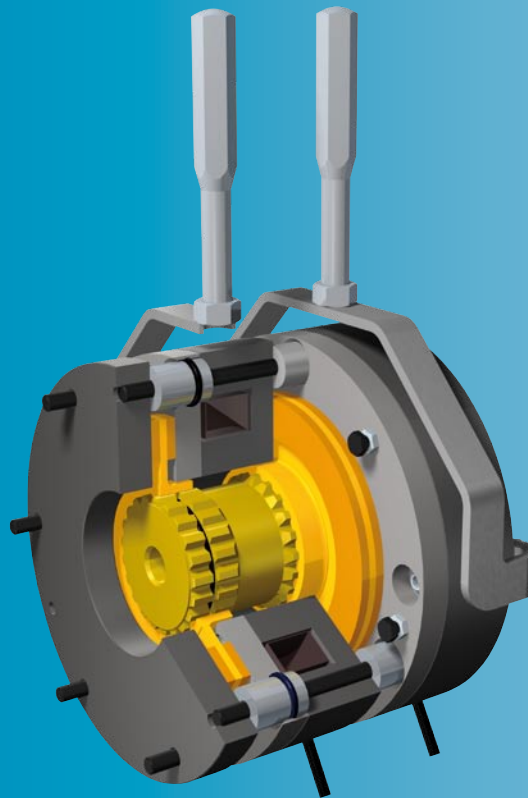


# ROBA-stop<sup>®</sup>-silenzio<sup>®</sup>

Stage and  
Elevator Brakes



*Reliable dual circuit brake  
in accordance with BGV C 1 and EN 81*

- *Also available as a single circuit brake*
- *Long-lasting low-noise operation*
- *Very short construction length*

K.896.V11.GB

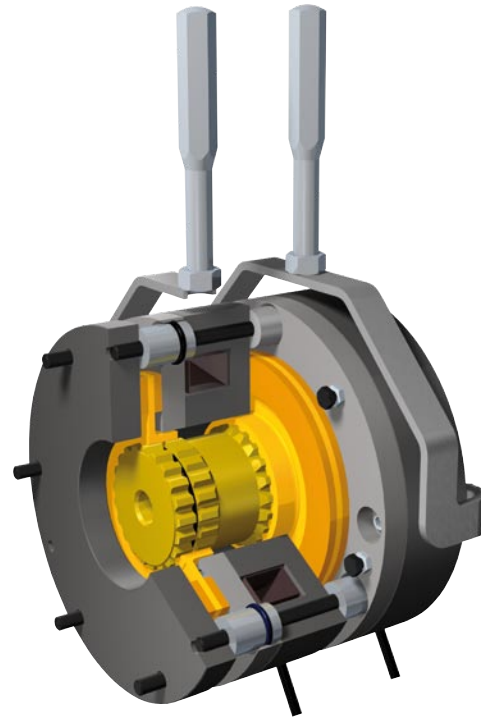
**mayr**<sup>®</sup>  
your reliable partner

## ROBA-stop®-silenzio®

### The perfect safety brake for elevator and stage drives

#### Characteristics

- **Dual circuit brake as redundant brake system with a very short construction length**
- **Microswitch can be mounted for function monitoring**
- **Simplest possible installation**
- **No air gap adjustment necessary**
- **Continuously low noise levels for several hundred thousand switchings**



#### The quietest safety brake

Due to a newly developed sound damping system, the ROBA-stop®-silenzio® is the quietest safety brake on the market, even in its standard version, basic variant (pages 4 to 7). In new condition, the noise level is < 50 dB (A) (noise pressure level measurement). This value lies well below the sound level of the mounted drive elements such as e.g. motor and gearbox. Further noise reduction is possible with a certain amount of extra work. Speak to us! We can accord with your request as far as noise levels are concerned, and guarantee our performance with a legally binding inspection certificate.

#### Long-lasting low-noise operation

Many safety brakes become louder after longer operation due to wear and scoring of the damping systems. Long-term tests have proved that the noise emissions from the ROBA-stop®-silenzio® maintain the very low level produced in new condition even after over 1.000.000 switchings.

#### Safe choice due to large type and size variety

12 construction sizes in different designs fulfil the demands for elevator and stage drives with a braking torque range of 2 x 3 Nm to 2 x 2150 Nm and therefore cover all required operation areas.

#### Optimised construction space

Due to new construction and removal of the complicated intermediate flange plate, we have been able to create a unique short construction length.

#### High operational safety

The ROBA-stop®-silenzio® is available as a single circuit brake or as a dual circuit brake. On the dual circuit brake, two independently operating brake bodies ensure high operational safety. It fulfils the demands according to BGV C1 (previously VBG 70) and DIN 56950.

#### Simple installation

The compact design as well as the single-part toothed hub ensures simple handling and installation. The working air gap is pre-set and needs no re-adjustment. This means that malfunctions due to operating and adjusting mistakes can be ruled out.

#### Function monitoring

On request, we are able to fit the ROBA-stop®-silenzio® with a release monitoring for function checks on both brakes, ensuring the highest possible system and personal safety.

#### Maintenance-free

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

#### Please Observe:

According to German notation, decimal points in this catalogue are represented with a comma (e.g. 0,5 instead of 0.5).

We reserve the right to make dimensional and constructional alterations.

**ROBA-stop®-silenzio®** Page 4 ▷

Sizes 4 to 1800

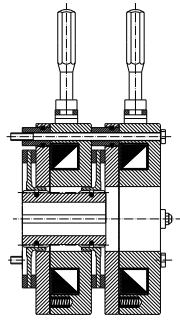
Braking torques

**2 x 3 to 2 x 2150 Nm**  
(Dual circuit brake)

**3 to 2150 Nm**  
(Single circuit brake)

Permitted shaft diameter

**8 to 95**



Type 896.0 \_\_.3

**Dual circuit brake**

Redundant brake system with two independently working brake bodies

Type 896.1 \_\_.3

**Single circuit brake**

Compact brake with an extremely short construction length

**ROBA-stop®-silenzio® in double rotor design** Page 8 ▷

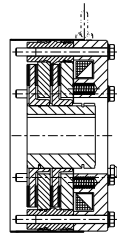
Sizes 300 to 1800

Braking torques

**450 to 4300 Nm**

Permitted shaft diameter

**44 to 95**



Type 896.2 \_\_.3

**Double rotor design**

Single circuit brake with two rotors (4 friction surfaces) with doubled braking torque

**ROBA-stop®-silenzio® with higher braking torque** Page 10 ▷

Sizes 200 to 1800

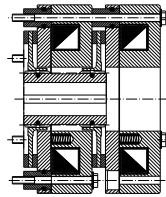
Braking torques

**2 x 300 to 2 x 2300 Nm**  
(Dual circuit brake)

**300 to 2300 Nm**  
(Single circuit brake)

Permitted shaft diameter

**45 to 95**



Design with higher braking torques for passenger elevators

Type 896.03 \_\_.3

**Dual circuit brake**

Redundant brake system with two independently working brake bodies

Type 896.13 \_\_.3

**Single circuit brake**

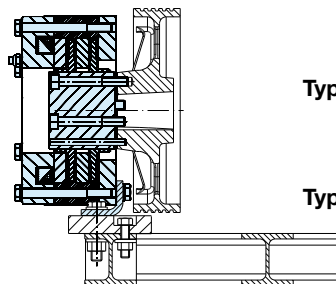
**ROBA®-sheavestop®- elevator brake acc. EN 81 to prevent excessive upward speed** Page 12 ▷

Sizes 500 to 1800

Braking torques

**760 to 4300 Nm**  
(Double rotor design)

**380 to 2300 Nm**  
(Single rotor design)



Simple retrofitting possible:  
For mounting onto a drive sheave, gearbox output shaft and machine frame

Type 896.8 \_\_. \_\_. \_\_

**Double rotor design**

Single circuit brake with two rotors with doubled braking torque

Type 896.7 \_\_. \_\_. \_\_

**Single rotor design**

Single circuit brake with one rotor

**Short Description Installation** Page 14 ▷

**Brake Dimensioning, Friction-Power Diagrams** Page 15 ▷

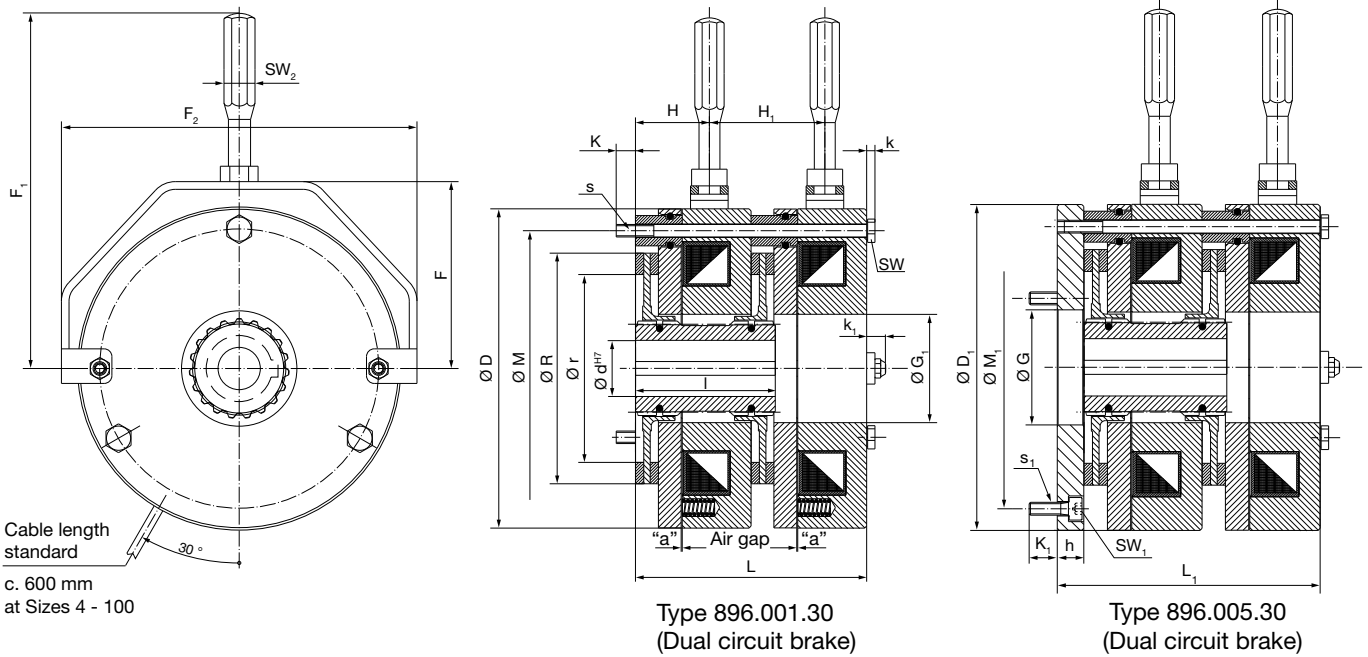
**Further Options** Page 18 ▷

**Switching Times, Electrical Connection, Electrical Accessories** Page 19 ▷

**Guidelines** Page 27 ▷

ROBA-stop®-silenzio® Type 896.0<sub>1</sub>\_\_3\_ – Sizes 4 to 100

Noises < 50 dB(A) (Noise pressure level measurement) at nominal braking torque

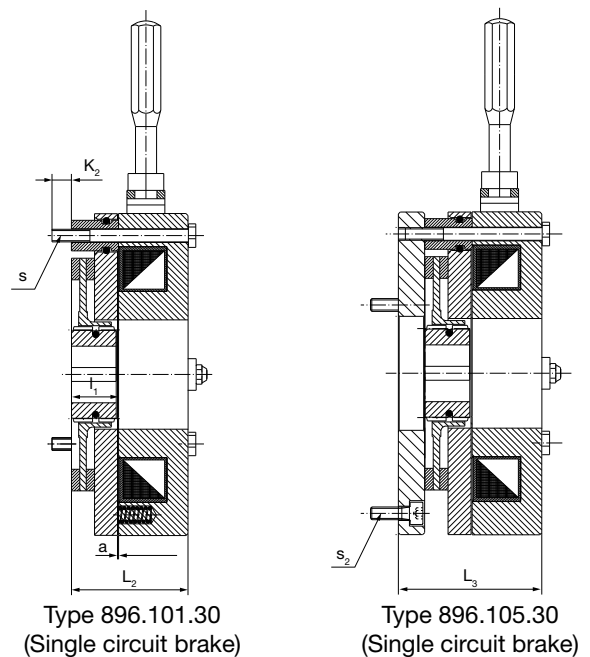


c. 600 mm at Sizes 4 - 100

Technical Data				Size					
				4	8	16	32	64	100
Nominal braking torque <sup>1)</sup>	Type 896.00__3_	M <sub>nom</sub>	[Nm]	2 x 4	2 x 8	2 x 16	2 x 32	2 x 64	2 x 100
	Type 896.10__3_	M <sub>nom</sub>	[Nm]	4	8	16	32	64	100
Input power	Type 896.00__3_	P <sub>20</sub>	[W]	2 x 23	2 x 31	2 x 33	2 x 45	2 x 55	2 x 63
	Type 896.10__3_	P <sub>20</sub>	[W]	23	31	33	45	55	63
Max. speed		n <sub>max</sub>	[rpm]	4500	3500	2900	2500	2300	2000
Weight (pilot bored)	Type 896.00__3_		[kg]	3	5,6	7	11	15,5	22
	Type 896.10__3_		[kg]	1,4	2,8	3,5	5,5	7,8	11
Nominal air gap (tolerance ± 0,07)		a	[mm]	0,4	0,5	0,5	0,5	0,5	0,5

1) Minimum nominal braking torque, braking torque tolerance + 60 %. For other braking torque adjustments: see Table below.

