



Catalog

Low voltage Water cooled motors

We provide motors and generators, services and expertise to save energy and improve customers' processes over the total lifecycle of our products, and beyond.



Low voltage Water cooled motors

Sizes 280 to 450

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General information

The motor range represents a new generation of water cooled motors developed in response to market demands for improved technical features. The range is available in IEC frame sizes 280 to 450. Water cooling is a very efficient method of transferring heat away from the motor, and water cooled motors provide high output power per unit of weight. Cooling efficiency is maintained throughout the speed range, which is especially important in constant torque applications. These advantages make the motors ideal for a range of uses, including marine applications, water and waste water pumping, printing machines, and wind turbine generators. The basic structure of the motors is optimized for variable speed use.

International motor efficiency standards

Since the validation of the standard IEC/EN 60034-30, a worldwide energy efficiency classification system exists for low voltage three-phase asynchronous motors. This system increases the level of harmonization in efficiency regulations around the world. International Electrotechnical Commission (IEC) standard IEC/EN 60034-30:2008 defines energy-efficiency (IE code) classes for single speed, three-phase, 50 and 60 Hz induction motors. The standard is part of an effort to unify motor testing procedures and efficiency and product labeling requirements to enable motor purchasers worldwide to easily recognize premium efficiency products. The efficiency levels defined in IEC/EN 60034-30 are based on test methods specified in IEC/EN 60034-2-1:2007.

To promote transparency in the market, IEC 60034-30 states that both the efficiency class and efficiency value must be shown on the motor rating plate and in product documentation. The documentation must clearly indicate the efficiency testing method used as the different methods can produce differing results.

All water cooled motors fulfill IE2 efficiency class. ABB determines efficiency values according to IEC/EN 60034-2-1 using the low uncertainty method i.e. indirect method, with additional load losses determined by measurement.

IEC/EN 60034-30:2008

IEC/EN 60034-30:2008 defines three International Efficiency (IE) classes for single speed, three-phase, cage induction motors.

- IE1 = Standard efficiency (EFF2 in the former European classification scheme)
- IE2 = High efficiency (EFF1 in the former European classification scheme and identical to EPAct in the USA for 60 Hz)
- IE3 = Premium efficiency (identical to "NEMA Premium" in the USA for 60 Hz)
- IE4 = Super premium, according to IEC/TS 60034-31

Efficiency levels defined in IEC/EN 60034-30 are based on test methods specified in IEC/EN 60034-2-1:2007.

Compared to the former European efficiency classes defined by the CEMEP agreement the scope has been expanded.

IEC/EN 60034-30 covers almost all motors (for example standard, hazardous area, marine, brake motors)

- Single speed, three-phase, 50 Hz and 60 Hz –2-, 4- or 6-pole
- Rated output from 0.75 to 375 kW
- Rated voltage UN up to 1000 V
- Duty type S1 (continuous duty) or S3 (intermittent periodic duty) with a rated cyclic duration factor of 80 % or higher
- Capable of operating direct online

The following motors are excluded from IEC 60034-30:

- Motors made solely for converter operation
- Motors completely integrated into a machine (for example, pump, fan or compressor) that cannot be tested separately from the machine

Minimum efficiency values defined in IEC 60034-30:2008 standard
(based on test methods specified in IEC 60034-2-1:2007)

Output kw	IE Standard efficiency			IE2 High efficiency			IE3 Premium efficiency		
	2 pole	4 pole	6 pole	2 pole	4 pole	6 pole	2 pole	4 pole	6 pole
0.75	72.1	72.1	70.0	77.4	79.6	75.9	80.7	82.5	78.9
1.1	75.0	75.0	72.9	79.6	81.4	78.1	82.7	84.1	81.0
1.5	77.2	77.2	75.2	81.3	82.8	79.8	84.2	85.3	82.5
2.2	79.7	79.7	77.7	83.2	84.3	81.8	85.9	86.7	84.3
3	81.5	81.5	79.7	84.6	85.5	83.3	87.1	87.7	85.6
4	83.1	83.1	81.4	85.8	86.6	84.6	88.1	88.6	86.8
5.5	84.7	84.7	83.1	87.0	87.7	86.0	89.2	89.6	88.0
7.5	86.0	86.0	84.7	88.1	88.7	87.2	90.1	90.4	89.1
11	87.6	87.6	86.4	89.4	89.8	88.7	91.2	91.4	90.3
15	88.7	88.7	87.7	90.3	90.6	89.7	91.9	92.1	91.2
18.5	89.3	89.3	88.6	90.9	91.2	90.4	92.4	92.6	91.7
22	89.9	89.9	89.2	91.3	91.6	90.9	92.7	93.0	92.2
30	90.7	90.7	90.2	92.0	92.3	91.7	93.3	93.6	92.9
37	91.2	91.2	90.8	92.5	92.7	92.2	93.7	93.9	93.3
45	91.7	91.7	91.4	92.9	93.1	92.7	94.0	94.2	93.7
55	92.1	92.1	91.9	93.2	93.5	93.1	94.3	94.6	94.1
75	92.7	92.7	92.6	93.8	94.0	93.7	94.7	95.0	94.6
90	93.0	93.0	92.9	94.1	94.2	94.0	95.0	95.2	94.9
110	93.3	93.3	93.3	94.3	94.5	94.3	95.2	95.4	95.1
132	93.5	93.5	93.5	94.6	94.7	94.6	95.4	95.6	95.4
160	93.7	93.8	93.8	94.8	94.9	94.8	95.6	95.8	95.6
200	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
250	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
315	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
355	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
375	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8

Cooling designation

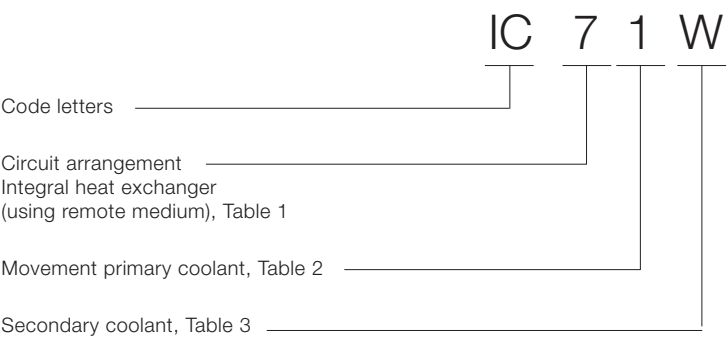


Table 1. Circuit arrangement

Characteristic numeral	Brief description	Definition
7 (see note 2)	Integral heat exchanger (using remote medium)	The primary coolant is circulated in a closed circuit and gives its heat via a heat exchanger, which is built into and forms an integral part of the machine, to the secondary coolant which is the remote medium.

Note 2. The nature of the heat exchanger is not specified (ribbed or plain tubes, etc.).

Table 2. Method of movement (Movement primary coolant)

Characteristic numeral	Brief description	Definition
1	Self-circulation	The coolant is moved dependent on the rotational speed of the main machine, either by action of the rotor alone or by means of a component designed for this purpose and mounted directly on the rotor of the main machine, or by a fan or pump unit mechanically driven by the rotor or the main machine.

Table 3. Coolant (Secondary coolant)

Characteristic letter	Coolant
W	Water

Optimized for variable speed applications

The basic structure of the M3LP water cooled motors is as standard optimized for variable speed applications. The basic selection rules below should be considered, please refer to product catalogue for Process performance motors for details.

Motor loadability with ACS 800 frequency converter

The curves in figure 1 are **guidelines** (not guaranteed values) for standard ACS 800 drives with DTC-control. These guidelines present the maximum continuous load torque of a motor as function of frequency (speed) to give the same temperature rise as with rated sinusoidal supply at nominal frequency and full rated load.

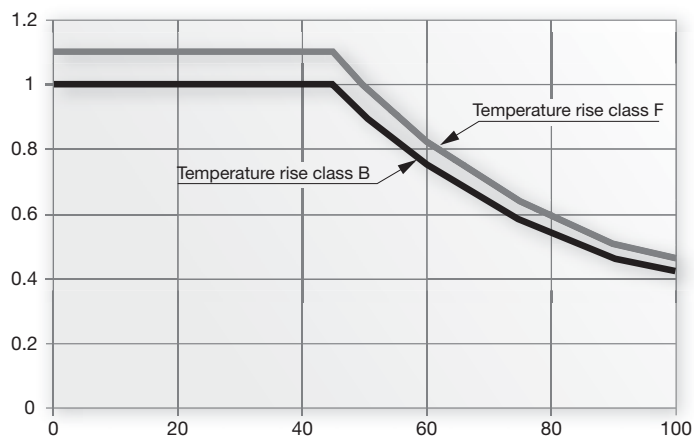


Figure 1. Motor loadability with ACS 800, field weakening point 50Hz.

Insulation protection

The increased voltage stresses of winding insulation in variable speed drive should be considered, therefore the precautions described in the table below must be taken to avoid risks of insulation damage.

Bearing currents

To avoid bearing currents all water cooled motors in variable speed drive must be equipped with insulated bearing at N-end.

Framesize	355	400, 450
$U_N \leq 500V$	Standard motor	Common mode filter
$U_N \leq 600V$	dU/dt filter (reactor) OR Reinforced insulation	dU/dt filter (reactor) and common mode filter OR Reinforced insulation and Common mode filter
$U_N \leq 690V$	Reinforced insulation And dU/dt filter (reactor) and Common mode filter	Reinforced insulation, dU/dt filter

Mechanical design

Stator

The frame material differs depending on the size of the motor. Frame sizes 280 and 315 are of casted aluminum with stainless steel water tubes inside the frame. These frames have also modular feet structure (steel).

Frame sizes 355 to 450 are provided with integrated feet, both the frame and feet made of steel. Bearing housing and terminal box are of cast iron. Motors can be supplied for foot mounting, flange mounting and combinations of these.

Degree of protection is IP 55 as standard, higher degree of protection, IP 56, is available as option.

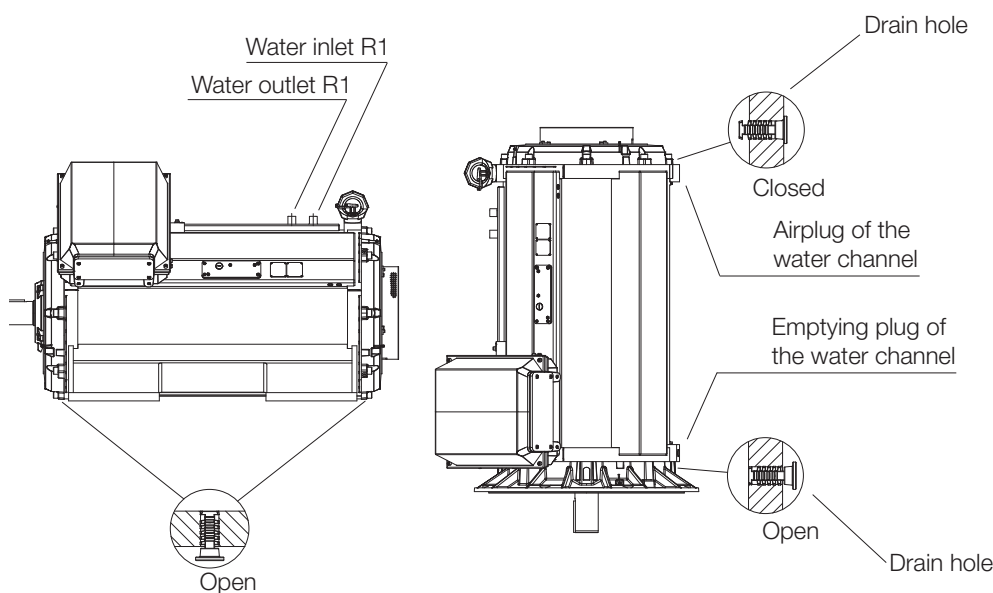
Motors from frame size 280 up to 315 ML are without bearing fan as standard, except motor types M3LP 315 ML 2-pole. Frame sizes 315KH and 355 are fitted with bearing fans at both non-drive and drive ends. Motors in frame sizes 400 and 450 are fitted with a bearing fan, which is mounted on the non-drive end.

Drain holes

Motors are supplied with drain holes and closable plugs as standard to avoid water from gathering in the windings.

Cooling channel

The motors in frame sizes 355 to 450 are equipped with emptying plug in the lowest position and air plug in the highest position at the channel. Due to the cooling channel construction no emptying or air plugs are needed for frame sizes 280-315.



Emptying plug and air plug for sizes 355 to 450.

M001000

Cooling water requirements

Requirements for cooling water in motor sizes 280–315

Water with a proportion of chloride up to 3000 mg/l can be used if the ingress of oxygen into cooling water is prevented and the cooling water temperature does not exceed 30 °C. The highest allowed pressure for cooling water is 5 bar.

Requirements for cooling water in motor sizes 355–450

Cooling water must be tap water quality. Sea water or water with a proportion of chloride above 120 mg/l should not be used. The highest allowed pressure for cooling water is 5 bar, with a recommended maximum input water temperature of 40 °C. Steel frame water-cooled construction is only to be used with a closed fresh water circulation. The cooling water circulates in ducts integrated in the machine frame. The material of the frame and ducts is carbon steel according to the standard EN 10025-S235JR. This material is prone to corrosion in saline and foul water. The corrosion products and fouling deposits might block the water flow in the ducts. This is why it is important to use pure water in the cooling system.

Standard values for the cooling water to be used in the cooling system:

- pH 6.5–9.5
- Alkalinity (CaCO₃) > 1 mmol/l
- Chloride (Cl) < 120 mg/l
- Conductivity < 1500 µS/cm

In most cases, normal tap water, i.e. water for domestic consumption, meets all these requirements.

The cooling water can also be inhibited with an agent protecting the cooling system against corrosion, fouling and, when necessary, against freezing. All materials in contact with the cooling water (pipes, heat exchanger, etc.) must be taken into account when selecting a suitable inhibitor.

The outlet water temperature rise is from 7–15 K.

The minimum pressure and amount of cooling water for the basic construction of a water cooled motor is shown in the following table.

Motor type M3LP Frame type	Number of inlets	Cooling water flow rate (l/min)	Water pressure min. (bar)	Water temperature rise (K)
280 SM_	1	20	2.0	7-12
315	1	30	2.0	7-12
355 ML_	1	30	2.0	10-15
355 LK_	1	35	2.0	10-15
400 L_	1	40	2.0	10-15
450 L_	1	50	2.0	10-15

Terminal box standard delivery

The terminal box in the frame sizes 280 to 355 is mounted on the top of the motor. The terminal boxes in the frame sizes 400 and 450 are mounted in the 45° angle on the motor, either on right or left hand side of the motor, to be defined when ordering.

Terminal box sizes 210, 370 & 750 can be turned 4x90° and terminal box size 1200 can be turned 2x180°. Degree of protection of standard terminal box is IP 55.

The terminal box is equipped with a steel flange for protection during transport. There are no cable glands or cable boxes as standard, but these are available as option. Please see variant code section table below for exact availability.

To ensure that suitable terminations for the motor can be supplied, please state the cable type, quantity and size when ordering. Non-standard terminal box designs - e.g. non-standard size or degree of protection - are available as options. The terminations are suitable for Cu- and Al-cables. The cables are connected to the terminals using cable lugs (not included with the motor).

Please see variant code pages for options.

