L-force catalogue

Automation systems
Drive solutions

Controls
Inverter
Motors
Gearboxes
Engineering Tools

Motors: IE3 three-phase AC motors m550-P, IE3 three-phase AC motors m240-P

Lenze
As easy as that.

Contents of the L-force catalogue

Selected portfolio

Additional portfolio

Lenze makes many things easy for you.

With our motivated and committed approach, we work together with you to create the best possible solution and set your ideas in motion - whether you are looking to optimise an existing machine or develop a new one. We always strive to make things easy and seek perfection therein. This is anchored in our thinking, in our services and in every detail of our products. It's as easy as that!

1

Developing ideas

Are you looking to build the best machine possible and already have some initial ideas? Then get these down on paper together with us, starting with small innovative details and stretching all the way to completely new machines. Working together, we will develop an intelligent and sustainable concept that is perfectly aligned with your specific requirements.

2

Drafting concepts

We see welcome challenges in your machine tasks, supporting you with our comprehensive expertise and providing valuable impetus for your innovations. We take a holistic view of the individual motion and control functions here and draw up consistent, end-to-end drive and automation solutions for you - keeping everything as easy as possible and as extensive as necessary.

3

Implementing solutions

Our easy formula for satisfied customers is to establish an active partnership with fast decision making processes and an individually tailored offer. We have been using this principle to meet the ever more specialised customer requirements in the field of machine engineering for many years.

4

Manufacturing machines

Functional diversity in perfect harmony: as one of the few full-range providers in the market, we can provide you with precisely those products that you actually need for any machine task – no more and no less. Our L-force product portfolio, a consistent platform for implementing drive and automation tasks, is invaluable in this regard.

5

Ensuring productivity

Productivity, reliability and new performance peaks on a daily basis – these are our key success factors for your machine. After delivery, we offer you cleverly devised service concepts to ensure continued safe operation. The primary focus here is on technical support, based on the excellent application expertise of our highly-skilled and knowledgeable after-sales team.

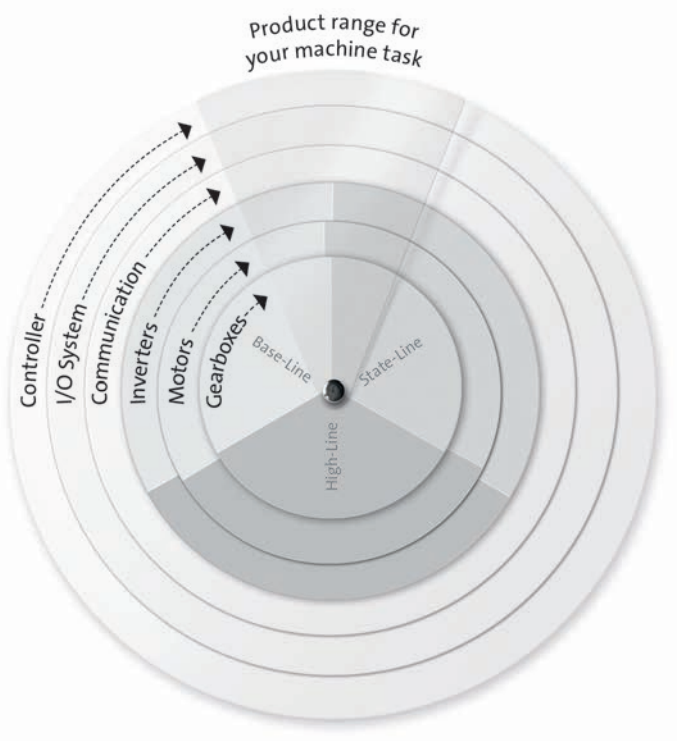
A matter of principle: the right products for every application.

Lenze's extensive L-force product portfolio follows a very simple principle. The functions of our finely scaled products are assigned to the three lines Base-Line, State-Line or High-Line.

But what does this mean for you? It allows you to quickly recognise which products represent the best solution for your own specific requirements.

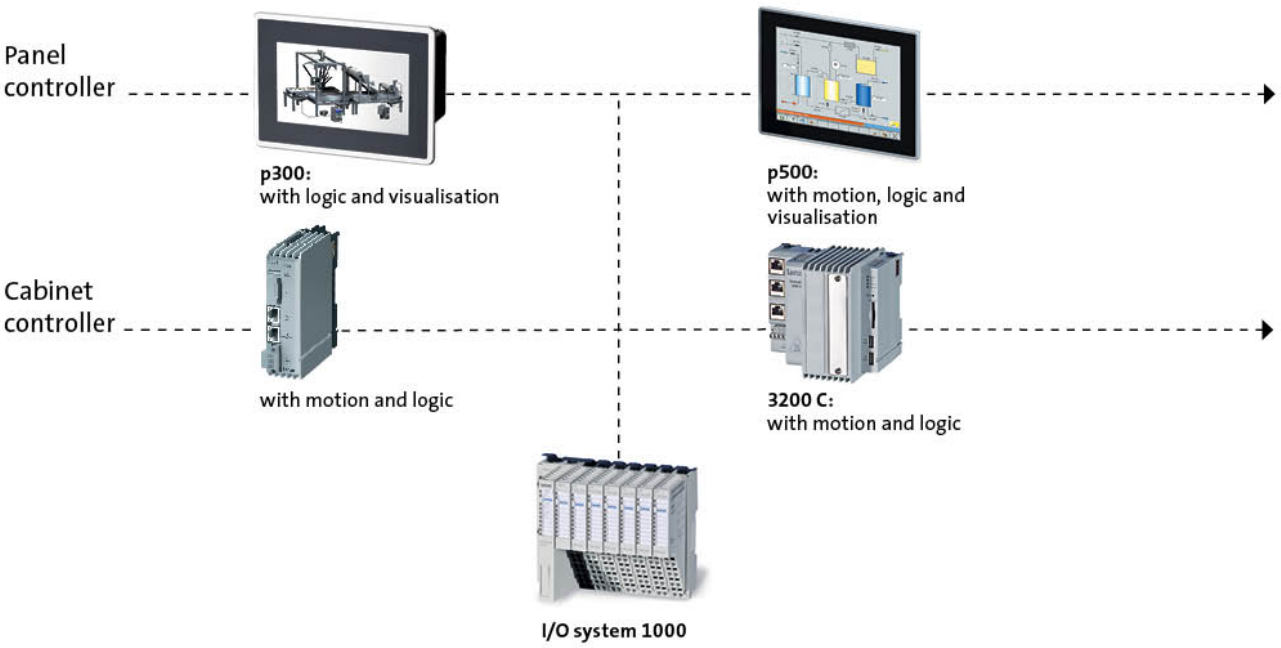
Powerful products with a major impact:
- Easy handling
- High quality and durability
- Reliable technologies in tune with the latest developments

Lenze products undergo the most stringent testing in our own laboratory. This allows us to ensure that you will receive consistently high quality and a long service life. In addition to this, five logistics centres ensure that the Lenze products you select are available for quick delivery anywhere across the globe. It's as easy as that!

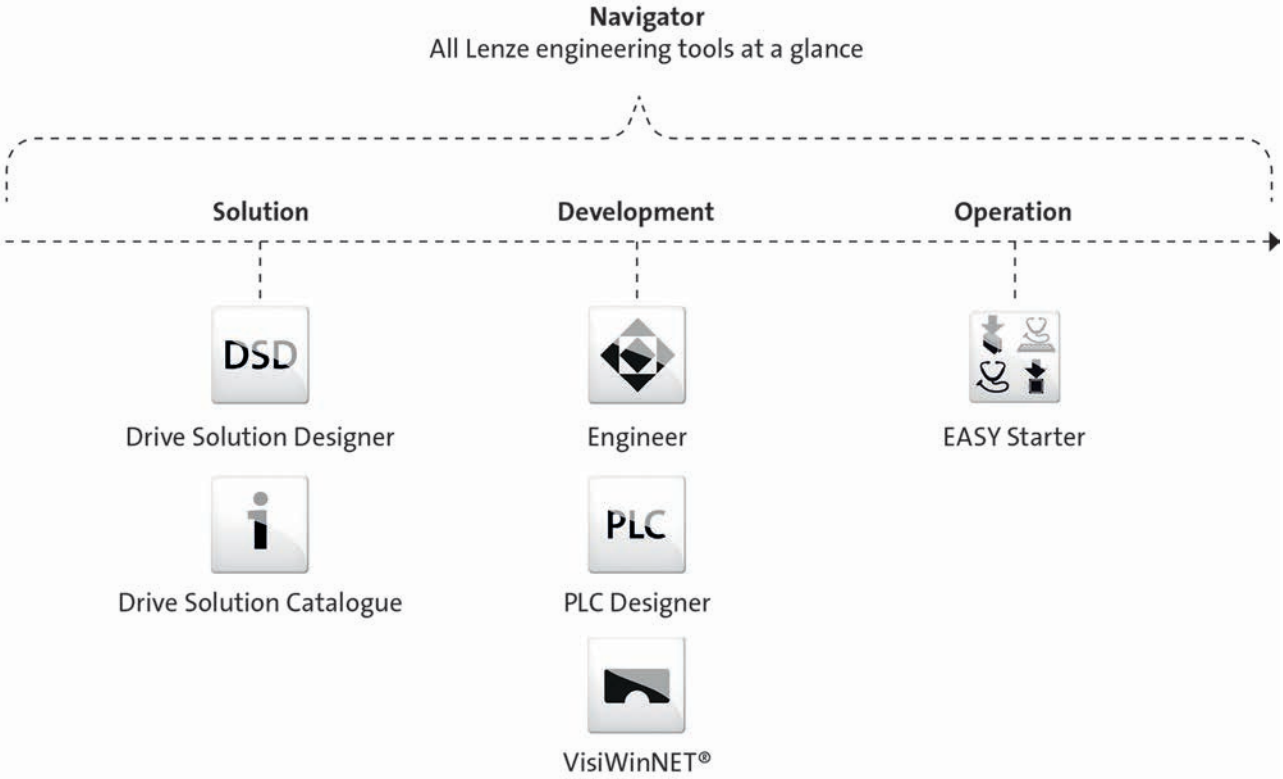


L-force product portfolio

Controls

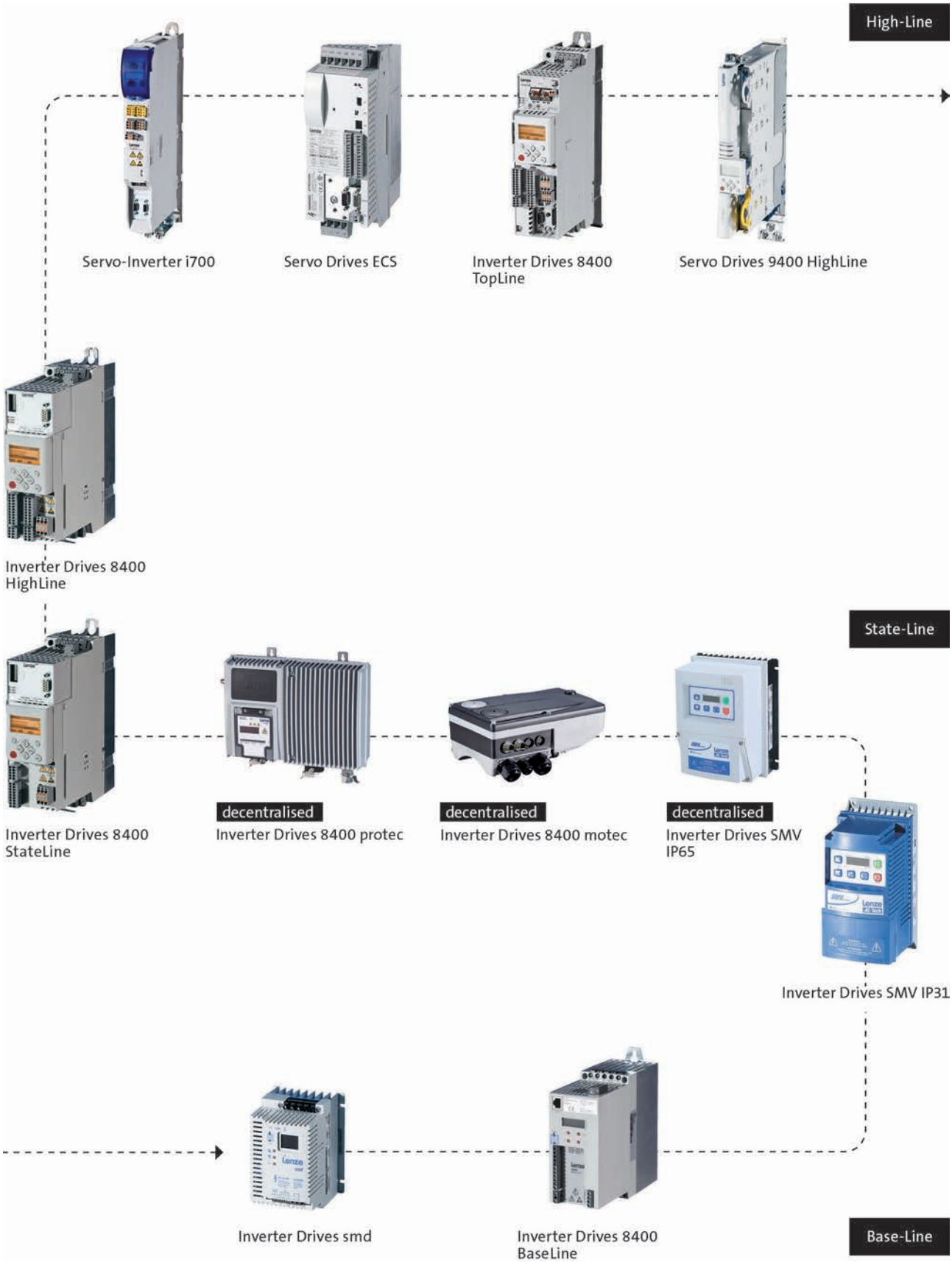


Engineering Tools



L-force product portfolio

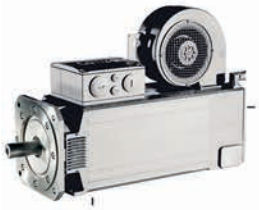
Inverter



L-force product portfolio

Motors

High-Line



MQA asynchronous servo motors

SDSGS synchronous servo motors

MDXKS synchronous servo motors

Synchronous servo motors MCS

Asynchronous servo motors MCA

Asynchronous servo motors SDSGA

State-Line

MF three-phase AC motors

MH three-phase AC motors

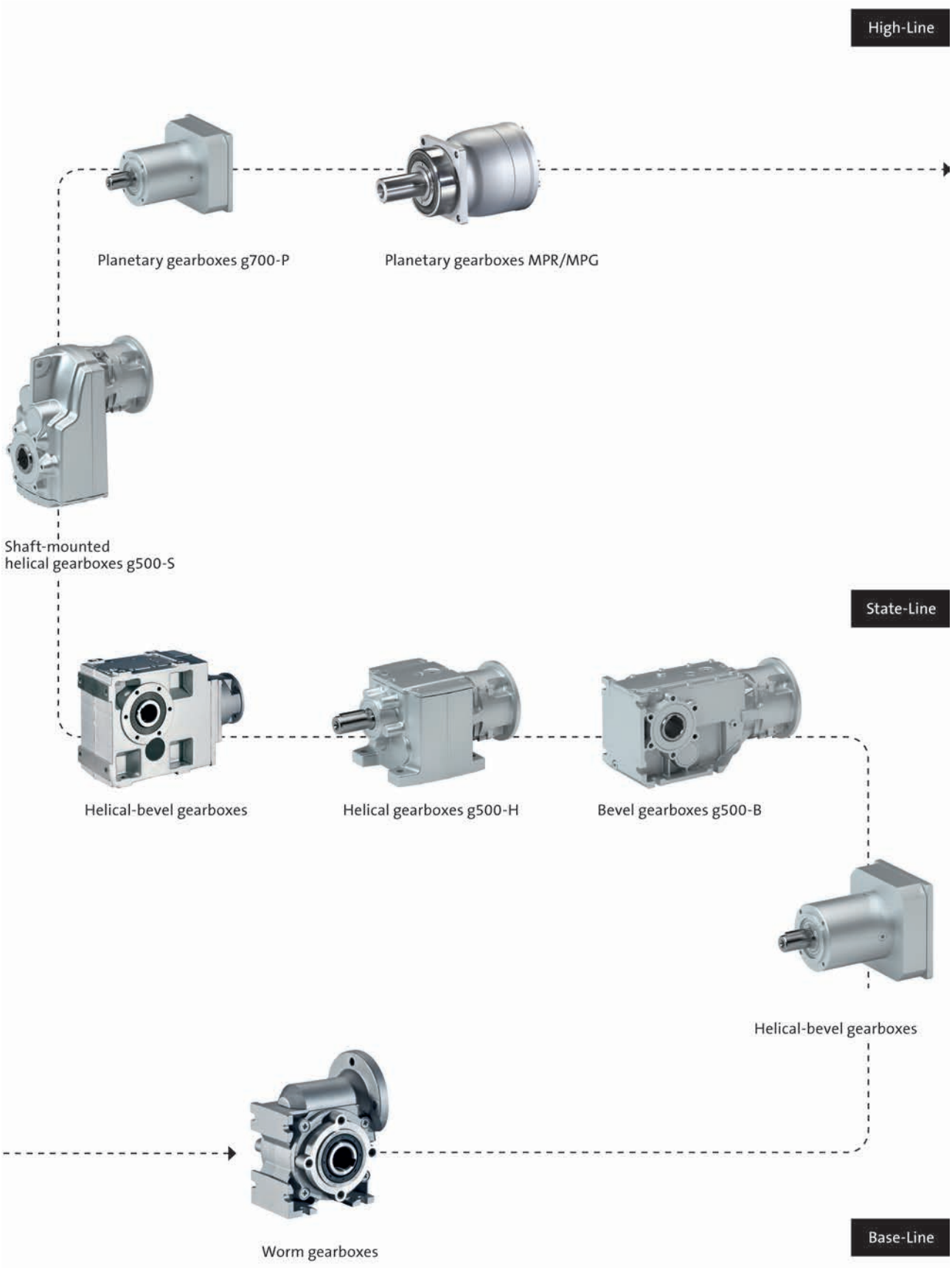
MD three-phase AC motors

Basic MD/MH three-phase AC motors

Base-Line

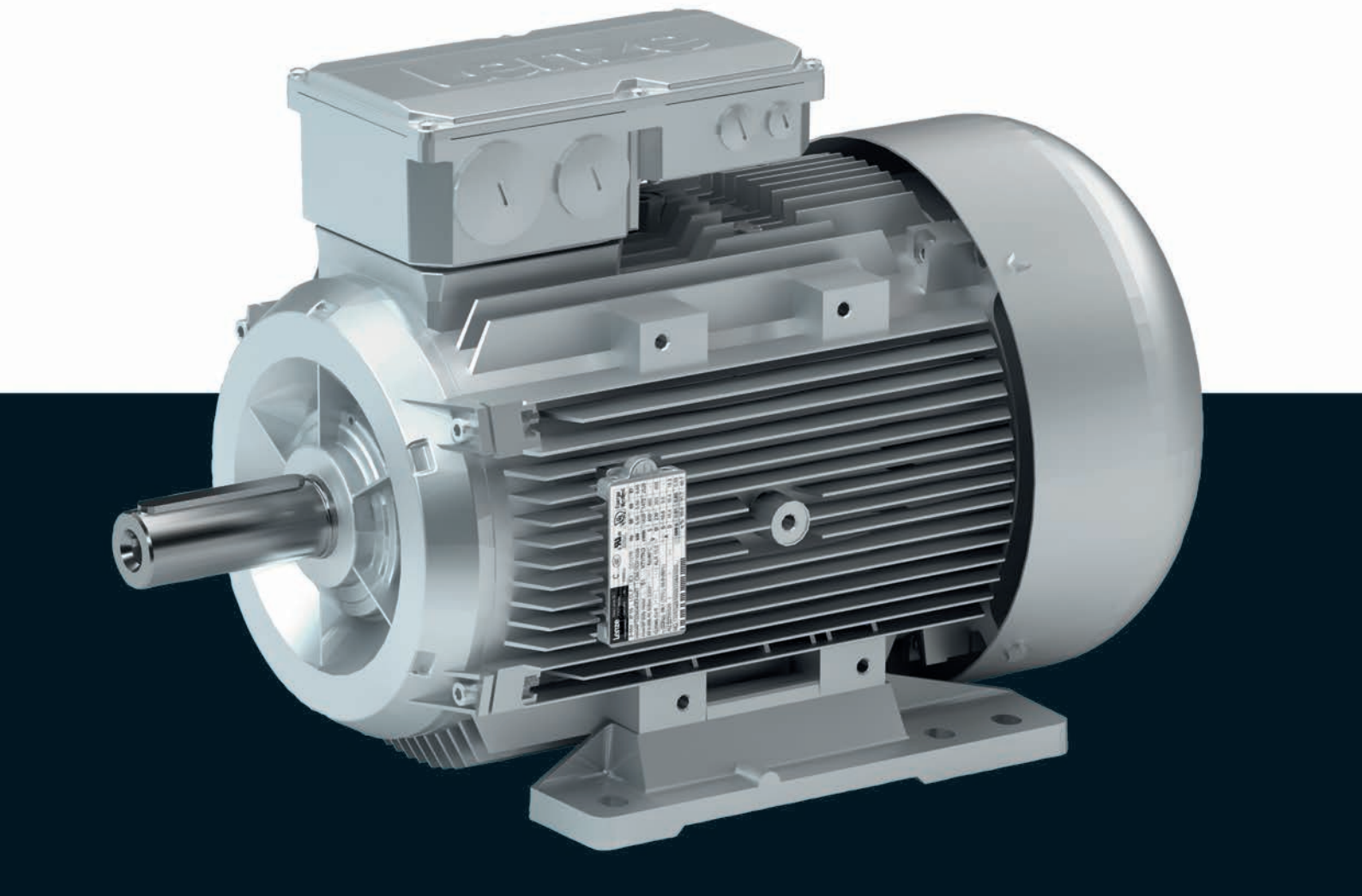
L-force product portfolio

Gearboxes



IE3 three-phase AC motors m550-P

Inverter operation 0.75 ... 45 kW



IE3 three-phase AC motors m550-P

Contents

List of abbreviations

$\eta_{100\,\%}$	[%]	Efficiency
$\eta_{75\,\%}$	[%]	Efficiency
$\eta_{50\,\%}$	[%]	Efficiency
cos ϕ		Power factor
I_N	[A]	Rated current
I_{max}	[A]	Max. current consumption
J	[kgcm²]	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

Inverter-operated motors

In a power range of 0.12 to 45 KW, Lenze offers inverter-compatible three-phase AC motors for comprehensive tasks.

They differ with regard to the efficiency class and can be used for the types required for open-loop or closed-loop controlled inverter operation.

Customer benefit

- Different efficiency classes for the greatest economic benefit
- Space-saving thanks to compact direct attachment to Lenze gearboxes
- Market-oriented modular system enables the ubiquitous use for extensive machine tasks
- Conventional connectors ensure quick connection, also during servicing

Motor	Efficiency class	Power range	Supply voltage
MD three-phase AC motor	IE1 motor	0.12 ... 22 kW	230/400 and 460 V
MH three-phase AC motor	IE2 motor	0.75 ... 45 kW	230/400 and 460 V
MF three-phase AC motor		0.55 ... 22 KW	230/400 V
m550-P three-phase AC motor	IE3 motor	0.75 ... 45 kW	230/400 and 460 V

Product information

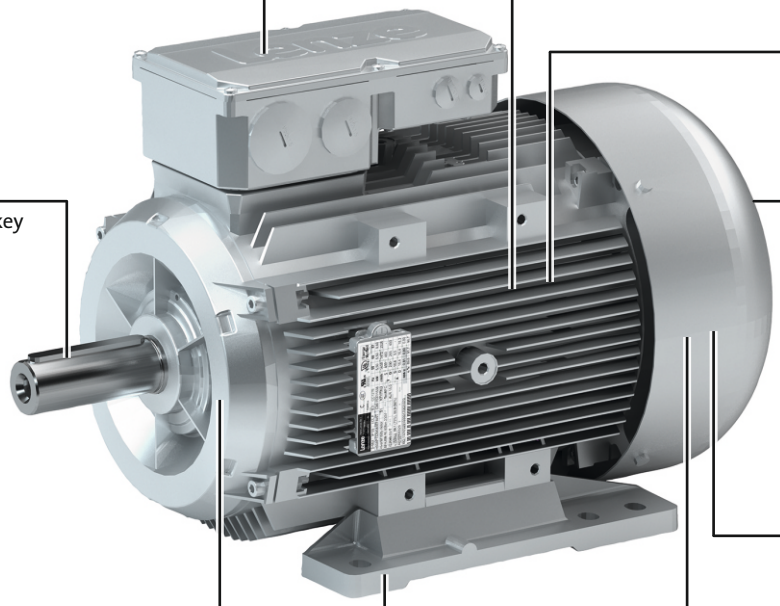
The product name

Operational performance	Product range		Design	Size	Motor length	Number of poles	Product
Inverter operation	m550	-	P	80	M	4	m550-P80/M4
				90	M		m550-P90/M4
					L		m550-P90/L4
				100	M		m550-P100/M4
					L		m550-P100/L4
				112	M		m550-P112/M4
				132	M		m550-P132/M4
					L		m550-P132/L4
				160	M		m550-P160/M4
					L		m550-P160/L4
				180	M		m550-P180/M4
					L		m550-P180/L4
				200	M		m550-P200/M4
				225	M		m550-P225/M4
					L		m550-P225/L4

Equipment

Overview

The equipment includes all the options available as standard and all the built-on accessories of the product.



Motor connection
Terminal box
Connector ICN
Connector HAN

Output shaft
Solid shaft with feather key

Motor design
Flange (B5)with through holes
Flange (B14) with threaded holes

Motor design
Foot (B3)

Number of poles
4-pole, 0.75 ... 45 kW

Temperature monitoring
Thermal contact TKO
PTC thermistor
Thermal detector KTY

Cooling
Integral fan
Blower

Feedback
No
Resolver
Incremental encoder
Absolute value encoder

Spring-applied brake
No
Standard
LongLife
Option manual release lever

The modular motor system

Motor details

Product	m550-P80/M4	m550-P90/M4	m550-P90/L4	m550-P100/M4	m550-P100/L4	m550-P112/M4
Technical data						
Rated power	0.75 kW	1.1 kW	1.5 kW	2.2 kW	3.0 kW	4.0 kW
Supply voltage	230/400 V; 460 V					
Operating mode	S1					
Motor design	B3 B5-FF165 B14-FT100 B14-FT130	B3 B5-FF165 B14-FT115 B14-FT130		B3 B5-FF215 B14-FT130		
Motor shaft	19 x 40 mm	24 x 50 mm		28 x 60 mm		
Colour	Primed Paint in various corrosion-protection designs in accordance with RAL colours					
Surface and corrosion protection	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)					
Connection type	Terminal box ICN connector HAN 10E connector HAN modular connector					
Spring-applied brake						
Characteristic torque [Nm]	3.5 ... 8.0	3.5 ... 23		7.0 ... 32	7.0 ... 46	14 ... 60
Brake voltage [V]	DC 24 AC 230/400/460					
Brake design	Standard LongLife					Standard
	Standard Overexcited Cold Brake					
Options	Manual release lever Low noise					
Feedback	With absolute value encoder With incremental encoder With resolver					
Cooling	Integral fan Blower					
Temperature monitoring	TKO thermal contact PTC thermistor KTY83-110 thermal detector KTY84-130 thermal detector					
Approval	cURus CCC [1]					
Degree of protection	IP54 / IP55					

[1] m550-P80/M4 and m550-P90/M4 in preparation.

5.6

The modular motor system

Motor details

Product	m550-P132/M4	m550-P132/L4	m550-P160/M4	m550-P160/L4	m550-P180/M4	m550-P180/L4
Technical data						
Rated power	5.5 kW	7,5 kW	11 kW	15 kW	18.5 kW	22 kW
Supply voltage	230/400 V; 460 V					
Operating mode	S1					
Motor design	B3 B5-FF265		B3 B5-FF300			
Motor shaft	38 x 80 mm		42 x 110 mm		48 x 110 mm	
Colour						
	Primed Paint in various corrosion-protection designs in accordance with RAL colours					
Surface and corrosion protection						
	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)					
Connection type						
	Terminal box ICN connector HAN modular connector		Terminal box HAN modular connector		Terminal box	
Spring-applied brake						
Characteristic torque [Nm]	35 ... 80	35 ... 100	60 ... 150	80 ... 200	80 ... 260	80 ... 315
Brake voltage [V]	DC 24 AC 230/400/460					
Brake design	Standard					
	Standard Overexcited Cold Brake					
Options	Manual release lever Low noise					
Feedback						
	With absolute value encoder With incremental encoder With resolver					
Cooling						
	Integral fan Blower					
Temperature monitoring						
	TKO thermal contact PTC thermistor KTY83-110 thermal detector KTY84-130 thermal detector					
Approval						
	cURus CCC					
Degree of protection						
	IP54 / IP55					

The modular motor system

Motor details

Product	m550-P200/M4	m550-P225/M4	m550-P225/L4
Technical data			
Rated power	30 kW	37 kW	45 kW
Supply voltage	230/400 V; 460 V		
Operating mode	S1		
Motor design	B3 B5-FF350	B3 B5-FF400	
Motor shaft	55 x 110 mm	60 x 140 mm	
Colour	Primed Paint in various corrosion-protection designs in accordance with RAL colours		
Surface and corrosion protection	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)		
Connection type	Terminal box		
Spring-applied brake			
Characteristic torque [Nm]	80 ... 400	265 ... 490	265 ... 600
Brake voltage [V]	DC 24 AC 230/400/460		
Brake design	Standard		
	Standard Overexcited Cold Brake		
Options	Manual release lever Low noise		
Feedback	With absolute value encoder With incremental encoder With resolver		
Cooling	Integral fan Blower		
Temperature monitoring	TKO thermal contact PTC thermistor KTY83-110 thermal detector KTY84-130 thermal detector		
Approval	cURus CCC		
Degree of protection	IP54 / IP55		

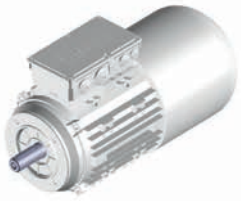
The modular motor system

Motor details

Design

B3 (with foot)

B5 (with flange)



B14 (mit with flange)

Connection type

Terminal box

ICN connector

HAN connector

Cooling: integral fan

Without built-on accessories

With spring-applied brake
With or without manual release lever

With feedback
With feedback and spring-applied brake

Cooling: blower

Without built-on accessories

With spring-applied brake
With or without manual release lever

With feedback
With feedback and spring-applied brake

Motor – inverter assignment

Rated frequency 50/60 Hz

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

Rated power	Product	Product key	
		Inverter	
P_N			
[kW]			
0.75	m550-P80/M4	E84DVB□7514S□□□2□	E84AV□□□7514□□□
1.10	m550-P90/M4	E84DVB□1124S□□□2□	E84AV□□□1124□□□
1.50	m550-P90/L4	E84DVB□1524S□□□2□	E84AV□□□1524□□□
2.20	m550-P100/M4	E84DVB□2224S□□□2□	E84AV□□□2224□□□
3.00	m550-P100/L4	E84DVB□3024S□□□2□	E84AV□□□3024□□□
4.00	m550-P112/M4	E84DVB□4024S□□□2□	E84AV□□□4024□□□
5.50	m550-P132/M4	E84DVB□5524S□□□2□	E84AV□□□5524□□□
7.50	m550-P132/L4	E84DVB□7524S□□□2□	E84AV□□□7524□□□
11.0	m550-P160/M4		E84AV□□□1134□□□
15.0	m550-P160/L4		E84AV□□□1534□□□
18.5	m550-P180/M4		E84AV□□□1834□□□
22.0	m550-P180/L4		E84AV□□□2234□□□
30.0	m550-P200/M4		E84AV□□□3034□□□
37.0	m550-P225/M4		E84AV□□□3734□□□
45.0	m550-P225/L4		E84AV□□□4534□□□

Motor – inverter assignment

Rated frequency 87 Hz

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

Rated power	Product	Product key	
		Inverter	
P_N			
[kW]			
1.35	m550-P80/M4	E84DVB□1524S□□□2□	E84AV□□□1524□□□
1.90	m550-P90/M4	E84DVB□2224S□□□2□	E84AV□□□2224□□□
2.60	m550-P90/L4	E84DVB□3024S□□□2□	E84AV□□□3024□□□
3.90	m550-P100/M4	E84DVB□4024S□□□2□	E84AV□□□4024□□□
5.20	m550-P100/L4	E84DVB□5524S□□□2□	E84AV□□□5524□□□
7.35	m550-P112/M4	E84DVB□7524S□□□2□	E84AV□□□7524□□□
9.60	m550-P132/M4		E84AV□□□1134□□□
13.1	m550-P132/L4		E84AV□□□1534□□□
19.2	m550-P160/M4		E84AV□□□2234□□□
26.3	m550-P160/L4		E84AV□□□3034□□□
32.2	m550-P180/M4		E84AV□□□3734□□□
38.5	m550-P180/L4		E84AV□□□4534□□□

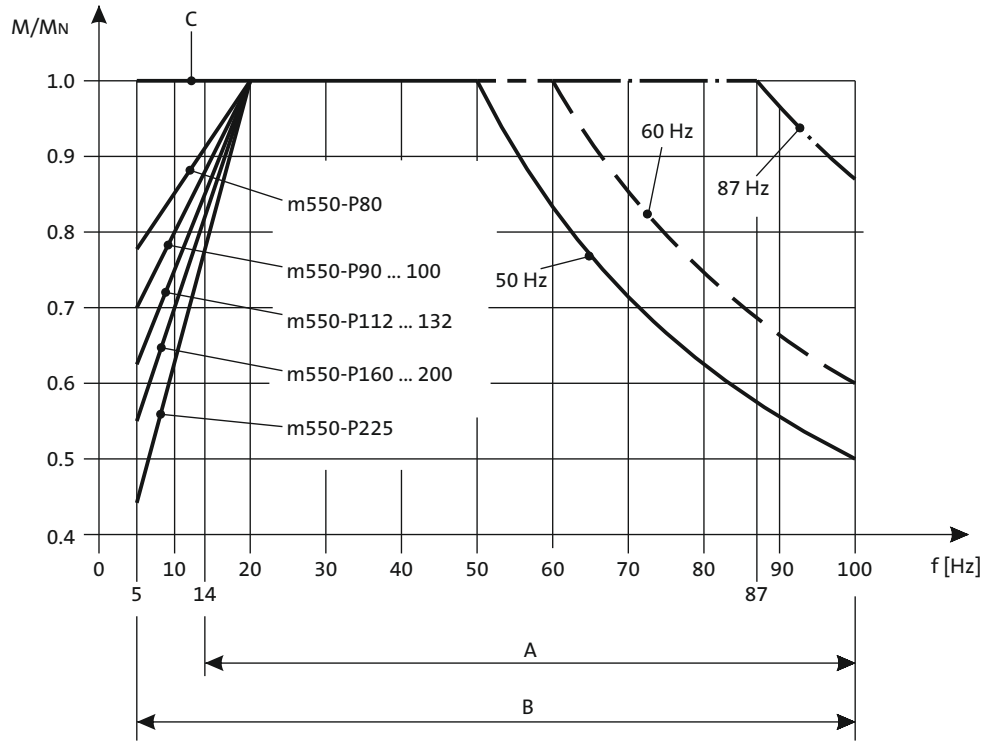
Dimensioning

Torque derating at low motor frequencies

During operation with the rated torque at low speeds (< 20 Hz), the integral fan does not rotate fast enough anymore to ensure sufficient cooling of the motor. In order to prevent overheating, operation without a blower requires a torque reduction of the motor.
The blower cools the motor steadily and irrespective of the motor speed. A torque reduction is not required and the motor can be actuated with its rated torque from 5 Hz to the rated frequency.

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.

Torque characteristics



A = Operation with integral fan and brake
B = Operation with integral fan and brake control "Holding current reduction"
C= operation with blower

► 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 our configuring software 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.

Standards and operating conditions

Overview

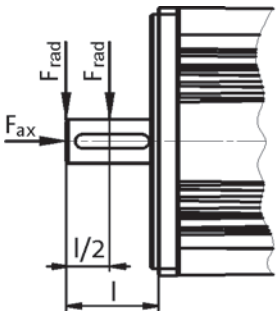
Degree of protection			
EN 60529			IP55 [1)] IP65 IP66
Energy efficiency class			
IEC 60034-30			IE3
IEC 60034-2-1			Methodology for measuring efficiency
10 CFR Part 431 (U.S. Integral hp Rule)			Table 5 (Premium Efficiency), CC127B
GB18613-2012 (China Energy Label optional)			Grade 2
Conformity			
CE			Low-Voltage Directive
			2014/35/EU
EAC			TP TC 004/2011 (TR CU 004/2011)
Approval			
			UkrSEPRO
CCC			GB Standard 12350-2009
CSA			CSA 22.2 No. 100
cURus			File-No. E210321 UL 1004-1 UL 1004-8
Temperature class			
IEC/EN 60034-1; utilisation			B
IEC/EN 60034-1; insulation system (enamel-insulated wire)			F
Vibrational severity			
IEC/EN 60034-14			A
Climatic conditions			
Transport (EN 60721-3-2)			2K3 (temperature: -20 °C ... +70 °C)
Storage (EN 60721-3-1)			1K3 (temperature: -20 °C ... +60 °C)
Storage (EN 60721-3-1) > 3 months			1K3 (Temperature: -20 °C ... +40 °C)
Operation (EN 60721-3-3)			3K3 (temperature: -20 °C ... +40 °C)
Operation (EN 60721-3-3) with brake			3K3 (temperature : -10 °C ... +40 °C)
Operation (EN 60721-3-3) with blower			3K3 (Temperature: -15 °C ... +40 °C)
Max. ambient temperature for operation			
With power reduction	$T_{opr,max}$	[°C]	60
Site altitude			
Amsl	H_{max}	[m]	4000

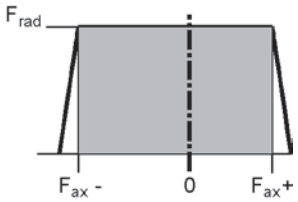
[1)] Designs with different degrees of protection:
IP55 with brake (IP54 with manual release lever).
IP54 with resolver RS1.
IP54 with HTL incremental encoder IG128-24V-H.

► 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, the efficiency regulations in other countries and the Lenze products concerned, please refer to the brochure "International efficiency directives for three-phase AC motors".

Permissible radial and axial forces

Application of forces





Application of force at l/2

► Forces at medium speed 2000 r/min.

Bearing service life L_{10}												
	10000 h			20000 h			30000 h			50000 h		
Product	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]
m550-P80/M4	961	-787	1087	767	-550	877	672	-442	742	570	-334	634
m550-P90/M4	990	-810	1125	830	-551	905	771	-439	760	654	-332	715
m550-P90/L4												
m550-P100/M4	1050	-760	1002	850	-501	950	775	-389	772	659	-272	790
m550-P100/L4												
m550-P112/M4	1550	-1137	1637	1247	-786	1286	1091	-631	1131	929	-470	969
m550-P132/M4	2323	-653	1253	1863	-422	1022	1639	-313	913	1397	-201	801
m550-P132/L4												
m550-P160/M4	4074	-1407	2067	3264	-984	1644	2871	-787	1447	2444	-583	1243
m550-P160/L4												
m550-P180/M4	4943	-1580	2480	3969	-1088	1988	3496	-854	1754	2983	-594	1494
m550-P180/L4												
m550-P200/M4	6666	-2202	3122	5359	-1555	2475	4724	-1251	2171	4036	-942	1862
m550-P225/M4	7386	-2527	3477	5956	-1800	2750	5260	-1460	2410	4508	-1111	2061
m550-P225/L4												

► 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 lifetime.
► Data for axial forces relate to the maximum radial force with the corresponding bearing service life.

Permissible radial and axial forces

Application of force at l

► Forces at medium speed 2000 r/min.

Bearing service life L_{10}												
	10000 h			20000 h			30000 h			50000 h		
Product												
	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]
m550-P80/M4	938	-787	1087	762	-550	877	676	-442	742	583	-334	634
m550-P90/M4	950	-810	1125	810	-551	905	720	-439	760	601	-332	715
m550-P90/L4												
m550-P100/M4	1065	-760	1002	840	-501	950	768	-389	772	663	-272	790
m550-P100/L4												
m550-P112/M4	1507	-1137	1637	1226	-786	1286	1089	-631	1131	942	-470	969
m550-P132/M4	2091	-653	1253	1677	-422	1022	1475	-313	913	1257	-201	801
m550-P132/L4												
m550-P160/M4	3610	-1407	2067	2892	-984	1644	2543	-787	1447	2166	-583	1243
m550-P160/L4												
m550-P180/M4	4462	-1580	2480	3583	-1088	1988	3156	-854	1754	2693	-594	1494
m550-P180/L4												
m550-P200/M4	6069	-2202	3122	4880	-1555	2475	4301	-1251	2171	3675	-942	1862
m550-P225/M4	6588	-2527	3477	5313	-1800	2750	4692	-1460	2410	4021	-1111	2061
m550-P225/L4												

► 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.

