



5 DR Series AC Motors/Brakemotors

5.1 Notes on the data of energy-efficient motors

The following table lists the short symbols used in the "Technical Data" tables.

P_N	Rated power
M_N	Rated torque
n_N	Rated speed
I_N	Rated current
$\cos\varphi$	Power factor
$\eta_{75\%}$	Efficiency at 75% of the rated power
$\eta_{100\%}$	Efficiency at 100% of the rated power
I_A/I_N	Starting current ratio
M_A/M_N	Starting torque ratio
M_H/M_N	Ramp-up torque ratio
m	Mass of the motor
J_{Mot}	Mass moment of inertia of the motor
BE..	Brake used
Z_0 BG	Switching frequency for operation with BG brake controller
Z_0 BGE	Switching frequency for operation with BGE brake controller
M_B	Braking torque
m_B	Mass of the brakemotor
J_{MOT_BE}	Mass moment of inertia of the brakemotor



DR Series AC Motors/Brakemotors

Technical data of 2-pole energy-efficient motors

5.2 Technical data of 2-pole energy-efficient motors

DRS: 3000 rpm - S1 IE1

Motor type DRS	P_N	M_N	n_N	I_N 400 V	I_N 380-420 V	$\cos\phi$	IE class	$\eta_{75\%}$ $\eta_{100\%}$	I_A/I_N	M_A/M_N M_H/M_N	m [kg] ²	J_{Mot} [10 ⁻⁴ kgm ²]
	[kW]	[Nm]	[rpm]	[A]	[A]			[%] ¹⁾				
DRS71M2	0.55	1.87	2810	1.37	1.42	0.79	–	73.5 72.9	4.9	2.9 2.1	9.1	7.1
DRS80S2	0.75	2.55	2800	1.73	1.78	0.84	IE1	74.6 74.4	4.6	2.5 2.3	11.5	14.9
DRS80M2	1.1	3.7	2840	2.35	2.4	0.88	IE1	77.7 76.5	6	2.7 2.5	14.3	21.5
DRS90M2	1.5	5.1	2830	3.1	3.2	0.89	IE1	80 78.3	5.9	2.7 2.6	18.4	35.5
DRS90L2	2.2	7.4	2820	4.45	4.6	0.89	IE1	82.8 80.5	5.8	2.9 2.5	21.5	43.5
DRS100M2	3	10.1	2840	5.8	6	0.91	IE1	84.6 82.5	6.4	3.1 2.8	26	56
DRS100LC2	4	13.2	2900	7.8	8	0.88	IE1	85.6 84.2	7.7	2.7 2.1	31	90
DRS112M2	4	13.2	2900	7.6	7.9	0.89	IE1	85.9 84.8	6.3	2.3 2.1	41.5	113
DRS132S2	5.5	18.2	2890	10.2	10.7	0.91	IE1	87 85.5	6.5	2.3 2.1	44	146
DRS132M2	7.5	24.5	2910	13.7	14.4	0.91	IE1	87.8 86.5	7.3	2.5 2.3	60	193
DRS132M2	9.2	30.5	2900	16.9	17.6	0.89	IE1	88.8 87.2	6.9	2.5 2.5	60	193

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRS.../FI..)

DRE: 3000 rpm - S1 IE2

Motor type DRE	P_N	M_N	n_N	I_N 400 V	I_N 380-420 V	$\cos\phi$	IE class	$\eta_{75\%}$ $\eta_{100\%}$	I_A/I_N	M_A/M_N M_H/M_N	m [kg] ²	J_{Mot} [10 ⁻⁴ kgm ²]
	[kW]	[Nm]	[rpm]	[A]	[A]			[%] ¹⁾				
DRE80M2	0.75	2.5	2890	1.54	1.6	0.89	IE2	79.2 79.2	7.9	3.4 3	14.3	21.5
DRE90M2	1.1	3.65	2870	2.2	2.3	0.89	IE2	82.2 81.2	7.2	3.2 3	18.4	35.5
DRE90M2	1.5	5.1	2830	2.95	3.05	0.89	IE2	83.5 81.8	5.9	2.7 2.6	18.4	35.5
DRE100M2	2.2	7.3	2880	4.15	4.3	0.91	IE2	85.6 84.5	8.2	3.8 3.3	26	56
DRE100L2	3	10.1	2850	5.5	5.7	0.93	IE2	87.4 85.6	7.2	3.5 3.1	29	68
DRE112M2	4	13.2	2900	7.5	7.8	0.89	IE2	87.6 86.5	6.3	2.3 2.1	41.5	113
DRE132S2	5.5	18.2	2890	10	10.5	0.91	IE2	88.9 87.4	6.5	2.3 2.1	46.5	146
DRE132M2	7.5	24.5	2910	13.5	14.3	0.91	IE2	89.8 88.5	7.3	2.5 2.3	60	193
DRE132MC2	9.2	30	2935	17.2	17.9	0.87	IE2	89.7 88.8	7.2	2.2 1.9	63	240

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRE.../FI..)



Motor type DRS	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRS71M2	0.55	1.87	2810	BE05	2000 4500	3.5	11.5	8.4
DRS80S2	0.75	2.55	2800	BE05	1400 3300	5	14.2	16.4
DRS80M2	1.1	3.7	2840	BE1	1300 3000	7	17.3	23
DRS90M2	1.5	5.1	2830	BE1	1100 2700	10	22.5	37
DRS90L2	2.2	7.4	2820	BE2	900 2200	14	26	48.5
DRS100M2	3	10.1	2840	BE2	700 1800	20	30.5	61
DRS100LC2	4	13.2	2900	BE5	- 700	28	37	96
DRS112M2	4	13.2	2900	BE5	- 600	28	50	118
DRS132S2	5.5	18.2	2890	BE5	- 500	40	53	151
DRS132M2	7.5	24.5	2910	BE5	- 500	55	75	205
DRS132MC2	9.2	30.5	2900	BE11	- 500	80	75	205

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRS...BE../FI..)

Motor type DRE	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRE80M2	0.75	2.5	2890	BE05	1300 3200	5	17	23
DRE90M2	1.1	3.65	2870	BE1	1100 2700	10	22.5	37
DRE90M2	1.5	5.1	2830	BE1	1100 2700	10	22.5	37
DRE100M2	2.2	7.3	2880	BE2	700 1800	14	30.5	61
DRE100L2	3	10.1	2850	BE2	450 1000	20	33.5	73
DRE112M2	4	13.2	2900	BE5	- 600	28	50	118
DRE132S2	5.5	18.2	2890	BE5	- 500	40	55	151
DRE132M2	7.5	24.5	2910	BE5	- 500	55	69	198
DRE132MC2	9.2	30	2935	BE11	- 380	80	78	250

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRE...BE../FI..)



DR Series AC Motors/Brakemotors

Technical data of 2-pole energy-efficient motors

DRP: 3000 rpm - S1 IE3

Motor type DRP	P _N [kW]	M _N [Nm]	n _N [rpm]	I _N 400 V [A]	I _N 380-420 V [A]	cosφ	IE class	η _{75%} η _{100%} [%] ¹⁾	I _A /I _N	M _A /M _N M _H /M _N	m [kg] ²⁾	J _{Mot} [10 ⁻⁴ kgm ²]
DRP80M2	0.75	2.5	2890	1.46	1.51	0.89	IE3	83.2 83.2	7.9	3.4 3	14.3	21.5
DRP90M2	1.1	3.65	2870	2.1	2.2	0.89	IE3	84.7 83.7	7.2	3.2 3	18.4	35.5
DRP100M2	1.5	4.95	2890	2.65	— ³⁾	0.93	IE3	87.9 87.1	8.7	3.8 3.3	26	56
DRP100M2	2.2	7.3	2880	4	— ³⁾	0.91	IE3	87.8 86.7	8.2	3.8 3.3	26	56
DRP100LC2	3	9.8	2920	5.5	— ³⁾	0.9	IE3	88 87.1	9.1	3 2.4	31	90
DRP112M2	3	9.8	2920	5.5	— ³⁾	0.89	IE3	88.6 88.2	7.4	2.6 2.4	41.5	113
DRP132S2	4	13.1	2910	7.2	— ³⁾	0.91	IE3	89.2 88.2	7.3	2.5 2.2	46.5	146
DRP132M2	5.5	17.9	2935	9.8	— ³⁾	0.9	IE3	90.7 90.1	8.7	2.9 2.5	60	193

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRP.../Fl..)

