

Transmax Transmission

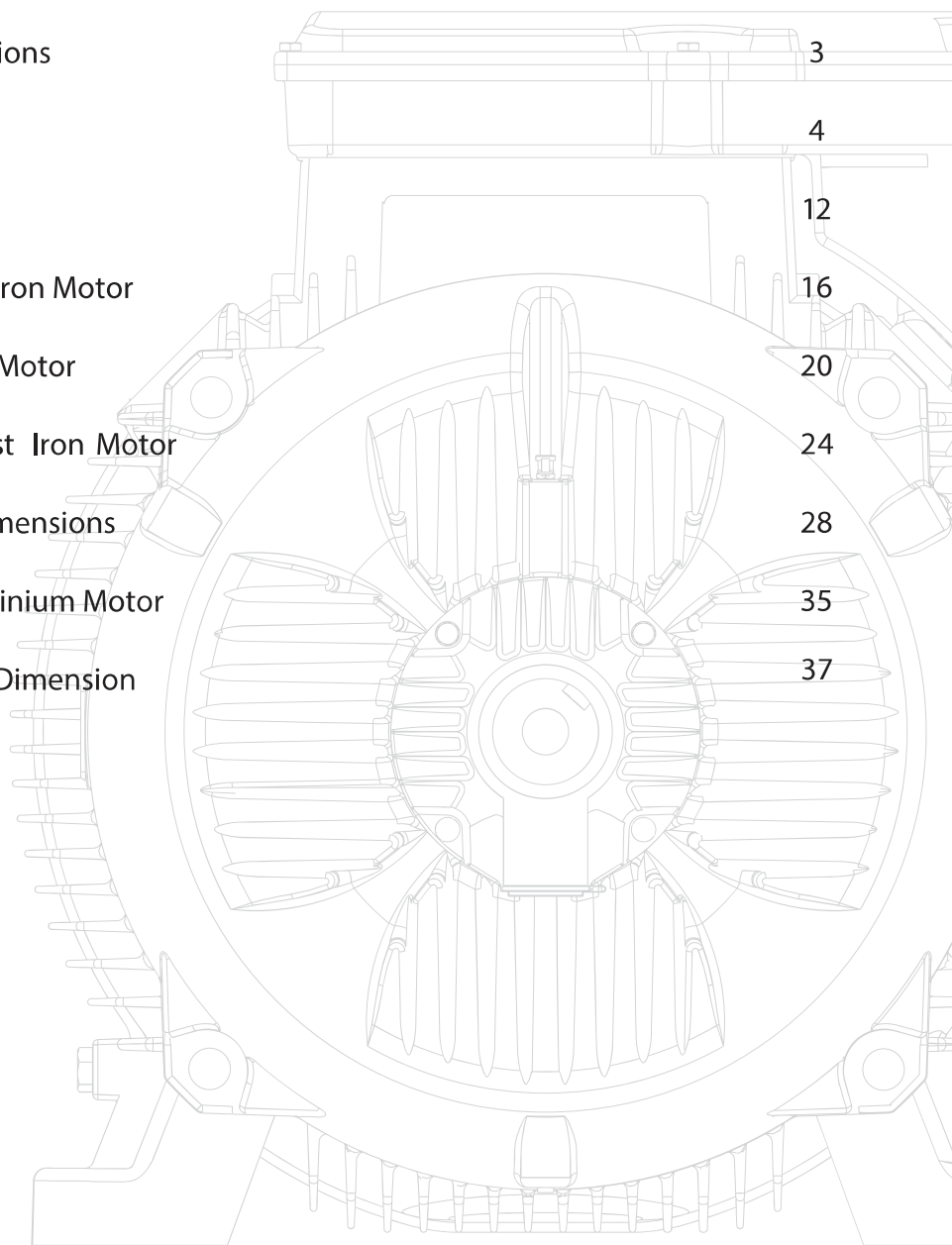


BRANCO
Electric Motor

01/2023

Content

○ Standards & Regulations	2
○ Conditions of Installations	3
○ Mechanical Design	4
○ Electrical Design	12
○ IE3 Premium Eff. Cast Iron Motor	16
○ IE2 High Eff. Cast Iron Motor	20
○ IE1 Standard Eff. Cast Iron Motor	24
○ BR Cast Iron Motor Dimensions	28
○ IE1 Standard Eff. Aluminium Motor	35
○ BA Aluminium Motor Dimension	37



Introduction

Transmax is a time-tested brand that supplies variety of engineering transmission components designed to increase both uptime and productivity. Each of our brands brings years of time-tested reliability and proven performance results. Together they deliver a product line unparalleled in its breadth.

Induction Motor

With **BRANCO** straightforward, robust design, these high quality motors offer extensive potential for modification. They are available with standard variants, ensuring they can be used in wide range of industrial applications. Most General performance motors are stocked both centrally and locally for global off-the-shelf availability and fast delivery worldwide.

Gear / Reducer

Wide range of ratio and type of reduction gear to suit industrial application needs. Quality consistency is our promise to customer. With years of experience gained, we are capable to provide appropriate transmission solution to maximize cost effectiveness of our client machine.

Taper Lock Pulley

TRANSMAX Taper Bushing Pulleys have been re-designed to ensure suitability for the demands of modern industry. The new design incorporates advantages of modern materials to give the optimum weight strength ratio in the finished pulleys. TRANSMAX Taper Bushing Pulleys are produced with accuracy and consistency of form and are suitable for use on drives with belt speed up to 40 meters per second.

Bearing

Industrial and Automotive bearings which are market relevant, ensure quality manufacturing products, wide range of ready stock to fulfil the market demand. We have unparalleled expertise in the distribution of bearings products which is all available from one single source. We do provide trade, OEM and aftermarket industries. Your need, we deliver.

Chain Couplings

TRANSMAX chain coupling is a flexible coupling of simple design consisting of a double strand chain coupled with a pair of sprockets. It is simple, compact and has high torque capacity that is normally in excess of the torque transmitted by shaft.

Variable Speed Drive (Frequency Inverter)

Artemis series variable speed drive features excellent drive control performance with V/F and sensorless vector control (SVC) technology, which provides efficient solution for most types of variable speed drive applications.

Standards & Regulations

The Motors comply with the relevant standards and regulations, especially:

Title	IEC	EU CENELES	D DIN/VDE	I CEI/UNEL	GB BS	F NFC	E UNE
Electrical							
General stipulations for electrical machines	60034-1	EN 60034-1	DIN EN 60034-1	CEI EN 60034-1	4999-1 4999-69	51-200 51-111	UNE EN 60034-1
Rotating electrical machines: methods for determining losses and efficiency using tests	60034-2	HD 53 2	DIN EN 60034-2	CEI EN 60034-2	4999-34	51-112	UNE EN 60034-2
Terminal markings and direction of rotation of rotating electrical machines	60034-8	HD 53 8 S4	DIN VDE 0530-8	CEI 2-8	4999-3	51-118	20113-8-96
Starting performance	60034-12	EN 60034-12	DIN EN 60034-12	CEI EN 60034-12	4999-1 12		UNE EN 60034-12
Standard voltages	60038	HD 472 S1	DIN IEC 60038	CEI 8-6			
Insulating materials	60085		DIN IEC 60085	CEI 15-26			
Mechanical							
Dimensions and output ratings	60072			UNEL 131 13			
Mounting dimensions and relationship frame sizes-output rating, IM B3	60072	HD 231	DIN 42673-1	UNEL 131 13	4999-10 51-110	51-105 51-104	201061/26 1980
Mounting dimensions and relationship frame sizes-output ratings, IM B5	60072	HD 231	DIN 42677-1	UNEL 131 17		20106-2-74	
Mounting dimensions and relationship frame sizes-output rating, IM B14	60072	HD 231	DIN 42677-1	UNEL 131 18	4999-10 51-110	51-105 51-104	20106-2-IC-80
Cylindrical shaft ends for electric motors	60072	HD 231	DIN 784-3	UNEL 13502	4999-10	51-111	
Degrees of protection	60034-5	EN 60034-5	DIN IEC 60034-5	CEI EN 60034-5	4999-20	EN 60034-5	20111-5
Methods of cooling	60034-6	EN 60034-6	DIN EN 60034-6	CEI EN 60034-7	4999-21		EN 60034-6
Mounting arrangements	60034-7	EN 60034-7	DIN EN 60034-7	CEI EN 60034-7	4999-22	51-117	EN 60034-7
Noise limits	60034-9	EN 60034-9	DIN EN 60034-9	CEI EN 60034-9	4999-51	51-119	EN 60034-9
Mechanical vibration	60034-14	EN 60034-14	DIN EN 60034-14	CEI EN 60034-14	4999-50	51-111	EN 60034-14
Mounting Flanges			DIN 42948	UNEL 13501			
Tolerances of mounting and shaft extensions			DIN 42955	UNEL 13501/ 13502			
Classification of environmental conditions	600721-2-1		DIN IEC 60721-2-1	CEI 75-1			
Mechanical vibration; balancing	ISO 8821		DIN ISO 8821				

Conditions of Installations

The Motors are designed for operation at altitudes ≤ 1000 m above sea-level and at ambient temperatures of up to 40° C. Exceptions are indicated on the rating plate.

