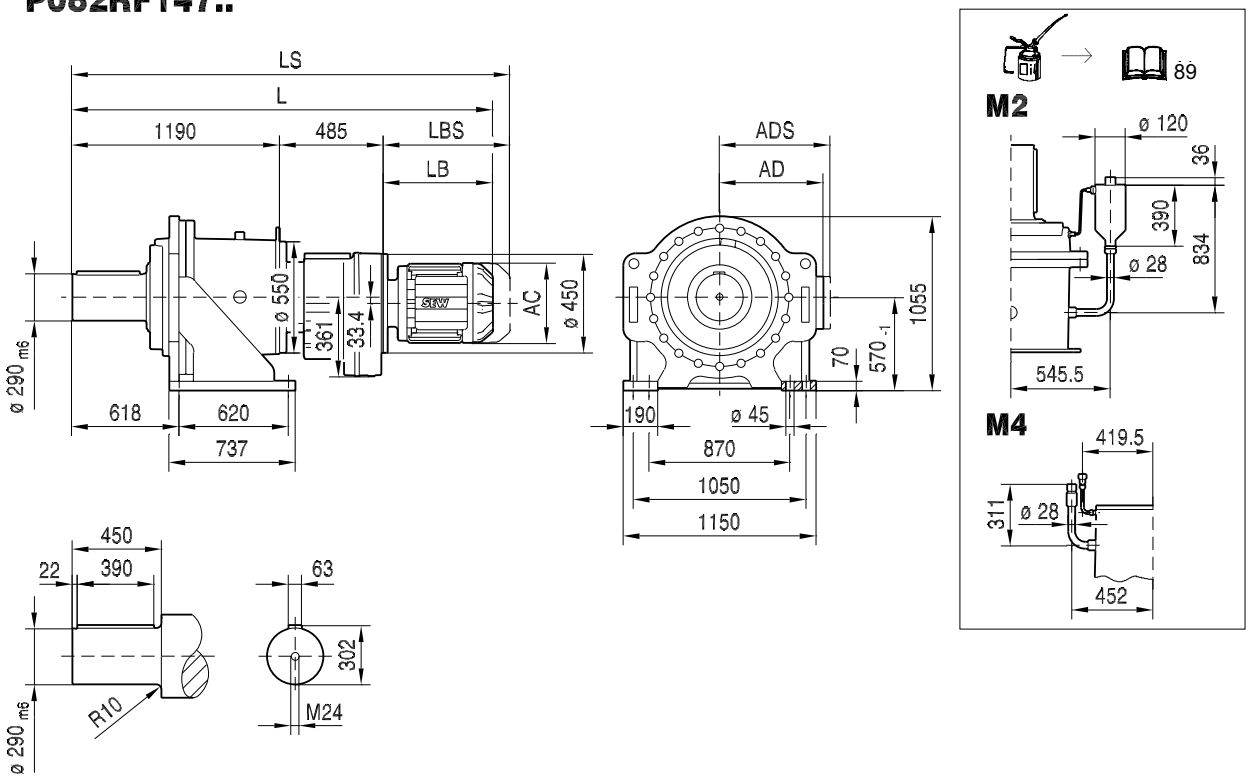


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2150	2173	2283	2257	2394	2394	2489	2591	2721
LS	2339	2362	2488	2462	2634	2634	2729	2842	2972
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

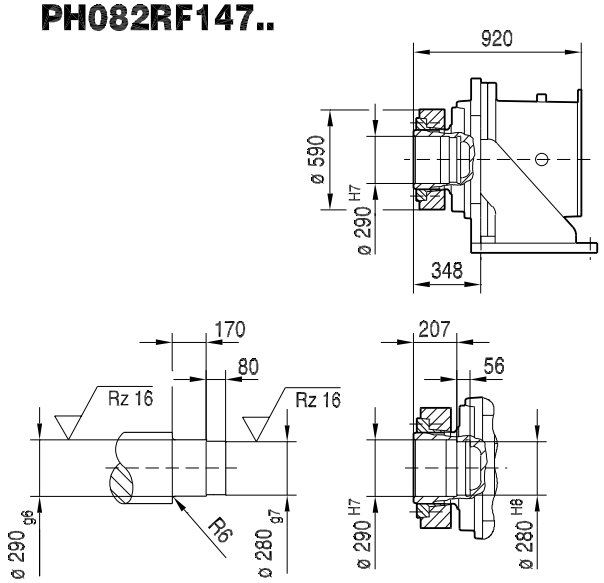
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P082RF147..

45 061 00 15



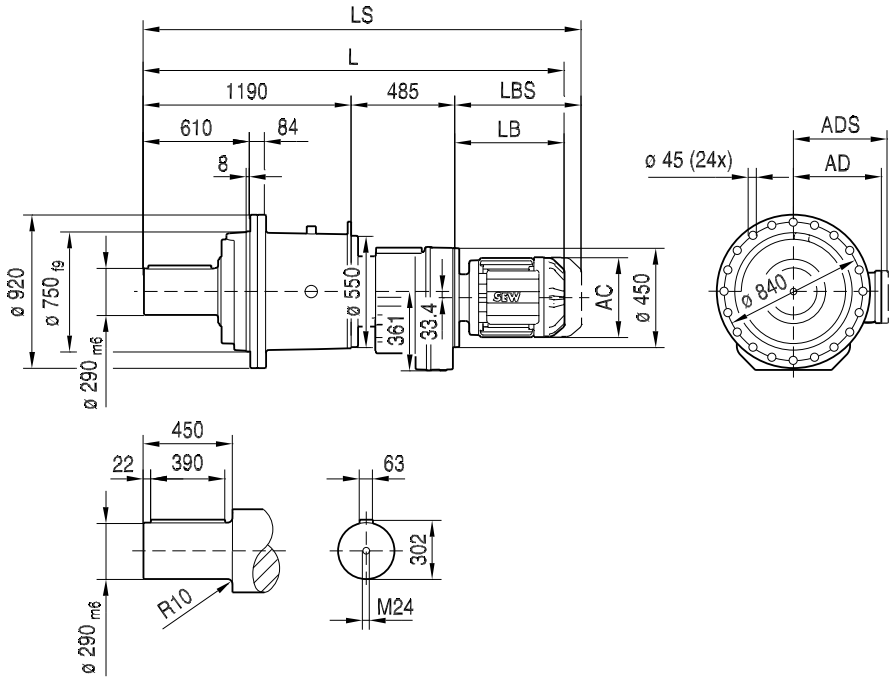
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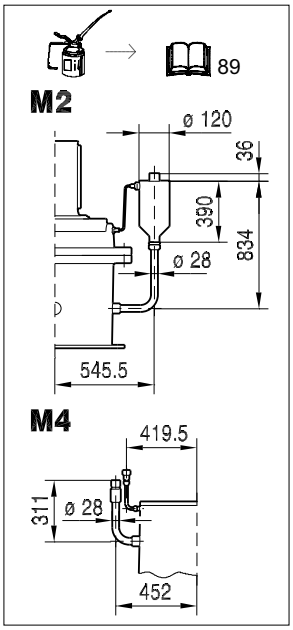
(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	2117	2183	2183	2206	2316	2290	2427	2427	2522	2624
LS	2254	2372	2372	2395	2521	2495	2667	2667	2762	2875
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

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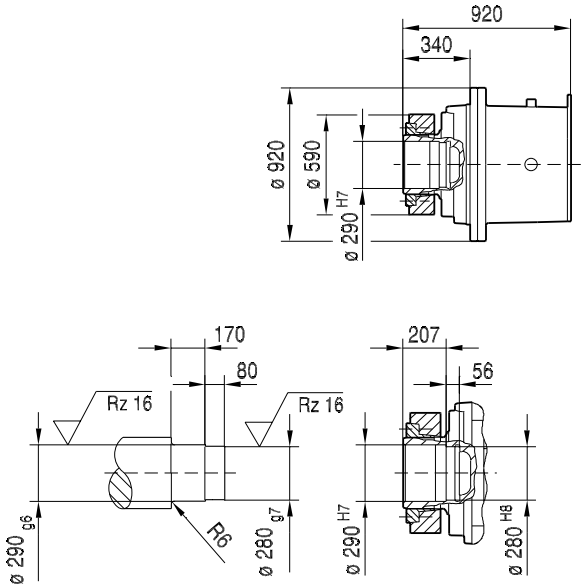
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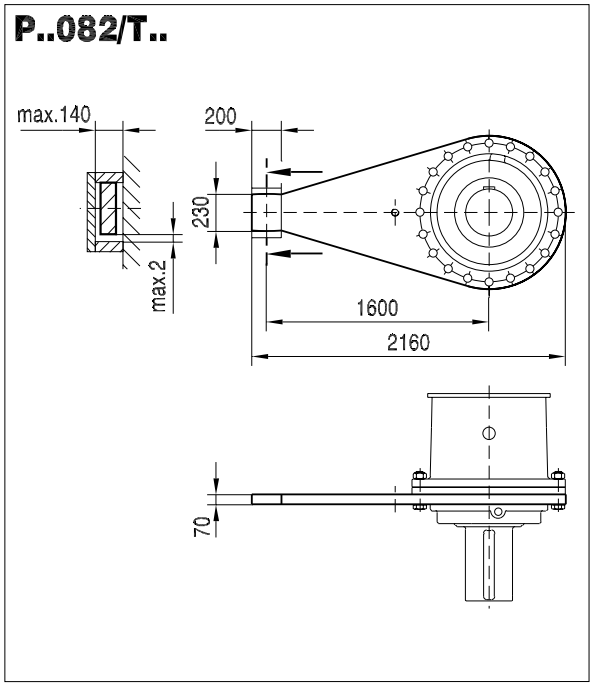
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P..082/T..

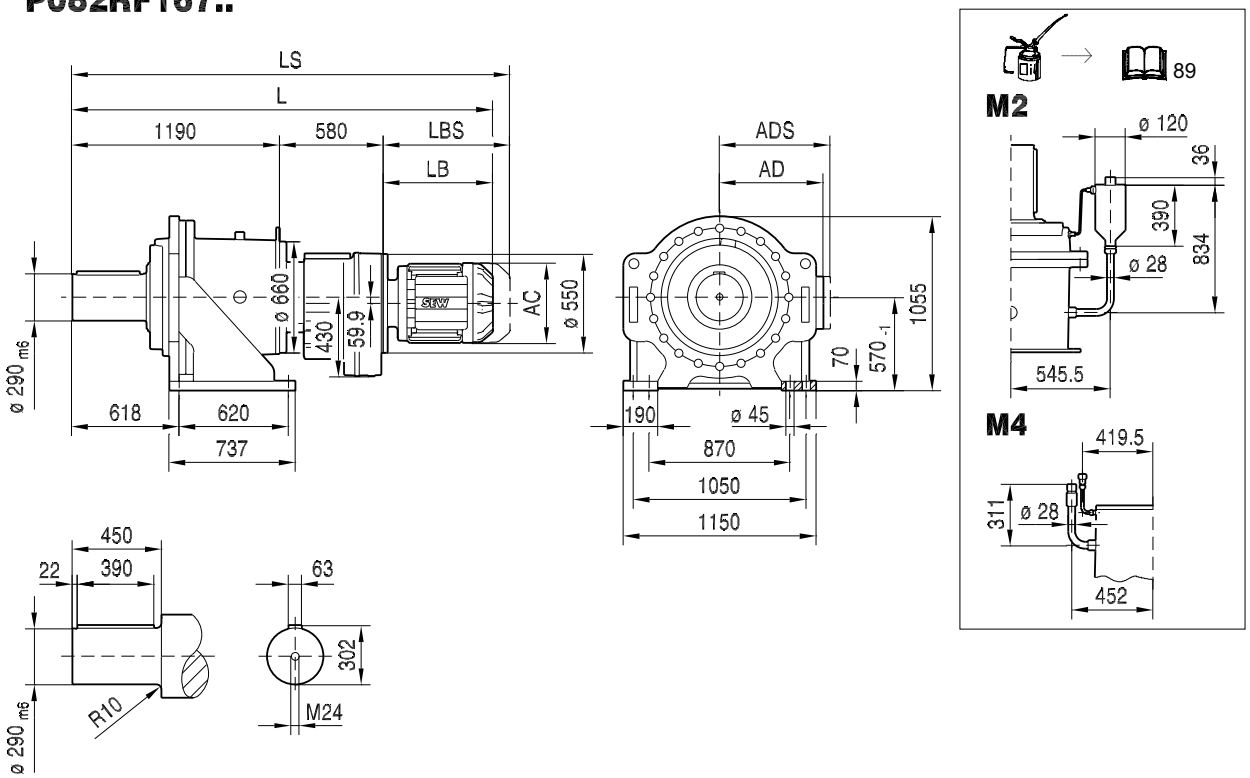


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	2117	2183	2183	2206	2316	2290	2427	2427	2522	2624
LS	2254	2372	2372	2395	2521	2495	2667	2667	2762	2875
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

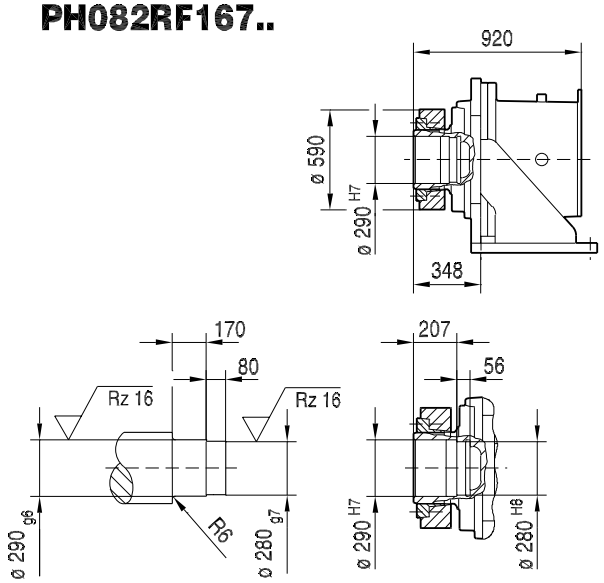
23488859/EN – 02/2017

P082RF167..

45 063 00 15



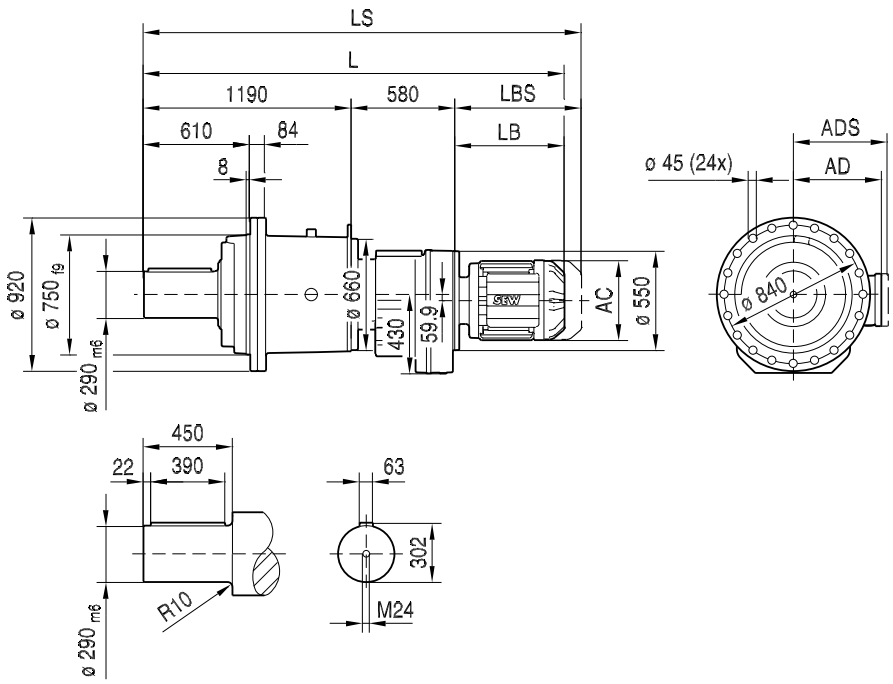
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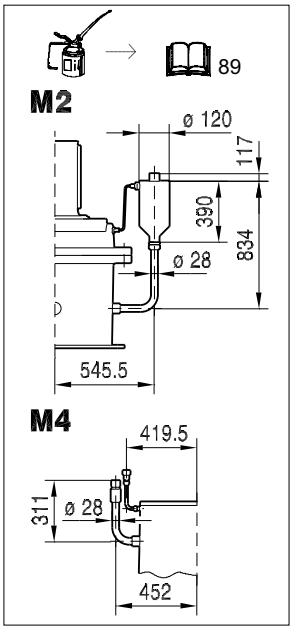
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2270	2293	2403	2377	2514	2514	2609	2711	2841
LS	2459	2482	2608	2582	2754	2754	2849	2962	3092
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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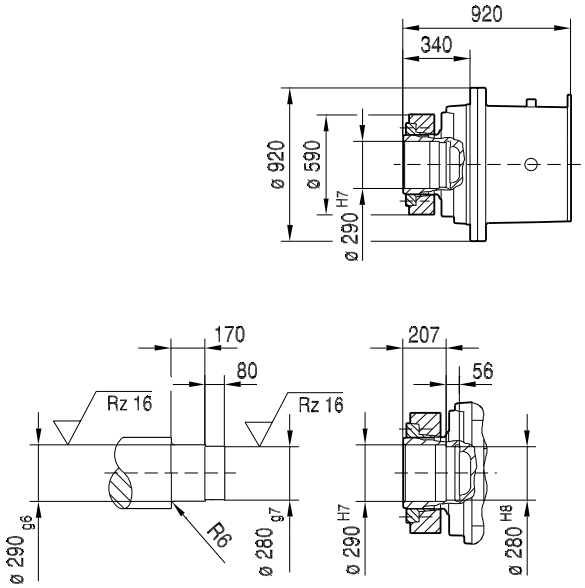
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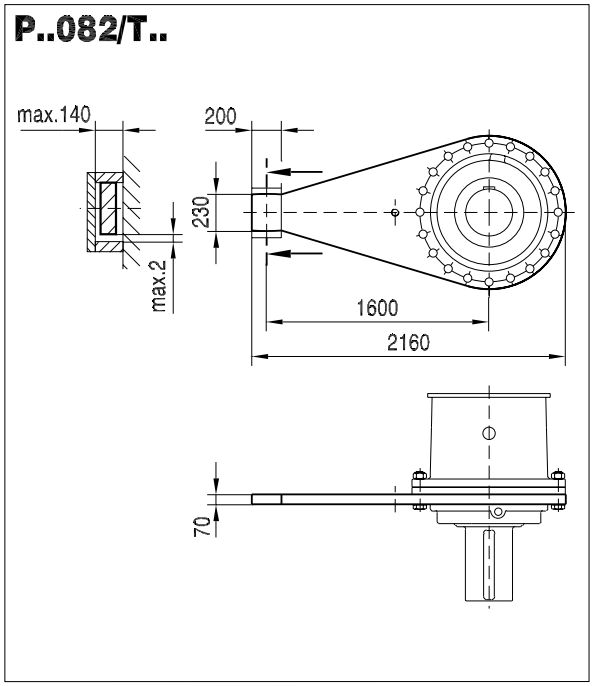
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PHF082RF167..



P..082/T..

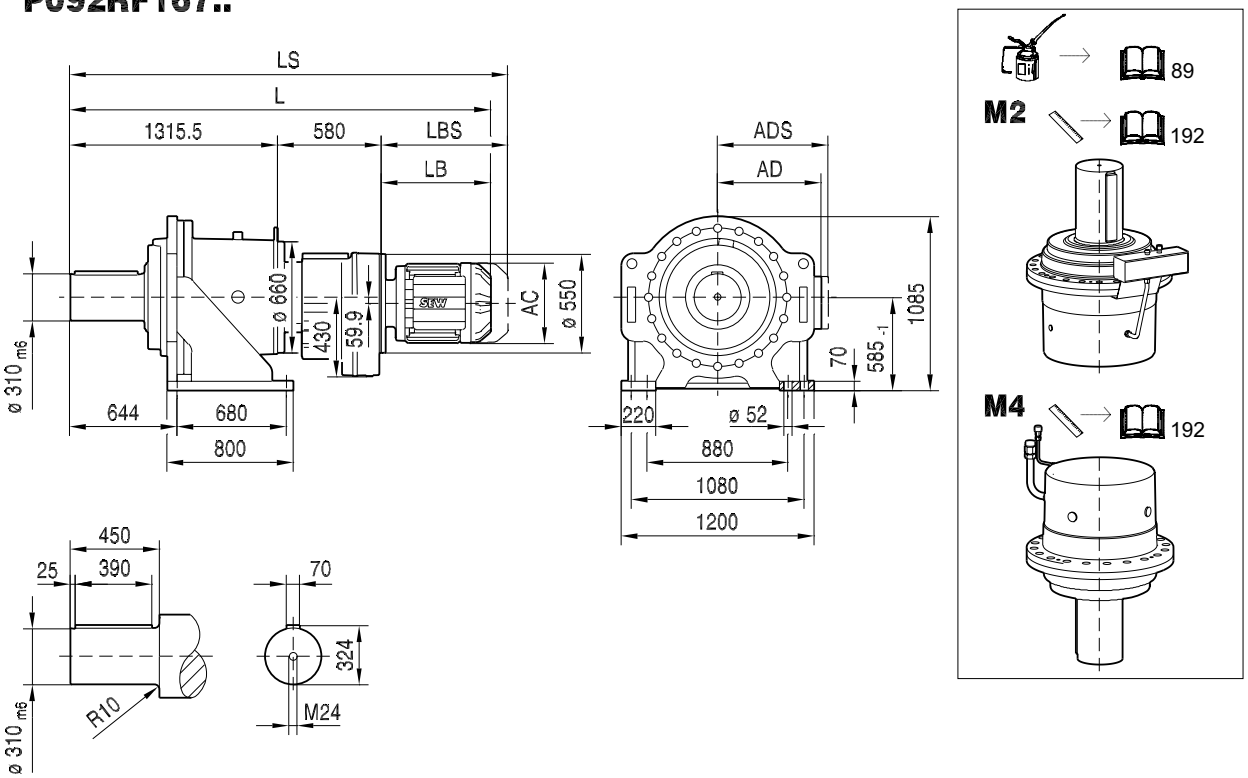


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2270	2293	2403	2377	2514	2514	2609	2711	2841
LS	2459	2482	2608	2582	2754	2754	2849	2962	3092
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

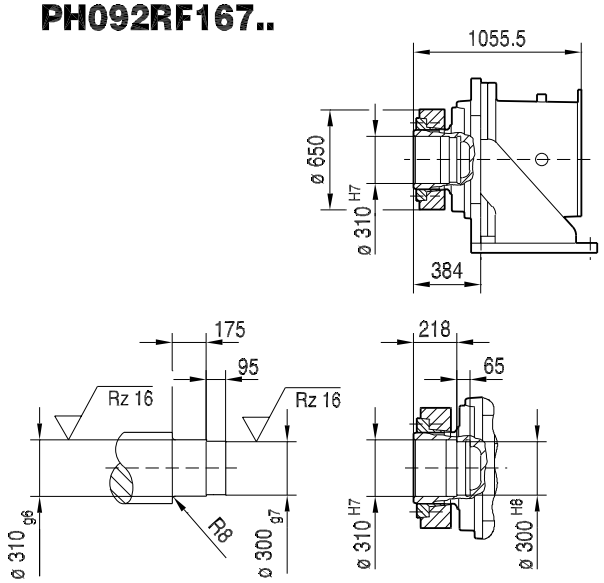
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P092RF167..

45 065 00 15



PH092RF167..

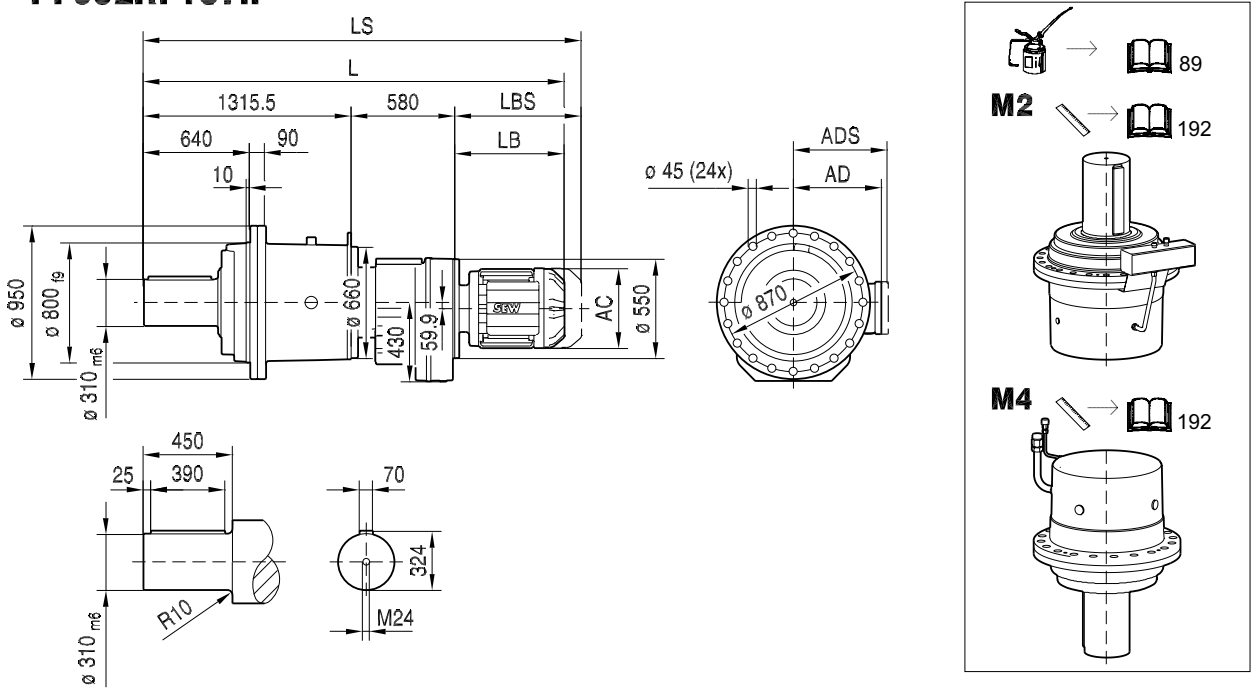


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2396	2419	2528	2503	2640	2640	2735	2837	2967
LS	2585	2608	2733	2708	2880	2880	2975	3088	3218
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

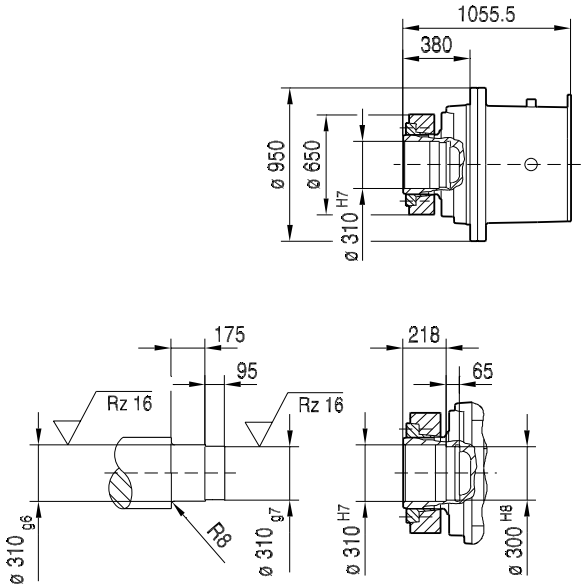
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PF092RF167..

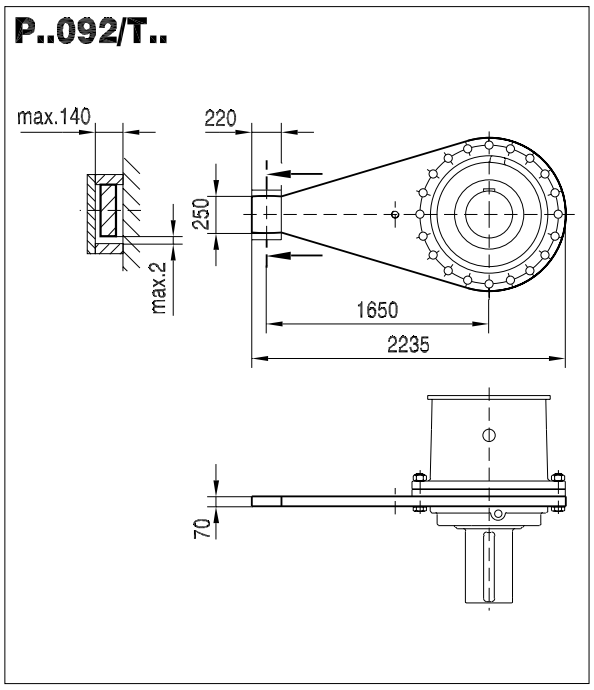
45 066 00 15



PHF092RF167..



P..092/T..

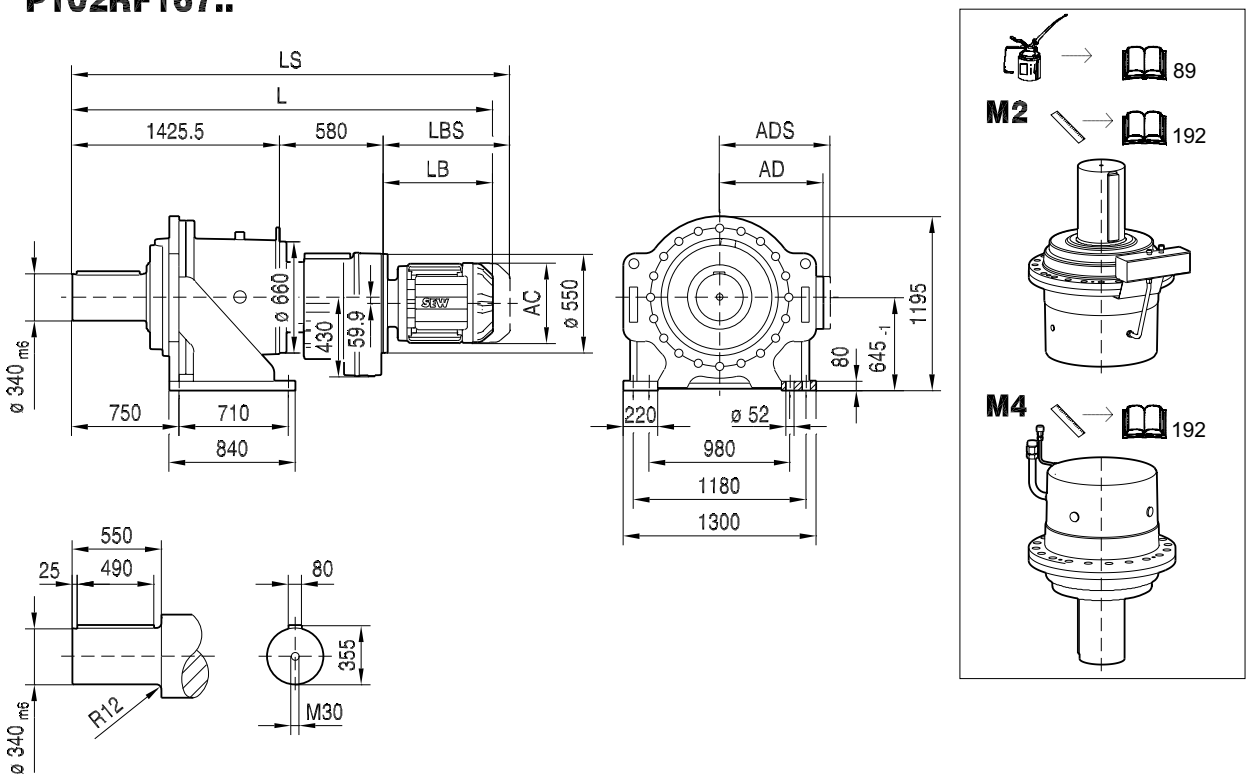


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2396	2419	2528	2503	2640	2640	2735	2837	2967
LS	2585	2608	2733	2708	2880	2880	2975	3088	3218
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

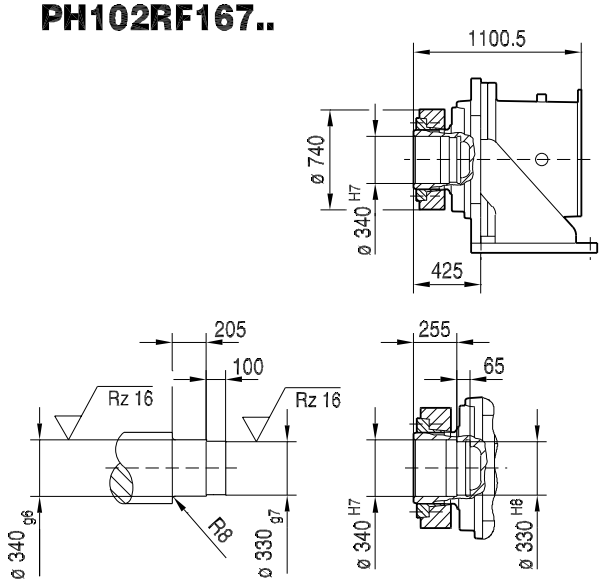
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P102RF167..

45 067 00 15



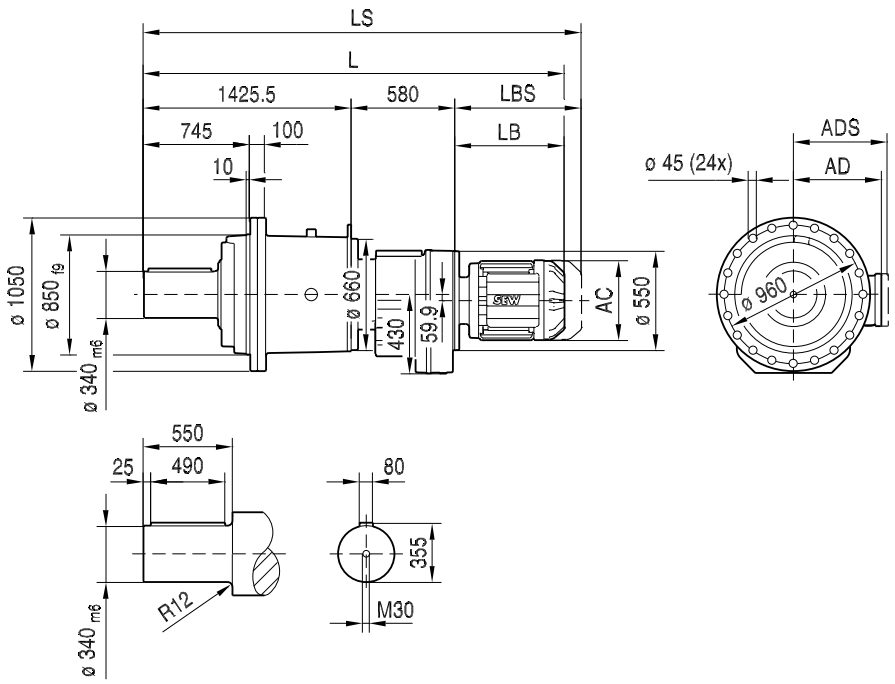
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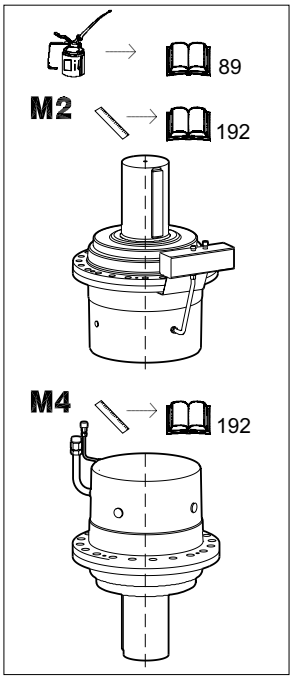
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2506	2529	2638	2613	2750	2750	2845	2947	3077
LS	2695	2718	2843	2818	2990	2990	3085	3198	3328
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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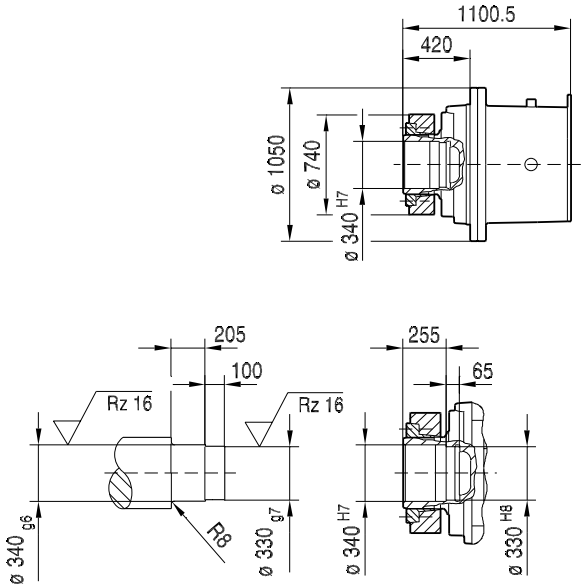
PF102RF167..



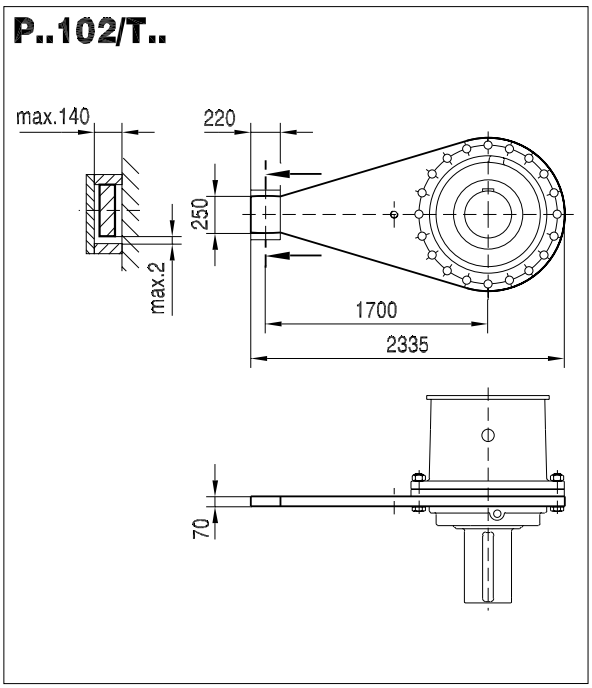
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PHF102RF167..



P..102/T..



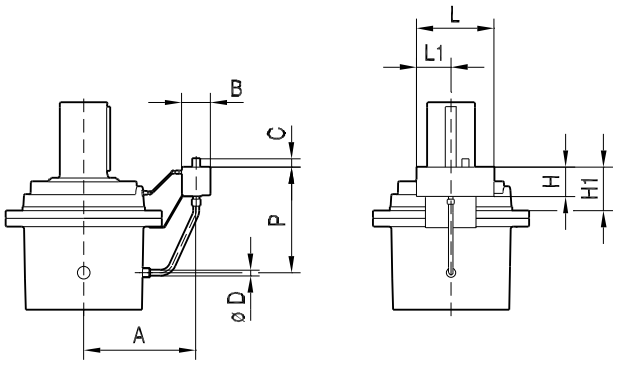
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	2506	2529	2638	2613	2750	2750	2845	2947	3077
LS	2695	2718	2843	2818	2990	2990	3085	3198	3328
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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10.4 Oil expansion tank for mounting position M2

45 015 00 11

P/PH/PF/PHF
M2

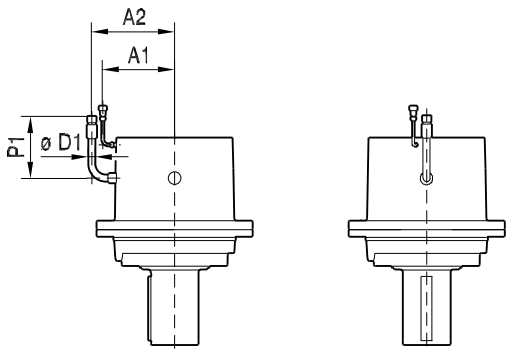


	A	B	C	Ø D	H	H1	L	L1	P
P.092	627.5	160	51	28	160	230	530	235	636.5
P.102	696.5	160	51	28	160	241	530	235	658.5

10.5 Oil expansion tank for mounting position M4

45 016 00 11

P/PH/PF/PHF
M4



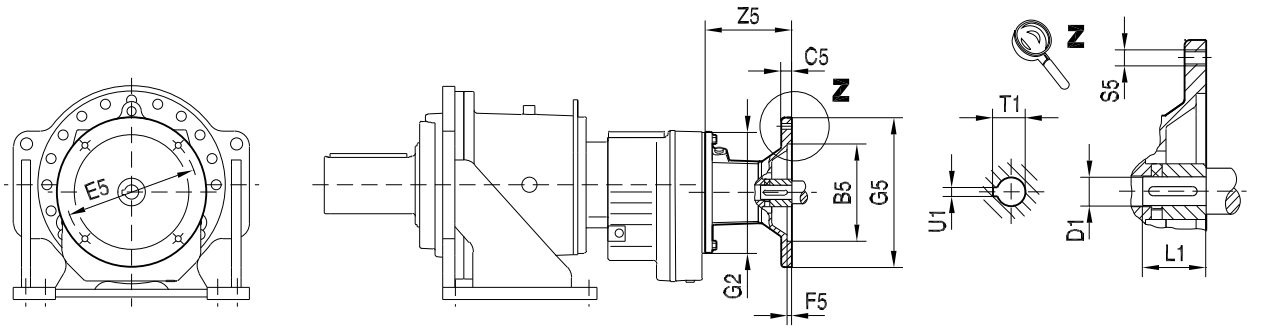
	A1	A2	Ø D1	P1
P.092	477	486	28	361
P.102	507	514	28	361

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10.6 AM adapters for mounting of IEC motors

P..RF..AM..

45 115 00 08



		B5	C5	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
P..RF77	AM63	95	10	115	3.5	200	140	M8	60	11	23	12.8	4
	AM71	110	10	130	3.5	200	160	M8	60	14	30	16.3	5
	AM80	130	12	165	4.5	200	200	M10	92	19	40	21.8	6
	AM90	130	12	165	4.5	200	200	M10	92	24	50	27.3	8
	AM100	180	15	215	5	200	250	M12	126	28	60	31.3	8
	AM112	180	15	215	5	200	250	M12	126	28	60	31.3	8
	AM132S/M	230	16	265	5	200	300	M12	179	38	80	41.3	10
	AM132ML	230	16	265	5	200	300	M12	179	38	80	41.3	10
P..RF87	AM80	130	12	165	4.5	250	200	M10	87	19	40	21.8	6
	AM90	130	12	165	4.5	250	200	M10	87	24	50	27.3	8
	AM100	180	15	215	5	250	250	M12	121	28	60	31.3	8
	AM112	180	15	215	5	250	250	M12	121	28	60	31.3	8
	AM132S/M	230	16	265	5	250	300	M12	174	38	80	41.3	10
	AM132ML	230	16	265	5	250	300	M12	174	38	80	41.3	10
	AM160	250	18	300	6	250	350	M16	232	42	110	45.3	12
	AM180	250	18	300	6	250	350	M16	232	48	110	51.8	14
P..RF97	AM100	180	15	215	5	300	250	M12	116	28	60	31.3	8
	AM112	180	15	215	5	300	250	M12	116	28	60	31.3	8
	AM132S/M	230	16	265	5	300	300	M12	169	38	80	41.3	10
	AM132ML	230	16	265	5	300	300	M12	169	38	80	41.3	10
	AM160	250	18	300	6	300	350	M16	227	42	110	45.3	12
	AM180	250	18	300	6	300	350	M16	227	48	110	51.8	14
	AM200	300	20	350	7	300	400	M16	268	55	110	59.3	16

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45 116 00 08

P..RF..AM..

Fig.1

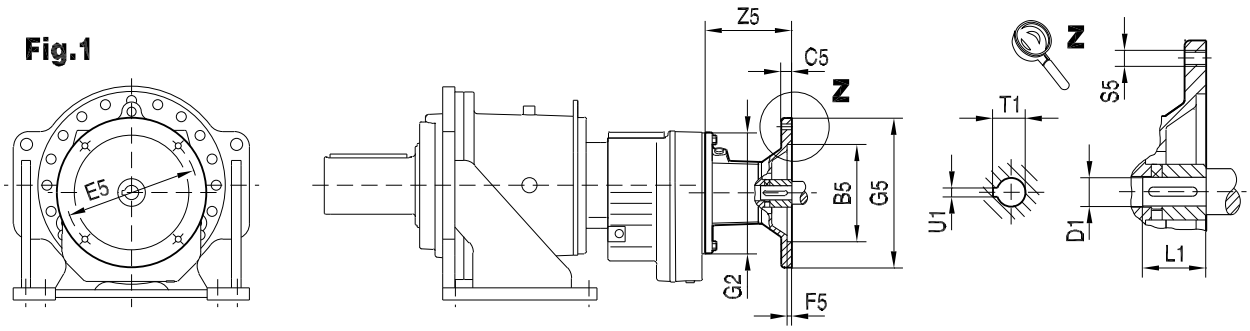


Fig.2

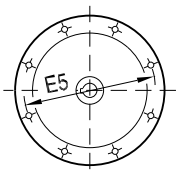
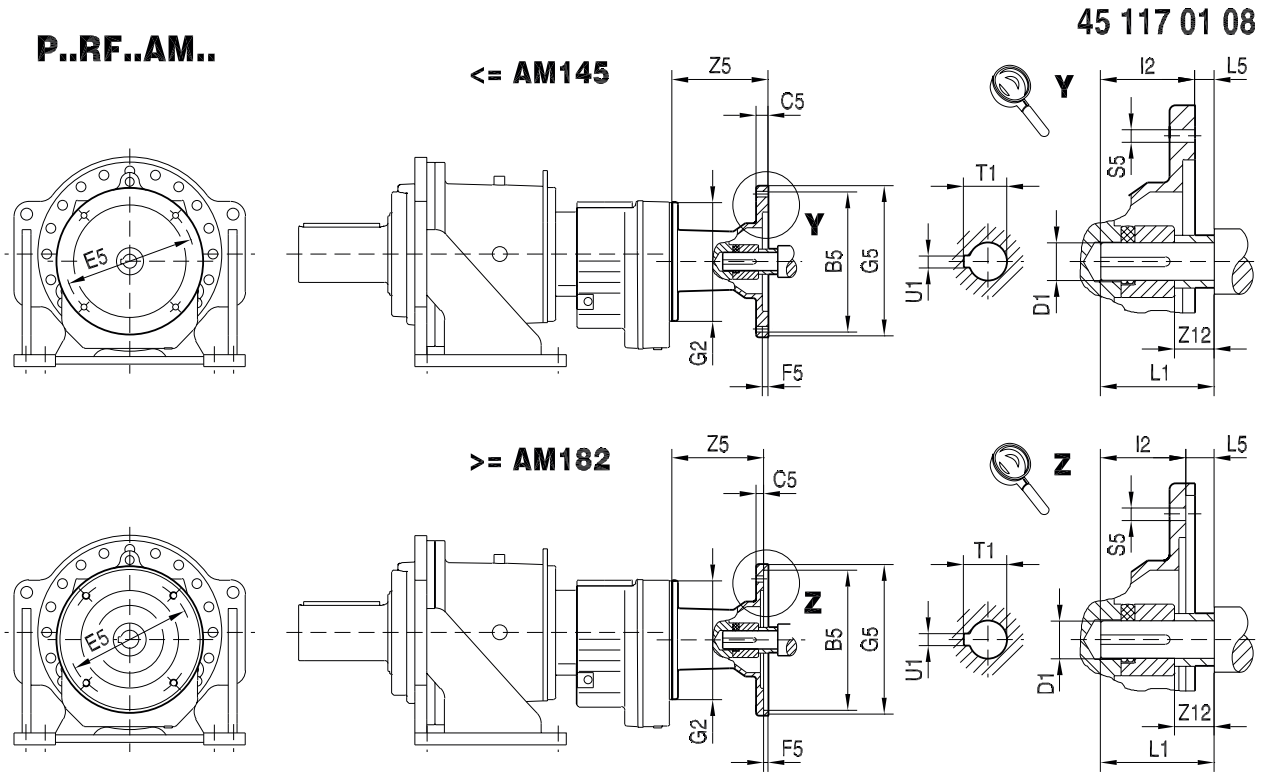


		Fig.	B5	C5	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
P..RF107	AM100	1	180	15	215	5	350	250	M12	110	28	60	31.3	8
	AM112	1	180	15	215	5	350	250	M12	110	28	60	31.3	8
	AM132S/M	1	230	16	265	5	350	300	M12	163	38	80	41.3	10
	AM132ML	1	230	16	265	5	350	300	M12	163	38	80	41.3	10
	AM160	1	250	18	300	6	350	350	M16	221	42	110	45.3	12
	AM180	1	250	18	300	6	350	350	M16	221	48	110	51.8	14
	AM200	1	300	20	350	7	350	400	M16	262	55	110	59.3	16
	AM225	2	350	22	400	7	350	450	M16	277	60	140	64.4	18
P..RF137	AM132S/M	1	230	16	265	5	400	300	M12	156	38	80	41.3	10
	AM132ML	1	230	16	265	5	400	300	M12	156	38	80	41.3	10
	AM160	1	250	18	300	5	400	350	M16	214	42	110	45.3	12
	AM180	1	250	18	300	5	400	350	M16	214	48	110	51.8	14
	AM200	1	300	20	350	7	400	400	M16	255	55	110	59.3	16
	AM225	2	350	22	400	7	400	450	M16	270	60	140	64.4	18
P..RF147	AM132S/M	1	230	16	265	5	450	300	M12	148	38	80	41.3	10
	AM132ML	1	230	16	265	5	450	300	M12	148	38	80	41.3	10
	AM160	1	250	18	300	6	450	350	M16	206	42	110	45.3	12
	AM180	1	250	18	300	6	450	350	M16	206	48	110	51.8	14
	AM200	1	300	20	350	7	450	400	M16	247	55	110	59.3	16
	AM225	2	350	22	400	7	450	450	M16	262	60	140	64.4	18
	AM250	2	450	25	500	7	450	550	M16	336	65	140	69.4	18
	AM280	2	450	25	500	7	450	550	M16	336	75	140	79.9	20
P..RF167	AM160	1	250	18	300	6	550	350	M16	198	42	110	45.3	12
	AM180	1	250	18	300	6	550	350	M16	198	48	110	51.8	14
	AM200	1	300	20	350	7	550	400	M16	239	55	110	59.3	16
	AM225	2	350	22	400	7	550	450	M16	254	60	140	64.4	18
	AM250	2	450	25	500	7	550	550	M16	328	65	140	69.4	18
	AM280	2	450	25	500	7	550	550	M16	328	75	140	79.9	20

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10.7 AM adapters for mounting of NEMA motors



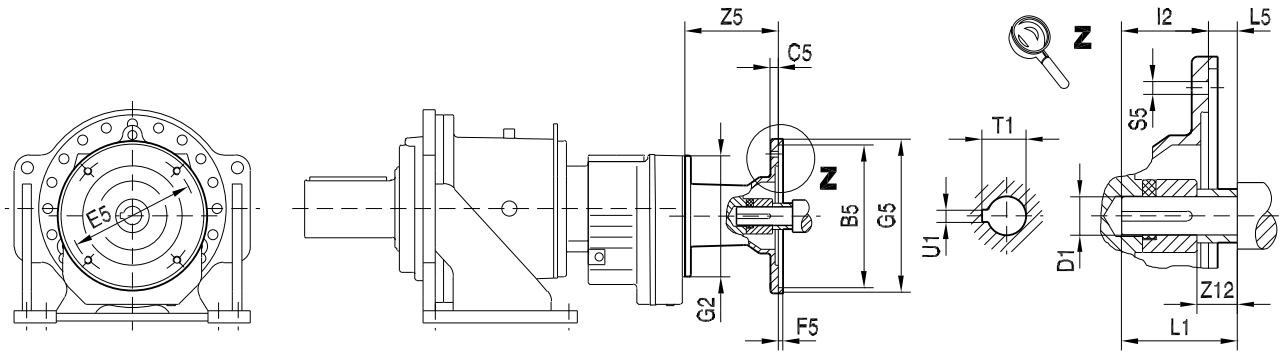
		B5	C5	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
P..RF77	AM56	114.3	11	149.2	4.5	200	170	52.55	-4.8	10.5	81	16.5	15.875	47	18.1	4.77
	AM143	114.3	12	149.2	4.5	200	170	54.1	3	10.5	103.5	14.5	22.225	57	24.7	4.77
	AM145	114.3	12	149.2	4.5	200	170	54.1	3	10.5	103.5	14.5	22.225	57	24.7	4.77
	AM182	215.9	10	184	5	200	228	66.75	3	15	139.5	16.5	28.575	69	31.7	6.35
	AM184	215.9	10	184	5	200	228	66.75	3	15	139.5	16.5	28.575	69	31.7	6.35
	AM213/215	215.9	11	184	5	200	228	79.55	6.3	15	188.5	15.8	34.925	85	38.7	7.94
P..RF87	AM143	114.3	12	149.2	4.5	250	170	54.1	3	10.5	98.5	14.5	22.225	57	24.7	4.77
	AM145	114.3	12	149.2	4.5	250	170	54.1	3	10.5	98.5	14.5	22.225	57	24.7	4.77
	AM182	215.9	10	184	5	250	228	66.75	3	15	134.5	16.5	28.575	69	31.7	6.35
	AM184	215.9	10	184	5	250	228	66.75	3	15	134.5	16.5	28.575	69	31.7	6.35
	AM213/215	215.9	11	184	5	250	228	79.55	6.3	15	183.5	15.8	34.925	85	38.7	7.94
	AM254/256	215.9	12	184	5	250	228	95.3	6.3	15	234	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5	250	286	111.05	6.3	15	241	15.8	47.625	117	53.4	12.7

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		B5	C5	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
P..RF97	AM182	215.9	10	184	5	300	228	66.75	3	15	129.5	16.5	28.575	69	24.7	6.35
	AM184	215.9	10	184	5	300	228	66.75	3	15	129.5	16.5	28.575	69	24.7	6.35
	AM213/215	215.9	11	184	5	300	228	79.55	6.3	15	178.5	15.8	34.925	85	38.7	7.94
	AM254/256	215.9	12	184	5	300	228	95.3	6.3	15	229	9	41.275	101	45.8	9.53
	AM284/286	266.7	20	228.6	5	300	286	111.05	6.3	15	236	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5	300	356	127.05	6.3	17.5	296	34.8	53.975	133	60	12.7
	AM364/365	317.5	17	279.4		300	356	143.05	6.3	17.5	296	34.8	60.325	149	67.6	15.875

P..RF..AM..

45 118 01 08



		B5	C5	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
P..RF107	AM182	215.9	10	184	5	350	228	66.75	3	15	123.5	16.5	28.575	69	31.7	6.35
	AM184	215.9	10	184	5	350	228	66.75	3	15	123.5	16.5	28.575	69	31.7	6.35
	AM213/215	215.9	11	184	5	350	228	79.55	6.3	15	172.5	15.8	34.925	85	38.7	7.94
	AM254/256	215.9	12	184	5	350	228	95.3	6.3	15	223	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5	350	286	111.05	6.3	15	230	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5	350	356	127.05	6.3	17.5	290	34.8	53.975	133	60	12.7
	AM364/365	317.5	17	279.4	5	350	356	143.05	6.3	17.5	290	34.8	60.325	149	67.6	15.875
P..RF137	AM213/215	215.9	11	184	5	400	228	79.55	6.3	15	165.5	15.8	34.925	85	38.7	7.94
	AM254/256	215.9	12	184	5	400	228	95.3	6.3	15	216	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5	400	286	111.05	6.3	15	223	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5	400	356	127.05	6.3	17.5	283	34.8	53.975	133	60	12.7
	AM364/365	317.5	17	279.4	5	400	356	143.05	6.3	17.5	283	34.8	60.325	149	67.6	15.875
P..RF147	AM213/215	215.9	11	184	5	450	228	79.55	6.3	15	157.5	15.8	34.925	85	38.7	7.94
	AM254/256	215.9	12	184	5	450	228	95.3	6.3	15	208	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5	450	286	111.05	6.3	15	215	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5	450	356	127.05	6.3	17.5	275	34.8	53.975	133	60	12.7
	AM364/365	317.5	17	279.4		450	356	143.05	6.3	17.5	275	34.8	60.325	149	67.6	15.875

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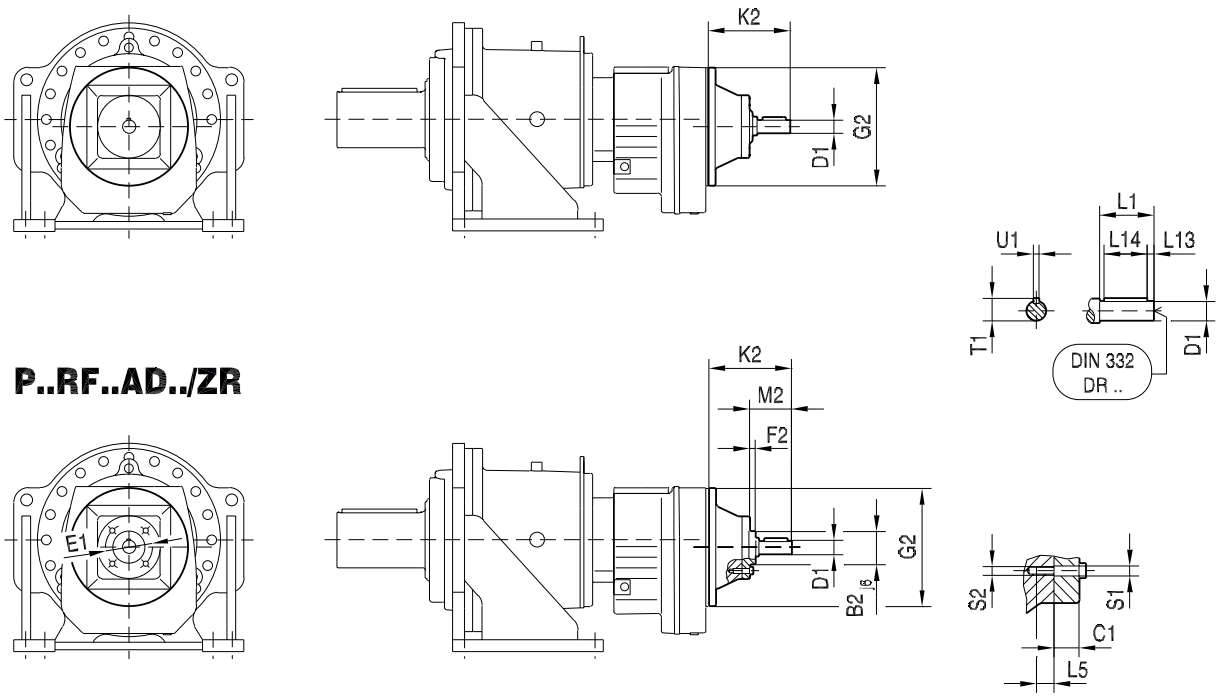
		B5	C5	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
P..RF167	AM254/256	215.9	12	184	5	550	228	95.3	6.3	15	200	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5	550	286	111.05	6.3	15	207	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5	550	356	127.05	6.3	17.5	267	34.8	53.975	133	60	12.7
	AM364/365	317.5	17	279.4		550	356	143.05	6.3	17.5	267	34.8	60.325	149	67.6	15.875

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10.8 AD input shaft assembly

P..RF..AD..

