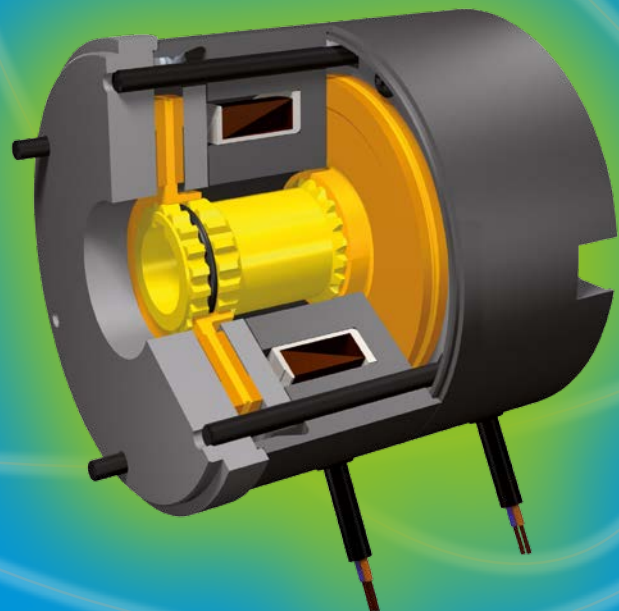




your reliable partner

ROBA[®]-secustop

**Safety brakes for
chain hoists and hoisting devices**

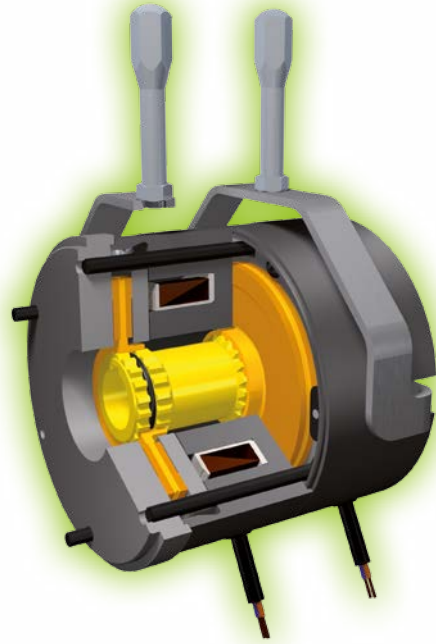


ROBA[®]-secustop

The perfect double brake for chain hoists and hoisting devices

Characteristics

- *cost-effective and economically priced*
- *easy installation without any adjustment work for high operational safety*
- *high reliability due to 100 % quality assurance*
- *maintenance-free due to wear-resistance*
- *low-noise due to integrated damping system*



Technical Data			Size		
			4	8	16
Nominal braking torque ⁷⁾	M _N	[Nm]	2 x 4	2 x 8	2 x 16
Electrical power	P ₂₀	[W]	2 x 31	2 x 34	2 x 33
Weight		[kg]	3	6	7
Maximum speed	n _{max}	[rpm]	4500	3600	3600
Protection			IP54		
Duty cycle			100 %		
Connection			2 x 0,88 mm ²		
Ambient temperature			-20 °C up to +40 °C		

Order Number

Without additional parts	0	
Hand release	1	
Flange plate	2	
Hand release and flange plate	3	3 Connection cable

