

# **ROBA®-duplostop® ROBA®-twinstop®**

the perfect elevator brakes for compact drives



www.**Mayr**<sup>®</sup>.com

P.Q8012.V00.EN





# Expert know-how in development and design

As the technological leader, *mayr*<sup>®</sup> power transmission focuses on continuous further development. Today, highly qualified engineers and technicians work on tomorrow's innovations using the most up-to-date tools. The many years of experience and countless trials carried out by the Research and Development department at the headquarters in Mauerstetten form the basis for a conscientiously-planned service lifetime, taking into account realistic and verified braking torque tolerances.

The values upheld by our traditional, family-run company also include long-term stability, independence as well as a good reputation and satisfied customers.

Therefore, we place emphasis on:

- Tested product quality
- Optimum customer service
- Comprehensive know-how
- Global presence
- Successful innovations
- Effective cost management

# Tested quality and reliability

*mayr*<sup>®</sup> brakes are subject to meticulous quality inspections. These include quality assurance measures during the construction process as well as a comprehensive final inspection. Only the best, tested quality leaves our factory. All products are rigorously tested on calibrated test stands, and adjusted precisely to the requested values. An electronic database in which the measurement values are archived together with the associated serial numbers guarantees 100 % traceability. On request, we confirm the product characteristics with a test protocol.

The certification of our quality management according to DIN EN ISO 9001:2000 confirms the quality-consciousness of our colleagues at every level of the company.

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Basic Type

3

With release monitoring 3)

With release<sup>3)</sup> and wear monitoring

 $\wedge$ 

Braking torque

(see Technical

Data)

 $\wedge$ Coil voltage 2)

24, 104, 180, 207

[VDC]

With wear monitoring

# Example: 200 / 8010.20233 / 2 x 150 Nm / 207 VDC

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1) Operation with overexcitation (1,4 to 2 x the nominal voltage) necessary (only on Type 8010). 2) We recommend connection via smoothed DC voltage or the application of a mayr®-DC voltage module.

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3) Release monitoring through mechanically-actuated microswitches or through optional contactless proximity switches (see page 11).

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4) Design with hub on Type 8010 available on request

### Design

These compact, rectangular elevator brakes are redundant safety brakes with two brake circuits next to one another. This permits an extremely short construction length depending on the construction type. On most designs, the additional attachment of an encoder is also possible without changing the total construction length. All these noise-damped safety brakes are designed for a duty cycle of 60 % with operating mode S3 in the standard version. Special designs for higher duty cycle are available on request.

Manually actuated using rotating hand release

With rotating hand release for Bowden cable

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Nominal braking torque 100 %

Braking torque increased 1)

Braking torque reduced

# **TÜV (German Technical Inspectorate)**

Type examination tested: Braking element acting on the traction

**Order Number** 

ROBA®-duplostop®

8

ROBA®-twinstop®

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Size

125

up to

1500

Basic Type

Certificate (EN 81-20 / EN 81-50)

unintended car movement.

sheave, as a part of the protection device against overspeed for the car moving in upwards direction, as well as against

release of the brake

### Also licensed as protection against excessive upward speeds when fitted with release monitoring (type examination tested)

Highest safety system of two independent brake circuits according to EN 81-20

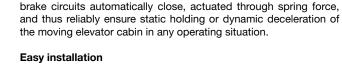
ROBA®-duplostop®, ROBA®-twinstop®

The doubled safety brakes for elevator drives

**Exceptionally short construction** 

**Performance Characteristics** 

- Cost-effective redundant elevator brake
- Brake circuits can be individually electrically switched and inspected
- Easy installation
- No air gap adjustment necessary
- Virtually silent due to patented
- mayr<sup>®</sup> noise damping Optional rotating hand release for manual



The compact brake design, which is easy to assemble, permits short brake assembly times. After the brakes have been mounted, no further adjustment work is required, as the working air gap and release monitoring have already been adjusted for reliable function at the factory. In this way, possible malfunctions due to mounting or adjustment errors are excluded through the design.

Both brake circuits brakes when the springs are applied, i.e. in ener-

gised operating condition, the electromagnetic brake is open. After the power is switched off or after unforeseeable power failures, both

### Maintenance-free

The safety brake is mainly maintenance-free. The maintenance work is limited to an inspection of the brake linings. These friction linings, however, are extremely wear-resistant, and have a very long lifetime.

#### Virtually silent

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The brakes operate extremely quietly due to the patented mayr® noise damping system.



