



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEX Scheme visit www.iecex.com

Certificate No.: **IECEX IMQ 21.0006X** Page 1 of 4 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2021-06-08

Applicant: **Bonani S.p.A**
Via Manara 21/A
I – 43126 Parma (PR)
Italy

Equipment: **Electrical motors, series L, M, N, X, Y, W**

Optional accessory:

Type of Protection: **Ex db eb; Ex eb; Ex tb; Ex db ec; Ex ec; Ex tc**

Marking: **Series L**
Ex eb IIB/IIC T3 Gb; or
Ex eb IIB/IIC T4 Gb; or (only for motor size 63R2)
Ex db eb IIB/IIC T3 Gb; (when provided with capacitor box)
Series M
Ex eb IIB/IIC T3 Gb; or
Ex eb IIB/IIC T4 Gb; or (only for motor size 63R2)
Ex db eb IIB/IIC T3 Gb; (when provided with capacitor box)
Ex tb IIIC T125°C Db
Series N
Ex tb IIIC T125°C Db
Series X
Ex ec IIB/IIC T3 Gc; or
Ex ec IIB/IIC T4 Gc; or (only for motor size 63R2)
Ex db ec IIB/IIC T3 Gc; (when provided with capacitor box)
Series Y
Ex ec IIB/IIC T3 Gc; or
Ex ec IIB/IIC T4 Gc; or (only for motor size 63R2)
Ex db ec IIB/IIC T3 Gc; (when provided with capacitor box)
Ex tc IIIB T125°C Dc
Series W
Ex tc IIIB T125°C Dc

Approved for issue on behalf of the IECEX
Certification Body:

Mr. Mauro CASARI

Position:

IMQ ExCB Manager

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
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Certificate issued by:

Istituto Italiano del Marchio di Qualità S.p.A
Via Quintiliano 43
20138 Milano
Italy





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Date of issue: 2021-06-08

Issue No: 0

Manufacturer: **Bonani S.p.A**
Via Manara 21/A
I – 43126 Parma (PR)
Italy

Additional
manufacturing
locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[IT/IMQ/ExTR21.0006/00](#)

Quality Assessment Report:

[IT/CES/QAR20.0006/00](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The three-phase and single-phase asynchronous squirrel cage motors (Series L, M, N, X, Y and W) are a range of motor size 56 up to 160 according to IEC 60034 code. They are made of aluminum and have separate parts: motor enclosure, terminal box (optional) and capacitor enclosure (optional).

The motor enclosure and the terminal box have types of protection "Increased safety" and/or "Dust tight";

The capacitor enclosure has types of protection "Ex db" and "Ex tb";

The motors can be equipped with auxiliary devices (starting capacitors, running capacitor, PTC, terminals).

PTC (130°C) are used only for two-speed motors and for "Ex tb" and "Ex tc" motors (when supplied by inverter). They are drowned in the head of stator winding (one on each phase).

The equipment can have two typical constructive solution:

- With terminal box
- Without terminal box

When the equipment is supplied with terminal box:

Motor can be provided with/without signal/power cable.

Power cable connected to power terminal, while signal cable are connected to already IECEx certified type terminal and adapter (manufactured by WAGO).

Double insulating sheet is used when both power and signal cables are used.

When the equipment is supplied without terminal box:

Motor is provided with cable (or cables) permanently connected to it.

Power cable and signal cables (where present) are permanently connected (crimped) and covered by a thermal shrink tube.