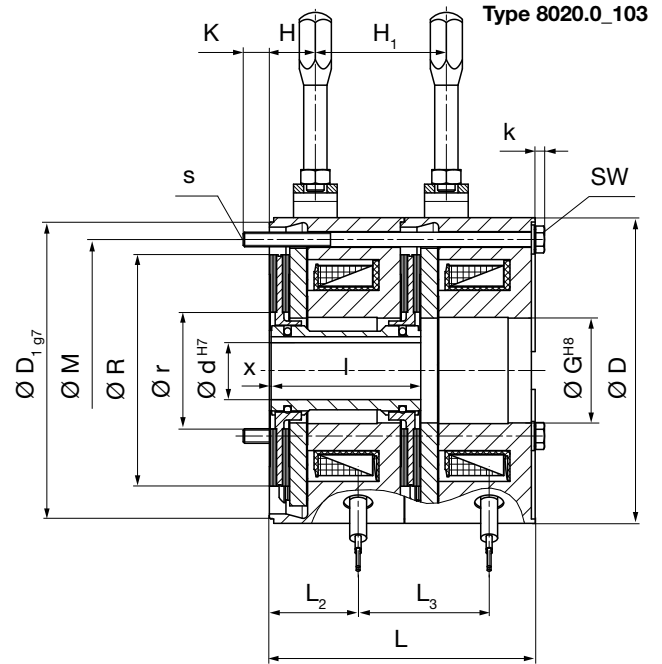
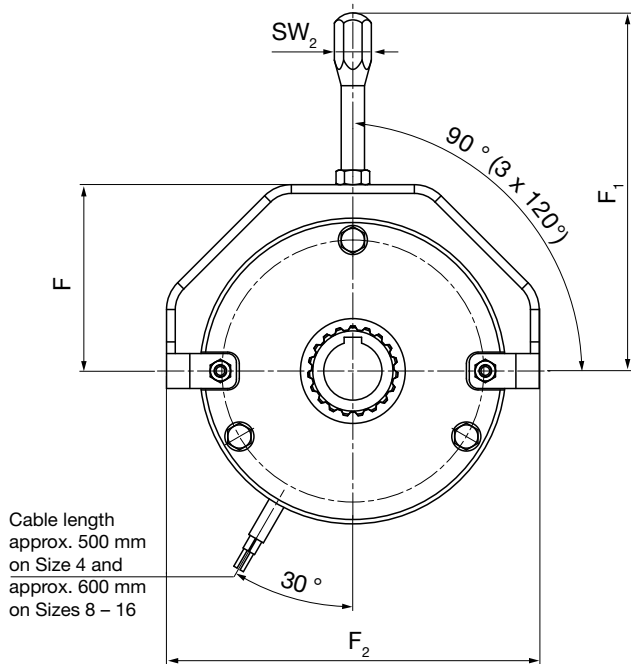


__	/	8	0	2	0	.	0	__	__	0	3	/	__	/	__	/	__
▲			▲	▲							▲		▲			▲	
Size	Nominal braking torque ⁷⁾ 100 %		0	0	without damping	Coil voltage ⁸⁾		Hub bore		Keyway acc.							
4			1	1	with damping	24, 104, 180, 207 [VDC]		Ø d ^{H7} (dimension page 3)		DIN 6885/1 or DIN 6885/3							
8																	
16																	

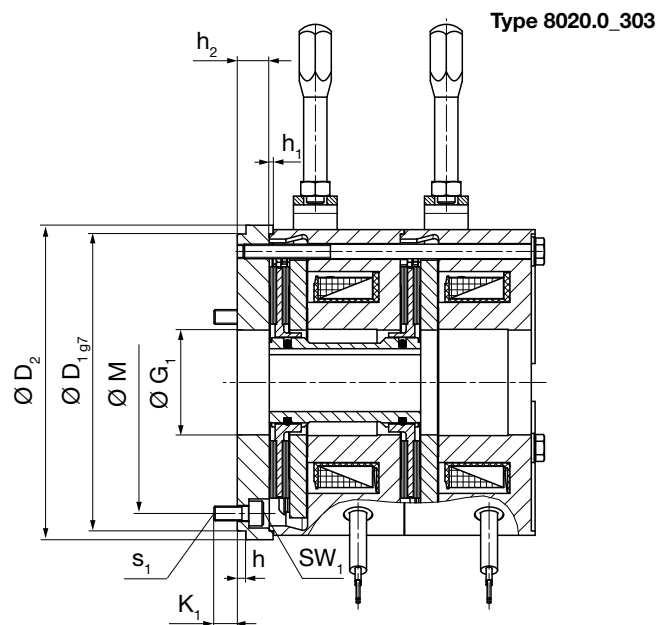
Example: 8 / 8020.01303 / 207 / 10 / 6885/1

7) Minimum nominal braking torque, braking torque tolerance + 60 %, other braking torque adjustments on request
8) We recommend connection via smoothed DC voltage or a mayr[®]-bridge rectifier.

