



SEW
EURODRIVE

Operating Instructions



Mobile Energy Supply
MOVITRANS® THM20C / THM20E Pick-Ups





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1 General Information

1.1 Use of this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, startup, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of the signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
▲ DANGER	Imminent danger	Severe or fatal injuries
▲ WARNING	Possible dangerous situation	Severe or fatal injuries
▲ CAUTION	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Structure of the section-related safety notes

Section-related safety notes do not apply to a specific action, but to several actions pertaining to one subject. The used symbols indicate either a general or a specific hazard.

This is the formal structure of a section-related safety note:



▲ SIGNAL WORD

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.

1.2.3 Structure of the embedded safety notes

Embedded safety notes are directly integrated in the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- **▲ SIGNAL WORD** Nature and source of hazard.
Possible consequence(s) if disregarded.
– Measure(s) to prevent the danger.



1.3 Rights to claim under limited warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Read the documentation before you start working with the unit!

1.4 Exclusion of liability

You must comply with the information contained in this documentation to ensure safe operation and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

1.5 Copyright

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Unauthorized duplication, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.



2 Safety Notes

2.1 Preliminary information

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and observed.

Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the units, have read through the documentation carefully and understood it. Consult SEW-EURODRIVE if you have any questions or if you require further information.

The following safety notes are primarily concerned with the use of MOVITRANS® units. If you use other SEW components, also refer to the safety notes for the respective components in the corresponding documentation.

Please also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, troubleshooting and maintenance for the units. Further, they are qualified as follows:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- Knowledge of this documentation

Any electronic work may only be performed by adequately qualified electricians. Qualified electricians in this context are persons who are familiar with the electronic installation, startup, troubleshooting and maintenance for the units. Further, they are qualified as follows:

- Training in electrical engineering, e.g. as an electrician or mechatronics technician (final examinations must have been passed).
- Knowledge of this documentation

All work in further areas of transportation, storage, operation and waste disposal may be carried out only by persons who are trained appropriately.



2.4 Designated use

Note the designated use of the following MOVITRANS® units:

- **MOVITRANS® units in general**

MOVITRANS® units are intended for use in industrial and commercial installations for the operation of contactless power transmission systems.

- **THM pick-ups**

In the energy transfer system MOVITRANS®, the THM20C and THM20E pick-ups on the mobile component tap the power without contact from the stationary line cable through magnetic coupling. The THM pick-ups may only be operated with the following designated and suitable units:

- MOVIPRO® drive controller

THM20C and THM20E pick-ups must **not** be connected to the MOVITRANS® TPM12B mobile converter.

Observe all information on the technical data and the permitted conditions where the units are operated.

Do not start up the unit (operate in the designated fashion) until you have established that the machine complies with the EMC Directive 2004/108/EC and that the end product categorically conforms to Machinery Directive 2006/42/EC. Observe standard EN 60204-1.

The rules and regulations of the German employers' liability insurance association ["Berufsgenossenschaft" - BG], in particular BG rules B11 concerning electromagnetic fields, must be observed during installation, startup and operation of systems with contactless energy transfer by induction for use in industrial workplaces.

2.5 Transport

Observe the following instructions when you receive a shipment:

- Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery.
- Inform the shipping company immediately about any damage.
- Do not startup any units if they were damaged in transit.

Observe the following notes for the transportation of MOVITRANS® units:

- Make sure that the units are not subject to mechanical impact during transport.
- Use suitable, sufficiently rated handling equipment.
- Observe the notes on the climatic conditions in the "Technical Data" chapter.
- Remove transport fixtures prior to startup.



2.6 Storage

Observe the following instructions when shutting down or storing MOVITRANS® units:

- Make sure that the units are not subject to mechanical impact during storage.
- Observe the notes on storage temperature in the "Technical Data" chapter.

2.7 Installation

Observe the following notes for installing the MOVITRANS® units:

- Protect the MOVITRANS® units from excessive strain.
- Ensure that components are not deformed and/or insulation spaces are maintained, particularly during transportation and handling.
- Electric components must not be mechanically damaged or destroyed.
- Protect the MOVITRANS® units from direct sunlight.

The following applications are prohibited unless explicitly permitted:

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in applications that are subject to mechanical vibration and shock loads in excess of the requirements in EN 61800-5-1.

2.8 Functional safety technology

MOVITRANS® units may not execute any safety functions without master safety systems.



2.9 Electrical connection

Observe the following notes for the electrical connection of MOVITRANS® units:

- Do not connect or disconnect plug connectors while they are energized.
- Observe applicable national accident prevention guidelines when working on live parts of MOVITRANS® units.
- Perform electrical installation according to the pertinent regulations (e.g. cable cross-sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.
- Protective measures and protection devices must comply with the regulations in force (e.g. EN 60204-1 or EN 61800-5-1).

Required preventive measures:

- Protective separation according to VDE 0100
- Equipotential bonding
- ESD protection

- Take suitable steps to ensure that the preventive measures and protection devices described in the operating instructions for the individual MOVITRANS® units have been implemented correctly.

2.10 Safe disconnection

The MOVIPRO® drive and application controller meets all requirements for reliable isolation of power and electronics connections in accordance with EN 61800-5-1. All connected circuits must also meet the requirements for reliable isolation.



2.11 Startup/operation

Observe the following notes for starting up and operating the MOVITRANS® units:

- Only qualified electricians with the relevant accident prevention training are allowed to perform installation, startup and service work on the unit. They must also comply with the regulations in force (e.g. EN 60204, VBG 4, DIN-VDE 0100/0113/0160).
- Never install damaged units and put them into operation.
- Do not deactivate monitoring and protection devices even for a test run.
- Take suitable measures to ensure that the system does not start up unintentionally when the power supply is switched on.
- During operation, the MOVITRANS® units can have live, bare and movable or rotating parts as well as hot surfaces, depending on their enclosure.
- When the unit is switched on, dangerous voltages are present at the output terminals and at any connected cables, terminals and MOVITRANS® units. Dangerous voltages can be present even when the MOVIPRO® drive and control unit is disabled and the system is at a standstill.
- The fact that the status LED and other display elements are no longer illuminated does not indicate that the unit has been disconnected from the power supply and no longer carries any voltage.
- Safety functions within the unit may cause system standstill. Removing the cause of the problem or performing a reset can result in an automatic restart of the plant. If safety reasons prohibit this action, disconnect the TPS10A stationary converter from the power supply before correcting the fault.
- Dangerous voltages can still be present at the unit inputs and outputs for up to 10 minutes after disconnecting the power supply.
- Do not remove the housing covers.

2.12 Inspection/maintenance

Only SEW-EURODRIVE is authorized to carry out repairs.

Never open the unit.

2.13 Disposal

Observe the latest national regulations in effect!

Dispose of materials separately in accordance with the regulations in force, for example:

- Electronics scrap
- Plastics
- Sheet metal
- Copper
- Aluminum



3 Unit Design

3.1 THM20C unit design

3.1.1 Type designation

The type designation of the MOVITRANS® THM20C pick-up comprises the following characteristic unit data:

T H M 20 C 008 - 490 - 008 - 1

Variant:

1 = Standard

Compensation capacity:

008 = 8 nF

Inductance: 490 = 4.9 mH

Nominal power: 008 = 0.8 kW

Type of pick-up: C = U shape

Series and generation

Type of installation: M = mobile

Component: H = pick-up

Type: T = MOVITRANS®

3.1.2 Short designation

This documentation uses the following short designations:

Unit	Short designation
MOVITRANS® THM20C008-490-008-1 pick-up	THM20C pick-up

3.1.3 Scope of delivery

The scope of delivery includes the following components:

Unit
1 THM20C pick-up
MOVITRANS® THM20C008-490-008-1 pick-up with PBT housing (polybutylene terephthalate)
With permanently installed connection cable including Han® Q 4/2 connector with angled cable outlet (maximum length 6 m (20 ft), depending on order)
With permanently installed connection cable including Han® Q 4/2 connector with straight cable outlet (maximum length 6 m (20 ft), depending on order)

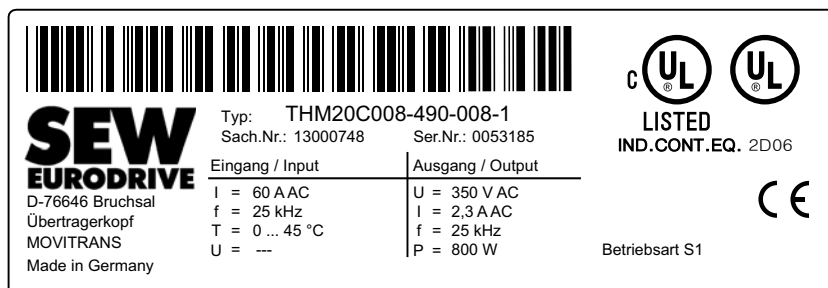


Unit Design

THM20C unit design

3.1.4 Nameplate

The THM20C pick-up has a nameplate that provides important information. The following figure shows the nameplate:

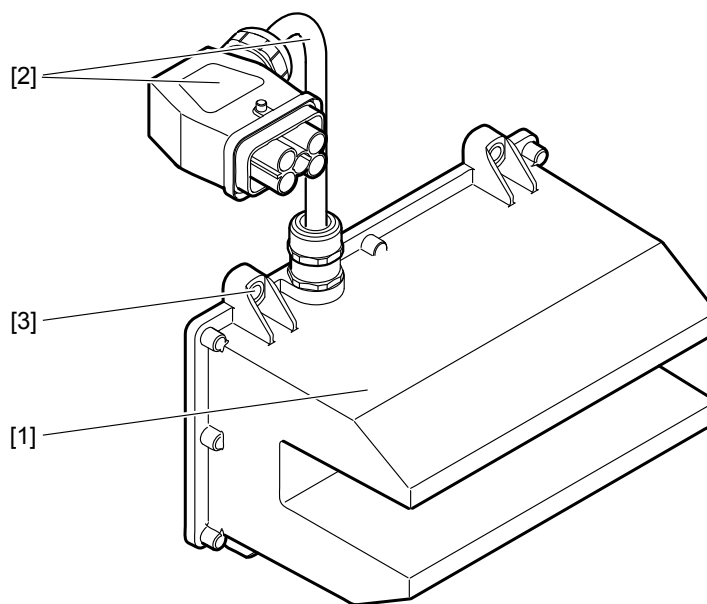


2799663115

Type	Type designation	f	Frequency
U	Voltage	P	Output power
I	Current	T	Ambient temperature

3.1.5 Basic unit

The following figure shows the unit design of the THM20C pick-up:



1530912139

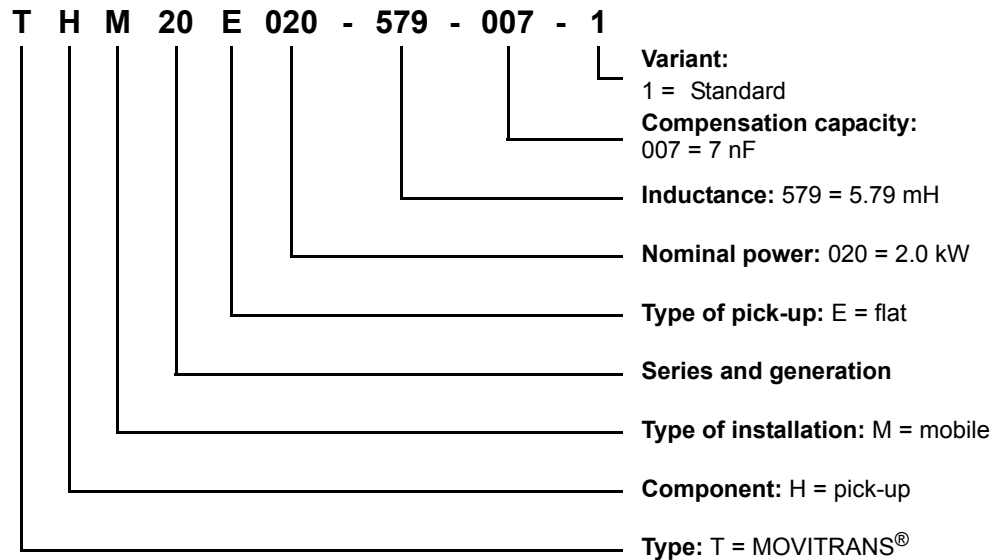
- [1] U-shaped THM20C pick-up
- [2] Permanently installed connection cable including Han® Q 4/2 connector with angled cable outlet; max. length 6 m (max. 20 ft), depending on order
- [3] 4 threaded holes M6 for fastening of THM10C pick-up



3.2 THM20E unit design

3.2.1 Type designation

The type designation of the MOVITRANS® THM20E pick-up comprises the following characteristic unit data:



3.2.2 Short designation

This documentation uses the following short designations:

Unit	Short designation
MOVITRANS® THM20E020-579-007-1 pick-up	THM20E pick-up

3.2.3 Scope of delivery

The scope of delivery includes the following components:

Unit
1 THM20E pick-up
MOVITRANS® THM20E020-579-007-1 pick-up
With permanently installed connection cable with flat plug (max. length 6 m (20 ft), depending on order)
With permanently installed connection cable including Han® Q 4/2 connector with angled cable outlet (max. length 6 m (20 ft), depending on order)
With permanently installed connection cable including Han® Q 4/2 connector with straight cable outlet (max. length 6 m (20 ft), depending on order)