Permissible temperature rises to various standards

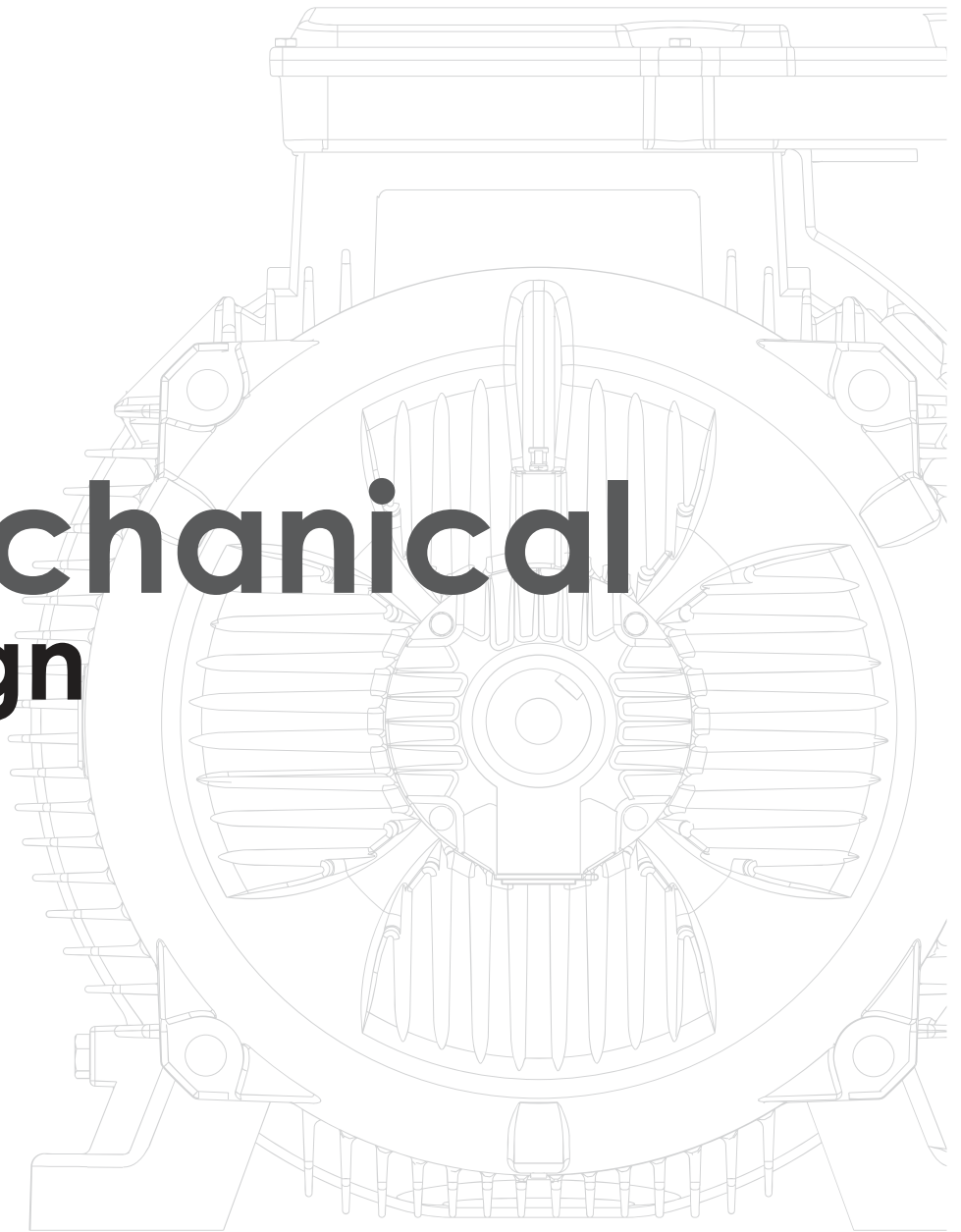
Standard/Regulation	Temperature of coolant °C	Permissible temperature rise in K (measured by resistance method) Temperature class		
		B	F	H
VDE 0530 part 1	40	80	105	125
International IEC 34-1	40	80	105	125
Britain BS 2613	40	80	105	
Canada CSA	40	80	105	
USA NEW A and ANSI	40	80	105	
italy CEI	40	80	105	
Sweden SEN	40	80	105	
Norway NEK	40	80	105	
Belgium NBN	40	80	105	
France NF	40	80	105	
Switzerland SEV	40	80	105	
India IS	40	80	-	
Germanischer Lloyd ¹⁾	45	75	90	
American Bureau Of Shipping ¹⁾	50	70	95	
Bureau Veritas ¹⁾	45	70	100	
Norske Veritas ¹⁾	45	70	90 ²⁾	
Lloyds Register ¹⁾	45	70	90	
Registro Italiano Navale ¹⁾	45	70	90	
Korean Register ¹⁾	50	70	90	
China Classification Society ¹⁾	45	75	95	

on request

1) Classification societies for marine motors

2) Only with special approval

Mechanical Design



Mechanical Design

Degrees of protection

Degrees of protection for mechanical machines are designated in accordance with IEC 60034-5 by the letters **IP** and two characteristic numerals.

First numeral: Protection against contact and ingress of foreign bodies

Second numeral: Protection against ingress of water

IP	Description	IP	Description
0	No special protection	0	No special protection
1	Protection against solid foreign bodies larger than 50 mm (Example: inadvertent contact with the hand)	1	Protection against vertically falling water drops (condensation)
2	Protection against solid foreign bodies larger than 12 mm (Example: inadvertent contact with the fingers)	2	Protection against dropping water when inclined by up to 15°
3	Protection against solid foreign bodies larger than 2.5 mm (Example: Wires, tools)	3	Protection against waterspray at up to 60° from vertical
4	Protection against solid foreign bodies larger than 1 mm (Example: Wires, bands)	4	Protection against water splashed from any direction
5	Protection against dust (harmful deposits of dust)	5	Protection against water projected by a nozzle from any direction
6	Complete protection against dust. Is not described for electrical machines tp IEC 34-5.	6	Protection against heavy seas or water projected in powerful jets
		7	Protection when submerged between 0.15 and 1m
		8	Protection when continuously submerged in water at conditions agreed between the manufacturer and the user .

The motors conform to degree of protection IP55 to IEC 60034-5. Higher protection on request.

The standard design for horizontal mounting is suitable for indoor and protected outdoor installation, climate group MODERATE (temperature of coolant -20° to +40° C)

For unprotected outdoor installation or severe climatic conditions (moisture category wet, climate group WORLDWIDE, extremely dusty site conditions, aggressive industrial atmosphere, danger of storm rain and coastal climate, danger of attack by termites, etc.), as well as vertical mounting, special protective measures are recommended, such as

- Protective cowl (for vertical *shaft-down* motors)
- For vertical shaft-up motors additional bearing seal and flange drainage
- Special paint finish
- Treatment of winding with protective moisture-proof varnish
- Anti-condensation heating (possibly winding heating)
- Condensation drain holes

The special measures to be applied have to be agreed with the factory once the conditions of installation have been settled.

The corresponding conditions of installation have to be clearly indicated in the order .

Tolerances

For industrial motors to EN 60034-1, certain tolerances must be allowed on guaranteed values, taking into consideration the necessary tolerances for the manufacture of such motors and the materials used. The standard includes the following remarks:

1. It is not intended that guarantees necessarily have to be given for all or any of the items involved. Quotations including guaranteed values subject to tolerances should say so, and the tolerances should be in accordance with the table.
2. Attention is drawn to the different interpretation of the term guarantee. In some countries a distinction is made between guaranteed values and typical or declared values.
3. Where a tolerance is stated in only one direction, the value is not limited in the other direction.

Values for	Tolerance
Efficiency (η) (by indirect determination)	- 0.15 (1- η) at $P_N \leq 150$ kW - 0.1 (1- η) at $P_N > 150$ kW
Power Factor ($\cos \varphi$)	$\frac{1 - \cos \varphi}{6}$, minimum 0.02, maximum 0.07
Slip (s) (at rated load and at working temperature)	$\pm 20\%$ of the guaranteed slip at $P_N \leq 1$ kW $\pm 30\%$ of the guaranteed slip at $P_N > 1$ kW
Breakaway starting current (I_A) (in the starting circuit envisaged)	$\pm 20\%$ of the guaranteed starting current (no lower limit)
Breakaway torque (M_A)	- 15 % and + 25 % of the guaranteed breakaway torque (+ 25 % may be exceeded by agreement)
Pull-up torque (M_s)	- 15 % of the guaranteed value
Pull-out torque (M_k)	- 10 % of the guaranteed value (after allowing for this tolerance, M_k/M_N not less than 1.6)
Moment of inertia (J)	$\pm 10\%$ of the guaranteed value

Mounting Arrangements

Mounting arrangements for rotating electrical machines are designated according to IEC 60034-7, Code I (in brackets Code II)

Our motors are available with the mounting arrangements listed below, depending on design and frame size. Motors with aluminium frame are equipped with removable feet that allow easy change of mounting arrangement.