Electrical characteristics:

Maximum supply voltage:	850 Vac
Rated frequency:	50 Hz or 60 Hz
Rated power:	0.06 kW to 22.2 kW
Poles:	2, 4, 6, 8 2/4, 4/8 double speed (mixed windings - Dahlander) 4/6, 6/8 double speed (with separate windings)
Insulation class:	F (155°C), H (180°C)
Duty:	S1
Degree of protection:	IP 65 (according to EN 60079-0 and IEC 60529)
Minimum Ambient temperature:	-40°C (or -20°C)
Maximum Ambient temperature:	55°C, (or 50°C or 45°C) or 40°C
Painting:	Not painted (standard version); or Conductive type for Series M, N, Y and W Insulating with up to 2 mm for Series L or X (Gas Group IIB) Insulating with up to 0.2 mm for Series L or X (Gas Group IIC)"

Complete details in Annex.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Flameproof joints (of capacitor box) are not intended to be repaired.
- Flamepaths are specified in the manufacturer documents. For information regarding the dimensions of the flameproof joints the manufacturer shall be contacted.
- The operating temperature of supply cable must be suitable for a temperature of 80°C.
- The user has to periodically clean the enclosure in order to avoid the creation of a dust layer ≥ 5 mm.
- All cable entry devices shall include an additional gasket on the mating part with the enclosure.

Further conditions detailed in Additional information section.



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Additional information:

In addition, for single-phase motors:

- The supply voltage must be within $\pm 5\%$ of the nominal value

In addition, for single speed motors with "Ex eb" type of protection:

- The user has to connect the equipment to a current-dependent safety device which, in case of locked rotor, de-energize within the limit time "tE".
- The intervention curve of the protection device, for the automatic de-energizing of supply, must coherent with the value I_A/I_N and the time "tE" shown on the marking plate.
- It is forbidden the self-restart of the equipment after the intervention of the protection.

In addition, for two speed motors with increased safety type of protection:

- the user has to connect the terminals of each PTC sensor to a relay type MS220KA manufactured by ZIEHL (one for each PTC) which, in case of locked rotor, de-energize the motor to avoid that the surface temperature reach the ignition value;
- It is forbidden the self-restart of the equipment after the intervention of the relay.
- The relay has to be placed in safe zone or in an appropriate certified enclosure.
- Supply through inverter: thermal protectors shall be connected to a safety device that, in case of activation, shut down the power supply. It is forbidden the self-restart of the equipment after the intervention of the relay.

Maximum temperature safety systems integrity level shall be at least 2, according to IEC 61508 or IEC 61511 standard. Other systems shall be SIL 1.

Annex:

[IECEX IMQ 21.0006 X issue No. 0 Annex.pdf](#)

Annex to: IECEx IMQ 21.0006X issue No. 0
Applicant: BONANI S.p.A.
Apparatus: Electrical motors
Series L, M, N, X, Y and W



General description

The three-phase and single-phase asynchronous squirrel cage motors (Series L, M, N, X, Y and W) are a range of motor size 56 up to 160 according to IEC 60034 code. They are made of aluminum and have separate parts: motor enclosure, terminal box (optional) and capacitor enclosure (optional).

The motor enclosure and the terminal box have types of protection "Increased safety" and/or "Dust tight";

The capacitor enclosure has types of protection "Ex db" and "Ex tb";

The motors can be equipped with auxiliary devices (starting capacitors, running capacitor, PTC, terminals). PTC (130°C) are used only for two-speed motors and for "Ex tb" and "Ex tc" motors (when supplied by inverter). They are drowned in the head of stator winding (one on each phase).

The equipment can have two typical constructive solution:

- With terminal box
- Without terminal box

When the equipment is supplied with terminal box:

Motor can be provided with/without signal/power cable.

Power cable connected to power terminal, while signal cable is connected to already IECEx certified type terminal and adapter (manufactured by WAGO).

Double insulating sheet is used when both power and signal cables are used.

When the equipment is supplied without terminal box:

Motor is provided with cable (or cables) permanently connected to it.

Power cable and signal cables (where present) are permanently connected (crimped) and covered by a thermal shrink tube.

Ventilation

Self-ventilation made by fan, who is fitted directly on the shaft.

Fans for "Ex eb" motors, which have a peripheral speed below 50 m/s, are made of plastic material.

Fans for "Ex tb" or "Ex eb" motors (which have a peripheral speed above 50 m/s) are made of plastic dissipative material or aluminum.