ROBA®-duplostop®

Function

mayr

your reliable partner

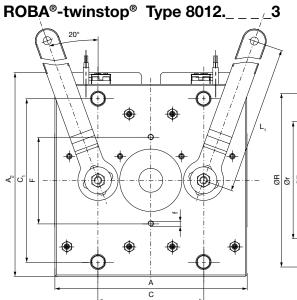


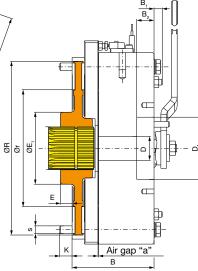
ROBA®-twinstop®



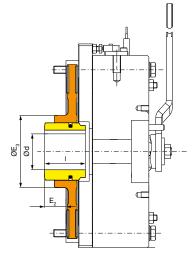


# Compact Design, Sizes 125 up to 225





Design for splined motor shaft



Hub design

 DIN 5480 (Ø d<sub>B</sub> x m x z) Directly splined motor shaft other splines on request

2) Spline length on request

Design with rotating hand release manually actuated

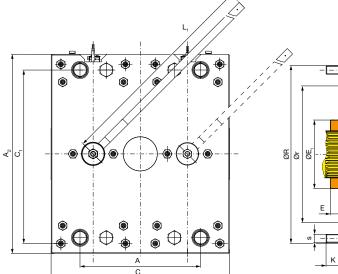
Dimensions			Si	ze		
			125	180	2:	25
	splined motor shaft <sup>1) 2)</sup>		45 x 2 x 21	50 x 2 x 24	55 x 2 x 26	55 x 2 x 26
Design			60 x 2.5 x 22	72 x 3 x 22	82 x 3 x 26	82 x 3 x 26
Design	Hub	d <sub>min</sub>	32	42	45	45
		d <sub>max</sub>	37	45	53	52
A			200	200	200	200
A	+2 2		212	237	267	267
В			85.6	92.6	97.6	97.6
B			10	11	10	10
B	2		18	15.5	20	20
С			110	110	110	110
C	C <sub>1</sub>		170	195	225	225
D		25	25	25	25	
D <sub>1</sub> <sup>+0,1</sup>		65	65	65	65	
	E		12	13.5	10.5	14.5
	E,		75	92	92	110
E,	2		22	22	20	20
E,	3		75	92	92	110
F			90	90	90	90
L,	I		233	233	273	273
f			2 x M6 (8 deep)			
к			13	16	15.5	15.5
1	I		42	46	50	50
r	r		122	145	145	180
R			181	196	196	222.5
S			4 x M8	4 x M8	4 x M10	4 x M10

Technical Data					Size				
Technical Data	125	180	22	25					
Nominal braking torque	Type 8012. <b>0</b> 3	M <sub>nom</sub>	[Nm]	2 x 125	2 x 180	2 x 225	2 x 250		
reduced braking torques up to:	Type 8012. <b>2</b> 3	М	[Nm]	2 x 90	2 x 140	2 x 170	-		
Electrical nominal power	Type 8012. <b>0</b> 3	P <sub>20</sub>	[W]	2 x 64	2 x 69	2 x 81	2 x 81		
Weight (without hub)			[kg]	21.6	24.5	29.7	30.3		
Maximum speed in the application range elevator			[rpm]	800	600	600	500		
Nominal air gap (Tolerance + 0,15/-0,05)			[mm]		0.	45			



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# ROBA®-twinstop® Type 8012.\_\_

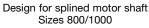


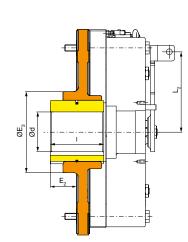
Air gap "a"

В,

Ш

Design with rotating hand release manually actuated (insertable) Sizes 800/1000





Compact Design, Sizes 600 up to 1000

Design with hub and rotating hand release for bowden cable Size 600

 DIN 5480 (Ø d<sub>B</sub> x m x z) Directly splined motor shaft other splines on request
 Spline length on request