3) In preparation



Motor type DRP	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRP80M2	0.75	2.5	2890	BE05	1300 3200	5	17	23
DRP90M2	1.1	3.65	2870	BE1	1100 2700	7	22.5	37
DRP100M2	1.5	4.95	2890	BE2	700 1800	14	30.5	61
DRP100M2	2.2	7.3	2880	BE2	700 1800	14	30.5	61
DRP100LC2	3	9.8	2920	BE2	300 700	20	36	95
DRP112M2	3	9.8	2920	BE5	– 600	20	50	118
DRP132S2	4	13.1	2910	BE5	– 500	28	55	151
DRP132M2	5.5	17.9	2935	BE5	– 500	40	69	198

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRP...BE../Fl.)



5.3 Technical data of 4-pole energy-efficient motors

DRS: 1500 rpm - S1 IE1

Motor type DRS	P _N [kW]	M _N [Nm]	n _N [rpm]	I _N 400 V [A]	I _N 380-420 V [A]	cosφ	IE class	η _{75%} η _{100%} [%] ¹⁾	I _A /I _N	M _A /M _N M _H /M _N	m [kg] ²⁾	J _{Mot} [10 ⁻⁴ kgm ²]
DRS71S4	0.37	2.55	1380	1.14	1.24	0.7	–	65.3 66.6	3.5	1.8 1.8	7.8	4.9
DRS71M4	0.55	3.8	1380	1.55	1.62	0.72	–	71.9 70.6	3.6	2.1 2.1	9.1	7.1
DRS80S4	0.75	5.1	1400	1.8	1.82	0.81	IE1	76.6 75.3	4.3	1.9 1.9	11.5	14.9
DRS80M4	1.1	7.4	1410	2.40	2.50	0.84	IE1	78.6 77	5.1	2.2 1.7	14.3	21.5
DRS90M4	1.5	10.3	1395	3.30	3.40	0.82	IE1	82 79.6	5.0	2.3 2.0	18.4	35.5
DRS90L4	2.2	15	1400	4.85	4.95	0.81	IE1	83.1 81.1	5.1	2.5 2.2	21.5	43.5
DRS100M4	3	20.5	1400	6.4	6.5	0.82	IE1	84.7 82.4	5.3	2.8 2.4	26	56
DRS100LC4	4	26.5	1445	8.4	8.5	0.81	IE1	86.4 85.3	6.5	2.5 2.3	31	90
DRS112M4	4	26.5	1435	8.1	8.4	0.84	IE1	85.6 83.8	6	2 1.7	41.5	146
DRS132S4	5.5	36.5	1445	11.1	11.6	0.82	IE1	86.7 85.7	6.7	2.4 2.1	44	190
DRS132M4	7.5	49.5	1445	14.4	15.1	0.85	IE1	89.1 87.1	6.6	2.4 1.9	60	255
DRS132MC4	9.2	60	1465	18.6	19.3	0.81	IE1	88.5 87.6	7.2	2.1 1.6	63	340
DRS160S4	9.2	60	1460	18.9	19.2	0.79	IE1	89 88	6.4	2.5 2	80	370
DRS160M4	11	72	1460	22	22.5	0.81	IE1	89.1 88	6.8	2.7 2.3	92	450
DRS160MC4	15	97	1470	30	31	0.80	IE1	90.2 89.1	6.3	2.1 1.7	94	590
DRS180S4	15	98	1460	29	29.5	0.83	IE1	90.3 89.5	6.2	2.3 2	122	900
DRS180M4	18.5	121	1465	34.5	35.5	0.85	IE1	92.8 90	6.5	2.2 1.8	141	1110
DRS180L4	22	143	1465	41.5	42.5	0.84	IE1	91.2 90.5	6.9	2.4 2	152	1300
DRS180LC4	30	195	1470	57	59	0.84	IE1	92.0 90.9	5.6	1.8 1.5	161	1680
DRS200L4	30	194	1475	57	59	0.82	IE1	91.9 91.3	6.4	2.1 1.9	260	2360
DRS225S4	37	240	1475	70	72	0.82	IE1	92 91.6	7.1	2.4 1.9	295	2930
DRS225M4	45	290	1480	84	86	0.83	IE1	92.7 92.3	7.4	2.5 2.2	315	3430
DRS225MC4	55	355	1480	106	108	0.81	IE1	92.8 92.4	6.8	2.4 1.8	330	4330
DRS315K4	110	710	1482	200	210	0.84	IE1	94.2 94	6.1	2.2 1.7	850	18400
DRS315S4	132	850	1484	230	240	0.85	IE1	94.2 94.2	6.5	2.4 1.9	930	22500
DRS315M4	160	1030	1483	280	290	0.87	IE1	94.8 94.6	6.9	2.1 1.7	1090	27900
DRS315L4	200	1290	1481	350	375	0.88	IE1	94.9 94.6	6.4	2.1 1.7	1170	31900

- 1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses
- 2) Applies for foot-mounted motor (DRS.../FI..)



Motor type DRS	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRS71S4	0.37	2.55	1380	BE05	6000 9500	5	10.2	6.2
DRS71M4	0.55	3.8	1380	BE1	4100 11000	10	11.7	8.4
DRS80S4	0.75	5.1	1400	BE1	3500 9000	10	14.5	16.4
DRS80M4	1.1	7.4	1410	BE2	3500 9000	14	18	26
DRS90M4	1.5	10.3	1395	BE2	2900 7500	20	23	40
DRS90L4	2.2	15	1400	BE5	- 5600	40	27.5	49.5
DRS100M4	3	20.5	1400	BE5	- 8500	40	32	62
DRS100LC4	4	26.5	1445	BE5	- 3800	55	37	96
DRS112M4	4	26.5	1435	BE5	- 3100	55	50	151
DRS132S4	5.5	36.5	1445	BE11	- 2800	80	59	200
DRS132M4	7.5	49.5	1445	BE11	- 2000	110	75	265
DRS132MC4	9.2	60	1465	BE11	- 1500	110	78	355
DRS160S4	9.2	60	1460	BE20	- 1100	150	106	420
DRS160M4	11	72	1460	BE20	- 1000	150	118	500
DRS160MC4	15	97	1470	BE20	- 900	200	120	640
DRS180S4	15	98	1460	BE20	- 900	200	154	960
DRS180M4	18.5	121	1465	BE30	- 800	300	181	1250
DRS180L4	22	143	1465	BE30	- 590	300	192	1440
DRS180LC4	30	195	1470	BE32	- 520	400	205	1910
DRS200L4	30	194	1475	BE32	- 550	400	315	2590
DRS225S4	37	240	1475	BE32	- 320	500	350	3160
DRS225M4	45	290	1480	BE32	- 270	600	370	3660
DRS225MC4	55	355	1480	BE32	- 200	600	375	4560
DRS315K4	110	710	1482	BE122	- 65	1600	1000	19500
DRS315S4	132	850	1484	BE122	- 50	2000	1080	23600
DRS315M4	160	1030	1483	BE122	- 35	2000	1230	29000
DRS315L4	200	1290	1481	BE122	- 25	2000	1310	33000

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRS...BE../FI..)



