

Selection and ordering HT-direct motors 1FW4 air-cooled

3



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Selection and ordering

HT-direct motors 1FW4 air-cooled

Overview



The motors are designed for the following rated voltages:

- 690 V $\sqrt{3}$ /50 Hz
- 400 V $\sqrt{3}$ /50 Hz
- 460 V $\sqrt{3}$ /60 Hz

Ambient temperature: -20 °C to +40 °C

Site altitude: Up to 1000 m above sea level

At higher ambient temperatures and site altitudes above 1000 m, a motor Order No. must be selected in accordance with the derating factors (see Page 3/12). The order codes for the cooling-water inlet temperature (see Page 3/6) and site altitude over 1000 m (see Page 3/6) must also be specified in the order.

Degree of protection: IP55

Cooling method: IC416

Type of construction: IM B3

Overview of torques and outputs
in accordance with the rated speed

Rated speed rpm	Max. rated torque Nm	Max. rated output kW
200	23000	481
300	22250	699
400	21500	900
500	20750	1086
600	20000	1256
800	14100	1181

Benefits

The well-proven cooling principle of the H-compact motors forms the basis for the air-cooled HT-direct motors. The constant cooling air flow independent of the motor speed from the external fan assembly mounted axially at the non-drive end ensures intensive, even motor cooling which is the basis of a long lifetime.

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Selection and ordering data

Rated torque	Rated output ¹⁾	Frame size	Efficiency at 690 V		Rated current at			Norm. max. torque at 690 V ²⁾	Moment of inertia	Version with two galvanically isolated winding systems ³⁾			Order No.	Weight, approx.	
			4/4-load	4/4-load	690 VY	400 VY	460 VY			T_{max}/T_{rated}	J	690 VY			400 VY
Nm	kW		%	cos φ	A	A	A		kgm ²					kg	
200 rpm, IP55 degree of protection, IMB3 type of construction															
7200	150	401	95.4	0.94	140	255	215	1.5	19.4	-	-	-	1FW4401-3HA	0-1AA0	3950
8520	178	403	95.6	0.92	174	280	250	1.5	22.4	-	-	-	1FW4403-3HA	0-1AA0	4150
9840	206	405	95.8	0.93	192	335	300	1.5	26.1	-	-	-	1FW4405-3HA	0-1AA0	4400
11520	241	407	96.0	0.94	220	380	355	1.5	30.9	-	-	-	1FW4407-3HA	0-1AA0	4720