Noises < 65 dB(A) (sound pressure level measurement) at nominal braking torque (only for Type 8020_1_ _ _)



Dimensions [mm]	Size		
	4	8	16
Ø D	90	105	132
Ø D _{1g7}	87	102	129
Ø D ₂	92	108	135
F	52,5	64	79
F ₁	112,5	123	166,5
F ₂	105	128	158
Ø G ^{H8}	30	36	45
Ø G ₁	30	36	44,5
H	20,8	15,8	26,3
H ₁	42,5	45	54
h	3	3	3
h ₁	1,5	1,5	1,5
h ₂	11	11	12,7
K	9,2	9	10,4
K ₁	6	8	10,1
k	2,3	3,2	4,3
L	86,3	91,3	109,3
L ₂	26,5	30,5	39,6
L ₃	42,5	44,2	54
l ⁵⁾	50	52	58
Ø M	72	90	112
Ø R	62,5	79,5	99
Ø r	32,1	40,1	45,1
s	3 x M4	3 x M5	3 x M6
s ₁	3 x M4	3 x M5	3 x M6
SW	7	8	10
SW ₁	3	4	5
SW ₂	Ø 20 ⁶⁾	11	14
x	0,5	0	2



Bores [mm]	Size			
	4	8	16	
Ø d ^{H7/1)}	min.	8	9	14
	max.	15 ²⁾	20 ³⁾	24 ⁴⁾

We reserve the right to make dimensional and constructional alterations.

- 1) Other diameters on request
- 2) Up to Ø 13 keyway acc. to DIN 6885/1, over Ø 13 keyway acc. to DIN 6885/3
- 3) Up to Ø 18 keyway acc. to DIN 6885/1, over Ø 18 keyway acc. to DIN 6885/3
- 4) Up to Ø 22 keyway acc. to DIN 6885/1, over Ø 22 keyway acc. to DIN 6885/3
- 5) Please observe the load on the shaft or key.
- 6) Hand release lever, round

ROBA®-secustop – Installation

Type 8020.0__03

Parts List

(Only use *mayr*® original parts)

- 1 Hub with 2 O-rings
- 2 O-ring
- 3 Coil carriers 1 and 2
- 4 Armature disks 1 and 2
- 5 Rotor 1
- 5.1 Rotor 2
- 6 Hand release
- 6.2 Hand release rod
- 7 Hexagon head screw
- 7.1 Washer
- 9 Flange plate
- 10 Cap screw
- 11 Thrust spring

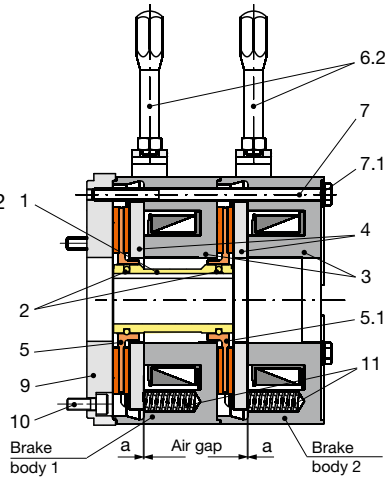


Fig 1: Type 8020.0_303

Installation – Short Description (Fig. 1)

Please find a detailed installation description in the Installation and Operational Instructions for the product (also on www.mayr.com).

1. Disassemble the flange plate (9 / dependent on Type) from the brake.
2. If necessary, mount the flange plate (9) onto the mounting surface using cap screws (10) (Please observe the tightening torque according to Table 1).
3. Mount the hub with the O-rings (1 / O-rings must be lightly greased) onto the shaft, bring it into the correct position and secure it axially.
4. Push rotor 1 (5) by hand using light pressure over both O-rings (2) onto the hub (1) (the rotor collar should face away from the machine wall or flange plate).
5. Push brake body 1 over hub (1) and rotor collar of rotor 1 (5) (the fixing holes should align with the threaded holes in the flange plate (9) or machine wall).
6. Push rotor 2 (5.1) by hand using light pressure over an O-ring (2) onto the hub (1), so that the friction lining of rotor 2 (5.1) lies against the brake body 1 (the rotor collar should be facing the machine wall or the flange plate).
7. Insert the hexagon head screws (7) into the bores in brake body 2 and then join with brake body 1 (see Fig. 1) and screw onto the machine wall or flange plate. Tighten the hexagon head screws (7) evenly all around using a torque wrench to a tightening torque acc. Table 1.

Hand Release

A hand release (6) is installed manufacturer-side, dependent on Size and Type (see Type key page 2 and Table 1).