Braking Torque Adjustment [Nm]						
	Size					
	4	8	16	32	64	100
<b>Dual circuit brake Type 896.0__3_</b>						
100 %	2 x 4	2 x 8	2 x 16	2 x 32	2 x 64	2 x 100
120 %	2 x 5	2 x 10	2 x 19	2 x 40	2 x 77	2 x 120
75 %	2 x 3	2 x 6	2 x 12	2 x 26	2 x 43	2 x 80
<b>Single circuit brake Type 896.1__3_</b>						
100 %	4	8	16	32	64	100
120 %	5	10	19	40	77	120
75 %	3	6	12	26	43	80



Type 896.<sup>0</sup><sub>1</sub> - .3 - Sizes 4 to 100

Dimensions		Size					
		4	8	16	32	64	100
Ø d <sup>H7 2)</sup>	Min	8	9	14	18	22	24
	Max	15 <sup>3)</sup>	20 <sup>4)</sup>	24 <sup>5)</sup>	30	35 <sup>6)</sup>	46 <sup>7)</sup>
Ø D		88	108	130	153	168	195
Ø D <sub>1</sub>		88	108	130	153	168	195
F		50,5	64	79	88,5	97	111
F <sub>1</sub>		112,5	123	166,5	175,6	235	249
F <sub>2</sub>		105	128	158	175	190	222
Ø G		26	45	45	52	60	77
Ø G <sub>1</sub>		29	36	45	52	60	77
H		29	27	33	37	42	36
H <sub>1</sub>		43	45,5	49	55	64	67
h		9	10	13	12	15	17
K		8,3	9	11,6	9,6	11,4	14,6
K <sub>1</sub>		8	7,5	10,8	10,8	14	14
K <sub>2</sub>		6,7	9,5	10,8	9	9,9	11,5
k		2,8	3,5	4	4	5,3	5,3
k <sub>1</sub>		7,2	10,5	10,1	10,2	14,5	19,6
L		87	91	99	109	127	134
L <sub>1</sub>		96	101	112	121	142	151
L <sub>2</sub>		43,5	45,5	49	54,5	63,5	67
L <sub>3</sub>		52,5	55,5	62	66,5	78,5	84
l		50	52	58	67	75	79
l <sub>1</sub>		Please observe the load on the shaft or key.					
		18	20	20	25	30	30
		Please observe the load on the shaft or key.					
Ø M		72	90	112	132	145	170
Ø M <sub>1</sub>		72	90	112	132	145	170
Ø R		60	75	93	110,5	124	139
Ø r		50	65	77	90	94	100
s		3 x M4	3 x M5	3 x M6	3 x M6	3 x M8	3 x M8
s <sub>1</sub>		3 x M4	3 x M5	3 x M6	3 x M6	3 x M8	6 x M8
s <sub>2</sub>		3 x M4	3 x M5	3 x M6	3 x M6	3 x M8	3 x M8
SW		7	8	10	10	13	13
SW <sub>1</sub>		3	4	5	5	6	6
SW <sub>2</sub>		Ø 20 <sup>8)</sup>	11	14	14	17	17

2) Other bore diameters available on request. 3) Over Ø 13 keyway acc. DIN 6885/3. 4) Over Ø 18 keyway acc. DIN 6885/3. 5) Over Ø 22 keyway acc. DIN 6885/3. 6) Over Ø 32 keyway acc. DIN 6885/3. 7) Over Ø 44 keyway acc. DIN 6885/3. 8) Hand release lever, round. We reserve the right to make dimensional and constructional alterations.

### Order Number

Without additional parts	0	Connection cable
Hand release	1	
Release monitoring	2	
Hand release/release monitoring	3	
Flange plate	4	
Flange plate/hand release	5	
Flange plate/hand release/release monitoring	6	
Flange plate/release monitoring	7	
		0 Without additional parts
		1 With cover

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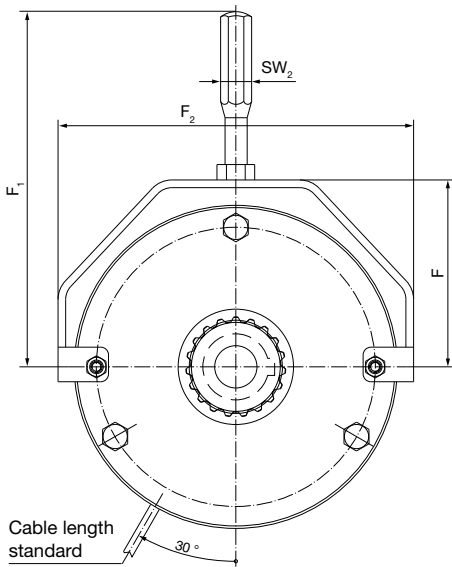
<b>Sizes 4 to 100</b>	Dual circuit brake Single circuit brake	0 1	0 1 2	Nominal braking torque 100 % Braking torque adjustment 120 % Braking torque adjustment 75 %	Coil voltage <sup>9)</sup> 24, 104, 180, 207 [VDC]	Hub bore Ø d <sup>H7</sup> (Dimensions page 5)	Keyway acc. DIN 6885/1 or 6885/3
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Example: 100 / 896.001.3 / 24 / 40 / 6885/1

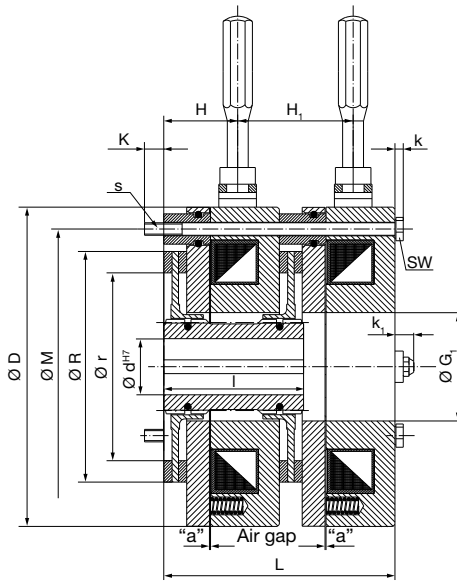
9) We recommend connection via smoothed DC voltage or a mayr®-bridge rectifier.

ROBA-stop®-silenzio® Type 896.0<sub>1</sub>\_\_3\_ – Sizes 200 to 1800

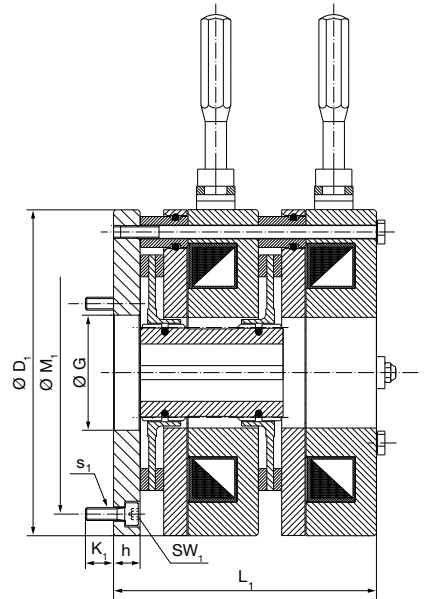
Noises < 50 dB(A) (Noise pressure level measurement) at nominal braking torque



Cable length standard  
c. 600 mm at Size 200 and  
c. 1000 mm at Sizes 300 - 1800



Type 896.001.30  
(Dual circuit brake)



Type 896.005.30  
(Dual circuit brake)

Technical Data				Size					
				200	300	500	800	1300	1800
Nominal braking torque <sup>1)</sup>	Type 896.00__3_	M <sub>nom</sub>	[Nm]	2 x 200	2 x 300	2 x 500	2 x 800	2 x 1300	2 x 1800
	Type 896.10__3_	M <sub>nom</sub>	[Nm]	200	300	500	800	1300	1800
Input power	Type 896.00__3_	P <sub>20</sub>	[W]	2 x 78	2 x 86	2 x 90	2 x 107	2 x 130	2 x 150
	Type 896.10__3_	P <sub>20</sub>	[W]	78	86	90	107	130	150
Max. speed		n <sub>max</sub>	[rpm]	1700	1500	1300	1150	1000	900
Weight (pilot bored)	Type 896.00__3_		[kg]	34	49	60	92	126	158
	Type 896.10__3_		[kg]	17	24	30	46	63	79
Nominal air gap (tolerance ± 0,07)		a	[mm]	0,5	0,5	0,5	0,5	0,5	0,5

1) Minimum nominal braking torque, braking torque tolerance + 60 %. For other braking torque adjustments: see Table below.

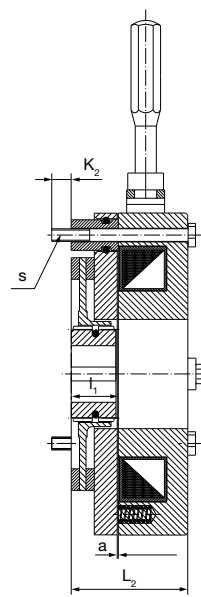
Braking Torque Adjustment [Nm]

	Size					
	200	300	500	800	1300	1800
Dual circuit brake Type 896.0__3_						
100 %	2 x 200	2 x 300	2 x 500	2 x 800	2 x 1300	2 x 1800
120 %	2 x 240	2 x 360	2 x 600	2 x 1000	2 x 1560	2 x 2150
75 %	2 x 150	2 x 225	2 x 380	2 x 600	2 x 980	2 x 1350
Single circuit brake Type 896.1__3_						
100 %	200	300	500	800	1300	1800
120 %	240	360	600	1000	1560	2150
75 %	150	225	380	600	980	1350

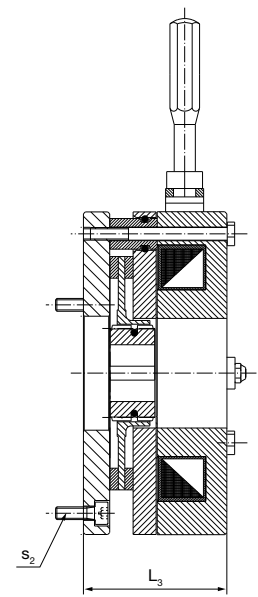
TÜV (German Technical Inspectorate) Certificate:

The Sizes 200 to 1800 with a microswitch for release monitoring have been prototype-inspected by the South German TÜV as brake systems having an effect on the drive sheave shaft and as part of a protective system for the upwards-moving elevator cage against excessive speed.

Certificate number: Dual circuit brake ABV 760/1  
Single circuit brake ABV 761/1



Type 896.101.30  
(Single circuit brake)



Type 896.105.30  
(Single circuit brake)

Type 896.0<sub>1</sub>\_\_\_.3\_ – Sizes 200 to 1800

Dimensions		Size					
		200	300	500	800	1300	1800
Ø d <sup>H7/2)</sup>	Min	35	40	50	65	75	85
	Max	48	60 <sup>3)</sup>	65	75	90	95
Ø D		223	261	285	329	370	415
Ø D <sub>1</sub>		223	264	288	332	373	418
F		126,5	148	166,5	On request	On request	On request
F <sub>1</sub>		325,5	487,5	705,5	On request	On request	On request
F <sub>2</sub>		256	296	310	On request	On request	On request
Ø G		84	96	114	135	146	160
Ø G <sub>1</sub>		84	96	114	135	146	160
H		48	50,5	28,5	On request	On request	On request
H <sub>1</sub>		76	79,5	86	On request	On request	On request
h		18	21	28	31	30	36
K		15,9	18,7	25,5	28	28	32
K <sub>1</sub>		18	18	19	22	27	26
K <sub>2</sub>		11,7	18,1	21,5	22,5	27,5	24,5
k		8,9	10	10	13	13	13
k <sub>1</sub>		18	21	19	On request	On request	On request
L		152	159	172	189	199	205
L <sub>1</sub>		170	180	200	220	229	241
L <sub>2</sub>		76	79,5	86	94,5	99,5	102,5
L <sub>3</sub>		94	100,5	114	125,5	129,5	138,5
I		88	93	102	122	142	152
I <sub>1</sub>		Please observe the load on the shaft or key.					
I <sub>2</sub>		35	50	50	60	70	75
I <sub>3</sub>		Please observe the load on the shaft or key.					
Ø M		196	230	250	290	330	370
Ø M <sub>1</sub>		196	230	250	290	330	370
Ø R		170	188	213	243	283,5	320
Ø r		122	135	150	180	208	230
s	Type 896.0___.3_	3 x M10	3 x M12	6 x M12	6 x M16	8 x M16	8 x M16
	Type 896.1___.3_	3 x M10	3 x M12	3 x M12	3 x M16	4 x M16	4 x M16
s <sub>1</sub>		6 x M10	6 x M12	6 x M16	6 x M16	8 x M16	8 x M20
s <sub>2</sub>		3 x M10	3 x M12	3 x M16	3 x M16	4 x M16	4 x M20
SW		16	18	18	24	24	24
SW <sub>1</sub>		8	10	14	14	14	17
SW <sub>2</sub>		14	17	Ø 25 <sup>4)</sup>	On request	On request	On request

2) Other bore diameters available on request.  
3) Over Ø 56 keyway acc. DIN 6885/3.

4) Hand release lever, round.

We reserve the right to make dimensional and constructional alterations.