12510	262	451	94.7	0.85	285	495	440	1.5	37.9	-	-	-	1FW4451-3HA	0-1AA0	4970
14395	301	453	95.1	0.86	315	540	475	1.5	44.9	-	-	-	1FW4453-3HA	0-1AA0	5180
16640	348	455	95.4	0.86	375	630	540	1.5	51.5	-	-	-	1FW4455-3HA	0-1AA0	5450
19780	414	503	96.1	0.87	420	700	600	1.5	89.3	-	-	-	1FW4503-3HA	0-1AA0	6610
23000	481	505	96.3	0.89	470	840	700	1.5	102.6	-	-	-	1FW4505-3HA	0-1AA0	7070
300 rpm, IP55 degree of protection, IMB3 type of construction															
7000	219	401	96.5	0.96	198	345	320	1.5	19.4	-	-	-	1FW4401-3HB	0-1AA0	3950
8280	260	403	96.5	0.97	230	415	360	1.5	22.4	-	-	-	1FW4403-3HB	0-1AA0	4150
9565	300	405	96.7	0.97	265	475	435	1.5	26.1	-	-	-	1FW4405-3HB	0-1AA0	4400
11200	351	407	96.8	0.94	320	570	475	1.5	30.9	-	-	-	1FW4407-3HB	0-1AA0	4720
12190	382	451	96.1	0.86	385	700	560	1.5	37.9	-	-	-	1FW4451-3HB	0-1AA0	4970
14030	440	453	96.4	0.86	465	830	680	1.5	44.9	-	-	-	1FW4453-3HB	0-1AA0	5180
16215	509	455	96.5	0.87	520	920	820	1.5	51.5	-	-	-	1FW4455-3HB	0-1AA0	5450
19135	601	503	97.0	0.88	580	1020	910	1.5	89.3	-	-	-	1FW4503-3HB	0-1AA0	6610
22250	699	505	97.1	0.88	680	1170	1020	1.5	102.6	-	-	-	1FW4505-3HB	0-1AA0	7070
400 rpm, IP55 degree of protection, IMB3 type of construction															
6800	284	401	96.9	0.98	250	445	410	1.5	19.4	-	-	-	1FW4401-3HC	0-1AA0	3950
8050	337	403	97.1	0.97	295	530	480	1.5	22.4	-	-	-	1FW4403-3HC	0-1AA0	4150
9290	389	405	97.1	0.94	365	640	510	1.5	26.1	-	-	-	1FW4405-3HC	0-1AA0	4400
10880	455	407	97.2	0.94	420	720	630	1.5	30.9	-	-	-	1FW4407-3HC	0-1AA0	4720
11870	497	451	96.7	0.86	540	840	750	1.5	37.9	-	-	-	1FW4451-3HC	0-1AA0	4970
13665	572	453	96.9	0.87	600	1040	910	1.5	44.9	-	-	-	1FW4453-3HC	0-1AA0	5180
15790	661	455	97.1	0.87	650	1200	1030	1.5	51.5	-	-	-	1FW4455-3HC	0-1AA0	5450
18490	774	503	97.4	0.91	720	1320	1130	1.5	89.3	-	✓	-	1FW4503-3HC	0-1AA0	6610
21500	900	505	97.5	0.88	880	1580	1320	1.5	102.6	-	✓	✓	1FW4505-3HC	0-1AA0	7070
Rated voltage															
• 460 VY														4	
• 690 VY														7	
• 400 VY														8	
Special voltage														9	
Other rated speed with additional plain text														-Z	

