

Zone 1 with type of protection Ex e II Increased Safety “e”

All 1MA motors are certified in type of protection Ex e II for temperature classes T1 to T3 at an ambient temperature from –20 to +40 °C and have an EU type test certificate according to Directive 94/9/EG (ATEX 95). Higher temperature classes are available on request.

Explosion protection is achieved when the certified motor versions interact with a similarly certified motor protection switch. The motor protection switch is selected in accordance with the values certified for the motor for the starting current ratio I_{LR}/I_{rated} and the t_E times, so that in the case of a locked rotor fault, the motor is isolated from the supply within the t_E time. The t_E times assigned to the separate temperature classes and the starting current ratio are marked on the rating plate.

Explosion protection can be achieved exclusively by the PTC thermistors embedded in the winding provided that the motor has been specially approved and certified for this. This type of protection is not technically possible for every motor, so it is essential to inquire before ordering.

With the exception of 2-pole motors of frame size 225 M and above, all motors are of an identical version, i.e. the motors can be operated at T1/T2 or T3 at the appropriate rated output. For special versions (different frequency, output, coolant temperature, site altitude, etc.) a new certificate is necessary (please inquire). The temperature class must be specified in the order, otherwise the universal version T1/T2 and T3 will be certified (doubling the certification costs).

Identification on the rating plate:

 II 2G Ex e II T1 – T3

Zone 1 with type of protection Ex de IIC explosion-proof enclosure “d”

All 1MJ motors are certified for the highest explosion group IIC, temperature classes T1 to T4 at ambient temperatures from –20 to +60 °C and have an EC type test certificate according to Directive 94/9/EG (ATEX 95).

These motors are designed such that an explosion within the housing cannot result in an explosion in the environment. The energy that is generated internally by an explosion is dissipated in the so-called “flameproof chamber” so far that the energy is no longer sufficient for ignition outside the casing. The housing temperature is below the ignition temperature of the gases to which temperature class T4 applies.

The 1MJ6 motors (frame sizes 71 to 200) generally have a located bearing on the non-drive-end (NDE) of the motor.

The following variations are possible on request:

- Coolant temperature >40 °C or site altitude >1000 m (for 1MJ6, the reduction factors listed in Catalog D 81.1 part 0 “Introduction” under “General technical data”, “Coolant temperature and site altitude” are applicable).
- Frequency and rated duty
- Pole-changing motors
- Insulated bearing at the non-drive-end (NDE)
- Use according to temperature class 155 (F) in mains-fed operation

On the frequency converter, motors in type of protection “explosion-proof enclosure” can be used thermally acc. to temperature class 155 (F). Converter-fed operation can be ordered with order code **A15** (PTC thermistors for tripping) or **A16** (PTC thermistors for alarm and tripping), whereby an additional PTC thermistor is fitted to 1MJ6/1MJ7 motors in the connection box.

Identification on the rating plate:

 II 2G Ex de IIC T1 – T4

or

 II 2G Ex d IIC T1 – T4

Zone 2 with type of protection Ex nA (non-sparking)

- Zone 2 acc. to IEC/EN 60079-15
The duty types are:
 - Design for Zone 2 for mains-fed operation (order code **M72**)
 - Design for Zone 2 for mains-fed operation, with derating (order code **M73**)

1LA/1LG motors are modified for this purpose in the "Non-sparking" design and are suitable for use in hazardous areas of Zone 2 for temperature classes T1 to T3. The maximum surface temperature that can occur during operation must lie below the limit temperature of the respective temperature class. The ventilation system must be in accordance with IEC/EN 60079-0. An external earthing terminal is fitted to the motors. The connection box is similar to the EExe design.


Please inquire in the case of

- Use in accordance with temperature class 155 (F)
- For pole-changing versions

For motors in the "Non-sparking" version, a conformity declaration is available from a recognized testing authority.

Ambient temperature -20 to +60 °C, whereby derating applies from 40 °C upwards. Other temperatures are available on request.

The rating plate or the extra rating plate contains the text:

 II 3G Ex nA II T3

IEC/EN 60079-15 and number of the "Conformity declaration"

The motors do not have a rated voltage range stamped on the rating plate.

