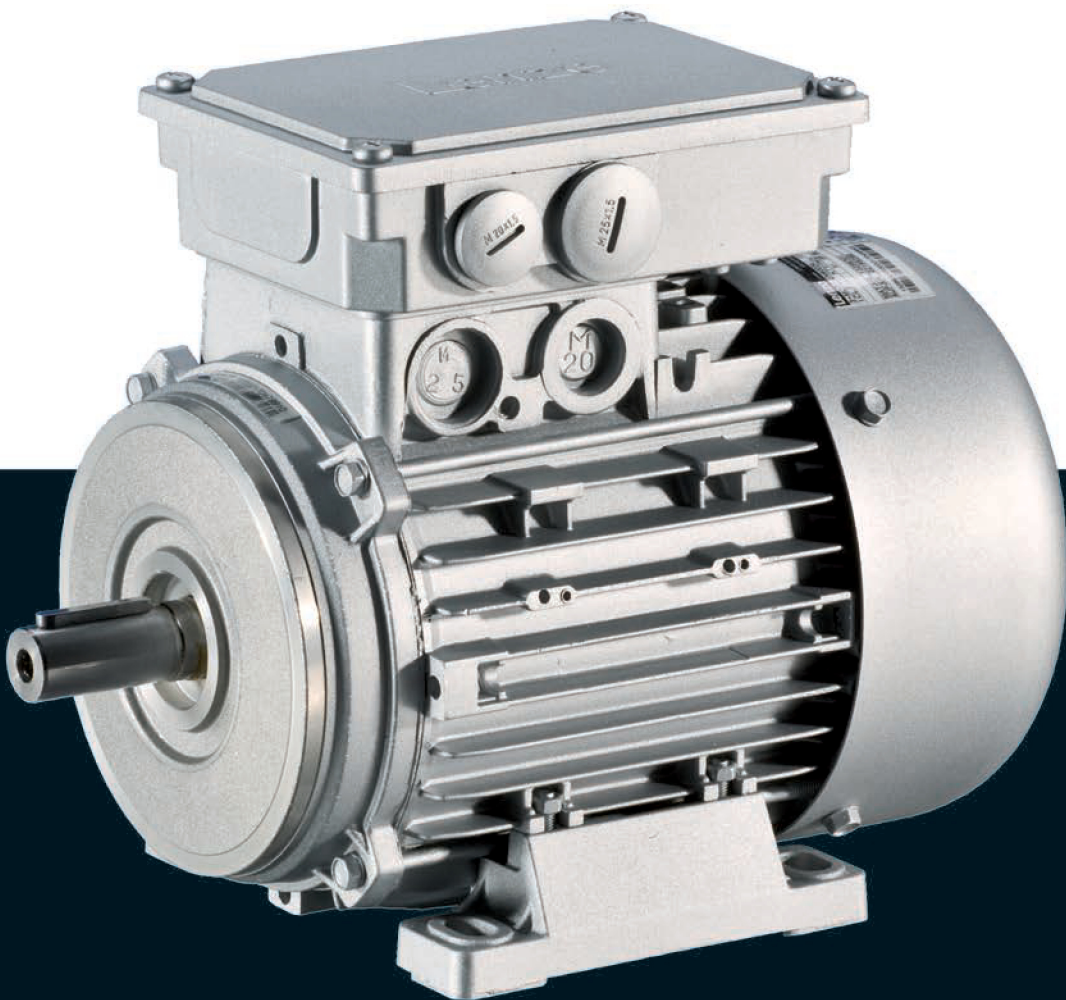


Motors

IE2 MH three-phase AC motors

0.75 to 45 kW



IE2 MH three-phase AC motors

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IE2 MH three-phase AC motors

General information



List of abbreviations

$\eta_{100\%}$	[%]	Efficiency
$\eta_{75\%}$	[%]	Efficiency
$\eta_{50\%}$	[%]	Efficiency
$\cos \phi$		Power factor
I_N	[A]	Rated current
$I_{\max}$	[A]	Max. current consumption
J	[kgcm ²]	Moment of inertia
m	[kg]	Mass
M_a	[Nm]	Starting torque
M_b	[Nm]	Stalling torque
$M_{\max}$	[Nm]	Max. torque
M_N	[Nm]	Rated torque
n_N	[r/min]	Rated speed
P_N	[kW]	Rated power
$P_{\max}$	[kW]	Max. power input

$U_{\max}$	[V]	Max. mains voltage
$U_{\min}$	[V]	Min. mains voltage
$U_{N, \Delta}$	[V]	Rated voltage
$U_{N, Y}$	[V]	Rated voltage

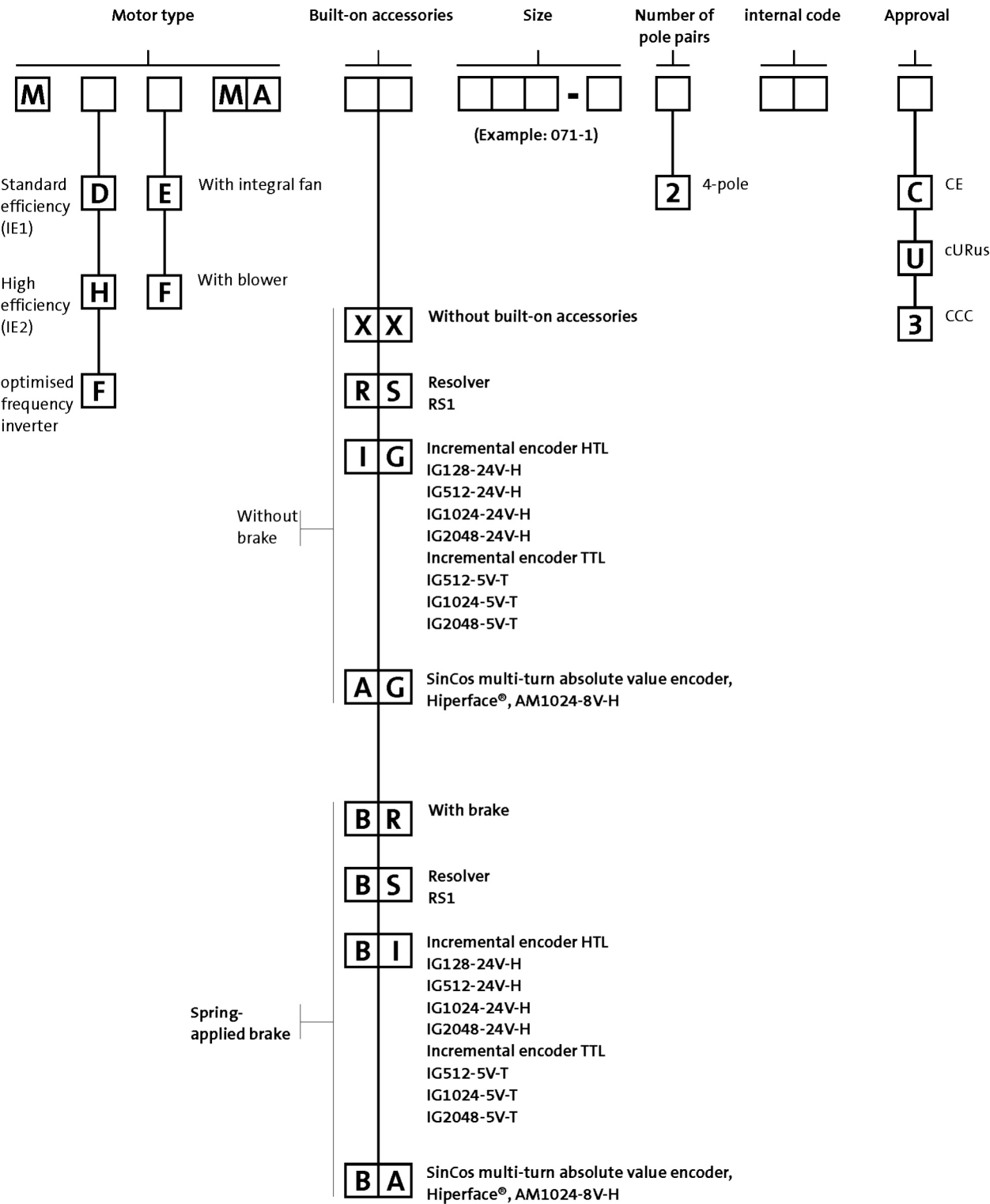
CE	Communauté Européenne
CSA	Canadian Standards Association
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
IEC	International Electrotechnical Commission
IM	International Mounting Code
IP	International Protection Code
NEMA	National Electrical Manufacturers Association
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDE	Verband deutscher Elektrotechniker (Association of German Electrical Engineers)
CCC	China Compulsory Certificate
EAC	Customs union Russia / Belarus / Kazakhstan certificate
cURus	Combined certification marks of UL for the USA and Canada
UkrSEPRO	Certificate for Ukraine

IE2 MH three-phase AC motors

General information



Product key



IE2 MH three-phase AC motors

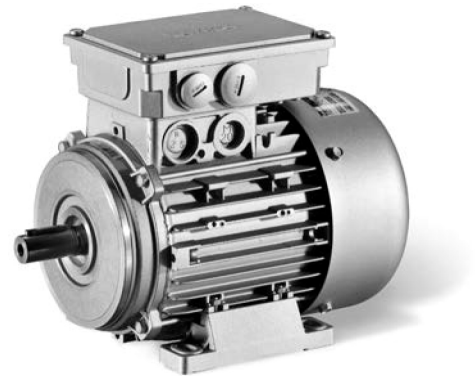
General information



Product information

For a long time now, three-phase AC motors from Lenze have been established in virtually all industrial sectors. Based on our many years of experience in the field of drive and automation technology, we have developed motors, which will ensure that your demands in terms of productivity, quality and availability are perfectly met.

Three-phase AC motors from the L-force series are primarily characterised by their comprehensive modularity. The wide variety of options allows you to precisely adjust the drive characteristics in line with your application. We call this Rightsizing.



L-force MH three-phase AC motors are available in a power range from 0.75 to 45 kW and comply with efficiency class IE2 (high efficiency) as per IEC 60034-30.

Since almost all IE2 motors are designed with the same dimensions as the standard efficiency motors, it is easy to switch between the two.

The energy efficiency of the L-force MH three-phase AC motors has been approved by Underwriters Laboratories (UL) as an independent third-party.

Basic versions

- The motors feature B3, B5 and B14 designs and dimensions standardised in line with IEC 60072-1 and/or DIN EN 50347 which makes them suitable for universal use.
- The thermal sensors integrated as standard allow for permanent temperature monitoring and are coordinated to the motor winding's temperature class F (155 °C).
- The motors of the basic version are adapted to ambient conditions by IP55 degree of protection.
- In tough operating conditions, the surface and corrosion protection system is provided to reliably protect the motor from aggressive media.

Options

- Various brake sizes – each available with several braking torques – can be combined with the three-phase AC motors.
- The LongLife version of the brake can easily reach 10×10^6 switching cycles.
- A resolver and various incremental and absolute value encoders can be fitted for speed and position detection.
- For fast commissioning, the motors are also available with connectors for the power connection, brake, blower and feedback.
- Instead of an integral fan, the motor can optionally be equipped with a blower. No torque reduction is then necessary, even at speeds below 20 Hz.
- For drive tasks in decentralised applications, the motor can be ordered with the motec inverter connected to the terminal box.
- The motors are available with cURus, GOST-R, CCC and UkrSepr approval.

IE2 MH three-phase AC motors

General information



Functions and features

Size		080	090	100
Motor				
Design				
			B3 B5 B14	
Shaft journal				
d x l	[mm]	19 x 40	24 x 50	28 x 60
Spring-applied brake				
Design			Standard or LongLife design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise	
Feedback				
Design			Resolver Incremental encoder Absolute value encoder (multi-turn)	
Temperature sensor				
Thermal contact			TKO	
Thermal detector			KTY83-110 KTY84-130	
PTC thermistor			PTC	
Motor connection				
Power connection			Terminal box ICN connector HAN10E connector HAN modular connector	
Brake connection			Terminal box ICN connector HAN modular connector HAN10E connector	
Blower connection			Terminal box ICN connector	
Feedback connection			Terminal box ICN connector	
Temperature sensor connection			Terminal box TKO or PTC at connector in the power connection KTY at connector in the feedback connection	
Shaft bearings				
Position of the locating bearing			Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A	
Bearing type		Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates		
Colour			Not coated Primed Paint in various corrosion-protection designs in accordance with RAL colours	

IE2 MH three-phase AC motors

General information



Functions and features

Size		112	132	160
Motor				
Design				
		B3 B5 B14	B3 B5	
Shaft journal				
d x l	[mm]	28 x 60	38 x 80	42 x 110
Spring-applied brake				
Design		Standard design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise		
Feedback				
Design		Resolver Incremental encoder Absolute value encoder (multi-turn)		
Temperature sensor				
Thermal contact		TKO		
Thermal detector		KTY83-110 KTY84-130		
PTC thermistor		PTC		
Motor connection				
Power connection		Terminal box ICN connector HAN10E connector HAN modular connector	Terminal box ICN connector HAN modular connector	Terminal box HAN modular connector
Brake connection		Terminal box ICN connector HAN modular connector HAN10E connector	Terminal box ICN connector HAN modular connector	Terminal box HAN modular connector
Blower connection		Terminal box ICN connector		
Feedback connection		Terminal box ICN connector		
Temperature sensor connection		Terminal box TKO or PTC at connector in the power connection KTY at connector in the feedback connection		
Shaft bearings				
Position of the locating bearing		Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A		
Bearing type		Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates		
Colour		Not coated Primed Paint in various corrosion-protection designs in accordance with RAL colours		

IE2 MH three-phase AC motors

General information



Functions and features

Size		180	200	225
Motor				
Design		B3 B5		
Shaft journal				
d x l	[mm]	48 x 110	55 x 110	60 x 140
Spring-applied brake				
Design		Standard design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise		
Feedback				
Design		Resolver Incremental encoder Absolute value encoder (multi-turn)		
Temperature sensor				
Thermal contact		TKO		
Thermal detector		KTY83-110 KTY84-130		
PTC thermistor		PTC		
Motor connection				
Power connection		Terminal box		
Brake connection		Terminal box		
Blower connection		Terminal box ICN connector		
Feedback connection		Terminal box ICN connector		
Temperature sensor connection		Terminal box		
Shaft bearings				
Position of the locating bearing		Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A		Drive end
Bearing type		Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates		
Colour				
		Not coated Primed Paint in various corrosion-protection designs in accordance with RAL colours		

IE2 MH three-phase AC motors

General information



Functions and features

Surface and corrosion protection

For optimum protection of three-phase AC motors against ambient conditions, the surface and corrosion protection system (OKS) offers tailor-made solutions.

Various surface coatings ensure that the motors operate reliably even at high air humidity, in outdoor installation or in the presence of atmospheric impurities. Any colour from the RAL Classic collection can be chosen for the top coat. The three-phase AC motors are also available unpainted (no surface and corrosion protection).