45 121 01 08

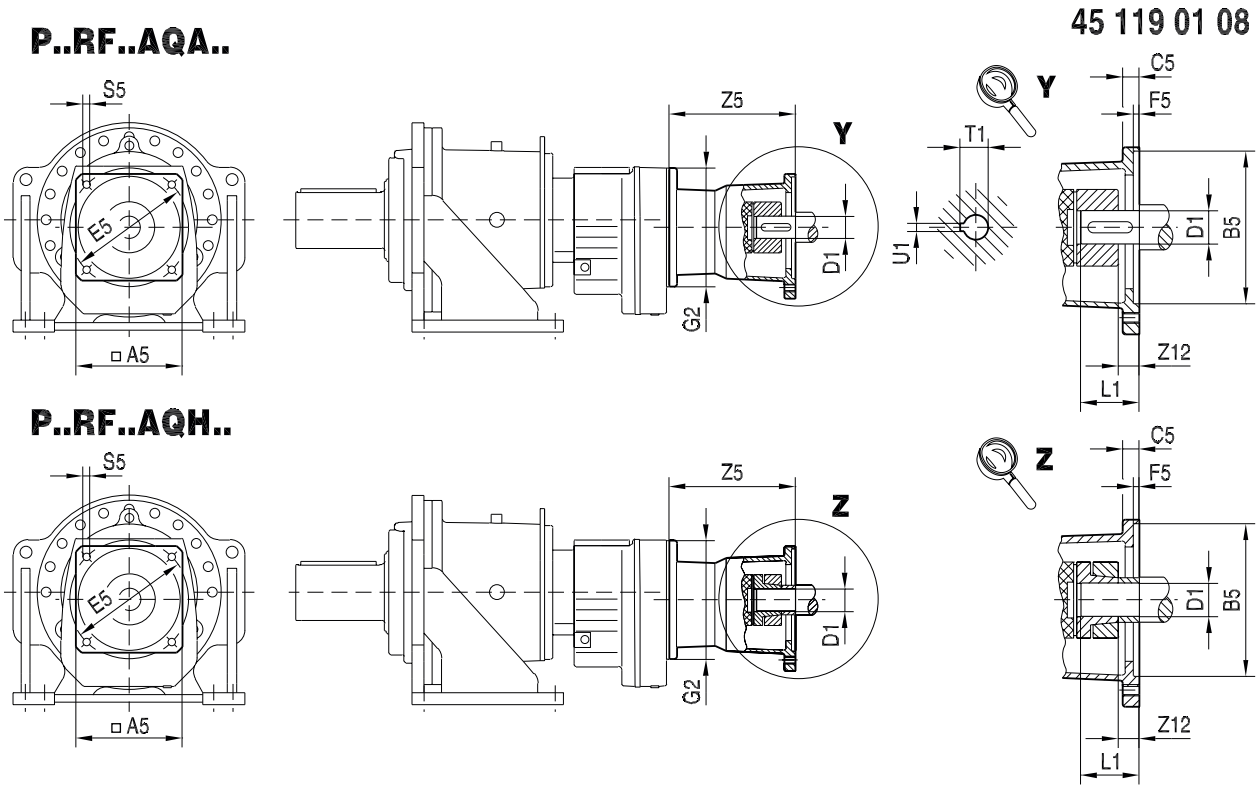


P..RF..AD../ZR

		B2	C1	E1	F2	G2	K2	L5	M2	S1	S2	D1	L1	L13	L14	T1	U1
P..RF77	AD2, AD2/ZR	55	13.5	80	8	200	116	12	50	9	M8	19	40	4	32	21.5	6
	AD3, AD3/ZR	70	15.5	105	8		151	16	60	11	M10	24	50	5	40	27	8
	AD4, AD4/ZR	100	16	130	13		224	20	95.5	13.5	M12	38	80	5	70	41	10
P..RF87	AD2, AD2/ZR	55	13.5	80	8	250	111	12	50	9	M8	19	40	4	32	21.5	6
	AD3, AD3/ZR	70	15.5	105	8		156	16	60	11	M10	28	60	5	50	31	8
	AD4, AD4/ZR	100	16	130	13		219	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5, AD5/ZR	120	24	180	11		292	20	126	13.5	M12	42	110	10	70	45	12
P..RF97	AD3, AD3/ZR	70	15.5	105	8	300	151	16	60	11	M10	28	60	5	50	31	8
	AD4, AD4/ZR	100	16	130	13		214	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5, AD5/ZR	120	24	180	11		287	20	126	13.5	M12	42	110	10	70	45	12
	AD6, AD6/ZR	130	22.5	200	11		327	26	130.5	17.5	M16	48	110	10	80	51.5	14
P..RF107	AD3, AD3/ZR	70	15.5	105	8	350	145	16	60	11	M10	28	60	5	50	31	8
	AD4, AD4/ZR	100	16	130	13		208	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5, AD5/ZR	120	24	180	11		281	20	126	13.5	M12	42	110	10	70	45	12
	AD6, AD6/ZR	130	22.5	200	11		321	26	130.5	17.5	M16	48	110	10	80	51.5	14
P..RF137	AD4, AD4/ZR	100	16	130	13	400	201	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5, AD5/ZR	120	24	180	11		274	20	126	13.5	M12	42	110	10	70	45	12
	AD6, AD6/ZR	130	22.5	200	11		314	26	130.5	17.5	M16	48	110	10	80	51.5	14
	AD7, AD7/ZR	125	19	190	13		308	30	133	22	M20	55	110	10	90	59	16
P..RF147	AD4, AD4/ZR	100	16	130	13	450	193	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5, AD5/ZR	120	24	180	11		266	20	126	13.5	M12	42	110	10	70	45	12
	AD6, AD6/ZR	130	22.5	200	11		306	26	130.5	17.5	M16	48	110	10	80	51.5	14
	AD7, AD7/ZR	125	19	190	13		300	30	133	22	M20	55	110	10	90	59	16
	AD8, AD8/ZR	120	22.5	210	5		383	19.5	155	13.5	M12	70	140	15	110	74.5	20
P..RF167	AD5, AD5/ZR	120	24	180	11	550	258	20	126	13.5	M12	42	110	10	70	45	12
	AD6, AD6/ZR	130	22.5	200	11		298	26	130.5	17.5	M16	48	110	10	80	51.5	14
	AD7, AD7/ZR	125	19	190	13		292	30	133	22	M20	55	110	10	90	59	16
	AD8, AD8/ZR	120	22.5	210	5		374	19.5	155	13.5	M12	70	140	15	110	74.5	20

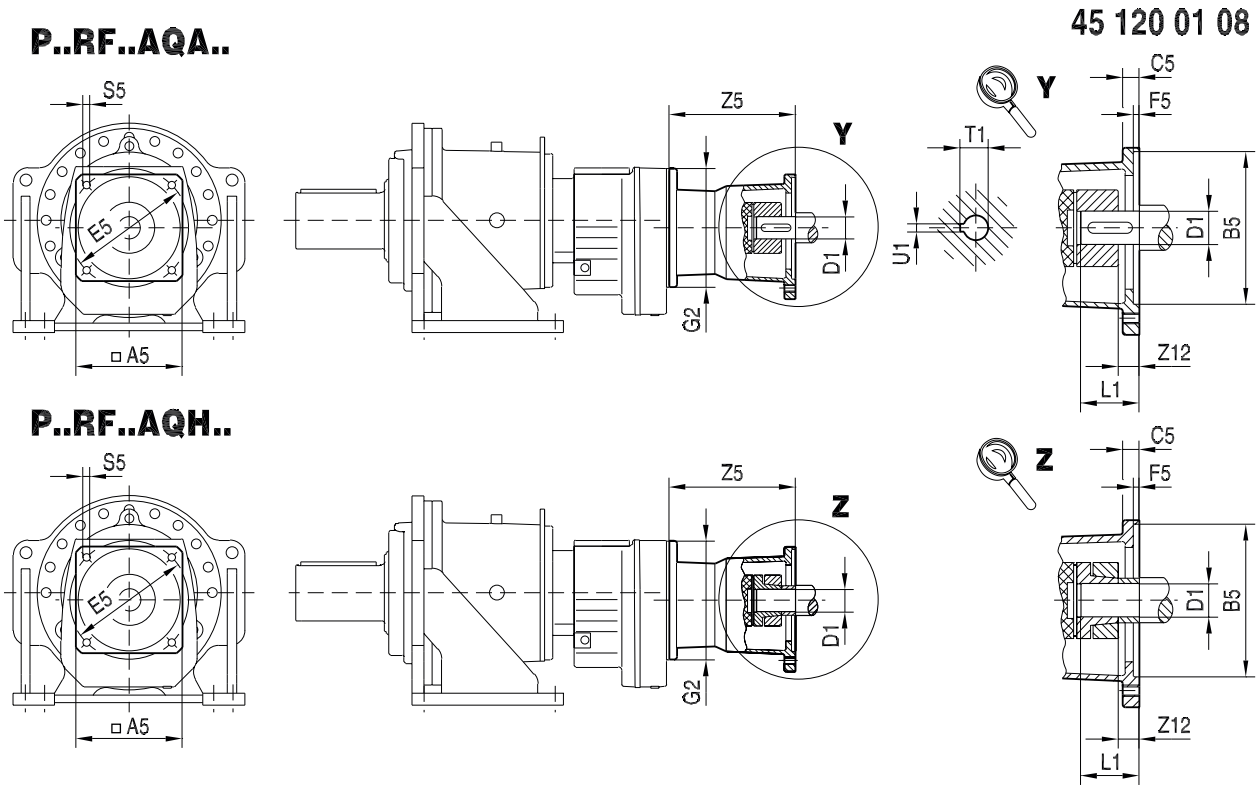
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10.9 AQA motor adapter



		A5	B5	C5	E5	F5	G2	S5	Z5	AQA Z12	AQH Z12	D1	L1	T1	U1
P..RF77	AQ..80/1	82	60	8	75	3.5	200	M5	92	5.5	5.5	11	23	12.8	4
	AQ..80/2	82	60	8	75	3.5	200	M5	92	5.5	5.5	14	30	16.3	5
	AQ..80/3	82	50	8	95	3	200	M6	92	5.5	5.5	14	30	16.3	5
	AQ..100/1	100	80	10	100	4	200	M6	116	0	0	14	30	16.3	5
	AQ..100/2	100	95	12	115	4	200	M8	116	0	0	14	30	16.3	5
	AQ..100/3	100	80	10	100	4	200	M6	130	2	14	19	40	21.8	6
	AQ..100/4	100	95	12	115	4	200	M8	130	2	14	19	40	21.8	6
	AQ..115/1	115	95	12	130	5	200	M8	139	11	23	19	40	21.8	6
	AQ..115/2	115	110	12	130	5	200	M8	139	11	23	19	40	21.8	6
	AQ..115/3	115	110	12	130	5	200	M8	139	16	16	24	50	27.3	8
	AQ..140/1	140	110	15	165	5	200	M10	167	16	16	24	50	27.3	8
	AQ..140/2	140	130	15	165	5	200	M10	167	16	16	24	50	27.3	8
	AQ..140/3	140	130	15	165	5	200	M10	180	22	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5	200	M12	225.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	16	215	5	200	M12	225.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	16	215	5	200	M12	249.5	34	34	38	80	41.3	10
P..RF87	AQ..100/1	100	80	10	100	4	250	M6	111	0	0	14	30	16.3	5
	AQ..100/2	100	95	12	115	4	250	M8	111	0	0	14	30	16.3	5
	AQ..100/3	100	80	10	100	4	250	M6	125	2	14	19	40	21.8	6
	AQ..100/4	100	95	12	115	4	250	M8	125	2	14	19	40	21.8	6
	AQ..115/1	115	95	12	130	5	250	M8	134	11	23	19	40	21.8	6
	AQ..115/2	115	110	12	130	5	250	M8	134	11	23	19	40	21.8	6
	AQ..115/3	115	110	12	130	5	250	M8	134	16	16	24	50	27.3	8
	AQ..140/1	140	110	15	165	5	250	M10	162	16	16	24	50	27.3	8
	AQ..140/2	140	130	15	165	5	250	M10	162	16	16	24	50	27.3	8
	AQ..140/3	140	130	15	165	5	250	M10	175	22	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5	250	M12	220.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	16	215	5	250	M12	220.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	16	215	5	250	M12	244.5	34	34	38	80	41.3	10

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		A5	B5	C5	E5	F5	G2	S5	Z5	AQA Z12	AQH Z12	D1	L1	T1	AU1
P..RF97	AQ..140/1	140	110	15	165	5	300	M10	157	16	16	24	50	27.3	8
	AQ..140/2		130												
	AQ..140/3								170	22	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5		M12	215.5	24	24	32	60	35.3	10
	AQ..190/2		180												
	AQ..190/3								239.5	34	34	38	80	41.3	10
P..RF107	AQ..140/1	140	110	15	165	5	350	M10	151	16	16	24	50	27.3	8
	AQ..140/2		130												
	AQ..140/3								164	22	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5		M12	209.5	24	24	32	60	35.3	10
	AQ..190/2		180												
	AQ..190/3								233.5	34	34	38	80	41.3	10
P..RF137	AQ..190/1	190	130	16	215	5	400	M12	202.5	24	25	32	60	35.3	10
	AQ..190/2		180												
	AQ..190/3								226.5	34	34	38	80	41.3	10
P..RF147	AQ..190/1	190	130	16	215	5	450	M12	194.5	24	24	32	60	35.3	10
	AQ..190/2		180												
	AQ..190/3								218.5	34	34	38	80	41.3	10

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11 P..KF.. bevel planetary gearmotors

11.1 Guide to the dimension sheets

11.1.1 P.. foot-mounted gear units

Size	Dimension sheet/page number								
	KF67	KF77	KF87	KF97	KF107	KF127	KF157	K167	K187
P002	228	230	232	234	-	-	-	-	-
P012	-	236	238	240	242	-	-	-	-
P022	-	-	244	246	248	-	-	-	-
P032	-	-	250	252	254	256	-	-	-
P042	-	-	-	258	260	262	-	-	-
P052	-	-	-	264	266	268	-	-	-
P062	-	-	-	-	270	272	-	-	-
P072	-	-	-	-	-	274	276	-	-
P082	-	-	-	-	-	-	278	-	-
P092	-	-	-	-	-	-	280	282	284
P102	-	-	-	-	-	-	-	286	288

11.1.2 PF.. flange-mounted gear units

Size	Dimension sheet/page number								
	KF67	KF77	KF87	KF97	KF107	KF127	KF157	K167	K187
PF002	229	231	233	235	-	-	-	-	-
PF012	-	237	239	241	243	-	-	-	-
PF022	-	-	245	247	249	-	-	-	-
PF032	-	-	251	253	255	257	-	-	-
PF042	-	-	-	259	261	263	-	-	-
PF052	-	-	-	265	267	269	-	-	-
PF062	-	-	-	-	271	273	-	-	-
PF072	-	-	-	-	-	275	277	-	-
PF082	-	-	-	-	-	-	279	-	-
PF092	-	-	-	-	-	-	281	283	285
PF102	-	-	-	-	-	-	-	287	289

11.1.3 Motor adapter

	Dimension sheet/page number							
	KF77	KF87	KF97	KF107	KF127	KF157	K167	K187
Adapter for mounting IEC motors P..KF..AM..	292	292	292	293	293	293	293	294
Adapter for mounting NEMA motors P..KF..AM..	295	295	296	296	296	296	296	296
Input shaft assembly P..KF..AD..	297	297	297	297	297	297	297	297
AQA motor adapter	298	298	299	299	-	-	-	-

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11.2 Selection tables K.. (60 Hz)

P_m = 0.75 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.43	16100	4029	156000	46200	36810	**P**	**012KF87**	**DRN**	**80M4**	435	238
						PF	**012KF87**	**DRN**	**80M4**	365	239
						PH	**012KF87**	**DRN**	**80M4**	450	238
						PHF	**012KF87**	**DRN**	**80M4**	380	239
0.50	13900	3490	156000	46200	36810	**P**	**012KF77**	**DRN**	**80M4**	400	236
0.57	12200	3063	156000	46200	36810	**PF**	**012KF77**	**DRN**	**80M4**	330	237
						PH	**012KF77**	**DRN**	**80M4**	410	236
						PHF	**012KF77**	**DRN**	**80M4**	340	237
0.46	15200	3793	124000	29200	24830	**P**	**002KF77**	**DRN**	**80M4**	320	230
						PF	**002KF77**	**DRN**	**80M4**	260	231
						PH	**002KF77**	**DRN**	**80M4**	320	230
						PHF	**002KF77**	**DRN**	**80M4**	265	231
0.50	14100	3519	124000	-	24830						
0.59	11900	2984	124000	-	24830						
0.65	10800	2694	124000	-	24830	**P**	**002KF67**	**DRN**	**80M4**	285	228
0.74	9500	2371	124000	-	24830	**PF**	**002KF67**	**DRN**	**80M4**	230	229
0.78	8970	2238	124000	-	24830	**PH**	**002KF67**	**DRN**	**80M4**	290	228
0.92	7640	1906	124000	-	24830	**PHF**	**002KF67**	**DRN**	**80M4**	235	229
1.0	6940	1732	124000	-	24830						
1.2	6010	1500	124000	-	24830						

P_m = 1.1 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.44	23500	4029	197000	-	51190	**P**	**022KF87**	**DRN**	**90S4**	590	244
0.52	19700	3387	197000	-	51190	**PF**	**022KF87**	**DRN**	**90S4**	485	245
0.57	18100	3113	197000	-	51190	**PH**	**022KF87**	**DRN**	**90S4**	600	244
						PHF	**022KF87**	**DRN**	**90S4**	500	245
0.44	23500	4029	156000	46200	36810	**P**	**012KF87**	**DRN**	**90S4**	440	238
0.64	16100	2764	156000	46200	36810	**PF**	**012KF87**	**DRN**	**90S4**	370	239
						PH	**012KF87**	**DRN**	**90S4**	455	238
						PHF	**012KF87**	**DRN**	**90S4**	385	239
0.46	22200	3807	156000	46200	36810						
0.50	20300	3490	156000	46200	36810						
0.58	17800	3063	156000	46200	36810	**P**	**012KF77**	**DRN**	**90S4**	405	236
0.69	14800	2540	156000	46200	36810	**PF**	**012KF77**	**DRN**	**90S4**	335	237
0.77	13300	2289	156000	46200	36810	**PH**	**012KF77**	**DRN**	**90S4**	415	236
0.88	11700	2008	156000	46200	36810	**PHF**	**012KF77**	**DRN**	**90S4**	345	237
0.99	10300	1772	156000	46200	36810						
0.58	17800	3051	123900	29200	24830	**P**	**002KF77**	**DRN**	**90S4**	325	230
0.61	16800	2891	124000	29200	24830	**PF**	**002KF77**	**DRN**	**90S4**	265	231
						PH	**002KF77**	**DRN**	**90S4**	325	230
						PHF	**002KF77**	**DRN**	**90S4**	270	231
0.74	13800	2371	124000	-	24830						
0.79	13000	2238	124000	-	24830						
0.92	11100	1906	124000	-	24830						
1.0	10100	1732	124000	-	24830	**P**	**002KF67**	**DRN**	**90S4**	295	228
1.2	8760	1500	124000	-	24830	**PF**	**002KF67**	**DRN**	**90S4**	235	229
1.3	8130	1392	124000	-	24830	**PH**	**002KF67**	**DRN**	**90S4**	295	228
1.5	6890	1181	124000	-	24830	**PHF**	**002KF67**	**DRN**	**90S4**	240	229
1.6	6220	1066	124000	-	24830						
1.9	5470	938	124000	-	24830						

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P_m = 1.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.44	32000	4029	197000	-	51190	**P**	**022KF87**	**DRN**	**90L4**	590	244
0.52	26900	3387	197000	-	51190	**PF**	**022KF87**	**DRN**	**90L4**	490	245
0.57	24700	3113	197000	-	51190	**PH**	**022KF87**	**DRN**	**90L4**	610	244
						PHF	**022KF87**	**DRN**	**90L4**	500	245
0.44	32000	4029	156000	46200	36810	**P**	**012KF87**	**DRN**	**90L4**	445	238
0.64	21900	2764	156000	46200	36810	**PF**	**012KF87**	**DRN**	**90L4**	375	239
						PH	**012KF87**	**DRN**	**90L4**	455	238
						PHF	**012KF87**	**DRN**	**90L4**	385	239
0.51	27700	3490	156000	46200	36810						
0.58	24300	3063	156000	46200	36810						
0.61	23000	2903	156000	46200	36810	**P**	**012KF77**	**DRN**	**90L4**	405	236
0.70	20100	2540	156000	46200	36810	**PF**	**012KF77**	**DRN**	**90L4**	335	237
0.77	18100	2289	156000	46200	36810	**PH**	**012KF77**	**DRN**	**90L4**	420	236
0.88	15900	2008	156000	46200	36810	**PHF**	**012KF77**	**DRN**	**90L4**	350	237
1.0	14000	1772	156000	46200	36810						
0.78	18100	2280	123700	29200	24830	**P**	**002KF77**	**DRN**	**90L4**	325	230
0.88	15800	2000	124000	29200	24830	**PF**	**002KF77**	**DRN**	**90L4**	270	231
						PH	**002KF77**	**DRN**	**90L4**	330	230
						PHF	**002KF77**	**DRN**	**90L4**	270	231
1.0	13700	1732	124000	-	24830						
1.2	11900	1500	124000	-	24830						
1.3	11000	1392	124000	-	24830	**P**	**002KF67**	**DRN**	**90L4**	295	228
1.5	9370	1181	124000	-	24830	**PF**	**002KF67**	**DRN**	**90L4**	240	229
1.7	8460	1066	124000	-	24830	**PH**	**002KF67**	**DRN**	**90L4**	300	228
1.9	7440	938	124000	-	24830	**PHF**	**002KF67**	**DRN**	**90L4**	245	229
2.0	7030	886	124000	-	24830						
2.3	5980	754	124000	-	24830						

P_m = 2.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.43	48100	4124	246900	86800	69620	**P**	**032KF97**	**DRN**	**100L4**	760	252
0.46	44300	3797	250300	86800	69620	**PF**	**032KF97**	**DRN**	**100L4**	640	253
						PH	**032KF97**	**DRN**	**100L4**	780	252
						PHF	**032KF97**	**DRN**	**100L4**	660	253
0.44	47000	4029	196800	-	51190						
0.52	39500	3387	197000	-	51190	**P**	**022KF87**	**DRN**	**100L4**	600	244
0.57	36300	3113	197000	-	51190	**PF**	**022KF87**	**DRN**	**100L4**	500	245
0.64	32200	2764	197000	-	51190	**PH**	**022KF87**	**DRN**	**100L4**	620	244
0.71	28800	2471	197000	-	51190	**PHF**	**022KF87**	**DRN**	**100L4**	520	245
0.64	32200	2764	156000	46200	36810						
0.79	25900	2222	156000	46200	36810	**P**	**012KF87**	**DRN**	**100L4**	455	238
0.92	22500	1929	156000	46200	36810	**PF**	**012KF87**	**DRN**	**100L4**	385	239
1.0	20100	1727	156000	46200	36810	**PH**	**012KF87**	**DRN**	**100L4**	470	238
1.2	16700	1433	156000	46200	36810	**PHF**	**012KF87**	**DRN**	**100L4**	400	239
0.46	44400	3807	156000	46200	36810						
0.51	40700	3490	156000	46200	36810						
0.69	29600	2540	156000	46200	36810	**P**	**012KF77**	**DRN**	**100L4**	420	236
0.77	26700	2289	156000	46200	36810	**PF**	**012KF77**	**DRN**	**100L4**	350	237
0.88	23400	2008	156000	46200	36810	**PH**	**012KF77**	**DRN**	**100L4**	430	236
1.0	20600	1772	156000	46200	36810	**PHF**	**012KF77**	**DRN**	**100L4**	360	237
1.3	16100	1381	156000	46200	36810						
0.77	26500	2280	115000	29200	24830	**P**	**002KF77**	**DRN**	**100L4**	340	230
1.1	18200	1565	123600	29200	24830	**PF**	**002KF77**	**DRN**	**100L4**	280	231
1.3	16000	1376	124000	29200	24830	**PH**	**002KF77**	**DRN**	**100L4**	340	230
						PHF	**002KF77**	**DRN**	**100L4**	285	231

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P_m = 2.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.5	13700	1181	124000	-	24830						
1.7	12400	1066	124000	-	24830						
1.9	10900	938	124000	-	24830						
2.0	10300	886	124000	-	24830	**P**	**002KF67**	**DRN**	**100L4**	310	228
2.3	8790	754	124000	-	24830	**PF**	**002KF67**	**DRN**	**100L4**	250	229
2.6	7990	685	124000	-	24830	**PH**	**002KF67**	**DRN**	**100L4**	310	228
3.0	6920	594	124000	-	24830	**PHF**	**002KF67**	**DRN**	**100L4**	255	229
3.4	6020	517	124000	-	24830						
3.6	5690	488	124000	-	20200						

P_m = 3.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.43	65600	4124	323000	-	100170	**P**	**042KF97**	**DRN**	**100L4**	1010	258
0.46	60400	3797	323000	-	100170	**PF**	**042KF97**	**DRN**	**100L4**	820	259
0.52	54000	3394	323000	-	100170	**PH**	**042KF97**	**DRN**	**100L4**	1010	258
						PHF	**042KF97**	**DRN**	**100L4**	820	259
0.43	65600	4124	228300	86800	69620	**P**	**032KF97**	**DRN**	**100L4**	760	252
0.46	60400	3797	234400	86800	69620	**PF**	**032KF97**	**DRN**	**100L4**	640	253
0.64	44000	2767	250500	86800	69620	**PH**	**032KF97**	**DRN**	**100L4**	780	252
						PHF	**032KF97**	**DRN**	**100L4**	660	253
0.71	39300	2471	252000	-	69620	**P**	**032KF87**	**DRN**	**100L4**	680	250
						PF	**032KF87**	**DRN**	**100L4**	560	251
						PH	**032KF87**	**DRN**	**100L4**	700	250
						PHF	**032KF87**	**DRN**	**100L4**	580	251
0.57	49500	3113	193200	-	51190						
0.64	44000	2764	197000	-	51190	**P**	**022KF87**	**DRN**	**100L4**	600	244
0.71	39300	2471	197000	-	51190	**PF**	**022KF87**	**DRN**	**100L4**	500	245
0.79	35300	2222	197000	-	51190	**PH**	**022KF87**	**DRN**	**100L4**	620	244
0.91	30700	1929	197000	-	51190	**PHF**	**022KF87**	**DRN**	**100L4**	520	245
0.64	44000	2764	156000	46200	36810						
0.79	35300	2222	156000	46200	36810	**P**	**012KF87**	**DRN**	**100L4**	455	238
0.91	30700	1929	156000	46200	36810	**PF**	**012KF87**	**DRN**	**100L4**	385	239
1.0	27500	1727	156000	46200	36810	**PH**	**012KF87**	**DRN**	**100L4**	470	238
1.2	22800	1433	156000	46200	36810	**PHF**	**012KF87**	**DRN**	**100L4**	400	239
0.69	40400	2540	156000	46200	36810						
1.3	21900	1381	156000	46200	36810	**P**	**012KF77**	**DRN**	**100L4**	420	236
1.5	19200	1212	156000	46200	36810	**PF**	**012KF77**	**DRN**	**100L4**	350	237
1.5	18200	1148	156000	46200	36810	**PH**	**012KF77**	**DRN**	**100L4**	430	236
1.8	16000	1005	156000	46200	36810	**PHF**	**012KF77**	**DRN**	**100L4**	360	237
1.9	14400	905	156000	46200	36810						
1.5	19200	1207	123000	29200	24830	**P**	**002KF77**	**DRN**	**100L4**	340	230
1.5	18200	1144	123600	29200	24830	**PF**	**002KF77**	**DRN**	**100L4**	280	231
1.8	15900	1001	124000	29200	24830	**PH**	**002KF77**	**DRN**	**100L4**	340	230
						PHF	**002KF77**	**DRN**	**100L4**	285	231
2.0	14100	886	124000	-	24830						
2.3	12000	754	124000	-	24830						
2.6	10900	685	124000	-	24830	**P**	**002KF67**	**DRN**	**100L4**	310	228
3.0	9450	594	124000	-	24830	**PF**	**002KF67**	**DRN**	**100L4**	250	229
3.4	8220	517	124000	-	24830	**PH**	**002KF67**	**DRN**	**100L4**	310	228
3.6	7760	488	124000	-	20200	**PHF**	**002KF67**	**DRN**	**100L4**	255	229
4.2	6610	415	124000	-	19100						
4.7	6010	378	124000	-	18300						

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P_m = 4.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
0.45	83600	3952	364000	140600	124060	**P**	**052KF107**	**DRN**	**112M4**		1270	266
0.50	75500	3568	364000	140600	124060	**PF**	**052KF107**	**DRN**	**112M4**		1070	267
						PH	**052KF107**	**DRN**	**112M4**		1260	266
						PHF	**052KF107**	**DRN**	**112M4**		1060	267
0.55	68500	3241	322900	111000	100170	**P**	**042KF107**	**DRN**	**112M4**		1130	260
						PF	**042KF107**	**DRN**	**112M4**		940	261
						PH	**042KF107**	**DRN**	**112M4**		1130	260
						PHF	**042KF107**	**DRN**	**112M4**		940	261
0.43	87200	4124	307900	-	100170							
0.47	80300	3797	313800	-	100170	**P**	**042KF97**	**DRN**	**112M4**		1010	258
0.52	71800	3394	320500	-	100170	**PF**	**042KF97**	**DRN**	**112M4**		820	259
0.64	58500	2767	323000	-	100170	**PH**	**042KF97**	**DRN**	**112M4**		1020	258
0.72	51900	2454	323000	111000	100170	**PHF**	**042KF97**	**DRN**	**112M4**		830	259
0.47	80300	3797	207900	86800	69620	**P**	**032KF97**	**DRN**	**112M4**		770	252
0.64	58500	2767	236500	86800	69620	**PF**	**032KF97**	**DRN**	**112M4**		650	253
0.80	46900	2218	248000	86800	69620	**PH**	**032KF97**	**DRN**	**112M4**		790	252
0.94	39700	1880	252000	86800	69620	**PHF**	**032KF97**	**DRN**	**112M4**		670	253
0.72	52300	2471	243000	-	69620	**P**	**032KF87**	**DRN**	**112M4**		690	250
						PF	**032KF87**	**DRN**	**112M4**		570	251
						PH	**032KF87**	**DRN**	**112M4**		710	250
						PHF	**032KF87**	**DRN**	**112M4**		590	251
0.80	47000	2222	196800	-	51190							
0.92	40800	1929	197000	-	51190	**P**	**022KF87**	**DRN**	**112M4**		610	244
1.0	36500	1727	197000	-	51190	**PF**	**022KF87**	**DRN**	**112M4**		510	245
1.2	30300	1433	197000	-	51190	**PH**	**022KF87**	**DRN**	**112M4**		630	244
1.4	26000	1231	197000	-	51190	**PHF**	**022KF87**	**DRN**	**112M4**		520	245
0.92	40800	1929	156000	46200	36810	**P**	**012KF87**	**DRN**	**112M4**		465	238
1.0	36500	1727	156000	46200	36810	**PF**	**012KF87**	**DRN**	**112M4**		395	239
1.2	30300	1433	156000	46200	36810	**PH**	**012KF87**	**DRN**	**112M4**		480	238
1.6	23100	1094	156000	46200	36810	**PHF**	**012KF87**	**DRN**	**112M4**		410	239
0.88	42400	2008	156000	46200	36810							
1.0	37400	1772	156000	46200	36810							
1.5	25600	1212	156000	46200	36810							
1.5	24200	1148	156000	46200	36810	**P**	**012KF77**	**DRN**	**112M4**		425	236
1.8	21200	1005	156000	46200	36810	**PF**	**012KF77**	**DRN**	**112M4**		355	237
1.9	19100	905	156000	46200	36810	**PH**	**012KF77**	**DRN**	**112M4**		440	236
2.2	16800	794	156000	46200	36810	**PHF**	**012KF77**	**DRN**	**112M4**		370	237
2.5	14800	701	156000	46200	36810							
2.9	13100	621	156000	46200	36810							
3.3	11200	530	156000	46200	36810							
1.3	29100	1376	110800	29200	24830							
1.5	25500	1207	116600	29200	24830	**P**	**002KF77**	**DRN**	**112M4**		345	230
2.0	19000	902	123100	29200	24830	**PF**	**002KF77**	**DRN**	**112M4**		290	231
2.2	16700	791	124000	29200	24830	**PH**	**002KF77**	**DRN**	**112M4**		350	230
2.5	14700	698	124000	29200	24830	**PHF**	**002KF77**	**DRN**	**112M4**		295	231
2.9	13000	619	124000	29200	24830							
3.4	10900	517	124000	-	24830							
3.6	10300	488	124000	-	20200	**P**	**002KF67**	**DRN**	**112M4**		315	228
4.3	8780	415	124000	-	19100	**PF**	**002KF67**	**DRN**	**112M4**		260	229
4.7	7980	378	124000	-	18300	**PH**	**002KF67**	**DRN**	**112M4**		320	228
5.4	6910	327	124000	-	16800	**PHF**	**002KF67**	**DRN**	**112M4**		265	229
6.2	6020	284	122300	-	16000							

P_m = 5.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
0.50	103800	3568	473000	-	185660	**P**	**062KF107**	**DRN**	**132S4**		1770	270
0.55	94300	3241	473000	-	185660	**PF**	**062KF107**	**DRN**	**132S4**		1400	271
						PH	**062KF107**	**DRN**	**132S4**		1760	270
						PHF	**062KF107**	**DRN**	**132S4**		1390	271

P_m = 5.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.45	115000	3952	363400	140600	124060	**P**	**052KF107**	**DRN**	**132S4**	1280	266
0.50	103800	3568	364000	140600	124060	**PF**	**052KF107**	**DRN**	**132S4**	1080	267
0.61	83700	2876	364000	140600	124060	**PH**	**052KF107**	**DRN**	**132S4**	1280	266
0.68	75900	2610	364000	140600	124060	**PHF**	**052KF107**	**DRN**	**132S4**	1080	267
0.55	94300	3241	301300	111000	100170	**P**	**042KF107**	**DRN**	**132S4**	1140	260
0.79	65300	2243	323000	111000	100170	**PF**	**042KF107**	**DRN**	**132S4**	950	261
0.90	57000	1958	323000	111000	100170	**PH**	**042KF107**	**DRN**	**132S4**	1140	260
						PHF	**042KF107**	**DRN**	**132S4**	950	261
0.64	80500	2767	313600	-	100170	**P**	**042KF97**	**DRN**	**132S4**	1030	258
0.72	71400	2454	320800	111000	100170	**PF**	**042KF97**	**DRN**	**132S4**	840	259
0.94	54700	1880	323000	111000	100170	**PH**	**042KF97**	**DRN**	**132S4**	1030	258
						PHF	**042KF97**	**DRN**	**132S4**	840	259
0.64	80500	2767	207600	86800	69620						
0.80	64500	2218	229600	86800	69620	**P**	**032KF97**	**DRN**	**132S4**	780	252
0.94	54700	1880	240500	86800	69620	**PF**	**032KF97**	**DRN**	**132S4**	660	253
1.1	47800	1643	247200	86800	69620	**PH**	**032KF97**	**DRN**	**132S4**	800	252
1.2	43700	1503	250800	86800	69620	**PHF**	**032KF97**	**DRN**	**132S4**	680	253
1.4	35800	1231	252000	-	69620	**P**	**032KF87**	**DRN**	**132S4**	700	250
						PF	**032KF87**	**DRN**	**132S4**	580	251
						PH	**032KF87**	**DRN**	**132S4**	720	250
						PHF	**032KF87**	**DRN**	**132S4**	600	251
1.0	50200	1727	192200	-	51190						
1.2	41700	1433	197000	-	51190	**P**	**022KF87**	**DRN**	**132S4**	620	244
1.4	35800	1231	197000	-	51190	**PF**	**022KF87**	**DRN**	**132S4**	520	245
1.6	31800	1094	197000	-	51190	**PH**	**022KF87**	**DRN**	**132S4**	640	244
1.8	28400	978	197000	-	51190	**PHF**	**022KF87**	**DRN**	**132S4**	540	245
2.0	25500	879	197000	-	51190						
1.2	41700	1433	156000	46200	36810	**P**	**012KF87**	**DRN**	**132S4**	475	238
1.6	31800	1094	156000	46200	36810	**PF**	**012KF87**	**DRN**	**132S4**	405	239
2.3	22200	763	156000	46200	36810	**PH**	**012KF87**	**DRN**	**132S4**	490	238
						PHF	**012KF87**	**DRN**	**132S4**	420	239
1.8	29200	1005	156000	46200	36810						
1.9	26300	905	156000	46200	36810						
2.2	23100	794	156000	46200	36810	**P**	**012KF77**	**DRN**	**132S4**	440	236
2.5	20400	701	156000	46200	36810	**PF**	**012KF77**	**DRN**	**132S4**	370	237
2.9	18000	621	156000	46200	36810	**PH**	**012KF77**	**DRN**	**132S4**	450	236
3.3	15400	530	156000	46200	36810	**PHF**	**012KF77**	**DRN**	**132S4**	380	237
4.2	12300	425	156000	-	36810						
1.8	29100	1001	110700	29200	24830						
2.0	26200	902	115500	29200	24830						
2.9	18000	619	123700	29200	24830						
3.4	15300	528	124000	29200	24830						
3.7	14000	483	124000	29200	24830						
4.2	12300	424	124000	29200	24830	**P**	**002KF77**	**DRN**	**132S4**	360	230
4.7	10800	374	124000	29200	24830	**PF**	**002KF77**	**DRN**	**132S4**	300	231
5.3	9640	331	124000	29200	24830	**PH**	**002KF77**	**DRN**	**132S4**	360	230
6.7	7680	264	119600	-	24830	**PHF**	**002KF77**	**DRN**	**132S4**	305	231
7.3	7020	241	116400	-	19100						
8.3	6160	212	112000	-	18900						
9.5	5430	187	107800	-	17900						
11	4820	166	104000	-	17000						
13	4110	141	99200	-	15600						

P_m = 7.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.52	135400	3425	523000	274600	245660	**P**	**072KF127**	**DRN**	**132M4**	2400	274
0.66	106900	2703	523000	274600	245660	**PF**	**072KF127**	**DRN**	**132M4**	1910	275
0.74	94300	2385	523000	274600	245660	**PH**	**072KF127**	**DRN**	**132M4**	2460	274
						PHF	**072KF127**	**DRN**	**132M4**	1970	275

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P_m = 7.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.41	171000	4322	449300	209100	185660	**P**	**062KF127**	**DRN**	**132M4**	1980	272
0.72	97100	2456	473000	209100	185660	**PF**	**062KF127**	**DRN**	**132M4**	1620	273
0.84	83900	2121	473000	209100	185660	**PH**	**062KF127**	**DRN**	**132M4**	1970	272
0.95	74200	1876	473000	209100	185660	**PHF**	**062KF127**	**DRN**	**132M4**	1610	273
0.50	141100	3568	468400	-	185660	**P**	**062KF107**	**DRN**	**132M4**	1790	270
0.55	128200	3241	473000	-	185660	**PF**	**062KF107**	**DRN**	**132M4**	1420	271
0.79	88700	2243	473000	-	185660	**PH**	**062KF107**	**DRN**	**132M4**	1770	270
1.1	65700	1661	473000	-	185660	**PHF**	**062KF107**	**DRN**	**132M4**	1410	271
0.62	113700	2876	364000	140600	124060	**P**	**052KF107**	**DRN**	**132M4**	1300	266
0.68	103200	2610	364000	140600	124060	**PF**	**052KF107**	**DRN**	**132M4**	1100	267
0.91	77400	1958	364000	140600	124060	**PH**	**052KF107**	**DRN**	**132M4**	1290	266
1.2	57400	1452	364000	140600	124060	**PHF**	**052KF107**	**DRN**	**132M4**	1090	267
1.6	43300	1095	364000	140600	124060	**P**	**052KF97**	**DRN**	**132M4**	1190	264
1.8	38400	971	364000	140600	124060	**PF**	**052KF97**	**DRN**	**132M4**	990	265
						PH	**052KF97**	**DRN**	**132M4**	1180	264
						PHF	**052KF97**	**DRN**	**132M4**	980	265
0.79	88700	2243	306600	111000	100170	**P**	**042KF107**	**DRN**	**132M4**	1160	260
0.91	77400	1958	316100	111000	100170	**PF**	**042KF107**	**DRN**	**132M4**	970	261
1.2	57400	1452	323000	111000	100170	**PH**	**042KF107**	**DRN**	**132M4**	1160	260
1.6	45000	1138	323000	111000	100170	**PHF**	**042KF107**	**DRN**	**132M4**	970	261
0.94	74400	1880	318500	111000	100170	**P**	**042KF97**	**DRN**	**132M4**	1040	258
1.5	47800	1209	323000	111000	100170	**PF**	**042KF97**	**DRN**	**132M4**	850	259
1.8	38400	971	323000	111000	100170	**PH**	**042KF97**	**DRN**	**132M4**	1050	258
2.0	34700	878	323000	111000	100170	**PHF**	**042KF97**	**DRN**	**132M4**	860	259
0.94	74400	1880	216800	86800	69620						
1.1	64900	1643	229100	86800	69620						
1.2	59400	1503	235500	86800	69620	**P**	**032KF97**	**DRN**	**132M4**	800	252
1.8	38400	971	252000	86800	69620	**PF**	**032KF97**	**DRN**	**132M4**	680	253
2.0	34700	878	252000	86800	69620	**PH**	**032KF97**	**DRN**	**132M4**	820	252
2.4	29400	744	252000	86800	69620	**PHF**	**032KF97**	**DRN**	**132M4**	700	253
2.7	25700	650	252000	86800	69620						
1.4	48700	1231	246400	-	69620						
2.3	30100	763	252000	-	69620	**P**	**032KF87**	**DRN**	**132M4**	720	250
2.6	27000	683	252000	-	69620	**PF**	**032KF87**	**DRN**	**132M4**	600	251
2.8	24800	628	252000	-	69200	**PH**	**032KF87**	**DRN**	**132M4**	740	250
3.1	22400	567	252000	-	69620	**PHF**	**032KF87**	**DRN**	**132M4**	620	251
3.3	21400	543	197000	64200	51190	**P**	**022KF97**	**DRN**	**132M4**	720	246
3.8	18600	470	197000	64200	51190	**PF**	**022KF97**	**DRN**	**132M4**	610	247
						PH	**022KF97**	**DRN**	**132M4**	730	246
						PHF	**022KF97**	**DRN**	**132M4**	630	247
1.6	43200	1094	197000	-	51190						
1.8	38600	978	197000	-	51190						
2.0	34700	879	197000	-	51190	**P**	**022KF87**	**DRN**	**132M4**	640	244
2.6	27000	683	197000	64200	51190	**PF**	**022KF87**	**DRN**	**132M4**	540	245
2.8	24800	628	197000	-	51190	**PH**	**022KF87**	**DRN**	**132M4**	660	244
3.6	19400	493	197000	64200	51190	**PHF**	**022KF87**	**DRN**	**132M4**	550	245
4.0	17300	438	197000	64200	51190						
4.3	16100	408	156000	46200	36810	**P**	**012KF97**	**DRN**	**132M4**	570	240
5.2	13500	342	156000	46200	36810	**PF**	**012KF97**	**DRN**	**132M4**	500	241
6.4	11000	279	150000	46200	36810	**PH**	**012KF97**	**DRN**	**132M4**	580	240
						PHF	**012KF97**	**DRN**	**132M4**	510	241
1.6	43200	1094	156000	46200	36810						
2.3	30100	763	156000	46200	36810	**P**	**012KF87**	**DRN**	**132M4**	495	238
3.6	19400	493	156000	46200	36810	**PF**	**012KF87**	**DRN**	**132M4**	425	239
4.5	15500	392	156000	46200	36810	**PH**	**012KF87**	**DRN**	**132M4**	510	238
5.5	12800	325	156000	46200	36810	**PHF**	**012KF87**	**DRN**	**132M4**	435	239
6.1	11400	291	151900	46200	36810						
1.6	45400	1148	156000	46200	36810						
1.8	39700	1005	156000	46200	36810	**P**	**012KF77**	**DRN**	**132M4**	455	236
2.5	27700	701	156000	46200	36810	**PF**	**012KF77**	**DRN**	**132M4**	385	237
2.9	24500	621	156000	46200	36810	**PH**	**012KF77**	**DRN**	**132M4**	470	236
3.3	20900	530	156000	46200	36810	**PHF**	**012KF77**	**DRN**	**132M4**	400	237

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P_m = 7.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
2.5	27600	698	113300	29200	24830						
4.2	16700	424	124000	29200	24830						
4.8	14700	374	124000	29200	24830						
5.3	13100	331	124000	29200	24830	**P**	**002KF77**	**DRN**	**132M4**	375	230
6.3	11100	283	122000	29200	24830	**PF**	**002KF77**	**DRN**	**132M4**	320	231
6.7	10400	264	119500	-	24830	**PH**	**002KF77**	**DRN**	**132M4**	380	230
8.4	8370	212	111800	-	18900	**PHF**	**002KF77**	**DRN**	**132M4**	320	231
9.5	7380	187	107700	-	17900						
11	6550	166	103900	-	17000						
13	5590	141	99100	-	15600						

P_m = 9.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.52	165000	3402	850000	631300	500000	**P**	**102KF167**	**DRN**	**132L4**	5090	286
0.67	127800	2636	850000	631300	500000	**PF**	**102KF167**	**DRN**	**132L4**	4130	287
0.75	114000	2352	850000	631300	500000	**PH**	**102KF167**	**DRN**	**132L4**	5150	286
						PHF	**102KF167**	**DRN**	**132L4**	4190	287
0.51	167200	3447	720000	513900	423000						
0.58	148700	3065	720000	513900	423000						
0.65	131600	2715	720000	513900	423000	**P**	**092KF167**	**DRN**	**132L4**	4240	282
0.74	115500	2383	720000	513900	423000	**PF**	**092KF167**	**DRN**	**132L4**	3540	283
0.80	107100	2209	720000	513900	423000	**PH**	**092KF167**	**DRN**	**132L4**	4250	282
0.87	98500	2031	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**132L4**	3550	283
1.0	85700	1767	720000	513900	423000						
0.42	203600	4198	523000	274600	245660						
0.52	166100	3425	523000	274600	245660	**P**	**072KF127**	**DRN**	**132L4**	2410	274
0.57	151400	3123	523000	274600	245660	**PF**	**072KF127**	**DRN**	**132L4**	1920	275
0.66	131100	2703	523000	274600	245660	**PH**	**072KF127**	**DRN**	**132L4**	2470	274
0.74	115600	2385	523000	274600	245660	**PHF**	**072KF127**	**DRN**	**132L4**	1980	275
0.50	171000	3526	449300	209100	185660						
0.55	156000	3216	459300	209100	185660	**P**	**062KF127**	**DRN**	**132L4**	1990	272
0.72	119100	2456	473000	209100	185660	**PF**	**062KF127**	**DRN**	**132L4**	1630	273
0.84	102800	2121	473000	209100	185660	**PH**	**062KF127**	**DRN**	**132L4**	1980	272
0.95	91000	1876	473000	209100	185660	**PHF**	**062KF127**	**DRN**	**132L4**	1620	273
0.62	139400	2876	469300	-	185660						
0.68	126500	2610	473000	-	185660	**P**	**062KF107**	**DRN**	**132L4**	1790	270
0.79	108800	2243	473000	-	185660	**PF**	**062KF107**	**DRN**	**132L4**	1430	271
0.91	94900	1958	473000	-	185660	**PH**	**062KF107**	**DRN**	**132L4**	1780	270
1.1	80500	1661	473000	-	185660	**PHF**	**062KF107**	**DRN**	**132L4**	1420	271
1.2	70400	1452	473000	-	185660						
0.62	139400	2876	342900	140600	124060						
0.68	126500	2610	354200	140600	124060	**P**	**052KF107**	**DRN**	**132L4**	1310	266
0.79	108800	2243	364000	140600	124060	**PF**	**052KF107**	**DRN**	**132L4**	1110	267
0.91	94900	1958	364000	140600	124060	**PH**	**052KF107**	**DRN**	**132L4**	1300	266
1.2	70400	1452	364000	140600	124060	**PHF**	**052KF107**	**DRN**	**132L4**	1100	267
1.4	59500	1227	364000	140600	124060						
1.3	65100	1343	364000	140600	124060	**P**	**052KF97**	**DRN**	**132L4**	1200	264
1.5	58600	1209	364000	140600	124060	**PF**	**052KF97**	**DRN**	**132L4**	1000	265
						PH	**052KF97**	**DRN**	**132L4**	1190	264
						PHF	**052KF97**	**DRN**	**132L4**	990	265
0.79	108800	2243	286400	111000	100170						
0.91	94900	1958	300800	111000	100170	**P**	**042KF107**	**DRN**	**132L4**	1160	260
1.1	80500	1661	313600	111000	100170	**PF**	**042KF107**	**DRN**	**132L4**	970	261
1.2	70400	1452	321500	111000	100170	**PH**	**042KF107**	**DRN**	**132L4**	1170	260
1.6	55100	1138	323000	111000	100170	**PHF**	**042KF107**	**DRN**	**132L4**	980	261
1.2	72800	1503	319700	111000	100170						
1.5	58600	1209	323000	111000	100170	**P**	**042KF97**	**DRN**	**132L4**	1050	258
1.6	53000	1095	323000	111000	100170	**PF**	**042KF97**	**DRN**	**132L4**	860	259
1.8	47000	971	323000	111000	100170	**PH**	**042KF97**	**DRN**	**132L4**	1060	258
2.0	42500	878	323000	111000	100170	**PHF**	**042KF97**	**DRN**	**132L4**	870	259

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P_m = 9.2 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
1.1	79600	1643	209000	86800	69620							
1.2	72800	1503	218900	86800	69620							
1.5	58600	1209	236400	86800	69620	**P**	**032KF97**	**DRN**	**132L4**		800	252
1.6	53000	1095	242200	86800	69620	**PF**	**032KF97**	**DRN**	**132L4**		680	253
1.8	47000	971	247900	86800	69620	**PH**	**032KF97**	**DRN**	**132L4**		830	252
2.0	42500	878	251800	86800	69620	**PHF**	**032KF97**	**DRN**	**132L4**		700	253
2.4	36000	744	252000	86800	69620							
2.7	31500	650	252000	86800	69620							
2.8	30400	628	252000	-	69200	**P**	**032KF87**	**DRN**	**132L4**		730	250
3.1	27400	567	252000	-	69620	**PF**	**032KF87**	**DRN**	**132L4**		610	251
						PH	**032KF87**	**DRN**	**132L4**		750	250
						PHF	**032KF87**	**DRN**	**132L4**		630	251
3.3	26300	543	197000	64200	51190	**P**	**022KF97**	**DRN**	**132L4**		720	246
3.8	22800	470	197000	64200	51190	**PF**	**022KF97**	**DRN**	**132L4**		620	247
						PH	**022KF97**	**DRN**	**132L4**		740	246
						PHF	**022KF97**	**DRN**	**132L4**		640	247
1.8	47400	978	196200	-	51190							
2.0	42600	879	197000	-	51190							
2.3	37000	763	197000	64200	51190	**P**	**022KF87**	**DRN**	**132L4**		650	244
2.6	33100	683	197000	64200	51190	**PF**	**022KF87**	**DRN**	**132L4**		550	245
2.8	30400	628	197000	-	51190	**PH**	**022KF87**	**DRN**	**132L4**		660	244
3.6	23900	493	197000	64200	51190	**PHF**	**022KF87**	**DRN**	**132L4**		560	245
4.0	21200	438	197000	64200	51190							
4.3	19800	408	156000	46200	36810	**P**	**012KF97**	**DRN**	**132L4**		580	240
5.2	16500	342	156000	46200	36810	**PF**	**012KF97**	**DRN**	**132L4**		510	241
6.4	13500	279	150000	46200	36810	**PH**	**012KF97**	**DRN**	**132L4**		590	240
						PHF	**012KF97**	**DRN**	**132L4**		520	241
2.3	37000	763	156000	46200	36810							
2.6	33100	683	156000	46200	36810							
2.8	30400	628	156000	46200	36810							
3.1	27400	567	156000	46200	36810	**P**	**012KF87**	**DRN**	**132L4**		500	238
3.6	23900	493	156000	46200	36810	**PF**	**012KF87**	**DRN**	**132L4**		430	239
4.0	21200	438	156000	46200	36810	**PH**	**012KF87**	**DRN**	**132L4**		520	238
4.5	19000	392	156000	46200	36810	**PHF**	**012KF87**	**DRN**	**132L4**		445	239
5.5	15700	325	156000	46200	36810							
6.1	14000	291	151900	46200	36810							
2.0	43900	905	156000	46200	36810	**P**	**012KF77**	**DRN**	**132L4**		465	236
2.2	38500	794	156000	46200	36810	**PF**	**012KF77**	**DRN**	**132L4**		395	237
						PH	**012KF77**	**DRN**	**132L4**		480	236
						PHF	**012KF77**	**DRN**	**132L4**		410	237
4.5	18900	391	123200	29200	24830							
5.5	15700	324	124000	29200	24830							
6.3	13600	282	121900	29200	24830	**P**	**002KF87**	**DRN**	**132L4**		420	232
7.2	11800	245	116900	29200	24830	**PF**	**002KF87**	**DRN**	**132L4**		365	233
8.1	10500	218	112800	29200	24830	**PH**	**002KF87**	**DRN**	**132L4**		425	232
9.1	9460	195	109100	29200	24830	**PHF**	**002KF87**	**DRN**	**132L4**		365	233
11	7850	162	103200	29200	24830							
3.4	25600	528	116500	29200	24830	**P**	**002KF77**	**DRN**	**132L4**		385	230
13	6850	141	99100	-	15600	**PF**	**002KF77**	**DRN**	**132L4**		325	231
						PH	**002KF77**	**DRN**	**132L4**		390	230
						PHF	**002KF77**	**DRN**	**132L4**		330	231

P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}							m	
				f_{LC}<=7.5	f_{LC}>107.5							
min^{-1}	Nm		N	Nm	Nm						kg	
0.52	197200	3402	850000	631300	500000	**P**	**102KF167**	**DRN**	**160M4**		5120	286
0.67	152800	2636	850000	631300	500000	**PF**	**102KF167**	**DRN**	**160M4**		4160	287
0.76	136300	2352	850000	631300	500000	**PH**	**102KF167**	**DRN**	**160M4**		5180	286
0.89	116200	2005	850000	631300	500000	**PHF**	**102KF167**	**DRN**	**160M4**		4220	287

P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.58	177700	3065	720000	513900	423000						
0.65	157300	2715	720000	513900	423000	**P**	**092KF167**	**DRN**	**160M4**	4270	282
0.75	138100	2383	720000	513900	423000	**PF**	**092KF167**	**DRN**	**160M4**	3570	283
0.80	128000	2209	720000	513900	423000	**PH**	**092KF167**	**DRN**	**160M4**	4280	282
0.87	117700	2031	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**160M4**	3580	283
1.0	102400	1767	720000	513900	423000						
0.47	218000	3761	683000	397100	359400	**P**	**082KF157**	**DRN**	**160M4**	3390	278
0.52	199400	3440	683000	397100	359400	**PF**	**082KF157**	**DRN**	**160M4**	2740	279
						PH	**082KF157**	**DRN**	**160M4**	3390	278
						PHF	**082KF157**	**DRN**	**160M4**	2740	279
0.47	221300	3818	523000	274600	245660	**P**	**072KF157**	**DRN**	**160M4**	2740	276
0.58	176100	3038	523000	274600	245660	**PF**	**072KF157**	**DRN**	**160M4**	2240	277
						PH	**072KF157**	**DRN**	**160M4**	2790	276
						PHF	**072KF157**	**DRN**	**160M4**	2300	277
0.52	198500	3425	523000	274600	245660	**P**	**072KF127**	**DRN**	**160M4**	2440	274
0.57	181000	3123	523000	274600	245660	**PF**	**072KF127**	**DRN**	**160M4**	1950	275
0.66	156600	2703	523000	274600	245660	**PH**	**072KF127**	**DRN**	**160M4**	2500	274
0.74	138200	2385	523000	274600	245660	**PHF**	**072KF127**	**DRN**	**160M4**	2010	275
0.50	204400	3526	423800	209100	185660						
0.55	186400	3216	438100	209100	185660	**P**	**062KF127**	**DRN**	**160M4**	2020	272
0.64	161300	2783	455800	209100	185660	**PF**	**062KF127**	**DRN**	**160M4**	1660	273
0.72	142300	2456	467700	209100	185660	**PH**	**062KF127**	**DRN**	**160M4**	2010	272
0.84	122900	2121	473000	209100	185660	**PHF**	**062KF127**	**DRN**	**160M4**	1650	273
0.95	108700	1876	473000	209100	185660						
0.79	130000	2243	473000	-	185660	**P**	**062KF107**	**DRN**	**160M4**	1830	270
0.91	113400	1958	473000	-	185660	**PF**	**062KF107**	**DRN**	**160M4**	1460	271
1.1	96200	1661	473000	-	185660	**PH**	**062KF107**	**DRN**	**160M4**	1820	270
						PHF	**062KF107**	**DRN**	**160M4**	1450	271
0.79	130000	2243	351300	140600	124060	**P**	**052KF107**	**DRN**	**160M4**	1340	266
0.91	113400	1958	364000	140600	124060	**PF**	**052KF107**	**DRN**	**160M4**	1140	267
1.2	84100	1452	364000	140600	124060	**PH**	**052KF107**	**DRN**	**160M4**	1330	266
1.4	71100	1227	364000	140600	124060	**PHF**	**052KF107**	**DRN**	**160M4**	1130	267
1.1	96200	1661	299500	111000	100170	**P**	**042KF107**	**DRN**	**160M4**	1200	260
1.2	84100	1452	310600	111000	100170	**PF**	**042KF107**	**DRN**	**160M4**	1010	261
1.6	65900	1138	323000	111000	100170	**PH**	**042KF107**	**DRN**	**160M4**	1200	260
						PHF	**042KF107**	**DRN**	**160M4**	1010	261
0.94	109000	1880	286100	111000	100170	**P**	**042KF97**	**DRN**	**160M4**	1080	258
1.5	70000	1209	321800	111000	100170	**PF**	**042KF97**	**DRN**	**160M4**	890	259
1.8	56200	971	323000	111000	100170	**PH**	**042KF97**	**DRN**	**160M4**	1090	258
2.0	50800	878	323000	111000	100170	**PHF**	**042KF97**	**DRN**	**160M4**	900	259
1.5	70000	1209	222700	86800	69620						
1.6	63400	1095	231000	86800	69620	**P**	**032KF97**	**DRN**	**160M4**	840	252
1.8	56200	971	239000	86800	69620	**PF**	**032KF97**	**DRN**	**160M4**	720	253
2.0	50800	878	244400	86800	69620	**PH**	**032KF97**	**DRN**	**160M4**	860	252
2.4	43100	744	251300	86800	69620	**PHF**	**032KF97**	**DRN**	**160M4**	740	253
2.7	37600	650	252000	86800	69620						
3.3	31400	543	197000	64200	51190	**P**	**022KF97**	**DRN**	**160M4**	760	246
3.8	27200	470	197000	64200	51190	**PF**	**022KF97**	**DRN**	**160M4**	660	247
						PH	**022KF97**	**DRN**	**160M4**	770	246
						PHF	**022KF97**	**DRN**	**160M4**	670	247
2.3	44200	763	197000	64200	51190						
2.6	39500	683	197000	64200	51190						
2.8	36300	628	197000	-	51190	**P**	**022KF87**	**DRN**	**160M4**	680	244
3.1	32800	567	197000	64200	51190	**PF**	**022KF87**	**DRN**	**160M4**	580	245
3.6	28500	493	197000	64200	51190	**PH**	**022KF87**	**DRN**	**160M4**	700	244
4.1	25300	438	197000	64200	51190	**PHF**	**022KF87**	**DRN**	**160M4**	590	245
4.5	22700	392	197000	-	51190						
4.3	23600	408	156000	46200	36810	**P**	**012KF97**	**DRN**	**160M4**	610	240
5.2	19700	342	156000	46200	36810	**PF**	**012KF97**	**DRN**	**160M4**	540	241
6.4	16100	279	150000	46200	36810	**PH**	**012KF97**	**DRN**	**160M4**	620	240
						PHF	**012KF97**	**DRN**	**160M4**	550	241

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P_m = 11.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
2.3	44200	763	156000	46200	36810						
2.6	39500	683	156000	46200	36810						
3.1	32800	567	156000	46200	36810						
3.6	28500	493	156000	46200	36810	**P**	**012KF87**	**DRN**	**160M4**	530	238
4.1	25300	438	156000	46200	36810	**PF**	**012KF87**	**DRN**	**160M4**	465	239
4.5	22700	392	156000	46200	36810	**PH**	**012KF87**	**DRN**	**160M4**	550	238
5.5	18800	325	156000	46200	36810	**PHF**	**012KF87**	**DRN**	**160M4**	480	239
6.3	16300	283	150700	46200	36810						
7.9	13000	225	140600	-	29500						
2.2	46000	794	156000	46200	36810	**P**	**012KF77**	**DRN**	**160M4**	495	236
2.5	40600	701	156000	46200	36810	**PF**	**012KF77**	**DRN**	**160M4**	425	237
						PH	**012KF77**	**DRN**	**160M4**	510	236
						PHF	**012KF77**	**DRN**	**160M4**	440	237
5.5	18700	324	123300	29200	24830						
6.3	16300	282	121800	29200	24830	**P**	**002KF87**	**DRN**	**160M4**	455	232
9.1	11300	195	109100	29200	24830	**PF**	**002KF87**	**DRN**	**160M4**	395	233
11	9380	162	103200	29200	24830	**PH**	**002KF87**	**DRN**	**160M4**	460	232
13	8160	141	98900	29200	24800	**PHF**	**002KF87**	**DRN**	**160M4**	400	233
3.7	27900	483	112700	29200	24830	**P**	**002KF77**	**DRN**	**160M4**	415	230
						PF	**002KF77**	**DRN**	**160M4**	360	231
						PH	**002KF77**	**DRN**	**160M4**	420	230
						PHF	**002KF77**	**DRN**	**160M4**	360	231

P_m = 15.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.50	282000	3570	850000	631300	500000	**P**	**102KF187**	**DRN**	**160L4**	5760	288
0.62	226700	2870	850000	631300	500000	**PF**	**102KF187**	**DRN**	**160L4**	4810	289
						PH	**102KF187**	**DRN**	**160L4**	5830	288
						PHF	**102KF187**	**DRN**	**160L4**	4870	289
0.76	185800	2352	850000	631300	500000	**P**	**102KF167**	**DRN**	**160L4**	5130	286
0.89	158300	2005	850000	631300	500000	**PF**	**102KF167**	**DRN**	**160L4**	4180	287
						PH	**102KF167**	**DRN**	**160L4**	5200	286
						PHF	**102KF167**	**DRN**	**160L4**	4240	287
0.49	285700	3617	720000	513900	423000	**P**	**092KF187**	**DRN**	**160L4**	4910	284
0.61	229700	2908	720000	513900	423000	**PF**	**092KF187**	**DRN**	**160L4**	4210	285
0.68	206000	2608	720000	513900	423000	**PH**	**092KF187**	**DRN**	**160L4**	4920	284
0.78	178900	2264	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**160L4**	4230	285
0.80	174400	2209	720000	513900	423000						
0.87	160400	2031	720000	513900	423000	**P**	**092KF167**	**DRN**	**160L4**	4280	282
1.0	139500	1767	720000	513900	423000	**PF**	**092KF167**	**DRN**	**160L4**	3580	283
1.4	99900	1265	720000	513900	423000	**PH**	**092KF167**	**DRN**	**160L4**	4290	282
1.4	96400	1221	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**160L4**	3600	283
1.6	89100	1129	720000	513900	423000						
0.47	297100	3761	683000	397100	359400	**P**	**082KF157**	**DRN**	**160L4**	3410	278
0.52	271700	3440	683000	397100	359400	**PF**	**082KF157**	**DRN**	**160L4**	2760	279
0.78	180900	2290	683000	397100	359400	**PH**	**082KF157**	**DRN**	**160L4**	3400	278
0.87	160900	2038	683000	397100	359400	**PHF**	**082KF157**	**DRN**	**160L4**	2750	279
0.58	240000	3038	523000	274600	245660	**P**	**072KF157**	**DRN**	**160L4**	2750	276
						PF	**072KF157**	**DRN**	**160L4**	2260	277
						PH	**072KF157**	**DRN**	**160L4**	2800	276
						PHF	**072KF157**	**DRN**	**160L4**	2310	277
0.52	270500	3425	520500	274600	245660						
0.66	213500	2703	523000	274600	245660	**P**	**072KF127**	**DRN**	**160L4**	2460	274
0.75	188400	2385	523000	274600	245660	**PF**	**072KF127**	**DRN**	**160L4**	1970	275
0.86	162700	2060	523000	274600	245660	**PH**	**072KF127**	**DRN**	**160L4**	2510	274
0.98	143900	1822	523000	274600	245660	**PHF**	**072KF127**	**DRN**	**160L4**	2020	275
1.2	120900	1531	523000	274600	245660						
1.3	109000	1381	523000	274600	245660						

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P_m = 15.0 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.72	194000	2456	432200	209100	185660						
0.84	167500	2121	451700	209100	185660	**P**	**062KF127**	**DRN**	**160L4**	2040	272
0.95	148200	1876	464200	209100	185660	**PF**	**062KF127**	**DRN**	**160L4**	1670	273
1.1	124500	1577	473000	209100	185660	**PH**	**062KF127**	**DRN**	**160L4**	2030	272
1.2	112300	1422	473000	209100	185660	**PHF**	**062KF127**	**DRN**	**160L4**	1660	273
1.4	97200	1231	473000	209100	185660						
1.1	131100	1661	473000	-	185660						
1.2	114600	1452	473000	-	185660	**P**	**062KF107**	**DRN**	**160L4**	1840	270
1.4	96900	1227	473000	209100	185660	**PF**	**062KF107**	**DRN**	**160L4**	1480	271
1.6	89800	1138	473000	209100	185660	**PH**	**062KF107**	**DRN**	**160L4**	1830	270
1.7	81500	1033	473000	209100	185660	**PHF**	**062KF107**	**DRN**	**160L4**	1470	271
1.2	114600	1452	363700	140600	124060						
1.4	96900	1227	364000	140600	124060	**P**	**052KF107**	**DRN**	**160L4**	1360	266
1.7	81500	1033	364000	140600	124060	**PF**	**052KF107**	**DRN**	**160L4**	1160	267
2.0	70000	887	364000	140600	124060	**PH**	**052KF107**	**DRN**	**160L4**	1350	266
2.3	61100	774	364000	140600	124060	**PHF**	**052KF107**	**DRN**	**160L4**	1150	267
2.0	69300	878	364000	140600	124060	**P**	**052KF97**	**DRN**	**160L4**	1240	264
2.4	58700	744	364000	140600	124060	**PF**	**052KF97**	**DRN**	**160L4**	1040	265
						PH	**052KF97**	**DRN**	**160L4**	1240	264
						PHF	**052KF97**	**DRN**	**160L4**	1040	265
1.6	89800	1138	305600	111000	100170	**P**	**042KF107**	**DRN**	**160L4**	1210	260
						PF	**042KF107**	**DRN**	**160L4**	1020	261
						PH	**042KF107**	**DRN**	**160L4**	1220	260
						PHF	**042KF107**	**DRN**	**160L4**	1030	261
1.8	76600	971	316800	111000	100170						
2.0	69300	878	322300	111000	100170	**P**	**042KF97**	**DRN**	**160L4**	1100	258
2.4	58700	744	323000	111000	100170	**PF**	**042KF97**	**DRN**	**160L4**	910	259
2.7	51300	650	323000	111000	100170	**PH**	**042KF97**	**DRN**	**160L4**	1100	258
3.3	42900	543	323000	111000	100170	**PHF**	**042KF97**	**DRN**	**160L4**	910	259
1.6	86400	1095	197900	86800	69620						
1.8	76600	971	213500	86800	69620						
2.4	58700	744	236300	86800	69620	**P**	**032KF97**	**DRN**	**160L4**	850	252
2.7	51300	650	243900	86800	69620	**PF**	**032KF97**	**DRN**	**160L4**	730	253
3.3	42900	543	251500	86800	69620	**PH**	**032KF97**	**DRN**	**160L4**	870	252
3.8	37100	470	252000	86800	69620	**PHF**	**032KF97**	**DRN**	**160L4**	750	253
4.3	32200	408	249400	-	69620						
3.3	42900	543	197000	64200	51190						
3.8	37100	470	197000	64200	51190						
4.3	32200	408	197000	64200	51190	**P**	**022KF97**	**DRN**	**160L4**	770	246
5.2	26900	342	197000	64200	51190	**PF**	**022KF97**	**DRN**	**160L4**	670	247
5.3	26300	333	197000	64200	51190	**PH**	**022KF97**	**DRN**	**160L4**	790	246
6.4	22000	279	197000	64200	51190	**PHF**	**022KF97**	**DRN**	**160L4**	690	247
7.4	19000	241	197000	64200	51190						
2.3	60200	763	175800	64200	51190	**P**	**022KF87**	**DRN**	**160L4**	700	244
2.6	53900	683	186500	64200	51190	**PF**	**022KF87**	**DRN**	**160L4**	600	245
						PH	**022KF87**	**DRN**	**160L4**	710	244
						PHF	**022KF87**	**DRN**	**160L4**	610	245
4.3	32200	408	156000	46200	36810						
5.2	26900	342	156000	46200	36810	**P**	**012KF97**	**DRN**	**160L4**	620	240
6.4	22000	279	150000	46200	36810	**PF**	**012KF97**	**DRN**	**160L4**	550	241
7.4	19000	241	143600	46200	36810	**PH**	**012KF97**	**DRN**	**160L4**	640	240
8.5	16500	209	137600	46200	36810	**PHF**	**012KF97**	**DRN**	**160L4**	570	241
10	13800	175	130500	46200	36810						
3.1	44700	567	156000	46200	36810	**P**	**012KF87**	**DRN**	**160L4**	550	238
3.6	38900	493	156000	46200	36810	**PF**	**012KF87**	**DRN**	**160L4**	480	239
						PH	**012KF87**	**DRN**	**160L4**	560	238
						PHF	**012KF87**	**DRN**	**160L4**	495	239
3.4	41900	530	156000	46200	36810	**P**	**012KF77**	**DRN**	**160L4**	510	236
						PF	**012KF77**	**DRN**	**160L4**	440	237
						PH	**012KF77**	**DRN**	**160L4**	530	236
						PHF	**012KF77**	**DRN**	**160L4**	455	237

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P_m = 15.0 kW

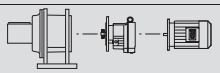
n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
7.6	18400	234	115200	29200	24830	**P**	**002KF97**	**DRN**	**160L4**	540	234
8.7	16000	203	110400	29200	24830	**PF**	**002KF97**	**DRN**	**160L4**	485	235
						PH	**002KF97**	**DRN**	**160L4**	550	234
						PHF	**002KF97**	**DRN**	**160L4**	490	235
5.5	25600	324	116500	29200	24830	**P**	**002KF87**	**DRN**	**160L4**	470	232
11	12700	162	103200	29200	24830	**PF**	**002KF87**	**DRN**	**160L4**	410	233
13	11100	141	98900	29200	24800	**PH**	**002KF87**	**DRN**	**160L4**	475	232
						PHF	**002KF87**	**DRN**	**160L4**	415	233
5.4	26100	331	115700	29200	24830	**P**	**002KF77**	**DRN**	**160L4**	430	230
						PF	**002KF77**	**DRN**	**160L4**	375	231
						PH	**002KF77**	**DRN**	**160L4**	435	230
						PHF	**002KF77**	**DRN**	**160L4**	380	231

P_m = 18.5 kW

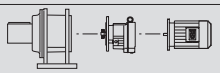
n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.50	347000	3570	850000	631300	500000	**P**	**102KF187**	**DRN**	**180M4**	5790	288
0.62	279000	2870	850000	631300	500000	**PF**	**102KF187**	**DRN**	**180M4**	4830	289
0.69	250200	2574	850000	631300	500000	**PH**	**102KF187**	**DRN**	**180M4**	5850	288
0.80	217200	2235	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**180M4**	4890	289
0.89	194800	2005	850000	631300	500000	**P**	**102KF167**	**DRN**	**180M4**	5160	286
1.1	161400	1661	850000	631300	500000	**PF**	**102KF167**	**DRN**	**180M4**	4200	287
1.4	121300	1249	850000	631300	500000	**PH**	**102KF167**	**DRN**	**180M4**	5220	286
1.6	108300	1114	850000	631300	500000	**PHF**	**102KF167**	**DRN**	**180M4**	4260	287
0.49	351600	3617	720000	513900	423000						
0.61	282600	2908	720000	513900	423000	**P**	**092KF187**	**DRN**	**180M4**	4940	284
0.68	253500	2608	720000	513900	423000	**PF**	**092KF187**	**DRN**	**180M4**	4240	285
0.79	220100	2264	720000	513900	423000	**PH**	**092KF187**	**DRN**	**180M4**	4950	284
0.87	199700	2054	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**180M4**	4250	285
1.0	171700	1767	720000	513900	423000						
1.1	163600	1683	720000	513900	423000						
1.4	122900	1265	720000	513900	423000	**P**	**092KF167**	**DRN**	**180M4**	4310	282
1.5	118700	1221	720000	513900	423000	**PF**	**092KF167**	**DRN**	**180M4**	3610	283
1.6	109700	1129	720000	513900	423000	**PH**	**092KF167**	**DRN**	**180M4**	4320	282
1.7	101200	1041	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**180M4**	3620	283
1.9	93500	962	720000	513900	423000						
0.47	365700	3761	648800	397100	359400						
0.52	334400	3440	675800	397100	359400	**P**	**082KF157**	**DRN**	**180M4**	3430	278
0.59	291000	2993	683000	397100	359400	**PF**	**082KF157**	**DRN**	**180M4**	2780	279
0.67	256800	2641	683000	397100	359400	**PH**	**082KF157**	**DRN**	**180M4**	3420	278
0.78	222600	2290	683000	397100	359400	**PHF**	**082KF157**	**DRN**	**180M4**	2770	279
0.87	198000	2038	683000	397100	359400						
0.77	225900	2325	523000	274600	245660	**P**	**072KF157**	**DRN**	**180M4**	2770	276
						PF	**072KF157**	**DRN**	**180M4**	2280	277
						PH	**072KF157**	**DRN**	**180M4**	2830	276
						PHF	**072KF157**	**DRN**	**180M4**	2340	277
0.66	262700	2703	523000	274600	245660						
0.86	200200	2060	523000	274600	245660	**P**	**072KF127**	**DRN**	**180M4**	2480	274
0.98	177100	1822	523000	274600	245660	**PF**	**072KF127**	**DRN**	**180M4**	1990	275
1.2	148800	1531	523000	274600	245660	**PH**	**072KF127**	**DRN**	**180M4**	2540	274
1.3	134200	1381	523000	274600	245660	**PHF**	**072KF127**	**DRN**	**180M4**	2040	275
0.84	206200	2121	422300	209100	185660						
0.95	182300	1876	441100	209100	185660	**P**	**062KF127**	**DRN**	**180M4**	2060	272
1.1	153200	1577	461000	209100	185660	**PF**	**062KF127**	**DRN**	**180M4**	1700	273
1.2	138200	1422	470100	209100	185660	**PH**	**062KF127**	**DRN**	**180M4**	2050	272
1.4	119600	1231	473000	209100	185660	**PHF**	**062KF127**	**DRN**	**180M4**	1680	273
1.4	119300	1227	473000	209100	185660	**P**	**062KF107**	**DRN**	**180M4**	1860	270
1.6	110500	1138	473000	209100	185660	**PF**	**062KF107**	**DRN**	**180M4**	1500	271
1.7	100300	1033	473000	209100	185660	**PH**	**062KF107**	**DRN**	**180M4**	1850	270
						PHF	**062KF107**	**DRN**	**180M4**	1490	271

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P_m = 18.5 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
1.6	110500	1138	364000	140600	124060	**P**	**052KF107**	**DRN**	**180M4**	1380	266
1.7	100300	1033	364000	140600	124060	**PF**	**052KF107**	**DRN**	**180M4**	1180	267
2.0	86200	887	364000	140600	124060	**PH**	**052KF107**	**DRN**	**180M4**	1370	266
2.3	75200	774	364000	140600	124060	**PHF**	**052KF107**	**DRN**	**180M4**	1170	267
1.6	110500	1138	284400	111000	100170	**P**	**042KF107**	**DRN**	**180M4**	1230	260
2.0	86200	887	308800	111000	100170	**PF**	**042KF107**	**DRN**	**180M4**	1040	261
						PH	**042KF107**	**DRN**	**180M4**	1240	260
						PHF	**042KF107**	**DRN**	**180M4**	1050	261
1.6	106400	1095	289000	111000	100170	**P**	**042KF97**	**DRN**	**180M4**	1120	258
2.4	72300	744	320100	111000	100170	**PF**	**042KF97**	**DRN**	**180M4**	930	259
2.7	63100	650	323000	111000	100170	**PH**	**042KF97**	**DRN**	**180M4**	1130	258
3.3	52800	543	323000	111000	100170	**PHF**	**042KF97**	**DRN**	**180M4**	940	259
2.0	85300	878	199900	86800	69620						
2.4	72300	744	219700	86800	69620	**P**	**032KF97**	**DRN**	**180M4**	880	252
2.7	63100	650	231300	86800	69620	**PF**	**032KF97**	**DRN**	**180M4**	750	253
3.3	52800	543	242500	86800	69620	**PH**	**032KF97**	**DRN**	**180M4**	900	252
3.8	45700	470	249100	86800	69620	**PHF**	**032KF97**	**DRN**	**180M4**	780	253
4.4	39700	408	249300	-	69620						
3.3	52800	543	188300	64200	51190						
3.8	45700	470	197000	64200	51190						
4.4	39700	408	197000	64200	51190	**P**	**022KF97**	**DRN**	**180M4**	800	246
5.2	33200	342	197000	64200	51190	**PF**	**022KF97**	**DRN**	**180M4**	690	247
5.3	32300	333	197000	64200	51190	**PH**	**022KF97**	**DRN**	**180M4**	810	246
6.4	27000	279	197000	64200	51190	**PHF**	**022KF97**	**DRN**	**180M4**	710	247
7.4	23400	241	197000	64200	51190						
3.1	55000	567	184700	64200	51190	**P**	**022KF87**	**DRN**	**180M4**	720	244
						PF	**022KF87**	**DRN**	**180M4**	620	245
						PH	**022KF87**	**DRN**	**180M4**	730	244
						PHF	**022KF87**	**DRN**	**180M4**	630	245
4.4	39700	408	156000	46200	36810						
5.2	33200	342	156000	46200	36810						
5.3	32300	333	156000	46200	36810	**P**	**012KF97**	**DRN**	**180M4**	650	240
6.4	27000	279	149900	46200	36810	**PF**	**012KF97**	**DRN**	**180M4**	580	241
7.4	23400	241	143500	46200	36810	**PH**	**012KF97**	**DRN**	**180M4**	660	240
8.5	20300	209	137500	46200	36810	**PHF**	**012KF97**	**DRN**	**180M4**	590	241
10	17000	175	130400	46200	36810						
4.1	42500	438	156000	46200	36810	**P**	**012KF87**	**DRN**	**180M4**	570	238
4.5	38100	392	156000	46200	36810	**PF**	**012KF87**	**DRN**	**180M4**	500	239
						PH	**012KF87**	**DRN**	**180M4**	590	238
						PHF	**012KF87**	**DRN**	**180M4**	520	239
8.8	19700	203	110400	29200	24830	**P**	**002KF97**	**DRN**	**180M4**	570	234
10	16500	170	104600	29200	24830	**PF**	**002KF97**	**DRN**	**180M4**	510	235
						PH	**002KF97**	**DRN**	**180M4**	570	234
						PHF	**002KF97**	**DRN**	**180M4**	510	235
6.3	27400	282	113700	29200	24830	**P**	**002KF87**	**DRN**	**180M4**	490	232
						PF	**002KF87**	**DRN**	**180M4**	435	233
						PH	**002KF87**	**DRN**	**180M4**	495	232
						PHF	**002KF87**	**DRN**	**180M4**	435	233