¹⁾ Temperature class 155 (temperature class F), used according to temperature class 155 (temperature class F)

²⁾ Maximum torque T_{max} = Overload torque for 120 s (higher overload torques on request)

³⁾ In the version with two galvanically isolated winding systems, two main terminal boxes 1XB1 631 are required.

- Not applicable
✓ Applicable

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Rated torque Nm	Rated output ¹⁾ kW	Frame size	Efficiency at 690 V		Rated current at			Norm. max. torque at 690 V ²⁾ T_{max}/T_{rated}	Moment of inertia J kgm ²	Version with two galvanically isolated winding systems ³⁾			Order No.	Weight, approx. kg	
			4/4-load %	4/4-load cos φ	690 V √	400 V √	460 V √			690 V √	400 V √	460 V √			
500 rpm, IP55 degree of protection, IMB3 type of construction															
6600	345	401	97.2	0.99	300	520	470	1.5	19.4	-	-	-	1FW4401-3HD	0-1AA0	3950
7810	408	403	97.3	0.95	365	640	570	1.5	22.4	-	-	-	1FW4403-3HD	0-1AA0	4150
9020	472	405	97.3	0.97	415	720	620	1.5	26.1	-	-	-	1FW4405-3HD	0-1AA0	4400
10560	552	407	97.4	0.96	490	830	720	1.5	30.9	-	-	-	1FW4407-3HD	0-1AA0	4720
11555	605	451	97.1	0.86	610	1050	920	1.5	37.9	-	-	-	1FW4451-3HD	0-1AA0	4970
13300	696	453	97.3	0.87	710	1180	1010	1.5	44.9	-	-	-	1FW4453-3HD	0-1AA0	5180
15370	804	455	97.4	0.88	780	1400	1170	1.5	51.5	-	✓	-	1FW4455-3HD	0-1AA0	5450
17845	934	503	97.6	0.93	860	1530	1290	1.5	89.3	-	✓	✓	1FW4503-3HD	0-1AA0	6610
20750	1086	505	97.6	0.89	1090	1650	1530	1.5	102.6	-	✓	✓	1FW4505-3HD	0-1AA0	7070
600 rpm, IP55 degree of protection, IMB3 type of construction															
6400	402	401	97.3	0.96	360	630	560	1.5	19.4	-	-	-	1FW4401-3HE	0-1AA0	3950
7570	475	403	97.3	0.97	420	720	630	1.5	22.4	-	-	-	1FW4403-3HE	0-1AA0	4150
8750	549	405	97.4	0.97	485	820	710	1.5	26.1	-	-	-	1FW4405-3HE	0-1AA0	4400
10240	643	407	97.5	0.99	550	970	830	1.5	30.9	-	-	-	1FW4407-3HE	0-1AA0	4720
11235	705	451	97.3	0.87	720	1200	1030	1.5	37.9	-	-	-	1FW4451-3HE	0-1AA0	4970
12930	812	453	97.5	0.90	770	1380	1150	1.5	44.9	-	✓	-	1FW4453-3HE	0-1AA0	5180
14950	939	455	97.5	0.93	860	1450	1360	1.5	51.5	-	✓	✓	1FW4455-3HE	0-1AA0	5450
17200	1080	503	97.6	0.88	1050	1850	1490	1.5	89.3	-	✓	✓	1FW4503-3HE	0-1AA0	6610
20000	1256	505	97.7	0.88	1230	1930	1640	1.5	102.6	✓	✓	✓	1FW4505-3HE	0-1AA0	7070
800 rpm, IP55 degree of protection, IMB3 type of construction															
6000	502	401	97.3	0.98	440	790	670	1.5	19.4	-	-	-	1FW4401-3HF	0-1AA0	3950
7100	594	403	97.3	0.97	520	940	790	1.5	22.4	-	-	-	1FW4403-3HF	0-1AA0	4150
8200	686	405	97.4	0.99	590	1010	910	1.5	26.1	-	-	-	1FW4405-3HF	0-1AA0	4400
9600	804	407	97.4	1.00	690	1190	1030	1.5	30.9	-	-	-	1FW4407-3HF	0-1AA0	4720
10600	888	451	97.4	0.90	850	1390	1190	1.5	37.9	-	✓	-	1FW4451-3HF	0-1AA0	4970
12200	1022	453	97.4	0.93	940	1640	1360	1.5	44.9	-	✓	✓	1FW4453-3HF	0-1AA0	5180
14100	1181	455	97.6	0.93	1080	1780	1630	1.5	51.5	-	✓	✓	1FW4455-3HF	0-1AA0	5450
Rated voltage															
• 460 V √														4	
• 690 V √														7	
• 400 V √														8	
Special voltage														9	
Other rated speed with additional plain text														-Z	

Notes for current-calculation:

The stator current from permanent-excited motors can not be calculated as usual with the rated output, converter output voltage, power factor and efficiency. The reason is that the induced voltage at the rated point does not comply with the converter output voltage automatically. The real terminal voltage is depending on the speed, the torque and the integer number of turns.

The stator current of the 1FW4-motor series is proportional to the speed. With it the required stator current for a torque differing from the rated torque can be calculated. The stator current should be calculated exactly with the project tool „SINAMICS MICROMASTER SIZER“.

¹⁾ Temperature class 155 (temperature class F), used according to temperature class 155 (temperature class F)
²⁾ Maximum torque T_{max} = Overload torque for 120 s (higher overload torques on request)

³⁾ In the version with two galvanically isolated winding systems, two main terminal boxes 1XB1 631 are required.
 - Not applicable
 ✓ Applicable