Surface and corrosion protection system	Applications	Measures
OKS-G (primed)	Dependent on subsequent top coat applied	2K PUR priming coat (grey)
OKS-S (small)	- Standard applications - Internal installation in heated buildings - Air humidity up to 90%	Surface coating corresponding to corrosivity category C1 (subject to EN 12944-2)
OKS-M (medium)	- Internal installation in non-heated buildings - Covered, protected external installation - Air humidity up to 95%	Surface coating corresponding to corrosivity category C2 (subject to EN 12944-2)
OKS-L (high) OKS-XL (extra Large)	- External installation - Air humidity above 95% - Chemical industry plants - Food industry	- Surface coating corresponding to corrosivity category C3 (subject to EN 12944-2) - Blower cover and B end shield additionally primed - Screws zinc-coated - Cable glands with gaskets - Corrosion-resistant brake with cover ring, stainless friction plate, and chrome-plated armature plate (on request) Optional measures: - Motor recesses sealed off (on request)

Structure of surface coating

Surface and corrosion protection system	Corrosivity category	Surface coating	Colour
	DIN EN ISO 12944-2	Structure	
Without OKS (uncoated)			
OKS-G (primed)		2K PUR priming coat	
OKS-S (small)	Comparable to C1	2K-PUR top coat	
OKS-M (medium)	Comparable to C2		
OKS-L (high) OKS-XL (extra Large)	Comparable to C3	2K PUR priming coat 2K-PUR top coat	Standard: RAL 7012 Optional: RAL Classic

IE2 MH three-phase AC motors

General information



Motor – inverter assignment

Rated frequency 50/60 Hz

- Decentralised inverter 8400 motec (E84DVB)
- Inverter Drives 8400 (E84AV)

Rated power	Product key		
	Motor	Inverter	
P_N			
[kW]			
0.75	MH□□□□□080-32	E84DVB□7514S□□□2□	E84AV□□□7514□□0
1.10	MH□□□□□090-12	E84DVB□1124S□□□2□	E84AV□□□1124□□0
1.50	MH□□□□□090-32	E84DVB□1524S□□□2□	E84AV□□□1524□□0
2.20	MH□□□□□100-12	E84DVB□2224S□□□2□	E84AV□□□2224□□0
3.00	MH□□□□□100-32	E84DVB□3024S□□□2□	E84AV□□□3024□□0
4.00	MH□□□□□112-22	E84DVB□4024S□□□2□	E84AV□□□4024□□0
5.50	MH□□□□□132-12	E84DVB□5524S□□□2□	E84AV□□□5524□□0
7.50	MH□□□□□132-22	E84DVB□7524S□□□2□	E84AV□□□7524□□0
11.0	MH□□□□□160-22		E84AV□□□1134□□0
15.0	MH□□□□□160-32		E84AV□□□1534□□0
18.5	MH□□□□□180-12		E84AV□□□1834□□0
22.0	MH□□□□□180-32		E84AV□□□2234□□0
30.0	MH□□□□□200-32		E84AV□□□3034□□0
37.0	MH□□□□□225-12		E84AV□□□3734□□0
45.0	MH□□□□□225-22		E84AV□□□4534□□0

IE2 MH three-phase AC motors

General information



Motor – inverter assignment

Rated frequency 87 Hz

- Decentralised inverter 8400 motec (E84DVB)
- Inverter Drives 8400 (E84AV)

Rated power	Product key		
	Motor	Inverter	
P _N			
[kW]			
1.35	MH□□□□□080-32	E84DVB□1524S□□□2□	E84AV□□□1524□□0
2.00	MH□□□□□090-12	E84DVB□2224S□□□2□	E84AV□□□2224□□0
2.70	MH□□□□□090-32	E84DVB□3024S□□□2□	E84AV□□□3024□□0
3.90	MH□□□□□100-12	E84DVB□4024S□□□2□	E84AV□□□4024□□0
5.40	MH□□□□□100-32	E84DVB□5524S□□□2□	E84AV□□□5524□□0
7.10	MH□□□□□112-22	E84DVB□7524S□□□2□	E84AV□□□7524□□0
9.70	MH□□□□□132-12		E84AV□□□1134□□0
13.2	MH□□□□□132-22		E84AV□□□1534□□0
19.4	MH□□□□□160-22		E84AV□□□2234□□0
26.4	MH□□□□□160-32		E84AV□□□3034□□0
32.5	MH□□□□□180-12		E84AV□□□3734□□0

IE2 MH three-phase AC motors

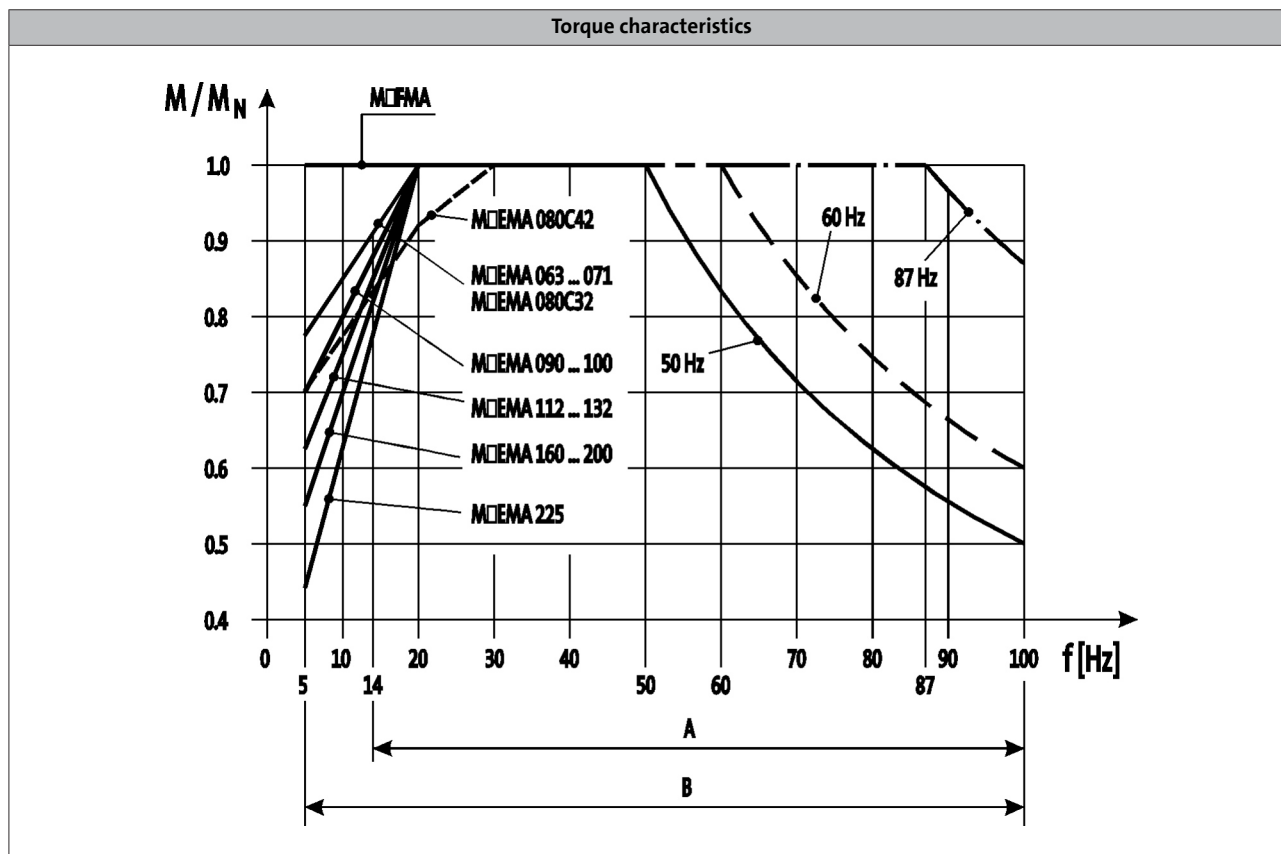
General information



Dimensioning

Torque derating at low motor frequencies

The diagram shows the motor frame size-dependent torque reduction for self-ventilated motors, taking the thermal behaviour during actuation of the inverter into consideration.



A = Operation with integral fan and brake

B = Operation with integral fan and brake control "Holding current reduction"

- The motor specifications stated in this catalogue for inverter operation apply to operation with a Lenze inverter. If you are uncertain, get in touch with the manufacturer of the inverter to ask whether the device is capable of driving the motor with the stated specifications (e.g. setting range, base frequency).

You can use the Drive Solution Designer for precise drive dimensioning.

The Drive Solution Designer helps you to carry out a fast and high-quality drive dimensioning. The software includes well-founded and proven knowledge on drive applications and electro-mechanical drive components.

Please contact your Lenze sales office.

IE2 MH three-phase AC motors

General information



IE2 MH three-phase AC motors

Technical data



Standards and operating conditions

Degree of protection			
EN 60529			IP55 ¹⁾ IP65 ¹⁾ IP66 ¹⁾
Energy efficiency class			
IEC 60034-30			IE2
IEC 60034-2-1			Methodology for measuring efficiency
Conformity			
CE			Low-Voltage Directive
			2006/95/EC
EAC			TP TC 004/2011 (TR CU 004/2011)
Approval			
			UkrSEPRO
CCC			GB Standard 12350-2009
CSA			CSA 22.2 No. 100 CSA C390-10
cURus ²⁾			UL 1004-1 UL 1004-8 Power Conversion Equipment (File-No. E210321)
Temperature class			
IEC/EN 60034-1; utilisation			B
IEC/EN 60034-1; insulation system (enamel-insulated wire)			F
Min. ambient operating temperature			
	T _{opr,min}	[°C]	-20
Max. ambient temperature for operation			
	T _{opr,max}	[°C]	40
With power reduction	T _{opr,max}	[°C]	60
Site altitude			
Amsl	H _{max}	[m]	4000
Max. speed			
	n _{max}	[r/min]	4500

¹⁾ Designs with different degrees of protection:
IP55 with brake (IP54 with manual release lever).
IP54 with resolver RS1.
IP54 with HTL incremental encoder IG128-24V-H.

²⁾ Motor frame size 225, in preparation.

- In the European Union, the ErP Directive stipulates minimum efficiency levels for three-phase AC motors. Geared three-phase AC motors that do not conform with this Directive do not meet CE requirements and must not be marketed in the European Economic Area. For further information about the ErP Directive and the Lenze products to which it relates, please refer to the brochure entitled "International efficiency directives for three-phase AC motors".

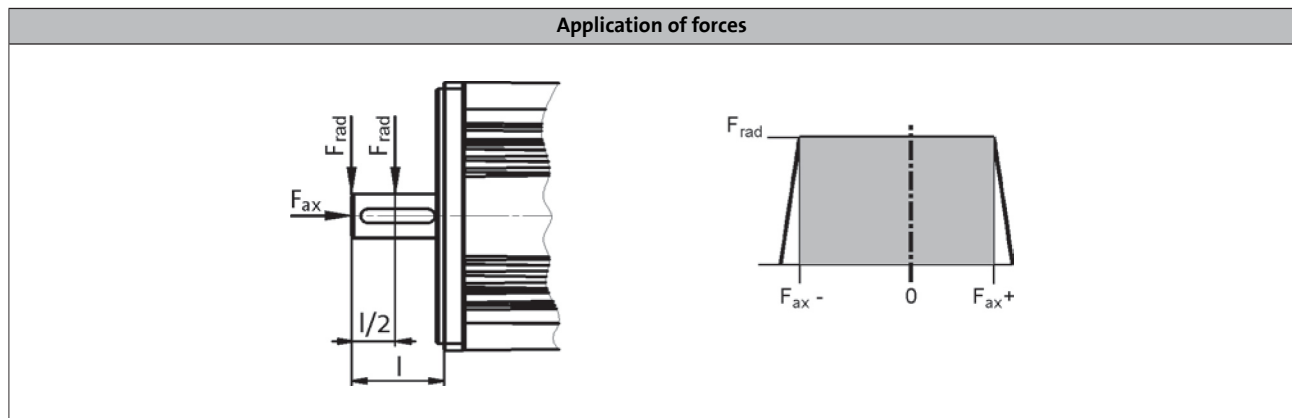
IE2 MH three-phase AC motors

Technical data



Permissible radial and axial forces

- Forces at medium speed 2000 r/min.



Application of force at $l/2$

Bearing service life L_{10}												
	10000 h			20000 h			30000 h			50000 h		
	F_{rad}	$F_{ax,-}$	$F_{ax,+}$	F_{rad}	$F_{ax,-}$	$F_{ax,+}$	F_{rad}	$F_{ax,-}$	$F_{ax,+}$	F_{rad}	$F_{ax,-}$	$F_{ax,+}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
063	600	-600	300	470	-480	180	410	-430	120	350	-370	70
071	740	-800	470	590	-630	300	510	-550	220	430	-470	140
080	960	-1090	580	770	-860	350	670	-760	250	570	-650	140
090	1050	-1160	630	840	-920	390	730	-800	280	620	-690	160
100	1490	-1490	910	1190	-1160	580	1050	-1010	430	890	-860	270
112	2250	-2330	1340	1790	-1830	840	1570	-1600	610	1330	-1360	370
132	3300	-2150	1190	2640	-1670	710	2320	-1440	480	1970	-1210	250
160	3750	-2700	1520	3000	-2130	950	2640	-1830	670	2250	-1440	360
180	5620	-3270	1790	4500	-2580	1120	3960	-2210	790	3375	-1750	420
200	5620	-3270	1790	4500	-2580	1120	3960	-2210	790	3375	-1750	420
225	5200	-3100	3900	3900	-2100	2900	3300	-1300	2100	2650	-1000	1800

- The values for the bearing service life L_{10} refer to an average speed of 2000 r/min. Depending on the ambient temperatures, the service life of the bearings is also reduced by the grease life-time.
- Data for axial forces relate to the maximum radial force with the corresponding bearing service life.

IE2 MH three-phase AC motors

Technical data



Permissible radial and axial forces

- Forces at medium speed 2000 r/min.

Application of force at I

Bearing service life L_{10}												
	10000 h			20000 h			30000 h			50000 h		
	F_{rad}	$F_{ax,-}$	$F_{ax,+}$	F_{rad}	$F_{ax,-}$	$F_{ax,+}$	F_{rad}	$F_{ax,-}$	$F_{ax,+}$	F_{rad}	$F_{ax,-}$	$F_{ax,+}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
063	400	-600	300	370	-480	180	320	-430	120	300	-370	70
071	680	-800	470	540	-630	300	470	-550	220	400	-470	140
080	880	-1090	580	700	-860	350	610	-760	250	520	-650	140
090	940	-1160	630	750	-920	390	660	-800	280	560	-690	160
100	1350	-1490	910	1080	-1160	580	940	-1010	430	800	-860	270
112	2040	-2330	1340	1620	-1830	840	1420	-1600	610	1210	-1360	370
132	3020	-2150	1190	2420	-1670	710	2120	-1440	480	1800	-1210	250
160	3410	-2700	1520	2730	-2130	950	2400	-1830	670	2050	-1440	360
180	4550	-3270	1790	3640	-2580	1120	3200	-2210	790	2730	-1750	420
200	4550	-3270	1790	3640	-2580	1120	3200	-2210	790	2730	-1750	420
225	4800	-3100	3900	3600	-2100	2900	3000	-1300	2100	2400	-1000	1800

- The values for the bearing service life L_{10} refer to an average speed of 2000 r/min. Depending on the ambient temperatures, the service life of the bearings is also reduced by the grease life-time.
- Data for axial forces relate to the maximum radial force with the corresponding bearing service life.

IE2 MH three-phase AC motors

Technical data



Rated data for 50 Hz

4-pole motors

	P _N	n _N	U _{N, Δ} ²⁾	I _{N, Δ}	U _{N, Y}	I _{N, Y}	I _a /I _N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MH□□□□□080-32	0.75	1410	230	3.10	400	1.80	5.00
MH□□□□□090-12	1.10	1430	230	4.60	400	2.70	5.40
MH□□□□□090-32	1.50	1435	230	5.80	400	3.30	6.30
MH□□□□□100-12	2.20	1445	230	8.60	400	5.00	6.00
MH□□□□□100-32	3.00	1445	230	12.1	400	7.00	6.50
MH□□□□□112-22	4.00	1455	230	14.5	400	8.40	6.00
MH□□□□□132-12	5.50	1470	230 400 ³⁾	20.6 11.9	400	11.9	6.10
MH□□□□□132-22	7.50	1460	230 400 ³⁾	27.0 15.6	400	15.6	8.50
MH□□□□□160-22	11.0	1470	230 400 ³⁾	37.7 21.8	400	21.8	8.00
MH□□□□□160-32	15.0	1470	230 400 ³⁾	50.3 29.1	400	29.1	8.20
MH□□□□□180-12	18.5	1475	230 400 ³⁾	58.8 34.0	400	34.0	8.40
MH□□□□□180-32	22.0	1470	230 400 ³⁾	68.9 39.8	400	39.8	7.80
MH□□□□□200-32	30.0	1465	230 400 ³⁾	93.8 53.9	400	53.9	7.00
MH□□□□□225-12	37.0	1483	230 400 ³⁾	113 65.0	400	65.0	7.50
MH□□□□□225-22	45.0	1480	230 400 ³⁾	137 79.0	400	79.0	7.60

	M _N	M _a	M _b	cos φ	η _{50 %}	η _{75 %}	η _{100 %}	J ¹⁾	m ¹⁾
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm ²]	[kg]
MH□□□□□080-32	5.08	12.0	12.1	0.84	74.9	79.6	79.6	28.0	11.0
MH□□□□□090-12	7.35	20.3	24.2	0.76	77.4	81.6	82.0	32.0	16.0
MH□□□□□090-32	10.0	33.0	34.0	0.76	82.2	83.4	82.8	36.0	18.0
MH□□□□□100-12	14.5	48.0	55.0	0.80	85.4	86.7	86.3	61.0	24.0
MH□□□□□100-32	19.8	67.0	76.0	0.73	83.8	85.6	85.5	66.0	26.5
MH□□□□□112-22	26.3	81.0	100	0.80	86.3	88.2	88.3	135	38.0
MH□□□□□132-12	35.7	90.0	108	0.77	88.2	89.3	89.2	290	59.0
MH□□□□□132-22	49.1	110	175	0.79	87.6	88.9	88.7	336	66.0
MH□□□□□160-22	71.5	164	243	0.82	89.4	90.0	89.8	570	109
MH□□□□□160-32	97.4	224	292	0.82	90.2	90.8	90.6	760	124
MH□□□□□180-12	120	359	371	0.86	90.8	91.4	91.2	1390	175
MH□□□□□180-32	143	400	372	0.87	91.4	92.0	91.6	1440	180
MH□□□□□200-32	196	469	528	0.87	91.9	92.5	92.3	1850	315
MH□□□□□225-12	238	620	620	0.87	94.0	94.6	94.3	4610	395
MH□□□□□225-22	290	698	669	0.88	93.7	94.5	94.3	5300	415

¹⁾ Without accessories

²⁾ Operation at 87 Hz is possible with 4-pole motors whose rated data at 50 Hz displays the voltage values Δ 230 V.
With motor frame sizes 132-12 to 225-22, the required voltage must also be specified in your order.