Foot Mounting

IM B3 (IM 1001)



IM B6 (IM 1051)



IM B7 (IM 1061)



IM B8 (IM 1071)



IM V5 (IM 101 1)



IM V6 (IM 1031)



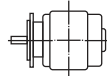
IM B33 (IM 2101)



Flange type C to
DIN 42 948 at
drive end

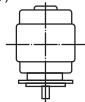
Flange Mounting

IM B5 (IM 3001)



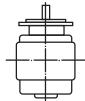
Flange type A to
DIN 42 948 at
drive end

IM V1 (IM 301 1)



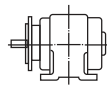
Flange type A to
DIN 42 948 at
drive end

IM V3 (IM 3031)



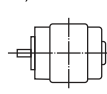
Flange type A to
DIN 42 948 at
drive end

IM B35 (IM 2001)



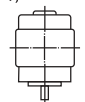
Flange type A to
DIN 42 948 at
drive end

IM B14 (IM 3601)



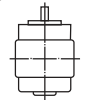
Flange type C to
DIN 42 948 at
drive end

IM V18 (IM 361 1)



Flange type C to
DIN 42 948 at
drive end

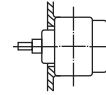
IM V19 (IM 3631)



Flange type C to
DIN 42 948 at
drive end

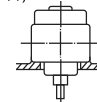
Motor Without Endshield Mounting

IM B9 (IM 9101)



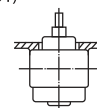
Without endshield
and without
ball bearings on
drive end

IM V8 (IM 91 11)



Without endshield
and without
ball bearings on
drive end

IM V9 (IM 9131)



Without endshield
and without
ball bearings on
drive end

IM B15 (IM 1201)



Without endshield
and without
ball bearings on
drive end

It is essential to state the desired mounting arrangement when ordering, as the constructive design depends partly on the mounting arrangement.

Bearings

BA Aluminium Motor Bearing Size

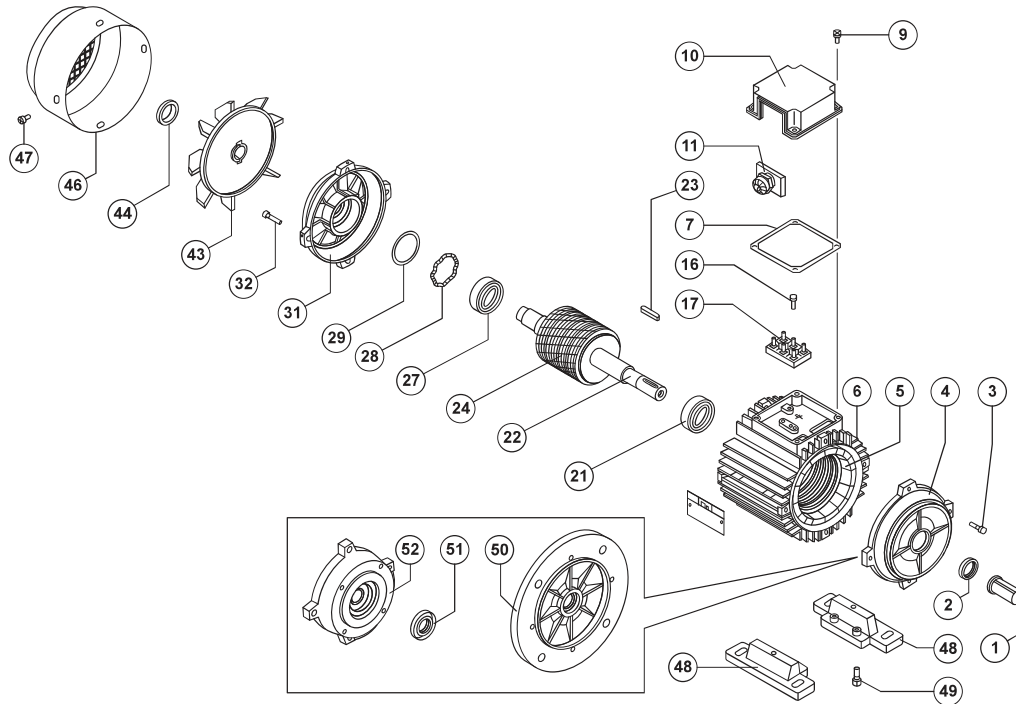
Frame	BA (Aluminium)	
	Drive end	Non-Drive end
56	6201ZZ	6201ZZ
63	6201ZZ	6201ZZ
71	6202ZZ	6202ZZ
80	6204ZZ	6204ZZ
90	6205ZZ	6204ZZ
100	6206ZZ	6206ZZ
112	6306ZZ	6306ZZ
132	6308ZZ	6308ZZ
160	6309ZZ	6309ZZ

Bearings

BR Cast Iron Motor Bearing Size

Frame Size	Poles	Drive end		Non-Drive end	
		Horizontal	Vertical	Horizontal	Vertical
80	2 to 8	6204ZZ	6204ZZ	6204ZZ	6204ZZ
90	2 to 8	6205ZZ	6205ZZ	6205ZZ	6205ZZ
100	2 to 8	6206ZZ	6206ZZ	6206ZZ	6206ZZ
112	2 to 8	6306ZZ	6306ZZ	6306ZZ	6306ZZ
132	2 to 8	6308ZZ	6308ZZ	6308ZZ	6308ZZ
160	2 to 8	6309ZZ	6309ZZ	6309ZZ	6309ZZ
180	2 to 8	6311	6311	6311	6311
200	2 to 8	6312	6312	6312	6312
225	2 to 8	6313	6313	6313	6313
250	2 to 8	6314	6314	6314	7314
280	2	6314	6314	6314	7314
	4 to 8	6317	6317	6317	7317
315	2	6317	6316	6316	7317
	4 to 8	6319	6319	NU 319	7319B
355	2	6319	6319	6319	7319B
	4 to 8	NU324	6324	NU 324	7324

Spare Parts



Part description

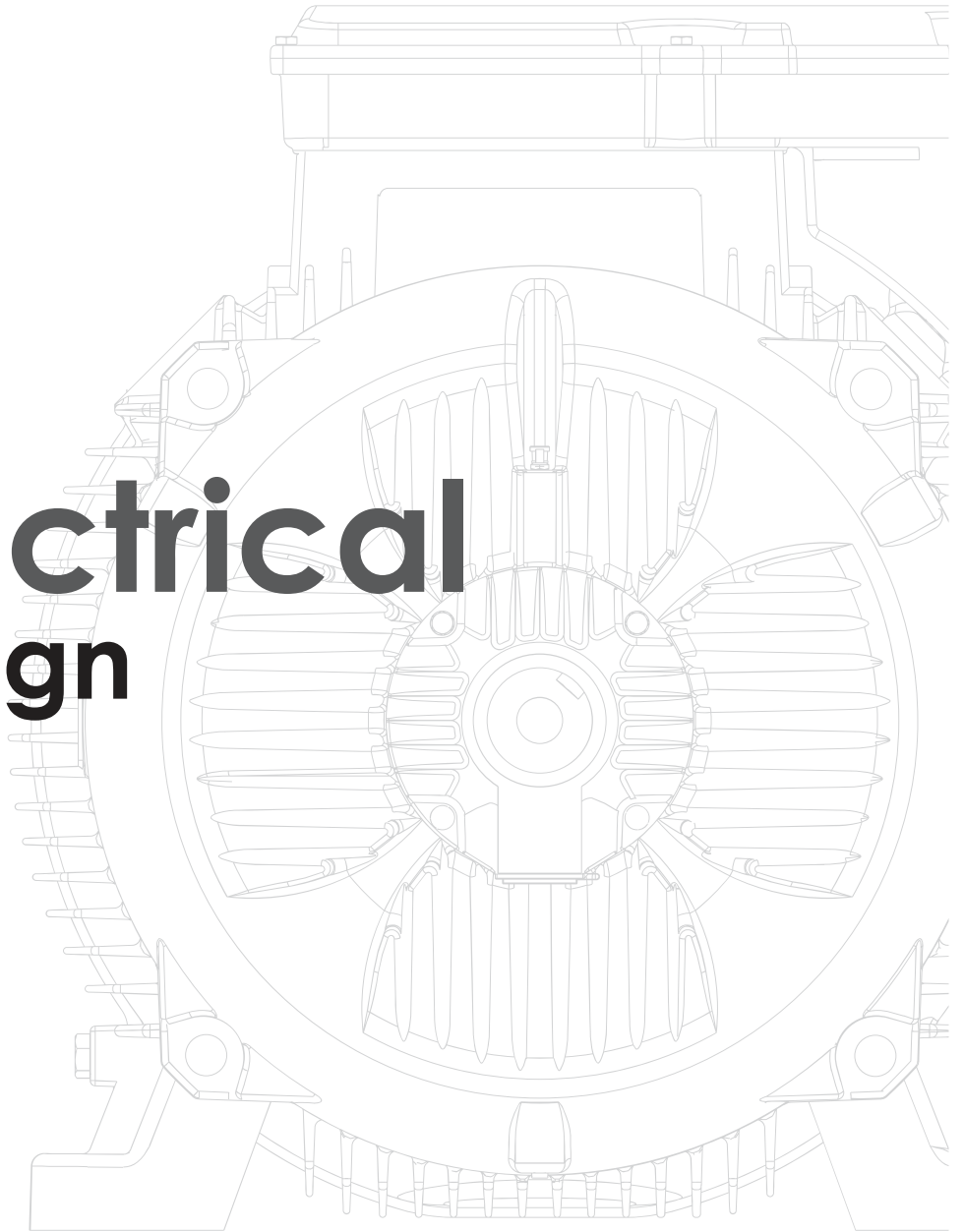
1 Shaft protection	24 Rotor assembly
2 Drive end dust seal	27 Non-drive end bearing
3 Drive end endshield fixing screw	28 Non-drive end pre-load washer
4 Drive end endshield	29 Non-drive end shim ring
5 Stator	31 Non-drive end endshield
6 Stator Frame	32 Non-drive end endshield fixing screw
7 Terminal box gasket	43 Fan
9 Terminal box fixing screw	44 Fan hose clamp
10 Terminal box	46 Fan cowl
11 Cable gland	47 Fan cowl fixing screw
16 Terminal board fixing screw	48 Feet
17 Terminal board	49 Feet fixing bolt
21 Drive end bearing	50 Flange B5
22 Motor shaft	51 Seal ring
23 Hub key	52 Flange B14

In enquires and orders for spare parts please state always:

Designation of spare part, motor type, mounting arrangement, motor serial number
(Product No. when available)

Enquire and orders cannot be handled without these data.