Standard delivery 400/690 V

Motor size	Pole number	Terminal box type	Terminal box opening	Single core cross-section	
				mm² for rated power	Terminal bolt size 6 x
280SMA, SMB	2-8	210	C	2x150	M12
280SMC	2	370	D	2x240	M12
280SMC	4, 8	210	C	2x150	M12
280SMD	4	370	D	2x240	M12
315KH	2-4	750	E	4x240	M12
315KH	6-8	370	D	2x240	M12
315MA, MB, MC	2-8	370	D	2x240	M12
315MLA, MLB	2	750	E	4x240	M12
315MLA, MLB	4-8	370	D	2x240	M12
355	4-6	750	E	4x240	M12
355MLC, LK	8	750	E	4x240	M12
355MLA, MLB	8	370	D	2x240	M12
400	4	1200	E	6x240	M12
400LA, LB	6-8	750	E	4x240	M12
400LC, LD	6	1200	E	6x240	M12
400LC	8	750	E	4x240	M12
450	2-6	1200	E	6x240	M12
450LA, LB	8	750	E	4x240	M12

Terminal bolt size M12

Earthing bolt size on stator frame M10

Examples of terminal boxes and connection parts below pictures show a collection of terminal boxes and connection parts.



M001001

Terminal box 370 outside



M001002

Terminal box 370 inside



M001003

Terminal box 370 from D-end



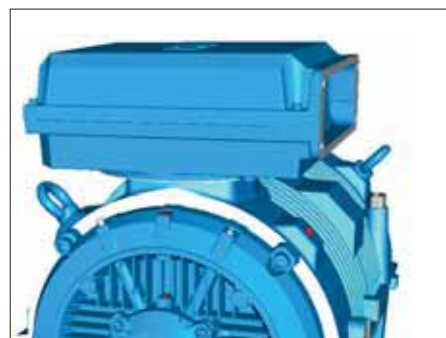
M001005

Terminal box 750 outside



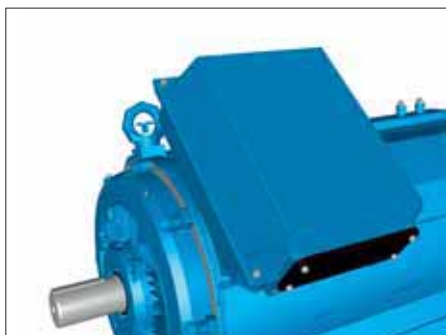
M001004

Terminal box 750 inside



M001010

Terminal box 750 from D-end



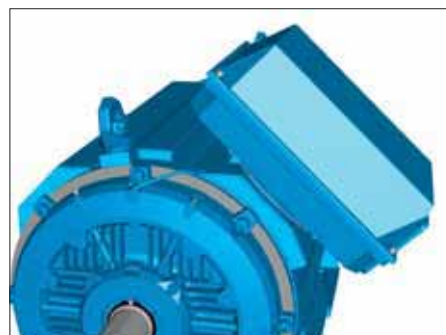
M001006

Terminal box 1200 outside



M001007

Terminal box 1200 inside



M001008

Terminal box 1200 from D-end

Terminal box alternatives



Motor frame sizes 355 to 450 with main terminal box

How to order?

- Check first that the teminal box can allow mounting of the cable and cores (refer to motor type and terminal box type cross reference page 18).
- If very large cables are used it might be necessary to use a larger terminal box than standard. Select the right cable gland(s) or cable sealing end unit(s) depending on outer diamater of the cable(s).
- Select appropriate adapter and flange and gland(s) or cable sealing end unit.
- Note that turning the terminal box to a non-standard position might limit the use of some adapters.

Main terminal box and maximum single core cross section

Only one size larger terminal box can be selected. Please check also the capacity of the cable entry, to make sure that the cables fit.

			One size larger terminal box can be selected if larger single cross section is needed		
Standard terminal box	Size of opening	Max single cross section per phase mm²	Variant code 019 larger terminal box than standard	Size of opening with Variant code 019	Max single cross section per phase mm²
210	C	2 x 240	370	D	2 x 300
370	D	2 x 300	750	E	4 x 500
750	E	4 x 500	1200	E	4 x 500
1200	E	4 x 500	NA	NA	NA

Optional adapters

There is a broad selection of cable termination accessories available to allow termination of one or several cables. The most common ones are explained below, for other options please contact ABB.

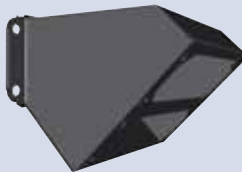
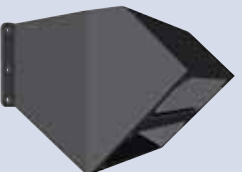
Ordering example

Motor	500 kW, 4-pole, 400 V, 50 Hz, B3
Cables	2 pieces, outer diameter 72 mm, singel core cross section 200 mm² clamping device needed, cable coming from below
Needed one terminal box for anticondensation heaters 240 V and another for PT100's in winding, one per phase 3-wire, material cast iron	
Motor	M3LP 355MLE 4 B3
Adapter	E-D, variant code 294
Cable sealing end unit	Variant code 278
Clamping	Variant code 231
Auxiliaries	Variant codes 380, 451, 502, 567, 568

Optional adapters

To allow easy termination of cables entering the terminal box from above or below it is recommended to use an angle

adapter. These can also be used to allow mounting of several cable sealing end units or gland plates.

Adapter	Variant code	Opening towards terminal box	Flange or opening for cable sealing end unit	Material	Notes
 M000430	292	C	C	Steel	
 M000431	293	D	D	Steel	
 M000432	294	E	D	Steel	
 M000433	295	E	2 pcs D	Steel	
 M000434	296	E	3 pcs D	Steel	Only possible on terminal box 1200
 M000435	444	E	2 pcs E	Steel	Only possible on terminal box 1200

Flange, maximum size of glands and material

Flanges are delivered blind or can be drilled and tapped to accommodate glands to suit the cable diameter and amount of glands needed. Standard flange material is aluminum with terminal boxes up to size 370. From size 750 upwards flanges are painted mild steel. Stainless steel flanges are available as options.

Size	Examples of maximum size and number of glands, metric		
C	2xM90	3xM50	7xM32
D	4xM90	4xM63	7xM50
E	6xM90	7xM63	9xM50

Related variant codes

- 729 Aluminum non-drilled flange for cable glands
- 730 Prepared for NPT cable glands
- 743 Painted non-drilled flange in steel for cable glands
- 744 Stainless steel non-drilled flange for cable glands
- 745 Painted steel flange equipped with brass cable glands
- 746 Stainless steel cable flange equipped with standard brass cable glands

Cable glands

Table below shows the selection of cable gland types and possible cable outer diameter for each size.

Cable gland type	Outer diameter, mm		
	Variant code 745; Painted steel flange equipped with brass cable glands	Variant code 231; Standard cable glands with clamping device	Variant code 704; EMC cable gland
M20	8-14	8-14	8-14
M25	10-16	10-16	10-16
M32	14-21	14-21	14-21
M40	18-27	18-27	18-27
M50	26-35	26-35	26-35
M63	32-49	32-49	32-49
M75	46-60	NA	NA
M90	55-70	NA	NA

For armoured and NPT cable glands please contact ABB.

Cable sealing end unit

As an alternative to flanges and cable glands, cable sealing end-units can be used. These allow more space for spreading the cores for easy terminating.

Cable sealing end units have rubber sealed entries for one or two main cables. In addition there are two M20 plugged holes for auxillary cables.



					Accessories Variant code 704; EMC cable gland	Variant code 231; Standard cable gland with clamping device
	Variant code	Opening towards terminal box	Cable outer diam- eter mm	Cable entry auxilliary cable		
 M000436	277	C	1 or 2 pcs 48-60 mm *)	2 pcs M20 plugged holes	Optional	Optional
 M000437	278	D	1 or 2 pcs 48-60 mm *)	2 pcs M20 plugged holes	Optional	Optional
 M000438	279	D	1 or 2 pcs 60-80 mm *)	2 pcs M20 plugged holes	Optional	Optional

*) The cable seal inside the cable sealing end unit can be used so that it is suitable for cable diameters 40-52mm.

Auxiliary terminal box

It's possible to equip the motors from frame size 160 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. By using variant code 418 auxiliary terminal box in aluminum is provided. Cast iron auxiliary terminal box can be ordered with variant code 567. Both are equipped with M20 glands for entry of the connection cables.

Connection terminals are spring loaded type for quick and easy connection. These are suitable for up to 2,5mm² wires. Auxiliary terminal boxes are equipped with an earthing terminal. The first auxiliary terminal box is as standard located a RHS at D-end.

Related variant codes:

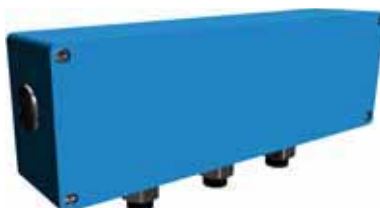
380	Separate terminal box for temperature detectors, standard material
418	Separate terminal box for auxiliaries, standard material
567	Separate terminal box material: cast iron
568	Separate terminal box for heating elements, standard material
569	Separate terminal box for brake

Small, aluminum auxiliary terminal box
(80 x 125 mm, max 12 strips).
Earthing size M4



M000439

Large, aluminum auxiliary terminal box
(80 x 250 mm, max 30 strips)
Earthing size M4



M000440

Cast iron auxiliary terminal box
(211 x 188 mm, max 30 strips)
Earthing size M6

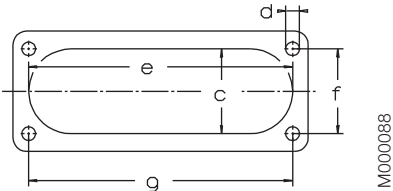


M000441

Standard cable entry size M20. Number of entries depends on the terminal box type and number of selected auxiliaries.

Dimension drawings

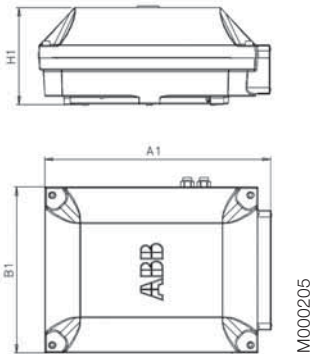
Terminal boxes, standard design with 6 terminal



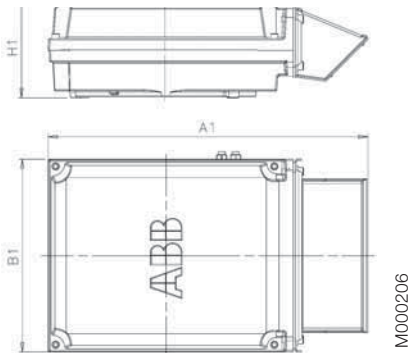
Dimensions for terminal box inlets

Inlet	c	e	f	g	d
C	62	193	62	193	M8
D	100	300	80	292	M10
E	115	370	100	360	M12

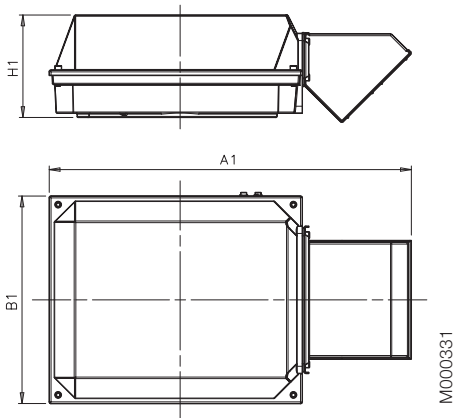
Motor sizes 280-315
Top- and side-mounted Terminal
boxes 210, 370



Motor sizes 355-450
Top-mounted
Terminal box 750 + adapter



Motor size 450
Top-mounted
Terminal box 1200



Motor sizes 280 - 400			
Terminal box type	A1	B1	H1
210	416	306	177
370	451	347	200
750 top-mounted	686	413	219
750 side-mounted	525	413	219
1200	1250	578	285
	1195	578	285
	1000	578	285

Bearings

The motors are normally fitted with single-row deep groove ball bearings as listed in the table below. SPM-nipples for bearing vibration monitoring are delivered as standard both at N- and D-end.

If the bearing at the D-end is replaced with a roller bearing (NU), higher radial forces can be handled. Roller bearings are suitable for belt drive applications.

Basic version with deep groove ball bearings

Motor size	Number of poles	Deep groove ball bearings	
		D-end	N-end
280	2-8	6316/C3	6316/C3
315	2	6316/C3	6316/C3
315	4-8	6319/C3	6316/C3
355	4-8	6322/C3	6316/C3
400	4-8	6324/C3	6319/C3
450	4-8	6326M/C3	6322/C3

When there are high axial forces e.g. in vertical position, angular contact ball bearings should be used, and direction of forces shall be informed. This option is available on request. When a motor with angular contact ball bearings is ordered, the method of mounting and direction and magnitude of the axial force must be specified. For special bearings, please see the variant codes.

Version with roller bearings, variant code 037

Motor size	Number of poles	Roller bearing variant code 037	
		D-end	
280	2	1)	
280	4-8	NU316/C3	
315	2	1)	
315	4-8	NU319/C3	
355	4-8	NU322/C3	
400	4-8	NU324/C3	
450	4-8	NU326/C3	

1) On request

Axially-locked bearings

All motors are equipped as standard with an axially- locked bearing at the D-end.

Transport locking

Motors that have roller bearings or angular contact ball bearing are fitted with a transport or angular contact ball bearings are lock before despatch to prevent damage to the bearings during transport. In case of transport locked bearing, motors are provided with a warning sign.

Bearing seals

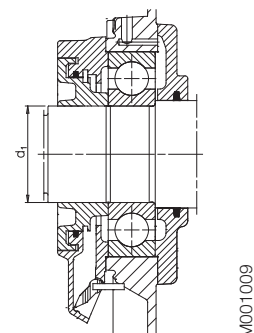
The size and type of seals are in accordance with the table below:

Motor size	Number of poles	D-end	N-end
280	2	Labyrinth seal	Enclosed
280	4-8	Axial seal VS80	Enclosed
315 ML, KH	2	Labyrinth seal	Labyrinth seal
315 M_	4-8	Axial seal VS95	Enclosed
315 KH	4-8	Labyrinth seal	Labyrinth seal
355	4-8	Labyrinth seal	Labyrinth seal
400	4-8	Labyrinth seal	Labyrinth seal
450	4-8	Labyrinth seal	Labyrinth seal

Bearing life

The nominal life L10 of a bearing is defined according to ISO 281 as the number of operating hours achieved or exceeded by 90% of identical bearings in a large test series under certain specified conditions. 50% of the bearings achieve at least five times this figure.

Locking may also be fitted in other cases where transport conditions are suspected of being potentially damaging.



Labyrinth seal

The calculated bearing life L10 for power transmission by means of a coupling (horizontal machine) is $\geq 200,000$ hours. Corresponding life L10 for vertical machine in V1 position is $\geq 40,000$ hours. Other values on request.

Lubrication

On delivery, the motors are ready lubricated with high quality grease. The recommended grease used can be seen from ABB's Low Voltage Motors Manual delivered together with the motor or from the lubrication plate fastened to the motor frame. See example of lubrication plate on page 26.

All motors are equipped with relubrication nipples. The bearing system has been built so that a valve disc can be used to ease the lubrication. Motors are lubricated while running.

Lubrication intervals

ABB follows the L1-principle in defining lubrication interval. That means that 99% of the motors are sure to make the interval time. The lubrication intervals can also be calculated according to the L10-principle, which are normally doubled compared to L1-values. Values available from ABB at request.

Frame size	Amount of grease g	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1000 r/min	500-750 r/min
Ball bearings: lubrication intervals in duty hours							
280	35	2000	3500	-	-	-	-
280	70	-	-	8000	10500	14000	17000
315	35	2000	3500	-	-	-	-
315	90	-	-	6500	8500	12500	16000
355	120	-	-	4200	6000	10000	13000
400	130	-	-	2800	4600	8400	12000
450	140	-	-	2400	4000	8000	8800

Pulley diameter

When the desired bearing life has been determined, the minimum permissible pulley diameter can be calculated using F_R , as follows:

$$D = \frac{1.9 \cdot 10^7 \cdot K \cdot P}{n \cdot F_R}$$

Grease outlet opening has closing valves at both ends. This should be opened before greasing and closed 1-2 hours after regreasing. After lubrication close the valves. This ensures that the construction is tight and dust or dirt cannot get inside the bearing.