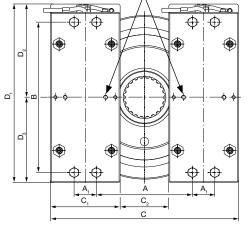
Size **Dimensions** 600 800 1000 80 x 3 x 25 72 x 3 x 22 90 x 3 x 28 splined motor . shaft 1) 2) 90 x 3 x 48 \_ \_ Design 42 45 d 32 Hub 45 d 55 53 **A**+4 237 240 220 A2+2 303 340 395 В 102.6 112 126 B, 8.4 10 13 **B**<sub>2</sub> 15 25 25 **C** +3 315 340 340 **C**<sub>1</sub> 258 300 342 **D** +0,1 65 65 65 D, 65.5 65.5 65.5 Ε 20 15 16 Ε, 124 130 124 Ε, 25 \_ \_ E<sub>3</sub> 124 130 124 L, 606 606 406  $L_2$ 123 171 171 κ 26 24 16 70 T \_ 250/280 r 250 260 R 315 315/348 338 s 4 x M8 4 x M12 4 x M16

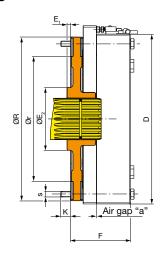
Technical Data	Size					
Technical Data	600	800	1000			
Nominal braking torque	Type 8012.03	M <sub>nom</sub>	[Nm]	2 x 600	2 x 800/900	2 x 1200
reduced braking torques up to:	Type 8012.23	М	[Nm]	may	Please contact rr® power transmis	sion
Electrical nominal power	Type 8012.03	P <sub>20</sub>	[W]	2 x 92	2 x 118	2 x 155
Weight (without hub)			[kg]	54	73	97
Maximum speed in the application range elevator			[rpm]	800	600	460
Nominal air gap (Tolerance + 0,15/-0,05)			[mm]		0.45	

We reserve the right to make dimensional and constructional alterations.



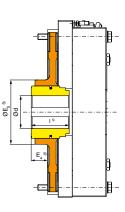
# ROBA®-duplostop® Type 8010.\_\_\_\_3





Design for splined motor shaft

# Sizes 200 up to 600



Hub design

_				ze	
D	imensions	200	40 short	0	600
		60 x 2.5 x 22	65 x 3 x 20	long 72 x 3 x 22	72 x 3 x 22
	splined motor	65 x 3 x 20	67 x 3 x 21	82 x 3 x 26	82 x 3 x 26
Design	shaft 1) 2)	67 x 3 x 21	72 x 3 x 22	90 x 3 x 28	-
	Hub <sup>3)</sup> <b>d</b> <sup>4)</sup>	45/56	56	56	56/62
Α	variable on request	138	153	128	165
<b>A</b> <sub>1</sub>		32	42	42	50
B		216	238	258	264
С	variable on request	270	315	290/335	355
<b>C</b> <sub>1</sub>		100	120	120	140
C <sub>2</sub>	variable on request	70	75	50/95	75
D		244	268	290	298
D <sub>1</sub>		256	280	303	311
D <sub>2</sub>		134	146	157	162
D <sub>3</sub>		122	134	146	149
	Type 8010.0 _ 0 _ 3	5	17	17	25
E,	Type 8010.2 _ 0 _ 3	-			-
	Type 8010.1 3	5	17	21	25
E <sub>2</sub>		90	90	90	110
F	Type 8010.0 _ 0 _ 3 Type 8010.2 _ 0 _ 3	86.1	96.1	101.1	101.1
	Type 8010.1 3	91.1	96.1	101.1	101.1
	Type 8010.0 _ 0 _ 3	14	14	19	19
К	Type 8010.2 _ 0 _ 3	14	14	13	13
	Type 8010.1 _ 0 _ 3	19	14	19	19
r		180	200	200/212	220/210
R		235	253	253/281	281
S		8 x M8	8 x M10	8 x M10	8 x M12



Rotating hand release Type 8010.\_\_2\_3

 DIN 5480 (Ø d<sub>B</sub> x m x z) Directly splined motor shaft other aplined on request

- other splines on request Spline length on request
- Spline length on request
   Recommended tolerance hub-shaft H7/k6