Order Number

Without additional parts	0	Connection cable
Hand release	1	
Release monitoring	2	
Hand release/release monitoring	3	
Flange plate	4	
Flange plate/hand release	5	
Flange plate/hand release/release monitoring	6	
Flange plate/release monitoring	7	0 Without additional parts 1 With cover

___ / 8 9 6 . ___ . 3 ___ / ___ / ___ / ___							
▲	▲	▲	▲	▲	▲		
<b>Sizes</b> 200 to 1800	Dual circuit brake Single circuit brake	0 1	0 1 2	Nominal braking torque 100 % Braking torque adjustment 120 % Braking torque adjustment 75 %	Coil voltage <sup>5)</sup> 24, 104, 180, 207 [VDC]	Hub bore Ø d <sup>H7</sup> (Dimensions page 7)	Keyway acc. DIN 6885/1 or 6885/3

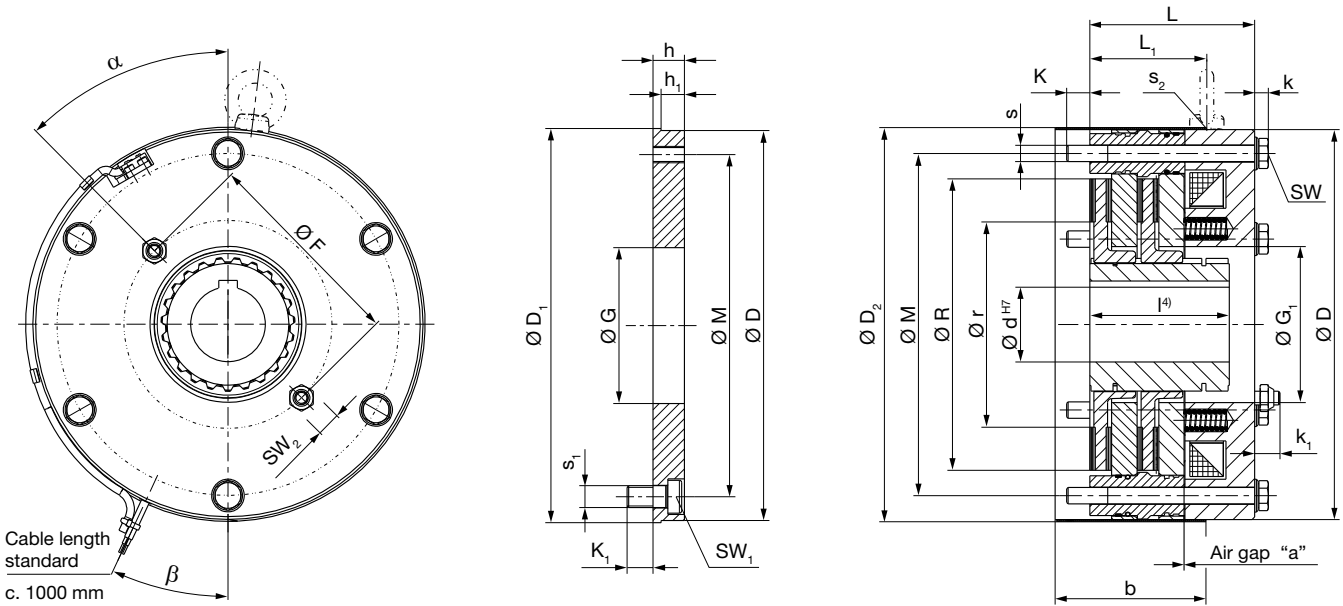
Example: 200 / 896.001.3 / 24 / 40 / 6885/1

5) We recommend connection via smoothed DC voltage or a mayr®-bridge rectifier.



Double rotor design Type 896.2\_ \_3\_ – Sizes 300 to 1800

Noises < 65 dB(A) (Noise pressure level measurement) at nominal braking torque



Technical Data				Size				
				300	500	800	1300	1800
Nominal braking torque <sup>1)</sup>	Type 896.20_ _3_	M <sub>nom</sub>	[Nm]	600	1000	1600	2600	3600
Input power	for overexcitation <sup>2)</sup>	P <sub>20</sub>	[W]	348	352	412	500	552
	for nominal voltage	P <sub>20</sub>	[W]	87	88	103	125	138
Max. speed		n <sub>max</sub>	[rpm]	300	300	300	250	250
Weight	without flange plate		[kg]	33	44	67	93	121
	with flange plate		[kg]	40,5	53	80	113	153
Nominal air gap (tolerance <sup>+0,15</sup> / <sub>-0,1</sub> )		a	[mm]	0,6	0,6	0,65	0,7	0,7

1) Minimum nominal braking torque, braking torque tolerance + 60 %. For other braking torque adjustments: see Table below.

	Braking Torque Adjustment [Nm]				
	Size				
	300	500	800	1300	1800
100 %	600	1000	1600	2600	3600
120 % <sup>7)</sup>	720	1200	2000	3120	4300
75 %	450	760	1200	1960	2700

TÜV (German Technical Inspectorate) Certificate:

The Sizes 300 to 1800 with a **microswitch for release monitoring** have been prototype-inspected by the South German TÜV as brake systems having an effect on the drive sheave shaft and as part of a protective system for the upwards-moving elevator cage against excessive speed.

These brakes are single circuit brakes. A service brake is additionally required in elevators.

Certificate number: ABV 762/1



Type 896.2 \_\_.3\_ – Sizes 300 to 1800

Dimensions	Size					
	300	500	800	1300	1800	
b	90	102	114	125	130	
Ø d <sup>H7</sup>	Min <sup>3)</sup>	40	50	65	75	85
	Max	60	65	75	90	95
Ø D	261	285	329	370	415	
Ø D <sub>1</sub>	264	288	332	373	418	
Ø D <sub>2</sub>	264	288	332	373	418	
Ø F	209	152	181	197	225	
Ø G	96	114	135	146	160	
Ø G <sub>1</sub>	96	114	135	146	160	
h	21	28	31	30	36	
h <sub>1</sub>	15	17	19	23	23	
k	10	10	13	13	13	
k <sub>1</sub>	21	19	25	25	24	
K	18,1	16,9	23,3	23,3	28,3	
K <sub>1</sub>	18	19	22	27	26	
l <sup>4)</sup>	93	102	122	142	152	
L	109,4	120,6	133,7	143,7	148,7	
L <sub>1</sub>	74,4	85,6	93,7	106,7	110,7	
Ø M	230	250	290	330	370	
Ø r	135	150	180	208	230	
Ø R	188	213	246	283,5	320	
s	3 x M12	6 x M12	6 x M16	8 x M16	8 x M16	
s <sub>1</sub>	6 x M12	6 x M16	6 x M16	8 x M16	8 x M20	
s <sub>2</sub> <sup>5)</sup>	M10	M10	M10	M12	M12	
SW	18/19	18/19	24	24	24	
SW <sub>1</sub>	10	14	14	14	17	
SW <sub>2</sub>	16/17	16/17	18/19	24	24	
α [°]	35	45	45	45	45	
β [°]	31	25	25	25	25	

2) When using a ROBA®-switch.

3) For smaller bores, please contact *mayr*® power transmission.

4) Please observe the load on the shaft or key.

5) Eyebolt (installation aid, not included in delivery).

We reserve the right to make dimensional and constructional alterations.

Order Number

Without additional parts	0	
Emergency hand release	1	
Release monitoring	2	
Emergency hand release/release monitoring	3	
Flange plate	4	
Flange plate/emergency hand release	5	
Flange plate/emergency hand release/release monitoring	6	0 Without additional parts
Flange plate/release monitoring	7	1 With cover

\_\_ / 8 9 6 . 2 \_\_ \_\_ . 3 \_\_ / \_\_ / \_\_ / \_\_

<b>Sizes</b> 300 to 1800	Nominal braking torque 100 % 0 Braking torque adjustment <sup>7)</sup> 120 % 1 Braking torque adjustment 75 % 2	Connection cable	Coil voltage <sup>6) 7)</sup> 16 <sup>8)</sup> , 24, 104, 180, 207 [VDC]	Hub bore Ø d <sup>H7</sup> (Dimensions page 9)	Keyway acc. DIN 6885/1
-----------------------------------	---	------------------	--	---	------------------------------

Example: 800 / 896.205.30 / 104 / 60 / 6885/1

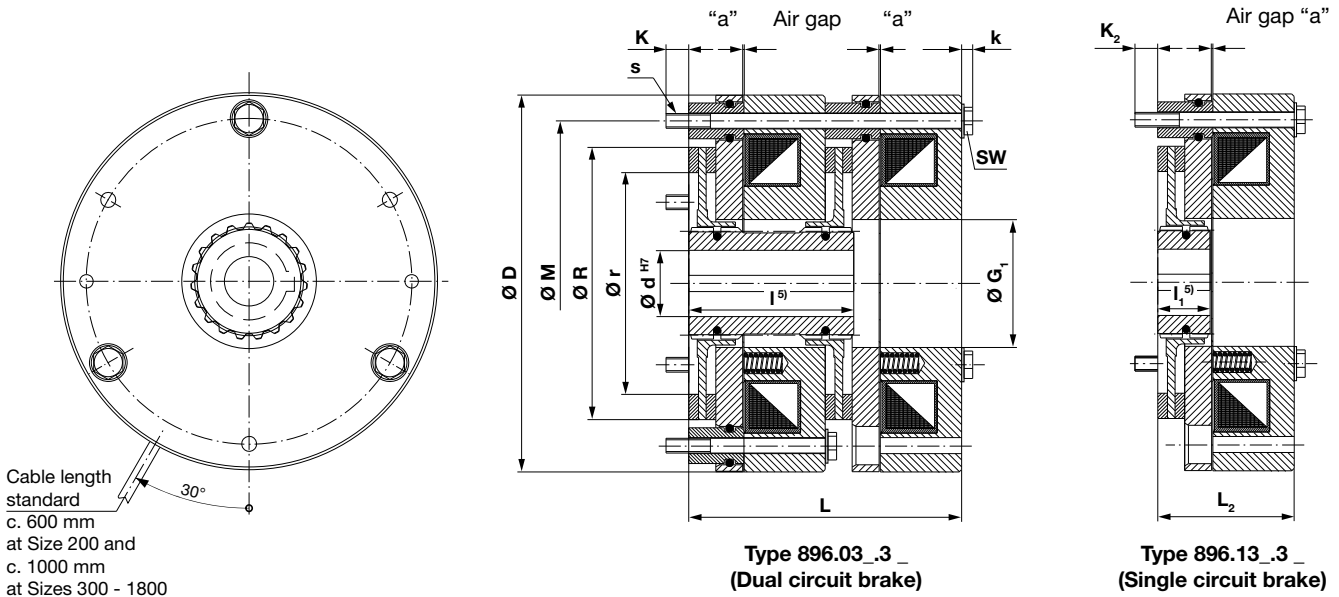
6) We recommend connection via smoothed DC voltage or a *mayr*®-bridge rectifier.

7) At a braking torque adjustment of 120 %, overexcitation (1,5 to 2 x the nominal voltage) is required for safe and fast release, using our ROBA®-switch fast acting rectifier (please contact *mayr*® power transmission if necessary).

8) Coil voltage 16 VDC only at Sizes 300 – 500.

**Design with higher braking torques for passenger elevators Type 896.\_3.\_3\_**  
**Sizes 200 to 1800**

Noises < 60 dB(A) (Noise pressure level measurement)



Technical Data				Size					
				200	300	500	800	1300	1800
Nominal braking torque <sup>1)</sup>	Type 896.03._3_	M <sub>nom</sub>	[Nm]	2 x 300	2 x 500	2 x 800	2 x 1200	2 x 1800	2 x 2300
	Type 896.13._3_	M <sub>nom</sub>	[Nm]	300	500	800	1200	1800	2300
Input power	Type 896.03._3_ <sup>2)</sup>	P <sub>20</sub>	[W]	2 x 304	2 x 348	2 x 352	2 x 412	2 x 500	2 x 552
	Type 896.03._3_ <sup>3)</sup>	P <sub>20</sub>	[W]	2 x 76	2 x 87	2 x 88	2 x 103	2 x 125	2 x 138
	Type 896.13._3_	P <sub>20</sub>	[W]	76	87	88	103	125	138
Max. speed		n <sub>max</sub>	[rpm]	500	500	250	250	250	250
Weight (pilot bored)	Type 896.03._3_		[kg]	34	49	60	92	126	158
	Type 896.13._3_		[kg]	17	24	30	46	63	79
Nominal air gap (tolerance ± 0,07)		a	[mm]	0,5	0,5	0,5	0,5	0,5	0,5

For safe and fast brake release, overexcitation (1,5 to 2 x the nominal voltage) is required.

**Preferred voltages in operation with ROBA®-switch:**

Nominal voltage: 104 V =>	overexcitation voltage: 207 V	on alternating voltage: 230 VAC
Nominal voltage: 180 V =>	overexcitation voltage: 360 V	on alternating voltage: 400 VAC
Nominal voltage: 207 V =>	overexcitation voltage: 360 V	on alternating voltage: 400 VAC
Nominal voltage: 16 V =>	overexcitation voltage: 24 V	on direct voltage: 24 VDC (only at Sizes 200 – 500)

- 1) Minimum nominal braking torque, braking torque tolerance + 60 %.
- 2) Capacity for overexcitation when using a ROBA®-switch.
- 3) Capacity for nominal voltage.