As an option, a grease collection method can be used.

The table below gives lubrication intervals according to the L1-principle for different speeds. The values are valid for horizontal mounted motors (B3), with about 80°C bearing temperature and using high quality grease with lithium complex soap and mineral or PAO-oil. For more information, see ABB's Low voltage motors manual and the additional manual for Low voltage water cooled motors.

Frame size	Amount of grease g	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1000 r/min	500-750 r/min
Roller bearings: lubrication intervals in duty hours							
280	35	1000	1800	-	-	-	-
280	70	-	-	4000	5300	7000	8500
315	35	1000	1800	-	-	-	-
315	90	-	-	3300	4300	6000	8000
355	120	-	-	2000	3000	5000	6500
400	130	-	-	1400	2300	4200	6000
450	140	-	-	1200	2000	4000	4400

- where:
- D = diameter of pulley, mm
 - P = power requirement, kW
 - n = motor speed, r/min
 - K = belt tension factor, dependent on belt type and type of duty. A common value for V-belts is 2.5.
 - F_R = permissible radial force

Permissible loadings on shaft

The tables give the permissible radial force in Newtons, assuming zero axial force. The values are based on normal conditions at 50 Hz and calculated bearing lives of 20,000 and 40,000 hours.

Motors are foot-mounted IM B3 version with force directed sideways. In some cases the strength of the shaft affects the permissible forces.

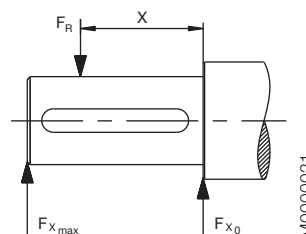
At 60 Hz the values must be reduced by 10%.

Permissible loads of simultaneous radial and axial forces will be supplied on request.

If the radial force is applied between points X0 and Xmax, the permissible force FR can be calculated from the following formula:

$$F_R = F_{X0} - \frac{X}{E} (F_{X0} - F_{Xmax})$$

E = length of shaft extension in basic version



Permissible radial forces

Motor size	Poles	Length of shaft extension E (mm)	Ball bearings				Roller bearings			
			20,000 hours		40,000 hours		20,000 hours		40,000 hours	
			F _{X0} (N)	F _{Xmax} (N)	F _{X0} (N)	F _{Xmax} (N)	F _{X0} (N)	F _{Xmax} (N)	F _{X0} (N)	F _{Xmax} (N)
280 SM_	2	140	7450	5700	5900	5050	20650	5700	16750	5700
	4	140	9400	5200	7450	5200	25450	5200	20650	5200
	6	140	10750	7800	8500	7250	28700	7800	23300	7800
	8	140	11850	7200	9400	7200	31300	7200	25450	7200
315 M_	2	140	7400	5200	5850	5050	20600	5200	16700	5200
	4	170	11400	9600	9000	7600	32800	10700	26600	10700
	6	170	13050	9600	10300	8700	37000	9600	30050	9600
	8	170	14350	10150	11350	9600	40400	10150	32800	10150
315 KH_	2	140	7450	6600	5850	5200	20800	7400	16850	7400
	4	170	11450	9900	9000	7800	33150	13800	26900	13800
	6	170	13050	11300	10250	8850	37400	13200	30350	13200
	8	170	14400	12450	11300	13700	40800	13700	33100	13700
355 ML_	4	210	15200	12900	12000	10100	45600	13600	37000	13600
	6	210	17400	13600	13700	11600	51500	13600	41800	13600
	8	210	19300	13600	15200	12900	56200	13600	45600	13600
355 LK	4	210	15300	13300	1200	10400	46200	13000	37500	13000
	6	210	17500	12800	13700	11900	52100	13000	42300	13000
	8	210	19300	13000	15200	13000	56900	13000	46100	13000
400 L_	4	210	15600	13700	12150	10700	53350	17900	43250	17900
	6	210	17750	15500	13800	12100	60200	15500	48800	15500
	8	210	19650	17000	15350	13500	65650	17000	53250	17000
450 L_	4	210	16900	15100	13000	11600	62350	22700	50550	22700
	6	210	19250	17200	14750	13150	70400	20000	57050	20000
	8	210	21400	19100	16450	14700	76750	19700	62250	19700

Permissible axial forces

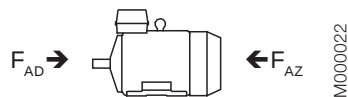
The following tables give the permissible axial forces in Newton, assuming zero radial force. The values are based on normal conditions at 50 Hz with standard bearings and calculated bearing lives of 20,000 and 40,000 hours.

At 60 Hz the values are to be reduced by 10%.

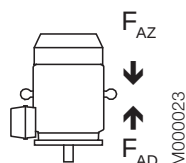
The permissible loads of simultaneous radial and axial forces will be supplied on request.

Given axial forces F_{AD} , assumes D-bearing locked by means of locking ring.

Mounting arrangement IM B3



Motor size	20,000 hours								40,000 hours							
	2-pole		4-pole		6-pole		8-pole		2-pole		4-pole		6-pole		8-pole	
	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)
280 SM	6250	4200	7850	5850	9050	7050	10200	8200	4850	2850	6050	4050	6950	4950	7850	5850
315 ML	6050	4050	9250	7250	10650	8650	11900	9950	4750	2750	7100	5100	8100	6100	9100	7100
315 KH	5950	3950	8950	6950	10300	8300	11500	9500	4650	2650	6850	4850	7800	5800	8700	6700
355 ML	-	-	8350	12200	10300	14100	12000	15800	-	-	5650	9450	7050	10800	8350	12150
355 LK	-	-	8100	11900	9850	13650	11500	15300	-	-	5400	9200	6650	10400	7850	11650
400 L	-	-	6950	12950	8600	14600	10250	16250	-	-	4200	10200	5350	11350	6600	12600
450 L	-	-	7350	13350	9050	15050	10850	16850	-	-	4400	10400	5600	11600	6900	12900



Mounting arrangement IM V1

Motor size	20,000 hours								40,000 hours							
	2-pole		4-pole		6-pole		8-pole		2-pole		4-pole		6-pole		8-pole	
	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)
280 SM	7600	3100	9650	4200	12150	5000	12250	6500	6250	1750	7850	2400	10050	2900	9900	4150
315 ML	8000	2300	12150	5100	14100	5850	15400	7150	6650	¹⁾	9950	2900	11550	3300	12550	4250
315 KH	9050	1850	13650	3800	16350	4300	17950	5250	7650	¹⁾	11500	1650	13800	1750	15100	2400
355 ML	-	-	14600	7900	17200	9400	18300	11600	-	-	11800	5150	13900	6100	14600	7850
355 LK	-	-	15900	6600	19300	7300	21000	8950	-	-	13100	3800	16000	4000	17300	5250
400 L	-	-	16700	6300	20750	6400	22450	8100	-	-	13850	3450	17400	3050	18650	4300
450 L	-	-	21100	3850	25850	3700	27800	5400	-	-	18050	¹⁾	22200	¹⁾	23700	¹⁾

¹⁾ On request

Ordering information

When placing an order, please state the following minimum data in the order, as in example.

The product code of the motor is composed in accordance with the following example.

Motor type	M3LP 450L
Pole number	6
Mounting arrangement (IM code)	IM B3 (IM 1001)
Rated output	1050 kW
Product code	3GLP 453 530-RDG
Variant codes if needed	

Explanation of the product code

A	B	C		D	E	F	G	
M3LP	450 L	3GLP	45	3	530	-	R D G	003 etc.
		1 2 3 4	5 6	7	8 9 10	11	12 13 14	

A = Motor type

B = Motor size

C = Product code

D = Mounting arrangement code

E = Voltage and frequency code

F = Generation code

G = Variant codes

The product code must be, if needed, followed by variant codes.

Positions 1 to 4

3GLP = Totally enclosed water cooled squirrel cage motor with steel frame

Positions 5 and 6

IEC-frame

28 = 280

31 = 315

35 = 355

40 = 400

45 = 450

Position 7

Speed (Pole pairs)

2 = 4 poles

3 = 6 poles

4 = 8 poles

Position 8 to 10

Serial number

Position 11

- (dash)

Position 12

Mounting arrangement

Frame size 280-355

A = Foot-mounted, top-mounted terminal box

B = Flange-mounted, large flange

Frame sizes 400-450

R = Foot-mounted, terminal box RHS seen from D-end. Please note that the motor with mounting code R means that the terminal box is on right hand seen from D-end. The terminal box is located at 45° angle on the motor.

L = Foot-mounted, terminal box LHS

B = Flange-mounted, large flange

Position 13

Code letter for voltage and frequency

Direct start or, with Δ -connection, also Y/ Δ -start

D = 380, 400, 415 V Δ 50 Hz / 440 V Δ 60 Hz

E = 500 V Δ 50 Hz

Position 14

Generation code

A, B, C,...

Technical data

Water cooled motors Technical data for totally enclosed squirrel cage three phase motors

IE2

IP55 IC71W - Insulation class F, temperature rise class B

			Efficiency IEC 60034-2-1; 2007														
			Full			3/4			1/2			Current		Torque		Moment of inertia	
Output			Speed	load	load	load	factor	I _N	I _S	T _N	T _I	T _b	J = 1/4 GD ²	Weight			
kW	Motor type	Product code	r/min	100%	75%	50%	cos φ	A	I _N	Nm	T _N	T _N	kgm ²	kg			
3000 r/min = 2 poles			400 V 50 Hz														
110	M3LP	280 SMA	3GLP 281 210-••G	2976	94.4	94.5	93.9	0.84	200	6.8	352	2.1	2.8	0.5	640		
132	M3LP	280 SMB	3GLP 281 220-••G	2972	94.7	94.9	94.8	0.87	231	6.3	424	1.9	2.5	0.5	660		
150	M3LP	280 SMC	3GLP 281 230-••G	2976	95.3	95.5	95.1	0.88	258	7.2	481	2.3	2.9	0.8	740		
160	M3LP	315 MA	3GLP 311 310-••G	2977	95.0	95.1	94.8	0.86	282	6.5	513	2.1	2.5	1.2	720		
200	M3LP	315 MB	3GLP 311 320-••G	2979	95.2	95.2	94.3	0.83	365	7.2	641	2.5	2.9	1.3	780		
250	M3LP	315 MC	3GLP 311 330-••G	2979	95.8	95.7	95.5	0.85	443	7.5	801	2.7	3.0	1.6	870		
315 ¹⁾	M3LP	315 MLA	3GLP 311 410-••G	2975	95.8	96.3	96.4	0.86	551	7.1	1011	2.6	2.6	2	1030		
335 ¹⁾	M3LP	315 MLB	3GLP 311 420-••G	2978	96.0	96.1	95.7	0.84	599	6.1	1074	2.2	2.5	2	1030		
355 ¹⁾	M3LP	315 KHA	3GLP 311 810-••G	2982	95.9	95.9	95.6	0.83	643	9.5	1136	2.7	3.1	2	1420		
375 ¹⁾	M3LP	315 KHB	3GLP 311 820-••G	2979	95.9	96.5	96.4	0.89	634	7.1	1202	2.3	2.9	2	1600		
1500 r/min = 4 poles			400 V 50 Hz														
90	M3LP	280 SMA	3GLP 282 210-••••G	1481	95.2	95.6	95.5	0.85	160	6.1	580	2.3	2.6	1.1	680		
110	M3LP	280 SMB	3GLP 282 220-••G	1484	94.9	95.2	94.9	0.81	206	6.8	707	2.7	2.9	1.1	680		
132	M3LP	280 SMC	3GLP 282 230-••G	1485	95.0	95.5	95.5	0.85	235	6.5	848	2.5	2.6	1.4	740		
160	M3LP	280 SMD	3GLP 282 240-••G	1483	95.0	95.4	95.3	0.8	303	6.6	1030	2.7	2.8	1.4	740		
185	M3LP	280 SME	3GLP 282 250-••G	1483	95.3	95.8	95.7	0.85	329	7.7	1191	3.4	3.1	1.7	790		
200	M3LP	315 MC	3GLP 312 330-••G	1487	95.4	95.6	95.3	0.84	360	6.6	1284	2.2	2.8	2.4	870		
250	M3LP	315 MLA	3GLP 312 410-••G	1485	96.0	96.0	95.9	0.83	452	6.9	1607	2.7	3.1	3.7	1030		
315 ¹⁾	M3LP	315 KHA	3GLP 312 810-••G	1485	95.6	96.0	96.0	0.87	546	6.2	2025	2.2	2.6	3.5	1490		
315	M3LP	355 MLA	3GLP 352 410-••G	1488	96.5	96.6	96.2	0.83	567	6.5	2021	2.1	2.4	5.3	1520		
355	M3LP	315 KHB	3GLP 312 820-••G	1485	95.8	96.2	96.2	0.88	607	6.5	2282	2.3	2.6	4	1520		
355	M3LP	355 MLB	3GLP 352 420-••G	1488	96.7	96.8	96.6	0.85	623	6.7	2278	2.0	2.4	6	1620		
375	M3LP	315 KHC	3GLP 312 830-••G	1484	95.6	95.9	95.9	0.87	650	6.3	2413	2.2	2.7	4.4	1560		
400	M3LP	355 MLC	3GLP 352 430-••G	1488	96.8	96.9	96.7	0.85	701	6.5	2567	2.2	2.5	7	1750		
450	M3LP	355 MLD	3GLP 352 440-••G	1488	96.7	96.8	96.6	0.85	790	7.2	2887	2.4	2.5	7.8	1900		
500	M3LP	355 MLE	3GLP 352 450-••G	1489	96.9	97.0	96.8	0.85	876	7.5	3206	2.5	2.6	8.4	2000		
560	M3LP	355 LKA	3GLP 352 810-••G	1489	97.0	97.1	96.8	0.86	968	7.4	3591	2.7	2.7	10	2350		
630	M3LP	355 LKB	3GLP 352 820-••G	1488	96.9	97.0	96.8	0.85	1104	7.3	4043	2.7	2.6	10.6	2450		
710	M3LP	400 LA	3GLP 402 510-••G	1488	96.8	97.0	96.9	0.86	1231	6.8	4556	2.0	2.3	15	3200		
780	M3LP	400 LB	3GLP 402 520-••G	1490	97.0	97.1	97.0	0.87	1334	7.1	4998	2.0	2.4	16	3300		
850	M3LP	400 LC	3GLP 402 530-••G	1490	97.1	97.2	97.1	0.86	1469	7.4	5447	2.0	2.5	17	3400		
1000	M3LP	450 LA	3GLP 452 510-••G	1490	97.2	97.3	97.2	0.88	1687	6.6	6408	0.8	2.6	23	3750		
1100	M3LP	450 LB	3GLP 452 520-••G	1490	97.2	97.3	97.2	0.88	1856	6.8	7049	0.8	2.7	25	4050		
1200	M3LP	450 LC	3GLP 452 530-••G	1491	97.2	97.3	97.1	0.88	2024	7.2	7685	0.9	2.8	30	4400		

1) Temperature rise class F

The two bullets in the product code indicate choice of mounting arrangements, voltage and frequency code (see ordering information page).

Efficiency classes are valid for 2 to 6 pole motors, up to 375 kW. Efficiency values are given according to IEC 60034-2-1; 2007.

Please note that the values are not comparable without knowing the testing method.

ABB has calculated the efficiency values according to indirect method, stray load losses (additional losses) determined from measuring.