4) Preferred bore

5) Dimensions on request

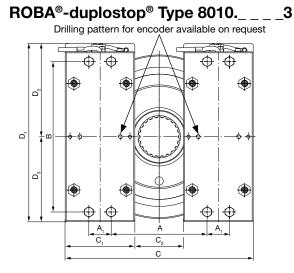
						Size			
Technical Data			200	40	00	600			
						short	long		
Nominal b	raking torque	Туре 8010.03	$M_{nom}$	[Nm]	2 x 200	2 x 410	2 x 430/480	2 x 590	
Higher braking torque	king torguo	Type 8010.1 3	М	[Nime]	2 x 220	-	2 x 490/540	2 x 640	
	Type ou tu. 13	IVI	[Nm]	2 x 240	-	-	2 x 670		
Reduced b	oraking torques up to:	Туре 8010.23	М	[Nm]	2 x 150	2 x 210/280	2 x 375	2 x 500	
Electrical I	nominal power	Type 8010.03	P <sub>20</sub>	[W]	2 x 74	2 x 93	2 x 92	2 x 86	
Weight				[kg]	27	36.6	43.5	51.6	
		Maximum speed	n <sub>max</sub>	[rpm]	1200	1000	1000	800	
Speed inspected max. speed in the elevator area as a type-examination tested brake		n	[rpm]	810	708	1000	500		
Nominal air gap (tolerance +0,15/-0,05) a			а	[mm]	0.45				

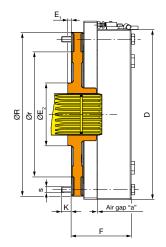
Braking torque tolerance 0 % / +60 %.

We reserve the right to make dimensional and constructional alterations.



# Sizes 800 up to 1500





Design for splined motor shaft



Rotating hand release manually actuated Type 8010.\_\_1\_3

Dimensions		Size			
		800	1000	1500	
splined shaft <sup>1) 2)</sup>	Туре 8010.0 3	82 x 3 x 26	90 x 3 x 28	95 x 3 x 30	
DIN 5480	2	90 x 3 x 28	98 x 4 x 23	98 x 4 x 23	
Ød <sub>e</sub> x m x z	Туре 8010.1 3	98 x 4 x 23	-	-	
Ă	variable on request	169	175	210	
<b>A</b> <sub>1</sub>		56	60	70	
В		300	342	410	
C	variable on request	375	395	480	
<b>C</b> <sub>1</sub>		150	160	200	
<b>C</b> <sub>2</sub>	variable on request	75	75	80	
D		336	380	458	
D <sub>1</sub>		349	393	458	
D <sub>2</sub>		181	203		
D <sub>3</sub>		168	190		
Е,	Type 8010.0 _ 0 _ 3 Type 8010.2 _ 0 _ 3	20	22.5	44	
1	Type 8010.13	20	22.5		
E <sub>2</sub>		124	132	150	
F	Type 8010.0 _ 0 _ 3 Type 8010.2 _ 0 _ 3	108.1	108.1	116	
	Type 8010.1 3	108.1	108.1		
к	Type 8010.0 _ 0 _ 3 Type 8010.2 _ 0 _ 3	22	22	21	
	Type 8010.1 _ 0 _ 3	22	22		
r		250	280	336	
R		315	348	418	
S		8 x M12	8 x M16	8 x M16	



Rotating hand release manually actuated (insertable) Type 8010.\_ \_1\_3 Size 1500

 Design with hub available on request (recommended tolerance hub-shaft H7/k6)
 Spline length on request

Taabaia	Technical Data					Size			
Technic						1000	1500		
Nominal b	oraking torque	Type 8010. <b>0</b> 3	$M_{nom}$	[Nm]	2 x 830	2 x 1015	2 x 1700		
Higher braking torque     Type 8010.13		Type <b>9010</b> 1 - 2	М	[Nm]	2 x 930	2 x 1200	-		
			111		2 x 900	-	-		
Reduced	braking torques up to:	Type 8010. <b>2</b> 3	М	[Nm]	2 x 650	2 x 920	2 x 1250		
Electrical	nominal power	Type 8010.03	P <sub>20</sub>	[W]	2 x 118	2 x 121	2 x 152		
Weight				[kg]	66.5	83	139		
		Maximum speed	n <sub>max</sub>	[rpm]	600	500	400		
Speed inspected max. speed in the elevator area as a type-examination tested brake		n	[rpm]	400	400	400			
Nominal air gap (tolerance +0,15/-0,05)			а	[mm]		0.45			

Braking torque tolerance 0 % / +60 %.