Protection against dust explosions in Zones 21 and 22

The distinction between Zones 21 and 22 is as follows:

- Zone 21 according to IEC 61241, EN 50281¹⁾
 - Design for Zone 21²⁾, as well as Zone 22 for conducting dust (IP65) for mains-fed operation (order code **M34**)
 - Design for Zone 21²⁾, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating (order code **M38**)

Overview of the technical specifications

Explosion-proof motors - The technology at a glance				
Motors	Type of protection "e"	Type of protection "d"	Type of protection "n"	Dust explosion protection
Frame size	63 M ... 315 L	71 M ... 315 M	63 M ... 450	56 M ... 450 L
Output range	0.12 to 160 kW	0.25 ... 132 kW	0.09 to 1000 kW	0.06 to 1000 kW
Number of poles	2/4/6	2/4/6/8	2/4/6/8	2/4/6/8
Temperature class	T1 - T3	T1 - T4	T3	-
Degree of protection	II 2 G Ex e II acc. to IEC/EN 60079-0 IEC/EN 60079-7	II 2 G Ex de II acc. to IEC/EN 60079-0 IEC/EN 60079-1	II 3 G Ex nA acc. to IEC/EN 60079-15	Zone 21: II 2D Ex td A21 IP65 T125 °C ³⁾ Zone 22: II 3D Ex td A22 IP55 T125 °C acc. to EN 50281/IEC 61241
Directive	94/9/EG, ATEX 95	94/9/EG, ATEX 95	94/9/EG, ATEX 95	94/9/EG, ATEX 95
Protection class	IP55	IP55	IP55	Zone 21: IP65 Zone 22: IP55
Voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages	All commonly used voltages
Frequency	50 and 60 Hz	50 and 60 Hz	50 and 60 Hz	50 and 60 Hz
Type of construction	All common types of construction	All common types of construction	All common types of construction	All common types of construction
Housing	FS 63 M ... 160 L aluminum FS 100 L ... 315 L cast-iron	FS 71 M ... 315 M cast-iron	FS 63 M ... 160 L aluminum FS 100 L ... 450 cast-iron	FS 56 M ... 225 M aluminum FS 100 L ... 450 ¹⁾ cast-iron
Cooling method	Surface-cooled	Surface-cooled	Surface-cooled	Surface-cooled
Temperature class	155 (F) used acc. to 130 (B)	155 (F) used acc. to 130 (B) ⁴⁾	155 (F) used acc. to 130 (B)	155 (F) used acc. to 130 (B) ⁵⁾
Insulation system	DURIGNIT IR 2000	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request	DURIGNIT IR 2000, converter-compatible up to 500 V, 690 V on request

¹⁾ Zone 21 only up to frame size 315 L

²⁾ Zone 21 takes into account conducting and non-conducting dust

³⁾ Zone 21 for "Non-standard motors frame size 315 and above" only up to frame size 315 possible.

- Zone 22 according to IEC 61241, EN 50281

- Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation (order code **M35**)
- Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating (order code **M39**)

The 1LA/1LG motors are modified for this purpose for use in zones subject to dust explosion hazards. The surface temperature is ≤125 °C at rated duty.


An external earthing terminal and a metal external fan are fitted to the motors. In the design for Zone 21, the connection box is similar to the Exe design.

Pole-changing versions are not possible for Zone 21 – they are possible for Zone 22 on request.

Certification:

- Zone 21: EC type-test certificate (ATEX), issued by the DMT testing authority (Deutsche Montan-Technologie) and EC declaration of conformity.
- Zone 22: EC declaration of conformity

Identification on the rating plate:

Zone 21:  II 2D Ex td A21 IP65 T125 °C

Zone 22:  II 3D Ex td A22 IP55 T125 °C

Ambient temperature -20 °C to +60 °C, whereby derating applies from 40 °C upwards. Other temperatures are available on request.

Generally, the following is valid:

All Ex motors in vertical type of construction with shaft extension pointing down must have a protective cover.

Ex motors cannot be designed in accordance with UL and CSA.

The certificates for the motors for hazardous areas are stored with the documentation in the SD configurator tool for low-voltage motors.

