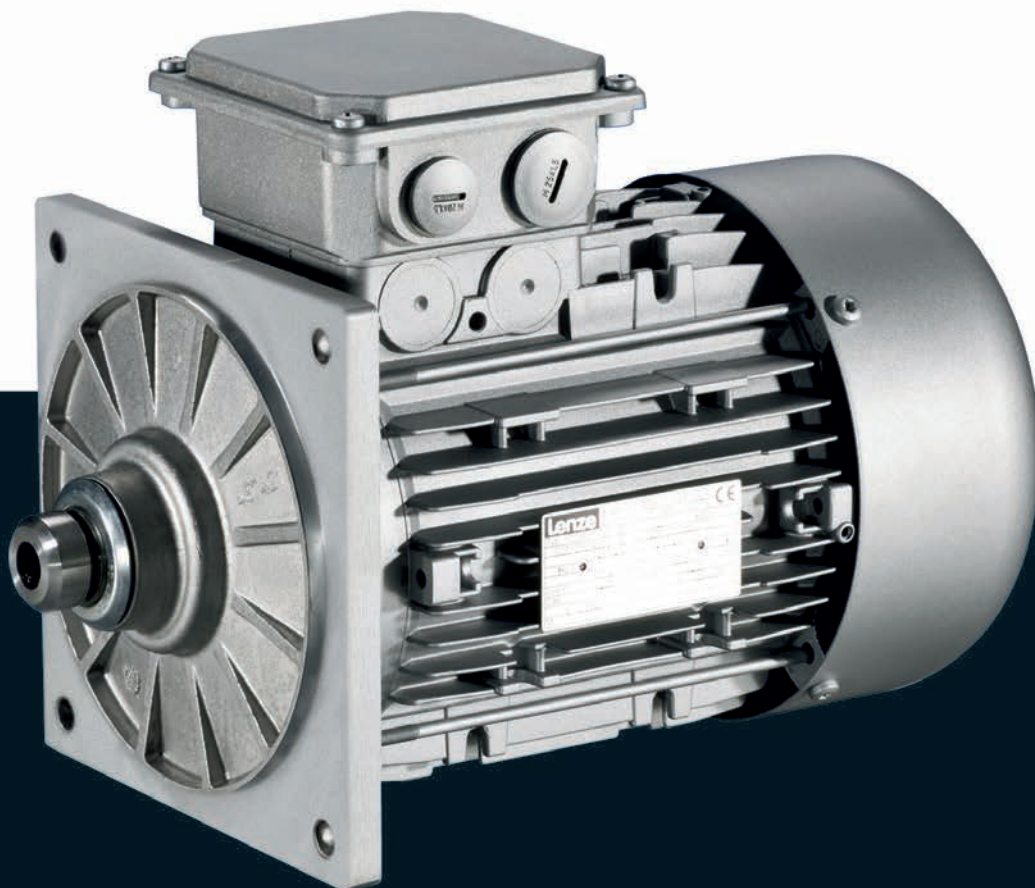


Motors

MF three-phase AC motors

0.55 ... 22 kW



MF three-phase AC motors

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MF three-phase AC motors

General information



List of abbreviations

| | | |
|----------------|----------------------|--------------------------|
| $\eta_{100\%}$ | [%] | Efficiency |
| $\eta_{75\%}$ | [%] | Efficiency |
| $\eta_{50\%}$ | [%] | Efficiency |
| $\cos \varphi$ | | 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 |

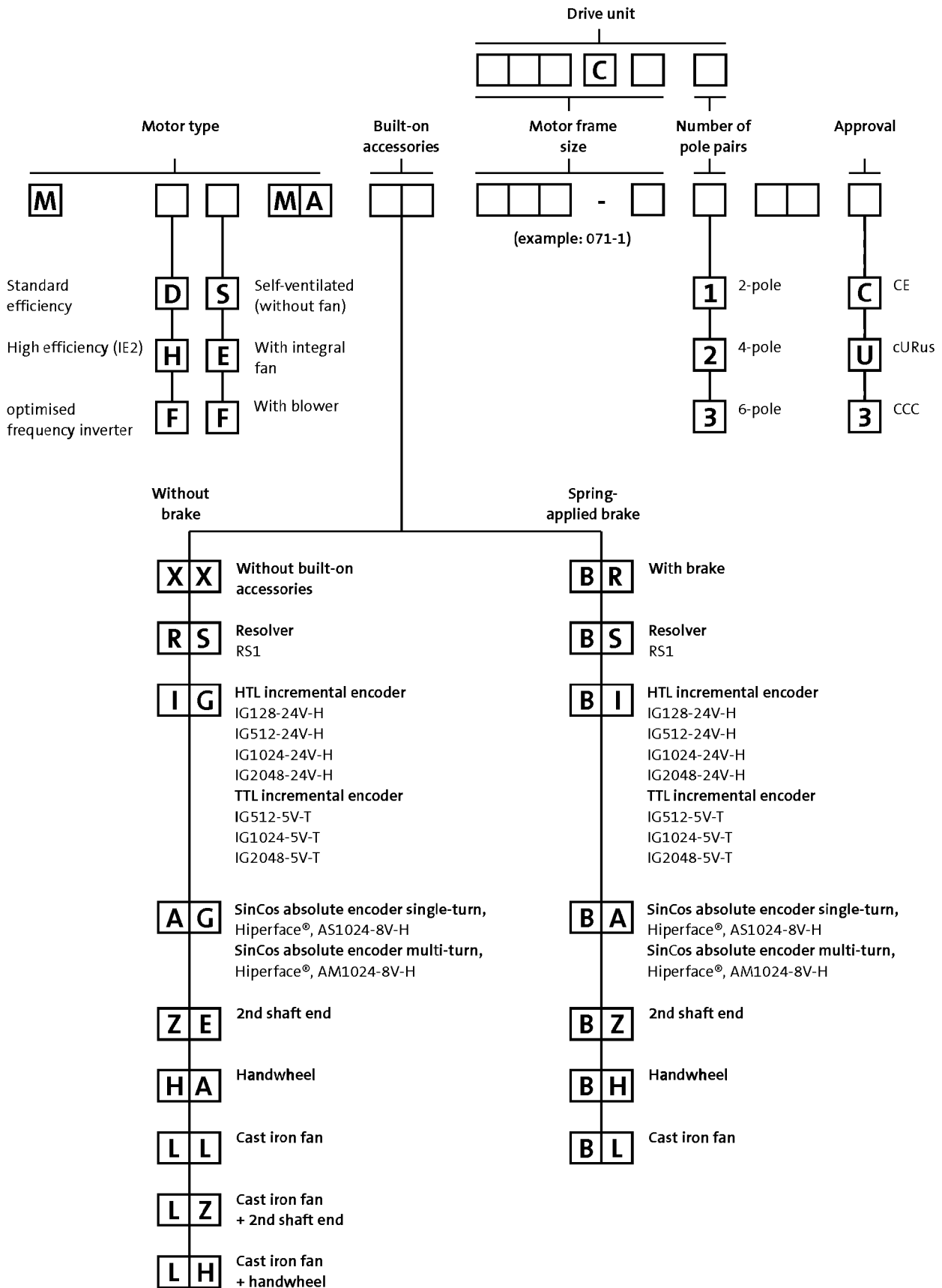
| | |
|----------|---|
| CE | Communauté Européenne |
| CSA | Canadian Standards Association |
| DIN | Deutsches Institut für Normung e.V. |
| EMC | Electromagnetic compatibility |
| EN | European standard |
| IEC | International Electrotechnical Commission |
| IM | International Mounting Code |
| IP | 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 |
| GOST | Certificate for Russian Federation |
| cURus | Combined certification marks of UL for the USA and Canada |
| UkrSEPRO | Certificate for Ukraine |

MF three-phase AC motors

General information



Product key



MF three-phase AC motors

General information

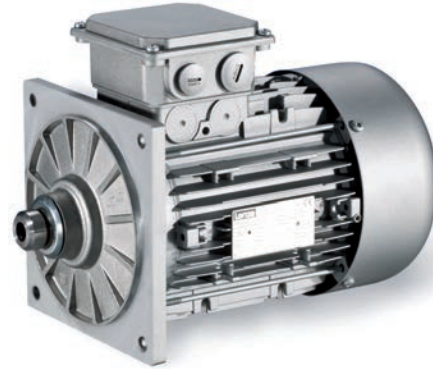


Product information

Special motors have been designed for direct attachment to Lenze gearboxes.

These motors are attached to the gearbox without the use of a clutch. Torque transmission between the tothing and the motor shaft is friction-locked via a tapered connection here.

This motor design means that the geared motors only require a small installation space.



L-force MF three-phase AC motors are available in a power range from 0.55 to 22 kW and have been fully optimised for inverter operation.

The benefits for you:

- Up to sizes smaller than standard three-phase AC motors
- The motors exceed the minimum efficiency levels of efficiency class IE2
- Large speed setting range: 1:24 (without field weakening)
- Dynamic thanks to a low moment of inertia

Basic versions

- 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 enclosure IP55.
- In tough operating conditions, the surface and corrosion protection system is provided to reliably protect the motor from corrosive 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 UkrSepro approval.
- Smooth start/braking is possible by increasing the motor's centrifugal mass with a cast iron fan.
- The motor can be equipped with a handwheel for manual setup or emergency operations.
- To protect the fan from falling objects, the fan cover can be equipped with a protection cover.
- A 2nd shaft end is available for further modifications.

MF three-phase AC motors

General information



Functions and features

| Size | 063 | 071 | 080 | 090 |
|----------------------------------|---|-----|--|---------------|
| Motor | | | | |
| Spring-applied brake | | | | |
| Design | Standard or LongLife design Reduced or standard braking torque With rectifier With manual release lever Low noise | | 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 | | | | |
| | Primed Not coated Paint in various corrosion-protection designs in accordance with RAL colours | | | |
| Further options | | | | |
| | Protection cover | | Protection cover | 2nd shaft end |

MF three-phase AC motors

General information



Functions and features

| Size | 100 | 112 | 132 |
|----------------------------------|--|--|---------------------------------------|
| Motor | | | |
| Spring-applied brake | | | |
| Design | Standard or LongLife design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise | 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 | Terminal box HAN modular connector |
| Brake connection | Terminal box ICN connector HAN modular connector HAN10E connector | Terminal box | 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 | Terminal box 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 | | | |
| | Primed Not coated Paint in various corrosion-protection designs in accordance with RAL colours | | |
| Further options | | | |
| | Protection cover 2nd shaft end | | |

5.7

MF 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) | <ul style="list-style-type: none"> Dependent on subsequent top coat applied | <ul style="list-style-type: none"> 1K priming coat (grey) |
| OKS-S (small) | <ul style="list-style-type: none"> Standard applications Internal installation in heated buildings Air humidity up to 90% | <ul style="list-style-type: none"> Surface coating as per corrosivity category C1 (in line with EN 12944-2) |
| OKS-M (medium) | <ul style="list-style-type: none"> Internal installation in non-heated buildings Covered, protected external installation Air humidity up to 95% | <ul style="list-style-type: none"> Surface coating as per corrosivity category C2 (in line with EN 12944-2) |
| OKS-L (high) | <ul style="list-style-type: none"> External installation Air humidity above 95% Chemical industry plants Food industry | <ul style="list-style-type: none"> Surface coating as per corrosivity category C3 (in line with EN 12944-2) Optional measures: <ul style="list-style-type: none"> Motor recesses sealed off (on request) 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) |

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) | | 1K priming coat | |
| OKS-S (small) | C1 | 2K-PUR top coat | |
| OKS-M (medium) | C2 | 1K priming coat 2K-PUR top coat | Standard: RAL 7012 Optional: RAL Classic |
| OKS-L (high) | C3 | 2K-EP priming coat 2K-PUR top coat | |

MF three-phase AC motors

General information



Motor – inverter assignment

Rated frequency 120 Hz

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

| Rated power | Product key | | |
|---------------|---------------|--------------------|-------------------|
| | Motor | Inverter | |
| P_N [kW] | | | |
| 0.55 | MF□□□□□063-32 | E84DVB□5514S□□□□2□ | E84AV□□□□5514□□□0 |
| 0.75 | MF□□□□□063-42 | E84DVB□7514S□□□□2□ | E84AV□□□□7514□□□0 |
| 1.10 | MF□□□□□071-32 | E84DVB□1124S□□□□2□ | E84AV□□□□1124□□□0 |
| 1.50 | MF□□□□□071-42 | E84DVB□1524S□□□□2□ | E84AV□□□□1524□□□0 |
| 2.20 | MF□□□□□080-32 | E84DVB□2224S□□□□2□ | E84AV□□□□2224□□□0 |
| 3.00 | MF□□□□□080-42 | E84DVB□3024S□□□□2□ | E84AV□□□□3024□□□0 |
| 4.00 | MF□□□□□090-32 | E84DVB□4024S□□□□2□ | E84AV□□□□4024□□□0 |
| 5.50 | MF□□□□□100-12 | E84DVB□5524S□□□□2□ | E84AV□□□□5524□□□0 |
| 7.50 | MF□□□□□100-32 | E84DVB□7524S□□□□2□ | E84AV□□□□7524□□□0 |
| 11.0 | MF□□□□□112-22 | | E84AV□□□□1134□□□0 |
| 15.0 | MF□□□□□132-12 | | E84AV□□□□1534□□□0 |
| 18.5 | MF□□□□□132-22 | | E84AV□□□□1834□□□0 |
| 22.0 | MF□□□□□132-32 | | E84AV□□□□2234□□□0 |