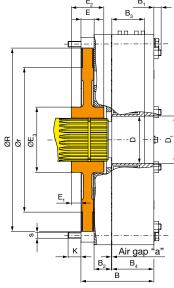
We reserve the right to make dimensional and constructional

7



# ROBA®-twinstop® Type 8012.\_\_\_3

# 



Design for splined motor shaft

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Rectangular Design, Sizes 200 up to 350

Hub design

 DIN 5480 (Ø d<sub>B</sub> x m x z) Directly splined motor shaft other splines on request

2) For version with hub

3) Possible without overexcitation < 65 dB (A)</li>
4) Preferred bore

Release version by hand on request



Rotating hand release for bowden cable Type 8012.\_\_2\_3

				Size	
C	Dimensi	ons	200	250	350
			60 x 2.5 x 22	65 x 3 x 20	65 x 3 x 20
Design <sup>1)</sup>	splined motor shaft		65 x 3 x 20	60 x 2.5 x 22	-
			90 x 3 x 28	90 x 3 x 28	90 x 3 x 28
	Hub	d 4)	56	56	56
	dun	d <sub>max</sub>	60	60	60
Α			160	160	200
Α			170	170	210
A	2		290	290	300
В			90.6	100.6	100.6
В			12	12	12
В			24.1	24.1	24.1
В			35	45	45
B <sub>4</sub>		48	58	58	
C		90	90	120	
C C		264	264	272	
D			65	65	65
D			65.5	65.5	65.5
E			18	18	18
E	1		5	13.5	17
E	2		41	45	52
E			90	110	110
E			28	28	28
E			110	110	110
F			180	180	200
F	1		135	135	185
f			4 x M5 (8 deep)	4 x M5 (8 deep)	4 x M5 (8 deep)
К		18	18	17	
I		65	65	65	
r			180 / 200 <sup>2)</sup>	200	208
R			235 / 253 <sup>2)</sup>	253	273
S			4 x M8	4 x M8	4 x M10

Size **Technical Data** 200 250 350 M<sub>nom</sub> Type 8012.0\_ \_ \_3 Nominal braking torque <sup>3)</sup> [Nm] 2 x 200 2 x 250 2 x 350 Increased braking torque without overexcitation Type 8012.1\_\_\_3 Μ [Nm] 2 x 280 2 x 410 2 x 160 reduced Μ [Nm] 2 x 230 2 x 300 Type 8012.2\_\_\_3 2 x 250 braking torque Μ [Nm] 2 x 185 Type 8012.0\_ \_ \_3 **Electrical nominal power** P<sub>20</sub> [W] 2 x 63 2 x 79 2 x 82 [kg] Weight (without hub) 23.7 26.8 34.6 n<sub>max</sub> [rpm] 1000 Maximum speed 1000 1000 Nominal air gap (Tolerance + 0,2/-0,05) [mm] 0.45 а

We reserve the right to make dimensional and constructional alterations.



# Spark Quenching Unit Type 070.000.6

# Application

Reduces spark production on the switching contacts occurring during DC-side switch-off of inductive loads.

- Voltage limitation according to VDE 0580 2000-07, Item 4.6.
- Reduction of EMC-disturbance by voltage rise limitation, suppression of switching sparks.
- Reduction of brake engagement times by a factor of 2 4 compared to freewheeling diodes.

# Function

The spark quenching unit will absorb voltage peaks resulting from inductive load switching, which can cause damage to insulation and contacts. It limits these to 70 V and reduces the contact load. Switching products with a contact opening distance of > 3 mm are suitable for this purpose.

# ROBA®-switch Type 017.\_00.2

# Application

ROBA<sup>®</sup>-switch fast acting rectifiers are used to connect DC consumers to alternating voltage supplies, for example electromagnetic brakes and clutches (ROBA-stop<sup>®</sup>, ROBA<sup>®</sup>-quick, ROBATIC<sup>®</sup>) as well as electromagnets, electrovalves, etc.

#### Fast acting rectifier ROBA®-switch 017.\_00.2

- Consumer operation with overexcitation or power reduction
- Input voltage: 100 500 VAC
- Maximum output current I<sub>RMS</sub>: 3 A at 250 VAC
- UL-approved

### **Function**

The ROBA<sup>®</sup>-switch is used for operation at an input voltage of between 100 and 500 VAC, depending on the size. They can switch internally from bridge rectification output voltage to half-wave rectification output voltage. The bridge rectification time can be modified from 0.05 to 2 seconds by exchanging the external resistor ( $R_{w}$ ).



# Application

Rectifiers are used to connect DC consumers to alternating voltage supplies, for example electromagnetic brakes and clutches (ROBA-stop®, ROBA-quick®, ROBATIC®), electromagnets, electrovalves, contactors, switch-on safe DC motors, etc.

# Function

The AC input voltage (VAC) is rectified (VDC) in order to operate DC voltage units. Also, voltage peaks, which occur when switching off inductive loads and which may cause damage to insulation and contacts, are limited and the contact load reduced.