DR Series AC Motors/Brakemotors

Technical data of 4-pole energy-efficient motors

DRE: 1500 rpm - S1 IE2

Motor type DRE	P_N	M_N	n_N	I_N 400 V	I_N 380-420 V	$\cos\phi$	IE class	$\eta_{75\%}$ $\eta_{100\%}$ [%] ¹⁾	I_A/I_N	M_A/M_N	m	J_{Mot} [10 ⁻⁴ kgm ²]
	[kW]	[Nm]	[rpm]	[A]	[A]					M_H/M_N		
DRE80M4	0.75	5.0	1435	1.68	1.75	0.79	IE2	81.3 81	6.2	2.8 2.1	14.3	21.5
DRE90M4	1.1	7.4	1420	2.45	2.55	0.79	IE2	82.4 82.4	5.9	2.8 2.3	18.4	35.5
DRE90L4	1.5	10	1430	3.35	3.45	0.77	IE2	84.7 84	6.6	3.2 2.8	21.5	43.5
DRE100M4	2.2	14.7	1425	4.6	4.7	0.80	IE2	85.4 86.7	6.4	3.3 2.7	26	56
DRE100LC4	3	19.7	1455	6.2	6.3	0.81	IE2	86.3 87.1	7.5	2.7 2.4	31	90
DRE112M4	3	19.7	1455	6	6.2	0.83	IE2	86.5 87.4	7.3	2.4 2	41.5	146
DRE132S4	4.0	26.0	1460	8	8.2	0.82	IE2	87.4 88.2	8	2.7 2.4	46.5	190
DRE132M4	5.5	36	1455	10.5	11	0.85	IE2	88.3 89.6	7.7	2.6 1.9	60	255
DRE132MC4	7.5	48.5	1470	14.8	15.2	0.82	IE2	89.0 89.5	8.2	2.2 1.8	63	340
DRE160S4	7.5	49	1465	14.7	15.3	0.82	IE2	89.3 90.3	6.5	2.4 1.8	80	370
DRE160M4	9.2	60	1470	18.3	18.7	0.80	IE2	90 90.7	7.7	2.9 2.2	89	450
DRE160MC4	11	71	1475	21.5	22	0.81	IE2	90 90.6	7.7	2.6 1.9	84	590
DRE180S4	11	71	1470	21	21.5	0.83	IE2	90.2 90.4	7.2	2.6 2.2	122	900
DRE180M4	15	97	1470	28	29	0.85	IE2	91 91.5	7.1	2.4 2	138	1110
DRE180L4	18.5	120	1470	34	35.5	0.85	IE2	92 92.6	7.1	2.5 2.1	152	1300
DRE180LC4	22	142	1480	42	43	0.82	IE2	91.8 92.2	7.1	2.3 1.9	161	1680
DRE200L4	30	194	1475	57	59	0.82	IE2	92.4 92.9	6.3	2.1 1.9	260	2360
DRE225S4	37	240	1477	70	72	0.82	IE2	93 93.4	7	2.5 2	295	2930
DRE225M4	45	290	1478	84	86	0.83	IE2	93.3 93.7	7.3	2.5 2.1	315	3430
DRE315K4	110	710	1483	196	205	0.85	IE2	94.7 994.9	6.0	2.3 1.8	850	18400
DRE315S4	132	850	1487	230	235	0.87	IE2	95 95	6.6	2.4 2	930	22500
DRE315M4	160	1030	1484	275	285	0.88	IE2	95.3 95.5	6.8	2.2 1.8	1090	27900
DRE315L4	200	1290	1482	345	360	0.89	IE2	95.3 95.7	6.6	2.2 1.8	1170	31900

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRE.../FI..)



Motor type DRE	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRE80M4	0.75	5.0	1435	BE1	3500 9000	10	17.3	23
DRE90M4	1.1	7.4	1420	BE2	3000 8000	14	23	40
DRE90L4	1.5	10	1430	BE2	3000 8000	20	26	48.5
DRE100M4	2.2	14.7	1425	BE5	- 8000	28	32	62
DRE100LC4	3	19.7	1455	BE5	- 3800	40	37	96
DRE112M4	3	19.7	1455	BE5	- 3100	40	50	151
DRE132S4	4.0	26.0	1460	BE5	- 2800	55	55	195
DRE132M4	5.5	36	1455	BE11	- 2000	80	75	265
DRE132MC4	7.5	48.5	1470	BE11	- 1500	110	78	355
DRE160S4	7.5	49	1465	BE11	- 1100	110	98	390
DRE160M4	9.2	60	1470	BE20	- 1000	150	115	500
DRE160MC4	11	71	1475	BE20	- 900	150	120	640
DRE180S4	11	71	1470	BE20	- 900	150	154	960
DRE180M4	15	97	1470	BE20	- 800	200	170	1170
DRE180L4	18.5	120	1470	BE30	- 590	300	192	1440
DRE180LC4	22	142	1480	BE30	- 520	300	200	1820
DRE200L4	30	194	1475	BE30	- 550	400	310	2500
DRE225S4	37	240	1477	BE32	- 320	500	350	3160
DRE225M4	45	290	1478	BE32	- 270	600	370	3660
DRE315K4	110	710	1483	BE122	- 65	1600	1000	19500
DRE315S4	132	850	1487	BE122	- 50	2000	1080	23600
DRE315M4	160	1030	1484	BE122	- 35	2000	1230	29000
DRE315L4	200	1290	1482	BE122	- 25	2000	1310	33000

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRE...BE../Fl..)



DR Series AC Motors/Brakemotors

Technical data of 4-pole energy-efficient motors

DRP: 1500 rpm - S1 IE3

Motor type DRP	P_N	M_N	n_N	I_N	I_N	$\cos\varphi$	IE class	$\eta_{75\%}$ $\eta_{100\%}$	I_A/I_N	M_A/M_N M_H/M_N	m	J_{Mot}
	[kW]	[Nm]	[rpm]	400 V [A]	380-420 V [A]							
DRP90M4	0.75	4.95	1450	1.81	1.86	0.72	IE3	82.7 83.3	7.3	3.7 3.1	18.4	35.5
DRP90L4	1.1	7.3	1440	2.4	2.5	0.78	IE3	86.0 85.3	6.8	3.2 2.7	21.5	43.5
DRP100M4	1.5	9.9	1440	3.2	3.3	0.79	IE3	87.2 86.6	7.4	3.6 3.1	26	56
DRP100L4	2.2	14.6	1440	4.75	4.85	0.77	IE3	87.5 87.1	7.7	4.1 3.2	29	68
DRP112M4	3	19.7	1455	6	6.2	0.82	IE3	88.7 88	7.3	2.4 2	41.5	146
DRP132M4	4	26	1465	7.7	8	0.84	IE3	90.4 89.7	8.9	2.6 2	60	255
DRP132MC4	5.5	35.5	1475	11	11.4	0.84	IE3	90.8 90.3	8.8	2.3 1.9	63	340
DRP160S4	5.5	35.5	1475	10.9	11.2	0.8	IE3	91.1 90.7	8	3.0 2.2	80	370
DRP160M4	7.5	48.5	1470	14.7	15.2	0.81	IE3	91.3 90.7	8.1	3.1 2.3	89	450
DRP160MC4	9.2	60	1475	17.5	18.2	0.84	IE3	92 91.3	7.6	2.5 1.8	94	590
DRP180S4	9.2	60	1475	17.5	18.1	0.82	IE3	92 92	7.8	2.8 2.3	122	900
DRP180M4	11	71	1475	20.5	21.5	0.84	IE3	92.5 92	8.1	2.9 2.2	138	1110
DRP180L4	15	97	1475	27.5	28.5	0.84	IE3	93.1 92.7	7.7	2.7 2	152	1300
DRP180LC4	18.5	119	1480	35	36	0.82	IE3	93.4 93.2	8	2.6 2	161	1680
DRP200L4	18.5	119	1483	34.5	36	0.83	IE3	93.5 93.3	7.8	2.6 2.2	260	2360
DRP200L4	22	142	1482	41	42.5	0.83	IE3	93.5 93.4	7.9	2.7 2.3	260	2360
DRP225S4	30	194	1480	55	57	0.85	IE3	94.3 93.9	7.4	2.6 2.2	290	2930
DRP225M4	37	240	1482	69	71	0.83	IE3	94.1 94	8.4	2.9 2.6	315	3430
DRP315K4	90	580	1484	159	169	0.86	IE3	95.1 95.2	6.7	2.4 1.9	850	18400
DRP315S4	110	710	1486	192	200	0.87	IE3	95.6 95.5	6.7	2.3 1.8	930	22500
DRP315M4	132	850	1488	230	240	0.87	IE3	95.6 95.6	8.1	2.5 2	1090	27900
DRP315L4	160	1030	1488	275	280	0.88	IE3	96.0 96.1	8.0	2.8 2.2	1170	31900

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRP.../FI..)