Technical data

Water cooled motors

Technical data with optimized outputs for totally enclosed squirrel cage three phase motors

IP55 IC71W - Insulation class F, temperature rise class B - Cooling water temperature + 26 to 40°C

Output kW	Motor type	Product code	Speed r/min	Efficiency							Current		Torque			Moment of inertia	Weight kg
				IEC 60034-2-1; 2007				Power factor cos φ	I _N A	I _s I _N	T _N Nm	T _I T _N	T _b T _N	J = 1/4 GD ² kgm ²			
				Full load 100%	3/4 load 75%	1/2 load 50%	Power										
3600 r/min = 2 poles				440 V 60 Hz													
125	¹⁾	M3LP 280 SMA	3GLP 281 210-••G	3573	94.2	94.2	93.4	0.87	200	6.5	334	1.7	2.6	0.5	640		
145	¹⁾	M3LP 280 SMB	3GLP 281 220-••G	3569	94.6	94.9	94.6	0.89	225	6.0	387	1.8	2.3	0.5	660		
175	¹⁾	M3LP 280 SMC	3GLP 281 230-••G	3570	94.9	95.2	95.0	0.9	268	6.8	468	2	2.6	0.8	740		
175	¹⁾	M3LP 315 MA	3GLP 311 310-••G	3575	95.1	95.2	94.9	0.87	277	6.1	467	1.9	2.3	1.2	720		
225	¹⁾	M3LP 315 MB	3GLP 311 320-••G	3576	95.4	95.4	94.8	0.86	359	6.3	600	1.9	2.4	1.3	780		
275	¹⁾	M3LP 315 MC	3GLP 311 330-••G	3578	95.9	95.9	95.4	0.88	427	7.4	733	2.4	2.7	1.6	870		
330	¹⁾	M3LP 315 MLA	3GLP 311 410-••G	3575	96.1	96.5	96.5	0.88	512	6.3	881	2.7	2.5	2.0	1030		
355	¹⁾	M3LP 315 MLB	3GLP 311 420-••G	3577	95.8	95.9	95.5	0.87	558	6.3	947	2.3	2.6	2.0	1030		
375	¹⁾	M3LP 315 KHA	3GLP 311 810-••G	3581	96.0	96.0	95.5	0.86	596	9.0	999	2.2	2.5	2.0	1420		
400	¹⁾	M3LP 315 KHB	3GLP 311 820-••G	3578	96.1	95.6	96.5	0.9	606	7.0	1067	2.2	2.5	2.0	1600		
1800 r/min = 4 poles				440 V 60 Hz													
100	¹⁾	M3LP 280 SMA	3GLP 282 210-••••G	1779	95.1	95.4	95.1	0.86	160	5.9	536	2.0	2.3	1.1	680		
125	¹⁾	M3LP 280 SMB	3GLP 282 220-••G	1782	94.8	95.3	95.2	0.85	203	6.7	669	2.4	2.6	1.1	680		
145	¹⁾	M3LP 280 SMC	3GLP 282 230-••G	1780	95.0	95.5	95.5	0.86	232	6.3	777	2.3	2.5	1.4	740		
175	¹⁾	M3LP 280 SMD	3GLP 282 240-••G	1782	95.3	95.7	95.7	0.84	286	6.7	937	2.5	2.6	1.4	740		
200		M3LP 280 SME	3GLP 282 250-••G	1782	95.7	96.1	96.1	0.87	315	7.7	1071	2.8	2.8	1.7	790		
225	¹⁾	M3LP 315 MC	3GLP 312 330-••G	1785	95.4	95.7	95.5	0.85	364	6.3	1203	2.0	2.5	2.4	870		
275		M3LP 315 MLA	3GLP 312 410-••G	1784	96.2	96.5	96.5	0.85	441	6.5	1472	2.1	2.5	3.7	1030		
330	¹⁾	M3LP 315 KHA	3GLP 312 810-••G	1784	95.5	96.0	95.9	0.88	515	6.4	1766	2.1	2.5	3.5	1490		
362		M3LP 355 MLA	3GLP 352 410-••G	1787	96.5	96.6	96.3	0.86	572	6.2	1934	1.8	2.1	5.3	1520		
375	¹⁾	M3LP 315 KHB	3GLP 312 820-••G	1784	95.8	96.1	96.1	0.88	583	6.5	2007	2.2	2.5	4.0	1520		
400		M3LP 355 MLB	3GLP 352 420-••G	1787	96.7	96.8	96.5	0.87	623	6.5	2137	1.8	2.1	6.0	1620		
400	¹⁾	M3LP 315 KHC	3GLP 312 830-••G	1783	95.7	95.9	95.8	0.88	623	6.2	2142	2.0	2.6	4.4	1560		
450		M3LP 355 MLC	3GLP 352 430-••G	1787	96.8	96.9	96.6	0.87	701	6.3	2404	1.9	2.2	7.0	1750		
500		M3LP 355 MLD	3GLP 352 440-••G	1787	96.7	96.9	96.6	0.87	779	6.8	2671	2.2	2.3	7.8	1900		
560		M3LP 355 MLE	3GLP 352 450-••G	1788	97.0	97.0	96.7	0.87	870	7.2	2990	2.2	2.4	8.4	2000		
630		M3LP 355 LKA	3GLP 352 810-••G	1788	97.0	97.1	96.8	0.87	979	7.2	3364	2.4	2.4	10.0	2350		
710		M3LP 355 LKB	3GLP 352 820-••G	1787	96.9	97.0	96.8	0.87	1105	7.0	3794	2.4	2.3	10.6	2450		
800		M3LP 400 LA	3GLP 402 510-••G	1787	96.6	96.9	96.7	0.86	1263	6.3	4275	1.7	2.0	15.0	3200		
880	¹⁾	M3LP 400 LB	3GLP 402 520-••G	1788	96.8	97.0	96.9	0.88	1355	6.6	4699	1.7	2.2	16.0	3300		
950	¹⁾	M3LP 400 LC	3GLP 402 530-••G	1789	97.1	97.2	96.9	0.88	1458	6.9	5070	1.7	2.3	17.0	3400		
1100	¹⁾	M3LP 450 LA	3GLP 452 510-••G	1789	97.1	97.2	97.0	0.89	1670	6.1	5871	0.7	2.4	23.0	3750		
1220	¹⁾	M3LP 450 LB	3GLP 452 520-••G	1789	97.1	97.2	97.0	0.89	1852	6.2	6512	0.7	2.4	25.0	4050		
1350	¹⁾	M3LP 450 LC	3GLP 452 530-••G	1790	97.1	97.1	96.8	0.89	2049	6.5	7201	0.7	2.5	30.0	4400		

1) Temperature rise class F

The two bullets in the product code indicate choice of mounting arrangements, voltage and frequency code (see ordering information page).

Efficiency values are given according to IEC 60034-2-1; 2007.

Please note that the values are not comparable without knowing the testing method.

ABB has calculated the efficiency values according to indirect method, stray load losses (additional losses) determined from measuring.

Technical data

Water cooled motors

IE2

Technical data for totally enclosed squirrel cage three phase motors

IP55 IC71W - Insulation class F, temperature rise class B

Output kW				Efficiency													Moment of inertia J = 1/4 GD²		Weight kg
				IEC 60034-2-1; 2007					Current		Torque								
				Full load	3/4 load	1/2 load	Power factor	I _N	I _s	T _N	T _I	T _b							
Motor type	Product code	Speed r/min	100%	75%	50%	cos φ	A	I _N	Nm	T _N	T _N	T _N	kgm²						
1000 r/min = 6 poles				400 V 50 Hz															
90	M3LP 280 SME	3GLP 283 250-••G	990	94.1	94.5	94.3	0.86	160	7.3	868	2.5	2.6	2.8	790					
110	M3LP 315 MB	3GLP 313 320-••G	992	94.4	94.7	94.2	0.82	205	7.2	1058	2.6	2.8	3.9	770					
132	M3LP 315 MC	3GLP 313 330-••G	992	94.7	94.9	94.4	0.82	245	7.2	1270	2.7	2.9	4.6	850					
160	M3LP 315 MLA	3GLP 313 410-••G	992	95.0	95.1	94.6	0.82	296	7.4	1540	2.9	3.0	5.3	1020					
185	M3LP 315 MLB	3GLP 313 420-••G	990	95.0	95.2	95.0	0.83	338	6.5	1784	2.4	2.6	5.3	1020					
220	M3LP 315 KHA	3GLP 313 810-••G	990	95.0	95.3	94.9	0.82	407	6.5	2122	2.5	2.7	6.6	1500					
250	M3LP 315 KHB	3GLP 313 820-••G	991	95.2	95.4	94.9	0.82	462	6.7	2409	2.6	2.8	7.5	1530					
250	M3LP 355 MLA	3GLP 353 410-••G	990	95.3	95.8	95.8	0.84	450	6.1	2411	0.9	2.3	8	1520					
315	M3LP 315 KHC	3GLP 313 830-••G	989	95.4	96.0	96.2	0.79	603	6.5	3041	2.4	2.6	7.8	1560					
315	M3LP 355 MLB	3GLP 353 420-••G	990	95.5	95.9	96.0	0.85	560	6.3	3038	0.9	2.3	9.8	1680					
355	M3LP 355 MLC	3GLP 353 430-••G	991	95.6	96.0	96.0	0.84	638	6.6	3420	1.0	2.5	10.6	1750					
400	M3LP 355 MLD	3GLP 353 440-••G	990	95.8	96.2	96.3	0.85	709	6.5	3858	1.0	2.4	12.2	1900					
450	M3LP 355 LKA	3GLP 353 810-••G	991	96.0	96.3	96.3	0.85	795	7.1	4336	1.1	2.6	14	2200					
500	M3LP 355 LKB	3GLP 353 820-••G	992	96.2	96.5	96.4	0.85	882	7.8	4813	1.3	2.9	16.5	2450					
560	M3LP 400 LA	3GLP 403 510-••G	992	96.2	96.5	96.4	0.84	1000	6.5	5390	0.9	2.4	17	2900					
630	M3LP 400 LB	3GLP 403 520-••G	993	96.4	96.6	96.5	0.84	1122	7.2	6058	1.1	2.7	20.5	3150					
710	M3LP 400 LC	3GLP 403 530-••G	993	96.7	96.8	96.6	0.84	1261	7.7	6827	1.2	2.9	22	3300					
800	M3LP 400 LD	3GLP 403 540-••G	993	96.5	96.7	96.5	0.82	1459	7.7	7693	1.2	2.9	24	3400					
850	M3LP 450 LA	3GLP 453 510-••G	992	96.7	97.0	97.1	0.87	1458	6.6	8182	0.9	2.6	31	3850					
920	M3LP 450 LB	3GLP 453 520-••G	992	96.8	97.1	97.1	0.87	1576	6.7	8856	1.1	2.4	37	4200					
1050	M3LP 450 LC	3GLP 453 530-••G	993	96.9	97.2	97.1	0.87	1797	7.4	10097	1.2	2.9	41	4500					
750 r/min = 8 poles				400 V 50 Hz															
55	M3LP 280 SMA	3GLP 284 210-••G	740	91.8	92.2	91.8	0.8	108	6.3	709	1.5	2.5	1.5	730					
75	M3LP 280 SMC	3GLP 284 230-••G	740	93.0	93.3	92.7	0.8	145	7.5	967	1.8	3.0	2.3	780					
90	M3LP 315 MB	3GLP 314 320-••G	740	93.1	93.6	93.3	0.82	170	6.7	1161	1.6	2.8	4.1	780					
110	M3LP 315 MC	3GLP 314 330-••G	740	93.5	94.0	93.7	0.82	207	7.0	1419	1.7	2.8	4.8	850					
132	M3LP 315 MLA	3GLP 314 410-••G	739	93.8	94.3	94.1	0.83	244	7.2	1705	2.0	2.7	5.6	1020					
160	M3LP 315 KHA	3GLP 314 810-••G	740	94.0	94.5	94.3	0.83	296	7.4	2064	1.7	2.7	6.9	1550					
160	M3LP 355 MLA	3GLP 354 410-••G	743	94.8	94.9	94.5	0.8	304	6.7	2056	1.1	2.5	8	1520					
200	M3LP 315 KHC	3GLP 314 830-••G	740	94.3	94.7	94.5	0.83	368	8.0	2580	1.5	2.4	8.6	1600					
200	M3LP 355 MLB	3GLP 354 420-••G	743	95.0	95.2	94.9	0.81	375	6.8	2570	1.1	2.5	9.8	1680					
250	M3LP 355 MLC	3GLP 354 430-••G	743	94.8	95.1	94.7	0.79	481	6.9	3213	1.2	2.6	10.6	1750					
315	M3LP 355 LKA	3GLP 354 810-••G	743	95.4	95.5	95.2	0.8	595	7.4	4048	1.3	2.7	15	2270					
355	M3LP 355 LKB	3GLP 354 820-••G	743	95.5	95.6	95.4	0.81	662	7.4	4562	1.3	2.7	16.5	2450					
400	M3LP 400 LA	3GLP 404 510-••G	742	95.8	96.1	96.0	0.83	726	6.2	5147	1.1	2.5	17	2900					
450	M3LP 400 LB	3GLP 404 520-••G	742	95.9	96.1	96.1	0.84	806	6.5	5791	1.1	2.6	21	3200					
500	M3LP 400 LC	3GLP 404 530-••G	743	96.0	96.2	96.1	0.83	905	7.0	6426	1.3	2.8	24	3400					
560	M3LP 450 LA	3GLP 454 510-••G	742	95.7	96.1	96.2	0.83	1017	5.8	7207	0.9	2.3	26	3450					
630	M3LP 450 LB	3GLP 454 520-••G	742	95.9	96.2	96.3	0.84	1128	6.0	8107	1.0	2.3	29	3700					

1) Temperature rise class F

The two bullets in the product code indicate choice of mounting arrangements, voltage and frequency code (see ordering information page).

Efficiency classes are valid for 2 to 6 pole motors, up to 375 kW. Efficiency values are given according to IEC 60034-2-1; 2007.

Please note that the values are not comparable without knowing the testing method.

ABB has calculated the efficiency values according to indirect method, stray load losses (additional losses) determined from measuring.