**TÜV (German Technical Inspectorate) Certificate:**

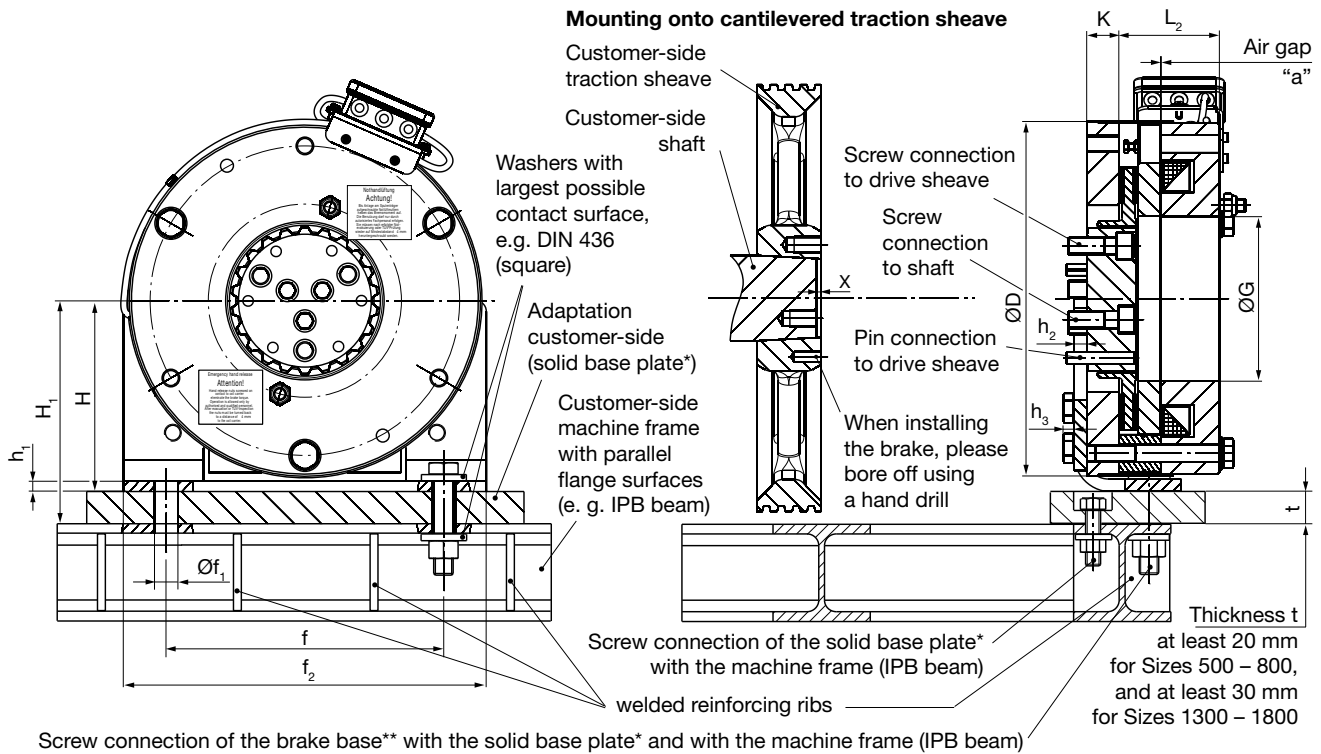
The Sizes 200 to 1800 with a **microswitch for release monitoring** have been prototype-inspected by the South German TÜV as brake systems having an effect on the drive sheave shaft and as part of a protective system for the upwards-moving elevator cage against excessive speed.

Certificate number: **Dual circuit brake**      **ABV 760/1**  
**Single circuit brake**                      **ABV 761/1**



ROBA®-sheavestop® Type 896.7<sub>8</sub> - Sizes 500 to 1800

Noises < 65 dB(A) (Noise pressure level measurement) at nominal braking torque

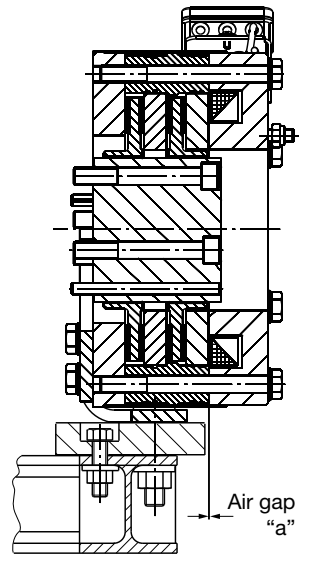


\* Contact surface on the machine frame for customer-side adaptor plate plane parallel (not spherical)  
 \*\* Adjustable brake base for compensation of height and angular misalignments on the machine frame on request (see Figs., page 13)

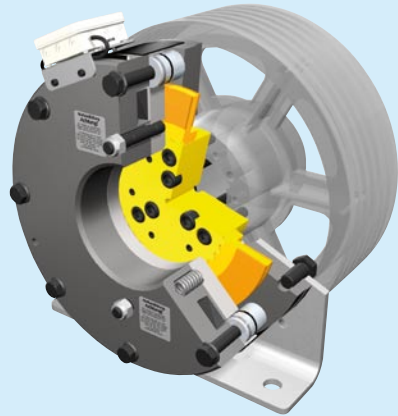
Type 896.7\_\_11 (Single rotor design)

Technical Data			Size <sup>2)</sup>			
			500	800	1300	1800
Nominal braking torque <sup>1)</sup>	Type 896.7__	$M_{nom}$ [Nm]	500	800	1300	1800
	Type 896.8__	$M_{nom}$ [Nm]	1000	1600	2600	3600
Input power		$P_{20}$ [W]	90	107	130	150
Nominal air gap	Type 896.7__	(tolerance $\pm 0,07$ ) a [mm]	0,5	0,5	0,5	0,5
	Type 896.8__	(tolerance $+0,15$ $-0,1$ ) a [mm]	0,6	0,65	0,7	0,7

Braking Torque Adjustment [Nm]	Type	Size <sup>2)</sup>							
		500	800	1300	1800	500	800	1300	1800
		896.7__ (Single rotor)				896.8__ (Double rotor)			
100 %		500	800	1300	1800	1000	1600	2600	3600
120 %		600	1000	1560	2150	1200	2000	3120	4300
75 %		380	600	980	1350	760	1200	1960	2700
Higher braking torque <sup>3) 4)</sup>		800	1200	1800	2300	1400	2200	-	-



Type 896.8\_\_11 (Double rotor design)



**TÜV (German Technical Inspectorate) Certificate:**  
 The Sizes 500 to 1800 (Size 300 available on request) with a **microswitch for release monitoring** have been prototype-inspected by the South German TÜV as brake systems having an effect on the drive sheave shaft and as part of a protective system for the upwards-moving elevator cage against excessive speed.  
 These brakes are single circuit brakes. A service brake is additionally required in elevators.  
**Certificate number:**  
 Single rotor design **ABV 781**  
 Double rotor design **ABV 782**

Type 896.7<sub>8</sub> - - - - - Sizes 500 to 1800

We reserve the right to make dimensional and constructional alterations.

Dimensions	Size <sup>2)</sup>			
	500	800	1300	1800
Ø D	288	332	373	418
f	220	260	300	345
Ø f <sub>1</sub>	22 for M20	22 for M20	25 for M24	25 for M24
f <sub>2</sub>	290	340	380	425
Ø G	114	135	146	160
L <sub>2</sub>	Type 896.7 - - - -	94,5	99,5	102,5
	Type 896.8 - - - -	120,6	133,7	148,7
H	160	180	200	225
h <sub>1</sub>	11	11	11	11
h <sub>2</sub>	12	12	12	12
h <sub>3</sub>	Type 896.7 - - - -	7,5	10	12,5
	Type 896.8 - - - -	10	13	16,5
K	28	30	30	36

In order to adapt the brake system to your application – in order to produce a customer-specific adapter shaft – we require from you the following drive-specific information (see also Fig., page 12):

<b>Threaded holes in shaft facing-side:</b>	<b>Threaded holes in drive sheave:</b>	<b>Dimensions and Technical Data:</b>
Threaded hole number .....	Threaded hole number .....	Dimension X (Fig.) [mm] .....
Threaded hole-Ø .....	Threaded hole-Ø .....	Angular position of bore templates to each other [°] .....
Threaded hole depth [mm] .....	Threaded hole depth [mm] .....	Required braking torque on the drive sheave [Nm] .....
Pitch circle-Ø [mm] .....	Pitch circle-Ø [mm] .....	Axis height available on machine base H <sub>1</sub> [mm] .....

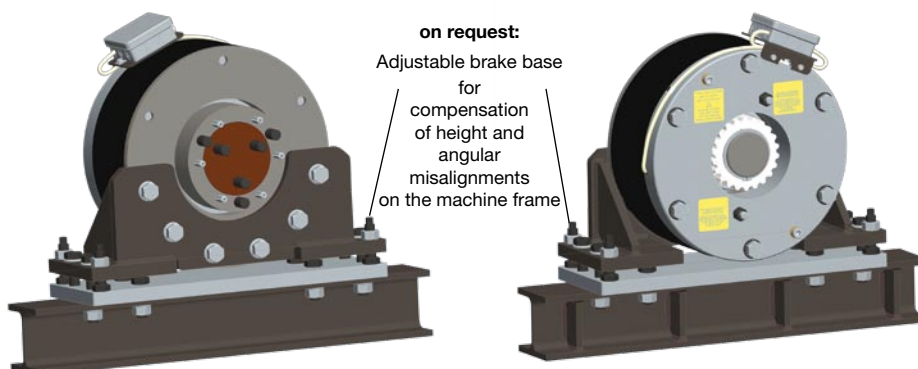
**Order Number**

Without additional parts	<b>0</b>	<b>1</b>	Terminal box with terminal
Emergency hand release	<b>1</b>	<b>3</b>	Connection cable
Release monitoring	<b>2</b>	<b>4</b>	Terminal box with half wave rectifier
Emergency hand release/release monitoring	<b>3</b>	<b>5</b>	Terminal box with bridge rectifier
Flange plate	<b>4</b>	<b>6</b>	Terminal box with spark quenching unit
Flange plate/emergency hand release	<b>5</b>	<b>7</b>	Terminal box with ROBA®-switch
Flange plate/emergency hand release/release monitoring	<b>6</b>		
Flange plate/release monitoring	<b>7</b>	<b>0</b>	Without additional parts
		<b>1</b>	With cover

___ / 8 9 6 . ___ . ___ . ___ . ___ / ___																												
<table border="0"> <tr> <td>▲</td> <td><b>Sizes <sup>2)</sup></b></td> <td>Single rotor design</td> <td><b>7</b></td> <td><b>0</b></td> <td>Nominal braking torque 100 %</td> <td>Coil voltage <sup>4)</sup></td> </tr> <tr> <td></td> <td><b>500 to 1800</b></td> <td>Double rotor design</td> <td><b>8</b></td> <td><b>1</b></td> <td>Braking torque adjustment <sup>4)</sup> 120 %</td> <td>24, 104, 180, 207 [VDC]</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td><b>2</b></td> <td>Braking torque adjustment 75 %</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td><b>3</b></td> <td>Higher braking torque <sup>4)</sup></td> <td></td> </tr> </table>	▲	<b>Sizes <sup>2)</sup></b>	Single rotor design	<b>7</b>	<b>0</b>	Nominal braking torque 100 %	Coil voltage <sup>4)</sup>		<b>500 to 1800</b>	Double rotor design	<b>8</b>	<b>1</b>	Braking torque adjustment <sup>4)</sup> 120 %	24, 104, 180, 207 [VDC]					<b>2</b>	Braking torque adjustment 75 %						<b>3</b>	Higher braking torque <sup>4)</sup>	
▲	<b>Sizes <sup>2)</sup></b>	Single rotor design	<b>7</b>	<b>0</b>	Nominal braking torque 100 %	Coil voltage <sup>4)</sup>																						
	<b>500 to 1800</b>	Double rotor design	<b>8</b>	<b>1</b>	Braking torque adjustment <sup>4)</sup> 120 %	24, 104, 180, 207 [VDC]																						
				<b>2</b>	Braking torque adjustment 75 %																							
				<b>3</b>	Higher braking torque <sup>4)</sup>																							

Example: 500 / 896.701.31 / 104



- 1) Minimum nominal braking torque, braking torque tolerance + 60 %. For other braking torque adjustments: see Table, page 12.
- 2) Size 300 available on request.
- 3) Switching noises < 75 dB(A) (noise pressure level measurement).
- 4) At a braking torque adjustment of 120 % (on the double rotor design) and at a higher braking torque (on all designs), overexcitation (1,5 to 2 x the nominal voltage) is required for safe and fast release, using our ROBA®-switch fast acting rectifier (please contact mayr® power transmission if necessary).