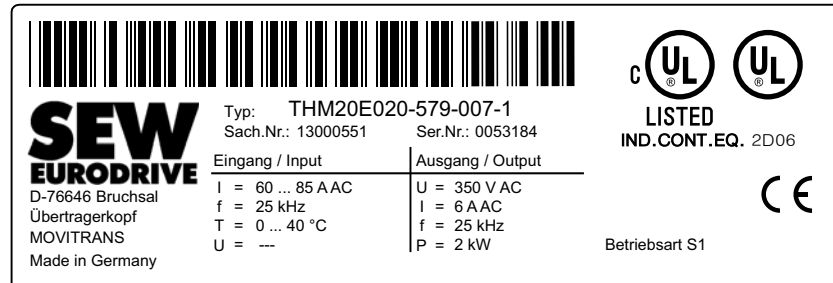


Unit Design

THM20E unit design

3.2.4 Nameplate

The THM20E pick-up has a nameplate that provides important information. The following figure shows an example of a nameplate:

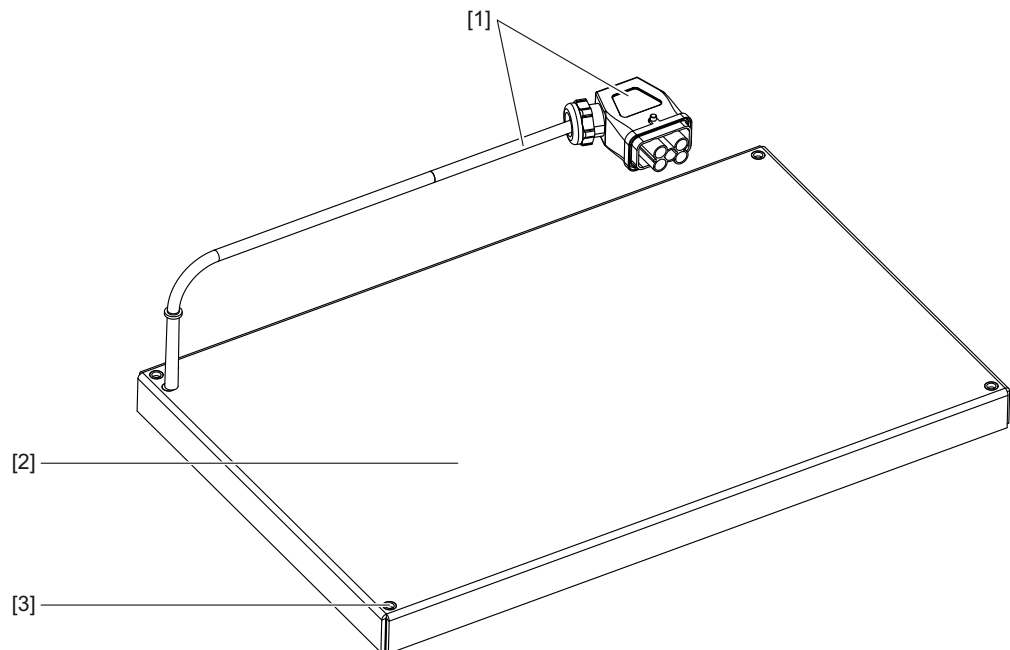


2799665931

Type	Type designation	f	Frequency
U	Voltage	P	Output power
I	Current	T	Ambient temperature

3.2.5 Basic unit

The following figure shows the unit design of the THM20E pick-up:



2803032203

- [1] Permanently installed connection cable including Han® Q 4/2 connector with angled cable outlet; max. length 6 m (max. 20 ft), depending on order
- [2] Flat THM20E pick-up
- [3] Four threaded holes M6 for mounting the THM20E pick-up

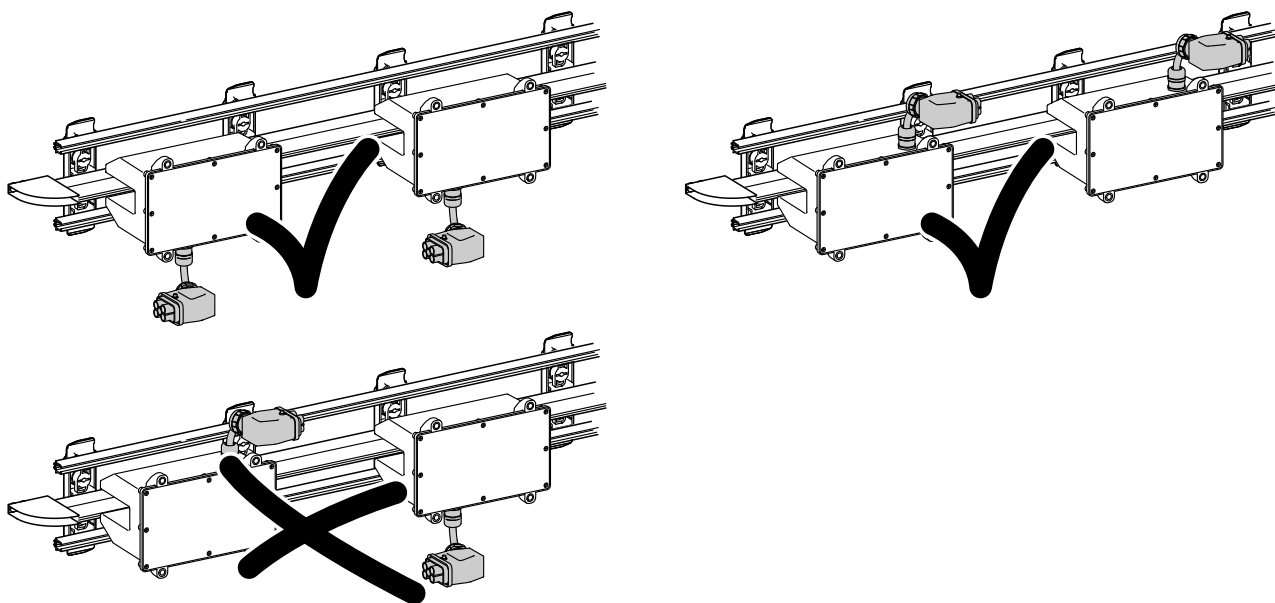


4 Mechanical Installation

4.1 Mechanical installation of THM20C

4.1.1 Mounting position

Make sure that the cable outputs of the THM20C pick-ups connected to the MOVIPRO® drive and control unit are always aligned in the same way with the TLS line cable. When choosing the mounting position, ensure that the cable outputs of the THM20C pick-ups do not point in opposite directions (up and down). They must all either be at the top or at the bottom. The following illustration shows correct and incorrect mounting positions:



1362544267



Mechanical Installation

Mechanical installation of THM20C

4.1.2 Installation

Observe the following installation instructions when mounting the THM20C pick-up:

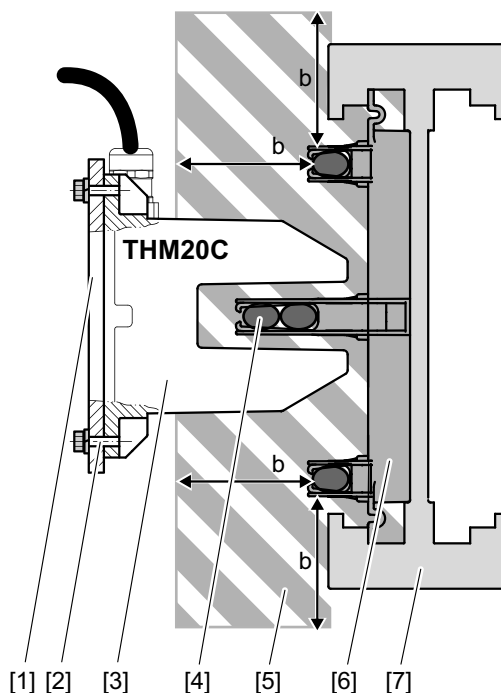
- Install the THM20C pick-up centered and parallel to the installed TLS line cable.
- Avoid lateral and angular misalignment when mounting the THM20C pick-up.
- Mount the THM20C pick-up free from stress. The THM20C pick-up must not be subjected to bending forces.



INFORMATION

The tightening torque for the M6 retaining screws is 3.5 Nm (31 in-lb).

- SEW-EURODRIVE recommends to use holding plates made of aluminum. Only attach the holding plates on the back of the THM20C pick-up. Do not attach the holding plates on the sides.
- Make sure that there is no ferromagnetic or electrically conductive material within a radius of 5 cm (2 in) around the TLS line cable.

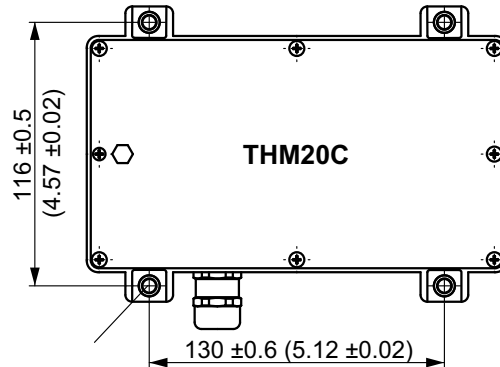


2701695243

- | | | | |
|-----|---|-----|---|
| b | Distance between TLS line cable and ferromagnetic or electrically conductive material = 5 cm (2 in) | [3] | THM20C pick-up |
| [1] | Holding plate | [4] | TLS line cable |
| [2] | M6 retaining screw with lock washer for securing the screw | [5] | Space free from ferromagnetic or electrically conductive material |
| | | [6] | TIS profile section system |
| | | [7] | Aluminum profile rail |



- The space between the THM20C pick-up and the TLS line cable must always be free of metallic materials.
- Observe the following bore dimensions in mm (in):



2701692427

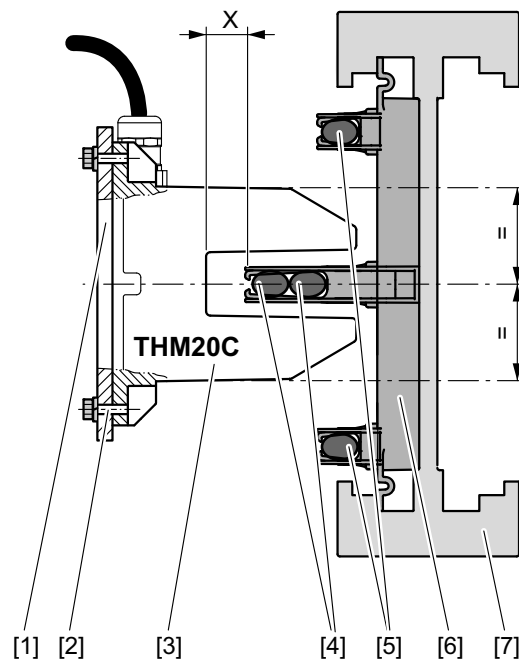
- Best coupling is achieved when the distance x between the TLS line cable and the THM20C pick-up is 19 mm (0.75 in). If you change the distance x, the output power decreases.



INFORMATION

For detailed information about the output power in relation to the distance x, refer to chapter "Technical data of THM20C".

The following figure shows a THM20C pick-up installed in an aluminum structure:



2701748747

- | | |
|--|---|
| x Distance between TLS line cable and THM20C pick-up = 19 mm (0.75 in) | [4] TLS10E008-01-1 line cable (supply conductor) |
| [1] Holding plate | [5] TLS10E008-01-1 line cable (return conductor) |
| [2] M6 retaining screw with lock washer for securing the screw | [6] TIS profile section system |
| [3] THM20C pick-up | [7] Aluminum profile rail (not included in scope of delivery) |

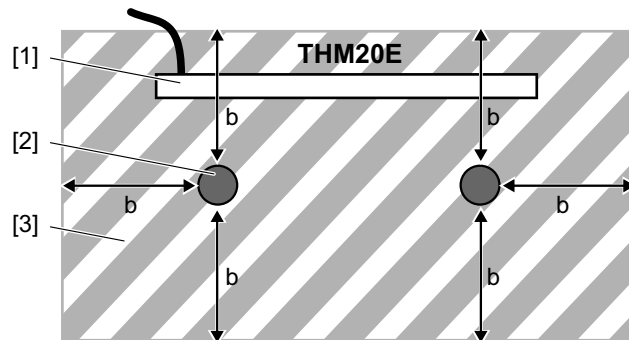


4.2 Mechanical installation of THM20E

4.2.1 Installation

Observe the following installation instructions when mounting the THM20E pick-up:

- Install the THM20E pick-up centered and parallel to the installed TLS line cable.
- Only mount the holding rails above the THM20E pick-up. Do not attach the holding rails on the sides.
- Make sure that there is no ferromagnetic or electrically conductive material within a radius of 8 to 10 cm (3 to 3.9 in) around the TLS line cable.