For converter-fed operation, Ex motors must always be monitored using PTC thermistors. Certified tripping units are required for this purpose, see Catalog LV1.

Comprehensive operating instructions and the declaration of conformity are supplied with Ex motors.
In the case of non-standard 1LA8 and 1PQ8 motors, the bearing temperature must be monitored (order code **A72**).

⁴⁾ For converter-fed operation used 155 (F)

⁵⁾ For "Non-standard motors frame size 315 and above" temperature class 155 (F) used according to 155 (F).

Coolant temperature and site altitude

Coolant temperature –40 °C to +40 °C for Ex motor

For all 1LA5, 1LA6, 1LA7, 1LA9 motors (with the exception of 1LA9 with increased output), 1LG4, 1LG6, 1MA6, 1MA7 frame sizes 56 to 315 with the respective types of protection Ex e, Ex nA or dust-Ex (Zone 21/22), the operating ambient temperature can optionally be expanded up to –40 °C. Technical measures are required for this purpose (e.g. metal external fan).
Order **D19**

The order code **D19** is not possible in combination with order code **L03** "Vibration-proof version".

The mechanical limit speed of the 2-pole motors 1LA5/1LA9 in design for Zone 21/22 is reduced from frame size 180 as compared to the values in Catalog D 81.1 part 5 "Motors operating with frequency converters":

Frame size	Motor type	2-pole	
		n_{\max} rpm	f_{\max} Hz
180	1LA5/1LA9	3300	55
200		3100	51
225		3000	50

With converter-fed operation and operation on 60 Hz supplies, particular attention has to be paid to the mechanical limit speeds – 60 Hz data are not stamped on the rating plate.
Alternative: 1LG4/1LG6 motors in design for Zone 21/22.

Special technology

The "Special technology" comprises Ex-mountings on explosion-proof motors.

The field of application of explosion-proof motors is considerably expanded by mounting Ex rotary pulse encoders or Ex separately driven fans.

The use of a separately driven fan is recommended to increase motor utilization at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed.

Both of these results can only be achieved with converter-fed operation.

For explosion-proof motor versions with Ex rotary pulse encoder or Ex separately driven fan, see tables below.

The following explosion-proof motor versions are available with an Ex rotary pulse encoder:

Type of protection	Order No. + order code	Frame size	Order code of the Ex rotary pulse encoder
Ex nA	1LA6/7/9... + M73 1LG4/6... + M73	100 L ... 160 L 180 M ... 315 L	H86: Mounting of explosion-proof rotary pulse encoder – LL841 900 006 – for use in Zones 2, 21, 22.
Dust-Ex (Zone 21)	1LA6/7... + M38 1LA5... + M38 1LA9... + M38 1LG4/6... + M38	100 L ... 160 L 180 M ... 225 M 100 L ... 200 L 180 M ... 315 L	
Dust-Ex (Zone 22)	1LA6/7... + M39 1LA5... + M39 1LA9... + M39 1LG4/6... + M39	100 L ... 160 L 180 M ... 225 M 100 L ... 200 L 180 M ... 315 L	
Ex nA or dust-Ex (Zone 22)	1LA6/7/9... + M75 1LG4/6... + M75	100 L ... 160 L 180 M ... 315 L	
Ex de	1MJ6... + A15/A16 1MJ7... + A15/A16	90 L ... 200 L 225 M ... 315 M	H87: Mounting of explosion-proof rotary pulse encoder on motors Ex d/de in Zone 1. • Ex OG 9 DN 1024 I (BG 90L – 160L) • Ex HOG 161 DN 1024I (BG 180M – 315L)

The following explosion-proof motor versions are available with an Ex separately driven fan:

Type of protection	Order No. + order code	Frame size	Order code of the Ex separately driven fan
Ex nA	1LG4/6 + M73	225 M ... 315 L	M95: "Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2".
Dust-Ex (Zone 21)	1LG4/6 + M38	225 M ... 315 L	M96: "Mounting of explosion-proof separately driven fan II 2D for use in Zone 21".
Dust-Ex (Zone 22)	1LG4/6 + M39 1LA6/7 + M39 1LA5 + M39 1LA9 + M39	180 M ... 315 L 100 L ... 160 L 180 M ... 225 M 100 L ... 200 L	M97: "Mounting of explosion-proof separately driven fan II 3D for use in Zone 22".
Ex de	1MJ7 + A15/A16	225 M ... 315 M	M98: "Mounting of explosion-proof separately driven fan Ex de for use in Zone 1".