Rated data for 50 Hz

4-pole motors

Product								
	P_N	n_N	n_{max}	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
	[kW]	[r/min]	[r/min]	[V]	[A]	[V]	[A]	
m550-P80/M4	0.75	1450	4500	230	2.80	400	1.60	7.8
m550-P90/M4	1.10	1444	4500	230	4.10	400	2.40	7.2
m550-P90/L4	1.50	1442	4500	230	5.70	400	3.30	8.0
m550-P100/M4	2.20	1452	4500	230	7.20	400	4.20	7.3
m550-P100/L4	3.00	1449	4500	230	9.70	400	5.60	7.0
m550-P112/M4	4.00	1453	4500	230	13.5	400	7.80	9.0
m550-P132/M4	5.50	1460	4500	230	18.4	400	10.6	8.5
m550-P132/L4	7.50	1477	4500	230	25.5	400	14.7	7.3
m550-P160/M4	11.0	1478	4500	230	39.5	400	22.8	9.4
m550-P160/L4	15.0	1470	4500	230	53.0	400	30.6	9.3
m550-P180/M4	18.5	1483	4500	230	58.4	400	33.7	9.1
m550-P180/L4	22.0	1480	4500	230	69.6	400	40.2	8.2
m550-P200/M4	30.0	1478	4500	230	96.0	400	55.4	11.2
m550-P225/M4	37.0	1483	2700	230	120	400	69.3	10.7
m550-P225/L4	45.0	1482	2700	230	146	400	84.3	9.4

Product									
	M_N	M_a	M_b	cos ϕ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
m550-P80/M4	4.90	16.0	17.6	0.80	81.7	83.9	82.5	26.8	15.0
m550-P90/M4	7.27	21.8	26.9	0.80	81.5	84.1	85.0	48.1	20.0
m550-P90/L4	9.93	31.8	39.7	0.79	82.4	84.9	85.0	51.8	21.0
m550-P100/M4	14.5	36.3	56.6	0.88	86.0	87.3	87.0	99.4	31.0
m550-P100/L4	19.8	47.5	69.3	0.88	85.8	87.2	88.0	111	33.0
m550-P112/M4	26.3	65.1	96.0	0.84	87.3	88.3	88.6	112	36.0
m550-P132/M4	36.0	119	137	0.84	88.6	90.3	89.6	300	57.0
m550-P132/L4	48.5	155	213	0.83	89.7	90.5	90.4	340	69.0
m550-P160/M4	71.1	249	320	0.76	89.8	91.2	91.4	770	108
m550-P160/L4	97.4	321	419	0.77	90.9	91.9	92.1	810	119
m550-P180/M4	119	357	429	0.85	93.0	93.2	92.6	1730	157
m550-P180/L4	142	369	440	0.85	92.9	93.2	93.0	1730	157
m550-P200/M4	194	736	853	0.84	93.4	93.7	93.6	2150	185
m550-P225/M4	238	929	1072	0.81	93.4	94.2	93.9	4350	280
m550-P225/L4	290	1218	1450	0.82	93.1	93.9	94.2	4350	280

[1] Without accessories

Rated data for 60 Hz

4-pole motors

Product						
	P_N	n_N	n_{max}	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
	[kW]	[r/min]	[r/min]	[V]	[A]	
m550-P80/M4	0.75	1758	4500	460	1.46	7.1
m550-P90/M4	1.10	1754	4500	460	2.10	8.3
m550-P90/L4	1.50	1750	4500	460	2.80	8.5
m550-P100/M4	2.20	1758	4500	460	3.60	7.6
m550-P100/L4	3.00	1756	4500	460	4.80	7.4
m550-P112/M4	4.00	1758	4500	460	6.80	8.0
m550-P132/M4	5.50	1765	4500	460	9.40	9.9
m550-P132/L4	7.50	1779	4500	460	12.6	7.9
m550-P160/M4	11.0	1780	4500	460	20.3	10.5
m550-P160/L4	15.0	1775	4500	460	26.9	9.9
m550-P180/M4	18.5	1783	4500	460	29.5	10.1
m550-P180/L4	22.0	1783	4500	460	35.1	9.1
m550-P200/M4	30.0	1779	4500	460	48.0	12.4
m550-P225/M4	37.0	1785	2700	460	61.2	11.4
m550-P225/L4	45.0	1783	2700	460	73.9	10.2

Product									
	M_N	M_a	M_b	cos ϕ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
m550-P80/M4	4.10	11.0	12.7	0.77	80.5	83.7	83.5	26.8	15.0
m550-P90/M4	6.00	20.4	27.0	0.77	82.9	85.6	87.0	48.1	20.0
m550-P90/L4	8.20	26.2	35.3	0.76	82.3	85.6	87.0	51.8	21.0
m550-P100/M4	11.9	33.3	52.4	0.87	87.1	88.7	90.0	99.4	31.0
m550-P100/L4	16.3	42.4	65.2	0.87	87.9	89.5	90.0	111	33.0
m550-P112/M4	21.7	72.6	91.1	0.83	87.3	88.9	89.5	112	36.0
m550-P132/M4	29.8	104	128	0.82	89.5	91.1	91.7	300	57.0
m550-P132/L4	40.3	145	181	0.82	89.6	91.2	91.7	340	69.0
m550-P160/M4	59.0	212	301	0.75	89.5	91.4	92.4	770	108
m550-P160/L4	80.7	291	363	0.75	91.1	92.4	93.0	810	119
m550-P180/M4	99.1	317	406	0.84	92.3	93.4	93.6	1730	157
m550-P180/L4	118	318	401	0.84	92.7	93.6	93.6	1730	157
m550-P200/M4	161	660	805	0.84	93.2	94.0	94.1	2150	185
m550-P225/M4	198	831	970	0.80	93.1	94.2	94.5	4350	280
m550-P225/L4	241	1109	1205	0.81	93.4	94.5	95.0	4350	280

[1] Without accessories

Rated data for 87 Hz

4-pole motors

Product							
	P_N	n_N	n_{max}	M_N	M_{max}	J [1]	m [1]
	[kW]	[r/min]	[r/min]	[Nm]	[Nm]	[kgcm²]	[kg]
m550-P80/M4	1.35	2560	4500	5.10	20.0	26.8	15.0
m550-P90/M4	1.90	2550	4500	7.20	29.0	48.1	20.0
m550-P90/L4	2.60	2552	4500	9.90	40.0	51.8	21.0
m550-P100/M4	3.90	2562	4500	14.5	58.0	99.4	31.0
m550-P100/L4	5.20	2559	4500	19.6	78.0	111	33.0
m550-P112/M4	7.35	2565	4500	27.2	109	112	36.0
m550-P132/M4	9.60	2570	4500	36.0	144	300	57.0
m550-P132/L4	13.1	2587	4500	48.5	194	340	69.0
m550-P160/M4	19.2	2588	4500	71.1	284	770	108
m550-P160/L4	26.3	2580	4500	97.4	390	810	119
m550-P180/M4	32.2	2593	4500	119	476	1730	157
m550-P180/L4	38.5	2590	4500	142	568	1730	157
m550-P200/M4	52.5	2588	4500	194	775	2150	185
m550-P225/M4	64.8	2593	2700	238	953	4350	280
m550-P225/L4	78.7	2592	2700	290	1160	4350	280

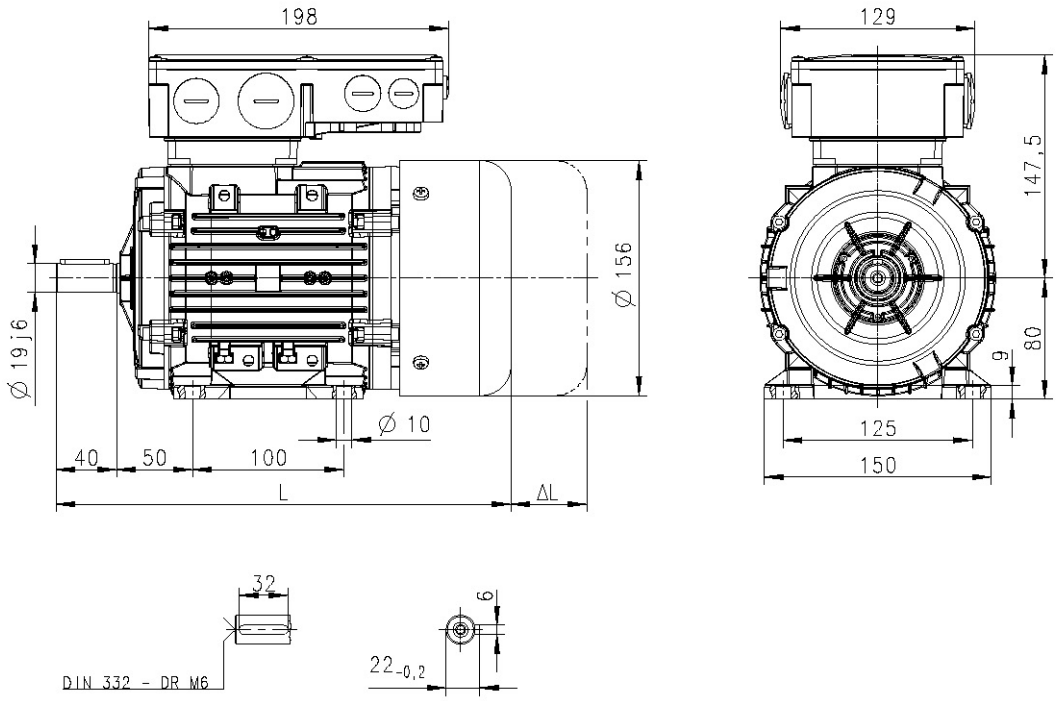
Product						
	$U_{N,\Delta}$	$I_{N,\Delta}$	cos ϕ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$
	[V]	[A]		[%]	[%]	[%]
m550-P80/M4	400	3.00	0.77	81.3	84.9	86.1
m550-P90/M4	400	4.20	0.75	85.6	87.0	87.4
m550-P90/L4	400	5.70	0.79	86.3	88.1	88.5
m550-P100/M4	400	7.20	0.88	87.3	89.9	90.4
m550-P100/L4	400	9.70	0.88	87.1	89.6	90.5
m550-P112/M4	400	14.0	0.84	87.5	89.5	90.6
m550-P132/M4	400	19.9	0.78	88.0	90.0	89.6
m550-P132/L4	400	25.5	0.82	88.4	90.4	90.4
m550-P160/M4	400	39.9	0.76	90.5	92.0	91.4
m550-P160/L4	400	51.3	0.81	91.5	92.5	92.1
m550-P180/M4	400	58.4	0.86	91.8	93.3	92.6
m550-P180/L4	400	70.1	0.86	92.3	93.5	93.0
m550-P200/M4	400	96.0	0.84	92.9	93.7	93.6
m550-P225/M4	400	122	0.81	91.1	93.0	93.9
m550-P225/L4	400	150	0.80	92.0	93.4	94.2

[1] Without accessories

Dimensions, self-ventilated (4-pole)

m550-P80

Foot mounting B3



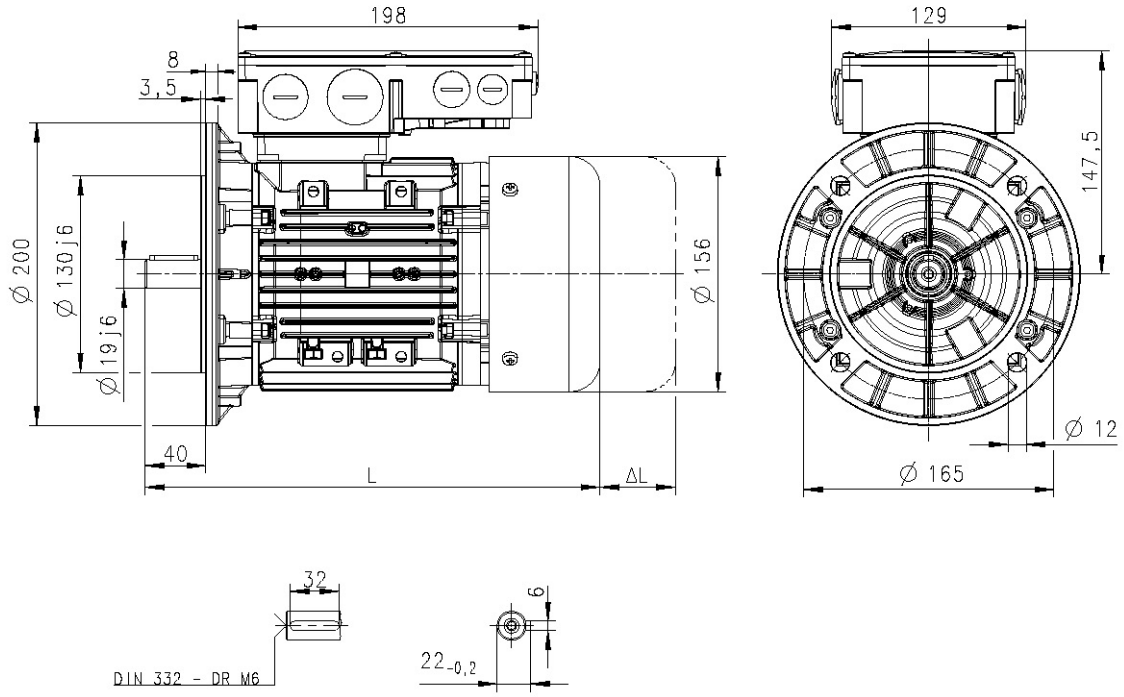
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	302
Length of motor options	Δ L	[mm]	110

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P80

Flange mounting B5



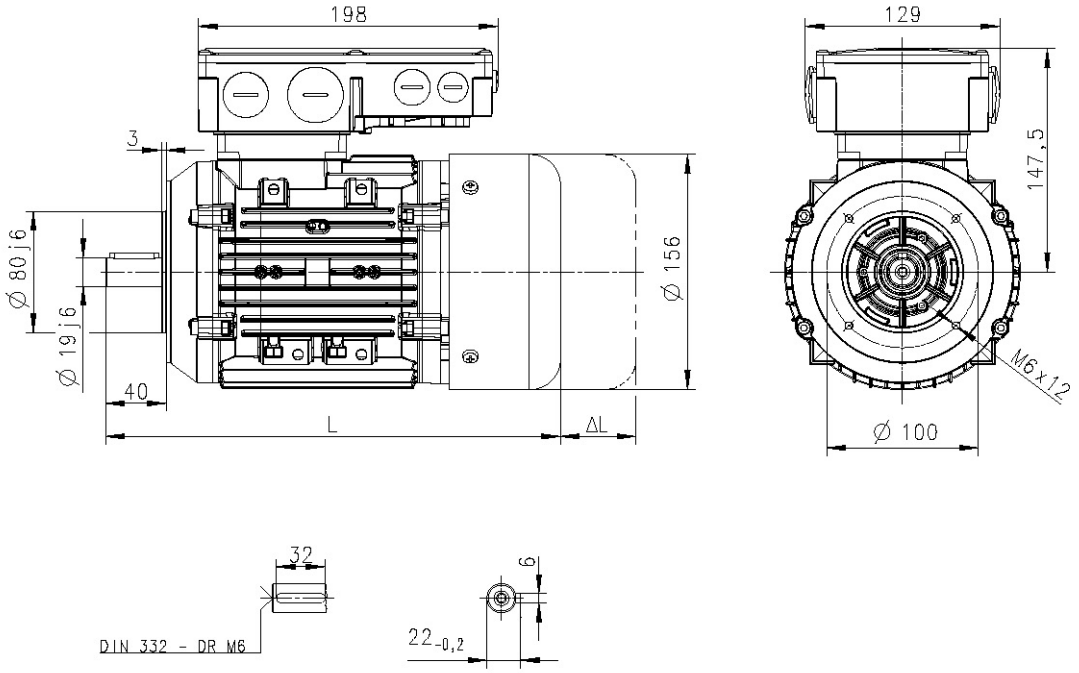
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	302
Length of motor options	Δ L	[mm]	110

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P80

Flange mounting B14



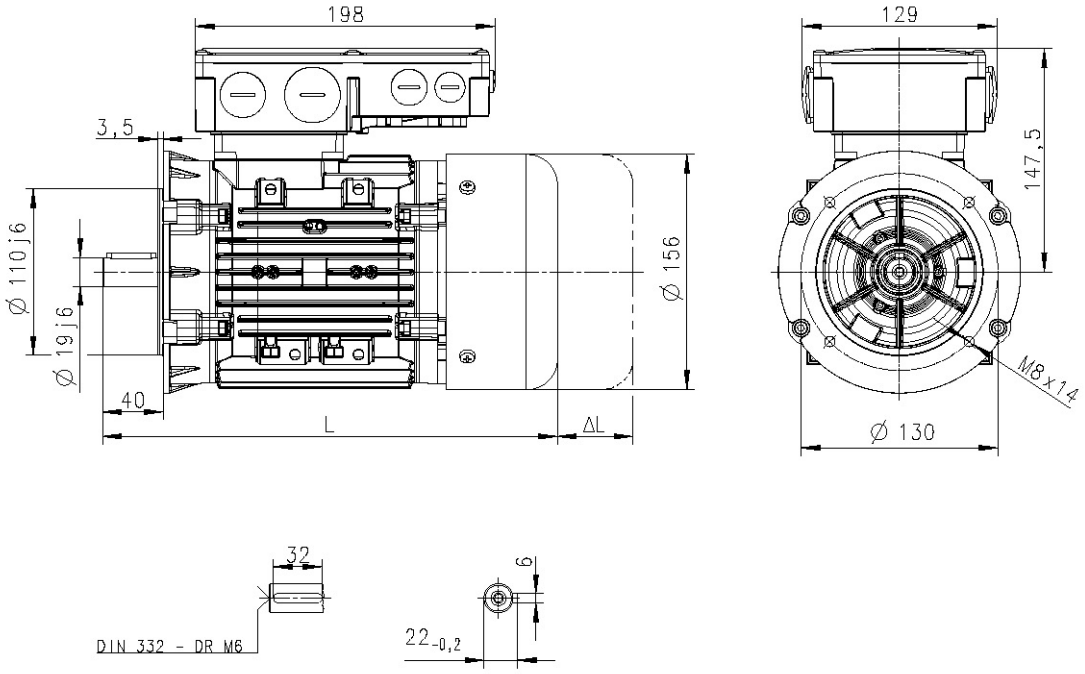
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	302
Length of motor options	Δ L	[mm]	110

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P80

Flange mounting B14



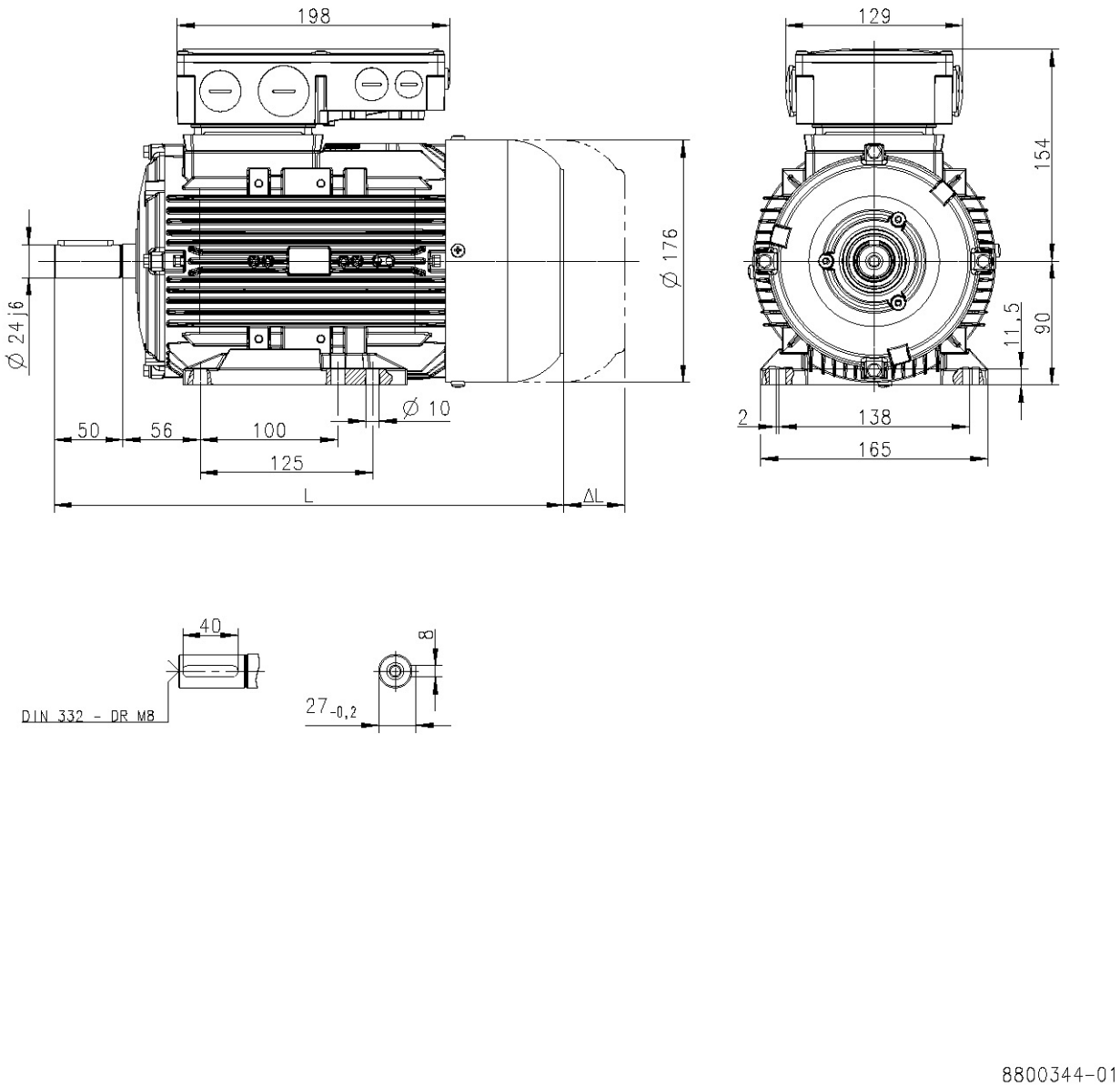
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	302
Length of motor options	Δ L	[mm]	110

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P90

Foot mounting B3



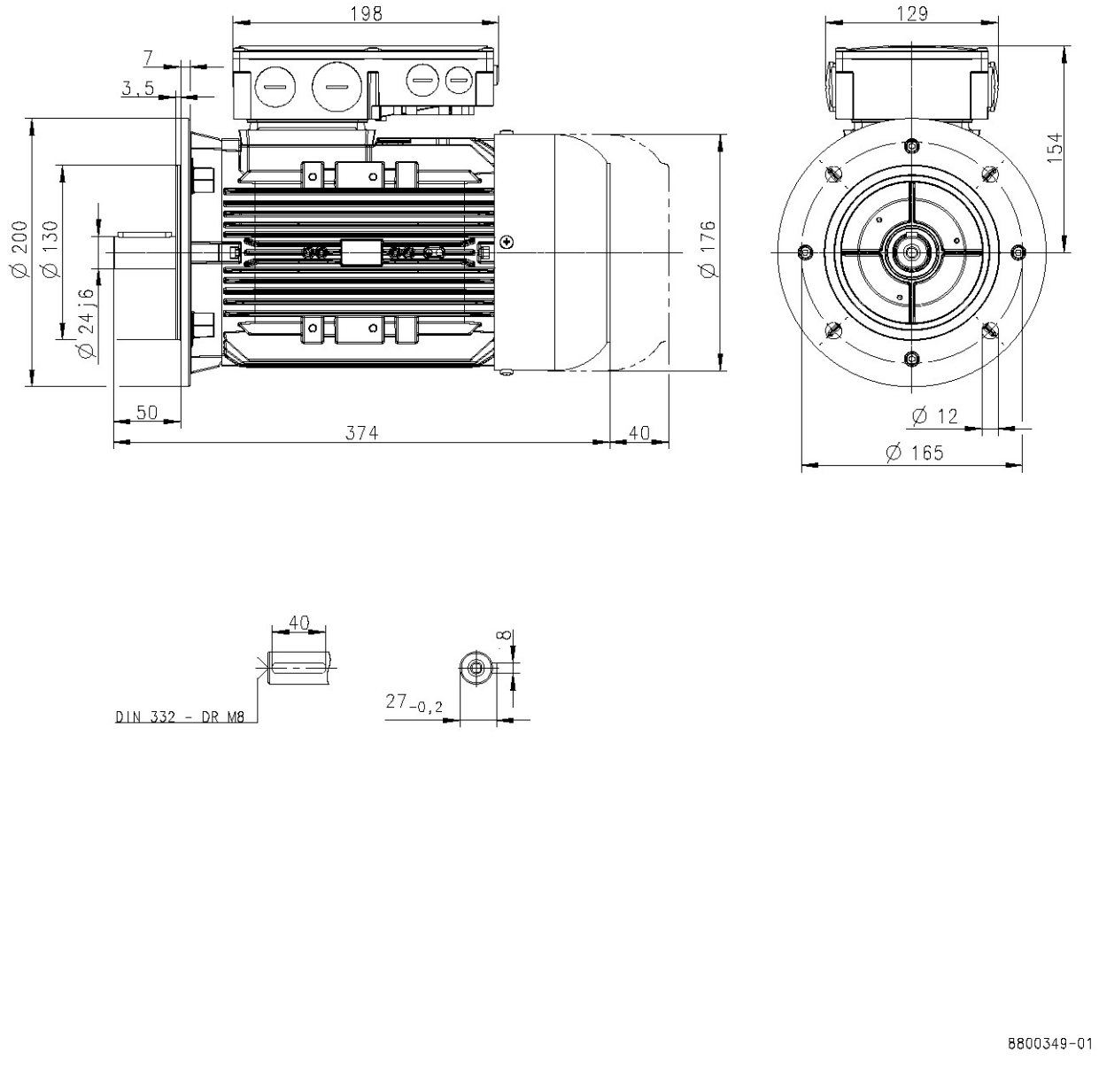
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	374	
Length of motor options	Δ L	[mm]	99	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P90

Flange mounting B5



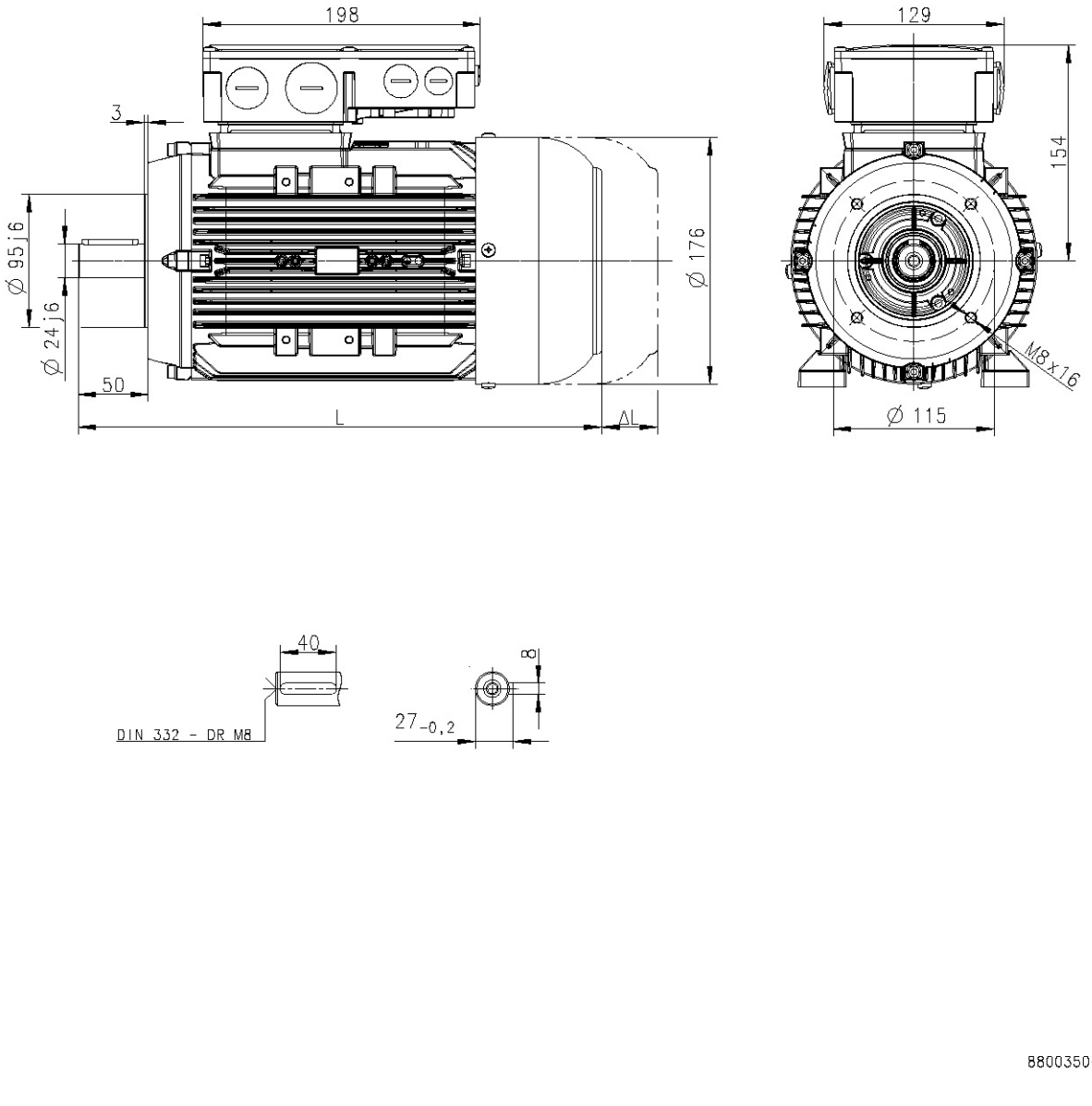
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	374	
Length of motor options	Δ L	[mm]	99	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P90

Flange mounting B14



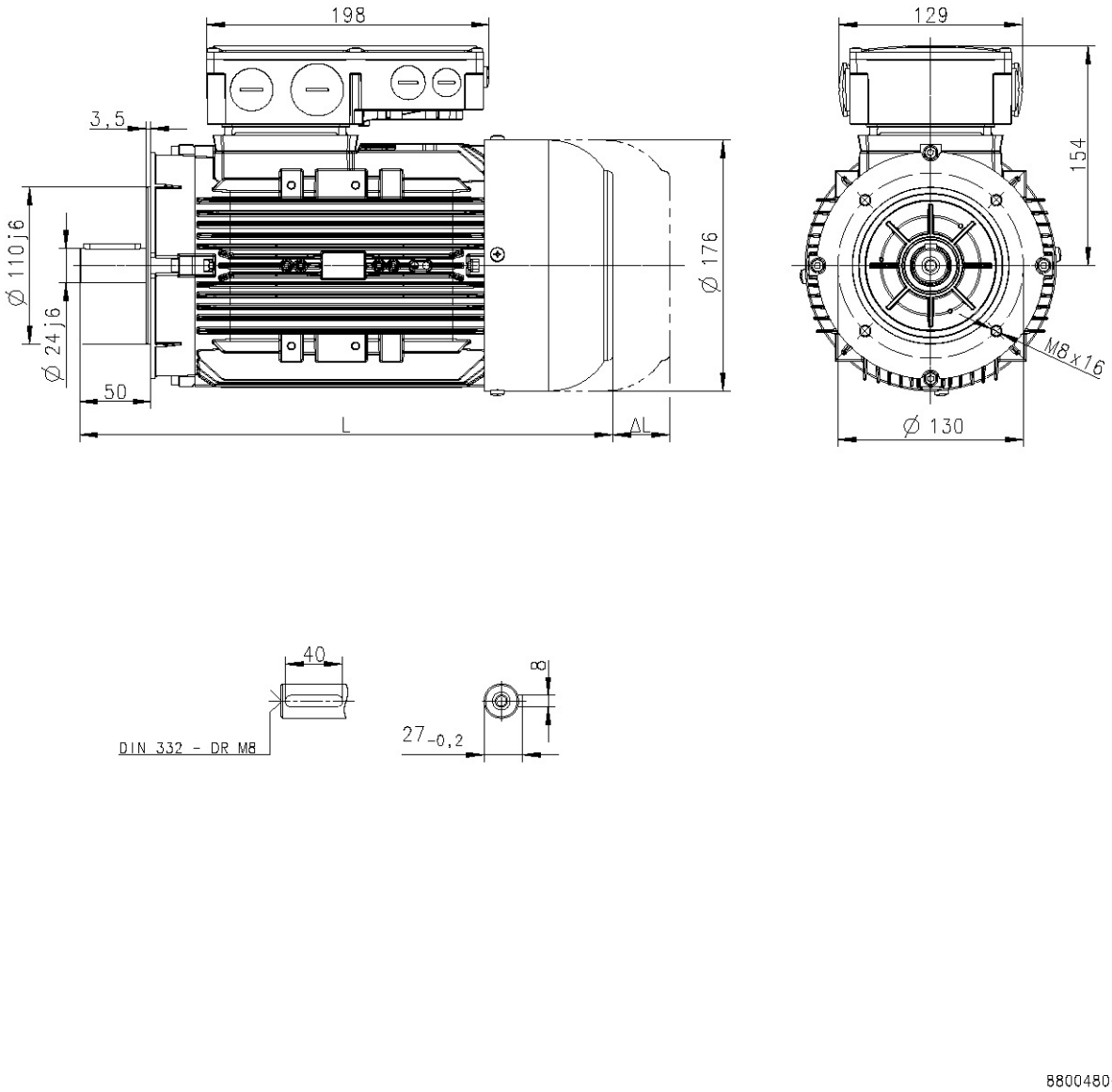
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	374	
Length of motor options	Δ L	[mm]	99	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P90

Flange mounting B14



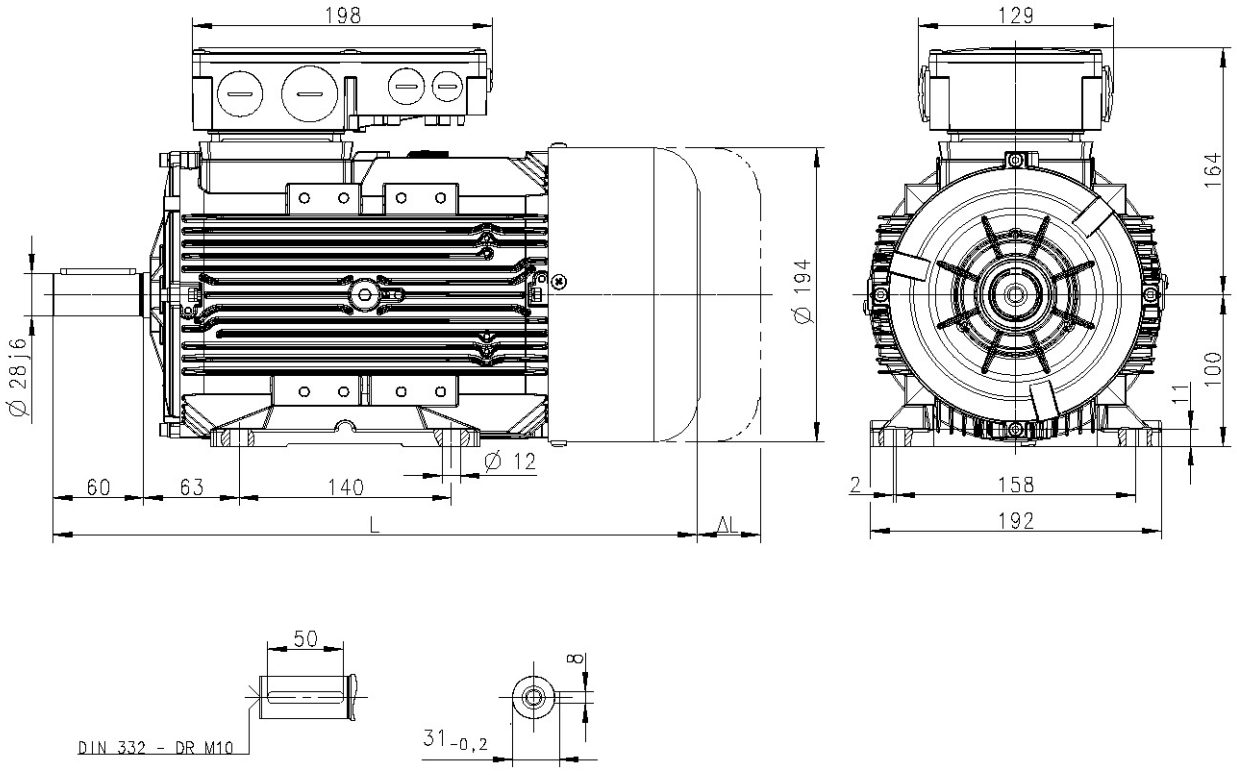
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	374	
Length of motor options	Δ L	[mm]	99	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P100

Foot mounting B3



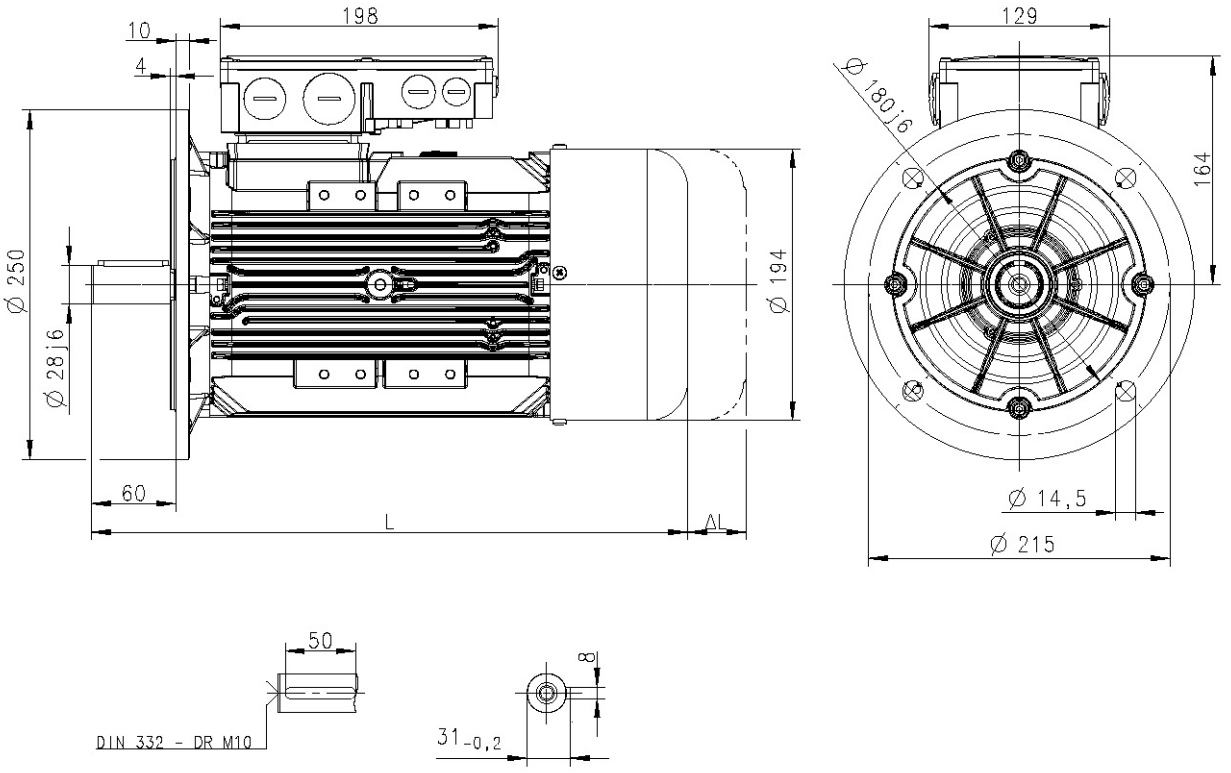
Product			m550-P100/M4	m550-P100/L4
Dimensions				
Motor length	L	[mm]	427	
Length of motor options	Δ L	[mm]	101	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P100

Flange mounting B5



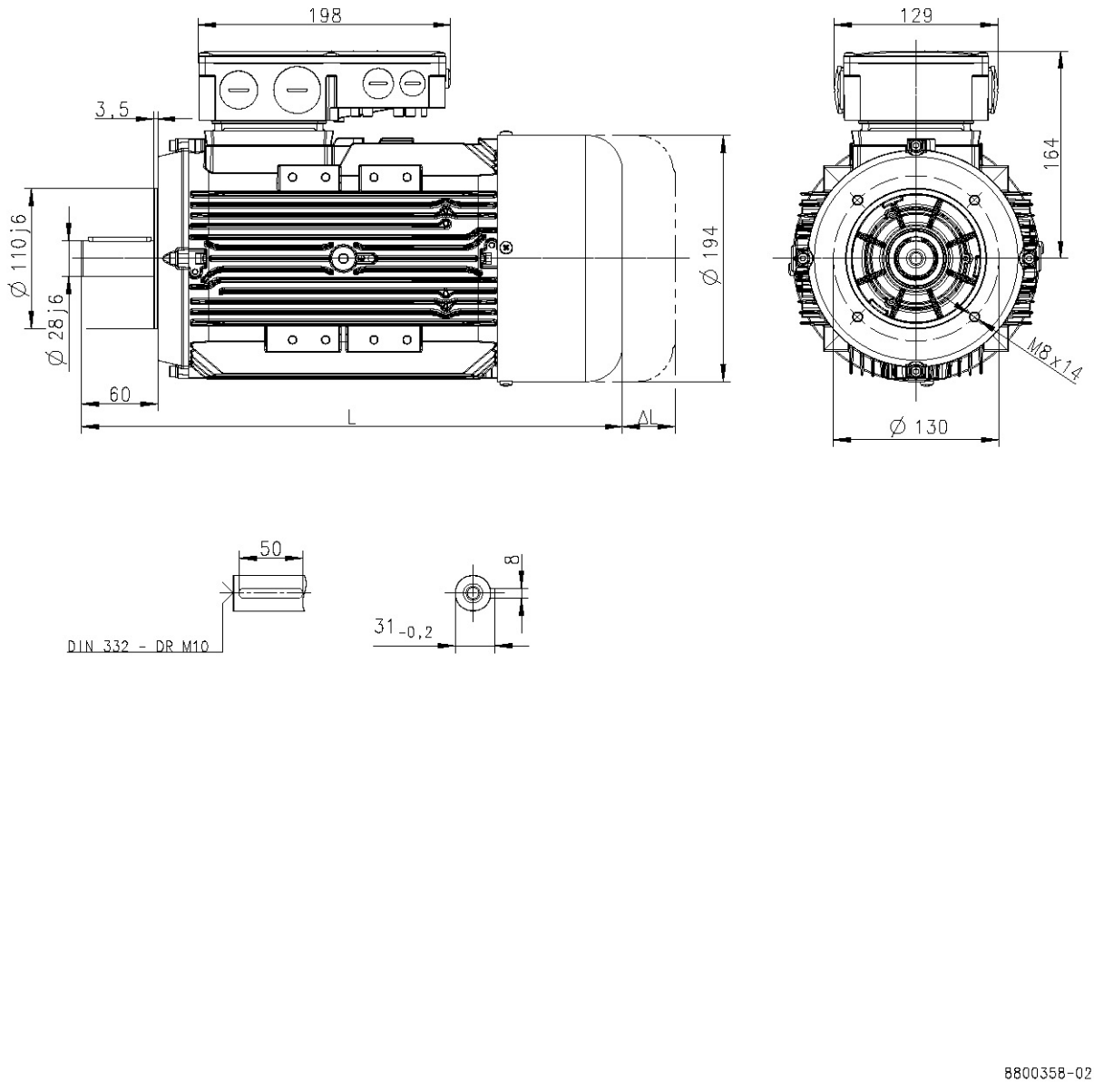
Product			m550-P100/M4	m550-P100/L4
Dimensions				
Motor length	L	[mm]	427	
Length of motor options	Δ L	[mm]	101	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P100

Flange mounting B14



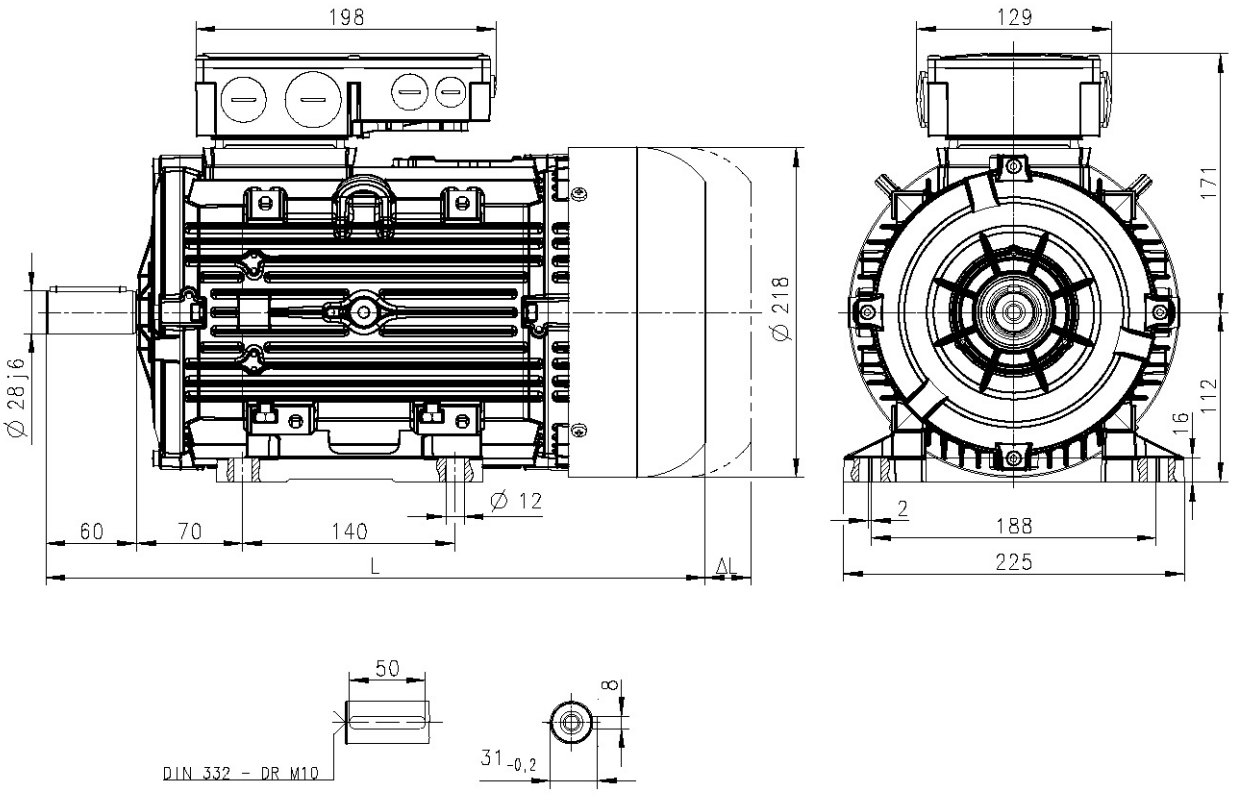
Product			m550-P100/M4	m550-P100/L4
Dimensions				
Motor length	L	[mm]	427	
Length of motor options	Δ L	[mm]	101	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P112

Foot mounting B3



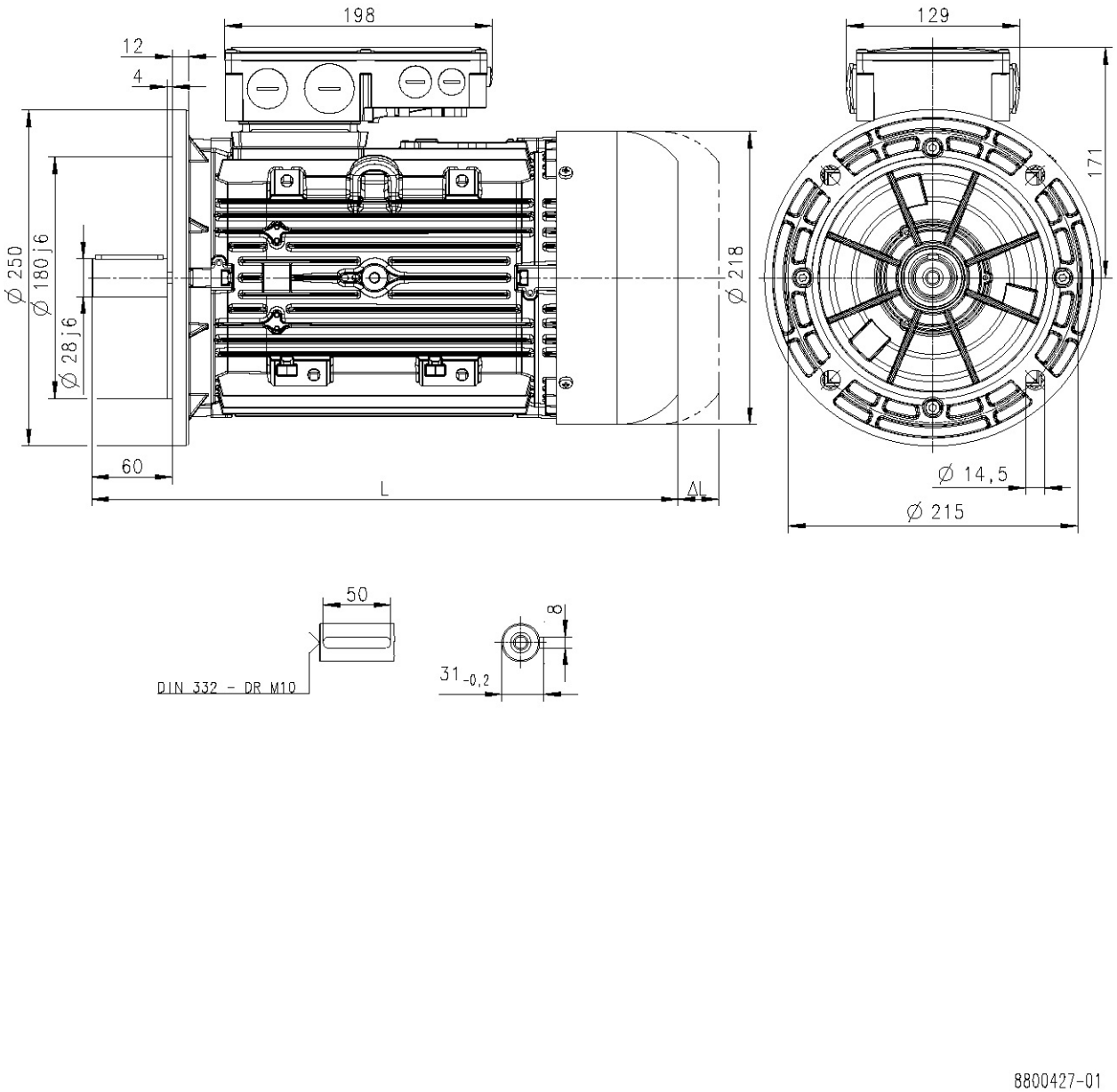
Product			m550-P112/M4
Dimensions			
Motor length	L	[mm]	444
Length of motor options	Δ L	[mm]	120