MF three-phase AC motors

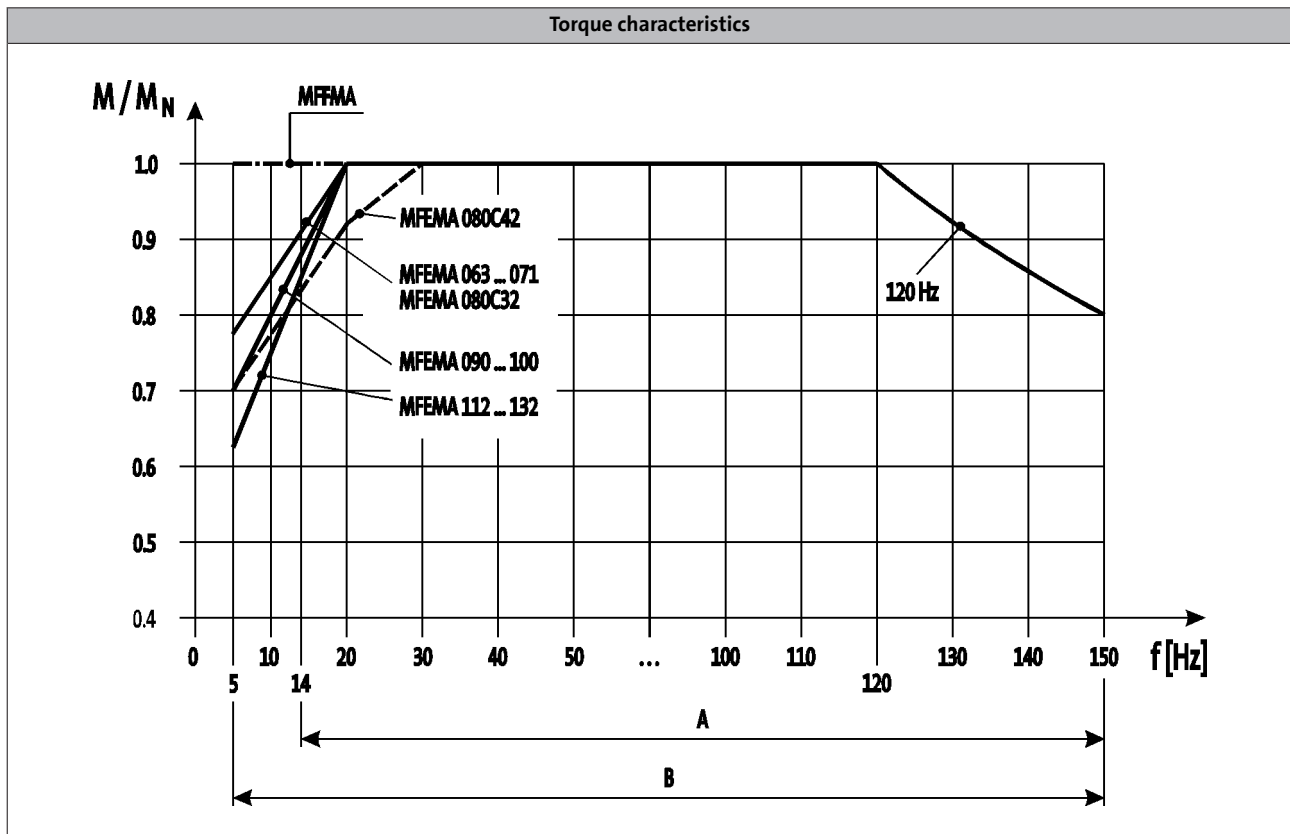
General information



Dimensioning

Torque derating at low motor frequencies

Motor size-dependent torque reduction, taking into account the thermal response during operation on the inverter.



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.

MF three-phase AC motors

General information



MF three-phase AC motors

Technical data



Standards and operating conditions

| | | | |
|---|---------------|---------|------------------------------------|
| Degree of protection | | | |
| EN 60529 | | | IP55 |
| Approval | | | |
| Class | | | cURus CCC GOST-R UkrSepro |
| 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 operating temperature | | | |
| | $T_{opr,max}$ | [°C] | 40 |
| With power reduction | $T_{opr,max}$ | [°C] | 60 |
| Site altitude | | | |
| Amsl | H_{max} | [m] | 4000 |
| Max. speed | | | |
| | n_{max} | [r/min] | 4500 |

MF three-phase AC motors

Technical data



Rated data for 120 Hz

4-pole motors

| | P_N | n_N | $U_{N,\Delta}$ | $I_{N,\Delta}$ | $U_{N,Y}$ | $I_{N,Y}$ |
|---------------|-------|---------|----------------|----------------|------------|-----------|
| | | | $\pm 10\%$ | | $\pm 10\%$ | |
| | [kW] | [r/min] | [V] | [A] | [V] | [A] |
| MF□□□□□063-32 | 0.55 | 3440 | 200 | 3.20 | 345 | 1.80 |
| MF□□□□□063-42 | 0.75 | 3400 | 210 | 4.00 | 370 | 2.30 |
| MF□□□□□071-32 | 1.10 | 3490 | 200 | 5.50 | 345 | 3.20 |
| MF□□□□□071-42 | 1.50 | 3450 | 205 | 6.80 | 360 | 3.90 |
| MF□□□□□080-32 | 2.20 | 3500 | 200 | 9.10 | 345 | 5.30 |
| MF□□□□□080-42 | 3.00 | 3480 | 210 | 11.4 | 370 | 6.60 |
| MF□□□□□090-32 | 4.00 | 3480 | | | 370 | 8.50 |
| MF□□□□□100-12 | 5.50 | 3525 | | | 340 | 12.9 |
| MF□□□□□100-32 | 7.50 | 3515 | | | 375 | 15.9 |
| MF□□□□□112-22 | 11.0 | 3530 | | | 370 | 23.5 |
| MF□□□□□132-12 | 15.0 | 3560 | | | 370 | 31.2 |
| MF□□□□□132-22 | 18.5 | 3560 | | | 360 | 39.0 |
| MF□□□□□132-32 | 22.0 | 3550 | | | 380 | 44.5 |

| | M_N | M_{max} | $\cos \varphi$ | $\eta_{75\%}$ | $\eta_{100\%}$ | $J^1)$ | $m^1)$ |
|---------------|-------|-----------|----------------|---------------|----------------|----------------------|--------|
| | [Nm] | [Nm] | | [%] | [%] | [kgcm ²] | [kg] |
| MF□□□□□063-32 | 1.53 | 6.00 | 0.68 | 75.0 | 75.0 | 3.70 | 4.40 |
| MF□□□□□063-42 | 2.11 | 8.00 | 0.69 | 79.6 | 79.6 | 3.70 | 4.40 |
| MF□□□□□071-32 | 3.01 | 12.0 | 0.77 | 81.4 | 81.4 | 12.8 | 6.40 |
| MF□□□□□071-42 | 4.15 | 16.0 | 0.80 | 82.8 | 82.8 | 12.8 | 6.40 |
| MF□□□□□080-32 | 6.00 | 24.0 | 0.86 | 84.3 | 84.3 | 28.0 | 11.0 |
| MF□□□□□080-42 | 8.20 | 32.0 | 0.86 | 85.5 | 85.5 | 28.0 | 11.0 |
| MF□□□□□090-32 | 10.9 | 44.0 | 0.85 | 87.0 | 86.6 | 32.0 | 18.0 |
| MF□□□□□100-12 | 14.9 | 60.0 | 0.81 | 87.9 | 87.7 | 61.0 | 26.5 |
| MF□□□□□100-32 | 20.3 | 80.0 | 0.81 | 88.9 | 88.7 | 61.0 | 26.5 |
| MF□□□□□112-22 | 29.7 | 120 | 0.78 | 89.8 | 89.8 | 107 | 38.0 |
| MF□□□□□132-12 | 40.3 | 160 | 0.84 | 88.9 | 90.6 | 336 | 66.0 |
| MF□□□□□132-22 | 49.6 | 200 | 0.84 | 89.9 | 91.2 | 336 | 66.0 |
| MF□□□□□132-32 | 59.2 | 240 | 0.83 | 90.5 | 91.6 | 336 | 66.0 |

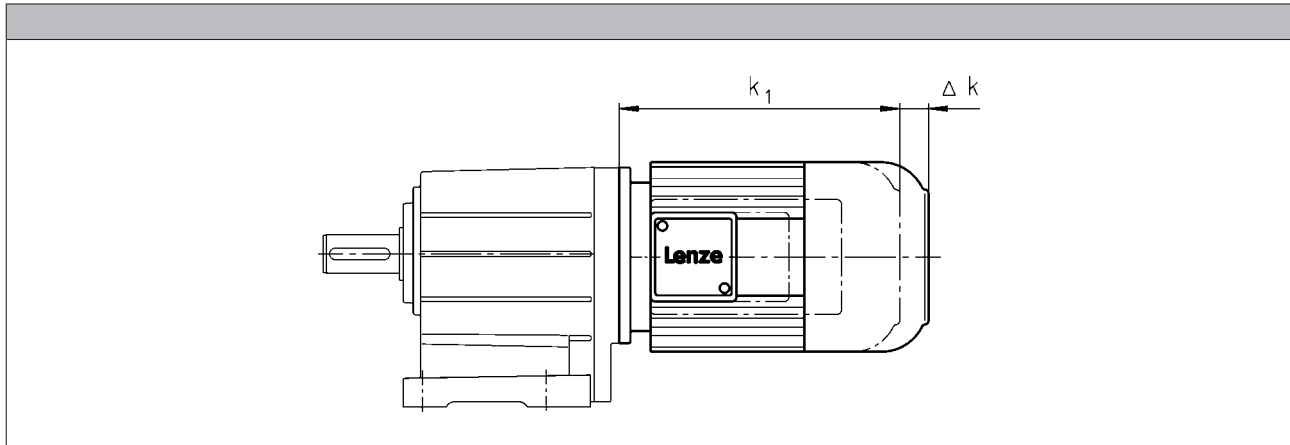
¹⁾ Without accessories

MF three-phase AC motors

Technical data



Dimensions, self-ventilated (4-pole)



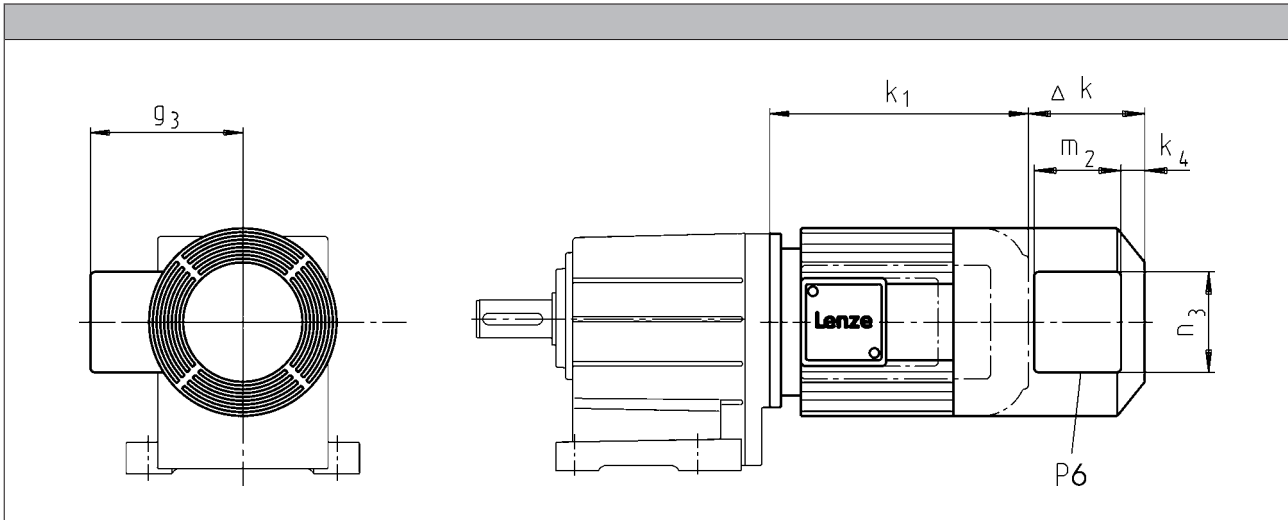
| Motor type | | | | |
|----------------------------|--------------------|--------------------|-------------------------------|-------------------------------|
| | MFEMAXX | MFEMABR | MFEMABS MFEMABI MFEMABA | MFEMARS MFEMAIG MFEMAAG |
| Motor frame size | Δk [mm] | Δk [mm] | Δk [mm] | Δk [mm] |
| 063-32 063-42 | 0 | 40 | 103 | 56 |
| 071-32 071-42 | | 52 | 96 | 52 |
| 080-32 080-42 | | 73 | 111 | 111 |
| 090-32 | | 68 | 105 | 87 |
| 100-12 100-32 | | 76 | 101 | 81 |
| 112-22 | | 90 | 120 | 80 |
| 132-12 132-22 132-32 | | 110 | 125 | 103 |