Motor type DRP	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRP90M4	0.75	4.95	1450	BE1	2900 7500	10	22.5	37.0
DRP90L4	1.1	7.3	1440	BE2	2300 5600	14	26	48.4
DRP100M4	1.5	9.9	1440	BE2	1800 8500	20	30.5	61
DRP100L4	2.2	14.6	1440	BE5	- 7600	28	35	74
DRP112M4	3	19.7	1455	BE5	- 3100	40	50	151
DRP132M4	4	26	1465	BE11	- 2000	55	75	265
DRP132MC4	5.5	35.5	1475	BE11	- 1500	80	78	355
DRP160S4	5.5	35.5	1475	BE11	- 1100	80	98	390
DRP160M4	7.5	48.5	1470	BE11	- 1000	110	107	470
DRP160MC4	9.2	60	1475	BE20	- 900	150	120	640
DRP180S4	9.2	60	1475	BE20	- 900	150	154	960
DRP180M4	11	71	1475	BE20	- 800	150	170	1170
DRP180L4	15	97	1475	BE20	- 590	200	184	1360
DRP180LC4	18.5	119	1480	BE30	- 520	300	200	1820
DRP200L4	18.5	119	1483	BE30	- 550	300	310	2500
DRP200L4	22	142	1482	BE30	- 550	300	310	2500
DRP225S4	30	194	1480	BE30	- 320	300	340	3070
DRP225M4	37	240	1482	BE32	- 270	400	370	3660
DRP315K4	90	580	1484	BE120	- 65	1200	1000	19500
DRP315S4	110	710	1486	BE122	- 50	1600	1080	23600
DRP315M4	132	850	1488	BE122	- 35	2000	1230	29000
DRP315L4	160	1030	1488	BE122	- 25	2000	1310	33000

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRP...BE../FI..)



5.4 Technical data of 6-pole energy-efficient motors

DRS: 1000 rpm - S1 IE1

Motor type DRS	P_N	M_N	n_N	I_N 400 V	I_N 380-420 V	$\cos\phi$	IE class	$\eta_{75\%}$ $\eta_{100\%}$	I_A/I_N	M_A/M_N	m	J_{Mot}
	[kW]	[Nm]	[rpm]	[A]	[A]			[%] ¹⁾		M_H/M_N		
DRS71S6	0.25	2.65	895	0.83	0.86	0.7	-	61.4 62.2	2.7	1.7 1.7	7.8	4.9
DRS71M6	0.37	3.9	905	1.13	1.16	0.71	-	66.4 66.5	3.1	1.9 1.9	9.1	7.1
DRS80S6	0.55	5.7	915	1.64	1.66	0.71	-	68.2 67.9	3.4	1.8 1.8	11.5	14.9
DRS80M6	0.75	7.8	915	2.15	2.15	0.71	IE1	71.6 70.7	3.6	2 1.9	14.3	21.5
DRS90L6	1.1	11.3	930	3.1	3.15	0.68	IE1	76.3 75	4.2	2.3 2.3	21.5	43.5
DRS100M6	1.5	15.5	925	4.25	4.25	0.68	IE1	77.3 75.7	4.2	2.7 2.7	26	56
DRS112M6	2.2	22	955	5.4	5.5	0.74	IE1	80.5 79.3	5.5	2.1 1.8	41.5	146
DRS112M6	3	30.5	945	7	7.2	0.76	IE1	83 81	5.1	1.9 1.6	41.5	146
DRS132S6	4	40.5	640	9.8	10.2	0.76	IE1	84.2 81.7	4.3	2.1 1.9	44	190
DRS160S6	5.5	55	960	12.9	13.1	0.73	IE1	85.4 84.4	5.2	2 1.8	80	520
DRS160M6	7.5	75	955	17.3	17.6	0.73	IE1	87.1 85.9	5.1	2.2 1.9	92	630

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRS.../FI..)

DRE: 1000 rpm - S1 IE2

Motor type DRE	P_N	M_N	n_N	I_N 400 V	I_N 380-420 V	$\cos\phi$	IE class	$\eta_{75\%}$ $\eta_{100\%}$	I_A/I_N	M_A/M_N	m	J_{Mot}
	[kW]	[Nm]	[rpm]	[A]	[A]			[%] ¹⁾		M_H/M_N		
DRE90L6	0.75	7.6	940	2.15	2.2	0.65	IE2	77.8 77.2	4.6	2.4 2.4	21.5	43.5
DRE100M6	1.1	11.2	940	3.1	3.15	0.64	IE2	79.4 78.7	4.7	3 2.9	26	56
DRE100L6	1.5	15.2	940	4	4.05	0.66	IE2	81.5 80.9	5	3.3 3.1	29	68
DRE112M6	2.2	22	955	5.2	5.3	0.74	IE2	84.2 83	5.5	2.1 1.8	41.5	146
DRE132S6	3	30	955	6.8	7	0.74	IE2	85.8 84.4	5.5	2.3 2.1	46.5	190
DRE132M6	4	40	960	9.5	9.6	0.71	IE2	86.2 85.4	6.1	2.8 2.6	60	255
DRE160M6	5.5	54	965	12.6	12.8	0.72	IE2	87.4 86.8	5.8	2.3 2	89	630

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRE.../FI..)



Motor type DRS	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRS71S6	0.25	2.65	895	BE05	7000 16000	5	10.2	9.4
DRS71M6	0.37	3.9	905	BE1	6600 15000	10	11.7	13
DRS80S6	0.55	5.7	915	BE2	6000 14000	14	15.2	19.4
DRS80M6	0.75	7.8	915	BE2	4300 10000	20	18	26
DRS90L6	1.1	11.3	930	BE5	3500 8000	28	27.5	49.5
DRS100M6	1.5	15.5	925	BE5	- 7000	40	32	62
DRS112M6	2.2	22	955	BE11	- 4000	80	56	156
DRS112M6	3	30.5	945	BE11	- 3600	80	56	156
DRS132S6	4	40.5	640	BE11	- 3500	80	59	199
DRS160S6	5.5	55	960	BE11	- 2700	110	98	540
DRS160M6	7.5	75	955	BE20	- 2700	150	118	680

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRS...BE../Fl..)

Motor type DRE	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRE90L6	0.75	7.6	940	BE2	3500 8000	20	26	48
DRE100M6	1.1	11.2	940	BE5	- 7000	28	32	62
DRE100L6	1.5	15.2	940	BE5	- 6000	40	35	74
DRE112M6	2.2	22	955	BE5	- 4000	55	50	150
DRE132S6	3	30	955	BE11	- 3500	80	61	199
DRE132M6	4	40	960	BE11	- 3300	80	75	260
DRE160M6	5.5	54	965	BE11	- 2700	110	107	650

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRE...BE../Fl..)



DR Series AC Motors/Brakemotors

Technical data of 6-pole energy-efficient motors

DRP: 1000 rpm - S1 IE3

Motor type DRP	P_N	M_N	n_N	I_N	I_N	$\cos\varphi$	IE class	$\eta_{75\%}$	I_A/I_N	M_A/M_N	m	J_{Mot}
	[kW]	[Nm]	[rpm]	400 V [A]	380-420 V [A]			$\eta_{100\%}$ [%] ¹⁾		M_H/M_N		
DRP90L6	0,75	7.6	940	2.05	— ³⁾	0.65	IE3	80 79.5	4,6	2,4 2.4	21.5	43.5
DRP100L6	1,1	11,1	950	3,1	— ³⁾	0.63	IE3	82.4 82.4	5,3	3,6 3.1	29	68
DRP112M6	1.5	14.8	965	3.5	— ³⁾	0.7	IE3	86.1 85.8	6.2	2.4 1.7	41.5	145
DRP132S6	2.2	22	965	5.1	— ³⁾	0.72	IE3	86.5 85.6	6	2.5 2.2	46.5	188
DRP132M6	3	29.5	970	7.1	— ³⁾	0.7	IE3	87.7 87.3	6.6	2.9 2.7	60	250
DRP160M6	4	39	975	9,3	— ³⁾	0.69	IE3	88.9 88.9	6,4	2,5 2.2	89	630

1) Efficiency levels according to IEC 60034-2-1 Ed.1 (2007) / PLL from Residual Losses

2) Applies for foot-mounted motor (DRP.../Fl..)

3) In preparation



Motor type DRP	P _N [kW]	M _N [Nm]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRP90L6	0,75	7.6	940	BE2	3500 8000	20	26	48
DRP100L6	1,1	11,1	950	BE5	- 6000	28	35	74
DRP112M6	1.5	14.8	965	BE5	- 4000	40	50	150
DRP132S6	2.2	22	965	BE5	- 3500	55	55	193
DRP132M6	3	29.5	970	BE11	- 3300	80	75	260
DRP160M6	4	39	975	BE11	- 2700	80	107	650

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque for IEC brakemotor
- 4) Applies for foot-mounted motor (DRP...BE../Fl..)