Special versions

Special versions	Order code	Comments
Motor protection		
Motor temperature monitoring using built-in temperature sensor 1 x KTY 84-130	A23	
Motor temperature monitoring using built-in temperature sensor 2 x KTY 84-130	A25	
2 PT100 resistance thermometers or 3-wire for 4-wire circuit from terminals, without evaluation unit for rolling-contact bearings	A40	
2 PT100 dual resistance thermometers for 3-wire or 4-wire circuit from terminals, without evaluation unit for rolling-contact bearings	A42	
6 PT100 resistance thermometers for winding temperature monitoring for 3-wire or 4-wire circuit from terminals	A65	
Rolling-contact bearing monitor based on SPM shock pulse method, complete alarm box	H07	
Motor connection and connection boxes		
Two-part plate on connection box	K06	
Terminal box on LHS (view onto DE)	K10	
Cable entry DIN 89280, maximum configuration	K57	
Rotation of the terminal box through 90°, entry from DE (This option is only possible when the motor can only be implemented with one terminal box).	K83	
Rotation of the terminal box through 90°, entry from NDE. (This option is only possible when the motor can only be implemented with one terminal box).	K84	
Rotation of connection box through 180°	K85	
Undrilled cable entry plate.	L01	
Auxiliary terminal box with cast-iron housing	M50	
Auxiliary terminal box with stainless-steel housing	M51	
Separate auxiliary terminal box with cable entry for heater	M52	
Auxiliary terminal box with aluminium housing	M88	
Shaft and rotor		
Standard cylindrical shaft end, but without keyway	K42	
Non-standard cylindrical shaft end (only when technically possible); additional plain text stating the dimensions of the non-standard shaft end is required (in mm)	Y55	
Coupling		
Thrust ring for coupling guard	L15	
Mounting of supplied coupling	L17	
Heating		
Anti-condensation heating for 230 V supply voltage	K45	
Anti-condensation heating for 115 V supply voltage	K46	
Anti-condensation heating for 400 V supply voltage	L08	
Anti-condensation heating for 500 V supply voltage	L09	
Anti-condensation heating for other supply voltages (with plain text for voltage)	Y83	
Colors and paint finish		
Unpainted (primed)	K23	
Special paint finish in standard color	K26	
Normal paint finish not in standard color	Y53	
Special paint finish not in standard color	Y54	
Special mounting technology		
Mounting of absolute encoder EQN 425 EnDat 2.1 2048	H81	
Mounting of absolute encoder HMG111 HTL + SSI	H82	
Mounting of incremental encoder HOG10 DN 2048	H83	
Mounting of incremental encoder HOG11 DN 2048	H84	
Mounting of incremental encoder LL861 (2048 pulses)	H85	
Mounting of a rotary pulse encoder in special design (with plain text for encoder designation)	Y70	
Balance and vibration severity		
Vibration severity grade B	K02	
Full-key balancing	L68	