Electrical Design



Electrical Design

Rated voltage

For the rated voltage of the motors, EN 60034-1 allows a tolerance of $\pm 5\%$. According to IEC 60038, the mains voltages may have a tolerance of $\pm 10\%$.

Therefore the motors are designed for the following rated voltage ranged (exceptions are shown in the data tables):

Mains voltage to DIN IEC 38	Rated voltage range of motor
230 V $\pm 10\%$	218-242 V $\pm 5\%$
400 V $\pm 10\%$	380-420 V $\pm 5\%$
690 V $\pm 10\%$	655-725 V $\pm 5\%$

Within the rated motor voltage range, the permissible maximum temperature is not exceeded. When the motors are operated at the limits of the voltage tolerance, the permissible overtemperature of the stator winding may be exceeded by 10 K.

Rated frequency

50 Hz motors can also be operated on 60Hz mains, provided the mains voltage increases proportionally to the frequency. The relative values for starting and breakaway torque remain nearly unchanged and slightly increase for the starting current. The rated speed increases by the factor 1.2 and output by factor 1.15. Should a motor designed for 50 Hz be operated at 60Hz without the voltage being increased, the rated output of the motor cannot be increased. Under these operating conditions, rated speed increases by factor 1.2. The relative values for starting and breakaway torque are reduced by factor 0.82 and for starting current by factor 0.9.

Rated current

The rated currents listed in the data tables apply to an operating voltage of 400 V. The conversion to other operating voltages, with output and frequency remaining unchanged, is to be made as follows:

Norminal voltage (V)	230	380	400	440	500	660	690
Conversion factor x In	1.74	1.05	1.0	0.91	0.80	0.61	0.58

Rated torque

$$\text{Rated torque in Nm} = 9550 \times \frac{\text{Rated voltage in kW}}{\text{Rated Speed in min}^{-1}}$$

Output

The outputs stated in this catalogue are for constant load in continuous running duty S1 according to EN 60034-1, based on an ambient temperature of 40° C and installation at altitudes up to 1000m above sea level.

For severe operating conditions, e.g. high switching rate , long run-up time or electric braking , a thermal reserve is necessary, which could call for higher thermal class or the use of a motor with a higher rating. In these cases we recommend to enquire with detailed information on the operating conditions.

Overload

At operating temperature three-phase motors are capable of withstanding an overload for 15 seconds at 1.5 times the rated torque at rated voltage. This overload is according to EN 60034-1 and will not result in excessive heating.

Utilizing thermal class F, motors can be operated continuously with an overload of 12 %. Nevertheless this is not valid for motors which to catalogue are utilized to thermal class F.

Connection diagrams

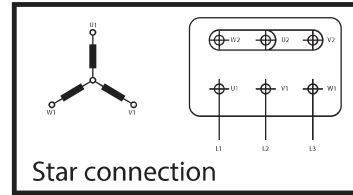
Windings of standard three-phase motors can be connected either in star or delta connection.

Star connection

A star connection is obtained by connecting W2, U2, V2 terminals to each other and U1, V1, W1 terminals to the mains. The phase current and voltage are:

$$I_{ph} = I_n ; U_{ph} = U_n / \sqrt{3}$$

where I_n is the line current and V_n the line voltage referred to the star connection.



Star connection

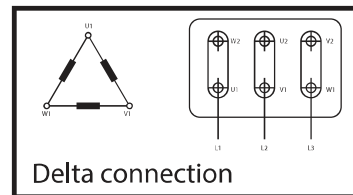
Delta connection

A delta connection is obtained by connecting the end of a phase to the beginning of the next phase.

The phase current I_{ph} and the phase voltage U_{ph} are:

$$I_{ph} = I_n / \sqrt{3} ; U_{ph} = U_n$$

where I_n and U_n are referred to the delta connection.



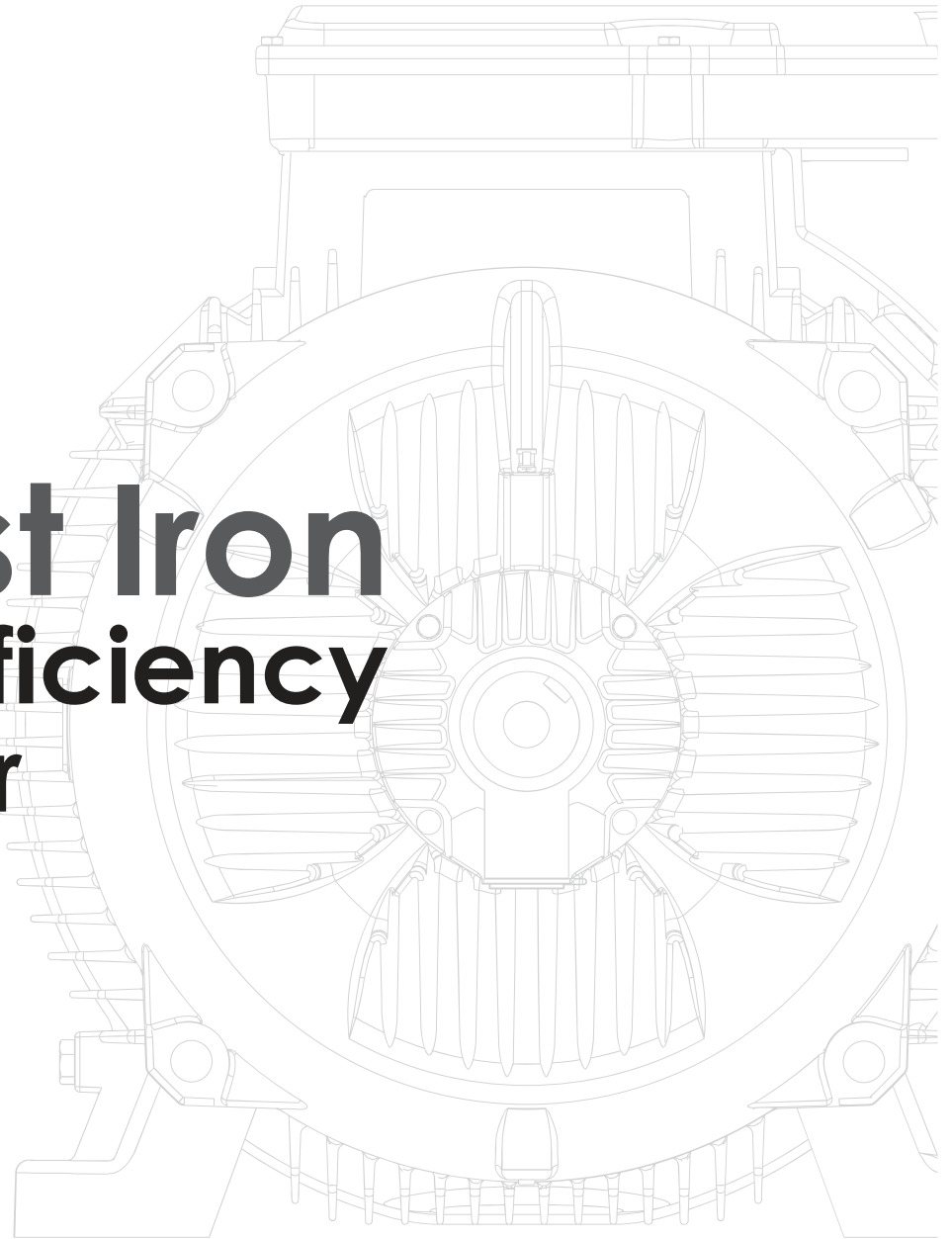
Delta connection

Star-delta starting

Star-delta starting allows a peak current reduction, ensuring however that the peak torque obtained is bigger than the resistant torque. Actually, it should be noted that the torque of an induction squirrel-cage motor is directly proportional to the square of the voltage. Motors whose rated voltage with delta connection corresponds to the mains voltage, can be started with the star-delta method.

All motors can be supplied with windings designed for star-delta starting (for example: 400V Δ / 690V ∇).