Technical Data for Installation		Size		
		4	8	16
Nominal air gap	a [mm]	0,25 ^{+0,10} _{-0,05}	0,25 ^{+0,10} _{-0,05}	0,25 ^{+0,10} _{-0,05}
Release force per lever/at nominal torque	F [N]	35	35	110
Actuation angle Hand release	α [°]	12	12	15
Tightening torques				
Fixing screws Item 7	T _A [Nm]	3	5,8	14,9
Fixing screws Item 10	T _A [Nm]	3	5,8	14,9

Table 1

Brake Dimensioning

Brake Size Selection

1. Brake Selection

$$M_{\text{erf.}} = \frac{9550 \times P}{n} \times K \leq M_N \quad [\text{Nm}]$$

$$t_v = \frac{J \times n}{9,55 \times M_v} \quad [\text{s}]$$

$$t_4 = t_v + t_1 \quad [\text{s}]$$

$$M_v = M_N + (-) \times M_L \quad [\text{Nm}]$$

2. Inspection of thermic load

$$Q_r = \frac{J \times n^2}{182,4} \times \frac{M_N}{M_v} \quad [\text{J}]$$

The permitted friction work $Q_{r \text{ zul.}}$ per braking for the specified switching frequency can be taken from the friction-power diagrams (page 5).

If the friction work per braking is known, the max. switching frequency can also be taken from the friction-power diagrams (page 5).



Due to operating parameters such as sliding speed, pressing or temperature, the **wear values** can only be considered **guideline values**.

The stated values $Q_{r 0,1}$ and $Q_{r \text{ ges.}}$ (Table 2) are only reference values for specific friction work values < 0,5 J/mm² and sliding speeds < 10 m/s.

Key:

J	[kgm ²]	Mass moment of inertia
K	[-]	Safety factor (1 – 3 x depending on conditions)
M _{erf.}	[Nm]	Required braking torque
M _v	[Nm]	Deceleration torque
M _L	[Nm]	Load torque on system *sign in brackets (-) is valid if load is braked from downward movement
M _N	[Nm]	Nominal torque (Technical Data page 3)
n	[rpm]	Speed
P	[kW]	Input power
t _v	[s]	Braking action
t ₁	[s]	Connection time (Table 4, page 5)
t ₄	[s]	Total switch-on time
Q _r	[J]	Friction work present per braking
Q _{r 0,1}	[J]	Friction work per 0,1 mm wear (Table 2)
Q _{r ges.}	[J]	Max. possible friction work related to nominal air gap (Table 2)
Q _{r zul.}	[J]	Permitted friction work per braking

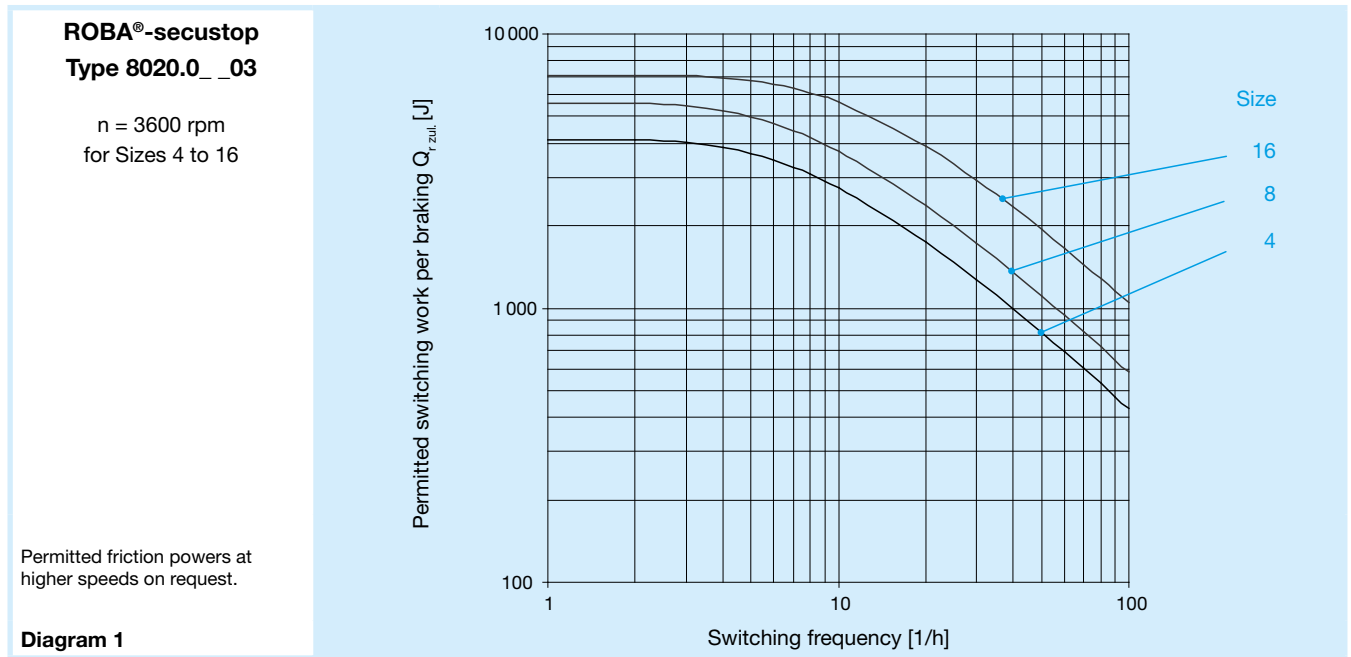
Friction Work		Size		
		4	8	16
Per 0,1 mm wear	Q _{r 0,1} [10 ⁶ J/0,1]	39,5	62,5	92,5
Max. possible friction work related to nominal air gap	Q _{r ges.} [10 ⁶ J]	118,5	337,5	585