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P112

Flange mounting B5



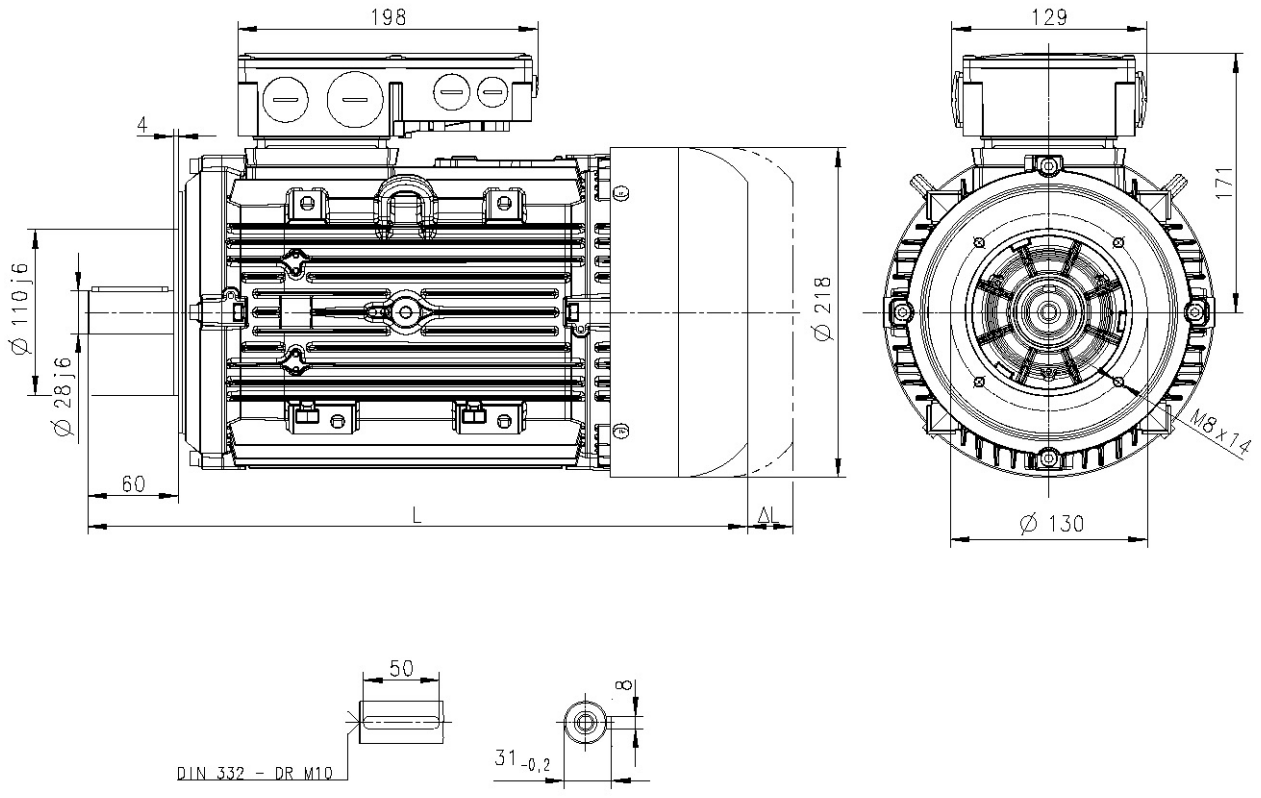
Product			m550-P112/M4
Dimensions			
Motor length	L	[mm]	444
Length of motor options	Δ L	[mm]	120

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P112

Flange mounting B14



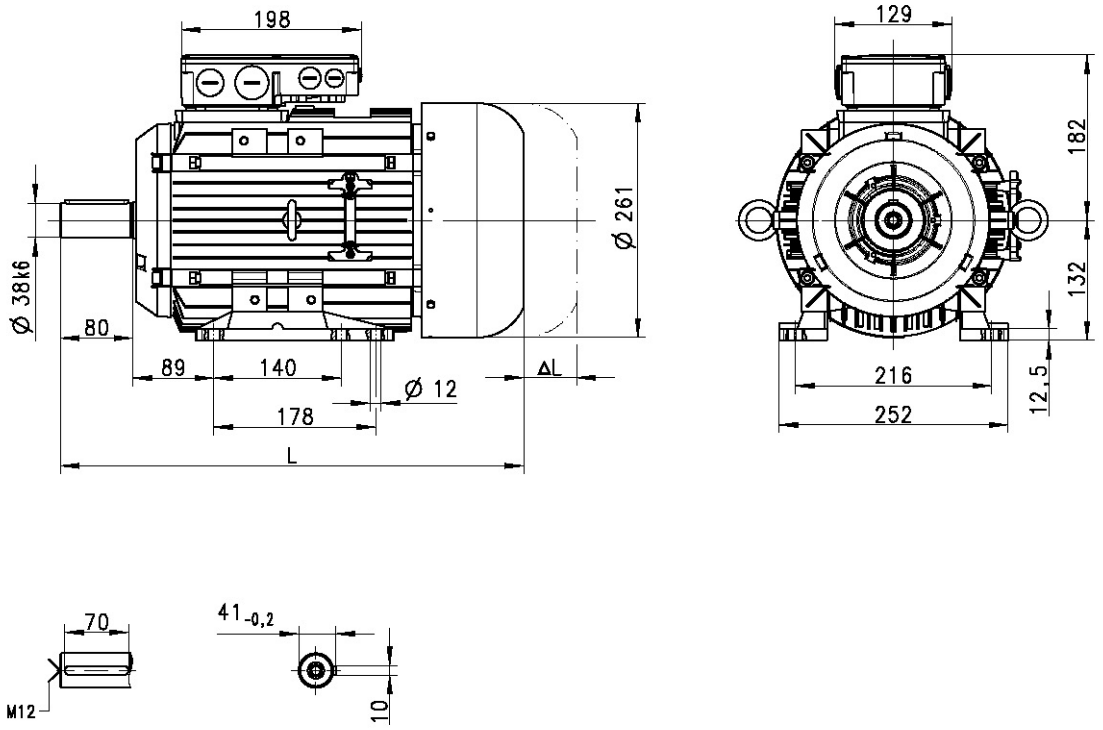
Product			m550-P112/M4
Dimensions			
Motor length	L	[mm]	444
Length of motor options	Δ L	[mm]	120

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P132

Foot mounting B3



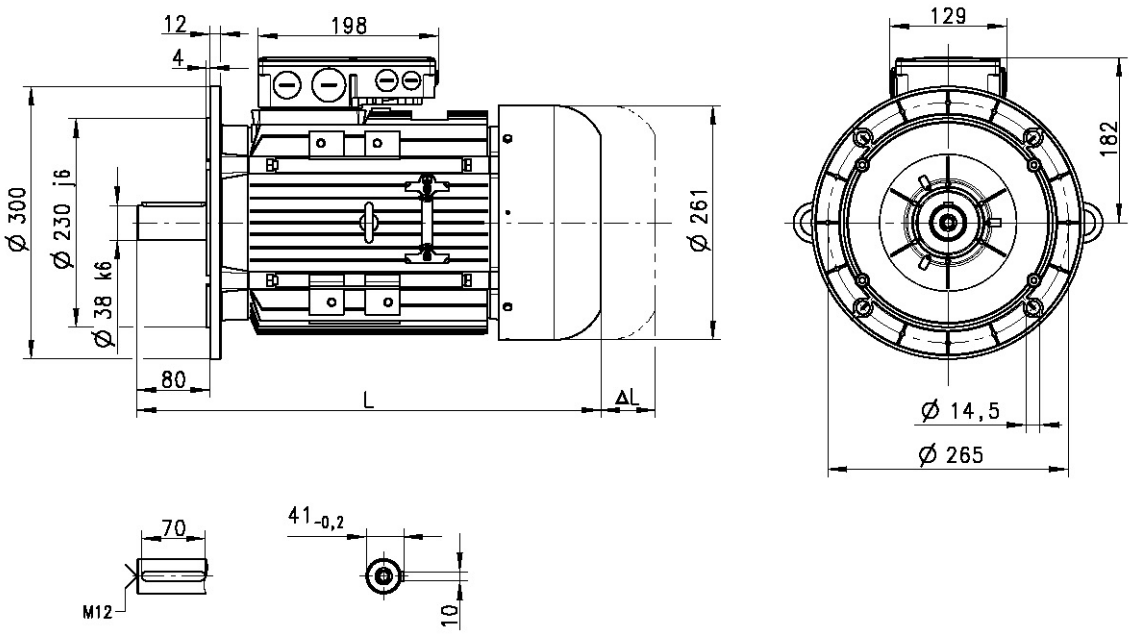
Product			m550-P132/M4	m550-P132/L4
Dimensions				
Motor length	L	[mm]	515	
Length of motor options	Δ L	[mm]	124	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P132

Flange mounting B5



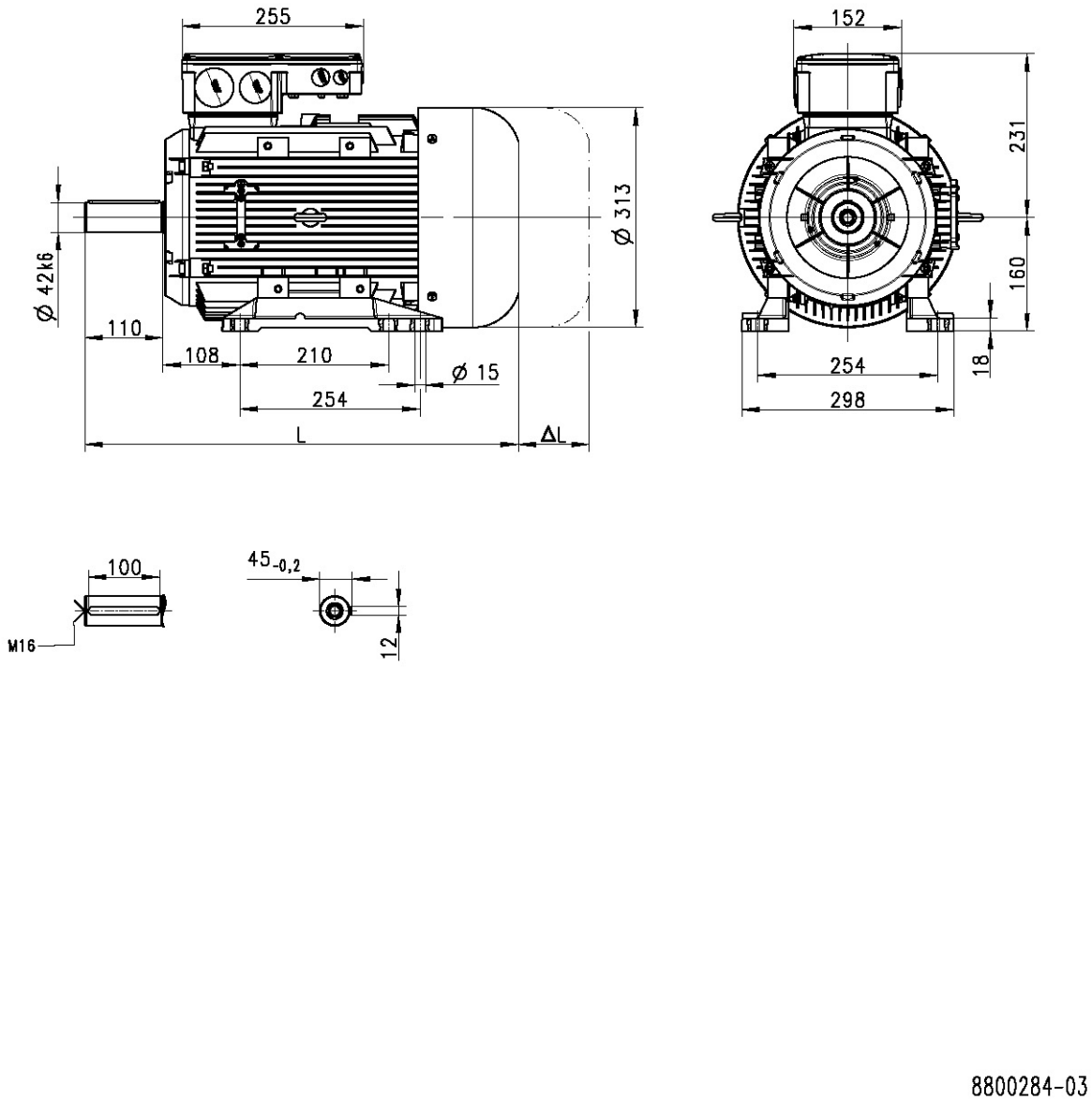
Product			m550-P132/M4	m550-P132/L4
Dimensions				
Motor length	L	[mm]	515	
Length of motor options	Δ L	[mm]	124	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P160

Foot mounting B3



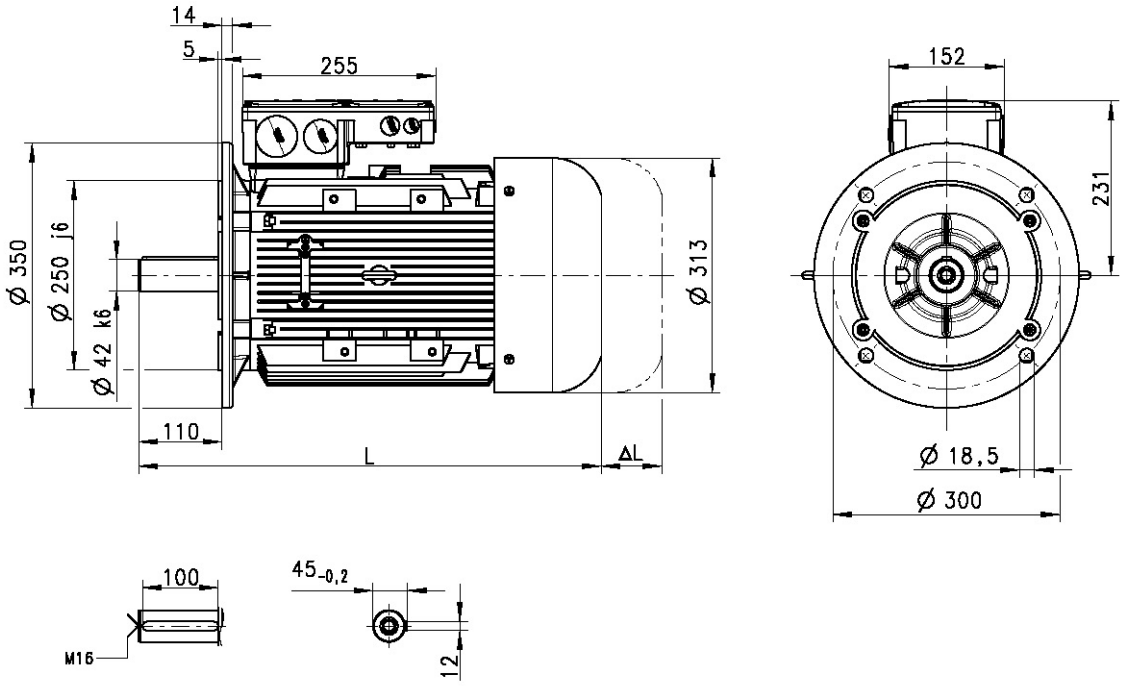
Product			m550-P160/M4	m550-P160/L4
Dimensions				
Motor length	L	[mm]	616	
Length of motor options	Δ L	[mm]	191	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P160

Flange mounting B5



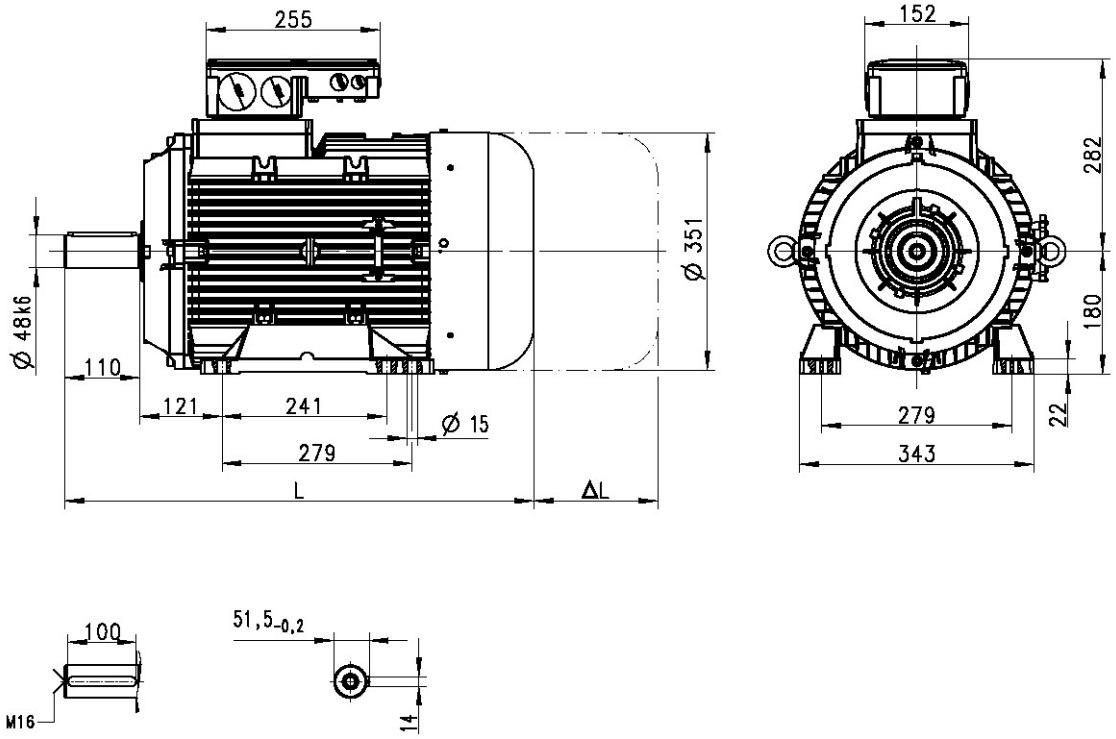
Product			m550-P160/M4	m550-P160/L4
Dimensions				
Motor length	L	[mm]	616	
Length of motor options	Δ L	[mm]	191	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P180

Foot mounting B3



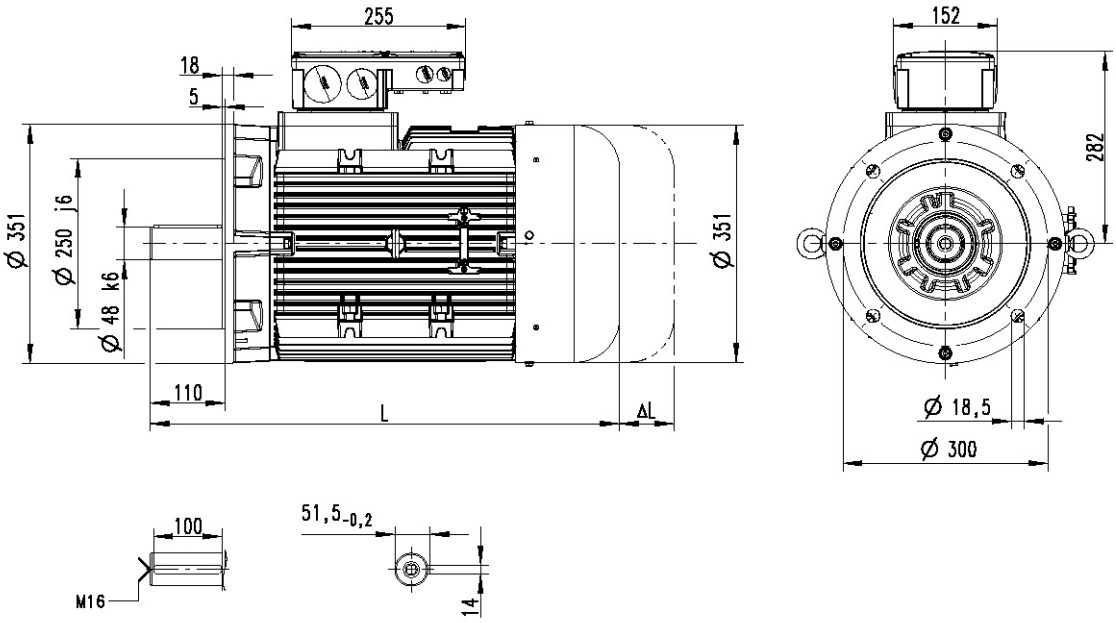
Product			m550-P180/M4	m550-P180/L4
Dimensions				
Motor length	L	[mm]	693	
Length of motor options	Δ L	[mm]	182	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P180

Flange mounting B5



8800505-00

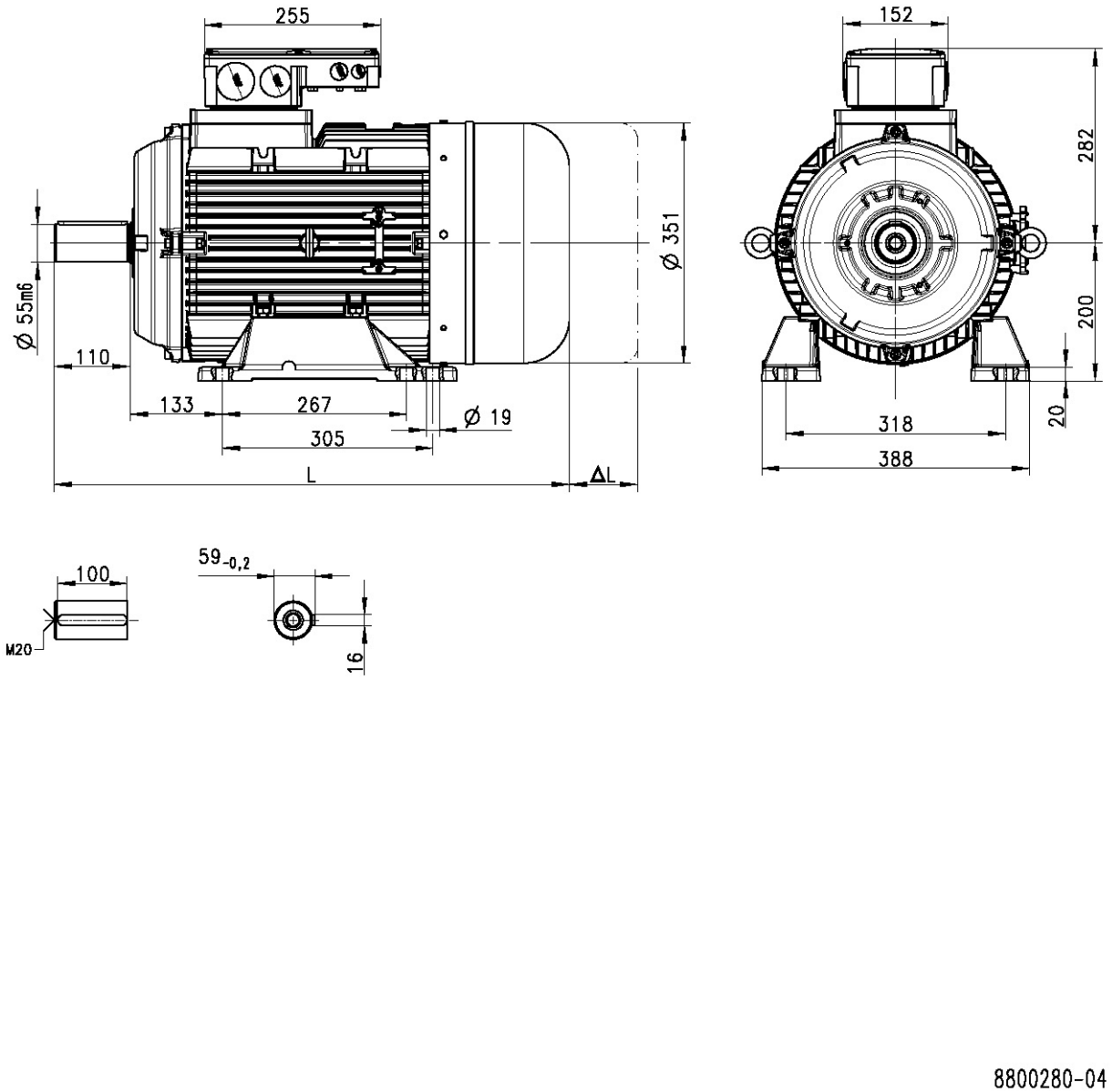
Product			m550-P180/M4	m550-P180/L4
Dimensions				
Motor length	L	[mm]	693	
Length of motor options	Δ L	[mm]	182	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P200

Foot mounting B3



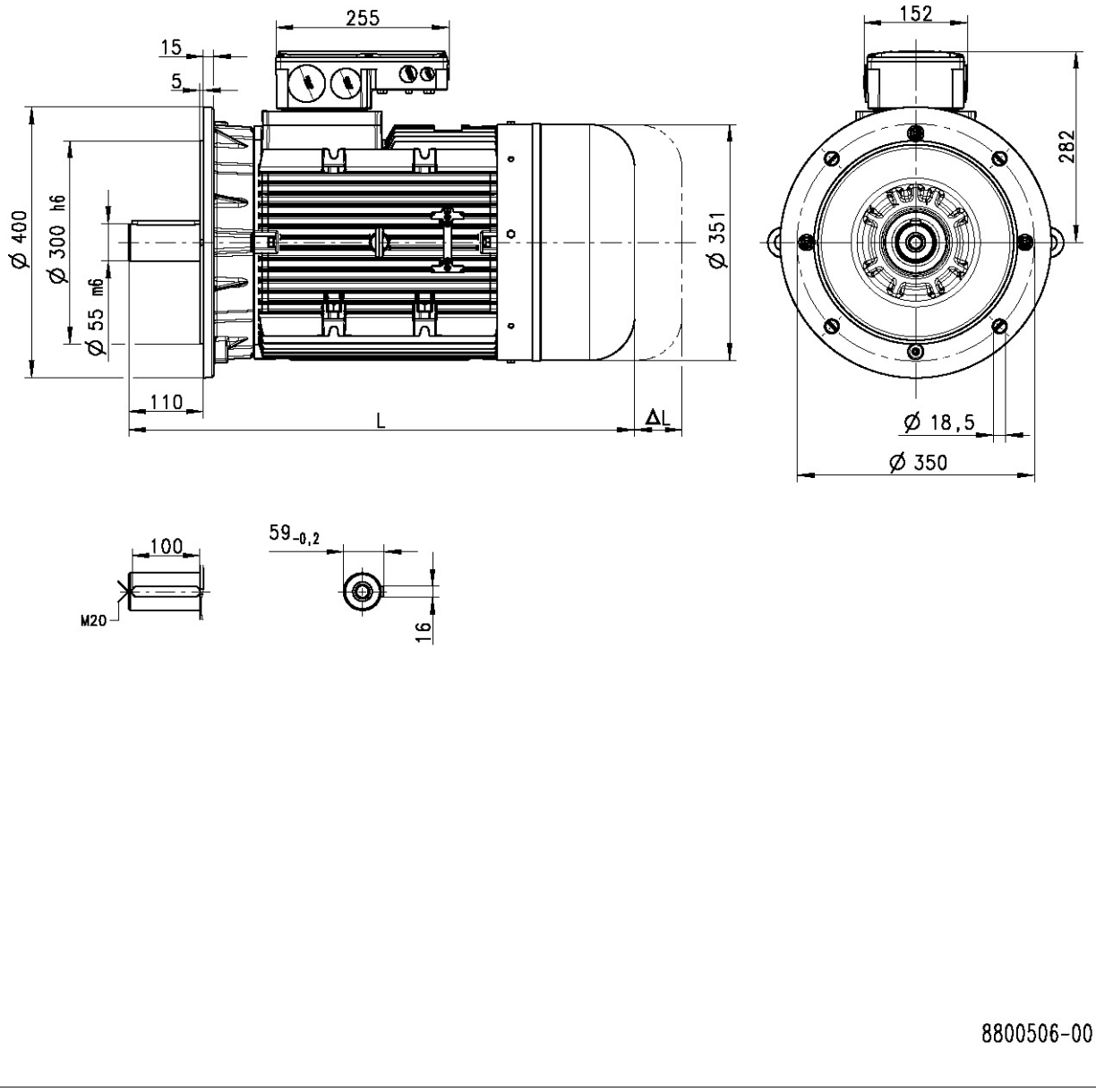
Product			m550-P200/M4
Dimensions			
Motor length	L	[mm]	751
Length of motor options	Δ L	[mm]	191

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P200

Flange mounting B5



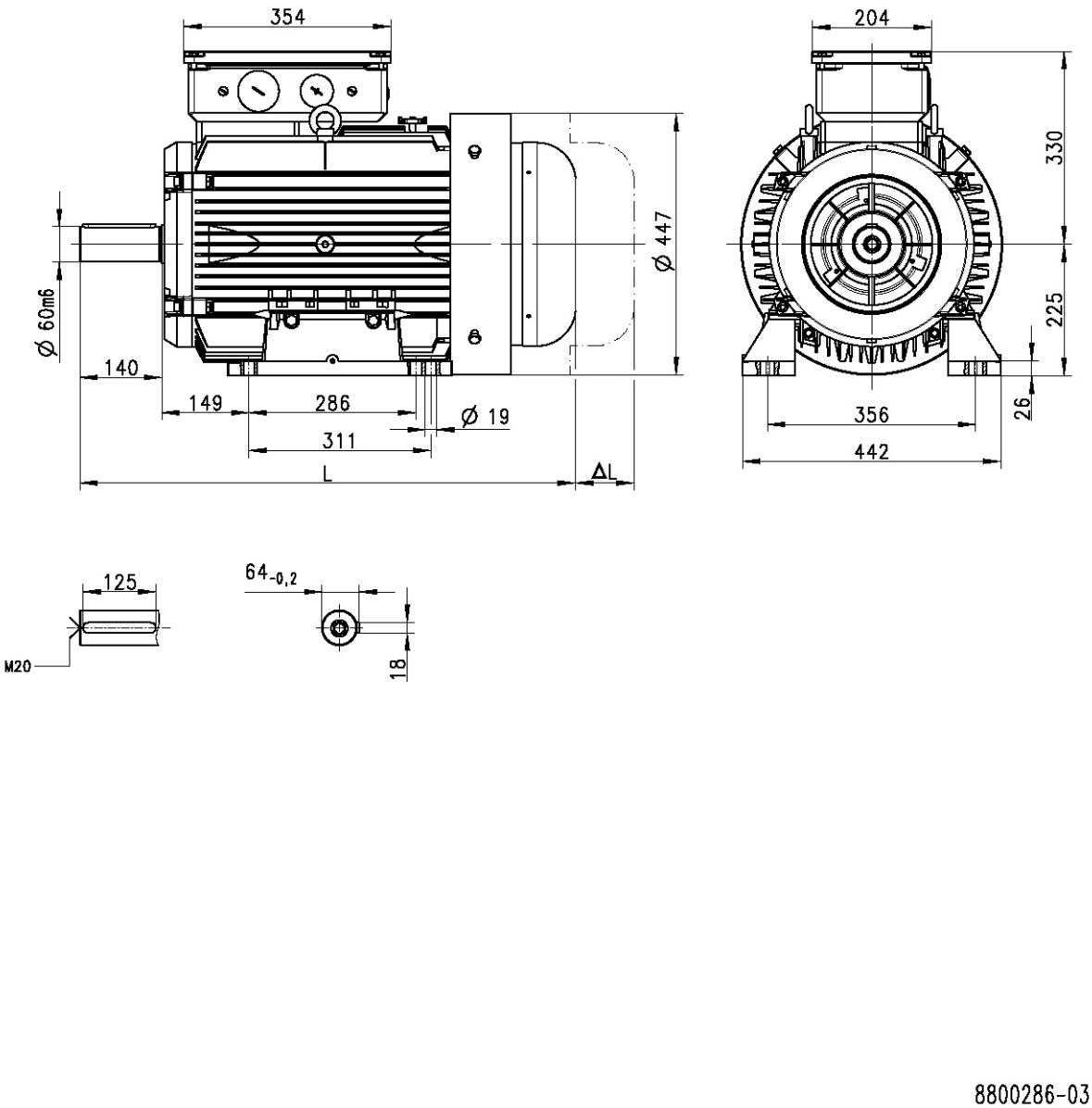
Product			m550-P200/M4
Dimensions			
Motor length	L	[mm]	751
Length of motor options	Δ L	[mm]	191

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P225

Foot mounting B3



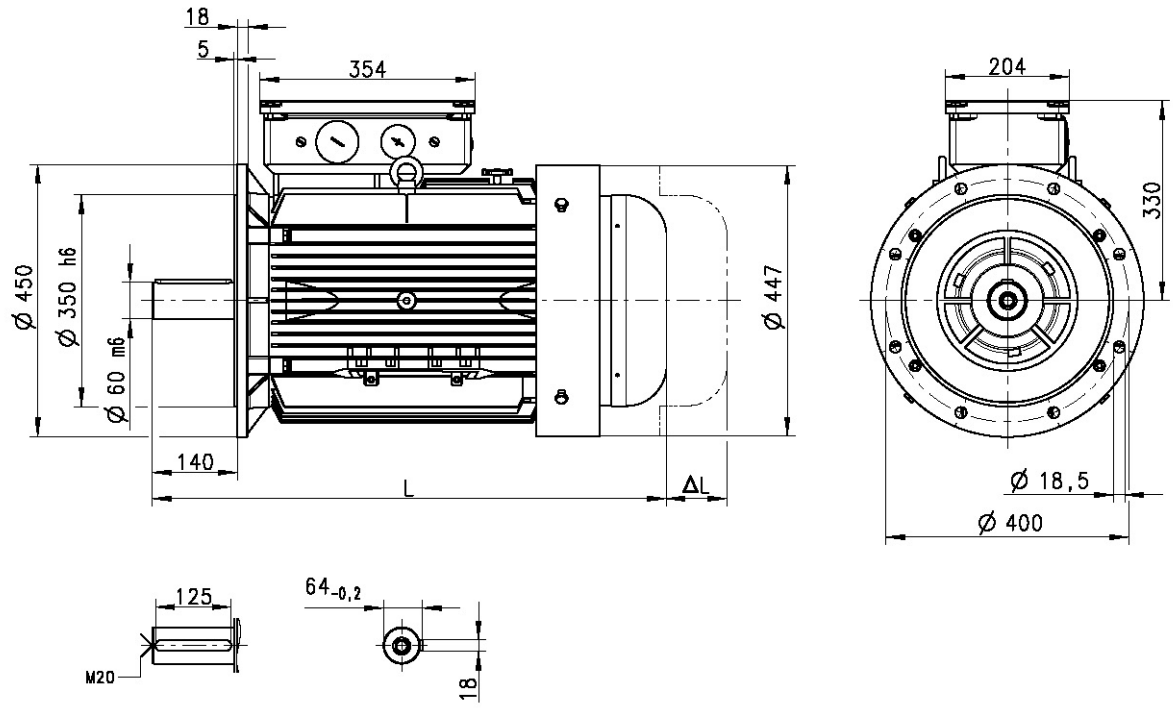
Product			m550-P225/M4	m550-P225/L4
Dimensions				
Motor length	L	[mm]	853	
Length of motor options	Δ L	[mm]	192	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, self-ventilated (4-pole)

m550-P225

Flange mounting B5



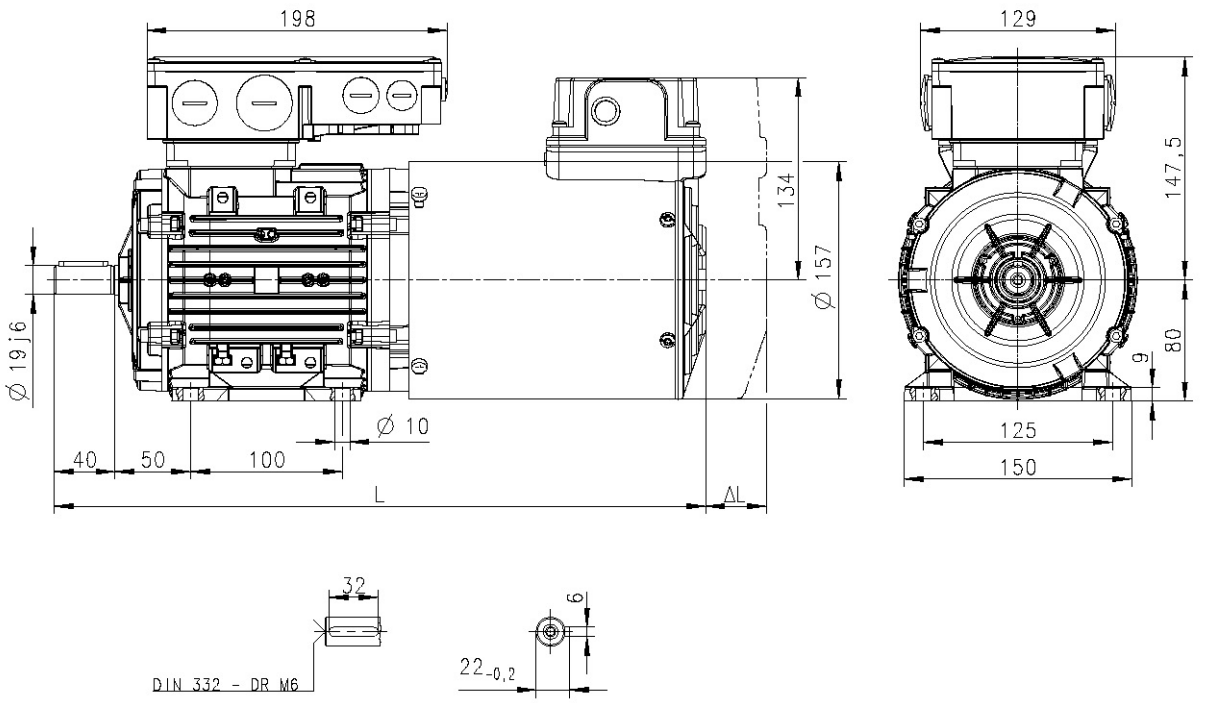
Product			m550-P225/M4	m550-P225/L4
Dimensions				
Motor length	L	[mm]	853	
Length of motor options	Δ L	[mm]	192	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P80

Foot mounting B3



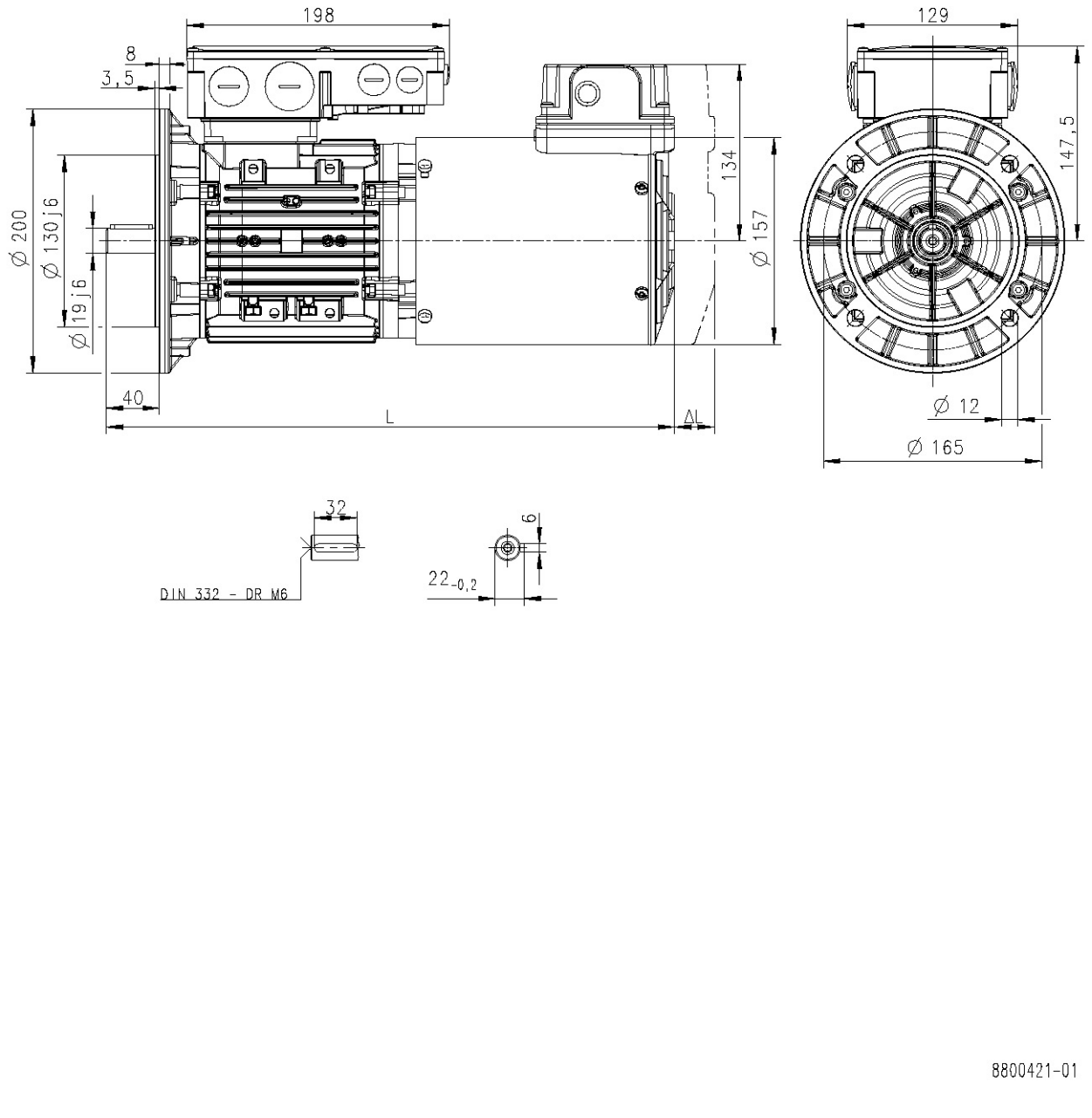
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	430
Length of motor options	Δ L	[mm]	55

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P80

Flange mounting B5



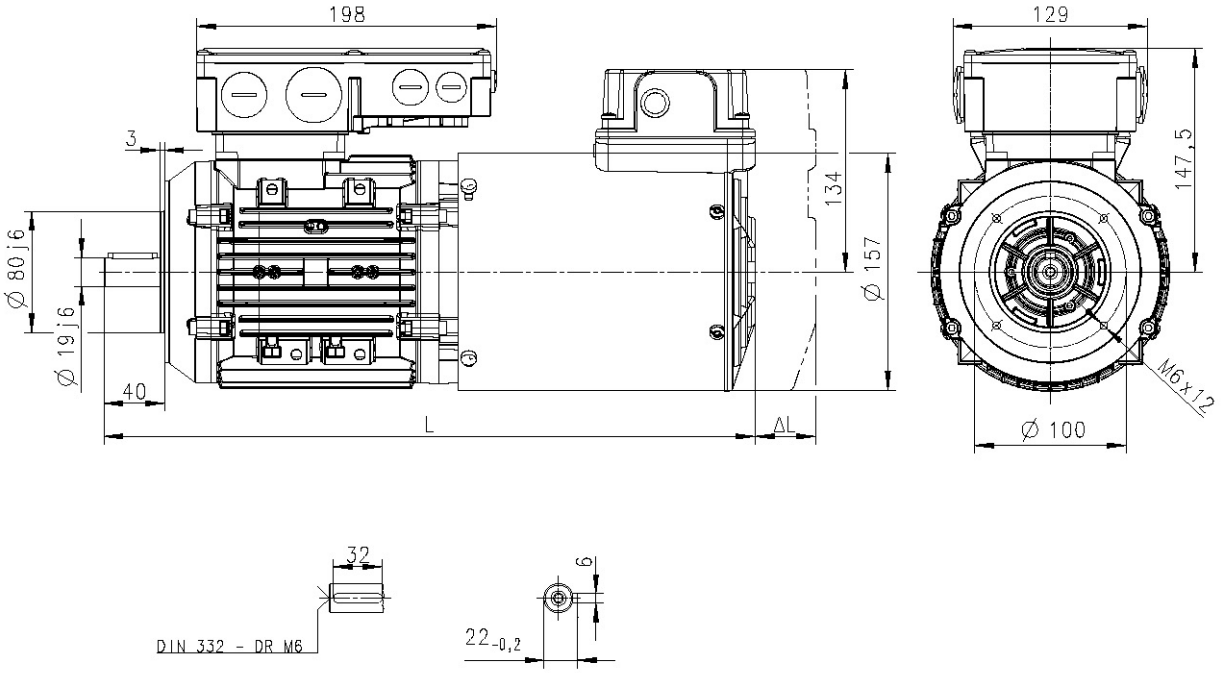
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	430
Length of motor options	Δ L	[mm]	55

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P80

Flange mounting B14



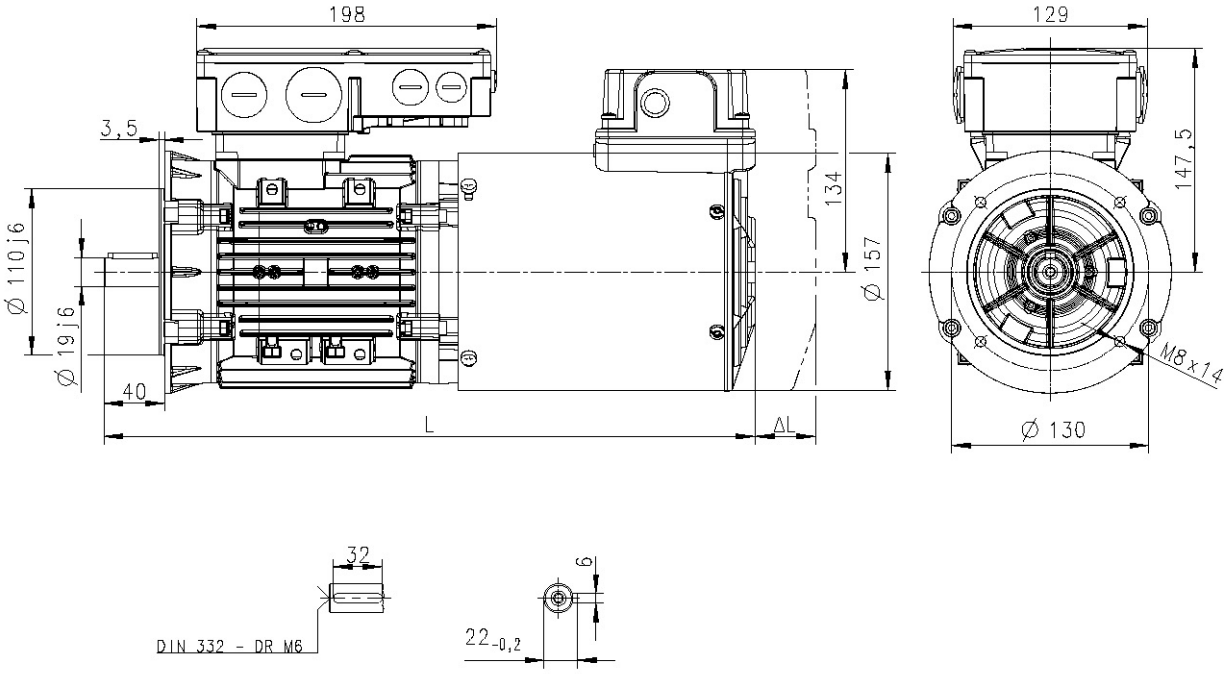
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	430
Length of motor options	Δ L	[mm]	55