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Special versions	Order code	Comments
Mechanical design and degrees of protection		
Bearing design for increased cantilever forces	K20	
IP56 degree of protection (non-heavy-sea)	K52	
Bolts for fixing machine to steel foundation	L31	
T-head bolts, anchor sleeves and soleplates for mounting on a concrete foundation	L33	
External screws made of stainless steel	P45	
Anormal stator winding		
Anormal stator winding for speeds below 170 rpm	L1Y	
Ambient temperature and site altitude		
Coolant temperature -50 to +40 °C	D02	
Coolant temperature -40 to +40 °C	D03	
Coolant temperature -30 to +40 °C	D04	
Site altitude up to 1500 m	D06	
Site altitude up to 2000 m	D07	
Site altitude up to 2500 m	D08	
Site altitude up to 3000 m	D09	
Coolant temperature up to 45 °C, torque reduction of 4%	D11	
Coolant temperature up to 50 °C, torque reduction of 8%	D12	
Coolant temperature up to 55 °C, torque reduction of 13%	D13	
Coolant temperature up to 60 °C, torque reduction of 18%	D14	
Marine version - Acceptance/certification		
Individual acceptance by classification authority with witness-testing and acceptance inspection certificate 3.1.C	E09	
Individual acceptance by classification authority	E10	
Marine design to GL, CT 45 °C, temperature class 155 used according to 155 (F according to F)	E11	
Marine design to LR, CT 45 °C, temperature class 155 used according to 155 (F according to F)	E21	
Marine design to BV, CT 45 °C, temperature class 155 used according to 155 (F according to F)	E31	
Marine design to DNV, CT 45 °C, temperature class 155 used according to 155 (F according to F)	E51	
Marine design to ABS, CT 45 °C, temperature class 155 used according to 155 (F according to F)	E61	
Marine design to CCS, CT 45 °C, temperature class 155 used according to 155 (F according to F)	E71	
Marine design, higher ambient temperature and/or temperature class 155 used according to 130 (F according to B), with plain text for ambient temperature, utilization and classification society	E80	
Rating plate and additional plates		
Second rating plate, separately packed	K31	
Rating plate with different data	Y80	
Additional plate with ordering data (customer information in plain text)	Y82	
Packaging, safety notes, documentation and test certificates		
Acceptance test certificate 3.1 according to EN 10204	B02	
Documentation on CD	B21	
Document - EU manufacturer's declaration	B30	
Document - Electrical data sheet	B31	
Document - Order dimension drawing	B32	
Document - Routine test certificate	B33	
Documentation in German	D00	(Documentation in English standard)
Documentation in Russian	D56	
Documentation in Italian	D72	
Documentation in French	D77	
Documentation in Spanish	D78	
Documentation in Portuguese	D79	
Documentation in Swedish	D83	

Selection and ordering

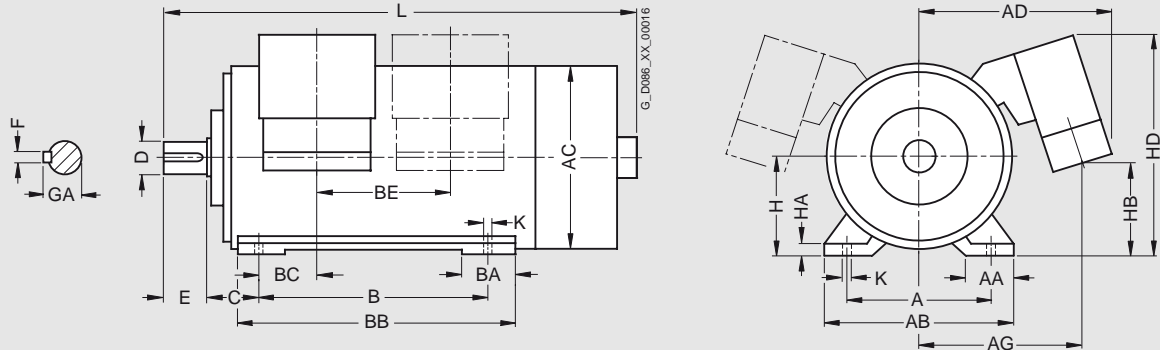
HT-direct motors 1FW4 air-cooled

Special versions	Order code	Comments
Packaging, safety notes, documentation and test certificates (continued)		
Standard test (routine test), witnessed	F01	
Visual acceptance and report handover, witnessed	F03	
Temperature-rise test, unwitnessed	F04	
Temperature-rise test, witnessed	F05	
Recording of continuous short-circuit characteristic and calculation of losses, unwitnessed	F16	
Recording of continuous short-circuit characteristic and calculation of losses, witnessed	F17	
Recording of load characteristic (T-n-characteristic curve) on converter, unwitnessed	F18	
Recording of load characteristic (T-n-characteristic curve) on converter, witnessed	F19	
Noise measurement in no-load operation, no noise analysis, unwitnessed	F28	
Noise measurement in no-load operation, no noise analysis, witnessed	F29	
Noise measurement in no-load operation, with noise analysis, unwitnessed	F62	
Noise measurement in no-load operation, with noise analysis, witnessed	F63	
Type test with heat run for horizontal motors, unwitnessed	F82	
Type test with heat run for horizontal motors, witnessed	F83	
Customized acceptance on customer converter, additional information required	F99	