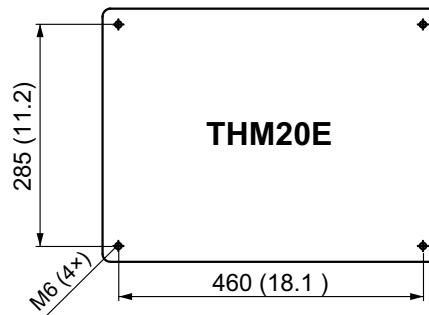


2701794827

b Distance between TLS line cable and ferromagnetic or electrically conductive material = 8 to 10 cm (3 to 3.9 in)

[1] THM20E pick-up
[2] TLS line cable
[3] Space free from ferromagnetic and electrically conductive material

- The space between the THM20E pick-up and the TLS line cables must always be free of metallic materials.
- Observe the following bore dimensions in mm (in):



2701792523



INFORMATION

The tightening torque for the M6 retaining screws is 3.5 Nm (31 in-lb).

- It is essential that you avoid lateral and angular misalignment of the THM20E, as this greatly decreases the transmittable power.



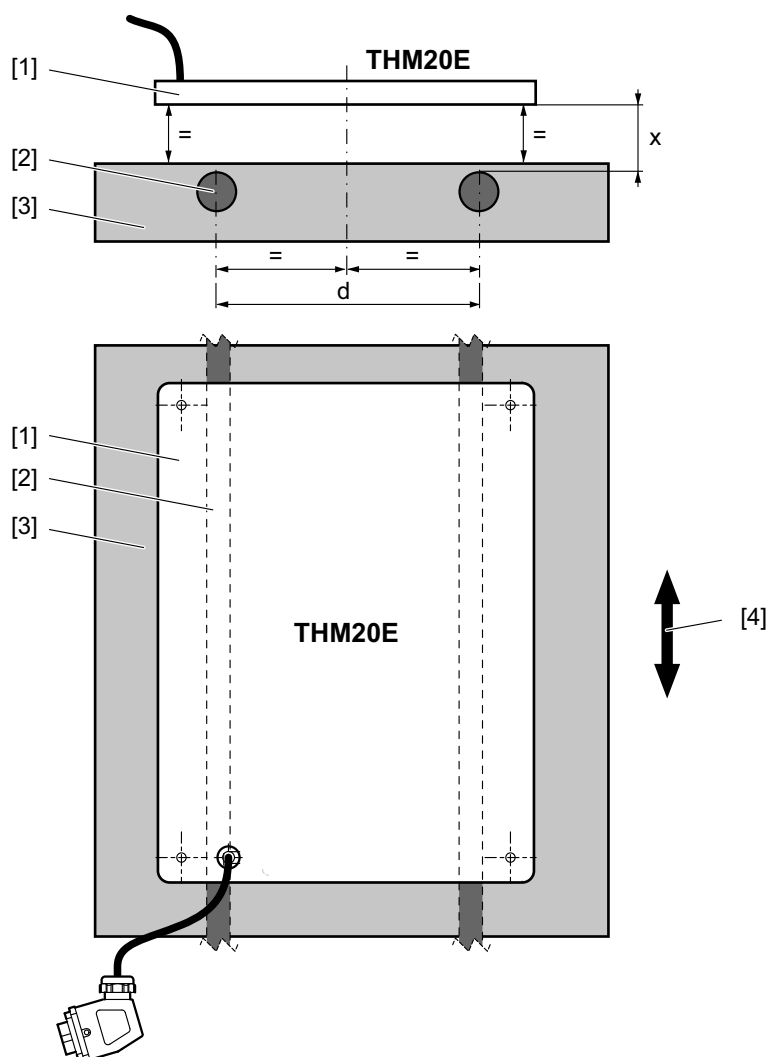
- The distance x between the TLS line cable and the THM20E influences the transmittable power and may not exceed 20 mm (0.79 in).



INFORMATION

For detailed information on the output power, refer to chapter "Technical data of THM20E".

The following figure shows an installed THM20E pick-up:



2701790219

- | | |
|--|---|
| <p>x Distance between TLS line cable and THM20E pick-up
= max. 20 mm (max. 0.79 in)</p> <p>d Distance between the TLS line cables
= 125 mm (4.92 in)</p> | <p>[1] THM20E pick-up</p> <p>[2] TLS line cable</p> <p>[3] E.g. concrete floor</p> <p>[4] Direction of movement</p> |
|--|---|



5 Electrical Installation

5.1 Electrical installation of THM20C

⚠ WARNING



Faulty installation.

Severe or fatal injuries.

- It is essential to comply with the safety notes in chapter 2 during installation.

5.1.1 Wiring diagram

The following table provides information about this connection:

Function		
Connection of the MOVITRANS® THM20C pick-up		
Connection type		
Han® Q 4/2, male		
Wiring diagram		
2444131083		
Assignment		
No.	Name	Function
1	THM pole 1	MOVITRANS® pick-up pole 1
2	n.c.	Not connected
3	THM pole 2	MOVITRANS® pick-up pole 2
4	n.c.	Not connected
11	n.c.	Not connected
12	n.c.	Not connected
PE	PE	PE connection



5.1.2 Connection to a MOVIPRO® drive and application controller

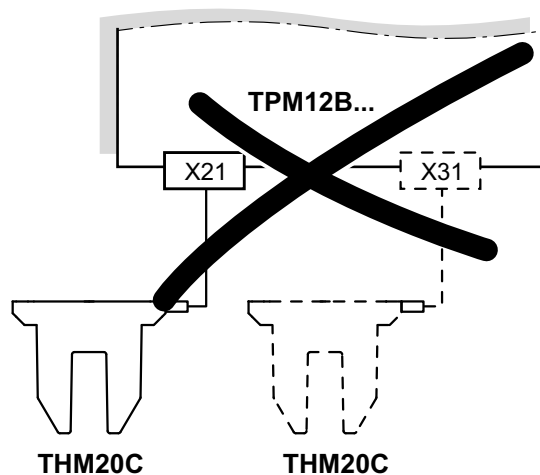
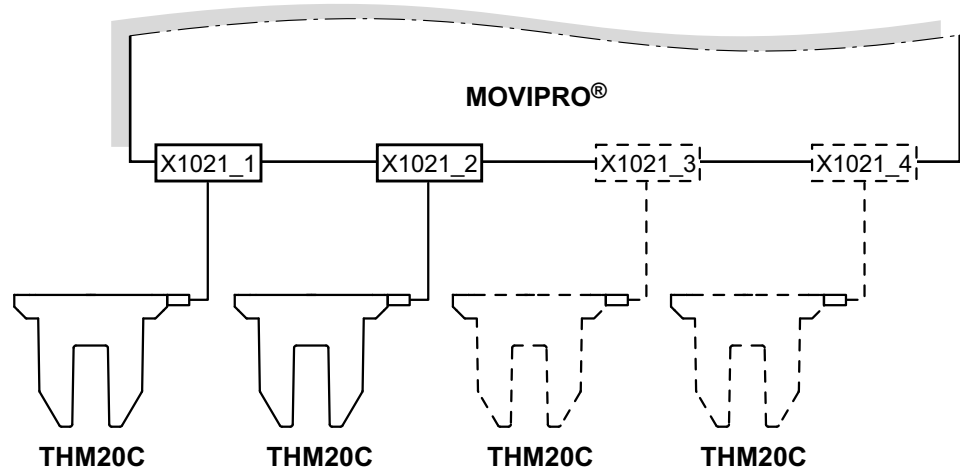
You can also connect the THM20C pick-up to a MOVIPRO® drive and application controller.



NOTICE

Damage to the components when connecting a pick-up to a TPM12B mobile converter
Damage to property

- Do not connect the pick-up to a TPM12B mobile converter.



2704923019



INFORMATION

For detailed information, refer to the relevant MOVIPRO® operating instructions.



Electrical Installation

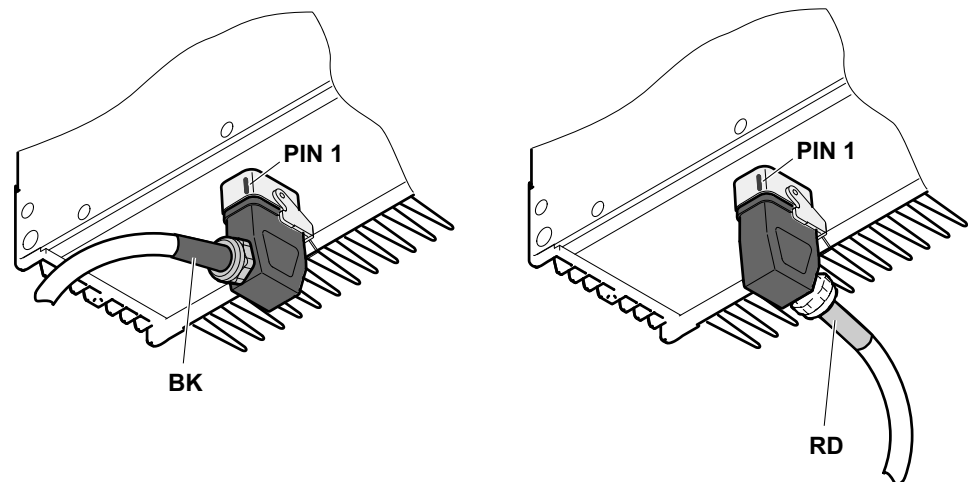
Electrical installation of THM20C

Cable output direction

The pick-ups with angled plug connector are available with different cable output directions. Please specify the respective color code for the required cable output direction in the order:

Cable code	
The cable output is on the same side as PIN 1 of the plug insert.	Black
The cable output is on the opposite side of PIN 1.	Red

The following figure shows the different cable output directions:



2891993611



INFORMATION

For information about the connection cables, refer to chapter "Technical Data".



5.2 Electrical installation of THM20E



⚠ WARNING

Faulty installation.

Severe or fatal injuries.

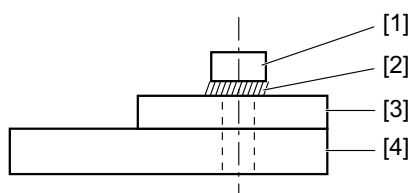
- It is essential to comply with the safety notes in chapter 2 during installation.

5.2.1 Equipotential bonding

You must establish local equipotential bonding between the individual mobile electrical units to prevent excessive contact voltage in the event of a fault.

Install equipotential bonding as follows:

- Connect the THM20E pick-up and all additional units with the reference potential of the mobile unit in line with high-frequency guidelines. Establish a wide-area, metallic contact between the unit housing and the unpainted body of the mobile unit.
- Between the THM20E pick-up and the metallic mounting plate (vehicle support frame), you must establish low-impedance equipotential bonding via a screw connection with a toothed washer on one side at a retaining screw of the THM20E pick-up.



1362553995

- | | | | |
|-----|--|-----|-------------------------------------|
| [1] | Screw | [4] | THM20E pick-up
with screw thread |
| [2] | Tooth lock washer | | |
| [3] | Mounting plate connected to the
central equipotential bonding | | |



5.2.2 Wiring diagram

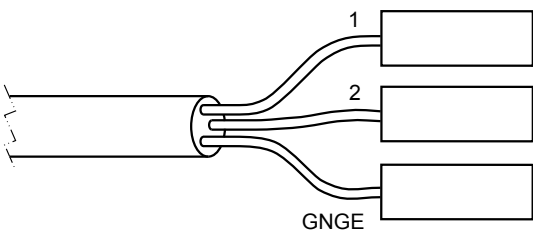


INFORMATION

For information about the connection cables, refer to chapter "Technical Data".

With flat connector

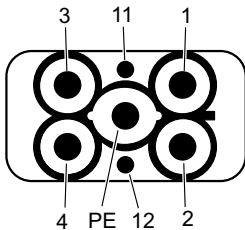
The table below shows the pin assignment of the THM20E connection cable with flat plug:

Function			
Connection of the MOVITRANS® THM20E pick-up			
Connection type			
Flat connector			
Wiring diagram			
			
2712453771			
Assignment			
No.	Color coding	Name	Function
1	Black	THM pole 1	MOVITRANS® pick-up pole 1
2	Black	THM pole 2	MOVITRANS® pick-up pole 2
PE	Green/yellow	PE	PE connection



With angled and straight cable outlet

The following table shows information about the plug connectors of the THM20E connection cables with angled and straight cable outlet:

Function		
Connection of the MOVITRANS® THM20E pick-up		
Connection type		
Han® Q 4/2, male		
Wiring diagram		
		
2444131083		
Assignment		
No.	Name	Function
1	THM pole 1	MOVITRANS® pick-up pole 1
2	n.c.	Not connected
3	THM pole 2	MOVITRANS® pick-up pole 2
4	n.c.	Not connected
11	n.c.	Not connected
12	n.c.	Not connected
PE	PE	PE connection



5.2.3 Connection to a MOVIPRO® drive and application controller

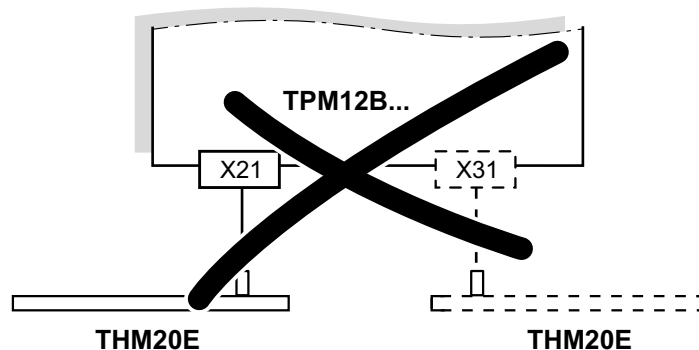
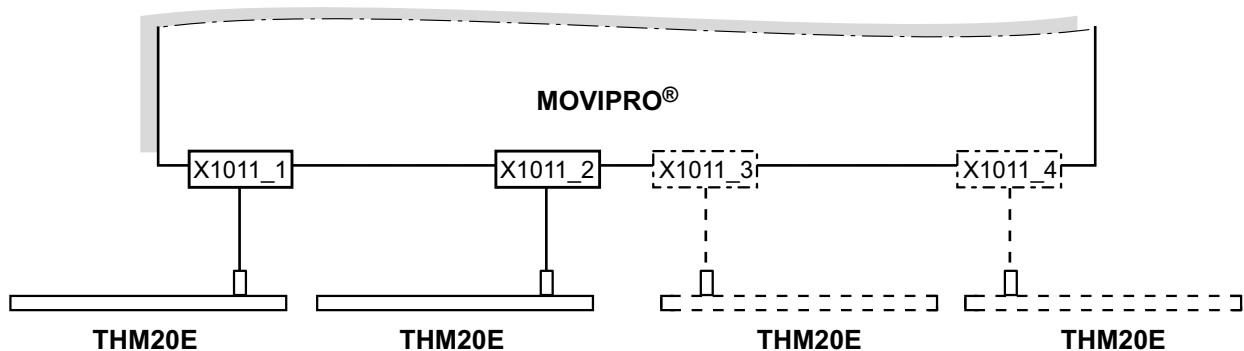
You can also connect the THM20E pick-up to a MOVIPRO® drive and application controller.