Cast Iron IE1 Efficiency Motor



CAST IRON IE1 Efficiency Motor

BR1 Series
Three-Phase Squirrel Cage Motors
380-415 V
Protection IP55

SPEED 3000 RPM 2-POLE 50HZ

Type	Rated Output		Rated Speed rpm	Efficiency			Power factor			Rated current A			Rated Torque Nm	Ts/Tn	Tmax/Tn	Is/In	Weight kg
	Kw	HP		100%FL	75%FL	50%FL	100%FL	75%FL	50%FL	380V	400V	415V					
				cos Φ													
BR1-80M1-2	0.75	1	2840	75.1	74.4	71.9	0.85	0.81	0.68	1.8	1.7	1.67	2.5	2.3	2.6	5.5	13
BR1-80M2-2	1.1	1.5	2840	78.6	78.3	75.6	0.84	0.81	0.68	2.6	2.5	2.4	3.7	2.3	2.6	5.6	15
BR1-90S-2	1.5	2	2850	79.8	79.1	77.0	0.86	0.82	0.71	3.4	3.2	3.1	5	2.5	2.9	6.1	20
BR1-90L-2	2.2	3	2850	82.2	81.8	80.4	0.86	0.82	0.72	4.8	4.6	4.4	7.4	2.7	2.9	6.1	23
BR1-100L-2	3	4	2880	83.3	82.7	81.4	0.89	0.85	0.75	6.3	6	5.8	10	2.7	2.9	6.5	30
BR1-112M-2	4	5.5	2880	84.9	85.5	84.7	0.92	0.88	0.82	8.3	7.9	7.6	13.3	2.6	2.9	6.5	40
BR1-132S1-2	5.5	7.5	2900	87.5	86.0	84.0	0.91	0.88	0.81	11.0	10.5	10.2	18.1	2.3	2.6	6.9	54
BR1-132S2-2	7.5	10	2900	87.8	87.2	85.0	0.90	0.86	0.81	14.9	14.2	13.5	24.5	2.5	2.8	0.9	60
BR1-160M1-2	11	15	2930	90.3	88.8	87.7	0.90	0.86	0.82	21.3	20.1	19.4	35.8	2.6	2.9	6.7	99
BR1-160M2-2	15	20	2930	91.0	91.0	90.1	0.90	0.87	0.84	28.8	27.2	26.2	48.8	2.6	2.9	6.7	110
BR1-160L-2	18.5	25	2930	91.7	90.8	89.9	0.90	0.87	0.82	34.7	32.9	31.8	60.4	2.5	2.8	6.8	127
BR1-180M-2	22	30	2940	90.6	90.1	88.1	0.90	0.87	0.82	41	38.9	37.6	71.4	2.6	2.8	6.6	167
BR1-200L1-2	30	40	2950	92.0	91.6	88.5	0.89	0.88	0.83	55.4	52.6	50.7	97.2	2.5	2.7	6.5	220
BR1-200L2-2	37	50	2950	92.3	91.9	89.7	0.91	0.88	0.84	67.9	64.5	62.2	119.8	2.4	2.6	6.5	242
BR1-225M-2	45	60	2970	93.0	92.4	89.9	0.90	0.89	0.85	82.1	78	75.3	145	2.4	2.6	6.8	281
BR1-250M-2	55	75	2970	93.2	92.9	90.1	0.89	0.89	0.82	99.6	94.6	91.3	177	2.5	2.8	6.8	373
BR1-280S-2	75	100	2970	94.0	93.0	91.0	0.91	0.88	0.83	134.8	128.1	123.5	241	2.4	2.7	6.7	477
BR1-280M-2	90	125	2970	94.2	93.8	92.5	0.91	0.89	0.86	159.5	151.5	146.1	290	2.4	2.7	6.7	516
BR1-315S-2	110	150	2980	94.5	93.8	92.4	0.92	0.89	0.84	194.6	184.9	178.2	353	2	2.5	6.6	792
BR1-315M-2	132	180	2980	94.9	94.7	93.3	0.92	0.90	0.87	233	221.4	213.4	423	2.1	2.5	6.6	828
BR1-315L1-2	160	215	2980	95.6	95.1	93.9	0.92	0.91	0.88	282.1	270	258.4	513	1.9	2.4	6.7	932
BR1-315L2-2	200	270	2980	95.4	94.9	94.0	0.92	0.91	0.89	347.7	330.1	318.4	641	1.9	2.4	6.7	1044
BR1-355M1-2	220	300	2980	95.3	94.6	92.7	0.93	0.92	0.89	379	361	349	705	1.48	2.34	5.42	1490
BR1-355M2-2	250	340	2980	95.8	95.2	94.1	0.93	0.93	0.90	429	408	393	802	1.65	2.44	5.74	1638
BR1-355L1-2	280	380	2980	94.0	94.2	93.6	0.90	0.86	0.82	478	457	437	897	2.01	2.76	6.69	1798
BR1-355L2-2	315	430	2980	94.0	94.2	93.7	0.91	0.87	0.82	537	510	491	1010	1.61	2.29	5.46	1834

CAST IRON IE1 Efficiency Motor

BR1 Series
Three-Phase Squirrel Cage Motors
380-415 V
Protection IP55

SPEED 1500 RPM 4-POLE 50HZ

Type	Rated Output		Rated Speed rpm	Efficiency			Power factor			Rated current A			Rated Torque Nm	Ts/Tn	Tmax/Tn	Is/In	Weight kg
	Kw	HP		100%FL	75%FL	50%FL	100%FL	75%FL	50%FL	380V	400V	415V					
BR1-80M1-4	0.55	0.75	1390	72.7	72.2	70.2	0.75	0.67	0.55	1.6	1.5	1.4	3.8	2.2	2.4	5.5	13
BR1-80M2-4	0.75	1	1390	72.6	72.3	70.5	0.76	0.66	0.55	2.1	2.0	1.9	5.2	2.2	2.4	5.6	15
BR1-90S-4	1.1	1.5	1400	76.5	76.1	74.9	0.80	0.69	0.55	2.9	2.8	2.7	7.5	2.2	2.5	5.4	20
BR1-90L-4	1.5	2	1400	79.2	78.8	77.1	0.79	0.71	0.59	3.8	3.6	3.5	10.2	2.4	2.6	5.2	24
BR1-100L1-4	2.2	3	1420	81.1	80.8	79.7	0.83	0.73	0.6	5.1	4.8	4.7	14.8	2.3	2.6	6.0	29
BR1-100L2-4	3	4	1420	83.0	82.6	81.2	0.82	0.76	0.64	6.8	6.5	6.2	20.2	2.3	2.7	6.1	32
BR1-112M-4	4	5.5	1440	84.4	83.9	81.8	0.84	0.77	0.68	8.8	8.4	8.1	26.5	2.3	2.8	6.5	42
BR1-132S-4	5.5	7.5	1440	86.6	86.1	84.8	0.83	0.77	0.68	11.8	11.1	10.7	36.5	2.3	2.9	6.8	57
BR1-132M-4	7.5	10	1440	88.4	87.3	85.3	0.86	0.81	0.72	15.6	14.8	14.3	49.8	2.4	3.0	6.5	69
BR1-160M-4	11	15	1460	89.1	88.1	87.1	0.84	0.82	0.76	22.3	21.4	20.6	72	2.3	2.9	6.9	107
BR1-160L-4	15	20	1460	90.3	89.3	88.0	0.85	0.82	0.75	30.1	28.8	27.7	98.2	2.3	2.9	6.8	129
BR1-180M-4	18.5	25	1470	90.3	89.7	88.2	0.88	0.84	0.74	36.1	34.4	33.1	120.2	2.3	2.9	6.4	162
BR1-180L-4	22	30	1470	91.3	90.8	88.6	0.88	0.85	0.76	42.7	40.8	39.3	143	2.3	2.9	6.9	172
BR1-200L-4	30	40	1470	92.3	91.5	88.8	0.89	0.86	0.81	57.5	54.6	52.7	195	2.4	2.9	6.8	224
BR1-225S-4	37	50	1480	92.8	91.8	90.0	0.89	0.87	0.78	69.7	66.2	63.8	238.9	2.2	2.7	6.5	277
BR1-225M-4	45	60	1480	92.8	92.1	90.0	0.89	0.86	0.8	84.5	80.3	77.4	290.5	2.3	2.5	6.3	302
BR1-250M-4	55	75	1480	93.0	92.3	90.1	0.88	0.85	0.79	103	97.9	94.3	355.1	2.2	2.5	6.4	383
BR1-280S-4	75	100	1480	93.9	93.2	91.5	0.90	0.89	0.85	138.1	131.2	126.5	483.9	2.1	2.8	6.8	527
BR1-280M-4	90	125	1480	94.3	93.9	91.7	0.89	0.88	0.82	165	156.8	151.1	580.7	2.2	2.7	6.9	548
BR1-315S-4	110	150	1480	95.3	94.8	92.8	0.89	0.89	0.87	200.5	190.5	183.6	709.8	1.9	2.7	6.5	850
BR1-315M-4	132	180	1480	95.6	94.9	93.6	0.88	0.88	0.83	240	228.0	219.8	851.8	2.3	3.2	6.8	918
BR1-315L1-4	160	215	1480	95.6	95.0	93.9	0.89	0.86	0.81	287	272.7	262.8	1032	2.6	3.0	6.6	1018
BR1-315L2-4	200	270	1480	95.8	95.0	94.0	0.89	0.87	0.78	358	340.1	327.8	1290	2.2	2.8	6.4	1122
BR1-355M1-4	220	300	1490	95.5	94.7	93.2	0.90	0.89	0.87	388	372	356	1410	1.94	2.41	6.18	1592
BR1-355M2-4	250	340	1490	95.6	95.5	94.3	0.92	0.89	0.87	440	420	403	1603	1.93	2.33	6.05	1650
BR1-355L1-4	280	380	1490	94.0	94.1	93.5	0.90	0.85	0.82	492	471	450	1795	2.01	2.35	6.17	1758
BR1-355L2-4	315	430	1490	94.0	94.2	93.6	0.90	0.86	0.82	554	521	506	2020	2.17	2.42	6.44	1804