³⁾ Star/delta start-up possible at 400 V.

IE2 MH three-phase AC motors

Technical data



Rated data for 60 Hz

4-pole motors

	P _N	n _N	U _{N, Δ} ²⁾	I _{N, Δ}	U _{N, Y}	I _{N, Y}	I _a /I _N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MH□□□□□080-32	0.75	1720	265	2.80	460	1.60	5.80
MH□□□□□090-12	1.10	1740	265	4.00	460	2.30	6.50
MH□□□□□090-32	1.50	1745	265	5.10	460	3.00	7.20
MH□□□□□100-12	2.20	1750	265	7.70	460	4.40	6.90
MH□□□□□100-32	3.00	1755	265	10.6	460	6.10	7.70
MH□□□□□112-22	4.00	1760	265	12.8	460	7.40	7.00
MH□□□□□132-12	5.50	1775	265 460 ³⁾	18.0 10.4	460	10.4	7.10
MH□□□□□132-22	7.50	1765	265 460 ³⁾	24.2 14.0	460	14.0	9.70
MH□□□□□160-22	11.0	1775	265 460 ³⁾	32.5 18.7	460	18.7	9.40
MH□□□□□160-32	15.0	1775	265 460 ³⁾	44.1 24.5	460	24.5	9.80
MH□□□□□180-12	18.5	1775	265 460 ³⁾	51.1 29.4	460	29.4	9.70
MH□□□□□180-32	22.0	1775	265 460 ³⁾	59.7 34.4	460	34.4	9.00
MH□□□□□200-32	30.0	1770	265 460 ³⁾	80.7 46.5	460	46.5	8.10
MH□□□□□225-12	37.0	1787	265 460 ³⁾	92.5 53.4	460	53.4	8.70
MH□□□□□225-22	45.0	1784	265 460 ³⁾	111 64.2	460	64.2	8.80

	M _N	M _a	M _b	cos φ	η _{50 %}	η _{75 %}	η _{100 %}	J ¹⁾	m ¹⁾
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm ²]	[kg]
MH□□□□□080-32	4.16	9.37	9.89	0.82	77.9	81.5	82.5	28.0	11.0
MH□□□□□090-12	6.04	17.0	20.0	0.71	79.3	83.0	84.0	32.0	16.0
MH□□□□□090-32	8.21	27.0	28.0	0.75	79.3	83.0	84.0	36.0	18.0
MH□□□□□100-12	12.0	40.0	47.0	0.78	82.6	86.5	87.5	61.0	24.0
MH□□□□□100-32	16.3	55.0	64.0	0.71	84.2	86.6	87.5	66.0	26.5
MH□□□□□112-22	21.7	69.0	84.0	0.79	84.2	86.6	87.5	135	38.0
MH□□□□□132-12	29.6	74.0	92.0	0.77	86.1	88.6	89.5	290	59.0
MH□□□□□132-22	40.6	92.0	147	0.79	86.1	88.6	89.5	336	66.0
MH□□□□□160-22	59.2	148	231	0.81	89.3	90.9	91.0	570	109
MH□□□□□160-32	80.7	210	274	0.81	89.3	90.9	91.0	760	124
MH□□□□□180-12	99.5	338	348	0.86	90.6	92.3	92.4	1390	175
MH□□□□□180-32	118	379	355	0.87	90.6	92.3	92.4	1440	180
MH□□□□□200-32	162	440	505	0.87	92.0	92.9	93.0	1850	315
MH□□□□□225-12	198	590	590	0.87	92.0	92.9	93.0	4610	395
MH□□□□□225-22	241	660	635	0.88	92.6	93.5	93.6	5300	415

¹⁾ Without accessories

²⁾ Operation at 87 Hz is possible with 4-pole motors whose rated data at 60 Hz displays the voltage values Δ 265 V.
With motor frame sizes 132-12 to 225-22, the required voltage must also be specified in your order.

³⁾ Star/delta start-up possible at 460 V.

IE2 MH three-phase AC motors

Technical data



Rated data for 87 Hz

4-pole motors

	P _N	n _N	M _N	M _{max}	U _{N, Δ}	I _{N, Δ}	cos φ	η _{50 %}	η _{75 %}	η _{100 %}	J ¹⁾	m ¹⁾
					± 10 %							
	[kW]	[r/min]	[Nm]	[Nm]	[V]	[A]		[%]	[%]	[%]	[kgcm ²]	[kg]
MH□□□□□080-32	1.35	2520	5.12	20.0	400	3.10	0.84	77.3	81.6	83.5	28.0	11.0
MH□□□□□090-12	2.00	2540	7.52	30.0	400	4.60	0.78	80.4	84.9	86.5	32.0	16.0
MH□□□□□090-32	2.70	2545	10.1	40.0	400	5.80	0.76	82.3	85.5	86.0	36.0	18.0
MH□□□□□100-12	3.90	2555	14.6	60.0	400	8.60	0.83	85.7	89.6	90.0	61.0	24.0
MH□□□□□100-32	5.40	2555	20.2	80.0	400	12.1	0.76	84.7	87.9	88.5	66.0	26.5
MH□□□□□112-22	7.10	2565	26.4	106	400	14.5	0.83	87.4	90.2	90.9	135	38.0
MH□□□□□132-12	9.70	2580	35.9	144	400	20.6	0.82	88.2	91.4	91.8	290	59.0
MH□□□□□132-22	13.2	2570	49.1	196	400	27.0	0.82	88.2	90.1	90.7	336	66.0
MH□□□□□160-22	19.4	2580	71.8	287	400	37.7	0.81	90.6	91.0	91.6	570	109
MH□□□□□160-32	26.4	2580	97.7	391	400	50.3	0.81	91.4	91.0	91.6	760	124
MH□□□□□180-12	32.5	2585	120	480	400	58.8	0.86	92.0	92.2	92.8	1390	175
MH□□□□□180-32	38.7	2580	143	573	400	68.9	0.87	92.1	92.9	93.4	1440	180
MH□□□□□200-32	52.7	2575	196	782	400	92.6	0.87	92.6	92.7	93.2	1850	315
MH□□□□□225-12	64.0	2593	236	920	400	113	0.87	93.0	94.4	94.8	4610	395
MH□□□□□225-22	78.0	2590	288	1150	400	137	0.85	93.5	94.3	94.7	5300	415

¹⁾ Without accessories

IE2 MH three-phase AC motors

Technical data



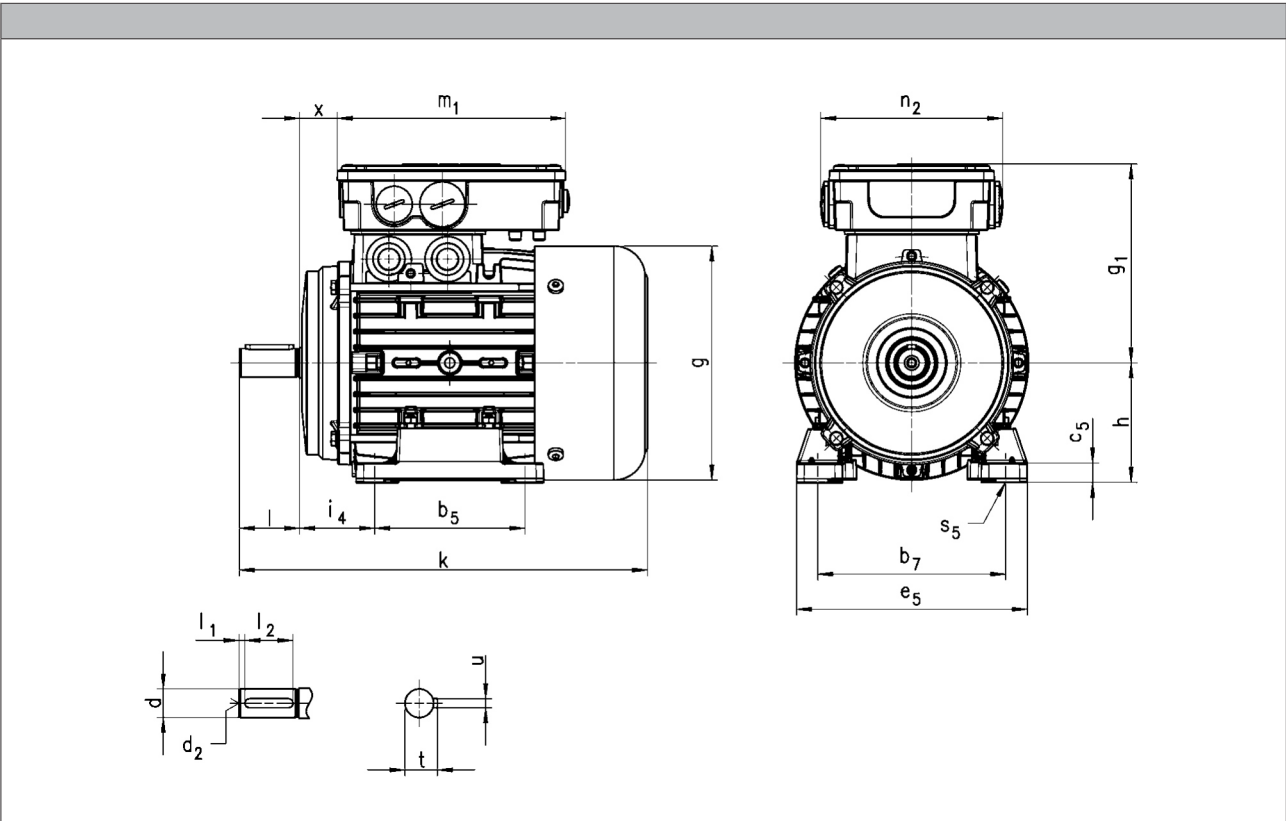
IE2 MH three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)

Design B3



Motor type	MHEMAXX						MHEMABR					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	272	156	132	25	152	121	345	154	132	25	152	121
090	331	176	137	29			399	176	137	29		
100	382 ¹⁾ 397 ²⁾	194	147	36			463 ¹⁾ 489 ²⁾	194	147	36		
112	436	218	158	38	194	125	526	218	158	38	194	125
132	497	258	187	51			576	258	187	51		
160	598 ³⁾ 642 ⁴⁾	310	220	69			703 ³⁾ 747 ⁴⁾	313	220	69		
180	671	348	239	75	253	152	784	351	239	75	253	152
200	728	351		77			841			77		
225	961	447	348	68	354	204	1074	447	348	68	354	204

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

IE2 MH three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)

Design B3

Motor type	MHEMARS MHEMAIG MHEMAAG	MHEMABS MHEMABI MHEMABA
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	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	369	156	132	25	152	121	383	156	142	24	194	125
090	418	178	137	29			436	176	147	28		
100	463 ¹⁾	196	147	36			479 ¹⁾	194	158	35		
	478 ²⁾						494 ²⁾					
112	516	220	158	38			556	218	168	37		
132	599	261	187	51	194	125	621	258	187	51		
160	681 ³⁾	313	220	69	253	152	789 ³⁾	313	220	69	253	152
	725 ⁴⁾						833 ⁴⁾					
180	750	351	239	75			863	351	239	75		
200	807			77			920			77		
225	1040	447	348	68			354	204	1153	447		

	d	d	d	d ₂	l	l ₁	l ₂	t	u	
	j6	k6	m6							
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
080	19			M6	40	5.0	32	21.5	6.0	
090	24			M8	50		40	27.0	8.0	
100	28			M10	60		50	31.0		
112				M12	80		70	41.0	10.0	
132		38		M16	110		100	45.0	12.0	
160		42						51.5	14.0	
180		48		M20	140		130	59.0	16.0	
200			55					64.0	18.0	
225			60							

	b ₇	i ₄	b ₅	e ₅	h	c ₅	s ₅
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	125	50	100	154	80	13	10.0
090	140	56	125	174	90		
100	160	63	140	194	100	15	12.0
112	190	70		223	112	14	
132	216	89	178	260	132	18	
160	254	108	210 ³⁾	305	160	22	14.5
			254 ⁴⁾				
180	279	121	241 ⁵⁾	350	180	23	
			279 ⁶⁾				
200	318	133	305	400	200	32	18.5
225	356	149	286 ⁷⁾	440	225	34	
			311 ⁸⁾				

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

⁵⁾ 180-12

⁶⁾ 180-32

⁷⁾ 225-12

⁸⁾ 225-22

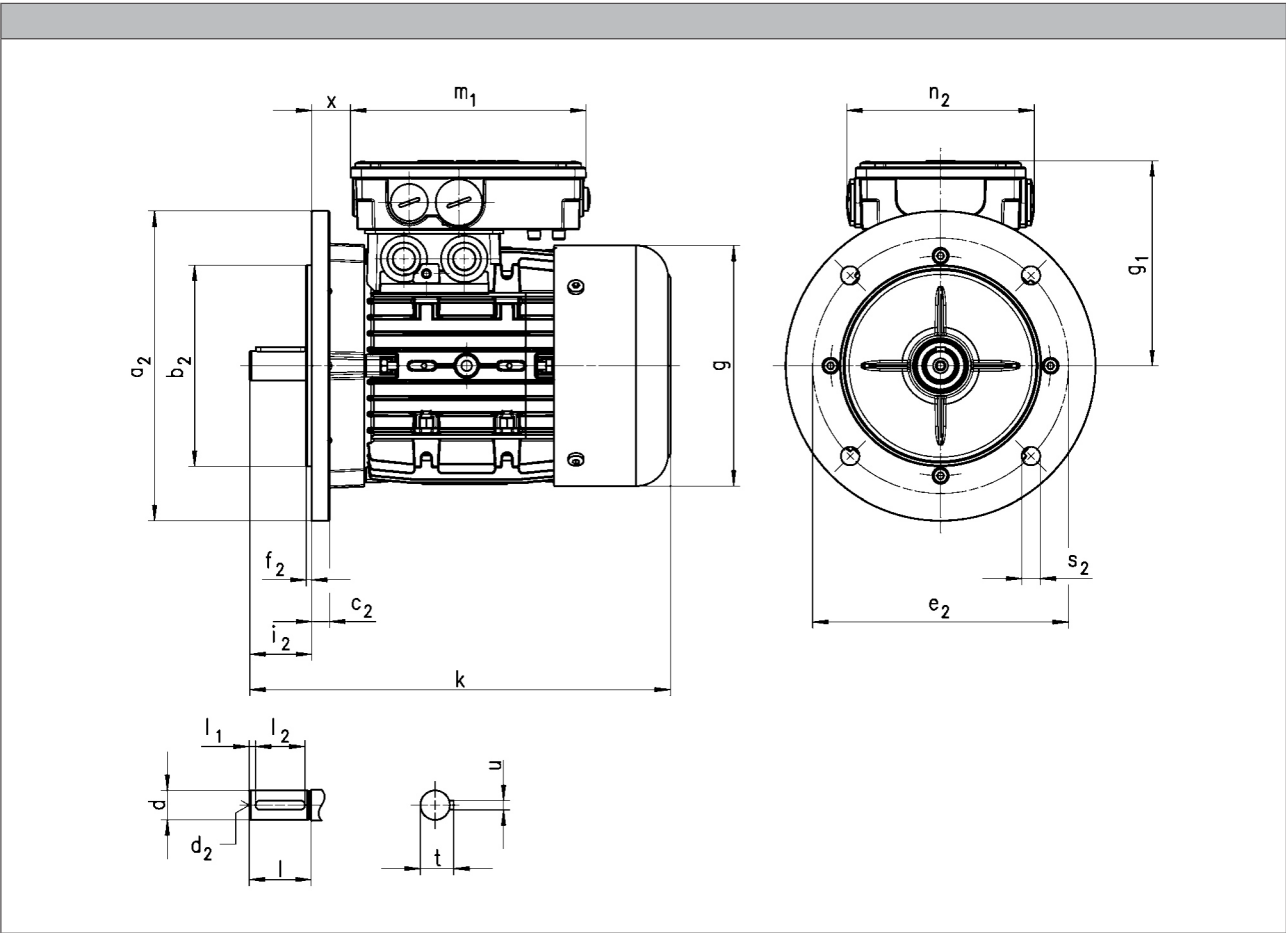
IE2 MH three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)