Table 2

Mass Moment of Inertia		Size		
		4	8	16
Rotor + hub with d _{max}				
Type 8020.0__03	J _{R+H} [10 ⁻⁴ kgm ²]	0,27	0,43	2,94

Table 3

ROBA®-secustop – Friction-Power Diagrams/Switching Times



Switching Times

According to directive VDI 2241, the switching times are measured at a sliding speed of 1 m/s with reference to a mean friction radius. The brake switching times are influenced by the temperature, by the air gap between the armature disk and the coil carrier, which depends on the wear status of the linings, and by the type of quenching circuit. These values stated in the Table are mean values which refer to the nominal air gap and the nominal torque on a warm brake.

Typical switching time tolerances are ± 20 %.

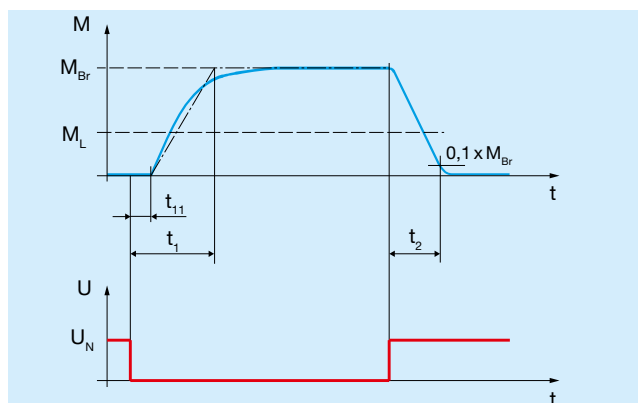


DC-side Switching

When measuring the DC-side switching times (t_{11} – time), the inductive switch-off voltage peaks are according to VDE 0580 limited to values smaller than 1200 volts. If other quenching circuits and constructional elements are installed, this switching time t_{11} and therefore also switching time t_1 increase.

Switching Times Type 8020.0 __ 03				Size		
				4	8	16
Nominal braking torque	Type 8020.0__03	M_N [Nm]	2 x 4	2 x 8	2 x 16	
Connection time	Type 8020.00_03 (without damping) DC-side switching	t_1 [ms]	43	81	101	
	Type 8020.01_03 (with damping) AC-side switching	t_1 [ms]	197	340	473	
Response delay on connection	Type 8020.00_03 (without damping) DC-side switching	t_{11} [ms]	30	68	40	
	Type 8020.01_03 (with damping) AC-side switching	t_{11} [ms]	114	190	252	
Separation time		t_2 [ms]	33	48	84	

Table 4: Switching Times Type 8020.0__03



Key:

- M_{Br} = Braking torque
- M_L = Load torque
- t_1 = Connection time
- t_{11} = Response delay on connection
- t_2 = Separation time
- U_N = Coil nominal voltage