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P80

Flange mounting B14



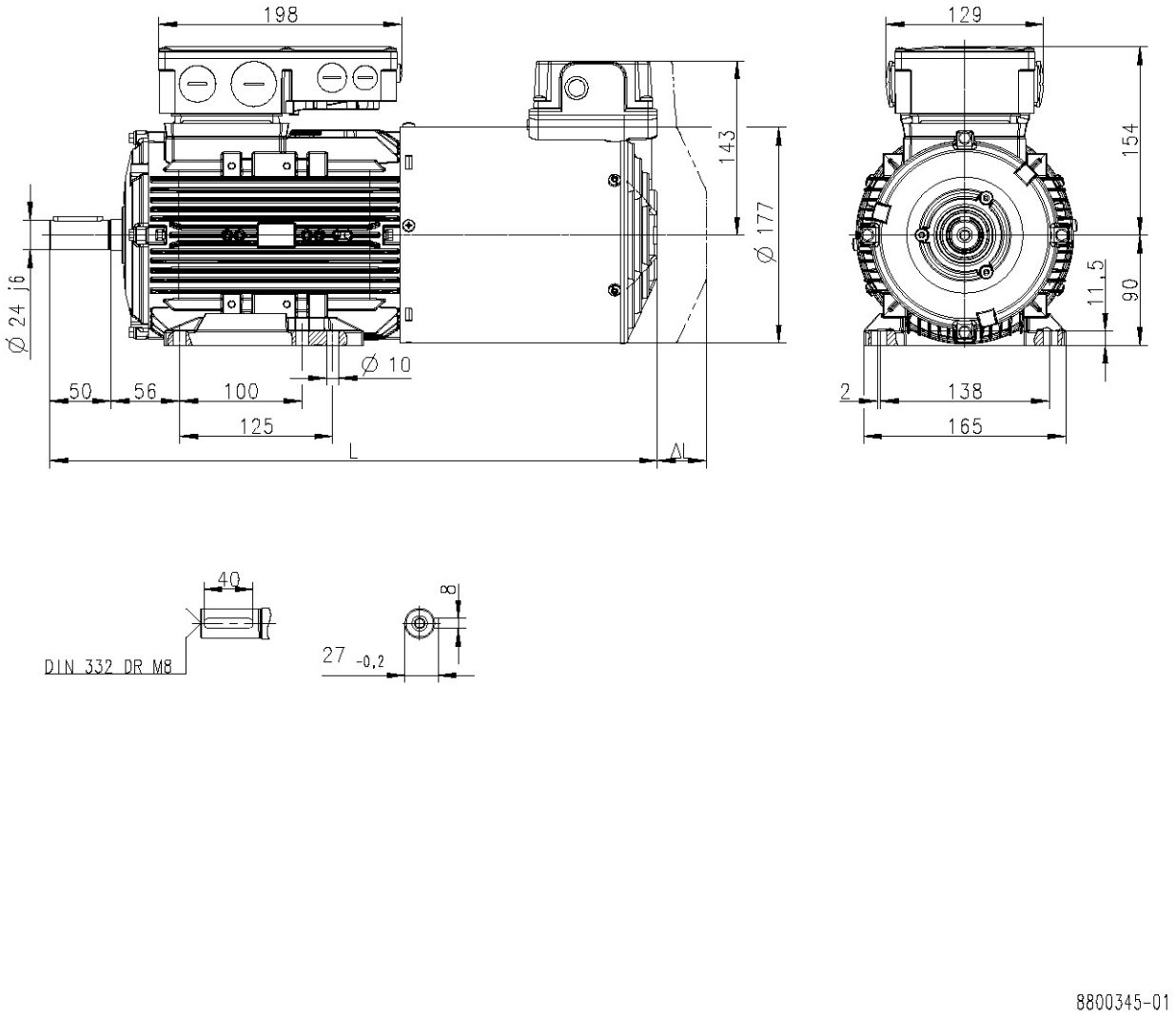
Product			m550-P80/M4
Dimensions			
Motor length	L	[mm]	430
Length of motor options	Δ L	[mm]	55

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P90

Foot mounting B3



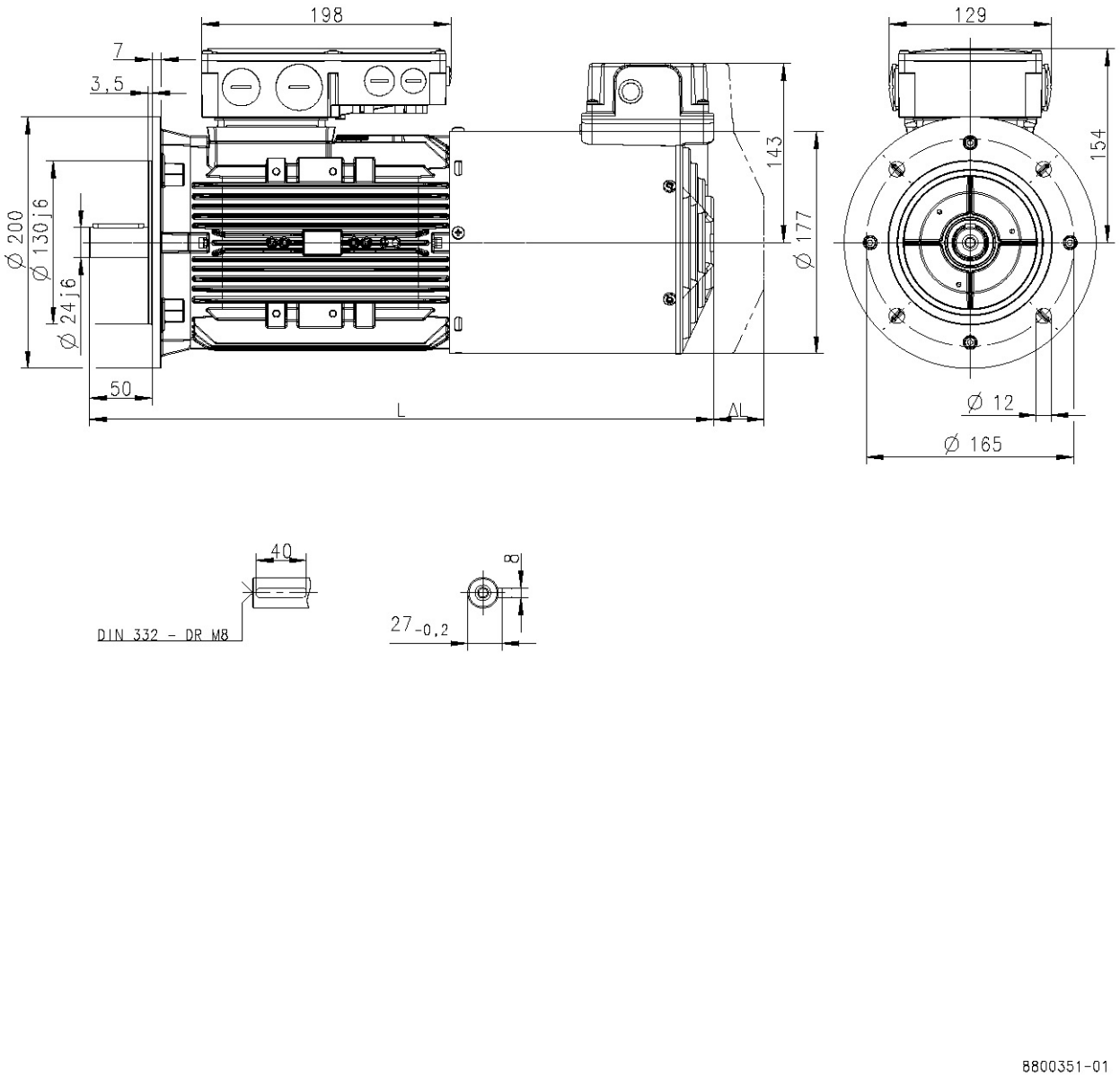
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	496	
Length of motor options	Δ L	[mm]	53	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P90

Flange mounting B5



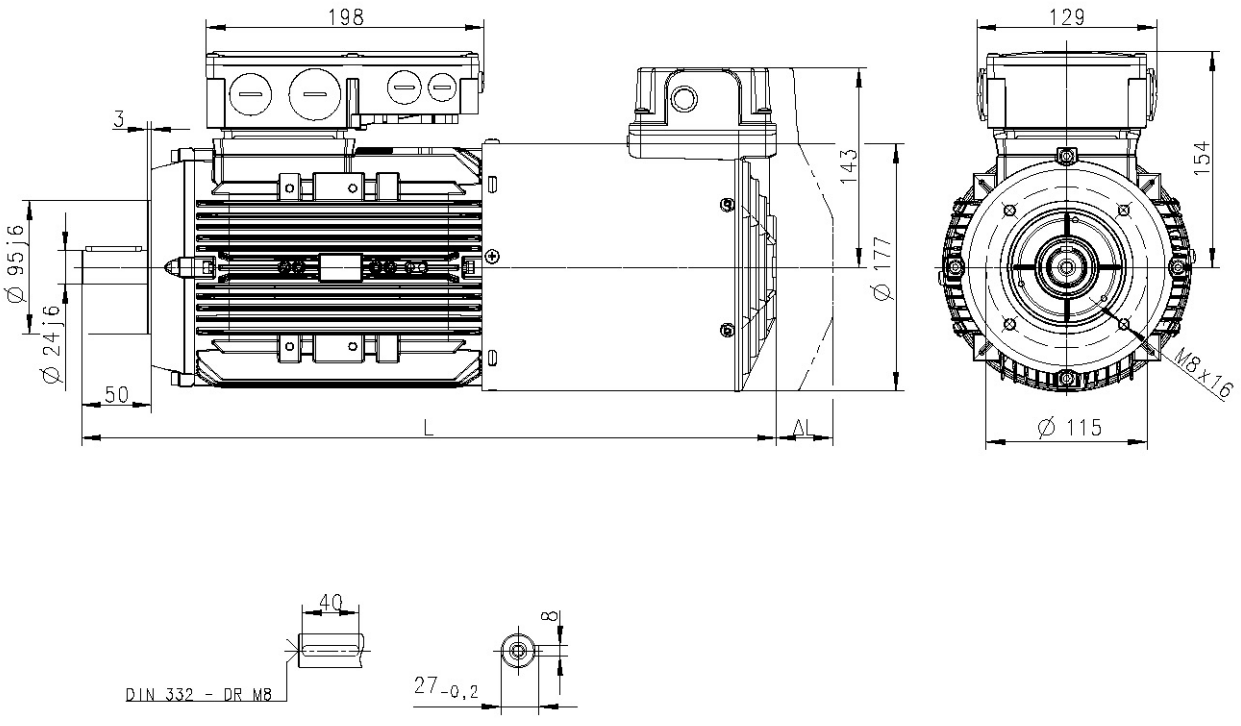
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	496	
Length of motor options	Δ L	[mm]	53	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P90

Flange mounting B14



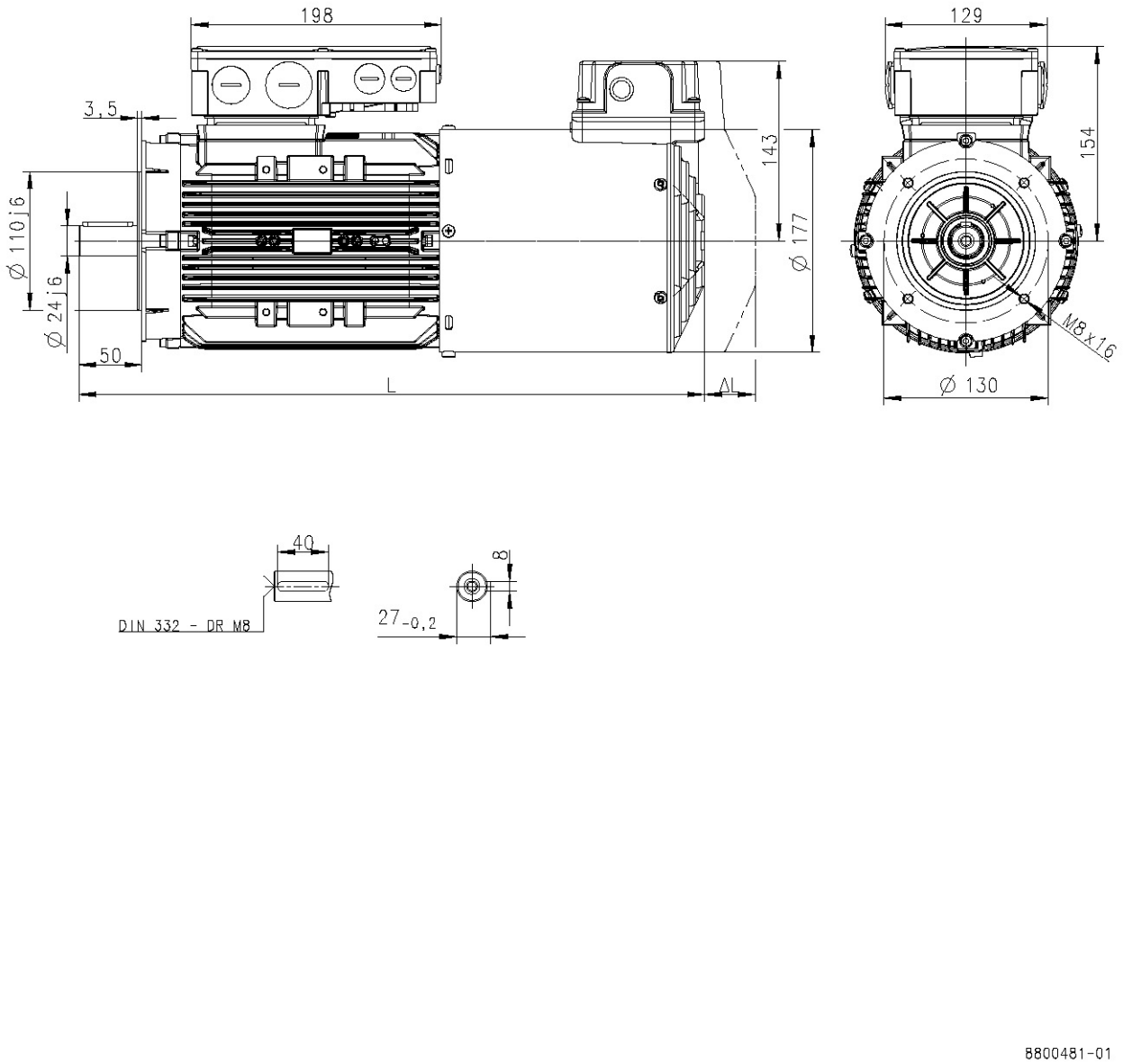
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	496	
Length of motor options	Δ L	[mm]	53	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P90

Flange mounting B14



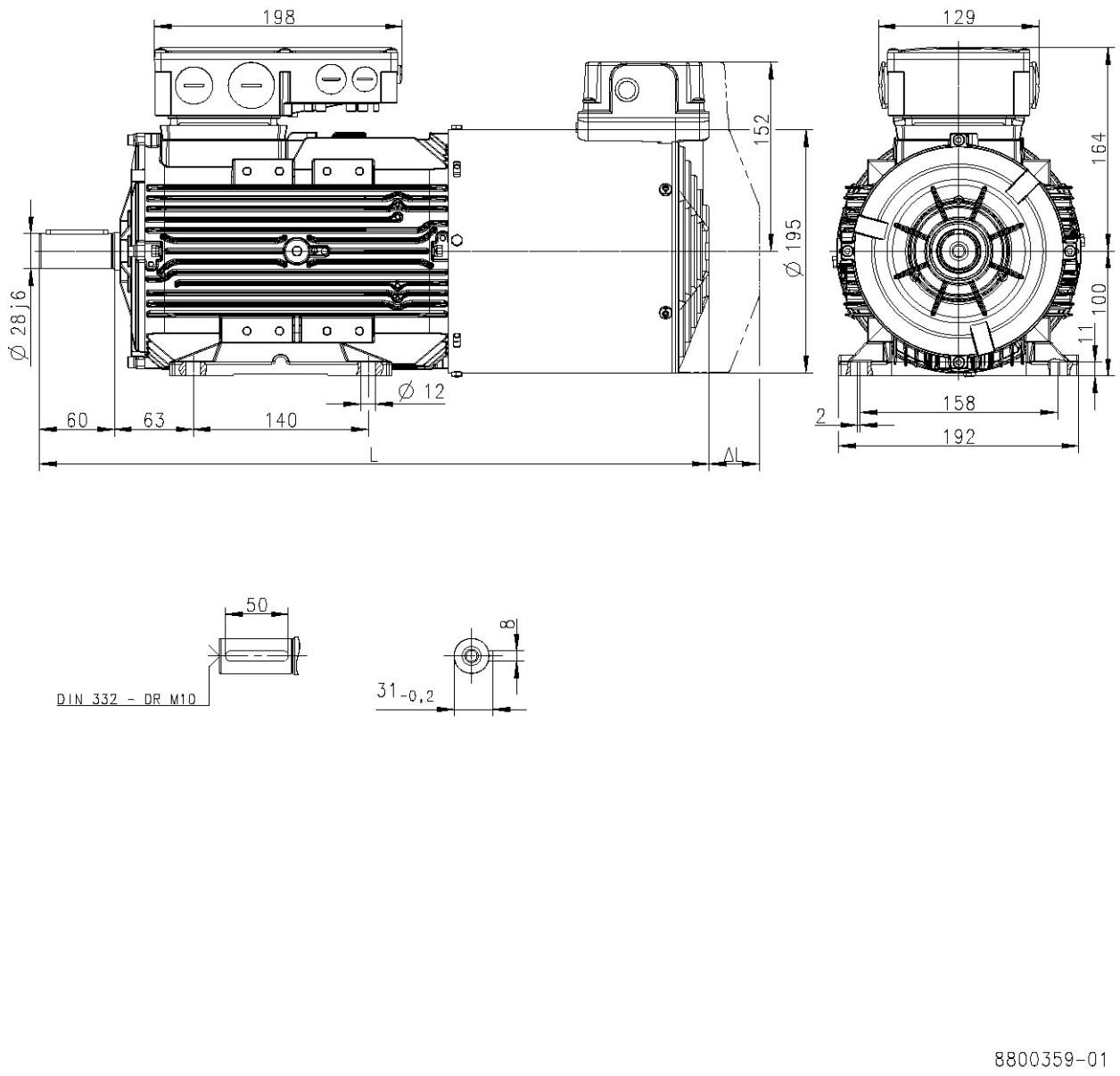
Product			m550-P90/M4	m550-P90/L4
Dimensions				
Motor length	L	[mm]	496	
Length of motor options	Δ L	[mm]	53	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P100

Foot mounting B3



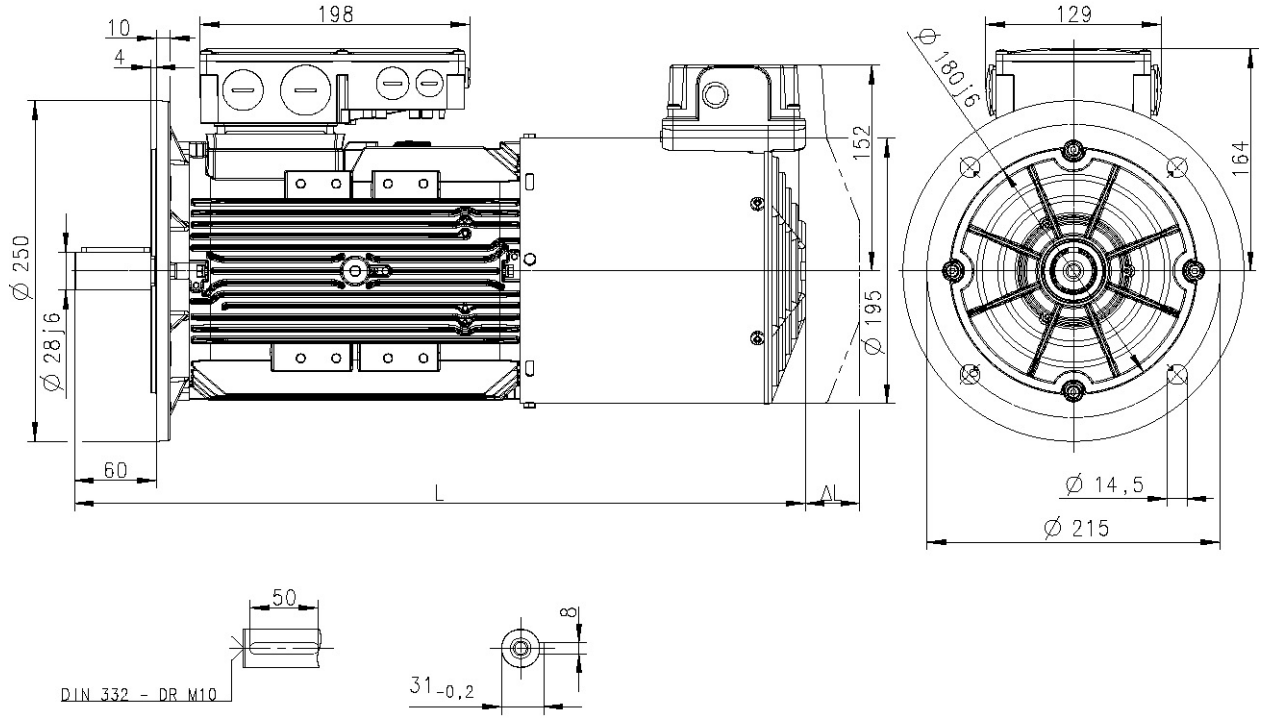
Product			m550-P100/M4	m550-P100/L4
Dimensions				
Motor length	L	[mm]	536	
Length of motor options	Δ L	[mm]	61	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P100

Flange mounting B5



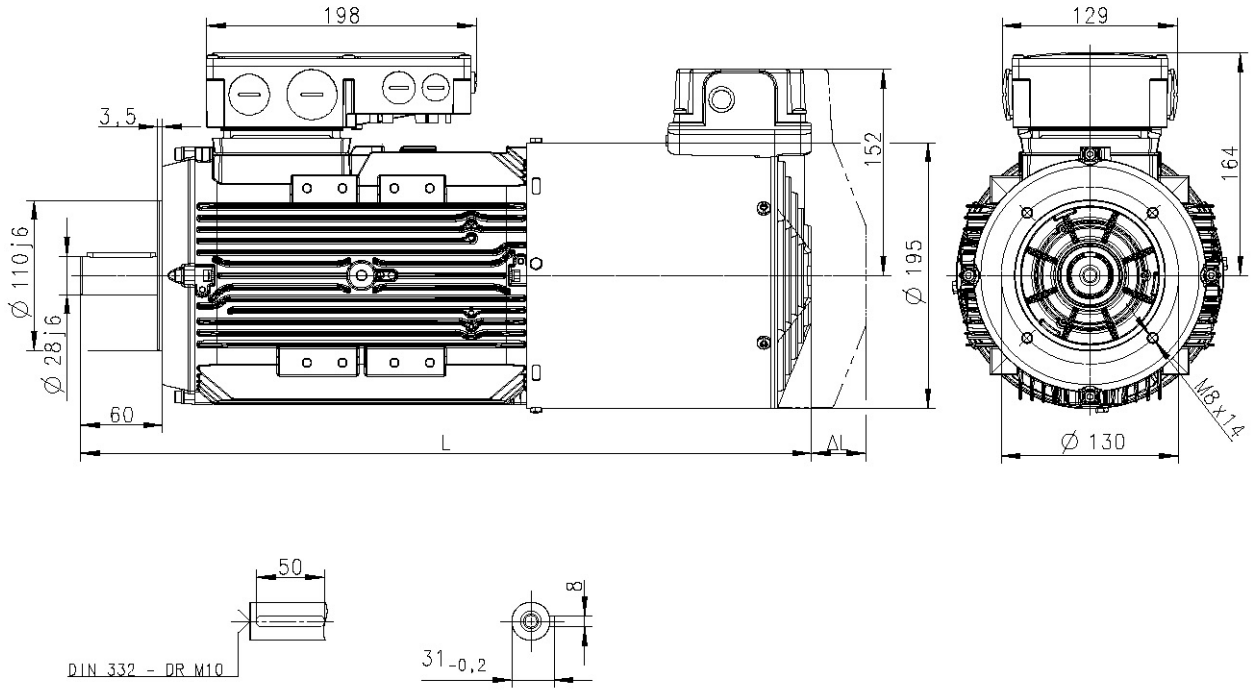
Product			m550-P100/M4	m550-P100/L4
Dimensions				
Motor length	L	[mm]	536	
Length of motor options	Δ L	[mm]	61	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P100

Flange mounting B14



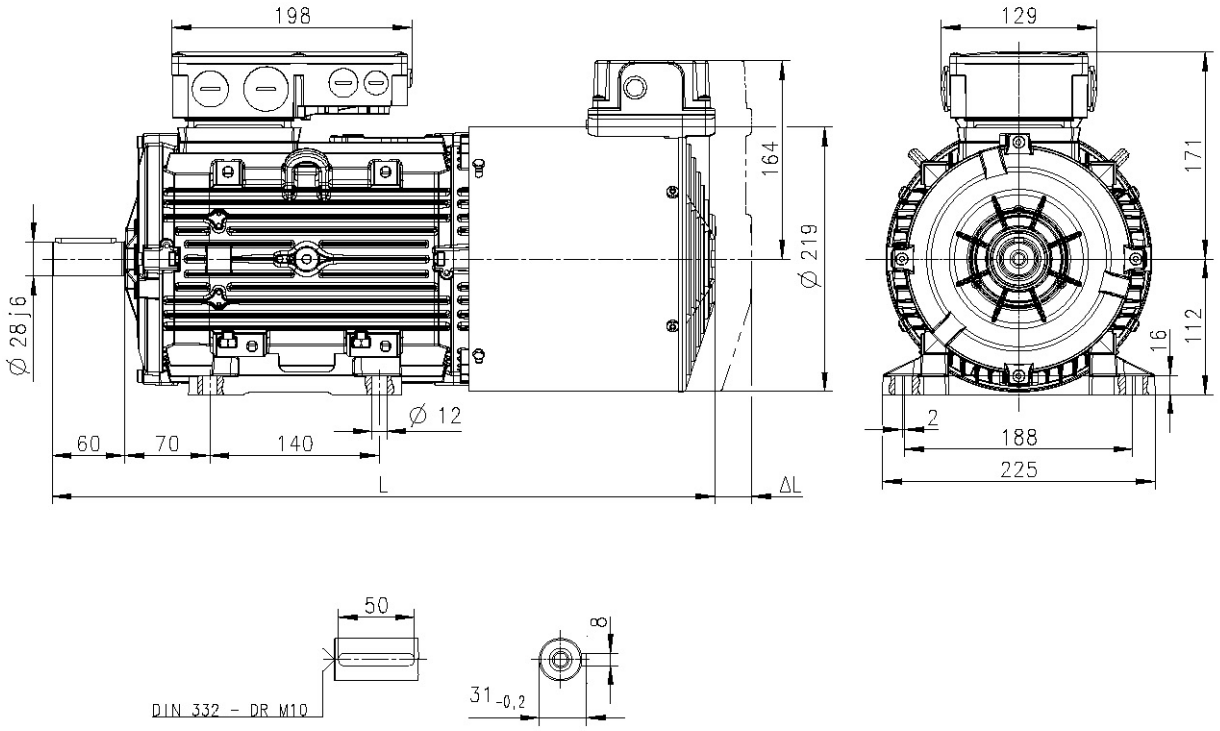
Product			m550-P100/M4	m550-P100/L4
Dimensions				
Motor length	L	[mm]	536	
Length of motor options	Δ L	[mm]	61	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P112

Foot mounting B3



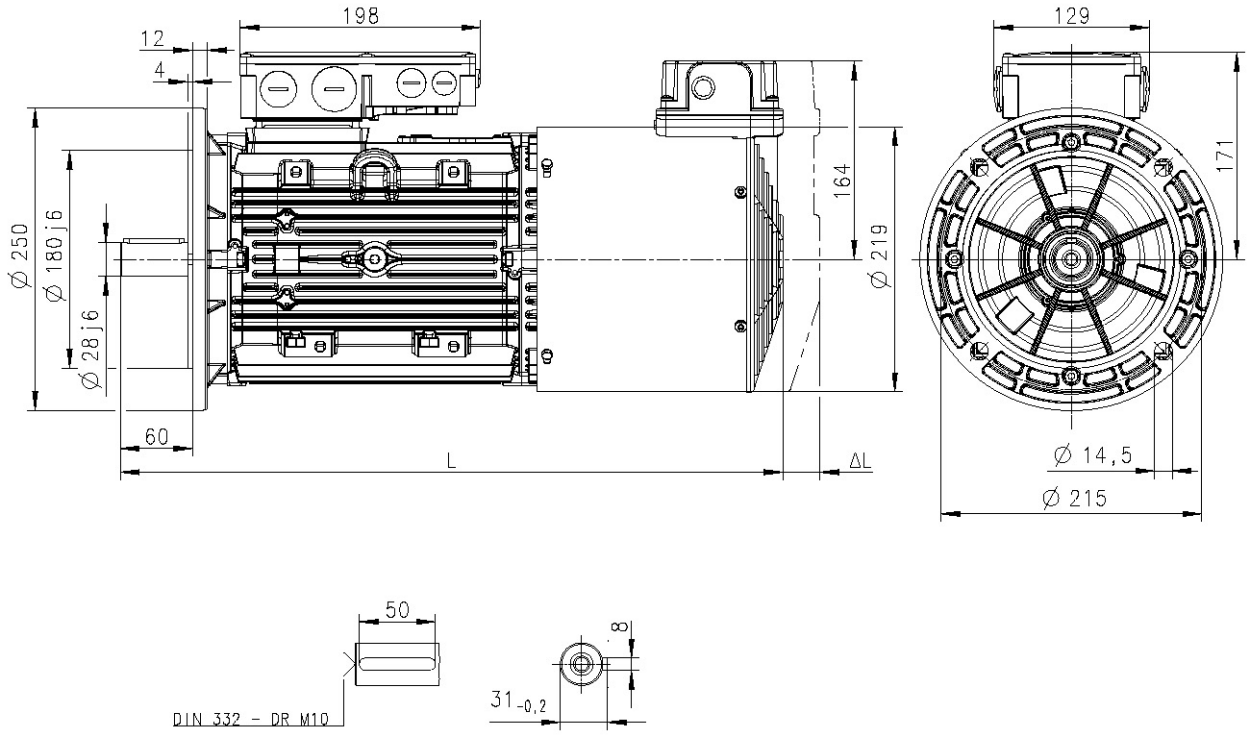
Product			m550-P112/M4
Dimensions			
Motor length	L	[mm]	547
Length of motor options	Δ L	[mm]	80

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P112

Flange mounting B5



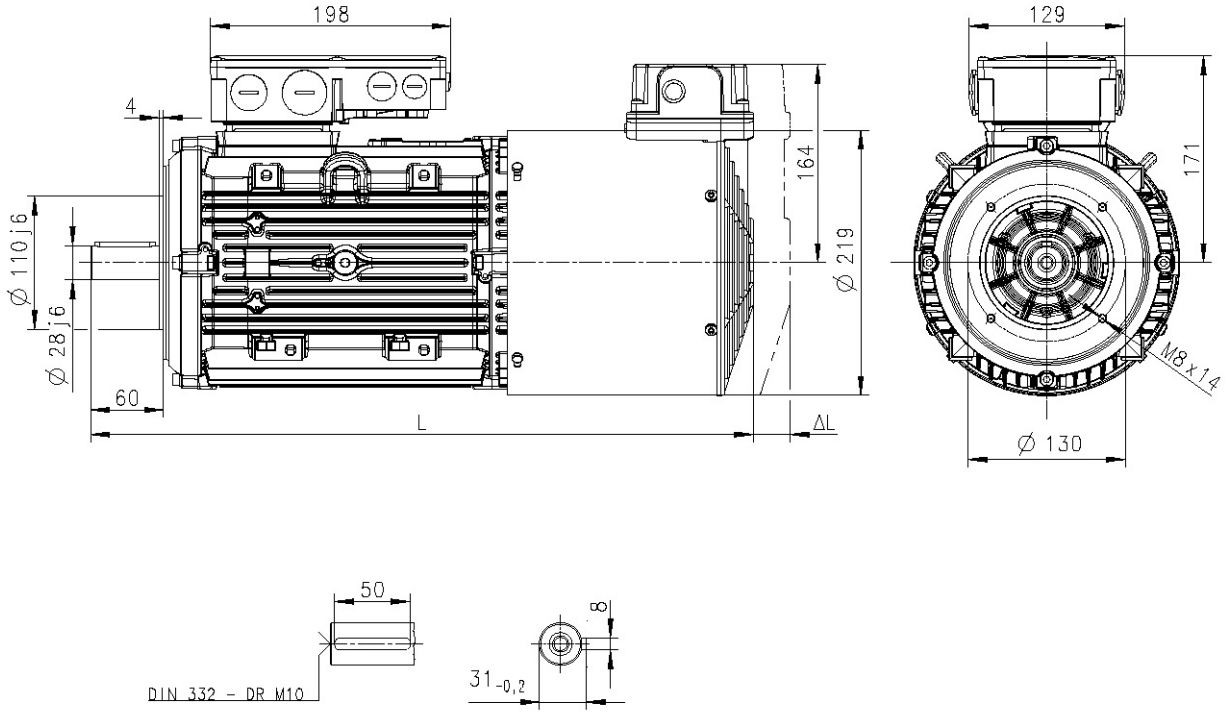
Product			m550-P112/M4
Dimensions			
Motor length	L	[mm]	547
Length of motor options	Δ L	[mm]	80

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P112

Flange mounting B14



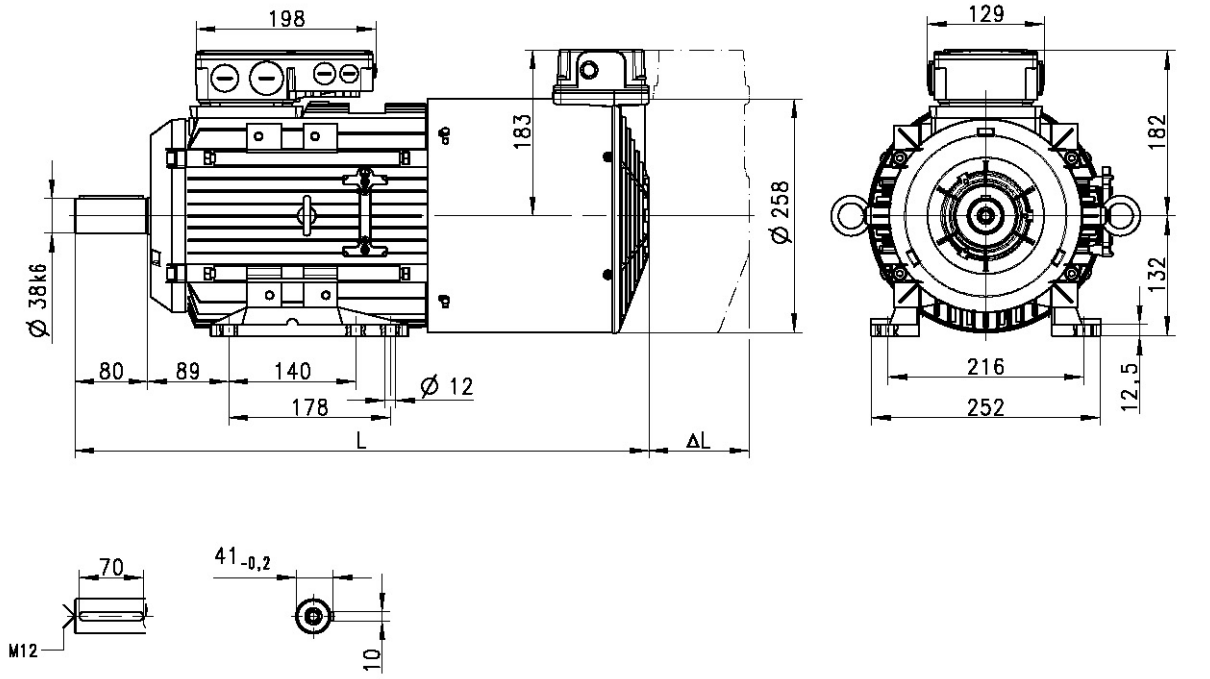
Product			m550-P112/M4
Dimensions			
Motor length	L	[mm]	547
Length of motor options	Δ L	[mm]	80

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P132

Foot mounting B3



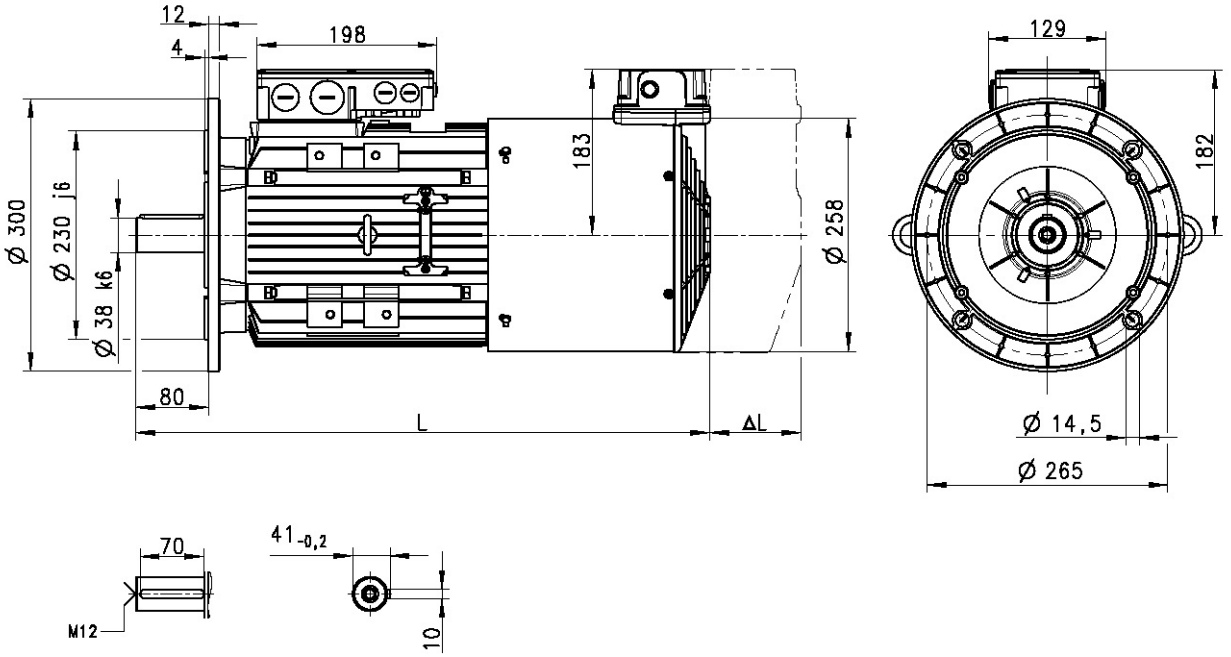
Product			m550-P132/M4	m550-P132/L4
Dimensions				
Motor length	L	[mm]	636	
Length of motor options	Δ L	[mm]	80	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P132

Flange mounting B5



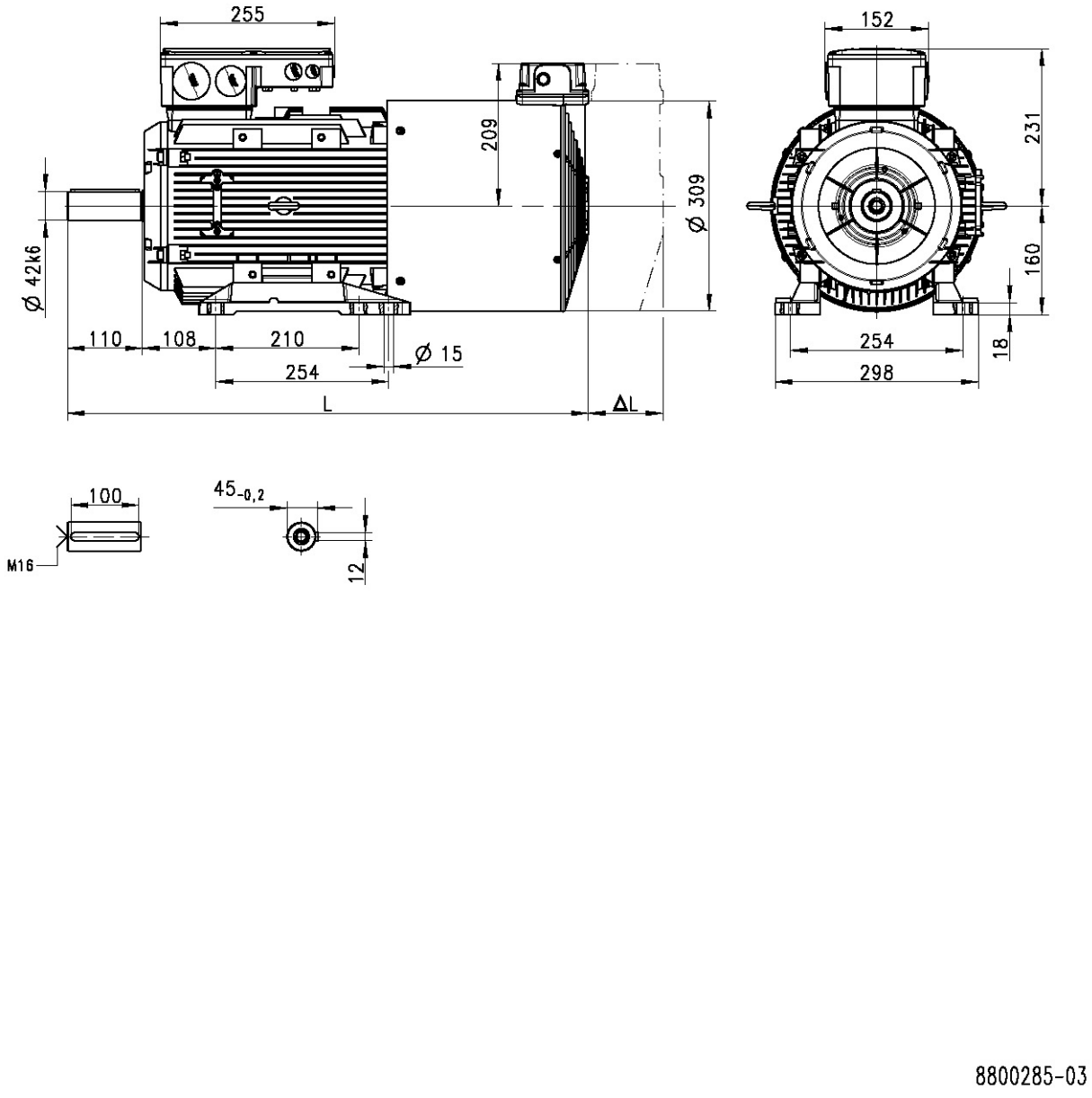
Product			m550-P132/M4	m550-P132/L4
Dimensions				
Motor length	L	[mm]	636	
Length of motor options	Δ L	[mm]	80	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P160

Foot mounting B3



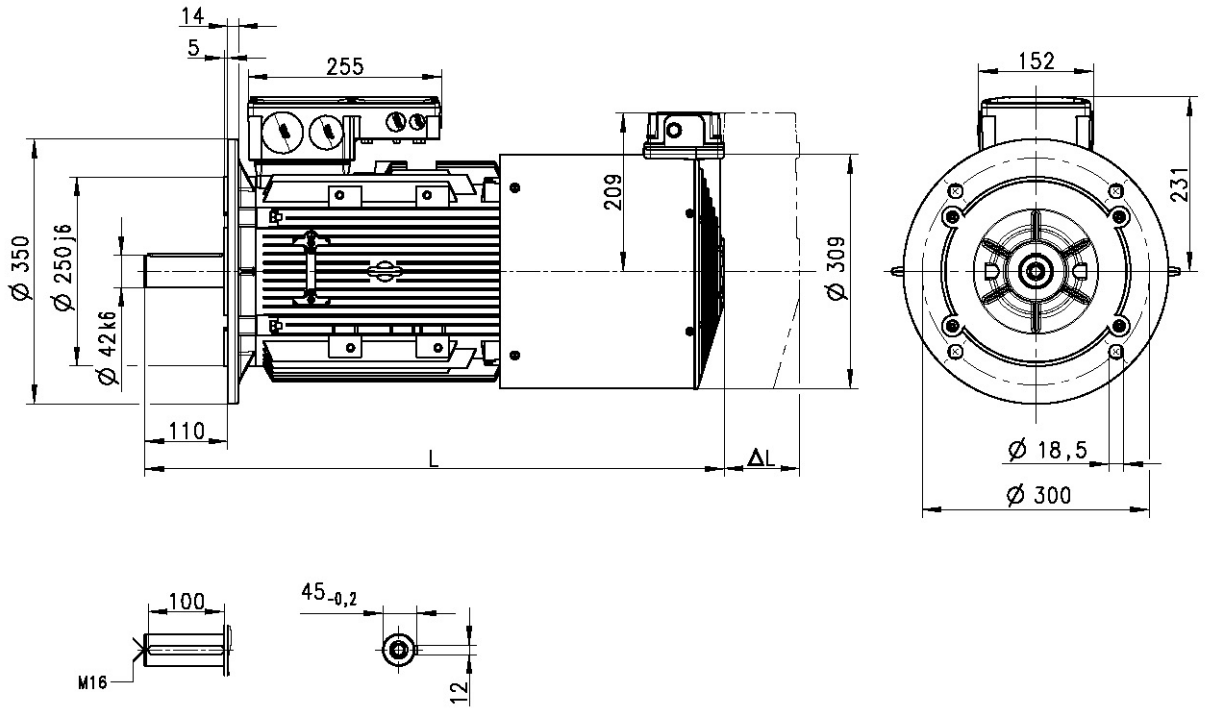
Product			m550-P160/M4	m550-P160/L4
Dimensions				
Motor length	L	[mm]	765	
Length of motor options	Δ L	[mm]	88	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P160

Flange mounting B5



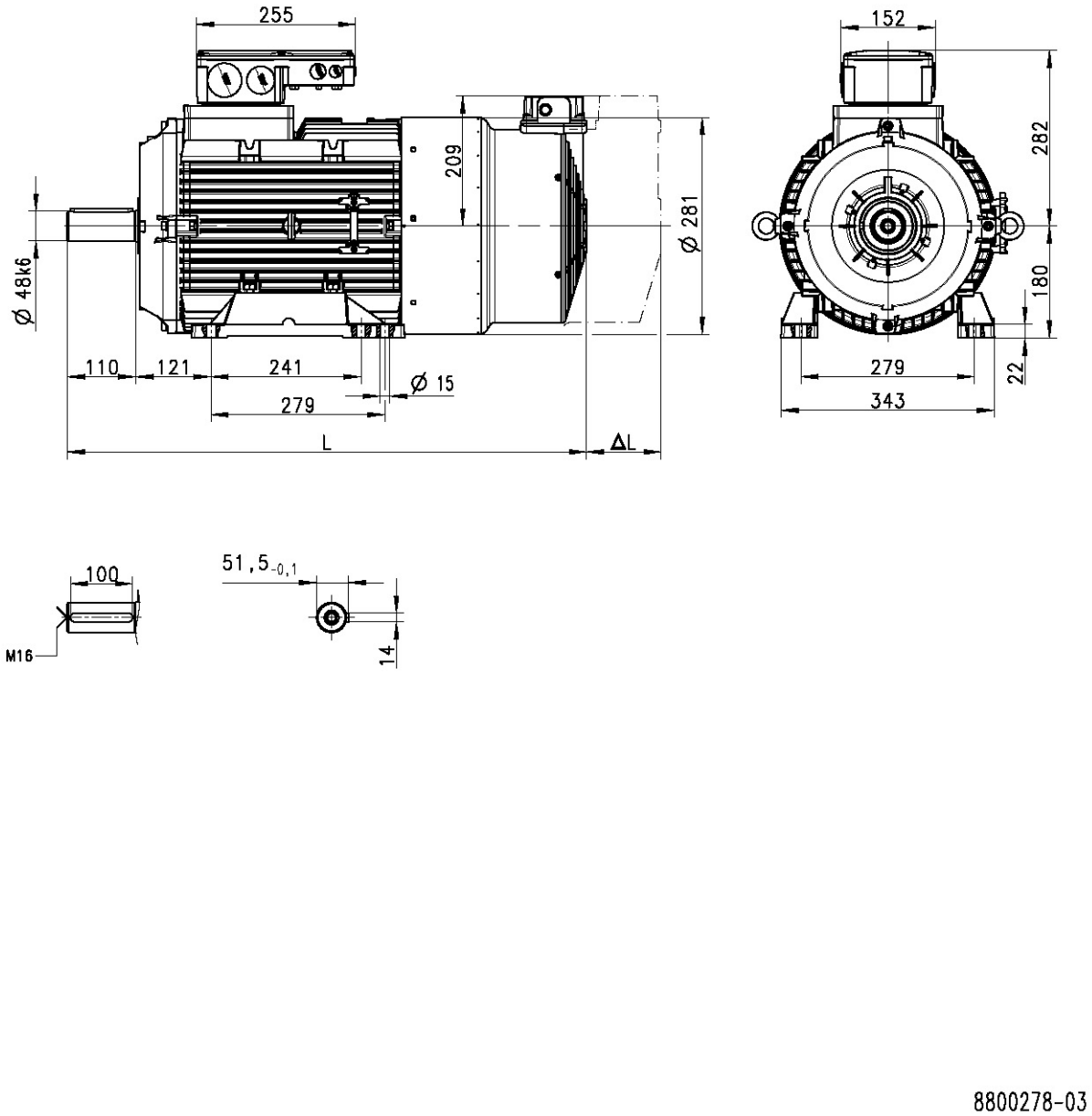
Product			m550-P160/M4	m550-P160/L4
Dimensions				
Motor length	L	[mm]	765	
Length of motor options	Δ L	[mm]	88	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P180