DR Series AC Motors/Brakemotors

Technical data for pole-changing motors DRS..8/2, 8/4

5.5 Technical data for pole-changing motors DRS..8/2, 8/4

DRS..8/2

Motor type DRS..	P _N [kW]	n _N [rpm]	I _N 400 V [A]	cosφ	I _A /I _N	M _A /M _N	M _H /M _N	m [kg] ¹⁾	J _{Mot} [10 ⁻⁴ kgm ²]
DRS71S8/2	0.06	685	0.48	0.62	1.7	1.7	1.7	7.8	4.9
	0.25	2870	0.91	0.69	3.4	2	1.6		
DRS71M8/2	0.1	670	0.73	0.62	1.8	1.6	1.6	9.1	7.1
	0.4	2850	1.17	0.79	2.9	2.1	1.6		
DRS80S8/2	0.15	655	0.88	0.59	1.9	1.7	1.7	11.5	14.9
	0.6	2680	1.6	0.89	3	2.3	2.1		
DRS80M8/2	0.22	680	1.15	0.6	2	1.7	1.7	14.3	21.4
	0.9	2780	2.4	0.8	4	2.6	2.4		
DRS90M8/2	0.3	710	1.41	0.55	2.5	1.4	1.4	18.4	35.4
	1.3	2880	3.3	0.8	4.6	1.9	1.7		
DRS90L8/2	0.45	710	2.15	0.55	2.5	2.5	1.5	21.5	43.7
	1.8	2890	4.3	0.81	5	2	1.8		
DRS100M8/2	0.6	715	2.9	0.55	2.5	1.5	1.6	26	56
	2.4	2900	5.3	0.83	6.1	2.5	1.9		
DRS112M8/2	0.8	710	3.6	0.53	2.7	1.5	1.5	41.5	146
	3	2730	7.1	0.83	4.3	2.9	2.1		
DRS132M8/2	1.1	710	4.2	0.56	3.1	1.5	1.5	60	253
	4.6	2785	9.4	0.91	5.8	3	2.1		

1) Applies for foot-mounted motor (DRS.../FI..)

DRS..8/4

Motor type DRS..	P _N [kW]	n _N [rpm]	I _N 400 V [A]	cosφ	I _A /I _N	M _A /M _N	M _H /M _N	m [kg] ¹⁾	J _{Mot} [10 ⁻⁴ kgm ²]
DRS112M8/4	1,2	675	4,2	0,58	2,9	1,9	1,9	41,5	146
	2,2	1390	4,6	0,87	4,8	2,2	1,9		
DRS132S8/4	1,6	680	5,8	0,55	2,9	2	2	44	190
	3,3	1385	6,8	0,87	4,7	2,1	1,9		
DRS132M8/4	2,1	680	7	0,59	3,3	1,9	1,9	60	253
	4,2	1390	8,6	0,87	5	2,1	1,9		
DRS160S8/4	2,7	725	9,2	0,54	4	2,1	1,9	80	370
	5,5	1470	11	0,84	6,3	1,9	1,4		
DRS160M8/4	3,8	730	12,9	0,54	3,9	2	1,9	92	448
	7,5	1470	15	0,84	6,2	1,9	1,4		
DRS180S8/4	5,5	730	17,4	0,55	4	2,2	2	122	895
	10	1465	18,7	0,87	6	1,9	1,4		
DRS180L8/4	7,5	735	22,5	0,55	4,4	2,4	2,1	152	1300
	15	1470	27,5	0,87	6	1,9	1,4		
DRS200L8/4	11	735	35,5	0,52	4	2,4	2	260	2360
	22	1475	41,5	0,85	5,9	1,8	1,4		
DRS225S8/4	14	735	45	0,52	4,1	2,5	2,2	295	2930
	28	1475	52	0,85	6,2	1,9	1,5		
DRS225M8/4	18	740	57	0,53	4	2,4	2	315	3430
	34	1475	63	0,86	6,3	2	1,5		

1) Applies for foot-mounted motor (DRS.../FI..)



Motor type DRS.	P _N [kW]	n _N [rpm]	BE..	Z ₀ BG ¹⁾ [1/h]	Z ₀ BGE ²⁾ [1/h]	M _B [Nm] ³⁾	m _B [kg] ⁴⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRS71S8/2	0.06 0.25	685 2870	BE05	15000 6000	20000 90000	1.8	10.2	6.2
DRS71M8/2	0.1 0.4	670 2850	BE05	14000 6000	18000 8000	3.5	11.5	8.4
DRS80S8/2	0.15 0.6	655 2680	BE05	8000 3800	14000 5000	5	14.2	16.4
DRS80M8/2	0.22 0.9	680 2780	BE1	8000 3000	14000 4000	7	17.3	22.9
DRS90M8/2	0.3 1.3	710 2880	BE1	-	11000 3500	10	21.5	36.9
DRS90L8/2	0.45 1.8	710 2890	BE2	-	10000 3300	14	26	48.4
DRS100M8/2	0.6 2.4	715 2900	BE2	-	9000 2600	20	30.5	60.7
DRS112M8/2	0.8 3	710 2730	BE5	-	7000 1500	28	50	150.8
DRS132M8/2	1.1 4.6	710 2785	BE5	-	5000 1000	40	69	257.85

- 1) Operation with BG brake control system
- 2) Operation with BGE brake control system
- 3) Standard braking torque
- 4) Applies for foot-mounted motor with brake (DRS...BE../FI..)

Motor type DRS.	P _N [kW]	n _N [rpm]	BE..	Z ₀ BGE ¹⁾ [1/h]	M _B [Nm] ²⁾	m _B [kg] ³⁾	J _{Mot_BE} [10 ⁻⁴ kgm ²]
DRS112M8/4	1,2 2,2	675 1390	BE5	3800 1800	40	50	150.8
DRS132S8/4	1,6 3,3	680 1385	BE5	3000 1600	55	53	194.8
DRS132M8/4	2,1 4,2	680 1390	BE11	3000 1500	80	75	263.5
DRS160S8/4	2,7 5,5	725 1470	BE11	2600 1400	80	98	392
DRS160M8/4	3,8 7,5	730 1470	BE11	1900 1300	110	110	470
DRS180S8/4	5,5 10	730 1465	BE20	1600 1200	150	154	955
DRS180L8/4	7,5 15	735 1470	BE20	1100 900	200	184	1360
DRS200L8/4	11 22	735 1475	BE30	900 700	300	310	2495
DRS225S8/4	14 28	735 1475	BE32	700 500	400	350	3160
DRS225M8/4	18 34	740 1475	BE32	600 450	500	370	3660

- 1) Operation with BGE brake control system
- 2) Standard braking torque
- 3) Applies for foot-mounted motor with brake (DRS...BE../FI..)



5.6 WPU smooth pole-change unit

Normal pole-changing motors cannot switch from high to low speed without jerks unless special measures are taken. The regenerative braking torque can either be lowered by reducing the voltage at the moment of the switchover using chokes, transformers or additional resistors to a lower value or by switching 2 phases only. All mentioned measures involve additional installation effort and switchgear. A time relay causes the voltage to return to normal voltage conditions. The relay is set empirically. The WPU smooth pole-change unit operates purely electronically.

Function

The switching command inhibits a phase of the supply voltage via a triac and reduces the switch-back torque to about one third. As soon as the synchronous speed of the high-pole winding is reached, the third phase is connected again with optimized current. The following figure shows the WPU smooth pole-change units.