Selection and ordering

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Dimension drawings



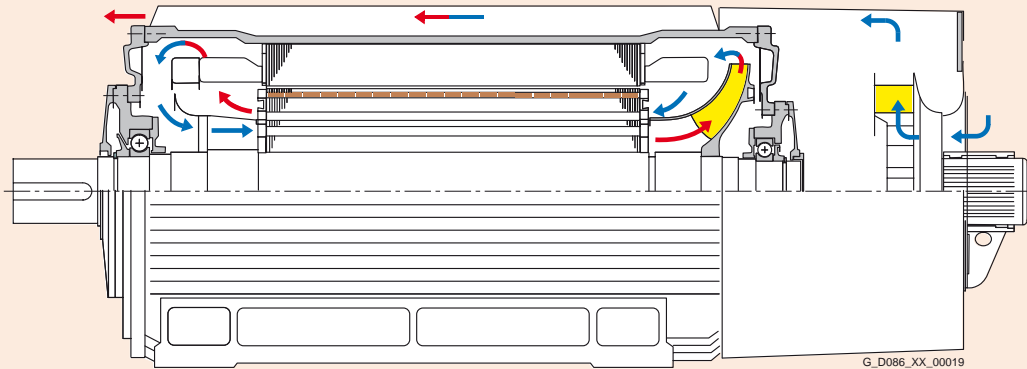
Type	Dimensions																		
	A	AA	AB	AC	AD ¹⁾	AG ¹⁾	B	BA	BB	BC	BE	C	H	HA	HB ¹⁾	HD	K	L	
1FW4401	750	150	900	855	865	775	1120	220	1320	201	745	254	400	35	440	1020	35	2470	
1FW4403																			
1FW4405																			
1FW4407																			
1FW4451	850	180	1030	955	910	820	1250	260	1490	220	865	280	450	42	530	1110	42	2880	
1FW4453																			
1FW4455																			
1FW4503	950	180	1130	1075	960	870	1320	260	1560	220	880	315	500	42	630	1210	42	3120	
1FW4505																			

Type	Dimensions for shaft extension according to DIN 748 "short"			
	D	E	F	GA
1FW4401	150	200	36	158
1FW4403				
1FW4405				
1FW4407				
1FW4451	170	240	40	179
1FW4453				
1FW4455				
1FW4503	190	280	45	200
1FW4505				

¹⁾ For 1XB1 631 terminal box.

Additional information

Structure



Basic structure of the air-cooled HT-direct motor 1FW4

HT-direct motors have two cooling circuits that can be used to achieve intensive and effective cooling:

- The aluminium fan within the motor provides air circulation between DE and NDE. This cools, in particular, the stator winding overhang, the magnetic rotor and the bearings.
- The heat from the internal air is dissipated across the surface of the motor housing. The external fan provides an even cooling air-flow over the complete speed range of the HT-direct motor.

Frame design

The housings are the same as the well-proven cast-iron housings of the 1LA4 series (H-compact motors). The condensation water drainage holes are present and they are sealed during transport. For certain applications (e.g. in shipbuilding and the chemicals industry), external components made from aluminium are not permitted.

In these cases, aluminium components (e.g. terminal boxes) are replaced with other materials.

Forced ventilation

Forced ventilation is necessary to achieve even, intensive cooling so that even at low speeds a high torque density can be achieved.

Data of the external fan unit

External fan unit for motor type 1FW4 . . .	Fre- quency	Voltage	Cur- rent	Input	Air flow rate
	Hz	V	A	kW	m ³ /s
. . . 401/403/405/407	50	230 Δ	11.1	1.6	1.7
		400 Y	6.4		
. . . 451/453/455	60	460 Y	6.2	2.8	2.02
		690 Y	4.7		
. . . 503/505	50	400 Δ	11.4	3.6	2.75
		690 Y	6.6		
. . . 503/505	60	460 Δ	10.9	6.3	3.3
		690 Y	6.6		

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Additional information

Mounting position of the terminal box and position of the cable entry

If a terminal box or cable entry position other than specified for the standard version is required, this must be specified using order codes or plain text.