Foot mounting B3



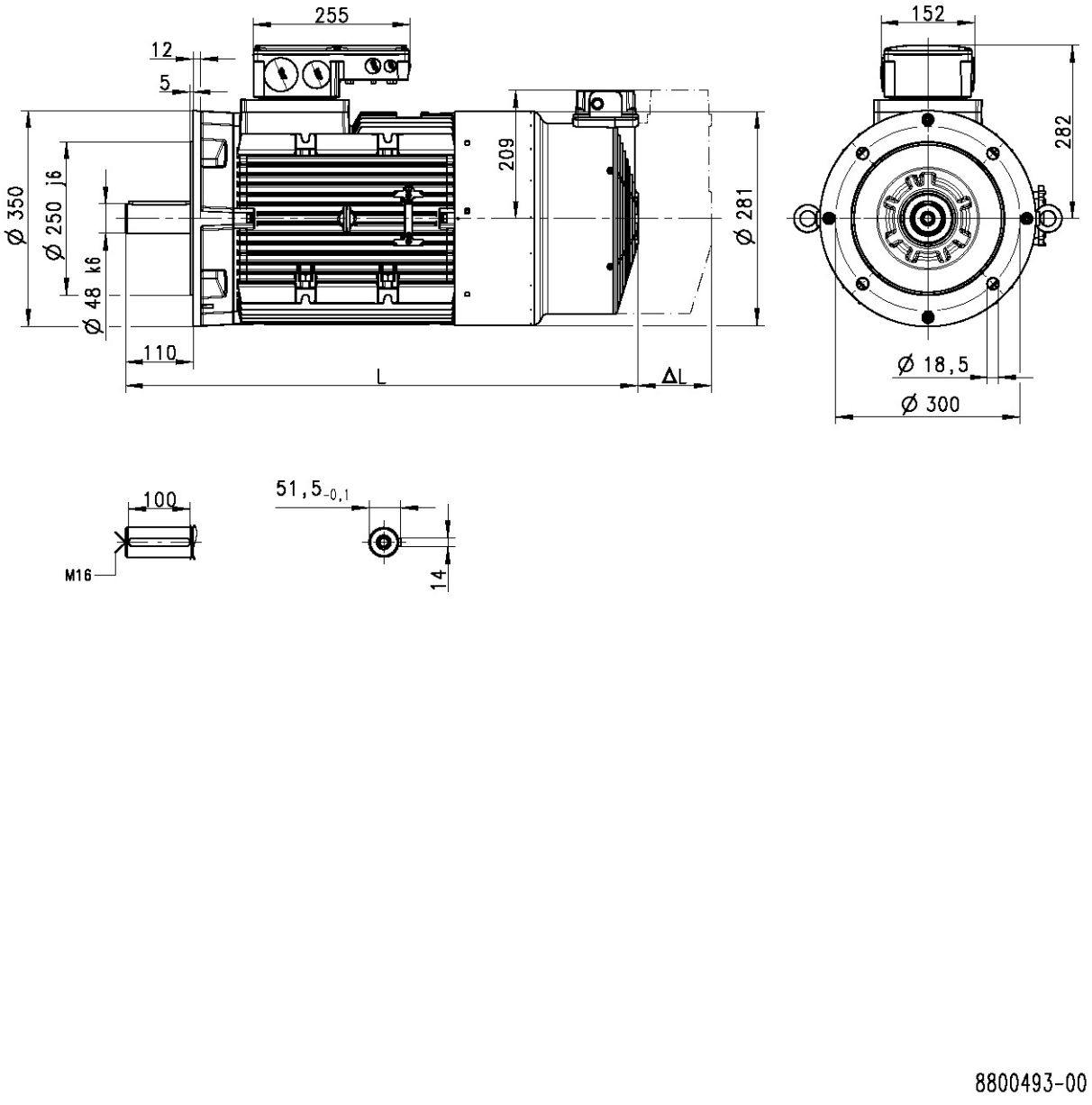
Product			m550-P180/M4	m550-P180/L4
Dimensions				
Motor length	L	[mm]	834	
Length of motor options	Δ L	[mm]	126	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P180

Flange mounting B5



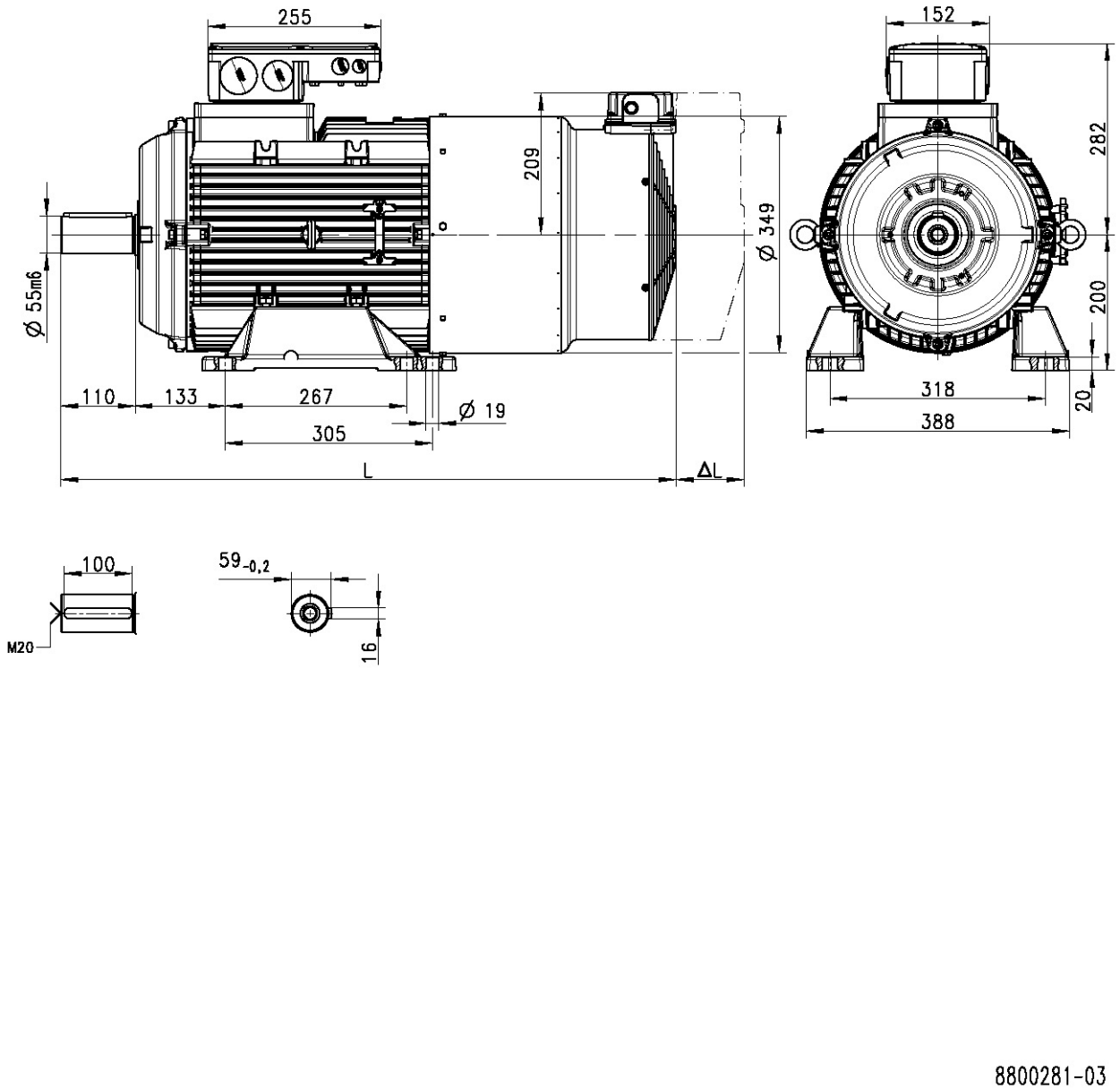
Product			m550-P180/M4	m550-P180/L4
Dimensions				
Motor length	L	[mm]	834	
Length of motor options	Δ L	[mm]	126	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P200

Foot mounting B3



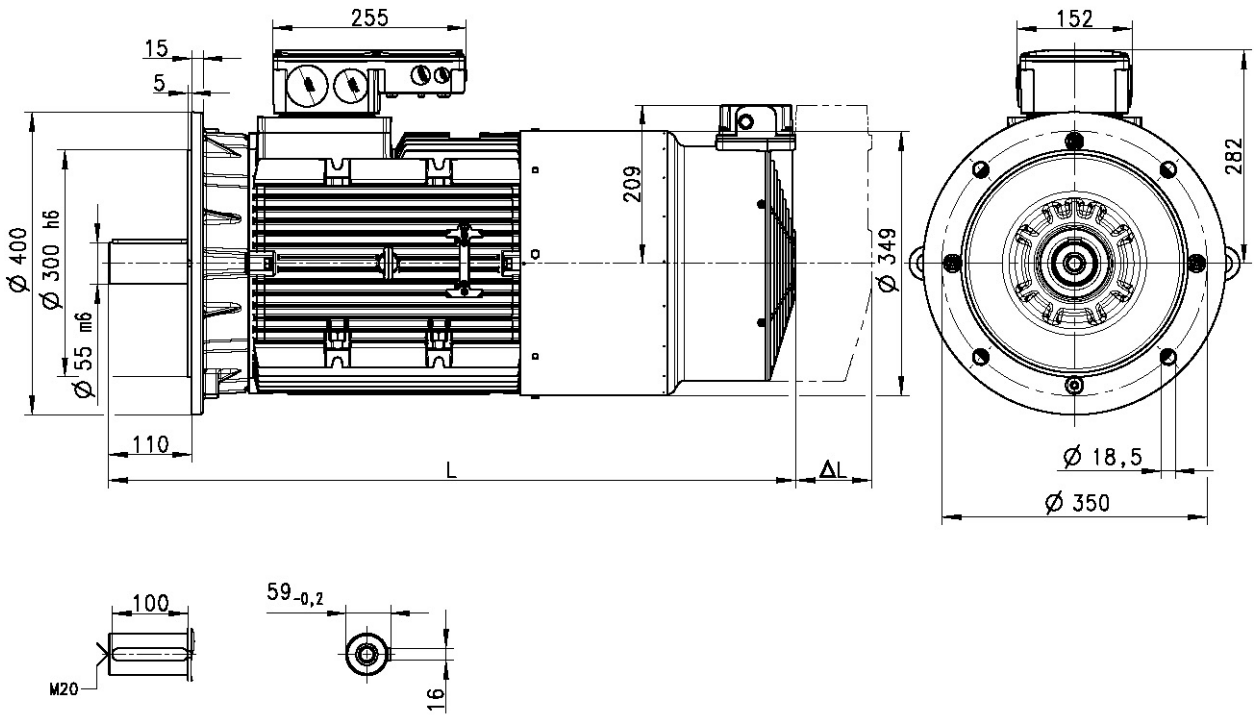
Product			m550-P200/M4
Dimensions			
Motor length	L	[mm]	908
Length of motor options	Δ L	[mm]	105

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P200

Flange mounting B5



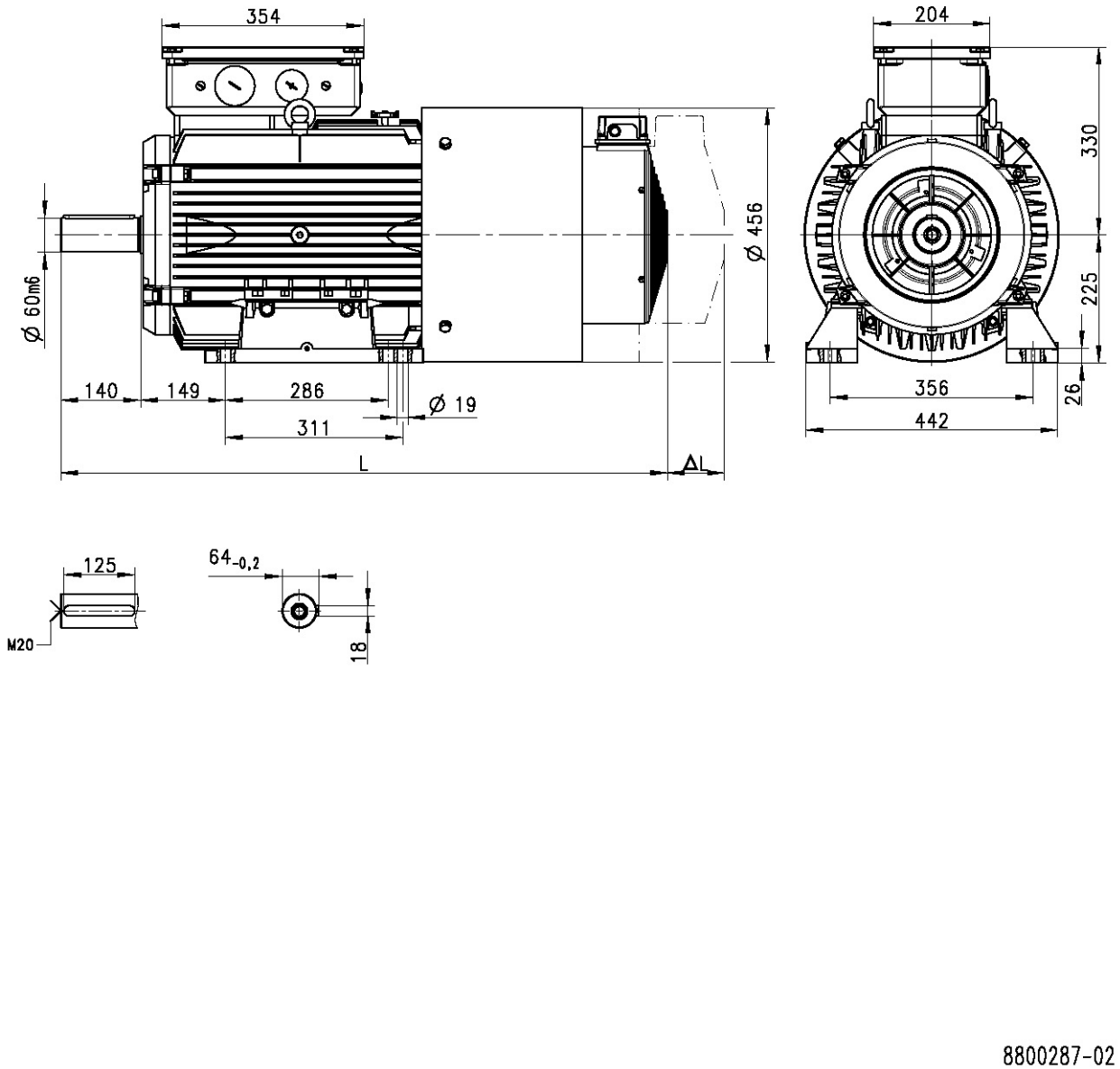
Product			m550-P200/M4
Dimensions			
Motor length	L	[mm]	908
Length of motor options	Δ L	[mm]	105

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P225

Foot mounting B3



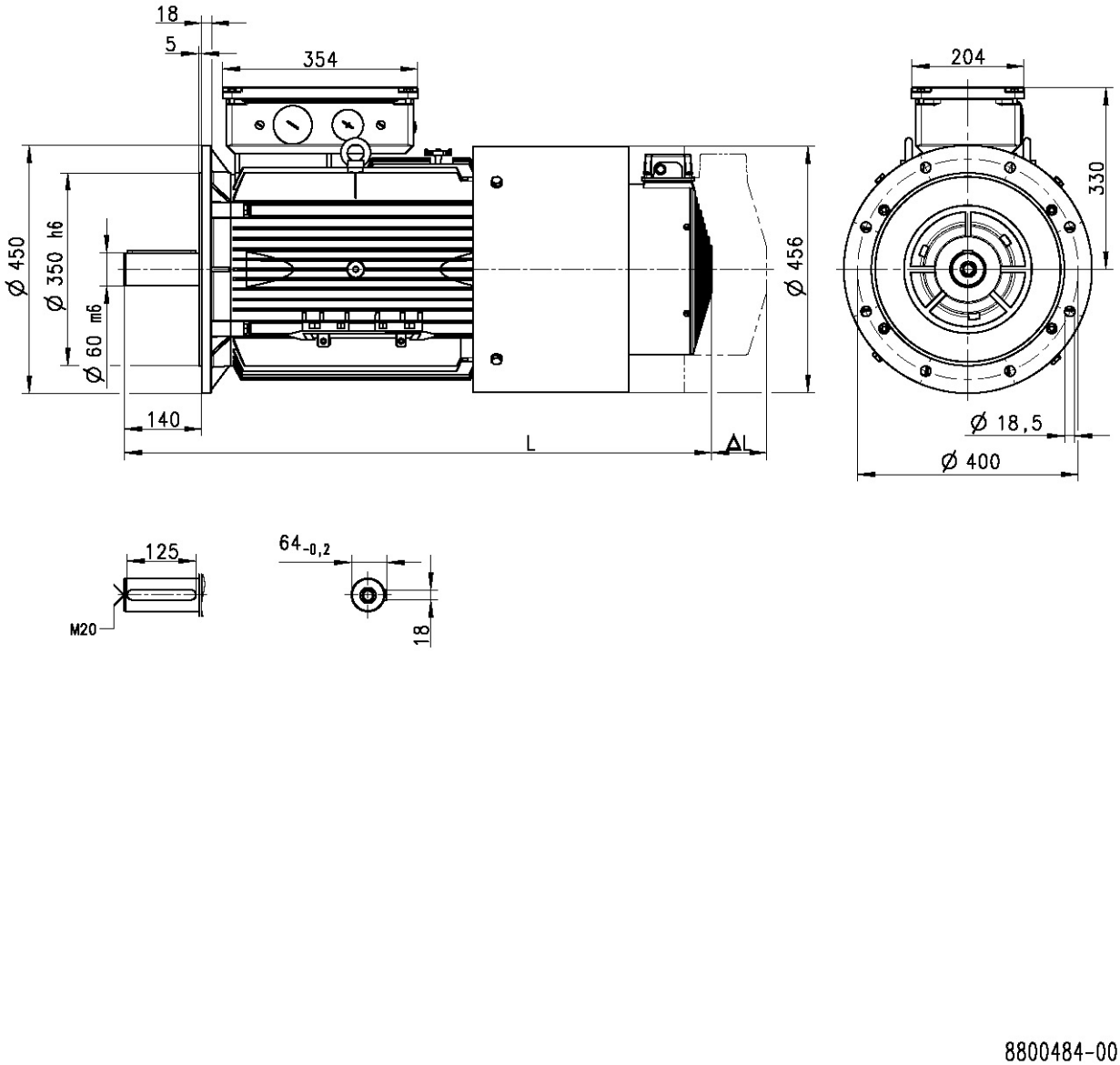
Product			m550-P225/M4	m550-P225/L4
Dimensions				
Motor length	L	[mm]	1066	
Length of motor options	Δ L	[mm]	0	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Dimensions, forced ventilated (4-pole)

m550-P225

Flange mounting B5



Product			m550-P225/M4	m550-P225/L4
Dimensions				
Motor length	L	[mm]	1066	
Length of motor options	Δ L	[mm]	0	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (longest type)

Additional length of the built-on accessories

Dimensions, self-ventilated (4-pole)

Product			m550-P80/M4	m550-P90/M4 m550-P90/L4	m550-P100/M4 m550-P100/L4	m550-P112/M4	m550-P132/M4 m550-P132/L4
			With brake				
Length of motor options	Δ L	[mm]	73	62	76	90	79
			With feedback				
Length of motor options	Δ L	[mm]	97	82	81	80	102
			With brake + feedback				
Length of motor options	Δ L	[mm]	110	99	101	120	124

Product			m550-P160/M4 m550-P160/L4	m550-P180/M4 m550-P180/L4	m550-P200/M4	m550-P225/M4 m550-P225/L4
			With brake			
Length of motor options	Δ L	[mm]	105	103	113	
			With feedback			
Length of motor options	Δ L	[mm]	105	79	78	79
			With brake + feedback			
Length of motor options	Δ L	[mm]	191	182	191	192

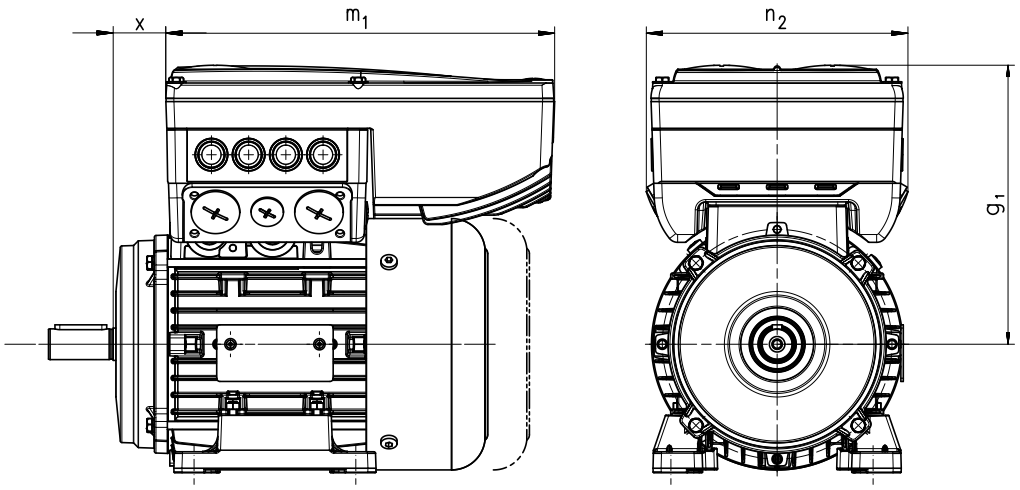
Dimensions, forced ventilated (4-pole)

Product			m550-P80/M4	m550-P90/M4 m550-P90/L4	m550-P100/M4 m550-P100/L4	m550-P112/M4	m550-P132/M4 m550-P132/L4
			With brake				
Length of motor options	Δ L	[mm]	55	53	61	80	
			With feedback				
Length of motor options	Δ L	[mm]	0			80	
			With brake + feedback				
Length of motor options	Δ L	[mm]	55	53	61	80	

Product			m550-P160/M4 m550-P160/L4	m550-P180/M4 m550-P180/L4	m550-P200/M4	m550-P225/M4 m550-P225/L4
			With brake			
Length of motor options	Δ L	[mm]	30	66	60	0
			With feedback			
Length of motor options	Δ L	[mm]	88	66	60	0
			With brake + feedback			
Length of motor options	Δ L	[mm]	88	126	105	0

Dimensions, 8400 motec inverter

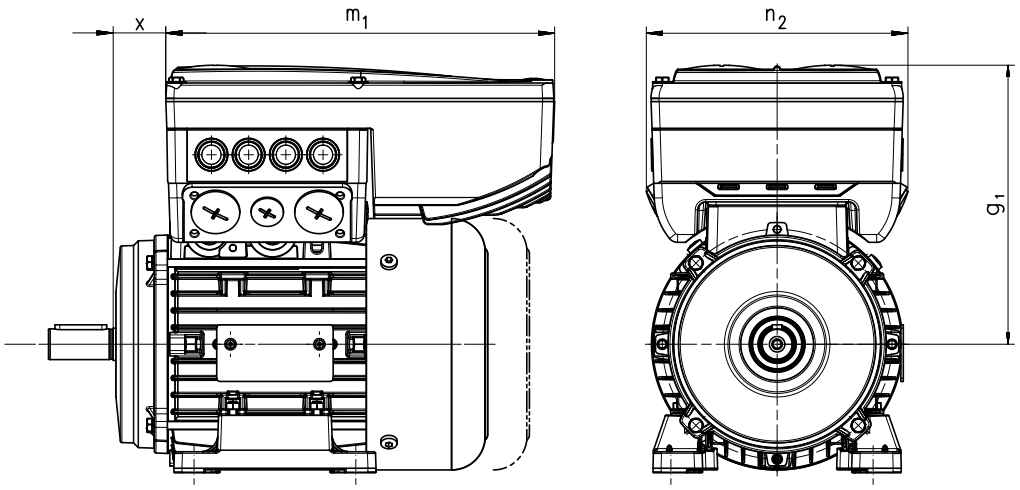
Rated frequency 50/60 Hz



Product	Product key				
	Inverter				
		$g_{1,\ 50Hz}$	$m_{1,\ 50Hz}$	$n_{2,\ 50Hz}$	x_{50Hz}
		[mm]	[mm]	[mm]	[mm]
m550-P80/M4	E84DVB□7514S□□□2□	190	241	161	30.0
m550-P90/M4	E84DVB□1124S□□□2□	198			49.0
m550-P90/L4	E84DVB□1524S□□□2□				
m550-P100/M4	E84DVB□2224S□□□2□	236	260	176	40.0
m550-P100/L4	E84DVB□3024S□□□2□				
m550-P112/M4	E84DVB□4024S□□□2□	300	325	195	34.0
m550-P132/M4	E84DVB□5524S□□□2□	304			46.0
m550-P132/L4	E84DVB□7524S□□□2□				

Dimensions, 8400 motec inverter

Rated frequency 87 Hz



Product	Product key				
	Inverter				
		$g_{1,\ 87Hz}$	$m_{1,\ 87Hz}$	$n_{2,\ 87Hz}$	x_{87Hz}
		[mm]	[mm]	[mm]	[mm]
m550-P80/M4	E84DVB□1524S□□□2□	190	241	161	30.0
m550-P90/M4	E84DVB□2224S□□□2□	227	260	176	47.0
m550-P90/L4	E84DVB□3024S□□□2□				
m550-P100/M4	E84DVB□4024S□□□2□	292	325	195	27.0
m550-P100/L4	E84DVB□5524S□□□2□				
m550-P112/M4	E84DVB□7524S□□□2□	300			34.0

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) - Optional measures: • Motor recesses sealed off (on request)
OKS-XL (extra Large)	• External installation • Air humidity above 95 % • Chemical industry plants • Food industry • Coastal areas with moderate salinity	Additional measures for surface and corrosion protection system L: • Rotor package and stator in the inner area primed with finishing varnish

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	Standard: RAL 7012 Optional: RAL Classic
OKS-M (medium)	Comparable to C2	2K PUR priming coat 2K-PUR top coat	
OKS-L (high) OKS-XL (extra Large)	Comparable to C3		
OKS-XL (extra Large)	Comparable to C4	Dipping primer of the grey iron parts 2K-EP priming coat (two times) 2K-PUR top coat	

Motor connection

The IE3 three-phase AC motors m550 are intended for inverter operation; mains operation, however, is also possible.
For 50 Hz operation, the motors are to be actuated in Δconnection with 230 V or in star/delta connection with 400 V.
For 60 Hz operation, the motors are to be actuated in star/delta connection with 460 V.
For inverter operation at 87 Hz, a rated voltage of 400 V in Δconnection has been defined.

The standard connection is implemented via a terminal box. Furthermore ICN and HAN connectors are provided to quickly carry out commissioning or maintenance operations.

Overview of the connection options

Product	m550-P80/M4	m550-P90/M4 m550-P90/L4	m550-P100/M4 m550-P100/L4	m550-P112/M4	m550-P132/M4 m550-P132/L4
Power connection/brake connection					
Terminal box	●	●	●	●	●
ICN connector M23	●	●	●	●	●
HAN 10E connector	●	●	●	●	
HAN modular connector	●	●	●	●	●
Feedback connection					
Terminal box	●	●	●	●	●
ICN connector M23	●	●	●	●	●
ICN connector M12 [1]	●	●	●	●	●
Blower connection					
Terminal box	●	●	●	●	●
ICN connector M17	●	●	●	●	●
Temperature sensor connection					
Terminal box	●	●	●	●	●
ICN connector M23 [2]	●	●	●	●	●
HAN 10E connector	●	●	●	●	
HAN modular connector	●	●	●	●	●

[1] Connection for IG128-24V-H incremental encoder
[2] TCO or PTC connected in the power connection and PT1000 connected in the feedback connection.

Motor connection

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 Δconfiguration 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 Δconfiguration.

The standard connection is implemented via a terminal box. Furthermore ICN and HAN connectors are provided to quickly carry out commissioning or maintenance operations.

Overview of the connection options

Product	m550-P80/M4	m550-P90/M4 m550-P90/L4	m550-P100/M4 m550-P100/L4	m550-P112/M4	m550-P132/M4 m550-P132/L4
Power connection/brake connection					
Terminal box	●	●	●	●	●
ICN connector M23	●	●	●	●	●
HAN 10E connector	●	●	●	●	
HAN modular connector	●	●	●	●	●
Feedback connection					
Terminal box	●	●	●	●	●
ICN connector M23	●	●	●	●	●
ICN connector M12 [1]	●	●	●	●	●
Blower connection					
Terminal box	●	●	●	●	●
ICN connector M17	●	●	●	●	●
Temperature sensor connection					
Terminal box	●	●	●	●	●
ICN connector M23 [2]	●	●	●	●	●
HAN 10E connector	●	●	●	●	
HAN modular connector	●	●	●	●	●

Product	m550-P160/M4 m550-P160/L4	m550-P180/M4 m550-P180/L4 m550-P180/V4	m550-P200/M4	m550-P225/M4 m550-P225/L4
Power connection/brake connection				
Terminal box	●	●	●	●
ICN connector M23				
HAN 10E connector				
HAN modular connector	●			
Feedback connection				
Terminal box	●	●	●	●
ICN connector M23				
ICN connector M12 [1]	●	●	●	●
Blower connection				
Terminal box	●	●	●	●
ICN connector M17	●	●	●	●
Temperature sensor connection				
Terminal box	●	●	●	●
ICN connector M23 [2]				
HAN 10E connector				
HAN modular connector	●			

[1] Connection for IG128-24V-H incremental encoder
[2] TCO or PTC connected in the power connection and PT1000 connected in the feedback connection.

Motor connection

Assignment: motor terminal box - built-on accessories

► Depending on the motor version, terminal boxes of different sizes (KK1 ... KK4) are used.

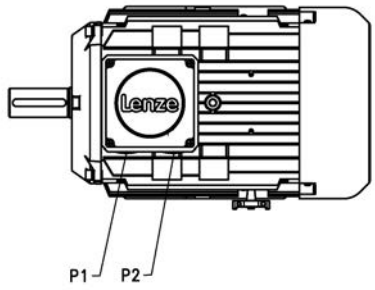
Product	m550-P80/M4	m550-P90/M4 m550-P90/L4	m550-P100/M4 m550-P100/L4	m550-P112/M4	m550-P132/M4 m550-P132/L4
Built-on accessories with 1 thermal sensor					
Without	KK1 KK1 + ICN HAN 10 E HAN modular	KK1 KK1 + ICN HAN 10 E HAN modular	KK1 KK1 + ICN HAN 10 E HAN modular	KK1 KK1 + ICN HAN 10 E HAN modular	KK3 KK3 + ICN HAN modular
Feedback	KK2 KK2 + ICN	KK2 KK2 + ICN	KK2 KK2 + ICN	KK2 KK2 + ICN	KK3 KK3 + ICN
Brake	KK2 KK2 + ICN HAN 10 E HAN modular	KK2 KK2 + ICN HAN 10 E HAN modular	KK2 KK2 + ICN HAN 10 E HAN modular	KK2 KK2 + ICN HAN 10 E HAN modular	KK3 KK3 + ICN HAN modular
Brake + Feedback	KK3 KK2 + ICN	KK3 KK2 + ICN	KK3 KK2 + ICN	KK3 KK2 + ICN	KK3 KK3 + ICN
Built-on accessories with 2 thermal sensors					
Without	KK2	KK2	KK2	KK2	KK3
Feedback	KK2	KK2	KK2	KK2	KK3
Brake (2-pole terminal)	KK2	KK2	KK2	KK2	KK3
Brake (rectifier)	KK3	KK3	KK3	KK3	KK3
Brake + Feedback	KK3	KK3	KK3	KK3	KK3

Product	m550-P160/M4 m550-P160/L4	m550-P180/M4 m550-P180/L4 m550-P180/V4	m550-P200/M4	m550-P225/M4 m550-P225/L4
Built-on accessories with 1 thermal sensor				
Without	KK4 HAN modular	KK4	KK4	KK4
Feedback	KK4	KK4	KK4	KK4
Brake	KK4 HAN modular	KK4	KK4	KK4
Brake + Feedback	KK4	KK4	KK4	KK4
Built-on accessories with 2 thermal sensors				
Without	KK4	KK4	KK4	KK4
Feedback	KK4	KK4	KK4	KK4
Brake (2-pole terminal)	KK4	KK4	KK4	KK4
Brake (rectifier)	KK4	KK4	KK4	KK4
Brake + Feedback	KK4	KK4	KK4	KK4

Connection via terminal box

The connection in the terminal box is implemented by means of conventional cable glands.

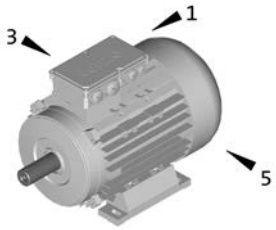
Cable entries for motors with terminal box KK1



Product	Dimensions	
	P_1	P_2
	[mm]	[mm]
m550-P80/M4	M20x1.5	M25x1.5
m550-P90/M4 m550-P90/L4		
m550-P100/M4 m550-P100/L4		
m550-P112/M4		

For IEC standard motors with terminal box KK1, the position of the cable entry can be selected.

Position of the cable entry for IEC standard motors

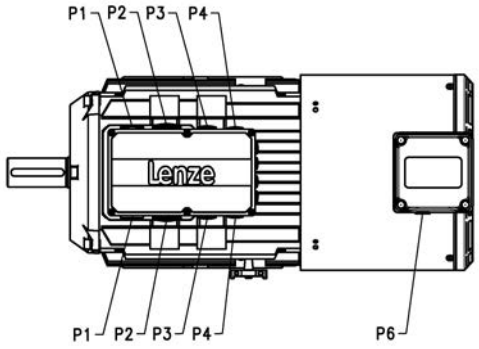


Possible cable entry position	1/3/5*

► If preferred positions are not specified in the order, the cable entry will be positioned as indicated by * on the diagram below.

Connection via terminal box

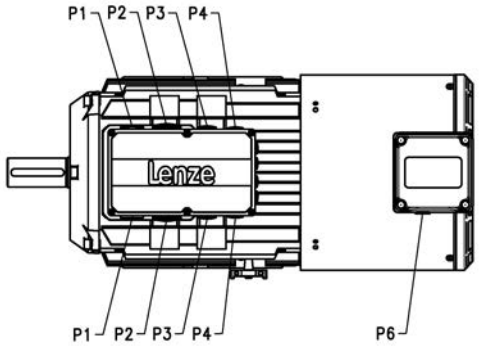
Cable entries for motors with terminal box KK2



Product	Dimensions				
	P_1	P_2	P_3	P_4	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]
m550-P80/M4	M20x1.5	M25x1.5			M16x1.5
m550-P90/M4 m550-P90/L4					
m550-P100/M4 m550-P100/L4					
m550-P112/M4					

Connection via terminal box

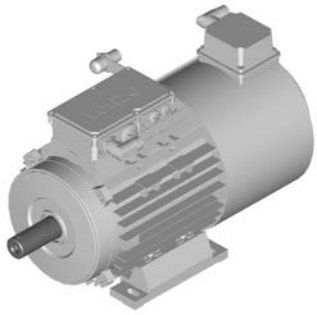
Cable entries for motors with terminal box KK3 and KK4



Product	Dimensions				
	P_1	P_2	P_3	P_4	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]
m550-P80/M4	M25x1.5	M32x1.5	M20x1.5	M16x1.5	M16x1.5
m550-P90/M4 m550-P90/L4					
m550-P100/M4 m550-P100/L4					
m550-P112/M4					
m550-P132/M4 m550-P132/L4					
m550-P160/M4 m550-P160/L4	M50x1.5	M40x1.5			
m550-P180/M4 m550-P180/L4 m550-P180/V4					
m550-P200/M4					
m550-P225/M4 m550-P225/L4	M12x1.5	M63x1.5	M50x1.5	M12x1.5	

Connections via ICN connectors

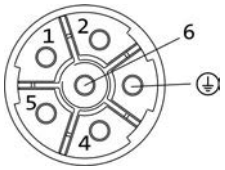
A connector is used for the power connection, connection of the brake, and the temperature monitoring connection.
The feedback and blower connections are implemented via a separate connector in each case.



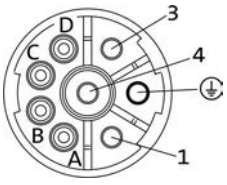
Connection for power, brake and temperature monitoring

For the power connection of the connector, a max. rated motor current of 16 A is permissible.
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 M23 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	

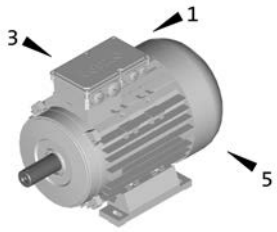
► ICN M23 8-pole

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 Thermal detector: +PT1000/+KTY	
B	TB2 / TP2 R2	Thermal sensor: TKO/PTC Thermal detector: -PT1000/-KTY	
C	BD1 / BA1	Brake +/AC	
D	BD2 / BA2	Brake -/AC	

Connections via ICN connectors

Connection for power, brake and temperature monitoring

For IEC standard motors, the position of the connector can be selected.

Position of the connector for IEC standard motors


Terminal box KK1

Possible cable entry position	1/3/5*

Terminal box KK2 and KK3

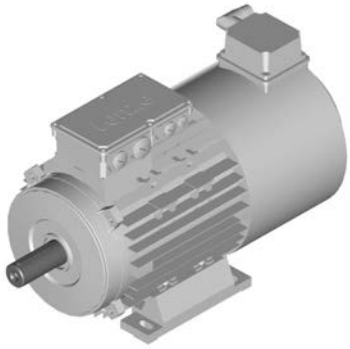
Possible connection position	3/5*

► If preferred positions are not specified in the order, the cable entry will be positioned as indicated by * on the diagram below.

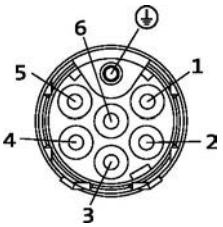
Connections via ICN connectors

Blower connection

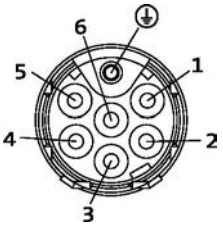
The blower is also optionally available with an ICN connector fixed to the terminal box of the blower for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing counter plugs can therefore continue to be used 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			

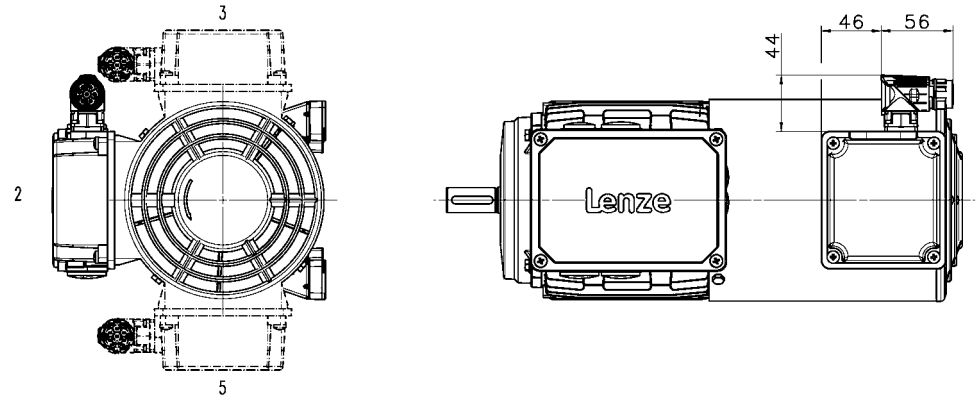
► Blower 3-ph

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	

Connections via ICN connectors

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.

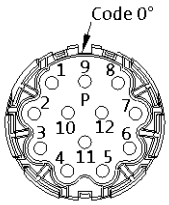


Connections via ICN connectors

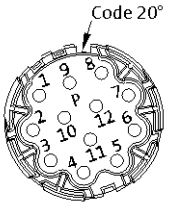
Feedback connection

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.
The feedback connector is located on the terminal box side opposite to the power connection

► 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	+PT1000/+KTY	PT1000/KTY thermal detector	
12	-PT1000/-KTY		

► 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	+PT1000/+KTY	PT1000/KTY thermal detector	
12	-PT1000/-KTY		

Connection via ICN M12 connector

IG128-24V-H incremental encoder connection

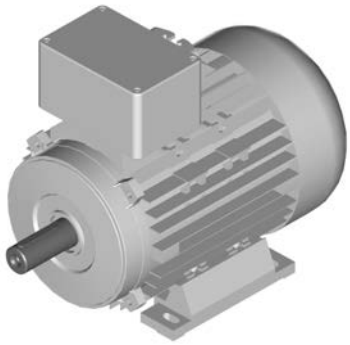
As a standard this incremental encoder is equipped with a connection cable of about 0.5 m length and with a common industry standard M12 connector at its end.

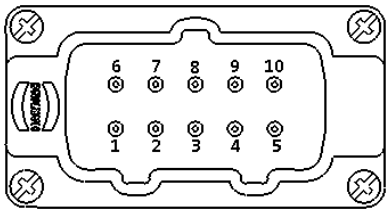
Pin assignment			
Contact	Designation	Meaning	
1	$+U_B$	Supply +	
2	B	Track B	
3	GND	Mass	
4	A	Track A	

Connections via HAN connectors

HAN 10 E

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.

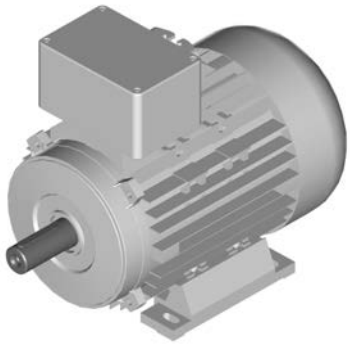


Pin assignment		
Contact	Meaning	
1	Terminal board: U1	
2	Terminal board: V1	
3	Terminal board: W1	
4	Brake +/AC	
5	Brake -/AC	
6	Terminal board: W2	
7	Terminal board: U2	
8	Terminal board: V2	
9	Thermal sensor: TKO/PTC Thermal detector: +PT1000/+KTY	
10	Thermal sensor: TKO/PTC Thermal detector: -PT1000/-KTY	

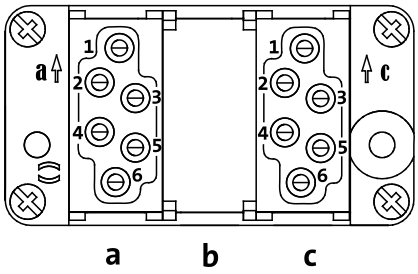
Connections via HAN connectors

HAN modular

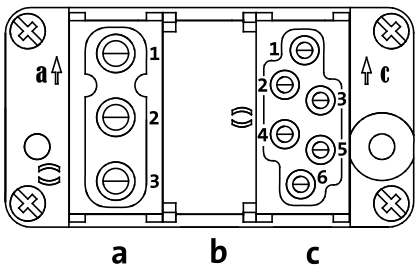
The connector is available with two different power modules (16 A or 40 A), depending on the rated motor current. The motor connection is determined in the terminal box and must be checked before commissioning.



► HAN modular 16 A

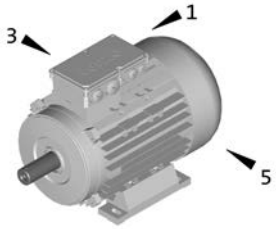
Pin assignment			
Module	Contact	Meaning	
A	1	Terminal board: U1	
	2	Terminal board: V1	
	3	Terminal board: W1	
B		Dummy module	
C	1	Thermal sensor: TKO/PTC Thermal detector: +PT1000/+KTY	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: TKO/PTC Thermal detector: -PT1000/-KTY	

► 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: TKO/PTC Thermal detector: +PT1000/+KTY	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: TKO/PTC Thermal detector: -PT1000/-KTY	

Connections via HAN connectors

For IEC standard motors, the position of the cable entry can be selected.

Position of the cable entry for IEC standard motors


Possible cable entry position	1*/3/5

► If preferred positions are not specified in the order, the cable entry will be positioned as indicated by * on the diagram below.

Spring-applied brake

The three-phase AC motors can be equipped with a spring-applied brake which is active when the supply voltage has been switched off (closed-circuit principle). In the deenergised state, the brake is applied. This prevents possible movement of the motor shaft with regard to the load after switch-off or in the event of a power failure.
For optimum adaptation of the brake motor to the application, several brake sizes and control variants are provided for each motor.

Versions

- **Standard**
  - 1 x 10^6 repeating switching cycles
  - 1 x 10^6 reversing switching cycles
- **LongLife**
  - 10 x 10^6 repeating switching cycles
  - 15 x 10^6 reversing switching cycles

Braking torques

In addition to the standard braking torque, depending on the brake size, the possibility of choosing between a reduced and an increased braking torque is provided.

- When the braking torque is reduced, great wear reserves can be attained. This is enabled by a reduction of the spring rate.
- In order to obtain a greater braking torque, the spring rate is increased. This is practical, for instance, for hoists, since here the gravity acts as an additional acceleration in the negative direction.

Manual release

By using the manual release lever, the brake can be released manually in deenergised operating state. The manual release makes positioning and maintenance work easier.

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 for protection against induction peaks.