Installation ROBA-stop®-silenzio®

Type 896.0  
1 - .3

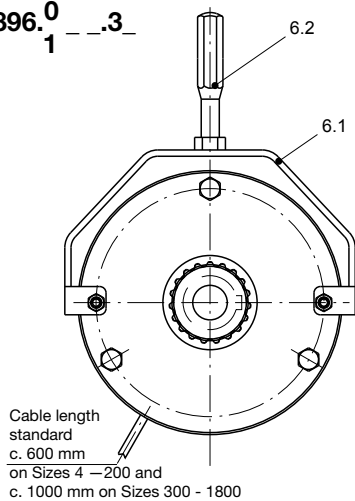


Fig. 1

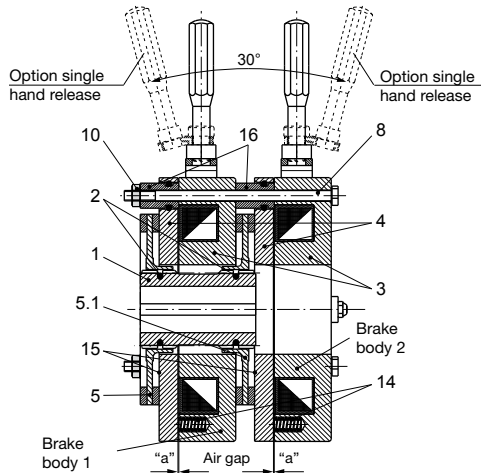


Fig. 2 (Dual circuit brake)

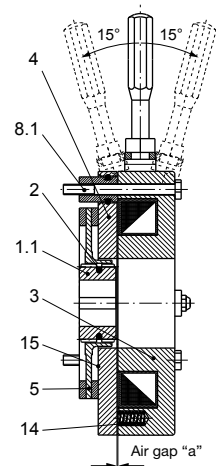


Fig. 3 (Single circuit brake)

Parts List (Only use mayr® original parts)

- |                                     |   |
|-------------------------------------|---|
| 1 Hub assembly with 2 O-rings (2)   | 6.2 Hand release rod                                      |
| 1.1 *Hub assembly with 1 O-ring (2) | 8 Hexagon head screw                                      |
| 2 O-ring                            | 8.1 **Hexagon head screw                                  |
| 3 Coil carrier assemblies 1 and 2   | 14 Thrust spring  |
| 4 Armature disks 1 and 2            | 15 Shoulder screw   |
| 5 Rotor 1                           | * Only on single circuit brake design                     |
| 5.1 Rotor 2                         | ** On Sizes 4 to 300, only on single circuit brake design |
| 6 Hand release assembly             |   |
| 6.1 Switching bracket               |   |

Installation Conditions (Figs. 1, 2 and 3)

- The eccentricity of the shaft end in relation to the fixing hole must not exceed 0,2 mm.
  - The position tolerance of the tapped holes for the hexagon head screws (8 and 8.1) must not exceed 0,2 mm.
  - The axial run-out deviation of the screw-on surface to the shaft must not exceed the permitted axial run-out tolerance according to DIN 42955 R. The related diameter is the pitch circle diameter to the brake attachment. Larger deviations can lead to a drop in torque, to continuous slipping on the rotors and to overheating.
  - The tolerances of the hub (1) and the shaft are to be chosen so that the hub toothing (1) is not widened. Toothing widening leads to the rotors (5 and 5.1) clamping on the hub (1) and therefore to brake malfunctions (recommended hub – shaft tolerance H7/k6).
  - The Rotors (5 and 5.1) and brake surfaces must be oil and grease-free. A suitable counter friction surface (steel or cast iron) must be used. Sharp-edged interruptions on the friction surface are to be avoided. Recommended surface quality in the friction surface area: Ra = 1,6 µm.
- In particular customer-side attachment surfaces made of grey cast iron are to be rubbed down with fine sandpaper (grain ~ 400).

Short Description (Figs. 1 and 2)

Please find detailed installation descriptions in the respective product Installation and Operational Instructions (also at www.mayr.de).

- Mount the hub assembly with O-rings (1 and 2) onto the shaft, observing the entire carrying length of the key, and secure it axially (e.g. with a locking ring).
- Push rotor 1 (5) by hand using light pressure over the O-rings (2) on the hub (1) and bring it into the correct position (rotor collar should be facing away from the machine wall). Make sure that the toothing moves easily. Do not damage the O-rings (2).
- Push the brake body 1 (3) over the hub (1) up to the shoulder on rotor 1 (5) and turn it into the correct position, aligned with the threaded bores on the machine wall.
- Push the rotor 2 (5.1) by hand using light pressure over the O-ring (2) onto the hub (1) and bring it into the correct position (rotor collar should face the machine wall). Make sure that the toothing moves easily. Do not damage the O-rings (2).
- Turn brake body 2 (3) with inserted fixing screws (8) to the correct position. Thread the fixing screws (8) into brake body 2 (3) and screw the entire brake onto the machine wall (observe the tightening torques acc. Table 1).
- Inspect air gap "a" according to Table 1.** The nominal air gap must be present.

Hand Release

A hand release (6) is installed manufacturer-side, dependent on Size and Type (see Type key pages 5 and 7 and Table 1). From Size 800, both circuits are released simultaneously with a lever.

Technical Data – Installation			Size											
			4	8	16	32	64	100	200	300	500	800	1300	1800
Nominal air gap	a	[mm]	0,4 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07	0,5 ± 0,07
Release force per lever / at nominal torque	F	[N]	35	35	110	100	130	200	250	250	300	c. 300	c. 320	c. 350
Actuation angle Hand release	α	[°]	15	15	15	15	15	15	15	15	-	-	-	-
Tightening torque fixing screw Item 8	T <sub>A</sub>	[Nm]	3	5	10	13	30	36	71	123	123	250	250	300

Table 1



## Brake Dimensioning

### Brake Size Selection

#### 1. Brake selection

$$M_{req.} = \frac{9550 \times P}{n} \times K \leq M_2 \quad [Nm]$$

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

$$t_4 = t_v + t_1 \quad [sec]$$

$$M_v = M_2 + (-) \times M_L \quad [Nm]$$

#### Key:

J	[kgm <sup>2</sup> ]	Mass moment of inertia
K	[-]	Safety factor (1 – 3 x acc. to conditions)
M <sub>req.</sub>	[Nm]	Required braking torque
M <sub>v</sub>	[Nm]	Delaying torque
M <sub>L</sub>	[Nm]	Load torque on system * sign in brackets is valid if load is braked during downward
M <sub>2</sub>	[Nm]	Nominal torque (Technical Data pages 4 – 12)
n	[rpm]	Speed
P	[kW]	Input power
t <sub>v</sub>	[s]	Braking action
t <sub>1</sub>	[s]	Connection time (Tables 4 and 5, page 19)
t <sub>4</sub>	[s]	Total switch-on time
Q <sub>r</sub>	[J/braking]	Friction work present per braking
Q <sub>r,0,1</sub>	[J/0,1]	Friction work per 0,1 mm wear (Table 2)
Q <sub>r,tot.</sub>	[J]	Friction work up to rotor replacement (Table 2)
Q <sub>r,perm.</sub>	[J/braking]	Permitted friction work (switching work) per braking

#### 2. Inspection of thermic load

$$Q_r = \frac{J \times n^2}{182,4} \times \frac{M_2}{M_v} \quad [J/braking]$$

The permitted friction work (switching work) Q<sub>r,perm.</sub> per braking for the specified switching frequency can be taken from the friction-power diagrams (pages 16 – 17).

If the friction work per braking is known, the max. switching frequency can also be taken from the friction-power diagrams (pages 16 – 17).

#### Please Observe!

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

Friction Work				Size											
				4	8	16	32	64	100	200	300	500	800	1300	1800
per 0,1 mm wear	Type 896.____	Q <sub>r,0,1</sub>	[10 <sup>6</sup> J/0,1]	22	28	56	73	116	155	227	269	215	249	357	447
up to rotor replacement	Type 896.____	Q <sub>r,tot.</sub>	[10 <sup>6</sup> J]	66	84	280	292	348	465	908	1076	1075	1245	1785	2235

Table 2

Mass Moment of Inertia Rotor + hub at d <sub>max</sub>				Size											
				4	8	16	32	64	100	200	300	500	800	1300	1800
ROBA-stop®-silenzio®															
Type 896.00_3_	J <sub>R+H</sub>	[10 <sup>-4</sup> kgm <sup>2</sup> ]		0,316	0,799	2,40	6,11	11,9	23,7	58,1	89,1	188	389	695	1110
Type 896.10_3_	J <sub>R+H</sub>	[10 <sup>-4</sup> kgm <sup>2</sup> ]		0,156	0,393	1,14	2,92	5,82	11,3	28,3	46	93,5	193	348	558
Double rotor design															
Type 896.20_3_	J <sub>R+H</sub>	[10 <sup>-4</sup> kgm <sup>2</sup> ]		-	-	-	-	-	-	-	89,1	188	389	695	1110
Design with higher braking torques															
Type 896.03_3_	J <sub>R+H</sub>	[10 <sup>-4</sup> kgm <sup>2</sup> ]		-	-	-	-	-	-	58,1	89,1	188	389	695	1110
Type 896.13_3_	J <sub>R+H</sub>	[10 <sup>-4</sup> kgm <sup>2</sup> ]		-	-	-	-	-	-	28,3	46	93,5	193	348	558
ROBA®-sheavestop®															
Type 896.70_ _ _	J <sub>R+H</sub>	[10 <sup>-4</sup> kgm <sup>2</sup> ]		-	-	-	-	-	-	-	-	93,5	193	348	558
Type 896.80_ _ _	J <sub>R+H</sub>	[10 <sup>-4</sup> kgm <sup>2</sup> ]		-	-	-	-	-	-	-	-	188	389	695	1110

Table 3



Friction-Power Diagrams

**ROBA-stop®-silenzio®**

**Type 896.10\_ \_ \_**

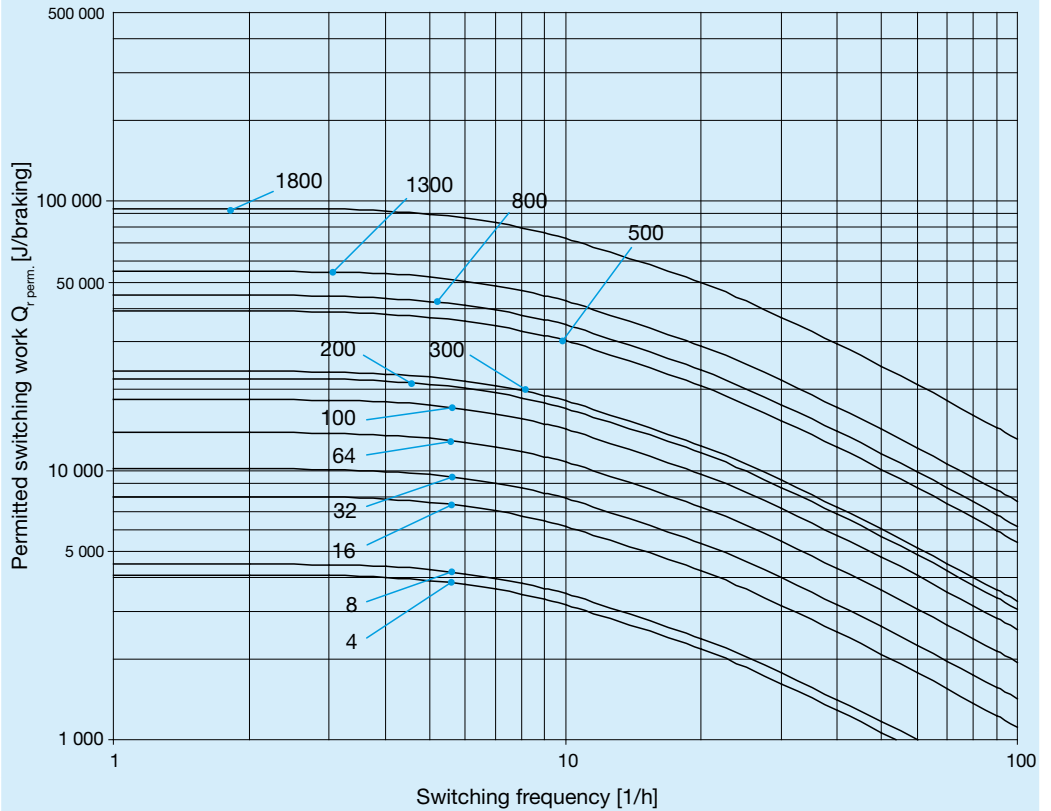
n = 1500 rpm  
for Sizes 4 to 300

n = 750 rpm  
for Sizes 500 to 1300

n = 500 rpm  
for Size 1800

Permitted friction powers at higher speeds on request.