MF three-phase AC motors

Technical data



Dimensions, forced ventilated (4-pole)



| Motor type | | | | | | | | | |
|------------|---------|---------|-------------------------------|-------------------------------|--|--|--|--|--|
| | MFFMAXX | MFFMABR | MFFMABS MFFMABI MFFMABA | MFFMARS MFFMAIG MFFMAAG | | | | | |

| Motor frame size | Δ k | Δ k | Δ k | Δ k | k ₄ | g ₃ | m ₂ | n ₃ | P ₆ |
|----------------------------|------|------|------|------|----------------|----------------|----------------|----------------|----------------|
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 063-32 063-42 | 128 | 170 | 170 | 128 | 12 | 115 | 95 | 105 | 1xM16x1.5 |
| 071-32 071-42 | | 165 | 165 | | | 122 | | | |
| 080-32 080-42 | | 183 | 183 | | 13 | 132 | 96 | 106 | |
| 090-32 | | 181 | 181 | | | 141 | | | |
| 100-12 100-32 | 109 | 170 | 170 | 109 | 22 | 150 | 95 | 105 | |
| 112-22 | 102 | 183 | 183 | 183 | | 162 | | | |
| 132-12 132-22 132-32 | 115 | 202 | 202 | 202 | 32 | 182 | | | |

5.7

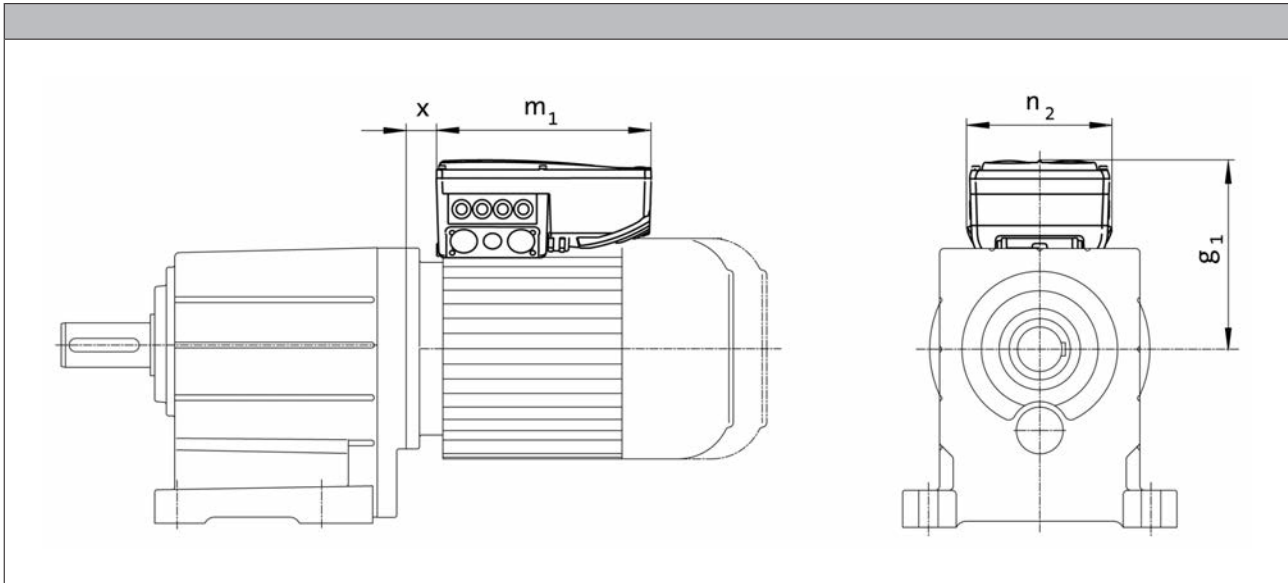
MF three-phase AC motors

Technical data



Dimensions, 8400 motec inverter

Rated frequency 120 Hz



| Product key | | | | | |
|--------------|--------------------|----------------|----------------|----------------|-------------|
| Motor | Inverter | $g_{1, 120Hz}$ | $m_{1, 120Hz}$ | $n_{2, 120Hz}$ | x_{120Hz} |
| | | [mm] | [mm] | [mm] | [mm] |
| MF□□□□063-32 | E84DVB□5514S□□□□2□ | 154 | 241 | 161 | 18.8 |
| MF□□□□063-42 | E84DVB□7514S□□□□2□ | 163 | | | 21.0 |
| MF□□□□071-32 | E84DVB□1124S□□□□2□ | 201 | 260 | 176 | 24.5 |
| MF□□□□071-42 | E84DVB□1524S□□□□2□ | 261 | | | 16.0 |
| MF□□□□080-32 | E84DVB□2224S□□□□2□ | 272 | 325 | 195 | 17.1 |
| MF□□□□080-42 | E84DVB□3024S□□□□2□ | | | | |
| MF□□□□090-32 | E84DVB□4024S□□□□2□ | | | | |
| MF□□□□100-12 | E84DVB□5524S□□□□2□ | | | | |
| MF□□□□100-32 | E84DVB□7524S□□□□2□ | | | | |

5.7

MF three-phase AC motors

Technical data



MF 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

Enclosure

• Without manual release IP55

• With manual release IP54

Friction lining

• Non-asbestos, low wearing

Options

• Manual release

• UL/CSA approval

• Noise-reduced

Motor – brake assignment

| Design | Standard | | LongLife | |
|------------------|---------------|-------------------------------|---------------|-------------------------------|
| Motor frame size | Size Brake | Rated torque M_k [Nm] | Size Brake | Rated torque M_k [Nm] |
| 063-32 | 06 | 2.50 | 06 | 4.00 |
| 063-42 | 06 | 4.00 | | |
| 071-32 | 06 | 2.50 | 06 | 4.00 |
| | 06 | 4.00 | 08 | 3.50 |
| | 08 | 3.50 | | |
| 071-42 | 06 | 2.50 | 06 | 4.00 |
| | 06 | 4.00 | 08 | 3.50 |
| | 08 | 3.50 | 08 | 8.00 |
| | 08 | 8.00 | | |
| 080-32 | 08 | 3.50 | 08 | 8.00 |
| | 08 | 8.00 | 10 | 7.00 |
| | 10 | 7.00 | | |
| 080-42 | 08 | 3.50 | 08 | 8.00 |
| | 08 | 8.00 | 10 | 7.00 |
| | 10 | 7.00 | 10 | 16.0 |
| | 10 | 16.0 | | |

MF three-phase AC motors

Accessories



Spring-applied brake

Motor – brake assignment

| Design | | Standard | | LongLife | | | |
|------------------|---------------|-------------------------------|----------------|-------------------------------|--|--------------|--|
| Motor frame size | Size Brake | Rated torque M_k [Nm] | Size Brake | Rated torque M_k [Nm] | | | |
| 090-32 | 08 | 3.50 | 08 10 10 | 8.00 7.00 16.0 | | | |
| | 08 | 8.00 | | | | | |
| | 10 | 7.00 | | | | | |
| | 10 | 16.0 | | | | | |
| | 10 | 23.0 | | | | | |
| 100-12 | 10 | 7.00 | 10 12 12 | 16.0 | | | |
| | 10 | 16.0 | | | | | |
| | 12 | 14.0 | | | | | |
| | 12 | 32.0 | | | | | |
| 100-32 | 10 | 7.00 | | 12 12 | | 14.0 32.0 | |
| | 10 | 16.0 | | | | | |
| | 12 | 14.0 | | | | | |
| | 12 | 32.0 | | | | | |
| | 12 | 46.0 | | | | | |
| 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 | | | | | |
| 132-22 132-32 | 14 | 35.0 | | | | | |
| | 14 | 60.0 | | | | | |
| | 16 | 60.0 | | | | | |
| | 16 | 80.0 | | | | | |
| | 16 | 100 | | | | | |

MF three-phase AC motors

Accessories



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



MF three-phase AC motors

Accessories



Spring-applied brake

Connection via mains voltage with brake rectifier

Bridge/half-wave rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage up to overexcitation time = 1.11
beyond 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.

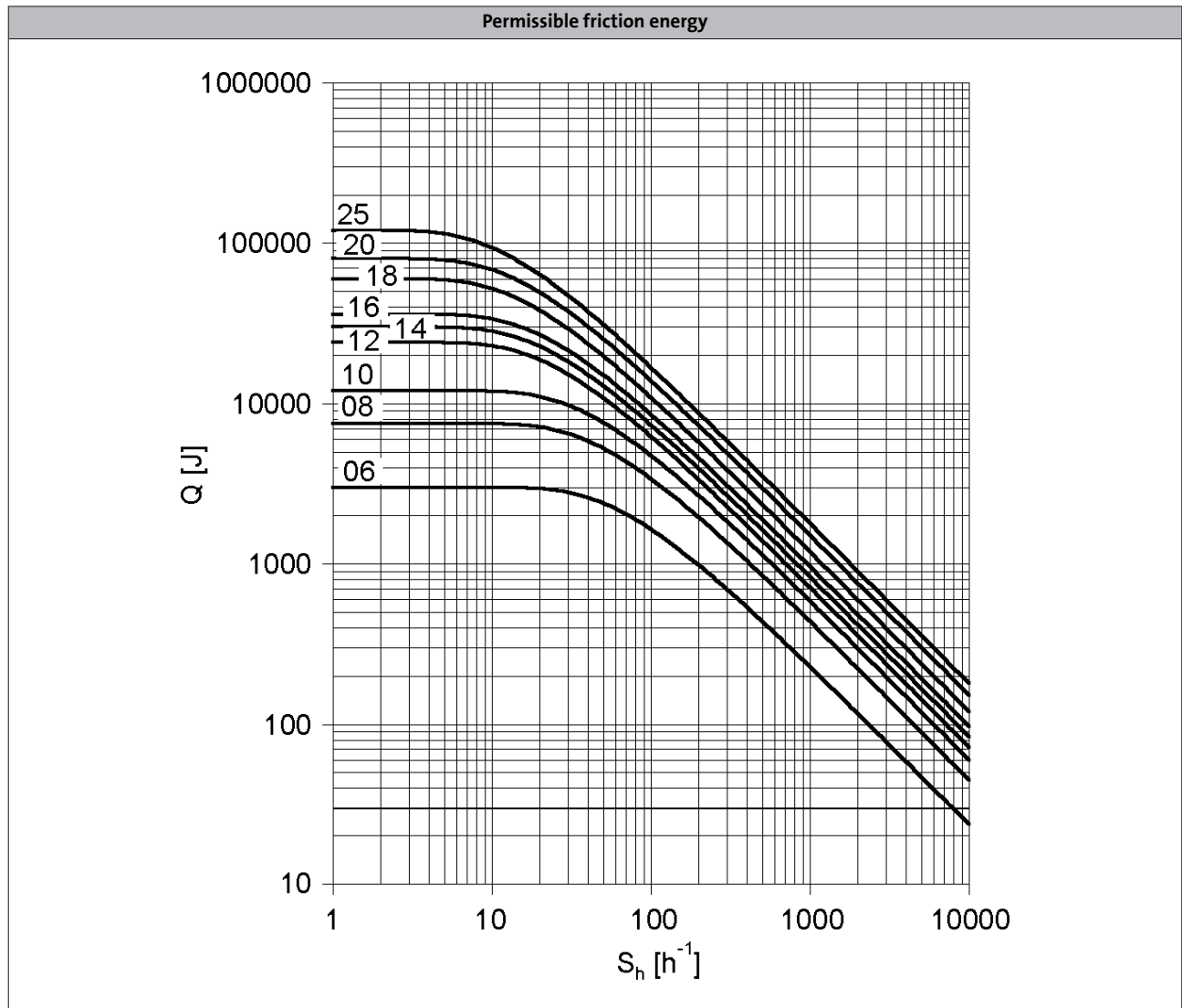
These features make this activation version particularly suitable for lifting applications. It is therefore only available in combination with a brake with increased braking torque.

• 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 ... 25

MF 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 |
|---------------------------------------|-----------------|----------------------|-------|-------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Coil power | | | | | | | | | | | |
| | 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 | | | | | | | | | | | |
| | $S_{h\ddot{u}}$ | [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 %.

MF 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 | | | | | | | | | | | |
| | $t_{\ddot{u}}$ | [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.

MF 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 |
|---------------------------------------|----------|----------------------|-------|-------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Coil power | | | | | | | | | | | |
| | 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 | | | | | | | | | | | |
| | $S_{hü}$ | [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 %.

MF 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 | | | | | | | | | | | |
| | $t_{\ddot{u}}$ | [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.