NOTICE

Damage to the components when connecting a pick-up to a TPM12B mobile converter
Damage to property

- Do not connect the pick-up to a TPM12B mobile converter.



2705373579



INFORMATION

For detailed information, refer to the relevant MOVIPRO® operating instructions.

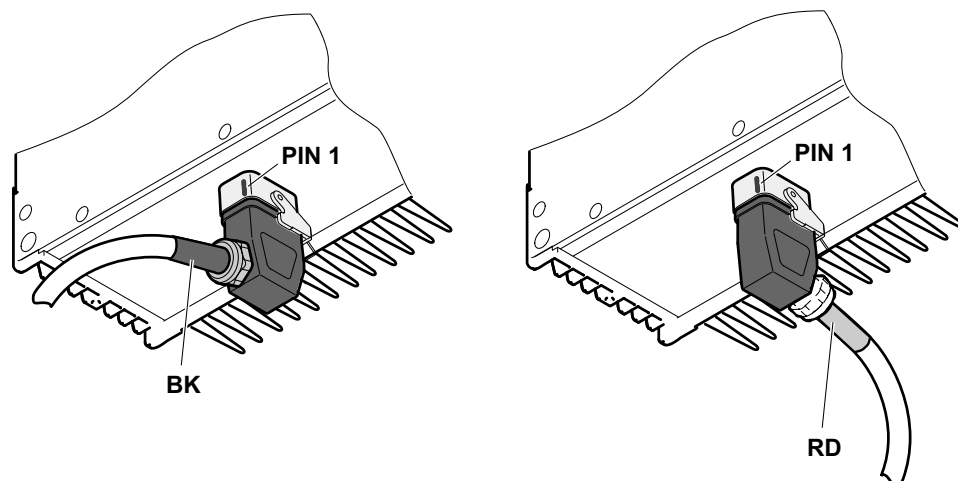


Cable output direction

The pick-ups with angled plug connector are available with different cable output directions. Please specify the respective color code for the required cable output direction in the order:

Cable code	
The cable output is on the same side as PIN 1 of the plug insert.	Black
The cable output is on the opposite side of PIN 1.	Red

The following figure shows the different cable output directions:



2891993611



INFORMATION

For information about the connection cables, refer to chapter "Technical Data".



6 Technical Data

6.1 Technical data of THM20C

6.1.1 Basic unit

The following table shows the general data for the THM20C pick-up:

MOVITRANS® THM20C008-490-008-1		
Ambient conditions		
Climate according to EN 60721-3-3		3K4
Mechanical according to EN 60721-3-3		3M4
Chemical according to EN 60721-3-3		3C2
Ambient temperature	ϑ_A	0 °C – +45 °C (+32 °F – +113 °F)
Storage and transportation temperature	ϑ_S	0 °C – +80 °C (+32 °F – +176 °F)
Degree of protection		IP65
Electrical data		
Line cable nominal current	I_N	AC 60 A
Working frequency	f_l	25 kHz
Nominal output voltage	V_O	AC 350 V
Nominal output current	I_O	AC 2.3 A
Nominal output power	P_N	800 W ¹⁾
Peak output power	P_{max}	1100 W ¹⁾
Nominal power loss	P_L	15 W
Inductance		4.9 mH
Capacity		8 nF
Mechanical data		
Nominal distance between THM20C and line cable	x	19 mm ²⁾ (0.75 in)
Dimensions		See dimension drawing (page 31)
Mass (without connection cable)		2.8 kg (6.8 lb)
Torque for retaining bolts		3.5 Nm (31 in-lb)

- 1) Compare section "Transmittable power" in this chapter
- 2) Compare section "Mounting" in chapter "Mechanical installation of THM20C"

6.1.2 Connection cables

SEW-EURODRIVE offers the following pre-fabricated cables with connector:

Connection cable	
Cable type	3-core cable, Ölflex-FD® 891 3G1,5
Cable length	max. 6 m (20 ft) (depending on order)
Smallest bending radius	≥ 40 mm
Cable cross section	3 x 1.5 mm ²
Connector type	Han® Q 4/2, male



INFORMATION

For additional cable information, refer to the catalogs of the cable manufacturer "LAPP KABEL".



6.1.3 Transmittable power

With the THM20C pick-up, a difference is made between the peak power P_1 ($P_1 > P_N$; $t_1 < 150$ s) and the minimum power P_2 ($P_2 < P_N$).

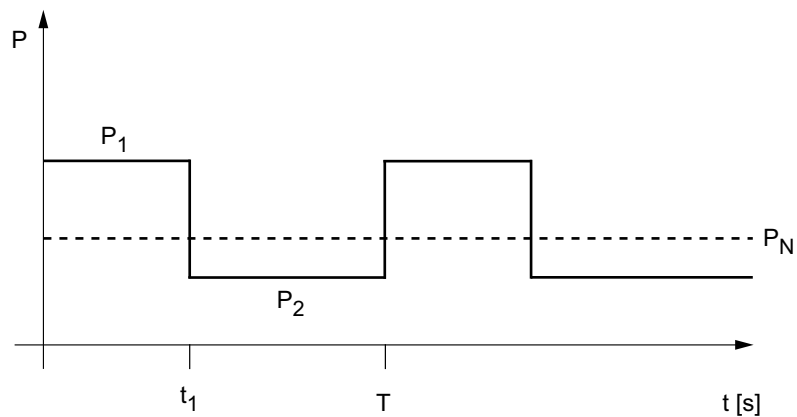
Line cable geometry/distance x between Line cable and THM20C pick-up [mm]	Transmittable power Line cable current = 60 A	
	Peak power P_1 [W]	Nominal power P_N [W]
Straight / 15	1100	800
Straight / 19	1100	800
Straight / 24	1100	800
Straight / 29	1000	700
Straight / 39	700	500
Inner curve with $r = 750$ mm / 19	1100	800
Outer curve with $r = 750$ mm / 19	1100	800
Vertical curve with $\alpha = 7^\circ$ / 19	1100	800

During project planning, you must determine the minimum power P_2 of the THM20C pick-up and the duty factor D:

$$D = \frac{t_1}{T}$$

5048901771

t_1 = cyclic duration factor for peak power $P_1 > P_N$
Maximum cyclic duration factor for peak power $t_1 < 150$ s
T = cycle duration



5048905355



INFORMATION

The following values are based on a distance of $x = 19$ mm between the line cable and the THM20C pick-up. If the actual distance is different, make sure that you do not exceed the peak power P_1 that is listed in the "Transmittable power" table.

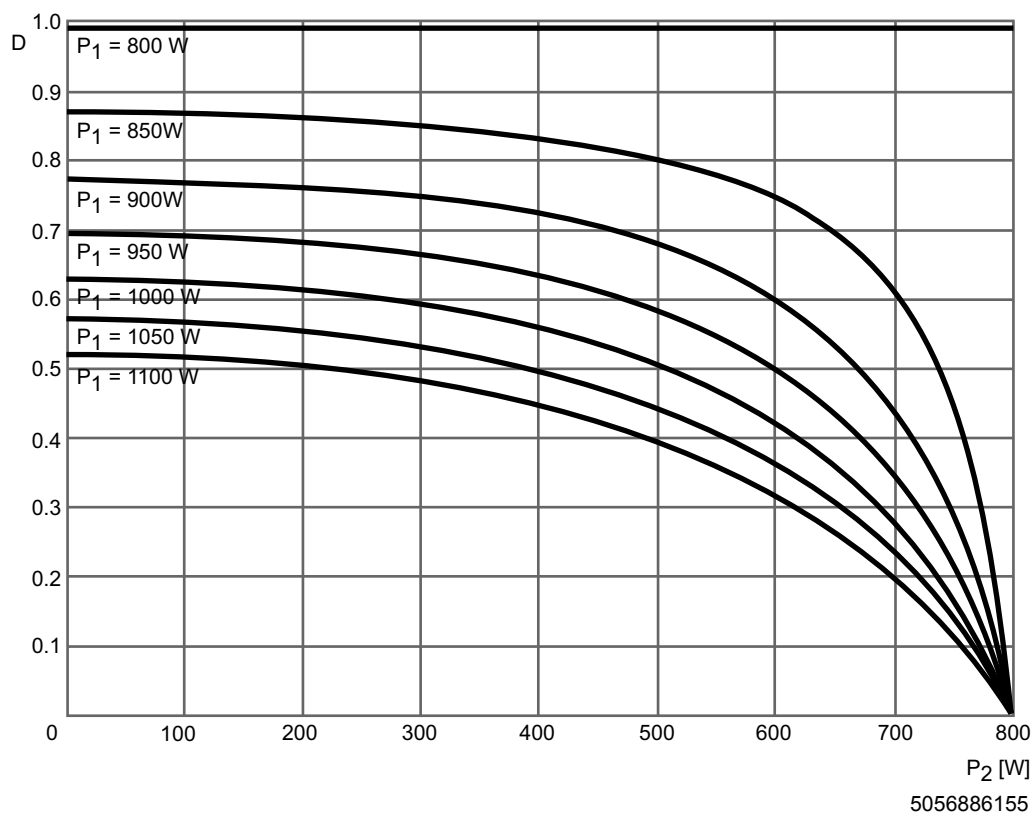


Technical Data

Technical data of THM20C

To prevent the THM20C pick-up from overheating, you must determine the peak power P_1 as a function of the minimum power P_2 and the cycle factor D .

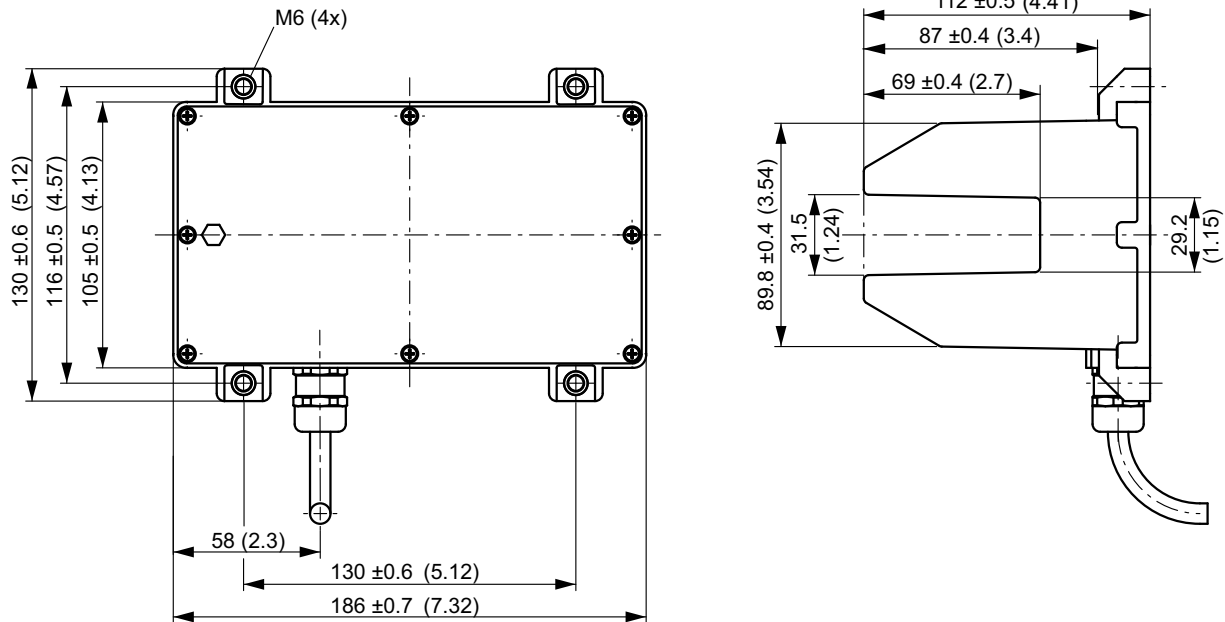
The following figure shows the permitted peak power ratings P_1 :



kVA	n
f	
i	
P	H_z

6.1.4 Dimension drawing

The following figure shows the dimensions of the THM20C pick-up in mm (in):