- Supply voltages
  DC 24 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:

Rectifier, 6-pole

- Approval UL / CSA
- Supply voltages
  AC 230 V
  AC 400 V
  AC 460 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

During the switching operation the bridge/half-wave rectifier functions as a bridge rectifier for the overexcitation time $t_{ü}$ 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 $t_{ü}$ 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

Assignment of 4-pole motors and brakes

Design	Standard	LongLife

Product	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
m550-P80/M4	08 08 10	3.50 8.00 7.00	08 10	8.00 7.00
m550-P90/M4 m550-P90/L4	08 08 10 10 10	3.50 8.00 7.00 16.0 23.0	08 10 10	8.00 7.00 16.0
m550-P100/M4	10 10 12 12	7.00 16.0 14.0 32.0	10 12 12	16.0 14.0 32.0
m550-P100/L4	10 10 12 12 12	7.00 16.0 14.0 32.0 46.0		
m550-P112/M4	12 12 14 14	14.0 32.0 35.0 60.0		
m550-P132/M4	14 14 16 16	35.0 60.0 60.0 80.0		
m550-P132/L4	14 14 16 16 16	35.0 60.0 60.0 80.0 100		

Spring-applied brake

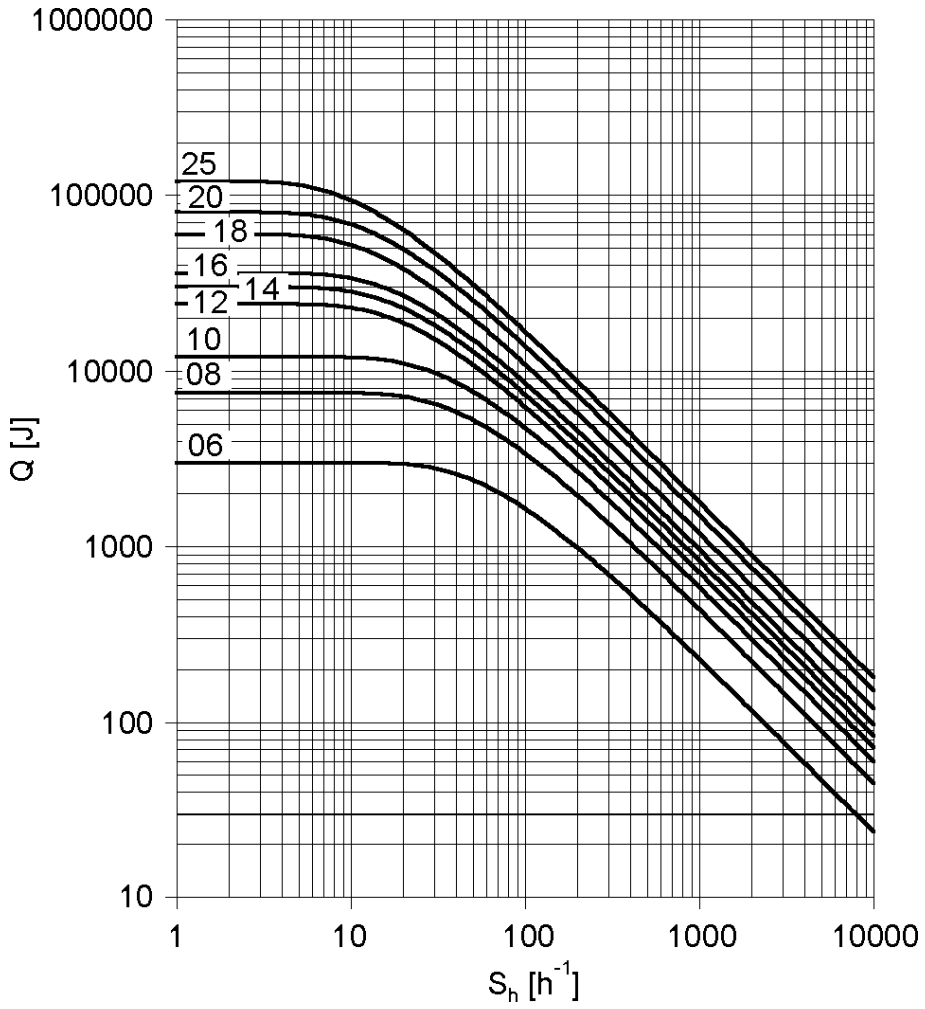
Assignment of 4-pole motors and brakes

Design	Standard	LongLife

Product	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
m550-P160/M4	16 16 18 18	60.0 80.0 80.0 150		
m550-P160/L4	18 18 18	80.0 150 200		
m550-P180/M4	18 18 20 20	80.0 150 145 260		
m550-P180/L4	18 18 20 20 20	80.0 150 145 260 315		
m550-P180/V4 m550-P200/M4	18 18 20 20 20 20	80.0 150 145 260 315 400		
m550-P225/M4	25 25 25	265 400 490		
m550-P225/L4	25 25 25 25	265 400 490 600		

Spring-applied brake

Permissible friction energy



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

Spring-applied brake

Rated data with reduced braking torque

- ► In case of the braking torque and the maximum switching energy, the unit for the values (100 ... 3600) isr/min.
- ► 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	[kgcm²]	0.15	0.61	2.00	4.50	6.30	15.0	29.0	73.0	200
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 %.

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											
	$t_{ü}$	[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.

Spring-applied brake

Rated data with standard braking torque

- ► In case of the braking torque and the maximum switching energy, the unit for the values (100 ... 3600) isr/min.
- ► 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											
	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm²]	0.15	0.61	2.00	4.50	6.30	15.0	29.0	73.0	200
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 %.

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											
	$t_{ü}$	[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.

Spring-applied brake

Rated data with increased braking torque

- ► In case of the braking torque and the maximum switching energy, the unit for the values (100 ... 3600) isr/min.
- ► 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												
	$S_{hü}$	[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	[kgcm²]	2.00	4.50	6.30	15.0	15.0	29.0	73.0	73.0	200	200
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

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												
	$t_{ü}$	[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												
	$t_{ü}$	[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

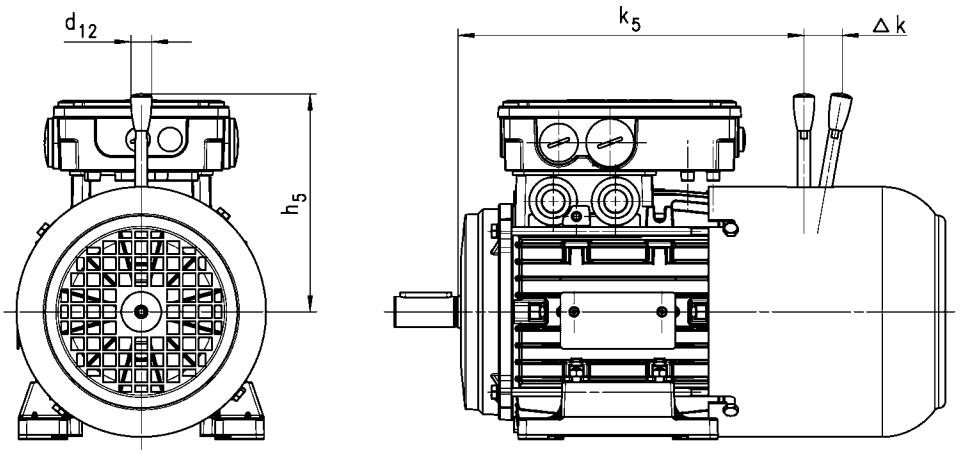
► The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.

Spring-applied brake

Manual release

By using the manual release lever, the brake can be released manually in deenergised operating state. The manual release makes positioning and maintenance work easier.

Manual release lever for IEC motors



	Size	Dimensions			
	Brake				
		k_5	Δk	h_5	d_{12}
		[mm]	[mm]	[mm]	[mm]
m550-P80/M4	08 10	246 257	27 28	136 132	13.0 13.0
m550-P90/M4 m550-P90/L4	08 10	291 302	27 28	136 132	13.0 13.0
m550-P100/M4 m550-P100/L4	10 12	338 340	28 37	132 161	13.0 13.0
m550-P112/M4	12 14	358 360	37 41	161 195	13.0 24.0
m550-P132/M4 m550-P132/L4	14 16	405 407	41 55	195 240	24.0 24.0
m550-P160/M4	16 18	479 484	55 59	240 279	24.0 24.0
m550-P160/L4	18	484	59	279	24.0
m550-P180/M4	18 20	552 559	59 74	279 319	24.0 24.0
m550-P180/L4	18 20	552 559	59 74	279 319	24.0 24.0
m550-P200/M4	18 20	620 626	59 74	279 319	24.0 24.0
m550-P225/M4 m550-P225/L4	25	650	103	445	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

Temperature monitoring

To protect the motor against overheating, the following thermal sensors are provided.
The thermal sensors are integrated into the windings. We recommend using an additional motor protection switch.

TKO thermal contacts

The TCO thermal contact (thermal NC contact) is a bimetallic-element switch. The TCO monitors the motor winding temperature; at too high temperatures, the motor relay switches. The motor is disconnected from the mains.

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

PTC thermistor

The PTC thermistor is actuated in connection with a tripping unit. If the motor gets too hot, the motor can be switched off by means of a contactor. In contrast to the thermal contact, quick restart is possible.

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

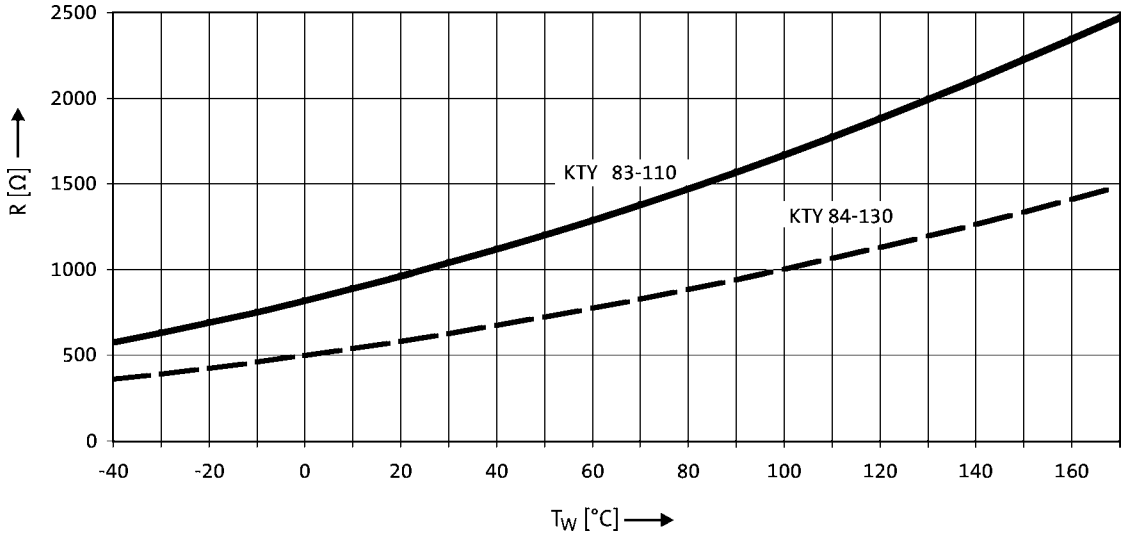
Temperature monitoring

KTY temperature sensor

The thermal detectors work as continuously variable resistors, showing a similar tendency as PTC thermistors. However, with an increasing temperature, the resistance only increases comparatively slowly, enabling the controller to determine the temperature at regular intervals and to already perform a process evaluation at an early stage. In this way, the motor can already be switched off before it is overheated.

	Function	Rated resistance			Max. input current	
		25 °C	150 °C	170 °C	25 °C	170 °C
		R_N	R_N	R_N	$I_{in,max}$	$I_{in,max}$
		[Ω]	[Ω]	[Ω]	[A]	[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

Variation of resistance

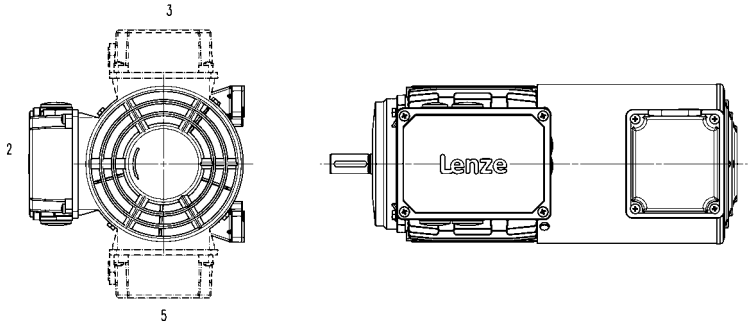


► If the thermal sensor is supplied with a measurement current of 1 mA, the relationship shown in the diagram between the temperature and the resistance measured applies.

Blower

During operation with the rated torque at low speeds (< 20 Hz), the integral fan does not rotate fast enough anymore to ensure sufficient cooling of the motor. In order to prevent overheating, operation without a blower requires a torque reduction of the motor.
The blower cools the motor steadily and irrespective of the motor speed. A torque reduction is not required and the motor can be actuated with its rated torque from 5 Hz to the rated frequency.

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



Rated data for 50 Hz

Product	Number of phases	Connection method				
			$U_{N, AC}$	P_N	I_N	m
			[V]	[kW]	[A]	[kg]
m550-P80/M4	1		230	0.036	0.16	2.30
	3	Δ		0.020	0.088	
		Y	400		0.051	
m550-P90/M4 m550-P90/L4	1		230	0.038	0.19	2.70
	3	Δ		0.036		
		Y	400		0.11	
m550-P100/M4 m550-P100/L4	1		230	0.044	0.20	3.00
	3	Δ		0.043	0.19	
		Y	400		0.11	
m550-P112/M4	1		230	0.050	0.23	3.10
	3	Δ		0.054	0.20	
		Y	400		0.11	
m550-P132/M4 m550-P132/L4	1		230	0.095	0.42	4.20
	3	Δ		0.091	0.33	
		Y	400		0.19	
m550-P160/M4 m550-P160/L4	1		230	0.22	0.97	6.20
	3	Δ		0.21	0.68	
		Y	400		0.39	

Blower

Rated data for 50 Hz

Product	Number of phases	Connection method				
			$U_{N, AC}$	P_N	I_N	m
			[V]	[kW]	[A]	[kg]
m550-P180/M4 m550-P180/L4 m550-P180/V4	1		230	0.22	0.97	8.00
	3	Δ		0.21	0.68	
		Y	400		0.39	
m550-P200/M4	1		230	0.22	0.97	
	3	Δ		0.21	0.68	
		Y	400		0.39	
m550-P225/M4 m550-P225/L4	1		230	0.22	0.97	15.0
	3	Δ		0.21	0.68	
		Y	400		0.39	

Rated data for 60 Hz

Product	Number of phases	Connection method				
			$U_{N, AC}$	P_N	I_N	m
			[V]	[kW]	[A]	[kg]
m550-P80/M4	3	Y	460	0.028	0.053	2.30
m550-P90/M4 m550-P90/L4				0.047	0.11	2.70
m550-P100/M4 m550-P100/L4				0.059		3.00
m550-P112/M4				0.074	0.12	3.10
m550-P132/L4 m550-P132/M4				0.13	0.21	4.20
m550-P160/M4 m550-P160/L4				0.33	0.47	6.20
m550-P180/M4 m550-P180/L4 m550-P180/V4						8.00
m550-P200/M4						
m550-P225/L4 m550-P225/M4						15.0

Feedback

Depending on the application, the following resolvers, incremental encoders or absolute value encoders are provided for speed and position detection.

Resolver

The stator-supplied resolver with two stator windings shifted by 90° and a rotor winding with transformer winding can detect both the speed and the rotor position. The rotor position is retained in the event of a voltage failure.

► 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		± 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

Feedback

Incremental encoder and SinCos absolute value encoder

Incremental encoders can only be used for speed measurement, but not for speed control. Homing is required in order to enable positioning later.

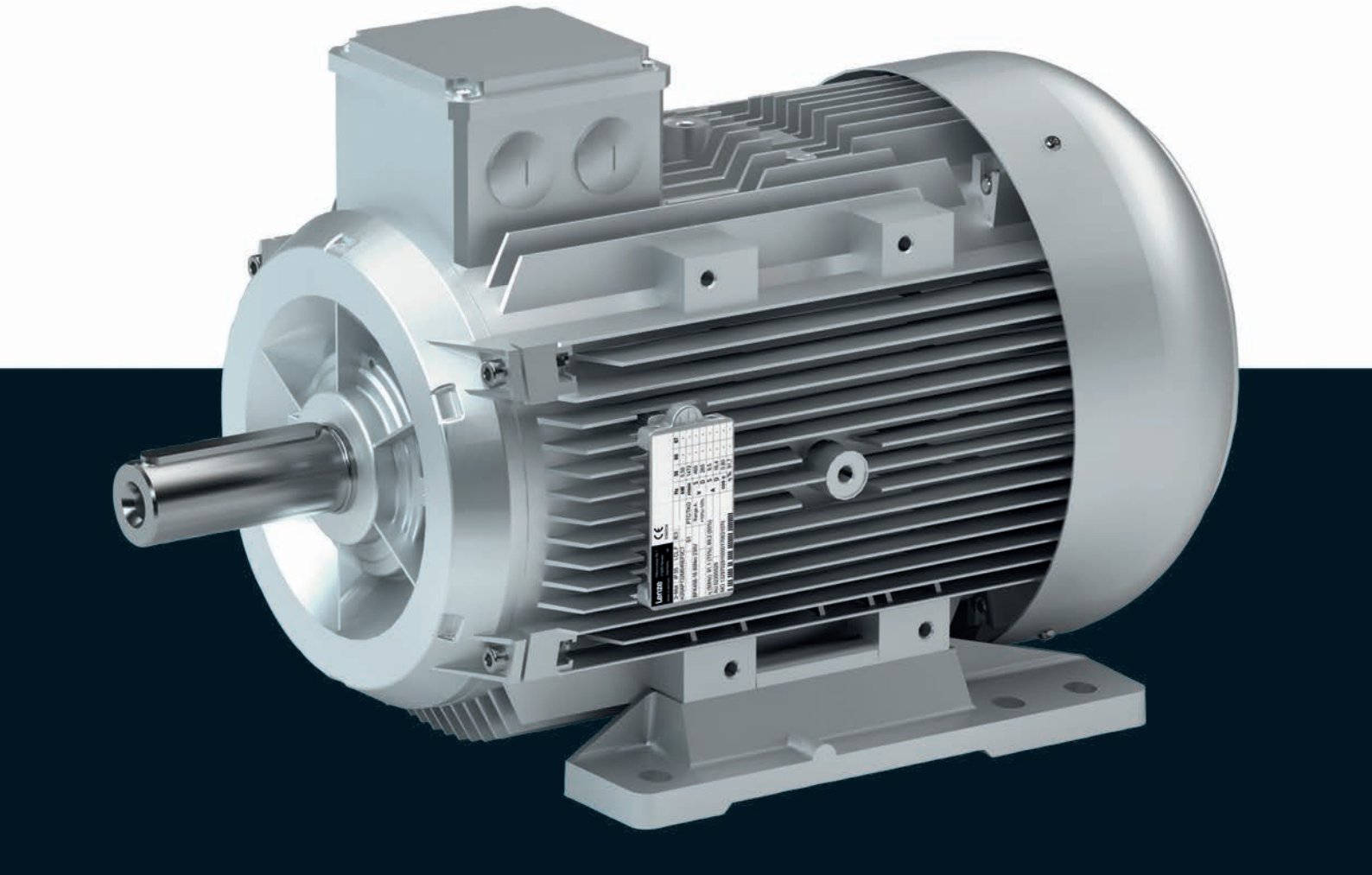
Absolute value encoders can detect the speed, the rotor position, and the machine position with a very high resolution. They are used for the positioning of dynamic applications and do not require homing.

► 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										
DC	$U_{in,min}$	[V]	8.00				4.75			7.00
Max. input voltage										
DC	$U_{in,max}$	[V]	26.0	30.0			5.25			12.0
Max. current consumption										
	I_{max}	[A]	0.040	0.15						0.080
Limit frequency										
	f_{max}	[kHz]	30.0	160			300			200

IE3 three-phase AC motors m240-P

Mains operation 0.75 ... 45 kW



IE3 three-phase AC motors m240-P

Contents

List of abbreviations

$\eta_{100\,\%}$	[%]	Efficiency
$\eta_{75\,\%}$	[%]	Efficiency
$\eta_{50\,\%}$	[%]	Efficiency
cos ϕ		Power factor
I_N	[A]	Rated current
I_{max}	[A]	Max. current consumption
J	[kgcm²]	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

Mains-operated motors

In a power range of 0.12 to 45 KW, Lenze offers mains-operated three-phase AC motors for basic tasks.

These drives differ from each other with regard to their efficiency class and can be used for the types required for mains operation.

Customer benefit

- Different efficiency classes for the greatest economic benefit
- Saving of space by compact direct mounting to Lenze gearboxes
- Optimum adaptation of the brake reaction by optional holding brakes and service brakes
- Optional overheat control by temperature monitoring

Motor	Efficiency class	Power range	Mains voltage	Mains frequency
MD three-phase AC motor	IE1 motor	0.12 ... 22 kW	230/400 and 460 V	50 and 60 Hz
MH three-phase AC motor	IE2 motor	0.75 ... 45 kW	230/400 and 460 V	50 and 60 Hz
m240-P three-phase AC motor	IE3 motor	0.75 ... 45 kW	230/400 V	50 Hz
Lenze Smart Motor m300		1.75 and 5 Nm	400 ... 460 V	50 and 60 Hz

Product information

The product name

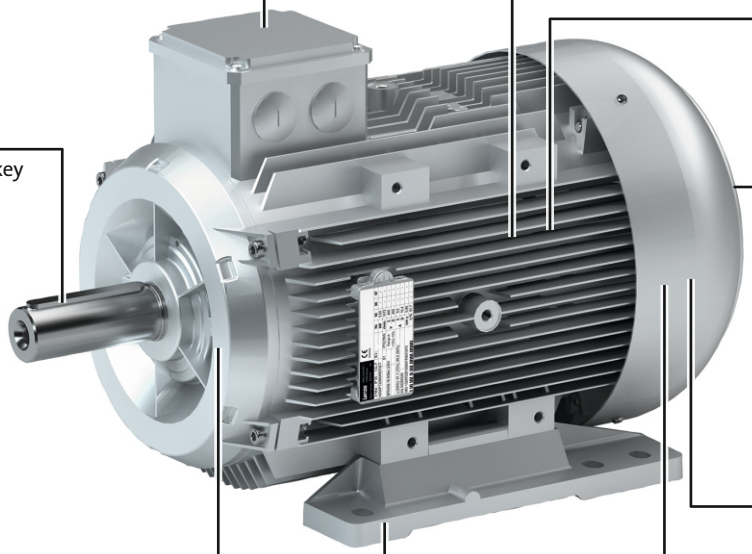
Operational performance	Product range	Design	Size	Motor length	Number of poles	Product
Mains operation	m240	P	80	M	2	m240-P80/M2
					4	m240-P80/M4
				L	2	m240-P80/L2
			90	M		m240-P90/M2
					4	m240-P90/M4
				L	2	m240-P90/L2
					4	m240-P90/L4
			100	M	2	m240-P100/M2
					4	m240-P100/M4
				L		m240-P100/L4
			112	M	2	m240-P112/M2
					4	m240-P112/M4
			132		2	m240-P132/M2
					4	m240-P132/M4
				L	2	m240-P132/L2
					4	m240-P132/L4
			160	M		m240-P160/M4
				L		m240-P160/L4
			180	M		m240-P180/M4
				L		m240-P180/L4
			200	M		m240-P200/M4
			225			m240-P225/M4
				L		m240-P225/L4

5.11

Equipment

Overview

The equipment includes all the options available as standard and all the built-on accessories of the product.



Motor connection
Terminal box

Output shaft
Solid shaft with feather key

Motor design
Flange (B5)with through holes
Flange (B14) with threaded holes

Motor design
Foot (B3)

Number of poles
2-pole, 0.75 ... 7.5 kW
4-pole, 0.75 ... 45 kW

Temperature monitoring
No
Thermal contact TKO
pTC thermistor

Cooling
Integral fan

Feedback
Without

Spring-applied brake
No
Standard
Option manual release lever

The modular motor system

Motor details of 2-pole motors

Product	m240-P80/M2	m240-P80/L2	m240-P90/M2	m240-P90/L2
Technical data				
Rated power	0.75 kW	1.1 kW	1.5 kW	2.2 kW
Mains voltage	230/400 V			
Mains frequency	50 Hz			
Operating mode	S1			
Motor design	B3 B5-FF165 B14-FT100 B14-FT130		B3 B5-FF165 B14-FT115 B14-FT130	
Motor shaft	19 x 40 mm		24 x 50 mm	
Colour	Primed Paint in various corrosion-protection designs in accordance with RAL colours			
Surface and corrosion protection	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)			
Connection type	Terminal box			
Spring-applied brake				
Characteristic torque [Nm]	3.5 ... 7.0		3.5 ... 16	
Brake voltage [V]	DC 24 AC 230 AC 400			
Brake design	Standard			
	Standard			
Options	Manual release lever			
Feedback	Without			
Cooling	Integral fan			
Temperature monitoring	Without TKO thermal contact PTC thermistor			
Degree of protection	IP54 / IP55			

The modular motor system

Motor details of 2-pole motors

Product	m240-P100/M2	m240-P112/M2	m240-P132/M2	m240-P132/L2
Technical data				
Rated power	3.0 kW	4.0 kW	5.5 kW	7,5 kW
Mains voltage	230/400 V	400 V		
Mains frequency	50 Hz			
Operating mode	S1			
Motor design	B3 B5-FF215 B14-FT130		B3 B5-FF265	
Motor shaft	28 x 60 mm		38 x 80 mm	
Colour				
	Primed Paint in various corrosion-protection designs in accordance with RAL colours			
Surface and corrosion protection				
	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)			
Connection type				
	Terminal box			
Spring-applied brake				
Characteristic torque [Nm]	7.0 ... 32	14 ... 60	35 ... 80	
Brake voltage [V]	DC 24 AC 230 AC 400			
Brake design	Standard			
	Standard			
Options	Manual release lever			
Feedback				
	Without			
Cooling				
	Integral fan			
Temperature monitoring				
	Without TKO thermal contact PTC thermistor			
Degree of protection				
	IP54 / IP55			

The modular motor system

Motor details of 4-pole motors

Product	m240-P80/M4	m240-P90/M4	m240-P90/L4	m240-P100/M4	m240-P100/L4	m240-P112/M4
Technical data						
Rated power	0.75 kW	1.1 kW	1.5 kW	2.2 kW	3.0 kW	4.0 kW
Mains voltage	230/400 V					400 V
Mains frequency	50 Hz					
Operating mode	S1					
Motor design	B3 B5-FF165 B14-FT100 B14-FT130	B3 B5-FF165 B14-FT115 B14-FT130		B3 B5-FF215 B14-FT130		
Motor shaft	19 x 40 mm	24 x 50 mm		28 x 60 mm		
Colour						
	Primed Paint in various corrosion-protection designs in accordance with RAL colours					
Surface and corrosion protection						
	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)					
Connection type						
	Terminal box					
Spring-applied brake						
Characteristic torque [Nm]	3.5 ... 8.0	3.5 ... 23		7.0 ... 32	7.0 ... 46	14 ... 60
Brake voltage [V]	DC 24 AC 230 AC 400					
Brake design	Standard					
	Standard					
Options	Manual release lever					
Feedback						
	Without					
Cooling						
	Integral fan					
Temperature monitoring						
	Without TKO thermal contact PTC thermistor					
Degree of protection						
	IP54 / IP55					

The modular motor system

Motor details of 4-pole motors

Product	m240-P132/M4	m240-P132/L4	m240-P160/M4	m240-P160/L4	m240-P180/M4
Technical data					
Rated power	5.5 kW	7,5 kW	11 kW	15 kW	18.5 kW
Mains voltage	400 V				
Mains frequency	50 Hz				
Operating mode	S1				
Motor design	B3 B5-FF265		B3 B5-FF300		
Motor shaft	38 x 80 mm		42 x 110 mm		48 x 110 mm
Colour	Primed Paint in various corrosion-protection designs in accordance with RAL colours				
Surface and corrosion protection	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)				
Connection type	Terminal box				
Spring-applied brake					
Characteristic torque [Nm]	35 ... 80	35 ... 100	60 ... 150	80 ... 200	80 ... 260
Brake voltage [V]	DC 24 AC 230 AC 400				
Brake design	Standard				
	Standard				
Options	Manual release lever				
Feedback	Without				
Cooling	Integral fan				
Temperature monitoring	Without TKO thermal contact PTC thermistor				
Degree of protection	IP54 / IP55				

The modular motor system

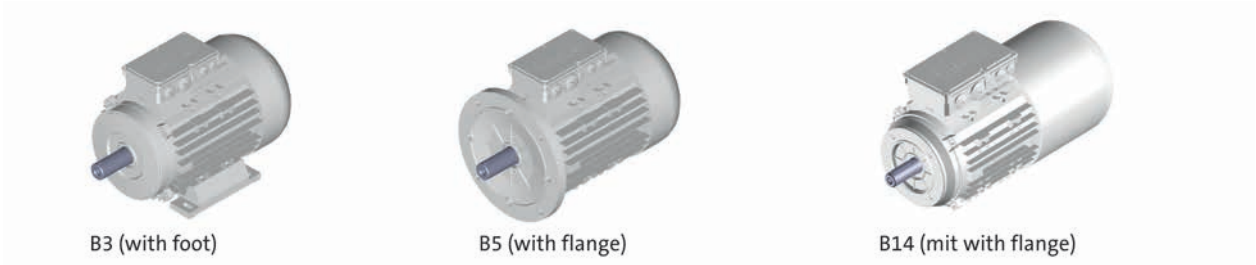
Motor details of 4-pole motors

Product	m240-P180/L4	m240-P200/M4	m240-P225/M4	m240-P225/L4
Technical data				
Rated power	22 kW	30 kW	37 kW	45 kW
Mains voltage	400 V			
Mains frequency	50 Hz			
Operating mode	S1			
Motor design	B3 B5-FF300	B3 B5-FF350	B3 B5-FF400	
Motor shaft	48 x 110 mm	55 x 110 mm	60 x 140 mm	
Colour	Primed Paint in various corrosion-protection designs in accordance with RAL colours			
Surface and corrosion protection	Without OKS(uncoated) OKS-G (primed) OKS-S (small) OKS-M (medium) OKS-L (large) OKS-XL (extra Large)			
Connection type	Terminal box			
Spring-applied brake				
Characteristic torque [Nm]	80 ... 315	80 ... 400	265 ... 490	265 ... 600
Brake voltage [V]	DC 24 AC 230 AC 400			
Brake design	Standard			
	Standard			
Options	Manual release lever			
Feedback	Without			
Cooling	Integral fan			
Temperature monitoring	Without TKO thermal contact PTC thermistor			
Degree of protection	IP54 / IP55			

The modular motor system

Motor details

Design



Connection type

Terminal box

Cooling: integral fan

Without built-on accessories

With spring-applied brake
With or without manual release lever

Standards and operating conditions

Overview

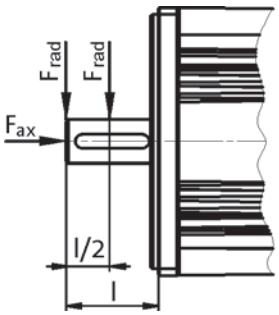
Degree of protection			
EN 60529			IP55 [1)] IP65 IP66
Energy efficiency class			
IEC 60034-30			IE3
IEC 60034-2-1			Methodology for measuring efficiency
Conformity			
CE			Low-Voltage Directive
			2014/35/EU
Temperature class			
IEC/EN 60034-1; utilisation			B
IEC/EN 60034-1; insulation system (enamel-insulated wire)			F
Vibrational severity			
IEC/EN 60034-14			A
Climatic conditions			
Transport (EN 60721-3-2)			2K3 (temperature: -25 °C ... +70 °C)
Storage (EN 60721-3-1)			1K3 (temperature: -20 °C ... +60 °C)
Storage (EN 60721-3-1) > 3 months			1K3 (Temperature: -20 °C ... +40 °C)
Operation (EN 60721-3-3)			3K3 (temperature: -20 °C ... +40 °C)
Operation (EN 60721-3-3) with brake			3K3 (temperature : -10 °C ... +40 °C)
Operation (EN 60721-3-3) with blower			3K3 (Temperature: -15 °C ... +40 °C)
Max. ambient temperature for operation			
With power reduction	$T_{opr,max}$	[°C]	60
Site altitude			
Amsl	H_{max}	[m]	4000

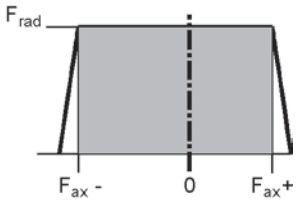
[1)] Types with deviating degrees of protection:
IP55 with brake (IP54 with manual release lever).

► 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, the efficiency regulations in other countries and the Lenze products concerned, please refer to the brochure "International efficiency directives for three-phase AC motors".

Permissible radial and axial forces

Application of forces





Application of force at l/2

► Forces at medium speed 2000 r/min.

Bearing service life L_{10}												
	10000 h			20000 h			30000 h			50000 h		
Product												
	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]
m240-P80/M2 m240-P80/M4 m240-P80/L2	961	-787	1087	767	-550	877	672	-442	742	570	-334	634
m240-P90/M2 m240-P90/M4 m240-P90/L2 m240-P90/L4	990	-810	1125	830	-551	905	771	-439	760	654	-332	715
m240-P100/M2 m240-P100/M4 m240-P100/L4	1050	-760	1002	850	-501	950	775	-389	772	659	-272	790
m240-P112/M2 m240-P112/M4	1550	-1137	1637	1247	-786	1286	1091	-631	1131	929	-470	969
m240-P132/M2 m240-P132/M4 m240-P132/L2 m240-P132/L4	2323	-653	1253	1863	-422	1022	1639	-313	913	1397	-201	801
m240-P160/M4 m240-P160/L4	4074	-1407	2067	3264	-984	1644	2871	-787	1447	2444	-583	1243
m240-P180/M4 m240-P180/L4	4943	-1580	2480	3969	-1088	1988	3496	-854	1754	2983	-594	1494
m240-P200/M4	6666	-2202	3122	5359	-1555	2475	4724	-1251	2171	4036	-942	1862
m240-P225/M4 m240-P225/L4	7386	-2527	3477	5956	-1800	2750	5260	-1460	2410	4508	-1111	2061

► 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 lifetime.
► Data for axial forces relate to the maximum radial force with the corresponding bearing service life.

Permissible radial and axial forces

Application of force at l

► Forces at medium speed 2000 r/min.

Bearing service life L_{10}												
	10000 h			20000 h			30000 h			50000 h		
Product												
	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]
m240-P80/M2 m240-P80/M4 m240-P80/L2	938	-787	1087	762	-550	877	676	-442	742	583	-334	634
m240-P90/M2 m240-P90/M4 m240-P90/L2 m240-P90/L4	950	-810	1125	810	-551	905	720	-439	760	601	-332	715
m240-P100/M2 m240-P100/M4 m240-P100/L4	1065	-760	1002	840	-501	950	768	-389	772	663	-272	790
m240-P112/M2 m240-P112/M4	1507	-1137	1637	1226	-786	1286	1089	-631	1131	942	-470	969
m240-P132/M2 m240-P132/M4 m240-P132/L2 m240-P132/L4	2091	-653	1253	1677	-422	1022	1475	-313	913	1257	-201	801
m240-P160/M4 m240-P160/L4	3610	-1407	2067	2892	-984	1644	2543	-787	1447	2166	-583	1243
m240-P180/M4 m240-P180/L4	4462	-1580	2480	3583	-1088	1988	3156	-854	1754	2693	-594	1494
m240-P200/M4	6069	-2202	3122	4880	-1555	2475	4301	-1251	2171	3675	-942	1862
m240-P225/M4 m240-P225/L4	6588	-2527	3477	5313	-1800	2750	4692	-1460	2410	4021	-1111	2061

► 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 lifetime.

► Data for axial forces relate to the maximum radial force with the corresponding bearing service life.

Rated data for 50 Hz

2-pole motors

Product							
	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
m240-P80/M2	0.75	2885	230	2.90	400	1.70	9.1
m240-P80/L2	1.10	2905	230	3.80	400	2.20	10.2
m240-P90/M2	1.50	2925	230	5.50	400	3.20	9.3
m240-P90/L2	2.20	2911	230	7.50	400	4.30	9.2
m240-P100/M2	3.00	2936	230	9.20	400	5.30	8.4
m240-P112/M2	4.00	2917	400	7.30			11.0
m240-P132/M2	5.50	2930	400	9.70			11.4
m240-P132/L2	7.50	2935	400	13.2			10.3

Product									
	M_N	M_a	M_b	cos ϕ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
m240-P80/M2	2.50	11.3	12.5	0.86	74.4	78.9	80.7	19.0	12.5
m240-P80/L2	3.60	14.4	19.1	0.86	77.5	81.5	82.9	15.0	12.5
m240-P90/M2	4.90	19.6	18.6	0.84	81.2	83.8	84.2	22.7	18.0
m240-P90/L2	7.20	21.6	25.2	0.88	83.7	84.9	85.9	26.0	18.0
m240-P100/M2	9.80	39.2	49.0	0.93	85.9	87.8	87.1	50.9	26.4
m240-P112/M2	13.1	48.5	72.0	0.90	85.7	87.9	88.4	49.0	31.5
m240-P132/M2	18.0	57.6	70.2	0.91	86.7	88.9	89.2	141	47.0
m240-P132/L2	24.5	103	120	0.91	88.9	90.1	90.1	160	53.0

[1] Without accessories

Rated data for 50 Hz

4-pole motors

Product							
	P_N	n_N	$U_{N,\Delta}$	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
m240-P80/M4	0.75	1443	230	2.90	400	1.70	6.9
m240-P90/M4	1.10	1445	230	4.20	400	2.40	7.2
m240-P90/L4	1.50	1435	230	5.80	400	3.30	7.5
m240-P100/M4	2.20	1446	230	7.80	400	4.50	8.0
m240-P100/L4	3.00	1453	230	10.9	400	6.30	9.5
m240-P112/M4	4.00	1435	400	8.00			8.8
m240-P132/M4	5.50	1465	400	11.1			8.7
m240-P132/L4	7.50	1460	400	14.8			9.5
m240-P160/M4	11.0	1470	400	22.0			8.1
m240-P160/L4	15.0	1470	400	28.6			8.2
m240-P180/M4	18.5	1460	400	34.1			7.7
m240-P180/L4	22.0	1465	400	39.9			7.7
m240-P200/M4	30.0	1475	400	55.3			8.0
m240-P225/M4	37.0	1485	400	68.9			7.5
m240-P225/L4	45.0	1485	400	83.0			7.7

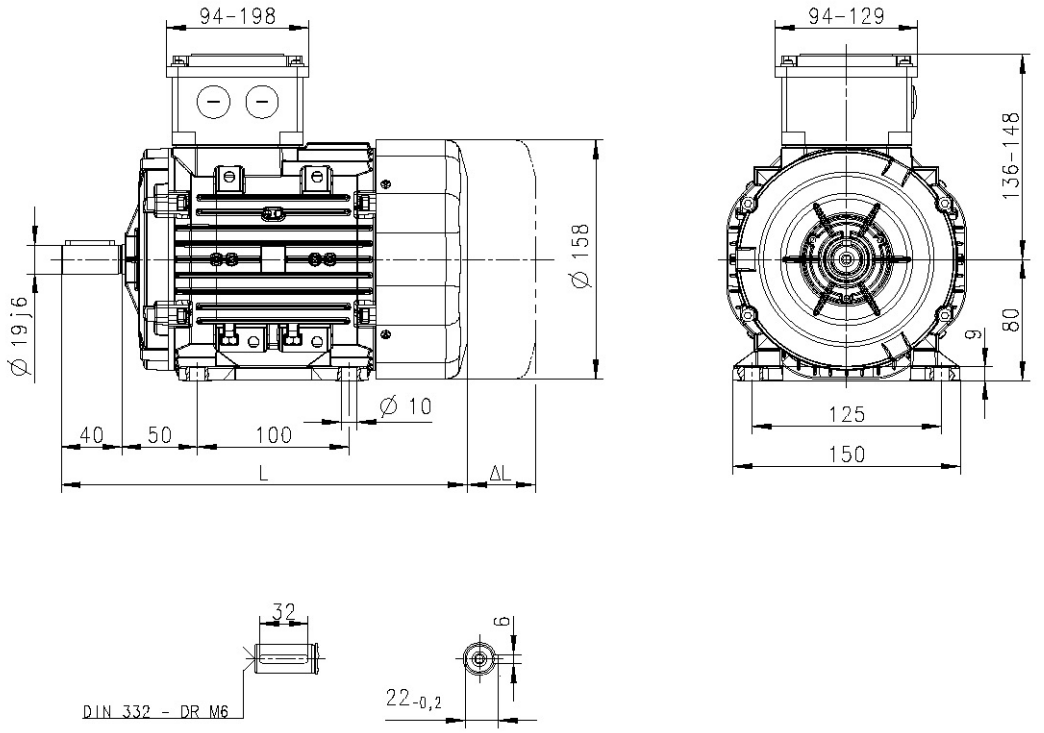
Product									
	M_N	M_a	M_b	cos ϕ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
m240-P80/M4	5.00	14.7	17.7	0.78	80.2	82.4	82.5	26.8	15.0
m240-P90/M4	7.30	22.6	27.7	0.77	80.8	83.5	84.1	42.6	19.0
m240-P90/L4	10.0	35.0	40.0	0.77	81.5	84.2	85.3	48.1	20.0
m240-P100/M4	14.5	31.9	39.2	0.83	83.8	85.7	86.7	81.7	26.0
m240-P100/L4	19.7	51.2	55.2	0.80	83.9	86.2	87.7	99.4	31.0
m240-P112/M4	26.4	84.2	97.3	0.83	87.2	88.3	88.6	112	34.0
m240-P132/M4	36.2	116	156	0.79	86.9	89.1	89.6	276	55.0
m240-P132/L4	49.4	158	222	0.81	88.0	89.9	90.4	298	57.0
m240-P160/M4	71.8	208	273	0.81	90.1	91.6	91.4	692	92.0
m240-P160/L4	97.6	283	371	0.83	91.1	92.1	92.1	704	99.0
m240-P180/M4	121	290	411	0.87	91.3	92.9	92.6	1122	126
m240-P180/L4	143	372	501	0.87	92.2	93.2	93.0	1277	135
m240-P200/M4	194	561	697	0.86	92.7	93.5	93.6	2645	183
m240-P225/M4	238	715	834	0.85	90.9	92.8	93.9	3643	260
m240-P225/L4	290	871	1016	0.85	91.7	93.2	94.2	4351	280

[1] Without accessories

Dimensions, self-ventilated

m240-P80

Foot mounting B3



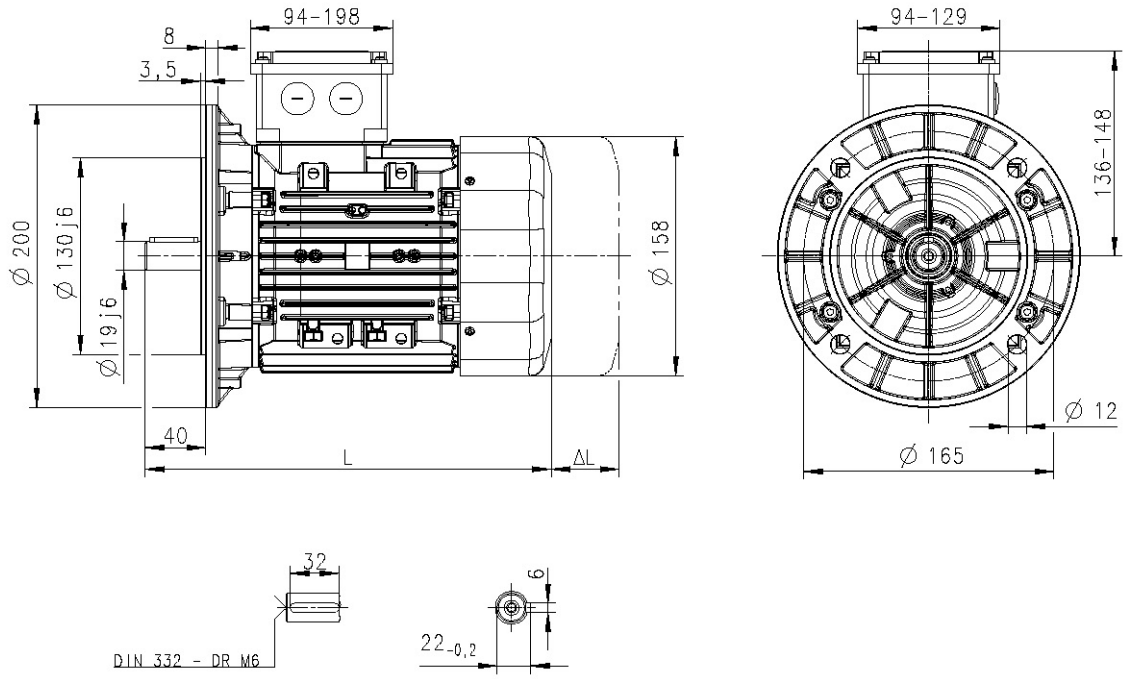
Product			m240-P80/M2 m240-P80/M4	m240-P80/L2
Dimensions				
Motor length	L	[mm]	268	
Length of motor options	Δ L	[mm]	107	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P80

Flange mounting B5



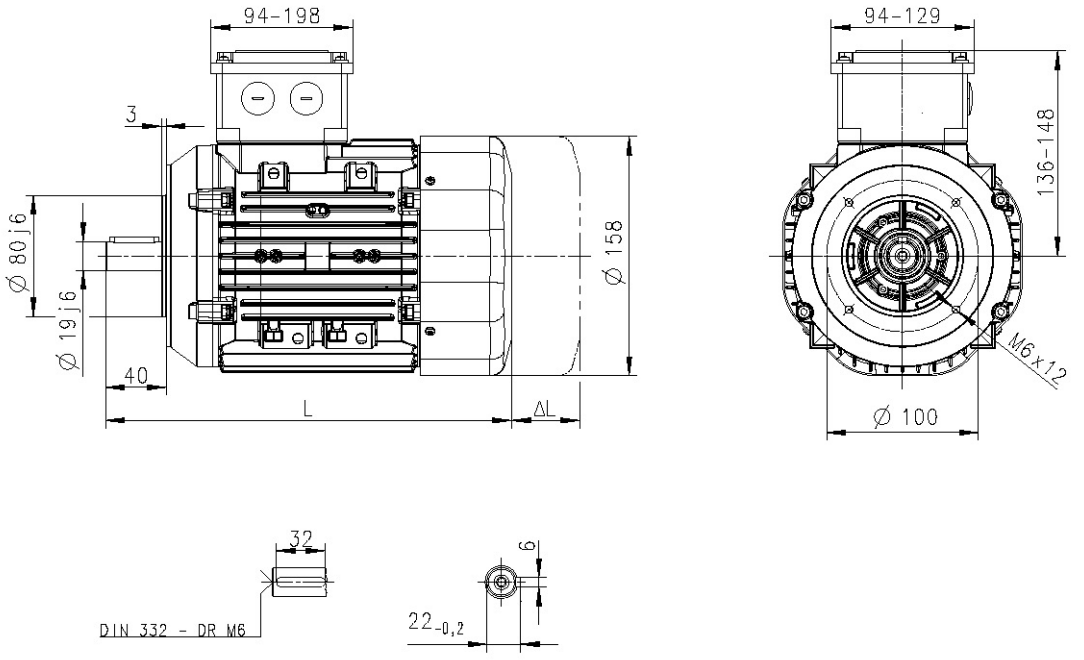
Product			m240-P80/M2 m240-P80/M4	m240-P80/L2
Dimensions				
Motor length	L	[mm]	268	
Length of motor options	Δ L	[mm]	107	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P80