Design B5



5.8

Motor type	MHEMAXX						MHEMABR					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	272	156	132	25	152	121	345	154	132	25	152	121
090	331	176	137	29			399	176	137	29		
100	382 ¹⁾	194	147	36			463 ¹⁾	194	147	36		
	397 ²⁾						489 ²⁾					
112	436	218	158	38			526	218	158	38		
132	497	258	187	51	194	125	576	258	187	51	194	125
160	598 ³⁾	310	220	69	253	152	703 ³⁾	313	220	69	253	152
	642 ⁴⁾						747 ⁴⁾					
180	671	348	75	784			351	239	75			
200	728	351	77	841					77			
225	961	447	348	68			354	204	1074	447		

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

IE2 MH three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)

Design B5

Motor type	MHEMARS MHEMAIG MHEMAAG						MHEMABS MHEMABI MHEMABA					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	369	156	132	25	152	121	383	156	142	24	194	125
090	418	178	137	29			436	176	147	28		
100	463 ¹⁾	196	147	36			479 ¹⁾	194	158	35		
	478 ²⁾						494 ²⁾					
112	516	220	158	38	194	125	556	218	168	37	253	152
132	599	261	187	51			621	258	187	51		
160	681 ³⁾	313	220	69	253	152	789 ³⁾	313	220	69	253	152
	725 ⁴⁾						833 ⁴⁾					
180	750	351	239	75			863	351	239	75		
200	807			77			920			77		
225	1040	447	348	68	354	204	1153	447	348	68	354	204

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

	d	d	d	d ₂	l	l ₁	l ₂	t	u	
	j6	k6	m6							
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
080	19			M6	40	5.0	32	21.5	6.0	
090	24			M8	50		40	27.0	8.0	
100	28			M10	60		50	31.0		
112				M12	80		70	41.0	10.0	
132		38		M16	110		100	45.0	12.0	
160		42						51.5	14.0	
180		48		M20	140			130	59.0	16.0
200									64.0	18.0
225			55							
			60							

	Flange size								
		a ₂	b ₂	b ₂	c ₂	e ₂	f ₂	s ₂	i ₂
			j6	h6					-0.6 ... 0.5
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080		200	130		11	165	3.5		40.0
090									50.0
100		250	180		15	215	4.0		60.0
112					20	265			80.0
132		300	230	13	300	5.0	110		
160		350	250						
180		400		300	17			350	
200		450		350	18			400	
225									140

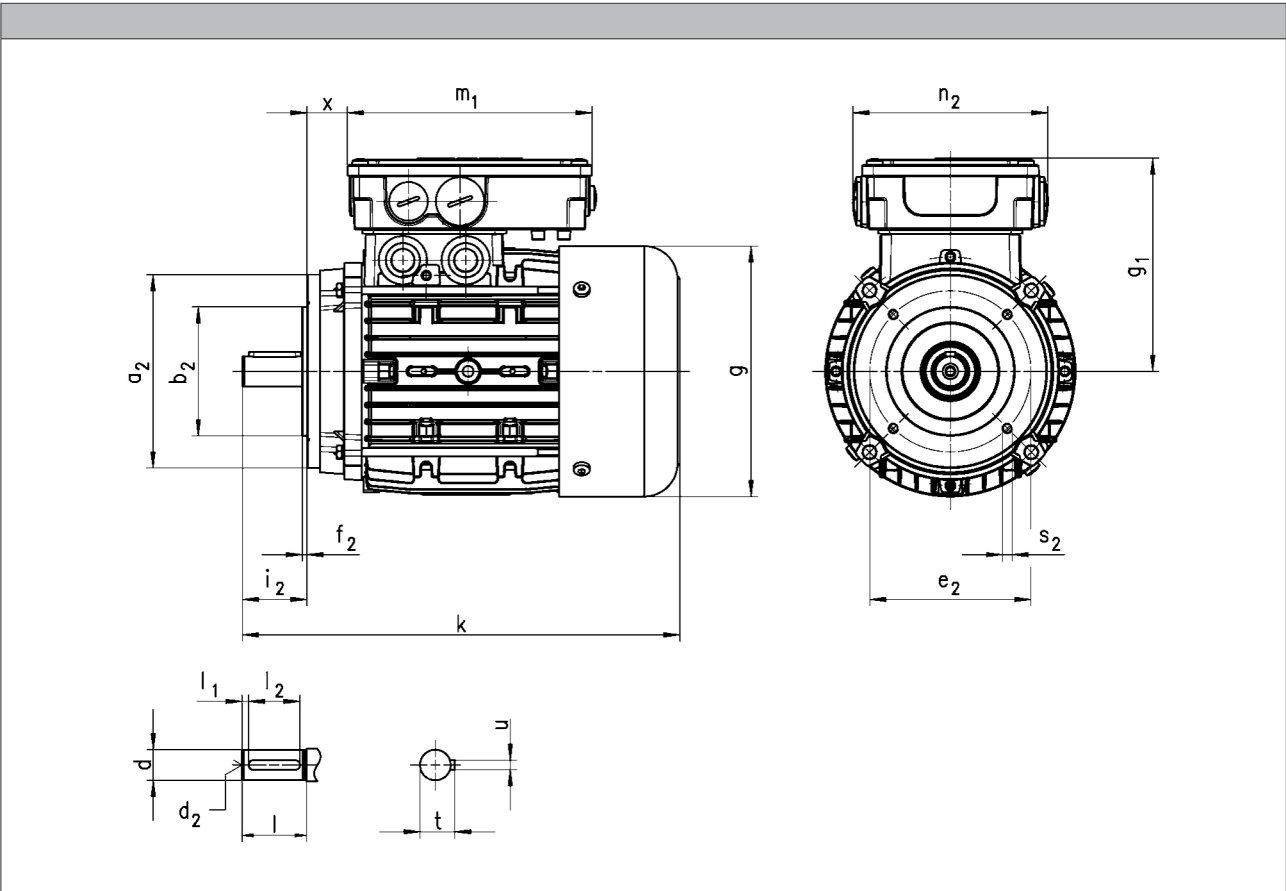
IE2 MH three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)

Design B14



5.8

Motor type	MHEMAXX						MHEMABR					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	272	156	132	25	152	121	345	154	132	25	152	121
090	331	176	137	29			399	176	137	29		
100	382 ¹⁾	194	147	36			463 ¹⁾	194	147	36		
	397 ²⁾						489 ²⁾					
112	436	218	158	38			526	218	158	38		

¹⁾ 100-12
²⁾ 100-32

IE2 MH three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)

Design B14

Motor type	MHEMARS MHEMAIG MHEMAAG						MHEMABS MHEMABI MHEMABA					
	k	g	g ₁	x	m ₁	n ₂	k	g	g ₁	x	m ₁	n ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	369	156	132	25	152	121	383	156	142	24	194	125
090	418	178	137	29			436	176	147	28		
100	463 ¹⁾	196	147	36			479 ¹⁾	194	158	35		
	478 ²⁾						494 ²⁾					
112	516	220	158	38			556	218	168	37		

¹⁾ 100-12

²⁾ 100-32

	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	19		M6	40	4.0	32	21.5	6.0
090	24		M8	50	5.0	40	27.0	8.0
100	28		M10	60		50	31.0	
112								

Flange size							
		a ₂	b ₂	e ₂	f ₂	s ₂	i ₂
			j6				-0.6 ... 0.5
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	FT100	120	80	100	3.0	M6x12	40.0
	FT130	160	110	130	3.5	M8x14	
090	FT115	140	95	115	3.0	M8x16	50.0
100	FT130	160	110	130	3.5	M8x14	60.0
112						M8x16	

5.8

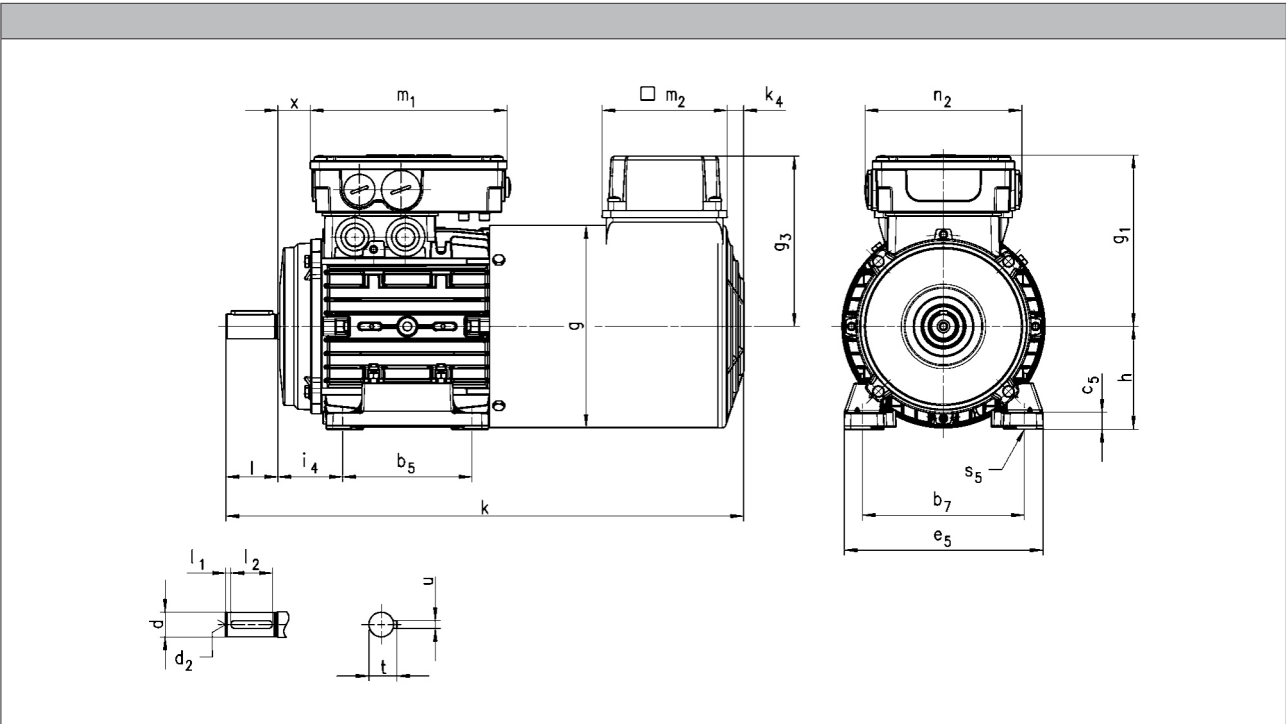
IE2 MH three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)

Design B3



Motor type																		
	MHFMAXX									MHFMABR								
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	400	156	132	25	152	121	132	13	96	455	156	132	25	152	121	132	13	96
090	460	176	137	29			141	22	95	513	176	137	29			141	22	95
100	491 ¹⁾	194	147	36			150			552 ¹⁾	194	147	36			150		
	506 ²⁾									567 ²⁾								
112	538	218	158	38			162			619	218	158	38			162		
132	612	257	187	51	194	125	182	32	96	698	257	187	51	194	125	182	32	96
160	747 ³⁾	309	220	69	253	152	209	31		777 ³⁾	309	220	69	253	152	209	31	
	791 ⁴⁾									821 ⁴⁾								
180	820	348	239	75						886	348	239	75					
200	883	351		77					106	943	351		77					106
225	1175	447	348	68					354	204	96	1175	447					348

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

IE2 MH three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)

Design B3

Motor type	MHFMARS MHFMAIG MHFMAAG										MHFMABS MHFMABI MHFMABA									
------------	-------------------------------	--	--	--	--	--	--	--	--	--	-------------------------------	--	--	--	--	--	--	--	--	--

	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	400	156	132	25	152	121	132	13	96	455	156	142	24	194	125	132	13	96
090	460	176	137	29			141	22	95	513	176	147	28			141	22	95
100	491 ¹⁾ 506 ²⁾	194	147	36	194	125	150			552 ¹⁾ 567 ²⁾	194	158	35	253	152	150		
112	619	218	158	38			162	32	96	619	218	168	37			162	31	96
132	698	257	187	51	253	152	182			698	257	187	51	253	152	182		
160	822 ³⁾ 866 ⁴⁾	309	220	69	253	152	209	31	96	835 ³⁾ 877 ⁴⁾	309	220	69	253	152	209	31	96
180	886	348	239	75						946	348	239	75					
200	943	351		77	354	204	209	31	96	1003	351		77					
225	1175	447	348	68						1175	447	348	68	354	204			

	d	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6	m6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	19	24	38	M6	40	4.0	32	21.5	6.0
090	24			M8	50		40	27.0	8.0
100	28	38	42	M10	60	5.0	50	31.0	
112				M12	80		70	41.0	10.0
132	38	42	48	M16	110	5.0	100	45.0	12.0
160								51.5	14.0
180	48	55	60	M20	140	5.0	130	59.0	16.0
200								64.0	18.0
225	60								

	b ₇	i ₄	b ₅	e ₅	h	c ₅	s ₅
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	125	50	100	154	80	13	10.0
090	140	56	125	174	90		
100	160	63	140	194	100	15	12.0
112	190	70		223	112	14	
132	216	89	178	260	132	18	14.5
160	254	108	210 ³⁾ 254 ⁴⁾	305	160	22	
180	279	121	241 ⁵⁾ 279 ⁶⁾	350	180	23	18.5
200	318	133	305	400	200	32	
225	356	149	286 ⁷⁾ 311 ⁸⁾	440	225	34	

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

⁵⁾ 180-12

⁶⁾ 180-32

⁷⁾ 225-12

⁸⁾ 225-22

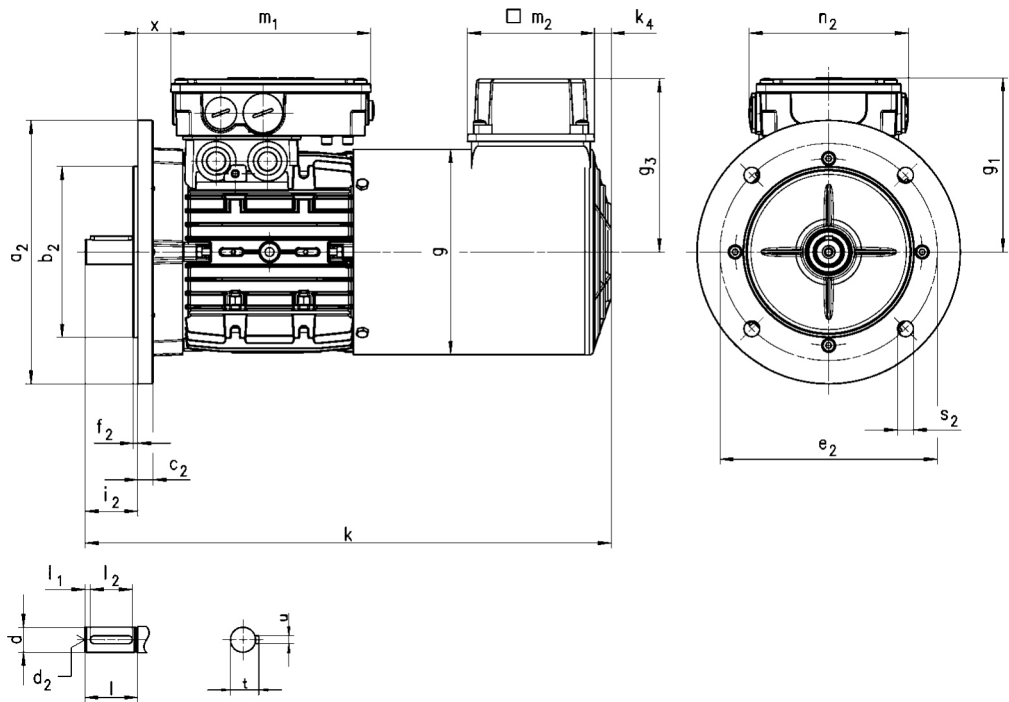
IE2 MH three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)