1532406411



6.2 Technical data of THM20E

6.2.1 Basic unit

The following table shows the general data for the THM20E pick-up:

MOVITRANS® THM20E020-579-007-		
Ambient conditions		
Climate according to EN 60721-3-3		3K4
Mechanical according to EN 60721-3-3		3M4
Chemical according to EN 60721-3-3		3C2
Ambient temperature	ϑ_A	0 °C – +40 °C (+32 °F – +104 °F)
Storage and transportation temperature	ϑ_S	0 °C – +80 °C (+32 °F – +176 °F)
Degree of protection		IP65
Electrical data		
Line cable nominal current	I_N	AC 60 – 85 A
Working frequency	f_l	25 kHz
Nominal output voltage	V_O	AC 350 V
Nominal output current	I_O	AC 2.9 A
Nominal output power	P_N	2000 W ¹⁾
Peak output power	P_{max}	See chapter "Transmittable mean power of THM20E"
Nominal power loss	P_L	20 W
Inductance		5.79 mH
Capacity		7 nF
Mechanical data		
Nominal distance between THM20E and line cable	x	15 mm ²⁾ (0.6 in)
Dimensions		See dimension drawing (page 46)
Mass (without connection cable)		11.2 kg (24.7 lb)
Torque for retaining bolts		3.5 Nm (31 in-lb)

1) cp. section "Transmittable mean power of THM20E" in this chapter

2) cp. section "Mounting" in chapter "Mechanical installation of THM20E"

6.2.2 Connection cables

SEW-EURODRIVE offers the following pre-fabricated cables with connector:

Connection cable	THM20E-020-579-007-1	THM20E-020-579-007-2	THM20E-020-579-007-3
Cable type with UL approval	3-core cable, Ölflex-FD® 891 3G1,5		
Cable length	max. 6 m (20 ft) (depending on order)		
Smallest bending radius	≥ 40 mm		
Cable cross section	3 x 1.5 mm ²		
Connector type	Tab connector, Width 6.3 mm (0.25 in)	Han® Q 4/2, male, With angled cable outlet	Han® Q 4/2, male, With straight cable outlet



INFORMATION

For additional cable information, refer to the catalogs of the cable manufacturer "LAPP KABEL".



6.2.3 THM20E transmittable mean power

Notes on pick-up characteristic curves

During project planning, you have to determine the continuous power P_2 (= actual power) and the peak power P_1 of the pick-up and compare these values with the characteristic curves. To do so, you must know the installation conditions of the pick-up.

Installation requirements

- Installation condition 1 (E_1):
 - The line cable is routed in the floor.
 - The horizontal surface of the pick-up can give off heat via free convection (→ installation correction factor $f_{E1} = 1.0$).
- Installation condition 2 (E_2):
 - The line cable is routed in the floor.
 - Slight air movement (0.5 ms^{-1}) over the entire surface of the pick-up (→ installation correction factor $f_{E2} = 1.25$).

Determining the peak power

What peak power P_1 can you expect with a given continuous power P_2 ?

- You can determine the temperature rise $\Delta\vartheta$ compared to the ambient temperature by means of the temperature rise factor k_1 and the continuous power P_2 of the pick-up.

$$\Delta\vartheta = \frac{k_1 \times P_2}{1000}$$

2716711691

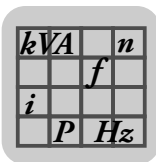
- You can now use the ambient temperature ϑ to determine the pick-up temperature ϑ_K :

$$\vartheta_K = \vartheta + \Delta\vartheta$$

2716714763

Result:

- When the pick-up temperature ϑ_K is below 65°C , the peak power P_1 is available.
- When the pick-up temperature ϑ_K is between 65°C and 85°C , you can interpolate linearly between peak power and continuous power.
- When the pick-up temperature ϑ_K is $> 85^\circ\text{C}$, you will have to use another characteristic curve with a smaller temperature rise factor k_1 .



Determining the permitted continuous power

Which continuous power P_2 is still permitted to ensure a specified peak power P_1 ?

- First of all, you have to use a characteristic curve where the values of the first section are higher than or identical with the required peak power P_1 . Follow the characteristic curve with the value of the ambient temperature ϑ to read off the temperature rise factor k_1 . You can now determine the permitted continuous power P_2 in [W] for installation condition E_1 using the following formula:

$$P_2(E_1) = \frac{(65^\circ\text{C} - \vartheta)}{k_1 \times 1000}$$

2716718475

- In the case of installation condition 2, you can determine the permitted continuous power P_2 using the installation correction factor f_{E2} :

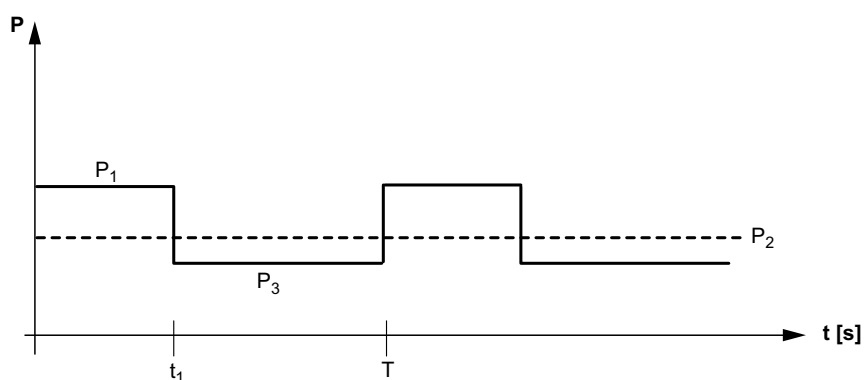
$$P_2(E_2) = f_{E2} \times P_2(E_1)$$

2717108363

Definition of parameters and influencing factors

- Line cable current I_L [A]
- Distance between the bottom of the pick-up and the top of the line cable x [mm]
- Peak power of the pick-up P_1 [W]
- Continuous power of the pick-up P_2 [W]
- Ambient temperature ϑ [$^\circ\text{C}$]
- Installation correction factor f_{E1} , f_{E2} , depending on the installation conditions E_1 , E_2
- Temperature rise $\Delta\vartheta$ of the pick-up compared to the ambient temperature ϑ

The following figure shows the continuous power P_2 of the pick-up:



2712518923



The continuous power of the pick-up is calculated using the following formula:

$$P_2 = \frac{P_1 \times t_1 + P_3 (T - t_1)}{T} \text{ with } t_1 < 400 \text{ s}$$

2712942475

P_1 = Peak power of the pick-up

P_2 = Continuous power of the pick-up

P_3 = Minimal power of the pick-up

t_1 = Time (here: $t_1 < 400$ s) during which the peak power is present at the pick-up

T = Cycle duration

Peak power P_1 as
function of the con-
tinuous power P_2

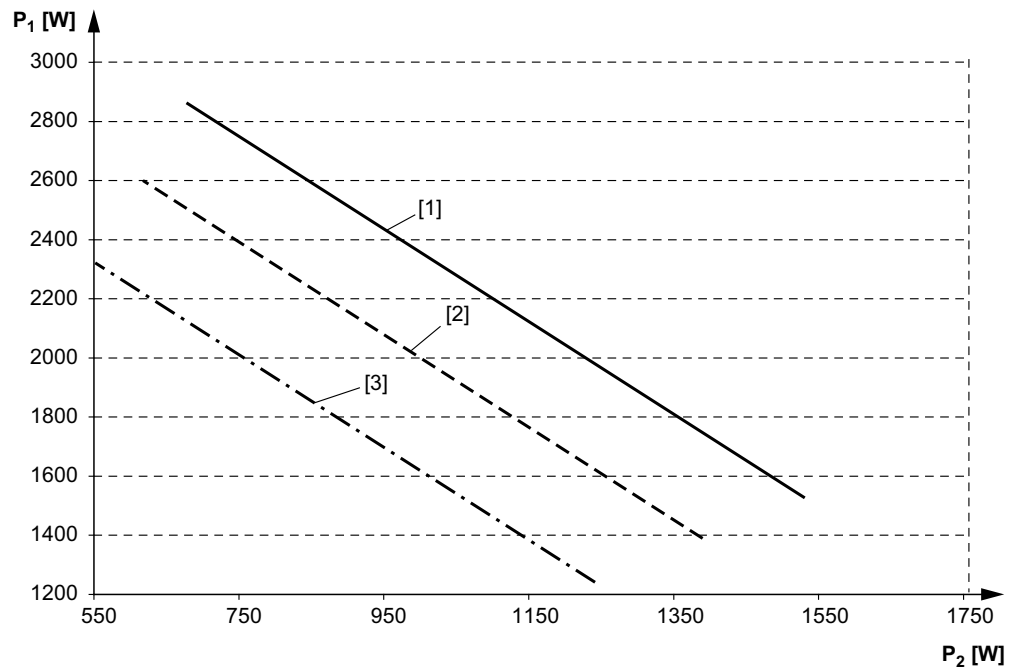
The following characteristic curves show the peak power P_1 of the pick-up as a function of the continuous power P_2 against the following variables:

- Line cable current I_L [A]
- Line cable distance x [mm]

$I_L = 60$ A,
 $\vartheta = 45$ °C, E_1

The following figure shows the peak power P_1 as a function of the continuous power P_2 with the following values:

- Line cable current $I_L = 60$ A
- Ambient temperature $\vartheta = 45$ °C
- Installation condition = E_1

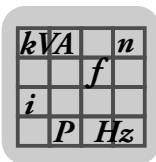


2713083147

[1] $x = 10$ mm

[2] $x = 15$ mm

[3] $x = 20$ mm



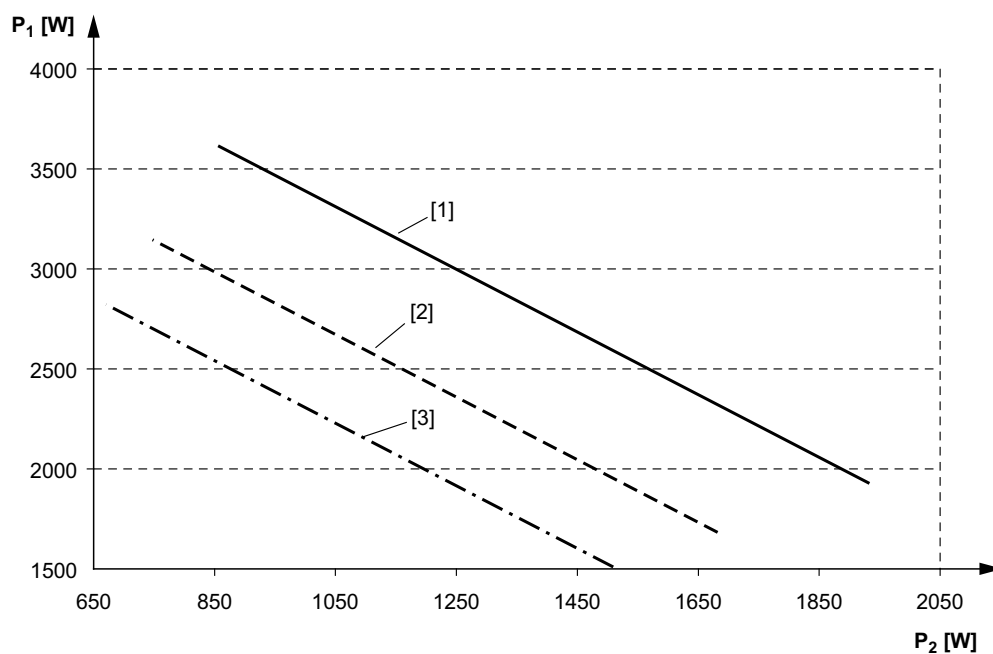
Technical Data

Technical data of THM20E

$I_L = 75 \text{ A}$,
 $\vartheta = 45 \text{ }^\circ\text{C}$, E_1

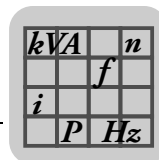
The following figure shows the peak power P_1 as a function of the continuous power P_2 with the following values:

- Line cable current $I_L = 75 \text{ A}$
- Ambient temperature $\vartheta = 45 \text{ }^\circ\text{C}$
- Installation condition = E_1