The degree of protection (IP) of ventilation openings are:

- IP 20 on the air inlet side
- IP 10 on the air outlet side

For the connection of the PTCs, the equipment with terminal box enclosure is provided with the following components IECEx/ATEX certified:

#	Manufacturer	Description	Ex mode of protection	IEC Ex Certificate n. ATEX Certificate n.	Temp. range	Suitable for T class
1	WAGO Kontakttechnik GmbH	COMPACT splicing wire connector type 221-682 Adapter 221-511	Ex eb IIC Gb	IECEX PTB 12.0011U Is.1 PTB 19 ATEX 1001U Is. 1	Service temperature -55°C ÷105°C	N/A

Annex to: IECEx IMQ 21.0006X issue No. 0
Applicant: BONANI S.p.A.
Apparatus: Electrical motors
Series L, M, N, X, Y and W



Electrical characteristics:

Mains supply

Maximum supply voltage: 850 Vac
Rated frequency: 50 Hz or 60 Hz
Rated power: 0.06 kW to 22.2 kW
Poles: 2, 4, 6, 8
2/4, 4/8 double speed (mixed windings - Dahlander)
4/6, 6/8 double speed (with separate windings)
Insulation class: F (155°C), H (180°C)
Duty: S1
Degree of protection: IP 65 (according to IEC 60079-0 and IEC 60529)
Minimum Ambient temperature: -40°C (or -20°C)
Maximum Ambient temperature: 55°C, (or 50°C or 45°C) or 40°C
Painting: Not painted (standard version); or
Conductive type for Series M, N, Y and W
Insulating with up to 2 mm for Series L or X (Gas Group IIB)
Insulating with up to 0.2 mm for Series L or X (Gas Group IIC)
Temperature class: T3
T4 (only for motor 63R2 with an ambient temperature of 40°C)
Maximum surface temperature: T125°C

Inverter supply (allowed only for “Ex tb” and “Ex tc” motors)

Possibility to supply through inverter exclusively with the use of thermal protectors applied in the windings. Such protectors shall be connected to appropriate protective devices.

Safety Ratings:

The other electrical safety characteristics as IA/IN, tE are listed in schedule document “Increased safety Motors Series L-M-N (X-Y-W)”

Installation conditions:

The equipment is foreseen to be installed in locations where there are environmental conditions as clearly specified at clause 1, par. 2 of IEC 60079-0.

Installation and use in atmospheric and environmental conditions that are out of above mentioned intervals require special considerations and additional measures.

It is not a requirement of the applicable standards listed in first page that the certification body confirm suitability for these special considerations and additional measures.

Installation of equipment shall be done according to IEC 60079-14 Standard requirements.

Capacitors have to be placed in the capacitor enclosure (if supplied) or in safe zone.

Cable entry devices shall be selected by the user according to IEC 60079-14 and with the following instructions:

- Cable entry devices, for terminal box, shall be IECEx certified according to current edition of IEC 60079-0, IEC 60079-7 and IEC 60079-31 standards. They shall have at least an IP 65 degree of protection, minimum EPL (Gb and Db) and operating temperature range from -40°C to +80°C.
- Cable entry device, for capacitor box, shall be M16x1.5, IECEx certified (according to current edition of IEC 60079-0, IEC 60079-1 and IEC 60079-31 standards) “barrier” cable glands suitable for a Pressure of 46 bar. It shall have at least an IP 65 degree of protection, minimum EPL (Gb and Db) and operating temperature range from -40°C to +80°C.

Unused cable entries shall be closed through a blanking element with the same characteristics as reported for cable entry devices.

Annex to: IECEx IMQ 21.0006X issue No. 0
Applicant: BONANI S.p.A.
Apparatus: Electrical motors
Series L, M, N, X, Y and W



Specific conditions of use (X):

- Flameproof joints (of capacitor box) are not intended to be repaired.
- Flamepaths are specified in the manufacturer documents. For information regarding the dimensions of the flameproof joints the manufacturer shall be contacted.
- The operating temperature of supply cable must be suitable for a temperature of 80°C.
- The user has to periodically clean the enclosure in order to avoid the creation of a dust layer ≥ 5 mm.
- All cable entry devices shall include an additional gasket on the mating part with the enclosure.