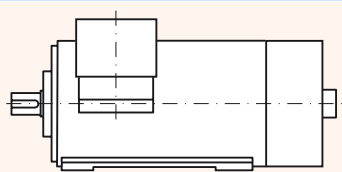
Mounting location

In the standard version, the terminal box is mounted on the **RHS of the motor (as viewed onto the DE shaft end)**. If a second terminal box is required, this is mounted alongside it on the same side (at NDE)

The terminal box can be mounted on the LHS of the motor as a special version.

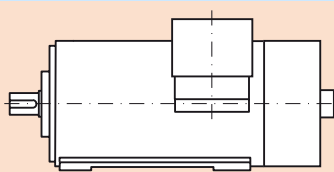
Basic version

Special versions



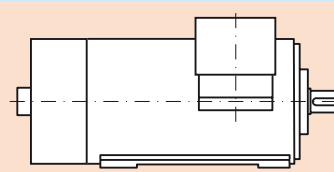
G_D086_XX_00020

Mounting position RHS, DE
Order code: –



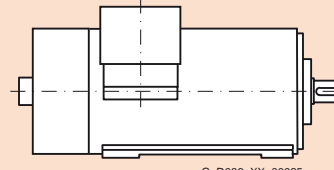
G_D086_XX_00022

Mounting position RHS, NDE
Order code: **Plain text**



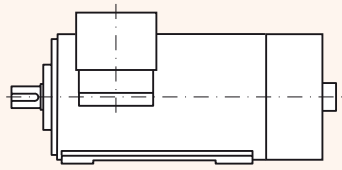
G_D086_XX_00023

Mounting position LHS, DE
Order code: **K10**



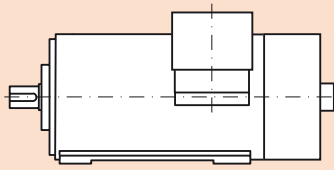
G_D086_XX_00025

Mounting position LHS, NDE
Order code: **K10 and plain text**



G_D086_XX_00020

Mounting position RHS and LHS, DE,
when two terminal boxes are required.
Order code: –



G_D086_XX_00022

Mounting position RHS and LHS, NDE,
when two terminal boxes are required.
Order code: **Plain text**

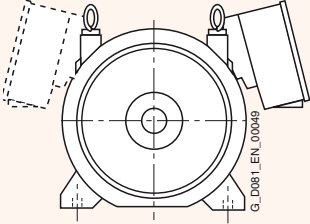
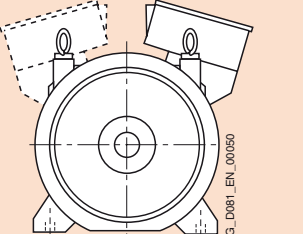
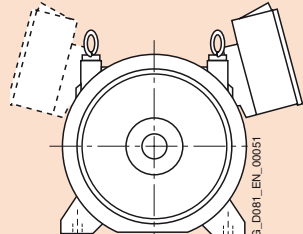
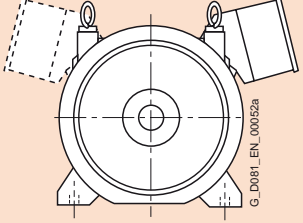
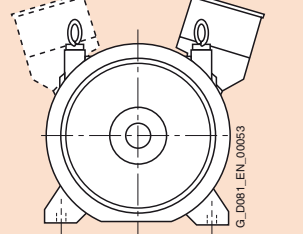
3

Selection and ordering HT-direct motors 1FW4 air-cooled

Cable entry

In the basic version, cable entry is from below.

Further cable entry directions are possible as special versions. In this case, the terminal box and if necessary also the console will have to be rotated.