Calculation output voltage				
Holding voltage	$VDC = VAC \times 0,45$			
Overexcitation voltage	VDC = VAC x 0,9			



Calculation output voltage

 $VDC = VAC \times 0.9$ 

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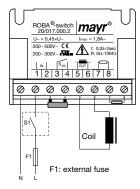
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# **Electrical Connection**

### Magnetic Field Removal

#### AC-side Switching

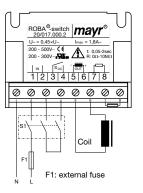


The power circuit is interrupted in front of the rectifier. The magnetic field slowly reduces. This delays the rise in braking torque.

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

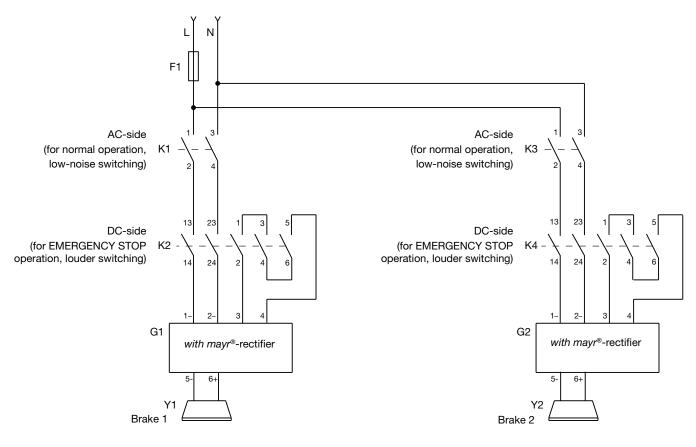
DC-side switching means **short brake engagement times (e.g. for EMERGENCY STOP operation)**; however, louder switching noises.

#### 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*<sup>®</sup>-rectifiers. To protect the switching contact from consumption when using DC-side switching, additional protective measures may be 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 protection circuits (e.g. *mayr*<sup>®</sup>-spark quenching unit), although this may of course then alter the switching times.

#### Switching example

The mayr®-rectifiers shown in the Figure below serve as a switching example (e.g. combined switching for the elevator industry).





# Contactless release monitoring for ROBA-stop<sup>®</sup> safety brakes

- Wear-free
- Robust
- Magnetic field-resistant
- Absolutely reliable

## Function

Release monitoring prevents unpermitted operating conditions such as for example starting up against a closed brake. *mayr*<sup>®</sup> power transmission, international leaders in safety brakes for safety-critical applications such as for example passenger elevators or vertical axes, now provides a contactless system with inductive proximity switches for its safety brakes as an alternative to the tried and tested release monitoring system with microswitches.

### Maximum reliability and accuracy

As there are no mechanical parts involved, the lifetime of this new, contactless release monitoring system is not dependent on the switching frequency. The system is **magnetic field** resistant and works **absolutely reliably** and **wear-free**. It is also resistant to impacts and vibrations, as there are no movable parts, and the electronics are completely encapsulated. Other advantages of the inductive proximity switch are the high switching point repetitive accuracy, the low hysteresis and the low temperature drift.

The switching bolt for the inductive proximity switch is installed at the factory and is, in contrast to the release monitoring system with microswitch, not adjustable. Application errors through adjustment of the switching point position can be excluded. This feature, too, plays an important role in maximising functional and operatinal safety.



# **Optionally NO or NC contacts**

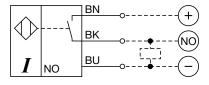
The contactless release monitoring system can be designed either as an NO or NC contact. With the NC contact function, the ,High' signal is generated if the brake is switched when de-energised. Here the armature disk drops and the brake closes. Cable breakage is recognised when the brake is closed.

With the NO contact function, the 'High' signal is generated if the brake is energised and the armature disk releases the rotor. The brake is released. Only on generation of the ,High' signal is the motor enabled for start-up. This reliably prevents the motor from starting up against a closed brake. Cable breakage is recognised when the brake is open.

### **Technical Data**

Operating voltage:	10 30 VDC
DC rated operating current:	≤ 150 mA
Ambient temperature	-25 to +85 °C
Repetitive accuracy	< 0.015 mm
Hysteresis	< 0.025 mm
Temperature drift	< +- 0.05 mm
(-25 °C to +85 °C)	

## NO contact function wiring diagram



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