In addition, for single-phase motors:

- The supply voltage must be within $\pm 5\%$ of the nominal value.

In addition, for single speed motors with “Ex eb” type of protection:

- The user has to connect the equipment to a current-dependent safety device which, in case of locked rotor, de-energize within the limit time “tE”.
- The intervention curve of the protection device, for the automatic de-energizing of supply, must be coherent with the value I_A/I_N and the time “tE” shown on the marking plate.
- It is forbidden the self-restart of the equipment after the intervention of the protection.

In addition, for two speed motors with increased safety type of protection:

- the user has to connect the terminals of each PTC sensor to a relay type MS220KA manufactured by ZIEHL (one for each PTC) which, in case of locked rotor, de-energize the motor to avoid that the surface temperature reaches the ignition value;
- It is forbidden the self-restart of the equipment after the intervention of the relay.
- The relay has to be placed in safe zone or in an appropriate certified enclosure.
- Supply through inverter: thermal protectors shall be connected to a safety device that, in case of activation, shut down the power supply. It is forbidden the self-restart of the equipment after the intervention of the relay.

Maximum temperature safety systems integrity level shall be at least 2, according to IEC 61508 or IEC 61511 standard. Other systems shall be SIL 1.

Warning:

“Do not open when an explosive atmosphere may be present”

“See installation instruction document”

Routine tests:

The manufacturer shall carry out the routine test prescribed at clauses 27 of the IEC 60079-0.

In addition, if the equipment marking is “Ex ... eb ... Gb”, manufacturer shall carry out the dielectric routine test prescribed at clause 7.1 of the IEC 60079-7 standard, the applied voltage shall be at least at $(1\ 000 + 2U)$ Vac or 1 500 Vac, whichever is greater, where “U” is the r.m.s. working voltage.

Alternatively, the test shall be carried out at 1.2 times the test voltage, but maintained for at least 100 ms.

In addition, if the equipment marking is “Ex ... ec ... Gc”, manufacturer shall carry out the dielectric routine test prescribed by relevant industrial standard.

Key code

The three-phase and single-phase electric motors are identified by a code as follows:

Key code												
	■	■	■	■	■	*	■	*	*	*	■	■
Series												
Motor 2G (Zone 1)	L											
Motor 2GD (Zone 1, 21)	M											
Motor 2D (Zone 21)	N											
Motor 3G (Zone 2)	X											
Motor 3GD (Zone 2, 22)	Y											
Motor 3D (Zone 22)	W											
Type												
Three-phase	T											
Single phase	S											
Number of poles												
Two				2								
Four				4								
Six				6								
Eight				8								
Double speed 2-4 poles				A								
Double speed 4-8 poles				E								
Double speed 4-6 poles				D								
Double speed 4-8 poles				B								
Size												
56					A							
63					B							
71					C							
80					D							
90S					F							
90L					H							
100					M							
112					P							
132S					R							
132M					T							
160					U							
Power												
1 st					A							
2 nd					B							
3 rd					C							
4 th					R							
Mounting												
Configuration												
Single phase with capacitor box									9			
Motor without connection box									8			
Motor with PTC (not for double speed box)									7			
Motor with cable									6			
Standard version									0			
Progressive number												
For special configuration												
Efficiency												
IE1										1	E	
IE2										2	E	

Annex to: IECEx IMQ 21.0006X issue No. 0
Applicant: BONANI S.p.A.
Apparatus: Electrical motors
Series L, M, N, X, Y and W



Notes:

* = Part of motor coding not pertaining EX safety

Standard motor is coded: ■■■■■ * 0 * 2 * ■■■

Standard motor is provided:

- with terminal box;
- without cables;
- without PTC;
- (single phase) is without capacitor box;
- (double speed) with PTC;

List of motors:

Three phase motors 1 speed

Type	Power [kW]	
	50Hz	60Hz
56A2	0.09	0.11
56B2	0.12	0.14
63R2	0.12	0.14
63A2	0.18	0.22
63B2	0.25	0.30
71A2	0.37	0.44
71B2	0.55	0.66
71C2	0.75	0.90
80A2	0.75	0.90
80B2	1.1	1.32
90S2	1.5	1.80
90L2	2.2	2.64
100LA2	3	3.60
100LB2	4	4.80
112M2	4	4.80
132S2	5.5	6.60
132M2	7.5	9.00
160MA2	11	13.20
160MB2	15	18.00
160L2	18.5	22.20

Type	Power [kW]	
	50Hz	60Hz
56A4	0.06	0.07
56B4	0.09	0.11
63A4	0.12	0.14
63B4	0.18	0.22
71A4	0.25	0.30
71B4	0.37	0.44
80A4	0.55	0.66
80B4	0.75	0.90
90S4	1.1	1.32
90L4	1.5	1.80
100LA4	2.2	2.64
100LB4	3	3.60
112M4	4	4.80
132S4	5.5	6.60
132M4	7.5	9.00
160M4	11	13.20
160L4	15	18.00

Type	Power [kW]	
	50Hz	60Hz
71A6	0.18	0.22
71B6	0.25	0.30
71C6	0.37	0.44
80A6	0.37	0.44
80B6	0.55	0.66
90S6	0.75	0.90
90L6	1.1	1.32
100L6	1.5	1.80
112M6	2.2	2.64
132S6	3	3.60
132M6	4	4.80
132MB6	5.5	6.60
160M6	7.5	9.00
160L6	11	13.20

Type	Power [kW]	
	50Hz	60Hz
71A8	0.09	0.11
71B8	0.12	0.14
80A8	0.18	0.22
80B8	0.25	0.30
90S8	0.37	0.44
90L8	0.55	0.66
100LA8	0.75	0.90
100LB8	1.1	1.32
112M8	1.5	1.80
132S8	2.2	2.64
132M8	3	3.60
160MA8	4	4.80
160M8	5.5	6.60
160L8	7.5	9.00

Single phase motors 1 speed

Type	Power [kW] [50 or 60Hz]
56A2	0.09
56B2	0.12
63A2	0.18
63B2	0.25
71A2	0.37
71B2	0.55
80A2	0.75
90S2	1.1
90L2	1.5
100L2	1.85
-	-

Type	Power [kW] [50 or 60Hz]
56A4	0.06
56B4	0.09
63A4	0.12
63B4	0.18
71A4	0.25
71B4	0.37
80A4	0.55
90S4	0.75
90L4	1.1
100LA4	1.5
100LB4	1.85

Three phase motors double speed constant torque

These motors are always provided with PTC thermistors, one for each speed: PTC130°C for T3 temperature class and ambient temperature 40°C.

2/4 poles			
Type	Power		T3
	50Hz	60Hz	
	[kW]	[kW]	(40°C)
63B24	0.21	0.25	PTC130
	0.13	0.16	PTC130
71A24	0.33	0.40	PTC130
	0.22	0.26	PTC130
71B24	0.45	0.54	PTC130
	0.3	0.36	PTC130
80A24	0.6	0.72	PTC130
	0.45	0.54	PTC130
80B24	0.85	1.02	PTC130
	0.65	0.78	PTC130
90S24	1.3	1.56	PTC130
	1	1.20	PTC130
90L24	1.6	1.92	PTC130
	1.3	1.56	PTC130
100LA24	2.5	3.00	PTC130
	1.8	2.16	PTC130
100LB24	3.3	3.96	PTC130
	2.6	3.12	PTC130
112M24	4.5	5.40	PTC130
	3.3	3.96	PTC130
132S24	5.5	6.60	PTC130
	4.4	5.28	PTC130
132M24	7.7	9.24	PTC130
	6.2	7.44	PTC130
160M24	11	13.20	PTC130
	8.8	10.56	PTC130
160L24	15	18.00	PTC130
	12	14.40	PTC130