Diagram 1



**ROBA®-sheavestop®**  
**Single rotor design**

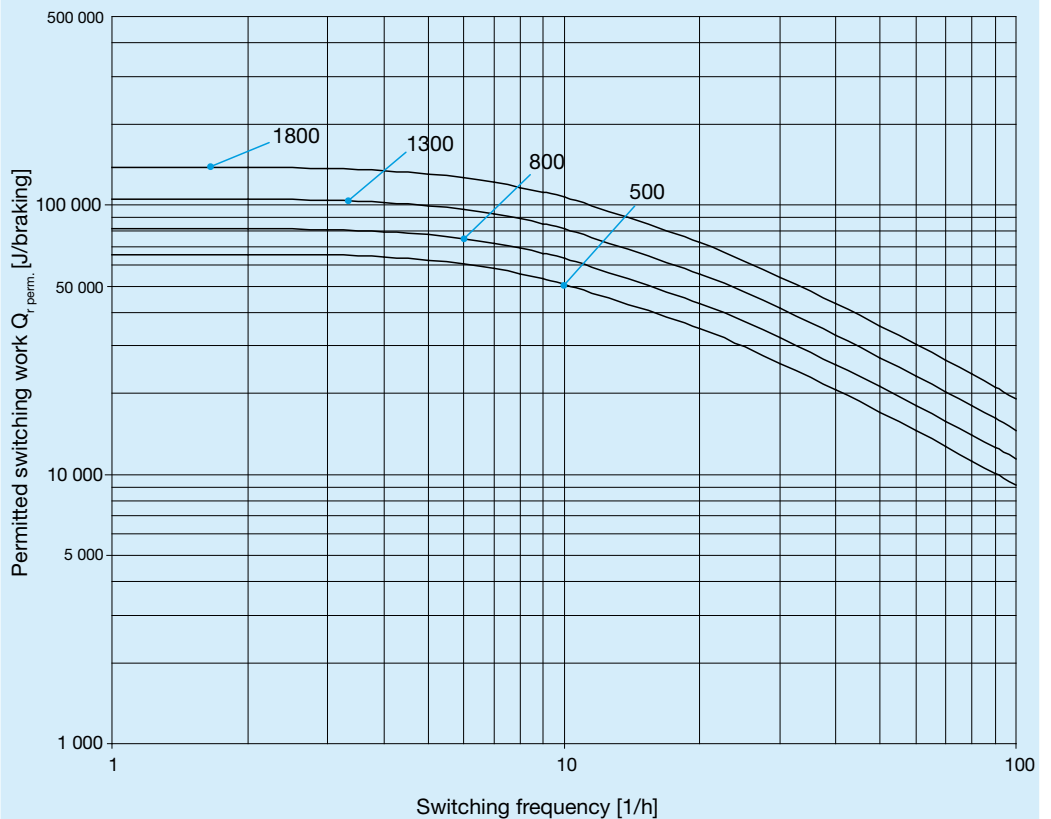
**Type 896.70\_ \_ \_**

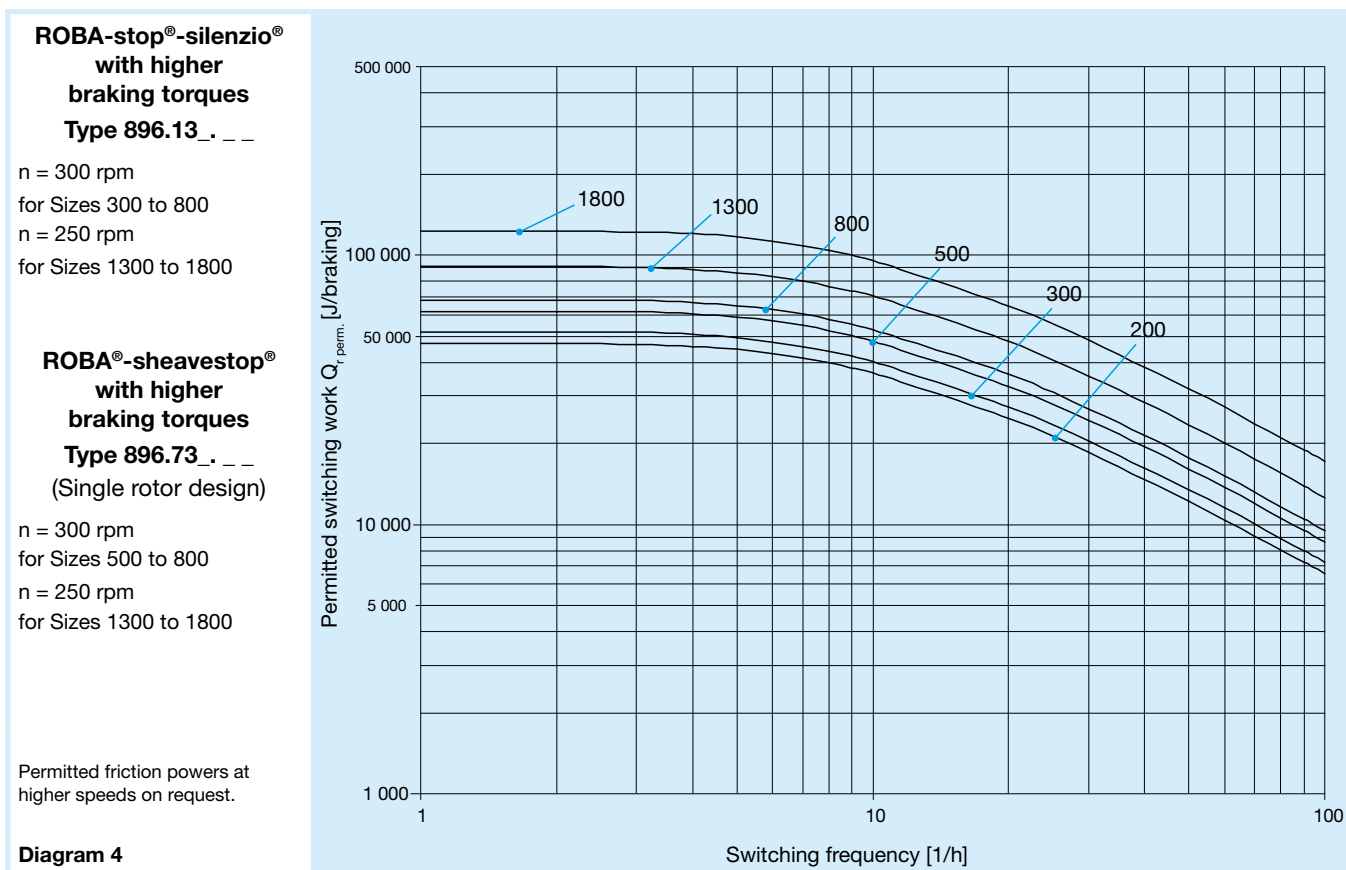
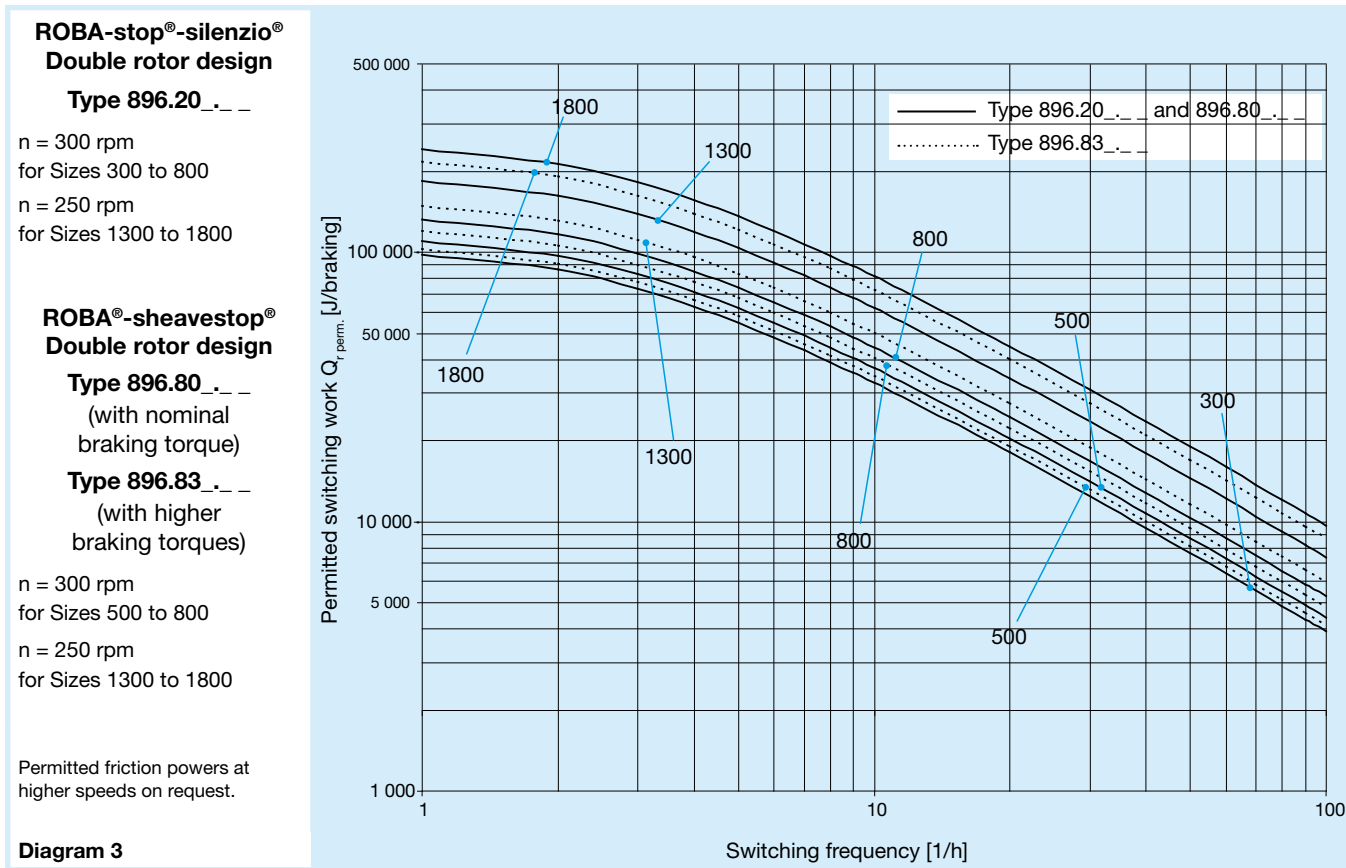
n = 300 rpm  
for Sizes 500 to 800

n = 250 rpm  
for Sizes 1300 to 1800

Permitted friction powers at higher speeds on request.

Diagram 2





**Further Options**

In addition to the standard brakes, mayr® power transmission provides a multitude of further designs, which cannot be described in detail in this catalogue.

Some of the most frequently requested options are:

- IP65 design with cover
- Dust-proof design with cover and cover plate
- Directly toothed shaft
- Threaded holes for the attachment of encoders
- Terminal box
- ROBA®-ES-attachment
- Customer-specific flange plate

Please contact mayr® for further information.

**Encoder Attachment**

Threaded holes (Item 1) in the coil carrier for the attachment of encoders.

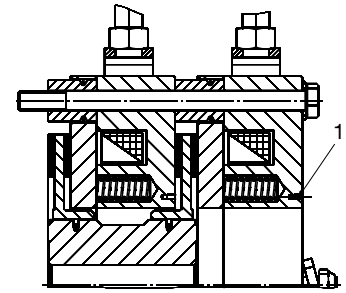


Fig. 4

**IP65 design**

The enclosed design (IP65) is equipped with a cover (Item 1).

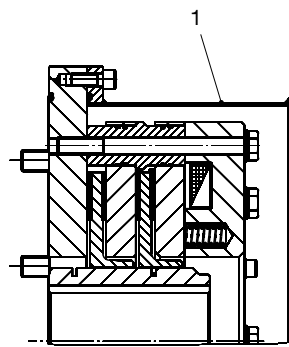


Fig. 1

**Terminal box**

Terminal box (Item 1) for the wiring and storage of rectifiers (ROBA®-switch, bridge rectifier).

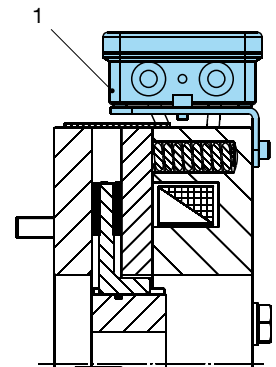


Fig. 5

**Dust-proof design**

The enclosed design (IP65) is equipped with a cover (Item 1) and with a cover plate (Item 2).

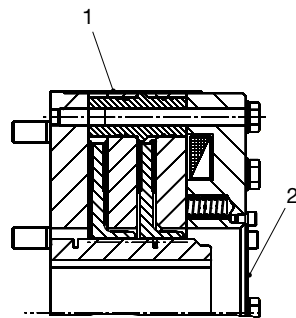


Fig. 2

**ROBA®-ES-attachment**

Space-saving connection of a ROBA®-ES shaft coupling (Item 1) directly onto the hub. The flexible shaft coupling of the ROBA®-ES Type series compensates for shaft misalignments and is vibration-damping.

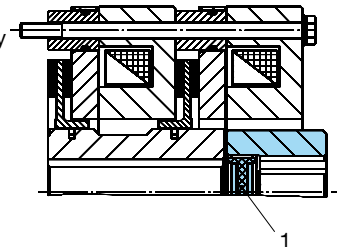


Fig. 6

**Directly toothed shaft**

Directly toothed shaft (Item 1) for larger shaft diameters and higher transmittable torques.

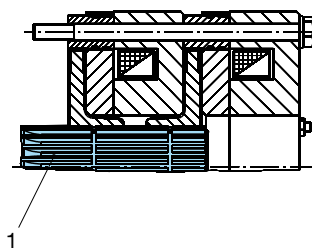


Fig. 3

**Special flange plate**

We offer a range of flange plates for customer-specific solutions, such as for example the special flange plate shown in Fig. 7 (Item 1) with customer-tailored centring (Item 2).

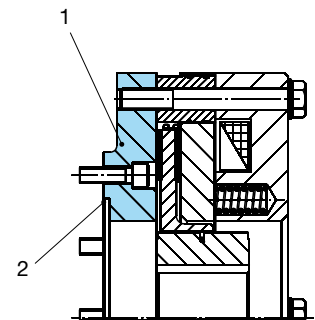


Fig. 7

## Switching Times

The switching times are only valid for the braking torques stated in the catalogue.