Flange mounting B14



8800416-02

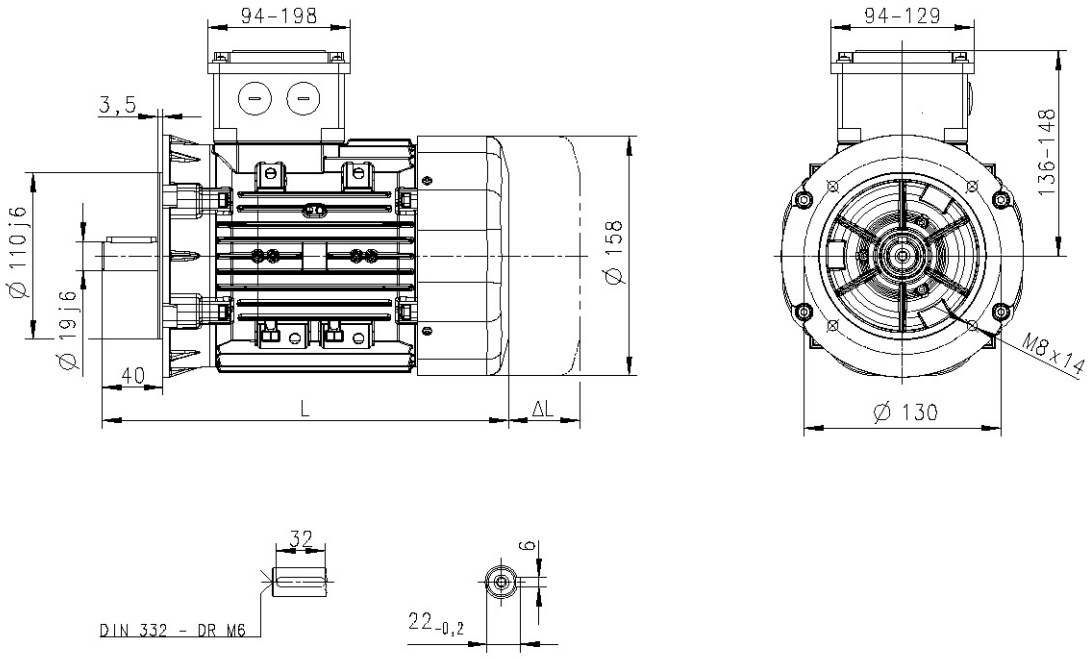
Product			m240-P80/M2 m240-P80/M4	m240-P80/L2
Dimensions				
Motor length	L	[mm]	268	
Length of motor options	Δ L	[mm]	107	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P80

Flange mounting B14



8800476-01

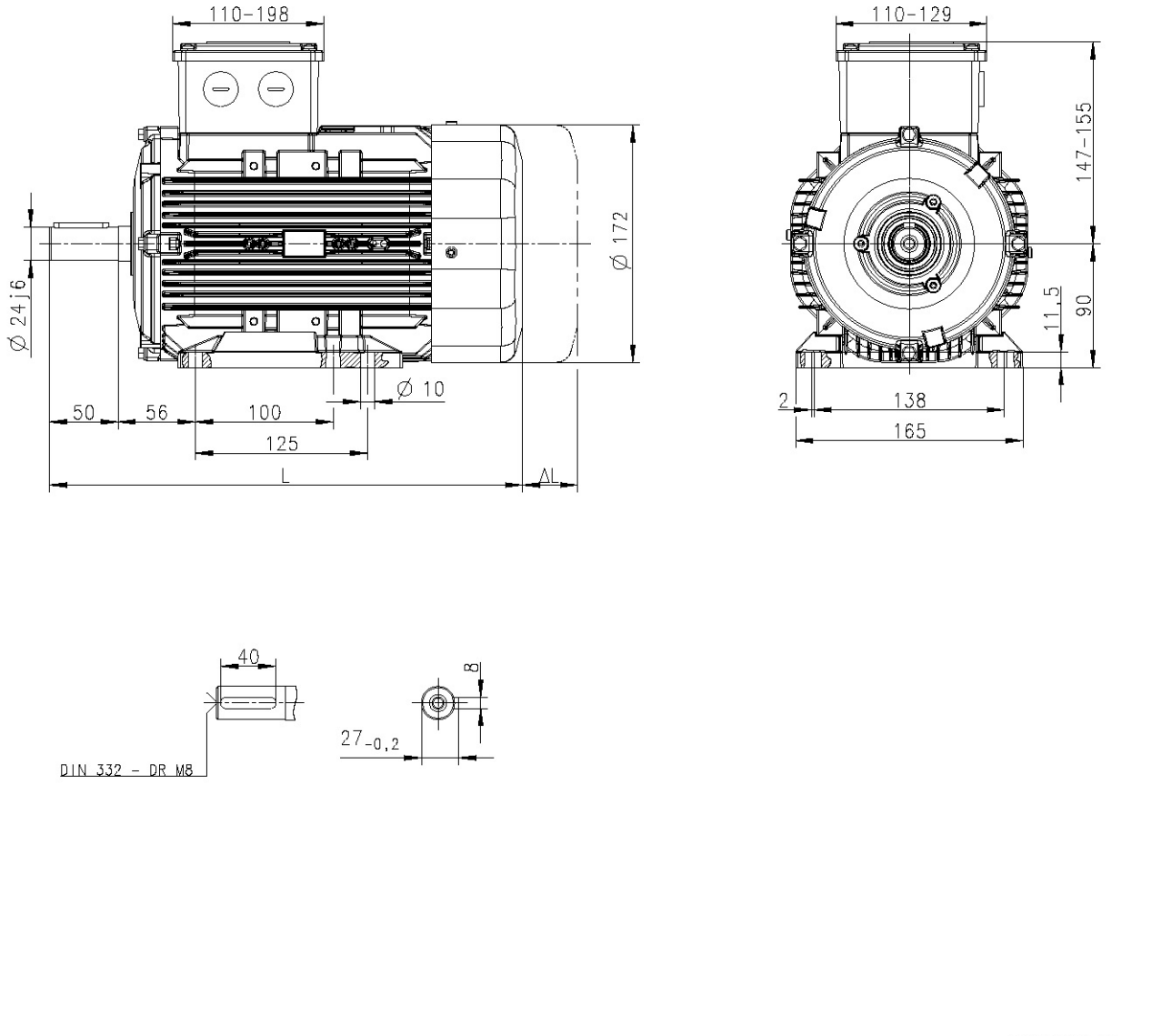
Product			m240-P80/M2 m240-P80/M4	m240-P80/L2
Dimensions				
Motor length	L	[mm]	268	
Length of motor options	Δ L	[mm]	107	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P90

Foot mounting B3



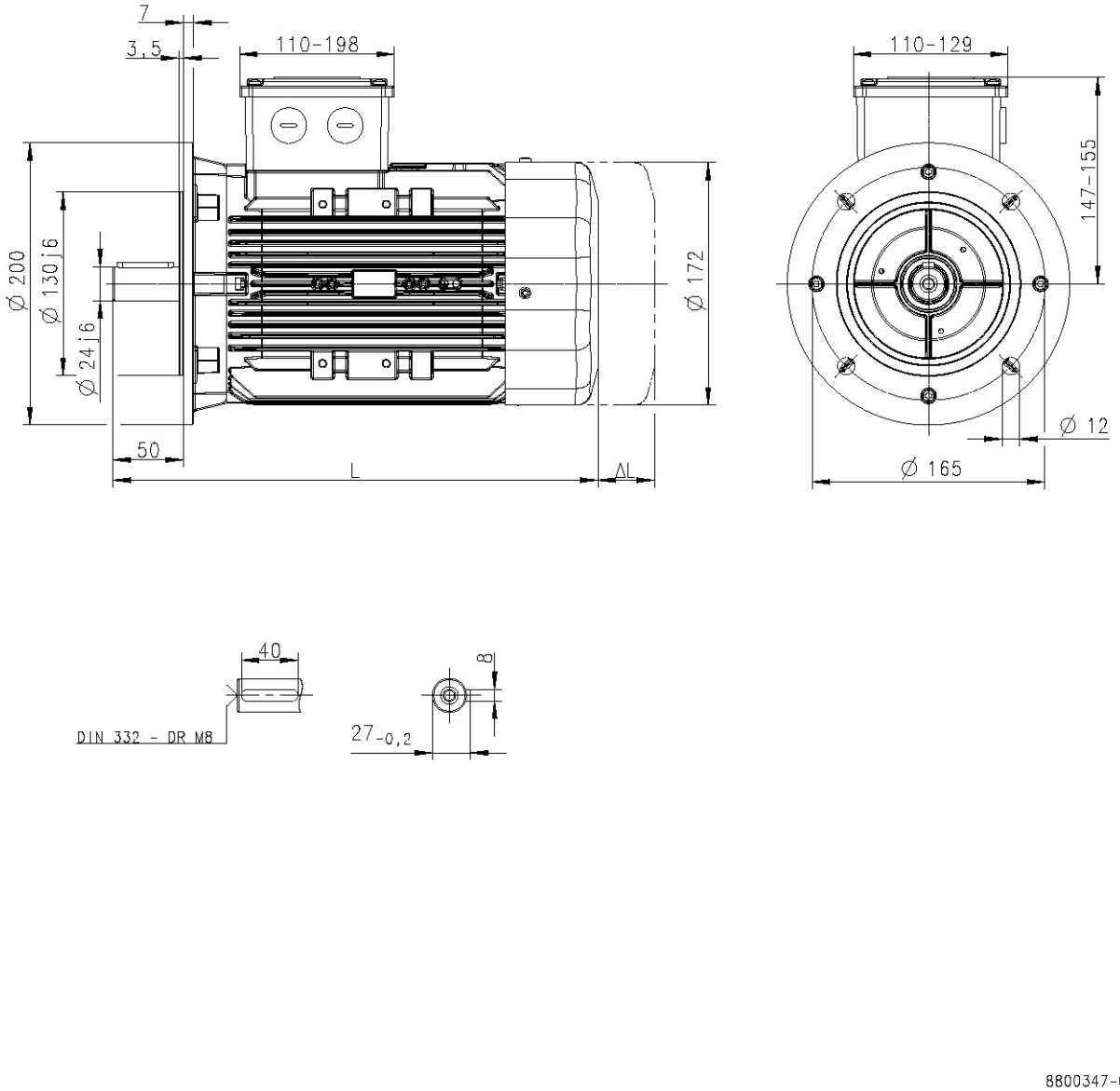
Product			m240-P90/M2 m240-P90/M4	m240-P90/L2 m240-P90/L4
Dimensions				
Motor length	L	[mm]	344	
Length of motor options	Δ L	[mm]	92	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P90

Flange mounting B5



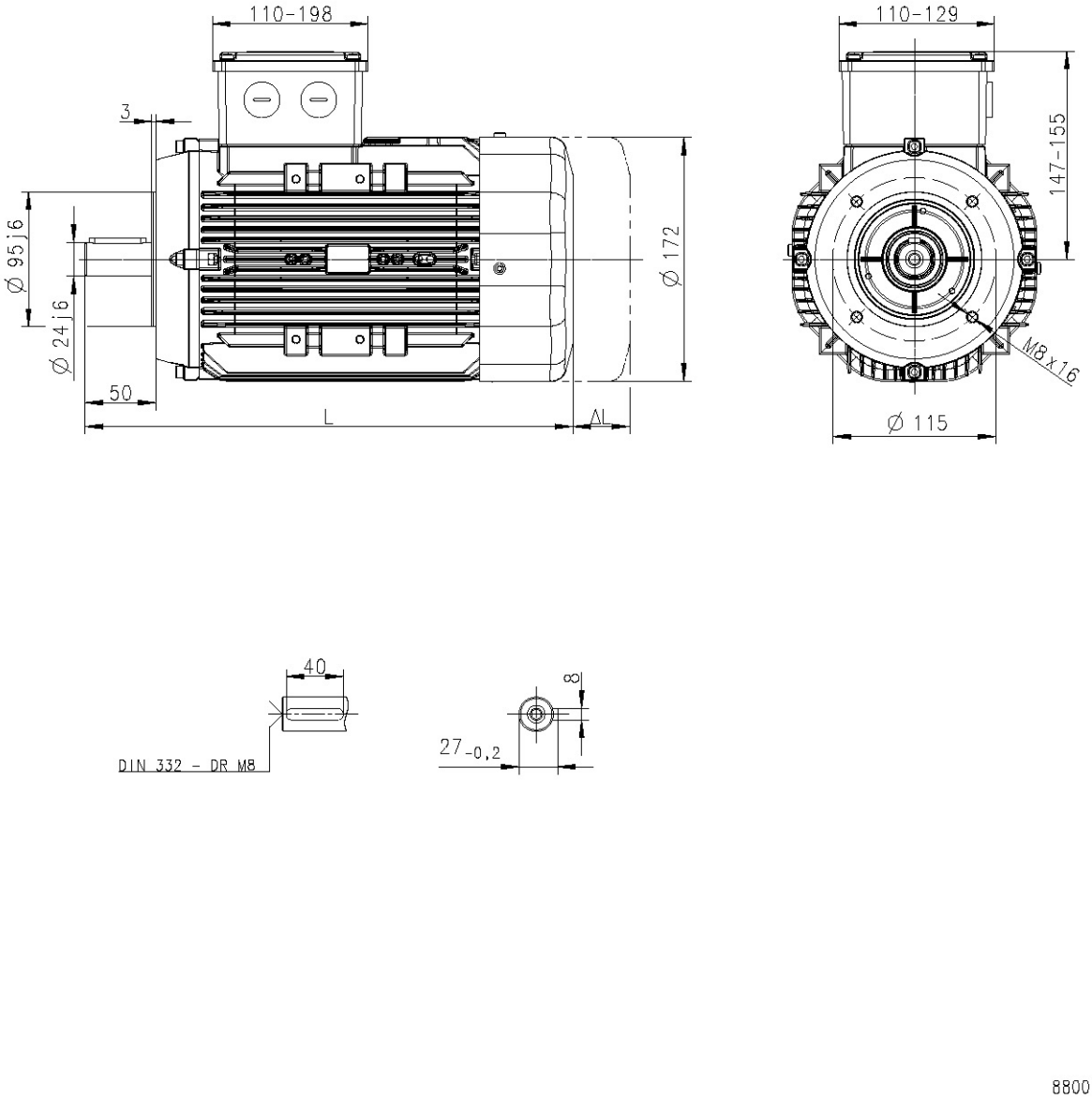
Product			m240-P90/M2 m240-P90/M4	m240-P90/L2 m240-P90/L4
Dimensions				
Motor length	L	[mm]	344	
Length of motor options	Δ L	[mm]	92	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P90

Flange mounting B14



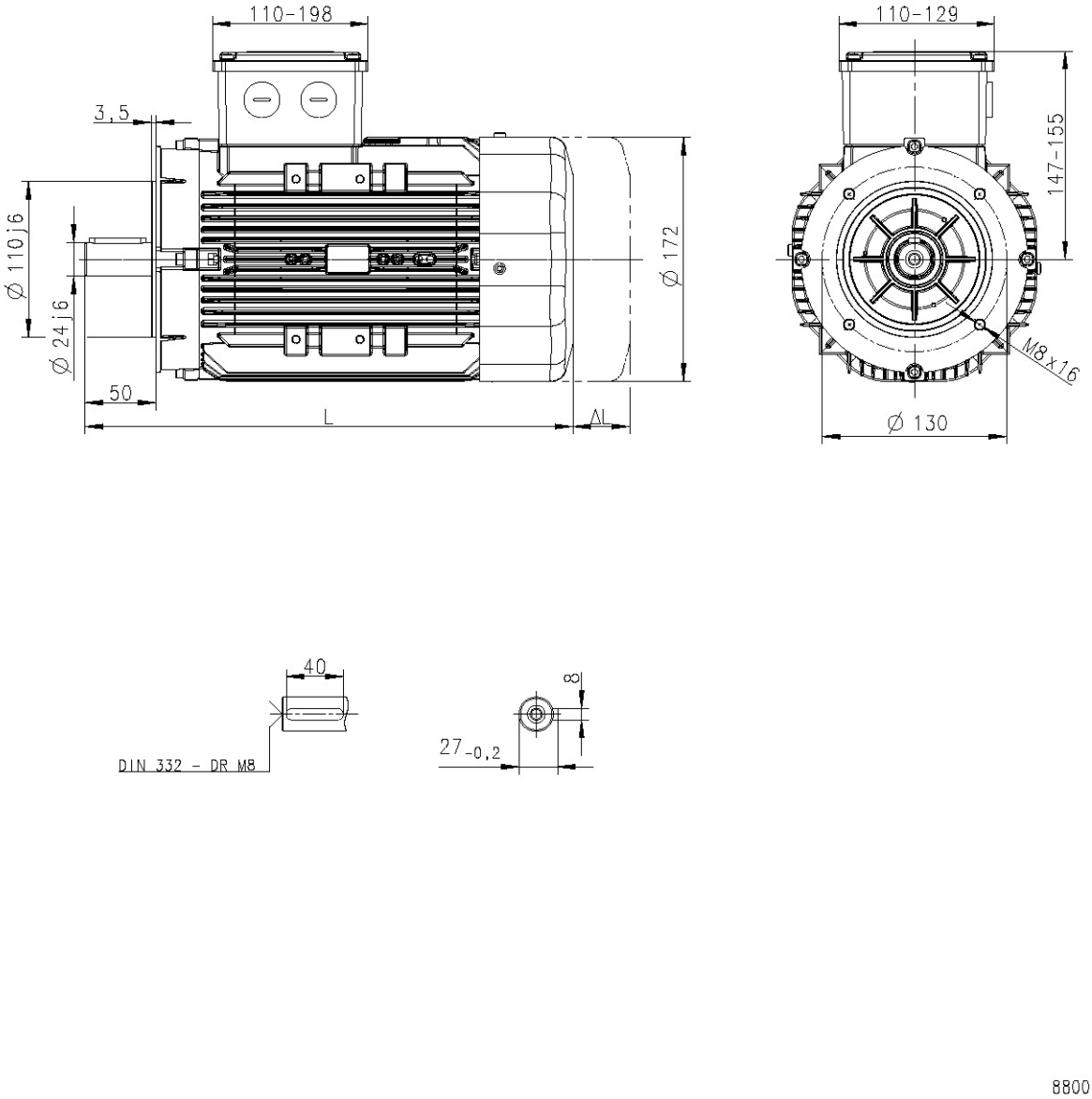
Product			m240-P90/M2 m240-P90/M4	m240-P90/L2 m240-P90/L4
Dimensions				
Motor length	L	[mm]	344	
Length of motor options	Δ L	[mm]	92	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P90

Flange mounting B14



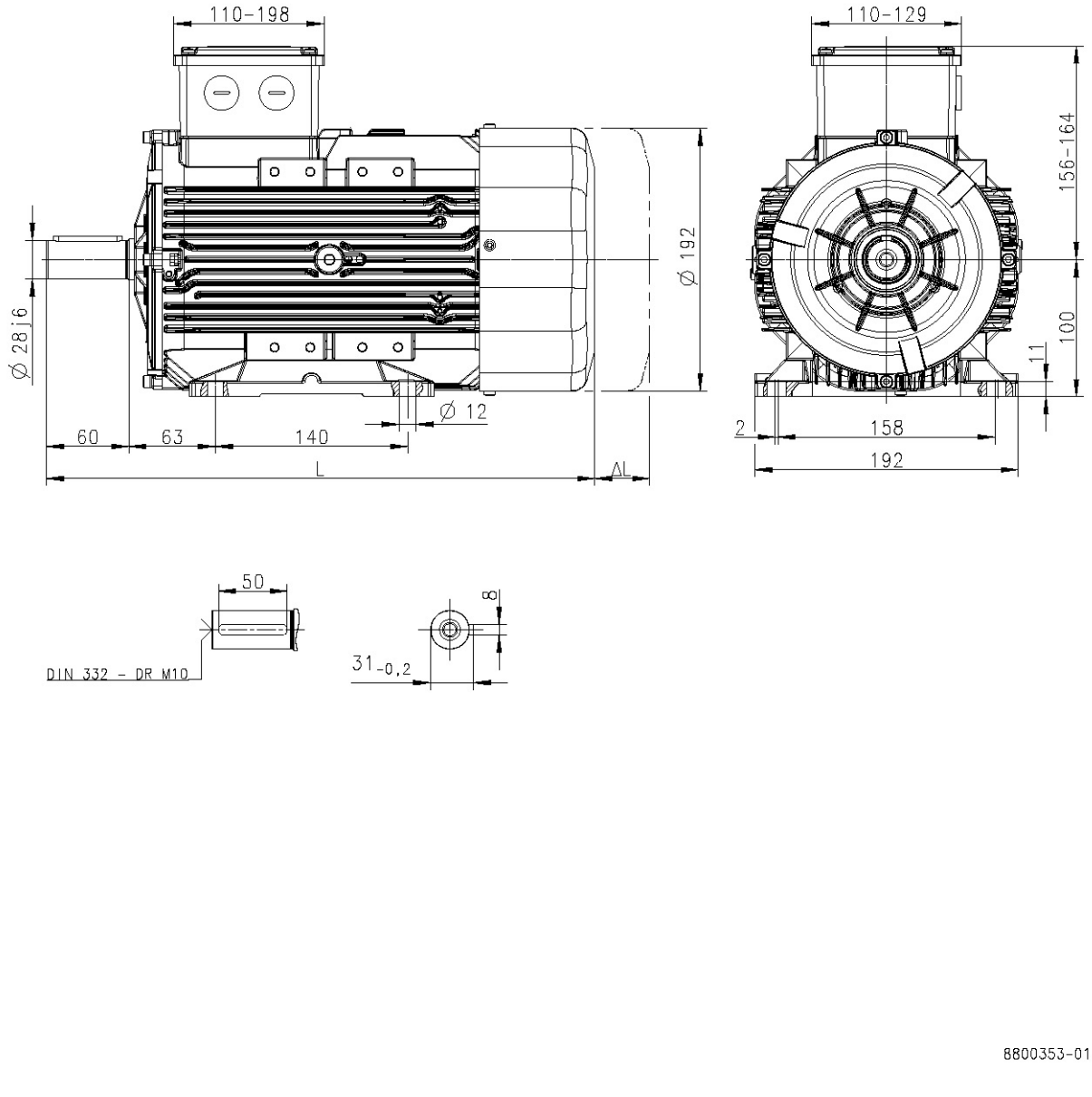
Product			m240-P90/M2 m240-P90/M4	m240-P90/L2 m240-P90/L4
Dimensions				
Motor length	L	[mm]	344	
Length of motor options	Δ L	[mm]	92	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P100

Foot mounting B3



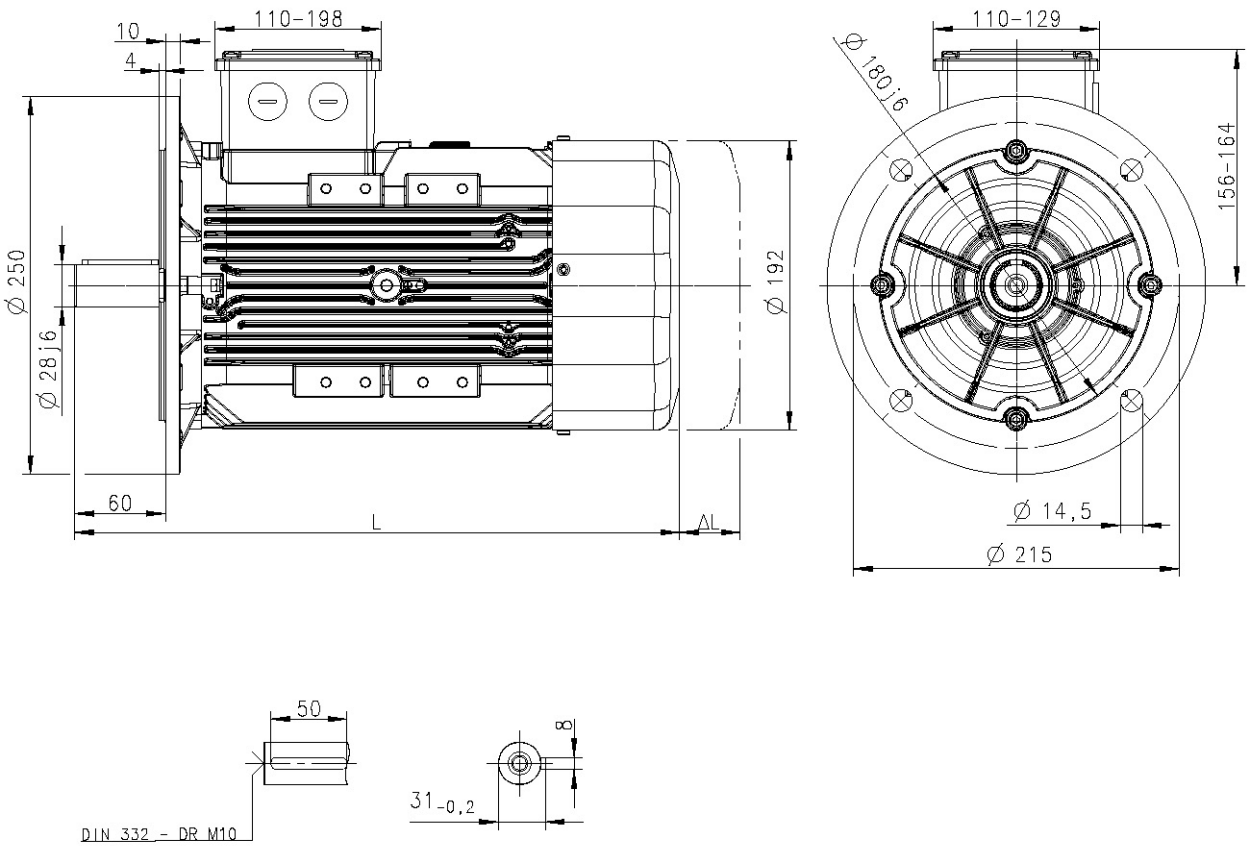
Product			m240-P100/M2 m240-P100/M4	m240-P100/L4
Dimensions				
Motor length	L	[mm]	400	
Length of motor options	Δ L	[mm]	103	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P100

Flange mounting B5



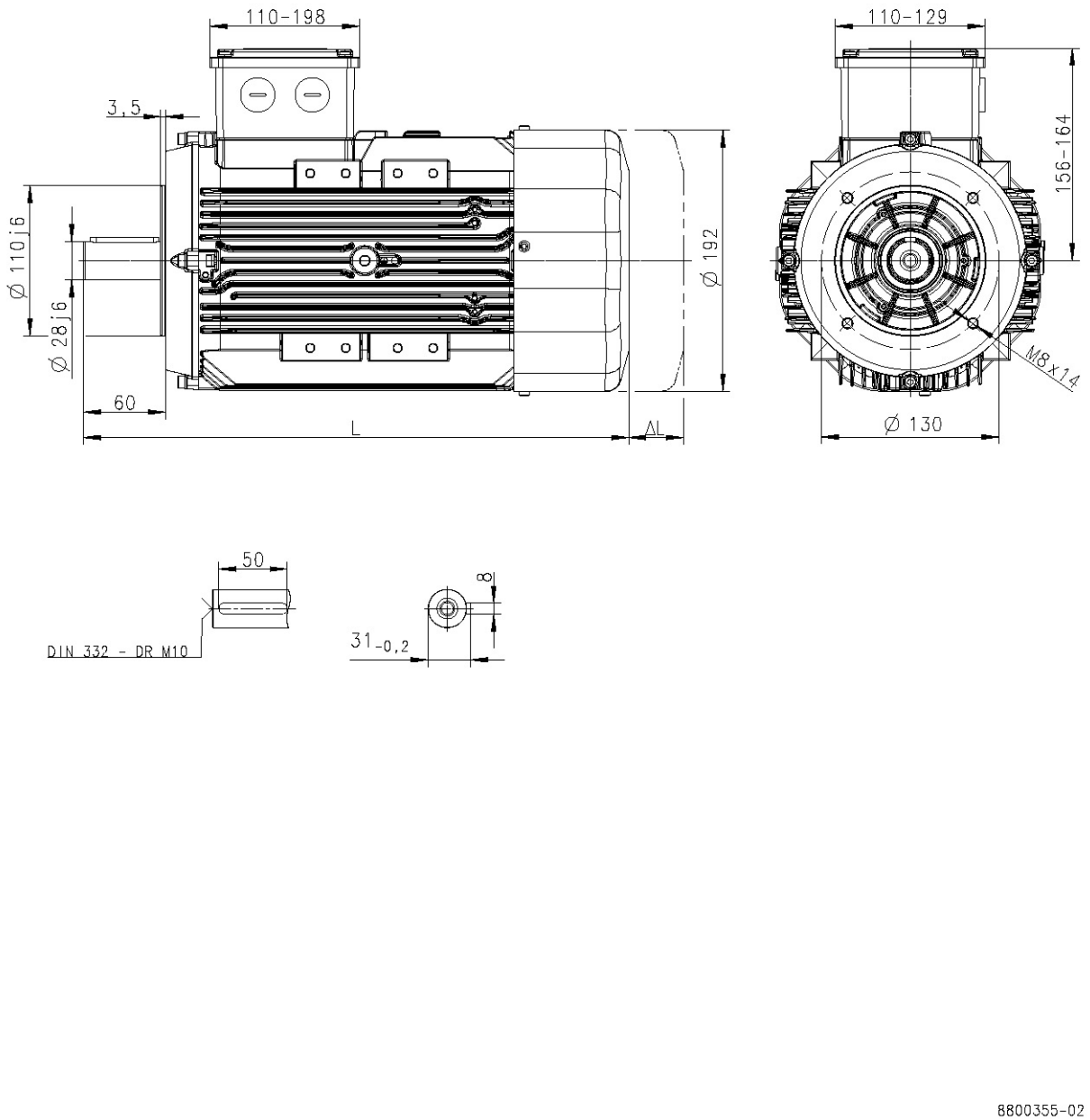
Product			m240-P100/M2 m240-P100/M4	m240-P100/L4
Dimensions				
Motor length	L	[mm]	400	
Length of motor options	Δ L	[mm]	103	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P100

Flange mounting B14



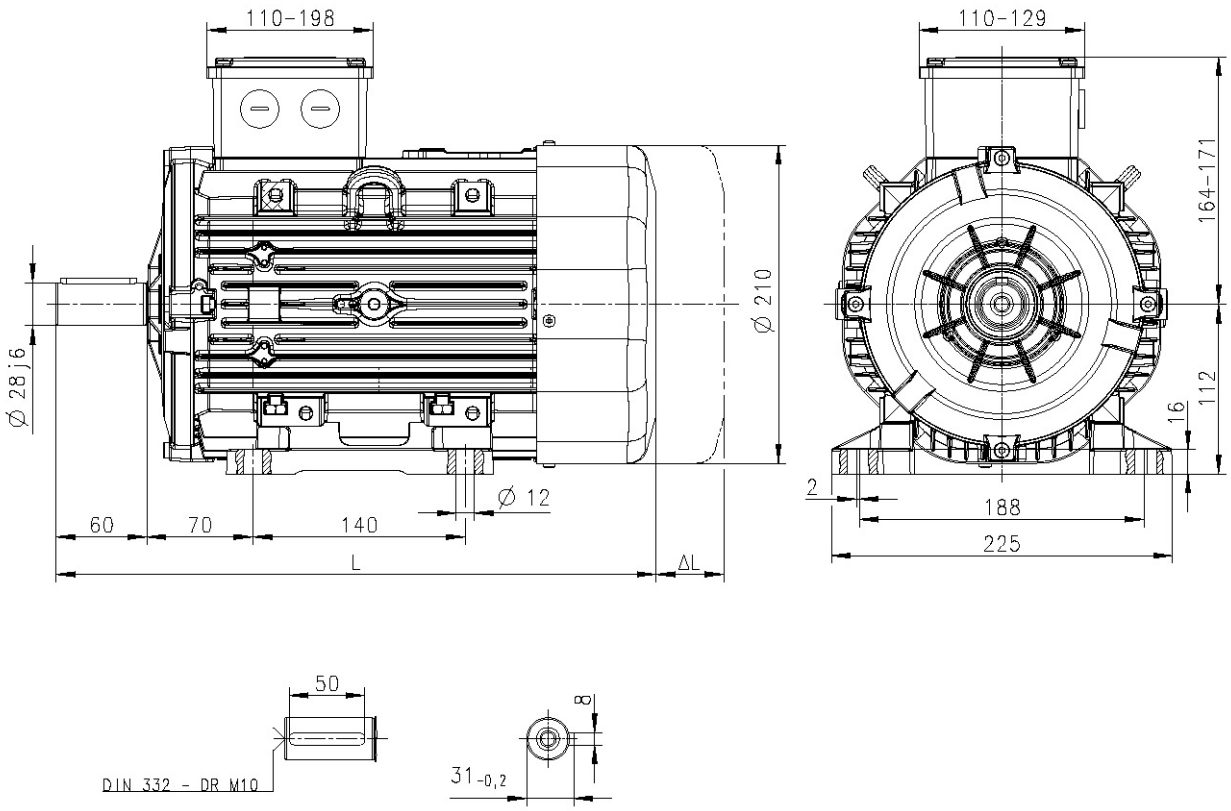
Product			m240-P100/M2 m240-P100/M4	m240-P100/L4
Dimensions				
Motor length	L	[mm]	400	
Length of motor options	Δ L	[mm]	103	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P112

Foot mounting B3



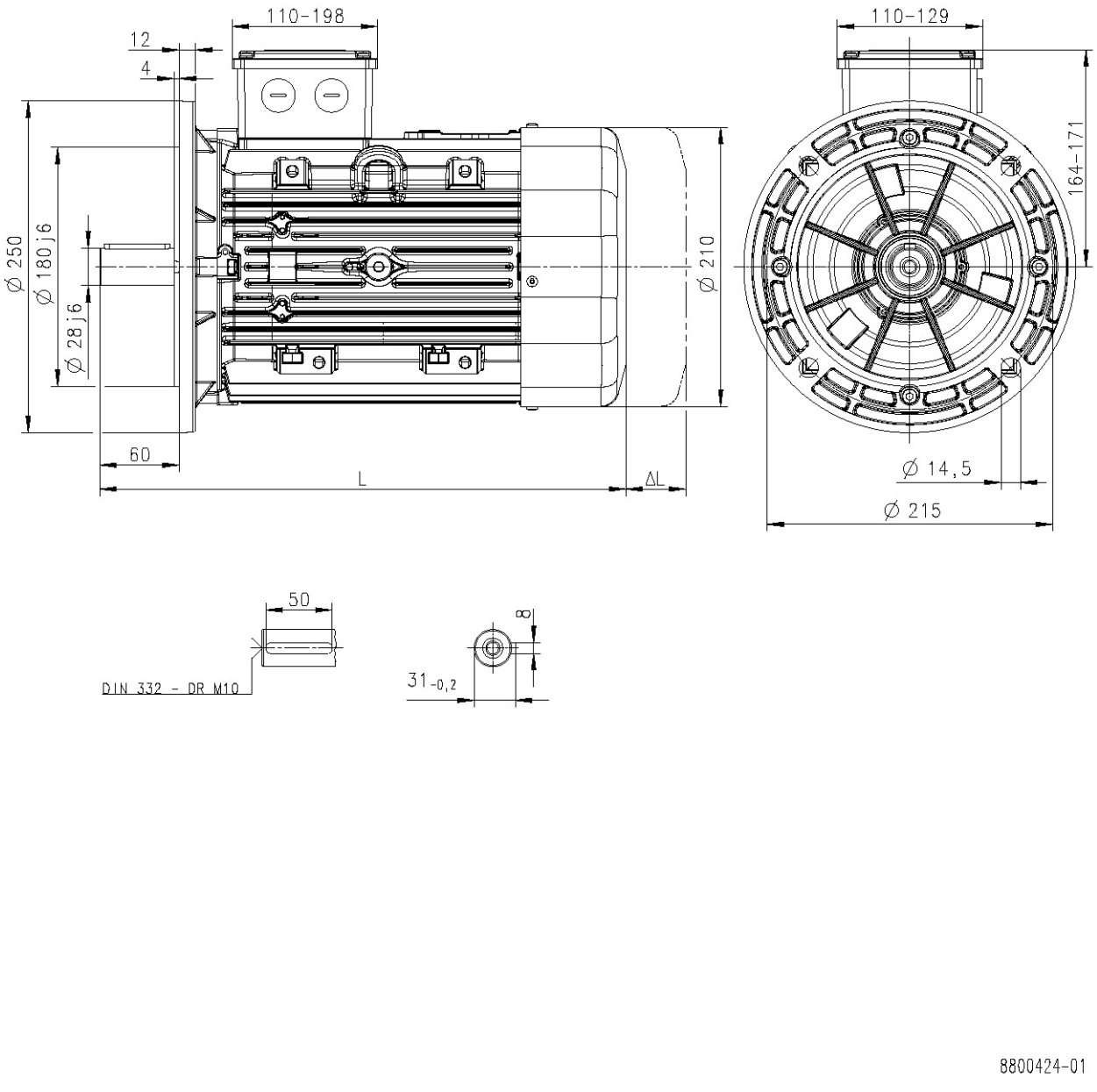
Product			m240-P112/M2 m240-P112/M4
Dimensions			
Motor length	L	[mm]	396
Length of motor options	Δ L	[mm]	111

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P112

Flange mounting B5



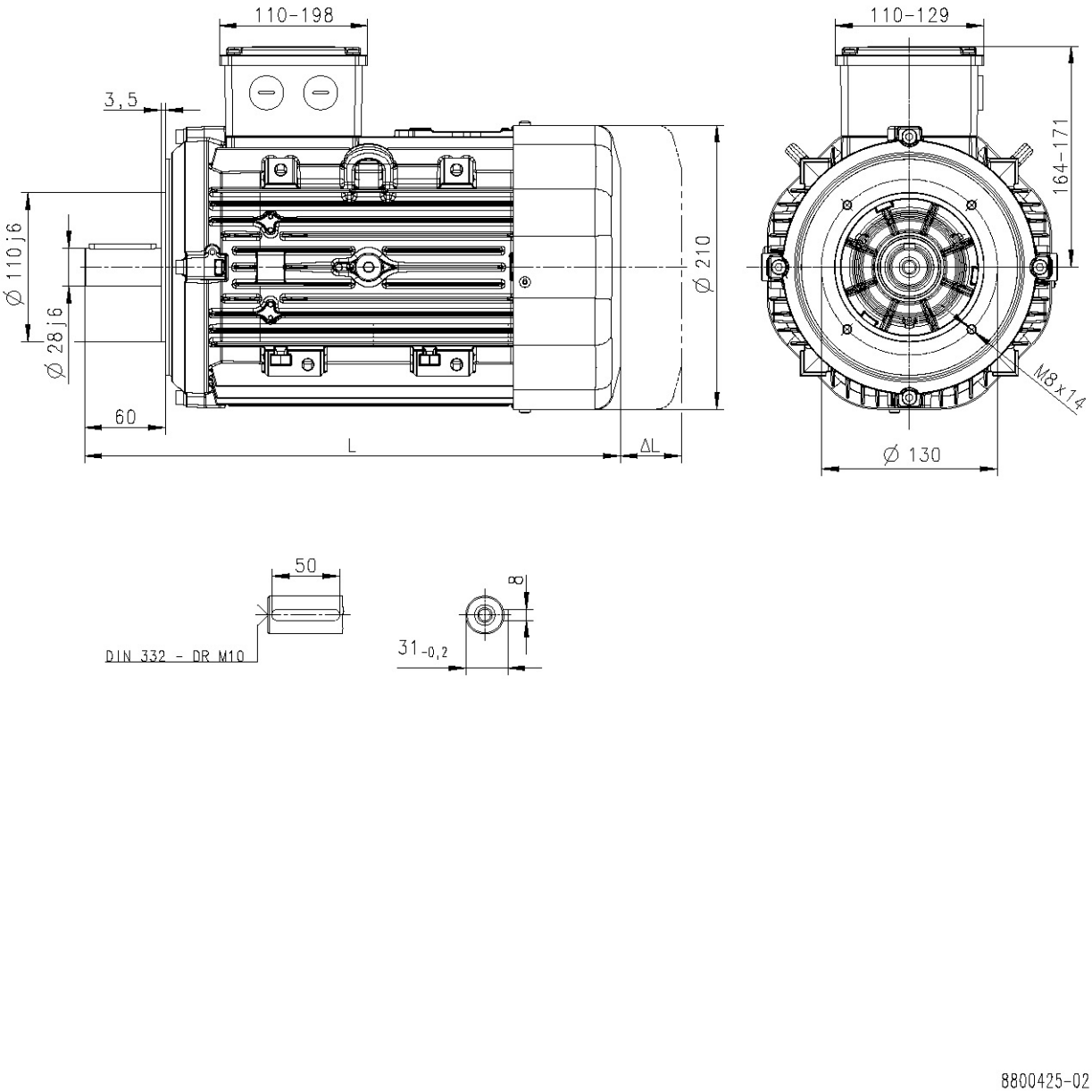
Product			m240-P112/M2 m240-P112/M4
Dimensions			
Motor length	L	[mm]	396
Length of motor options	Δ L	[mm]	111

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P112

Flange mounting B14



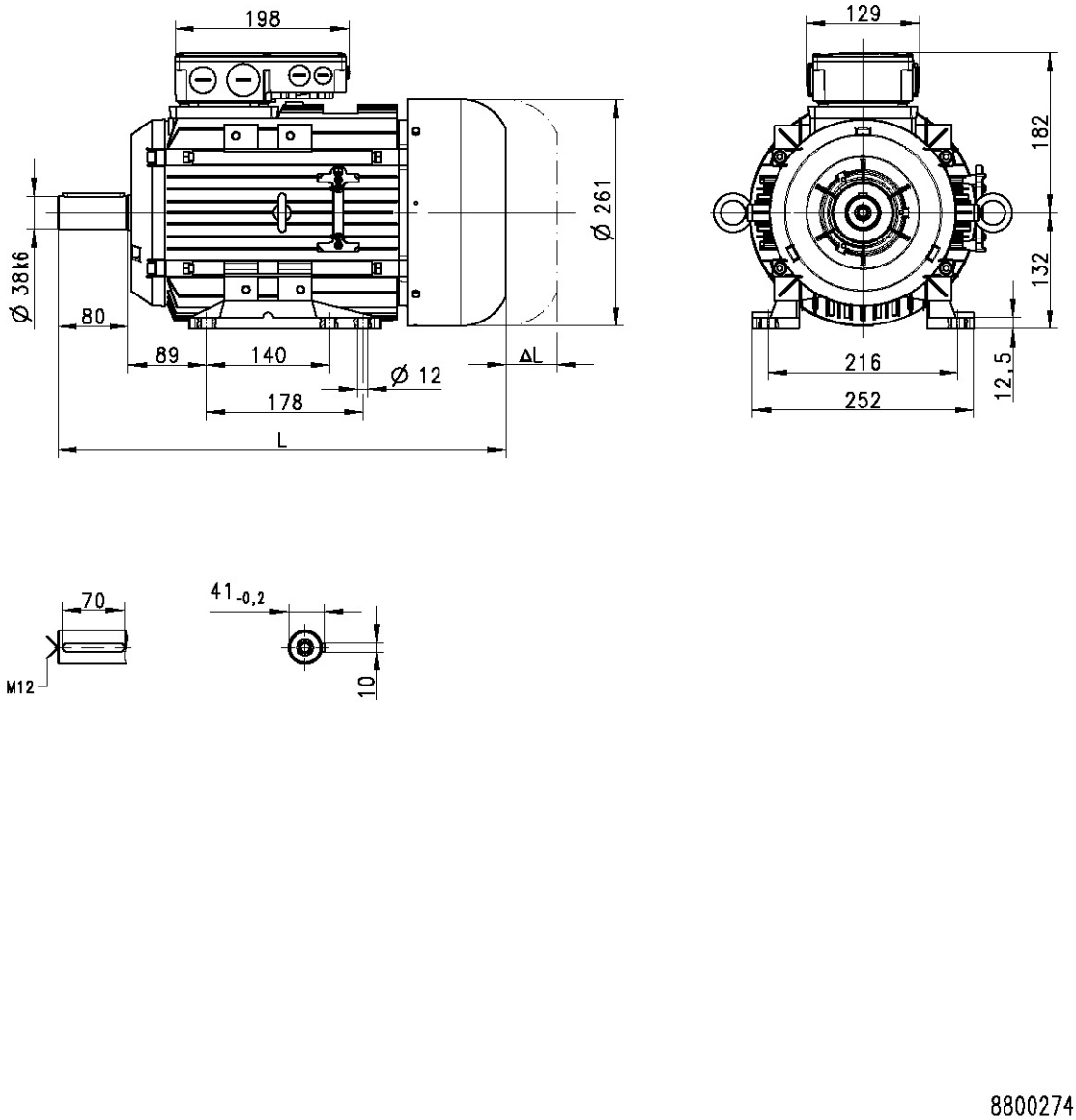
Product			m240-P112/M2 m240-P112/M4
Dimensions			
Motor length	L	[mm]	396
Length of motor options	Δ L	[mm]	111

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P132

Foot mounting B3



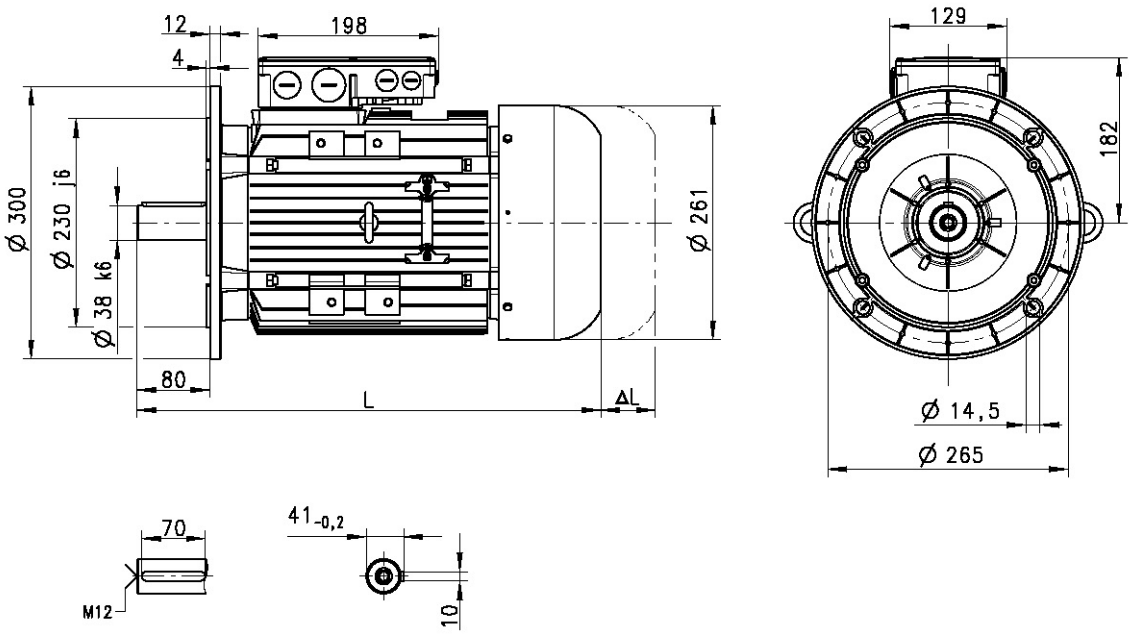
Product			m240-P132/M2 m240-P132/M4	m240-P132/L2
Dimensions				
Motor length	L	[mm]	476	
Length of motor options	Δ L	[mm]	118	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P132