Technical data

Water cooled motors

Technical data with optimized outputs for totally enclosed squirrel cage three phase motors

IP55 IC71W - Insulation class F, temperature rise class B - Cooling water temperature + 26 to 40°C

				Efficiency											Moment of inertia		Weight
				IEC 60034-2-1; 2007					Current		Torque						
				Full	3/4	1/2	Power	I _N	I _s	T _N	T _I	T _b					
Output	Motor type	Product code	Speed	load	load	load	factor						A	Nm	T _N	T _N	J = 1/4 GD ₂
kW					r/min	100%	75%	50%	cos φ						kgm ²	kg	
1200 r/min = 6 poles				440 V 60 Hz													
95	M3LP	280 SME	3GLP 283 250-••G	1189	94.6	94.9	94.5	0.86	153	6.7	762	2.3	2.6	2.8	790		
115	M3LP	315 MB	3GLP 313 320-••G	1192	94.5	94.6	94.2	0.84	190	7.4	921	2.4	2.7	3.9	770		
145	M3LP	315 MC	3GLP 313 330-••G	1191	94.7	94.9	94.6	0.84	239	7.1	1162	2.4	2.6	4.6	850		
175	M3LP	315 MLA	3GLP 313 410-••G	1191	95.0	95.2	94.7	0.84	287	7.4	1403	2.6	2.7	5.3	1020		
200	M3LP	315 MLB	3GLP 313 420-••G	1188	95.0	95.5	95.2	0.85	324	6.3	1607	1.8	2.2	5.3	1020		
240	M3LP	315 KHA	3GLP 313 810-••G	1190	95.0	95.3	94.8	0.84	394	6.3	1925	2.3	2.4	6.6	1500		
270	M3LP	315 KHB	3GLP 313 820-••G	1190	95.2	95.4	94.9	0.84	443	6.8	2166	2.4	2.6	7.5	1530		
280	M3LP	355 MLA	3GLP 353 410-••G	1189	95.3	95.8	95.8	0.85	453	5.6	2248	0.7	2.0	8.0	1520		
335	M3LP	315 KHC	3GLP 313 830-••G	1189	95.9	96.4	96.7	0.82	558	6.0	2690	1.7	2.2	7.8	1560		
350	M3LP	355 MLB	3GLP 353 420-••G	1189	95.5	95.9	96.0	0.85	565	5.8	2810	0.8	2.1	9.8	1680		
400	M3LP	355 MLC	3GLP 353 430-••G	1190	95.6	96.0	96.1	0.85	645	6.0	3209	0.8	2.2	10.6	1750		
450	M3LP	355 MLD	3GLP 353 440-••G	1189	95.7	96.1	96.2	0.86	717	6.0	3614	0.8	2.1	12.2	1900		
500	M3LP	355 LKA	3GLP 353 810-••G	1190	96.0	96.2	96.2	0.86	794	6.5	4012	0.9	2.3	14.0	2200		
560	M3LP	355 LKB	3GLP 353 820-••G	1191	96.2	96.4	96.4	0.86	888	7.2	4490	1.0	2.5	16.5	2450		
630	¹⁾	M3LP	400 LA	3GLP 403 510-••G	1191	96.1	96.4	96.4	0.85	1012	6.0	5051	0.7	2.1	17.0	2900	
710	¹⁾	M3LP	400 LB	3GLP 403 520-••G	1192	96.2	96.5	96.4	0.85	1139	6.6	5687	0.9	2.3	20.5	3150	
800	¹⁾	M3LP	400 LC	3GLP 403 530-••G	1192	96.6	96.8	96.6	0.86	1263	7.2	6408	1.0	2.6	22.0	3300	
900	¹⁾	M3LP	400 LD	3GLP 403 540-••G	1192	96.5	96.6	96.5	0.85	1439	7.1	7210	1.0	2.6	24.0	3400	
950	¹⁾	M3LP	450 LA	3GLP 453 510-••G	1191	96.6	97.0	97.0	0.88	1466	6.0	7616	0.8	2.3	31.0	3850	
1020	¹⁾	M3LP	450 LB	3GLP 453 520-••G	1191	96.6	97.0	97.0	0.88	1574	6.1	8178	0.9	2.2	37.0	4200	
1150	¹⁾	M3LP	450 LC	3GLP 453 530-••G	1192	96.8	97.0	97.0	0.88	1771	7.0	9212	1.0	2.7	41.0	4500	
900 r/min = 8 poles				440 V 60 Hz													
60	M3LP	280 SMA	3GLP 284 210-••G	889	91.6	92.0	91.4	0.82	104	6.1	644	1.4	2.4	1.5	730		
80	M3LP	280 SMC	3GLP 284 230-••G	890	92.7	92.9	92.1	0.82	138	7.3	858	1.7	3.0	2.3	780		
100	M3LP	315 MB	3GLP 314 320-••G	889	93.0	93.5	93.2	0.83	169	6.2	1074	1.4	2.6	4.1	780		
125	M3LP	315 MC	3GLP 314 330-••G	889	93.3	93.9	93.6	0.84	209	6.4	1342	1.5	2.5	4.8	850		
145	M3LP	315 MLA	3GLP 314 410-••G	889	93.5	94.1	94.0	0.84	242		1557	1.7	2.6	5.6	1020		
175	M3LP	315 KHA	3GLP 314 810-••G	889	93.9	94.4	94.2	0.84	291	7.0	1879	1.4	2.5	6.9	1550		
185	M3LP	355 MLA	3GLP 354 410-••G	892	94.7	94.9	94.5	0.82	312	6.1	1980	0.8	2.1	8.0	1520		
220	M3LP	315 KHC	3GLP 314 830-••G	889	94.2	94.7	94.4	0.84	364	7.5	2363	1.4	2.3	8.6	1600		
230	M3LP	355 MLB	3GLP 354 420-••G	892	94.9	95.2	94.9	0.83	383	6.1	2462	0.9	2.1	9.8	1680		
285	M3LP	355 MLC	3GLP 354 430-••G	892	94.9	95.2	94.9	0.82	480	6.3	3051	1.0	2.2	10.6	1750		
362	M3LP	355 LKA	3GLP 354 810-••G	892	95.3	95.6	95.3	0.83	600	6.8	3875	1.1	2.3	15.0	2270		
400	M3LP	355 LKB	3GLP 354 820-••G	892	95.5	95.7	95.5	0.83	662	6.8	4282	1.1	2.3	16.5	2450		
450	¹⁾	M3LP	400 LA	3GLP 404 510-••G	891	95.8	96.1	96.1	0.85	725	5.7	4822	0.9	2.2	17.0	2900	
500	¹⁾	M3LP	400 LB	3GLP 404 520-••G	891	95.9	96.2	96.1	0.86	795	6.0	5358	0.9	2.3	21.0	3200	
560	¹⁾	M3LP	400 LC	3GLP 404 530-••G	892	96.1	96.3	96.1	0.85	899	6.5	5995	1.1	2.5	24.0	3400	
630	¹⁾	M3LP	450 LA	3GLP 454 510-••G	891	95.7	96.1	96.2	0.85	1016	5.3	6752	0.8	2.0	26.0	3450	
710	¹⁾	M3LP	450 LB	3GLP 454 520-••G	891	95.8	96.2	96.3	0.85	1144	5.5	7609	0.8	2.1	29.0	3700	

1) Temperature rise class F

The two bullets in the product code indicate choice of mounting arrangements, voltage and frequency code (see ordering information page).

Efficiency values are given according to IEC 60034-2-1; 2007.

Please note that the values are not comparable without knowing the testing method.

ABB has calculated the efficiency values according to indirect method, stray load losses (additional losses) determined from measuring.

Variant codes

		Frame Size				
Code	Variant	280	315	355	400	450
Administration						
530	2-year extension on standard warranty.	P	P	P	P	P
531	Sea freight packing.	P	P	P	P	P
Balancing						
052	Vibration acc. to Grade A (IEC 60034-14).	S	S	S	S	S
417	Vibration acc. to Grade B (IEC 60034-14).	NA	NA	P	P	NA
423	Balanced without key.	P	P	P	P	P
424	Full key balancing.	P	P	P	P	P
Bearings and lubrication						
036	Transport lock for bearings.	P	P	P	P	P
037	Roller bearing at D-end.	P	P	P	P	P
040	Heat resistant grease.	P	P	P	P	P
041	Bearings regreasable via grease nipples.	S	S	S	S	S
042	Locked drive-end.	S	S	S	S	S
043	SPM compatible nipples for vibration measurement.	S	S	S	S	S
058	Angular contact bearing at D-end, shaft force away from bearing.	P	P	P	P	P
059	Angular contact bearing at N-end, shaft force towards bearing.	P	P	P	P	P
060	Angular contact bearing at D-end, shaft force towards bearing.	P	P	P	P	P
061	Angular contact bearing at N-end, shaft force away from bearing.	P	P	P	P	P
107	Pt100 2-wire in bearings.	P	P	P	P	P
130	Pt100 3-wire in bearings.	P	P	P	P	P
420	Bearing mounted PTC thermistors.	P	P	P	P	P
433	Outlet grease collector.	P	P	P	P	P
796	Grease nipples JIS B 1575 PT 1/8 Type A.	P	P	P	P	P
797	Stainless steel SPM nipples.	P	P	P	P	P
798	Stainless steel grease nipples.	P	P	P	P	P
799	Grease nipples flat type DIN 3404, thread M10x1.	P	P	P	P	P
800	Grease nipples JIS B 1575 PT 1/8" pin type.	P	P	P	P	P
Branch standard designs						
056	Float type leakage detector.	R	R	P	P	P
178	Stainless steel / acid proof bolts.	P	P	P	P	P
204	Jacking bolts for foot mounted motors.	P	P	S	S	S
209	Non-standard voltage or frequency, (special winding).	P	P	P	P	P
396	Motor designed for ambient temperature -20°C to -40°C, wti h space heaters (code 450/451 must be added).	NA	NA	R	R	R
397	Motor designed for ambient temperature -40°C to -55°C, wti h space heaters (code 450/451 must be added).	NA	NA	R	R	R
398	Motor designed for ambient temperature -20°C to -40°C.	NA	NA	R	R	R
399	Motor designed for ambient temperature -40°C to -55°C.	NA	NA	R	R	R
425	Corrosion protected stator and rotor core.	P	P	P	P	P
Cooling system						
075	Cooling method IC418 (without fan).	NA	NA	NA	R	R
Coupling						
035	Assembly of customer supplied coupling-half.	P	P	P	P	P
Documentation						
141	Binding dimension drawing.	P	P	P	P	P
Drain holes						
065	Plugged existing drain holes.	P	P	P	P	P
448	Draining holes with metal plugs.	P	P	P	P	P

P = New manufacture only
 R = On request

S = Included as standard
 NA = Not applicable

Code	Variant	Frame Size				
		280	315	355	400	450
Earthing bolt						
067	External earthing bolt.	S	S	S	S	S
Heating elements						
450	Heating element, 100-120V.	P	P	P	P	P
451	Heating element, 200-240V.	P	P	P	P	P
Insulation system						
014	Winding insulation class H.	P	P	P	P	P
405	Special winding insulation for frequency converter supply.	P	P	P	P	P
406	Winding for supply >690<=1000 Volts.	P	P	P	P	P
Mounting arrangements						
009	IM 2001 foot/flange mounted, IEC flange, from IM 1001 (B35 from B3).	P	P	P	P	P
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001) & IM B34 (2101).	S	S	P	P	P
305	Additional lifting lugs.	P	P	S	R	R
Painting						
111	Painting system C3M acc. to ISO 12944-5:2007	S	S	NA	NA	NA
114	Special paint colour, standard grade.	P	P	P	P	P
115	Painting system C4M acc. To ISO 12944-5: 2007	P	P	P	P	P
754	Painting system C5M acc. to ISO 12944-5:2007	NA	NA	P	P	P
Protection						
005	Metal protective roof, vertical motor, shaft down.	NA	NA	R	R	R
076	Draining holes with plugs in open position.	S	S	NA	NA	NA
158	Degree of protection IP65.	P	P	P	R	NA
403	Degree of protection IP56.	P	P	P	P	P
434	Degree of protection IP56, open deck.	P	P	P	P	NA
783	Labyrinth sealing at D-end.	P	P	S	S	S
Rating & instruction plates						
002	Restamping voltage, frequency and output, continuous duty.	P	P	P	P	P
003	Individual serial number.	S	S	S	S	S
004	Additional text on std rating plate (max 12 digits on free text line).	P	P	P	P	P
095	Restamping output (maintained voltage, frequency), intermittent duty.	P	P	P	P	P
126	Tag plate.	P	P	P	P	P
135	Mounting of additional identification plate, stainless.	P	P	P	P	P
139	Additional identification plate delivered loose.	P	P	P	P	P
159	Additional plate with text "Made in"	P	P	P	P	P
160	Additional rating plate affixed.	P	P	P	P	P
161	Additional rating plate delivered loose.	P	P	P	P	P
163	Frequency converter rating plate. Rating data according to quotation.	P	P	P	P	P
Shaft & rotor						
069	Two shaft extensions as per basic catalogue.	P	P	P	P	P
070	One or two special shaft extensions, standard shaft material.	P	P	P	P	P
156	Cylindrical shaft extension, N-end, without key-way.	NA	NA	R	R	R
164	Shaft extension with closed key-way.	NA	NA	R	R	R
165	Shaft extension with open key-way.	S	S	S	S	S
410	Stainless steel shaft (standard or non-standard design).	P	P	P	P	P
Standards and regulations						
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	NA	NA	R	R	R
775	Design according to SHELL DEP 33.66.05.31-Gen. January 1999 design.	NA	NA	NA	NA	R
778	GOST Export/Import Certificate (Russia).	NA	NA	R	R	R
779	SASO Export/Import Certificate (Saudi Arabia)	NA	NA	R	R	R

P = New manufacture only
R = On request

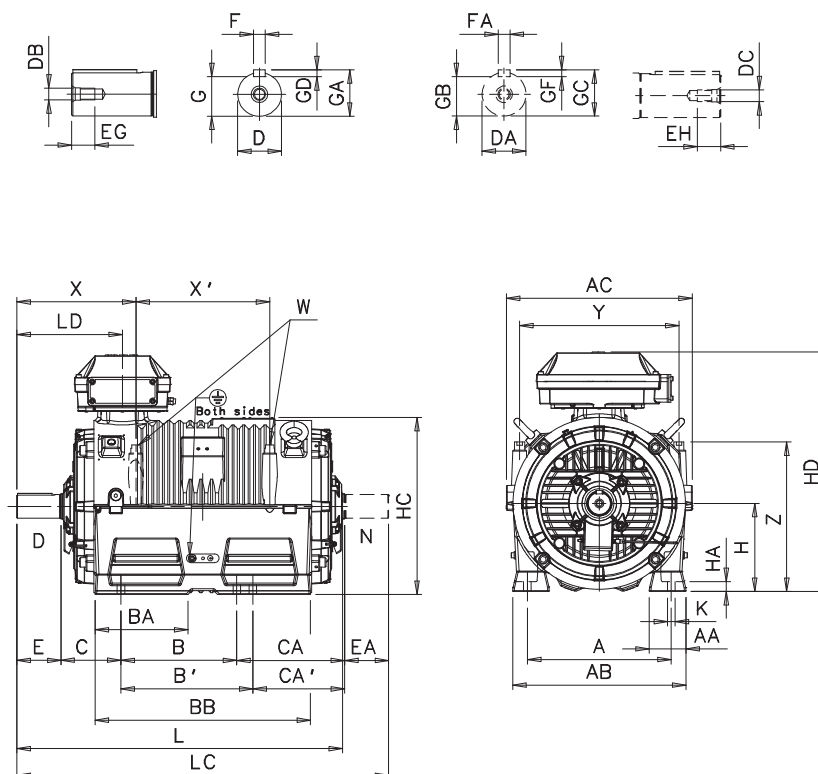
S = Included as standard
NA = Not applicable