Basic version	Special versions	
 <p>G_D081_EN_00049</p> <p>Cable entry: bottom Console: 0 degrees Order code: -</p>	 <p>G_D081_EN_00050</p> <p>Cable entry: top Console: 180 degrees Order code: K85</p> <p>Not possible with two opposed terminal boxes</p>	 <p>G_D081_EN_00051</p> <p>Cable entry: top Console: 0 degrees Order code: plain text</p> <p>With cable entry from above, protection against rain and other adverse weather conditions must be provided.</p>
	 <p>G_D081_EN_00052a</p> <p>Cable entry: DE / NDE Console: 0 degrees Order code: K83/K84</p>	 <p>G_D081_EN_00053</p> <p>Cable entry: DE / NDE Console: 180 degrees Order code: plain text</p>

Selection and ordering HT-direct motors 1FW4 air-cooled

Additional information

Packing weights and packing dimensions

Packing weights, tare

Type 1FW4 ...	Land transport on battens	Sea transport in wooden cases
	Type of construction IM B3	Type of construction IM B3
	kg	kg
... 401/403/405/407	90	395
... 451/453/455	95	470
... 501/503/505	100	550

Packing dimension = Largest motor dimension + Supplement

Dimensions	Supplements for	
	Land transport on battens	Sea transport in wooden cases
	Type of construction IM B3	Type of construction IM B3
	mm	mm
Length	+250	+250
Width	+200	+200
Height	+200	+500

Cooling

The motors are designed in accordance with EN 60034-1 for operation up to 40 °C ambient temperature, maintaining all of the motor data.

When the HT-direct motors are operated at higher ambient temperatures, derating factors must be taken into account.

The motors are forced-ventilated as standard. Installation or building in of the motor must not affect the air inlet.

Different ambient temperature and site altitude

Forced-ventilated HT-direct motors are designed for ambient temperatures from -20 °C to +40 °C.

The motors are suitable for site altitudes up to 1000 m above sea level.

For higher ambient temperatures and/or site altitudes higher than 1000 m above sea level, the specified motor rated torque must be reduced using the factor k_{HT} .

Depending on the frame size of the motor, special windings may be added to the motors for the different operating conditions.

This results in a maximum torque of the motor of:

$$T_{max} = T_{rated} \cdot k_{HT}$$

T_{max} = Maximum torque in Nm

T_{rated} = Rated torque in Nm

k_{HT} = Factor for different ambient temperature and site altitude

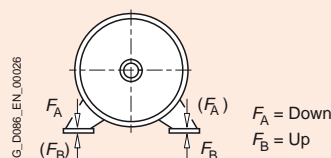
If the maximum torque is no longer adequate for the drive, it should be checked whether the motor with the next higher rated torque fulfills the requirements.

Factor k_{HT} for different ambient temperature and site altitude

Ambient temperature °C	Factor k_{HT} for site altitude above sea level				
	1000 m	1500 m	2000 m	2500 m	3000 m
30	1.07	1.04	1.02	0.98	0.95
35	1.03	1.02	0.98	0.94	0.92
40	1	0.97	0.93	0.90	0.87
45	0.95	0.93	0.88	0.86	0.83
50	0.91	0.88	0.83	0.81	O. R.
55	0.85	0.83	O. R.	O. R.	O. R.
60	0.8	O. R.	O. R.	O. R.	O. R.

Ambient temperature and site altitude are rounded off to 5 °C or 500 m.

Dynamic foundation loading



Type	F_A ¹⁾ kN	F_B ¹⁾ kN
1FW4401-3 ...	44	10
1FW4403-3 ...	50	15
1FW4405-3 ...	57	18
1FW4407-3 ...	67	25
1FW4451-3 ...	71	24
1FW4453-3 ...	77	27
1FW4455-3 ...	88	34
1FW4501-3 ...	93	33
1FW4503-3 ...	113	48
1FW4505-3 ...	136	66

¹⁾ Load at one motor long side (that is for two feet).