P_m = 22 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
0.50	412700	3570	850000	631300	500000						
0.62	331800	2870	850000	631300	500000	**P**	**102KF187**	**DRN**	**180L4**	5800	288
0.69	297600	2574	850000	631300	500000	**PF**	**102KF187**	**DRN**	**180L4**	4850	289
0.80	258400	2235	850000	631300	500000	**PH**	**102KF187**	**DRN**	**180L4**	5870	288
0.88	234400	2028	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**180L4**	4910	289
1.1	192000	1661	850000	631300	500000	**P**	**102KF167**	**DRN**	**180L4**	5170	286
1.4	144300	1249	850000	631300	500000	**PF**	**102KF167**	**DRN**	**180L4**	4220	287
1.6	128700	1114	850000	631300	500000	**PH**	**102KF167**	**DRN**	**180L4**	5240	286
1.9	109700	949	850000	631300	500000	**PHF**	**102KF167**	**DRN**	**180L4**	4280	287

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P_m = 22 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.49	418100	3617	720000	513900	423000						
0.61	336100	2908	720000	513900	423000	**P**	**092KF187**	**DRN**	**180L4**	4950	284
0.68	301500	2608	720000	513900	423000	**PF**	**092KF187**	**DRN**	**180L4**	4250	285
0.79	261800	2264	720000	513900	423000	**PH**	**092KF187**	**DRN**	**180L4**	4960	284
0.87	237500	2054	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**180L4**	4270	285
1.0	204600	1770	720000	513900	423000						
1.4	146200	1265	720000	513900	423000						
1.5	141200	1221	720000	513900	423000						
1.6	130400	1129	720000	513900	423000	**P**	**092KF167**	**DRN**	**180L4**	4320	282
1.7	120300	1041	720000	513900	423000	**PF**	**092KF167**	**DRN**	**180L4**	3620	283
1.9	111200	962	720000	513900	423000	**PH**	**092KF167**	**DRN**	**180L4**	4330	282
2.1	99700	863	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**180L4**	3640	283
2.2	92100	797	720000	513900	423000						
0.45	454500	3932	720000	513900	423000	**P**	**092KF157**	**DRN**	**180L4**	3950	280
						PF	**092KF157**	**DRN**	**180L4**	3250	281
						PH	**092KF157**	**DRN**	**180L4**	3960	280
						PHF	**092KF157**	**DRN**	**180L4**	3260	281
0.67	305400	2641	683000	397100	359400						
0.78	264700	2290	683000	397100	359400	**P**	**082KF157**	**DRN**	**180L4**	3450	278
0.87	235500	2038	683000	397100	359400	**PF**	**082KF157**	**DRN**	**180L4**	2800	279
1.0	203000	1756	683000	397100	359400	**PH**	**082KF157**	**DRN**	**180L4**	3440	278
1.2	164900	1427	683000	397100	359400	**PHF**	**082KF157**	**DRN**	**180L4**	2790	279
0.77	268700	2325	522400	274600	245660	**P**	**072KF157**	**DRN**	**180L4**	2790	276
0.86	239000	2068	523000	274600	245660	**PF**	**072KF157**	**DRN**	**180L4**	2300	277
1.2	167400	1449	523000	274600	245660	**PH**	**072KF157**	**DRN**	**180L4**	2840	276
						PHF	**072KF157**	**DRN**	**180L4**	2350	277
0.98	210600	1822	523000	274600	245660						
1.3	159600	1381	523000	274600	245660	**P**	**072KF127**	**DRN**	**180L4**	2500	274
1.5	138100	1195	523000	274600	245660	**PF**	**072KF127**	**DRN**	**180L4**	2010	275
1.7	121800	1055	523000	274600	245660	**PH**	**072KF127**	**DRN**	**180L4**	2550	274
2.0	105200	911	523000	274600	245660	**PHF**	**072KF127**	**DRN**	**180L4**	2060	275
1.1	182200	1577	441200	209100	185660						
1.2	164300	1422	453800	209100	185660						
1.4	142200	1231	467700	209100	185660	**P**	**062KF127**	**DRN**	**180L4**	2080	272
1.6	125500	1086	473000	209100	185660	**PF**	**062KF127**	**DRN**	**180L4**	1710	273
1.9	108400	938	473000	209100	185660	**PH**	**062KF127**	**DRN**	**180L4**	2060	272
2.1	95800	830	473000	209100	185660	**PHF**	**062KF127**	**DRN**	**180L4**	1700	273
2.6	80500	697	473000	209100	185660						
1.6	131400	1138	473000	209100	185660						
1.7	119300	1033	473000	209100	185660	**P**	**062KF107**	**DRN**	**180L4**	1880	270
2.0	102500	887	473000	209100	185660	**PF**	**062KF107**	**DRN**	**180L4**	1520	271
2.3	89500	774	473000	209100	185660	**PH**	**062KF107**	**DRN**	**180L4**	1870	270
2.7	75900	657	473000	209100	185660	**PHF**	**062KF107**	**DRN**	**180L4**	1500	271
3.1	66300	574	473000	209100	185660						
3.2	65000	563	364000	140600	124060	**P**	**052KF127**	**DRN**	**180L4**	1590	268
3.5	57900	502	364000	140600	124060	**PF**	**052KF127**	**DRN**	**180L4**	1390	269
						PH	**052KF127**	**DRN**	**180L4**	1580	268
						PHF	**052KF127**	**DRN**	**180L4**	1380	269
1.6	131400	1138	350100	140600	124060	**P**	**052KF107**	**DRN**	**180L4**	1400	266
2.0	102500	887	364000	140600	124060	**PF**	**052KF107**	**DRN**	**180L4**	1200	267
2.7	75900	657	364000	140600	124060	**PH**	**052KF107**	**DRN**	**180L4**	1390	266
						PHF	**052KF107**	**DRN**	**180L4**	1190	267
1.5	139700	1209	342700	140600	124060	**P**	**052KF97**	**DRN**	**180L4**	1280	264
1.6	126500	1095	354300	140600	124060	**PF**	**052KF97**	**DRN**	**180L4**	1080	265
3.3	62800	543	364000	140600	124060	**PH**	**052KF97**	**DRN**	**180L4**	1270	264
3.8	54300	470	364000	140600	124060	**PHF**	**052KF97**	**DRN**	**180L4**	1070	265
4.2	48700	421	310800	111000	100170	**P**	**042KF127**	**DRN**	**180L4**	1450	262
						PF	**042KF127**	**DRN**	**180L4**	1260	263
						PH	**042KF127**	**DRN**	**180L4**	1450	262
						PHF	**042KF127**	**DRN**	**180L4**	1260	263

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P_m = 22 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
2.0	102500	887	293100	111000	100170						
2.3	89500	774	305900	111000	100170	**P**	**042KF107**	**DRN**	**180L4**	1250	260
3.1	66300	574	323000	111000	100170	**PF**	**042KF107**	**DRN**	**180L4**	1060	261
3.4	60900	527	323000	111000	100170	**PH**	**042KF107**	**DRN**	**180L4**	1250	260
3.9	53100	460	319200	111000	100170	**PHF**	**042KF107**	**DRN**	**180L4**	1060	261
4.6	45000	390	303600	111000	100170						
2.0	101400	878	294300	111000	100170	**P**	**042KF97**	**DRN**	**180L4**	1140	258
2.7	75100	650	318000	111000	100170	**PF**	**042KF97**	**DRN**	**180L4**	950	259
4.4	47200	408	307900	-	100170	**PH**	**042KF97**	**DRN**	**180L4**	1140	258
5.2	39400	342	291900	-	100170	**PHF**	**042KF97**	**DRN**	**180L4**	950	259
6.2	33300	289	224600	86800	69620	**P**	**032KF127**	**DRN**	**180L4**	1200	256
6.9	29700	257	216900	86800	69620	**PF**	**032KF127**	**DRN**	**180L4**	1080	257
						PH	**032KF127**	**DRN**	**180L4**	1220	256
						PHF	**032KF127**	**DRN**	**180L4**	1100	257
4.6	45000	390	245800	86800	69620	**P**	**032KF107**	**DRN**	**180L4**	1000	254
5.2	39400	341	236200	86800	69620	**PF**	**032KF107**	**DRN**	**180L4**	880	255
6.0	34000	294	225900	86800	69620	**PH**	**032KF107**	**DRN**	**180L4**	1020	254
6.6	31200	270	220200	-	69620	**PHF**	**032KF107**	**DRN**	**180L4**	900	255
2.4	85900	744	198700	86800	69620						
2.7	75100	650	215800	86800	69620	**P**	**032KF97**	**DRN**	**180L4**	890	252
3.3	62800	543	231700	86800	69620	**PF**	**032KF97**	**DRN**	**180L4**	770	253
3.8	54300	470	240900	86800	69620	**PH**	**032KF97**	**DRN**	**180L4**	910	252
6.4	32200	279	222300	-	69620	**PHF**	**032KF97**	**DRN**	**180L4**	790	253
7.4	27800	241	212800	-	69620						
7.6	27200	236	197000	64200	51190	**P**	**022KF107**	**DRN**	**180L4**	920	248
8.9	23100	200	197000	64200	51190	**PF**	**022KF107**	**DRN**	**180L4**	820	249
10	20200	175	197000	64200	51190	**PH**	**022KF107**	**DRN**	**180L4**	940	248
						PHF	**022KF107**	**DRN**	**180L4**	840	249
3.3	62800	543	171000	64200	51190						
3.8	54300	470	185900	64200	51190						
4.4	47200	408	196500	64200	51190	**P**	**022KF97**	**DRN**	**180L4**	810	246
5.2	39400	342	197000	64200	51190	**PF**	**022KF97**	**DRN**	**180L4**	710	247
5.3	38500	333	197000	64200	51190	**PH**	**022KF97**	**DRN**	**180L4**	830	246
6.4	32200	279	197000	64200	51190	**PHF**	**022KF97**	**DRN**	**180L4**	720	247
8.5	24200	209	197000	-	51190						
10	20200	175	197000	64200	51190						
3.6	56900	493	181600	64200	51190	**P**	**022KF87**	**DRN**	**180L4**	730	244
						PF	**022KF87**	**DRN**	**180L4**	630	245
						PH	**022KF87**	**DRN**	**180L4**	750	244
						PHF	**022KF87**	**DRN**	**180L4**	650	245
5.2	39400	342	156000	46200	36810						
5.3	38500	333	156000	46200	36810	**P**	**012KF97**	**DRN**	**180L4**	660	240
7.4	27800	241	143500	46200	36810	**PF**	**012KF97**	**DRN**	**180L4**	590	241
8.5	24200	209	137500	46200	36810	**PH**	**012KF97**	**DRN**	**180L4**	680	240
10	20200	175	130400	46200	36810	**PHF**	**012KF97**	**DRN**	**180L4**	610	241
4.5	45300	392	156000	46200	36810	**P**	**012KF87**	**DRN**	**180L4**	590	238
5.5	37600	325	156000	46200	36810	**PF**	**012KF87**	**DRN**	**180L4**	520	239
						PH	**012KF87**	**DRN**	**180L4**	600	238
						PHF	**012KF87**	**DRN**	**180L4**	530	239
7.6	27000	234	114200	29200	24830	**P**	**002KF97**	**DRN**	**180L4**	580	234
						PF	**002KF97**	**DRN**	**180L4**	520	235
						PH	**002KF97**	**DRN**	**180L4**	590	234
						PHF	**002KF97**	**DRN**	**180L4**	530	235
7.3	28300	245	112100	29200	24830	**P**	**002KF87**	**DRN**	**180L4**	510	232
8.2	25200	218	112700	29200	24830	**PF**	**002KF87**	**DRN**	**180L4**	450	233
						PH	**002KF87**	**DRN**	**180L4**	510	232
						PHF	**002KF87**	**DRN**	**180L4**	455	233

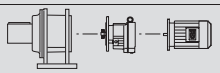
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P_m = 30 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.50	562200	3570	840800	631300	500000						
0.62	451900	2870	850000	631300	500000						
0.69	405300	2574	850000	631300	500000	**P**	**102KF187**	**DRN**	**200L4**	5910	288
0.80	351900	2235	850000	631300	500000	**PF**	**102KF187**	**DRN**	**200L4**	4960	289
0.88	319300	2028	850000	631300	500000	**PH**	**102KF187**	**DRN**	**200L4**	5970	288
1.0	275000	1747	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**200L4**	5020	289
1.2	231100	1468	850000	631300	500000						
0.52	535700	3402	850000	631300	500000						
1.4	196600	1249	850000	631300	500000	**P**	**102KF167**	**DRN**	**200L4**	5280	286
1.6	175400	1114	850000	631300	500000	**PF**	**102KF167**	**DRN**	**200L4**	4330	287
1.9	149500	949	850000	631300	500000	**PH**	**102KF167**	**DRN**	**200L4**	5340	286
2.3	123800	787	850000	631300	500000	**PHF**	**102KF167**	**DRN**	**200L4**	4390	287
2.7	105700	671	850000	631300	500000						
0.61	457900	2908	720000	513900	423000						
0.68	410700	2608	720000	513900	423000						
0.79	356600	2264	720000	513900	423000	**P**	**092KF187**	**DRN**	**200L4**	5060	284
0.87	323500	2054	720000	513900	423000	**PF**	**092KF187**	**DRN**	**200L4**	4360	285
1.0	278700	1770	720000	513900	423000	**PH**	**092KF187**	**DRN**	**200L4**	5070	284
1.2	234200	1487	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**200L4**	4370	285
1.4	202800	1288	720000	513900	423000						
0.58	482700	3065	699300	513900	423000						
1.7	163900	1041	720000	513900	423000						
1.9	151500	962	720000	513900	423000						
2.1	135800	863	720000	513900	423000	**P**	**092KF167**	**DRN**	**200L4**	4430	282
2.2	125500	797	720000	513900	423000	**PF**	**092KF167**	**DRN**	**200L4**	3730	283
2.4	115900	736	720000	513900	423000	**PH**	**092KF167**	**DRN**	**200L4**	4440	282
2.6	107100	680	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**200L4**	3740	283
2.8	102100	649	720000	513900	423000						
3.1	91100	579	720000	513900	423000						
0.57	492700	3129	688700	513900	423000	**P**	**092KF157**	**DRN**	**200L4**	4050	280
0.65	434800	2761	720000	513900	423000	**PF**	**092KF157**	**DRN**	**200L4**	3360	281
						PH	**092KF157**	**DRN**	**200L4**	4070	280
						PHF	**092KF157**	**DRN**	**200L4**	3370	281
0.88	320800	2038	683000	397100	359400						
1.0	276500	1756	683000	397100	359400	**P**	**082KF157**	**DRN**	**200L4**	3550	278
1.2	224700	1427	683000	397100	359400	**PF**	**082KF157**	**DRN**	**200L4**	2900	279
1.5	185000	1175	683000	397100	359400	**PH**	**082KF157**	**DRN**	**200L4**	3550	278
1.7	163200	1037	683000	397100	359400	**PHF**	**082KF157**	**DRN**	**200L4**	2900	279
1.2	228000	1449	523000	274600	245660	**P**	**072KF157**	**DRN**	**200L4**	2900	276
						PF	**072KF157**	**DRN**	**200L4**	2410	277
						PH	**072KF157**	**DRN**	**200L4**	2950	276
						PHF	**072KF157**	**DRN**	**200L4**	2460	277
1.3	217400	1381	523000	274600	245660						
1.5	188100	1195	523000	274600	245660	**P**	**072KF127**	**DRN**	**200L4**	2610	274
1.7	166000	1055	523000	274600	245660	**PF**	**072KF127**	**DRN**	**200L4**	2120	275
2.0	143300	911	523000	274600	245660	**PH**	**072KF127**	**DRN**	**200L4**	2660	274
2.2	126800	806	523000	274600	245660	**PHF**	**072KF127**	**DRN**	**200L4**	2170	275
1.4	193700	1231	432400	209100	185660						
1.6	170900	1086	449300	209100	185660	**P**	**062KF127**	**DRN**	**200L4**	2180	272
1.9	147600	938	464500	209100	185660	**PF**	**062KF127**	**DRN**	**200L4**	1820	273
2.1	130600	830	473000	209100	185660	**PH**	**062KF127**	**DRN**	**200L4**	2170	272
2.6	109700	697	473000	209100	185660	**PHF**	**062KF127**	**DRN**	**200L4**	1810	273
3.2	88600	563	473000	209100	185660						
1.4	193200	1227	432800	209100	185660	**P**	**062KF107**	**DRN**	**200L4**	1990	270
2.0	139700	887	469200	209100	185660	**PF**	**062KF107**	**DRN**	**200L4**	1620	271
2.3	121900	774	473000	209100	185660	**PH**	**062KF107**	**DRN**	**200L4**	1980	270
						PHF	**062KF107**	**DRN**	**200L4**	1610	271
3.2	88600	563	364000	140600	124060	**P**	**052KF127**	**DRN**	**200L4**	1700	268
3.6	78900	502	364000	140600	124060	**PF**	**052KF127**	**DRN**	**200L4**	1500	269
4.2	66300	421	358400	140600	124060	**PH**	**052KF127**	**DRN**	**200L4**	1690	268
						PHF	**052KF127**	**DRN**	**200L4**	1490	269

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P_m = 30 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}					m	
				f_{LC}<=7.5	f_{LC}>107.5					
min^{-1}	Nm		N	Nm	Nm				kg	
2.0	139700	887	342700	140600	124060	**P**	**052KF107**	**DRN**	**200L4**	1500	266
2.7	103400	657	364000	140600	124060	**PF**	**052KF107**	**DRN**	**200L4**	1300	267
4.6	61400	390	350200	140600	124060	**PH**	**052KF107**	**DRN**	**200L4**	1500	266
						PHF	**052KF107**	**DRN**	**200L4**	1300	267
2.0	138100	878	344100	140600	124060	**P**	**052KF97**	**DRN**	**200L4**	1390	264
						PF	**052KF97**	**DRN**	**200L4**	1190	265
						PH	**052KF97**	**DRN**	**200L4**	1380	264
						PHF	**052KF97**	**DRN**	**200L4**	1180	265
4.2	66300	421	310800	111000	100170	**P**	**042KF127**	**DRN**	**200L4**	1550	262
5.2	53600	341	291400	111000	100170	**PF**	**042KF127**	**DRN**	**200L4**	1360	263
						PH	**042KF127**	**DRN**	**200L4**	1560	262
						PHF	**042KF127**	**DRN**	**200L4**	1370	263
3.1	90400	574	305100	111000	100170						
3.4	82900	527	311600	111000	100170	**P**	**042KF107**	**DRN**	**200L4**	1360	260
3.9	72400	460	318900	111000	100170	**PF**	**042KF107**	**DRN**	**200L4**	1170	261
4.6	61400	390	303600	111000	100170	**PH**	**042KF107**	**DRN**	**200L4**	1360	260
5.2	53600	341	291600	111000	100170	**PHF**	**042KF107**	**DRN**	**200L4**	1170	261
2.7	102300	650	293400	111000	100170	**P**	**042KF97**	**DRN**	**200L4**	1250	258
						PF	**042KF97**	**DRN**	**200L4**	1060	259
						PH	**042KF97**	**DRN**	**200L4**	1250	258
						PHF	**042KF97**	**DRN**	**200L4**	1060	259
6.2	45400	289	224500	86800	69620	**P**	**032KF127**	**DRN**	**200L4**	1310	256
6.9	40400	257	216800	86800	69620	**PF**	**032KF127**	**DRN**	**200L4**	1190	257
						PH	**032KF127**	**DRN**	**200L4**	1330	256
						PHF	**032KF127**	**DRN**	**200L4**	1210	257
4.6	61400	390	233300	86800	69620						
5.2	53600	341	236000	86800	69620	**P**	**032KF107**	**DRN**	**200L4**	1110	254
6.1	46300	294	225800	86800	69620	**PF**	**032KF107**	**DRN**	**200L4**	990	255
6.6	42500	270	220100	-	69620	**PH**	**032KF107**	**DRN**	**200L4**	1130	254
7.6	37100	236	211300	-	69620	**PHF**	**032KF107**	**DRN**	**200L4**	1010	255
3.3	85500	543	199400	86800	69620						
3.8	74000	470	217200	86800	69620	**P**	**032KF97**	**DRN**	**200L4**	1000	252
6.4	43800	279	222200	-	69620	**PF**	**032KF97**	**DRN**	**200L4**	880	253
7.4	37900	241	212800	-	69620	**PH**	**032KF97**	**DRN**	**200L4**	1020	252
10	27500	175	193300	86800	52400	**PHF**	**032KF97**	**DRN**	**200L4**	900	253
7.6	37100	236	197000	64200	51190	**P**	**022KF107**	**DRN**	**200L4**	1030	248
8.9	31400	200	197000	64200	51190	**PF**	**022KF107**	**DRN**	**200L4**	930	249
10	27500	175	197000	64200	51190	**PH**	**022KF107**	**DRN**	**200L4**	1050	248
						PHF	**022KF107**	**DRN**	**200L4**	950	249
5.2	53700	342	186800	64200	51190	**P**	**022KF97**	**DRN**	**200L4**	920	246
5.3	52400	333	188900	64200	51190	**PF**	**022KF97**	**DRN**	**200L4**	820	247
7.4	37900	241	197000	64200	51190	**PH**	**022KF97**	**DRN**	**200L4**	930	246
10	27500	175	197000	64200	51190	**PHF**	**022KF97**	**DRN**	**200L4**	830	247
10	27500	175	130300	46200	36810	**P**	**012KF107**	**DRN**	**200L4**	880	242
						PF	**012KF107**	**DRN**	**200L4**	810	243
						PH	**012KF107**	**DRN**	**200L4**	900	242
						PHF	**012KF107**	**DRN**	**200L4**	830	243
6.4	43800	279	149800	46200	36810	**P**	**012KF97**	**DRN**	**200L4**	770	240
7.4	37900	241	143500	46200	36810	**PF**	**012KF97**	**DRN**	**200L4**	700	241
10	27500	175	130300	46200	36810	**PH**	**012KF97**	**DRN**	**200L4**	790	240
						PHF	**012KF97**	**DRN**	**200L4**	720	241
6.1	45700	291	151700	46200	36810	**P**	**012KF87**	**DRN**	**200L4**	690	238
6.3	44500	283	150500	46200	36810	**PF**	**012KF87**	**DRN**	**200L4**	620	239
						PH	**012KF87**	**DRN**	**200L4**	710	238
						PHF	**012KF87**	**DRN**	**200L4**	640	239
10	26700	170	104600	29200	24830	**P**	**002KF97**	**DRN**	**200L4**	690	234
						PF	**002KF97**	**DRN**	**200L4**	630	235
						PH	**002KF97**	**DRN**	**200L4**	700	234
						PHF	**002KF97**	**DRN**	**200L4**	640	235
11	25400	162	103000	29200	24830	**P**	**002KF87**	**DRN**	**200L4**	610	232
						PF	**002KF87**	**DRN**	**200L4**	560	233
						PH	**002KF87**	**DRN**	**200L4**	620	232
						PHF	**002KF87**	**DRN**	**200L4**	560	233

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P_m = 37 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.62	556700	2870	844600	631300	500000						
0.69	499400	2574	850000	631300	500000	**P**	**102KF187**	**DRN**	**225S4**	5940	288
0.80	433600	2235	850000	631300	500000	**PF**	**102KF187**	**DRN**	**225S4**	4990	289
0.88	393400	2028	850000	631300	500000	**PH**	**102KF187**	**DRN**	**225S4**	6000	288
1.0	338800	1747	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**225S4**	5050	289
1.2	284800	1468	850000	631300	500000						
1.4	246500	1271	850000	631300	500000						
0.68	511300	2636	850000	631300	500000	**P**	**102KF167**	**DRN**	**225S4**	5310	286
1.9	184200	949	850000	631300	500000	**PF**	**102KF167**	**DRN**	**225S4**	4360	287
2.3	152600	787	850000	631300	500000	**PH**	**102KF167**	**DRN**	**225S4**	5370	286
2.7	130200	671	850000	631300	500000	**PHF**	**102KF167**	**DRN**	**225S4**	4420	287
0.68	505900	2608	674200	513900	423000						
0.79	439300	2264	720000	513900	423000						
0.87	398500	2054	720000	513900	423000	**P**	**092KF187**	**DRN**	**225S4**	5090	284
1.0	343300	1770	720000	513900	423000	**PF**	**092KF187**	**DRN**	**225S4**	4390	285
1.2	288500	1487	720000	513900	423000	**PH**	**092KF187**	**DRN**	**225S4**	5100	284
1.4	249800	1288	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**225S4**	4400	285
1.7	208200	1073	720000	513900	423000						
1.9	177500	915	720000	513900	423000						
0.75	462200	2383	720000	513900	423000						
0.81	428400	2209	720000	513900	423000						
2.1	167300	863	720000	513900	423000	**P**	**092KF167**	**DRN**	**225S4**	4460	282
2.2	154600	797	720000	513900	423000	**PF**	**092KF167**	**DRN**	**225S4**	3760	283
2.4	142800	736	720000	513900	423000	**PH**	**092KF167**	**DRN**	**225S4**	4470	282
2.6	131900	680	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**225S4**	3770	283
2.8	125800	649	720000	513900	423000						
3.1	112200	579	720000	513900	423000						
3.6	95600	493	720000	513900	423000						
0.75	464400	2394	717900	513900	423000	**P**	**092KF157**	**DRN**	**225S4**	4080	280
						PF	**092KF157**	**DRN**	**225S4**	3390	281
						PH	**092KF157**	**DRN**	**225S4**	4100	280
						PHF	**092KF157**	**DRN**	**225S4**	3400	281
0.88	395300	2038	620400	397100	359400						
1.0	340700	1756	670600	397100	359400	**P**	**082KF157**	**DRN**	**225S4**	3590	278
1.2	276800	1427	683000	397100	359400	**PF**	**082KF157**	**DRN**	**225S4**	2940	279
1.5	227900	1175	683000	397100	359400	**PH**	**082KF157**	**DRN**	**225S4**	3580	278
1.7	201100	1037	683000	397100	359400	**PHF**	**082KF157**	**DRN**	**225S4**	2930	279
2.0	174300	899	683000	397100	359400						
1.3	267800	1381	523000	274600	245660						
1.5	231800	1195	523000	274600	245660	**P**	**072KF127**	**DRN**	**225S4**	2640	274
1.7	204500	1055	523000	274600	245660	**PF**	**072KF127**	**DRN**	**225S4**	2150	275
2.0	176600	911	523000	274600	245660	**PH**	**072KF127**	**DRN**	**225S4**	2690	274
2.2	156200	806	523000	274600	245660	**PHF**	**072KF127**	**DRN**	**225S4**	2200	275
2.6	131300	677	523000	274600	245660						
2.1	160900	830	456100	209100	185660						
2.6	135200	697	471800	209100	185660	**P**	**062KF127**	**DRN**	**225S4**	2220	272
3.2	109200	563	473000	209100	185660	**PF**	**062KF127**	**DRN**	**225S4**	1850	273
3.6	97200	502	471800	209100	185660	**PH**	**062KF127**	**DRN**	**225S4**	2200	272
4.2	81700	421	447700	209100	185660	**PHF**	**062KF127**	**DRN**	**225S4**	1840	273
1.7	200200	1033	427200	209100	185660	**P**	**062KF107**	**DRN**	**225S4**	2020	270
						PF	**062KF107**	**DRN**	**225S4**	1660	271
						PH	**062KF107**	**DRN**	**225S4**	2010	270
						PHF	**062KF107**	**DRN**	**225S4**	1640	271
3.2	109200	563	364000	140600	124060	**P**	**052KF127**	**DRN**	**225S4**	1730	268
3.6	97200	502	364000	140600	124060	**PF**	**052KF127**	**DRN**	**225S4**	1530	269
4.2	81700	421	358100	140600	124060	**PH**	**052KF127**	**DRN**	**225S4**	1720	268
5.2	66000	341	336100	140600	124060	**PHF**	**052KF127**	**DRN**	**225S4**	1520	269
2.7	127400	657	353500	140600	124060	**P**	**052KF107**	**DRN**	**225S4**	1540	266
4.6	75600	390	349900	140600	124060	**PF**	**052KF107**	**DRN**	**225S4**	1340	267
5.2	66100	341	336100	140600	124060	**PH**	**052KF107**	**DRN**	**225S4**	1530	266
						PHF	**052KF107**	**DRN**	**225S4**	1330	267

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P_m = 37 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
4.2	81700	421	310500	111000	100170	**P**	**042KF127**	**DRN**	**225S4**	1590	262
5.2	66000	341	291400	111000	100170	**PF**	**042KF127**	**DRN**	**225S4**	1400	263
						PH	**042KF127**	**DRN**	**225S4**	1590	262
						PHF	**042KF127**	**DRN**	**225S4**	1400	263
3.4	102200	527	293500	111000	100170	**P**	**042KF107**	**DRN**	**225S4**	1390	260
4.6	75600	390	303400	111000	100170	**PF**	**042KF107**	**DRN**	**225S4**	1200	261
5.2	66100	341	291400	111000	100170	**PH**	**042KF107**	**DRN**	**225S4**	1390	260
						PHF	**042KF107**	**DRN**	**225S4**	1200	261
3.3	105400	543	290100	111000	100170	**P**	**042KF97**	**DRN**	**225S4**	1280	258
						PF	**042KF97**	**DRN**	**225S4**	1090	259
						PH	**042KF97**	**DRN**	**225S4**	1280	258
						PHF	**042KF97**	**DRN**	**225S4**	1090	259
6.2	55900	289	224400	86800	69620	**P**	**032KF127**	**DRN**	**225S4**	1340	256
6.9	49800	257	216800	86800	69620	**PF**	**032KF127**	**DRN**	**225S4**	1220	257
						PH	**032KF127**	**DRN**	**225S4**	1360	256
						PHF	**032KF127**	**DRN**	**225S4**	1240	257
4.6	75600	390	215000	86800	69620						
5.2	66100	341	227700	86800	69620	**P**	**032KF107**	**DRN**	**225S4**	1140	254
6.1	57000	294	225700	86800	69620	**PF**	**032KF107**	**DRN**	**225S4**	1020	255
8.9	38700	200	201000	-	69620	**PH**	**032KF107**	**DRN**	**225S4**	1160	254
10	33900	175	193100	86800	69620	**PHF**	**032KF107**	**DRN**	**225S4**	1040	255
8.9	38700	200	197000	64200	51190	**P**	**022KF107**	**DRN**	**225S4**	1060	248
10	33900	175	197000	64200	51190	**PF**	**022KF107**	**DRN**	**225S4**	960	249
						PH	**022KF107**	**DRN**	**225S4**	1080	248
						PHF	**022KF107**	**DRN**	**225S4**	980	249
6.4	54000	279	186400	64200	51190	**P**	**022KF97**	**DRN**	**225S4**	950	246
						PF	**022KF97**	**DRN**	**225S4**	850	247
						PH	**022KF97**	**DRN**	**225S4**	970	246
						PHF	**022KF97**	**DRN**	**225S4**	860	247
8.5	40600	209	137400	46200	36810	**P**	**012KF97**	**DRN**	**225S4**	800	240
						PF	**012KF97**	**DRN**	**225S4**	730	241
						PH	**012KF97**	**DRN**	**225S4**	820	240
						PHF	**012KF97**	**DRN**	**225S4**	750	241

P_m = 45 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.69	607300	2574	807000	631300	500000						
0.80	527300	2235	850000	631300	500000						
0.88	478400	2028	850000	631300	500000	**P**	**102KF187**	**DRN**	**225M4**	5940	288
1.0	412100	1747	850000	631300	500000	**PF**	**102KF187**	**DRN**	**225M4**	4990	289
1.2	346300	1468	850000	631300	500000	**PH**	**102KF187**	**DRN**	**225M4**	6000	288
1.4	299900	1271	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**225M4**	5050	289
1.7	249900	1059	850000	631300	500000						
2.0	213000	903	850000	631300	500000						
0.68	621900	2636	795400	631300	500000	**P**	**102KF167**	**DRN**	**225M4**	5310	286
0.76	554900	2352	845900	631300	500000	**PF**	**102KF167**	**DRN**	**225M4**	4360	287
2.3	185600	787	850000	631300	500000	**PH**	**102KF167**	**DRN**	**225M4**	5370	286
2.7	158400	671	850000	631300	500000	**PHF**	**102KF167**	**DRN**	**225M4**	4420	287
0.87	484700	2054	697200	513900	423000						
1.0	417500	1770	720000	513900	423000						
1.2	350900	1487	720000	513900	423000	**P**	**092KF187**	**DRN**	**225M4**	5090	284
1.4	303800	1288	720000	513900	423000	**PF**	**092KF187**	**DRN**	**225M4**	4390	285
1.7	253200	1073	720000	513900	423000	**PH**	**092KF187**	**DRN**	**225M4**	5100	284
1.9	215900	915	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**225M4**	4400	285
2.3	183000	776	720000	513900	423000						

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P_m = 45 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.88	479200	2031	703000	513900	423000						
2.6	160500	680	720000	513900	423000	**P**	**092KF167**	**DRN**	**225M4**	4460	282
2.8	153000	649	720000	513900	423000	**PF**	**092KF167**	**DRN**	**225M4**	3760	283
3.1	136500	579	720000	513900	423000	**PH**	**092KF167**	**DRN**	**225M4**	4470	282
3.6	116300	493	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**225M4**	3770	283
4.4	96400	409	720000	513900	423000						
0.84	502500	2130	678000	513900	423000	**P**	**092KF157**	**DRN**	**225M4**	4080	280
0.97	433100	1836	720000	513900	423000	**PF**	**092KF157**	**DRN**	**225M4**	3390	281
						PH	**092KF157**	**DRN**	**225M4**	4100	280
						PHF	**092KF157**	**DRN**	**225M4**	3400	281
1.5	277200	1175	683000	397100	359400						
1.7	244600	1037	683000	397100	359400	**P**	**082KF157**	**DRN**	**225M4**	3590	278
2.0	212000	899	683000	397100	359400	**PF**	**082KF157**	**DRN**	**225M4**	2940	279
2.2	188700	800	683000	397100	359400	**PH**	**082KF157**	**DRN**	**225M4**	3580	278
2.6	162600	689	683000	397100	359400	**PHF**	**082KF157**	**DRN**	**225M4**	2930	279
3.1	134100	568	523000	274600	245660	**P**	**072KF157**	**DRN**	**225M4**	2930	276
3.7	113700	482	523000	274600	245660	**PF**	**072KF157**	**DRN**	**225M4**	2440	277
						PH	**072KF157**	**DRN**	**225M4**	2980	276
						PHF	**072KF157**	**DRN**	**225M4**	2490	277
1.7	248700	1055	523000	274600	245660						
2.0	214800	911	523000	274600	245660						
2.2	190000	806	523000	274600	245660	**P**	**072KF127**	**DRN**	**225M4**	2640	274
2.6	159600	677	523000	274600	245660	**PF**	**072KF127**	**DRN**	**225M4**	2150	275
3.3	128900	547	523000	274600	245660	**PH**	**072KF127**	**DRN**	**225M4**	2690	274
3.7	114800	487	523000	-	245660	**PHF**	**072KF127**	**DRN**	**225M4**	2200	275
4.4	96500	409	514100	-	245660						
2.1	195600	830	430900	209100	185660						
2.6	164400	697	453800	209100	185660	**P**	**062KF127**	**DRN**	**225M4**	2220	272
3.2	132800	563	473000	209100	185660	**PF**	**062KF127**	**DRN**	**225M4**	1850	273
3.6	118300	502	471800	209100	185660	**PH**	**062KF127**	**DRN**	**225M4**	2200	272
4.2	99400	421	447700	209100	185660	**PHF**	**062KF127**	**DRN**	**225M4**	1840	273
5.2	80300	341	420100	209100	185660						
3.2	132800	563	348900	140600	124060	**P**	**052KF127**	**DRN**	**225M4**	1730	268
3.6	118300	502	360900	140600	124060	**PF**	**052KF127**	**DRN**	**225M4**	1530	269
4.2	99400	421	358100	140600	124060	**PH**	**052KF127**	**DRN**	**225M4**	1720	268
5.2	80300	341	336100	140600	124060	**PHF**	**052KF127**	**DRN**	**225M4**	1520	269
5.2	80300	341	291400	111000	100170	**P**	**042KF127**	**DRN**	**225M4**	1590	262
6.2	68000	289	277200	111000	100170	**PF**	**042KF127**	**DRN**	**225M4**	1400	263
6.9	60600	257	267900	111000	100170	**PH**	**042KF127**	**DRN**	**225M4**	1590	262
						PHF	**042KF127**	**DRN**	**225M4**	1400	263
3.9	108500	460	286700	111000	100170	**P**	**042KF107**	**DRN**	**225M4**	1390	260
						PF	**042KF107**	**DRN**	**225M4**	1200	261
						PH	**042KF107**	**DRN**	**225M4**	1390	260
						PHF	**042KF107**	**DRN**	**225M4**	1200	261
8.3	50900	216	205800	86800	69620	**P**	**032KF127**	**DRN**	**225M4**	1340	256
10	41100	175	193000	86800	69620	**PF**	**032KF127**	**DRN**	**225M4**	1220	257
						PH	**032KF127**	**DRN**	**225M4**	1360	256
						PHF	**032KF127**	**DRN**	**225M4**	1240	257
5.2	80400	341	207800	86800	69620	**P**	**032KF107**	**DRN**	**225M4**	1140	254
						PF	**032KF107**	**DRN**	**225M4**	1020	255
						PH	**032KF107**	**DRN**	**225M4**	1160	254
						PHF	**032KF107**	**DRN**	**225M4**	1040	255
7.6	55600	236	183900	64200	51190	**P**	**022KF107**	**DRN**	**225M4**	1060	248
						PF	**022KF107**	**DRN**	**225M4**	960	249
						PH	**022KF107**	**DRN**	**225M4**	1080	248
						PHF	**022KF107**	**DRN**	**225M4**	980	249
10	41200	175	130200	46200	36810	**P**	**012KF107**	**DRN**	**225M4**	920	242
						PF	**012KF107**	**DRN**	**225M4**	850	243
						PH	**012KF107**	**DRN**	**225M4**	930	242
						PHF	**012KF107**	**DRN**	**225M4**	860	243

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P_m = 55 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
0.88	584800	2028	824300	631300	500000						
1.0	503700	1747	850000	631300	500000						
1.2	423300	1468	850000	631300	500000	**P**	**102KF187**	**DRN**	**250ME4**	6140	288
1.4	366500	1271	850000	631300	500000	**PF**	**102KF187**	**DRN**	**250ME4**	5190	289
1.7	305400	1059	850000	631300	500000	**PH**	**102KF187**	**DRN**	**250ME4**	6200	288
2.0	260400	903	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**250ME4**	5250	289
2.3	220700	766	850000	631300	500000						
0.89	578100	2005	829300	631300	500000	**P**	**102KF167**	**DRN**	**250ME4**	5510	286
2.7	193600	671	850000	631300	500000	**PF**	**102KF167**	**DRN**	**250ME4**	4560	287
						PH	**102KF167**	**DRN**	**250ME4**	5570	286
						PHF	**102KF167**	**DRN**	**250ME4**	4620	287
1.0	510300	1770	669200	513900	423000						
1.2	428900	1487	720000	513900	423000						
1.4	371300	1288	720000	513900	423000	**P**	**092KF187**	**DRN**	**250ME4**	5290	284
1.7	309400	1073	720000	513900	423000	**PF**	**092KF187**	**DRN**	**250ME4**	4590	285
1.9	263800	915	720000	513900	423000	**PH**	**092KF187**	**DRN**	**250ME4**	5300	284
2.3	223700	776	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**250ME4**	4600	285
2.7	192600	668	720000	513900	423000						
1.0	509500	1767	670100	513900	423000						
1.1	485300	1683	696600	513900	423000	**P**	**092KF167**	**DRN**	**250ME4**	4660	282
3.1	166800	579	720000	513900	423000	**PF**	**092KF167**	**DRN**	**250ME4**	3960	283
3.6	142200	493	720000	513900	423000	**PH**	**092KF167**	**DRN**	**250ME4**	4670	282
4.4	117800	409	720000	513900	423000	**PHF**	**092KF167**	**DRN**	**250ME4**	3970	283
5.1	100500	349	706600	513900	423000						
1.2	430100	1492	720000	513900	423000	**P**	**092KF157**	**DRN**	**250ME4**	4280	280
						PF	**092KF157**	**DRN**	**250ME4**	3590	281
						PH	**092KF157**	**DRN**	**250ME4**	4300	280
						PHF	**092KF157**	**DRN**	**250ME4**	3600	281
1.5	338800	1175	672200	397100	359400						
1.7	299000	1037	683000	397100	359400	**P**	**082KF157**	**DRN**	**250ME4**	3780	278
2.0	259200	899	683000	397100	359400	**PF**	**082KF157**	**DRN**	**250ME4**	3130	279
2.2	230600	800	683000	397100	359400	**PH**	**082KF157**	**DRN**	**250ME4**	3780	278
2.6	198700	689	683000	397100	359400	**PHF**	**082KF157**	**DRN**	**250ME4**	3130	279
3.1	163900	568	523000	274600	245660	**P**	**072KF157**	**DRN**	**250ME4**	3130	276
3.7	139000	482	523000	274600	245660	**PF**	**072KF157**	**DRN**	**250ME4**	2640	277
						PH	**072KF157**	**DRN**	**250ME4**	3180	276
						PHF	**072KF157**	**DRN**	**250ME4**	2690	277
2.0	262500	911	523000	274600	245660						
2.2	232200	806	523000	274600	245660	**P**	**072KF127**	**DRN**	**250ME4**	2840	274
2.6	195100	677	523000	274600	245660	**PF**	**072KF127**	**DRN**	**250ME4**	2340	275
3.7	140400	487	523000	-	245660	**PH**	**072KF127**	**DRN**	**250ME4**	2890	274
4.4	118000	409	514100	-	245660	**PHF**	**072KF127**	**DRN**	**250ME4**	2400	275
2.6	201000	697	426600	209100	185660						
3.2	162300	563	455200	209100	185660	**P**	**062KF127**	**DRN**	**250ME4**	2410	272
3.6	144600	502	466300	209100	185660	**PF**	**062KF127**	**DRN**	**250ME4**	2050	273
4.2	121500	421	447700	209100	185660	**PH**	**062KF127**	**DRN**	**250ME4**	2400	272
5.2	98100	341	420100	209100	185660	**PHF**	**062KF127**	**DRN**	**250ME4**	2040	273
2.7	189400	657	435800	209100	185660	**P**	**062KF107**	**DRN**	**250ME4**	2220	270
						PF	**062KF107**	**DRN**	**250ME4**	1850	271
						PH	**062KF107**	**DRN**	**250ME4**	2200	270
						PHF	**062KF107**	**DRN**	**250ME4**	1840	271
5.2	98100	341	336100	140600	124060	**P**	**052KF127**	**DRN**	**250ME4**	1930	268
6.2	83200	289	319700	140600	124060	**PF**	**052KF127**	**DRN**	**250ME4**	1730	269
						PH	**052KF127**	**DRN**	**250ME4**	1920	268
						PHF	**052KF127**	**DRN**	**250ME4**	1720	269
6.9	74100	257	267900	111000	100170	**P**	**042KF127**	**DRN**	**250ME4**	1780	262
8.3	62300	216	254200	111000	100170	**PF**	**042KF127**	**DRN**	**250ME4**	1590	263
10	50300	175	238400	111000	100170	**PH**	**042KF127**	**DRN**	**250ME4**	1790	262
						PHF	**042KF127**	**DRN**	**250ME4**	1600	263
6.2	83200	289	203300	86800	69620	**P**	**032KF127**	**DRN**	**250ME4**	1540	256
6.9	74100	257	216800	86800	69620	**PF**	**032KF127**	**DRN**	**250ME4**	1420	257
10	50300	175	193000	86800	69620	**PH**	**032KF127**	**DRN**	**250ME4**	1560	256
						PHF	**032KF127**	**DRN**	**250ME4**	1440	257

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P_m = 55 kW

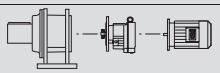
n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
6.1	84800	294	200600	86800	69620	**P**	**032KF107**	**DRN**	**250ME4**	1340	254
						PF	**032KF107**	**DRN**	**250ME4**	1220	255
						PH	**032KF107**	**DRN**	**250ME4**	1360	254
						PHF	**032KF107**	**DRN**	**250ME4**	1240	255
8.9	57600	200	180400	64200	51190	**P**	**022KF107**	**DRN**	**250ME4**	1260	248
						PF	**022KF107**	**DRN**	**250ME4**	1160	249
						PH	**022KF107**	**DRN**	**250ME4**	1270	248
						PHF	**022KF107**	**DRN**	**250ME4**	1170	249

P_m = 75 kW

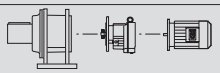
n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
1.2	577300	1468	829800	631300	500000						
1.4	499800	1271	850000	631300	500000						
1.7	416500	1059	850000	631300	500000	**P**	**102KF187**	**DRN**	**280S4**	6140	288
2.0	355100	903	850000	631300	500000	**PF**	**102KF187**	**DRN**	**280S4**	5190	289
2.3	301000	766	850000	631300	500000	**PH**	**102KF187**	**DRN**	**280S4**	6200	288
2.7	259300	660	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**280S4**	5250	289
3.2	217900	554	850000	631300	500000						
1.3	557400	1418	844100	631300	500000	**P**	**102KF167**	**DRN**	**280S4**	5510	286
						PF	**102KF167**	**DRN**	**280S4**	4560	287
						PH	**102KF167**	**DRN**	**280S4**	5570	286
						PHF	**102KF167**	**DRN**	**280S4**	4620	287
1.4	506400	1288	673600	513900	423000						
1.7	422000	1073	720000	513900	423000						
1.9	359800	915	720000	513900	423000	**P**	**092KF187**	**DRN**	**280S4**	5290	284
2.3	305000	776	720000	513900	423000	**PF**	**092KF187**	**DRN**	**280S4**	4590	285
2.7	262700	668	720000	513900	423000	**PH**	**092KF187**	**DRN**	**280S4**	5300	284
3.2	220800	561	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**280S4**	4600	285
3.7	191200	486	720000	513900	423000						
1.4	497400	1265	683600	513900	423000						
1.5	480300	1221	701800	513900	423000	**P**	**092KF167**	**DRN**	**280S4**	4660	282
1.6	443800	1129	720000	513900	423000	**PF**	**092KF167**	**DRN**	**280S4**	3960	283
4.4	160600	409	720000	513900	423000	**PH**	**092KF167**	**DRN**	**280S4**	4670	282
5.1	137100	349	706600	513900	423000	**PHF**	**092KF167**	**DRN**	**280S4**	3970	283
1.4	482900	1228	699100	513900	423000	**P**	**092KF157**	**DRN**	**280S4**	4290	280
1.6	426100	1084	720000	513900	423000	**PF**	**092KF157**	**DRN**	**280S4**	3590	281
						PH	**092KF157**	**DRN**	**280S4**	4300	280
						PHF	**092KF157**	**DRN**	**280S4**	3600	281
2.2	314500	800	683000	397100	359400	**P**	**082KF157**	**DRN**	**280S4**	3790	278
2.6	271000	689	683000	397100	359400	**PF**	**082KF157**	**DRN**	**280S4**	3140	279
						PH	**082KF157**	**DRN**	**280S4**	3780	278
						PHF	**082KF157**	**DRN**	**280S4**	3130	279
3.1	223500	568	523000	274600	245660						
3.7	189500	482	523000	274600	245660	**P**	**072KF157**	**DRN**	**280S4**	3130	276
4.2	167900	429	520700	274600	245660	**PF**	**072KF157**	**DRN**	**280S4**	2640	277
4.8	144700	369	498000	274600	245660	**PH**	**072KF157**	**DRN**	**280S4**	3180	276
6.0	117600	300	467900	274600	245660	**PHF**	**072KF157**	**DRN**	**280S4**	2690	277
7.0	99700	254	445300	274600	245660						
2.6	266100	677	523000	274600	245660	**P**	**072KF127**	**DRN**	**280S4**	2840	274
						PF	**072KF127**	**DRN**	**280S4**	2350	275
						PH	**072KF127**	**DRN**	**280S4**	2890	274
						PHF	**072KF127**	**DRN**	**280S4**	2400	275
3.6	197200	502	429700	209100	185660	**P**	**062KF127**	**DRN**	**280S4**	2410	272
5.2	133800	341	420100	209100	185660	**PF**	**062KF127**	**DRN**	**280S4**	2050	273
						PH	**062KF127**	**DRN**	**280S4**	2400	272
						PHF	**062KF127**	**DRN**	**280S4**	2040	273
5.2	133800	341	336100	140600	124060	**P**	**052KF127**	**DRN**	**280S4**	1930	268
10	68600	175	275000	140600	124060	**PF**	**052KF127**	**DRN**	**280S4**	1730	269
						PH	**052KF127**	**DRN**	**280S4**	1920	268
						PHF	**052KF127**	**DRN**	**280S4**	1720	269

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P_m = 75 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
6.9	101000	257	267900	111000	100170	**P**	**042KF127**	**DRN**	**280S4**	1780	262
10	68600	175	238400	111000	100170	**PF**	**042KF127**	**DRN**	**280S4**	1600	263
						PH	**042KF127**	**DRN**	**280S4**	1790	262
						PHF	**042KF127**	**DRN**	**280S4**	1600	263
8.3	84900	216	200500	86800	69620	**P**	**032KF127**	**DRN**	**280S4**	1540	256
						PF	**032KF127**	**DRN**	**280S4**	1420	257
						PH	**032KF127**	**DRN**	**280S4**	1560	256
						PHF	**032KF127**	**DRN**	**280S4**	1440	257

P_m = 90 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
1.4	600100	1271	812600	631300	500000						
1.7	500100	1059	850000	631300	500000						
2.0	426400	903	850000	631300	500000	**P**	**102KF187**	**DRN**	**280M4**	6260	288
2.3	361500	766	850000	631300	500000	**PF**	**102KF187**	**DRN**	**280M4**	5300	289
2.7	311400	660	850000	631300	500000	**PH**	**102KF187**	**DRN**	**280M4**	6320	288
3.2	261700	554	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**280M4**	5360	289
3.7	226500	480	850000	631300	500000						
1.4	589500	1249	820700	631300	500000	**P**	**102KF167**	**DRN**	**280M4**	5630	286
1.6	526000	1114	850000	631300	500000	**PF**	**102KF167**	**DRN**	**280M4**	4670	287
						PH	**102KF167**	**DRN**	**280M4**	5690	286
						PHF	**102KF167**	**DRN**	**280M4**	4730	287
1.7	506700	1073	673300	513900	423000						
1.9	432000	915	720000	513900	423000						
2.3	366200	776	720000	513900	423000	**P**	**092KF187**	**DRN**	**280M4**	5400	284
2.7	315400	668	720000	513900	423000	**PF**	**092KF187**	**DRN**	**280M4**	4710	285
3.2	265100	561	720000	513900	423000	**PH**	**092KF187**	**DRN**	**280M4**	5420	284
3.7	229500	486	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**280M4**	4720	285
4.4	191300	405	720000	513900	423000						
1.7	491500	1041	690000	513900	423000	**P**	**092KF167**	**DRN**	**280M4**	4770	282
1.9	454200	962	720000	513900	423000	**PF**	**092KF167**	**DRN**	**280M4**	4080	283
5.1	164600	349	706600	513900	423000	**PH**	**092KF167**	**DRN**	**280M4**	4790	282
						PHF	**092KF167**	**DRN**	**280M4**	4090	283
1.6	511700	1084	667700	513900	423000	**P**	**092KF157**	**DRN**	**280M4**	4400	280
1.9	443600	940	720000	513900	423000	**PF**	**092KF157**	**DRN**	**280M4**	3700	281
						PH	**092KF157**	**DRN**	**280M4**	4410	280
						PHF	**092KF157**	**DRN**	**280M4**	3710	281
2.2	377600	800	637700	397100	359400	**P**	**082KF157**	**DRN**	**280M4**	3900	278
						PF	**082KF157**	**DRN**	**280M4**	3250	279
						PH	**082KF157**	**DRN**	**280M4**	3890	278
						PHF	**082KF157**	**DRN**	**280M4**	3240	279
3.1	268400	568	522800	274600	245660	**P**	**072KF157**	**DRN**	**280M4**	3240	276
						PF	**072KF157**	**DRN**	**280M4**	2750	277
						PH	**072KF157**	**DRN**	**280M4**	3300	276
						PHF	**072KF157**	**DRN**	**280M4**	2810	277
3.3	258100	547	523000	274600	245660	**P**	**072KF127**	**DRN**	**280M4**	2950	274
						PF	**072KF127**	**DRN**	**280M4**	2460	275
						PH	**072KF127**	**DRN**	**280M4**	3000	274
						PHF	**072KF127**	**DRN**	**280M4**	2510	275
4.2	198900	421	428200	209100	185660	**P**	**062KF127**	**DRN**	**280M4**	2530	272
						PF	**062KF127**	**DRN**	**280M4**	2160	273
						PH	**062KF127**	**DRN**	**280M4**	2520	272
						PHF	**062KF127**	**DRN**	**280M4**	2150	273
6.2	136200	289	319900	140600	124060	**P**	**052KF127**	**DRN**	**280M4**	2040	268
						PF	**052KF127**	**DRN**	**280M4**	1840	269
						PH	**052KF127**	**DRN**	**280M4**	2040	268
						PHF	**052KF127**	**DRN**	**280M4**	1840	269

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P_m = 90 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
8.3	102000	216	254200	111000	100170	**P**	**042KF127**	**DRN**	**280M4**	1900	262
						PF	**042KF127**	**DRN**	**280M4**	1710	263
						PH	**042KF127**	**DRN**	**280M4**	1900	262
						PHF	**042KF127**	**DRN**	**280M4**	1710	263
10	82300	175	193100	86800	69620	**P**	**032KF127**	**DRN**	**280M4**	1650	256
						PF	**032KF127**	**DRN**	**280M4**	1530	257
						PH	**032KF127**	**DRN**	**280M4**	1670	256
						PHF	**032KF127**	**DRN**	**280M4**	1550	257

P_m = 110 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
1.7	609200	1059	805500	631300	500000						
2.0	519400	903	850000	631300	500000						
2.3	440300	766	850000	631300	500000	**P**	**102KF187**	**DRN**	**315S4**	6500	288
2.7	379300	660	850000	631300	500000	**PF**	**102KF187**	**DRN**	**315S4**	5550	289
3.2	318700	554	850000	631300	500000	**PH**	**102KF187**	**DRN**	**315S4**	6560	288
3.7	276000	480	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**315S4**	5610	289
4.5	230000	400	850000	631300	500000						
1.9	546100	949	850000	631300	500000	**P**	**102KF167**	**DRN**	**315S4**	5870	286
						PF	**102KF167**	**DRN**	**315S4**	4920	287
						PH	**102KF167**	**DRN**	**315S4**	5930	286
						PHF	**102KF167**	**DRN**	**315S4**	4980	287
2.3	446100	776	720000	513900	423000						
2.7	384300	668	720000	513900	423000	**P**	**092KF187**	**DRN**	**315S4**	5650	284
3.2	322900	561	720000	513900	423000	**PF**	**092KF187**	**DRN**	**315S4**	4950	285
3.7	279600	486	720000	513900	423000	**PH**	**092KF187**	**DRN**	**315S4**	5660	284
4.4	233000	405	720000	513900	423000	**PHF**	**092KF187**	**DRN**	**315S4**	4960	285
5.2	198700	345	704100	513900	423000						
2.1	496100	863	685000	513900	423000	**P**	**092KF167**	**DRN**	**315S4**	5020	282
2.2	458400	797	720000	513900	423000	**PF**	**092KF167**	**DRN**	**315S4**	4320	283
						PH	**092KF167**	**DRN**	**315S4**	5030	282
						PHF	**092KF167**	**DRN**	**315S4**	4330	283
2.1	480700	836	701300	513900	423000	**P**	**092KF157**	**DRN**	**315S4**	4640	280
						PF	**092KF157**	**DRN**	**315S4**	3950	281
						PH	**092KF157**	**DRN**	**315S4**	4660	280
						PHF	**092KF157**	**DRN**	**315S4**	3960	281
2.6	396400	689	619200	397100	359400	**P**	**082KF157**	**DRN**	**315S4**	4150	278
						PF	**082KF157**	**DRN**	**315S4**	3500	279
						PH	**082KF157**	**DRN**	**315S4**	4140	278
						PHF	**082KF157**	**DRN**	**315S4**	3490	279
5.3	195700	341	419700	209100	185660	**P**	**062KF127**	**DRN**	**315S4**	2770	272
						PF	**062KF127**	**DRN**	**315S4**	2410	273
						PH	**062KF127**	**DRN**	**315S4**	2760	272
						PHF	**062KF127**	**DRN**	**315S4**	2400	273

P_m = 132 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
2.0	622900	903	794500	631300	500000						
2.3	528100	766	850000	631300	500000	**P**	**102KF187**	**DRN**	**315ME4**	6630	288
2.7	454900	660	850000	631300	500000	**PF**	**102KF187**	**DRN**	**315ME4**	5670	289
3.2	382300	554	850000	631300	500000	**PH**	**102KF187**	**DRN**	**315ME4**	6690	288
3.7	331000	480	850000	631300	500000	**PHF**	**102KF187**	**DRN**	**315ME4**	5730	289
4.5	275800	400	850000	631300	500000						
5.2	235200	341	826400	631300	500000						

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P_m = 132 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
2.3	542700	787	850000	631300	500000	**P**	**102KF167**	**DRN**	**315ME4**	6000	286
						PF	**102KF167**	**DRN**	**315ME4**	5040	287
						PH	**102KF167**	**DRN**	**315ME4**	6060	286
						PHF	**102KF167**	**DRN**	**315ME4**	5100	287
2.7	460900	668	720000	513900	423000						
3.2	387300	561	720000	513900	423000	**P**	**092KF187**	**DRN**	**315ME4**	5780	284
3.7	335300	486	720000	513900	423000	**PF**	**092KF187**	**DRN**	**315ME4**	5080	285
4.4	279400	405	720000	513900	423000	**PH**	**092KF187**	**DRN**	**315ME4**	5790	284
5.2	238300	345	704100	513900	423000	**PHF**	**092KF187**	**DRN**	**315ME4**	5090	285
2.4	507800	736	672100	513900	423000	**P**	**092KF167**	**DRN**	**315ME4**	5150	282
2.6	469200	680	713100	513900	423000	**PF**	**092KF167**	**DRN**	**315ME4**	4450	283
2.8	447300	649	720000	513900	423000	**PH**	**092KF167**	**DRN**	**315ME4**	5160	282
						PHF	**092KF167**	**DRN**	**315ME4**	4460	283
2.5	497000	721	684100	513900	423000	**P**	**092KF157**	**DRN**	**315ME4**	4770	280
						PF	**092KF157**	**DRN**	**315ME4**	4070	281
						PH	**092KF157**	**DRN**	**315ME4**	4780	280
						PHF	**092KF157**	**DRN**	**315ME4**	4080	281
4.9	253900	369	497400	274600	245660	**P**	**072KF157**	**DRN**	**315ME4**	3610	276
						PF	**072KF157**	**DRN**	**315ME4**	3120	277
						PH	**072KF157**	**DRN**	**315ME4**	3670	276
						PHF	**072KF157**	**DRN**	**315ME4**	3180	277

P_m = 160 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
2.7	552300	660	847700	631300	500000						
3.2	464200	554	850000	631300	500000	**P**	**102KF187**	**DRN**	**315L4**	6650	288
3.7	401900	480	850000	631300	500000	**PF**	**102KF187**	**DRN**	**315L4**	5700	289
4.5	334900	400	850000	631300	500000	**PH**	**102KF187**	**DRN**	**315L4**	6710	288
5.2	285500	341	826900	631300	500000	**PHF**	**102KF187**	**DRN**	**315L4**	5760	289
2.7	562300	671	840600	631300	500000	**P**	**102KF167**	**DRN**	**315L4**	6020	286
						PF	**102KF167**	**DRN**	**315L4**	5070	287
						PH	**102KF167**	**DRN**	**315L4**	6080	286
						PHF	**102KF167**	**DRN**	**315L4**	5130	287
3.2	470300	561	712000	513900	423000	**P**	**092KF187**	**DRN**	**315L4**	5800	284
3.7	407200	486	720000	513900	423000	**PF**	**092KF187**	**DRN**	**315L4**	5100	285
4.4	339300	405	720000	513900	423000	**PH**	**092KF187**	**DRN**	**315L4**	5810	284
5.2	289300	345	704100	513900	423000	**PHF**	**092KF187**	**DRN**	**315L4**	5110	285
3.0	490300	585	691300	513900	423000	**P**	**092KF157**	**DRN**	**315L4**	4800	280
						PF	**092KF157**	**DRN**	**315L4**	4100	281
						PH	**092KF157**	**DRN**	**315L4**	4810	280
						PHF	**092KF157**	**DRN**	**315L4**	4110	281
6.0	250500	300	467700	274600	245660	**P**	**072KF157**	**DRN**	**315L4**	3640	276
						PF	**072KF157**	**DRN**	**315L4**	3150	277
						PH	**072KF157**	**DRN**	**315L4**	3690	276
						PHF	**072KF157**	**DRN**	**315L4**	3200	277

P_m = 200 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2} f_{LC}<=7.5	M_{N2} f_{LC}>107.5					m	
min^{-1}	Nm		N	Nm	Nm					kg	
3.2	579300	554	828400	631300	500000	**P**	**102KF187**	**DRN**	**315H4**	6770	288
3.7	501500	480	850000	631300	500000	**PF**	**102KF187**	**DRN**	**315H4**	5820	289
4.5	417900	400	850000	631300	500000	**PH**	**102KF187**	**DRN**	**315H4**	6830	288
5.2	356300	341	826400	631300	500000	**PHF**	**102KF187**	**DRN**	**315H4**	5880	289
3.7	508100	486	671700	513900	423000	**P**	**092KF187**	**DRN**	**315H4**	5920	284
4.4	423400	405	720000	513900	423000	**PF**	**092KF187**	**DRN**	**315H4**	5220	285
5.2	361000	345	704100	513900	423000	**PH**	**092KF187**	**DRN**	**315H4**	5930	284
						PHF	**092KF187**	**DRN**	**315H4**	5230	285

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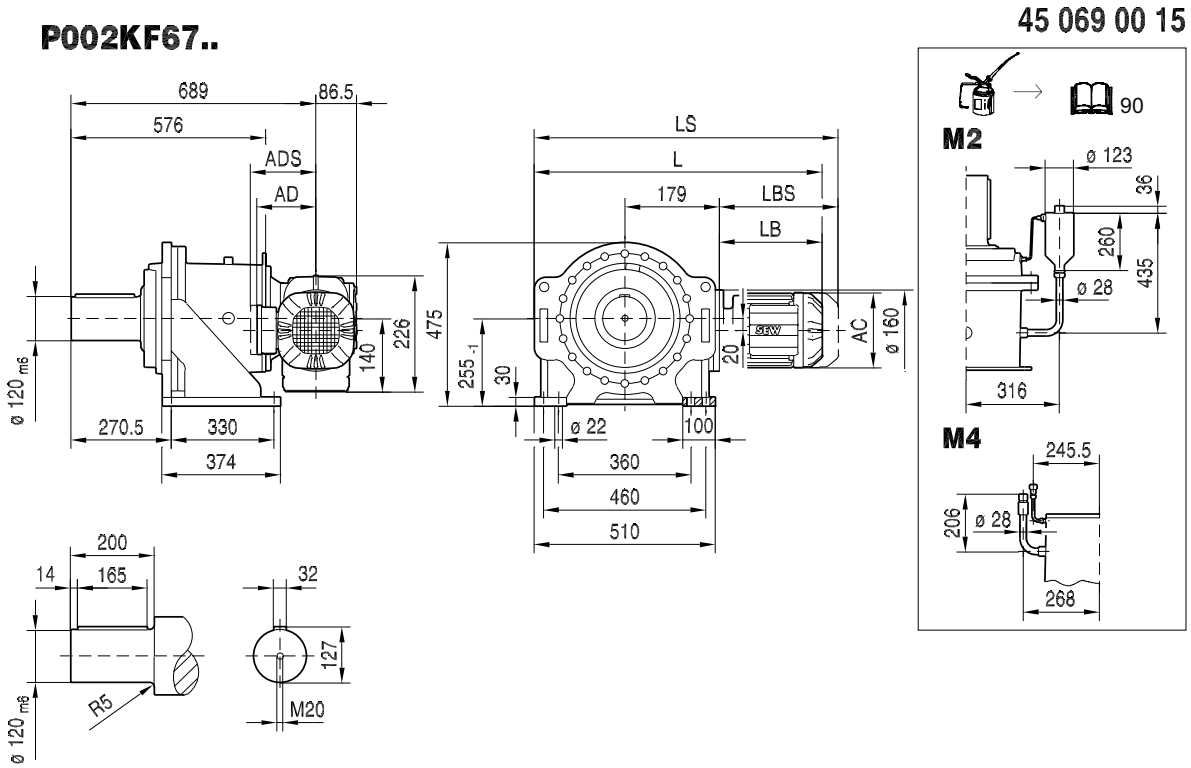
P_m = 200 kW

n_2	M_a	i_{ex}	F_{Ra} [1]	M_{N2}						m	
				f_{LC}<=7.5	f_{LC}>107.5						
min^{-1}	Nm		N	Nm	Nm					kg	
4.4	427000	409	720000	513900	423000	**P**	**092KF167**	**DRN**	**315H4**	5290	282
						PF	**092KF167**	**DRN**	**315H4**	4590	283
						PH	**092KF167**	**DRN**	**315H4**	5300	282
						PHF	**092KF167**	**DRN**	**315H4**	4600	283
7.1	265100	254	444900	274600	245660	**P**	**072KF157**	**DRN**	**315H4**	3760	276
						PF	**072KF157**	**DRN**	**315H4**	3270	277
						PH	**072KF157**	**DRN**	**315H4**	3810	276
						PHF	**072KF157**	**DRN**	**315H4**	3320	277

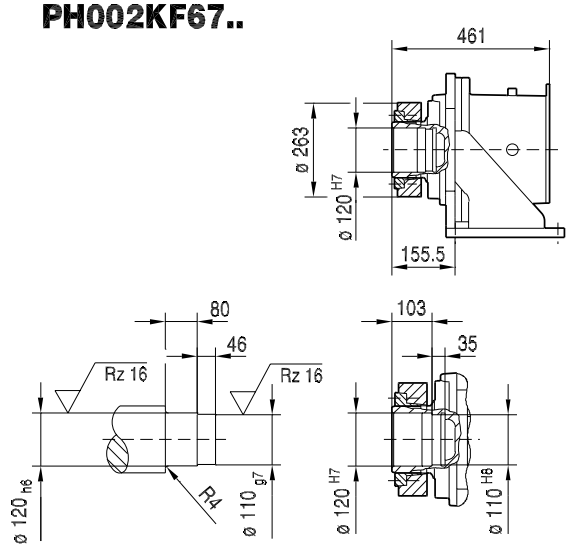
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11.3 Dimension sheets [mm]

P002KF67..



PH002KF67..