03100AXX

Advantages of WPU

- Load independent and wear-free
- No energy loss which means high efficiency
- No restriction on start-up and rated torque and no restriction on the motor starting frequency
- Minimum wiring
- Suitable for any standard motor

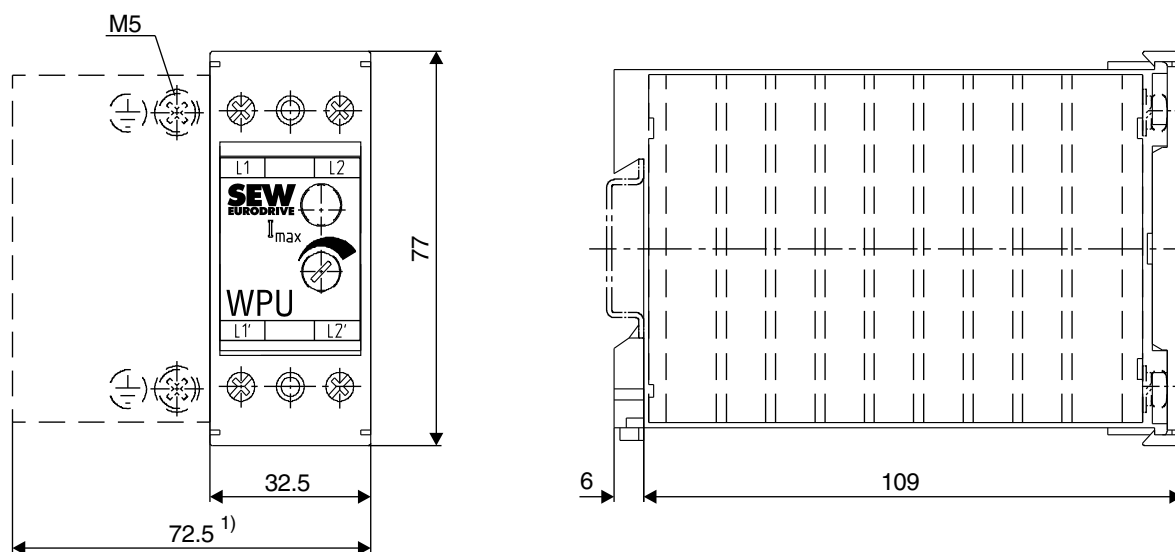


Technical data

Type	WPU 1001	WPU 1003	WPU 1010	WPU 2030
Part number	825 742 6	825 743 4	825 744 2	825 745 0
For pole-changing motors with rated current at low speed in S1 continuous running duty I_N	0.2 - 1 A _{AC}	1 - 3 A _{AC}	3 - 10 A _{AC}	10 - 30 A _{AC}
For pole-changing motors with rated current at low speed in S3 intermittent periodic duty 40/60 % cdf I_N	0.2 - 1 A _{AC}	1 - 5 A _{AC}	3 - 15 A _{AC}	10 - 50 A _{AC}
Rated supply voltage V_{line}	2 × 150-500 V _{AC}			
Line frequency f_{line}	50/60 Hz			
Rated current in S1 continuous running duty I_N	1 A _{AC}	3 A _{AC}	10 A _{AC}	30 A _{AC}
Ambient temperature ϑ_{Umg}	-15 to +45 °C			
Degree of protection	IP20			
Mass	0.3 kg	0.3 kg	0.6 kg	1.5 kg
Mechanical design	DIN rail housing with screw connections			Control cabinet back panel

WPU smooth pole-change unit

WPU 1001, 1003, 1010



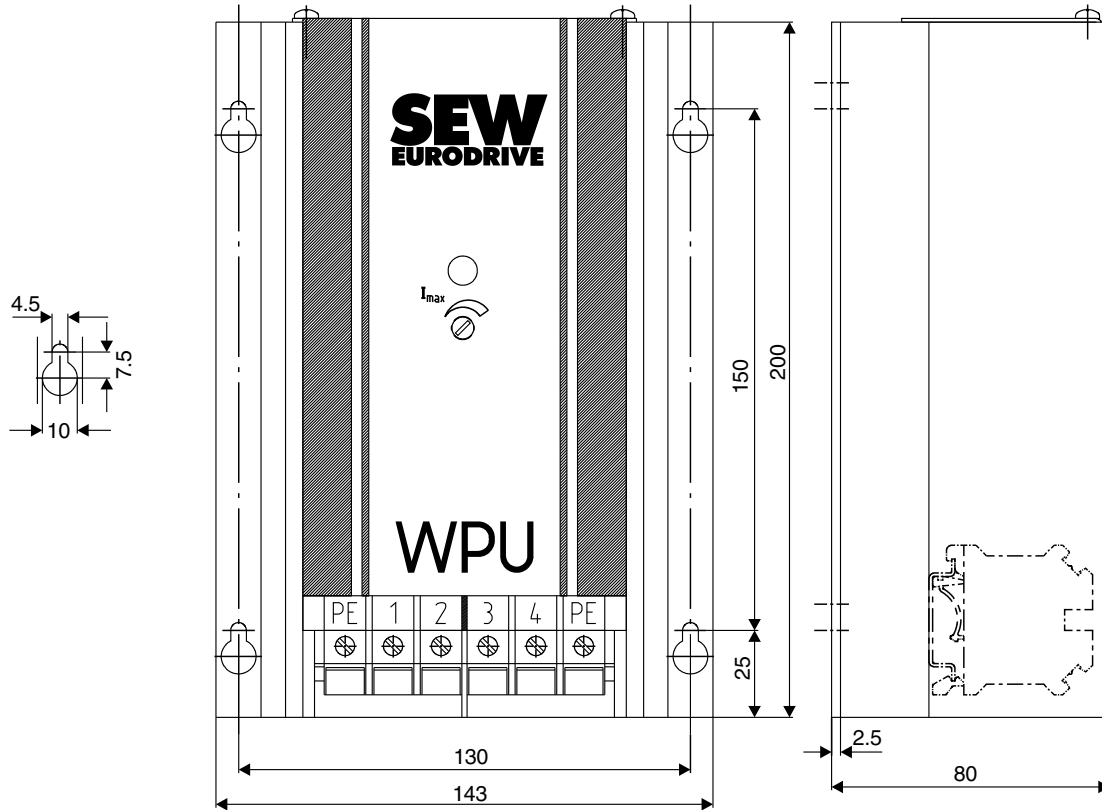
03330AXX

1) Heat sink for WPU 1010 only



DR Series AC Motors/Brakemotors
WPU smooth pole-change unit

WPU 2030



03331AXX



5.7 Key to the data tables of the asynchronous DRL servomotors

The following table lists the short symbols used in the "Technical Data" tables.

n_N	Rated speed
M_N	Rated torque
I_N	Rated current
J_{Mot}	Mass moment of inertia of the motor
$M_{pk\ Dyn1}$	Maximum limit torque (dynamics package 1)
$M_{pk\ Dyn2}$	Maximum limit torque (dynamics package 2)
m	Mass of the motor
BE..	Brake used
m_B	Mass of the brakemotor
J_{MOT_BE}	Mass moment of inertia of the brakemotor
$M_B\ Dyn1$	Braking torque (dynamics package 1)
$M_B\ Dyn2$	Braking torque (dynamics package 2)



5.8 Technical data for DRL asynchronous servomotors

System voltage: 400 V

n_N	DRL motor type	M_N	I_N	M_{pk}	M_{pk}	m	J_{Mot}
		[Nm]	[A]	Dyn1 [Nm]	Dyn2 [Nm]		
1200	DRL71S4	2.7	1.18	5	8.5	8.6	4.9
	DRL71M4	4	1.6	7	14	10	7.1
	DRL80M4	9.5	2.9	14	30	15.2	21.5
	DRL90L4	15	4.8	25	46	22.5	43.5
	DRL100L4	26	8.5	40	85	30	68
	DRL132S4	42	12.6	80	150	45.5	190
	DRL132MC4	56	17.6	130	200	65	340
	DRL160M4	85	25.5	165	280	93	450
	DRL160MC4	90	28	185	320	95	590
	DRL180M4	135	38	250	430	143	1110
	DRL180L4	165	47	320	520	154	1300
	DRL180LC4	175	52	420	600	163	1680
	DRL225S4	250	72	520	770	295	2930
	DRL225MC4	290	89	770	1100	330	4330
1700	DRL71S4	2.7	1.63	5	8.5	8.6	4.9
	DRL71M4	4	2.2	7	14	10	7.1
	DRL80M4	9.5	4	14	30	15.2	21.5
	DRL90L4	15	6.6	25	46	22.5	43.5
	DRL100L4	26	11.4	40	85	30	68
	DRL132S4	42	17.8	80	150	45.5	190
	DRL132MC4	56	24.9	130	200	65	340
	DRL160M4	85	35	165	280	93	450
	DRL160MC4	90	36	185	320	95	590
	DRL180M4	135	52	250	430	143	1110
	DRL180L4	165	63	320	520	154	1300
	DRL180LC4	175	72	420	600	163	1680
	DRL225S4	245	97	520	770	295	2930
	DRL225MC4	280	130	770	1100	330	4330
2100	DRL71S4	2.6	2	5	8.5	8.6	4.9
	DRL71M4	3.8	2.7	7	14	10	7.1
	DRL80M4	9.5	5	14	30	15.2	21.5
	DRL90L4	15	8.4	25	46	22.5	43.5
	DRL100L4	25	14	40	85	30	68
	DRL132S4	41	21.4	80	150	45.5	190
	DRL132MC4	52	28.8	130	200	65	340
	DRL160M4	85	44	165	280	93	450
	DRL160MC4	88	48	185	320	95	590
	DRL180M4	130	64	250	430	143	1110
	DRL180L4	160	78	320	520	154	1300
	DRL180LC4	170	87	420	600	163	1680
	DRL225S4	235	119	520	770	295	2930
	DRL225MC4	265	142	770	1100	330	4330