MF 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 |
|---------------------------------------|----------|----------------------|-------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Coil power | | | | | | | | | | | | |
| | 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 | | | | | | | | | | | | |
| | $S_{hü}$ | [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 |

MF 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 | Q_{BW} | [MJ] | 198 | 353 | 253 | 563 | 241 | 578 | 1596 | 580 | 2465 | 1409 |
| Overexcitation time | $t_{\ddot{u}}$ | [ms] | 300 | | | 1300 | | | | | | |
| Min. rest time | t | [ms] | 900 | | | 3900 | | | | | | |
| 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 |

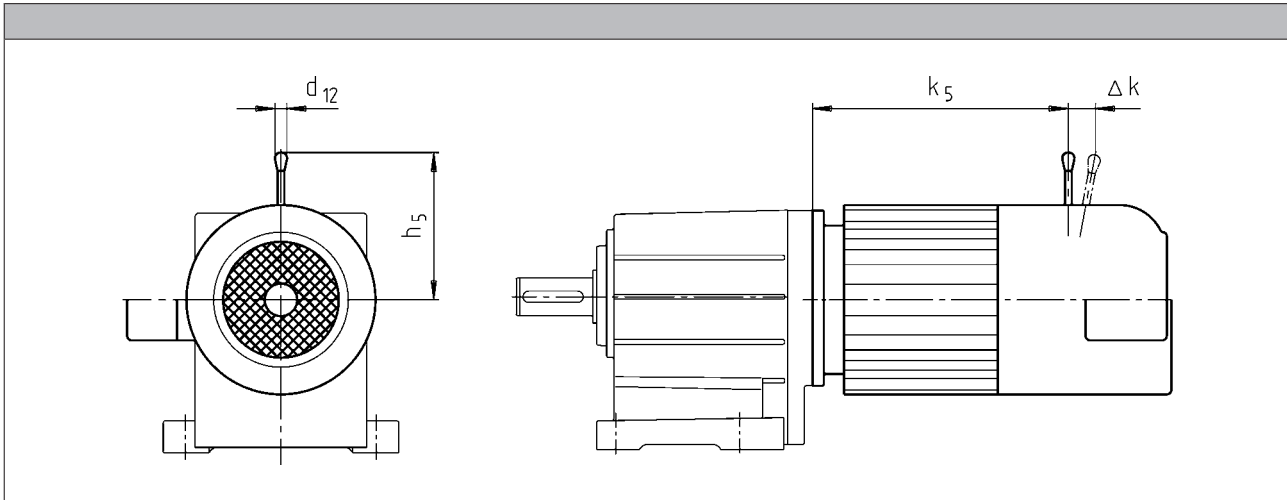
| Design | | | Over-excitation | | | | | | | | | |
|---------------------|----------------|------|-----------------|------|------|------|------|------|------|------|-----|-----|
| Size | | | 10 | 12 | 14 | 16 | 18 | 20 | 25 | | | |
| Friction energy | Q_{BW} | [MJ] | 264 | 706 | 761 | 966 | 1542 | 2322 | 3522 | | | |
| Overexcitation time | $t_{\ddot{u}}$ | [ms] | 300 | | | 1300 | | | | | | |
| Min. rest time | t | [ms] | 900 | | | 3900 | | | | | | |
| 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.



Spring-applied brake

Manual release lever



| Motor frame size | Size | k_5 [mm] | Δk [mm] | h_5 [mm] | d_{12} [mm] |
|----------------------------|----------|---------------|--------------------|---------------|------------------|
| | Brake | | | | |
| 063-32 063-42 | 06 | 173 | 29 | 107 | 13.0 |
| 071-32 071-42 | 06 08 | 186 187 | 29 27 | 107 116 | 13.0 13.0 |
| 080-32 080-42 | 06 08 | 207 218 | 29 27 | 107 116 | 13.0 13.0 |
| 090-32 | 08 10 | 245 256 | 27 28 | 116 132 | 13.0 13.0 |
| 100-12 100-32 | 10 12 | 294 296 | 28 37 | 132 161 | 13.0 13.0 |
| 112-22 | 12 14 | 292 296 | 37 41 | 161 195 | 13.0 24.0 |
| 132-12 132-22 132-32 | 14 16 | 373 373 | 41 55 | 195 240 | 24.0 24.0 |

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 071, 080, 090 for brake and retracting (M□□MA BR/BS/BA/BI)

MF 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 | | [M Ω] | 10.0 |
| Number of pole pairs | | | | |
| | | | | 1 |

MF 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 V _{ss} |
| 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] | 8.00 | | | | 4.75 | | | 7.00 |
| Max. input voltage | | | 26.0 | | 30.0 | | | 5.25 | | 12.0 |
| DC | U _{in,max} | [V] | 26.0 | | 30.0 | | | 5.25 | | 12.0 |
| Max. current consumption | | | 0.040 | | | 0.15 | | | 0.080 | |
| | I _{max} | [A] | 0.040 | | | 0.15 | | | 0.080 | |
| Limit frequency | | | 30.0 | | 160 | | | 300 | | 200 |
| | f _{max} | [kHz] | 30.0 | | 160 | | | 300 | | 200 |
| 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

MF three-phase AC motors

Accessories



Blower

- The use of a blower enables operation below 20 Hz without torque derating.

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 | 0.060 | |
| Y | | 346 | 525 | | | | |
| 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 | 0.25 | 0.97 | 8.00 |
| | 3 | Δ | 200 | 303 | | 0.87 | |
| Y | | 346 | 525 | 0.50 | | | |

MF three-phase AC motors

Accessories



Blower

Rated data for 50 Hz

| Size | Number of phases | Connection method | U _{min} | U _{max} | P _{max} | I _{max} | m |
|-------|------------------|-------------------|------------------|------------------|------------------|------------------|------|
| Motor | | | [V] | [V] | [kW] | [A] | [kg] |
| 200 | 1 | | 230 | 277 | 0.25 | 0.97 | 8.00 |
| | | 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 | U _{min} | U _{max} | P _{max} | I _{max} | m |
|-------|------------------|-------------------|------------------|------------------|------------------|------------------|------|
| Motor | | | [V] | [V] | [kW] | [A] | [kg] |
| 063 | 1 | | 230 | 277 | 0.032 | 0.12 | 2.00 |
| | | Δ | 220 | 332 | 0.028 | 0.10 | |
| | 3 | Y | 380 | 575 | | 0.060 | 0.10 |
| | | Δ | 220 | 332 | 0.029 | | 0.10 |
| 071 | 3 | Y | 380 | 575 | 0.060 | 0.14 | 2.30 |
| | | Δ | 220 | 332 | | 0.034 | |
| 080 | 1 | | 230 | 277 | 0.037 | 0.14 | 2.30 |
| | | Δ | 220 | 332 | 0.034 | 0.10 | |
| | 3 | Y | 380 | 575 | | 0.060 | 0.14 |
| | | Δ | 220 | 332 | 0.077 | | 0.33 |
| 090 | 3 | Y | 380 | 575 | 0.077 | 0.19 | 3.00 |
| | | Δ | 220 | 332 | | 0.075 | |
| 100 | 1 | | 230 | 277 | 0.075 | 0.30 | 3.00 |
| | | Δ | 220 | 332 | 0.087 | 0.31 | |
| | 3 | Y | 380 | 575 | | 0.087 | 0.18 |
| | | Δ | 220 | 332 | 0.094 | | 0.37 |
| 112 | 3 | Y | 380 | 575 | 0.10 | 0.31 | 3.10 |
| | | Δ | 220 | 332 | | 0.10 | |
| 132 | 1 | | 230 | 277 | 0.15 | 0.57 | 4.20 |
| | | Δ | 220 | 332 | | 0.15 | |
| | 3 | Y | 380 | 575 | 0.15 | | 0.25 |
| | | Δ | 220 | 332 | | 0.36 | 0.93 |
| 160 | 3 | Y | 380 | 575 | 0.36 | | 0.56 |
| | | Δ | 220 | 332 | | 0.36 | 0.93 |
| 180 | 3 | Y | 380 | 575 | 0.36 | | 0.56 |
| | | Δ | 220 | 332 | | 0.36 | 0.93 |
| 200 | 3 | Y | 380 | 575 | 0.36 | | 0.56 |
| | | Δ | 220 | 332 | | 0.28 | 0.76 |
| 225 | 3 | Y | 380 | 575 | 0.26 | | 0.43 |
| | | Δ | 220 | 400 | | 0.28 | 0.76 |

5.7

MF 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} | $I_{in,max}$ | AC $U_{in,max}$ |
| | -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 |

MF three-phase AC motors

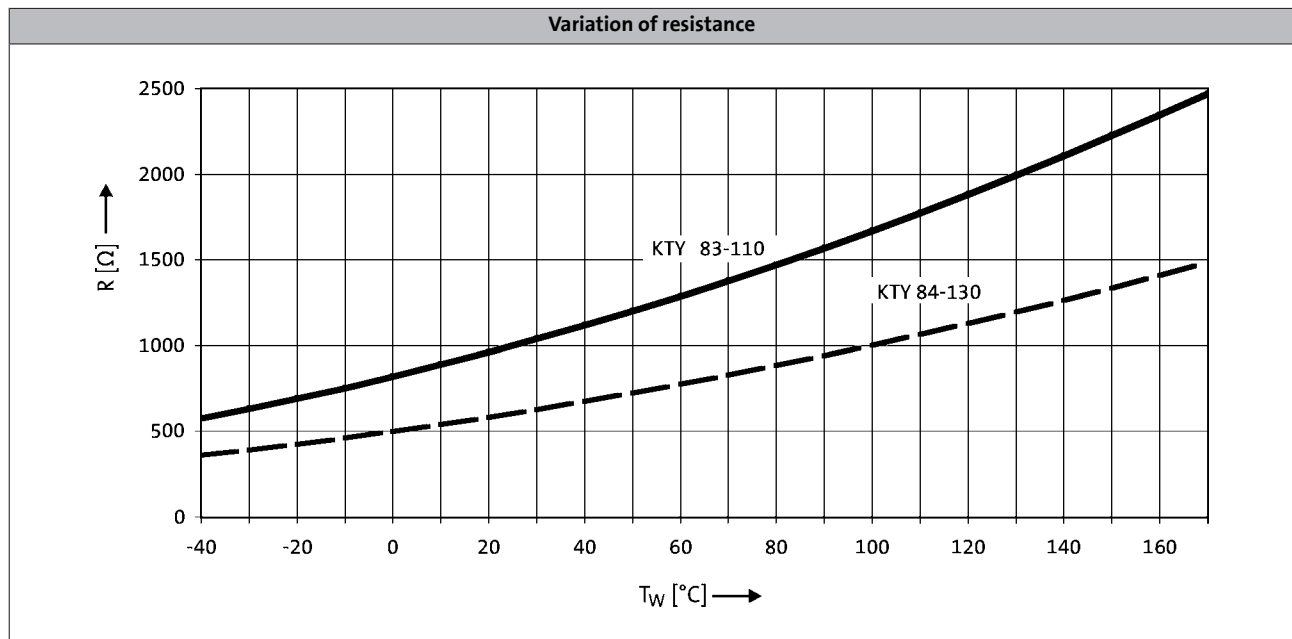
Accessories



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 detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.

MF three-phase AC motors

Accessories



Terminal box

The MF three-phase AC motors are designed specifically for inverter operation. With a base frequency of 120Hz, the rated voltage has been specified at approximately 200 V in delta connection (up to 2.2 kW) and approximately 350V in star configurations.

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.