Design B5



Motor type																				
	MHFMAXX										MHFMABR									
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
080	400	156	132	25	152	121	132	13	96	455	156	132	25	152	121	132	13	96		
090	460	176	137	29			141	22	95	513	176	137	29			141	22	95		
100	491 ¹⁾	194	147	36			150			552 ¹⁾	194	147	36			150				
	506 ²⁾									567 ²⁾										
112	538	218	158	38			162			619	218	158	38			162				
132	612	257	187	51	194	125	182	32	698	257	187	51	194	125	182	32				
160	747 ³⁾	309	220	69	253	152	209	31	96	777 ³⁾	309	220	69	253	152	209	31	96		
	791 ⁴⁾									821 ⁴⁾										
180	820	348	239	75					106	886	348	239	75							
200	883	351		77						943	351		77					106		
225	1175	447	348	68					354	204	96	1175	447					348	68	354

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

IE2 MH three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)

Design B5

Motor type																				
	MHFMARS MHFMAIG MHFMAAG									MHFMABS MHFMABI MHFMABA										
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		
080	400	156	132	25	152	121	132	13	96	455	156	142	24	194	125	132	13	96		
090	460	176	137	29			141	22	95	513	176	147	28			141	22	95		
100	491 ¹⁾	194	147	36			150			552 ¹⁾	194	158	35			150				
	506 ²⁾									567 ²⁾									162	150
112	619	218	158	38			162	619	218	168	37	162								
132	698	257	187	51	194	125	182	32	698	257	187	51	182	32						
160	822 ³⁾	309	220	69	253	152	209	31	96	835 ³⁾	309	220	69	253	152	209	31	96		
	866 ⁴⁾									877 ⁴⁾									946	348
180	886	348	239	75					106	1003	351	239	77						106	
200	943	351	77	96									1175						447	348
225	1175	447	348	68					354	204	96	1175	447						348	68

¹⁾ 100-12

²⁾ 100-32

³⁾ 160-22

⁴⁾ 160-32

	d	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6	m6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	19			M6	40	4.0	32	21.5	6.0
090	24			M8	50	5.0	40	27.0	8.0
100	28			M10	60		50	31.0	
112				M12	80		70	41.0	
132				38	M16		110	100	45.0
160	42	51.5	14.0						
180	48	59.0	16.0						
200			55	M20	140		130	64.0	18.0
225			60						

	Flange size								
		a ₂	b ₂	b ₂	c ₂	e ₂	f ₂	s ₂	i ₂
			j6	h6					-0.6 ... 0.5
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080		200	130		11	165	3.5		40.0
090									50.0
100		250	180		15	215	4.0		60.0
112									80.0
132		300	230		20	265	5.0		110
160		350	250	13	300				
180									
200		400		300	17	350		140	
225		450		350	18	400			

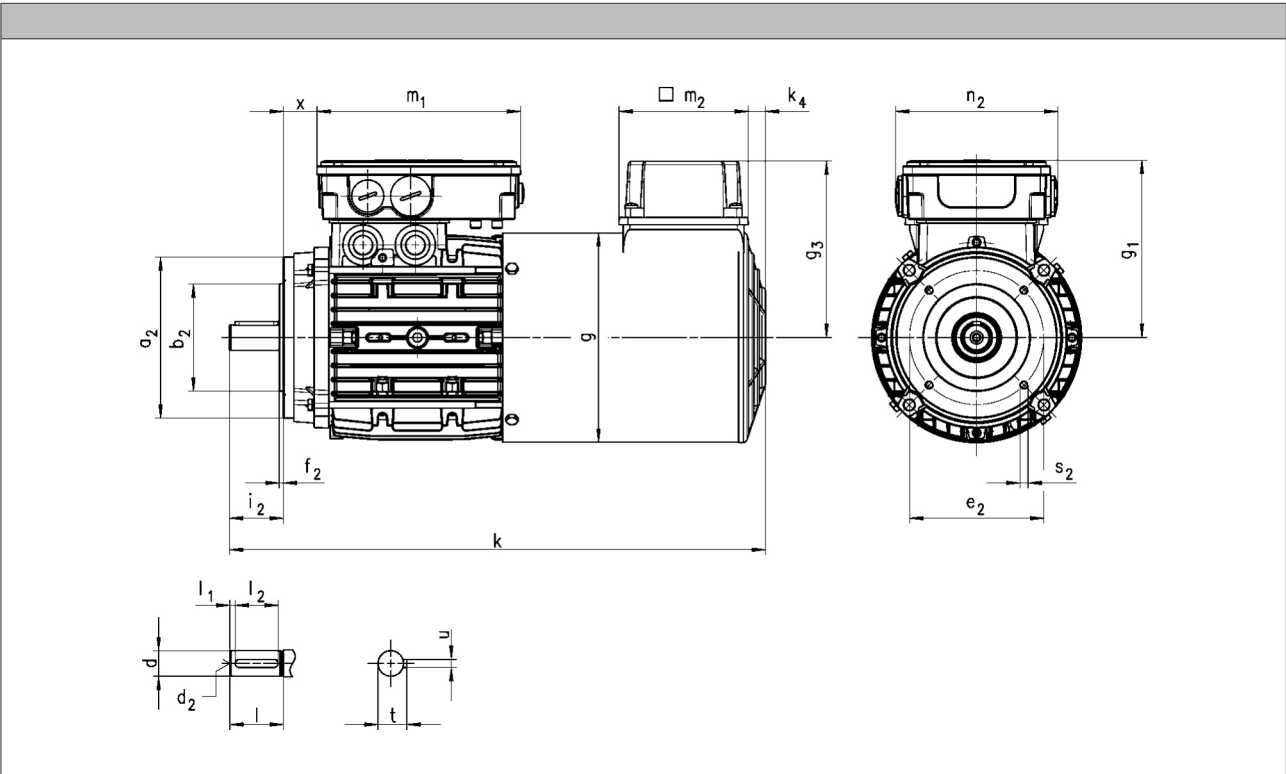
IE2 MH three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)

Design B14



Motor type	MHFMAXX										MHFMABR										
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂			
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			
080	400	156	132	25	152	121	132	13	96	455	156	132	25	152	121	132	13	96			
090	460	176	137	29			141	22	95	513	176	137	29			141	150	22	95		
100	491 ¹⁾	194	147	36			150			552 ¹⁾	194	147	36			150				22	95
	506 ²⁾									567 ²⁾											
112	538	218	158	38			162			619	218	158	38			162					

¹⁾ 100-12

²⁾ 100-32

IE2 MH three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)

Design B14

Motor type	MHFMARS MHFMAIG MHFMAAG									MHFMABS MHFMABI MHFMABA													
	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂	k	g	g ₁	x	m ₁	n ₂	g ₃	k ₄	m ₂					
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]					
080	400	156	132	25	152	121	132	13	96	455	156	142	24	194	125	132	13	96					
090	460	176	137	29			141	22	95	513	176	147	28			141	22	95					
100	491 ¹⁾	194	147	36			150			552 ¹⁾	194	158	35										
	506 ²⁾									567 ²⁾													
112	619	218	158	38			162			619	218	168	37			162							

¹⁾ 100-12

²⁾ 100-32

	d	d	d ₂	l	l ₁	l ₂	t	u
	j6	k6						
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	19		M6	40	4.0	32	21.5	6.0
090	24		M8	50	5.0	40	27.0	8.0
100	28		M10	60		50	31.0	
112								

Flange size		a ₂	b ₂	e ₂	f ₂	s ₂	i ₂
			j6				-0.6 ... 0.5
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080	FT100	120	80	100	3.0	M6x12	40.0
	FT130	160	110	130	3.5	M8x14	
090	FT115	140	95	115	3.0	M8x16	50.0
100	FT130	160	110	130	3.5	M8x14	60.0
112						M8x16	

5.8

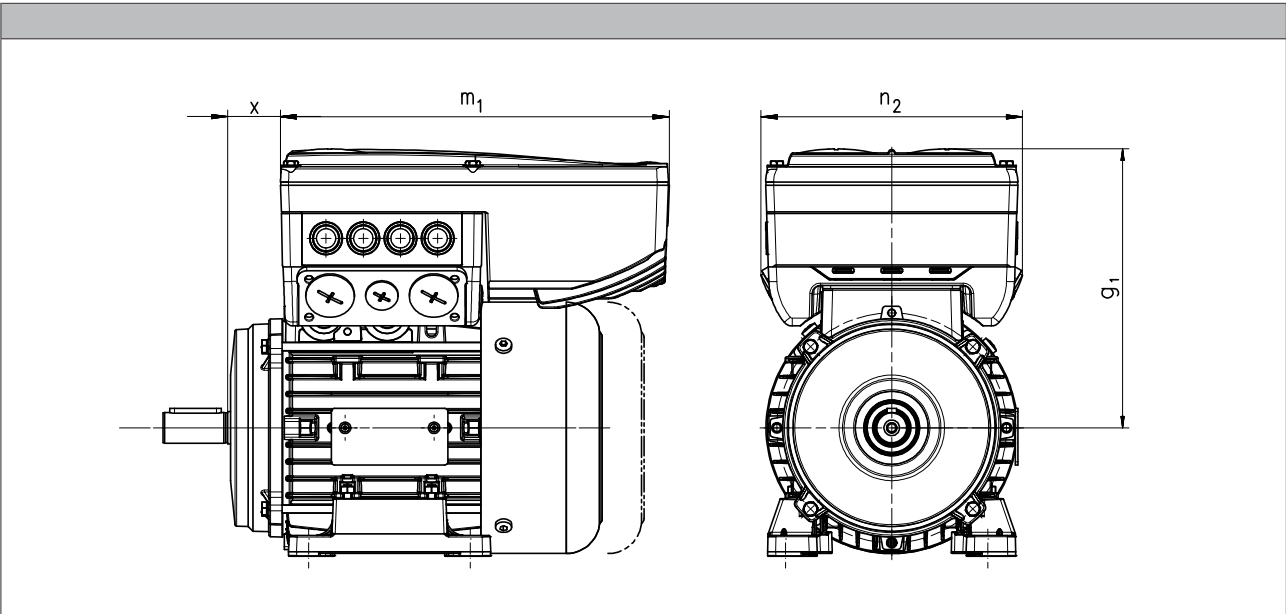
IE2 MH three-phase AC motors

Technical data



Dimensions, 8400 motec inverter

Rated frequency 50/60 Hz



Product key					
Motor	Inverter				
		g ₁ , 50Hz	m ₁ , 50Hz	n ₂ , 50Hz	x _{50Hz}
		[mm]	[mm]	[mm]	[mm]
MH□□□□□080-32	E84DVB□7514S□□□2□	172	241	161	32.5
MH□□□□□090-12	E84DVB□1124S□□□2□	177			36.2
MH□□□□□090-32	E84DVB□1524S□□□2□				
MH□□□□□100-12	E84DVB□2224S□□□2□	217	260	176	42.4
MH□□□□□100-32	E84DVB□3024S□□□2□				
MH□□□□□112-22	E84DVB□4024S□□□2□	282	325	195	32.0
MH□□□□□132-12	E84DVB□5524S□□□2□				
MH□□□□□132-22	E84DVB□7524S□□□2□	301			47.5

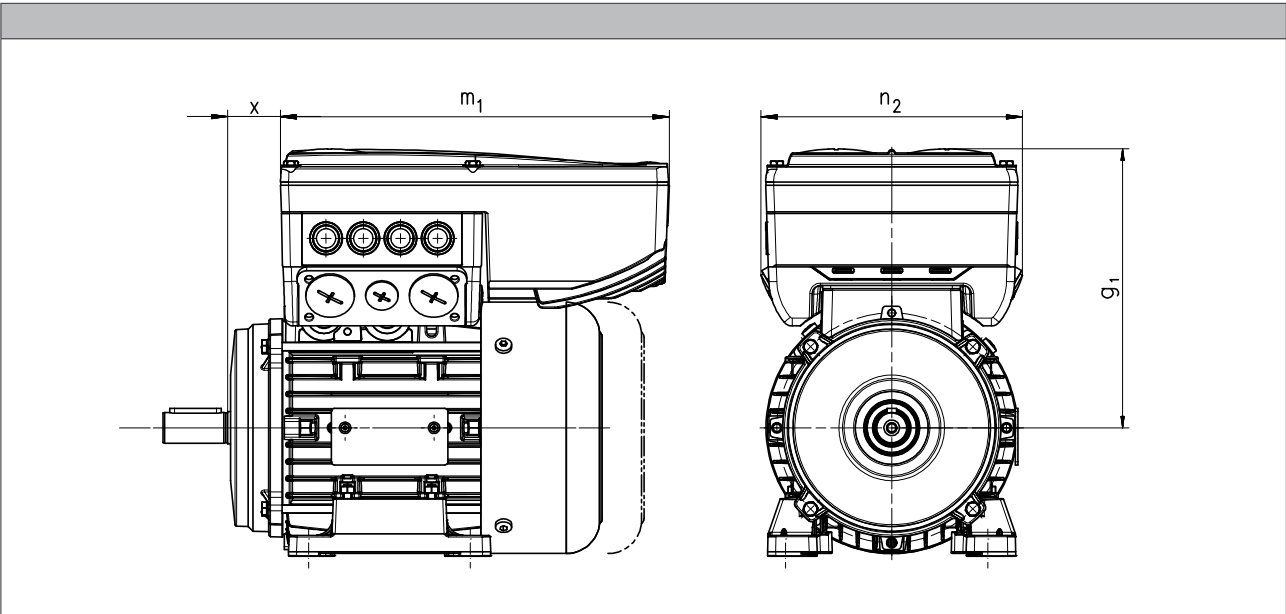
IE2 MH three-phase AC motors

Technical data



Dimensions, 8400 motec inverter

Rated frequency 87 Hz



Product key					
Motor	Inverter				
		g ₁ , 87Hz	m ₁ , 87Hz	n ₂ , 87Hz	x _{87Hz}
		[mm]	[mm]	[mm]	[mm]
MH□□□□□080-32	E84DVB□1524S□□□□2□	172	241	161	32.5
MH□□□□□090-12	E84DVB□2224S□□□□2□	206	260	176	35.2
MH□□□□□090-32	E84DVB□3024S□□□□2□				
MH□□□□□100-12	E84DVB□4024S□□□□2□	272	325	195	29.9
MH□□□□□100-32	E84DVB□5524S□□□□2□				
MH□□□□□112-22	E84DVB□7524S□□□□2□	282			32.0

IE2 MH three-phase AC motors

Technical data



IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Three-phase AC motors can be fitted with a spring-applied brake. This is activated after the supply voltage is switched off (closed-circuit principle). For optimum adjustment of the brake motor to the application, a range of braking torques and control modes is available for every motor frame size. For applications with very high operating frequencies the brake is also available in a LongLife version, with reinforced mechanical brake components.