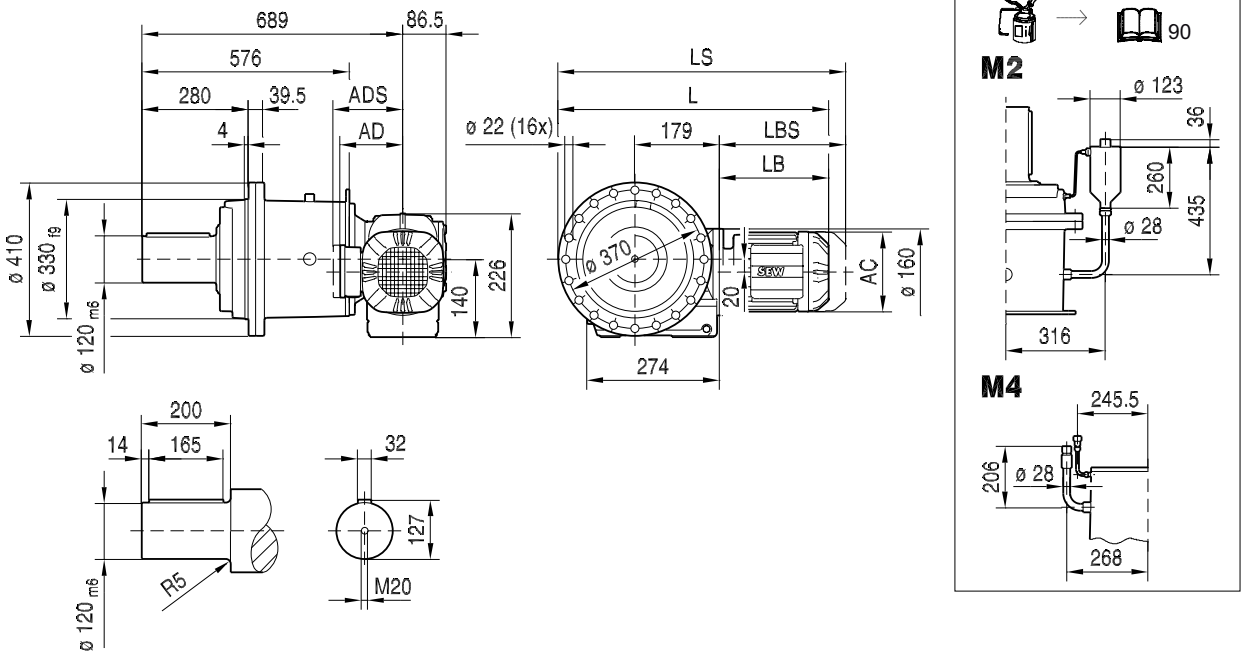


(→ 100)	DR63..	DR71S	DR71M	DRN80M	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M
AC	132	139	139	156	179	179	197	197	221	221	261
AD	105	119	119	128	140	140	157	157	170	170	228
ADS	105	129	129	139	150	150	158	158	172	172	228
L	619	630	655	709	711	743	739	789	820	874	892
LS	674	698	723	790	804	836	833	883	932	986	1030
LB	185	196	221	275	277	309	305	355	386	440	458
LBS	240	264	289	356	370	402	399	449	498	552	596

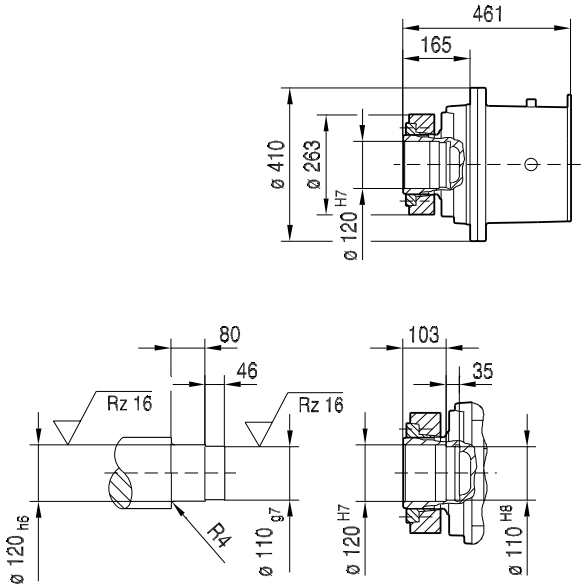
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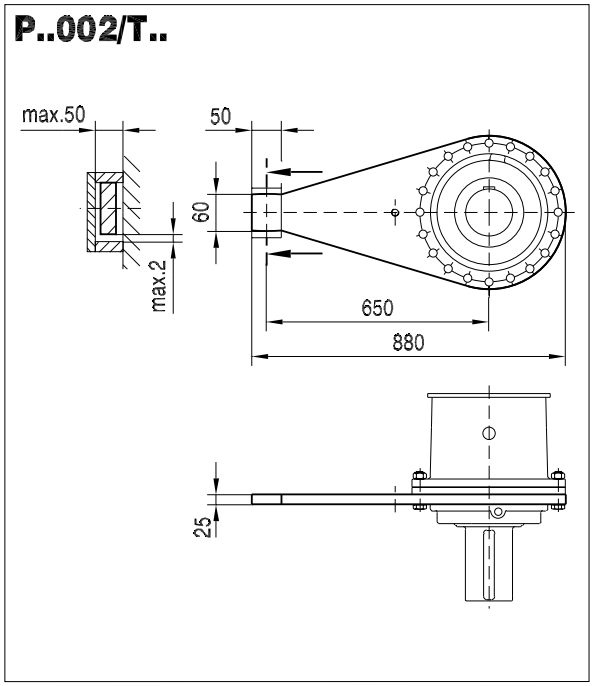
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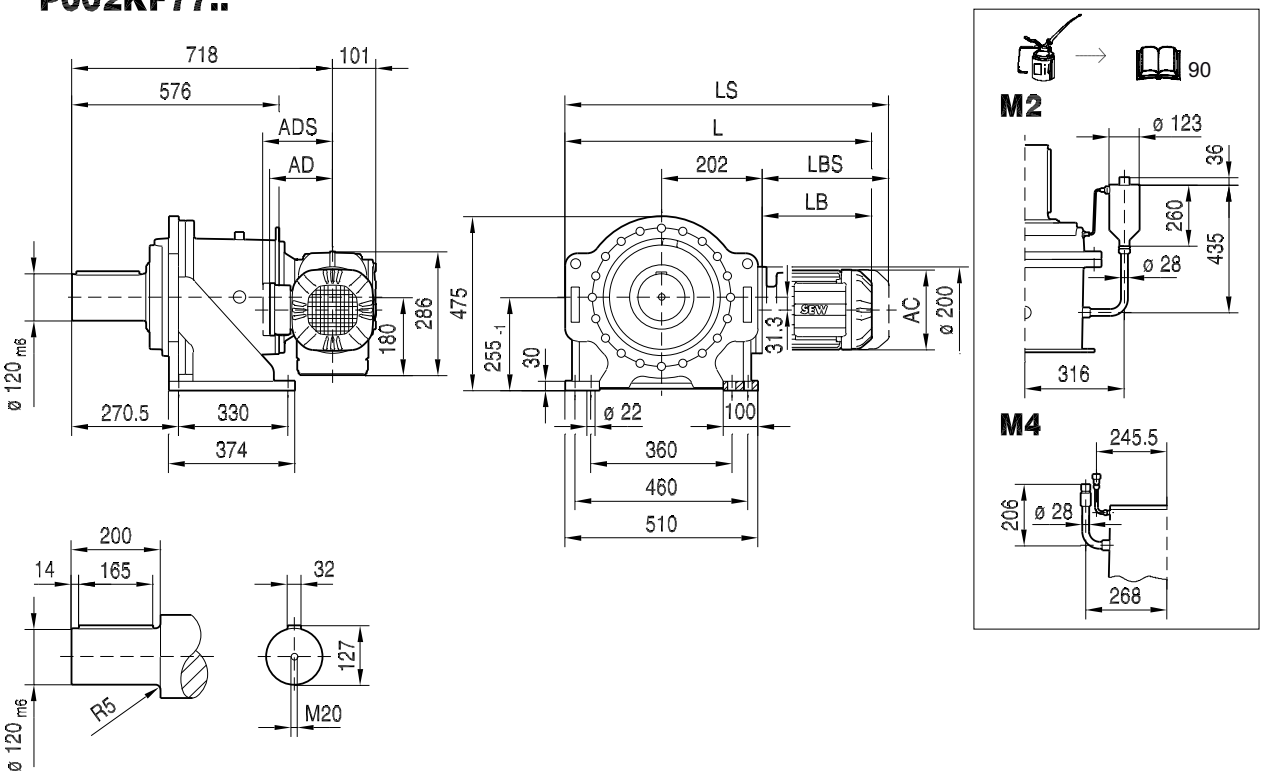


(→ 🗎 100)	DR63..	DR71S	DR71M	DRN80M	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M
AC	132	139	139	156	179	179	197	197	221	221	261
AD	105	119	119	128	140	140	157	157	170	170	228
ADS	105	129	129	139	150	150	158	158	172	172	228
L	569	580	605	659	661	693	689	739	770	824	842
LS	624	648	673	740	754	786	783	833	882	936	980
LB	185	196	221	275	277	309	305	355	386	440	458
LBS	240	264	289	356	370	402	399	449	498	552	596

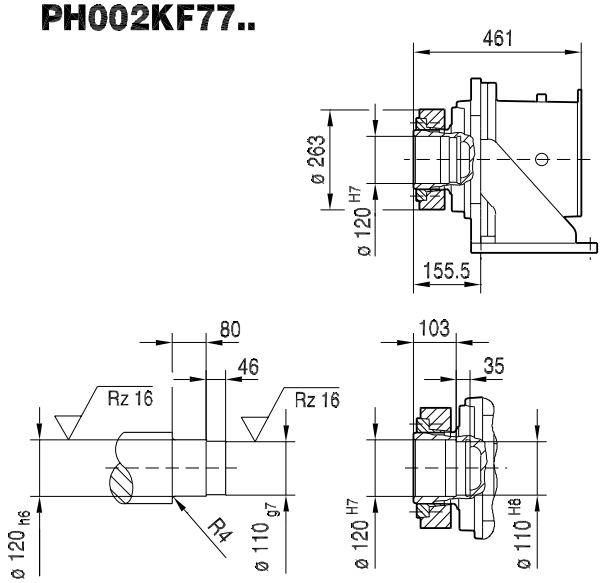
23488859/EN – 02/2017

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45 071 00 15



PH002KF77..

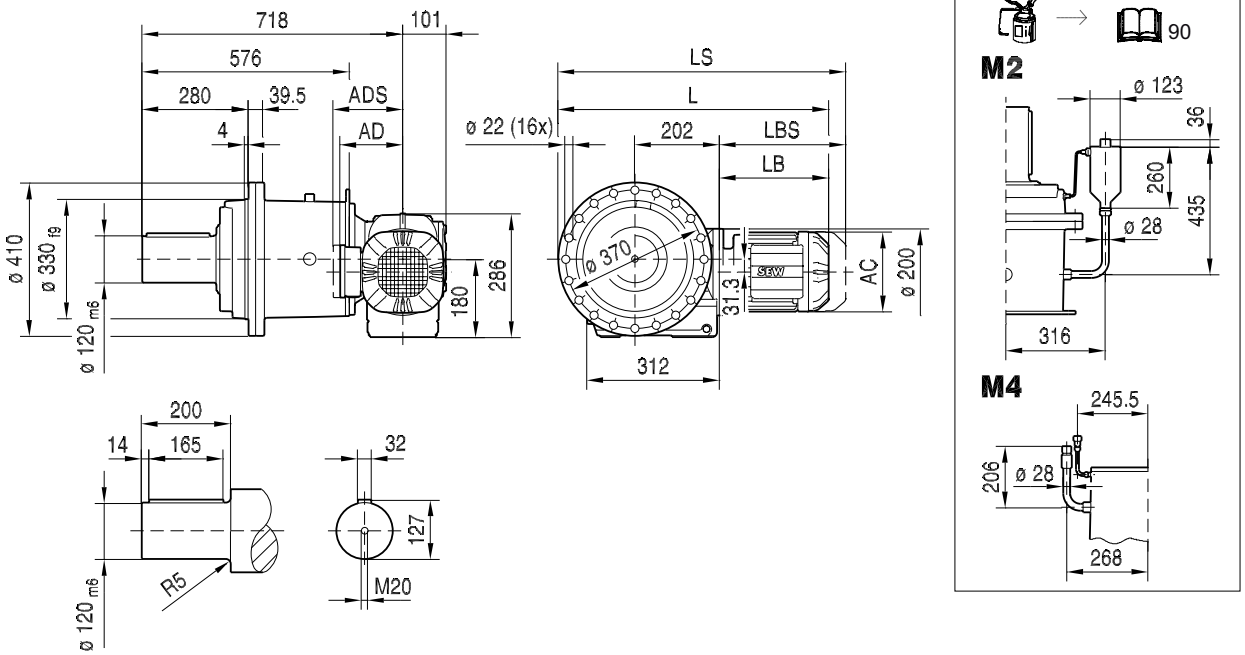


(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	727	759	755	805	836	886	904	930	996	996
LS	820	852	849	899	948	998	1042	1067	1185	1185
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

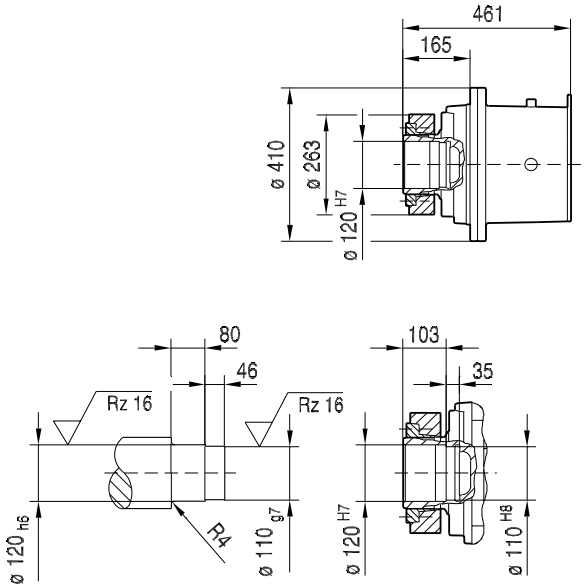
23488859/EN – 02/2017

PF002KF77..

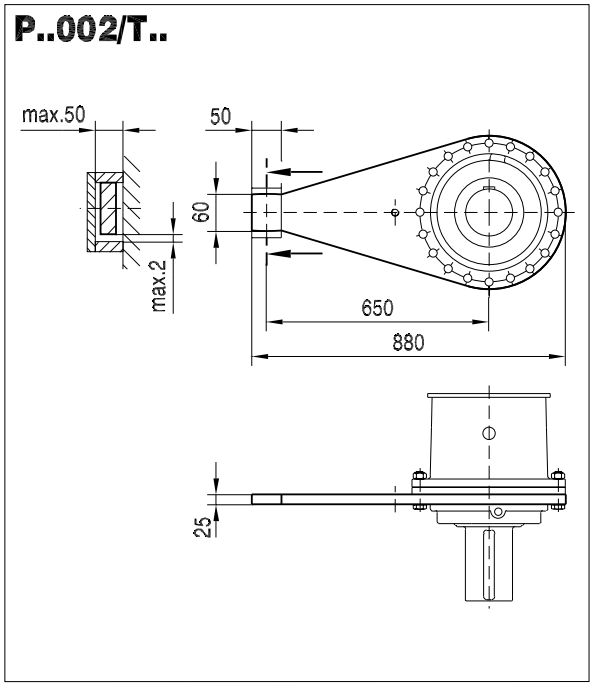
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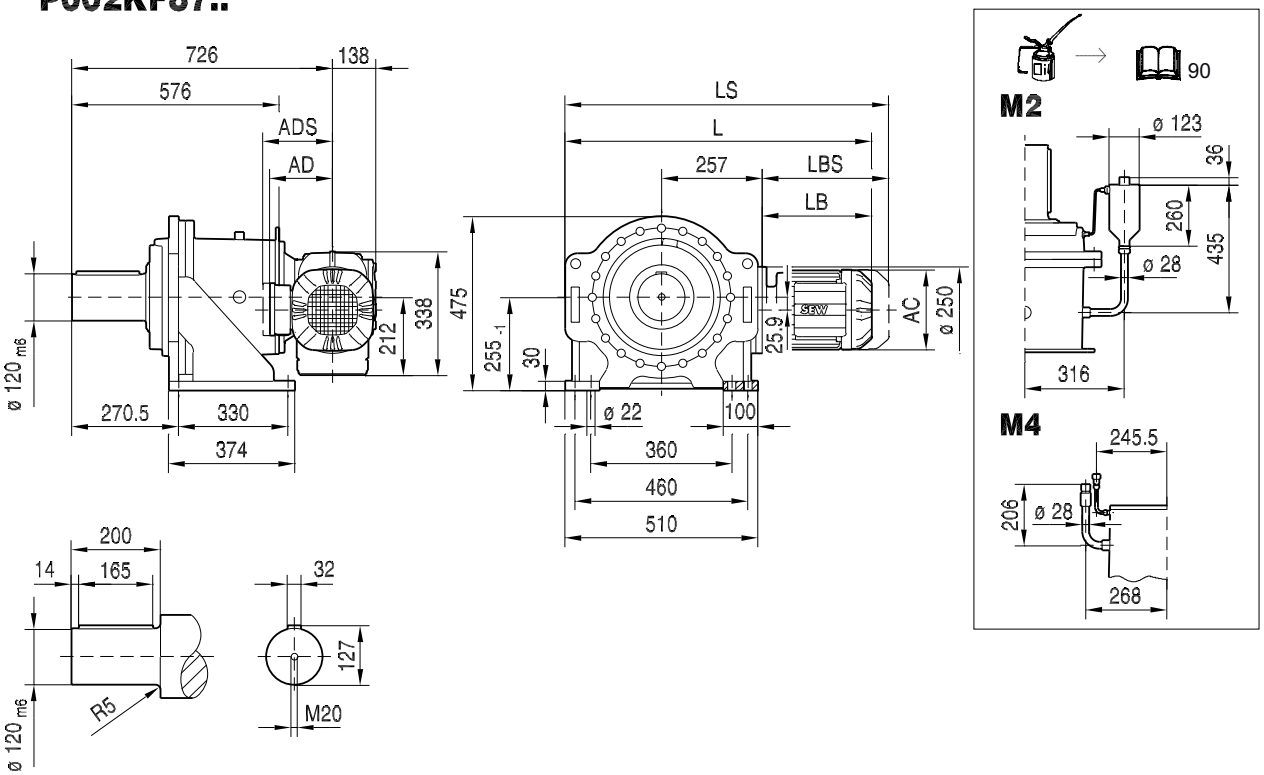


(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	677	709	705	755	786	836	854	880	946	946
LS	770	802	799	849	898	948	992	1017	1135	1135
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

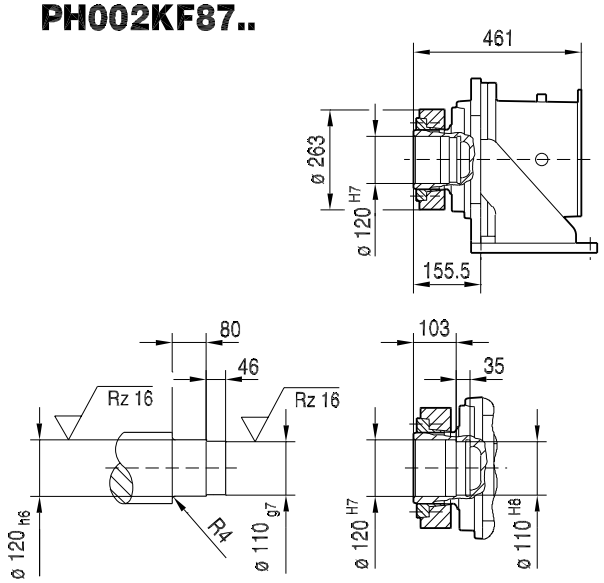
23488859/EN – 02/2017

P002KF87..

45 073 00 15



PH002KF87..

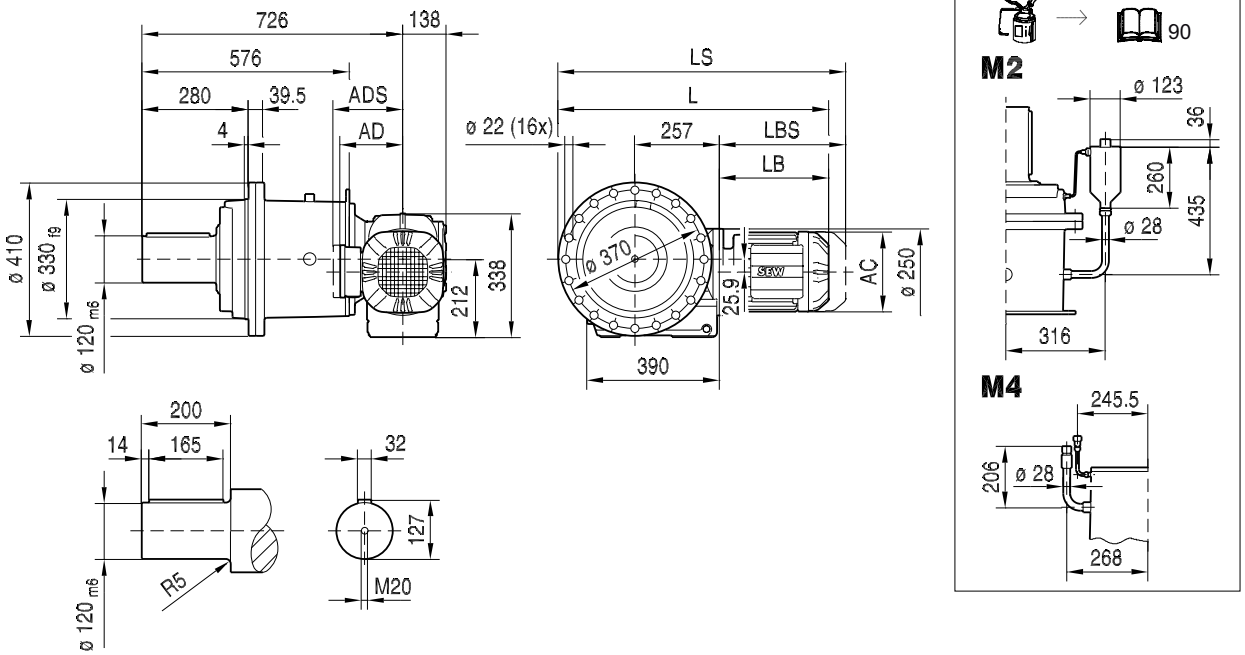


(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	805	855	886	936	954	980	1046	1046	1069	1179
LS	899	949	998	1048	1092	1117	1235	1235	1258	1384
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

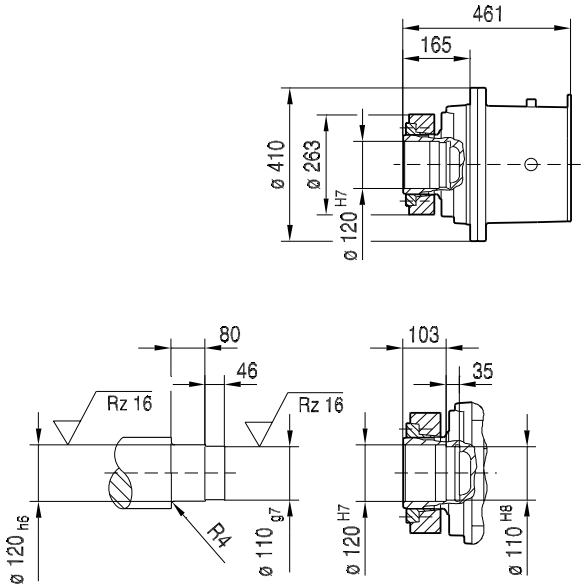
23488859/EN – 02/2017

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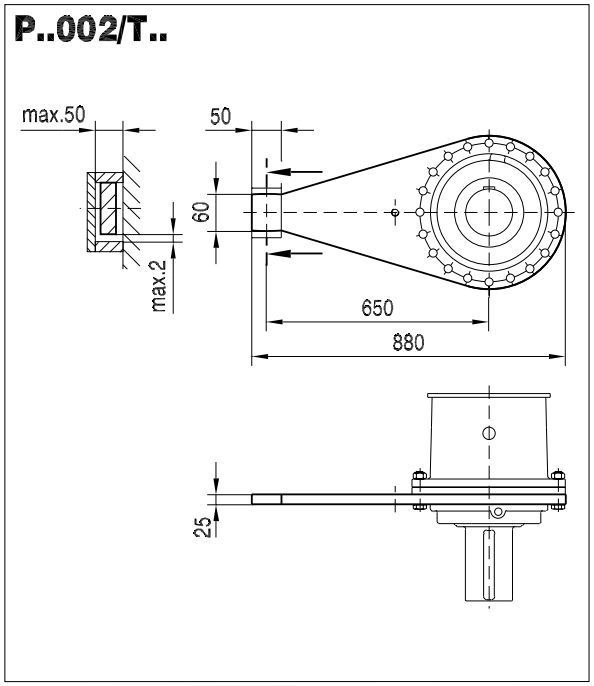
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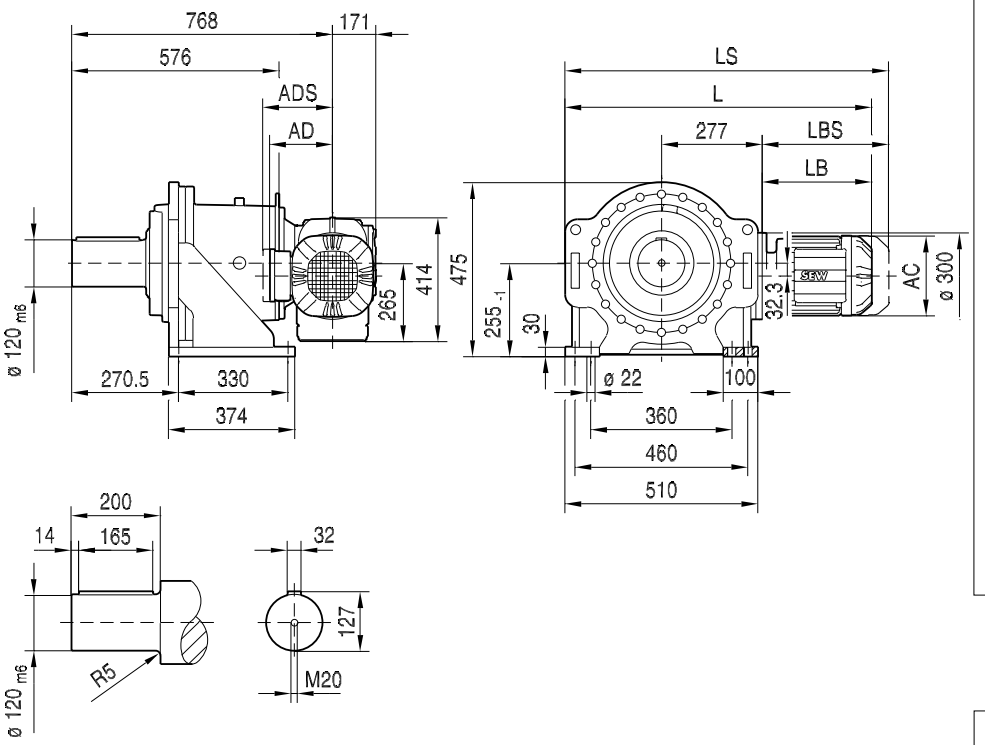


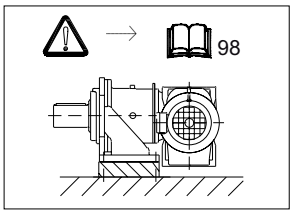
(→ 🗎 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	755	805	836	886	904	930	996	996	1019	1129
LS	849	899	948	998	1042	1067	1185	1185	1208	1334
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

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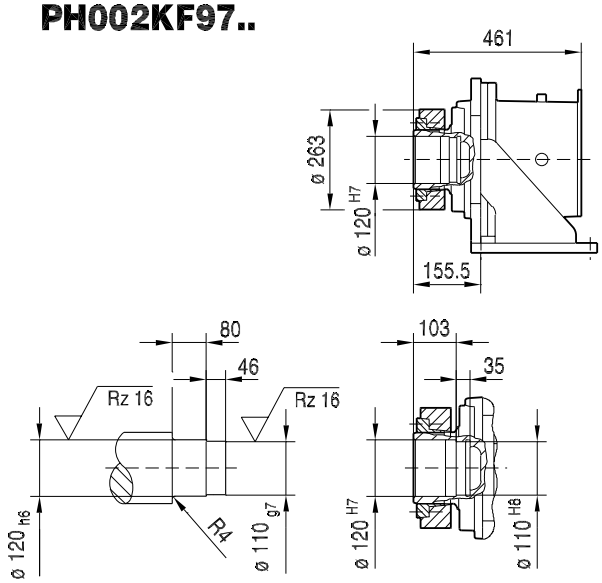
P002KF97..

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PH002KF97..

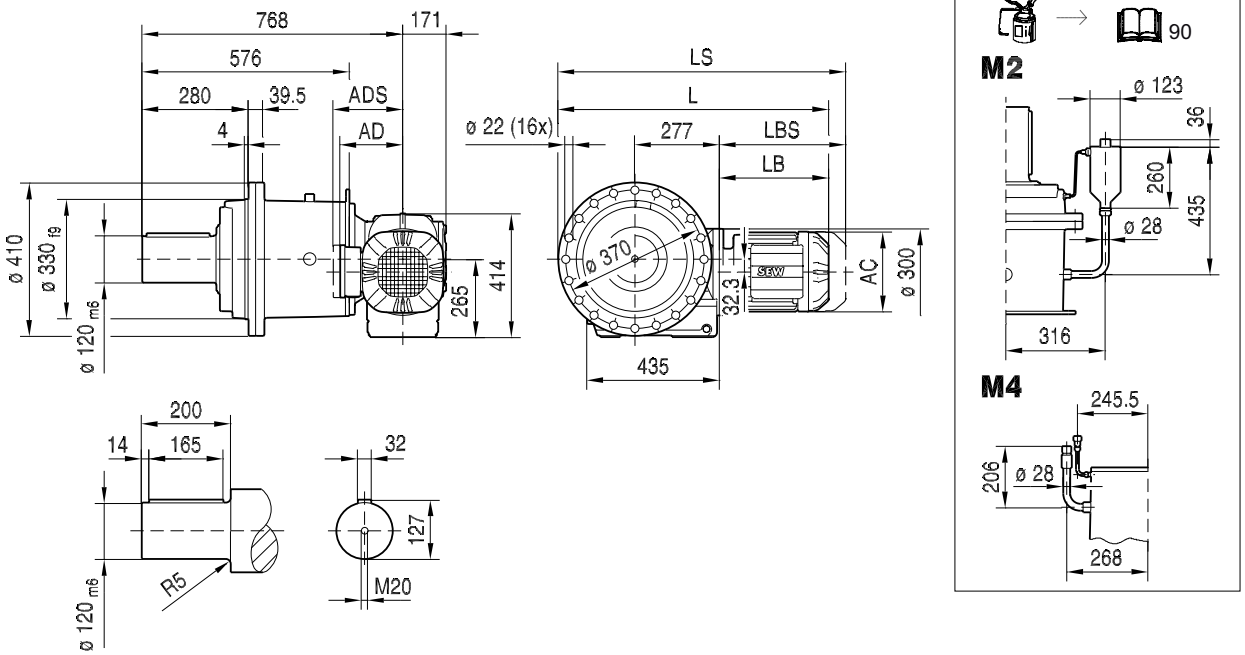


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	221	261	261	314	314	357	394	434
AD	170	228	228	253	253	268	283	305
ADS	172	228	228	253	253	268	283	305
L	951	969	995	1061	1061	1084	1194	1168
LS	1063	1107	1132	1250	1250	1273	1399	1373
LB	419	437	463	529	529	552	662	636
LBS	531	575	600	718	718	741	867	841

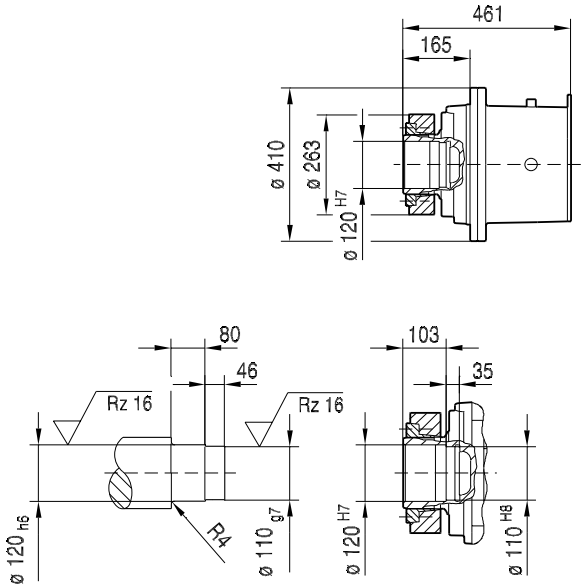
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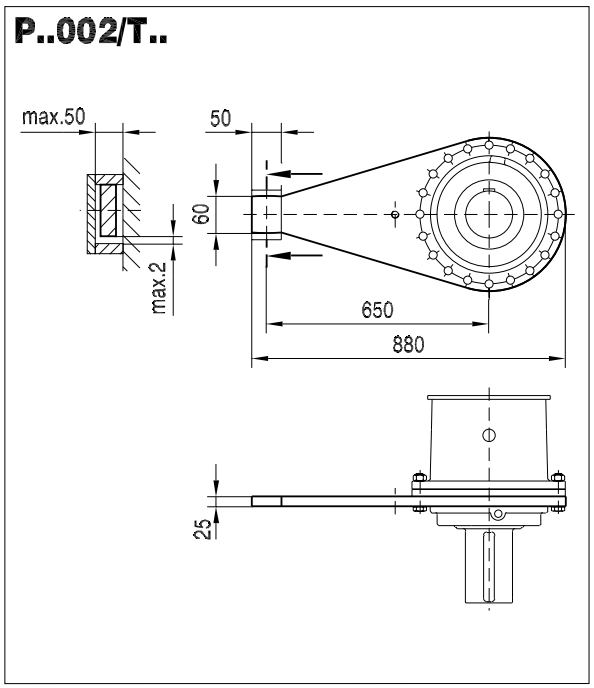
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P..002/T..

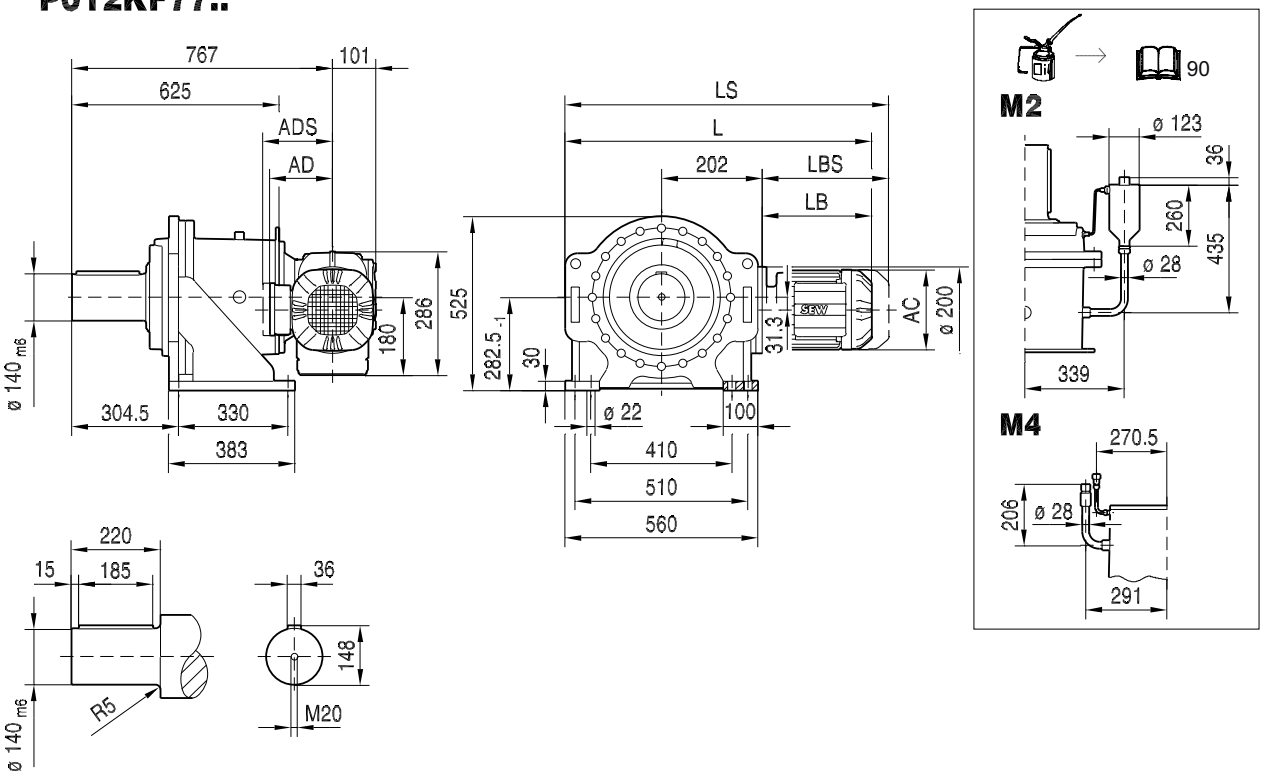


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	221	261	261	314	314	357	394	434
AD	170	228	228	253	253	268	283	305
ADS	172	228	228	253	253	268	283	305
L	901	919	945	1011	1011	1034	1144	1118
LS	1013	1057	1082	1200	1200	1223	1349	1323
LB	419	437	463	529	529	552	662	636
LBS	531	575	600	718	718	741	867	841

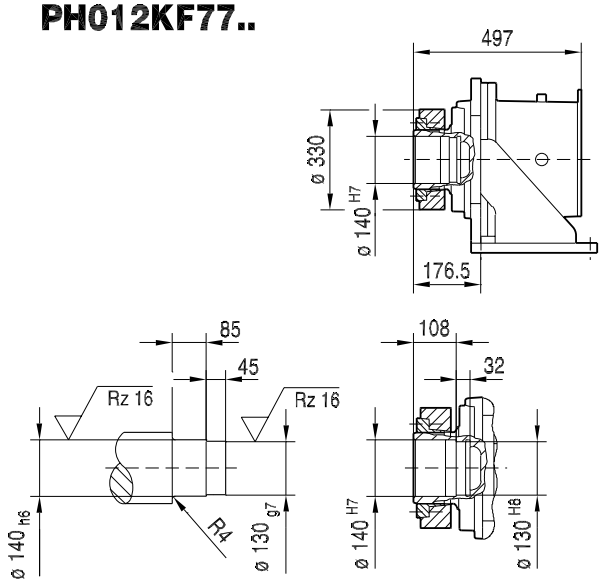
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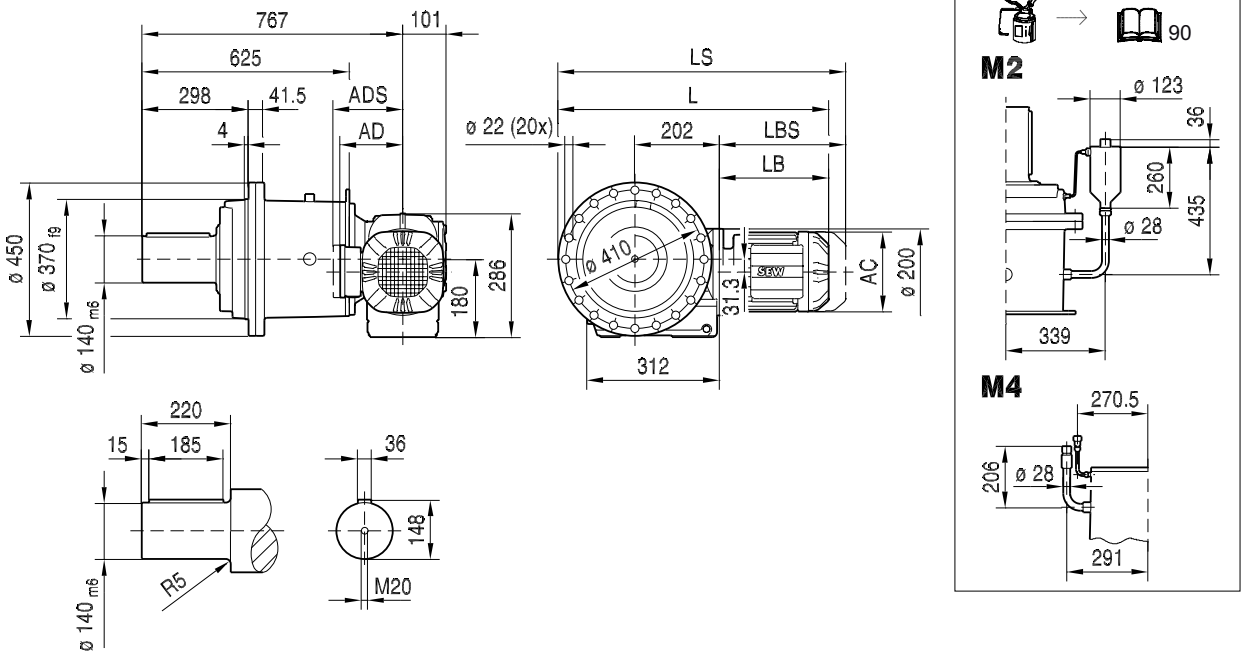


(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	752	784	780	830	861	911	929	955	1021	1021
LS	845	877	874	924	973	1023	1067	1092	1210	1210
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

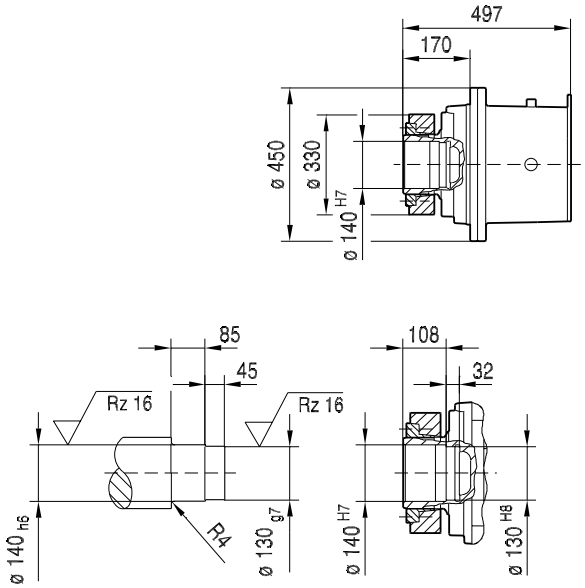
23488859/EN – 02/2017

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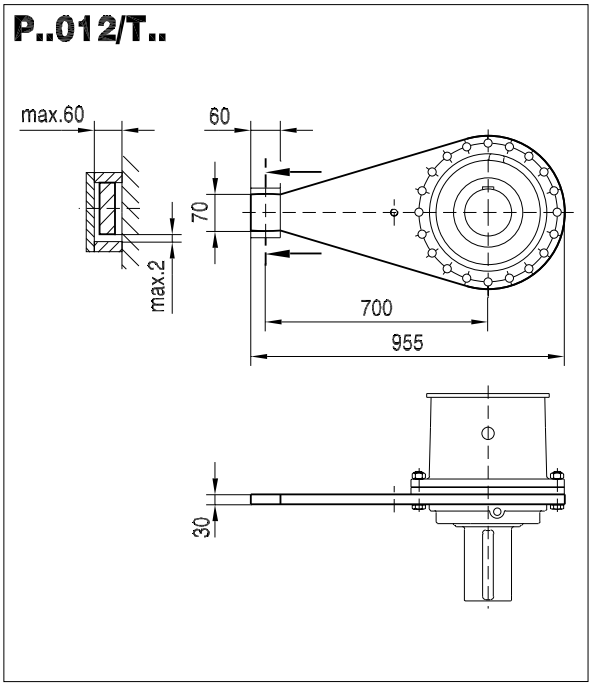
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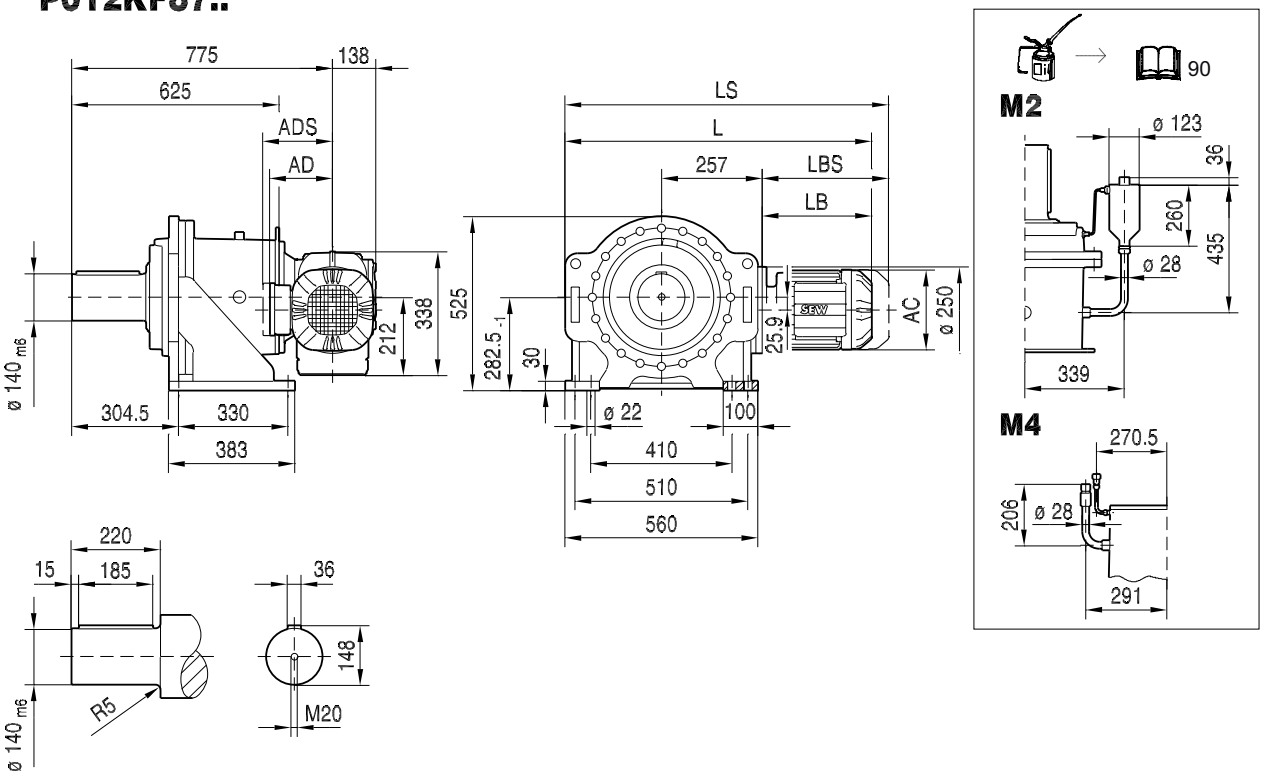


(→ 100)	DRN90S	DRN90L	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L
AC	179	179	197	197	221	221	261	261	314	314
AD	140	140	157	157	170	170	228	228	253	253
ADS	150	150	158	158	172	172	228	228	253	253
L	697	729	725	775	806	856	874	900	966	966
LS	790	822	819	869	918	968	1012	1037	1155	1155
LB	270	302	298	348	379	429	447	473	539	539
LBS	363	395	392	442	491	541	585	610	728	728

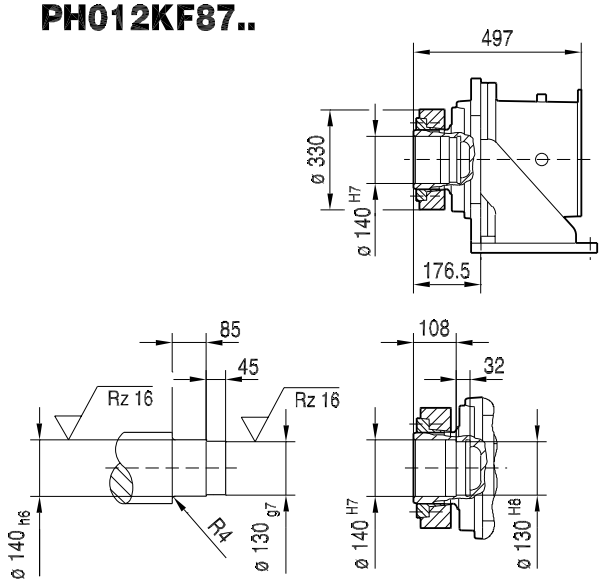
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P012KF87..

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PH012KF87..

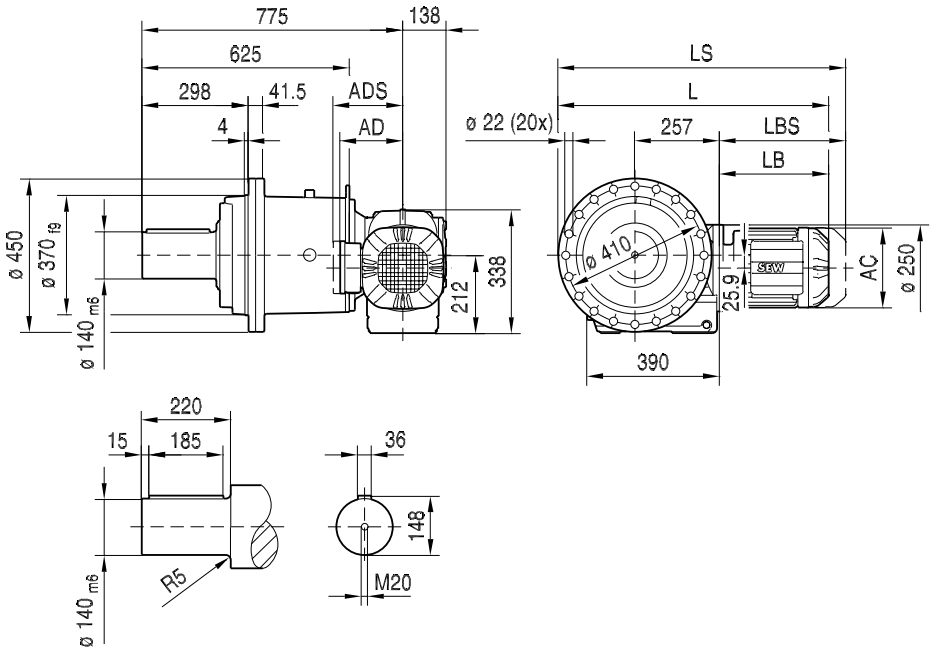


(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	830	880	911	961	979	1005	1071	1071	1094	1204
LS	924	974	1023	1073	1117	1142	1260	1260	1283	1409
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

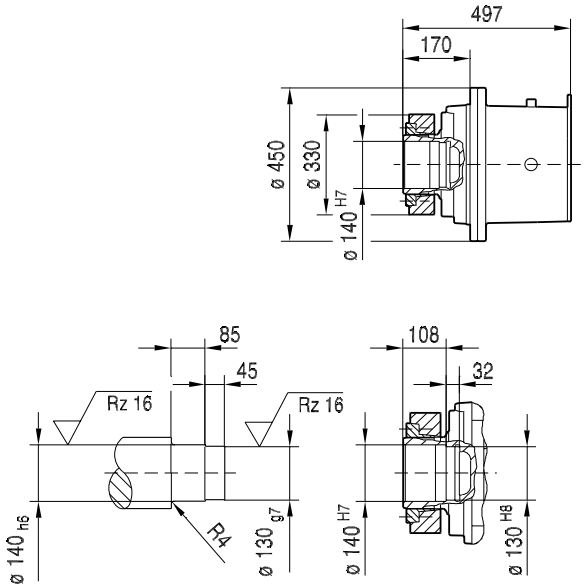
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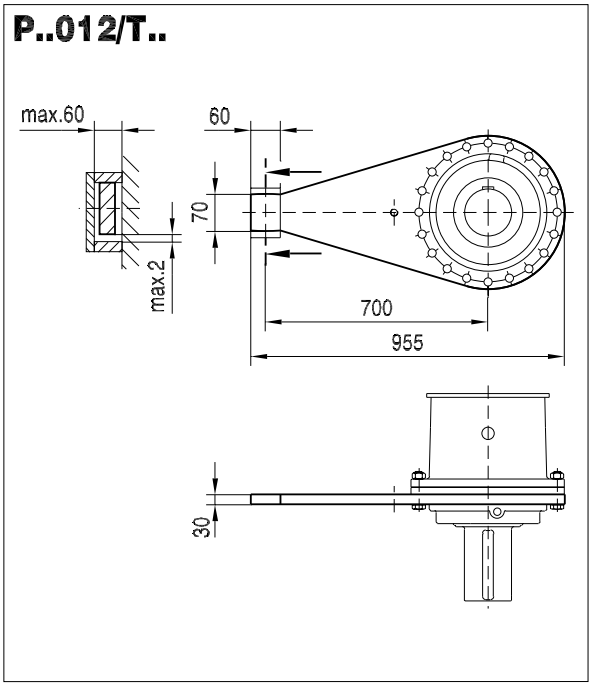
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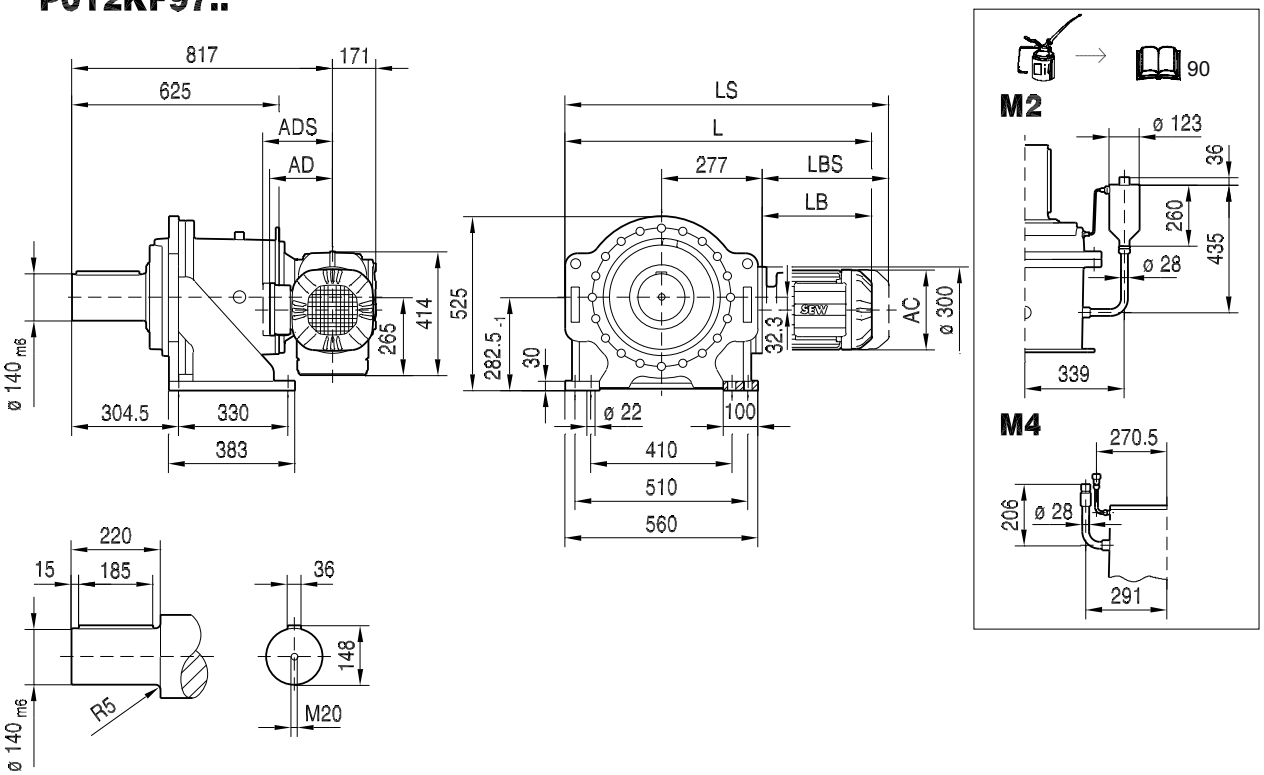
P..012/T..



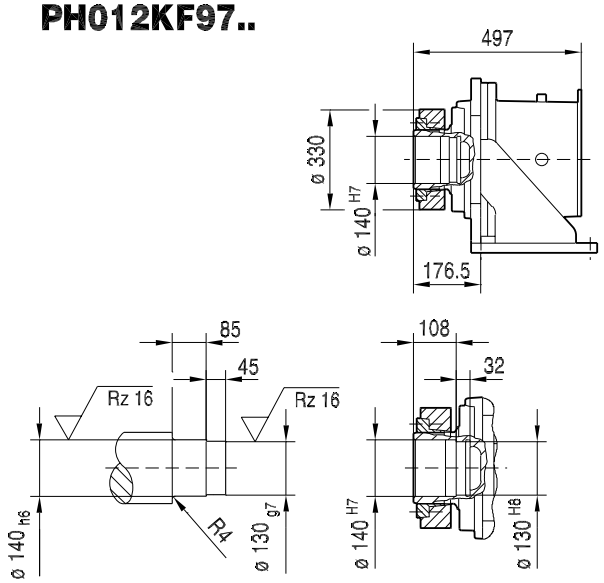
(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	775	825	856	906	924	950	1016	1016	1039	1149
LS	869	919	968	1018	1062	1087	1205	1205	1228	1354
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

P012KF97..

45 081 00 15



PH012KF97..

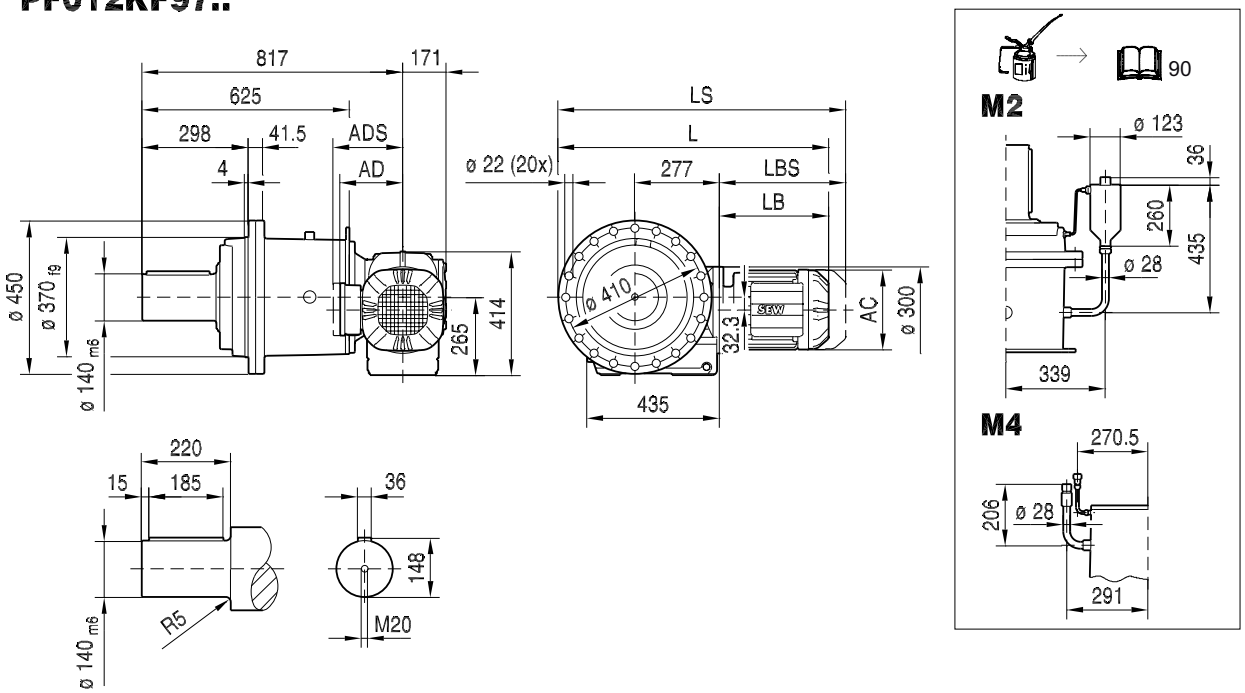


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	221	261	261	314	314	357	394	434
AD	170	228	228	253	253	268	283	305
ADS	172	228	228	253	253	268	283	305
L	976	994	1020	1086	1086	1109	1219	1193
LS	1088	1132	1157	1275	1275	1298	1424	1398
LB	419	437	463	529	529	552	662	636
LBS	531	575	600	718	718	741	867	841

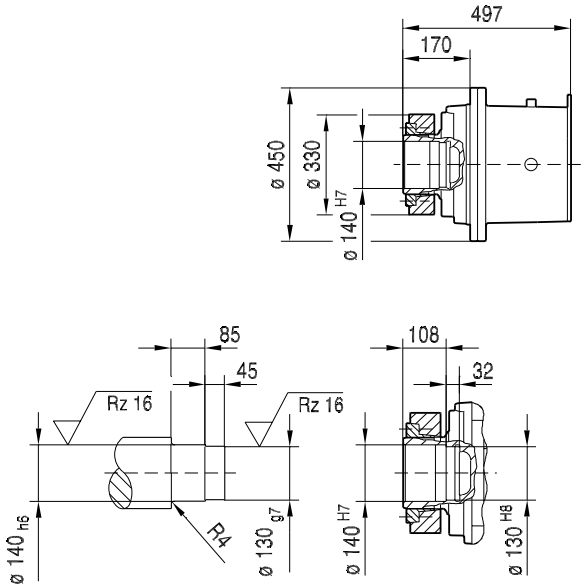
23488859/EN – 02/2017

PF012KF97..

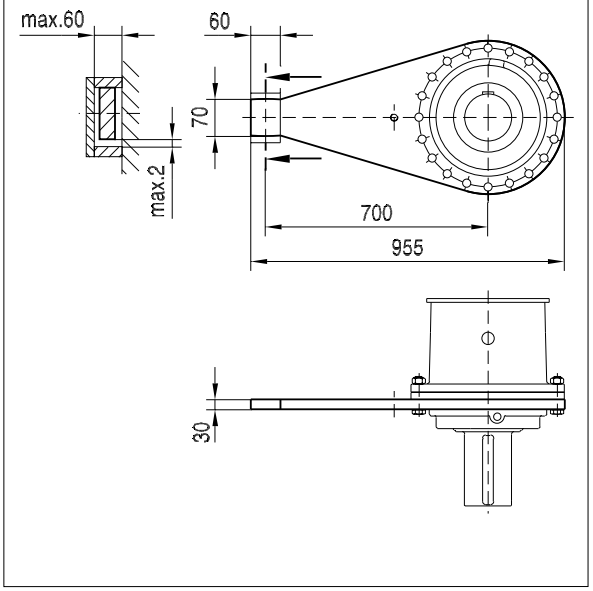
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PHF012KF97..



P..012/T..

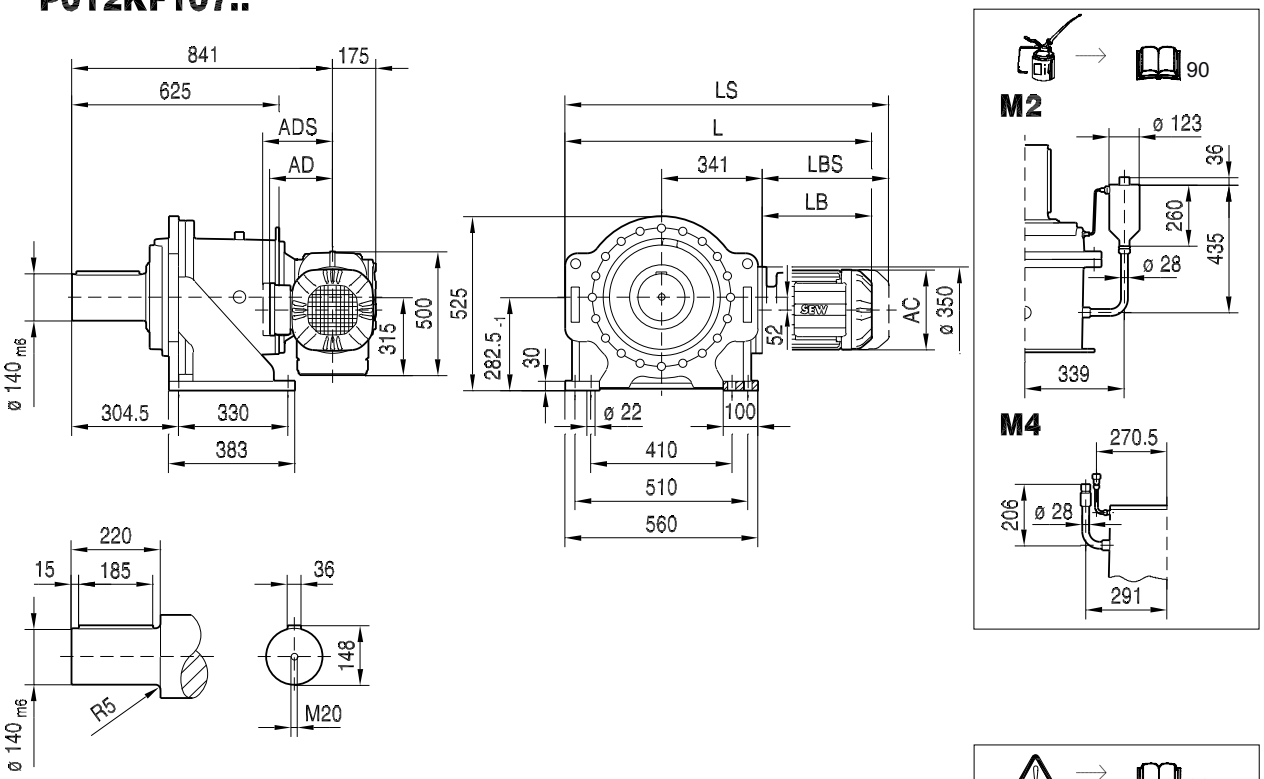


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	221	261	261	314	314	357	394	434
AD	170	228	228	253	253	268	283	305
ADS	172	228	228	253	253	268	283	305
L	921	939	965	1031	1031	1054	1164	1138
LS	1033	1077	1102	1220	1220	1243	1369	1343
LB	419	437	463	529	529	552	662	636
LBS	531	575	600	718	718	741	867	841

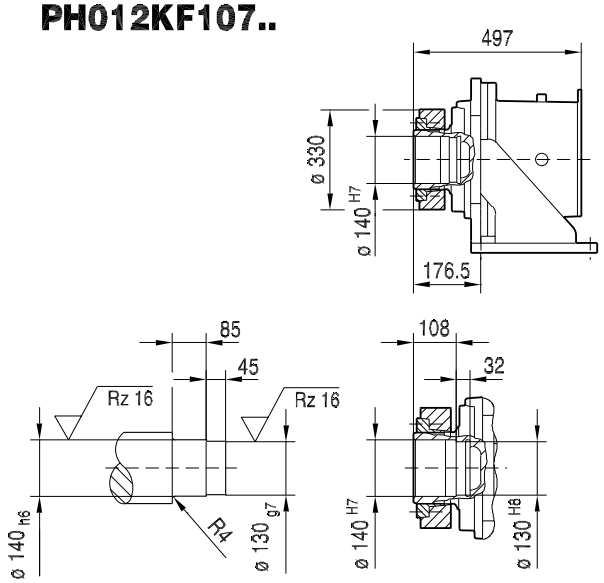
23488859/EN – 02/2017

P012KF107..

45 083 00 15



PH012KF107..