Motor terminal box - built-on accessories assignment: 4-pole / 6-pole motors

| Motor type | M□□MAXX | M□□MARS M□□MAIG M□□MAAG | M□□MAZE |
|------------|---------|-------------------------------|---------|
|------------|---------|-------------------------------|---------|

| Motor frame size | Terminal box | | |
|----------------------------|------------------|-----|-----|
| | 063-32 063-42 | KK1 | KK2 |
| 071-32 071-42 | KK1 | KK2 | KK2 |
| 080-32 080-42 | KK1 | KK2 | KK2 |
| 090-32 | KK1 | KK2 | KK2 |
| 100-12 100-32 | KK1 | KK2 | KK2 |
| 112-22 | KK1 | KK2 | KK2 |
| 132-12 132-22 132-32 | KK1 | KK3 | KK3 |

| Motor type | M□□MABR | M□□MABS M□□MABI M□□MABA | M□□MABZ |
|------------|---------|-------------------------------|---------|
|------------|---------|-------------------------------|---------|

| Motor frame size | Terminal box | | |
|----------------------------|------------------|-----|-----|
| | 063-32 063-42 | KK2 | KK3 |
| 071-32 071-42 | KK2 | KK3 | KK2 |
| 080-32 080-42 | KK2 | KK3 | KK2 |
| 090-32 | KK2 | KK3 | KK2 |
| 100-12 100-32 | KK2 | KK3 | KK2 |
| 112-22 | KK2 | KK3 | KK2 |
| 132-12 132-22 132-32 | KK3 | KK3 | KK3 |

MF three-phase AC motors

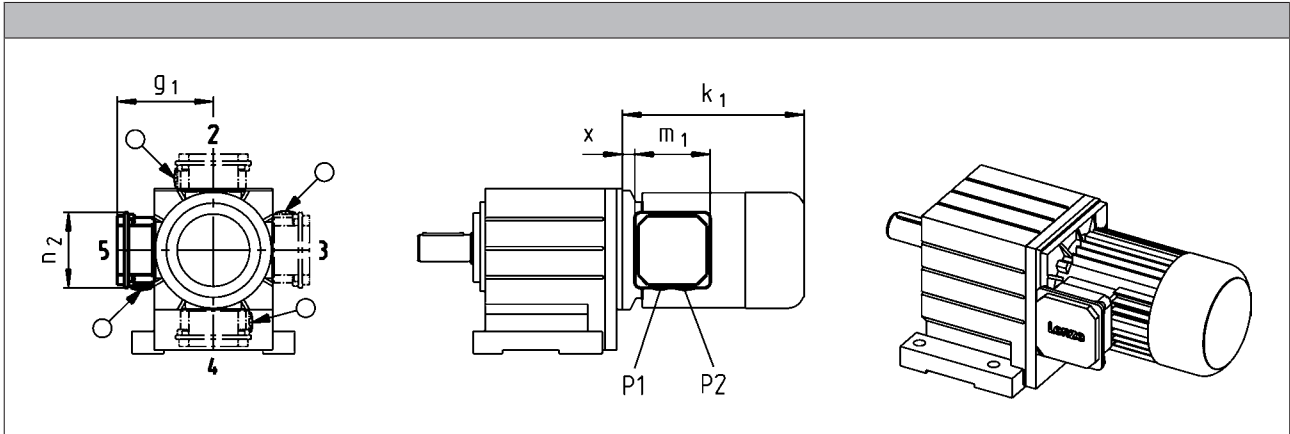
Accessories



Terminal box

Dimensions of KK1

- ▶ For motors with motor terminal box KK1, the connector position can be selected in accordance with the terminal box position.
- ▶ If preferred positions are not specified in the order, the cable entry will be positioned as circled on the diagram below.



| Size | | | | | | |
|-------|------------------------|--------------------------|----------------------------|----------------------------|----------------------------------|--------------------|
| Motor | | | | | | |
| | x | g ₁ | m ₁ | n ₂ | P ₁ | P ₂ |
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 063 | 21 12 ¹⁾ | 100 117 ¹⁾ | 75.0 93.0 ¹⁾ | 75.0 93.0 ¹⁾ | M16x1.5 M20x1.5 ¹⁾ | M20x1.5 M20x1.5 |
| 071 | 24 15 ¹⁾ | 109 126 ¹⁾ | | | | |
| 080 | 14 | 150 | 115 | 115 | M20x1.5 | M25x1.5 |
| 090 | 19 | 157 | | | | |
| 100 | 20 | 166 | | | | |
| 112 | 22 | 176 | | | | |
| 132 | 33 | 195 | 122 | 122 | M32x1.5 | M32x1.5 |

¹⁾ UL/CSA approval: cURus

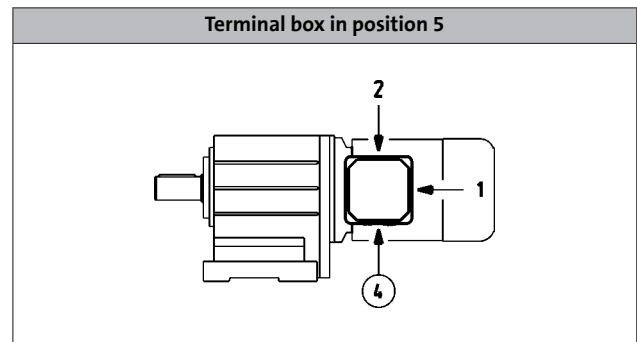
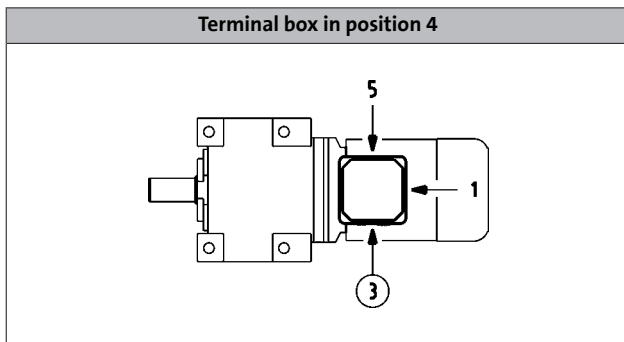
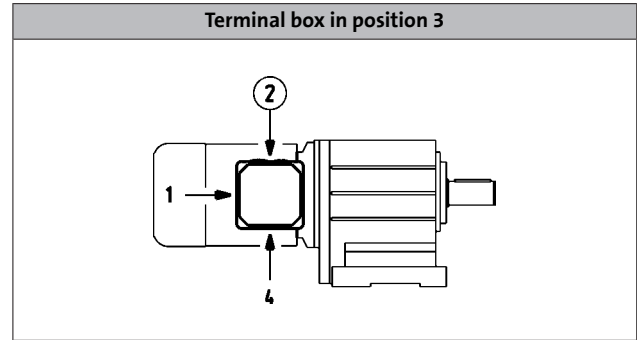
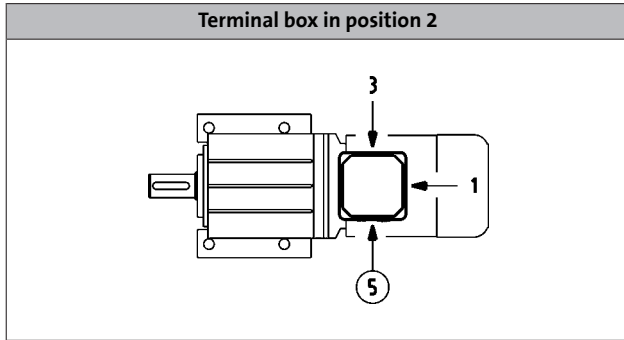
MF three-phase AC motors

Accessories



Terminal box

Cable entry position when using KK1



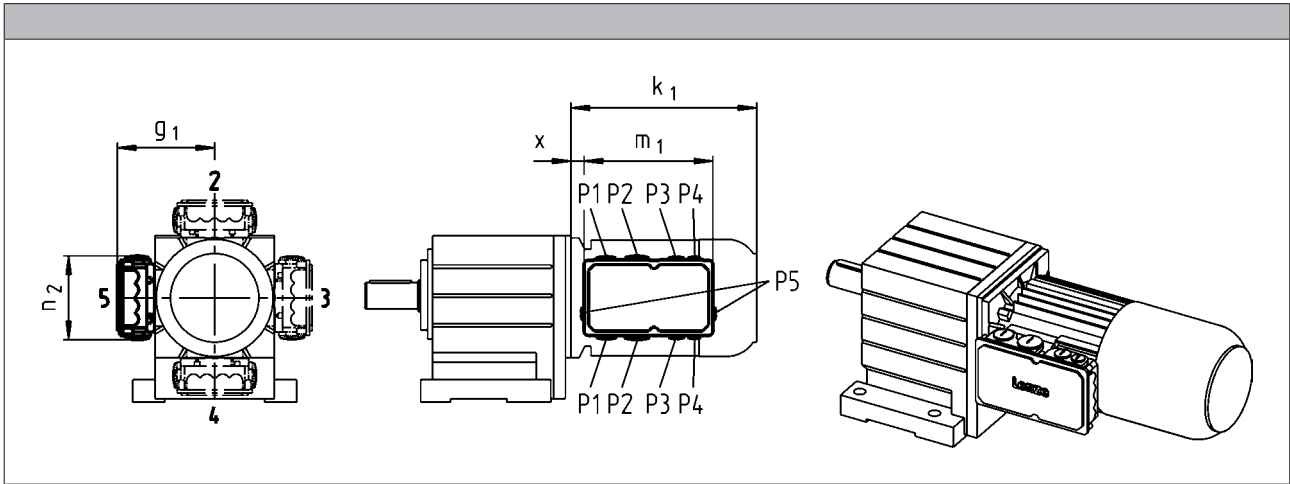
MF three-phase AC motors

Accessories



Terminal box

Dimensions of KK2



| Size | | | | | | |
|-------|------|-------|-------|-------|---------|---------|
| Motor | | | | | | |
| | x | g_1 | m_1 | n_2 | P_1 | P_2 |
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 063 | 13 | 107 | 136 | 103 | M16x1.5 | M20x1.5 |
| 071 | 15 | 118 | | | | |
| 080 | 17 | 132 | | | | |
| 090 | 22 | 137 | 152 | 121 | M20x1.5 | M25x1.5 |
| 100 | 23 | 147 | | | | |
| 112 | 25 | 158 | | | | |

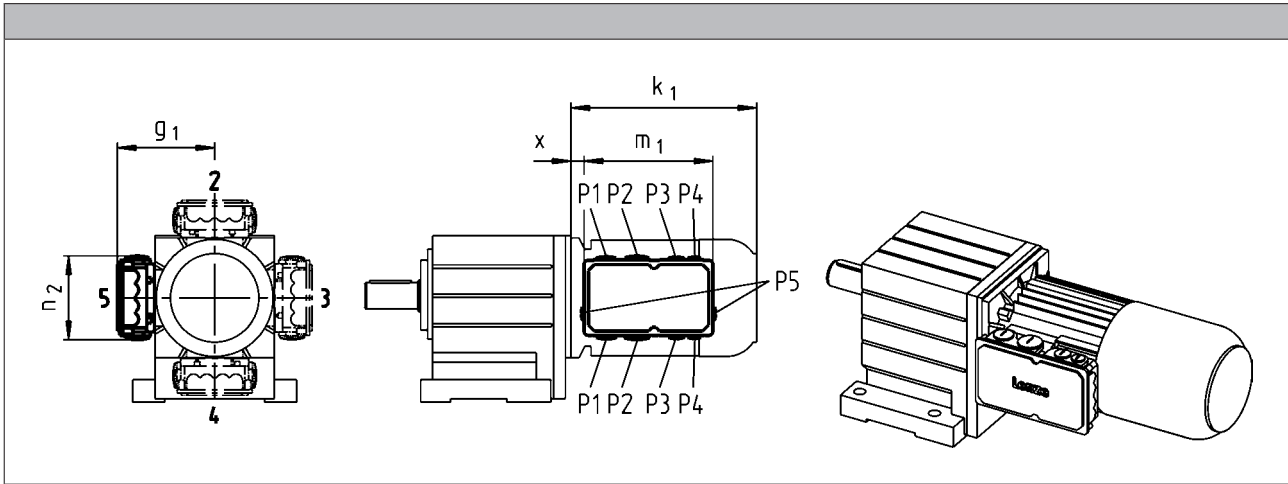
MF three-phase AC motors

Accessories



Terminal box

Dimensions of KK3



| Size | | | | | | | | | |
|-------|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Motor | x | g ₁ | m ₁ | n ₂ | P ₁ | P ₂ | P ₃ | P ₄ | P ₅ |
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 063 | 2 | 124 | 195 | 125 | M25x1.5 | M32x1.5 | M20x1.5 | M20x1.5 | |
| 071 | 5 | 133 | | | | | | | |
| 080 | 15 | 142 | | | | | | | |
| 090 | 20 | 147 | | | | | | | |
| 100 | 21 | 158 | | | | | | | |
| 112 | 23 | 168 | | | | | | | |
| 132 | 38 | 187 | 226 | 127 | M50x1.5 | M16x1.5 | M16x1.5 | | |
| 160 | 35 | 210 | | | | | | | |
| 180 | 73 | 230 | | | | | | | |
| 225 | 95 | 346 | | | | | | | 354 |

¹⁾ Cable entry only possible at one position.
 Terminal box position 2: cable entry at position 5.
 Terminal box position 3: cable entry at position 2.
 Terminal box position 4: cable entry at position 3.
 Terminal box position 5: cable entry at position 4.

MF three-phase AC motors

Accessories

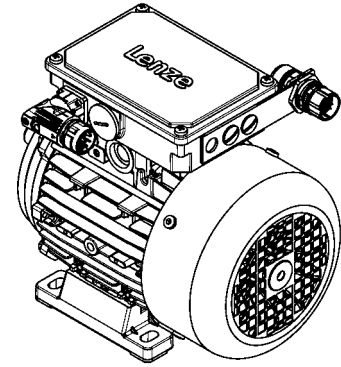


Connectors

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 power, brake and temperature monitoring. The connections to the feedback system and the blower each employ a separate connector.



Connection for power, brake and temperature monitoring

The connectors can be rotated through 270° and are fitted with a bayonet catch for SpeedTec connectors. As this connector is also compatible with conventional union nuts, existing mating connectors can continue to be used without difficulty. The motor connection is determined in the terminal box and must be checked before commissioning.