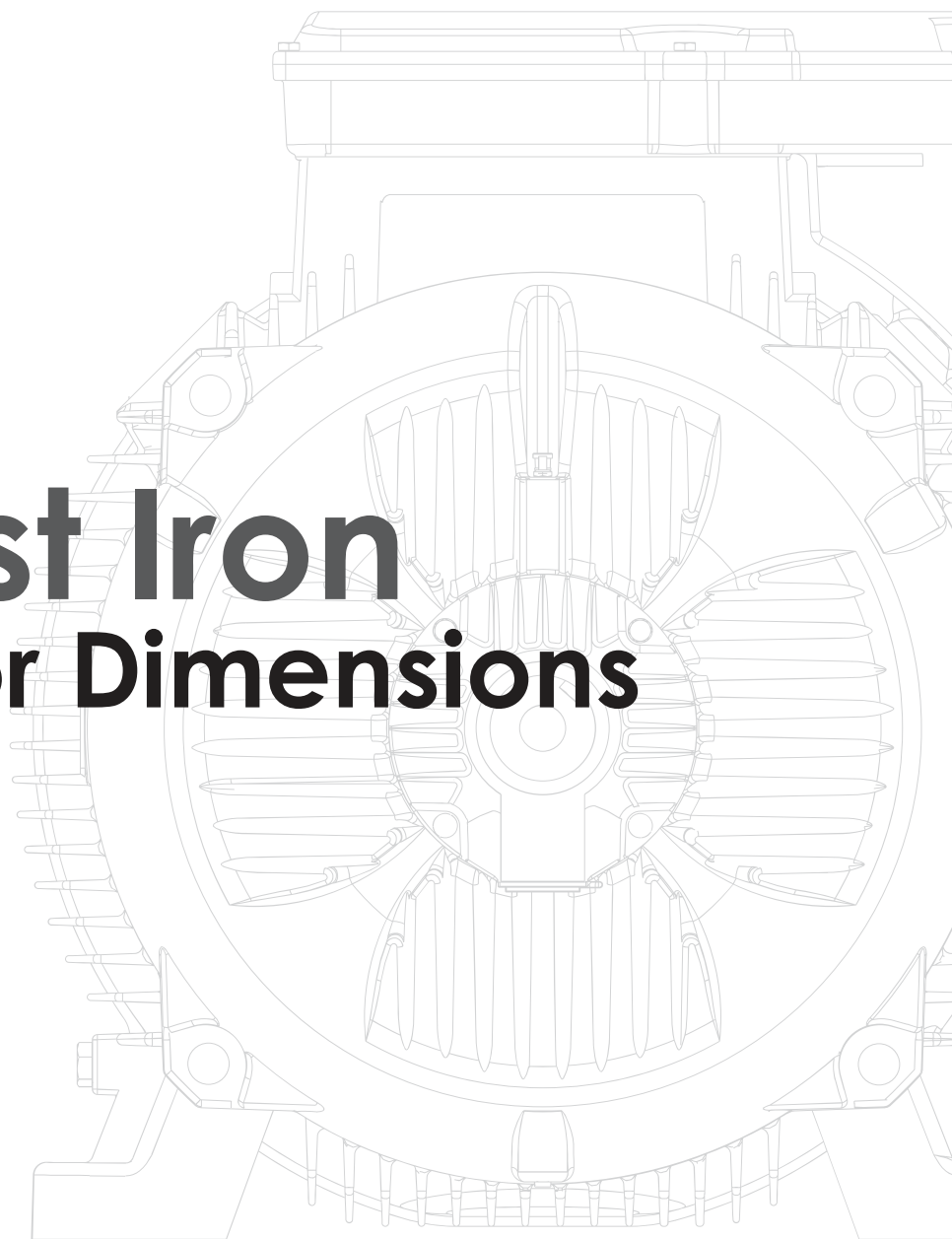
CAST IRON IE1 Efficiency Motor

BR1 Series
Three-Phase Squirrel Cage Motors
380-415 V
Protection IP55

SPEED 1000RPM 6-POLE 50HZ

Type	Rated Output		Rated Speed rpm	Efficiency			Power factor			Rated current A			Rated Torque Nm	Ts/Tn	Tmax/Tn	Is/In	Weight kg
	Kw	HP		100%FL	75%FL	50%FL	100%FL	75%FL	50%FL	380V	400V	415V					
				cos Φ													
BR1-80M1-6	0.37	0.55	890	63.5	63.4	56.2	0.70	0.63	0.50	1.34	1.27	1.22	3.5	2.0	2.1	4.0	16.5
BR1-90S-6	0.75	1	910	69.3	69.0	67.3	0.72	0.62	0.53	2.3	2.2	2.1	7.9	2.3	2.7	4.1	21
BR1-90L-6	1.1	1.5	910	71.8	71.4	68.3	0.71	0.64	0.55	3.2	3.0	2.9	11.5	2.3	2.7	4.6	23
BR1-100L-6	1.5	2	920	73.1	72.7	70.6	0.73	0.66	0.52	4.1	3.9	3.8	15.6	2.4	2.8	5	29
BR1-112M-6	2.2	3	940	76.2	75.3	72.8	0.74	0.66	0.55	5.6	5.3	5.1	22.4	2.1	2.5	5.2	37
BR1-132S-6	3	4	960	78.2	77.7	75.6	0.77	0.74	0.60	7.4	7.0	6.8	29.9	1.9	2.5	5.6	52
BR1-132M1-6	4	5.5	960	81.7	81.2	78.2	0.77	0.68	0.55	9.8	9.2	8.9	39.8	2.1	2.7	6.2	59
BR1-132M2-6	5.5	7.5	960	83.6	83.2	80.8	0.78	0.69	0.58	12.9	12.2	11.7	54.7	2.3	2.8	6.5	72
BR1-160M-6	7.5	10	970	85.0	84.2	81.9	0.78	0.69	0.56	17.2	16.2	15.7	73.9	2	2.6	5.6	98
BR1-160L-6	11	15	970	87.8	87.3	84.8	0.78	0.75	0.69	24.2	23.3	22.4	108	2.1	2.4	5.8	121
BR1-180L-6	15	20	970	88.7	88.2	86.3	0.79	0.77	0.68	31.6	30.0	28.9	148	2	2.4	5.7	164
BR1-200L1-6	18.5	25	970	88.9	88.3	86.2	0.83	0.79	0.65	38.5	36.6	35.3	182	2.2	2.8	6.7	208
BR1-200L2-6	22	30	970	90.3	90.1	87.5	0.83	0.80	0.71	44.7	42.5	40.9	217	2.3	2.9	6.6	217
BR1-225M-6	30	40	980	90.2	89.8	87.6	0.86	0.83	0.74	59.3	56.3	54.3	293	2.2	2.7	6.8	287
BR1-250M-6	37	50	980	91.9	91.4	88.5	0.84	0.82	0.76	70.1	66.6	64.2	361	2	2.5	6.2	355
BR1-280S-6	45	60	980	92.1	91.8	89.2	0.88	0.83	0.77	86	81.7	78.7	438	1.9	2.5	6.1	456
BR1-280M-6	55	75	985	92.5	92.2	89.4	0.87	0.84	0.77	105	99.8	96.1	536	2.1	2.7	6.7	502
BR1-315S-6	75	100	990	93.0	92.2	90.1	0.88	0.88	0.83	142	134.9	130.0	724	2	2.7	6.5	786
BR1-315M-6	90	125	990	94.4	94.3	92.4	0.86	0.84	0.80	170	161.5	155.7	869	2	2.6	6.2	884
BR1-315L1-6	110	150	990	94.9	94.5	92.6	0.86	0.84	0.77	206	195.7	188.6	1062	1.9	2.7	6	964
BR1-315L2-6	132	180	990	94.9	94.6	92.7	0.86	0.85	0.82	244	231.8	223.4	1274	2	2.7	5.8	1060
BR1-355M1-6	160	215	990	95.0	94.7	92.6	0.87	0.87	0.81	291	275	267	1544	2.28	2.95	7.13	1554
BR1-355M2-6	200	270	990	95.2	94.8	92.9	0.88	0.88	0.84	361	342	330	1930	2.3	2.89	7.09	1768
BR1-355L1-6	220	300	990	96.1	95.6	93.5	0.89	0.86	0.82	395	376	365	2122	1.84	2.73	5.9	1796
BR1-355L2-6	250	340	990	96.3	95.8	93.6	0.90	0.87	0.83	448	425	409	2413	2.16	2.64	6.59	1902

Cast Iron Motor Dimensions



A detailed line drawing of an industrial aluminium motor, showing the stator, rotor, and cooling fan assembly. The drawing is centered on the page and serves as a background for the text.