2713808907

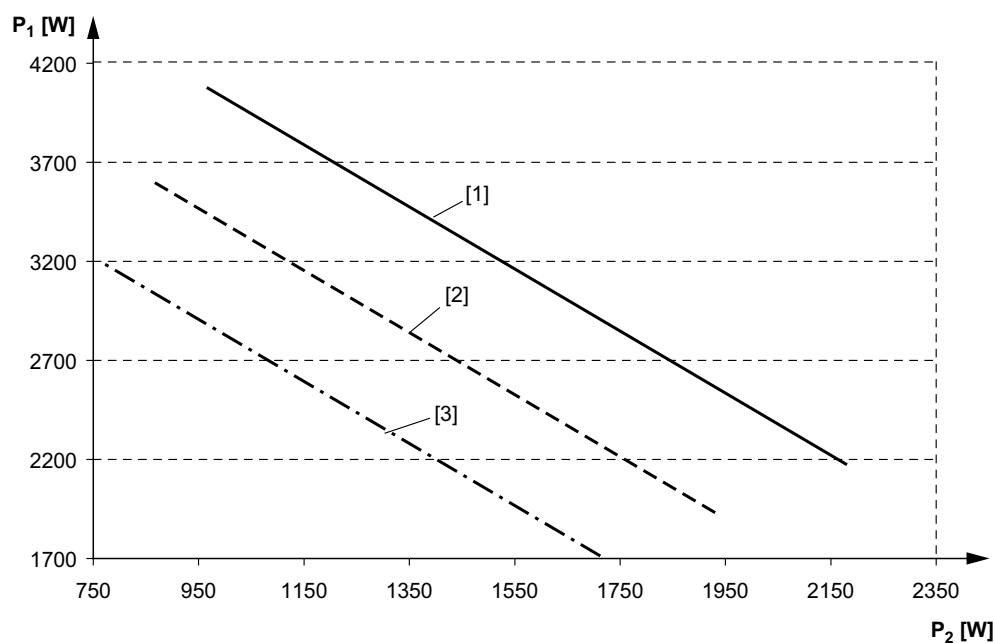
- [1] $x = 10 \text{ mm}$
 [2] $x = 15 \text{ mm}$
 [3] $x = 20 \text{ mm}$



$I_L = 85 \text{ A}$,
 $\vartheta = 45 \text{ °C}$, E_1

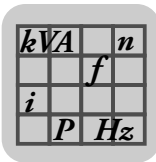
The following figure shows the peak power P_1 as a function of the continuous power P_2 with the following values:

- Line cable current $I_L = 85 \text{ A}$
- Ambient temperature $\vartheta = 45 \text{ °C}$
- Installation condition = E_1



2713814539

- [1] $x = 10 \text{ mm}$
 [2] $x = 15 \text{ mm}$
 [3] $x = 20 \text{ mm}$



Pick-up characteristic curves

The following characteristic curves show the transmittable power P_4 of the pick-up against the following values:

- Ambient temperature ϑ [°C]
- Time under load t [s]
- Line cable current I_L [A]
- Line cable distance x [mm]
- Temperature rise factor k_1

i

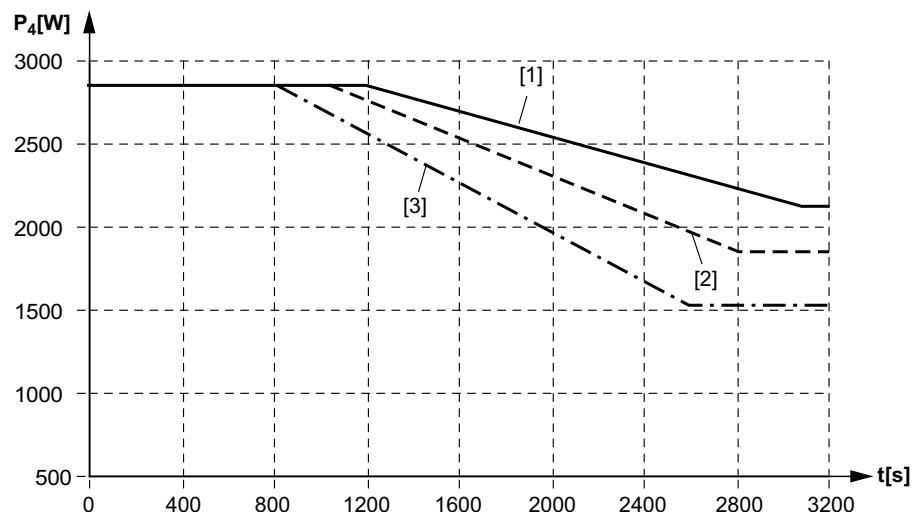
INFORMATION

- The first inflection point of the characteristic curve occurs at a pick-up temperature ϑ_K of 65 °C. From this point on, the pick-up power P_4 decreases with increasing pick-up temperature ϑ_K almost linearly with the pick-up temperature ϑ_K .
- The second inflection point of the characteristic curves occurs at the maximum pick-up temperature ϑ_K of 85 °C. At this temperature, the maximum continuous power P_2 is reached at the corresponding ambient temperature. The temperature rise factor k_1 determines the magnitude of the temperature rise $\Delta\vartheta$ compared to the ambient temperature ϑ , based on the transmitted continuous power P_2 .
- The temperature values ϑ in the characteristic curves refer to installation condition E_1 (→ chapter "Notes on pick-up characteristic curves" (page 33)).

Transmittable power at $I_L = 60$ A,
 $x = 10$ mm

The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 60$ A
- Line cable distance $x = 10$ mm



2714152203

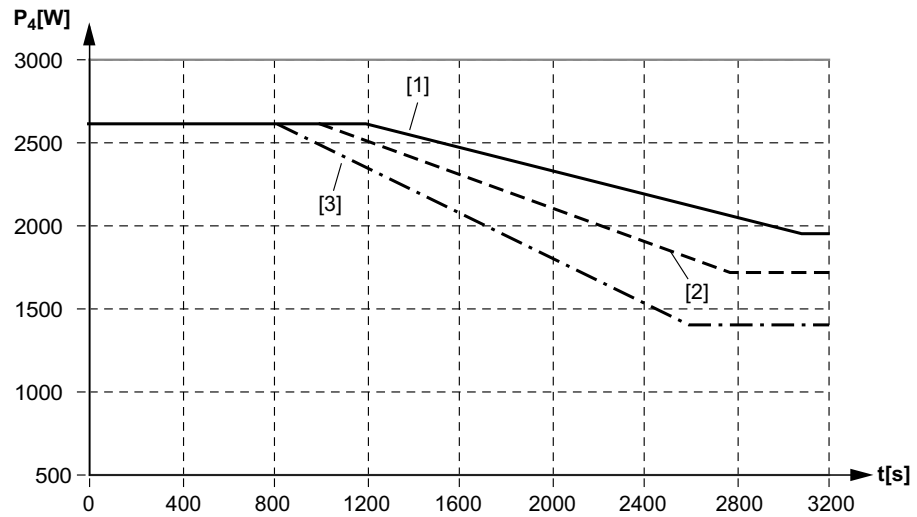
- [1] $\vartheta = 20$ °C / $k_1 = 32$
- [2] $\vartheta = 30$ °C / $k_1 = 29.4$
- [3] $\vartheta = 45$ °C / $k_1 = 32.6$



Transmittable
power at $I_L = 60\text{ A}$,
 $x = 15\text{ mm}$

The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 60\text{ A}$
- Line cable distance $x = 15\text{ mm}$



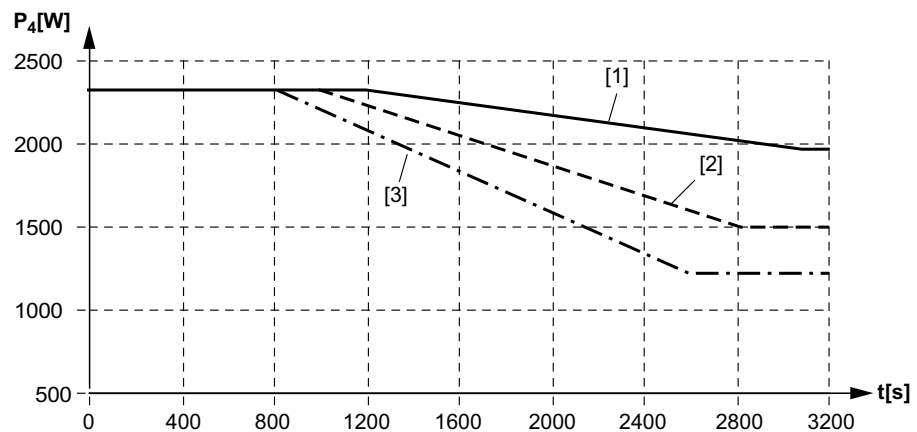
2714156043

- [1] $\vartheta = 20\text{ °C} / k_1 = 35.3$
- [2] $\vartheta = 30\text{ °C} / k_1 = 32.4$
- [3] $\vartheta = 45\text{ °C} / k_1 = 35.9$

Transmittable
power at $I_L = 60\text{ A}$,
 $x = 20\text{ mm}$

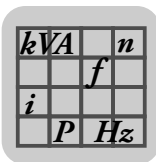
The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 60\text{ A}$
- Line cable distance $x = 20\text{ mm}$



2714687755

- [1] $\vartheta = 20\text{ °C} / k_1 = 39.5$
- [2] $\vartheta = 30\text{ °C} / k_1 = 36.3$
- [3] $\vartheta = 45\text{ °C} / k_1 = 40.2$



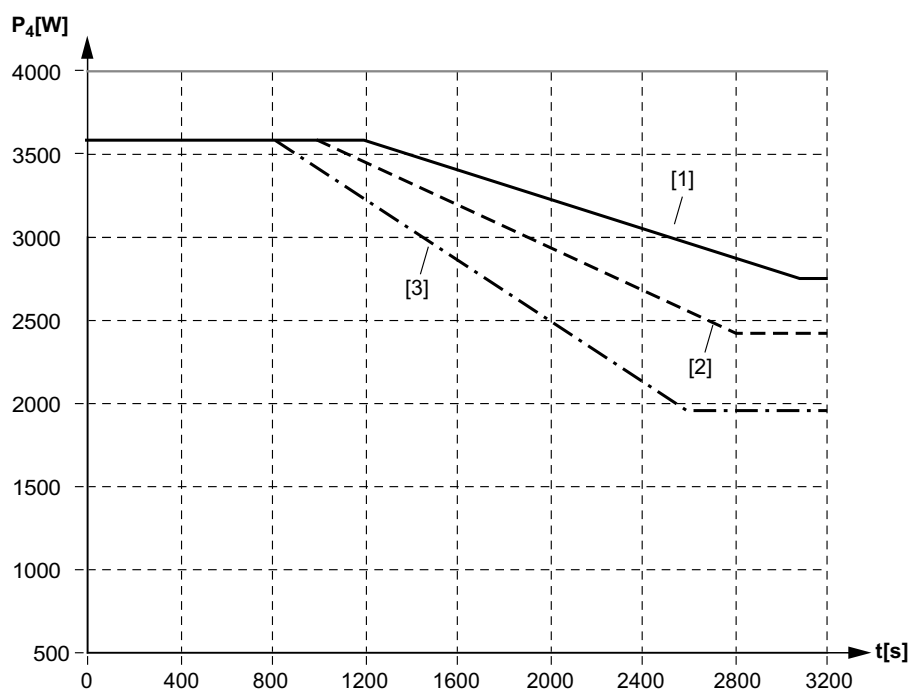
Technical Data

Technical data of THM20E

Transmittable
power at $I_L = 75\text{ A}$,
 $x = 10\text{ mm}$

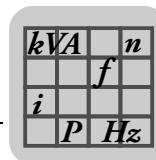
The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 75\text{ A}$
- Line cable distance $x = 10\text{ mm}$



2714692235

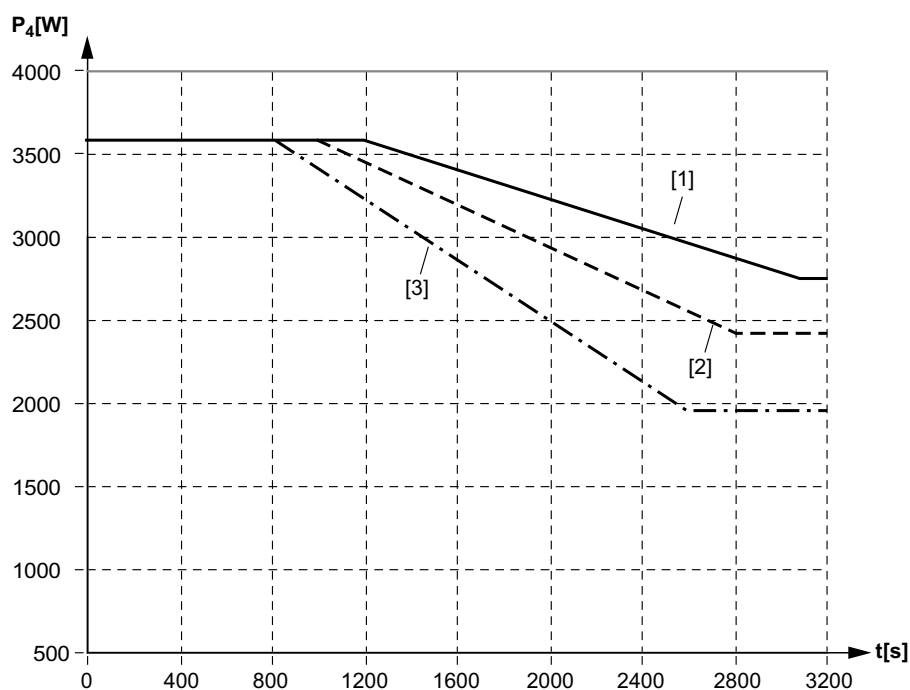
- [1] $\vartheta = 20\text{ °C} / k_1 = 25.4$
 [2] $\vartheta = 30\text{ °C} / k_1 = 23.3$
 [3] $\vartheta = 45\text{ °C} / k_1 = 25.8$