Code	Variant	Frame Size				
		280	315	355	400	450
Stator winding temperature sensors						
120	KTY 84-130 (1 per phase) in stator winding.	P	P	P	P	P
121	Bimetal detectors, break type (NCC), (3 in series), 130°C, in stator winding.	P	P	P	P	P
122	Bimetal detectors, break type (NCC), (3 in series), 150°C, in stator winding.	P	P	P	P	P
123	Bimetal detectors, break type (NCC), (3 in series), 170°C, in stator winding.	P	P	P	P	P
124	Bimetal detectors, break type (NCC), (3 in series), 140°C, in stator winding.	P	P	P	P	P
125	Bimetal detectors, break type (NCC), (2x3 in series), 150°C, in stator winding.	P	P	P	P	P
127	Bimetal detectors, break type (NCC), (3 in series, 130°C & 3 in series, 150°C), in stator winding.	P	P	P	P	P
435	PTC - thermistors (3 in series), 130°C, in stator winding.	P	P	P	P	P
436	PTC - thermistors (3 in series), 150°C, in stator winding.	S	S	S	S	S
437	PTC - thermistors (3 in series), 170°C, in stator winding.	P	P	P	P	P
439	PTC - thermistors (2x3 in series), 150°C, in stator winding.	P	P	P	P	P
441	PTC - thermistors (3 in series, 130°C & 3 in series, 150°C), in stator winding.	P	P	P	P	P
442	PTC - thermistors (3 in series, 150°C & 3 in series, 170°C), in stator winding.	P	P	P	P	P
445	Pt-100 2-wire in stator winding, 1 per phase	P	P	P	P	P
446	Pt-100 2-wire in stator winding, 2 per phase	P	P	P	P	P
502	Pt-100 3-wire in stator winding, 1 per phase.	P	P	P	P	P
503	Pt-100 3-wire in stator winding, 2 per phase.	P	P	P	P	P
511	PTC thermistors (2 x 3 in series), 130 C, in stator winding	P	P	P	P	P
Terminal box						
019	Larger than standard terminal box.	P	P	P	R	NA
021	Terminal box LHS (seen from D-end).	NA	NA	P	P	P
022	Cable entry LHS (seen from D-end).	P	P	NA	NA	NA
157	Terminal box degree of protection IP65.	P	P	P	P	P
180	Terminal box RHS (seen from D-end).	NA	NA	P	NA	NA
187	Cable glands of non-standard design.	NA	NA	R	R	R
231	Standard cable glands with clamping device.	P	P	P	P	P
277	Cable sealing end unit, size small for C-opening.	P	NA	NA	NA	NA
278	Cable sealing end unit, size medium for D-opening.	P	P	NA	NA	NA
279	Cable sealing end unit, size large for D-opening.	P	P	NA	NA	NA
292	Adapter C-C.	P	NA	NA	NA	NA
293	Adapter D-D.	P	P	NA	NA	NA
294	Adapter E-D.	P	P	P	NA	NA
295	Adapter E-2D.	P	P	P	P	NA
296	Adapter E-3D.	P	NA	NA	P	P
380	Separate terminal box for temperature detectors, std. material	P	P	P	P	P
400	4 x 90 degr turnable terminal box.	P	P	P	NA	NA
402	Terminal box adapted for Al cables.	S	S	S	S	S
418	Separate terminal box for auxiliaries, standard material.	P	P	P	P	P
444	Adapter E-2E.	NA	NA	NA	NA	P
466	Terminal box at N-end.	P	P	P	P	P
468	Cable entry from D-end.	NA	NA	P	P	NA
469	Cable entry from N-end.	P	P	P	P	NA
567	Separate terminal box material: Cast Iron.	P	P	P	P	P
568	Separate terminal box for heating elements, std. material.	P	P	P	P	P
569	Separate terminal box for brakes.	NA	NA	P	P	P
729	Aluminum non-drilled flange for cable glands.	P	P	P	P	P
743	Painted non-drilled flange in steel for cable glands.	P	P	P	P	P
744	Stainless steel non-drilled flange for cable glands.	P	P	P	P	P
745	Painted steel flange equipped with nickle plated brass cable glands.	P	P	P	P	P
746	Stainless steel cable flange equipped with standard nickle plated brass cable glands	P	P	P	P	P
753	Cast iron terminal box.	S	S	S	S	S
P = New manufacture only S = Included as standard R = On request NA = Not applicable						

Code	Variant	Frame Size				
		280	315	355	400	450
Testing						
145	Type test report from a catalogue motor, 400V 50Hz.	P	P	P	P	P
146	Type test with report for one motor from specific delivery batch.	P	P	P	P	P
148	Routine test report.	P	P	P	P	P
149	Test according to separate test specification.	NA	NA	R	R	R
150	Customer witnessed testing. Specify test procedure with other codes.	P	P	P	P	P
221	Type test and multi-point load test with report for one motor from specific delivery batch.	NA	NA	R	R	R
222	Torque/speed curve, type test and multi-point load test with report for one motor from specific delivery batch.	P	P	R	R	R
760	Vibration level test.	P	P	P	P	P
761	Vibration spectrum test for one motor from specific delivery batch.	P	P	P	P	P
762	Noise level test for one motor from specific delivery batch.	P	P	P	P	P
763	Noise spectrum test for one motor from specific delivery batch.	P	P	P	P	P
764	Test for one motor from specific delivery batch with ABB frequency converter available at ABB test field. ABB standard test procedure.	P	P	P	P	P
Variable speed drives						
062	Tachogenerator.	P	P	P	P	P
182	Mounting of non-listed pulse tacho.	P	P	P	P	P
470	Prepared for hollow shaft pulse tacho (L&L equivalent).	P	P	P	P	P
471	512 pulse tacho (L&L 861).	NA	NA	NA	R	R
472	1024 pulse tacho (L&L 861007455-1024).	P	P	P	P	P
473	2048 pulse tacho (L&L 861007455-2048).	P	P	P	P	P
479	Mounting of other type of pulse tacho with shaft extension, tacho not included.	P	P	P	P	P
658	Special tacho mounted, price category 1 Tachometer types: Leine&Linde 861207356-0100 Leine&Linde 861207356-0050 Leine&Linde 861007456-1024 Leine&Linde 861007456-2048	P	P	P	P	P
659	Special tacho mounted, price category 2 Tachometer types: Leine&Linde DUO 865027391-0050-1024 Leine&Linde DUO 865027391-0100-1024 Leine&Linde DUO 865127991-1024-0015 Huebner POG10 DN 1024 Huebner HOG10 DN 1024	P	P	P	P	P
660	Special tacho mounted, price category 3 Tachometer types: Huebner POG 10 DN 1024 I + FSL Huebner POG 10 DN 1024 I + DSL.E Huebner HOG 10 DN 1024 I + FSL Huebner HOG 10 DN 1024 I + DSL.E	P	P	P	P	P
701	Insulated bearing at N-end.	P	P	P	P	P
704	EMC cable gland.	P	P	P	P	P
P = New manufacture only S = Included as standard R = On request NA = Not applicable						

Water cooled motors

Foot-mounted; IM B3 (IM 1001), IM B6 (IM 1051), IM B7 (IM 1061), IM B8 (IM 1071), IM V5 (IM1011), IM V6 (IM 1031)



Motors																				
size	Poles	A	AA	AB	AC	B	B'	BA	BB	C	CA	CA'	D	DA	DB	DC	E	EA	EG	EH
280 SM	2	457	116	550	590	368	419	295	685	190	342.5	291.5	65	60	M20	M20	140	140	40	40
	4-8	457	116	550	590	368	419	295	685	190	342.5	291.5	75	65	M20	M20	140	140	40	40
315 ML	2	508	116	598	666	457	508	246	745	216	343	292	70	60	M20	M20	140	140	40	40
	4-8	508	116	598	666	457	508	246	745	216	320	269	90	75	M24	M24	170	140	48	40
315 KH	2	508	116	598	666	560	710	291	906	216	400	250	70	60	M20	M20	140	140	40	40
	4-8	508	116	598	666	560	710	291	906	216	400	250	90	75	M24	M24	170	140	48	40

Motors																									
size	Poles	F	FA	G	GA	GB	GC	GD	GF	H	HA	HC	HD ¹⁾	HD ²⁾	HD ³⁾	K	L	LC	LD	X	X'	Y	Z	W	O
280 SM	2	18	18	58	69	53	64	11	11	280	31	563	762	785	-	24	1034	1181	335	378	425	506	475	R1/2"	-
	4-8	20	18	67.5	79.5	58	69	12	11	280	31	563	762	785	-	24	1034	1181	335	378	425	506	475	R1/2"	-
315 ML	2	20	18	62.5	74.5	53	64	12	11	315	40	633	-	858	873	28	1145	1295	383	440	400	574	520	R1"	-
	4-8	25	20	81	95	67.5	79.5	14	12	315	40	633	-	858	873	28	1156	1303	413	470	400	574	520	R1"	-
315 KH	2	20	18	62.5	74.5	53	64	12	11	315	40	633	-	858	873	28	1305	1455	383	446	550	574	520	R1"	10
	4-8	25	20	81	95	67.5	79.5	14	12	315	40	633	-	858	873	28	1336	1486	413	476	550	574	520	R1"	10

Tolerances:

A, B	± 0,8	¹⁾ Terminal box 210
D, DA	ISO m6	²⁾ Terminal box 370
F, FA	ISO h9	³⁾ Terminal box 750
H	0, -1.0	
N	ISO j6 (280 SM)	
	ISO js6 (315 ML)	
C	± 0,8	
W	Water Inlet / Outlet	

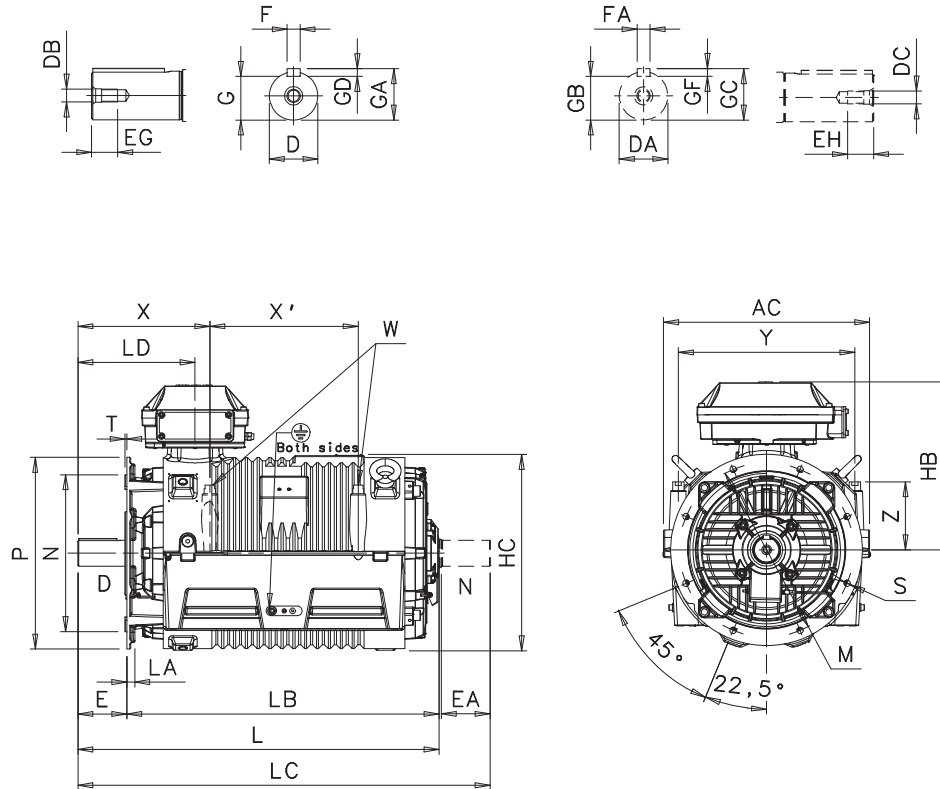
Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Dimension drawings

Water cooled motors

M3LP 280-315

Flange-mounted; V1 (IM 3011), V3 (IM 3031) – terminal box angle mounted



Motors																			
size	Poles	AC	D	DA	DB	DC	E	EA	EG	EH	F	FA	G	GA	GB	GC	GD	GF	
280 SM	2	590	65	60	M20	M20	140	140	40	40	18	18	58	69	53	64	11	11	
	4-8	590	75	65	M20	M20	140	140	40	40	20	18	67.5	79.5	58	69	12	11	
315 ML	2	666	70	60	M20	M20	140	140	40	40	20	18	62.5	69	53	64	12	11	
	4-8	666	90	75	M24	M24	170	140	48	40	25	20	81	95	67.5	79.5	14	12	
315 KH	2	666	70	60	M20	M20	140	140	40	40	20	18	62.5	74.5	53	64	12	11	
	4-8	666	90	75	M24	M24	170	140	48	40	25	20	81	95	67.5	79.5	14	12	

Motors																					
size	Poles	HB ¹⁾	HB ²⁾	HB ³⁾	HC	L	LA	LB	LC	LD	M	N	P	S	T	X	X'	Y	Z	W	O
280 SM	2	762	785	-	562	1034	23	894	1181	335	500	450	550	18	5	378	425	506	195	R1/2"	-
	4-8	762	785	-	562	1034	23	894	1181	335	500	450	550	18	5	378	425	506	195	R1/2"	-
315 ML	2	-	543	558	626	1145	25	1005	1295	383	600	550	660	23	6	440	400	574	205	R1"	-
	4-8	-	543	558	626	1156	25	986	1303	413	600	550	660	23	6	470	400	574	205	R1"	-
315 KH	2	-	543	558	626	1305	25	1165	1455	383	600	550	660	23	6	446	550	574	205	R1"	10
	4-8	-	543	558	626	1336	25	1166	1486	413	600	550	660	23	6	476	550	574	205	R1"	10

Tolerances:

A, B	± 0,8	¹⁾ Terminal box 210
D, DA	ISO m6	²⁾ Terminal box 370
F, FA	ISO h9	³⁾ Terminal box 750
H	0, -1,0	
N	ISO j6 (280 SM)	
	ISO js6 (315 ML)	
C	± 0,8	
W	Water Inlet / Outlet	

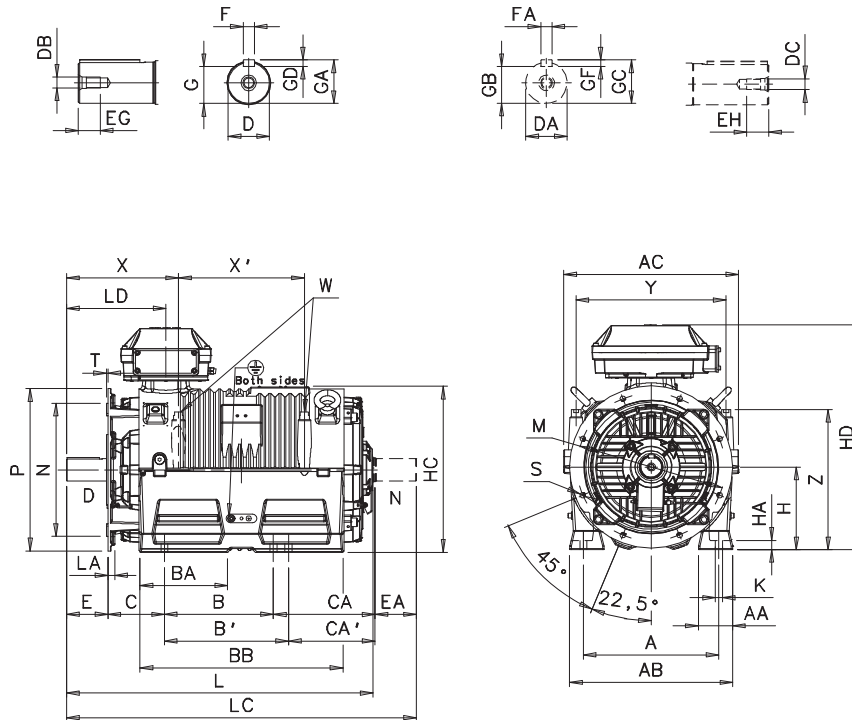
Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Dimension drawings

Water cooled motors

M3LP 280-315

Foot- and flange-mounted: IM B35 (IM 2001), IM V15 (IM 2011), IM V36 (IM 2031)



Motors																									
size	Poles	A	AA	AB	AC	B	B`	BA	BB	C	CA	CA`	D	DA	DB	DC	E	EA	EG	EH	F	FA	G	GA	
280 SM	2	457	116	550	590	368	419	295	685	190	342.5	291.5	65	60	M20	M20	140	140	40	40	18	18	58	69	
	4-8	457	116	550	590	368	419	295	685	190	342.5	291.5	75	65	M20	M20	140	140	40	40	20	18	67.5	79.5	
315 ML	2	508	116	598	666	457	508	246	745	216	343	292	70	60	M20	M20	140	140	40	40	20	18	62.5	74.5	
	4-8	508	116	598	666	457	508	246	745	216	320	269	90	75	M24	M24	170	140	48	40	25	20	81	95	
315 KH	2	508	116	598	666	560	710	291	906	216	400	250	70	60	M20	M20	140	140	40	40	20	18	62.5	74.5	
	4-8	508	116	598	666	560	710	291	906	216	400	250	90	75	M24	M24	170	140	48	40	25	20	81	95	