Diagram 2: Torque-Time Diagram

ROBA®-secustop – Electrical Connection

Electrical Connection and Wiring

DC current is necessary for operation of the brake. The coil voltage is indicated on the Type tag as well as on the brake body and is designed according to the DIN IEC 60038 ($\pm 10\%$ tolerance). Operation can take place with alternating voltage using a rectifier or another suitable DC power supply. The connection possibilities can vary dependent on the brake equipment. Please follow the exact connections according to the Wiring Diagram. The manufacturer and the user must observe the applicable regulations and standards (e.g. DIN EN 60204-1 and DIN VDE 0580). Their observance must be guaranteed and double-checked!



Supply voltage requirements when **operating noise-damped brakes** (for Type 8020.01_03)

In order to minimise **noise development on the released brake**, it must only be operated via DC voltage with low ripple content. AC current operation can take place using a **bridge rectifier** or another suitable DC power supply. Supplies whose output voltages have a high ripple content (e.g. half-wave rectifiers, phase angle control systems, ...) are not suitable for operation of the brake.

Device Fuses

To protect against damage from short circuits, please add suitable device fuses to the mains cable.

Switching Behaviour

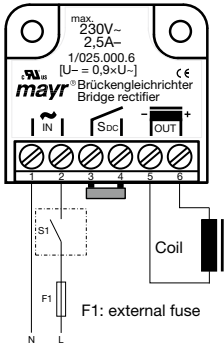
The reliable operational behaviour of a brake is to a large extent dependent on the switching mode used. Furthermore, the switching times are influenced by the temperature and the air gap between the armature disk and the coil carrier (dependent on the wear condition of the linings).

Magnetic Field Build-up

When the voltage is switched on, a magnetic field is built up in the brake coil, which attracts the armature disk to the coil carrier and releases the brake.

Magnetic Field Removal

• AC-side Switching

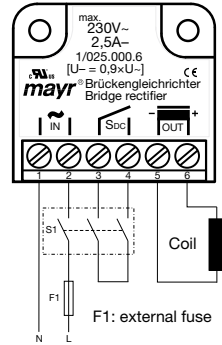


The power circuit is interrupted in front of the rectifier. The magnetic field slowly reduces. This delays the rise in braking torque.

When switching times are not important, please switch AC-side, as no protective measures are necessary for the coil and the switching contacts.

AC-side switching means **low-noise switching**; however, the brake engagement time is longer (approx. 6 – 10 times longer than with DC-side switch-off), use for non-critical braking times.

• DC-side Switching



The power circuit is interrupted between the rectifier and the coil as well as mains-side. The magnetic field reduces extremely quickly. This causes a quick rise in braking torque.

When switching DC-side, high voltage peaks are produced in the coil, which can lead to wear on the contacts from sparks and to destruction of the insulation.

DC-side switching means **short brake engagement times (e.g. for EMERGENCY STOP operation)**; however, louder switching noises.

• Protection Circuit

When using DC-side switching, the coil must be protected by a suitable protection circuit according to VDE 0580, which is integrated in *mayr*® rectifiers.

To protect the switching contact from consumption when using DC-side switching, additional protective measures are necessary (e.g. series connection of switching contacts).

The switching contacts used should have a minimum contact opening of 3 mm and should be suitable for inductive load switching.

Please make sure on selection that the rated voltage and the rated operating current are sufficient. Depending on the application, the switching contact can also be protected by other protective circuits (e.g. *mayr*®-spark quenching units), although this may of course then alter the switching times.



Guidelines on the Declaration of Conformity: A conformity evaluation has been carried out for the product (electromagnetic safety brake) in terms of the EC low voltage directive 2006/95/EC. The Declaration of Conformity is laid out in writing in a separate document and can be requested if required.

Guidelines on the EMC Directive (2004/108/EC): The product cannot be operated independently according to the EMC Directive. Due to their passive state, brakes are also non-critical equipment according to the EMC. Only after integration of the product into an overall system can this be evaluated in terms of the EMC. For electronic equipment, the evaluation has been verified for the individual product in laboratory conditions but not in the overall system.