Transmittable
power at $I_L = 75\text{ A}$,
 $x = 15\text{ mm}$

The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 75\text{ A}$
- Line cable distance $x = 15\text{ mm}$



2714700299

- [1] $\vartheta = 20\text{ °C} / k_1 = 29.2$
- [2] $\vartheta = 30\text{ °C} / k_1 = 26.8$
- [3] $\vartheta = 45\text{ °C} / k_1 = 29.7$



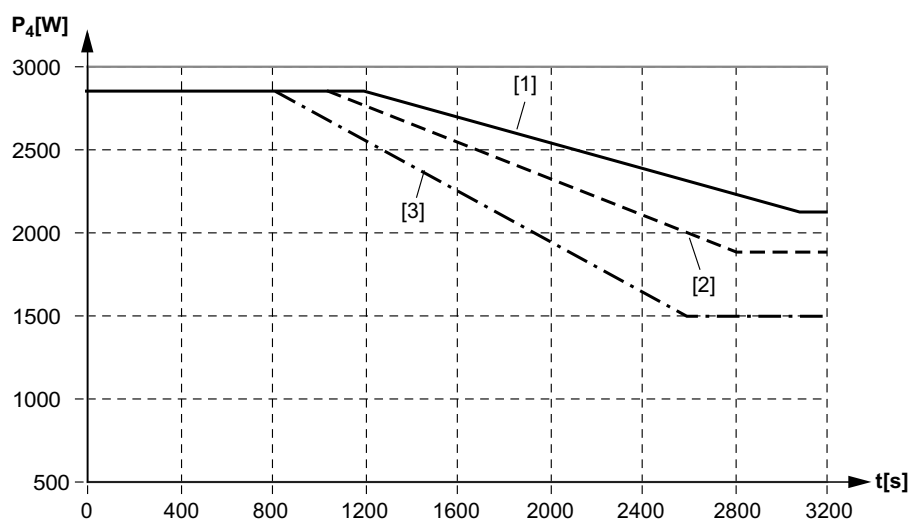
Technical Data

Technical data of THM20E

Transmittable
power at $I_L = 75\text{ A}$,
 $x = 20\text{ mm}$

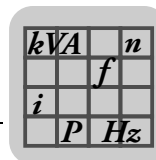
The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 75\text{ A}$
- Line cable distance $x = 20\text{ mm}$



2714708235

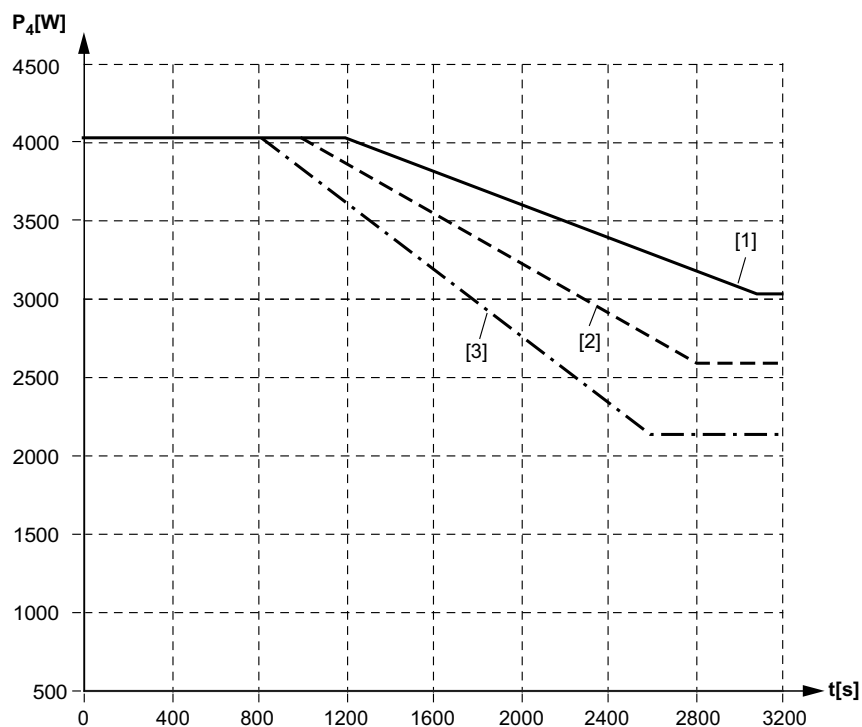
- [1] $\vartheta = 20\text{ °C} / k_1 = 32.5$
 [2] $\vartheta = 30\text{ °C} / k_1 = 29.8$
 [3] $\vartheta = 45\text{ °C} / k_1 = 33.1$



Transmittable
power at $I_L = 85\text{ A}$,
 $x = 10\text{ mm}$

The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 85\text{ A}$
- Line cable distance $x = 10\text{ mm}$



2714716683

- [1] $\vartheta = 20\text{ °C} / k_1 = 22.5$
 [2] $\vartheta = 30\text{ °C} / k_1 = 20.7$
 [3] $\vartheta = 45\text{ °C} / k_1 = 22.9$



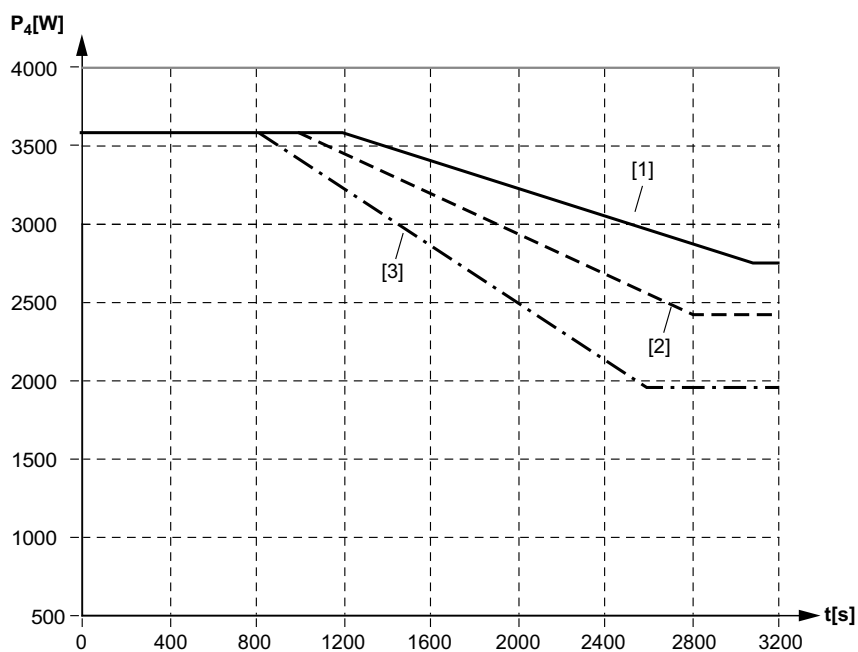
Technical Data

Technical data of THM20E

Transmittable
power at $I_L = 85\text{ A}$,
 $x = 15\text{ mm}$

The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 85\text{ A}$
- Line cable distance $x = 15\text{ mm}$



2714722827

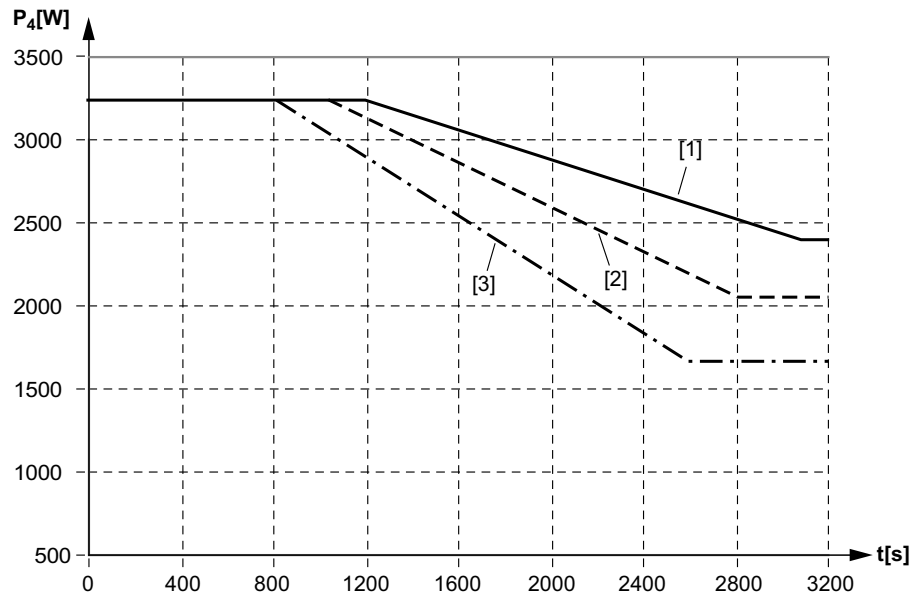
- [1] $\vartheta = 20\text{ °C} / k_1 = 25.4$
 [2] $\vartheta = 30\text{ °C} / k_1 = 23.3$
 [3] $\vartheta = 45\text{ °C} / k_1 = 22.9$



Transmittable
power at $I_L = 85\text{ A}$,
 $x = 20\text{ mm}$

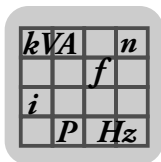
The following figure shows the transmittable power for the following values:

- Line cable current $I_L = 85\text{ A}$
- Line cable distance $x = 20\text{ mm}$



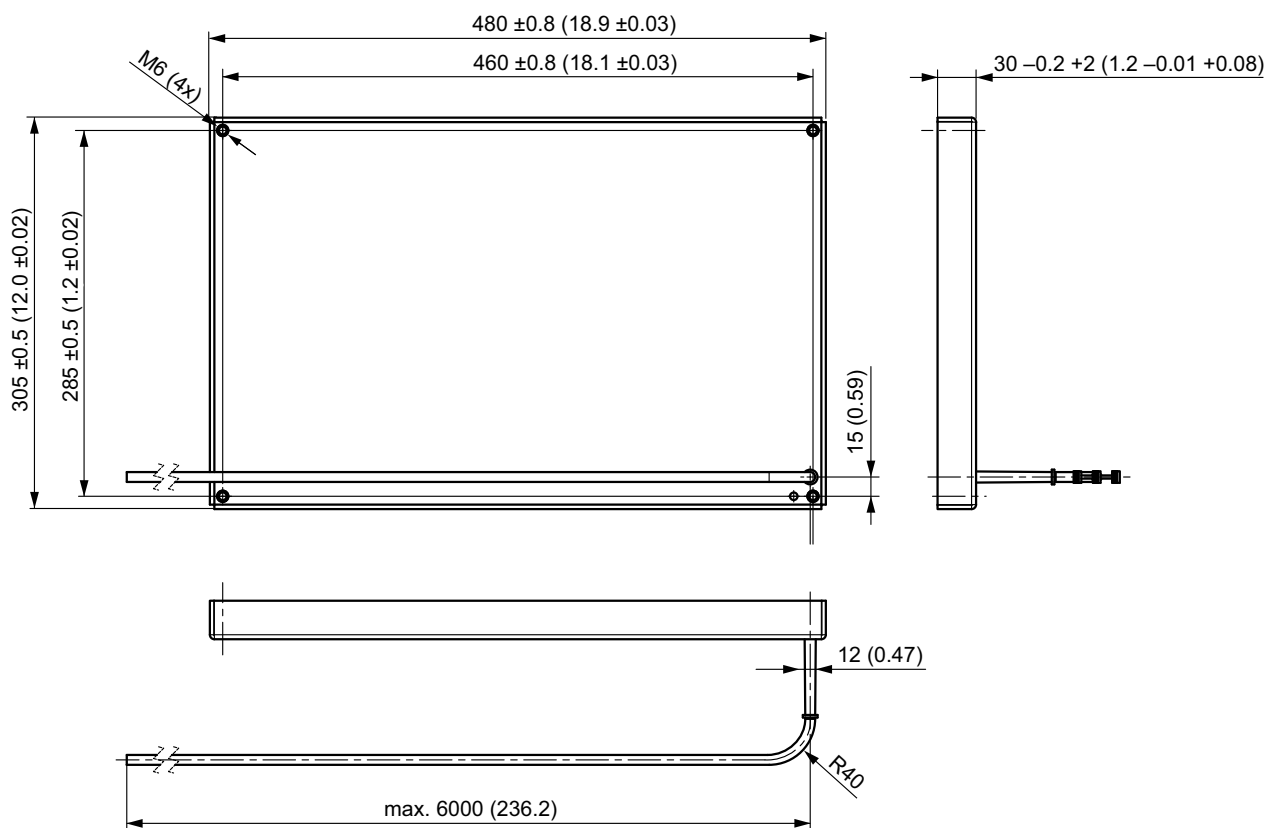
2714731915

- [1] $\vartheta = 20\text{ °C} / k_1 = 28.6$
 [2] $\vartheta = 30\text{ °C} / k_1 = 26.3$
 [3] $\vartheta = 45\text{ °C} / k_1 = 29.1$



6.2.4 Dimension drawing

The following figure shows the dimensions of the THM20E pick-up in mm (in):



2712514059



7 Address List

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	Central	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357 14 euro cents/min on the German land-line network. Max 42 euro cents/min from a German mobile network. Prices for mobile and international calls may differ.
	Additional addresses for service in Germany provided on request!		