Table continued on page 66.



n_N	Motor type DRS	M_N [Nm]	IN [A]	BE..	M_B Dyn1 [Nm]	M_B Dyn2 [Nm]	m_B [kg] ¹⁾	J_{Mot_BE} [10 ⁻⁴ kgm ²]
1200	DRL71S4	2.7	1.18	BE05	5	5	11	6,2
	DRL71M4	4	1.6	BE1	7	10	12,6	8,4
	DRL80M4	9.5	2.9	BE2	14	20	18,9	26
	DRL90L4	15	4.8	BE5	20	40	28,5	49,5
	DRL100L4	26	8.5	BE5	40	55	36	74
	DRL132S4	42	12.6	BE11	80	110	60	200
	DRL132MC4	56	17.6	BE11	110	110	79	355
	DRL160M4	85	25.5	BE20	150	200	120	500
	DRL160MC4	90	28	BE20	150	200	122	640
	DRL180M4	135	38	BE30	200	300	183	1250
	DRL180L4	165	47	BE30	300	300	194	1440
	DRL180LC4	175	52	BE32	400	400	210	1910
	DRL225S4	250	72	BE32	500	500	350	3160
DRL225MC4	290	89	BE32	600	600	385	4560	
1700	DRL71S4	2.7	1.63	BE05	5	5	11	6,2
	DRL71M4	4	2.2	BE1	7	10	12,6	8,4
	DRL80M4	9.5	4	BE2	14	20	18,9	26
	DRL90L4	15	6.6	BE5	20	40	28,5	49,5
	DRL100L4	26	11.4	BE5	40	55	36	74
	DRL132S4	42	17.8	BE11	80	110	60	200
	DRL132MC4	56	24.9	BE11	110	110	79	355
	DRL160M4	85	35	BE20	150	200	120	500
	DRL160MC4	90	36	BE20	150	200	122	640
	DRL180M4	135	52	BE30	200	300	183	1250
	DRL180L4	165	63	BE30	300	300	194	1440
	DRL180LC4	175	72	BE32	400	400	210	1910
	DRL225S4	245	97	BE32	500	500	350	3160
DRL225MC4	280	130	BE32	600	600	385	4560	
2100	DRL71S4	2.6	2	BE05	5	5	11	6,2
	DRL71M4	3.8	2.7	BE1	7	10	12,6	8,4
	DRL80M4	9.5	5	BE2	14	20	18,9	26
	DRL90L4	15	8.4	BE5	20	40	28,5	49,5
	DRL100L4	25	14	BE5	40	55	36	74
	DRL132S4	41	21.4	BE11	80	110	60	200
	DRL132MC4	52	28.8	BE11	110	110	79	355
	DRL160M4	85	44	BE20	150	200	120	500
	DRL160MC4	88	48	BE20	150	200	122	640
	DRL180M4	130	64	BE30	200	300	183	1250
	DRL180L4	160	78	BE30	300	300	194	1440
	DRL180LC4	170	87	BE32	400	400	210	1910
	DRL225S4	235	119	BE32	500	500	350	3160
DRL225MC4	265	142	BE32	600	600	385	4560	

Table continued on page 67.

1) Applies for foot-mounted motor with brake (DRL...BE../FI..)



DR Series AC Motors/Brakemotors

Technical data for DRL asynchronous servomotors

n_N	DRL motor type	M_N [Nm]	IN [A]	M_{pk} Dyn1 [Nm]	M_{pk} Dyn2 [Nm]	m [kg]	J_{Mot} [10 ⁻⁴ kgm ²]
3000	DRL71S4	2.5	2.68	5	8.5	8.6	4.9
	DRL71M4	3.6	3.55	7	14	10	7.1
	DRL80M4	8.8	6.5	14	30	15.2	21.5
	DRL90L4	14	11	25	46	22.5	43.5
	DRL100L4	21	16.6	40	85	30	68
	DRL132S4	35	25.5	80	150	45.5	190
	DRL132MC4	42	34.8	130	200	65	340
	DRL160M4	79	57	165	280	93	450
	DRL160MC4	83	59	185	320	95	590
	DRL180M4	105	73	250	430	143	1110
	DRL180L4	130	90	320	520	154	1300
	DRL180LC4	140	105	420	600	163	1680
	DRL225S4	195	139	520	770	295	2930
	DRL225MC4	220	188	770	1100	330	4330



n_N	Motor type DRS	M_N [Nm]	I_N [A]	BE..	M_B Dyn1 [Nm]	M_B Dyn2 [Nm]	m_B [kg] ¹⁾	J_{Mot_BE} [10 ⁻⁴ kgm ²]
3000	DRL71S4	2.5	2.68	BE05	5	5	11	6,2
	DRL71M4	3.6	3.55	BE1	7	10	12,6	8,4
	DRL80M4	8.8	6.5	BE2	14	20	18,9	26
	DRL90L4	14	11	BE5	20	40	28,5	49,5
	DRL100L4	21	16.6	BE5	40	55	36	74
	DRL132S4	35	25.5	BE11	80	110	60	200
	DRL132MC4	42	34.8	BE11	110	110	79	355
	DRL160M4	79	57	BE20	150	200	120	500
	DRL160MC4	83	59	BE20	150	200	122	640
	DRL180M4	105	73	BE30	200	300	183	1250
	DRL180L4	130	90	BE30	300	300	194	1440
	DRL180LC4	140	105	BE32	400	400	210	1910
	DRL225S4	195	139	BE32	500	500	350	3160
	DRL225MC4	220	188	BE32	600	600	385	4560

1) Applies for foot-mounted motor with brake (DRL...BE../Fl.)



5.9 Amortization calculation for energy-efficient motors

Project planning for energy-efficient motors

DRE, DRP

Due to their higher costs and mass moment of inertia of the rotor, energy efficient motors are not suitable for any application.

Important requirements for an economically and ecologically suitable application are:

- High number of daily operating hours
- Majority of operation with high capacity utilization
- Few starting and braking operations
- Combination with gear units that also feature a high efficiency

For example, a garage door drive that is operated twice a day and reaches the output speed by using a helical-worm gear unit should not be an energy efficient motor. The additional costs cannot be justified.

The indexing mechanism that operates a slider or cam follower 60 times per minute should not be an energy efficient motor. The starting energy increases due to the higher rotor mass. In such applications, an energy efficient motor actually consumes more energy than a standard motor.

But a conveyor belt that transports material in the cement plant all day long, cooling tower drives, agitators, drives in wastewater treatment plants, etc. benefit significantly from using an energy efficient motor and save the plant operator money.

The energy consumption of electric drives with asynchronous motors can be considerably reduced if all existing means such as process optimization with electronic control and energy efficient motors are used in a meaningful way and in combination.

By using all design options for building an energy efficient motor, the DR motor offers an excellent platform for saving electrical energy.

Additional documentation

In addition to the information provided in this catalog, the sections "Project Planning of AC Motors" and "Technical Data and Dimension Sheets for AC Motors" in the Gearmotors catalog contain more detailed information.

You will find additional links to a wide selection of our documentation in many languages for download on the SEW-EURODRIVE homepage (<http://www.sew-eurodrive.com>).