Features

Versions

- **Standard**
 - 1 x 10⁶ repeating switching cycles
 - 1 x 10⁶ reversing switching cycles
- **LongLife**
 - 10 x 10⁶ repeating switching cycles
 - 15 x 10⁶ reversing switching cycles

Control

- DC supply
- AC supply via rectifier in the terminal box

Degree of protection

- Without manual release IP55
- With manual release IP54

Friction lining

- Non-asbestos, low wearing

Options

- Manual release
- UL/CSA approval
- Noise-reduced

Assignment of 4-pole motors and brakes

Design	Standard		LongLife	
	Standard		LongLife	
Motor frame size	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M _k		M _k
		[Nm]		[Nm]
080-32	08	3.50	08	8.00
	08	8.00		7.00
	10	7.00		
090-12 090-32	08	3.50	08	8.00
	08	8.00		7.00
	10	16.0		16.0
	10	23.0		
100-12	10	7.00	10 12 12	
	10	16.0		16.0
	12	14.0		14.0
	12	32.0		32.0
100-32	10	7.00		
	10	16.0		
	12	14.0		
	12	32.0		
	12	46.0		

IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Assignment of 4-pole motors and brakes

Design				
	Standard		LongLife	
Motor frame size	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M _k		M _k
		[Nm]		[Nm]
112-22	12	14.0		
	12	32.0		
	14	35.0		
	14	60.0		
132-12	14	35.0		
	14	60.0		
	16	60.0		
	16	80.0		
132-22	14	35.0		
	14	60.0		
	16	60.0		
	16	80.0		
	16	100		
160-22	16	60.0		
	16	80.0		
	18	80.0		
	18	150		
160-32	18	80.0		
	18	150		
	18	200		
180-12	18	80.0		
	18	150		
	20	145		
	20	260		
180-32	18	80.0		
	18	150		
	20	145		
	20	260		
	20	315		
200-32	18	80.0		
	18	150		
	20	145		
	20	260		
	20	315		
	20	400		
225-12	25	265		
	25	400		
	25	490		
225-22	25	265		
	25	400		
	25	490		
	25	600		



Spring-applied brake

Direct connection without rectifier

If the brake is activated directly without a rectifier, a freewheeling diode or a spark suppressor is required to protect against induction peaks.

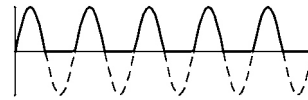
- Supply voltages
 - DC 24 V
 - DC 180 V
 - DC 205 V

Connection via mains voltage with brake rectifier

If the brake is not directly supplied with DC voltage, a rectifier is required. This is included in the scope of supply and is located in the terminal box of the motor. The rectifier converts the AC voltage of the connection into DC voltage. The following rectifiers are available:

Half-wave rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage = 2.22
- Approved by UL/CSA
- Supply voltages
 - AC 230 V
 - AC 400 V
 - AC 460 V



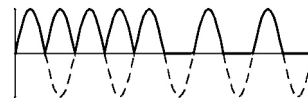
Bridge rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage = 1.11
- Supply voltage
 - AC 230 V



Bridge/half-wave rectifier, 6-pole

- Supply voltage / brake coil voltage ratio
 - up to the overexcitation time = 1.11
 - From the overexcitation time = 2.22
- Supply voltages
 - AC 230 V
 - AC 400 V



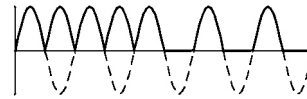


Spring-applied brake

Connection via mains voltage with brake rectifier

Bridge/half-wave rectifier, 6-pole

- Supply voltage / brake coil voltage ratio
up to the overexcitation time = 1.11
From the overexcitation time = 2.22
- Supply voltages
AC 230 V
AC 400 V



During the switching operation the bridge/half-wave rectifier functions as a bridge rectifier for the overexcitation time t_{ij} and then as a half-wave rectifier. This combination optimises the performance of the brake – depending on the assignment of brake coil voltage and supply voltage:

- **Short-time overexcitation of the brake coil**

Activating the brake coil for the overexcitation time t_{ij} with twice the rated voltage allows the disengagement time to be reduced. The brake opens more quickly and wear on the friction lining is reduced.

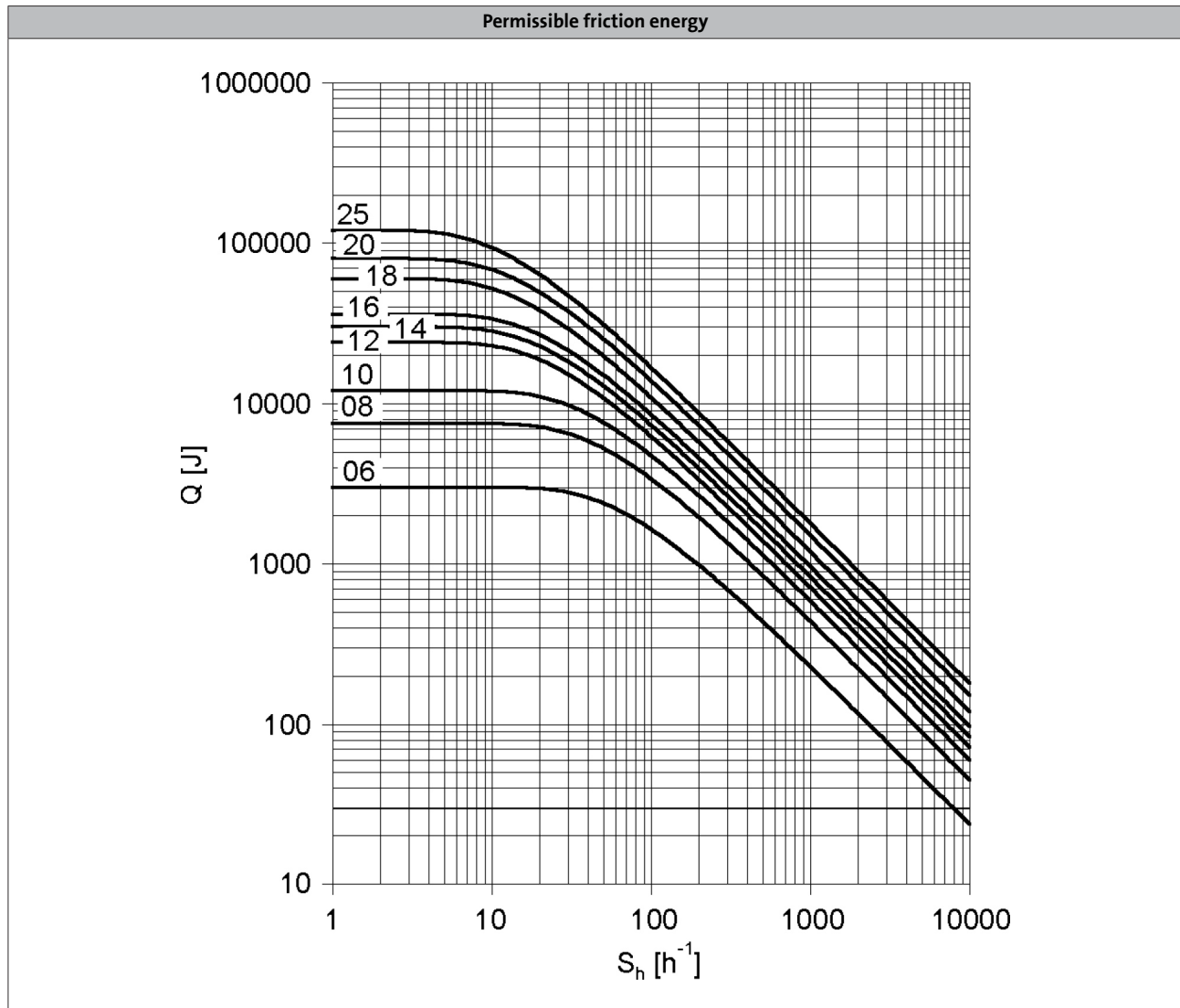
These features make this activation version particularly suitable for lifting applications. It is therefore only available in combination with a brake with increased braking torque.

- **Holding current reduction (cold brake)**

By reducing the holding current, the bridge/half-wave rectifier is able to reduce the power input to the open brake. As the brake heats up less, this type of activation is known as "cold brake".



Spring-applied brake



Q = Switching energy per switching cycle
 S_h = Operating frequency
 Brake size = 06 to 25

IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Rated data with reduced braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Power input											
	P _{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M _B	[Nm]	2.50	3.50	7.00	14.0	35.0	60.0	80.0	145	265
1000	M _B	[Nm]	2.30	3.10	6.10	12.0	30.0	50.0	65.0	115	203
1200	M _B	[Nm]	2.30	3.10	6.00	12.0	29.0	48.0	63.0	112	199
1500	M _B	[Nm]	2.20	3.00	5.80	11.0	28.0	47.0	61.0	109 ¹⁾	193 ¹⁾
1800	M _B	[Nm]	2.10	2.90	5.70	11.0	28.0	46.0	60.0 ¹⁾		
3000	M _B	[Nm]	2.00	2.80	5.30	10.0	26.0 ¹⁾	43.0 ¹⁾			
3600	M _B	[Nm]	2.00	2.70	5.20	10.0 ¹⁾					
Maximum switching energy											
100	Q _E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q _E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q _E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q _E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 ¹⁾	36.0 ¹⁾
1800	Q _E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 ¹⁾		
3000	Q _E	[KJ]	3.00	7.50	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾			
3600	Q _E	[KJ]	3.00	7.50	12.0	7.00 ¹⁾					
Transition operating frequency											
	S _{hü}	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm ²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass											
	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

¹⁾ In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Rated data with reduced braking torque

- Activation via half-wave or bridge rectifier

Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Delay time											
Engaging	t_{11}	[ms]	11.0	14.0	20.0	21.0	37.0	53.0	32.0	47.0	264
Rise time											
Braking torque	t_{12}	[ms]	13.0	10.0	17.0	19.0	22.0	30.0	20.0	100	120
Engagement time	t_1	[ms]	24.0	37.0	40.0	59.0	83.0	52.0	147	384	
Disengagement time	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

- Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Overexcitation time	$t_{\bar{u}}$	[ms]	300				1300				
Min. rest time	t	[ms]	900				3900				
Delay time											
Engaging	t_{11}	[ms]	12.0	22.0	35.0	49.0	61.0	114	83.0	126	304
Rise time											
Braking torque	t_{12}	[ms]	14.0	16.0	30.0	45.0	37.0	65.0	52.0	269	138
Engagement time	t_1	[ms]	26.0	38.0	66.0	93.0	97.0	180	134	395	443
Disengagement time	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

- The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Rated data with standard braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Power input											
	P_{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M_B	[Nm]	4.00	8.00	16.0	32.0	60.0	80.0	150	260	400
1000	M_B	[Nm]	3.70	7.20	14.0	27.0	51.0	66.0	121	206	307
1200	M_B	[Nm]	3.60	7.00	14.0	27.0	50.0	65.0	118	201	300
1500	M_B	[Nm]	3.50	6.80	13.0	26.0	48.0	63.0	115	195 ¹⁾	291 ¹⁾
1800	M_B	[Nm]	3.40	6.70	13.0	26.0	47.0	61.0	112 ¹⁾		
3000	M_B	[Nm]	3.20	6.30	12.0	24.0	44.0 ¹⁾	57.0 ¹⁾			
3600	M_B	[Nm]	3.20	6.10	12.0	23.0 ¹⁾					
Maximum switching energy											
100	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 ¹⁾	36.0 ¹⁾
1800	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 ¹⁾		
3000	Q_E	[KJ]	3.00	7.50	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾			
3600	Q_E	[KJ]	3.00	7.50	12.0	7.00 ¹⁾					
Transition operating frequency											
	$S_{h\ddot{u}}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm ²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass											
	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

¹⁾ In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Rated data with standard braking torque

- Activation via half-wave or bridge rectifier

Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Delay time											
Engaging	t_{11}	[ms]	15.0		28.0		17.0	27.0	33.0	65.0	110
Rise time											
Braking torque	t_{12}	[ms]	13.0	16.0	19.0	25.0		30.0	45.0	100	120
Engagement time	t_1	[ms]	28.0	31.0	47.0	53.0	42.0	57.0	78.0	165	230
Disengagement time	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

- Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)								
Size			06	08	10	12	14	16	18	20	25
Friction energy	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Overexcitation time	$t_{\bar{u}}$	[ms]	300				1300				
Min. rest time	t	[ms]	900				3900				
Delay time											
Engaging	t_{11}	[ms]	16.0	25.0	31.0	48.0	33.0	58.0	80.0	102	154
Rise time											
Braking torque	t_{12}	[ms]	14.0	27.0	21.0	43.0	49.0	64.0	109	157	168
Engagement time	t_1	[ms]	30.0	52.0		90.0	82.0	122	189	259	322
Disengagement time	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

- The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Rated data with increased braking torque

- Please enquire for braking torques and maximum switching work values not listed here.

Size			10	12	14	16	16	18	20	20	25	25
Power input												
	P_{in}	[kW]	0.030	0.040	0.050	0.055	0.055	0.085	0.10	0.10	0.11	0.11
Braking torque												
100	M_B	[Nm]	23.0	46.0	75.0	100	125	200	315	400	490	600
1000	M_B	[Nm]	20.0	39.0	64.0	83.0	103	162	249	317	376	461
1200	M_B	[Nm]	20.0	39.0	62.0	81.0	101	158	244	309	367	449
1500	M_B	[Nm]	19.0	38.0	60.0	78.0	98.0	153	237 ¹⁾	300 ¹⁾	356 ¹⁾	436 ¹⁾
1800	M_B	[Nm]	19.0	37.0	59.0	77.0	96.0	150 ¹⁾				
3000	M_B	[Nm]	17.0	34.0	55.0 ¹⁾	71.0 ¹⁾	89.0 ¹⁾					
3600	M_B	[Nm]	17.0	33.0 ¹⁾								
Maximum switching energy												
100	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1000	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1200	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1500	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	24.0 ¹⁾	24.0 ¹⁾	36.0 ¹⁾	36.0 ¹⁾
1800	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	36.0 ¹⁾				
3000	Q_E	[KJ]	12.0	24.0	18.0 ¹⁾	11.0 ¹⁾	11.0 ¹⁾					
3600	Q_E	[KJ]	12.0	7.00 ¹⁾								
Transition operating frequency												
	$S_{h\ddot{u}}$	[1/h]	40.0	30.0	28.0	27.0	27.0	20.0	19.0	19.0	15.0	15.0
Moment of inertia												
	J	[kgcm ²]	0.20	0.45	0.63	1.50	1.50	2.90	7.30	7.30	20.0	20.0
Mass												
	m	[kg]	2.60	4.20	5.80	8.70	8.70	12.6	19.5	19.5	31.0	31.0

¹⁾ In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

- Activation via half-wave or bridge rectifier

Size												
			10	12	14	16		18	20		25	
Friction energy												
	Q _{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Delay time												
Engaging	t ₁₁	[ms]	10.0	16.0	11.0	22.0	17.0	24.0	46.0	17.0	77.0	38.0
Rise time												
Braking torque	t ₁₂	[ms]	19.0	25.0		30.0		45.0	100		120	
Engagement time												
	t ₁	[ms]	29.0	41.0	36.0	52.0	47.0	69.0	146	117	197	158
Disengagement time												
	t ₂	[ms]	109	193	308	297	435	356	378	470	451	532

IE2 MH three-phase AC motors

Accessories



Spring-applied brake

Rated data with increased braking torque

- Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)									
Size			10	12	14	16	18	20	25			
Friction energy			198	353	253	563	241	578	1596	580	2465	1409
Overexcitation time												
	t _ü	[ms]	300		1 300							
Min. rest time												
	t	[ms]	900		3 900							
Delay time												
Engaging	t ₁₁	[ms]	24.0	27.0	17.0	41.0	21.0	60.0	69.0	17.0	123	85.0
Rise time												
Braking torque	t ₁₂	[ms]	44.0	43.0	37.0	55.0	37.0	113	148	100	190	270
Engagement time												
	t ₁	[ms]	68.0	70.0	54.0	97.0	57.0	173	217	334	313	355
Disengagement time												
	t ₂	[ms]	109	193	308	297	435	356	378	470	451	532

Design			Over-excitation									
Size			10	12	14	16	18	20	25			
Friction energy												
	Q _{BW}	[MJ]	264	706	761	966	1542	2322	3522			
Overexcitation time												
	t _ü	[ms]	300		1 300							
Min. rest time												
	t	[ms]	900		3 900							
Delay time												
Engaging	t ₁₁	[ms]	29.0	54.0	31.0	70.0	46.0	86.0	103	55.0	171	135
Rise time												
Braking torque	t ₁₂	[ms]	53.0	87.0	68.0	93.0	83.0	160	222	319	266	430
Engagement time												
	t ₁	[ms]	82.0	141	99.0	163	129	246	325	374	437	565
Disengagement time												
	t ₂	[ms]	53.0	81.0	117	141	168	151	160	167	184	204