Motors																												
size	Poles	GB	GC	GD	GF	H	HA	HC	HD ¹⁾	HD ²⁾	HD ³⁾	K	L	LA	LB	LC	LD	M	N	P	S	T	X	X'	Y	Z	W	O
280 SM	2	53	64	11	11	280	31	563	762	785	-	24	1034	23	894	1181	335	500	450	550	18	5	335	425	506	475	R1/2"	-
	4-8	58	69	12	11	280	31	563	762	785	-	24	1034	23	894	1181	335	500	450	550	18	5	335	425	506	475	R1/2"	-
315 ML	2	53	64	12	11	315	40	633	-	858	873	28	1145	25	956	1295	383	600	550	660	23	6	440	400	574	520	R1"	-
	4-8	67.5	79.5	14	12	315	40	633	-	858	873	28	1156	25	986	1303	413	600	550	660	23	6	470	400	574	520	R1"	-
315 KH	2	53	64	12	11	315	40	633	-	858	873	28	1305	25	1165	1455	383	600	550	660	23	6	446	550	574	520	R1"	10
	4-8	67.5	79.5	14	12	315	40	633	-	858	873	28	1336	25	1166	1486	413	600	550	660	23	6	476	550	574	520	R1"	10

Tolerances:

A, B	± 0,8	¹⁾ Terminal box 210
D, DA	ISO m6	²⁾ Terminal box 370
F, FA	ISO h9	³⁾ Terminal box 750
H	0, -1,0	
N	ISO j6 (280 SM)	
	ISO js6 (315 ML)	
C	± 0,8	
W	Water Inlet / Outlet	

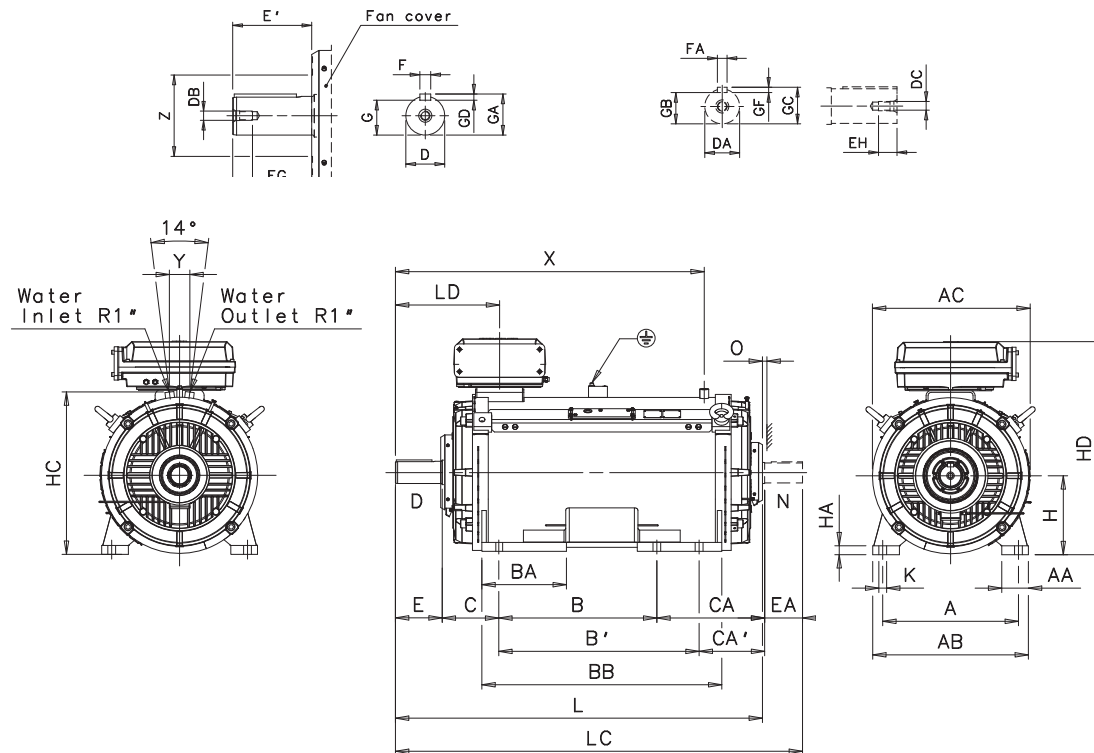
Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Dimension drawings

Water cooled motors

M3LP 355

Foot-mounted; IM B3 (IM 1001), IM B6 (IM 1051), IM B7 (IM 1061), IM B8 (IM 1071), IM V5 (IM 1011), IM V6 (IM 1031)



Motor size	Poles	A	AA	AB	AC	B	B'	BA	BB	C	CA	CA'	D	DA	DB	DC	E	E'	EA	EG	EH
355 ML	4-8	610	120	700	702	560	630	265	848	254	406	336	100	90	M24	M24	210	204	170	51	51
355 LK	4-8	610	120	700	702	710	900	380	1078	254	486	296	100	90	M24	M24	210	204	170	51	51

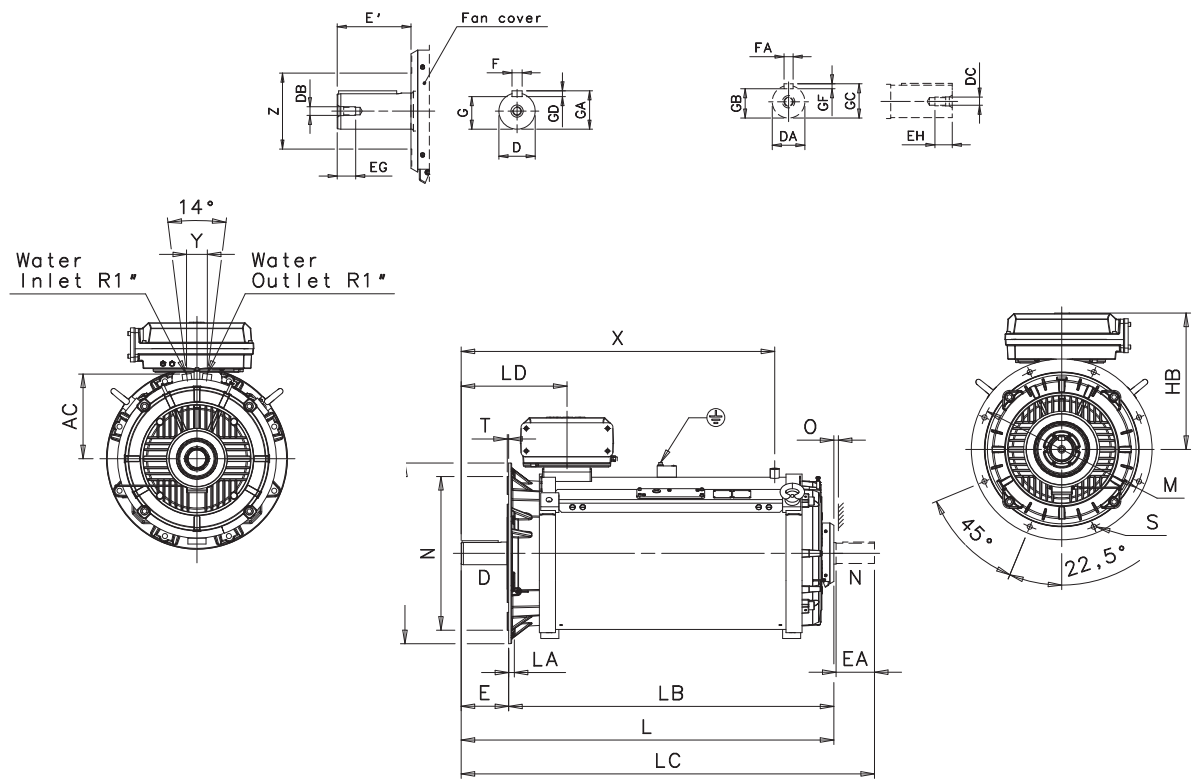
Motor size	Poles	F	FA	G	GA	GB	GC	GD	GF	H	HA	HC	HD ¹⁾	HD ²⁾	K	L	LC	LD	O	X	Y	Z
355 ML	4-8	28	25	90	106	81	95	16	14	355	40	729	944	958	35	1418	1600	468	10	1157	92	210
355 LK	4-8	28	25	90	106	81	95	16	14	355	40	729	944	958	35	1648	1830	468	10	1387	92	210

Tolerances:

A, B	± 0,8	¹⁾ Terminal box 750
D, DA	ISO m6	²⁾ Terminal box 1200
F, FA	ISO h9	
H	0, -1.0	
N	ISO js6	
C	± 0,8	

Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Flange-mounted; IM B5 (IM 3001), V1 (IM 3011), V3 (IM 3031)



Motor size	Poles	AC	D	DA	DB	DC	E	E'	EA	EG	EH	F	FA	G	GA	GB	GC	GD	GF
355 ML	4-8	374	100	90	M24	M24	210	204	170	51	51	28	25	90	106	81	95	16	14
355 LK	4-8	374	100	90	M24	M24	210	204	170	51	51	28	25	90	106	81	95	16	14

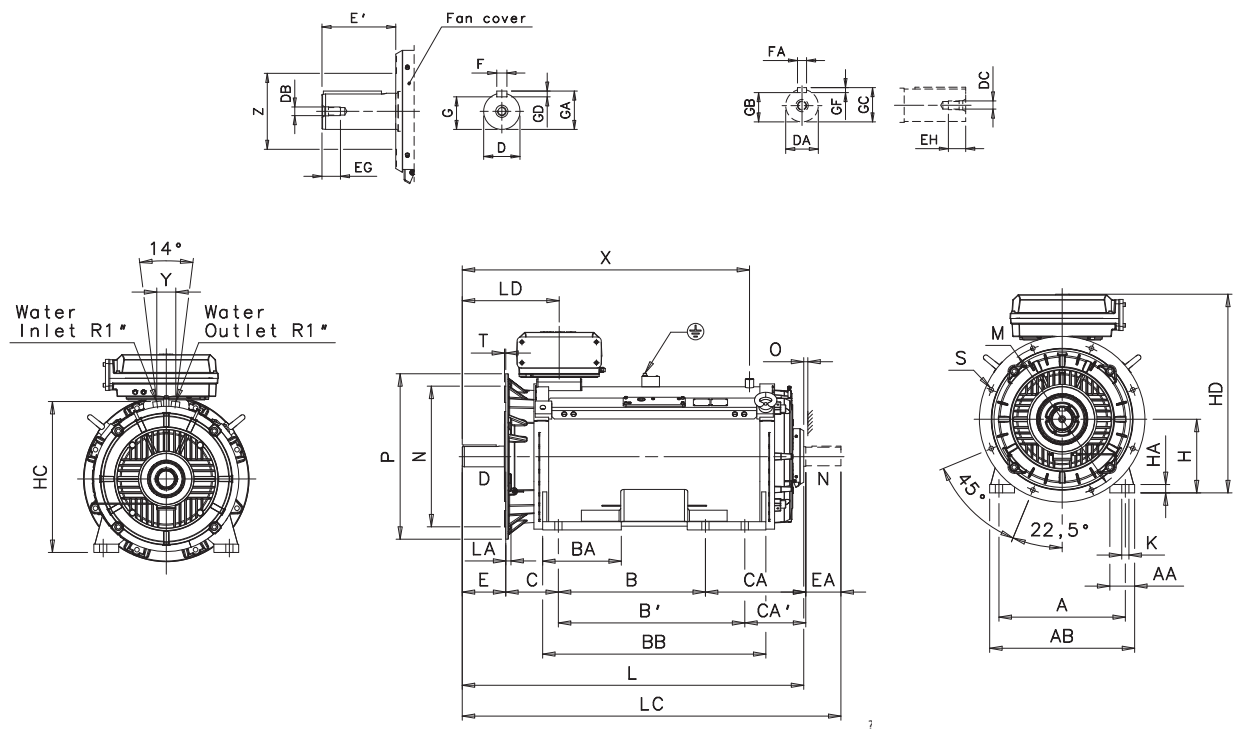
Motor size	Poles	HB ¹⁾	HB ²⁾	L	LA	LB	LC	LD	M	N	O	P	S	T	X	Y	Z
355 ML	4-8	589	603	1418	25	1208	1600	468	740	680	10	800	23	6	1157	92	210
355 LK	4-8	589	603	1648	25	1438	1830	468	740	680	10	800	23	6	1387	92	210

Tolerances:

A, B	± 0,8	¹⁾ Terminal box 370
D, DA	ISO m6	²⁾ Terminal box 750
F, FA	ISO h9	
H	0, -1.0	
N	ISO js6	
C	± 0,8	

Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Foot- and flange-mounted; IM B35 (IM 2001), IM V15 (IM 2011), IM V36 (IM 2031)



Motor																								
size	Poles	A	AA	AB	B	B'	BA	BB	C	CA	CA'	D	DA	DB	DC	E	E'	EA	EG	EH	F	FA	G	GA
355 ML	4-8	610	120	700	560	630	265	848	254	406	336	100	90	M24	M24	210	204	170	51	51	28	25	90	106
355 LK	4-8	610	120	700	710	900	380	1078	254	486	296	100	90	M24	M24	210	204	170	51	51	28	25	90	106

Motor size	Poles	GB	GC	GD	GF	H	HA	HC	HD ¹⁾	HD ²⁾	K	L	LA	LC	LD	M	N	O	P	S	T	X	Y	Z
355 ML	4-8	81	95	16	14	355	40	729	944	958	35	1418	25	1600	468	740	680	10	800	23	6	1157	92	210
355 LK	4-8	81	95	16	14	355	40	729	944	958	35	1648	25	1830	468	740	680	10	800	23	6	1387	92	210

Tolerances:

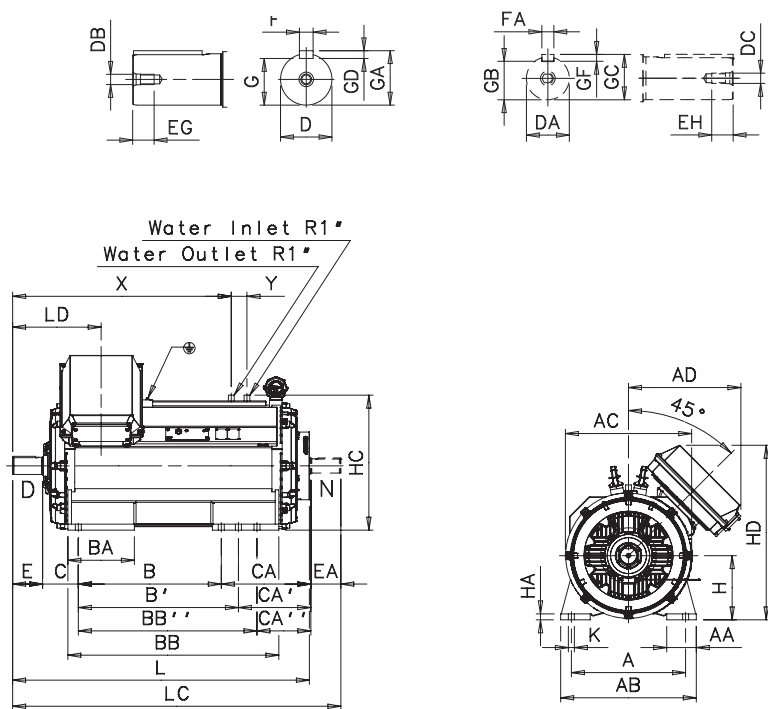
A, B	± 0,8	¹⁾ Terminal box 370
D, DA	ISO m6	²⁾ Terminal box 750
F, FA	ISO h9	
H	0, -1,0	
N	ISO js6	
C	± 0,8	

Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Dimension drawings
Water cooled motors

M3LP 400-450

Foot-mounted; IM B3 (IM 1001), IM B6 (IM 1051), IM B7 (IM 1061), IM B8 (IM 1071), IM V5 (IM 1011), IM V6 (IM 1031)
- terminal box mounted in 45° angle



Motor size	Poles					AD		AD																	
	1)	A	AA	AB	AC	1)	2)	B	B'	B''	BA	BB	C	CA	CA'	CA''	D	DA	DB	DC	E	EA	EG	EH	
400 L	4-8	710	183	840	790	679	752	900	1000	-	400	1292	224	541	441	-	110	90	M24	M24	210	170	50	50	
450 L	4-8	800	207	950	884	714	788	1000	1120	1250	465	1476	250	627	507	377	120	100	M24	M24	210	210	50	50	