Amortization calculation for 100% motor load in shift operation

Comparison calculation

Motor data

	DRS100M4	DRE112M4
P _n	3 kW	3 kW
Load factor	100 %	100 %
η	82.4 %	87 %

Actual power
consumed

$$P_{in} = \frac{P_n \times \text{Load factor}}{\text{Eta}}$$

5

	DRS100M4	DRE112M4
P _{in}	3.64 kW	3.46 kW

Operating time

Annual operating time = daily operating time x annual operating days

Shift operation	Operation	
	DRS100M4	DRE112M4
1-shift	2000 h/a	2000 h/a
2-shift	4000 h/a	4000 h/a
3-shift	6000 h/a	6000 h/a

Power
consumption

Energy per year = P_{in} x operating time

Shift operation	Energy		
	DRS100M4 E1	DRE112M4 E2	Difference E1 - E2
1-shift	7280 kWh/a	6920 kWh/a	360 kWh/a
2-shift	14560 kWh/a	13840 kWh/a	720 kWh/a
3-shift	21840 kWh/a	20760 kWh/a	1080 kWh/a



DR Series AC Motors/Brakemotors

Amortization calculation for energy-efficient motors

Energy cost difference

Cost difference = energy difference x energy price

Energy price = 0.12 €/kWh

Shift operation	Cost difference
1-shift	43.20 € / a
2-shift	86.40 € / a
3-shift	129.60 € / a

Cost savings/
amortization

Savings in the year X = expenses in the year X - (cost difference in the year X)

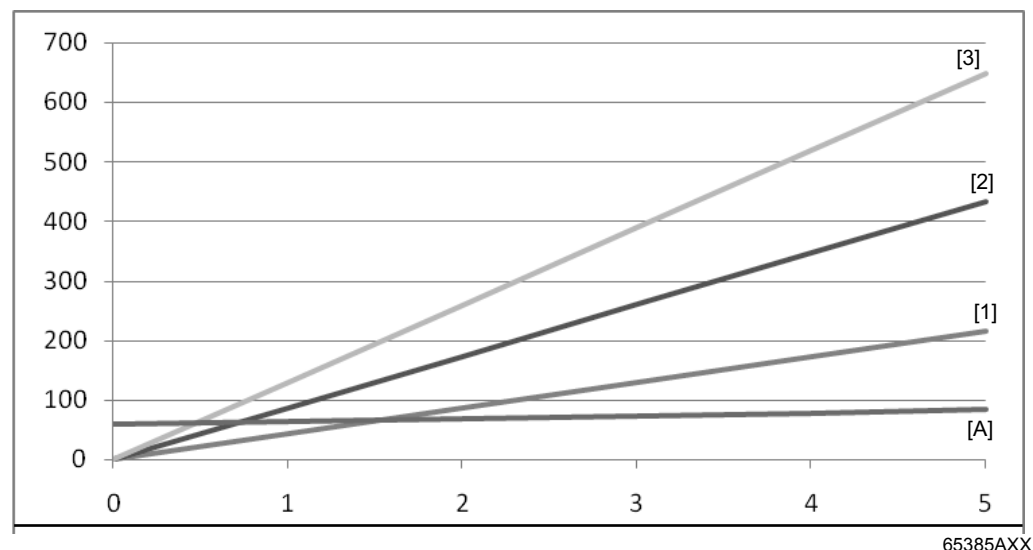
Option pricing for energy-efficient motor DRE112M4 = 75 €

Interest rate per year = 7.0 %

Years	Savings			Expenditure Gross price	Expenditure with 20 % discount
	1-shift	2-shift	3-shift		
0	0 €	0 €	0 €	75 €	60 €
1	43.20 €	86.40 €	129.60 €	80.25 €	64.20 €
2	86.40 €	172.80 €	259.20 €	85.87 €	68.69 €
3	129.60 €	259.20 €	388.80 €	91.88 €	73.50 €
4	172.80 €	345.60 €	518.40 €	98.31 €	78.65 €
5	216 €	432 €	648 €	105.19 €	84.15 €

Amortization/years

The following diagram "Saved energy costs" shows the investment calculation for 100% motor load.



Key:

- [A] Expenses with a discount of 20 % [2] 2-shift with 100 % motor load
 [1] 1-shift with 100 % motor load [3] 3-shift with 100 % motor load



Amortization calculation for 75 % motor load in shift operation

Comparison calculation

Motor data

	DRS100M4	DRE112M4
P _n	3 kW	3 kW
Load factor	75 %	75 %
h	84.7 %	87.6 %

Actual power consumed

$$P_{in} = \frac{P_n \times \text{Load factor}}{\text{Eta}}$$

5

	DRS100M4	DRE112M4
P _{in}	2.66 kW	2.57 kW

Operating time

Annual operating time = daily operating time x annual operating days

Shift operation	Operation	
	DRS100M4	DRE112M4
1-shift	2000 h/a	2000 h/a
2-shift	4000 h/a	4000 h/a
3-shift	6000 h/a	6000 h/a

Power consumption

Energy per year = P_{in} x operating time

Shift operation	Energy		
	DRS100M4 E1	DRE112M4 E2	Difference E1 - E2
1-shift	5310 kWh/a	5140 kWh/a	170 kWh/a
2-shift	10630 kWh/a	10270 kWh/a	360 kWh/a
3-shift	15940 kWh/a	15410 kWh/a	530 kWh/a

Energy cost difference

Cost difference = energy difference x energy price

Energy price = 0.12 €/kWh

Shift operation	Cost difference
1-shift	20.40 € / a
2-shift	43.20 € / a
3-shift	63.60 € / a



DR Series AC Motors/Brakemotors

Amortization calculation for energy-efficient motors

Cost savings/
amortization

Savings in the year X = expenses in the year X - (cost difference in the year X)

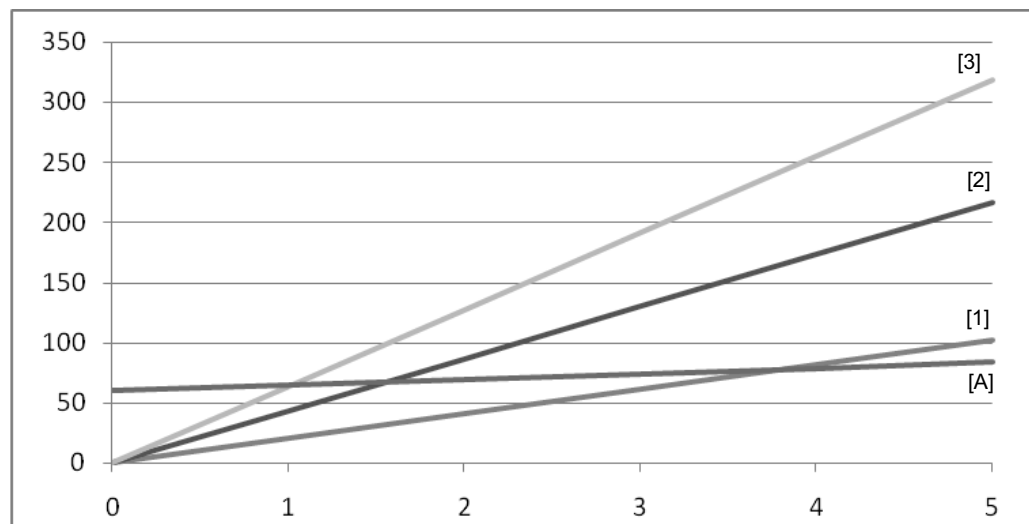
Option pricing for energy-efficient motor DRE112M4 = 75 €

Interest rate per year = 7.0 %

Years	Savings			Expenditure Gross price	Expenditure for 20 % discount
	1-shift	2-shift	3-shift		
0	0 €	0 €	0 €	75 €	60 €
1	20.40 €	43.20 €	63.60 €	80.25 €	64.20 €
2	40.80 €	86.40 €	127.20 €	85.87 €	68.69 €
3	61.20 €	129.60 €	190.80 €	91.88 €	73.50 €
4	81.60 €	172.80 €	254.40 €	98.31 €	78.65 €
5	102 €	216 €	318 €	105.19 €	84.15 €

Amortization/years

The following diagram "Saved energy costs" shows the investment calculation for 75 % motor load.



65386AXX

Key

[A] Expenses with a discount of 20 %

[3] 2-shift with 75 % motor load

[1] 1-shift with 75 % motor load

[4] 3-shift with 75 % motor load