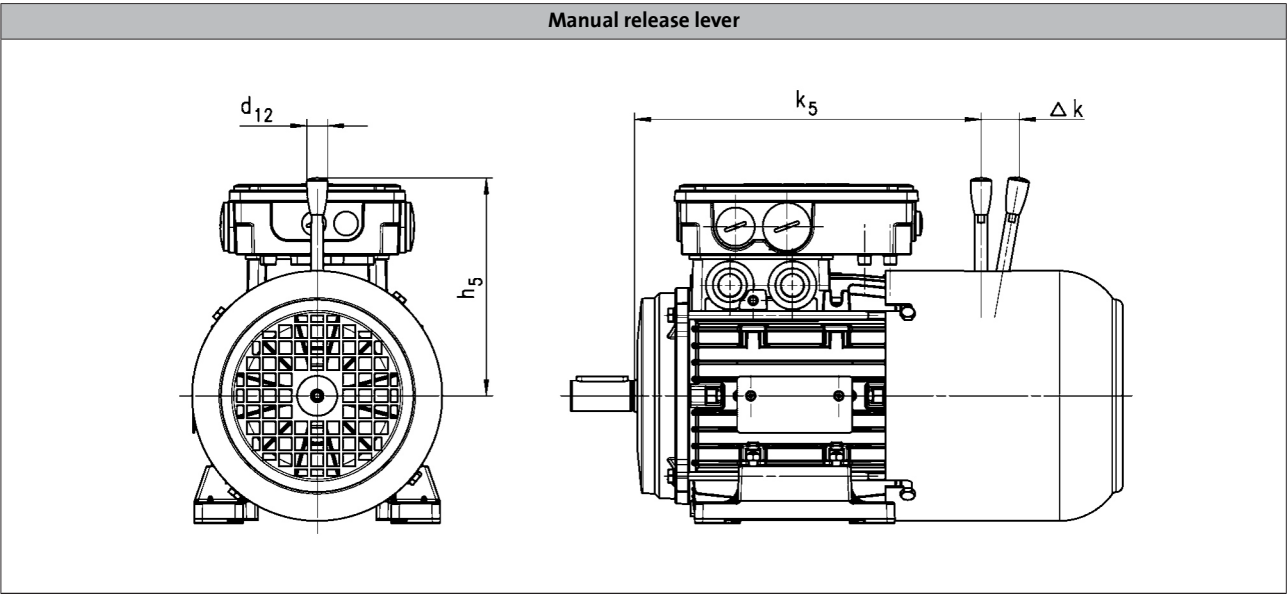
- The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

IE2 MH three-phase AC motors

Accessories



Spring-applied brake



Brake					
		k ₅	Δ k	h ₅	d ₁₂
		[mm]	[mm]	[mm]	[mm]
080	08	224	27	116	13.0
	10	239	28	132	13.0
090	08	264	27	116	13.0
	10	277	28	132	13.0
100 ¹⁾	10	305	28	132	13.0
	12	307	37	161	13.0
100 ²⁾	10	320	28	132	13.0
	12	322	37	161	13.0
112	12	320	37	161	13.0
	14	323	41	195	24.0
132	14	400	41	195	24.0
	16	406	55	240	24.0
160	16	505	55	240	24.0
	18	509	59	279	24.0
180	18	540	59	279	24.0
	20	546	74	319	24.0
200	18	597	59	279	24.0
	20	603	74	319	24.0
225	25	757	103	445	24.0

¹⁾ 100-12

²⁾ 100-32

The following combinations with manual release lever and motor connection in the same position are not possible:

- HAN connector with connection in position 1
- Inverter motec
- Terminal box of motor sizes 080, 090, for brake and retracting (M□□MA BR/BS/BA/BI)

IE2 MH three-phase AC motors

Accessories



Resolver

Stator-fed resolver with two stator windings offset by 90° and one rotor winding with transformer winding.

- The three-phase AC motors with resolver cannot be used for speed-dependent safety functions in connection with the SM 301 safety module.

Product key				RS1
Accuracy				
			[°]	-10 ... 10
Absolute positioning				
				1 revolution
Max. input voltage				
DC	$U_{in,max}$		[V]	10.0
Max. input frequency				
	$f_{in,max}$		[kHz]	4.00
Ratio				
Stator / rotor		$\pm 5 \%$		0.30
Rotor impedance				
	Z_{ro}		[Ω]	51 + j90
Stator impedance				
	Z_{so}		[Ω]	102 + j150
Impedance				
	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance				
At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				
				1

IE2 MH three-phase AC motors

Accessories



Incremental encoder and SinCos absolute value encoder

- The three-phase AC motors with incremental encoders or SinCos absolute value encoders cannot be used for speed-dependent safety functions in connection with the SM 301 safety module.

Encoder type			HTL incremental				TTL incremental			SinCos absolute value
Product key			IG128-24V-H	IG512-24V-H	IG1024-24V-H	IG2048-24V-H	IG512-5V-T	IG1024-5V-T	IG2048-5V-T	AM1024-8V-H
Encoder type										Multi-turn
Pulses			128	512	1024	2048	512	1024	2048	1024
Output signals			HTL				TTL			1 Vss
Interfaces			A, B track	A, B, N track and inverted						Hiperface
Absolute revolutions			0							4096
Accuracy			-22.5 ... 22.5	-2 ... 2						-0.8 ... 0.8
Min. input voltage			8.00				4.75			7.00
DC	U _{in,min}	[V]								
Max. input voltage			26.0	30.0			5.25			12.0
DC	U _{in,max}	[V]								
Max. current consumption			0.040	0.15						0.080
	I _{max}	[A]								
Limit frequency			30.0	160			300			200
	f _{max}	[kHz]								
Inverter assignment			E84AVSC E84AVHC	E84AVHC			E84AVTC E94A ECS EVS93			

Inverters

- Inverter Drives 8400 StateLine (E84AVSC)
- Inverter Drives 8400 HighLine (E84AVHC)
- Inverter Drives 8400 TopLine (E84AVTC)

Servo-Inverters

- Servo Drives 9400 (E94A)
- 9300 servo inverters (EVS93)
- Servo Drives ECS

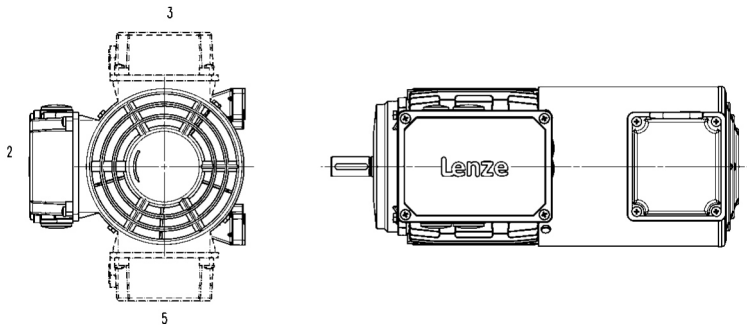
IE2 MH three-phase AC motors

Accessories



Blower

► The blower terminal box is available in positions 2, 3 or 5.



Rated data for 50 Hz

Size	Number of phases	Connection method					
Motor			U_{min}	U_{max}	P_{max}	I_{max}	m
			[V]	[V]	[kW]	[A]	[kg]
063	1		230	277	0.027	0.11	2.00
	3	Δ	200	303	0.028	0.12	
		Y	346	525		0.070	
071	1		230	277	0.027	0.10	2.10
	3	Δ	200	303	0.031	0.11	
		Y	346	525		0.060	
080	1		230	277	0.029	0.11	2.30
	3	Δ	200	303	0.031	0.11	
		Y	346	525		0.060	
090	1		220	277	0.065	0.29	2.70
	3	Δ	200	303	0.091	0.38	
		Y	346	525		0.22	
100	1		220	277	0.066	0.28	3.00
	3	Δ	200	303	0.091	0.37	
		Y	346	525		0.22	
112	1		220	277	0.071	0.28	3.10
	3	Δ	200	303	0.097	0.35	
		Y	346	525		0.20	
132	1		230	277	0.098	0.40	4.20
	3	Δ	200	303	0.12	0.58	
		Y	346	525		0.33	
160	1		230	277	0.25	0.97	6.20
	3	Δ	200	303		0.87	
		Y	346	525		0.50	
180	1		230	277		0.97	8.00
	3	Δ	200	303		0.87	
		Y	346	525		0.50	

IE2 MH three-phase AC motors

Accessories



Blower

Rated data for 50 Hz

Size	Number of phases	Connection method					
Motor							
			U _{min}	U _{max}	P _{max}	I _{max}	m
			[V]	[V]	[kW]	[A]	[kg]
200	1		230	277	0.25	0.97	8.00
	3	Δ	200	303		0.87	
		Y	346	525		0.50	
225	3	Δ	200	400	0.28	1.10	15.0
		Y	346	525	0.17	0.35	

Rated data for 60 Hz

Size	Number of phases	Connection method					
Motor							
			U _{min}	U _{max}	P _{max}	I _{max}	m
			[V]	[V]	[kW]	[A]	[kg]
063	1		230	277	0.032	0.12	2.00
	3	Δ	220	332	0.028	0.10	
		Y	380	575		0.060	
071	1		230	277	0.033	0.12	2.10
	3	Δ	220	332	0.029	0.10	
		Y	380	575		0.060	
080	1		230	277	0.037	0.14	2.30
	3	Δ	220	332	0.034	0.10	
		Y	380	575		0.060	
090	1		220	277	0.065	0.25	2.70
	3	Δ	220	332	0.077	0.33	
		Y	380	575		0.19	
100	1		220	277	0.075	0.30	3.00
	3	Δ	220	332	0.087	0.31	
		Y	380	575		0.18	
112	1		220	277	0.094	0.37	3.10
	3	Δ	220	332	0.10	0.31	
		Y	380	575		0.18	
132	1		230	277	0.15	0.57	4.20
	3	Δ	220	332		0.44	
		Y	380	575		0.25	
160	3	Δ	220	332	0.36	0.93	6.20
		Y	380	575		0.56	
		Δ	220	332		0.93	
180	3	Y	380	575	0.36	0.56	8.00
		Δ	220	332		0.93	
		Y	380	575		0.56	
200	3	Δ	220	332	0.28	0.76	15.0
		Y	380	575		0.43	
		Δ	220	400		0.76	
225	3	Y	380	575	0.26	0.43	15.0
		Δ	220	400		0.76	
		Y	380	575		0.43	

IE2 MH three-phase AC motors

Accessories



Temperature monitoring

- The thermal sensors are integrated in the windings. The use of an additional motor protection switch is recommended.

TKO thermal contacts

Function	Operating temperature	Min. reset temperature	Max. reset temperature	Max. input current	Max. input voltage
	T	$T_{\min}$	$T_{\max}$	$I_{\text{in,max}}$	AC $U_{\text{in,max}}$
	-5 ... 5 [°C]				
		[°C]	[°C]	[A]	[V]
NC contact	150	90.0	135	2.50	250

PTC thermistor

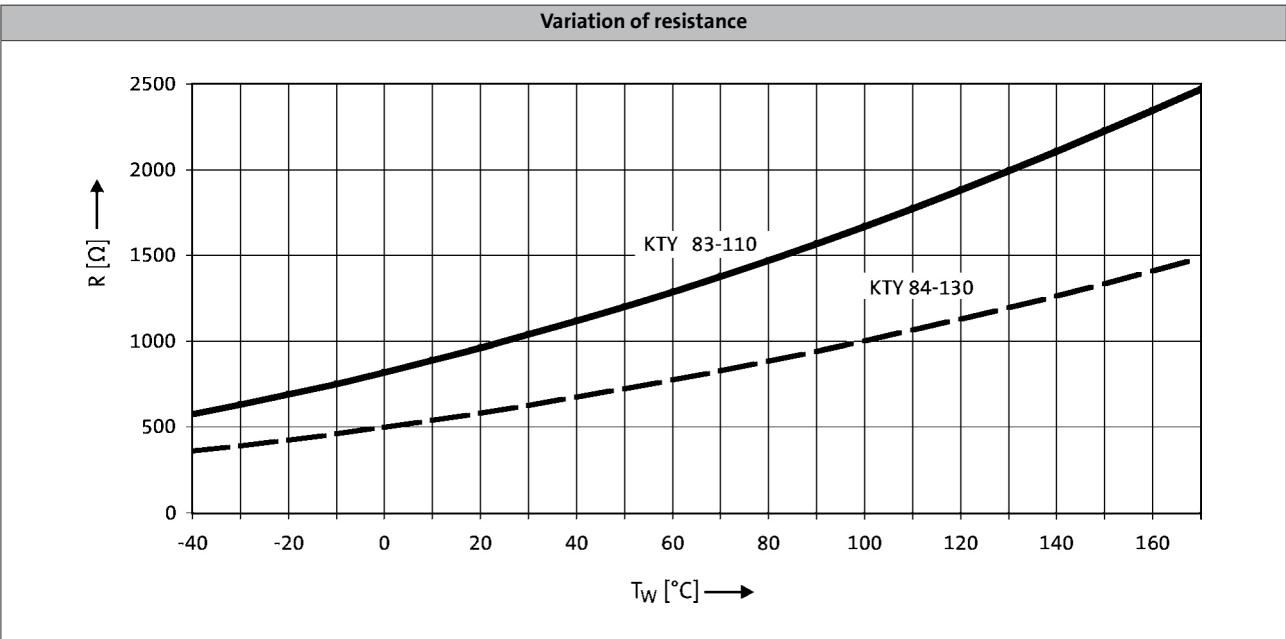
Function	Operating temperature	Rated resistance			Standard
		155 °C	-20 °C	140 °C	
	T	R_N	R_N	R_N	
	-5 ... 5 [°C]				
		[Ω]	[Ω]	[Ω]	
Sudden change in resistance	150	550	30.0	250	DIN 44080 DIN VDE 0660 Part 303



Temperature monitoring

KTY temperature sensor

	Function	Rated resistance			Max. input current	
		25 °C	150 °C	170 °C	25 °C	170 °C
		R _N [Ω]	R _N [Ω]	R _N [Ω]	I _{in,max} [A]	I _{in,max} [A]
KTY83-110	Continuous resistance change	1000	2225	2471	0.010	0.002
KTY84-130	Continuous resistance change	603	1334	1482	0.010	0.002



- If the thermal sensor is supplied with a measurement current of 1 mA, the above relationship between the temperature and the resistance applies.

IE2 MH three-phase AC motors

Accessories

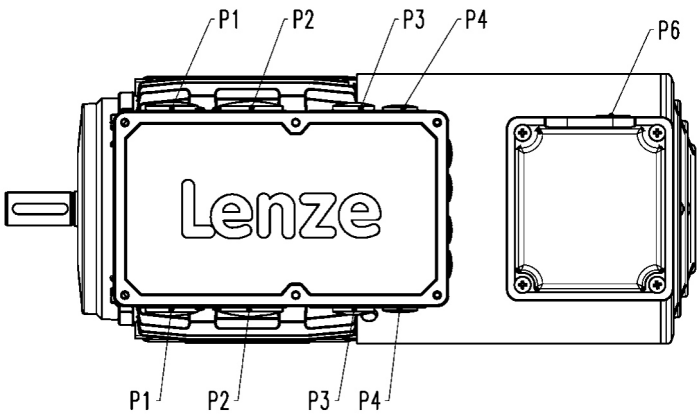


Terminal box

The three-phase AC motors are designed for operation at a constant mains frequency and with an inverter.
For 50 Hz operation, the motors are operated in Δ configuration at 230 V or in star configuration at 400 V.
For inverter operation, the base frequency has been specified as 87 Hz at a rated voltage of 400 V in Δ configuration.

In the standard version, the motors are connected in the terminal box. As an option, the motors are also available with the connectors described on the following pages as long as the permissible ratings are not exceeded.

Connections



Motor type		
Built-on accessories	M□□MAXX M□□MABR M□□MARS M□□MAIG M□□MAAG	M□□MABS M□□MABI M□□MABA

	P ₁	P ₂	P ₃	P ₄	P ₆	P ₁	P ₂	P ₃	P ₄	P ₆	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
063	M16x1.5	M20x1.5			M16x1.5	M25x1.5	M32x1.5	M20x1.5	M16x1.5	M16x1.5	
071											
080											
090											
100											
112	M20x1.5	M25x1.5	M20x1.5	M16x1.5		M50x1.5	M16x1.5				
132											
160											
180	M50x1.5	M16x1.5				M16x1.5					
200											
225 ¹⁾	M12x1.5	M63x1.5	M50x1.5	M12x1.5		M12x1.5	M63x1.5	M50x1.5	M12x1.5		

¹⁾ The cable glands P1 to P4 are only arranged at the bottom.