4/8 poles			
Type	Power		T3
	50Hz	60Hz	
	[kW]	[kW]	(40°C)
63B48	0.09	0.11	PTC130
	0.04	0.05	PTC130
71A48	0.15	0.18	PTC130
	0.09	0.11	PTC130
71B48	0.22	0.26	PTC130
	0.12	0.14	PTC130
80A48	0.37	0.44	PTC130
	0.18	0.22	PTC130
80B48	0.6	0.72	PTC130
	0.28	0.34	PTC130
90S48	0.75	0.90	PTC130
	0.37	0.44	PTC130
90L48	1.1	1.32	PTC130
	0.55	0.66	PTC130
100LA48	1.5	1.80	PTC130
	0.75	0.90	PTC130
100LB48	1.85	2.22	PTC130
	0.95	1.14	PTC130
112M48	2.4	2.88	PTC130
	1.4	1.68	PTC130
132S48	3.7	4.44	PTC130
	2.2	2.64	PTC130
132M48	4.8	5.76	PTC130
	2.8	3.36	PTC130
160M48	7.5	9.00	PTC130
	4.8	5.76	PTC130
160L48	10	12.00	PTC130
	6.6	7.92	PTC130

4/6 poles			
Type	Power		T3 (40°C)
	50Hz	60Hz	
	[kW]	[kW]	
71A46	0.22	0.26	PTC130
	0.15	0.18	PTC130
71B46	0.28	0.33	PTC130
	0.18	0.21	PTC130
80A46	0.37	0.44	PTC130
	0.3	0.36	PTC130
80B46	0.5	0.6	PTC130
	0.37	0.44	PTC150
90S46	0.75	0.9	PTC130
	0.45	0.54	PTC130
90L46	1.1	1.32	PTC130
	0.75	0.9	PTC130
100LA46	1.5	1.8	PTC130
	0.9	1.08	PTC130
100LB46	1.8	2.16	PTC130
	1.1	1.32	PTC130
112M46	2.2	2.64	PTC130
	1.5	1.8	PTC130
132S46	3.6	4.32	PTC130
	2.2	2.64	PTC130
132M46	5.5	6.6	PTC130
	4	4.8	PTC130
160M46	6.6	7.92	PTC130
	4.4	5.28	PTC130
160L46	8.8	10.56	PTC130
	5.9	7.08	PTC130

6/8 poles			
Type	Power		T3 (40°C)
	50Hz	60Hz	
	[kW]	[kW]	
71A68	0.08	0.10	PTC130
	0.04	0.05	PTC130
71B68	0.12	0.14	PTC130
	0.08	0.10	PTC130
80B68	0.19	0.23	PTC130
	0.11	0.13	PTC130
80B68	0.25	0.30	PTC130
	0.19	0.23	PTC130
90S68	0.37	0.44	PTC130
	0.26	0.31	PTC130
90L68	0.55	0.66	PTC130
	0.37	0.44	PTC130
100LA68	0.75	0.90	PTC130
	0.55	0.66	PTC130
100LB68	1.1	1.32	PTC130
	0.75	0.90	PTC130
112M68	1.5	1.80	PTC130
	1.1	1.32	PTC130
132S68	2.1	2.52	PTC130
	1.4	1.68	PTC130
132M68	3	3.60	PTC130
	1.85	2.22	PTC130
160M68	4	4.80	PTC130
	2.8	3.36	PTC130
160L68	5.5	6.60	PTC130
	4	4.80	PTC130

Three phase motors double speed quadratic torque

These motors are always provided with PTC thermistors, one for each speed: PTC130°C for T3 temperature class and ambient temperature 40°C.