Note: Notwithstanding, Ex separately driven fans can also be used for mains-fed operation in special applications.

Ex rotary pulse encoder

The rotary pulse encoder can only be mounted on a standard non-drive end (NDE), i.e. a second shaft extension or protective cover cannot be supplied. Therefore, the user must implement a suitable cover for vertical mounting positions to prevent small parts from falling into the fan cover (see also standard IEC//EN 60079-0).

Ex rotary pulse encoders do not have insulated bearings due to their construction (request required!).

The degree of protection of the rotary pulse encoder must be observed. The relevant data are stamped on the rating plate of the rotary pulse encoder.

When an Ex rotary pulse encoder is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Dimensions and weights".

LL 841 900 006 rotary pulse encoder

With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments. It is resistant to shock and vibration.

The LL 841 900 006 rotary pulse encoder for use in Zones 2, 21, 22 can be supplied with the already mounted ADS diagnostic system for an early error detection in the encoder.

Order code **H86**

Manufacturer:

Leine und Linde (Germany) GmbH

Bahnhofstraße 36

73430 Aalen

Tel. +49 (0)73 61-78093-0

Fax +49 (0)73 61-78093-11

<http://www.leinelinde.com>

e-Mail: info@leinelinde.se

Technical data for LL 841 900 006 (HTL version)

Mounting of encoder for use below -20 °C and higher than +40 °C on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	max. 80 mA
Admissible load current per output	40 mA
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, A', B, B', 0, 0' High Current HTL Isolated switching output for ADS signal
Pulse offset between the two outputs	90° ±25° el.
Output amplitude	$U_{\text{High}} > U_B - 4 \text{ V}$ $U_{\text{Low}} < 2.5 \text{ V}$
Mark space ratio	1:1 ±10 %
Edge steepness	50 V/μs (without load)
Maximum frequency	100 kHz for 350 m cable
Maximum speed	4200 rpm
Temperature range	-40 to +70 °C
Degree of protection	IP65
Max. adm. radial cantilever force	150 N
Max. adm. axial force	100 N
Termination system	Terminal strips in encoder, Cable connection M20 x 1.5 radial

Ex OG9 DN 1024 I rotary pulse encoder

The Ex OG9 DN 1024 I rotary pulse encoder for use on Ex d/de motors in Zone 1 (frame sizes 90 to 160) can be supplied already mounted.

Order code **H87**

Manufacturer:

Baumer Hübner GmbH

Planufer 92b

10967 Berlin

Tel. +49 (0)30-6 90 03-0

Fax +49 (0)30-6 90 03-1 04

<http://www.baumerhuebner.com>

e-Mail: info@baumerhuebner.com

Technical data for Ex OG9 DN 1024 I rotary pulse encoder (HTL version)

Mounting of encoder for use below -20 °C and higher than +40 °C on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 90 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	6 short-circuit proof square-wave pulses A, B and A', B' and R, R'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{\text{High}} \geq U_B - 3.5 \text{ V}$ $U_{\text{Low}} \leq 1.5 \text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/μs
Maximum frequency	120 kHz
Maximum speed	7000 rpm
Temperature range	-20 to +55 °C
Degree of protection	IP56
Max. adm. radial cantilever force	350 N
Max. adm. axial force	200 N
Termination system	Terminals with increased safety e, Cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	73 775 B
Weight	Approx. 3.5 kg

Ex HOG 161 DN 1024 I rotary pulse encoder

With its rugged construction, this rotary pulse encoder is also suitable for difficult operating environments.