Aluminium IE1 Efficiency Motor

SPEED 3000 RPM 2-POLE 50HZ

Model	Power kW	Current(A)			Current(A)			Current(A)			Speed r.p.m	eff %	Power factor Cos Φ	Tst/Tn (Times)	Tmax/Tn (Times)	Tmin/Tn (Times)	Ist/In (Times)	Noise dB(A)	WT (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
BA1-63-2	0.18	1.00	0.58	0.33	0.95	0.55	0.32	0.92	0.53	0.31	2710	63	0.75	2.2	2.4	1.6	6	61	4.00
BA1-711-2	0.37	1.76	1.02	0.59	1.67	0.97	0.56	1.61	0.93	0.54	2730	70	0.79	2.2	2.4	1.6	6	64	5.20
BA1-712-2	0.55	2.57	1.49	0.86	2.45	1.42	0.82	2.36	1.36	0.79	2760	71	0.79	2.2	2.4	1.6	6	64	6.00
BA1-801-2	0.75	3.21	1.83	1.07	3.06	1.77	1.02	2.94	1.70	0.98	2770	73	0.84	2.2	2.4	1.5	6	67	8.70
BA1-802-2	1.1	4.56	2.64	1.52	4.35	2.51	1.45	4.18	2.42	1.39	2770	76.2	0.83	2.2	2.4	1.5	6	67	10.00
BA1-90S-2	1.5	5.97	3.46	1.99	5.76	3.28	1.90	5.47	3.16	1.82	2840	78.5	0.84	2.2	2.4	1.5	6	72	12.00
BA1-90L1-2	2.2	8.39	4.85	2.80	8.0	4.61	2.66	7.69	4.45	2.56	2840	81	0.85	2.2	2.4	1.4	6	72	14.50
BA1-100L1-2	3	11.0	6.34	3.65	10.4	6.03	3.48	10.0	5.81	3.35	2840	82.6	0.87	2.2	2.3	1.4	7	76	20.00
BA1-112M-2	4	14.3	8.30	4.78	13.7	7.88	4.55	13.1	7.60	4.38	2880	84.2	0.87	2.2	2.3	1.4	7.5	77	26.00
BA1-132S1-2	5.5	19.1	11.1	6.38	18.2	10.5	6.08	17.5	10.1	5.85	2900	85.7	0.88	2	2.2	1.2	7.5	80	38.40
BA1-132S2-2	7.5	25.7	14.9	8.57	24.5	14.1	8.16	23.6	13.6	7.86	2920	87	0.88	2	2.2	1.2	7.5	80	41.30
BA1-160M1-2	11	36.3	21.0	12.1	34.6	20.0	11.5	33.3	19.2	11.1	2940	88.4	0.9	2	2.2	1.2	7.5	86	76.00
BA1-160M2-2	15	48.4	28.0	16.1	46.1	26.6	15.4	44.4	25.7	14.8	2940	89.4	0.91	2	2.2	1.2	7.5	86	77.50

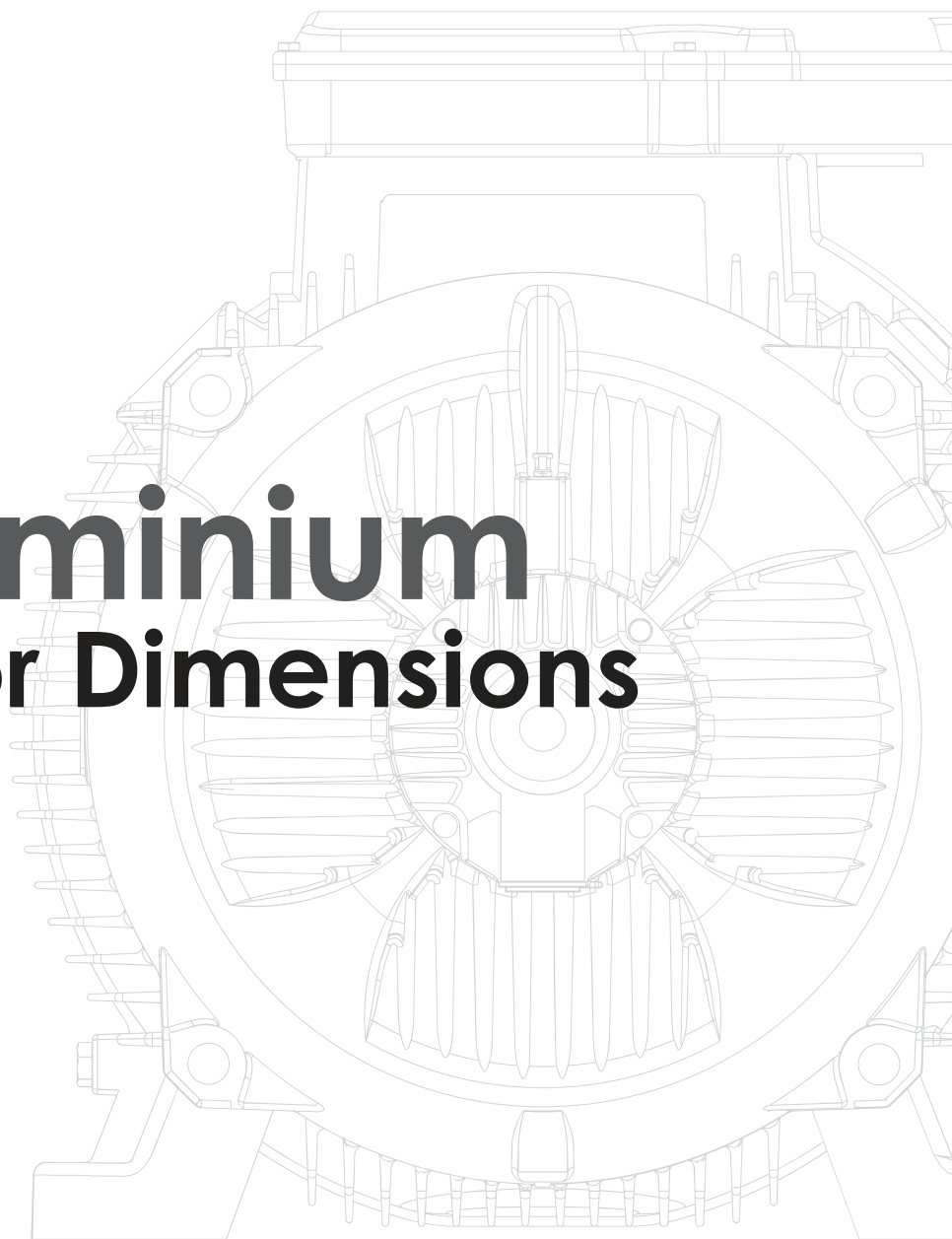
SPEED 1500 RPM 4-POLE 50HZ

Model	Power kW	Current(A)			Current(A)			Current(A)			Speed r.p.m	eff %	Power factor Cos Φ	Tst/Tn (Times)	Tmax/Tn (Times)	Tmin/Tn (Times)	Ist/In (Times)	Noise dB(A)	WT (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
BA1-63-4	0.18	1.28	0.74	0.43	1.21	0.70	0.40	1.17	1.67	0.39	1310	57	0.65	2.2	2.4	2	4	52	4.20
BA1-71-4	0.37	2.02	1.17	0.67	1.92	1.11	0.64	1.85	1.07	0.62	1370	65	0.74	2.2	2.4	1.7	6	55	5.80
BA1-801-4	0.55	2.67	1.66	0.96	2.74	1.58	0.91	2.63	1.52	0.88	1370	67	0.75	2.3	2.4	1.7	6	58	8.10
BA1-802-4	0.75	3.50	2.03	1.17	3.34	1.93	1.11	3.21	1.86	1.07	1380	72	0.78	2.3	2.4	1.6	6	58	9.10
BA1-90S-4	1.1	4.80	2.78	1.60	4.57	2.64	1.52	4.40	2.54	1.47	1400	76.2	0.79	2.2	2.4	1.6	6	61	11.70
BA1-90L1-4	1.5	6.27	3.63	2.09	5.97	3.45	1.99	5.75	3.32	1.92	1400	78.5	0.8	2.2	2.4	1.6	6	61	14.40
BA1-100L1-4	2.2	8.80	5.09	2.93	8.38	4.84	2.79	8.07	4.66	2.69	1420	81	0.81	2.2	2.3	1.5	7	64	19.20
BA1-100L2-4	3	11.8	6.81	3.92	11.2	6.47	3.74	10.8	6.24	3.60	1420	82.6	0.81	2.2	2.3	1.5	7	64	22.50
BA1-112M-4	4	15.0	8.70	5.01	14.3	8.26	4.77	13.8	7.96	4.59	1430	84.2	0.83	2.2	2.2	1.5	7	65	29.00
BA1-132S-4	5.5	20.1	11.6	6.68	19.1	11.0	6.37	18.4	10.6	6.13	1450	85.7	0.84	2.2	2.2	1.4	7	71	39.00
BA1-132M-4	7.5	26.6	15.4	8.87	25.4	14.6	8.45	24.4	14.1	8.13	1450	87	0.85	2.2	2.2	1.4	7	71	48.60
BA1-160M-4	11	37.5	21.7	12.5	35.8	20.6	11.9	34.4	19.9	11.5	1460	88.4	0.87	2.2	2.2	1.4	7	75	73.00
BA1-160L1-4	15	51.2	29.6	17.1	48.8	28.2	16.3	46.9	27.1	15.6	1460	88.4	0.87	2.2	2.2	1.4	7.5	75	88.50