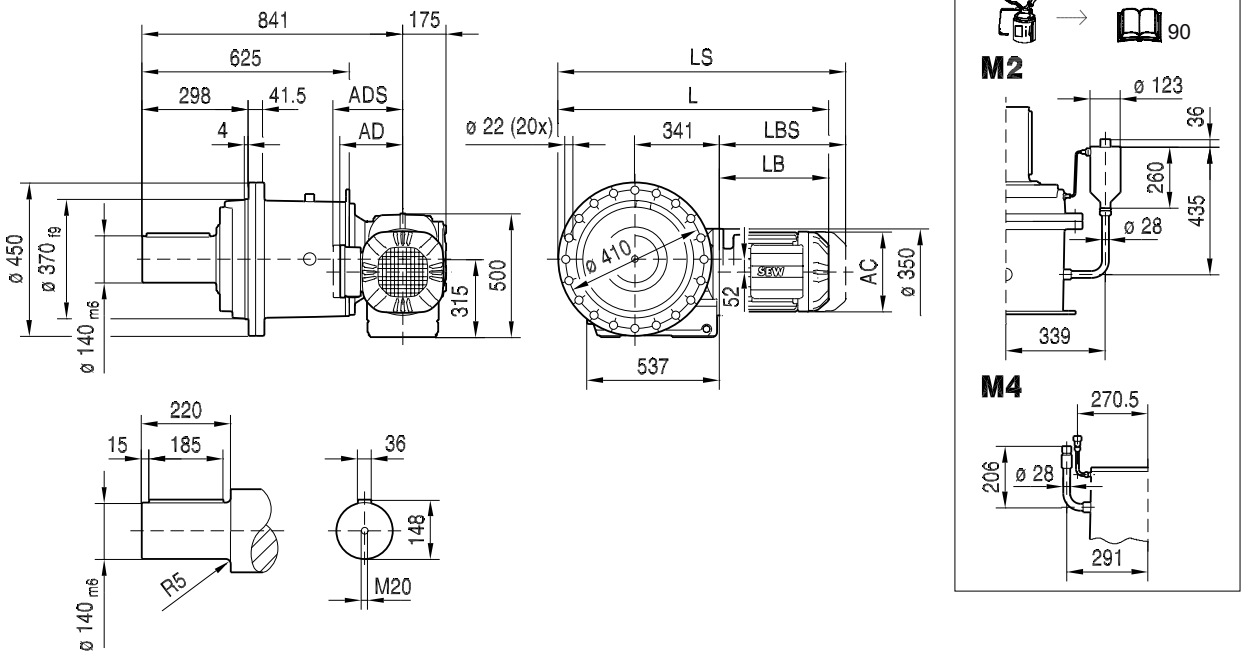


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	1034	1052	1078	1144	1144	1167	1277	1251	1388
LS	1146	1190	1215	1333	1333	1356	1482	1456	1628
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

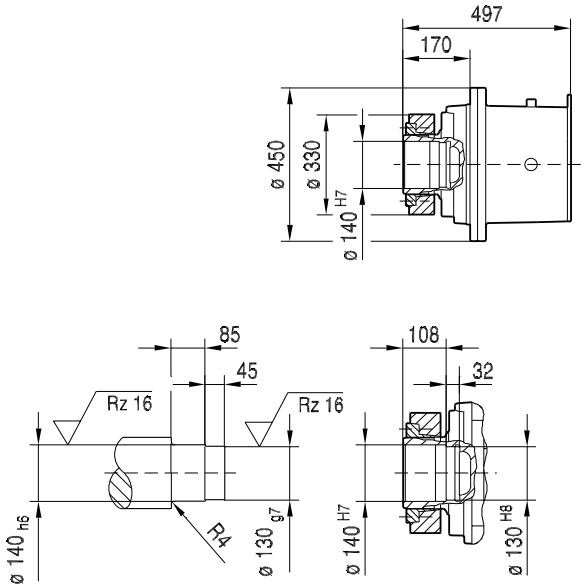
23488859/EN – 02/2017

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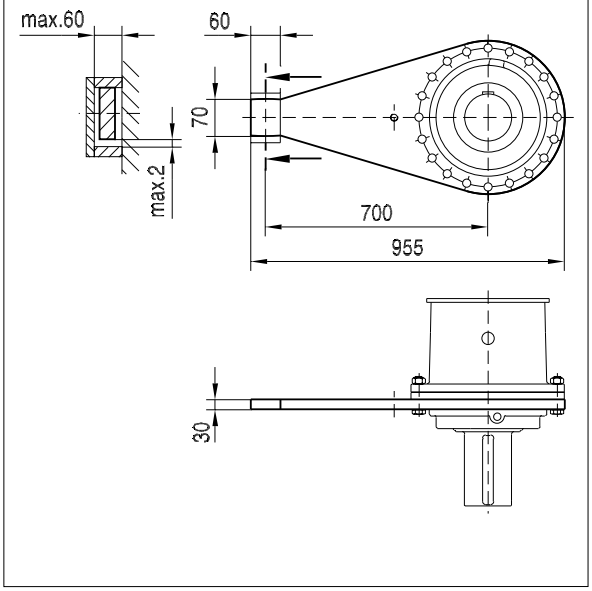
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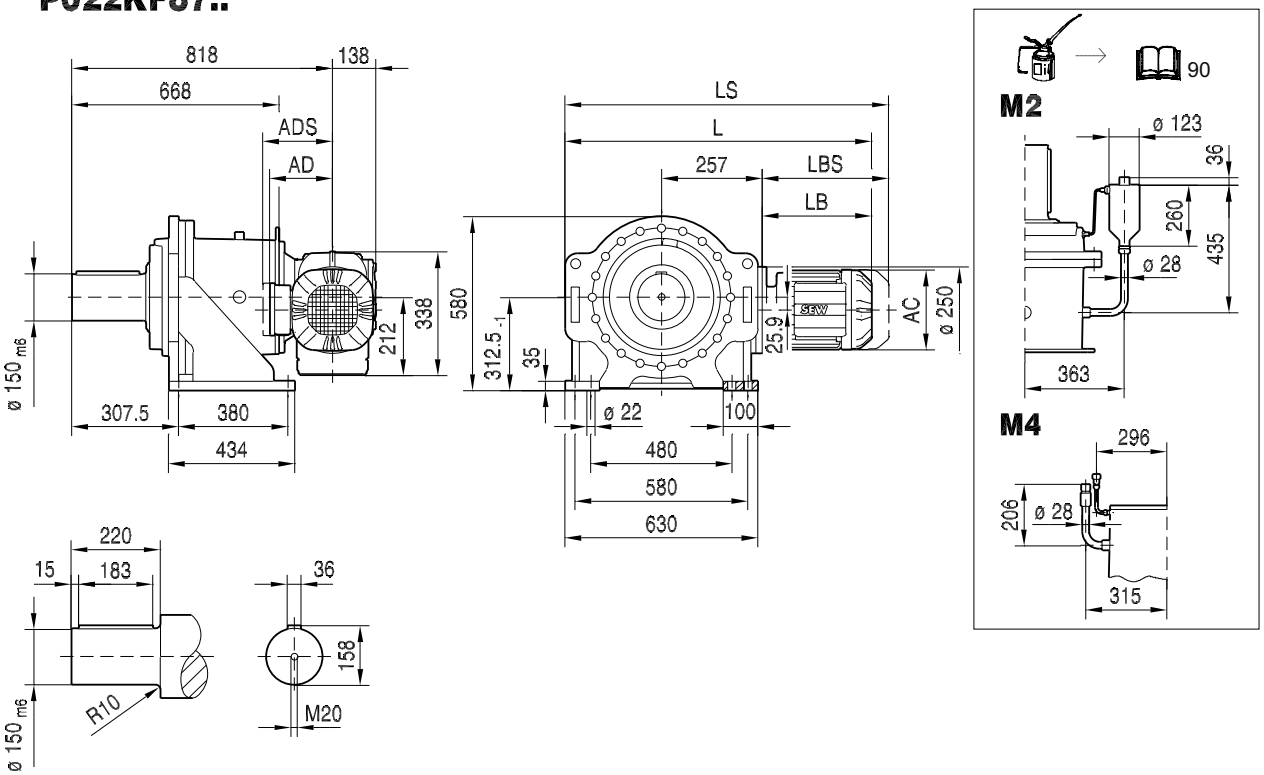


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	979	997	1023	1089	1089	1112	1222	1196	1333
LS	1091	1135	1160	1278	1278	1301	1427	1401	1573
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

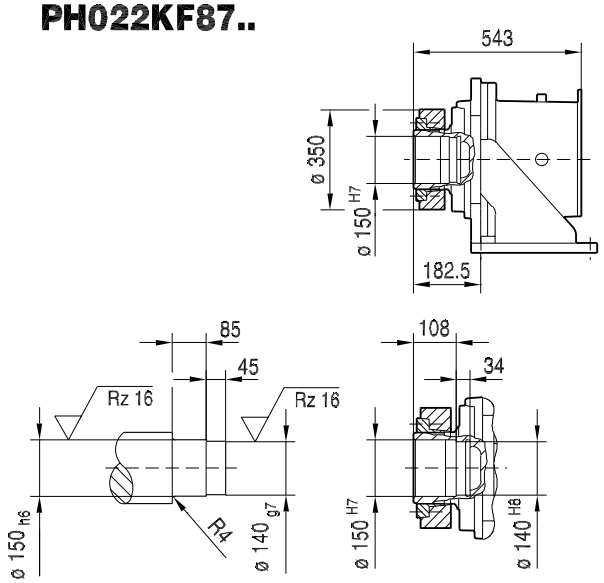
23488859/EN – 02/2017

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45 085 00 15



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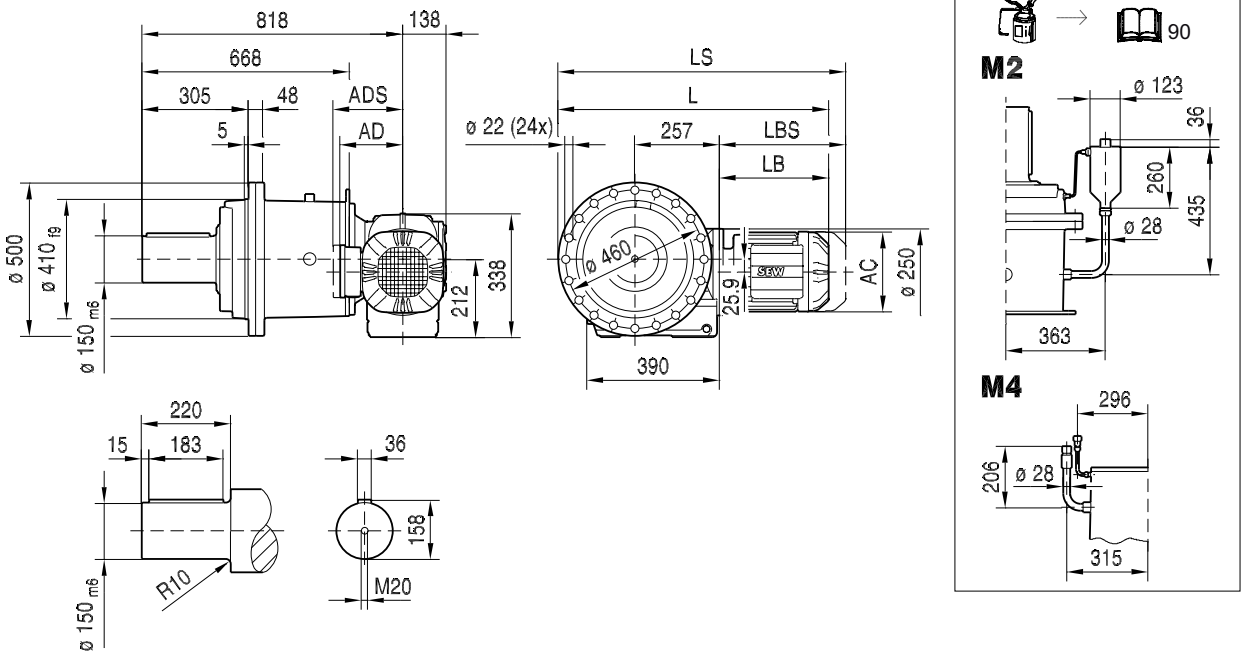


(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	865	915	946	996	1014	1040	1106	1106	1129	1239
LS	959	1009	1058	1108	1152	1177	1295	1295	1318	1444
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

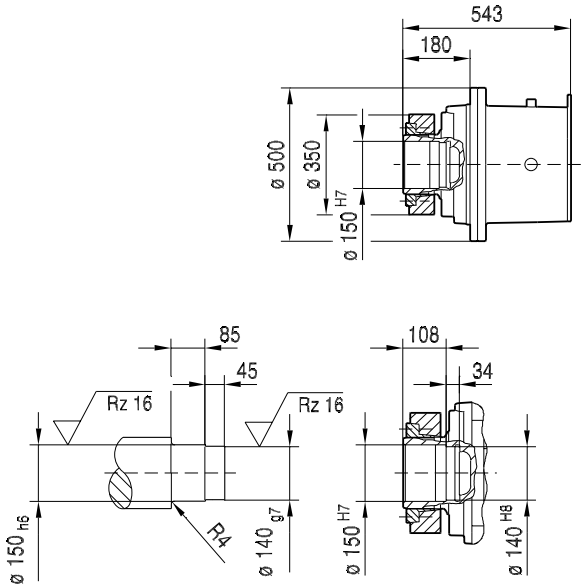
23488859/EN – 02/2017

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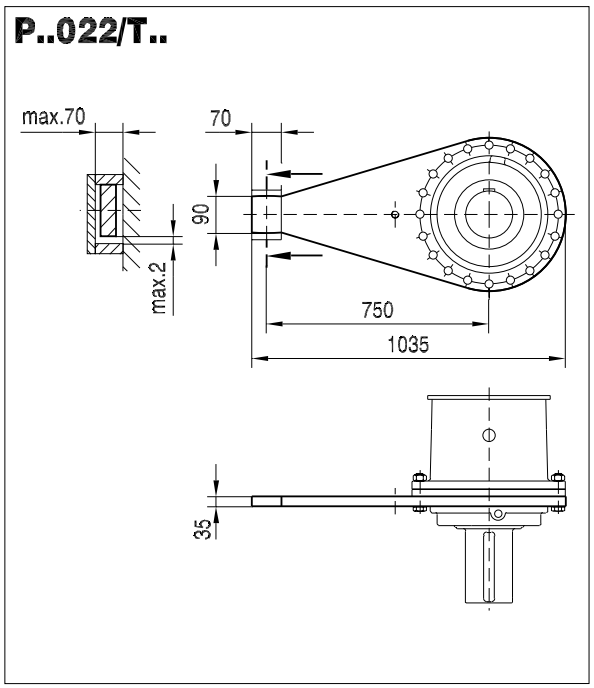
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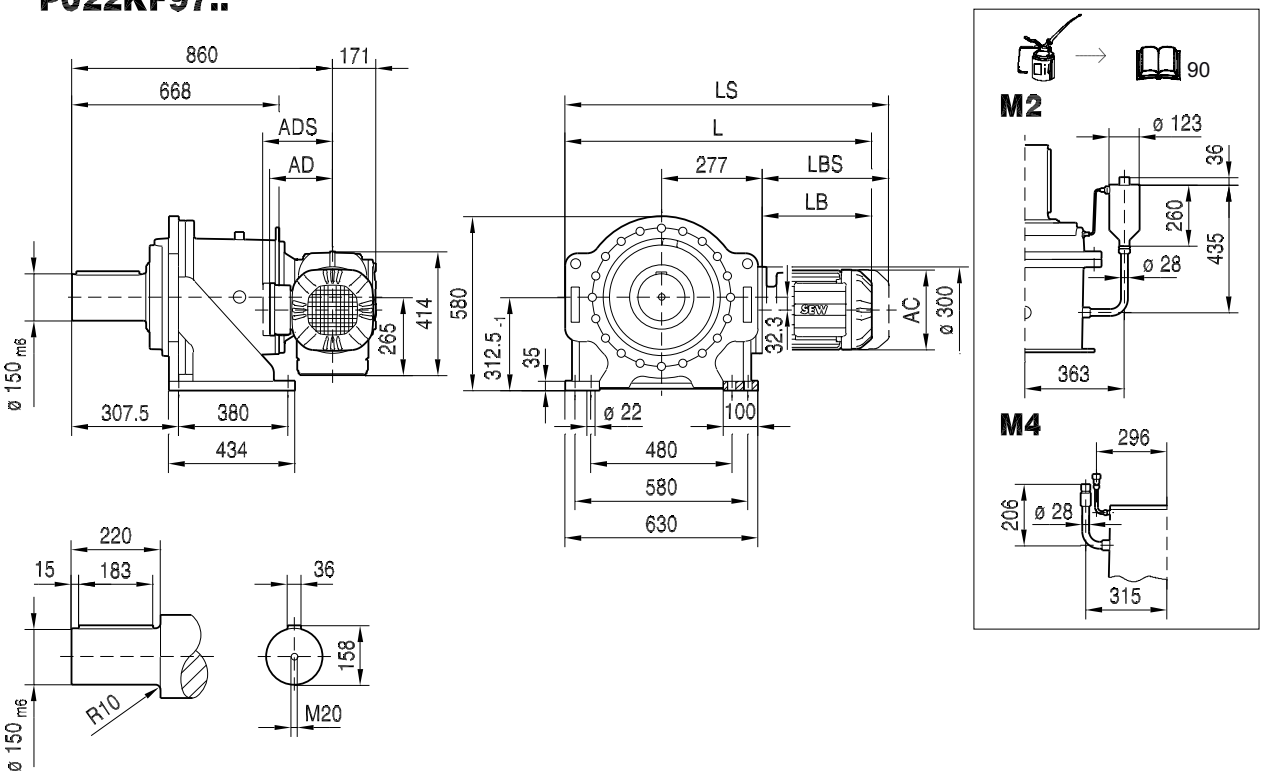


(→ 🗎 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	800	850	881	931	949	975	1041	1041	1064	1174
LS	894	944	993	1043	1087	1112	1230	1230	1253	1379
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

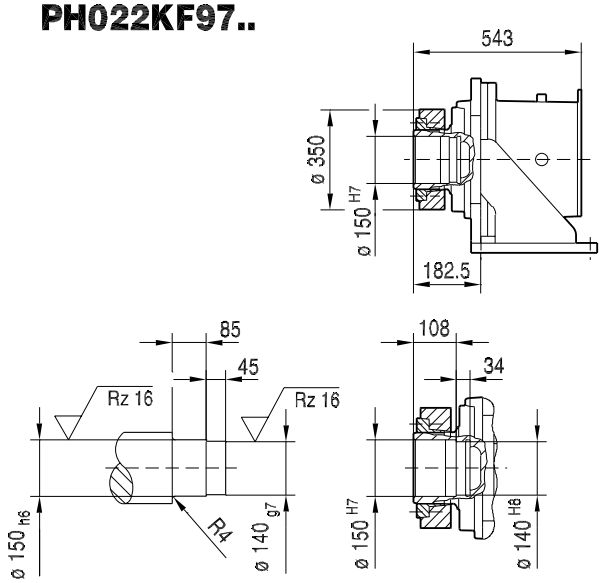
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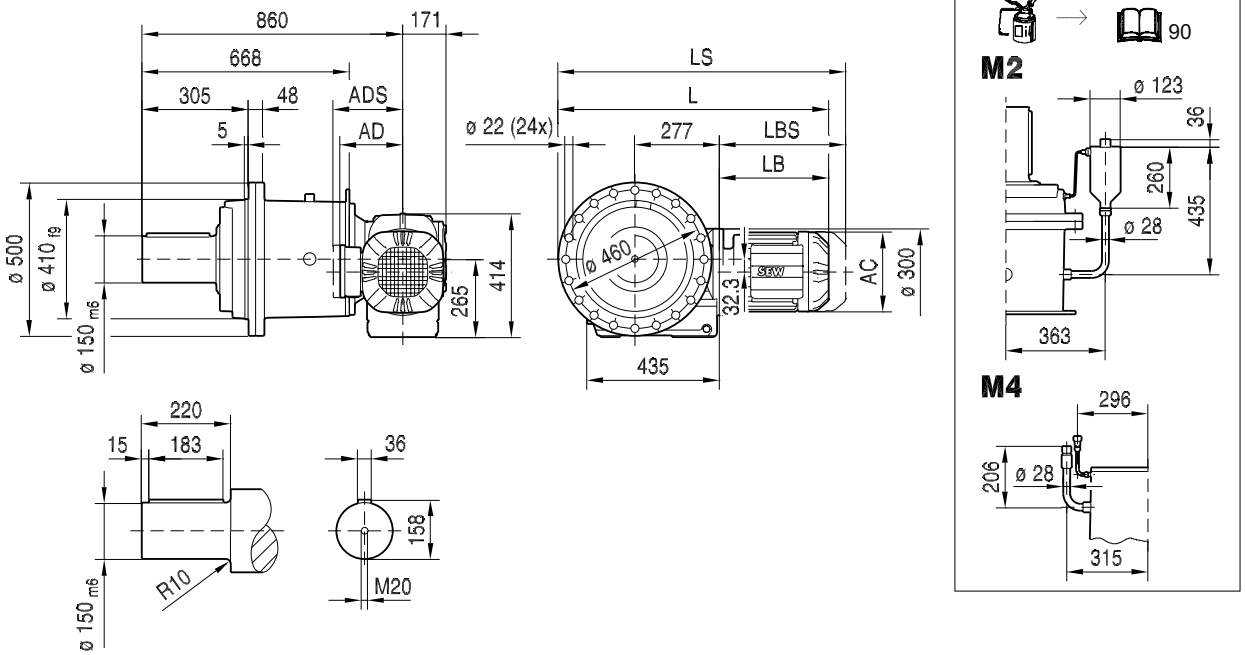


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	221	261	261	314	314	357	394	434
AD	170	228	228	253	253	268	283	305
ADS	172	228	228	253	253	268	283	305
L	1011	1029	1055	1121	1121	1144	1254	1228
LS	1123	1167	1192	1310	1310	1333	1459	1433
LB	419	437	463	529	529	552	662	636
LBS	531	575	600	718	718	741	867	841

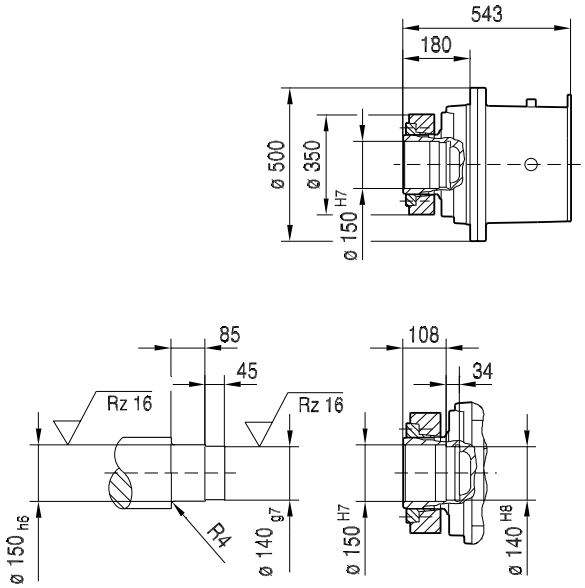
23488859/EN – 02/2017

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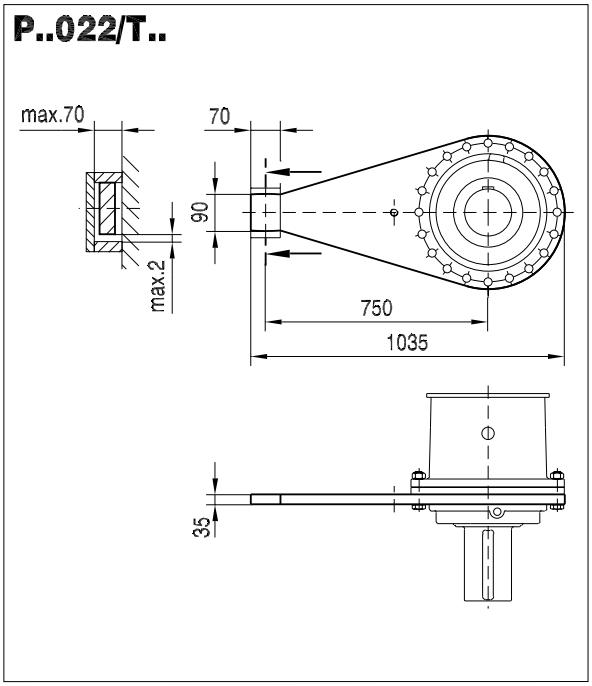
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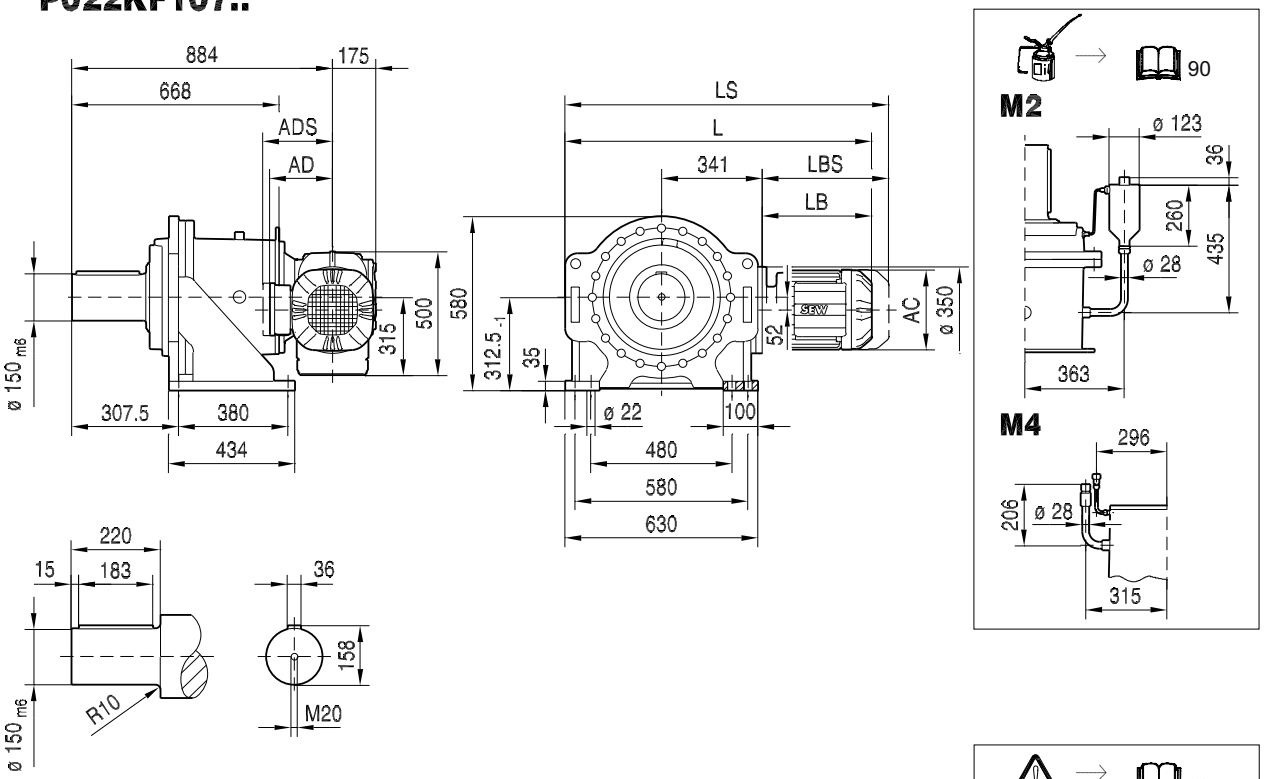
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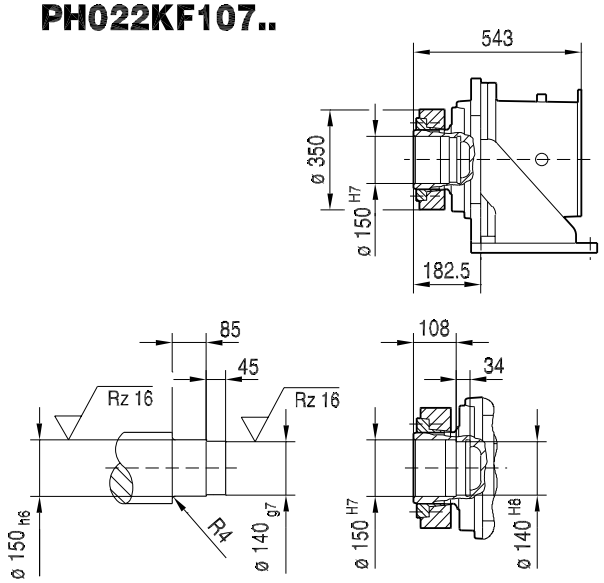
(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	221	261	261	314	314	357	394	434
AD	170	228	228	253	253	268	283	305
ADS	172	228	228	253	253	268	283	305
L	946	964	990	1056	1056	1079	1189	1163
LS	1058	1102	1127	1245	1245	1268	1394	1368
LB	419	437	463	529	529	552	662	636
LBS	531	575	600	718	718	741	867	841

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45 089 00 15



PH022KF107..

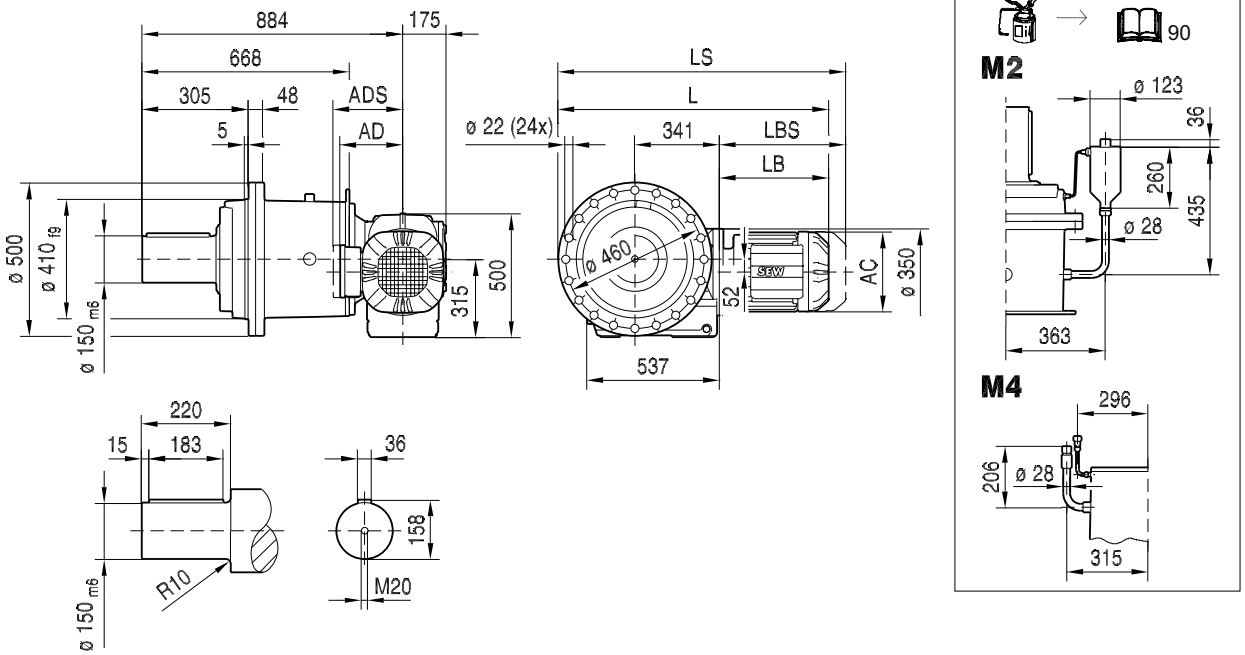


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	1069	1087	1113	1179	1179	1202	1312	1286	1423
LS	1181	1225	1250	1368	1368	1391	1517	1491	1663
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

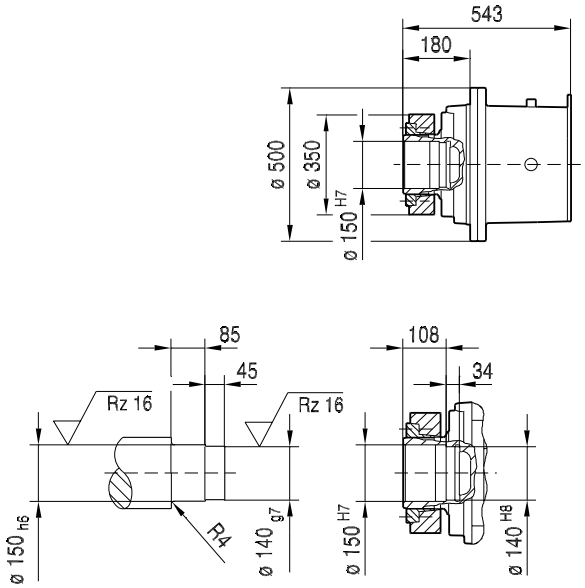
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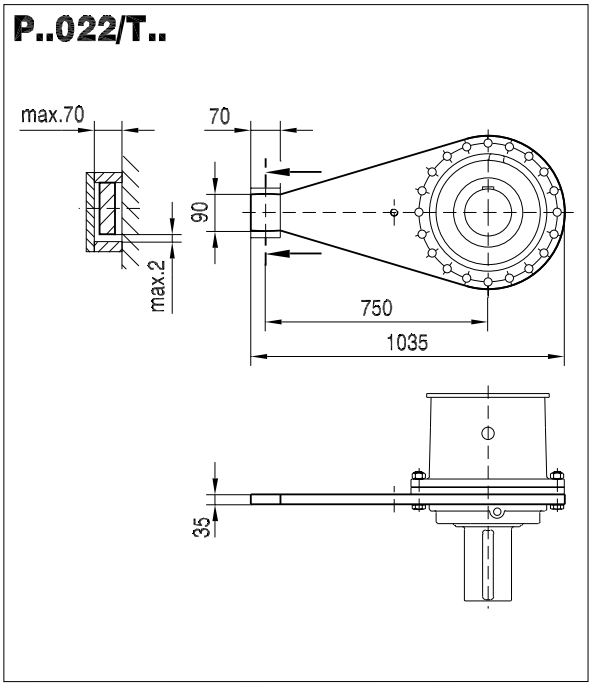
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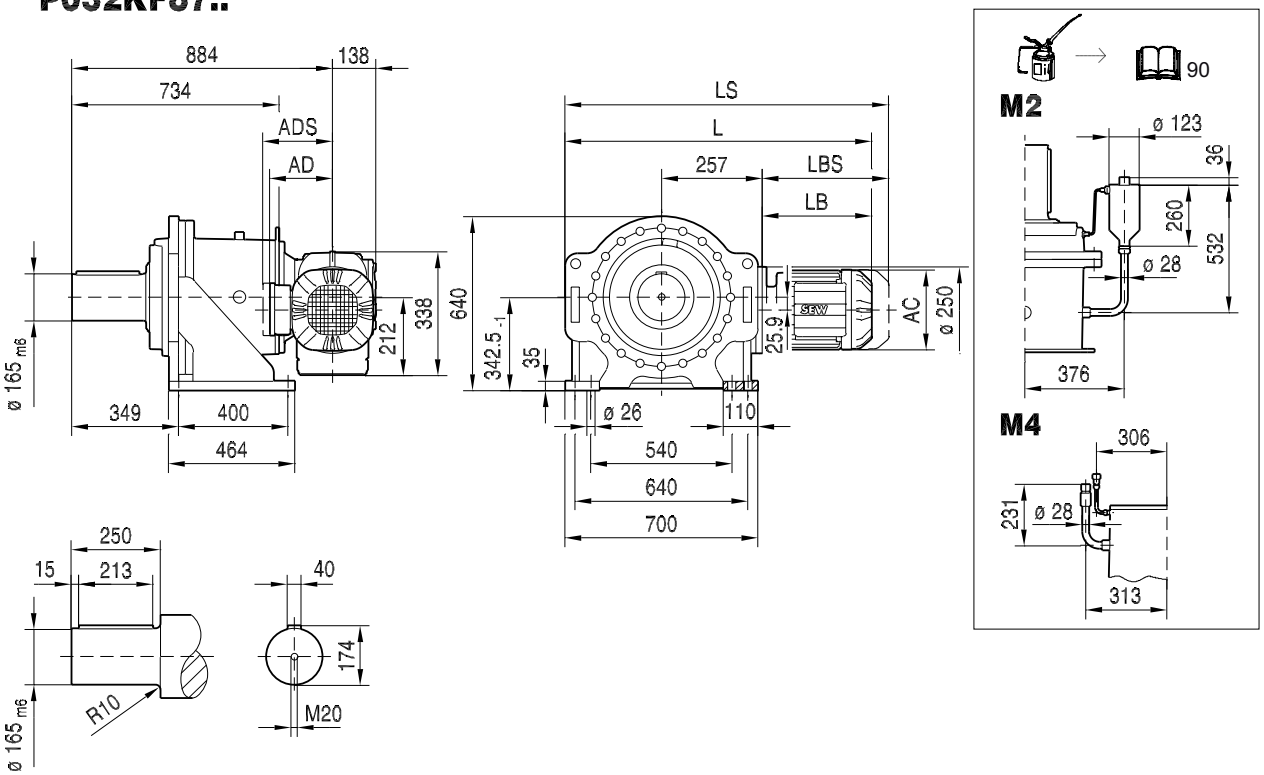


(→ 100)	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	261	261	314	314	357	394	434	495
AD	170	228	228	253	253	268	283	305	394
ADS	172	228	228	253	253	268	283	305	394
L	1004	1022	1048	1114	1114	1137	1247	1221	1358
LS	1116	1160	1185	1303	1303	1326	1452	1426	1598
LB	413	431	457	523	523	546	656	630	767
LBS	525	569	594	712	712	735	861	835	1007

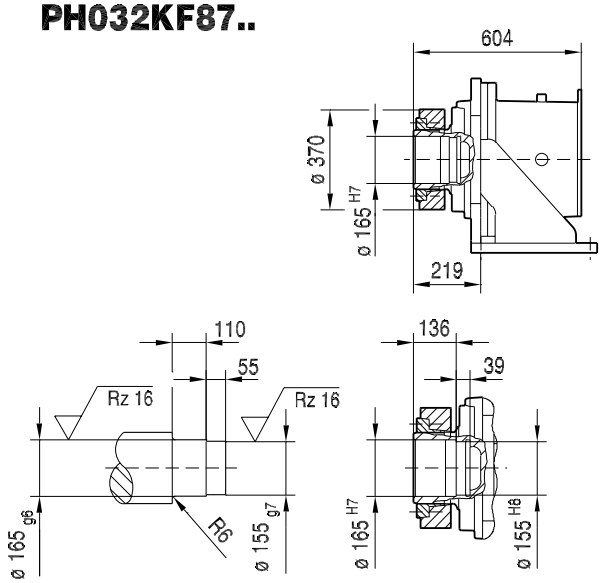
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P032KF87..

45 091 00 15



PH032KF87..

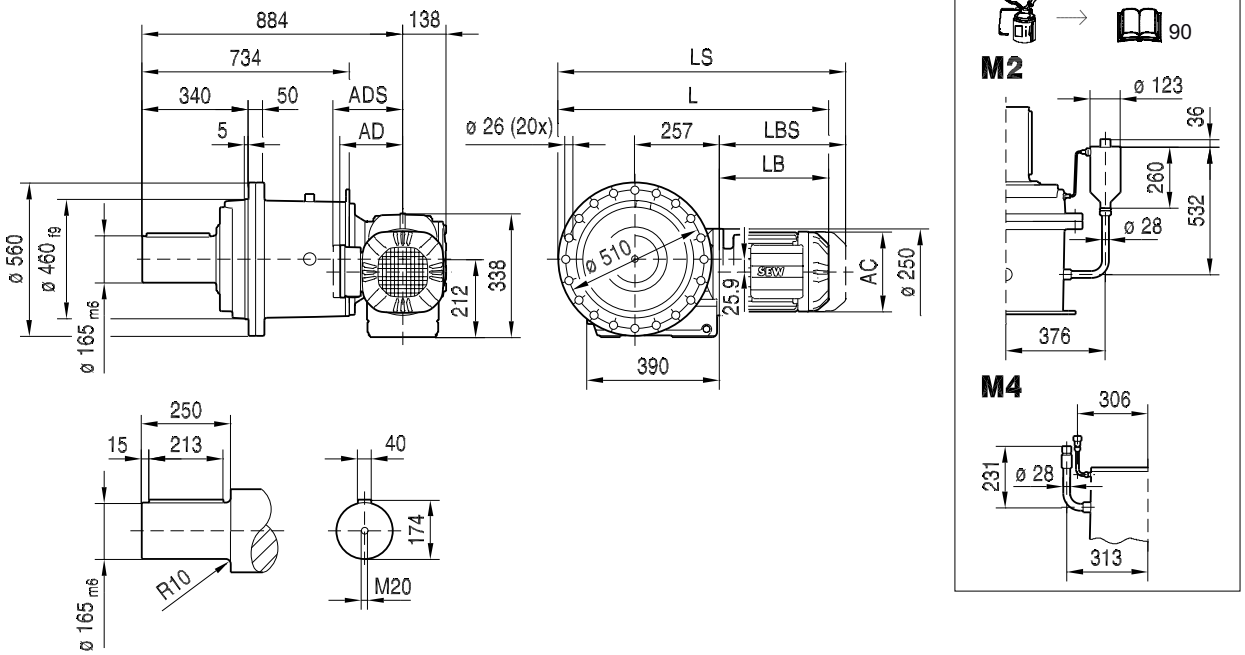


(→ 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	900	950	981	1031	1049	1075	1141	1141	1164	1274
LS	994	1044	1093	1143	1187	1212	1330	1330	1353	1479
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

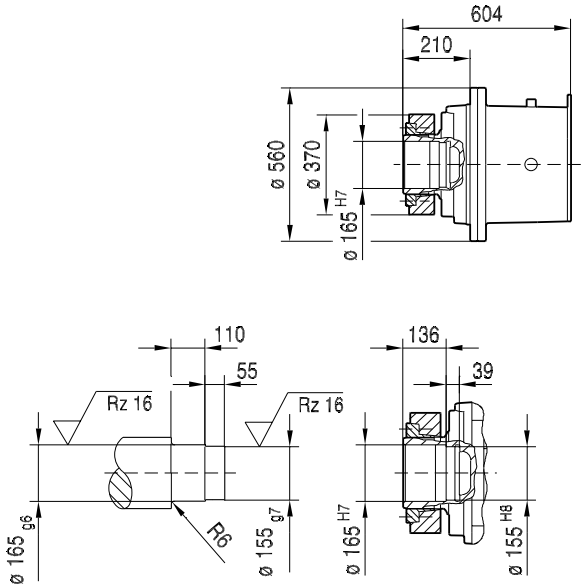
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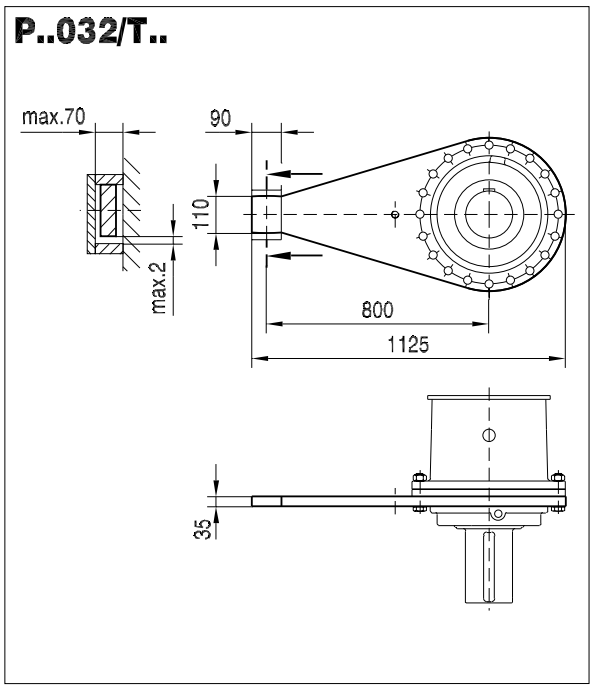
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P..032/T..

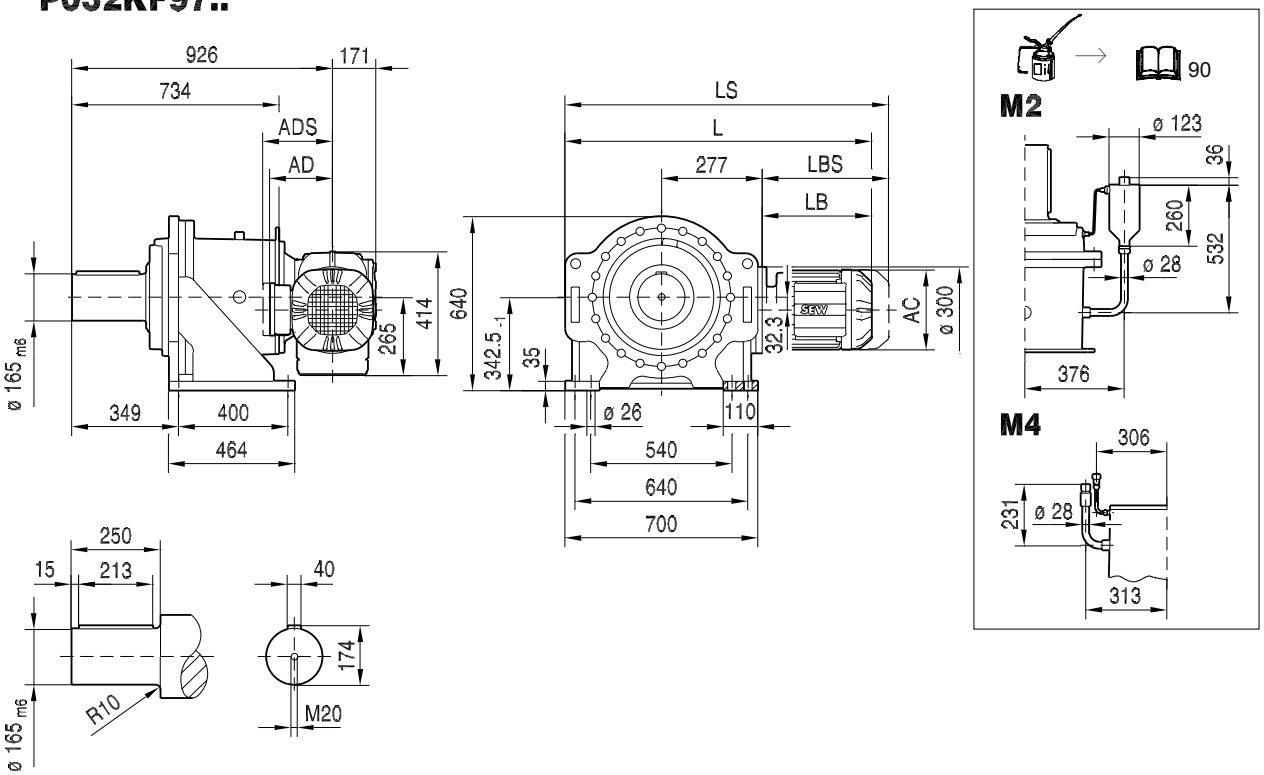


(→ 🗎 100)	DRN100LS	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L
AC	197	197	221	221	261	261	314	314	357	394
AD	157	157	170	170	228	228	253	253	268	283
ADS	158	158	172	172	228	228	253	253	268	283
L	830	880	911	961	979	1005	1071	1071	1094	1204
LS	924	974	1023	1073	1117	1142	1260	1260	1283	1409
LB	293	343	374	424	442	468	534	534	557	667
LBS	387	437	486	536	580	605	723	723	746	872

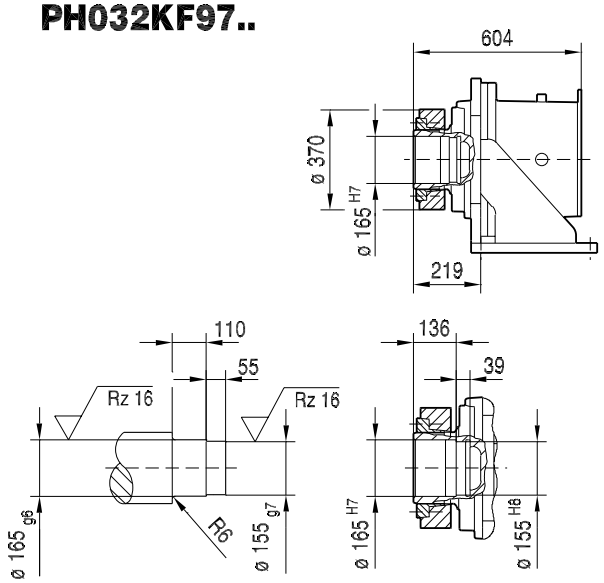
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45 093 00 15



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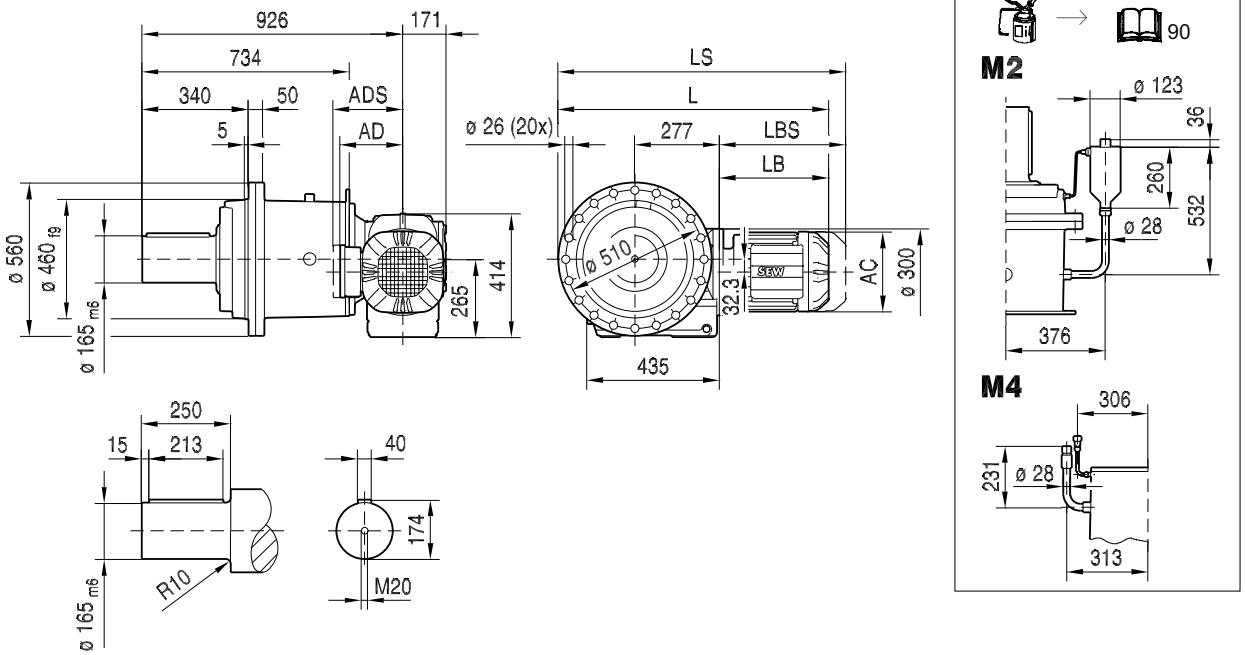


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	965	996	1046	1064	1090	1156	1156	1179	1289	1263
LS	1059	1108	1158	1202	1227	1345	1345	1368	1494	1468
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

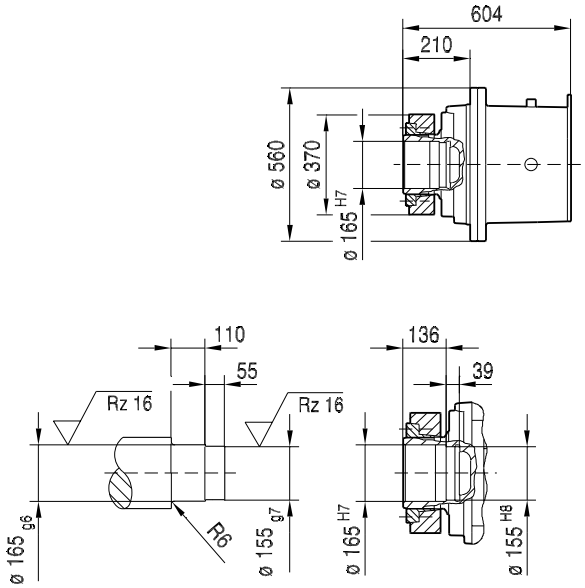
23488859/EN – 02/2017

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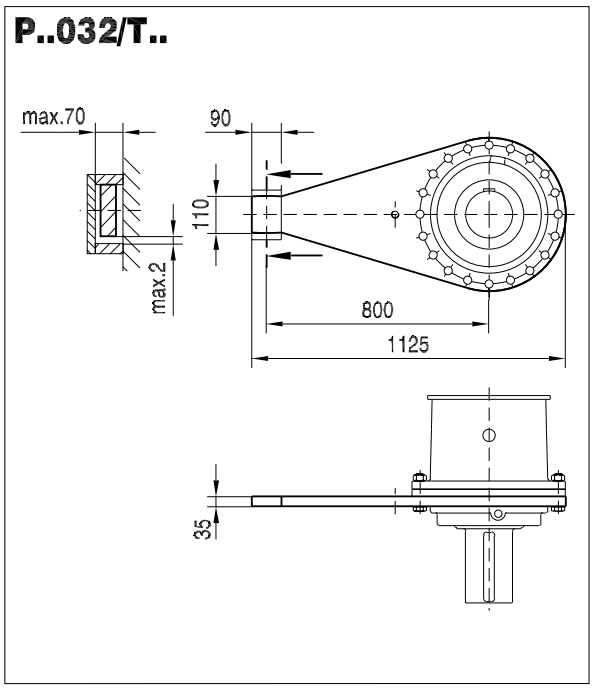
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P..032/T..

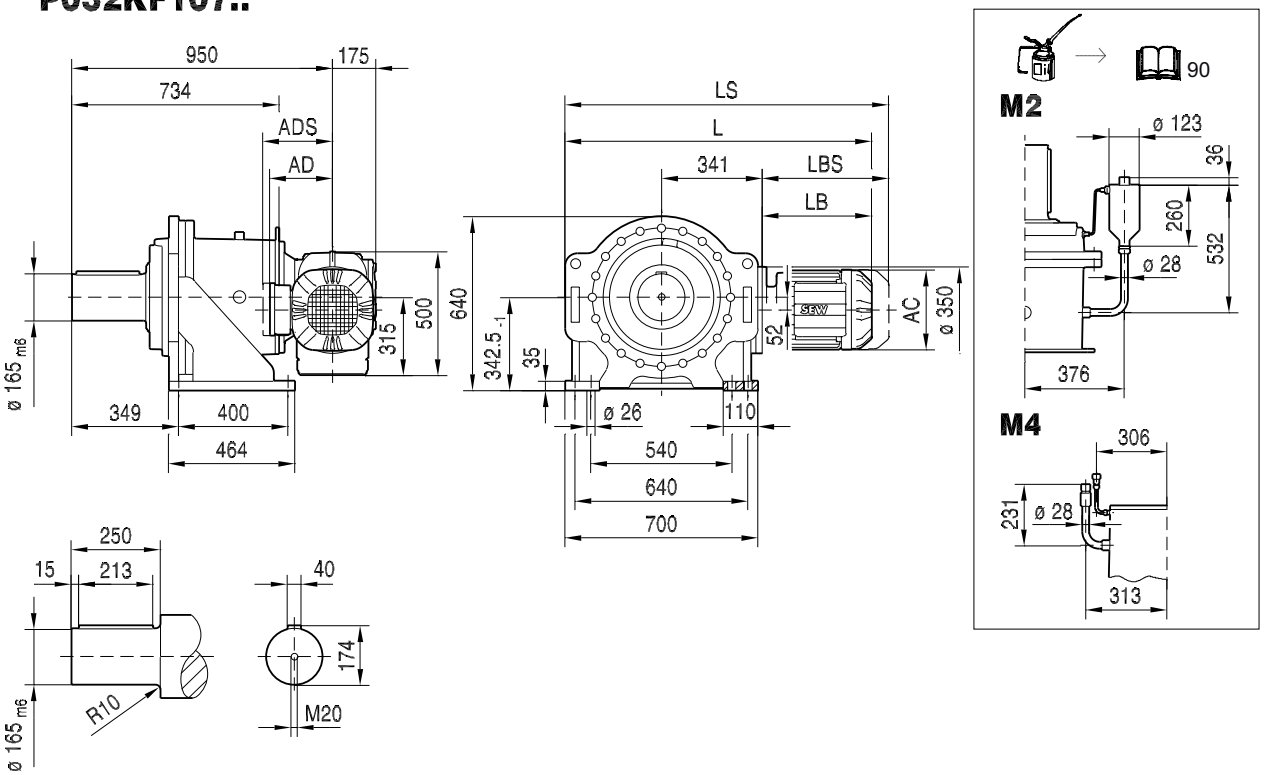


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	895	926	976	994	1020	1086	1086	1109	1219	1193
LS	989	1038	1088	1132	1157	1275	1275	1298	1424	1398
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

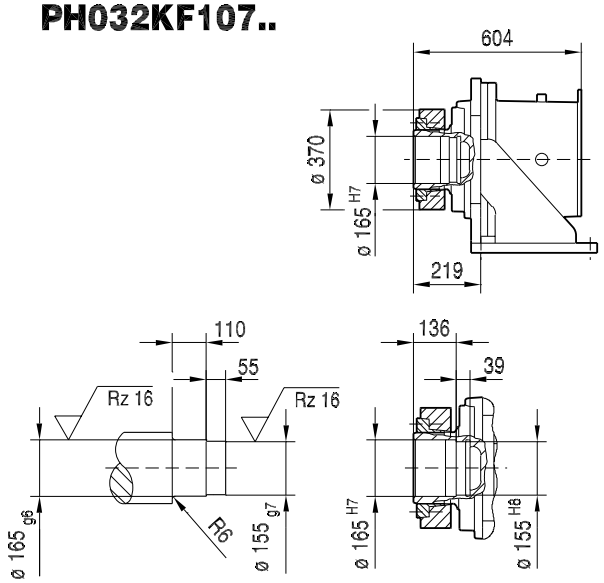
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P032KF107..

45 095 00 15



PH032KF107..

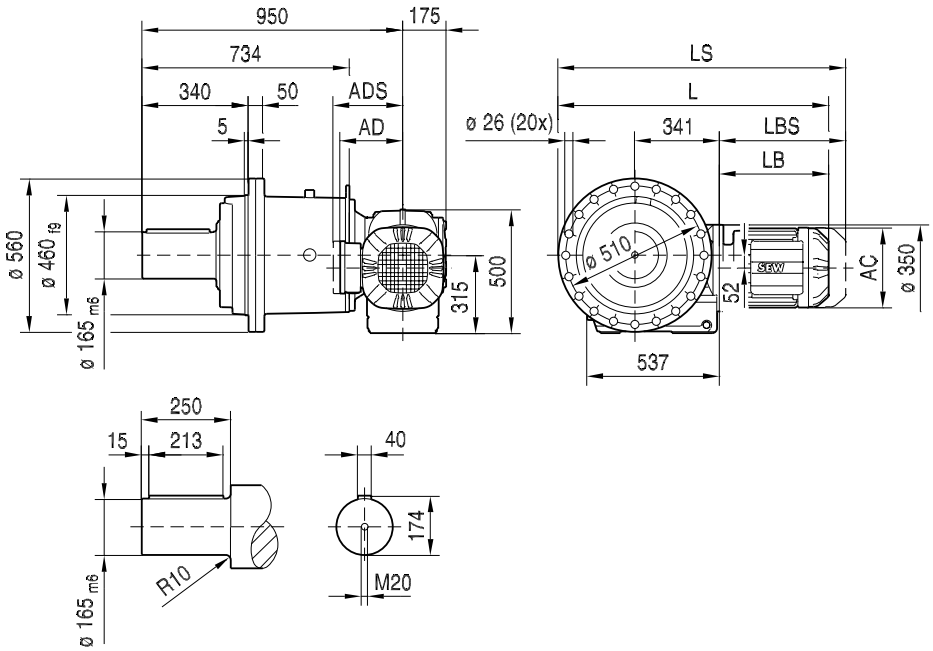


(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1054	1104	1122	1148	1214	1214	1237	1347	1321	1458
LS	1166	1216	1260	1285	1403	1403	1426	1552	1526	1698
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

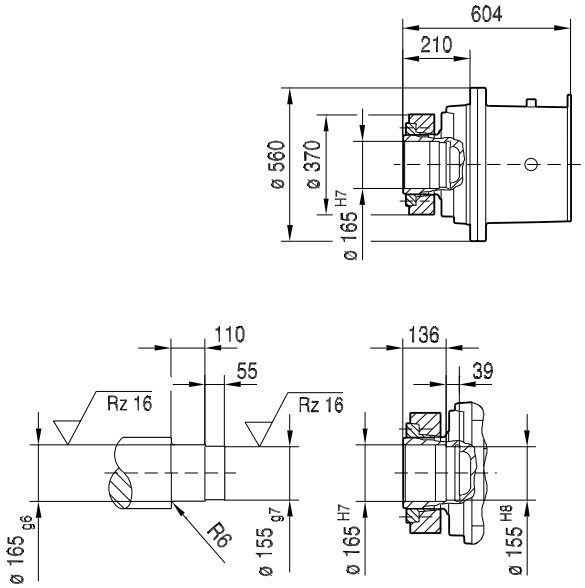
23488859/EN – 02/2017

PF032KF107..

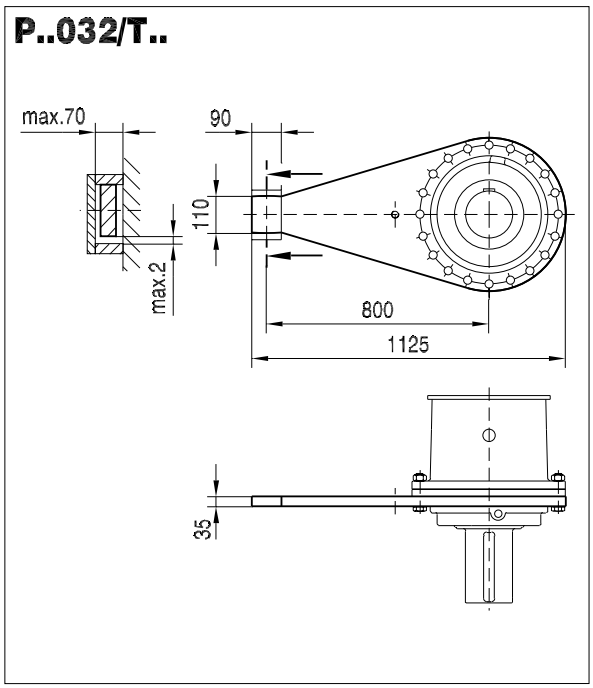
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PHF032KF107..



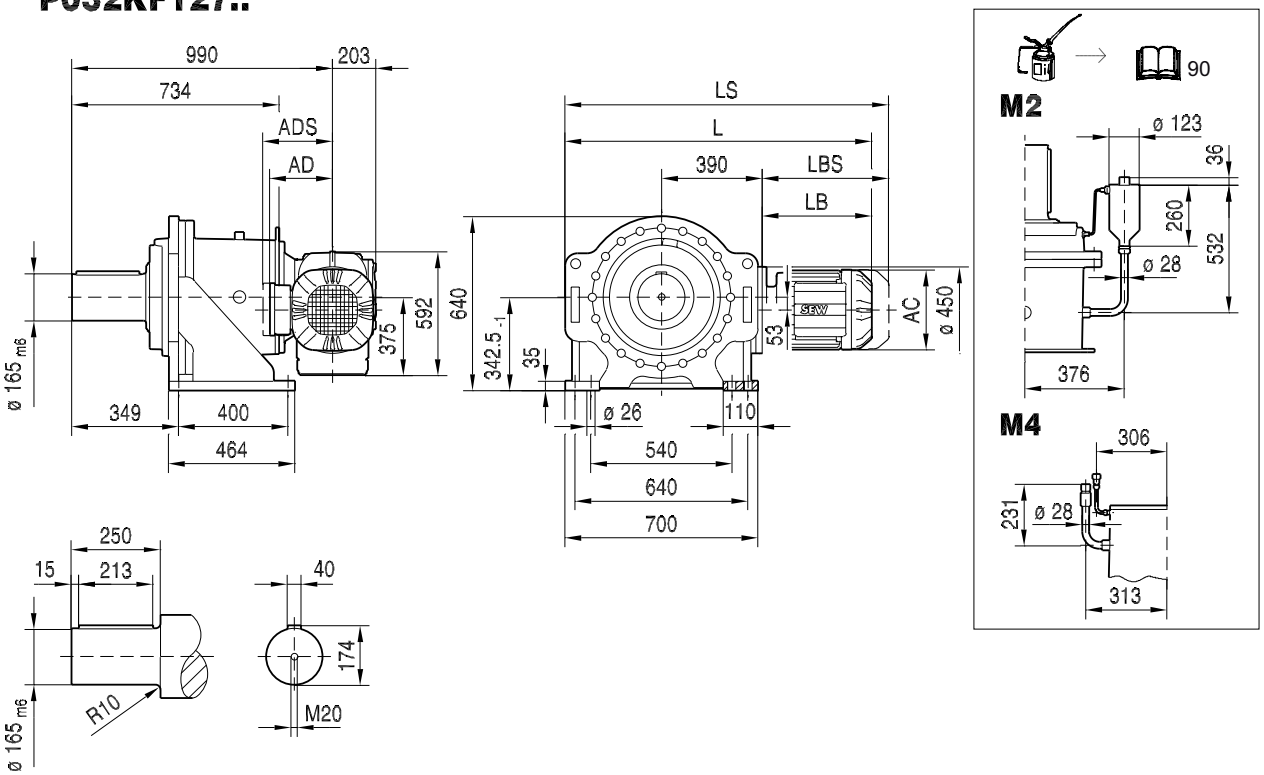
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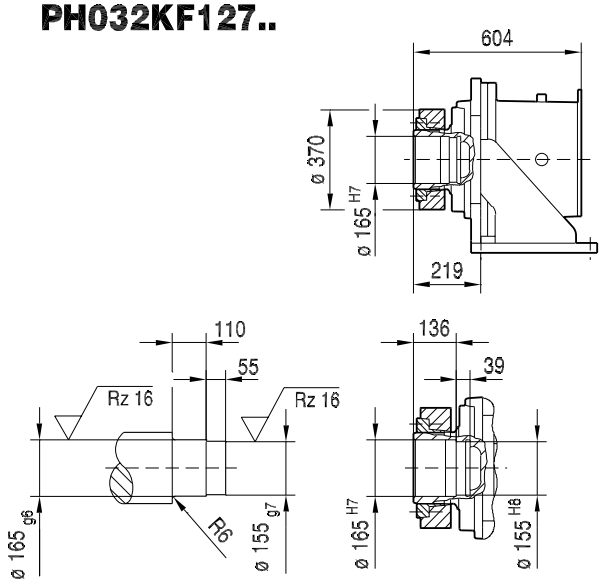
(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	984	1034	1052	1078	1144	1144	1167	1277	1251	1388
LS	1096	1146	1190	1215	1333	1333	1356	1482	1456	1628
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

P032KF127..

45 097 00 15



PH032KF127..

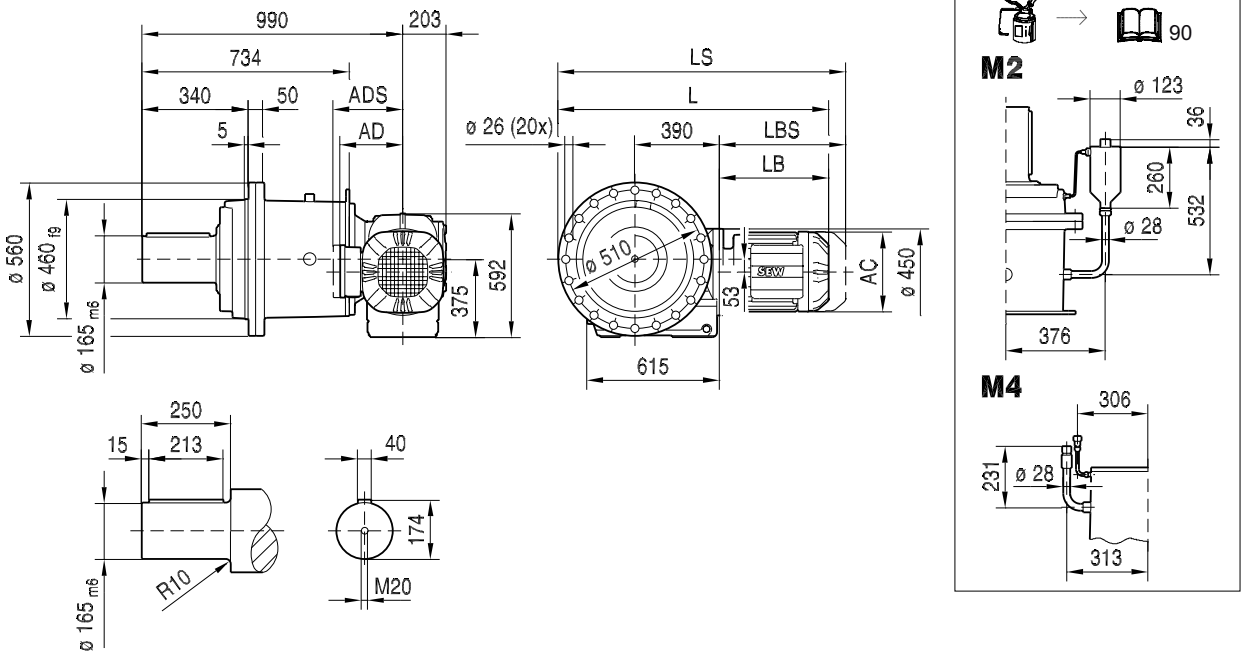


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1182	1248	1248	1271	1381	1355	1492	1492	1587	1689
LS	1319	1437	1437	1460	1586	1560	1732	1732	1827	1940
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

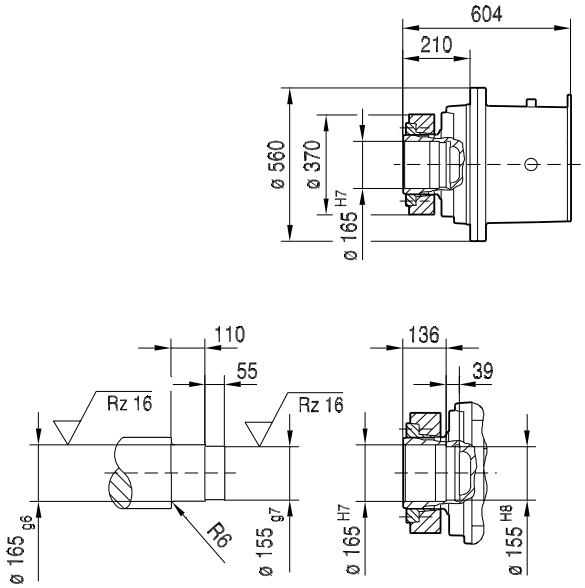
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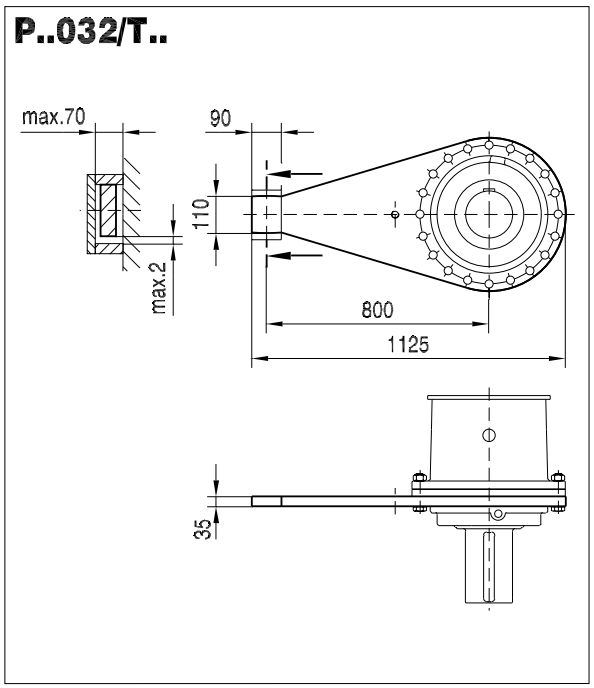
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P..032/T..