IE2 MH three-phase AC motors

Accessories

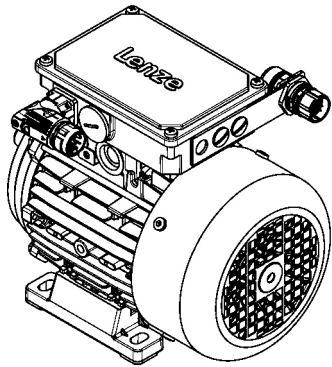


Plug connectors

ICN, HAN and M12 connectors (only for IG128-24V-H incremental encoder) are available for the three-phase AC motors.

ICN connector

A connector is used for the power connection, connection of the brake, and the temperature monitoring connection. The feedback and blower connections are implemented via a separate connector in each case.



Connection for power, brake and temperature monitoring

The connectors can be rotated by 270° and are equipped with a bayonet catch for SpeedTec connectors. As the connector fixing is also compatible with conventional box nuts, existing mating connectors can still be used without difficulty. The motor connection is determined in the terminal box.

► ICN 6-pole

No connection of temperature monitoring possible!

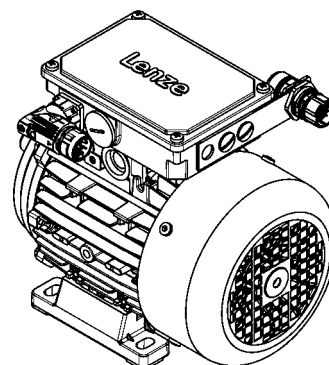
Pin assignment			
Contact	Designation	Meaning	
1	BD1 / BA1	Brake +/AC	
2	BD2 / BA2	Brake -/AC	
PE	PE	PE conductor	
4	U	Phase U power	
5	V	Phase V power	
6	W	Phase W power	

► ICN 8-pole

Pin assignment			
Contact	Designation	Meaning	
1	U	Phase U power	
PE	PE	PE conductor	
3	W	Phase W power	
4	V	Phase V power	
A	TB1 / TP1 / R1	Thermal sensor: TKO/PTC/ +KTY	
B	TB2 / TP2 / R2	Thermal sensor: TKO/PTC/ -KTY	
C	BD1 / BA1	Brake +/AC	
D	BD2 / BA2	Brake -/AC	

ICN connector

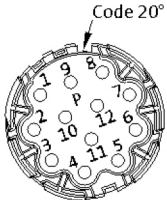
All encoder systems (apart from IG128-24V-H) are also available with an ICN connector fixed to the motor terminal box for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing mating connectors can therefore continue to be used without difficulty.



Pin assignment		
Contact	Designation	Meaning
1	+Ref	Transformer windings
2	-Ref	
3	+VCC ETS	
4	+COS	Cosine stator windings
5	-COS	
6	+SIN	
7	-SIN	Sine stator windings
8		
9		
10		Not assigned
11	+KTY	
12	-KTY	

The diagram shows a circular 12-pin connector. The pins are numbered 1 through 12 in a clockwise direction starting from the top. Pin 1 is labeled 'Code 0°'. Pin 9 is labeled 'P'. Pin 12 is labeled '12'.

Pin assignment		
Contact	Designation	Meaning
1	B	Track B/+SIN
2	A ⁻	Track A inverse/-COS
3	A	Track A/+COS
4	+U _B	Supply +
5	GND	Mass
6	Z ⁻	Zero track inverse/-RS485
7	Z	Zero track/+RS485
8		Not assigned
9	B ⁻	Track B inverse/-SIN
10		Not assigned
11	+KTY	KTY temperature sensor
12	-KTY	



IE2 MH three-phase AC motors

Accessories



ICN connector

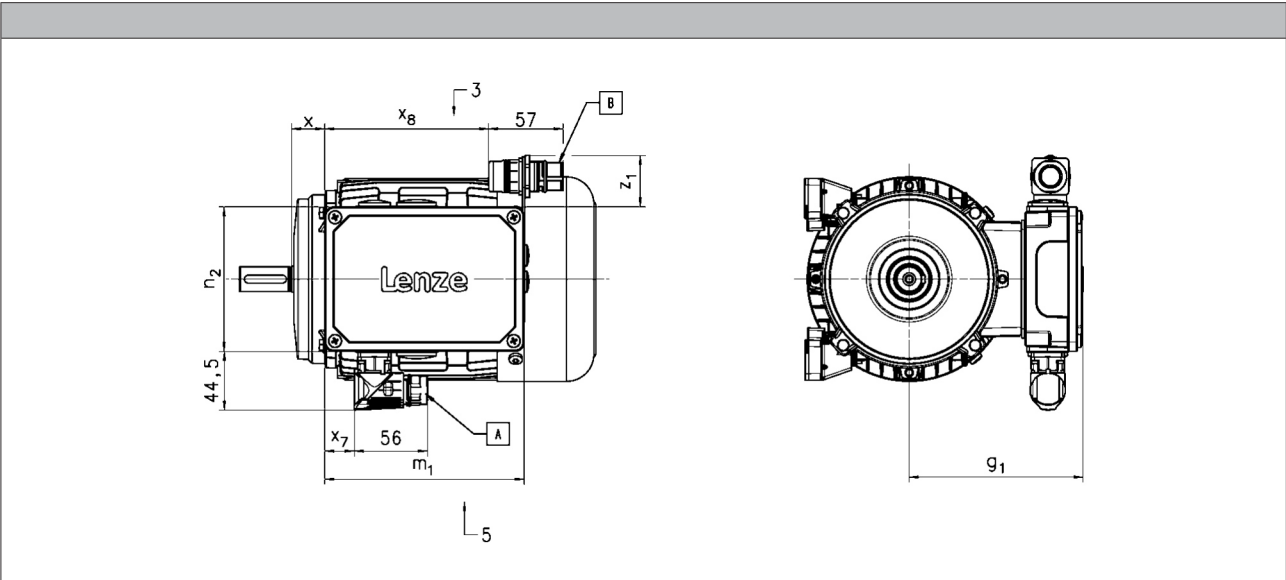
Dimensions of the connectors on the terminal box

The following connector positions are possible:

- power connection (A) in position 5 and feedback connection (B) in position 3
- power connection (A) in position 3 and feedback connection (B) in position 5

With the following motors, the feedback connection (B) is only available in position 3 or 5:

- motor frame size 132 to 180



Motor type	M□□MAXX M□□MARS M□□MAIG M□□MAAG				M□□MABR M□□MABS M□□MABI M□□MABA		
	g ₁	x	m ₁	n ₂	x ₇	x ₈	z _{1, max}
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	109	17	136	103	16	109	43
071	118	24					
080	132	25	152	121	23	125	41
090	137	29					
100	147	36					
112	158	38					
132	187	51	194	125	27	166	71
160	220	69	253	152		200	65
180	239	75					
200		77				328	51
225	348	68	354	204			

IE2 MH three-phase AC motors

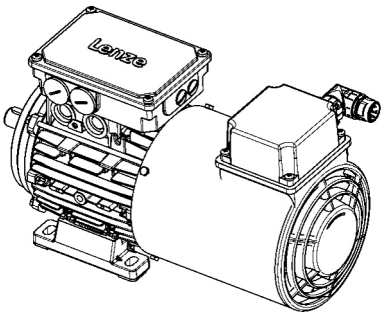
Accessories



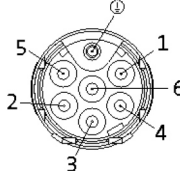
ICN connector

Blower connection

The blower is also optionally available with an ICN connector fixed to the terminal box of the blower for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing counter plugs can therefore continue to be used without difficulty.



► Blower 1-ph

Pin assignment			
Contact	Designation	Meaning	
PE	PE	PE conductor	
1	U1	Fan	
2	U2		
3		Not assigned	
4			
5			
6			

► Blower 3-ph

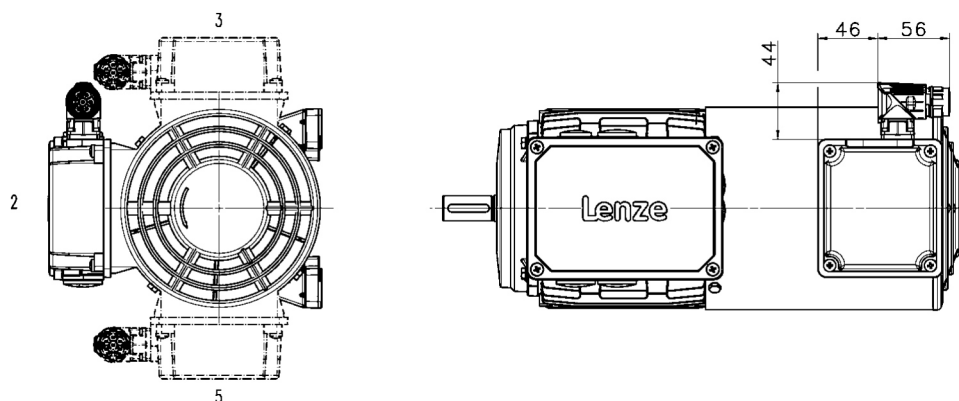
Pin assignment			
Contact	Designation	Meaning	
PE	PE	PE conductor	
1	U	Phase U power	
2		Not assigned	
3	V	Phase V power	
4		Not assigned	
5			
6	W	Phase W power	



ICN connector

Blower connection

- The blower terminal box is available in positions 2, 3 or 5.
- In addition, the cover of the blower terminal box (including connectors) can be rotated progressively through 90° if necessary.



IE2 MH three-phase AC motors

Accessories



M12 connector

IG128-24V-H incremental encoder connection

As a standard this incremental encoder is equipped with a connection cable of about 0.5 m length and with a common industry standard M12 connector at its end.

Pin assignment			
Contact	Designation	Meaning	
1	+U _B	Supply +	
2	B	Track B	
3	GND	Mass	
4	A	Track A	

IE2 MH three-phase AC motors

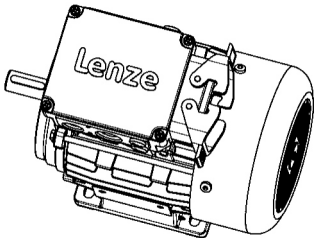
Accessories



HAN connector

10E

In the case of the rectangular HAN-10E connectors, all six ends of the three winding phases are taken out to the power contacts. The motor circuit is therefore determined in the mating connector.



Pin assignment		
Contact	Meaning	
1	Terminal board: U1	
2	Terminal board: V1	
3	Terminal board: W1	
4	Brake +/AC	
5	Brake -/AC	
6	Terminal board: W2	
7	Terminal board: U2	
8	Terminal board: V2	
9	Thermal sensor: +KTY/PTC/TKO	
10	Thermal sensor: KTY/PTC/TKO	

IE2 MH three-phase AC motors

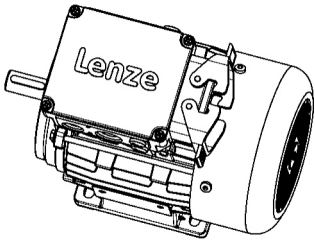
Accessories



HAN connector

HAN modular

The connector is available with two different power modules (16 A or 40 A), depending on the rated motor current. The motor connection is determined in the terminal box and must be checked before commissioning.



► HAN modular 16 A

Pin assignment			
Module	Contact	Meaning	
A	1	Terminal board: U1	
	2	Terminal board: V1	
	3	Terminal board: W1	
B		Dummy module	
C	1	Thermal sensor: +KTY/PTC/TKO	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: KTY/PTC/TKO	

► HAN modular 40 A

Pin assignment			
Module	Contact	Meaning	
A	1	Terminal board: U1	
	2	Terminal board: V1	
	3	Terminal board: W1	
B		Dummy module	
C	1	Thermal sensor: +KTY/PTC/TKO	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: KTY/PTC/TKO	

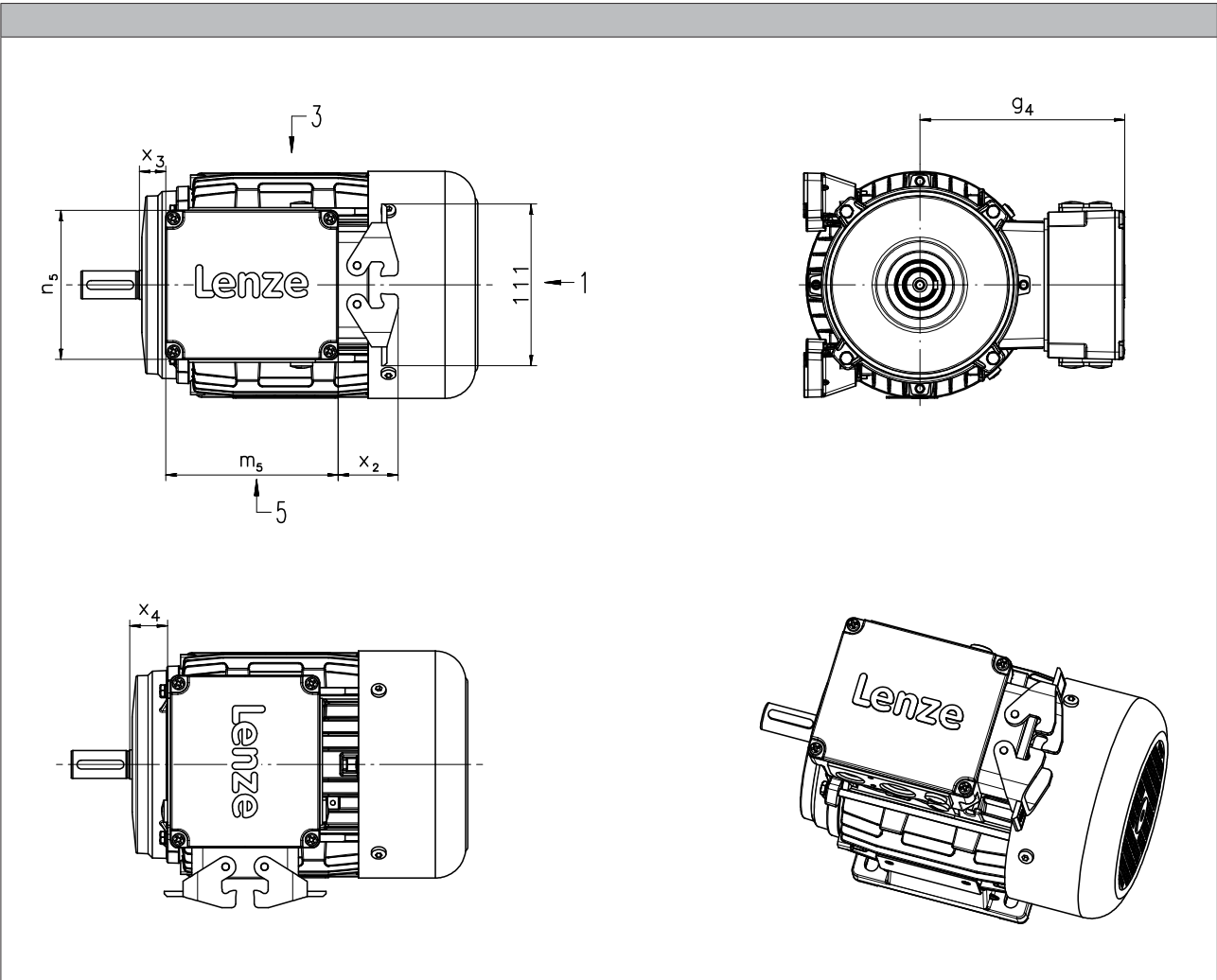
IE2 MH three-phase AC motors

Accessories



HAN connector

- The connection position for the connector is shown in position 1. Positions 3 and 5 are also possible.



5.8

Motor type	M□□MAXX M□□MABR					
	g4 [mm]	m5 [mm]	n5 [mm]	x2 [mm]	x3 [mm]	x4 [mm]
063	120	118	102	41	11	12
071	129				16	17
080	138				18	26
090	143				22	30
100	154				29	37
112	164	120	180	47	28	36
132 ¹⁾	233				48	18
160	248				72	42

¹⁾ In the case of the B5 design motors, it is not possible to connect the connector at position 3 or 5.