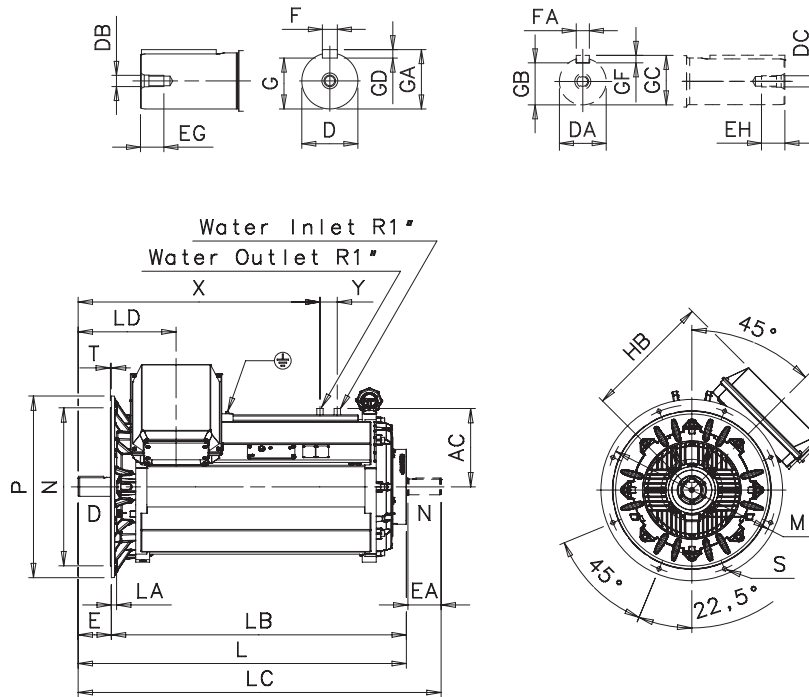
Motor size	Poles												HD		HD							
	¹⁾	F	FA	G	GA	GB	GC	GD	GF	H	HA	HC	¹⁾	²⁾	K	L	LC	LD	X	Y		
400 L	4-8	28	25	100	116	81	95	16	14	400	40	851	1036	1138	35	1865	2045	616	1345	110		
450 L	4-8	32	28	109	127	100	116	18	16	450	42	946	1122	1224	42	2077	2297	620	1530	110		

Tolerances:

A, B	± 0,8	1) Terminal box 750
D, DA	ISO m6	2) Terminal box 1200
F, FA	ISO h9	
H	0, -1.0	
N	ISO js6	
C	± 0,8	

Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Flange-mounted; V1 (IM 3011), V3 (IM 3031) – terminal box mounted in 45° angle



Motor																			
size	Poles ¹⁾	AC	D	DA	DB	DC	E	EA	EG	EH	F	FA	G	GA	GB	GC	GD	GF	
400 L	4-8	451	110	90	M24	M24	210	170	50	50	28	25	100	116	81	95	16	14	
450 L	4-8	496	120	100	M24	M24	210	210	50	50	32	28	109	127	100	116	18	16	

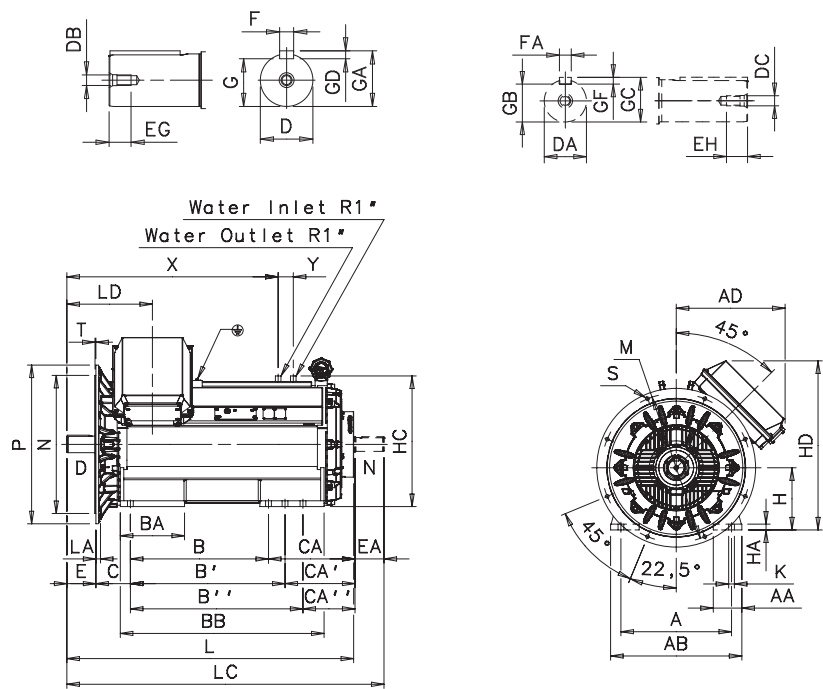
Motor																
size	Poles ¹⁾	HB ¹⁾	HB ²⁾	L	LA	LB	LC	LD	M	N	P	S	T	X	Y	
400 L	4-8	690	752	1865	26	1655	2045	616	940	880	1000	28	6	1345	110	
450 L	4-8	740	802	2077	33	1867	2297	620	1080	1000	1150	28	6	1530	110	

Tolerances:

D, DA	ISO m6	¹⁾ Terminal box 750
F, FA	ISO h9	²⁾ Terminal box 1200
N	ISO js6	

Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Foot- and flange-mounted; IM B35 (IM 2001), IM V15 (IM 2011), IM V36 (IM 2031) – terminal box mounted in 45° angle



Motor	Poles																							
size	¹⁾	A	AA	AB	AD ¹⁾	AD ²⁾	B	B'	B''	BA	BB	C	CA	CA'	CA''	D	DA	DB	DC	E	EA	EG	EH	F
400 L	4-8	710	183	840	679	752	900	1000	-	400	1292	224	541	441	-	110	90	M24	M24	210	170	50	50	28
450 L	4-8	800	207	950	714	788	1000	1120	1250	320	1476	250	622	502	372	120	100	M24	M24	210	210	50	50	32

Motor	Poles																									
size	¹⁾	FA	G	GA	GB	GC	GD	GF	H	HA	HC	HD ¹⁾	HD ²⁾	K	L	LA	LC	LD	M	N	P	S	T	X	Y	
400 L	4-8	25	100	116	81	95	16	14	400	40	851	1036	1138	35	1865	26	2045	616	940	880	1000	28	6	1345	110	
450 L	4-8	28	109	127	100	116	18	16	450	42	946	1122	1224	42	2077	33	2297	620	1080	1000	1150	28	6	1530	110	

Tolerances:

A, B	± 0,8	¹⁾ Terminal box 750
D, DA	ISO m6	²⁾ Terminal box 1200
F, FA	ISO h9	
H	0, -1,0	
N	ISO js6	
C	± 0,8	

Above table gives the main dimensions in mm.
For detailed drawings please see our web site
www.abb.com/motors&generators or contact us.

Rating plates

The rating plate is in table form giving values current and power factor for six voltages.

Motor size 280

Rating plate

CE		IE2	
3 ~ Motor		M3LP 280SMD 4 IMB3 / IM1001	
472610-10		2010	No. 3GF10052589
V		Hz	kW
r/min		A	cos φ
Duty		IP 55	
690 Y		50	160
400 D		50	160
415 D		50	160
IE2-95.0%(100%)-95.4%(75%)-95.3%(50%)		Prod. code 3GLP282240-ADG	
Nmax		r/min	
6316/C3		700	
kg		IEC 60034-1	

Motor size 450

Rating plate

CE		IE2	
3 ~ Motor		M3LP 450LC 4 IMB3 / IM1001	
472610-11		2010	No. 3GF10052500
V		Hz	kW
r/min		A	cos φ
Duty		IP 55	
690 Y		50	1200
400 D		50	1200
415 D		50	1200
IE2-95.0%(100%)-95.4%(75%)-95.3%(50%)		Prod. code 3GLP452530-RDG	
Nmax		r/min	
6326/C3		4400	
kg		IEC 60034-1	

Motor sizes 280 to 450

Lubrication plate

					
Regreasing intervals in duty hours					
Bearings		6316/C3 		6316/C3	
Amount of grease		70 		70	
Mounting	Ambient temp.	1800 r/min	1500 r/min	1000 r/min	0-900 r/min
Hor	25	8000	10500	14000	17000
Hor	40	4000	5250	7000	8500
Vert	25	4000	5250	7000	8500
Vert	40	2000	2630	3500	4250
Do not exceed the motor max. speed					
The following or similar high performance grease can be used:					
Esso	Unirex N2 or N3		Shell	Albida EMS2	
Total	Multis Complex S2 A		Mobil	Mobilith SCH 100	
Klüber	Klüberplex BEM 41-132		FAG	Arcanol TEMP110	
			472610-10		
See respective "Motor Manual"					

Motor size 280

Instruction plate for cooling water

3GF10052589	ABB
Water inlet: LEFT	
Water outlet: RIGHT	
Inlet water temp: +35°C...+40°C	
Water flow: 20L/MIN	
Water pressure: min/max 2 / 5 bar	

Motor size 450

Instruction plate for cooling water

3GF10052500	ABB
Water inlet: CLOSER ND-END	
Water outlet: CLOSER D-END	
Inlet water temp: +30°C...+40°C	
Water flow: 50L/MIN	
Water pressure: min/max 2 / 5 bar	

Water cooled motors in brief

Basic design

Motor size		280	315	355	400	450
Stator	Material	Cast aluminum			Steel plate	
	Paint colour shade	Blue, Munsell 8B 4.5/3.25 / NCS 4822 B05G / RAL 5014				
	Paint thickness	C3 medium				
Bearing end shields	Material	Cast iron EN-GJL200/GG20/GRS 200, EN-GLJ-250/GG25/GRS 250, EN-GJS-400/GG40/GRP 400				
	Paint colour shade	Blue, Munsell 8B 4.5/3.25 / NCS 4822 B05G / RAL 5014				
	Paint thickness	C3 medium				
Bearings	D-end 2-pole	6316/C3	6316/C3	NA		
	D-end 4-8 pole		6319/C3	6322/C3	6324/C3	6326M/C3
	N-end 2-pole	6316/C3	6316/C3	N/A		
	N-end 4-8 pole			6316/C3	6319/C3	6322/C3
Axially-locked bearings	Inner bearing cover	As standard, locked at D-end				
Bearing seals		V-ring or labyrinth seal as standard see chapter on Bearing seal				
Lubrication		Regreasable bearings, regreasing nipples, M10x1				
Measuring nipples		As standard				
Rating plate	Material	Stainless steel, EN 10088, thickness 0.5 mm				
Terminal box	Frame material	Cast iron EN-GJL-250/GG 25/GRS 250				
	Cover material	Cast iron EN-GJL-250/GG 25/GRS 250				Steel
	Cover screws material	Steel 8.8, zinc electroplated				
Connections	Cable entries	Aluminum non-drilled flange		Painted non-drilled steel flange		
	Terminals	6 terminals for connection with cable lugs (not included)				
	Cable glands	Cable glands as option				
Stator winding	Material	Copper				
	Insulation	Insulation class F				
	Winding protection	3 PTC thermistors as standard, 155°C				
Rotor winding	Material	Pressure die-cast aluminum				
Balancing method		Half key balancing as standard				
Key way		Open key way				
Heating elements	On request	65 W	2x65 W	2x65 W	2x65 W	2x100 W
Drain holes		Standard, open on delivery				
Enclosure		IP 55, higher protection on request				
Cooling method		IC71W				

ABB Motors' and Generators' total product offer



ABB offers several comprehensive ranges of AC motors and generators. We manufacture synchronous motors for even the most demanding applications, and a full range of low and high voltage induction motors. Our in-depth knowledge of virtually every type of industrial processing ensures we always specify the best solution for your needs.

Low voltage motors

- Process performance motors
- Industrial performance motors
- General performance motors

High voltage induction motors

- High voltage cast iron motors
- Induction modular motors
- Slip-ring modular motors

Motors and generators for explosive atmospheres

- Flameproof
- Increased safety
- Non-sparking
- Pressurized
- Dust ignition proof

Marine motors and generators

Synchronous motors Generators

- Synchronous generators for diesel and gas engines
- Synchronous generators for steam and gas turbines
- Wind turbine generators

DC motors

Traction motors and generators

- Frameless traction motors
- Modular traction motors
- Synchronous traction generators

Motors for other applications

- Low voltage open drip proof motors
- Low voltage brake motors
- Low voltage single phase motors
- Low voltage high ambient motors
- Permanent magnet motors and generators
- High speed motors
- Low voltage smoke venting motors
- Low voltage water cooled motors
- Motors for roller table drives
- Servo motors

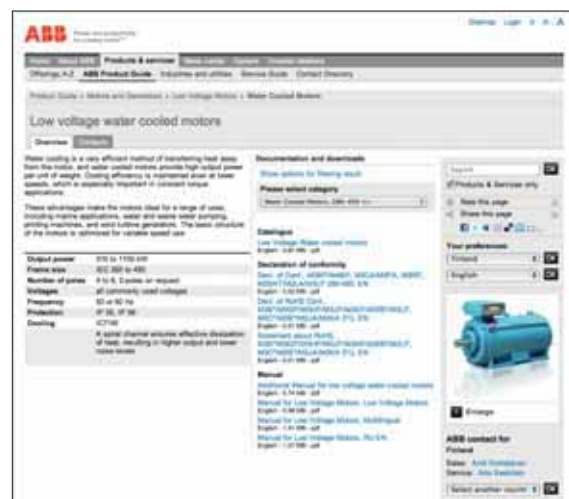
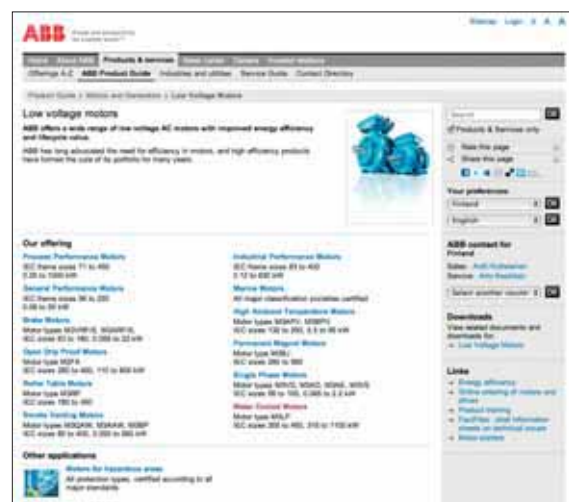
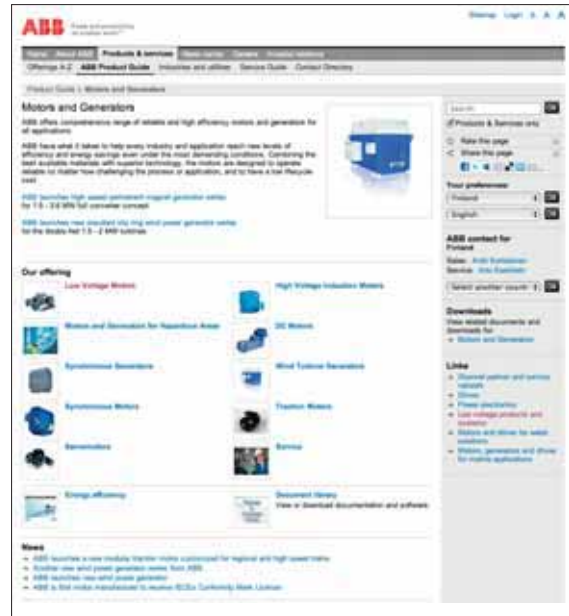
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