The HOG10 DN 1024 I rotary pulse encoder for use on Ex d/de motors in Zone 1 (frame sizes 180 to 315) can be supplied already mounted.
Order code **H87**

Manufacturer:
Baumer Hübner GmbH
Planufer 92b
10967 Berlin
Tel. +49 (0)30-6 90 03-0
Fax +49 (0)30-6 90 03-1 04

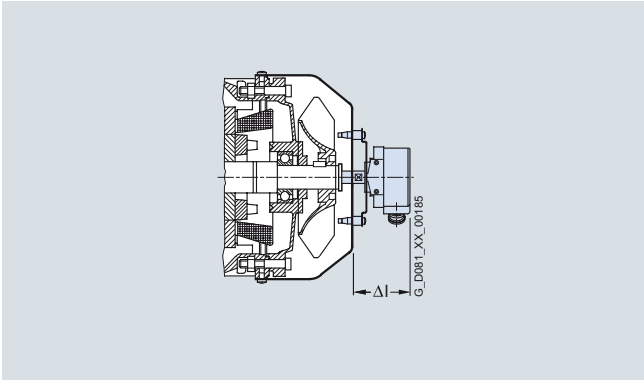
<http://www.baumerhuebner.com>
e-Mail: info@baumerhuebner.com

Technical data for HOG10 DN 1024 I (HTL version)

Mounting of encoder for use below -20 °C and higher than +40 °C on request.

Supply voltage U_B	+9 V to +30 V
Current input without load	Approx. 100 mA
Admissible load current per output	60 mA, 300 mA peak
Pulses per revolution	1024
Outputs	64 short-circuit proof square-wave pulses A, B and A', B' and R, R'
Pulse offset between the two outputs	90° ±20 %
Output amplitude	$U_{High} = U_B - 3.5\text{ V}$ $U_{Low} = 1.5\text{ V}$
Mark space ratio	1:1 ±20 %
Edge steepness	10 V/µs
Maximum frequency	120 kHz
Maximum speed	5600 rpm
Temperature range	-20 to +65 °C
Degree of protection	IP56
Max. adm. radial cantilever force	650 N
Max. admissible axial force	450 N
Termination system	Terminals with increased safety e, Cable connection M20 x 1.5
Mech. design acc. to Hübner Ident. No.	74 140 A
Weight	Approx. 8.8 kg

Dimensions and weights of the rotary pulse encoders



Ex rotary pulse encoder (on cover), order codes **H86, H87**

Frame size	Ex d/de (Zone 1)	Ex nA (Zone 2) and dust-Ex (Zone 21/22)					
	1MJ6/7	1LA5/6/7/9		1LG4/6			
	Δl mm	Weight approx. kg	Δl mm	Weight approx. kg	Δl mm	Weight approx. kg	
90	184	14.0	–		–		
100	188	14.5	110	2.0	–		
112	190	14.5	110	2.0	–		
132	186	16.5	110	2.0	–		
160	183	17.5	110	2.0	–		
180	164	9.0	110	2.0	100	3	
200	164	9.0	110	2.0	100	3	
225	160	12	110	2.0	100	3	
250	160	12	–		100	3	
280	160	12	–		100	3	
315	160	12	–		100	3	

The 1MJ6 motors of frame sizes 90 to 160 feature the rugged, flanged Ex OG9 rotary pulse encoder, which provides a high mechanical protection itself.

A protective cover of non-corrosive sheet steel is available for Ex rotary pulse encoders from the “Special technology” section, see “Mechanical protection for encoder” under “Mechanical design and degrees of protection”.

Order code **M68**

Consequently, the motor length also increases:

- 1LA up to 146 mm
- 1MJ6 up to 175 mm
- 1LG/1MJ7 up to 25 mm

Ex separately driven fan

The use of a separately driven fan is recommended to increase motor utilization at low speeds and to limit noise generation at speeds significantly higher than the synchronous speed. Both of these results can only be achieved with converter-fed operation. Please inquire about traction and vibratory operation.

The separately driven fan can be supplied already mounted for the following zones:

- Mounting of explosion-proof separately driven fan Ex de for use in Zone 1
Order code **M98**
- Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2
Order code **M95**
- Mounting of explosion-proof separately driven fan II 2D for use in Zone 21
Order code **M96**
- Mounting of explosion-proof separately driven fan II 3D for use in Zone 22
Order code **M97**

The supply voltage of the Ex separately driven fan motors is defined as follows:

Type 2CW2 has voltage windings for wide range voltages (see subsequently "Technical data of separately driven fan for Ex motors 1LA5/6/7/9, 1LG4/6 (frame sizes 180 and 200) in design for Zone 22").

