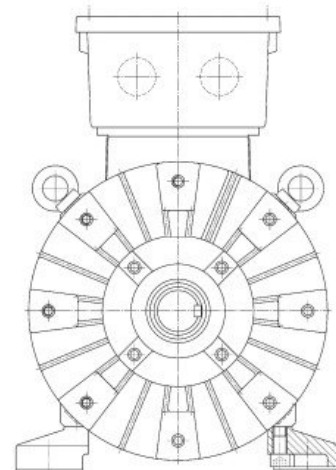
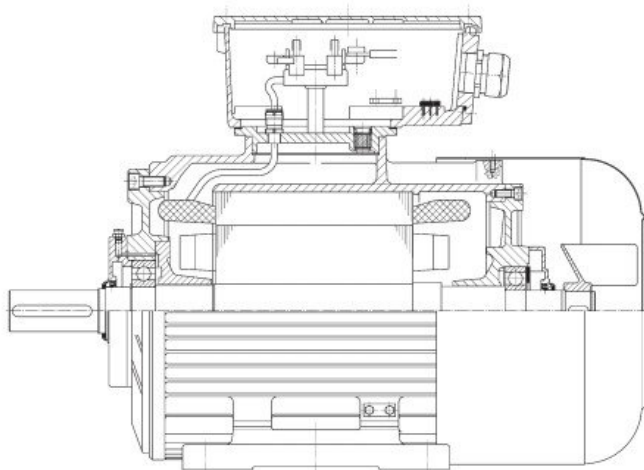


Materials, Plates and Labeling

18

For housing, end shields, terminal boxes and fans



Materials for housing, end shields, terminal boxes and fans

Frame size	Housing type		End shield	Terminal box		Fan cowl	Radial-flow fan	Axial-flow fan
	Material	Feet		Ex e	Ex d		2-pole	4, 6, 8-pole
63	Gray cast iron	Gray cast iron	Gray cast iron	Gray cast iron	Gray cast iron	Omitted	Omitted	Omitted
71		Bolted		Bolted	Bolted	Sheet steel	Plastic ¹⁾	Plastic ¹⁾
80								
90								
100								
112								
132								Plastic
160								
180								
200							Cast aluminum alloy ²⁾	Cast aluminum alloy ²⁾
225								
250								
280								
315								
355						Steel		
400	Steel	Steel	Steel			welded	Steel	Steel
450	welded	welded	welded				welded	welded

Note

- 1) For special operating conditions, e.g. low temperature, fans made of cast aluminum or steel can also be supplied for the frame size range 63 to 200.
- 2) Fans of steel on request

Labeling

Rating and test information is contained on a single plate attached to the housing. A duplicate is attached to the inside of the Ex e terminal box lid. The plates are made of stainless steel (material 1.4300)

Noise class 1 Standard version

Radial-flow fans that are suited for rotation in both directions are employed for the standard type. The fans used are capable of conveying large volumes of air efficiently and at low noise levels.

Noise class 2 axial-flow fans, series ...A - low-noise

For more exacting requirements, we recommend the low-noise variant with bi-directional axial-flow fan. These fans are available for 2-pole motors from frame size 112 and 4-pole motors from frame size 132. Through the aerodynamic design and the optimum angle of attack of the fan blades, a noise reduction for 2-pole motors of up to 10 dB(A) is achieved compared with the standard version.

Noise class 3 axial-flow fans in special-purpose design, series ...AR - very low-noise

For applications requiring extremely low noise levels, ATB has developed a range of exceptionally quiet, surface-cooled three-phase motors. Featuring a 2-pole design, these motors are approx. 12 dB(A) quieter than their standard, radial-flow fan counterparts, and are quieter even than the low-noise axial-flow fan motors.

For tables with the operating data for classes 1 to 3, see pages 60 and 62.

Noise class 4 Water-cooled, series ...W - lowest-noise version

The water-cooled ATB motors offer the following advantages:

- Reduced noise level due to omission of fan
- Prevention of air turbulence in dusty atmospheres (risk of dust explosion)
- Increased output compared to EN 50347 by a rating stage
- Mounting dimensions of IEC frame sizes are maintained
- Good heat removal without dissipation into surrounding air
- Potential for use of dissipated heat in heat exchangers

The motor housing is a welded steel construction and is double-walled for water-cooling. To prevent corrosion, the water jacket is coated internally with several layers of synthetic material.