France			
Production Sales Service	Haguenau	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocomme.com sew@usocomme.com
Production	Forbach	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15



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	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
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Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
Austria			
Assembly Sales Service	Wien	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
Belarus			
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Belgium			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be
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Sales	Douala	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 33 431137 Fax +237 33 431137 electrojemba@yahoo.fr
Canada			
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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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	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn



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Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Sales	Prague	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Lužná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 255 709 601 Fax +420 220 121 237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
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Estonia			
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Gabon			
Sales	Libreville	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr



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Greece			
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Sales	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
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Assembly Sales Service	Solaro	SEW-EURODRIVE di R. Blicke & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it



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Kazakhstan			
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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 info@medrives.com http://www.medrives.com
Lithuania			
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Luxembourg			
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Netherlands			
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	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferryroad Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Norway			
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Peru			
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	Service	Tel. +48 42 6765332 / 42 6765343 Fax +48 42 6765346	Linia serwisowa Hotline 24H Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
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Senegal			
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Serbia			
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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
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	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
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	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
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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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Sales	Ho Chi Minh City	All sectors except for ports, mining and off-shore: Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn



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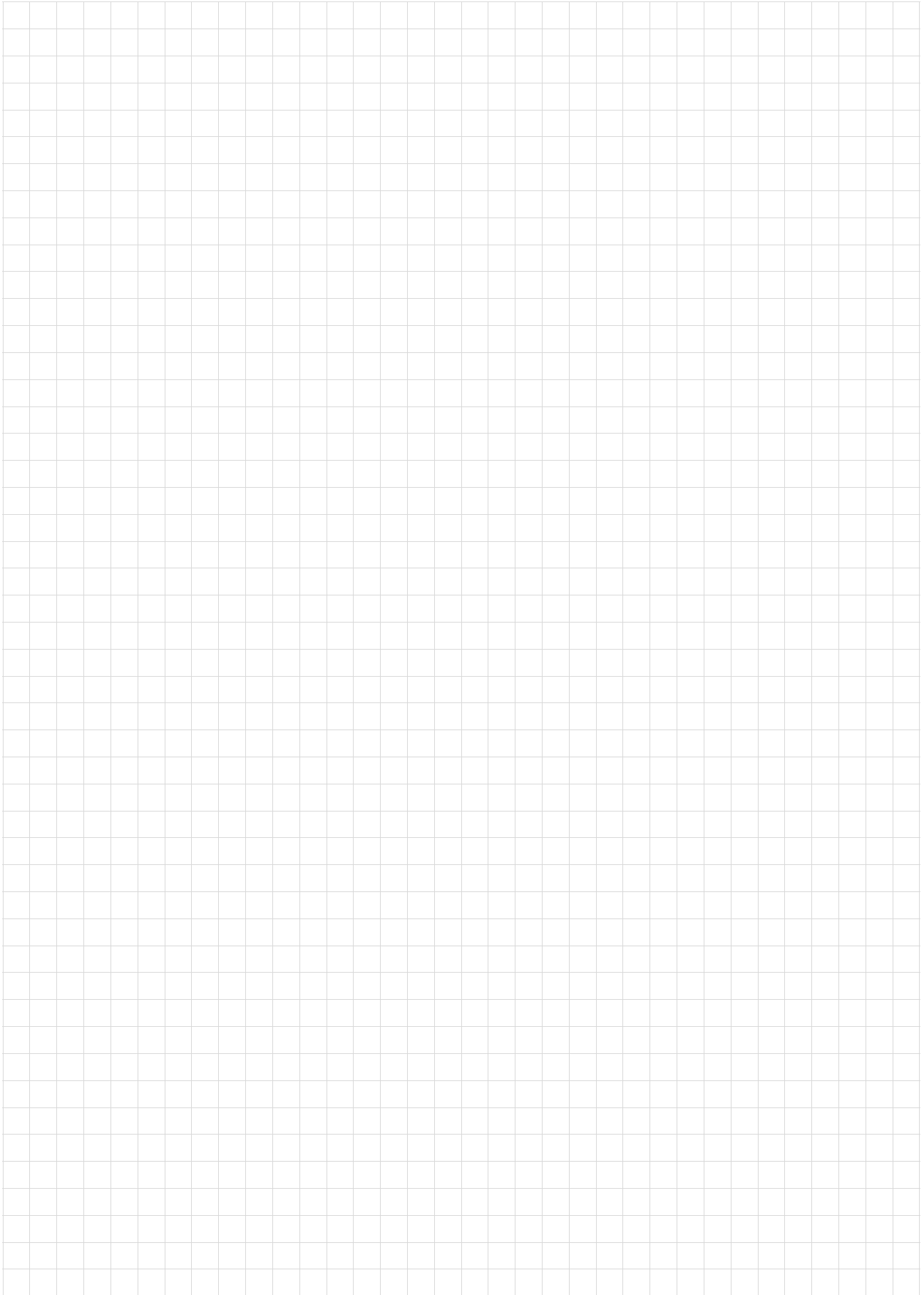
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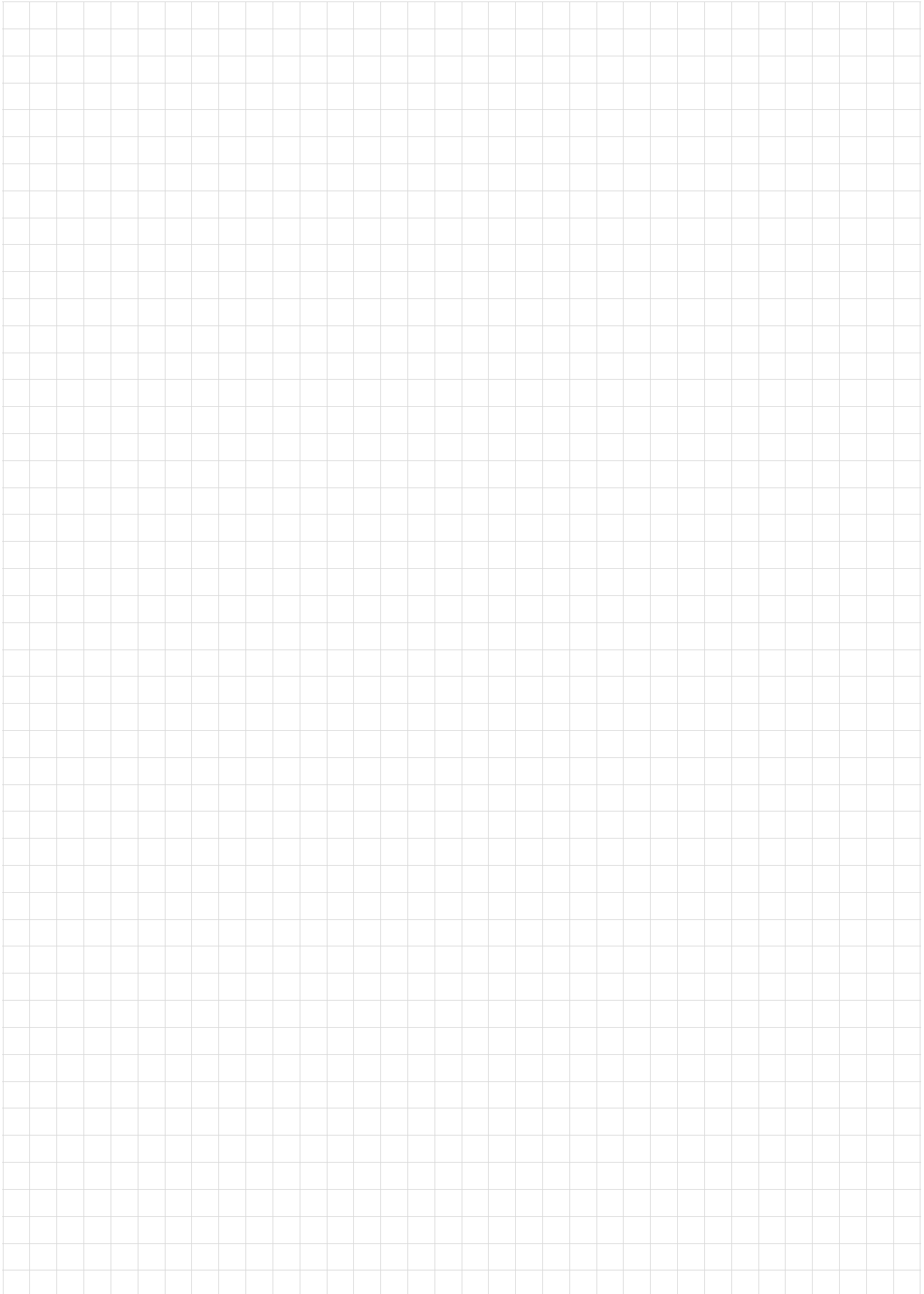
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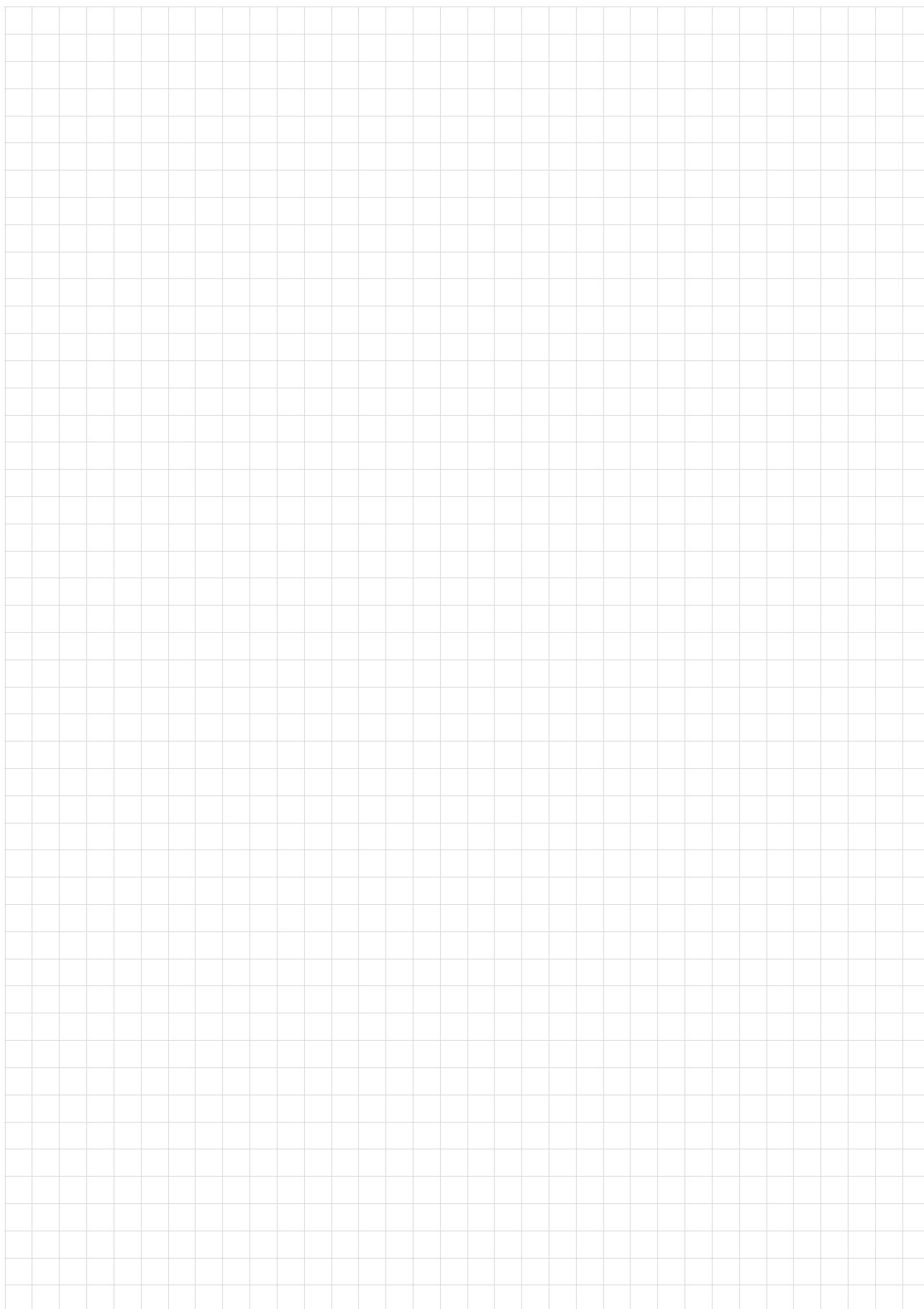
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