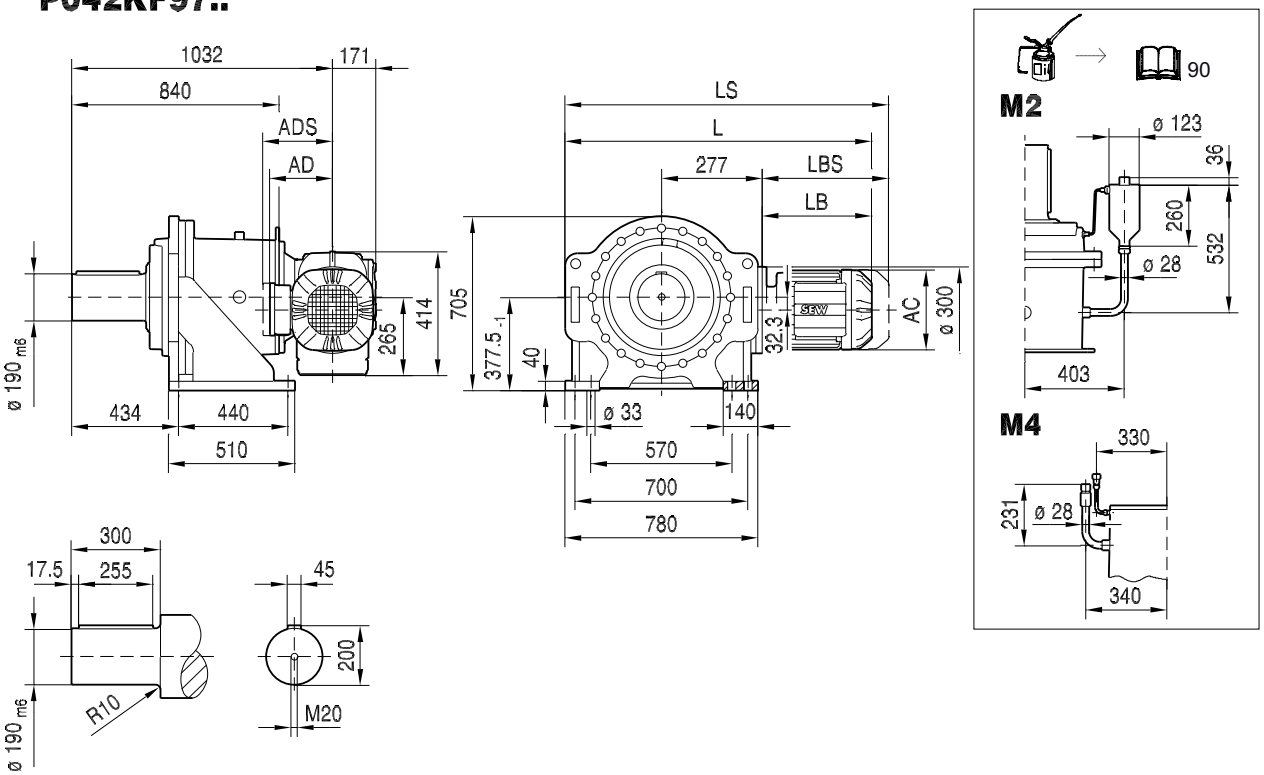


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1112	1178	1178	1201	1311	1285	1422	1422	1517	1619
LS	1249	1367	1367	1390	1516	1490	1662	1662	1757	1870
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

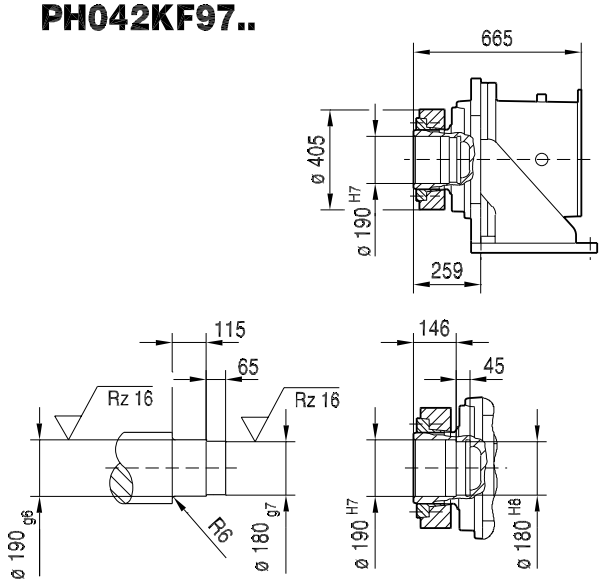
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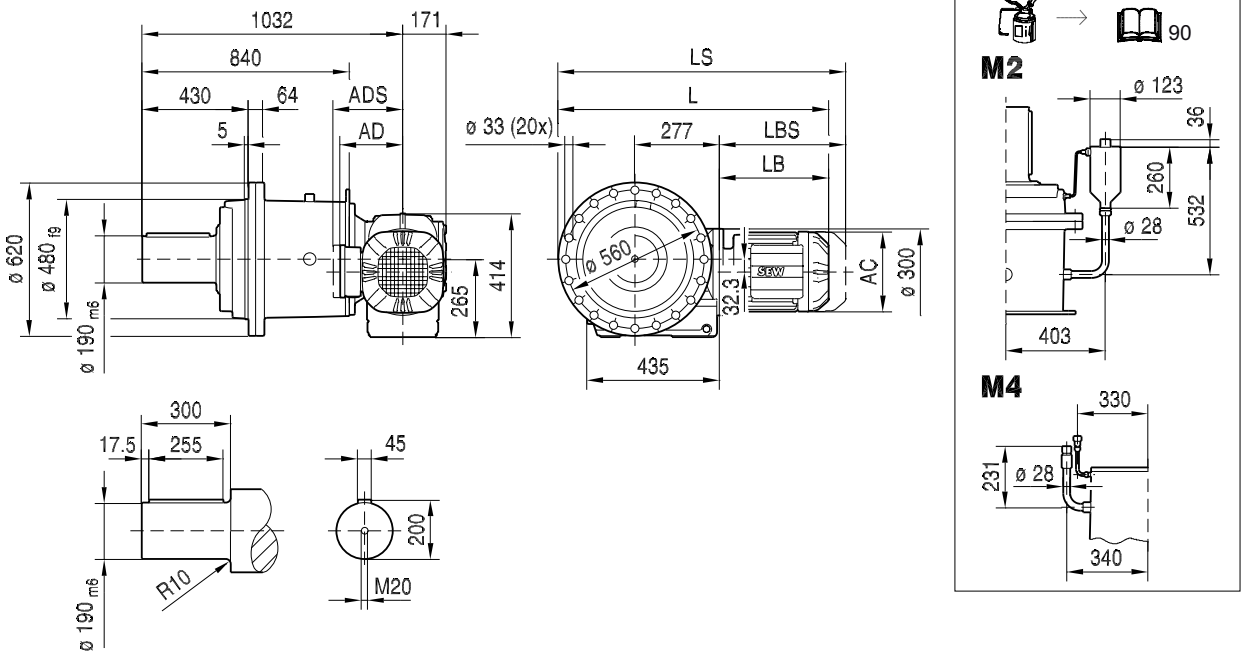


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1005	1036	1086	1104	1130	1196	1196	1219	1329	1303
LS	1099	1148	1198	1242	1267	1385	1385	1408	1534	1508
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

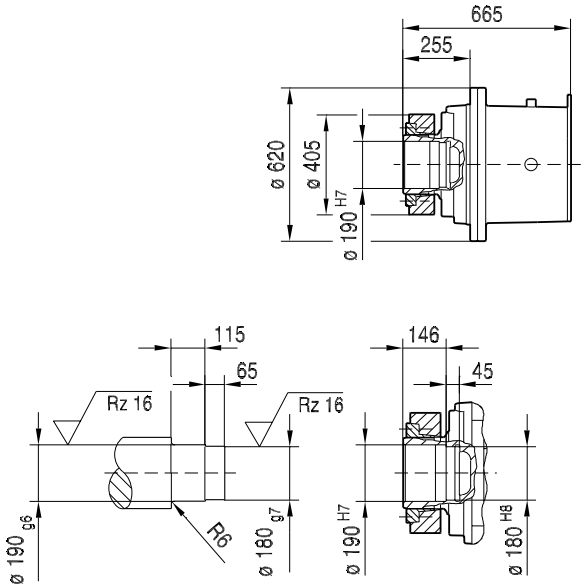
23488859/EN – 02/2017

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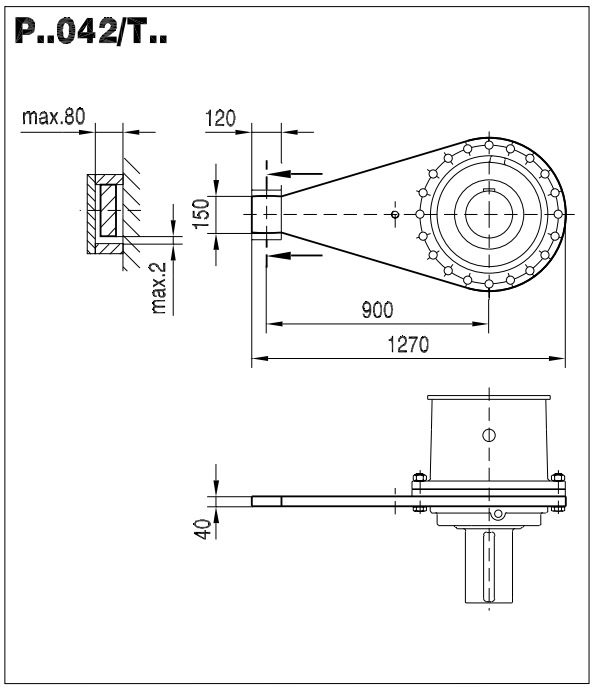
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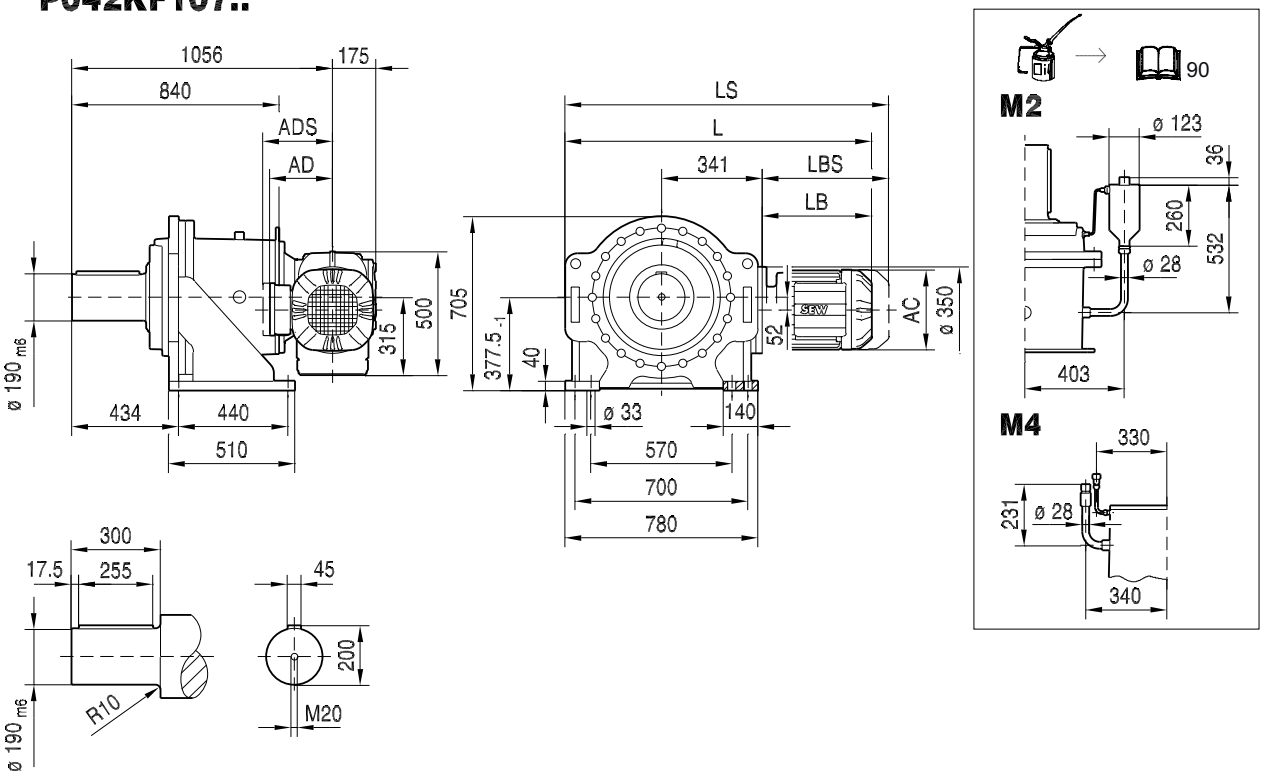


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	925	956	1006	1024	1050	1116	1116	1139	1249	1223
LS	1019	1068	1118	1162	1187	1305	1305	1328	1454	1428
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

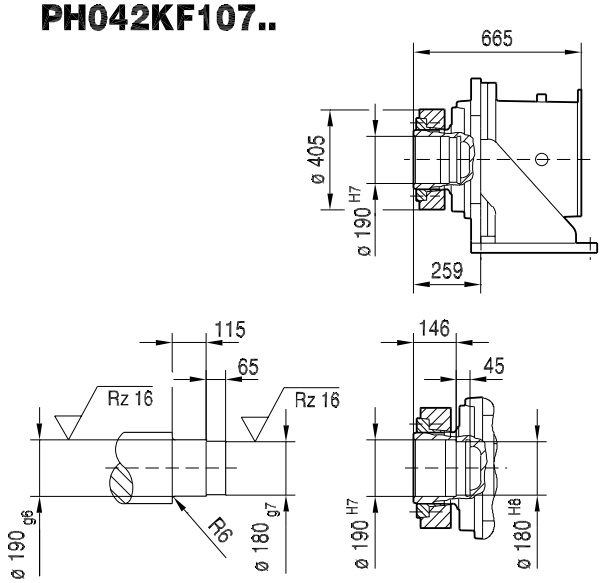
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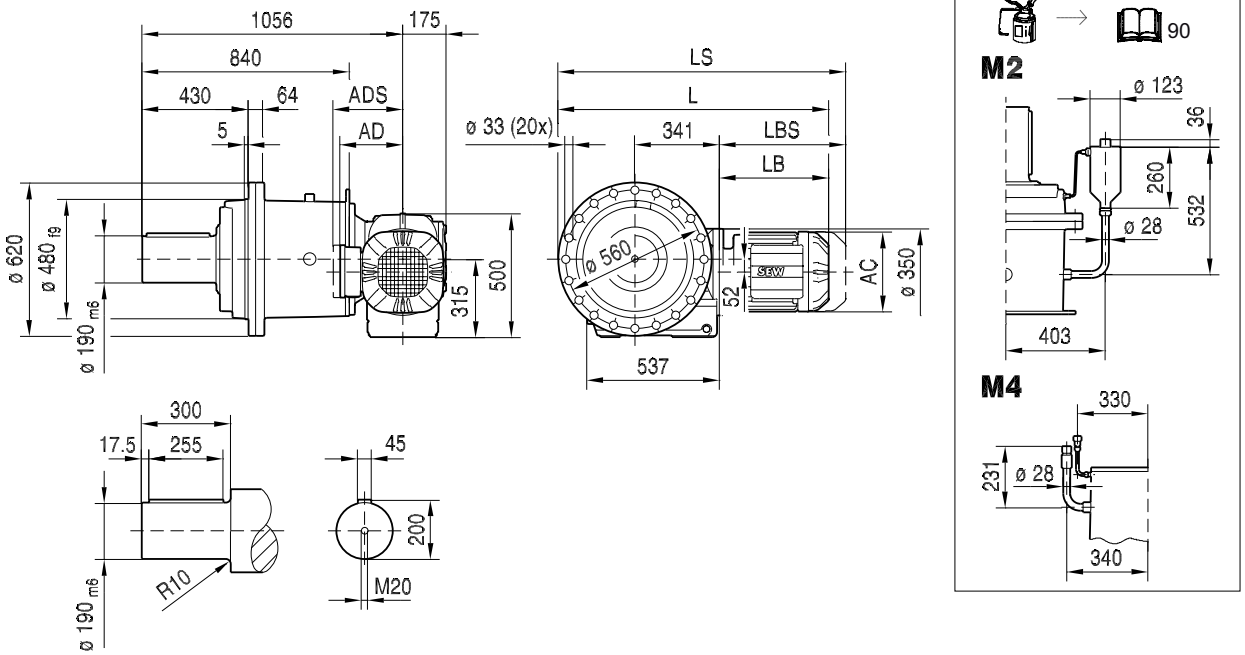


(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1094	1144	1162	1188	1254	1254	1277	1387	1361	1498
LS	1206	1256	1300	1325	1443	1443	1466	1592	1566	1738
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

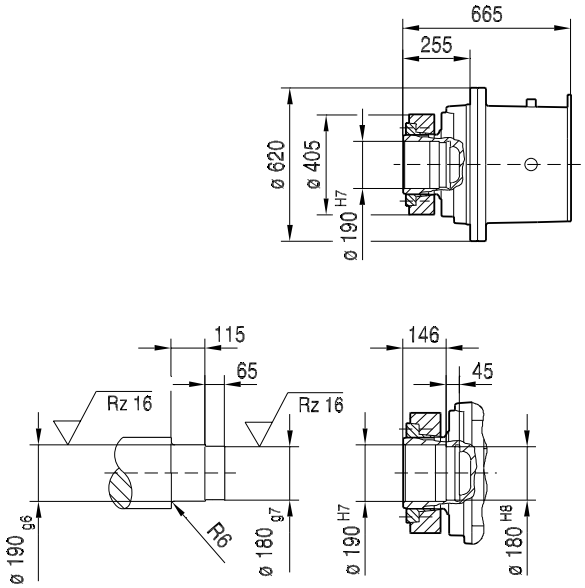
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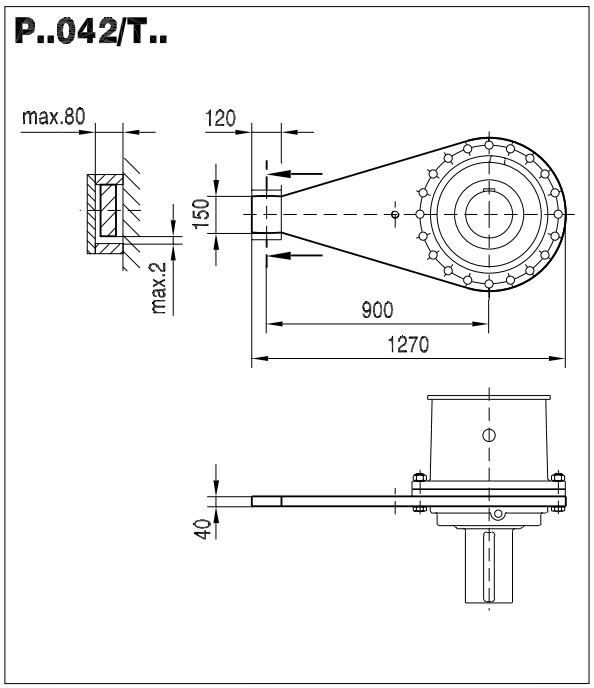
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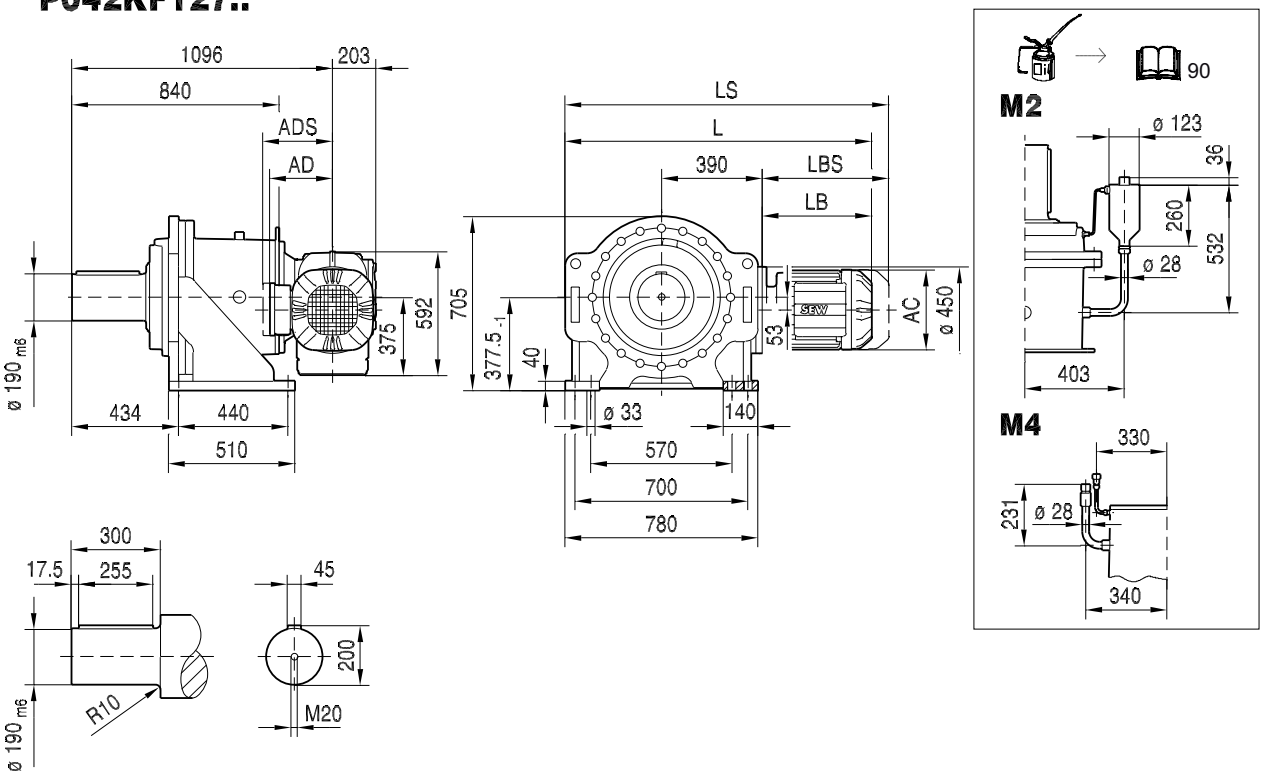
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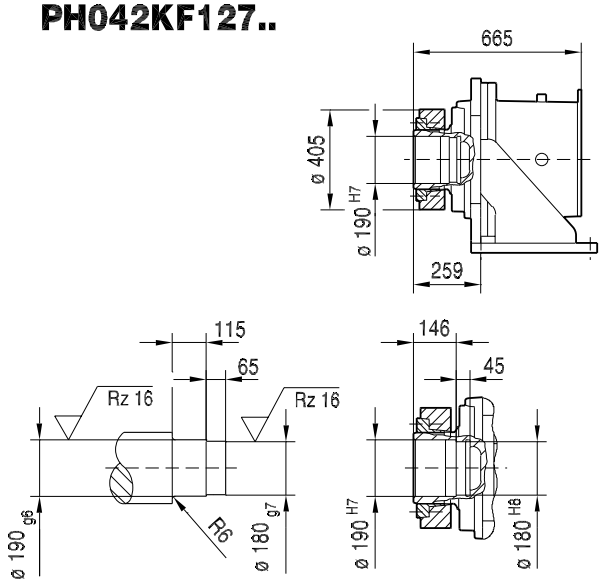
(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1014	1064	1082	1108	1174	1174	1197	1307	1281	1418
LS	1126	1176	1220	1245	1363	1363	1386	1512	1486	1658
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

P042KF127..

45 103 00 15



PH042KF127..

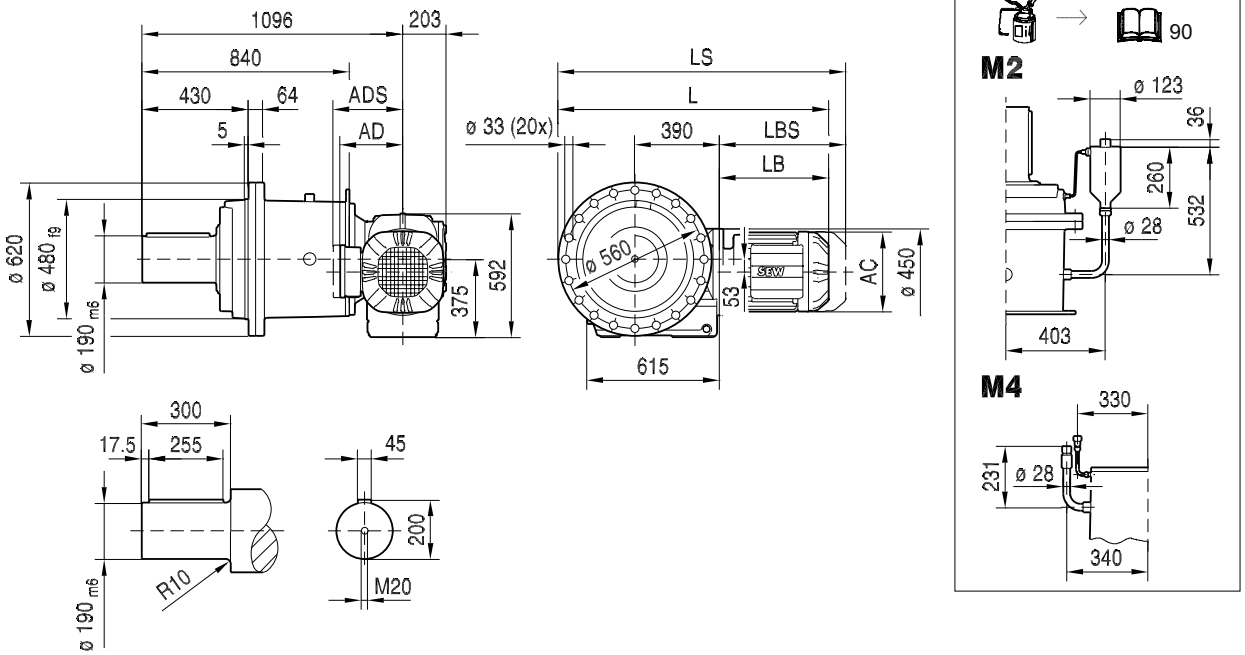


(→ 🗎 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1222	1288	1288	1311	1421	1395	1532	1532	1627	1729
LS	1359	1477	1477	1500	1626	1600	1772	1772	1867	1980
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

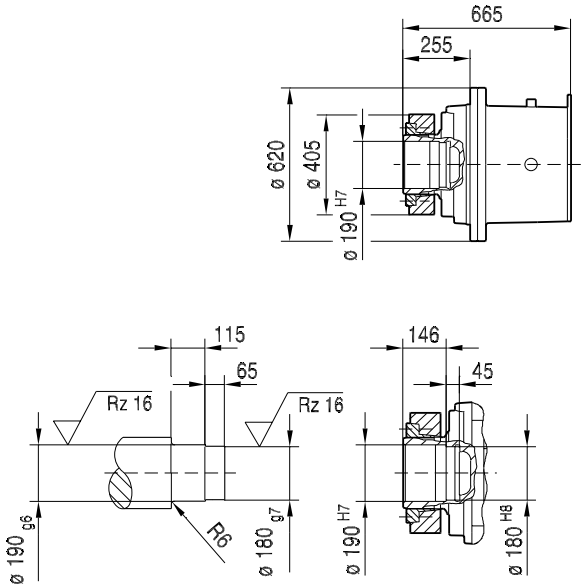
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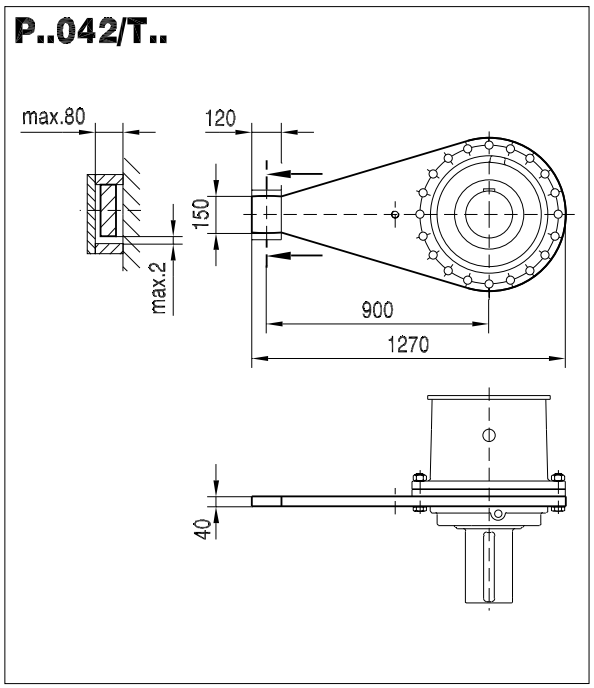
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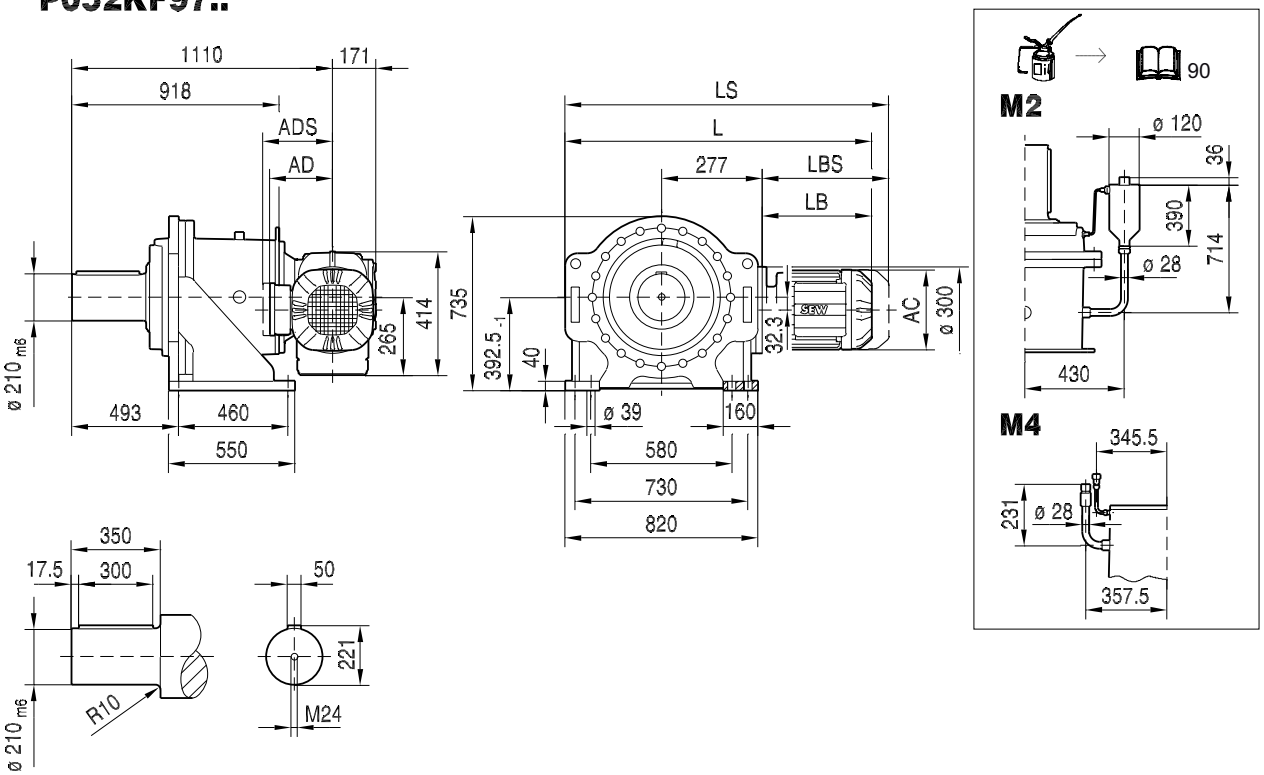
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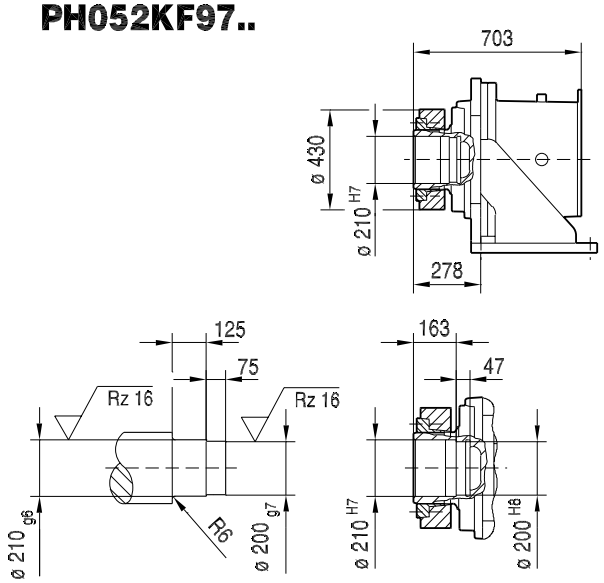
(→ 🗎 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1142	1208	1208	1231	1341	1315	1452	1452	1547	1649
LS	1279	1397	1397	1420	1546	1520	1692	1692	1787	1900
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

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45 105 00 15



PH052KF97..

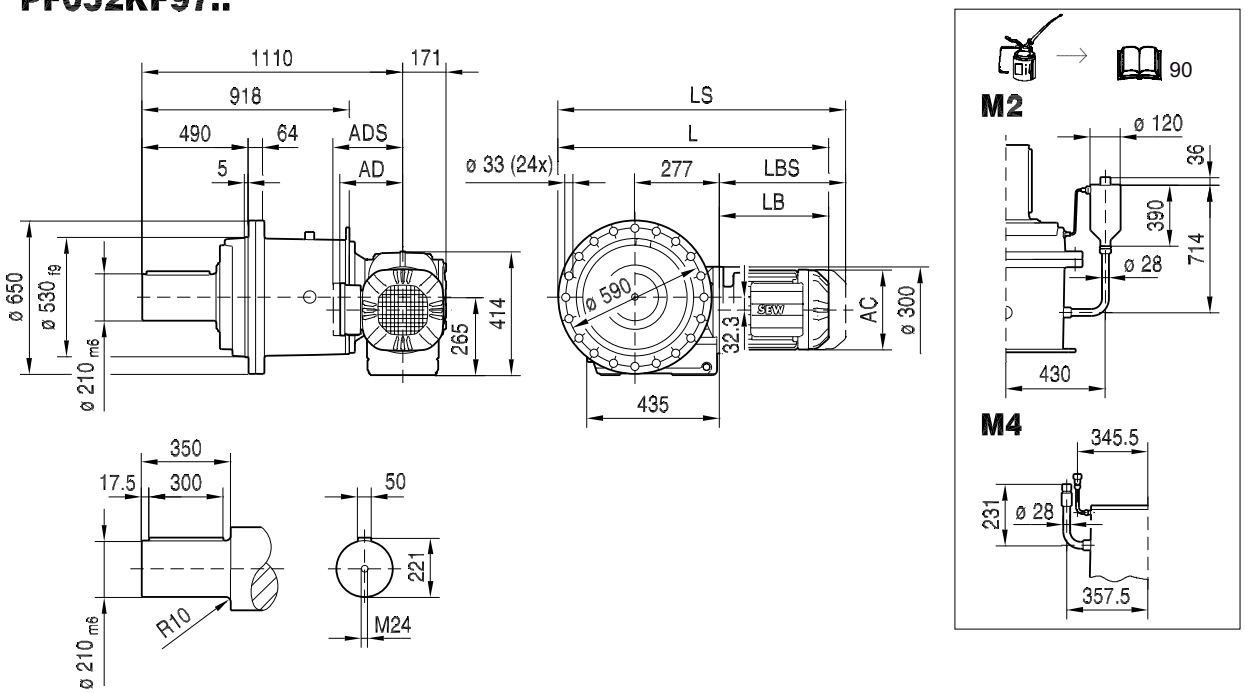


(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	1025	1056	1106	1124	1150	1216	1216	1239	1349	1323
LS	1119	1168	1218	1262	1287	1405	1405	1428	1554	1528
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

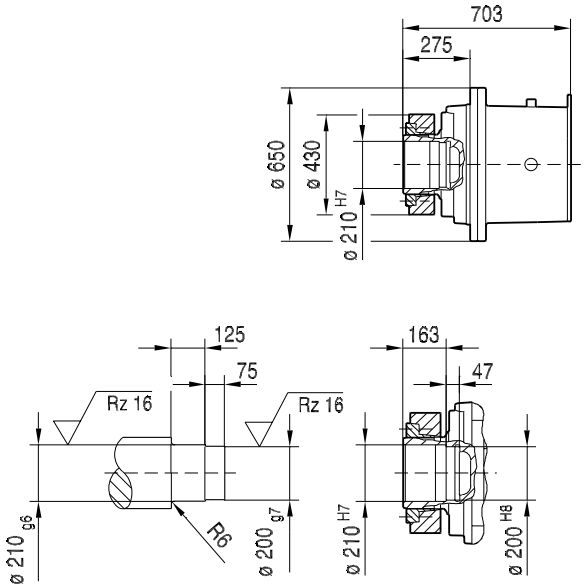
23488859/EN – 02/2017

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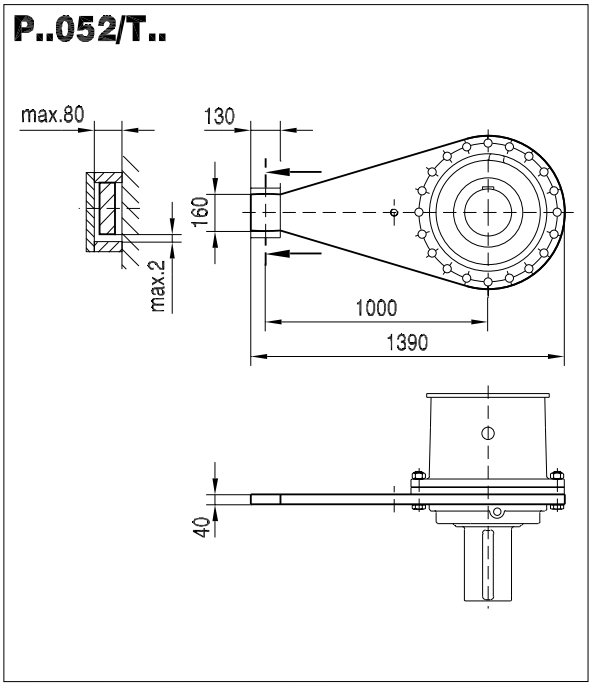
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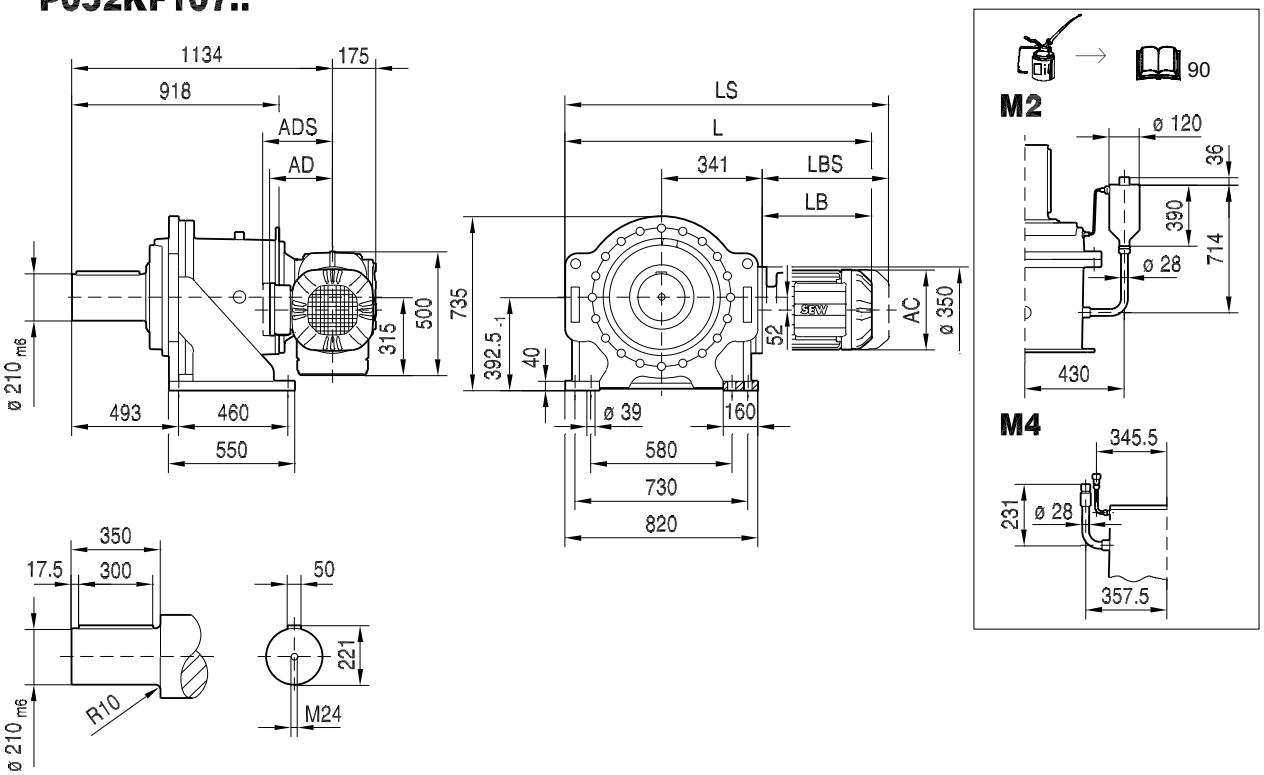
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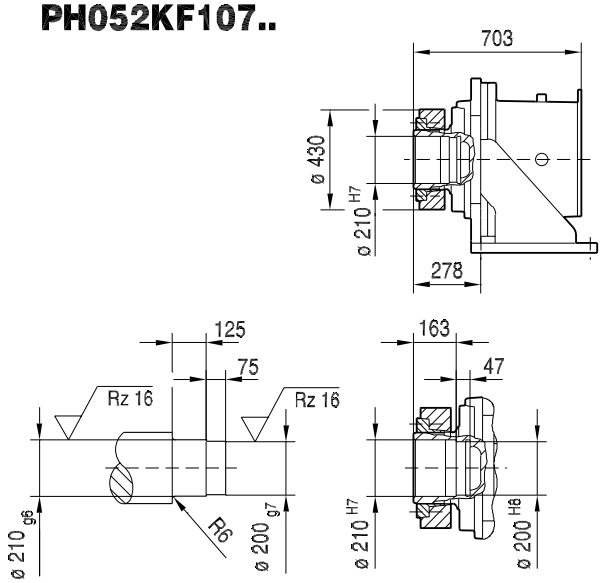
(→ 100)	DRN100L	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..
AC	197	221	221	261	261	314	314	357	394	434
AD	157	170	170	228	228	253	253	268	283	305
ADS	158	172	172	228	228	253	253	268	283	305
L	940	971	1021	1039	1065	1131	1131	1154	1264	1238
LS	1034	1083	1133	1177	1202	1320	1320	1343	1469	1443
LB	338	369	419	437	463	529	529	552	662	636
LBS	432	481	531	575	600	718	718	741	867	841

P052KF107..

45 107 00 15



PH052KF107..

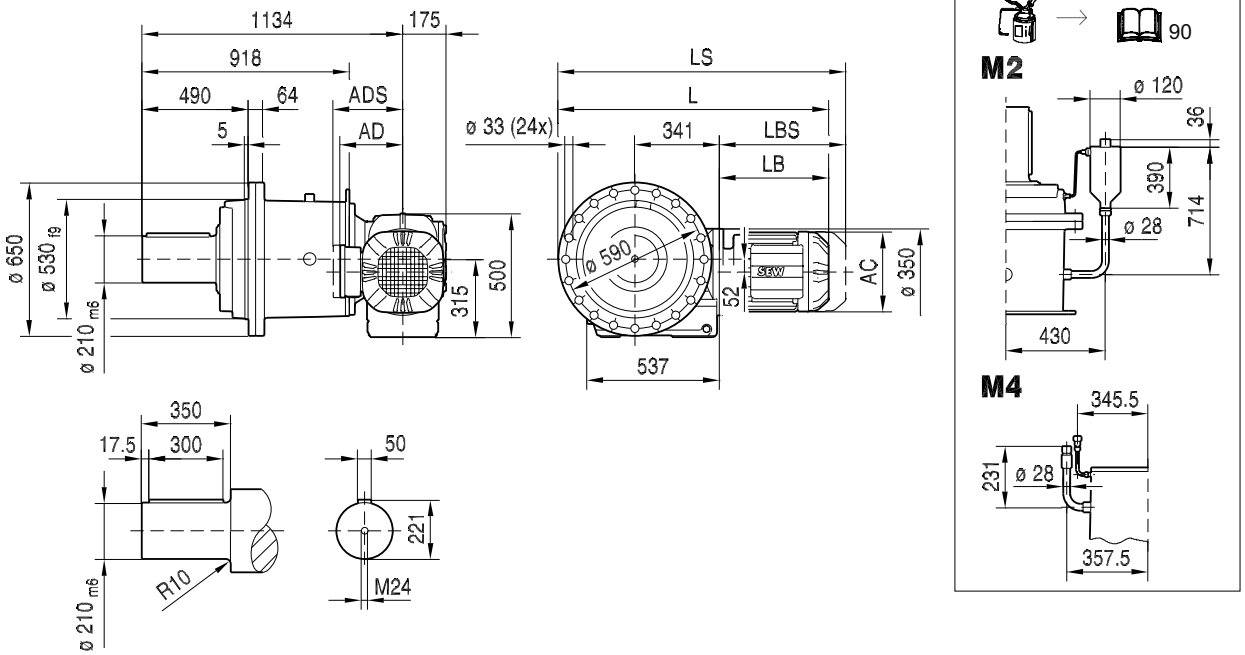


(→ 🗎 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1114	1164	1182	1208	1274	1274	1297	1407	1381	1518
LS	1226	1276	1320	1345	1463	1463	1486	1612	1586	1758
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

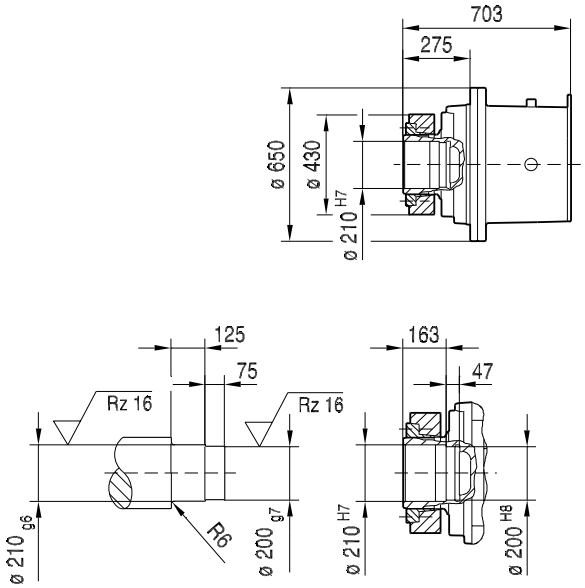
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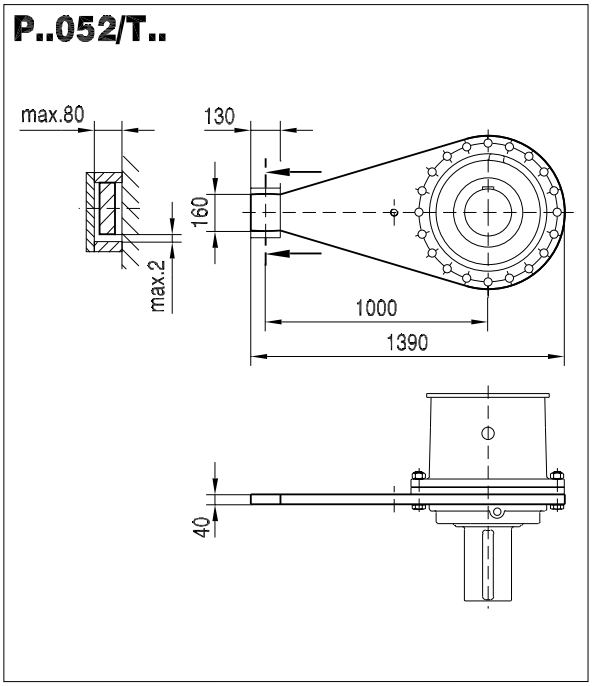
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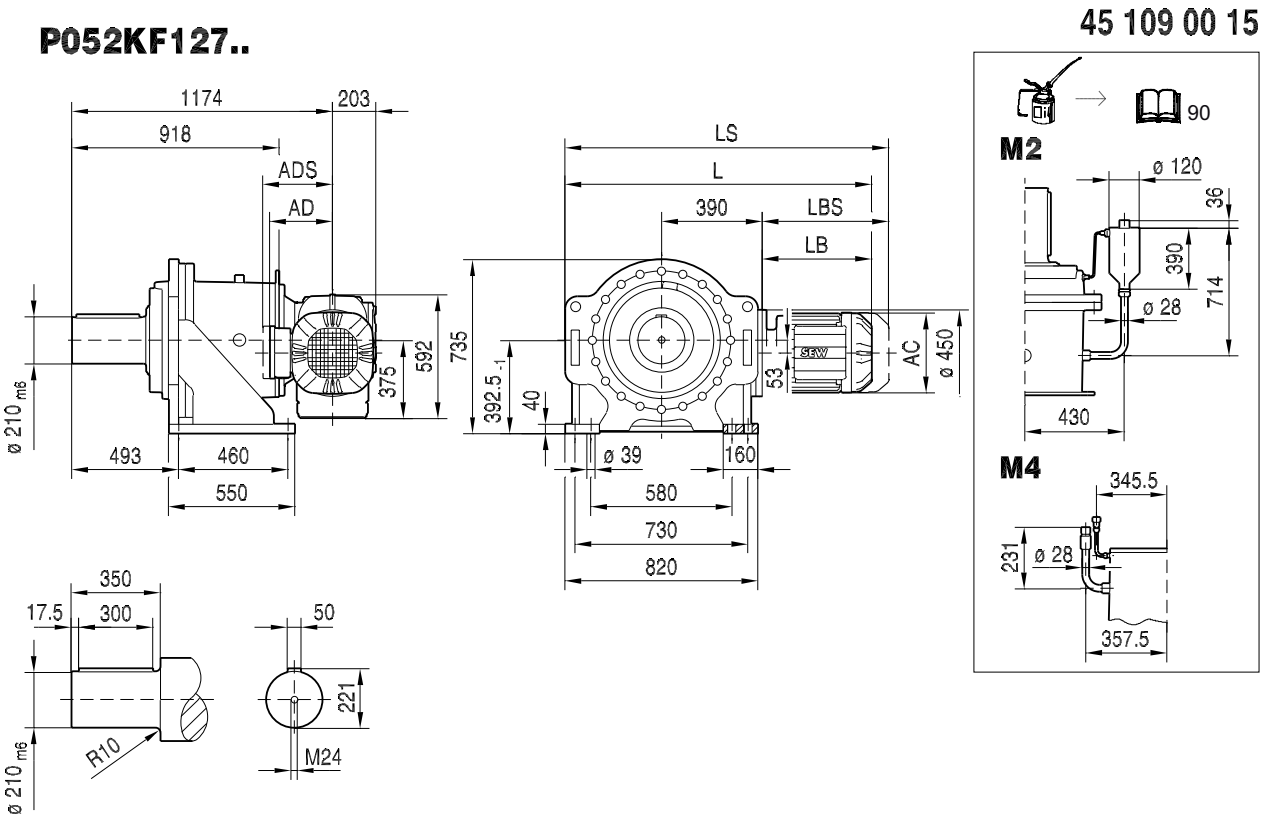


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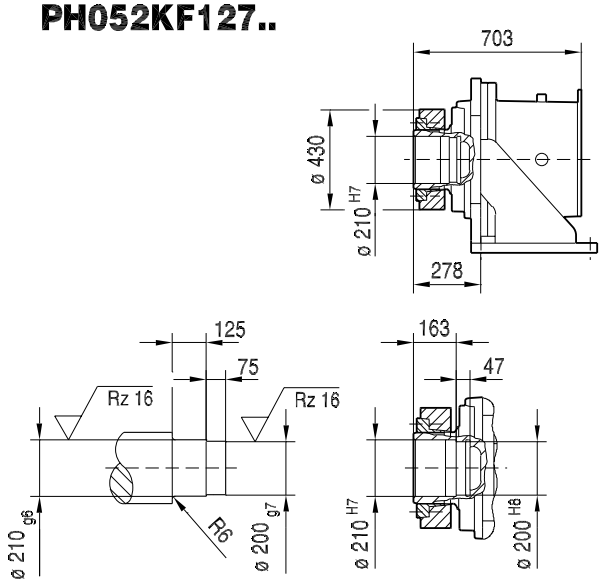


(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1029	1079	1097	1123	1189	1189	1212	1322	1296	1433
LS	1141	1191	1235	1260	1378	1378	1401	1527	1501	1673
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

P052KF127..



PH052KF127..

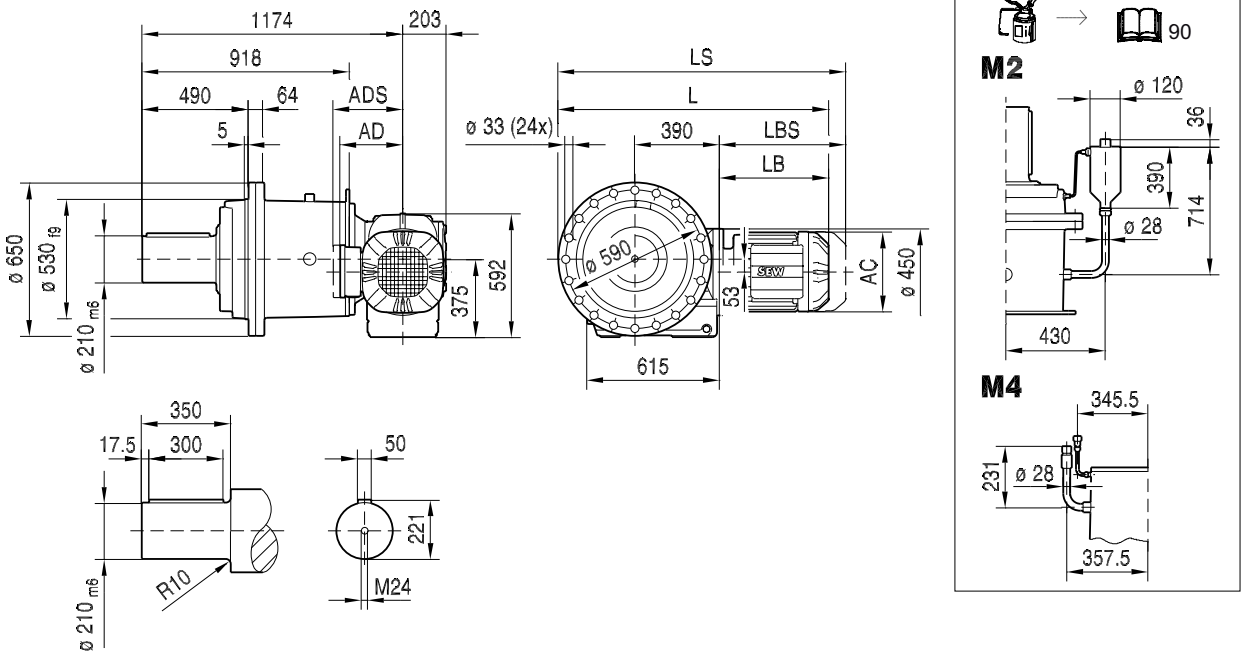


(→ 🗎 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1242	1308	1308	1331	1441	1415	1552	1552	1647	1749
LS	1379	1497	1497	1520	1646	1620	1792	1792	1887	2000
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

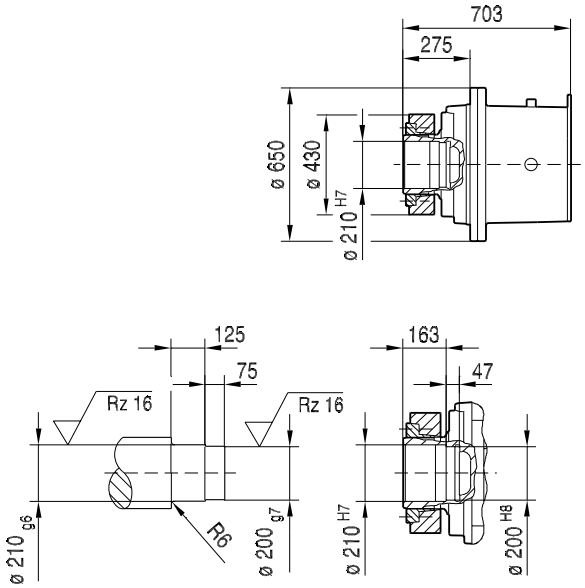
23488859/EN – 02/2017

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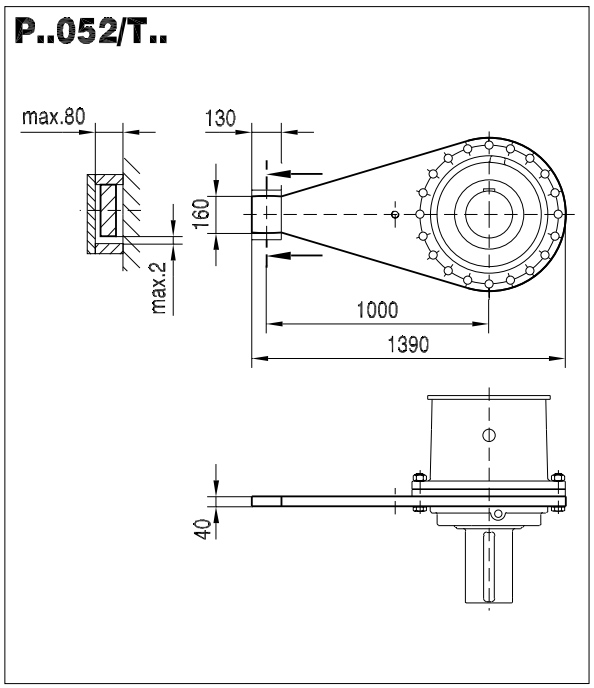
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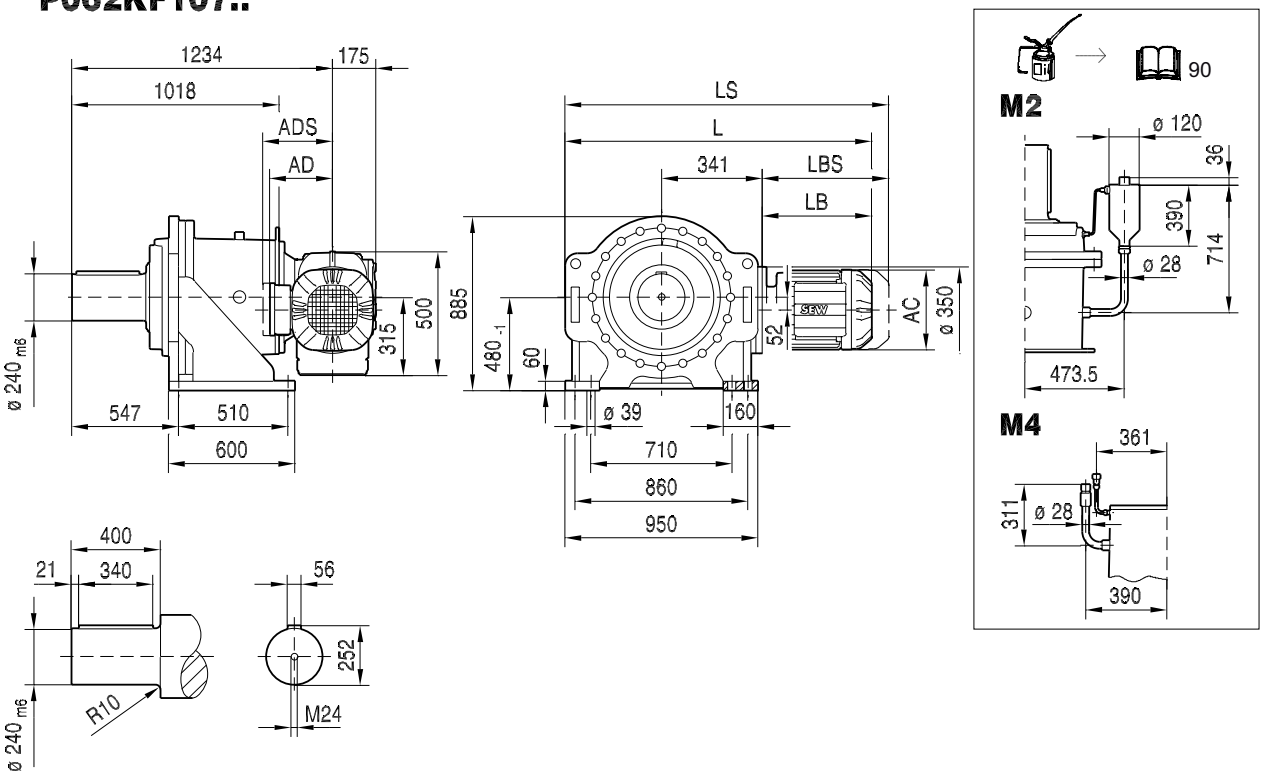


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1157	1223	1223	1246	1356	1330	1467	1467	1562	1664
LS	1294	1412	1412	1435	1561	1535	1707	1707	1802	1915
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

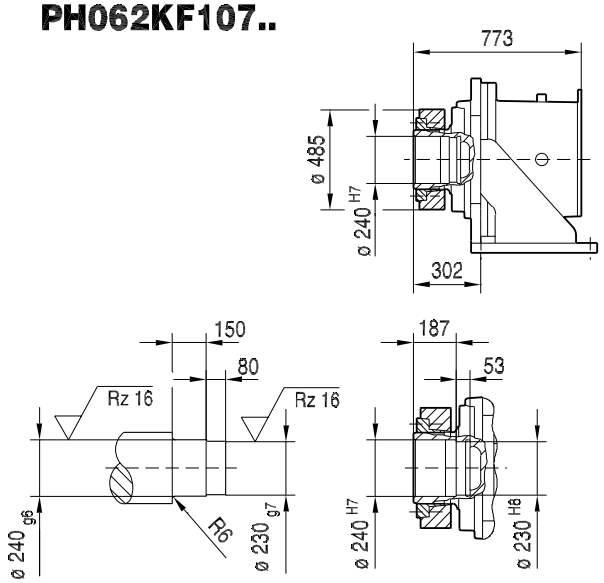
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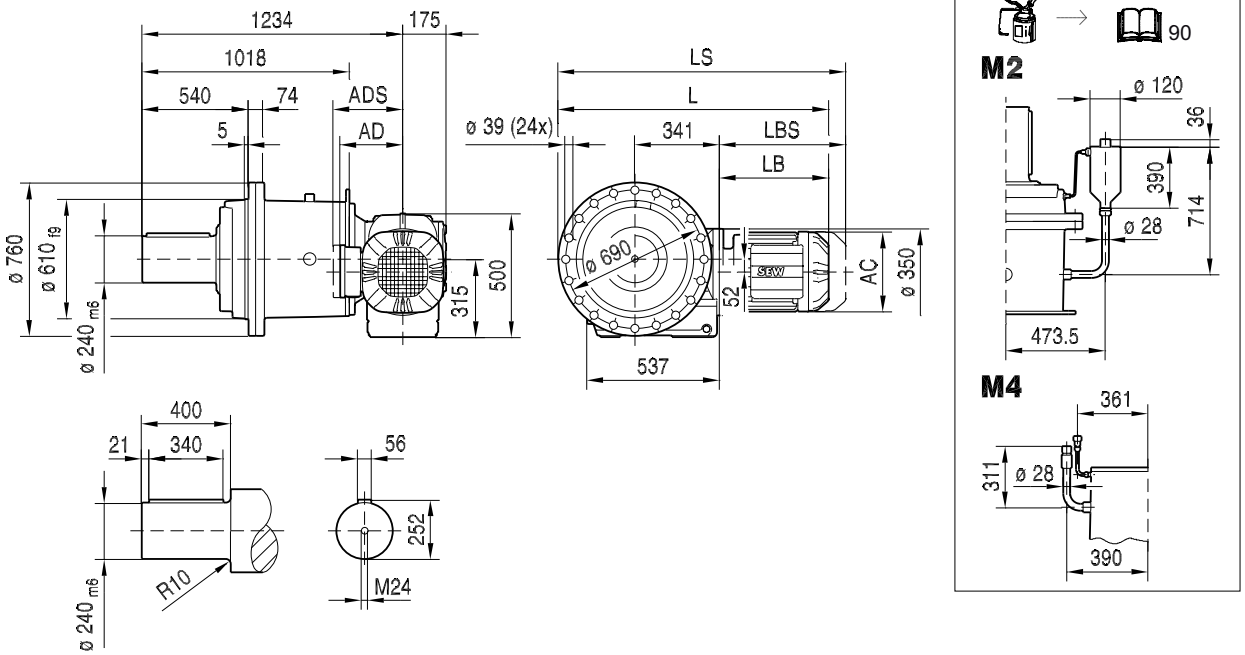


(→ 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1179	1229	1247	1273	1339	1339	1362	1472	1446	1583
LS	1291	1341	1385	1410	1528	1528	1551	1677	1651	1823
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

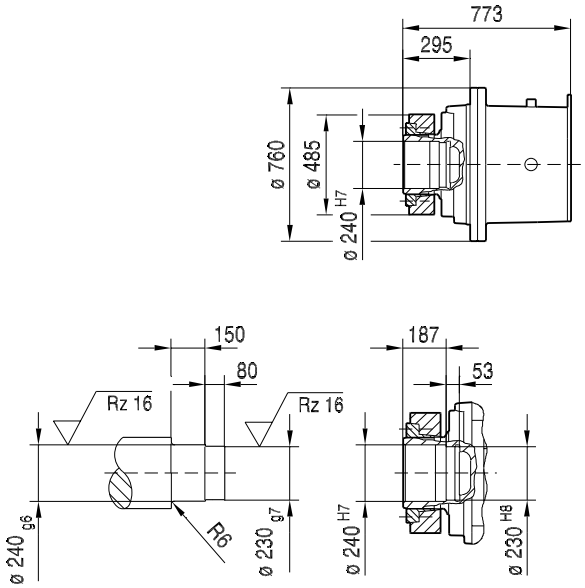
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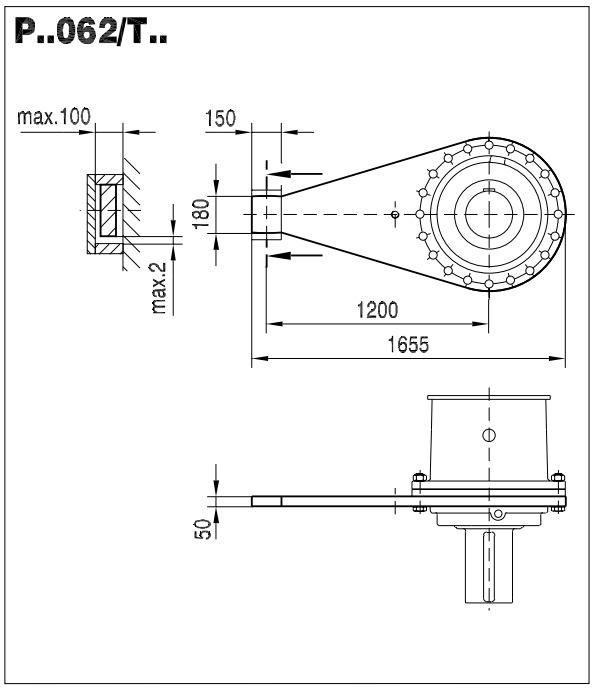
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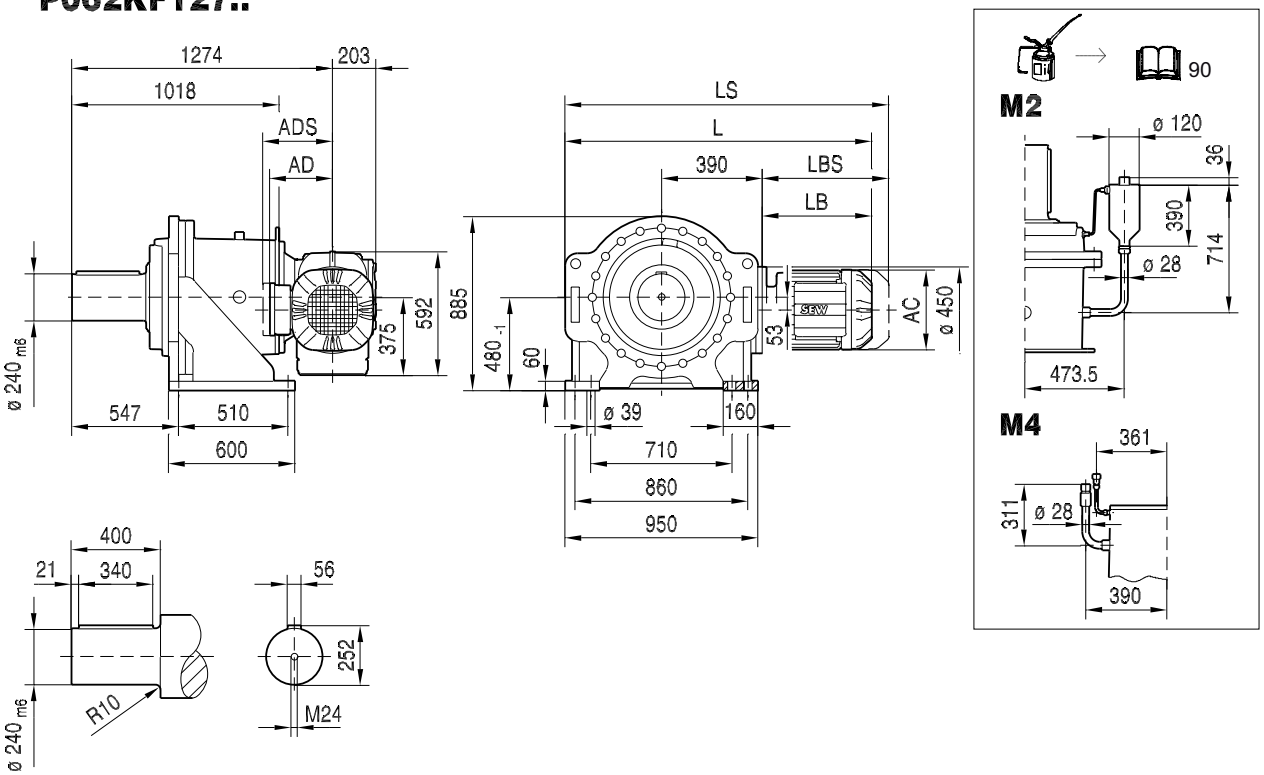