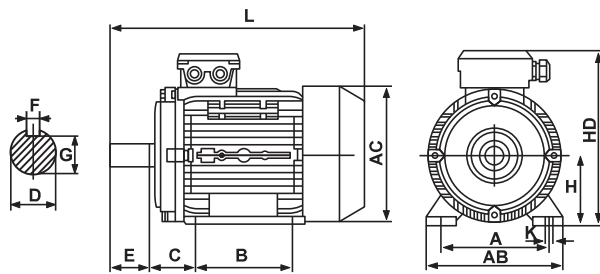
SPEED 1000 RPM 6-POLE 50HZ

Model	Power kW	Current(A)			Current(A)			Current(A)			Speed r.p.m	eff %	factor Cos Φ	Tst/Tn (Times)	Tmax/Tn (Times)	Tmin/Tn (Times)	Ist/In (Times)	Noise dB(A)	WT (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
BA1-71-6	0.18	1.28	0.74	0.43	1.22	0.70	0.41	1.17	0.68	0.39	860	56	0.66	1.6	1.7	1.5	4	52	5.60
BA1-801-6	0.37	2.24	1.30	0.75	2.13	1.23	0.71	2.05	1.19	0.68	900	62	0.7	1.9	1.9	1.5	4	56	8.10
BA1-802-6	0.55	2.99	1.73	1.00	2.85	1.65	0.95	2.74	1.59	0.91	900	67	0.72	2	2.3	1.5	4	56	9.60
BA1-90S-6	0.75	3.96	2.29	1.32	3.77	2.18	1.26	3.63	2.10	1.21	920	69	0.72	2.2	2.2	1.5	5.5	59	11.30
BA1-90L-6	1.1	5.49	3.18	1.83	5.23	3.02	1.74	5.03	2.91	1.68	925	72	0.73	2.2	2.2	1.3	5.5	59	14.40
BA1-100L1-6	1.5	7.00	4.05	2.33	6.67	3.85	2.22	6.42	3.71	2.14	945	74	0.76	2.2	2.2	1.3	6	61	18.80
BA1-112M-6	2.2	9.70	5.64	3.25	9.28	5.36	3.09	8.93	5.16	2.98	955	78	0.76	2.2	2.2	1.3	6	64	25.00
BA1-132S-6	3	13.1	7.59	4.37	12.5	7.21	4.16	12.0	6.95	4.01	960	79	0.76	2	2	1.3	6.5	64	35.00
BA1-132M1-6	4	17.2	9.93	5.72	16.4	9.44	5.45	15.7	9.10	5.24	960	80.5	0.76	2	2	1.3	6.5	68	47.60
BA1-132M2-6	5.5	22.6	13.1	7.53	21.5	12.4	7.17	20.7	12.0	6.9	960	83	0.77	2	2	1.3	6.5	68	50.70
BA1-160M-6	7.5	28.6	16.6	9.5	27.3	15.7	9.08	26.2	15.2	8.7	960	86	0.8	2	2.2	1.3	6.5	68	70.0
BA1-160L-6	11	41.8	24.2	13.9	39.8	23.0	13.3	38.3	22.1	12.8	960	87.5	0.79	2	2.2	1.2	6.5	73	87.0

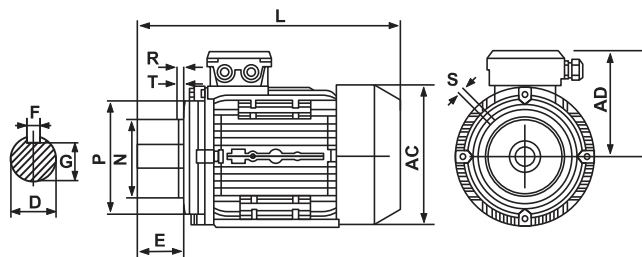
Aluminium Motor Dimensions



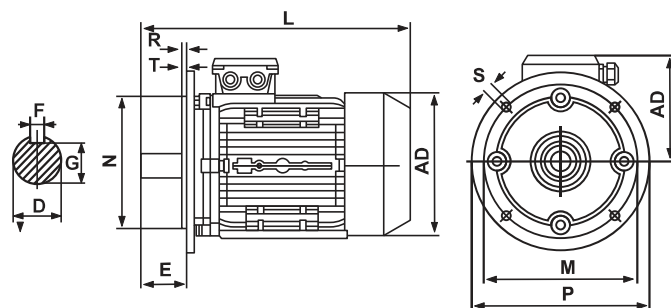
Frame Size	Installation Size (mm) IMB3									Installation Size (mm) IMB14					Installation Size (mm) IMB5					Outline Dimension (mm)				
	A	B	C	D	E	F	G	H	K	M	N	P	S	T	M	N	P	S	T	AB	AC	AD	HD	L
56	90	71	36	9	20	3	7.2	56	6	65	50	80	M5	2.5	98	80	120	7	3	110	120	110	155	195
63	100	80	40	11	23	4	8.5	63	7	75	60	90	M5	2.5	115	95	140	10	3	130	130	115	165	230
71	112	90	45	14	30	5	11	71	7	85	70	105	M6	2.5	130	110	160	10	3.5	145	145	125	185	255
80	125	100	50	19	40	6	15.5	80	10	100	80	120	M6	3	165	130	200	12	3.5	160	165	135	215	295
90S	140	100	56	24	50	8	20	90	10	115	95	140	M8	3	165	130	200	12	3.5	180	185	145	235	335
90L	140	125	56	24	50	8	20	90	10	115	95	140	M8	3	165	130	200	12	3.5	180	185	145	235	360
100L	160	140	63	28	60	8	24	100	12	130	110	160	M8	3.5	215	180	250	15	4	205	215	170	255	380
112M	190	140	70	28	60	8	24	112	12	130	110	160	M8	3.5	215	180	250	15	4	245	240	180	285	400
132S	216	140	89	38	80	10	33	132	12	165	130	200	M10	4.0	265	230	300	15	4	280	275	195	325	475
132M	216	178	89	38	80	10	33	132	12	165	130	200	M10	4.0	265	230	300	15	4	280	275	195	325	515
160M	254	210	108	42	110	12	37	160	15	215	180	250	M12	4.0	300	250	350	15	5	320	330	255	420	615
160L	254	254	108	42	110	12	37	160	15	215	180	250	M12	4.0	300	250	350	15	5	320	330	255	420	670
180M	279	241	121	48	110	14	42.5	180	15	265	230	300	M15	4.0	300	250	350	19	5	355	380	280	455	700
180L	279	279	121	48	110	14	42.5	180	15	265	230	300	M15	4.0	300	250	350	19	5	355	380	280	455	740



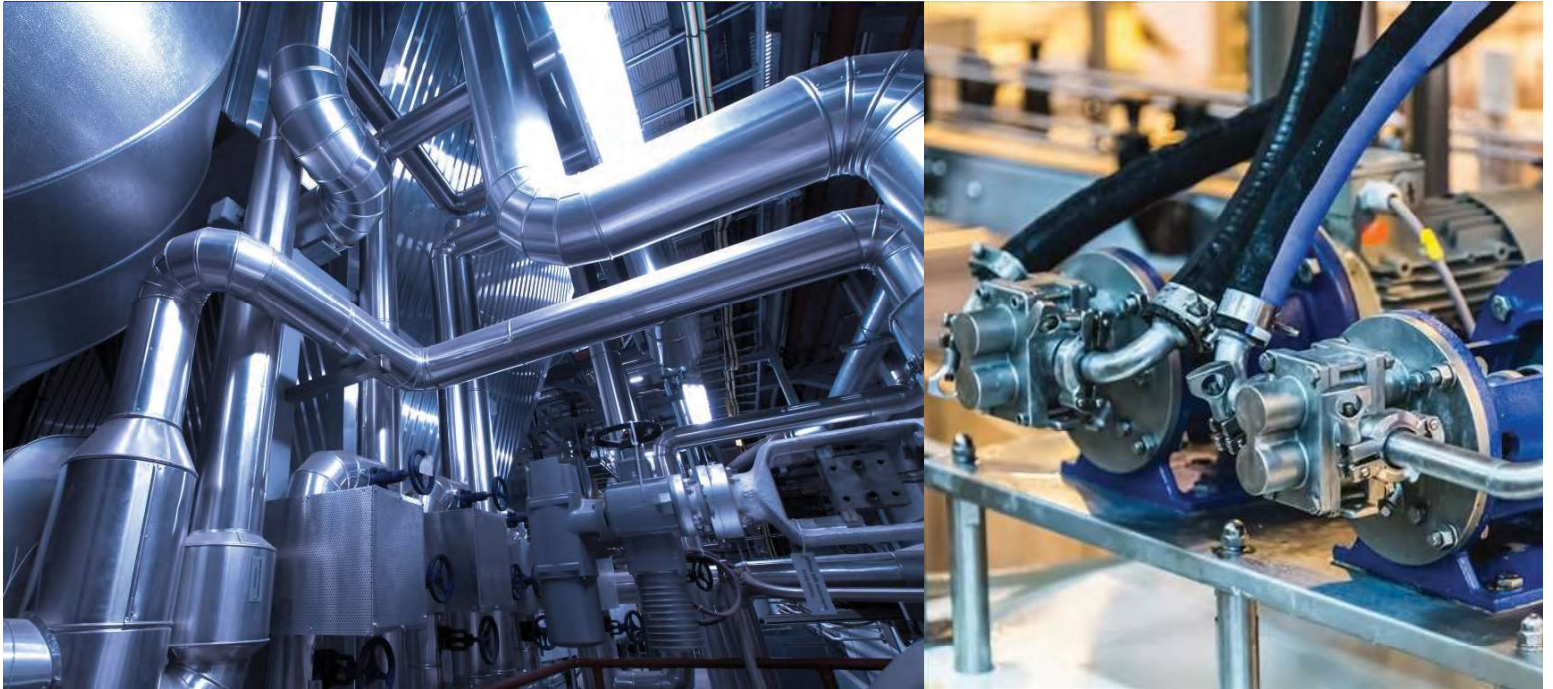
IM B3 # 56-180



IM B14 # 56-180



IM B5 # 56-180



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