The specified output values apply at a maximum water inlet temperature of 30 °C. The maximum permissible suspended matter content is 30 mg/l.

All motors are equipped with PTC thermistor temperature sensors for overload protection. Cooling water flow monitoring devices are therefore not required.

For tables with operating data, see page 110.

Frequency inverter operation

All systems are suitable for inverter operation without any restrictions.



Radial-flow fan, bi-directional
[noise class 1]



Axial-flow fan, fan cowl with inlet opening,
uni-directional
[noise class 2 and 3]



Water-cooled motors,
[noise class 4]

CD...H type series

The high-voltage three-phase motors are explosion-proof with a flameproof enclosure, in accordance with DIN EN 60079-1 for Group IIC and temperature classes T3 to T6.

Winding

According to design, round-wire random-wound windings or conventional form-wound coils are employed. The thermal application meets insulation class B. Only in special cases, the class F limit is slightly exceeded.

Design

- Series CD 355...H to CD 450...H
- Acceptance for category II 2G for use in zones 1 and 2
- Acceptance for category II 2G for use in zones 21 and 22
- Temperature classes T3 to T6
- Power range from 160 to approx. 700 kW (for 1500 rpm)
- Rated voltage from 3 kV to 6.6 kV
- 50Hz for 2 to 8 poles, 60 Hz for 4 to 8 poles
- Self-cooling (IC411) with fans which are independent of the direction of rotation
- Low-noise design with axial fans which are dependent of the direction of rotation
- Anti-condensation heater
- Low temperature up to -55 °C without heater
- Ambient temperatures of up to 60 °C
- Altitude of installation above 1000 m m.s.l.
- Installation of temperature sensors such as PT 100, PTC thermistors or KTY in winding and bearing for additional protection
- Customer-specific special-purpose versions

For tables with operating data, see page 111.



High voltage motor Ex d IIC

Three-phase AC Asynchronous Motors with Integrated Frequency Inverter

44

Compact drives

CD...I type series

Compact drives with the explosion protection types II 2G Ex de IIC T4 or II 2D Ex tD A21 IP65 T120 °C consist of a flameproof ATB type CD motor with a type CEIGL flameproof frequency inverter attached. It is suitable for rotation-speed-controlled applications in explosion-hazard areas of zones 1 and 21.

Frequency range

The certification covers a frequency range from 2 to 100 Hz. Compact drives are therefore suitable for use in drive solutions up to 6000 rpm. Above 50 Hz, the drive is designed for operation in the field-weakening range, i.e. with constant power.

Monitoring

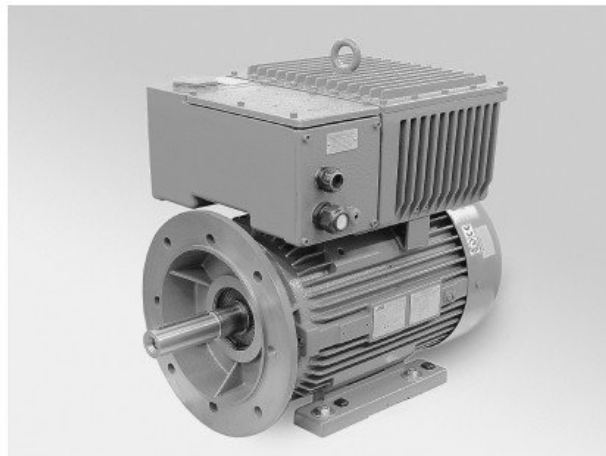
The thermal monitoring of motor and inverter is implemented through PTC thermistor temperature sensors. Optionally a certified thermistor tripping device, as well as an input contactor, can be installed in the inverter casing. A compact drive with galvanic separation can therefore provide the necessary switching functionality in case of a fault in an explosion-hazard area, without additional switching devices.

Frequency inverter

A full-featured LENZE 8200 vector frequency inverter is used to drive the motor with field-oriented vector control and a switching frequency of 4 kHz., providing excellent running and control characteristics across the entire speed and torque range. The adaptation of the inverter to the motor with the recording of the motor parameters, as well as the base parameterization of the frequency inverter, is carried out during final inspection and testing.