The separately driven fan motors 1LA/1MJ have a rated voltage (rated voltage range) with tolerances in accordance with EC/EN 60034-1, Categories A and B.

A rating plate with the operating data is applied to the Ex separately driven fan motors.

The type of protection of the Ex separately driven fan motor corresponds with the type of protection of the assigned Ex basic motor (note order codes for the appropriate zone).

Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it.

Coolant temperatures deviating from -20 to +40 °C on request.

The Ex separately driven fan has degree of protection IP55 as standard (higher degrees of protection on request).

Motors with separately driven fans must use a PTC thermistor as motor protection. The Ex motor versions for converter-fed operation (order codes: M73, M38, M39, M75, M77, A15, A16) already have PTC thermistors for tripping. The PTC thermistor must safely shut down the motor if the separately driven fan is defective.

For selection information and order numbers, see the tables "Technical data of separately driven fan for Ex motors ..." on the following pages. A rating plate listing all the important data is fitted to the separately driven fan. For supply voltages outside the rated voltage range for 1LA motors, order code **Y81** and plain text required. Please note the direction of rotation of the separately driven fan (axial-flow fan) when connecting it. Admissible coolant temperatures are CT_{\min} -20 °C or CT_{\max} +40 °C. Lower coolant temperatures on request.

When the separately driven fan is mounted, the length of the motor increases by Δl . For an explanation of the additional dimensions and weights, see "Technology", "Dimensions and weights".

Technical data of separately driven fan for Ex motors 1LA5/6/7/9, 1LG4/6 (frame sizes 180 and 200) in design for Zone 22

Frame size	Designation on rating plate of separately driven fan	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current
		V		Hz	rpm	kW	A
100	2CW2 180-8RF54-1AC0	1 AC	230 to 277	50	2790	0.075	0.29
		3 AC	220 to 290 Δ	50	2830	0.086	0.27
		3 AC	380 to 500 Y	50	2830	0.086	0.16
		1 AC	230 to 277	60	3280	0.094	0.28
		3 AC	220 to 332 Δ	60	3490	0.093	0.27
		3 AC	380 to 575 Y	60	3490	0.093	0.16
112	2CW2 180-8RF54-1AC1	1 AC	230 to 277	50	2720	0.073	0.26
		3 AC	220 to 290 Δ	50	2770	0.085	0.27
		3 AC	380 to 500 Y	50	2770	0.085	0.15
		1 AC	230 to 277	60	3000	0.107	0.31
		3 AC	220 to 332 Δ	60	3280	0.094	0.28
		3 AC	380 to 575 Y	60	3280	0.094	0.16
132	2CW2 180-8RF54-1AC2	1 AC	230 to 277	50	2860	0.115	0.40
		3 AC	220 to 290 Δ	50	2880	0.138	0.45
		3 AC	380 to 500 Y	50	2880	0.138	0.24
		1 AC	230 to 277	60	3380	0.185	0.59
		3 AC	220 to 332 Δ	60	3470	0.148	0.41
		3 AC	380 to 575 Y	60	3470	0.148	0.24
160 to 225 ¹⁾	2CW2 180-8RF54-1AC3	1 AC	230 to 277	50	2780	0.236	0.96
		3 AC	220 to 290 Δ	50	2840	0.220	0.76
		3 AC	380 to 500 Y	50	2830	0.220	0.43
		3 AC	220 to 332 Δ	60	3400	0.284	0.94
		3 AC	380 to 575 Y	60	3400	0.284	0.56

¹⁾ Separately driven fans with Order No. **1LA. ...** are used for 1LG motors of frame size 225 and above.