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. The 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 %.**

**Please Observe:** DC-side switching

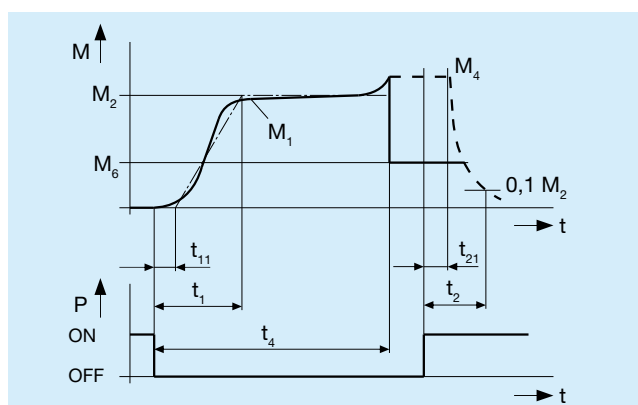
When measuring the DC-side switching times ( $t_{11}$  – time), the inductive switch-off peaks are according to VDE 0580 limited to values smaller than 1200 volts. If other quenching circuits and constructional elements are installed, this switching time  $t_{11}$  and therefore also switching time 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

Switching Times Type 896.0_ _ _				Size											
				4	8	16	32	64	100	200	300	500	800	1300	1800
Nominal braking torque Type 896.10_ _ _		$M_2$	[Nm]	4	8	16	32	64	100	200	300	500	800	1300	1800
Connection time	DC-side switching	$t_1$	[ms]	33	39	99	118	107	120	185	246	259	267	266	420
	AC-side switching	$t_1$	[ms]	135	196	398	518	447	488	968	1087	1133	1231	1464	1920
Response delay on connection	DC-side switching	$t_{11}$	[ms]	6	9	17	29	18	13	56	57	59	67	72	105
	AC-side switching	$t_{11}$	[ms]	52	79	145	229	164	154	412	429	518	531	588	800
Separation time		$t_2$	[ms]	52	70	94	120	174	234	270	308	444	581	589	850

**Table 4:** Switching times Type 896.0\_ \_ \_ : ROBA-stop®-silenzio®, Double Rotor design from Size 300, ROBA®-sheavestop® from Size 500

Switching Times Type 896.3_ _ _				Size					
				200	300	500	800	1300	1800
Nominal braking torque Type 896.13_ _ _		$M_2$	[Nm]	300	500	800	1200	1800	2300
Connection time	DC-side switching	$t_1$	[ms]	108	162	172	174	233	500
	AC-side switching	$t_1$	[ms]	550	630	745	848	930	1222
Response delay on connection	DC-side switching	$t_{11}$	[ms]	12	13	27	32	34	44
	AC-side switching	$t_{11}$	[ms]	165	153	136	139	302	570
Separation time (with overexcitation)		$t_2$	[ms]	155	193	255	358	432	625

**Table 5:** Switching times Type 896.3\_ \_ \_ : ROBA-stop®-silenzio® design with higher braking torques



**Key:**

- $M_1$  = Switching torque
- $M_2$  = Nominal torque (characteristic torque)
- $M_4$  = Transmittable torque
- $M_6$  = Load torque
- $P$  = Input power
- $t_1$  = Connection time
- $t_{11}$  = Response delay on connection
- $t_2$  = Separation time
- $t_{21}$  = Response delay on separation
- $t_4$  = Total switch-on time +  $t_{11}$

**Diagram 3:** Torque-Time

## Electrical Connection and Wiring

DC current is necessary for the 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). The device can be operated with AC voltage in connection with a rectifier as well as with other suitable DC voltage supplies. Dependent on the brake equipment, the connection possibilities can vary. Please follow the exact connections according to the wiring diagram. The manufacturer and the user must observe the applicable directives 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.

In order to minimise the **noise development on released brakes**, they may only be operated via DC voltage with low ripple content. Operation is possible with AC voltage using a **bridge rectifier** or another suitable DC supply. Supplies whose output voltage show a high ripple content (e.g. half-wave rectifiers, phase controlled modulators, ...) are unsuitable for brake operation.

At variance with this, brakes specially dimensioned for overexcitation must be operated with the ROBA®-switch fast acting rectifier.

## Earthing Connection

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

## Device Fuses

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

## Switching Behaviour

The 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.

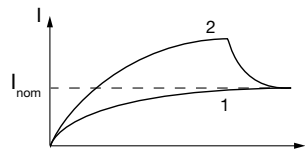
### • Field Build-up with Normal Excitation

If we energise the magnetic coil with nominal voltage the coil voltage does not immediately reach its nominal value. The coil inductivity causes the current to rise slowly as an exponential function. Accordingly, the build-up of the magnetic field happens more slowly and the braking torque drop (curve 1, above) is also delayed.

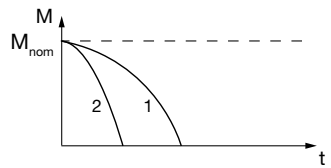
### • Field Build-up with Overexcitation

A quicker drop in braking torque is achieved if the coil is temporarily placed under a higher voltage than the nominal voltage, as the current then increases more quickly. Once the brake is released, switch to the nominal voltage (curve 2, above). The relationship between overexcitation and separation time  $t_2$  is approximately indirectly proportional. This means that, using doubled nominal voltage (overexcitation voltage), it is possible to halve the separation time  $t_2$  in order to release the brake. The ROBA®-switch fast acting rectifier works on this principle.

Current path



Braking torque path



Operation with overexcitation requires testing of:

- the necessary overexcitation time \*
- as well as of the RMS coil capacity \*\* for a cycle frequency higher than 1 cycle per minute.

### \* Overexcitation time $t_{over}$

Increased wear and therefore an enlarged air gap as well as coil heat-up lengthen the separation time  $t_2$  of the brake. Therefore, as overexcitation time  $t_{over}$ , please select at least double the separation time  $t_2$  with nominal power on each brake size.

The spring forces also influence the brake separation time  $t_2$ : Higher spring forces increase the separation time  $t_2$  and lower spring forces reduce the separation time  $t_2$ .

- Spring force (braking torque adjustment) = 100 %:

The overexcitation time  $t_{over}$  is double the separation time  $t_2$  on each brake size.

- Spring force (braking torque adjustment) > 100 %:

The overexcitation time  $t_{over}$  is higher than double the separation time  $t_2$  on each brake size.

### \*\* Coil capacity $P_{RMS}$



$$P_{RMS} \leq P_{nom}$$

The coil capacity  $P_{RMS}$  may not be larger than  $P_{nom}$ . Otherwise, the coil may fail due to thermic overload.

### Calculations:

$P_{RMS}$  [W] RMS coil capacity, dependent on switching frequency, overexcitation, power reduction and switch-on time duration

$$P_{RMS} = \frac{P_{over} \times t_{over} + P_{nom} \times t_{nom}}{t_{tot}}$$

$P_{nom}$  [W] Coil nominal capacity (Catalogue value, Type tag)

$P_{over}$  [W] Coil capacity on overexcitation

$$P_{over} = \left( \frac{U_{over}}{U_{nom}} \right)^2 \times P_{nom}$$

$t_{over}$  [s] Time of operation with power reduction

$t_{nom}$  [s] Time of operation with coil nominal voltage

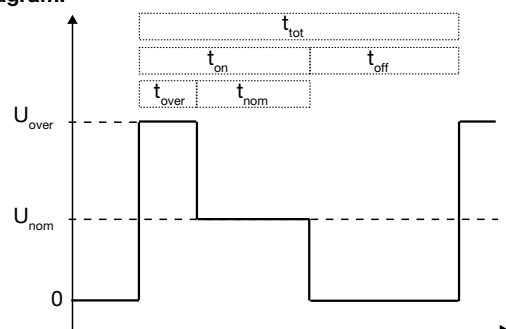
$t_{off}$  [s] Time without voltage

$t_{tot}$  [s] Total time ( $t_{over} + t_{nom} + t_{off}$ )

$U_{over}$  [V] Overexcitation voltage (bridge voltage)

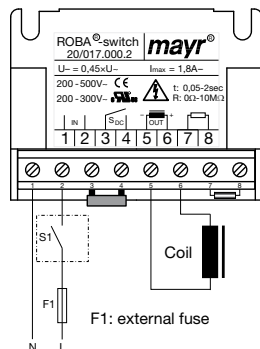
$U_{nom}$  [V] Coil nominal voltage

### Time Diagram:



## Magnetic Field Removal

### • AC-side Switching

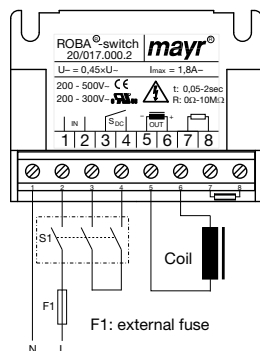


The power circuit is interrupted before the rectifier. The magnetic field slowly reduces. This delays the rise in braking torque.

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 (c. 6 – 10 times longer than with DC-side switch-off). Use for non-critical braking times.

### • DC-side Switching



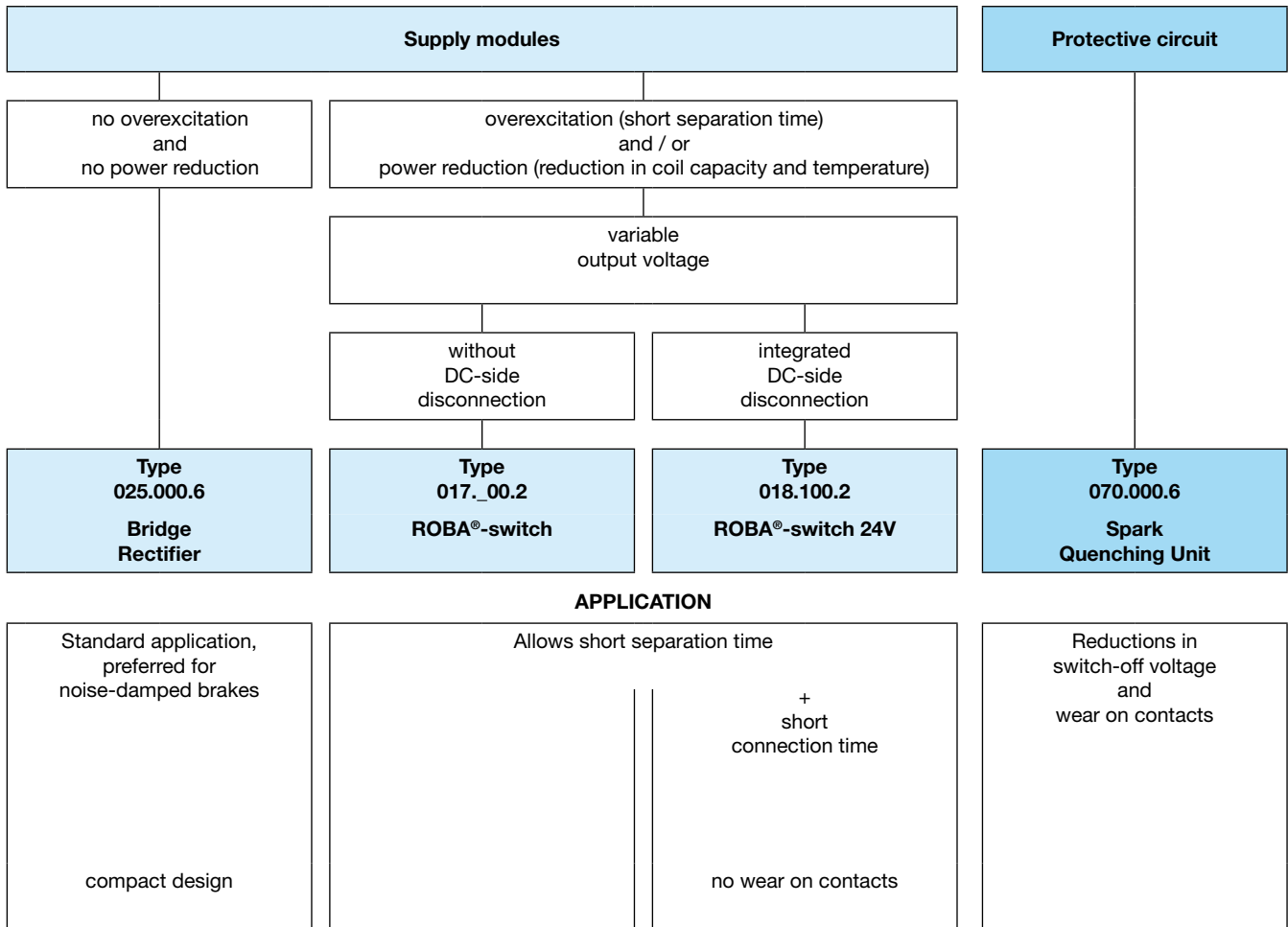
The power circuit is interrupted between the rectifier and the coil as well as mains-side. The magnetic field is removed very quickly, resulting in a rapid rise in braking torque.

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

DC-side switching means **short brake engagement time (e.g. for EMERGENCY STOP operation)**. However, this produces louder switching noises.

### • Protective Circuit

When using DC-side switching, the coil must be protected by a suitable protective 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 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 operation current are sufficient. Depending on the application, the switching contact can also be protected by other protective circuits (e.g. *mayr*® spark quencher), although this may of course then alter the switching time.