Flange mounting B5



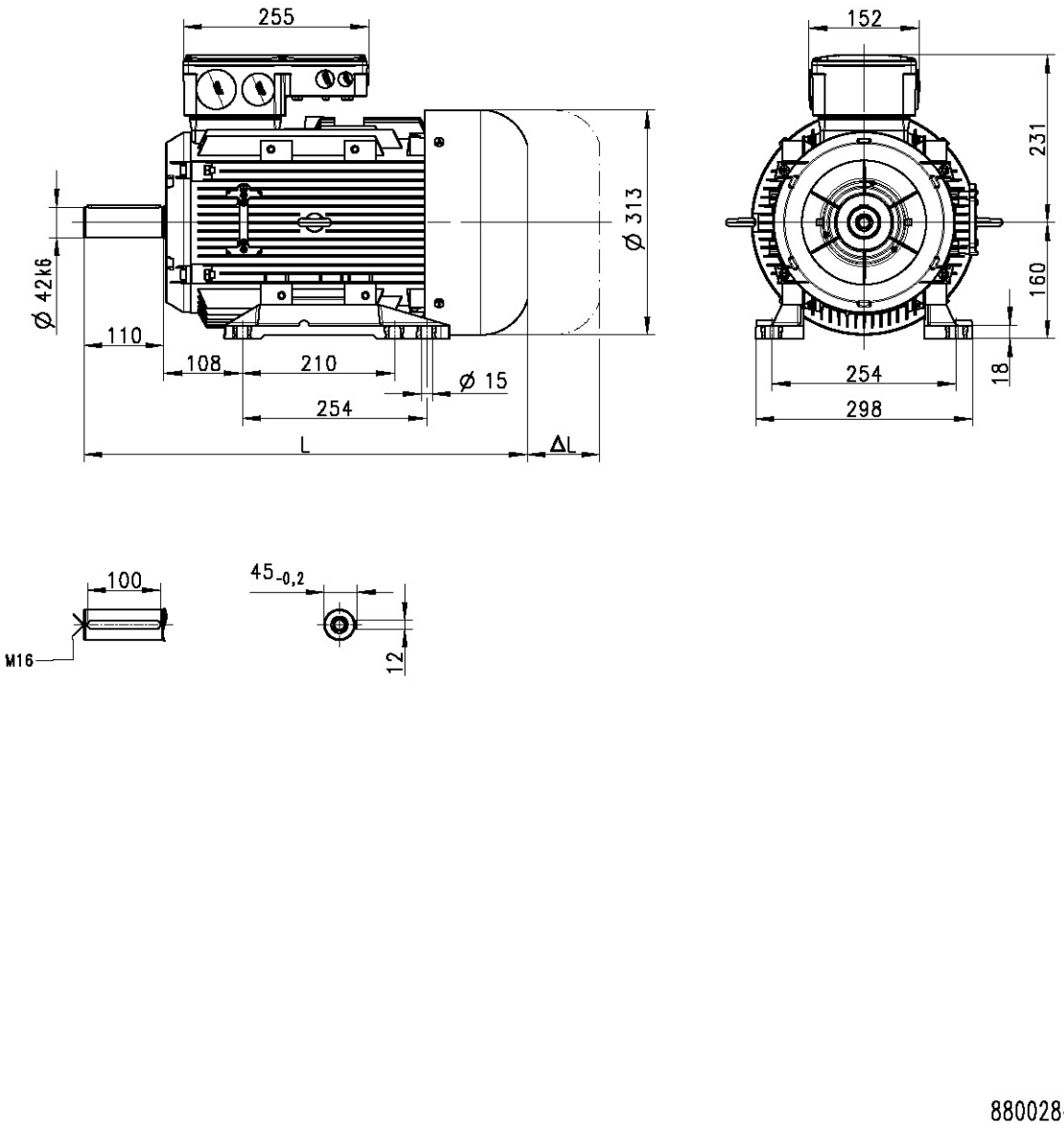
Product			m240-P132/M2 m240-P132/M4	m240-P132/L2
Dimensions				
Motor length	L	[mm]	476	
Length of motor options	Δ L	[mm]	118	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P160

Foot mounting B3



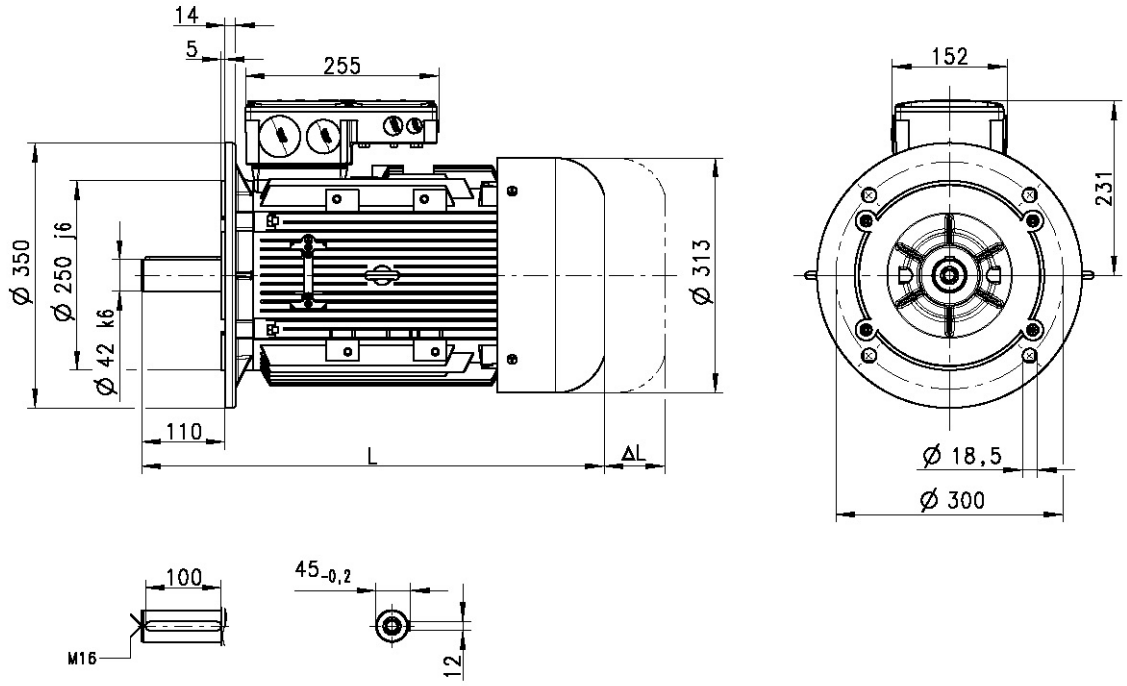
Product			m240-P160/M4	m240-P160/L4
Dimensions				
Motor length	L	[mm]	575	
Length of motor options	Δ L	[mm]	146	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P160

Flange mounting B5



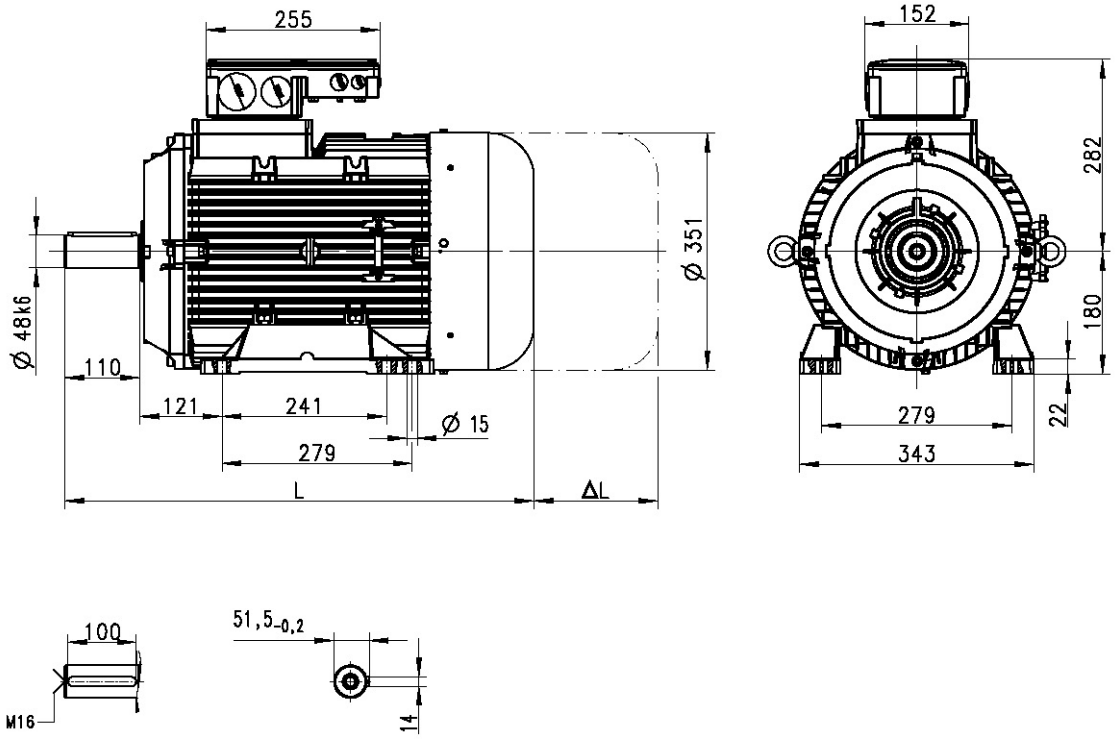
Product			m240-P160/M4	m240-P160/L4
Dimensions				
Motor length	L	[mm]	575	
Length of motor options	Δ L	[mm]	146	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P180

Foot mounting B3



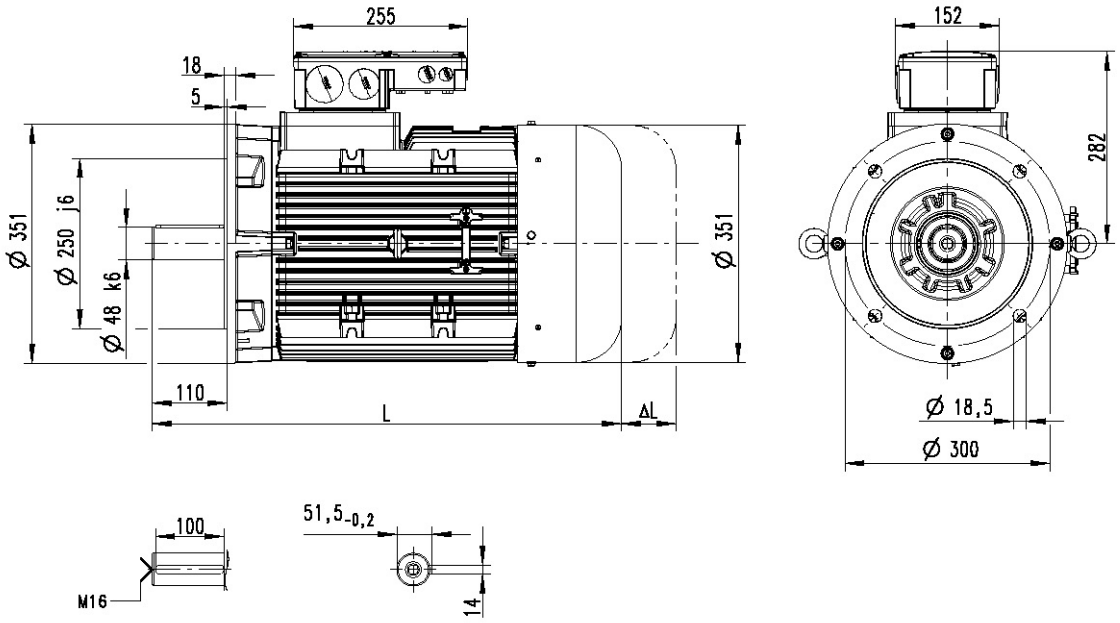
Product			m240-P180/M4	m240-P180/L4
Dimensions				
Motor length	L	[mm]	689	
Length of motor options	Δ L	[mm]	107	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P180

Flange mounting B5



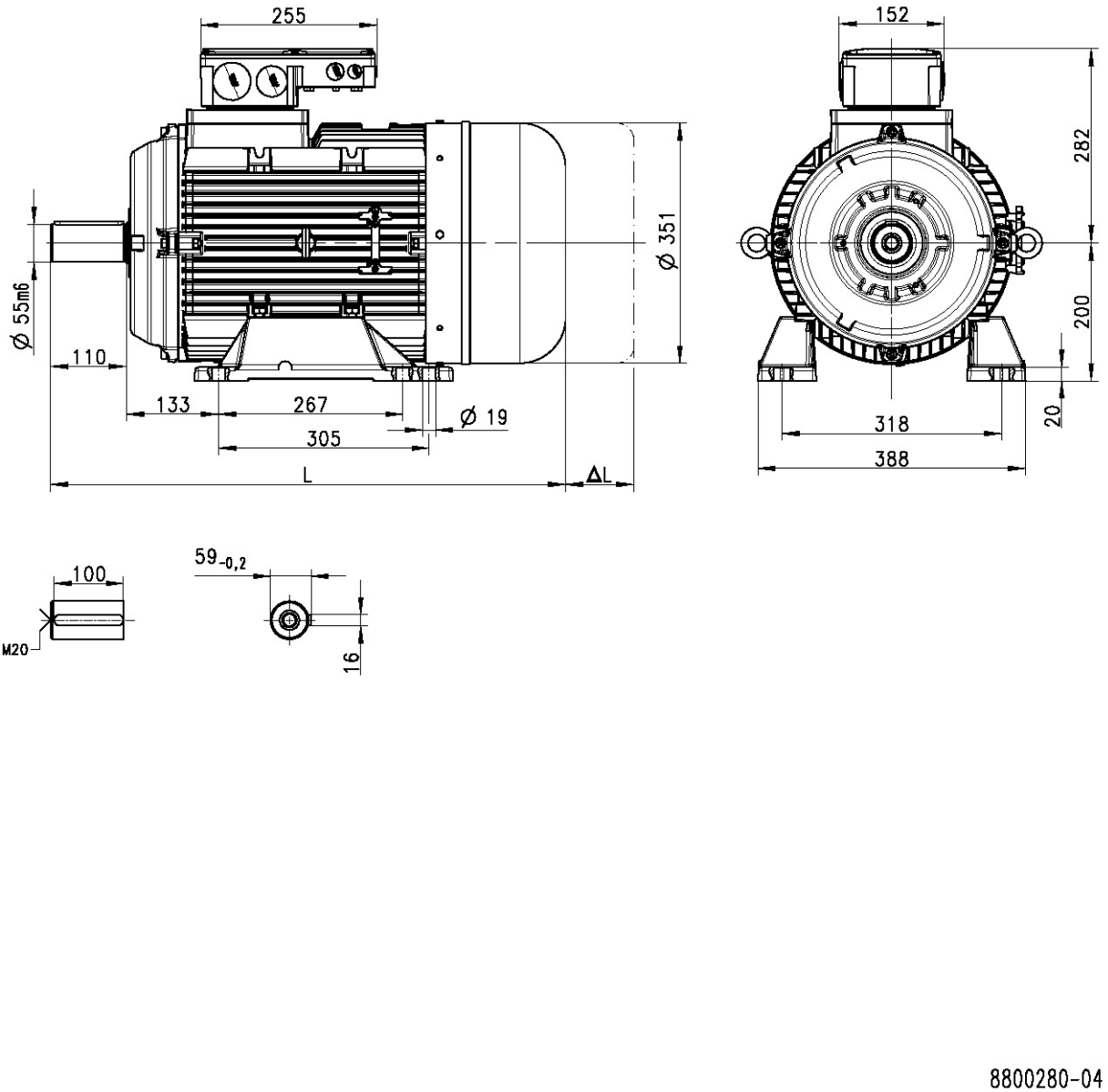
Product			m240-P180/M4	m240-P180/L4
Dimensions				
Motor length	L	[mm]	689	
Length of motor options	Δ L	[mm]	107	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P200

Foot mounting B3



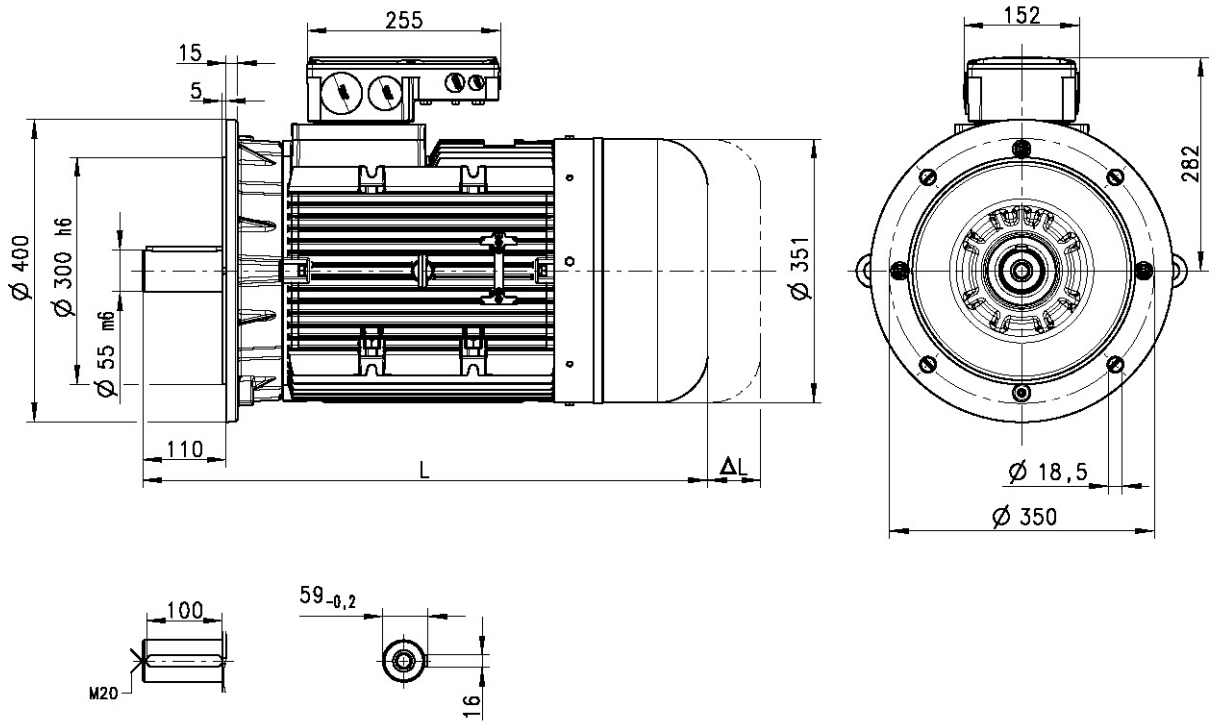
Product			m240-P200/M4
Dimensions			
Motor length	L	[mm]	752
Length of motor options	Δ L	[mm]	112

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P200

Flange mounting B5



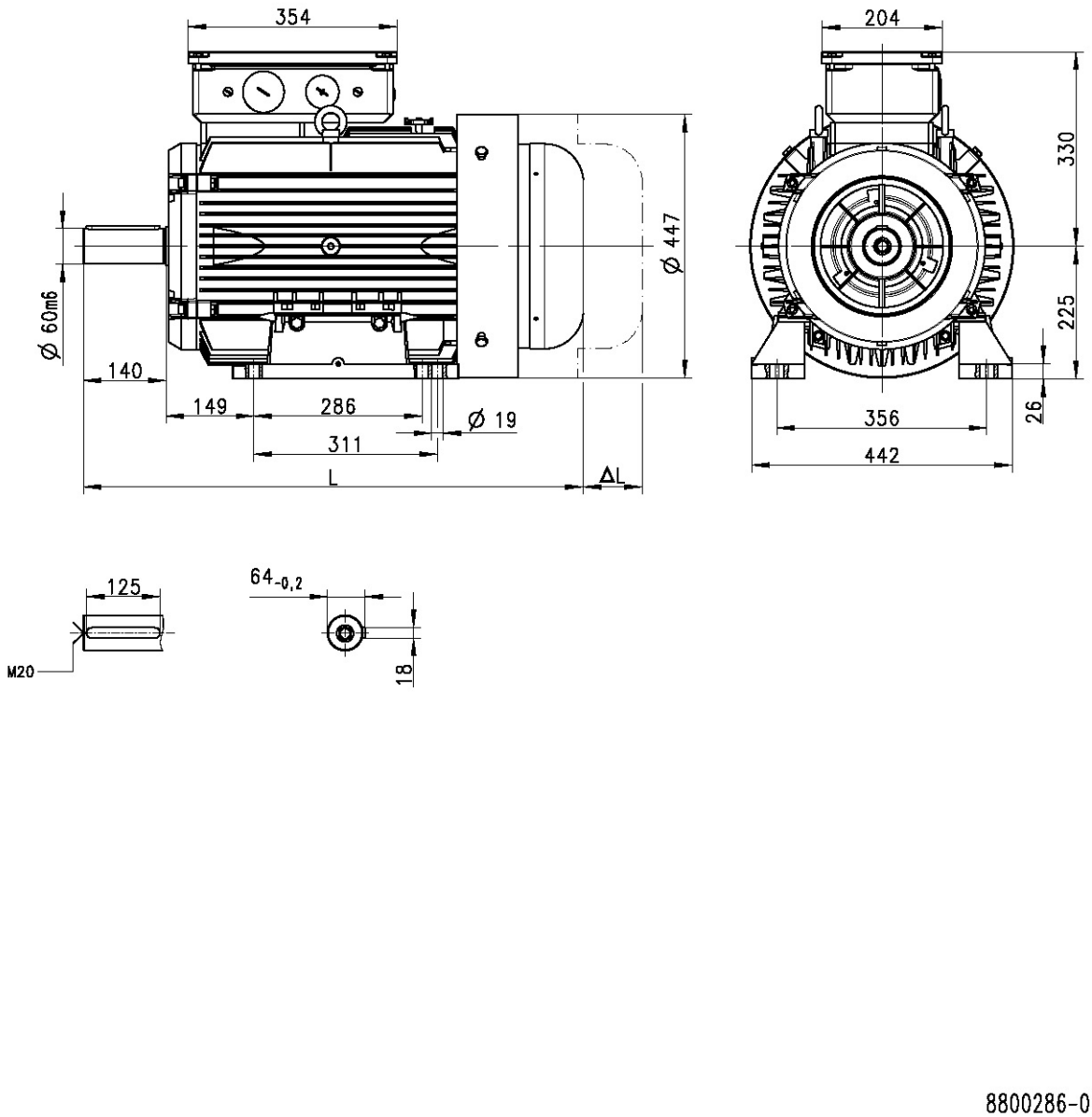
Product			m240-P200/M4
Dimensions			
Motor length	L	[mm]	752
Length of motor options	Δ L	[mm]	112

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P225

Foot mounting B3



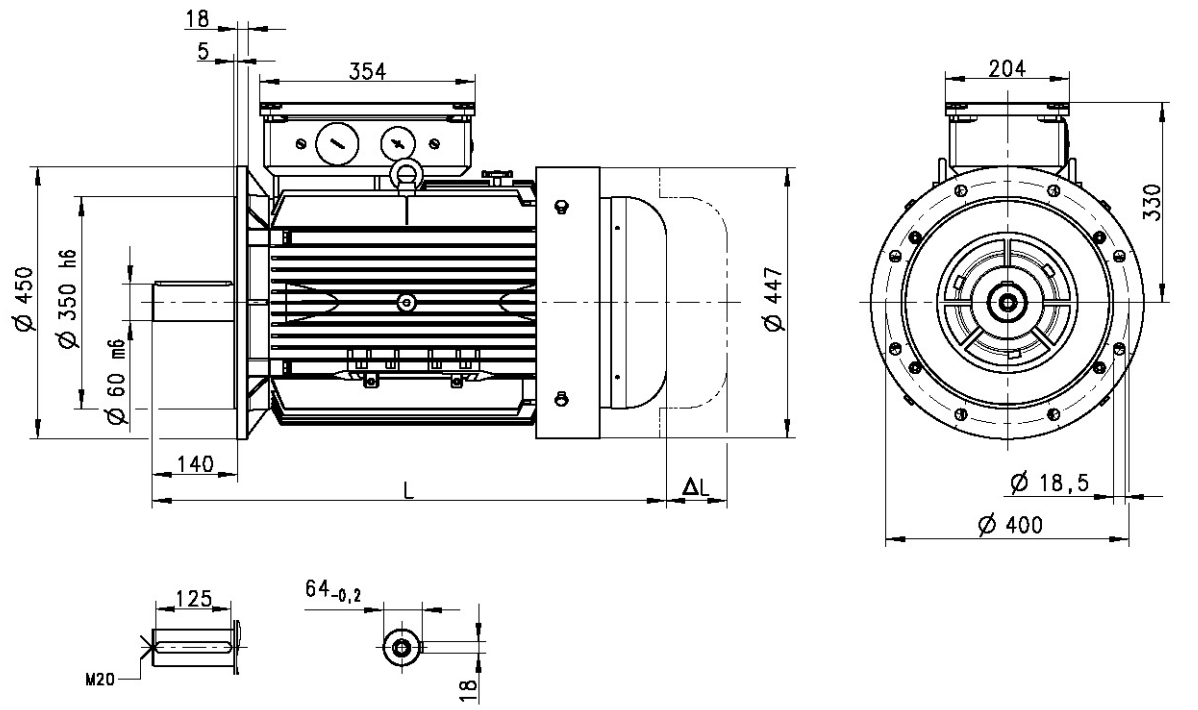
Product			m240-P225/M4	m240-P225/L4
Dimensions				
Motor length	L	[mm]	765	
Length of motor options	Δ L	[mm]	201	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

Dimensions, self-ventilated

m240-P225

Flange mounting B5



Product			m240-P225/M4	m240-P225/L4
Dimensions				
Motor length	L	[mm]	765	
Length of motor options	Δ L	[mm]	201	

L = length of the motor without built-on accessories
ΔL = additional length of the built-on accessories (with brake)

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) - Optional measures: • Motor recesses sealed off (on request)
OKS-XL (extra Large)	• External installation • Air humidity above 95 % • Chemical industry plants • Food industry • Coastal areas with moderate salinity	Additional measures for surface and corrosion protection system L: • Rotor package and stator in the inner area primed with finishing varnish

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	Standard: RAL 7012 Optional: RAL Classic
OKS-M (medium)	Comparable to C2	2K PUR priming coat 2K-PUR top coat	
OKS-L (high) OKS-XL (extra Large)	Comparable to C3		
OKS-XL (extra Large)	Comparable to C4	Dipping primer of the grey iron parts 2K-EP priming coat (two times) 2K-PUR top coat	

Motor connection

The m240 three-phase AC motors are destined for operation on the supply system. They are connected via a terminal box.

Overview of the connection options

Product	m240-P80/M2 m240-P80/M4 m240-P80/L2	m240-P90/M2 m240-P90/M4 m240-P90/L2 m240-P90/L4	m240-P100/M2 m240-P100/M4 m240-P100/L4	m240-P112/M2 m240-P112/M4	m240-P132/M2 m240-P132/M4 m240-P132/L2 m240-P132/L4
Power connection/brake connection					
Terminal box	●	●	●	●	●
Temperature sensor connection					
Terminal box	●	●	●	●	●

Product	m240-P160/M4 m240-P160/L4	m240-P180/M4 m240-P180/L4 m240-P180/V4	m240-P200/M4	m240-P225/M4 m240-P225/L4
Power connection/brake connection				
Terminal box	●	●	●	●
Temperature sensor connection				
Terminal box	●	●	●	●

Motor connection

Assignment: motor terminal box - built-on accessories

► Depending on the motor version, terminal boxes of different sizes (KKA ... KK4) are used.

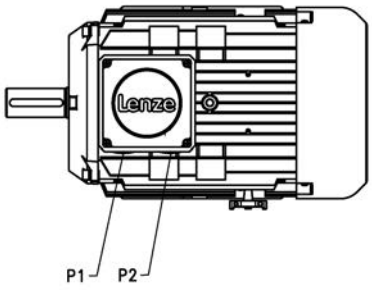
Product	m240-P80/M2 m240-P80/M4 m240-P80/L2	m240-P90/M2 m240-P90/M4 m240-P90/L2 m240-P90/L4	m240-P100/M2 m240-P100/M4 m240-P100/L4	m240-P112/M2 m240-P112/M4	m240-P132/M2 m240-P132/M4 m240-P132/L2 m240-P132/L4
Built-on accessories with 1 thermal sensor					
Without	KKA	KKA	KKA	KKA	KKA
Brake	KK2	KK2	KK2	KK2	KK3
Built-on accessories with 2 thermal sensors					
Without	KKA	KKA	KKA	KKA	KKA
Brake (2-pole terminal)	KK2	KK2	KK2	KK2	KK3
Brake (rectifier)	KK3	KK3	KK3	KK3	KK3

Product	m240-P160/M4 m240-P160/L4	m240-P180/M4 m240-P180/L4 m240-P180/V4	m240-P200/M4	m240-P225/M4 m240-P225/L4
Built-on accessories with 1 thermal sensor				
Without	KKA	KKA	KKA	KKA
Brake	KK4	KK4	KK4	KK4
Built-on accessories with 2 thermal sensors				
Without	KKA	KKA	KKA	KKA
Brake (2-pole terminal)	KK4	KK4	KK4	KK4
Brake (rectifier)	KK4	KK4	KK4	KK4

Connection via terminal box

The connection in the terminal box is implemented by means of conventional cable glands.

Cable entries for motors with terminal box KKA

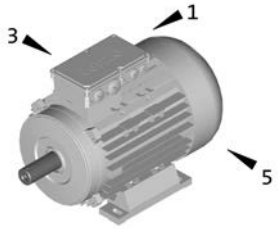


Product	Dimensions	
	P_1	P_2
	[mm]	[mm]
m240-P80/M2 m240-P80/M4 m240-P80/L2	M20x1.5	M20x1.5
m240-P90/L2 m240-P90/M2 m240-P90/M4	M25x1.5	M25x1.5
m240-P100/M2 m240-P100/M4 m240-P100/L4		
m240-P112/M2 m240-P112/M4	M32x1.5	M32x1.5
m240-P132/L4 m240-P132/M2 m240-P132/M4 m240-P132/L2		
m240-P160/L4 m240-P160/M4		
m240-P180/L4 m240-P180/M4 m240-P180/V4	M40x1.5	M40x1.5
m240-P200/M4	M50x1.5	M50x1.5
m240-P225/M4 m240-P225/L4		

Connection via terminal box

Cable entries for motors with terminal box KKA

For IEC standard motors with terminal box KK1, the position of the cable entry can be selected.

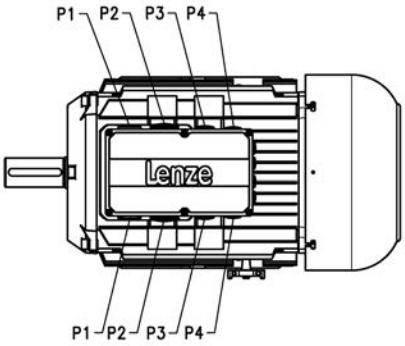
Position of the cable entry for IEC standard motors


Possible cable entry position	1/3/5*

► If preferred positions are not specified in the order, the cable entry will be positioned as indicated by * on the diagram below.

Connection via terminal box

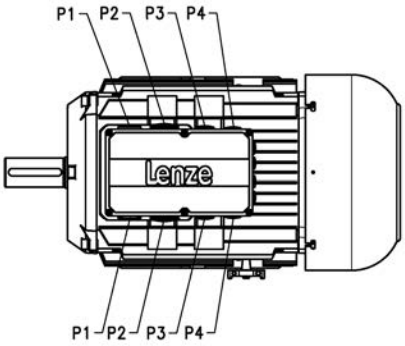
Cable entries for motors with terminal box KK2



Product	Dimensions				
	P_1	P_2	P_3	P_4	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]
m240-P80/M2 m240-P80/M4 m240-P80/L2	M20x1.5	M25x1.5			M16x1.5
m240-P90/M2 m240-P90/M4 m240-P90/L2 m240-P90/L4					
m240-P100/M2 m240-P100/M4 m240-P100/L4					
m240-P112/M2 m240-P112/M4					

Connection via terminal box

Cable entries for motors with terminal box KK3 and KK4



Product	Dimensions				
	P_1	P_2	P_3	P_4	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]
m240-P80/M2 m240-P80/M4 m240-P80/L2	M25x1.5	M32x1.5	M20x1.5	M16x1.5	M16x1.5
m240-P90/M2 m240-P90/M4 m240-P90/L2 m240-P90/L4					
m240-P100/M2 m240-P100/M4 m240-P100/L4					
m240-P112/M2 m240-P112/M4					
m240-P132/M2 m240-P132/M4 m240-P132/L2 m240-P132/L4					
m240-P160/M4 m240-P160/L4	M50x1.5	M40x1.5			
m240-P180/M4 m240-P180/L4 m240-P180/V4					
m240-P200/M4					
m240-P225/M4 m240-P225/L4	M12x1.5	M63x1.5	M50x1.5	M12x1.5	

Spring-applied brake

The three-phase AC motors can be equipped with a spring-applied brake which is active when the supply voltage has been switched off (closed-circuit principle). In the deenergised state, the brake is applied. This prevents possible movement of the motor shaft with regard to the load after switch-off or in the event of a power failure.
For optimum adaptation of the brake motor to the application, several brake sizes and control variants are provided for each motor.

Types
- **Standard**
  - 1 x 10^6 repeating switching cycles
  - 1 x 10^6 reversing switching cycles

Control
- DC supply
- AC supply via rectifiers in the terminal box

Degree of protection
- Without manual release IP55
- With manual release IP54

Friction lining
- Asbestos-free, low-wear

Options
- Manual release

Braking torques

In addition to the standard braking torque, depending on the brake size, the possibility of choosing between a reduced and an increased braking torque is provided.
- When the braking torque is reduced, great wear reserves can be attained. This is enabled by a reduction of the spring rate.
- In order to obtain a greater braking torque, the spring rate is increased. This is practical, for instance, for hoists, since here the gravity acts as an additional acceleration in the negative direction.

Manual release

By using the manual release lever, the brake can be released manually in deenergised operating state. The manual release makes positioning and maintenance work easier.

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 for protection against induction peaks.

- Supply voltages
  DC 24 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:

Rectifier, 6-pole

- Supply voltages
  AC 230 V
  AC 400 V

Spring-applied brake

Assignment of 2-pole motors and brakes

Design	Standard	LongLife

Product	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
m240-P80/M2 m240-P80/L2	08 08 10	3.50 8.00 7.00		
m240-P90/M2 m240-P90/L2	08 08 10 10	3.50 8.00 7.00 16.0		
m240-P100/M2	10 10 12 12	7.00 16.0 14.0 32.0		
m240-P112/M2	12 12 14 14	14.0 32.0 35.0 60.0		
m240-P132/M2 m240-P132/L2	14 14 16 16	35.0 60.0 60.0 80.0		

Spring-applied brake

Assignment of 4-pole motors and brakes

Design	Standard	LongLife

Product	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
m240-P80/M4	08 08 10	3.50 8.00 7.00		
m240-P90/M4 m240-P90/L4	08 08 10 10 10	3.50 8.00 7.00 16.0 23.0		
m240-P100/M4	10 10 12 12	7.00 16.0 14.0 32.0		
m240-P100/L4	10 10 12 12 12	7.00 16.0 14.0 32.0 46.0		
m240-P112/M4	12 12 14 14	14.0 32.0 35.0 60.0		
m240-P132/M4	14 14 16 16	35.0 60.0 60.0 80.0		
m240-P132/L4	14 14 16 16 16	35.0 60.0 60.0 80.0 100		

Spring-applied brake

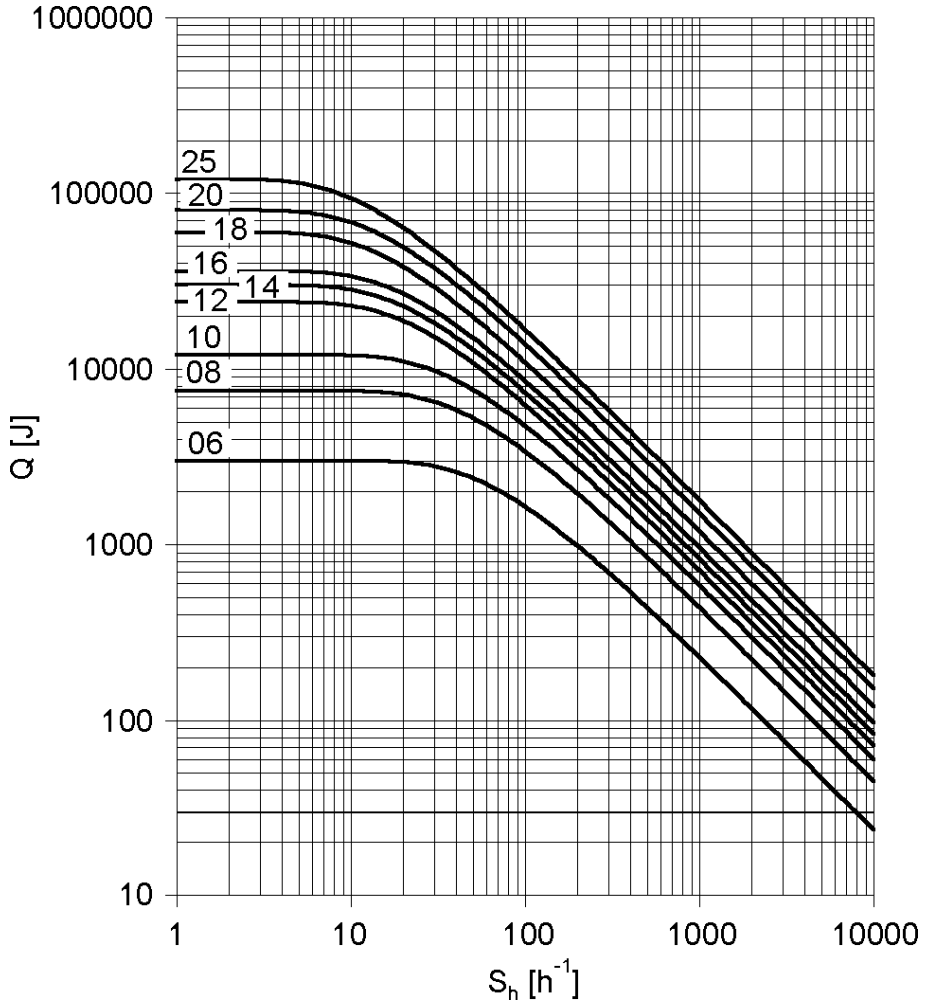
Assignment of 4-pole motors and brakes

Design	Standard	LongLife

Product	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
m240-P160/M4	16 16 18 18	60.0 80.0 80.0 150		
m240-P160/L4	18 18 18	80.0 150 200		
m240-P180/M4	18 18 20 20	80.0 150 145 260		
m240-P180/L4	18 18 20 20 20	80.0 150 145 260 315		
m240-P180/V4 m240-P200/M4	18 18 20 20 20 20	80.0 150 145 260 315 400		
m240-P225/M4	25 25 25	265 400 490		
m240-P225/L4	25 25 25 25	265 400 490 600		

Spring-applied brake

Permissible friction energy



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

Spring-applied brake

Rated data with reduced braking torque

- ► In case of the braking torque and the maximum switching energy, the unit for the values (100 ... 3600) isr/min.
- ► 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	[kgcm²]	0.15	0.61	2.00	4.50	6.30	15.0	29.0	73.0	200
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 %.

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

► 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

Rated data with standard braking torque

- ► In case of the braking torque and the maximum switching energy, the unit for the values (100 ... 3600) isr/min.
- ► 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											
	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm²]	0.15	0.61	2.00	4.50	6.30	15.0	29.0	73.0	200
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 %.

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

► 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

Rated data with increased braking torque

- ► In case of the braking torque and the maximum switching energy, the unit for the values (100 ... 3600) isr/min.
- ► 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												
	$S_{hü}$	[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	[kgcm²]	2.00	4.50	6.30	15.0	15.0	29.0	73.0	73.0	200	200
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 %.

5.11

- ► Activation via half-wave or bridge rectifier

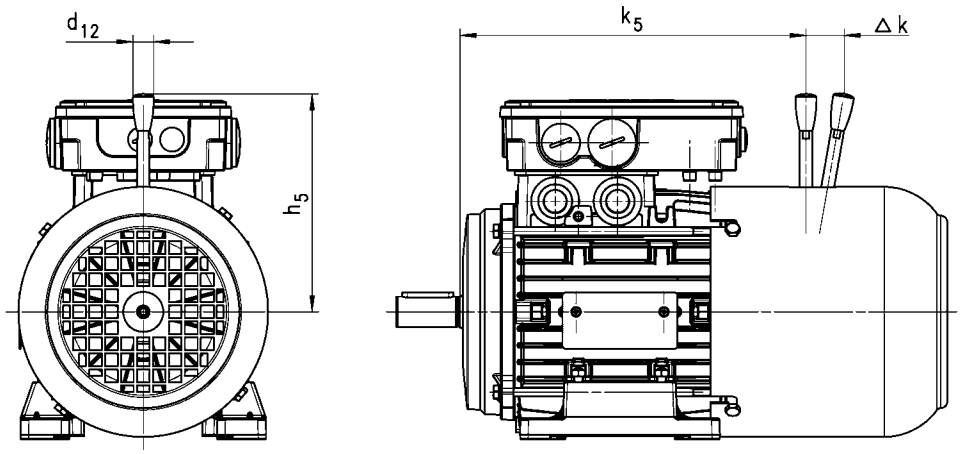
Size			10	12	14	16		18	20		25	
Friction energy												
	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Delay time												
Engaging	t_{11}	[ms]	10.0	16.0	11.0	22.0	17.0	24.0	46.0	17.0	77.0	38.0
Rise time												
Braking torque	t_{12}	[ms]	19.0	25.0		30.0		45.0	100		120	
Engagement 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

Spring-applied brake

Manual release for 2-pole motors

By using the manual release lever, the brake can be released manually in deenergised operating state. The manual release makes positioning and maintenance work easier.

Manual release lever for IEC motors



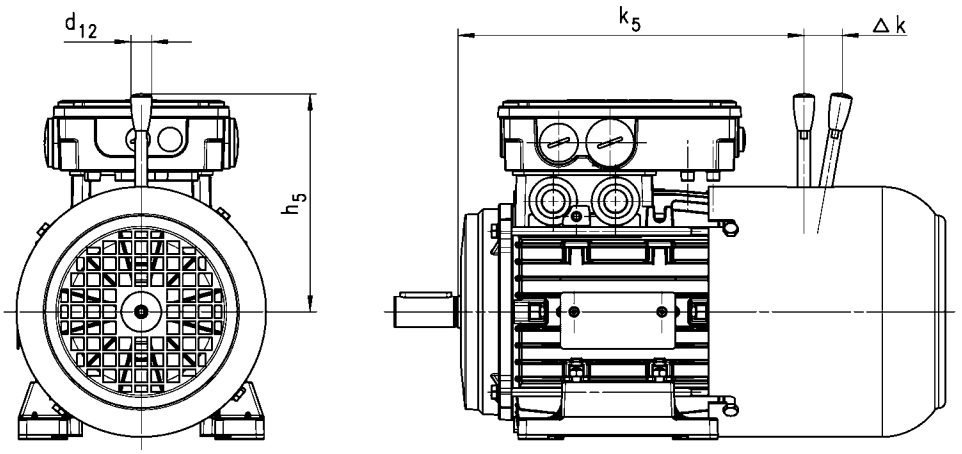
	Size	Dimensions			
	Brake				
		k_5	Δ k	h_5	d_{12}
		[mm]	[mm]	[mm]	[mm]
m240-P80/M2 m240-P80/L2	08 10	246 257	27 28	136 132	13.0 13.0
m240-P90/M2 m240-P90/L2	08 10	291 302	27 28	136 132	13.0 13.0
m240-P100/M2	10 12	338 340	28 37	132 161	13.0 13.0
m240-P112/M2	12 14	358 360	37 41	161 195	13.0 24.0
m240-P132/M2 m240-P132/L2	14 16	405 407	41 55	195 240	24.0 24.0

Spring-applied brake

Manual release for 4-pole motors

By using the manual release lever, the brake can be released manually in deenergised operating state. The manual release makes positioning and maintenance work easier.

Manual release lever for IEC motors



	Size	Dimensions			
	Brake				
		k_5	Δ k	h_5	d_{12}
		[mm]	[mm]	[mm]	[mm]
m240-P80/M4	08 10	246 257	27 28	136 132	13.0 13.0
m240-P90/M4 m240-P90/L4	08 10	291 302	27 28	136 132	13.0 13.0
m240-P100/M4 m240-P100/L4	10 12	338 340	28 37	132 161	13.0 13.0
m240-P112/M4	12 14	358 360	37 41	161 195	13.0 24.0
m240-P132/M4 m240-P132/L4	14 16	405 407	41 55	195 240	24.0 24.0
m240-P160/M4	16 18	479 484	59	279	24.0
m240-P160/L4	18	484	59	279	24.0
m240-P180/M4	18 20	552 559	59 74	279 319	24.0 24.0
m240-P180/L4	18 20	552 559	59 74	279 319	24.0 24.0
m240-P200/M4	18 20	620 626	59 74	279 319	24.0 24.0
m240-P225/M4 m240-P225/L4	25	650	103	445	24.0

Temperature monitoring

To protect the motor against overheating, the following thermal sensors are provided.
The thermal sensors are integrated into the windings. We recommend using an additional motor protection switch.

TKO thermal contacts

The TCO thermal contact (thermal NC contact) is a bimetallic-element switch. The TCO monitors the motor winding temperature; at too high temperatures, the motor relay switches. The motor is disconnected from the mains.

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

PTC thermistor

The PTC thermistor is actuated in connection with a tripping unit. If the motor gets too hot, the motor can be switched off by means of a contactor. In contrast to the thermal contact, quick restart is possible.

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

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