(→ 🗎 100)	DRN112M	DRN132S	DRN132M	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M
AC	221	221	261	261	314	314	357	394	434	495
AD	170	170	228	228	253	253	268	283	305	394
ADS	172	172	228	228	253	253	268	283	305	394
L	1084	1134	1152	1178	1244	1244	1267	1377	1351	1488
LS	1196	1246	1290	1315	1433	1433	1456	1582	1556	1728
LB	363	413	431	457	523	523	546	656	630	767
LBS	475	525	569	594	712	712	735	861	835	1007

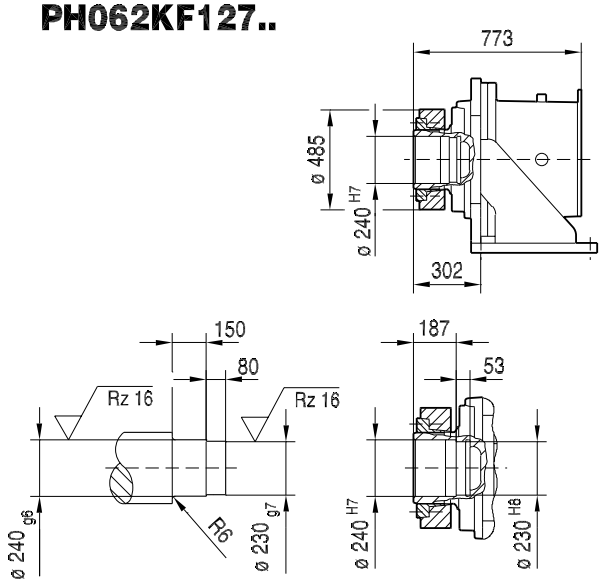
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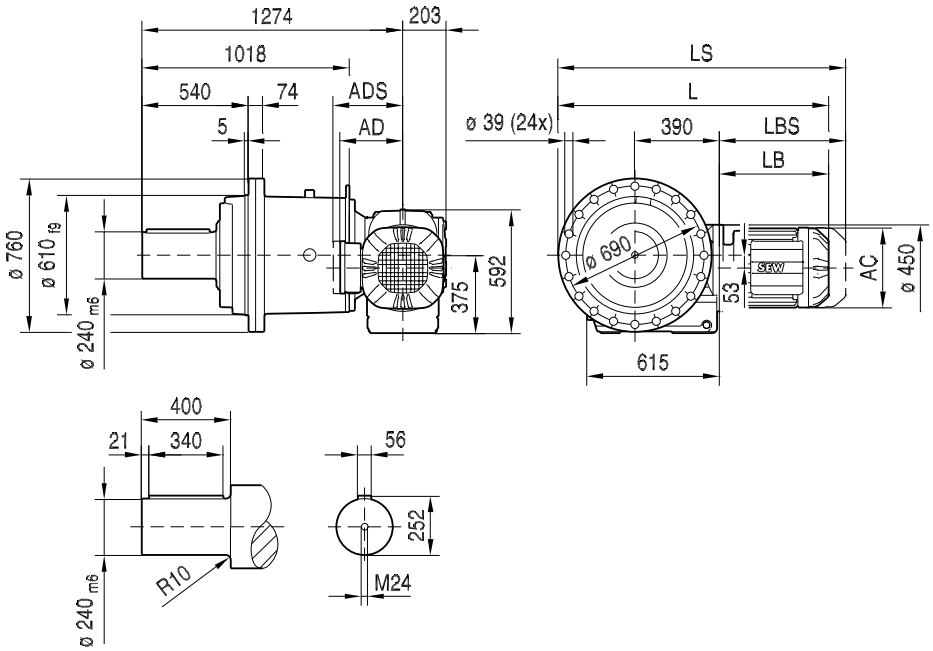


(→ 🗎 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1307	1373	1373	1396	1506	1480	1617	1617	1712	1814
LS	1444	1562	1562	1585	1711	1685	1857	1857	1952	2065
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

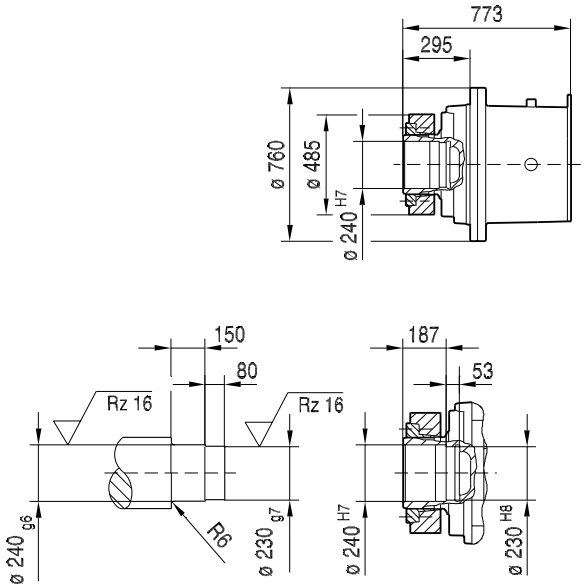
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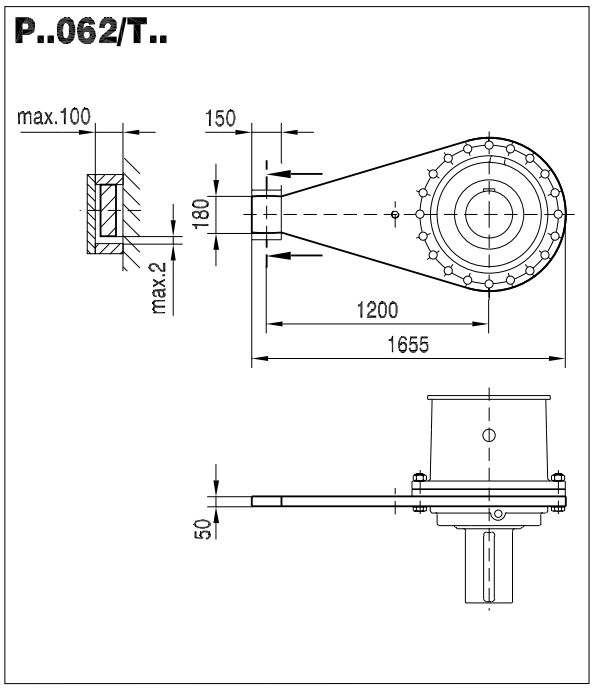
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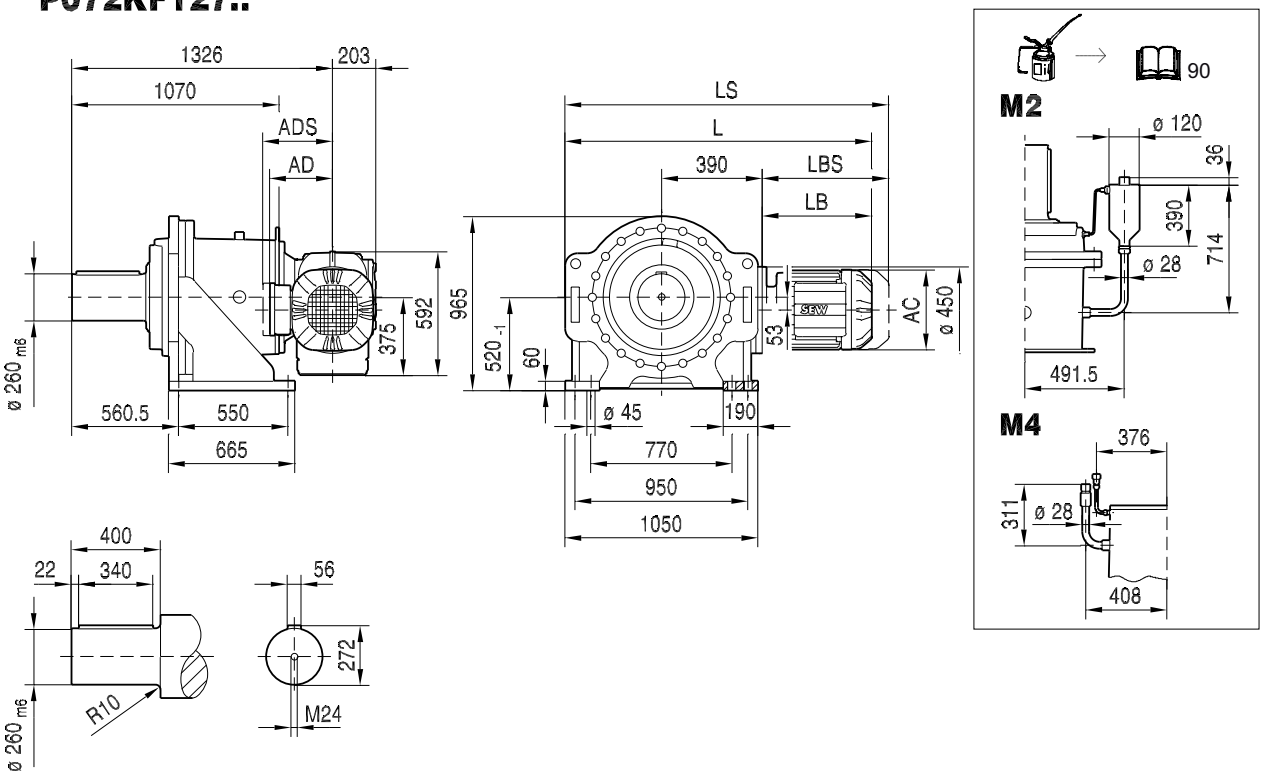


(→ 🗎 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1212	1278	1278	1301	1411	1385	1522	1522	1617	1719
LS	1349	1467	1467	1490	1616	1590	1762	1762	1857	1970
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

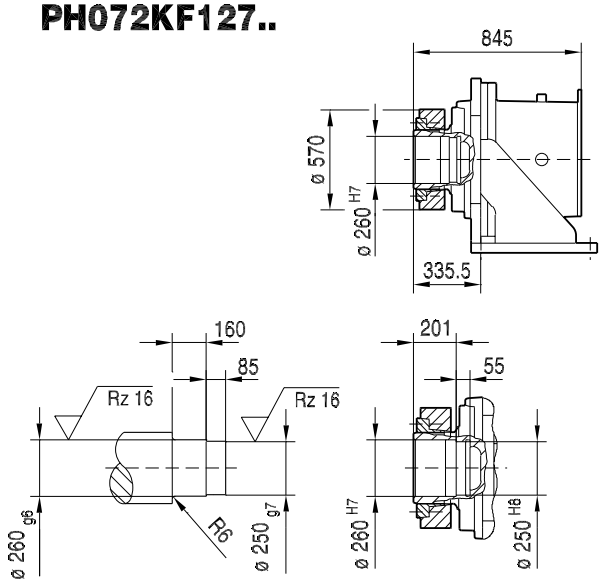
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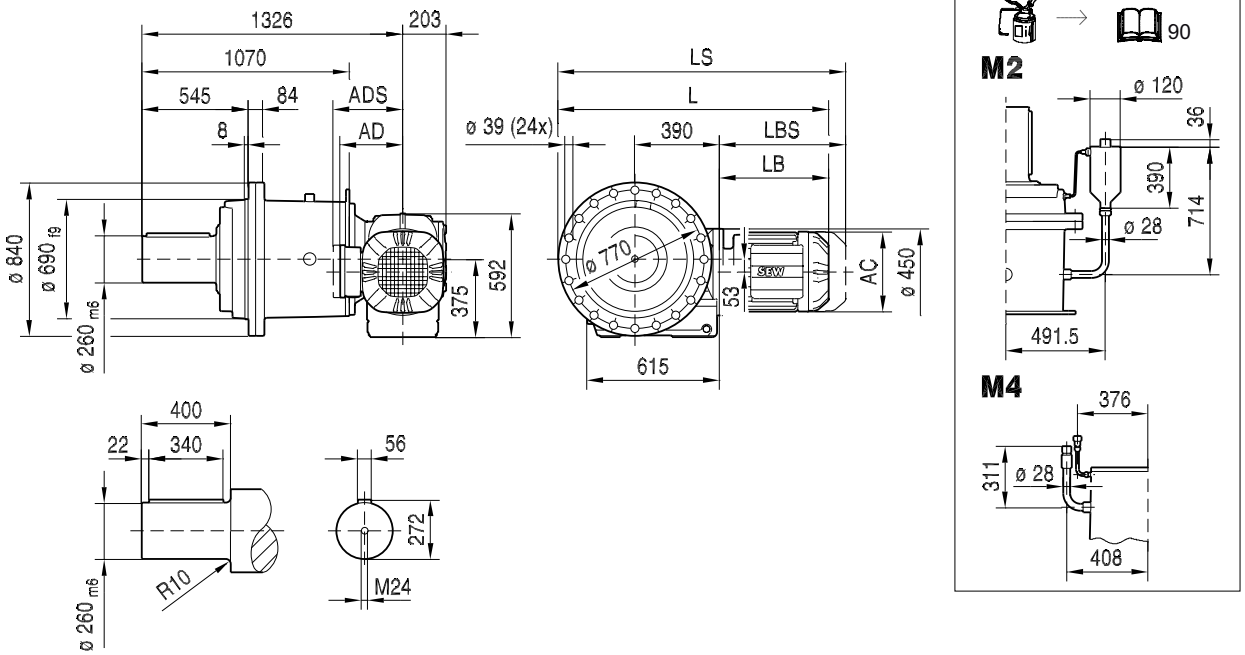


(→ 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1357	1423	1423	1446	1556	1530	1667	1667	1762	1864
LS	1494	1612	1612	1635	1761	1735	1907	1907	2002	2115
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

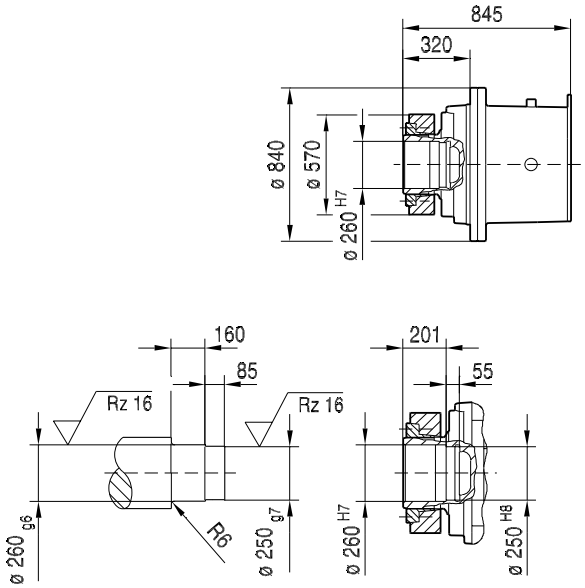
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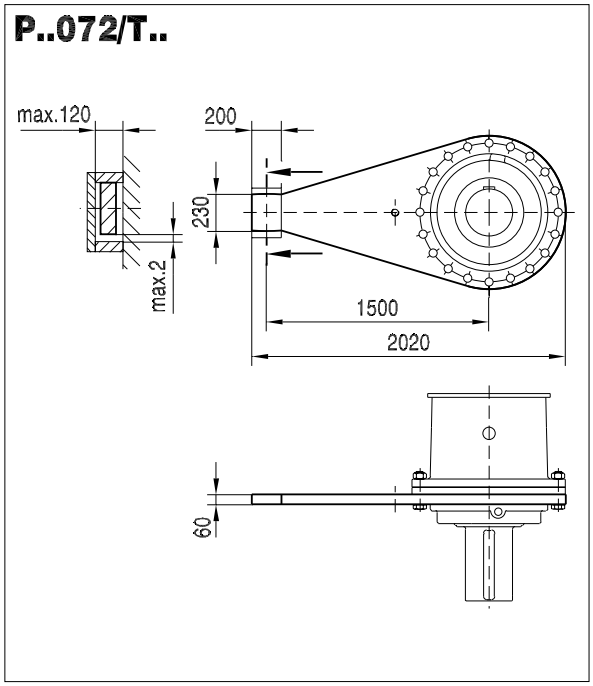
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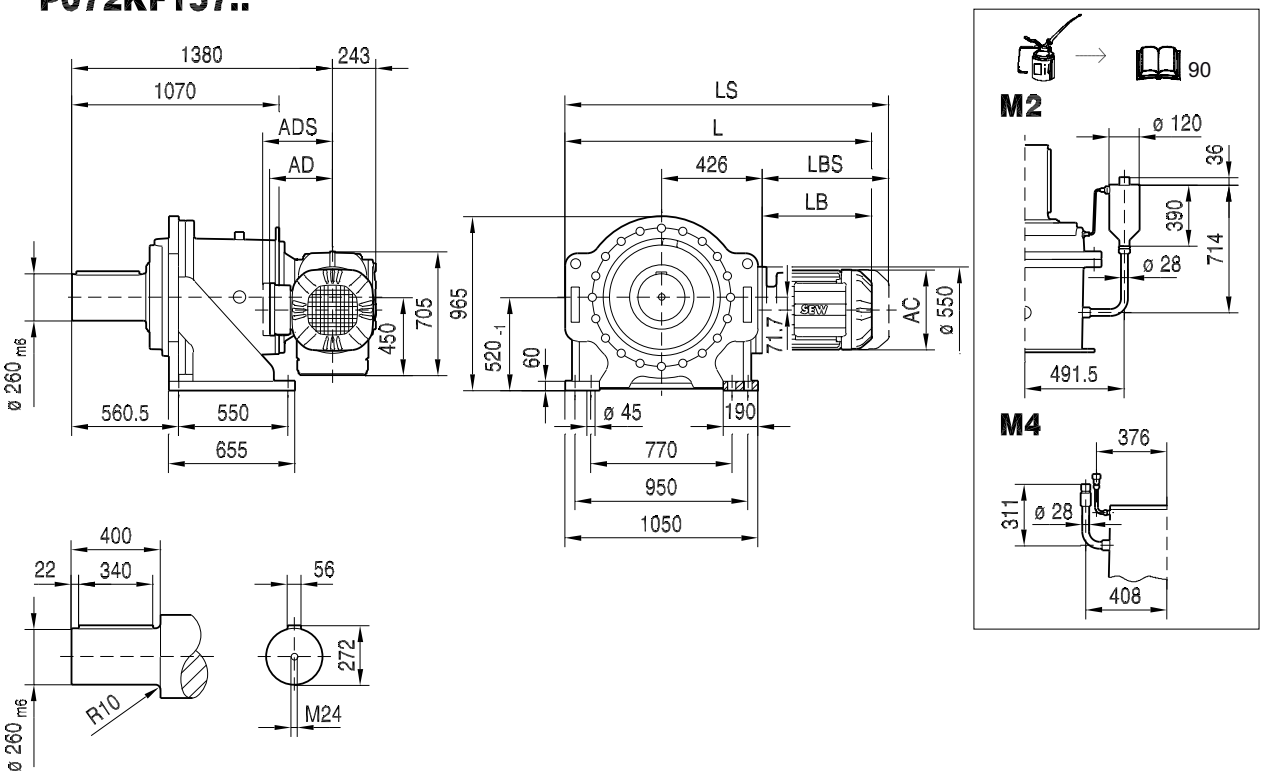


(→ 🗎 100)	DRN132L	DRN160M	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M
AC	261	314	314	357	394	434	495	495	495	624
AD	228	253	253	268	283	305	394	394	394	506
ADS	228	253	253	268	283	305	394	394	394	506
L	1252	1318	1318	1341	1451	1425	1562	1562	1657	1759
LS	1389	1507	1507	1530	1656	1630	1802	1802	1897	2010
LB	442	508	508	531	641	615	752	752	847	949
LBS	579	697	697	720	846	820	992	992	1087	1200

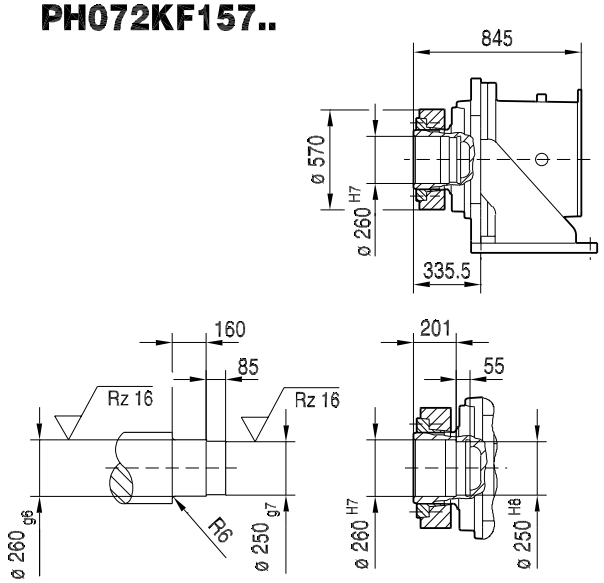
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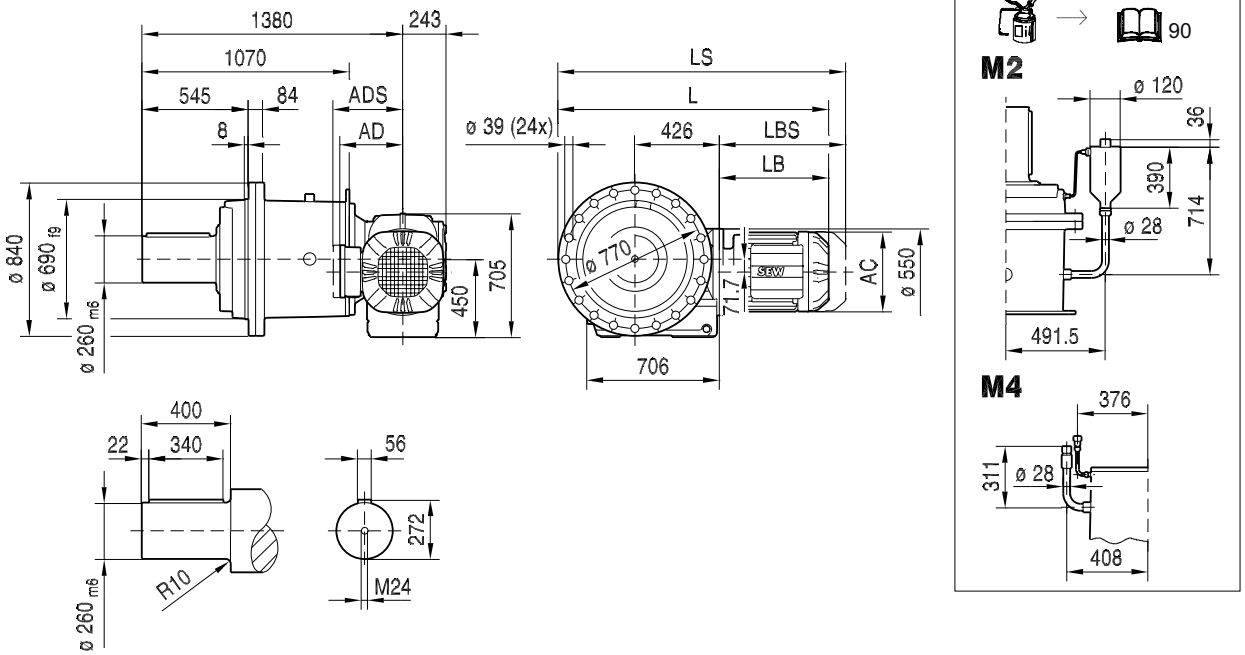


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1451	1474	1584	1558	1695	1695	1790	1892	2022
LS	1640	1663	1789	1763	1935	1935	2030	2143	2273
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

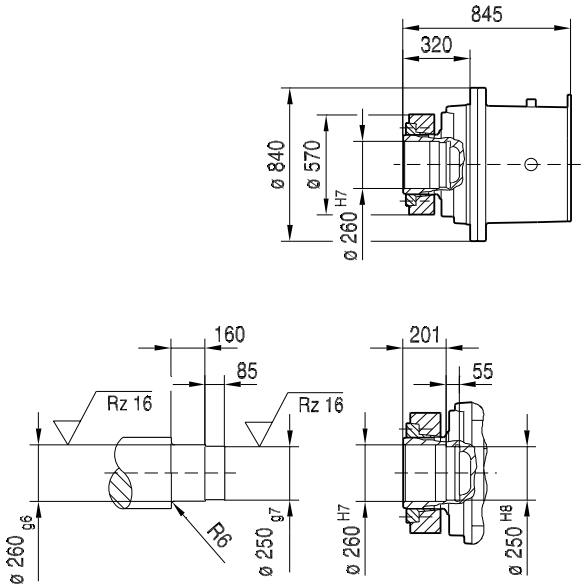
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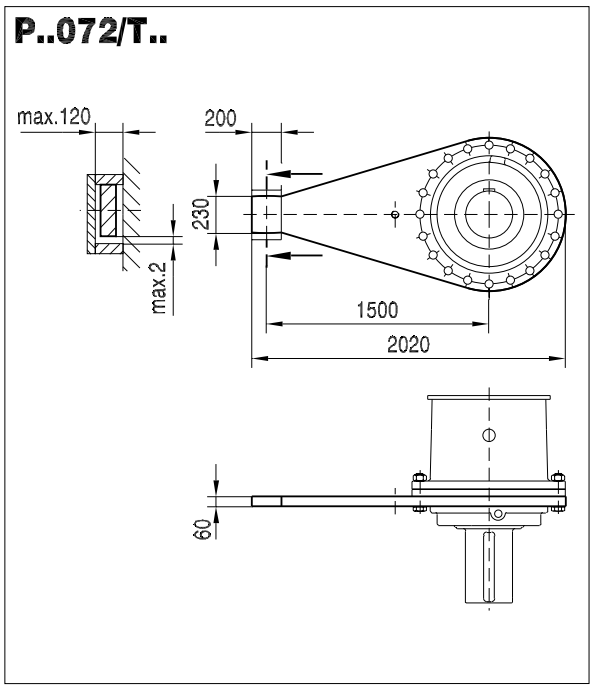
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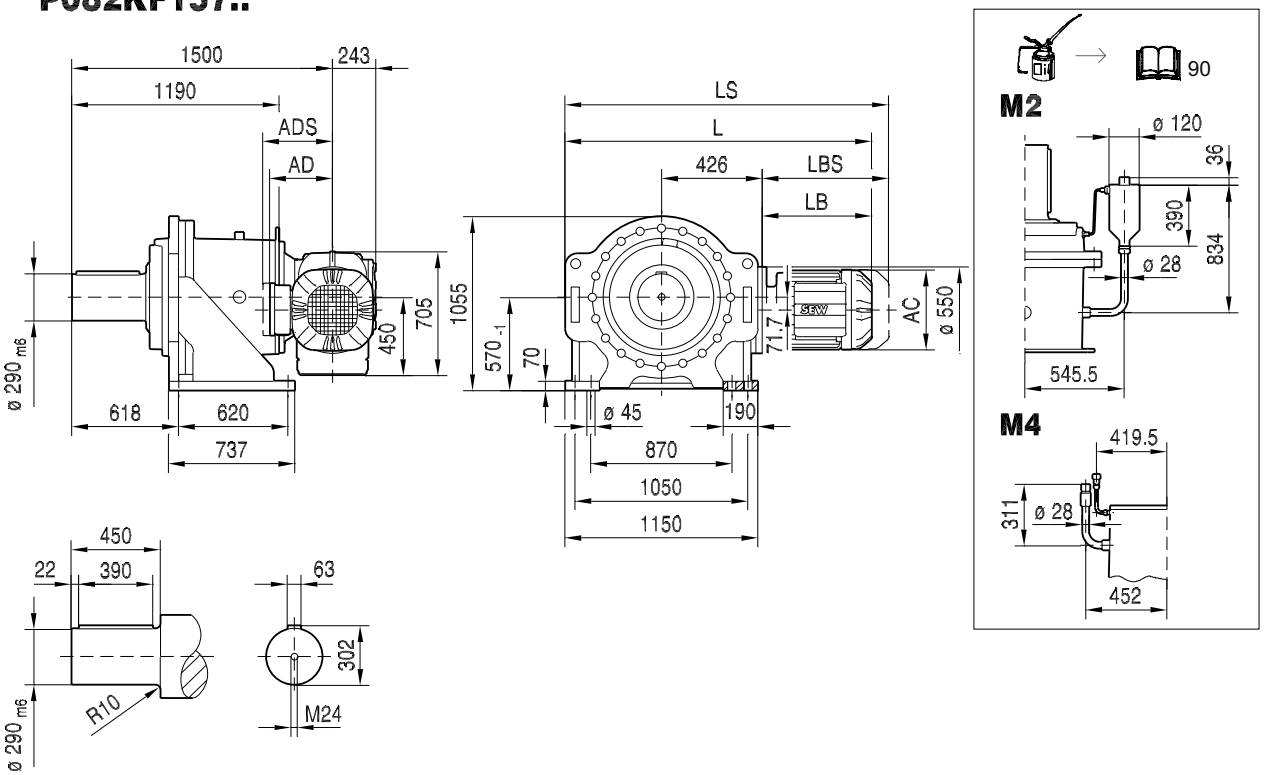


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1346	1369	1479	1453	1590	1590	1685	1787	1917
LS	1535	1558	1684	1658	1830	1830	1925	2038	2168
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

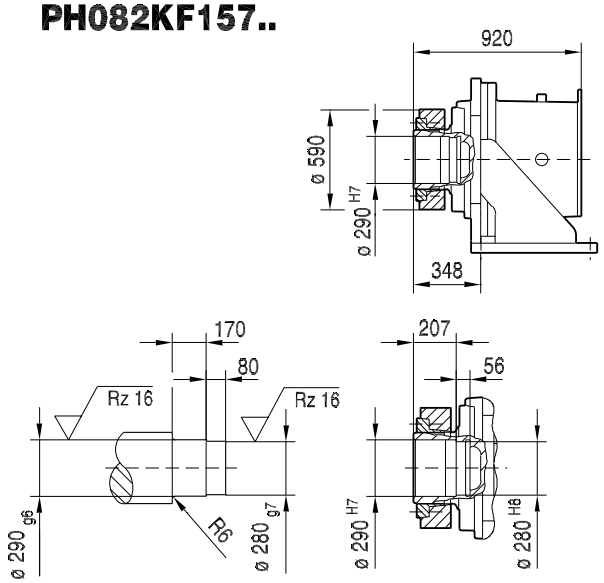
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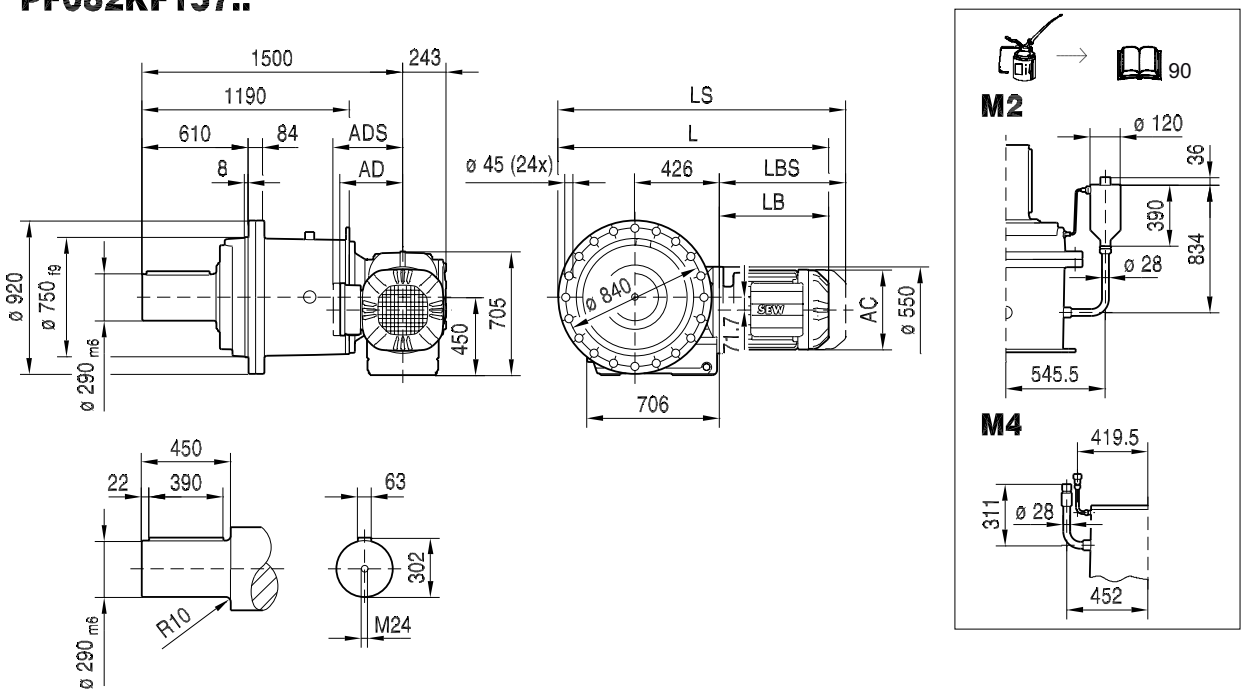


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1501	1524	1634	1608	1745	1745	1840	1942	2072
LS	1690	1713	1839	1813	1985	1985	2080	2193	2323
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

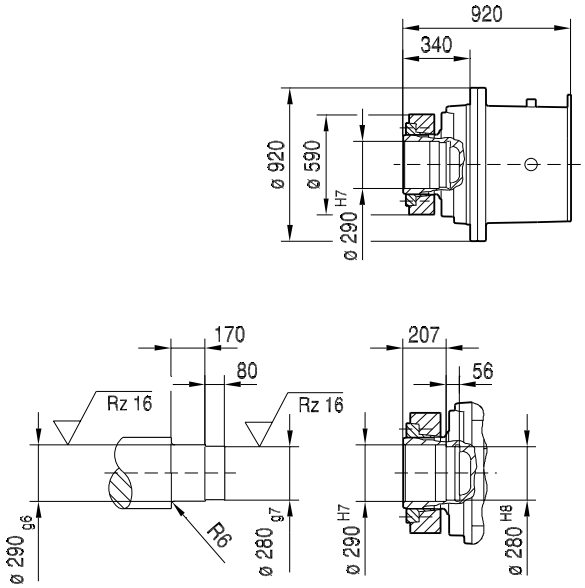
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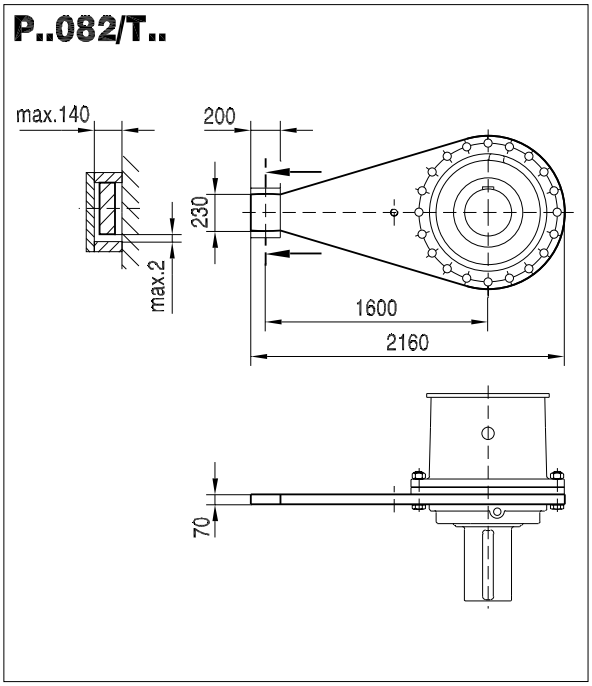
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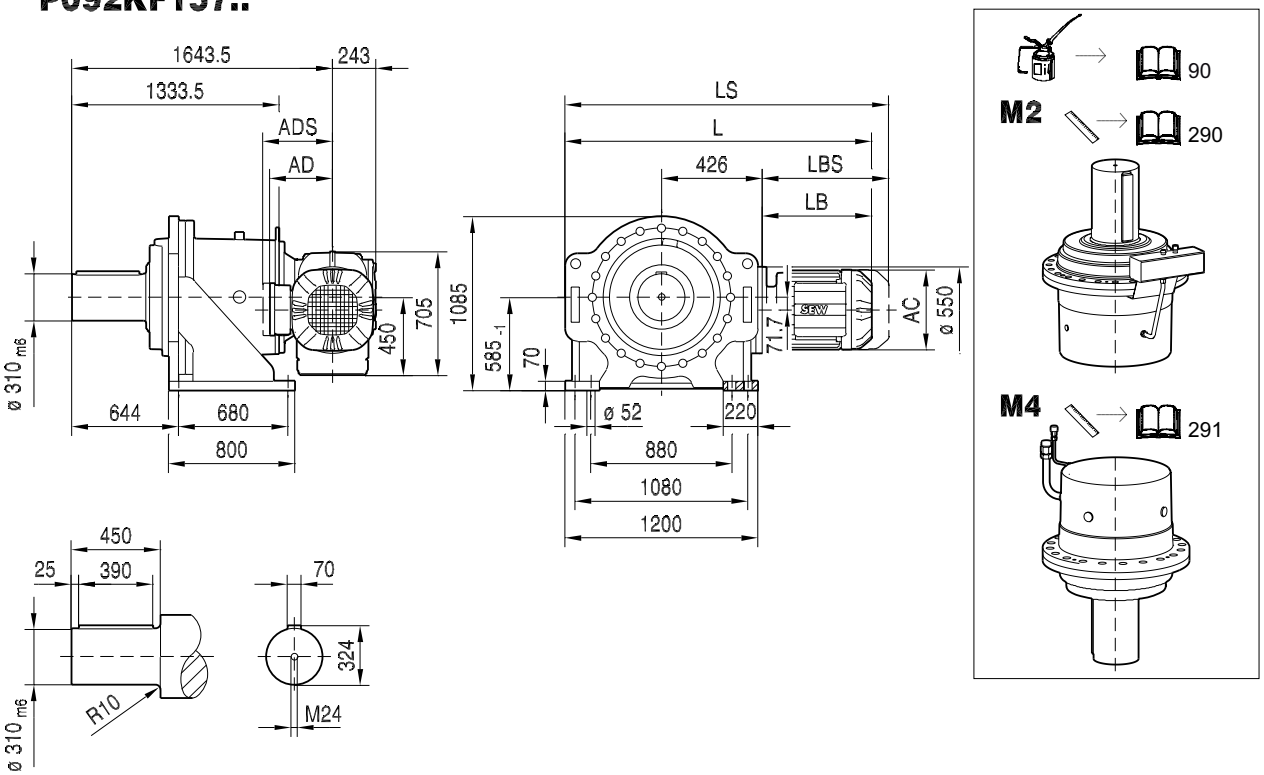


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1386	1409	1519	1493	1630	1630	1725	1827	1957
LS	1575	1598	1724	1698	1870	1870	1965	2078	2208
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

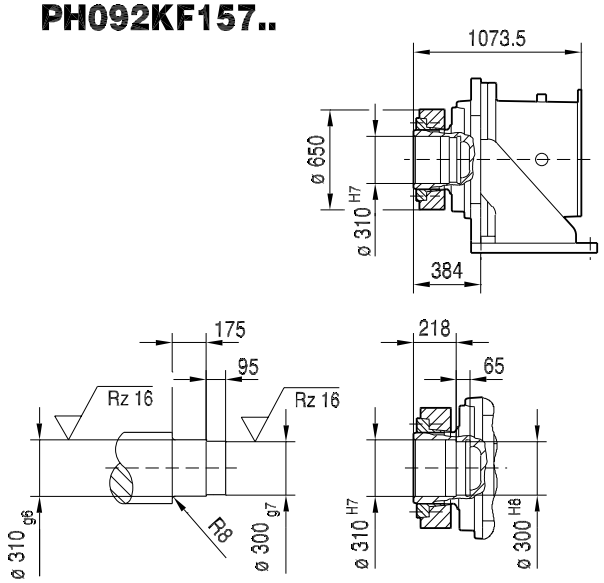
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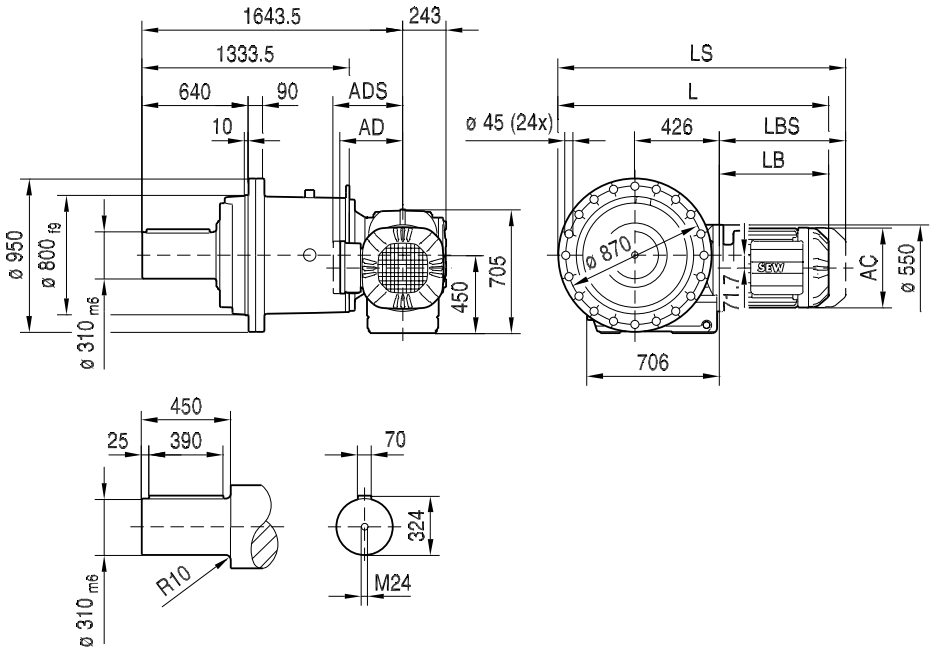


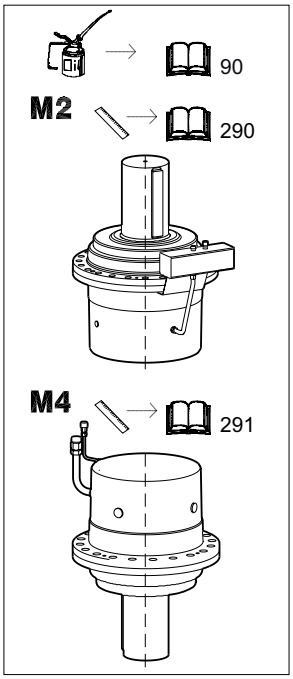
(→ 🗎 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1526	1549	1659	1633	1770	1770	1865	1967	2097
LS	1715	1738	1864	1838	2010	2010	2105	2218	2348
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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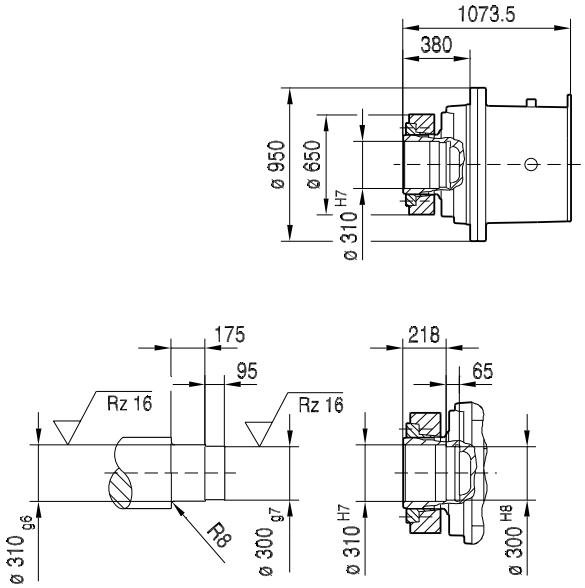
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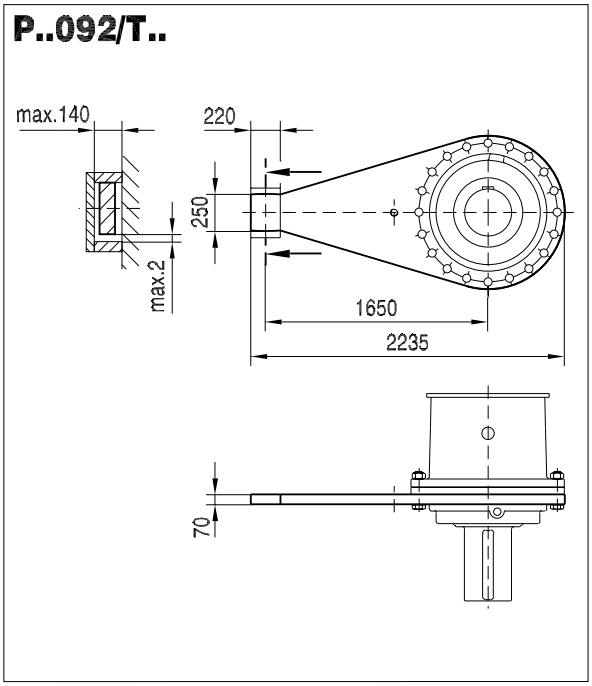




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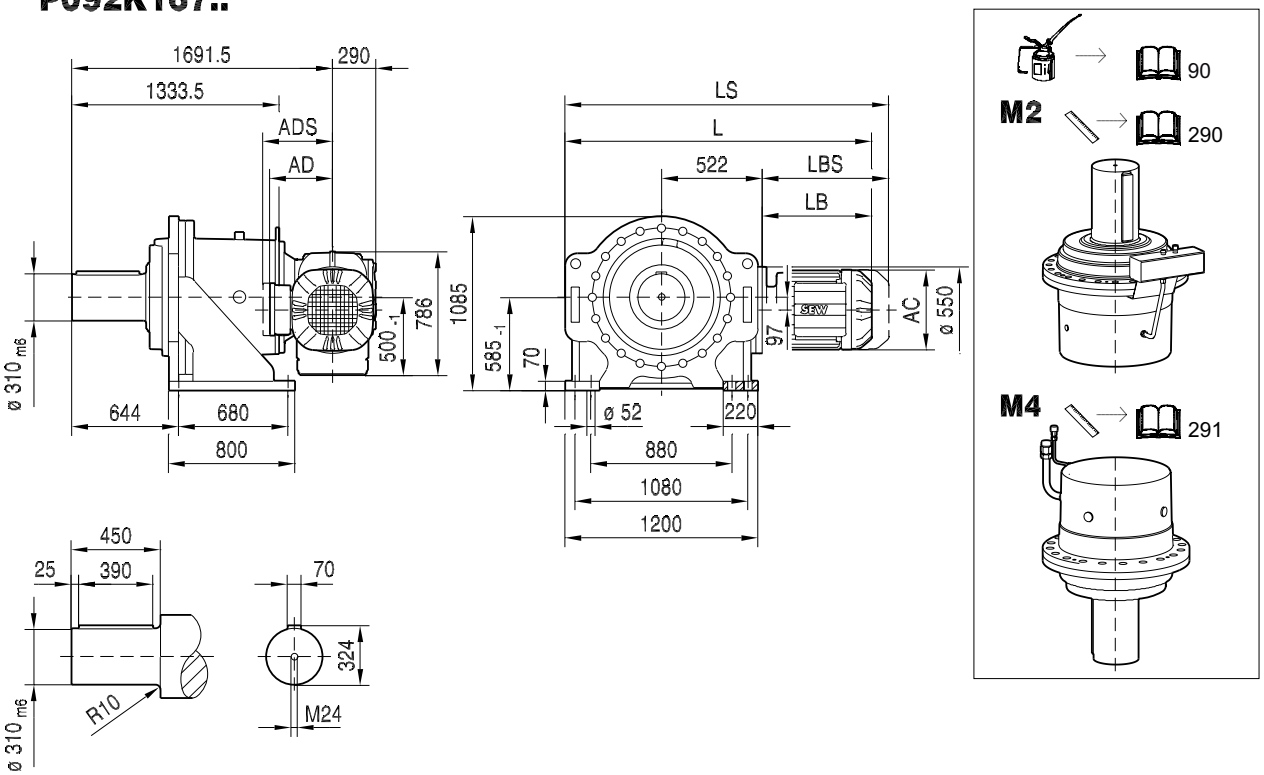
P..092/T..



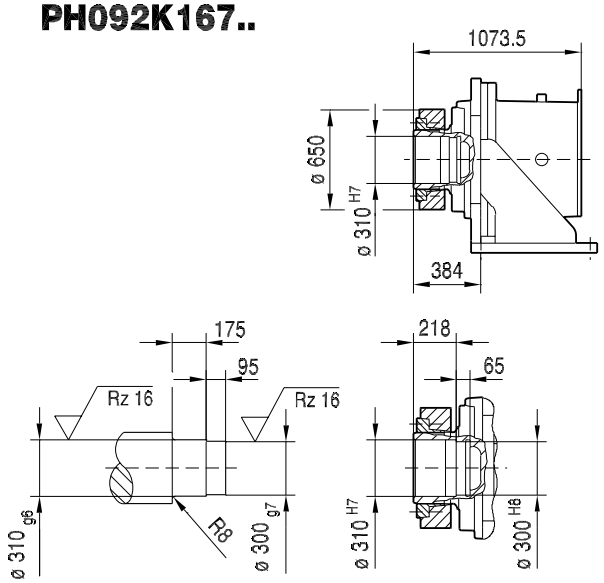
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1401	1424	1534	1508	1645	1645	1740	1842	1972
LS	1590	1613	1739	1713	1885	1885	1980	2093	2223
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

P092K167..

45 121 00 15



PH092K167..

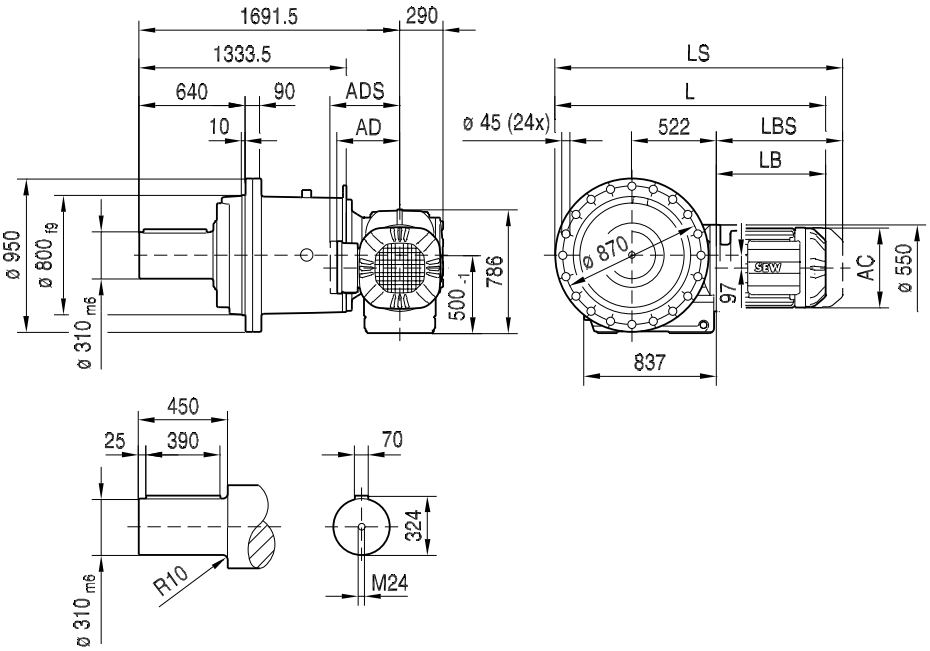


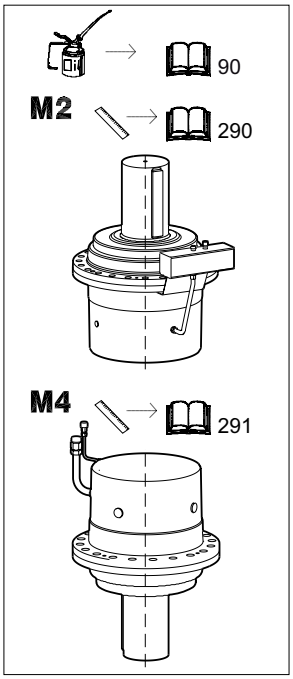
(→ 🗎 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1622	1645	1755	1729	1866	1866	1961	2063	2193
LS	1811	1834	1960	1934	2106	2106	2201	2314	2444
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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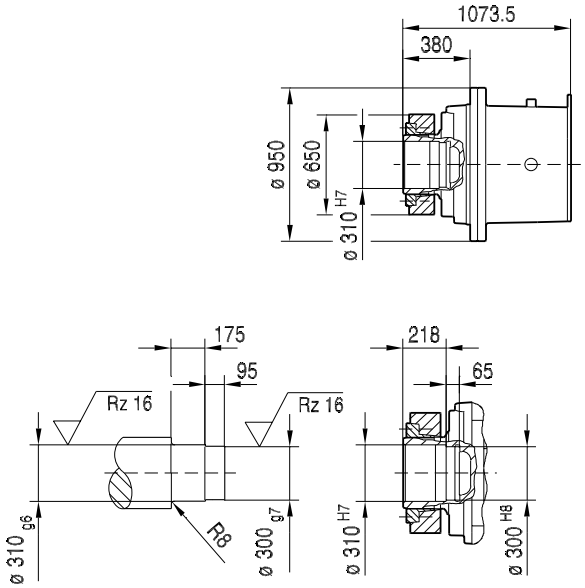
PF092K167..

45 122 00 15

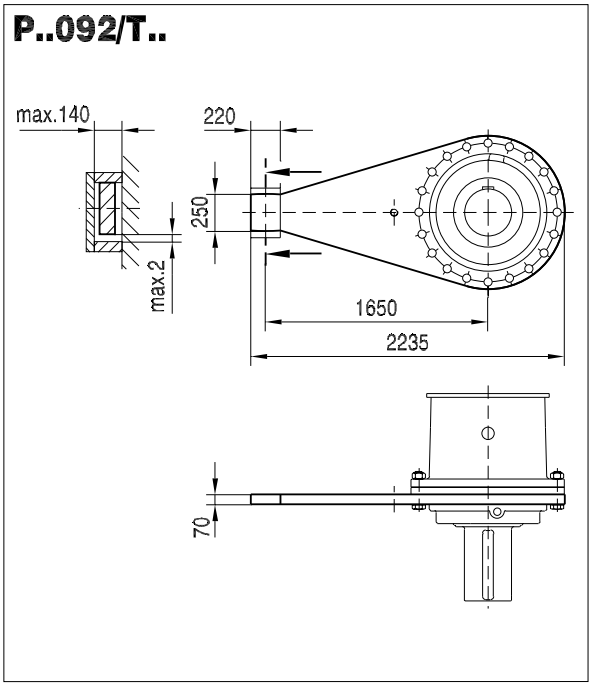




PHF092K167..



P..092/T..

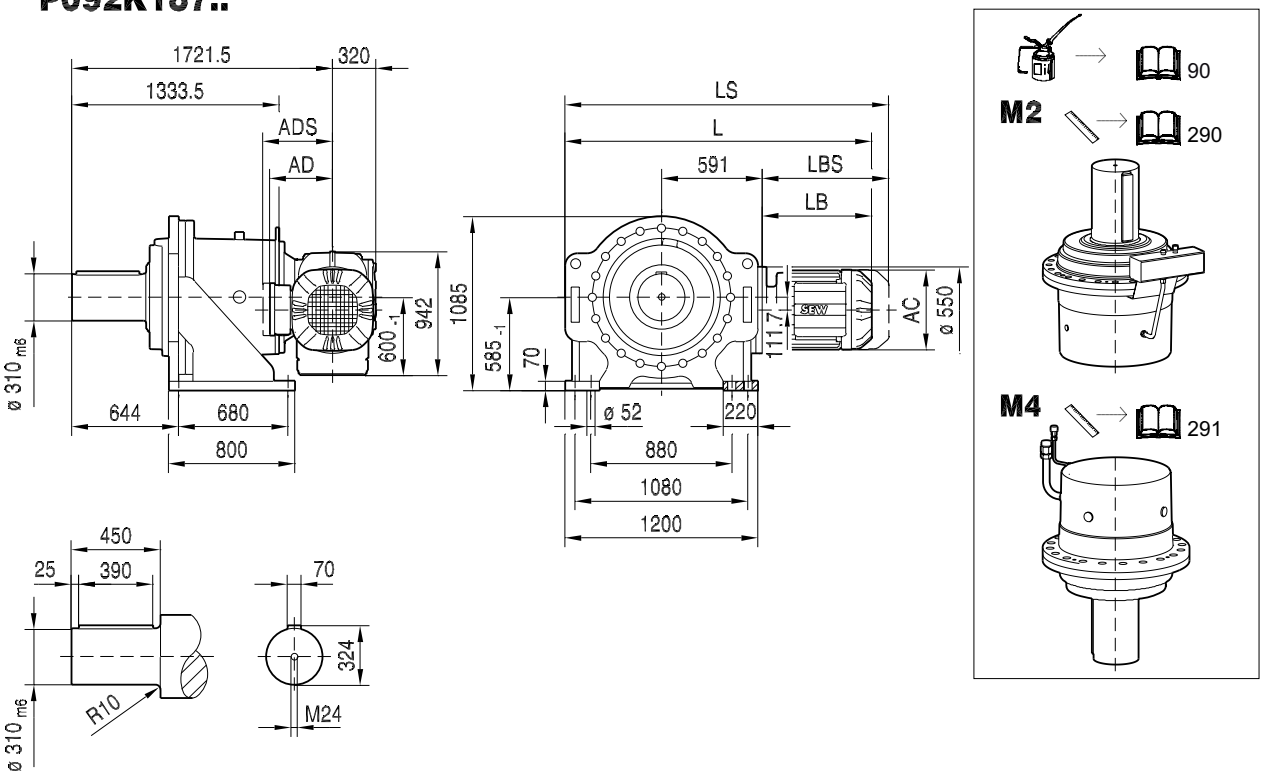


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1497	1520	1630	1604	1741	1741	1836	1938	2068
LS	1686	1709	1835	1809	1981	1981	2076	2189	2319
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

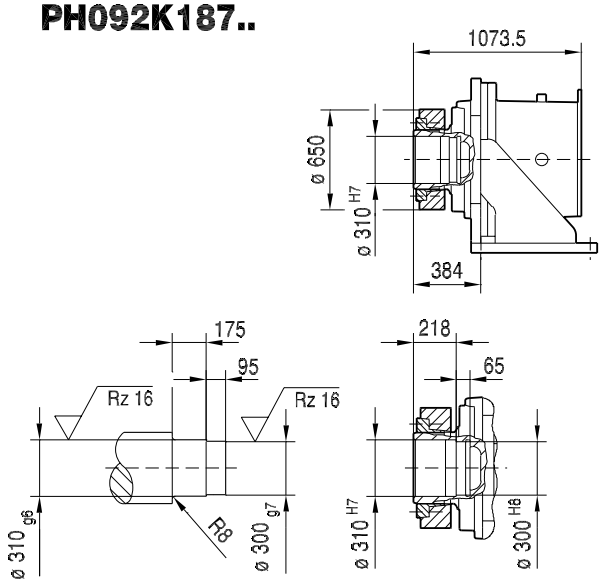
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P092K187..

45 123 00 15



PH092K187..

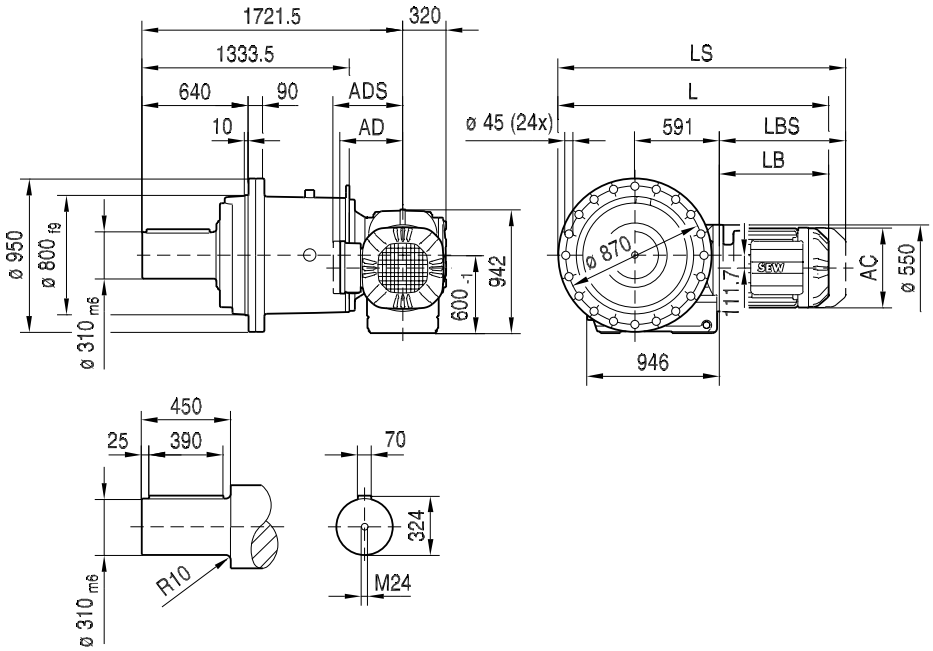


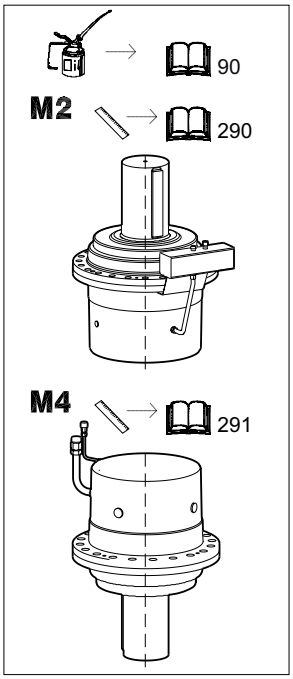
(→ 🗎 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1691	1714	1824	1798	1935	1935	2030	2132	2262
LS	1880	1903	2029	2003	2175	2175	2270	2383	2513
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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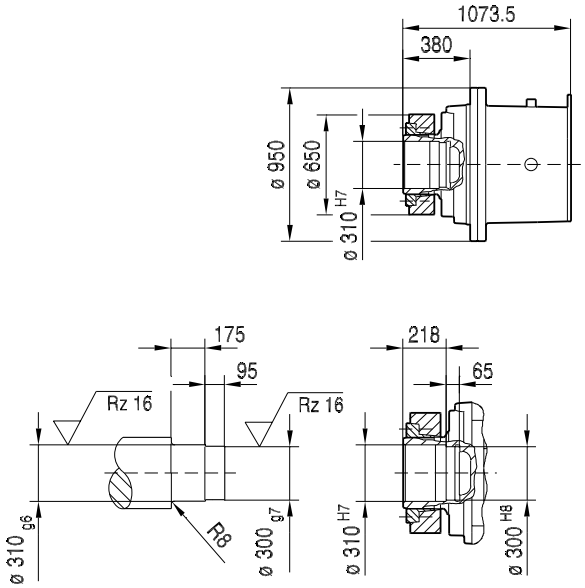
PF092K187..

45 124 00 15

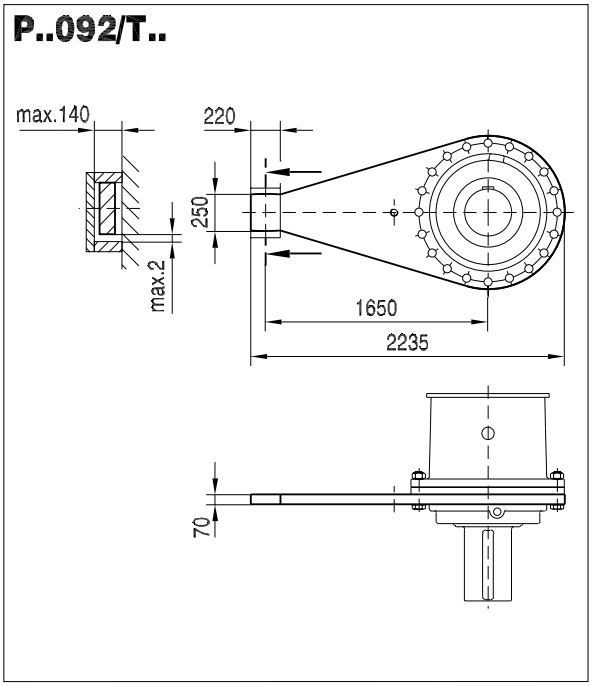




PHF092K187..



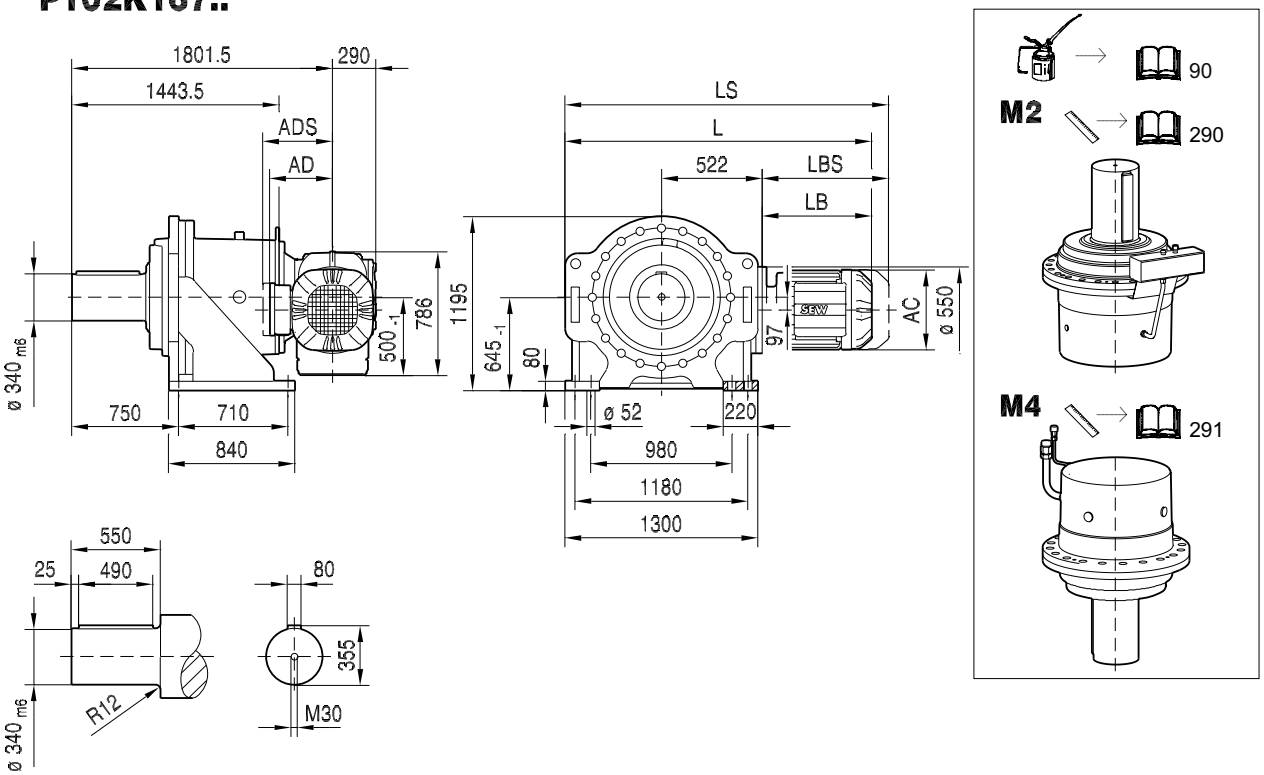
P..092/T..