► ICN 6-pole

| 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 | V | Phase V power | |
| 4 | W | Phase W 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 | |

MF three-phase AC motors

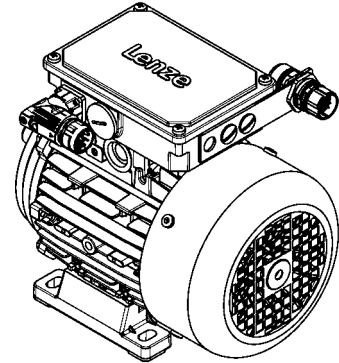
Accessories



ICN connector

Feedback connection

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.



► Resolver

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

5.7

► Hiperface incremental encoder and SinCos absolute value encoder

| 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 | |

MF three-phase AC motors

Accessories



ICN connector

Motor terminal box with ICN connectors - built-on accessories assignment: 4-pole / 6-pole motors

| Motor type | M□□MAXX | M□□MARS M□□MAIG M□□MAAG | M□□MAZE |
|------------|---------|-------------------------------|---------|
|------------|---------|-------------------------------|---------|

| Motor frame size | Terminal box | | |
|------------------|------------------|-----|-----|
| | 063-32 063-42 | KK1 | KK2 |
| 071-32 071-42 | KK1 | KK2 | KK2 |
| 080-32 080-42 | KK1 | KK2 | KK2 |
| 090-32 | KK1 | KK2 | KK2 |
| 100-12 100-32 | KK1 | KK2 | KK2 |

| Motor type | M□□MABR | M□□MABS M□□MABI M□□MABA | M□□MABZ |
|------------|---------|-------------------------------|---------|
|------------|---------|-------------------------------|---------|

| Motor frame size | Terminal box | | |
|------------------|------------------|-----|-----|
| | 063-32 063-42 | KK2 | KK3 |
| 071-32 071-42 | KK2 | KK3 | KK2 |
| 080-32 080-42 | KK2 | KK3 | KK2 |
| 090-32 | KK2 | KK3 | KK2 |
| 100-12 100-32 | KK2 | KK3 | KK2 |

5.7

MF three-phase AC motors

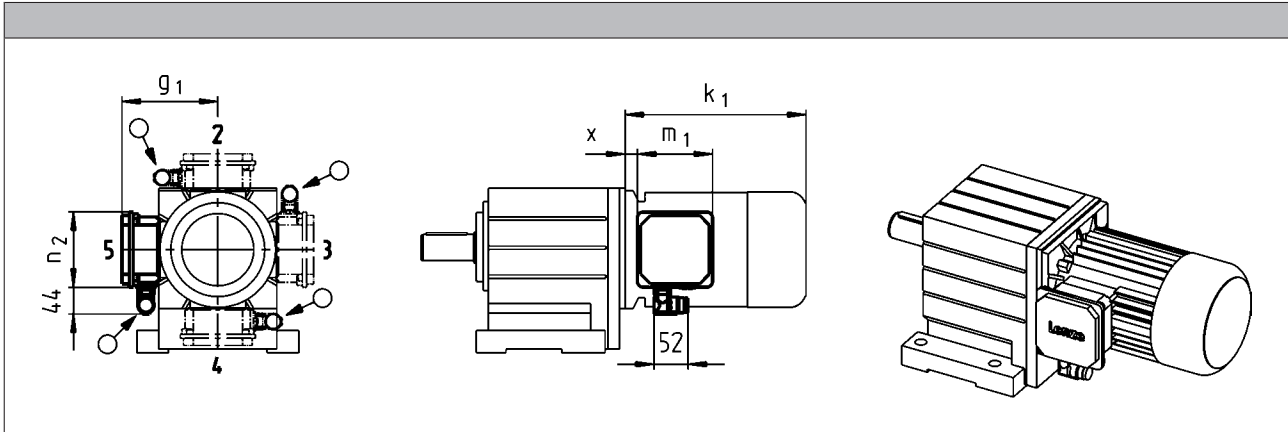
Accessories



ICN connector

Dimensions of KK1

- ▶ For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- ▶ If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.



| Size | | | | |
|-------|------|----------------|----------------|----------------|
| Motor | x | g ₁ | m ₁ | n ₂ |
| | [mm] | [mm] | [mm] | [mm] |
| 063 | 12 | 117 | 93.0 | 93.0 |
| 071 | 15 | 126 | | |
| 080 | 14 | 150 | | |
| 090 | 19 | 157 | 115 | 115 |
| 100 | 20 | 166 | | |
| 112 | 22 | 176 | | |
| 132 | 33 | 195 | 122 | 122 |

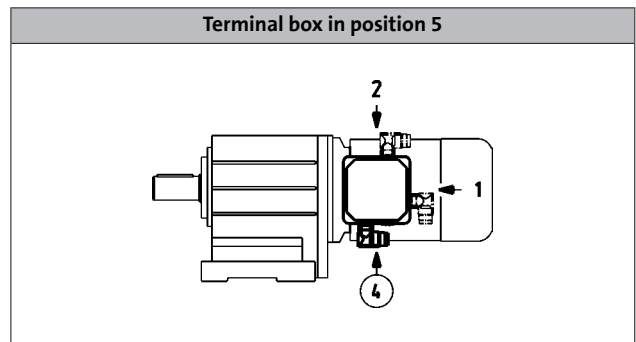
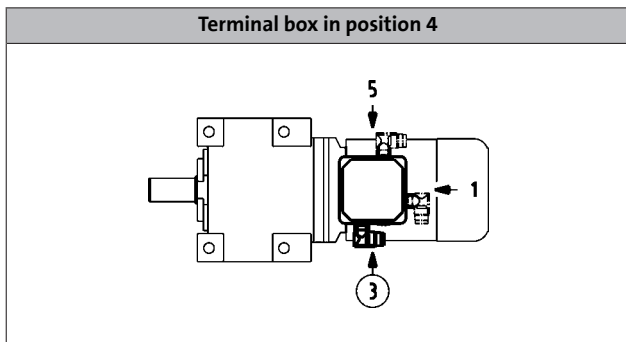
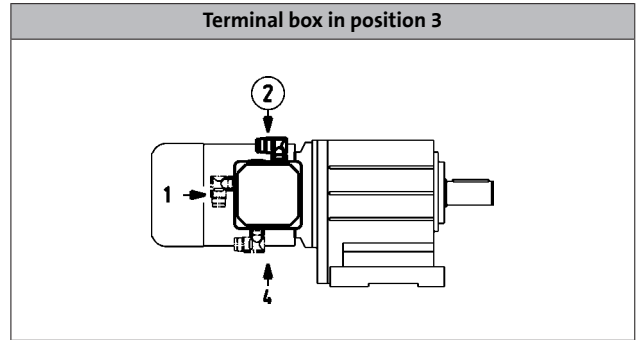
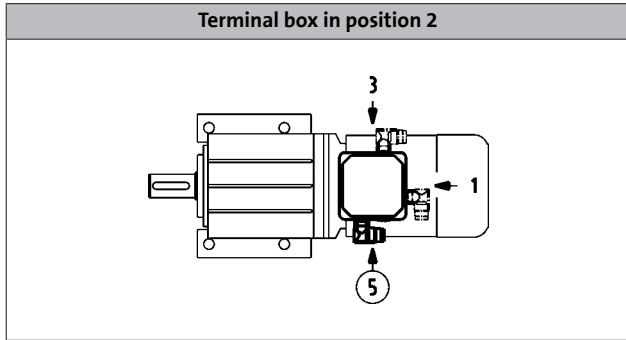
MF three-phase AC motors

Accessories



ICN connector

Connector position when using KK1



MF three-phase AC motors

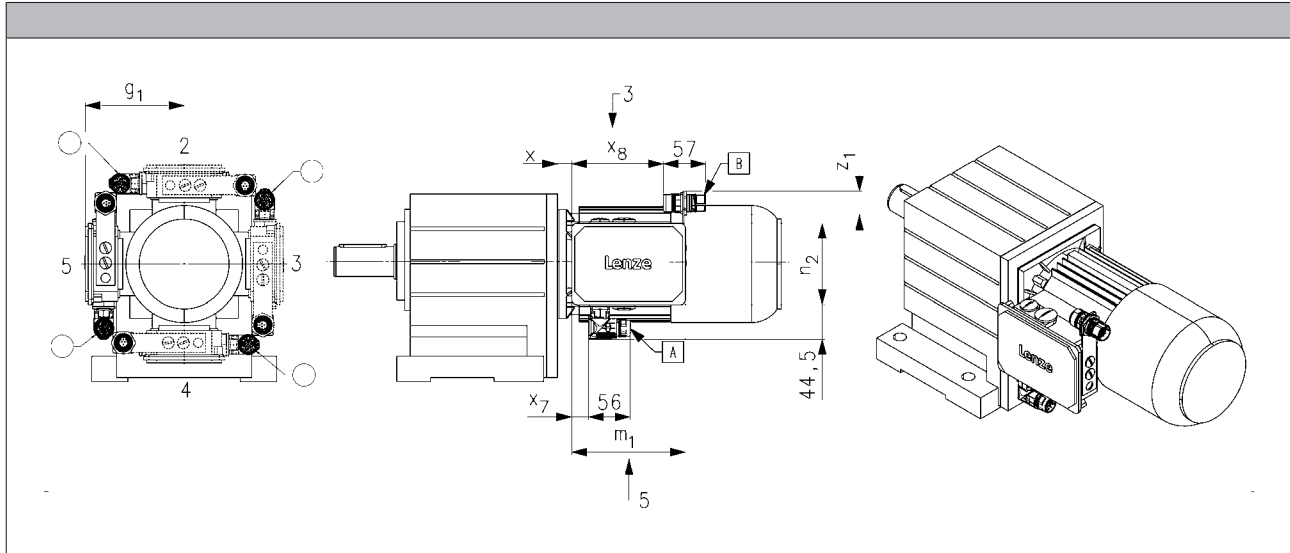
Accessories



ICN connector

Dimensions of KK2/KK3

- ▶ For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- ▶ If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.



| Size | | | | | | | |
|-------|------|----------------|----------------|----------------|----------------|----------------|---------------------|
| Motor | x | g ₁ | m ₁ | n ₂ | x ₇ | x ₈ | z _{1, max} |
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 063 | 13 | 107 | 136 | 103 | 16 | 109 | 43 |
| 071 | 15 | 118 | | | | | |
| 080 | 17 | 132 | | | | | |
| 090 | 22 | 137 | 152 | 121 | 23 | 125 | 41 |
| 100 | 23 | 147 | | | | | |
| 112 | 25 | 158 | | | | | |
| 132 | 38 | 187 | 195 | 125 | | 166 | 71 |

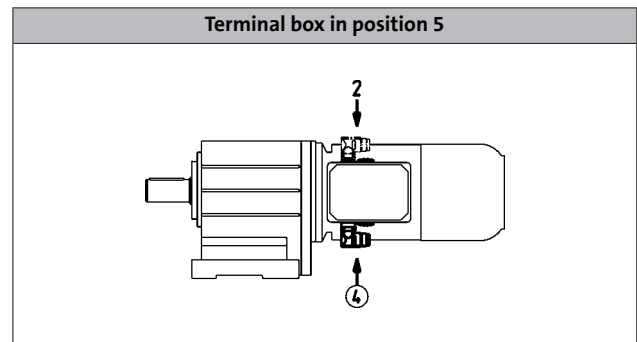
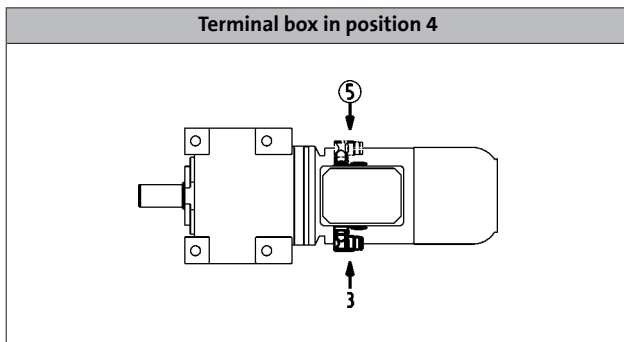
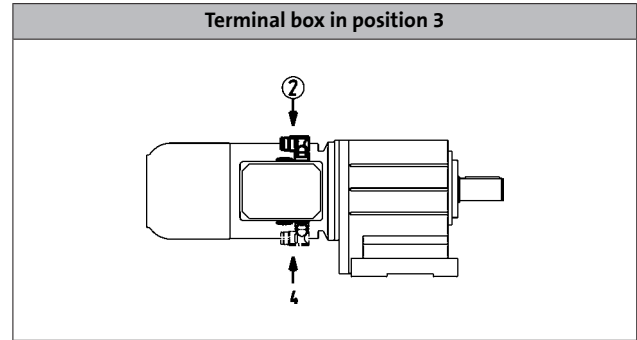
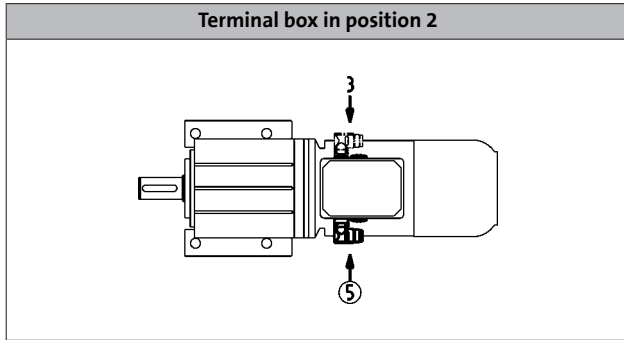
MF three-phase AC motors