2/4 poles			
Type	Power		T3
	50Hz	60Hz	
	[kW]	[kW]	(40°C)
63B24	0.24	0.29	PTC130
	0.07	0.08	PTC130
71A24	0.37	0.44	PTC130
	0.09	0.11	PTC130
71B24	0.5	0.60	PTC130
	0.14	0.17	PTC130
80A24	0.75	0.90	PTC130
	0.18	0.22	PTC130
80B24	1	1.20	PTC130
	0.25	0.30	PTC130
90S24	1.5	1.80	PTC130
	0.37	0.44	PTC130
90L24	2	2.40	PTC130
	0.51	0.61	PTC130
100LA24	2.6	3.12	PTC130
	0.62	0.74	PTC130
100LB24	3.3	3.96	PTC130
	0.75	0.90	PTC130
112M24	4.4	5.28	PTC130
	1.1	1.32	PTC130
132S24	6.5	7.80	PTC130
	2	2.40	PTC130
132M24	8.5	10.20	PTC130
	2.5	3.00	PTC130
160M24	12	14.40	PTC130
	3	3.60	PTC130
160L24	16	19.20	PTC130
	4.4	5.28	PTC130

4/8 poles			
Type	Power		T3
	50Hz	60Hz	
	[kW]	[kW]	(40°C)
-	-	-	-
	-	-	-
71A48	0.2	0.24	PTC130
	0.05	0.06	PTC130
71B48	0.3	0.36	PTC130
	0.07	0.08	PTC130
80A48	0.45	0.54	PTC130
	0.1	0.12	PTC130
80B48	0.65	0.78	PTC130
	0.14	0.17	PTC130
90S48	0.9	1.08	PTC130
	0.22	0.26	PTC130
90L48	1.2	1.44	PTC130
	0.3	0.36	PTC130
100LA48	1.9	2.28	PTC130
	0.44	0.53	PTC130
100LB48	2.2	2.64	PTC130
	0.55	0.66	PTC130
112M48	3	3.60	PTC130
	0.75	0.90	PTC130
132S48	4.4	5.28	PTC130
	1.1	1.32	PTC130
132M48	5.9	7.08	PTC130
	1.5	1.80	PTC130
160M48	8.8	10.56	PTC130
	2.5	3.00	PTC130
160L48	12	14.40	PTC130
	3.2	3.84	PTC130

4/6 poles			
Type	Power		T3
	50Hz	60Hz	
	[kW]	[kW]	(40°C)
71B46	0.3	0.36	PTC130
	0.1	0.12	PTC130
80A46	0.44	0.528	PTC130
	0.13	0.156	PTC130
80B46	0.59	0.708	PTC130
	0.18	0.216	PTC130
90S46	0.9	1.08	PTC130
	0.3	0.36	PTC130
90L46	1.15	1.38	PTC130
	0.4	0.48	PTC130
100LA46	1.8	2.16	PTC130
	0.6	0.72	PTC130
100LB46	2.2	2.64	PTC130
	0.7	0.84	PTC130
112M46	3	3.6	PTC130
	0.9	1.08	PTC130
132S46	4	4.8	PTC130
	1.2	1.44	PTC130
132M46	5.5	6.6	PTC130
	1.7	2.04	PTC130
160M46	7.5	9	PTC130
	2.5	3	PTC130
160L46	11	13.2	PTC130
	3.3	3.96	PTC130

6/8 poles			
Type	Power		T3
	50Hz	60Hz	
	[kW]	[kW]	(40°C)
80B68	0.33	0.40	PTC130
	0.09	0.11	PTC130
80B68	0.4	0.48	PTC130
	0.12	0.14	PTC130
90S68	0.48	0.58	PTC130
	0.19	0.23	PTC130
90L68	0.66	0.79	PTC130
	0.25	0.30	PTC130
100LA68	0.88	1.06	PTC130
	0.37	0.44	PTC130
100LB68	1.1	1.32	PTC130
	0.44	0.53	PTC130
112M68	1.5	1.80	PTC130
	0.75	0.90	PTC130
132S68	2.2	2.64	PTC130
	0.88	1.06	PTC130
132M68	3	3.60	PTC130
	1.2	1.44	PTC130
132MB68	3.7	4.44	PTC130
	1.5	1.80	PTC130
160M68	5.5	6.60	PTC130
	2.5	3.00	PTC130
160L68	7.5	9.00	PTC130
	4	4.80	PTC130