Control

The compact drive is controlled using various exchangeable frequency inverter modules according to user requirements. These modules are available for bus systems such as PROFIBUS-DP, interbus or CAN-Bus or as I/O modules for conventional control over analog set point value and ON/OFF contacts.



Compact Drive Type CD 132 M-4

Specifications

Ignition protection type	flameproof enclosure/dust protection II 2G Ex de IIC T4 II 2D Ex tD A21 IP65 T120 °C
Inverter casing certification	PTB 08 ATEX 1111X
Frame sizes	80 to 160
Supply voltage	380 to 500 V $\pm 10\%$, 50/60 Hz
Range of power	0,55 bis 11 kW
Maximum current	150 % I_n for 60 s in 10 min
Leakage current to PE (to EN 50178)	> 3,5 mA Fixed installations required
Fixed installations required	double PE
Output frequency	2 to 50/100 Hz
Frequency resolution absolute	0,02 Hz
Protective insulation of control circuits	Safe isolation of PELV to EN 50178
EMC	Compliance with requirements of EN 61800-3/A11

EMC

To limit power line interference, the inverter is equipped with a line reactor integrated into the flameproof casing as well as an EMC filter for grounded mains networks. The compact drive therefore meets the prerequisites of the specifications of the EMC Directive 2004/108/EC as well as the low-voltage Directive 2006/42/EC, i.e. conformity with DIN EN 61800-3/A11 and compliance with the limit value class A according to DIN EN 55011

Type... S series

This brake is always attached to a reinforced fan cowl on the non-drive side of the motor. Properties:

- Frame sizes 80 to 200
- Terminal compartment Ex e
- 10 to 270 Nm depending on frame size (for standard assignment, see page 106)
- 110 to 400 VAC 1~, 50/60 Hz 12 up to 356VDC
- Category 2 G / 2D / 2GD
- Protection type Ex de / Ex tD A21
- Protection group IIC
- Temperature class T5
- Maximum surface temperature T100°C
- Protection type IP67
- Ambient temperature -20 °C to +40 °C
- Thermal protection by means of thermo switch
- Manual ventilation (optional)
- Micro switch (optional)



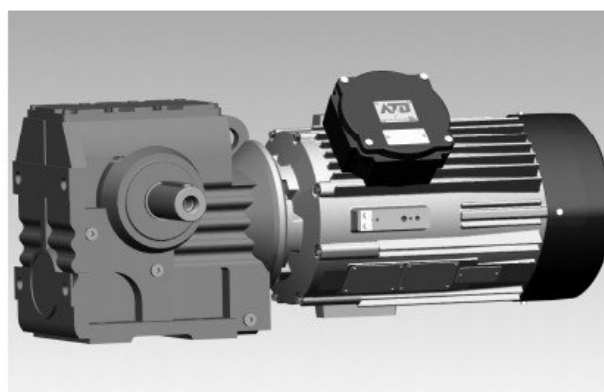
Motor with attached type... S brake

Direct transmission mounting

Motors with oil proof flanges can be fitted directly to transmission units. The shafts of these motors are sealed with radial seal rings to DIN 3760. The available flanges are listed in the table on page 38.

The seal rings must be spray or mist lubricated.

Motors up to frame size 450 have the fixed bearing on the drive side, in order to limit the thermal expansion of the rotor to the transmission.



Motor with attached transmission

ATB motors are designed to cover a wide range of applications. To meet the special requirements associated with each of these uses, a series of attachments has been developed. The standard attachment and use of brakes, tachogenerators and pulse generators, as well as reverse running locks, enables you to save costs. With the installation of one component, different combinations of special-purpose versions can be achieved.

Attachments are available for frame sizes of 80 and higher. Explosion-proof equipment is connected to a reinforced fan cowl and either coupled to the motor shaft directly or by means of a backlash-free coupling.

For IE2 or IE3 motor versions, the shaft length may be exceeded by the attachment for design reasons.

For IE1 frame sizes 80 to 132 brakes and rotary encoders can be incorporated directly into the explosion-proof motor housing.

Tachogenerator

Actual-value sensors are employed for the electrical remote measurement, as well as regulation of the motor speed. These devices convert the input variable "rotation speed" into an analog or digital electric signal.

Attached devices are connected using a separate terminal box.

In case of motors with integrated sensor (...R series), the connection is implemented in the main terminal box.