Guidelines on the Machinery Directive (2006/42/EC): The product is a component for installation into machines according to the Machinery Directive 2006/42/EC. The brakes can fulfil the specifications for safety-related applications in coordination with other elements. The type and scope of the required measures result from the machine risk analysis. The brake then becomes a machine component and the machine manufacturer assesses the conformity of the safety device to the directive. It is forbidden to start use of the product until you have ensured that the machine accords with the regulations stated in the directive.

Guidelines on the ATEX Directive (2006/42/EC): Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion. For application of this product in areas where there is a high danger of explosion, it must be classified and marked according to directive 94/9/EC.

Safety Regulations

Brakes may generate several risks, among others:



During the required risk assessment when designing the machine or system, the dangers involved must be evaluated and removed by taking appropriate protective measures.

To prevent injury or damage, only professionals and specialists are allowed to work work on the devices. They must be familiar with the dimensioning, transport, installation, initial operation, maintenance and disposal according to the relevant standards and regulations.

Application Conditions



The catalogue values are guideline values which have been determined in test facilities. It may be necessary to carry out your own tests for the intended application. When dimensioning the brakes, please remember that installation situations, braking torque fluctuations, permitted friction work, run-in behaviour and wear as well as general ambient conditions can all affect the given values. These factors should therefore be carefully assessed, and alignments made accordingly.

- Mounting dimensions and connecting dimensions must be adjusted according to the size of the brake at the place of installation.
- The magnetic coils are designed for a relative duty cycle of 100 %, if no other values are stated.
- The braking torque is dependent on the present run-in condition of the brakes.
- The brakes are only designed for dry running. The torque is lost if the friction surfaces come into contact with oil, grease, water or similar substances or foreign bodies.
- Manufacturer-side corrosion protection of the metallic surfaces.
- The rotors may rust up and block in corrosive ambient conditions and/or after long periods of storage.

Ambient Temperature: – 20 °C up to + 40 °C

Earthing Connection

The brake is designed for Protection Class I. This protection covers not only the basic insulation, but also the connection of all conductive parts to the protective conductor (PE) on the fixed installation. If the basic insulation fails, no contact voltage will remain. Please carry out a standardised inspection of the protective conductor connections to all contactable metal parts!

Protection

(mechanical) IP54: When installed, dust-proof and protected against contact as well as against water spray from any direction (dependent on customer-side mounting method).

(electrical) IP54: When installed, dust-proof and protected against contact as well as against water spray coming from any direction.

Intended Use

mayr[®] brakes have been developed, manufactured and tested in compliance with the VDE 0580 standard and in accordance with the EU Low Voltage Directive as electromagnetic components. During installation, operation and maintenance of the product, the requirements for the standard must be observed. *mayr*[®] brakes are for use in machines and systems and must only be used in the situations for which they are ordered and confirmed. Using them for any other purpose is not allowed!

Guidelines for Electromagnetic Compatibility (EMC)

In accordance with the EMC Directives 2004/108/EC, the individual components produce no emissions. However, functional components e.g. mains-side energisation of the brakes with rectifiers, phase demodulators, ROBA[®]-switch devices or similar controls can produce disturbance which lies above the allowed limit values. For this reason it is important to read the Installation and Operational Instructions very carefully and to keep to the EMC Directives.

Standards, Directives and Regulations Used

VDE 0580	Electromagnetic devices and components, general specifications
2006/95/EC	Low voltage directive
95/16/EC	Elevator directive
CSA C22.2 No. 14-2010	Industrial Control Equipment
UL 508 (Edition 17)	Industrial Control Equipment
EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 61000-6-4	Interference emission
EN 12016	Interference immunity (for elevators, escalators and moving walkways)
EN 60204-1	Electrical equipment of machines

Liability

- The information, guidelines and technical data in these documents were up to date at the time of printing. Demands on previously delivered brakes are not valid.
- Liability for damage and operational malfunctions will not be taken if:
 - the Installation and Operational Instructions are ignored or neglected.
 - the brakes are used inappropriately.
 - the brakes are modified.
 - the brakes are worked on unprofessionally.
 - the brakes are handled or operated incorrectly.

Guarantee

- The guarantee conditions correspond with the Chr. Mayr GmbH + Co. KG sales and delivery conditions.
- Mistakes or deficiencies are to be reported to *mayr*[®] at once!



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You can find the complete address for the representative responsible for your area under www.mayr.com in the internet.