Accessories



ICN connector

Connector position when using KK2/KK3



MF three-phase AC motors

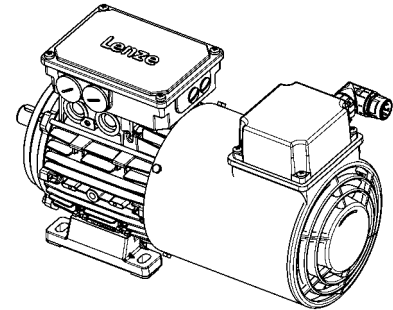
Accessories



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 | 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 | Not assigned |
| 5 | | |
| 6 | W | Phase W power |

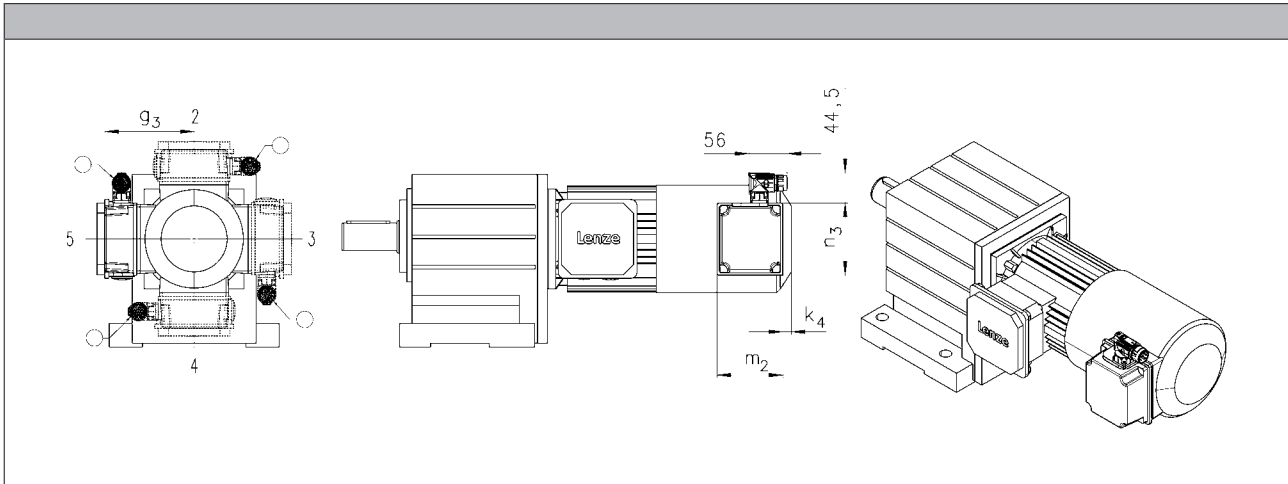
MF three-phase AC motors

Accessories



ICN connector

Dimensions of blower



| Size | | | | |
|-------|-------|-------|-------|-------|
| Motor | k_4 | g_3 | m_2 | n_3 |
| | [mm] | [mm] | [mm] | [mm] |
| 063 | 12 | 115 | 95 | 105 |
| 071 | | 122 | | |
| 080 | 13 | 132 | 96 | 106 |
| 090 | 22 | 141 | 95 | 105 |
| 100 | | 150 | | |
| 112 | | 162 | | |
| 132 | 32 | 182 | | |
| 160 | 31 | 209 | 96 | 106 |
| 180 | | | | |
| 225 | | | | |

- In addition, the cover of the blower terminal box (including connectors) can be rotated progressively through 90° if necessary.

MF three-phase AC motors

Accessories

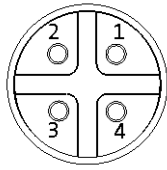


M12 connector

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 |



MF three-phase AC motors

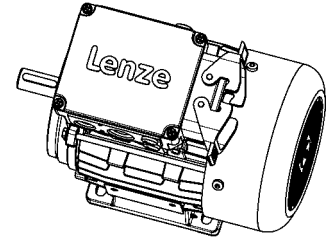
Accessories



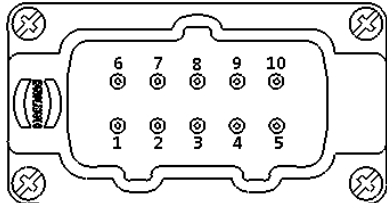
HAN connector

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 |



MF three-phase AC motors

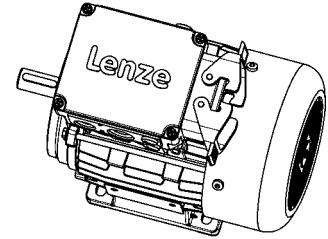
Accessories



HAN connector

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 | |
| 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 | | |

MF three-phase AC motors

Accessories



HAN connector

| Motor type | M□□MAXX M□□MABR | M□□MAZE M□□MABZ |
|----------------------------|--|------------------------|
| Motor frame size | Terminal box with HAN connector | |
| 063-32 063-42 | HAN-10E HAN modular | |
| 071-32 071-42 | HAN-10E HAN modular | HAN-10E HAN modular |
| 080-32 080-42 | HAN-10E HAN modular | HAN-10E HAN modular |
| 090-32 | HAN-10E HAN modular | HAN-10E HAN modular |
| 100-12 100-32 | HAN-10E HAN modular | HAN-10E HAN modular |
| 112-22 | | |
| 132-12 132-22 132-32 | HAN modular | HAN modular |

Motor terminal box with HAN connectors - built-on accessories assignment: 4-pole / 6-pole motors

MF three-phase AC motors

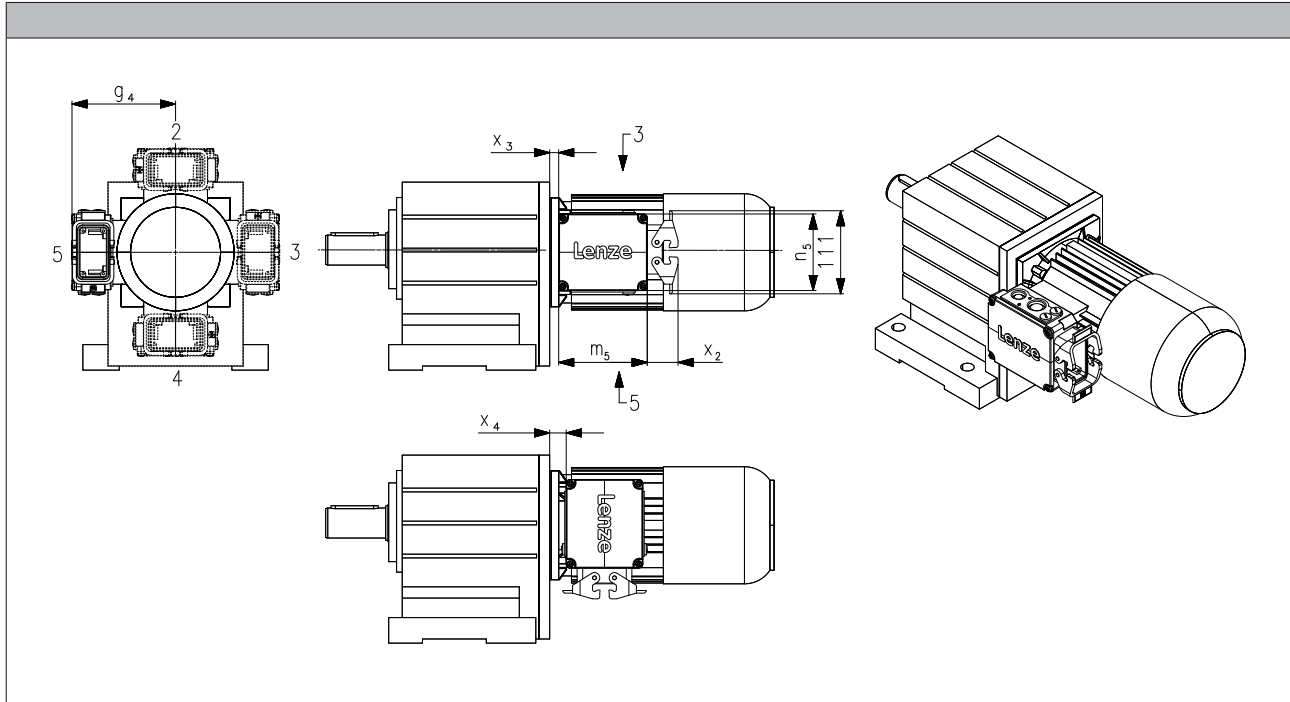
Accessories



HAN connector

Dimensions

- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- Unless the connector position is specified, it will be supplied in position 1.



| Size | | | |
|-------|-------|-------|-------|
| Motor | g_4 | x_3 | x_4 |
| | [mm] | [mm] | [mm] |
| 063 | 120 | 5.00 | 6.00 |
| 071 | 129 | 7.00 | 8.00 |
| 080 | 138 | 11.0 | 19.0 |
| 090 | 143 | 15.0 | 23.0 |
| 100 | 154 | 16.0 | 24.0 |
| 112 | 164 | 13.5 | 21.5 |
| 132 | 233 | 34.5 | 4.50 |
| 160 | 248 | 39.0 | 9.00 |

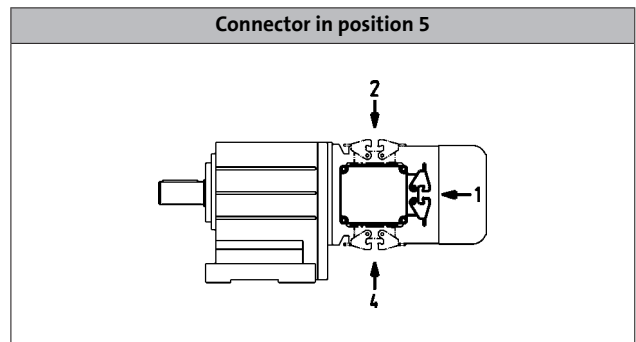
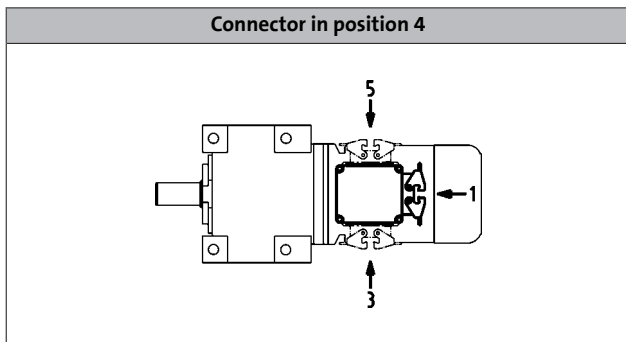
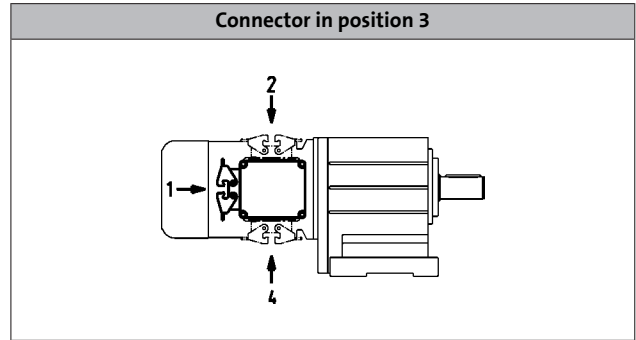
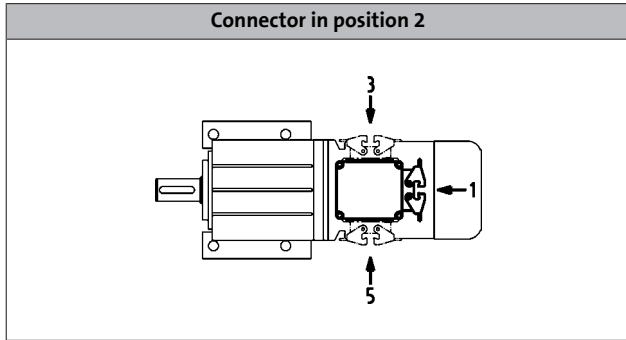
MF three-phase AC motors