Motor with integrated incremental sensor

Reverse-running lock

In the operation of conveying systems or pumps, the reverse-running lock prevents reverse-running after the shutdown of the motor.

For the frame sizes 80 to 100, locking ball bearing can be used. This is especially recommended if this version should be combined with another attachment. Although the locking bodies are integrated into the bearings, the load-bearing capacity of the bearings is reduced only slightly compared to normal bearings. Since the locking bodies rub against the raceways, however, the maximum rotation speed is limited to 1500 rpm and a reduced bearing service life is to be expected.

From frame size 90, the reverse-running lock can also be mounted onto a reinforced fan cowl directly on the extended motor shaft. This reverse-running lock is designed so that the clamping pieces lift off the stationary outer ring due to the centrifugal force if the minimum speed is maintained. No additional frictional forces or noise are therefore generated with this version.

Reverse-running lock specifications

Frame size	Locking-bearing DS type	Rated torque [Nm]	Useful life at 1500 rpm [h]
80	ZZ 6204 L	32	3800
80 Y / 90	FC 6205	40	5600
90 Y / 100	ZZ 6206 M	110	1900

Frame size	Reverse-running lock Type	Rated torque [Nm]	Lift-off speed [U/min]
90	FXM 31-17 NX	100	890
100	FXM 38-17 NX	150	860
112	FXM 38-17 NX	150	860
132	FXM 38-17 NX	150	860
160	FXM 66-25 NX	800	700
180	FXM 66-25 NX	800	700
200	FXM 86-25 NX	1350	630
225	FXM 86-25 NX	1350	630
250	on request		
280	on request		

Special-Purpose Motors

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Built-on and built-in equipment,
reverse-running lock, direct gearing mounting

Our motors can be supplied with flameproof spring-loaded brakes in two variants. Attached as a flange version on the drive side (...SV type) or attached to a reinforced fan cowl on the non-drive side of the motor (...SVN or ...S types).

The electrical connection is made in a separate terminal compartment cast on to the brake.

Type...SV and ...SVN series

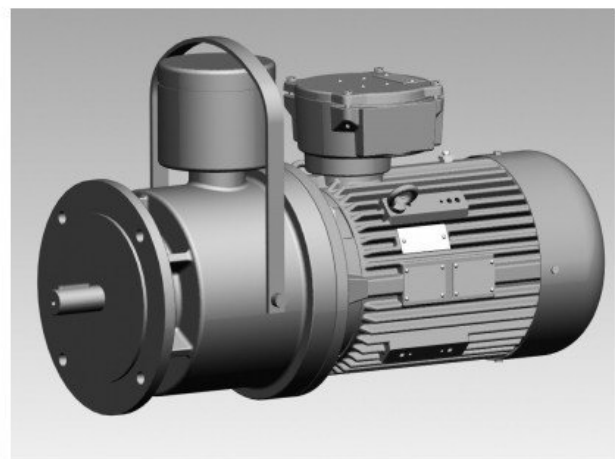
With flange motors of frame sizes 63 to 280 (e.g. B5 or B14 types), we recommend attaching this brake directly to the drive-side shaft end and the motor flange.

The brake then provides the IEC connection dimensions for shaft and flange for attaching it to the machine (...SV type).

For foot-mounted motors, the brake can be attached to a reinforced fan cowl on the non-drive side of the motor (...SVN type).

This brake is available in the following versions:

- Frame size 63 - 160 all pole configurations
Frame size 180 - 225 only 4, 6 or 8 poles
or 2-poles S3 40%
Frame size 250 - 280 only 4, 6, 8 poles
- Terminal box Ex d
- 5 to 1200 Nm depending on frame size (for standard assignments, see page 107)
- 24 to 690 VAC 1~, 50/60 Hz,
(for brake sizes 80 to 160 also 3~) 24 to 300 VDC
- Category 2 G / 2D / 2GD
- Protection type Ex d / Ex tD A21
Protection group IIB / IIC
- Temperature class T3 / T4 / T5
- maximum surface temperature T200°C / T135°C / T100°C
- Protection type IP66
- Ambient temperature -20 to +40 °C / -50 to +55 °C
- thermal protection by means of thermo switch (in addition, PTC thermistor as an option)
- Manual ventilation (optional; not for 250/280)
- Micro switch (optional)
- Anti-condensation heater (optional)
- Special flanges or shafts on request



Type CD...SV series