Technical data of separately driven fan for Ex motors 1LG4/6 (frame sizes 225 to 315) n design for Zones 2 ¹⁾, 21, 22

Frame size	Designation on rating plate of separately driven fan	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current at rated voltage ²⁾
			V	Hz	rpm	kW	A
225 M to 280 M	1LA7 073-2AA62-Z	3 AC	220 to 240 Δ	50	2800	0.550	1.36
		3 AC	380 to 420 Y	50	2800	0.550	0.79
		3 AC	440 to 480 Y	60	3400	0.630	1.32
315 – 2-pole	1LA9 073-2LA92-Z	3 AC	220 to 240 Δ	50	2780	0.700	1.73
		3 AC	380 to 420 Y	50	2780	0.700	1.00
		3 AC	440 to 480 Y	60	3385	0.700	1.64
315 – 4, 6, 8 -pole	1LA7 073-2AA62-Z	3 AC	220 to 240 Δ	50	2800	0.550	1.36
		3 AC	380 to 420 Y	50	2800	0.550	0.79
		3 AC	440 to 480 Y	60	3400	0.630	1.32

Technical data of separately driven fan for Ex motors 1MJ7 (frame sizes 225 bis 315) in design for Zone 1

Frame size	Designation on rating plate of separately driven fan	Rated voltage range		Frequency	Rated speed	Power consumption	Rated current at rated voltage
			V	Hz	rpm	kW	A
225 M to 280 M	1MJ6 073-2CA92-Z: Data for 50/60 Hz	3 AC	220 to 240 Δ	50	2790	0.550	1.38
		3 AC	380 to 420 Y	50	2790	0.550	0.8
		3 AC	440 to 480 Y	60	3390	0.630	1.38
315 – 2-pole	1MJ6 073-2CA92-Z: Data for 50/60 Hz	3 AC	220 to 240 Δ	50	2790	0.550	1.38
		3 AC	380 to 420 Y	50	2790	0.550	0.8
		3 AC	440 to 480 Y	60	3390	0.630	1.38
315 – 4-, 6-, 8-pole	1MJ6 073-2CA92-Z: Data for 50/60 Hz	3 AC	220 to 240 Δ	50	2790	0.550	1.38
		3 AC	380 to 420 Y	50	2790	0.550	0.8
		3 AC	440 to 480 Y	60	3390	0.630	1.38

¹⁾ There is no rated voltage range for motors for Zone 2.

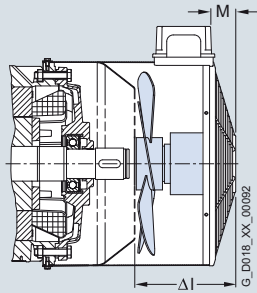
²⁾ The values are only valid for the medium voltage of the rated voltage; therefore, there is no valid rated voltage range.

Dimensions and weights of the Ex separately driven fans

Ex rotary pulse encoder (on cover) order codes **H86, H87**

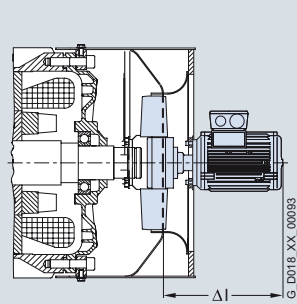
**1LA frame sizes 100 ... 225,
1LG frame sizes 180 and 200**

Ex separately driven fan
Order code **M97**



**1LG from frame size 225
1MJ7 from frame size 225**

Separately driven fan
Order codes **M95, M96, M98**



Frame size	Zone 22				Zones 2, 21		Zone 1 (Ex d/de)	
	1LA5/6/7/9		1LG4/6		1LG4/6		1MJ6/7	
	Δl	Weight approx. kg	Δl	Weight approx. kg	Δl	Weight approx. kg	Δl	Weight approx. kg
	mm	kg	mm	kg	mm	kg	mm	kg
100	141	4	–	–	–	–	–	–
112	158	4.5	–	–	–	–	–	–
132	177	5.5	–	–	–	–	–	–
160	227	7	–	–	–	–	–	–
180	269	10	269	10	–	–	–	–
200	272	11	272	11	–	–	–	–
225	272	11	235	22	235	22	372	27
250	–	–	235	25	235	25	370	32
280	–	–	235	28	235	28	370	34
315	–	–	247	36	247	36	385	40