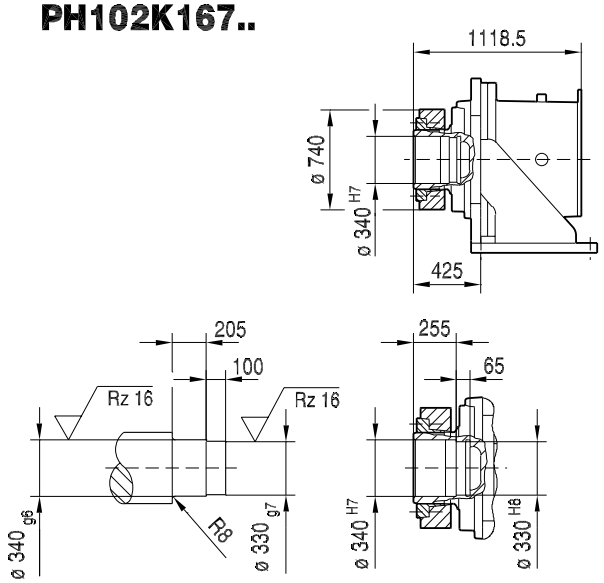
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1566	1589	1699	1673	1810	1810	1905	2007	2137
LS	1755	1778	1904	1878	2050	2050	2145	2258	2388
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

P102K167..

45 125 00 15



PH102K167..

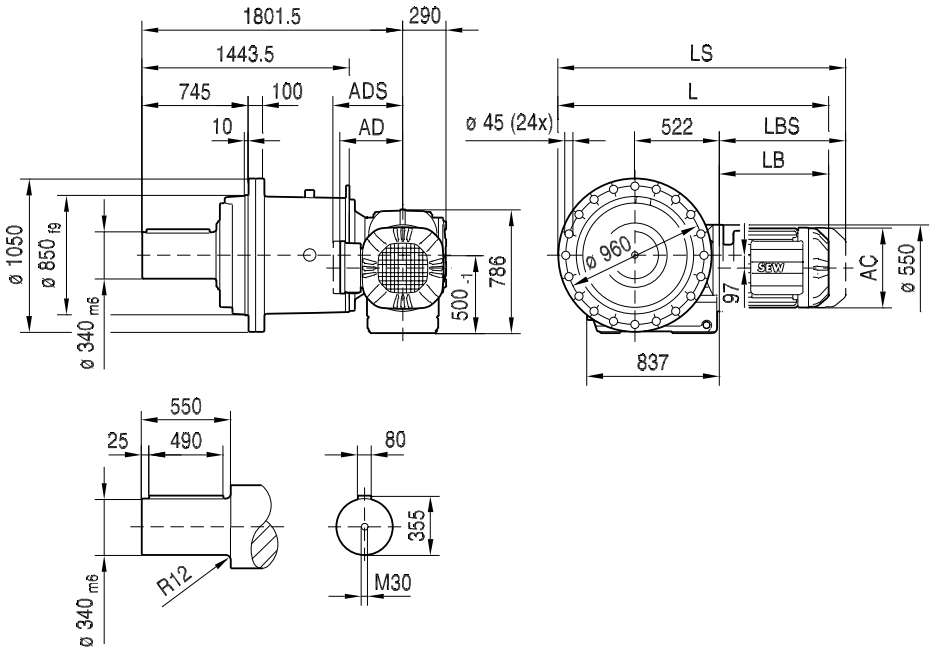


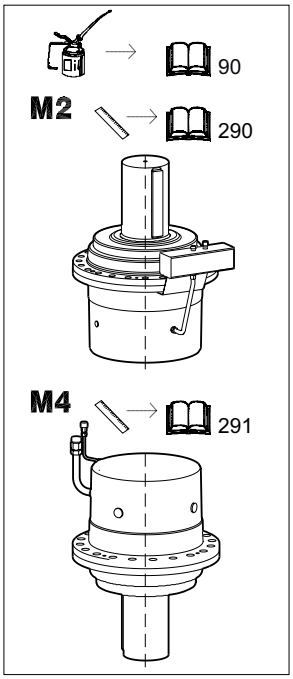
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1672	1695	1805	1779	1916	1916	2011	2113	2243
LS	1861	1884	2010	1984	2156	2156	2251	2364	2494
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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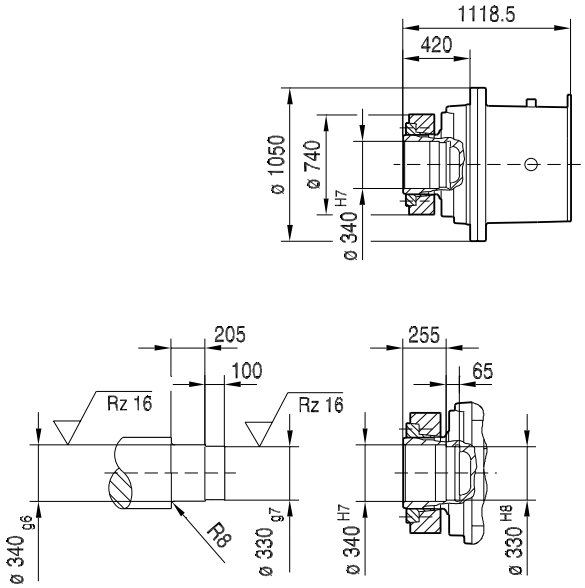
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45 126 00 15

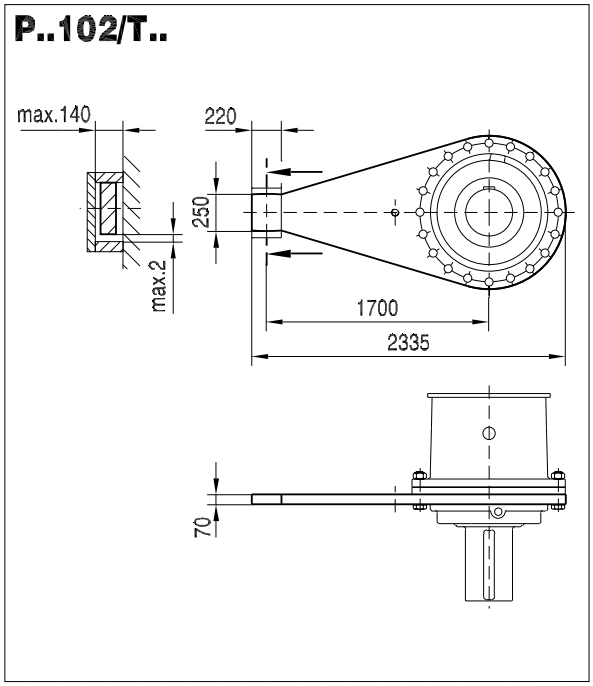




PHF102K167..



P..102/T..

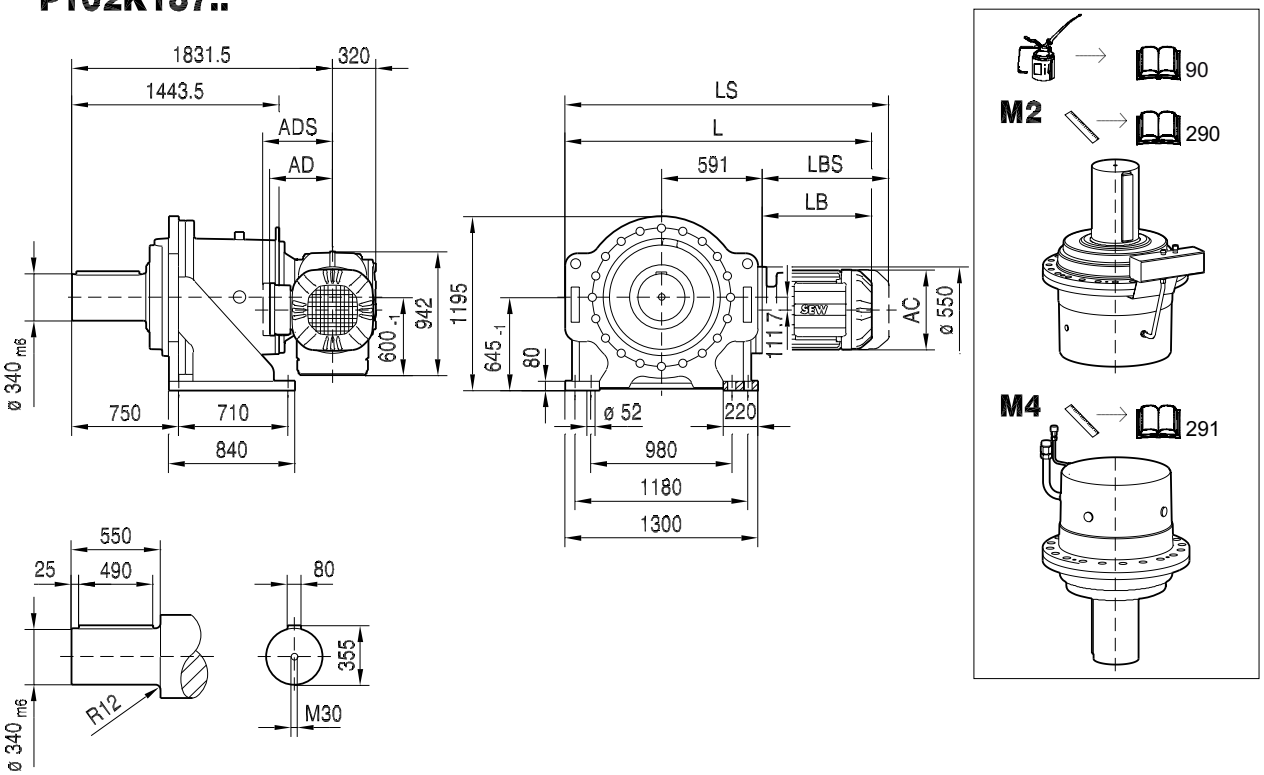


(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1547	1570	1680	1654	1791	1791	1886	1988	2118
LS	1736	1759	1885	1859	2031	2031	2126	2239	2369
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

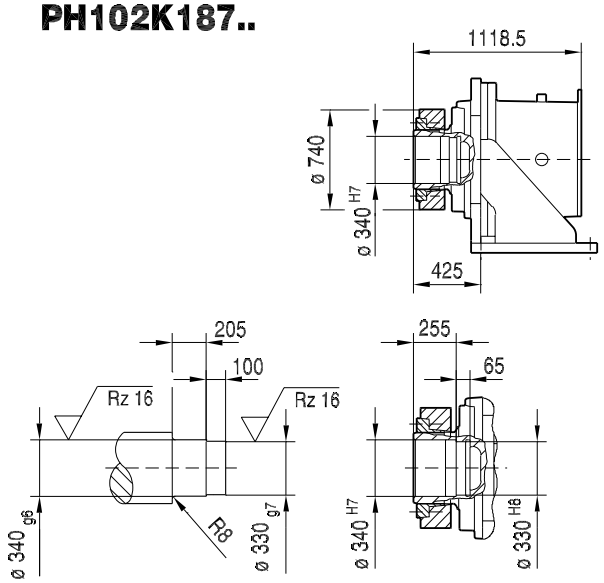
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P102K187..

45 127 00 15



PH102K187..

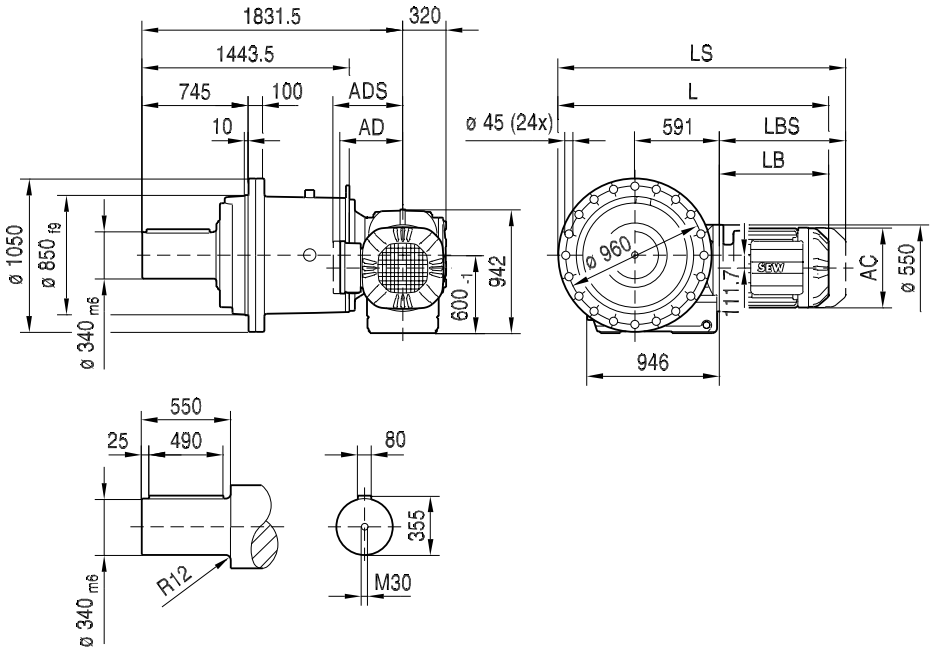


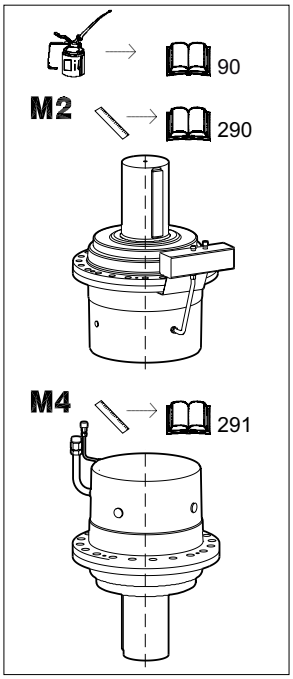
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1741	1764	1874	1848	1985	1985	2080	2182	2312
LS	1930	1953	2079	2053	2225	2225	2320	2433	2563
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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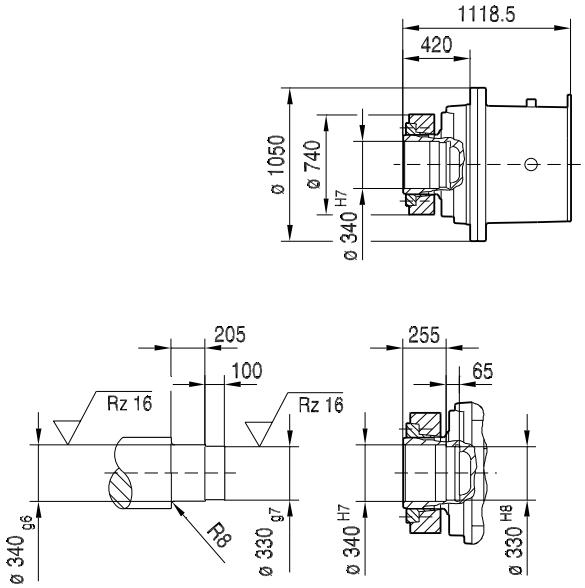
PF102K187..

45 128 00 15

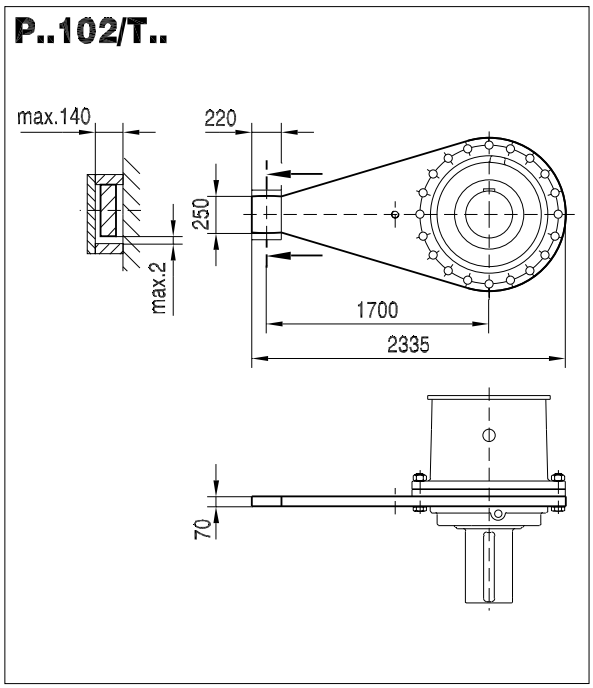




PHF102K187..



P..102/T..



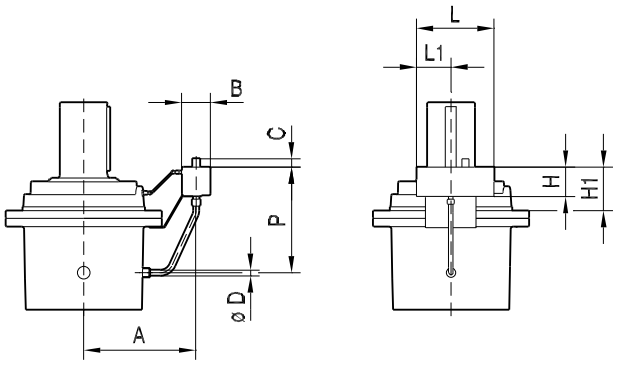
(→ 100)	DRN160L	DRN180..	DRN200L	DRN225..	DRN250M	DRN280S	DRN280M	DRN315S-M	DRN315ME-H
AC	314	357	394	434	495	495	495	624	624
AD	253	268	283	305	394	394	394	506	506
ADS	253	268	283	305	394	394	394	506	506
L	1616	1639	1749	1723	1860	1860	1955	2057	2187
LS	1805	1828	1954	1928	2100	2100	2195	2308	2438
LB	500	523	633	607	744	744	839	941	1071
LBS	689	712	838	812	984	984	1079	1192	1322

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11.4 Oil expansion tank for mounting position M2

45 015 00 11

P/PH/PF/PHF
M2



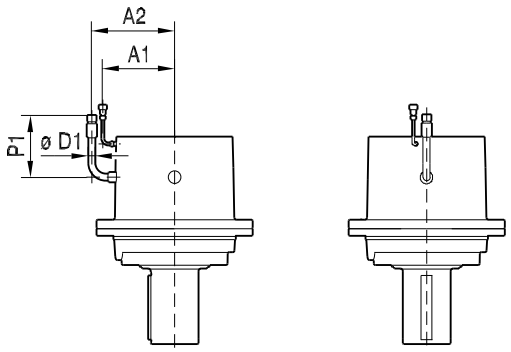
	A	B	C	Ø D	H	H1	L	L1	P
P.092	627.5	160	51	28	160	230	530	235	636.5
P.102	696.5	160	51	28	160	241	530	235	658.5

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11.5 Oil expansion tank for mounting position M4

45 016 00 11

P/PH/PF/PHF
M4



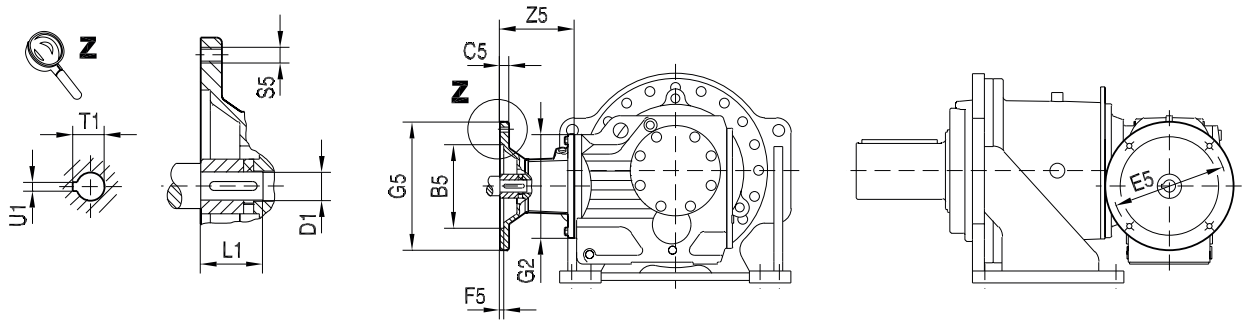
	A1	A2	Ø D1	P1
P.092	477	486	28	361
P.102	507	514	28	361

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11.6 AM adapter for mounting IEC motors

45 122 00 08

P..KF..AM..



		B5	C5	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
P..KF77	AM63	95	10	115	3.5	200	140	M8	60	11	23	12.8	4
	AM71	110		130			160			14	30	16.3	5
	AM80	130	12	165	4.5		200	M10	92	19	40	21.8	6
	AM90									24	50	27.3	8
	AM100	180	15	215	5		250	M12	126	28	60	31.3	8
	AM112												
	AM132S/M	230	16	265			300		179	38	80	41.3	10
	AM132ML												
P..KF87	AM80	130	12	165	4.5	250	200	M10	87	19	40	21.8	6
	AM90									24	50	27.3	8
	AM100	180	15	215	5		250	M12	121	28	60	31.3	8
	AM112												
	AM132S/M	230	16	265			300		174	38	80	41.3	10
	AM132ML												
	AM160	250	18	300	6		350	M16	232	42	110	45.3	12
	AM180									48		51.8	14
P..KF97	AM100	180	15	215	5	300	250	M12	116	28	60	31.3	8
	AM112												
	AM132S/M	230	16	265			300		169	38	80	41.3	10
	AM132ML												
	AM160	250	18	300	6		350	M16	227	42	110	45.3	12
	AM180									48		51.8	14
	AM200	300	20	350	7		400		268	55		59.3	16

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45 123 00 08

P..KF..AM..

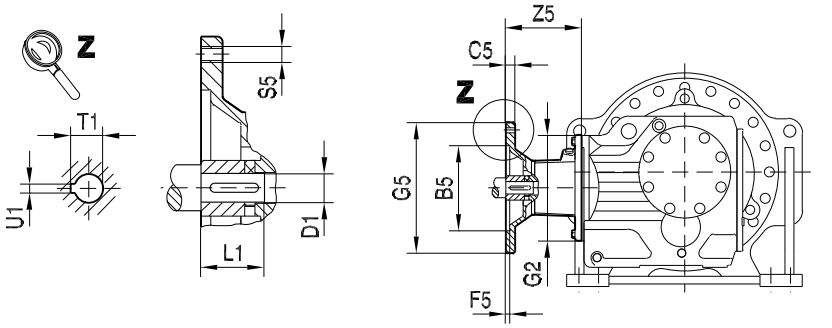


Fig.1

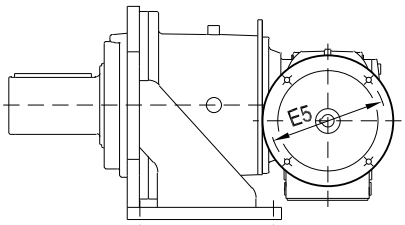


Fig.2

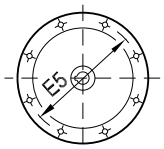


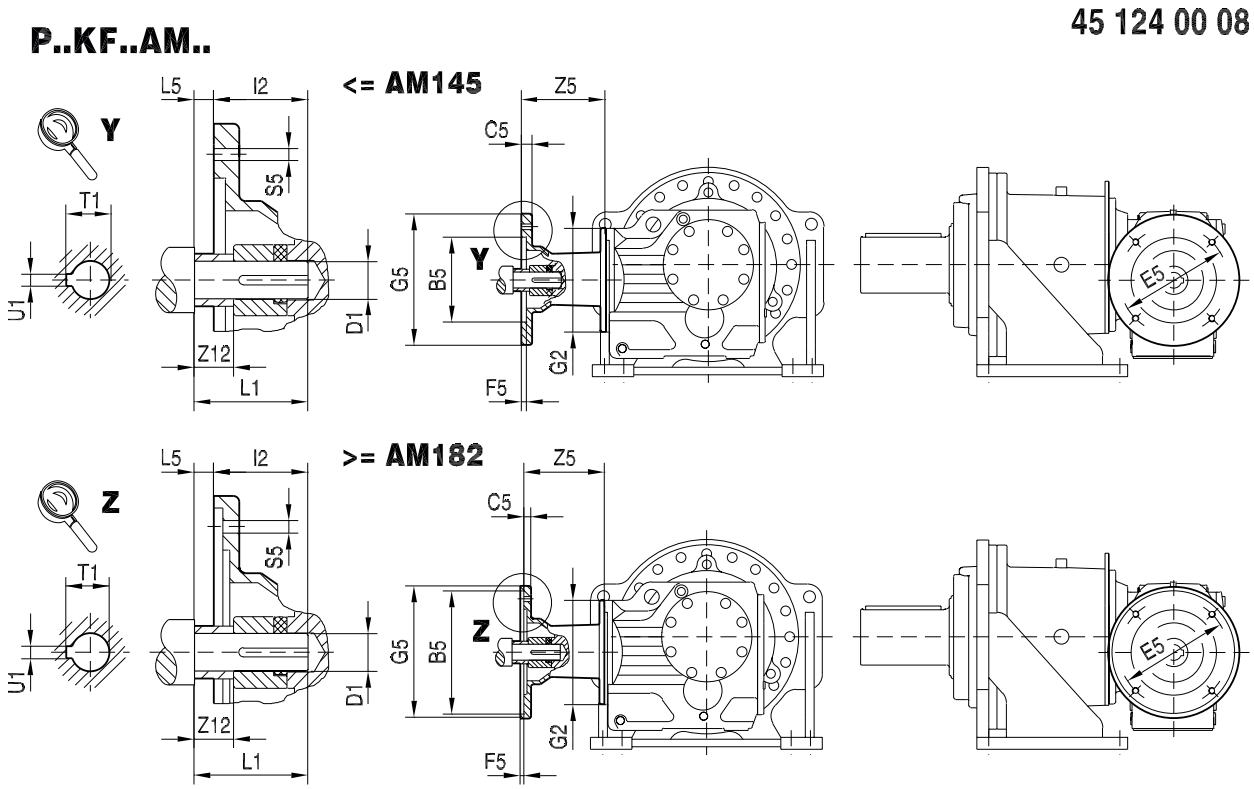
		Fig.	B5	C5	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
P..KF107	AM100	1	180	15	215	5	350	250	M12	110	28	60	31.3	8
	AM112													
	AM132S/M		230	16	265			300		163	38	80	41.3	10
	AM132ML													
	AM160		250	18	300	6		350	M16	221	42	110	45.3	12
	AM180										48		51.8	14
	AM200	2	300	20	350	7		400		262	55		59.3	16
P..KF127	AM132S/M	1	230	16	265	5	450	300	M12	148	38	80	41.3	10
	AM132ML													
	AM160		250	18	300	6		350	M16	206	42	110	45.3	12
	AM180										48		51.8	14
	AM200		300	20	350	7		400		247	55		59.3	16
	AM225	2	350	22	400			450		262	60	140	64.4	18
	AM250		450	25	500			550		336	65		69.4	
	AM280										75		79.9	20
P..KF157	AM160	1	250	18	300	6	550	350	M16	198	42	110	45.3	12
	AM180										48		51.8	14
	AM200		300	20	350	7		400		239	55		59.3	16
	AM225	2	350	22	400			450		254	60	140	64.4	18
	AM250		450	25	500			550		328	65		69.4	
	AM280										75		79.9	20
P..K167	AM160	1	250	18	300	6.0	550	350	M16	198	0	42	110	45.3
	AM180									198	0	48		51.8
	AM200		300	20	350	7.0		400		239	0	55		59.3
	AM225	2	350	22	400			450		254	0	60	140	64.4
	AM250		450	25	500			550		328	19	65		69.4
	AM280											75		79.9

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		Fig.	B5	C5	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
P..K187	AM160	1	250	18	300	6.0	550	350	M16	198	0	42	110	45.3
	AM180					6.0		350		198		48		51.8
	AM200		300	20	350	7.0		400		239		55		59.3
	AM225	2	350	22	400			450		254		60	140	64.4
	AM250		450	25	500			550		328	19	65	140	69.4
	AM280									328	19	75	140	79.9

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11.7 AM adapters for mounting of NEMA motors



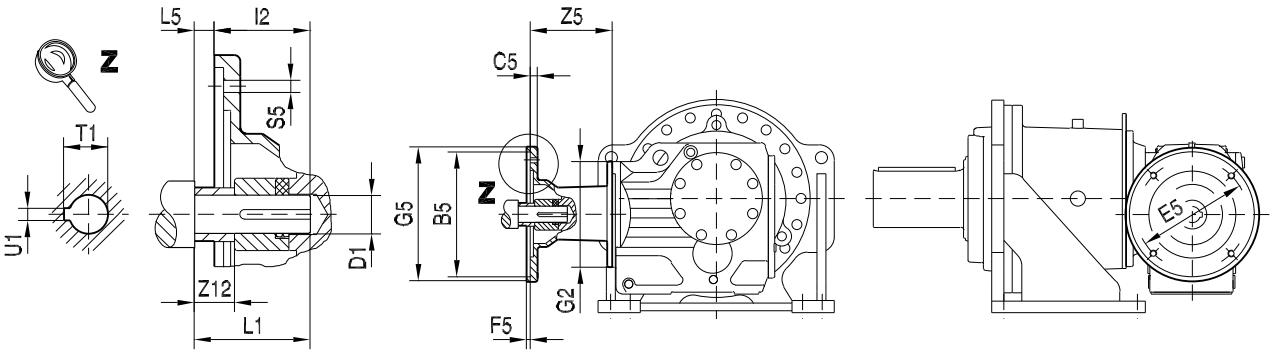
		B5	C5	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
P..KF77	AM56	114.3	11	149.2	4.5	200	170	52.55	-4.8	10.5	81	16.5	15.875	47	18.1	4.76
	AM143		12					54.1	3		103.5	14.5	22.225	57	24.7	
	AM145															
	AM182	215.9	10	184	5		228	66.75	3	15	139.5	16.5	28.575	69	31.7	6.35
	AM184															
	AM213/215		11					79.55	6.3		188.5	15.8	34.925	85	38.7	7.94
P..KF87	AM143	114.3	12	149.2	4.5	250	170	54.1	3	10.5	98.5	14.5	22.225	57	24.7	4.76
	AM145															
	AM182	215.9	10	184	5		228	66.75	3	15	134.5	16.5	28.575	69	31.7	6.35
	AM184															
	AM213/215		11					79.55	6.3		183.5	15.8	34.925	85	38.7	7.94
	AM254/256		12					95.3	6.3		234	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5		286	111.05	6.3	15	241	15.8	47.625	117	53.4	12.7

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		B5	C5	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
P..KF97	AM182	215.9	10	184	5	300	228	66.75	3	15	129.5	16.5	28.575	69	31.7	6.35
	AM184															
	AM213/215		11					79.55	6.3		178.5	15.8	34.925	85	38.7	7.94
	AM254/256		12					95.3	6.3		229	9	41.275	101	45.8	9.53
	AM284/286	266.7	20	228.6	5		286	111.05	6.3	15	236	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5		356	127.05	6.3	17.5	296	34.8	53.975	133	60	12.7
	AM364/365							143.05					60.325	149	67.6	15.875

P..KF..AM..

45 125 00 08



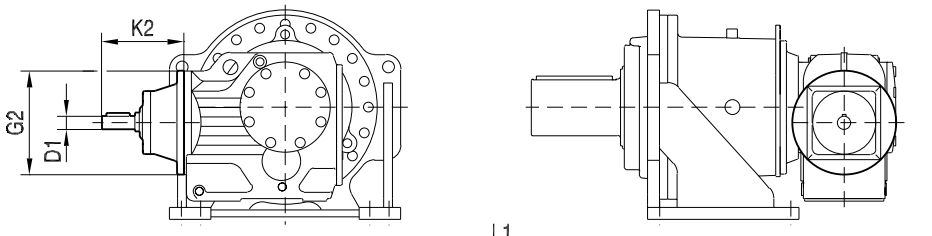
		B5	C5	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
P..KF107	AM182	215.9	10	184	5	350	228	66.85	3	15	123.5	16.5	28.575	69	31.7	6.35
	AM184															
	AM213/215		11					79.55	6.3		172.5	15.8	34.925	85	38.7	7.94
	AM254/256		12					95.3	6.3		223	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5		286	111.05	6.3	15	230	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5		356	127.05	6.3	17.5	290	34.8	53.975	133	60	12.7
	AM364/365							143.05					60.325	149	67.6	15.875
P..KF127	AM213/215	215.9	11	184	5	450	228	79.55	6.3	15	157.5	15.8	34.925	85	38.7	7.94
	AM254/256		12					95.3	6.3		208	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5		286	111.05	6.3	15	215	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5		356	127.05	6.3	17.5	275	34.8	53.975	133	60	12.7
	AM364/365							143.05					60.325	149	67.6	15.875
P..KF157 **P..K167** **P..K187**	AM254/256	215.9	12	184	5	550	228	79.55	6.3	15	200	9	41.275	101	45.8	9.53
	AM284/286	266.7	15	228.6	5		286	95.3	6.3	15	207	15.8	47.625	117	53.4	12.7
	AM324/326	317.5	17	279.4	5		356	111.05	6.3	17.5	267	34.8	53.975	133	60	12.7
	AM364/365							127.05					60.325	149	67.6	15.875

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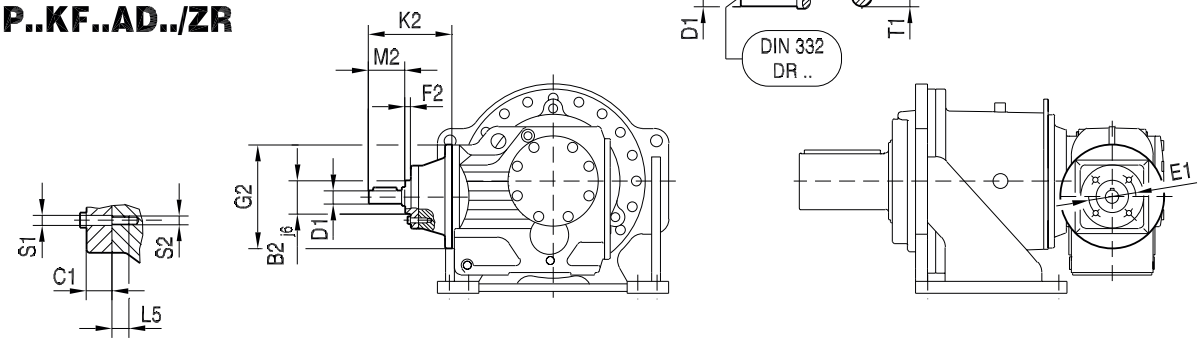
11.8 AD input shaft assembly

P..KF..AD..

46 128 01 08



P..KF..AD../ZR

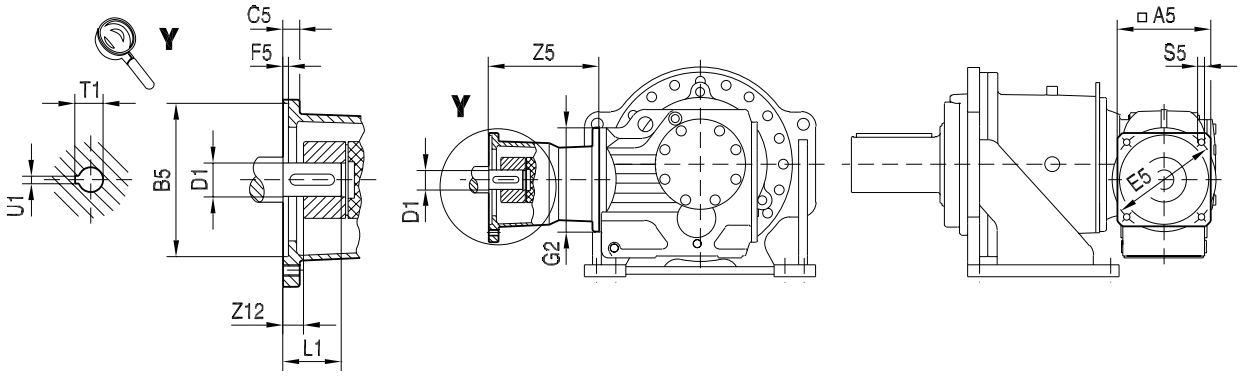


		B2	C1	E1	F2	G2	K2	L5	M2	S1	S2	D1	L1	L13	L14	T1	U1
P..KF77	AD2 , AD2/ZR	55	13.5	80	8	200	116	12	50	9	M8	19	40	4	32	21.5	6
	AD3 , AD3/ZR	70	15.5	105	8		151	16	60	11	M10	24	50	5	40	27	8
	AD4 , AD4/ZR	100	16	130	13		224	20	95.5	13.5	M12	38	80	5	70	41	10
P..KF87	AD2 , AD2/ZR	55	13.5	80	8	250	111	12	50	9	M8	19	40	4	32	21.5	6
	AD3 , AD3/ZR	70	15.5	105	8		156	16	60	11	M10	28	60	5	50	31	8
	AD4 , AD4/ZR	100	16	130	13		219	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5 , AD5/ZR	120	24	180	11		292	20	126	13.5	M12	42	110	10	70	45	12
P..KF97	AD3 , AD3/ZR	70	15.5	105	8	300	151	16	60	11	M10	28	60	5	50	31	8
	AD4 , AD4/ZR	100	16	130	13		214	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5 , AD5/ZR	120	24	180	11		287	20	126	13.5	M12	42	110	10	70	45	12
	AD6 , AD6/ZR	130	22.5	200	11		327	26	130.5	17.5	M16	48	110	10	80	51.5	14
P..KF107	AD3 , AD3/ZR	70	15.5	105	8	350	145	16	60	11	M10	28	60	5	50	31	8
	AD4 , AD4/ZR	100	16	130	13		208	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5 , AD5/ZR	120	24	180	11		281	20	126	13.5	M12	42	110	10	70	45	12
	AD6 , AD6/ZR	130	22.5	200	11		321	26	130.5	17.5	M16	48	110	10	80	51.5	14
P..KF127	AD4 , AD4/ZR	100	16	130	13	450	193	20	95.5	13.5	M12	38	80	5	70	41	10
	AD5 , AD5/ZR	120	24	180	11		266	20	126	13.5	M12	42	110	10	70	45	12
	AD6 , AD6/ZR	130	22.5	200	11		306	26	130.5	17.5	M16	48	110	10	80	51.5	14
	AD7 , AD7/ZR	125	19	190	13		300	30	133	22	M20	55	110	10	90	59	16
	AD8 , AD8/ZR	120	22.5	210	5		383	19.5	155	13.5	M12	70	140	15	110	74.5	20
P..KF127	AD5 , AD5/ZR	120	24	180	11	550	258	20	126	13.5	M12	42	110	10	70	45	12
	AD6 , AD6/ZR	130	22.5	200	11		298	26	130.5	17.5	M16	48	110	10	80	51.5	14
	AD7 , AD7/ZR	125	19	190	13		292	30	133	22	M20	55	110	10	90	59	16
	AD8 , AD8/ZR	120	22.5	210	5		374	19.5	155	13.5	M12	70	140	15	110	74.5	20
K..157 **K..167** **K..187**	AD5 , AD5/ZR	120	24	180	11	550	258	20	126	13.5	M12	42	110	10	70	45	12
	AD6 , AD6/ZR	130	22.5	200	11		298	26	130.5	17.5	M16	48	110	10	80	51.5	14
	AD7 , AD7/ZR	125	19	190	13		292	30	133	22	M20	55	110	10	90	59	16
	AD8 , AD8/ZR	120	22.5	210	5		374	19.5	155	13.5	M12	70	140	15	110	74.5	20

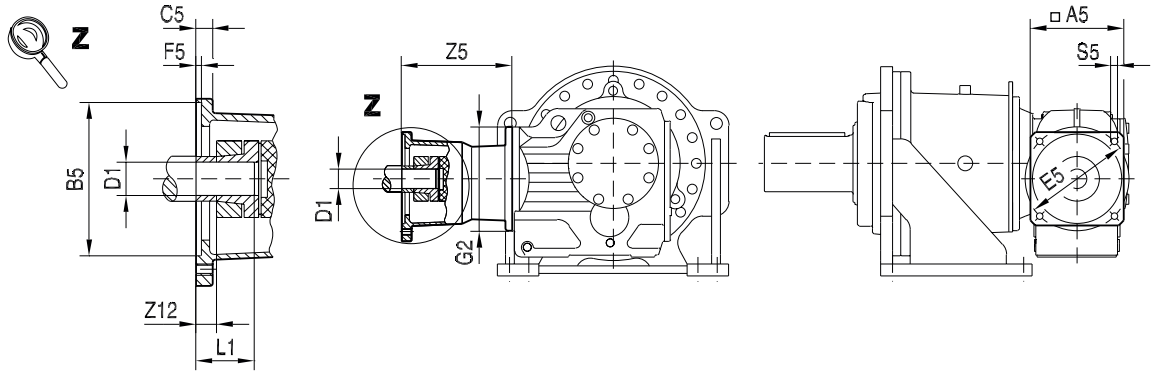
11.9 AQA motor adapters

46 126 01 08

P..KF..AQA..



P..KF..AQH..

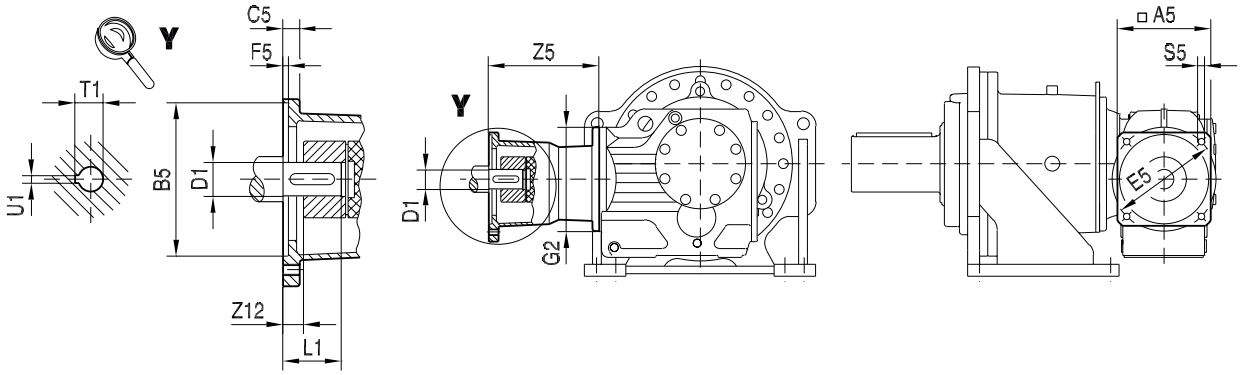


		A5	B5	C5	E5	F5	G2	S5	Z5	AQA Z12	AQH Z12	D1	L1	T1	U1
P..KF77	AQ..80/1	82	60	8	75	3.5	200	M5	92	5.5	5.5	11	23	12.8	4
	AQ..80/2	82	60	8	75	3.5	200	M5	92	5.5	5.5	14	30	16.3	5
	AQ..80/3	82	50	8	95	3	200	M6	92	5.5	5.5	14	30		5
	AQ..100/1	100	80	10	100	4	200	M6	116	0	0	14	30	16.3	5
	AQ..100/2	100	95	12	115	4	200	M8	116	0	0	14	30	16.3	5
	AQ..100/3	100	80	10	100	4	200	M6	130	2	14	19	40	21.8	6
	AQ..100/4	100	95	12	115	4	200	M8	130	2	14	19	40	21.8	6
	AQ..115/1	115	95	12	130	5	200	M8	139	11	23	19	40	21.8	6
	AQ..115/2	115	110	12	130	5	200	M8	139	11	23	19	40	21.8	6
	AQ..115/3	115	110	12	130	5	200	M8	139	16	16	24	50	27.3	8
	AQ..140/1	140	110	15	165	5	200	M10	167	16	16	24	50	27.3	8
	AQ..140/2	140	130	15	165	5	200	M10	167	16	16	24	50	27.3	8
	AQ..140/3	140	130	15	165	5	200	M10	180	22	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5	200	M12	225.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	16	215	5	200	M12	225.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	16	215	5	200	M12	249.5	34	34	38	80	41.3	10
P..KF87	AQ..100/1	100	80	10	100	4	250	M6	111	0	0	14	30	16.3	5
	AQ..100/2	100	95	12	115	4	250	M8	111	0	0	14	30	16.3	5
	AQ..100/3	100	80	10	100	4	250	M6	125	2	14	19	40	21.8	6
	AQ..100/4	100	95	12	115	4	250	M8	125	2	14	19	40	21.8	6
	AQ..115/1	115	95	12	130	5	250	M8	134	11	23	19	40	21.8	6
	AQ..115/2	115	110	12	130	5	250	M8	134	11	23	19	40	21.8	6
	AQ..115/3	115	110	12	130	5	250	M8	134	16	16	24	50	27.3	8
	AQ..140/1	140	110	15	165	5	250	M10	162	16	16	24	50	27.3	8
	AQ..140/2	140	130	15	165	5	250	M10	162	16	16	24	50	27.3	8
	AQ..140/3	140	130	15	165	5	250	M10	175	22	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5	250	M12	220.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	16	215	5	250	M12	220.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	16	215	5	250	M12	244.5	34	34	38	80	41.3	10

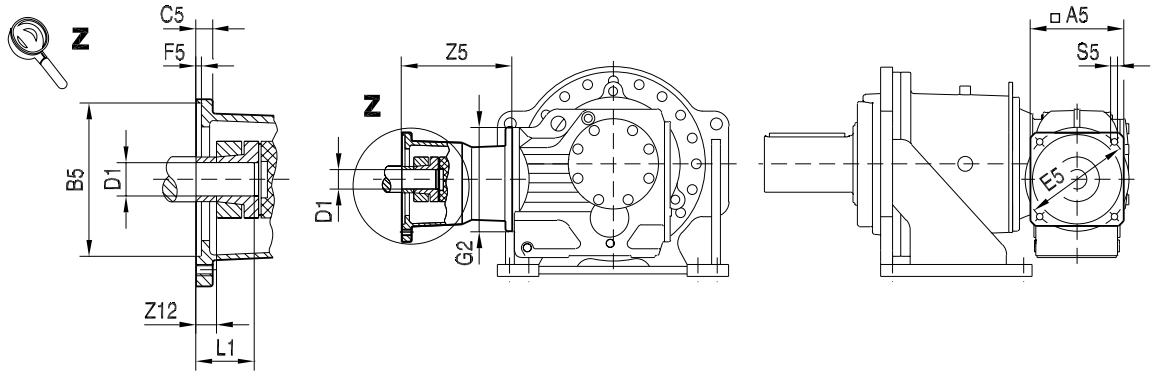
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46 127 01 08

P..KF..AQA..



P..KF..AQH..



		A5	B5	C5	E5	F5	G2	S5	Z5	AQA Z12	AQH Z12	D1	L1	T1	AU1
P..KF97	AQ..140/1	140	110	15	165	5	300	M10	157	21	16	24	50	27.3	8
	AQ..140/2	140	130	15	165	5	300	M10	157	21	16	24	50	27.3	8
	AQ..140/3	140	130	15	165	5	300	M10	170	24	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5	300	M12	215.5	26	24	32	60	35.3	10
	AQ..190/2	190	180	16	215	5	300	M12	215.5	26	24	32	60	35.3	10
	AQ..190/3	190	180	16	215	5	300	M12	239.5	39	34	38	80	41.3	10
P..KF107	AQ..140/1	140	110	15	165	5	350	M10	151	21	16	24	50	27.3	8
	AQ..140/2	140	130	15	165	5	350	M10	151	21	16	24	50	27.3	8
	AQ..140/3	140	130	15	165	5	350	M10	164	24	22	32	60	35.3	10
	AQ..190/1	190	130	16	215	5	350	M12	209.5	26	24	32	60	35.3	10
	AQ..190/2	190	180	16	215	5	350	M12	209.5	26	24	32	60	35.3	10
	AQ..190/3	190	180	16	215	5	350	M12	233.5	39	34	38	80	41.3	10

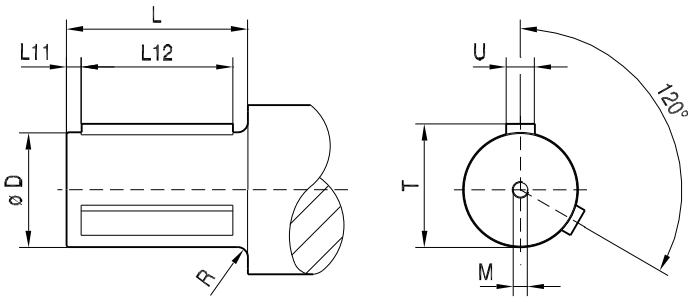
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12 Additional dimension sheets

12.1 Output shaft

12.1.1 P.. Solid shaft with 2 keys

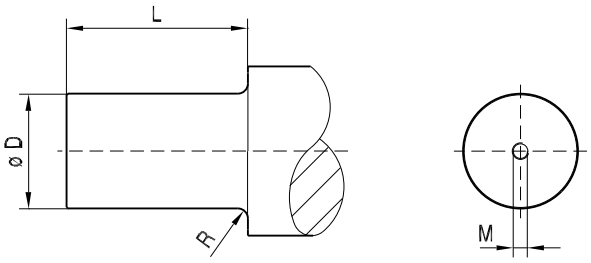
45 002 00 14



	Ø D	L11	L12	L	T	V	M	R
P.002	120_{m6}	14	165	200	127	32	M20	5
P.012	140_{m6}	15	185	220	148	36	M20	5
P.022	150_{m6}	15	183	220	158	36	M20	10
P.032	165_{m6}	15	213	250	174	40	M20	10
P.042	190_{m6}	17.5	255	300	200	45	M20	10
P.052	210_{m6}	17.5	300	350	221	50	M24	10
P.062	240_{m6}	21	340	400	252	56	M24	10
P.072	260_{m6}	22	340	400	272	56	M24	10
P.082	290_{m6}	22	390	450	302	63	M24	10
P.092	310_{m6}	25	390	450	324	70	M24	10
P.102	340_{m6}	25	490	550	355	80	M30	12

12.1.2 PR.. Smooth solid shaft

45 003 00 14



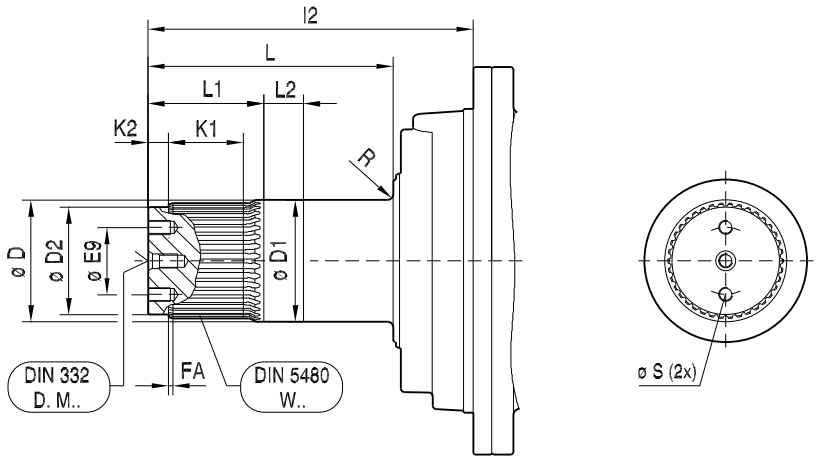
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	Ø D	L	M	R
P.002	120_{v6}	200	M20	5
P.012	140_{v6}	220	M20	5
P.022	150_{v6}	220	M20	10
P.032	165_{v6}	250	M20	10
P.042	190_{v6}	300	M20	10
P.052	210_{v6}	350	M24	10
P.062	240_{v6}	400	M24	10
P.072	260_{v6}	400	M24	10
P.082	290_{v6}	450	M24	10
P.092	310_{v6}	450	M24	10
P.102	340_{v6}	550	M30	12

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12.1.3 PL.. Splined solid shaft

45 002 00 16



18553858827

DIN 5480 - Solid shaft														
	Ø D1	**Ø D2**	**L2**	**K2**	**L**	**l2**	**L1**	**K1**	**R**	**Ø E9**	**DIN 332 D.M..**	**Ø S (2x)**	**FA**	**DIN 5480-W..**
PLF.002	120_{m6}	95_{m6}	20	20	200	280	135	80	5	-	M20	-	8	110x5x30x20x8f
PLF.012	140_{m6}	115_{m6}	25	25	220	298	145	85	5	-	M20	-	8	130x5x30x24x8f
PLF.022	150_{m6}	125_{m6}	25	25	220	305	155	95	10	-	M20	-	8	140x5x30x26x8f
PLF.032	165_{m6}	145_{m6}	25	25	250	340	157	100	10	90	M20	M20	8	160x5x30x30x8f
PLF.042	190_{m6}	165_{m6}	30	30	300	430	175	110	10	125	M20	M20	8	180x5x30x34x8f
PLF.052	210_{m6}	185_{m6}	35	35	350	490	180	110	10	140	M24	M24	8	200x5x30x38x8f
PLF.062	240_{m6}	205_{m6}	35	35	400	540	210	130	10	160	M24	M24	8	220x5x30x42x8f
PLF.072	260_{m6}	235_{m6}	40	40	400	545	215	135	10	160	M24	M24	8	250x5x30x48x8f
PLF.082	290_{m6}	265_{m6}	40	40	450	610	235	155	10	190	M24	M24	8	280x5x30x54x8f
PLF.092	310_{m6}	280_{m6}	45	45	450	640	245	160	10	220	M24	M24	8	300x5x30x58x8f
PLF.102	340_{m6}	300_{m6}	50	50	550	745	265	167	12	235	M30	M30	8	320x5x30x62x8f

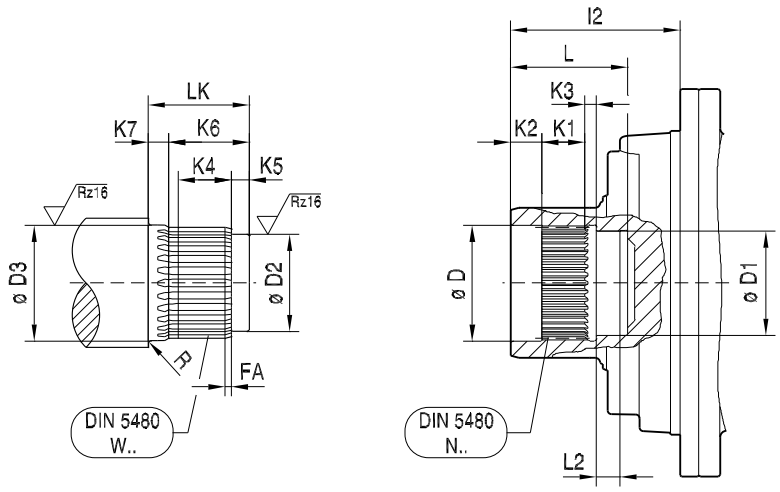
INFORMATION

For applications with overhung loads, contact SEW-EURODRIVE.

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12.1.4 PV.. Splined hollow shaft

45 001 00 16



18553855499

DIN 5480 - Hollow shaft									
	Ø D	**Ø D1**	**K2**	**L2**	**L**	**I2**	**K1**	**K3**	**DIN 5480-N..**
PVF.002	132^{H7}	110^{H7}	35	20	138	165	50	18	130x5x30x24x9H
PVF.012	152^{H7}	130^{H7}	35	20	140	170	54	19	150x5x30x28x9H
PVF.022	162^{H7}	140^{H7}	35	20	152.5	180	65	19.5	160x5x30x30x9H
PVF.032	182^{H7}	155^{H7}	45	25	175	210	70	20	180x5x30x34x9H
PVF.042	202^{H7}	180^{H7}	45	30	191	255	80	21	200x5x30x38x9H
PVF.052	222^{H7}	200^{H7}	55	35	210	275	82	23	220x5x30x42x9H
PVF.062	252^{H7}	230^{H7}	60	35	240	295	95	32	250x5x30x48x9H
PVF.072	282^{H7}	250^{H7}	60	37	256	320	98	43	280x5x30x54x9H
PVF.082	302^{H7}	280^{H7}	60	38	263	340	125	22	300x5x30x58x9H
PVF.092	322^{H7}	300^{H7}	70	40	283	380	130	23	320x5x30x62x9H
PVF.102	362^{H7}	330^{H7}	90	45	320	420	125	40	360x8x30x44x9H

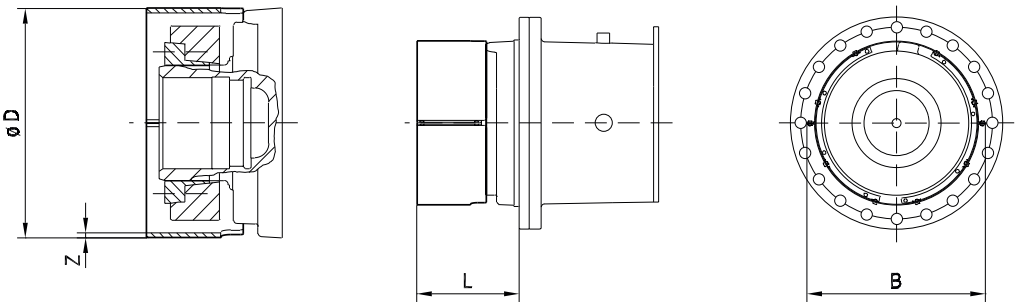
Recommendations for customer shaft										
	ØD3	**ØD2**	**K7**	**K5**	**LK**	**K6**	**K4**	**R**	**FA**	**DIN 5480-W..**
PVF.002	132_{m6}	110_{m6}	24	30	125	101	62	3	8x30°	130x5x30x24x8f
PVF.012	152_{m6}	130_{m6}	24	31	130	106	66	3	8x30°	150x5x30x28x8f
PVF.022	162_{m6}	140_{m6}	24	31.5	141.5	117.5	77	3	8x30°	160x5x30x30x8f
PVF.032	182_{m6}	155_{m6}	34	37	162	128	82	5	8x30°	180x5x30x34x8f
PVF.042	202_{m6}	180_{m6}	34	43	178	144	92	5	8x30°	200x5x30x38x8f
PVF.052	222_{m6}	200_{m6}	44	50	197	153	94	5	8x30°	220x5x30x42x8f
PVF.062	252_{m6}	230_{m6}	49	59	224	175	107	5	8x30°	250x5x30x48x8f
PVF.072	282_{m6}	250_{m6}	49	72	240	191	110	6	8x30°	280x5x30x54x8f
PVF.082	302_{m6}	280_{m6}	49	52	247	198	137	6	8x30°	300x5x30x58x8f
PVF.092	322_{m6}	300_{m6}	59.5	55	265	205.5	142	8	8x30°	320x5x30x62x8f
PVF.102	362_{m6}	330_{m6}	77	75	302	225	139	8	10x30°	360x8x30x44x8f

INFORMATION

For applications with overhung loads, contact SEW-EURODRIVE.

12.2 Protection cover for shrink disk

45 133 00 08



	B	ø D	L	Z
P.002	350	307	176	2
P.012	396	353	182.5	2
P.022	452	409	193	2
P.032	472	429	224.5	2
P.042	522	479	269	2
P.052	566	523	293	2
P.062	636	593	312	2
P.072	712	669	335.5	2
P.082	776	733	360	2
P.092	734	684	399.5	2
P.102	824	774	435.5	2

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13 Address directory SEW-EURODRIVE

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	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
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Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de

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Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
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	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
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	Scotland	SEW-EURODRIVE Ltd. No 37 Enterprise House Springkerse Business Park Stirling FK7 7UF	Tel. +44 17 8647-8730 Fax +44 17 8645-0223
	Northern Ireland	Heyn Engineering (NI) Ltd. 1 Corry Place, Belfast, BT3 9AH	Tel. +44 02890350022 Fax +44 02890350012 http://www.heyn.co.uk info@heyn.co.uk
Greece			
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Technical Office	Thessaloniki	Christ. Boznos & Son S.A. Asklipiou 26 562 24 Evosmos, Thessaloniki	Tel. +30 2 310 7054-00 Fax +30 2 310 7055-15 info@boznos.gr

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Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is
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	Bellary	SEW-EURODRIVE India Private Limited Door no-56/279 Ward No-15, Sindhigi compound, Near Raghavendra talkies, Bellary-583101, Karnataka	Tel. +91 77609 88668 salesbellary@seweurodriveindia.com
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Nashik	SEW-EURODRIVE India Private Limited 107, "YOG" Bunglow, Mahatama Nagar, Trimbak Road, Nashik – 422 007, Maharashtra	Tel. +91 96657 52978 salesnashik@seweurodriveindia.com
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Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
Lebanon			
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Sales (Jordan, Kuwait , Saudi Arabia, Syria)	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
representation: Belgium			
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Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Technical Offices	Kuala Lumpur	SEW-EURODRIVE SDN BHD No. 2, Jalan Anggerik Mokara 31/46 Kota Kemuning Seksyen 31 40460 Shah Alam Selangor Darul Ehsan West Malaysia	Tel. +60 3 51229633 Fax +60 3 51229622 sewsa@sew-eurodrive.com.my
	Penang	SEW-EURODRIVE SDN BHD No. 38, Jalan Bawal Kimsar Garden 13700 Prai, Penang West Malaysia	Tel. +60 4 3999349 Fax +60 4 3999348 sewpg@sew-eurodrive.com.my

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	Kuching	SEW-EURODRIVE SDN BHD No. 69, Lot 10899 1st Floor, Jalan Tun Jugah 93350 Kuching Sarawak East Malaysia	Tel. +60 82 572780 Fax +60 82 571780 sewswk@sew-eurodrive.com.my
	Kota Kinabalu	SEW-EURODRIVE SDN BHD East Malaysia	Tel. +60 19 7539395 sales@sew-eurodrive.com.my
	Ipoh	SEW-EURODRIVE SDN BHD West Malaysia	Tel. +60 19 7177366 sewsa@sew-eurodrive.com.my
Mexiko			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Narny zam street 62 Union building, Suite A-403-1 Sukhbaatar district, Ulaanbaatar 14230	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service	Bouskoura	SEW-EURODRIVE Morocco Parc Industriel CFCIM, Lot 55 and 59 Bouskoura	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Technical Office	Palmerston North	SEW-EURODRIVE NEW ZEALAND LTD. C/-Grant Shearman, RD 5, Aronui Road Palmerston North	Tel. +64 6 355-2165 Fax +64 6 355-2316 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd Plot 296A, Adeyemo Akapo Str. Omole GRA Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com bolaji.adekunle@greenpegltd.com

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Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
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Poland			
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Technical Offices	Tychy	SEW-EURODRIVE Polska Sp.z.o.o. ul. Strzelecka 66 43-109 Tychy	Tel. +48 32 32 32 610 Fax +48 32 32 32 648
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	Radom	SEW-EURODRIVE Polska Sp.z.o.o. ul. Słowackiego 84 26-600 Radom	Tel. +48 48 679 47 00 Fax +48 48 679 47 09
	Rzeszów	SEW-EURODRIVE Polska Sp.z.o.o. ul. Armii Krajowej 80 35-307 Rzeszów	Tel. +48 17 784 27 00 Fax +48 17 784 27 09
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Service Competence Center	Lisbon	SEW-EURODRIVE, LDA. Núcleo Empresarial I de São Julião do Tojal Rua de Entremuros, 54 Fracção I 2660-533 São Julião do Tojal	Tel. +351 21 958-0198 / +351 939 598 717 Fax +351 21 958-0245 esc.lisboa@sew-eurodrive.pt

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Sambia			
representation: South Africa			
Senegal			
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Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybničná 40 831 06 Bratislava	Tel.+421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 Mobile +421 907 671 976 sew@sew-eurodrive.sk

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South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
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South Korea			
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	Busan	SEW-EURODRIVE KOREA CO., LTD. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
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	Daejeon	SEW-EURODRIVE KOREA CO., LTD. No.302 Hongin officetel, 28, Daehak-ro, Yuseong-gu, Daejeon, Zip 305-710	Tel. +82 42 828-6461 Fax +82 42 828-6463
	Gwangju	SEW-EURODRIVE KOREA CO., LTD. 5fl., Hyundai B/D B, 40, Bungmun-daero, Buk-gu, Gwangju, Zip 500-855	Tel. +82 62 511-9172 Fax +82 62 511-9174
	Seoul	SEW-EURODRIVE KOREA CO., LTD. No.1804 Ace Hiend Tower 8th, 84, Gasan digital 1-ro, Geumcheon-gu, Seoul, Zip 153-797	Tel. +82 2 862-8051 Fax +82 2 862-8199
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

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	Valencia	MEB Músico Andreu i Piqueres, 4 46.900 Torrente (Valencia)	Tel. +34 961 565 493 Fax +34 961 566 688 mebsa.valencia@mebsa.com
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Sales	Gothemburg	SEW-EURODRIVE AB Gustaf Werners gata 8 421 32 Västra Frölunda	Tel. +46 31 709 68 80 Fax +46 31 709 68 93 goteborg@sew.se
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 141 46 Huddinge	Tel. +46 8 449 86 80 Fax +46 8 449 86 93 stockholm@sew.se
	Malmö	SEW-EURODRIVE AB Borrgatan 5 211 24 Malmö	Tel. +46 40 680 64 80 Fax +46 40 680 64 93 malmo@sew.se
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Technical Offices	Rhaetian Switzerland	Patrice Salvi Rue des Ormes 10 2300 La Chaux-de-Fonds	Tel. +41 61 417 17 81 Fax +41 61 417 17 00
	Bern / Solothurn	Rudolf Bühler Muntersweg 5 2540 Grenchen	Tel. +41 32 652 2339 Fax +41 32 652 2331
	Central Switzerland, Aargau	Armin Pfister Stierenweid 4950 Huttwil, BE	Tel. +41 62 962 54 55 Fax +41 62 962 54 56
	Zürich, Ticino	Gian-Michele Muletta Fischerstrasse 61 8132 Egg bei Zürich	Tel. +41 44 994 81 15 Fax +41 44 994 81 16
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	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
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	Khon Kaen	SEW-EURODRIVE (Thailand) Ltd. 4th Floor, Kaow-U-HA MOTOR Bldg, 359/2, Mitraphab Road. Muang District Khonkaen 40000	Tel. +66 43 225745 Fax +66 43 324871 sewthailand@sew-eurodrive.com
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Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
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	Ankara	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti 1368.Cadde Eminel İşmerkezi No: 18/68 İvogsan / Ankara	Tel. +90 312 385 33 90 Fax +90 312 385 32 58
	Bursa	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Üçevler Mah. Bayraktepe Sok. Akay İş Merkezi Kat:3 No: 7/6 Nilüfer / Bursa	Tel. +90 224 443 45 60 Fax +90 224 443 45 58
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	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
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	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	IGLogistics@seweurodrive.com
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Vietnam			
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	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn

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14 Appendix

14.1 Abbreviation key

d_0	Mean diameter of the installed transmission element	mm
F_{A1}	Axial load on HSS	N
F_{A2}	Axial load on LSS	N
F_F	Peak load factor	–
F_R	Overhung load	N
$F_{R\ per}$	Permitted overhung load	N
$F_{R\ max}$	Maximum overhung load	N
F_{Start}	Start factor	–
$F_{S\ min}$	Application-specific service factor	–
F_S	Service factor = MN2 / MK2 = PN1 / PK1	–
f_z	Transmission element factor	–
η	Efficiency	–
H	Installation altitude above sea level	m
HSS	High-speed gear shaft (usually input shaft)	–
i	Gear ratio	–
i_{ex}	Exact gear unit ratio	–
IP...	Degree of protection of electrical instruments	–
$L_{h\ min}$	Required minimum bearing life of the gear unit	h
LSS	Low-speed gear shaft (usually output shaft)	–
M_a	Output torque in relation to motor power	Nm
M_{K1}	Input torque (= operating torque on HSS)	Nm
$M_{K1\ max}$	Peak input torque (= peak operating torque on HSS)	Nm
M_{K2}	Output torque (= operating torque on LSS)	Nm
$M_{K2\ max}$	Peak output torque (= peak operating torque on LSS)	Nm
$M_{K2\ per}$	Permitted peak output torque	Nm
M_M	Nominal motor torque	Nm
M_{N2}	Nominal gear unit torque	Nm
n_1	Input speed	rpm
n_2	Output speed	rpm
n_M	Motor speed	rpm
P_{K1}	Operating power on HSS	kW
$P_{K1\ max}$	Peak operating power on HSS	kW
$P_{K1\ per}$	Permitted peak operating power on HSS	kW
P_{K2}	Operating power on LSS	kW
P_M	Nominal motor power	kW
P_{N1}	Nominal gear unit power (referring to HSS)	kW
t	Time under load within a cycle	s

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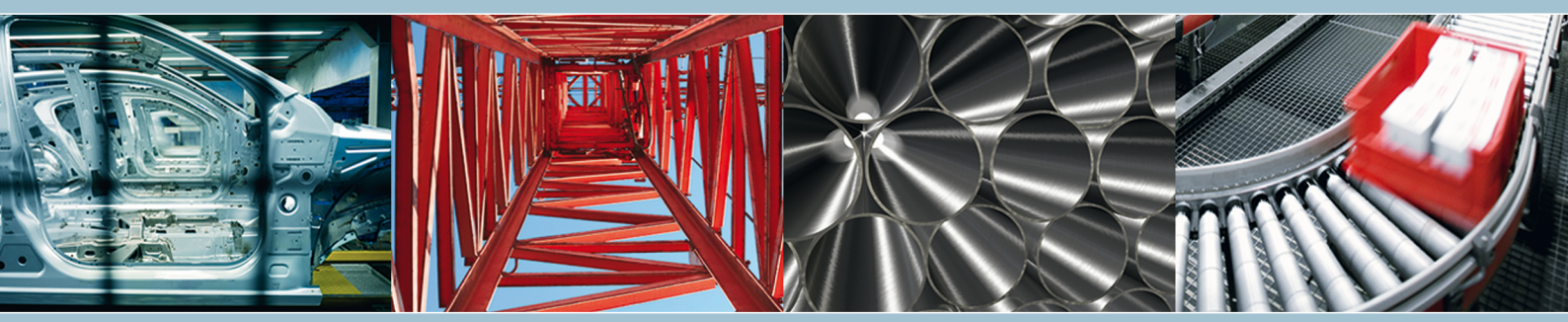
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