Accessories



HAN connector

Position of connector



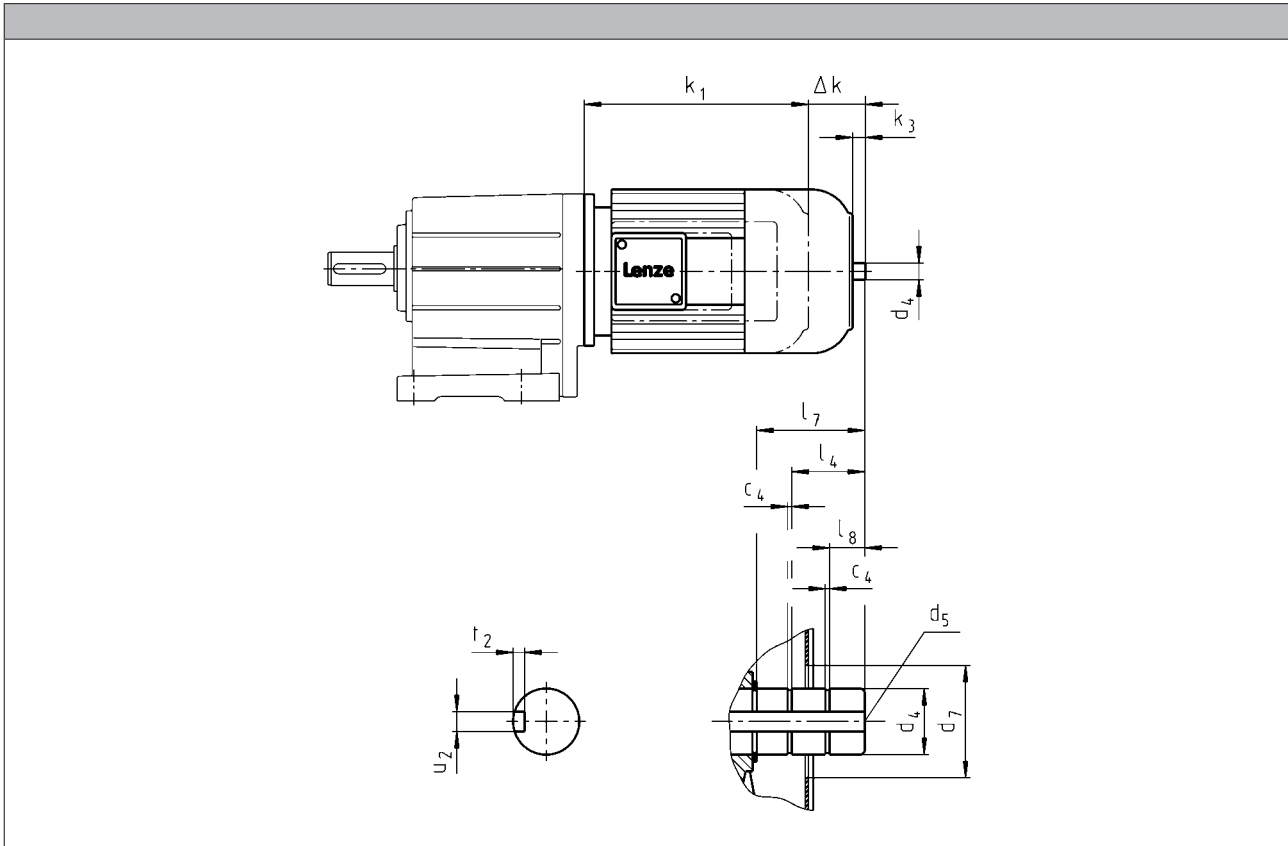
MF three-phase AC motors

Accessories



2nd shaft end

Dimensions, self-ventilated (4/6-pole)



| | |
|----------------------|------------------|
| Motor type | |
| Built-on accessories | M□MAZE M□MABZ |

| Motor frame size | Δ k | k ₃ | c ₄ | d ₄ | d ₄ | d ₅ | d ₇ | l ₄ | l ₇ | l ₈ | u ₂ | t ₂ |
|----------------------------|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | [mm] | [mm] | [mm] | h6 [mm] | j6 [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 071-32 071-42 | 47 | 11.0 | 1.10 | 14.0 | | M5 | 34.0 | | 19.0 | 3.00 | 5.00 | 3.00 |
| 080-32 080-42 | 68 | 9.00 | 1.10 | 14.0 | | M5 | 34.0 | | 19.0 | 4.50 | 5.00 | 3.00 |
| 090-32 | 57 | 9.00 | 1.10 | 14.0 | | M5 | 34.0 | | 19.0 | 5.00 | 5.00 | 3.00 |
| 100-12 100-32 | 71 | 18.5 | 1.30 | | 20.0 | M6 | 34.0 | 17.0 | 32.5 | 10.5 | 6.00 | 3.50 |
| 112-22 | 84 | 16.0 | 1.30 | | 20.0 | M6 | 34.0 | 17.0 | 28.5 | 7.00 | 6.00 | 3.50 |
| 132-12 132-22 132-32 | 101 | 24.5 | 1.60 | | 30.0 | M10 | 46.0 | 24.5 | 42.0 | 8.50 | 8.00 | 4.00 |

¹⁾ During operation, appropriate measures must be taken to make fan cover opening safe.

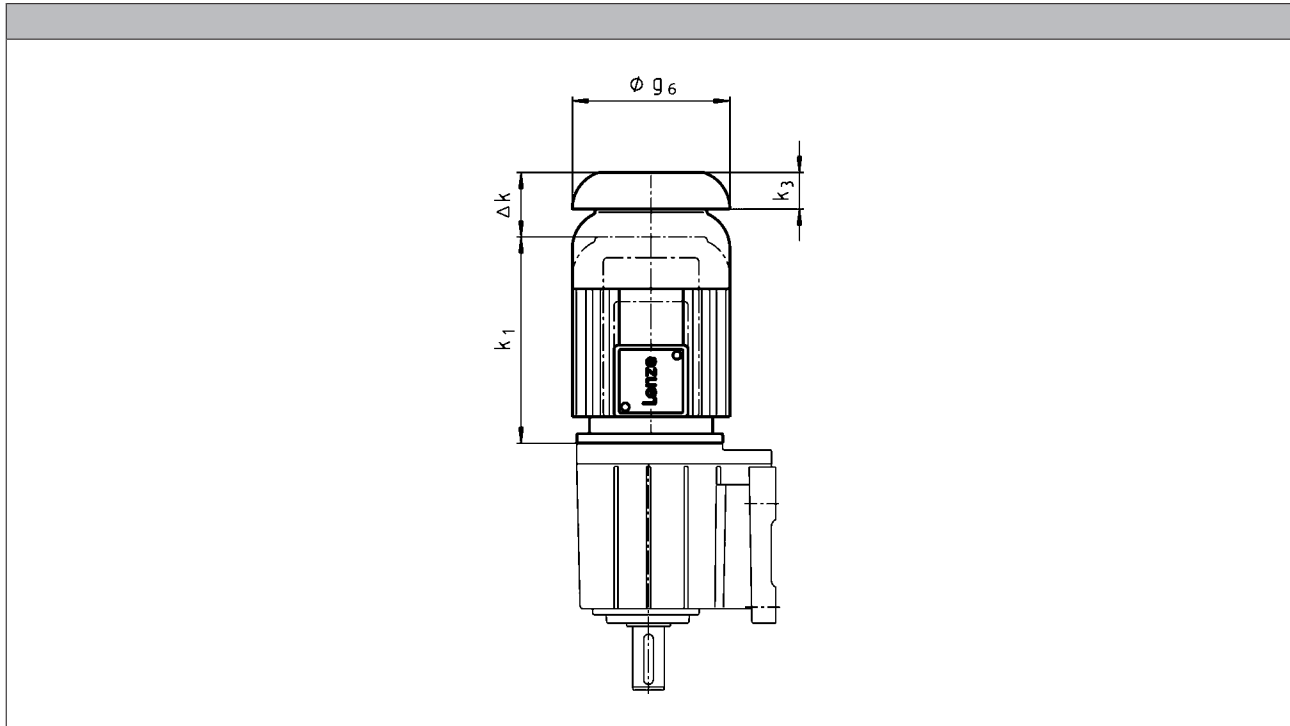
MF three-phase AC motors

Accessories



Protection cover

Dimensions, self-ventilated (4/6-pole)



| Motor type | | | | | | |
|------------|---------|---------|-------------------------------|-------------------------------|--|--|
| | M□□MAXX | M□□MABR | M□□MABS M□□MABI M□□MABA | M□□MARS M□□MAIG M□□MAAG | | |

| Motor frame size | Motor type | | | | | |
|----------------------------|------------|------|------|------|----------------|----------------|
| | Δ k | Δ k | Δ k | Δ k | k ₃ | g ₆ |
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 063-32 063-42 | 26 | 66 | 129 | 82 | 11.0 | 123 |
| 071-32 071-42 | 26 | 78 | 122 | 78 | 12.0 | 138 |
| 080-32 080-42 | 26 | 99 | 137 | 127 | 16.0 | 156 |
| 090-32 | 26 | 94 | 131 | 113 | 15.0 | 176 |
| 100-12 100-32 | 31 | 107 | 132 | 112 | 17.0 | 194 |
| 112-22 | 31 | 121 | 151 | 111 | 18.0 | 218 |
| 132-12 132-22 132-32 | 31 | 141 | 156 | 134 | 20.0 | 257 |

5.7

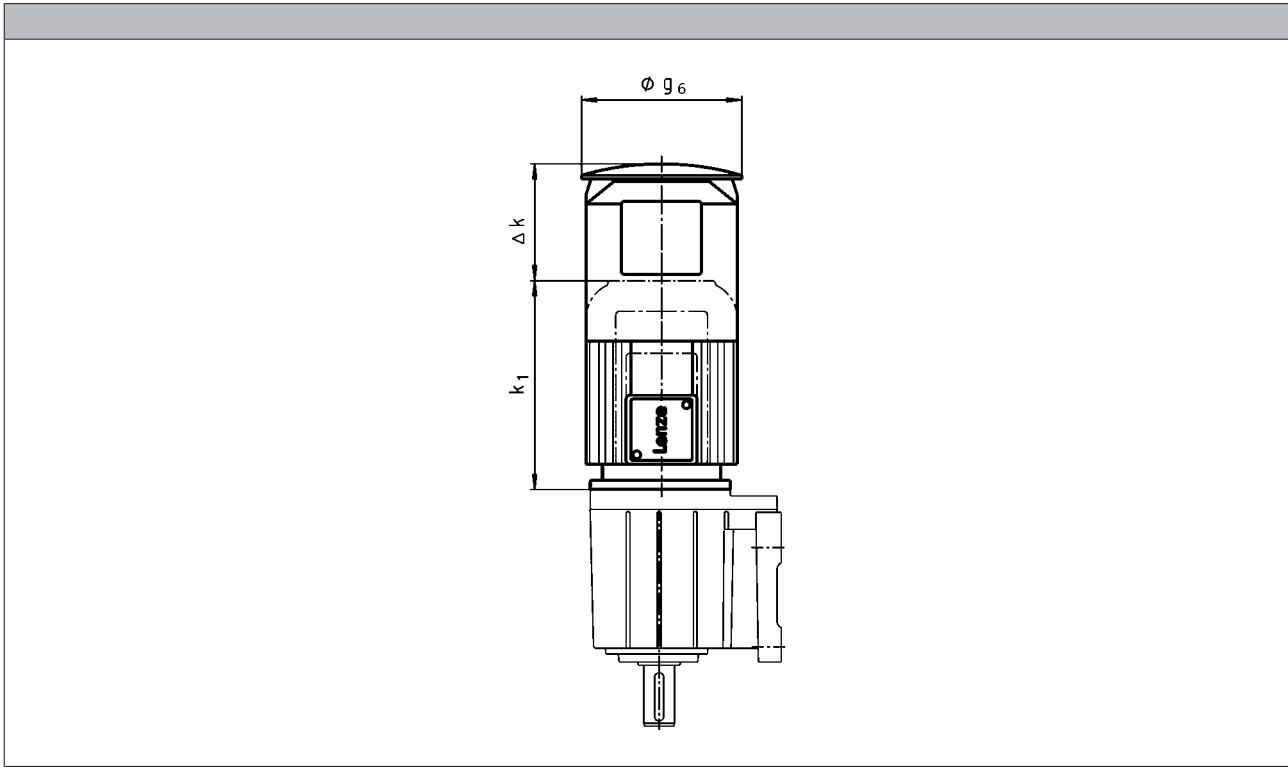
MF three-phase AC motors

Accessories



Protection cover

Dimensions, forced ventilated (4/6-pole)



| Motor type | | | |
|------------|-------------------------------|-------------------------------|--|
| M□□MAXX | M□□MABR M□□MABS M□□MABI | M□□MARS M□□MAIG M□□MAAG | |

| Motor frame size | Motor type | | | g ₆ [mm] |
|----------------------------|-------------|-------------|-------------|------------------------|
| | Δ k [mm] | Δ k [mm] | Δ k [mm] | |
| 063-32 063-42 | 169 | 209 | 169 | 133 |
| 071-32 071-42 | 165 | 202 | 165 | 150 |
| 080-32 080-42 | 168 | 224 | 168 | 170 |
| 090-32 | 157 | 210 | 157 | 188 |
| 100-12 100-32 | 137 | 198 | 137 | 210 |
| 112-22 | 135 | 216 | 216 | 249 |
| 132-12 132-22 132-32 | 140 | 226 | 226 | 300 |

5.7