**Example 1**

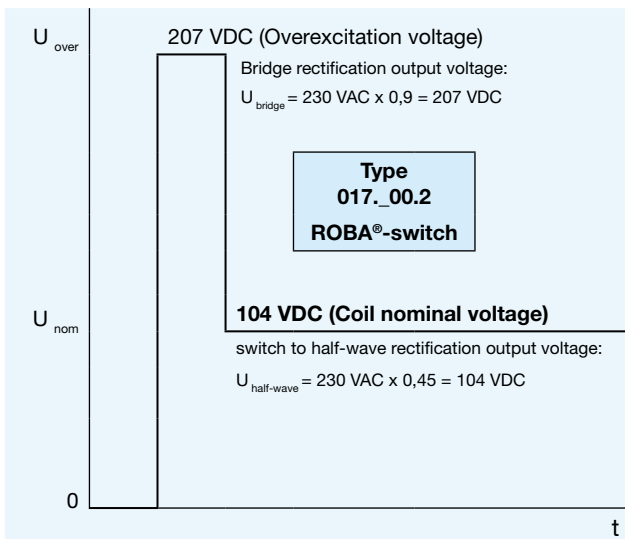
Available: network voltage 230 VAC

Wanted: short separation time (overexcitation)

Required: supply module / coil nominal voltage

Solution:

- Supply module: Type 017\_00.2
- Coil nominal voltage: 104 VDC





## 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.

## Electrical Connection (Terminals)

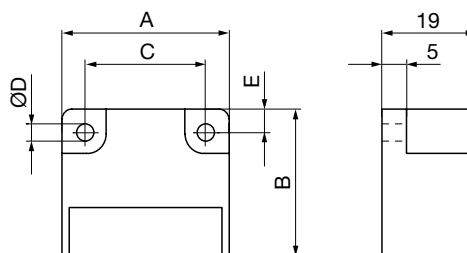
- 1 + 2 Input voltage
- 3 + 4 Connection for an external switch for DC-side switching
- 5 + 6 Coil
- 7 - 10 Free nc terminals (only for Size 2)



## Order Number

_	/	0	2	5	.	0	0	0	.	6
▲										
Size										
1										
2										

## Dimensions (mm)



Size	A	B	C	ØD	E
1	34	30	25	3,5	4,5
2	54	30	44	4,5	5,0

**Accessories:** Mounting bracket set for 35 mm rail acc. EN 60715: Article-No. 1803201

## Technical Data

	Bridge rectifier	
Calculation output voltage	VDC = VAC x 0,9	
Type	<b>1/025</b>	<b>2/025</b>
Max. input voltage	230 VAC	230 VAC
Max. output voltage	207 VDC	207 VDC
Output current at ≤ 50°C	2,5 A	2,5 A
Output current at max. 85 °C	1,7 A	1,7 A
Max. coil capacity at 115 VAC ≤ 50 °C	260 W	260 W
Max. coil capacity at 115 VAC up to 85 °C	177 W	177 W
Max. coil capacity at 230 VAC ≤ 50 °C	517 W	517 W
Max. coil capacity at 230 VAC up to 85 °C	352 W	352 W
Max. coil capacity at 400 VAC ≤ 50 °C	-	-
Max. coil capacity at 400 VAC up to 85 °C	-	-
Max. coil capacity at 500 VAC ≤ 50 °C	-	-
Max. coil capacity at 500 VAC up to 85 °C	-	-
Max. coil capacity at 600 VAC ≤ 50 °C	-	-
Max. coil capacity at 600 VAC up to 85 °C	-	-
Peak reverse voltage	1600 V	1600 V
Rated insulation voltage	320 V <sub>RMS</sub>	320 V <sub>RMS</sub>
Pollution degree (insulation coordination)	1	1
Protection fuse	To be included in the input voltage line.	
Recommended microfuse switching capacity H <small>The microfuse corresponds to the max. possible connection capacity. If fuses are used corresponding to the actual capacities, the permitted limit integral I<sup>2</sup>t must be observed on selection.</small>	FF 3,15A	FF 3,15A
Permitted limit integral I <sup>2</sup> t	40 A <sup>2</sup> s	40 A <sup>2</sup> s
Protection	IP65 components, encapsulated / IP20 terminals	
Terminals	Cross-section 0,14 - 1,5 mm <sup>2</sup> (AWG 26-14)	
Ambient temperature	- 25 °C up to + 85 °C	
Storage temperature	- 25 °C up to + 105 °C	
Conformity markings	UL, CE	UL, CE
Installation conditions	The installation position can be user-defined. Please ensure sufficient heat dissipation and air convection! Do not install near to sources of intense heat!	



### Application

ROBA®-switch fast acting rectifiers are used to connect DC consumers to alternating voltage supplies, for example electromagnetic brakes and clutches (ROBA-stop®, ROBA®-quick, ROBATIC®) as well as electromagnets and 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  $I_{RMS}$ : 3 A at 250 VAC
- UL-approved

### Function

The ROBA®-switch units are used for operation at an input voltage of between 100 and 500 VAC, dependent on 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.

### Electrical Connection (Terminals)

- 1 + 2 Input voltage (fitted protective varistor)
- 3 + 4 Connection for external contact for DC-side switch-off
- 5 + 6 Output voltage (fitted protective varistor)
- 7 + 8  $R_{ext}$  for bridge rectifier timing adjustment

### Technical Data

Input voltage	see Table 1
Output voltage	see Table 1
Protection	IP65 components, IP20 terminals, IP10 $R_{ext}$
Terminal nom. cross-section	1,5 mm <sup>2</sup> , (AWG 22-14)
Ambient temperature	-25 °C up to +70 °C
Storage temperature	-40 °C up to +105 °C

ROBA®-switch Sizes, Table 1

	Size			
	Type 017.000.2		Type 017.100.2	
	10	20	10	20
Input voltage VAC ± 10 %	100 - 250	200 - 500	100 - 250	200 - 500
Output voltage VDC, $U_{bridge}$	90 - 225	180 - 450	90 - 225	180 - 450
Output voltage VDC, $U_{half-wave}$	45 - 113	90 - 225	45 - 113	90 - 225
Output current $I_{RMS}$ at ≤ 45 °C, (A)	2,0	1,8	3,0	2,0
Output current $I_{RMS}$ at max. 70 °C, (A)	1,0	0,9	1,5	1,0
Conformity markings				

### Order Number

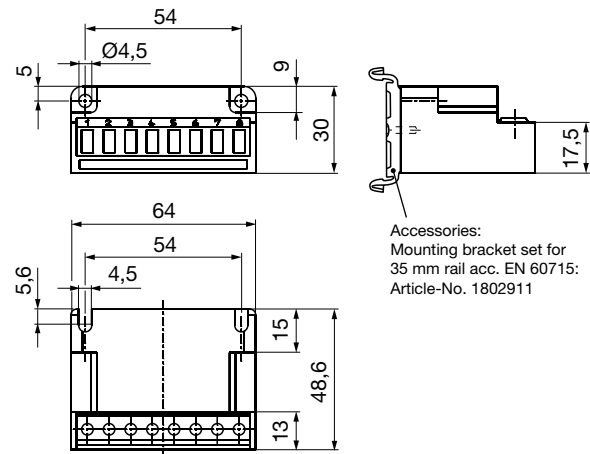
\_\_ / 0 1 7 . \_\_ 0 0 . 2

<b>Size</b>	<b>UL-approved</b>
10	0 up to 300 V
20	1 up to 500 V



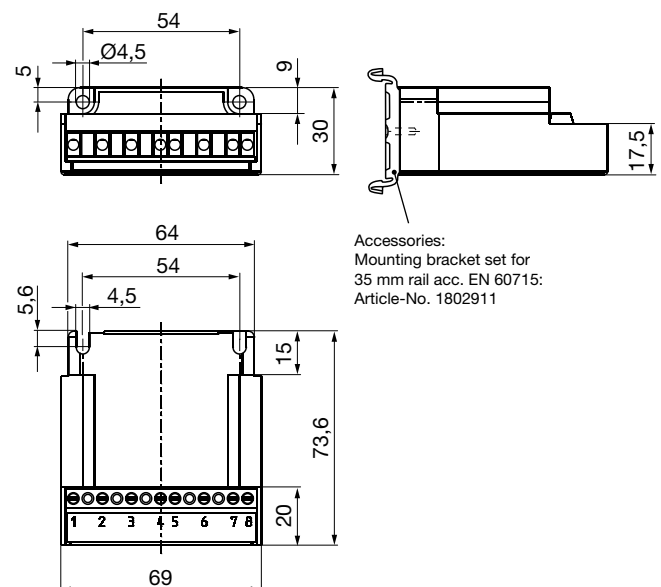
### Dimensions (mm)

Type 017.000.2



Accessories:  
Mounting bracket set for 35 mm rail acc. EN 60715: Article-No. 1802911

Type 017.100.2



Accessories:  
Mounting bracket set for 35 mm rail acc. EN 60715: Article-No. 1802911

## Application

ROBA®-switch 24V fast switching modules are used to operate DC consumers with overexcitation or power reduction, for example electromagnetic brakes and clutches (ROBA-stop®, ROBA®-quick, ROBATIC®), electromagnets, electrovalves etc.

### Fast acting rectifier ROBA®-switch 24V 018.100.2

- Consumer operation with overexcitation or power reduction
- Integrated DC-side switch-off (shorter connection time  $t_1$ )
- Input voltage: 24 VDC
- Max. output current  $I_{RMS}$ : 5 A



The ROBA®-switch 24V with integrated DC-side switch-off is not suitable for being the only safety switch-off in applications!



## Function

The ROBA®-switch 24V units are used for an input voltage of 24 VDC. They can switch internally automatically, meaning that the output voltage switches to holding voltage from the input voltage (=overexcitation voltage). The overexcitation time can be adjusted via a DIP switch to 150 ms, 450 ms, 1 s, 1,5 s and 2,15 s. The holding voltage can be adjusted via a further DIP switch to 1/4, 1/3, 1/2 and 2/3 of the input voltage (equals 6 V, 8 V, 12 V and 16 V at an input voltage of 24 V).

Apart from this, the ROBA®-switch 24V has an integrated DC-side switch-off. In contrast to the usual DC-side switch-off, no further protective measures or external components are required. The DC-side switch-off is activated in standard mode and causes short switching times on the electromagnetic consumer. This can, however, be deactivated by installing a bridge between terminals 7 and 8 in order to produce soft brakings and quieter switching noises. However, this substantially lengthens the switching times (c. 6 – 10x).

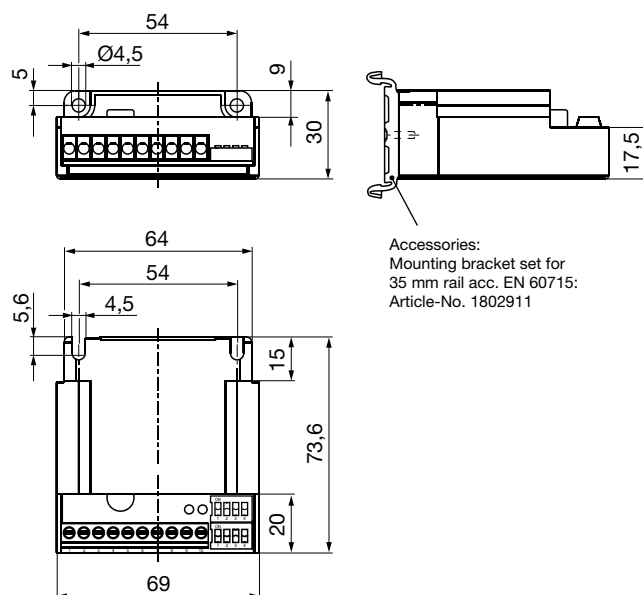
## Electrical connection (terminals)

- 2 + 3 Input voltage, ground
- 4 Control input
- 5 – 7 Input voltage +24 VDC
- 8 + 9 Output voltage +
- 10 Output voltage -

## Technical Data

Input voltage $U_i$	24 VDC +20 % / -10 % SELV/PELV
Output voltage $U_{over}$	Input voltage $U_i$
Output voltage $U_{hold}$	1/4, 1/3, 1/2, 2/3 x $U_i$ ± 20 %
Output current $I_{RMS}$ at ≤ 45 °C	5,0 A
Output current $I_{RMS}$ at max 70 °C	2,5 A
Protection	IP00
Terminal nominal cross-section	1,5 mm <sup>2</sup> (AWG 22-14)
Ambient temperature	-25 °C up to +70 °C
Storage temperature	-40 °C up to +105 °C

## Dimensions (mm)



## Order number

— / 0 1 8 . 1 0 0 . 2



Size  
1

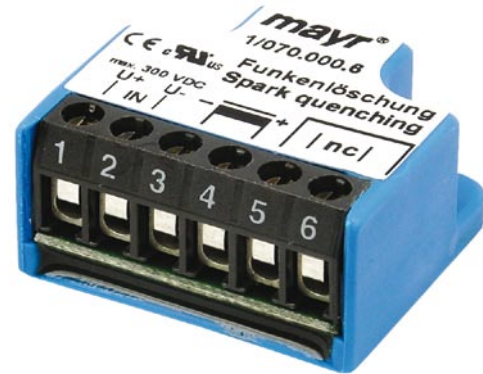
**Application**

Reduces spark production on the switching contacts occurring during DC-side switching-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 free-wheeling diodes.

**Function**

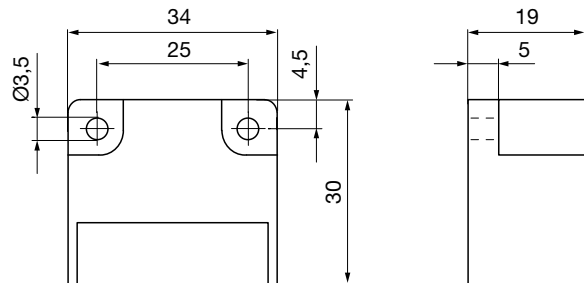
The spark quenching unit will absorb voltage peaks resulting from inductive load switching, which can cause damage to insulation and contacts. It limits these to 70 V and reduces the contact load. Switching products with a contact opening distance of > 3 mm are suitable for this purpose.



**Electrical Connection** (Terminals)

- 1 (+) Input voltage
- 2 (-) Input voltage
- 3 (-) Coil
- 4 (+) Coil
- 5 Free nc terminal
- 6 Free nc terminal

**Dimensions** (mm)



**Technical Data**


Input voltage	max. 300 VDC, max. 615 V <sub>peak</sub> (rectified voltage 400 VAC, 50/60 Hz)
Switch-off energy	max. 9 J/2 ms
Power dissipation	max. 0,1 Watt
Max. voltage nc terminals	250 V
Protection	IP65 / IP20 terminals
Ambient temperature	-25 °C up to +85 °C
Storage temperature	-25 °C up to +105 °C
Max. conductor connection diameter	2,5 mm <sup>2</sup> / AWG 26-12
Max. terminal tightening torque	0,5 Nm

**Accessories**

Mounting bracket set for 35 mm rail acc. EN 60715:  
Article-No. 1803201

**Order Number**

\_\_\_ / 0 7 0 . 0 0 0 . 6

 **Size**  
1



**Guidelines on the Declaration of Conformity:** A conformity evaluation has been carried out for the product (electromagnetic safety brake) according to the EC Low Voltage Directive 2006/95/EC. The conformity evaluation is set 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 unit to the directive. It is forbidden to put the product into initial operation until it has been ensured that the machine accords with the stipulations 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. In order to use this product in areas where there is a danger of explosion, classification and marking according to the directive 94/9/EC must be carried out.

## Safety Guidelines

Brakes may generate, among other things, the following risks:



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 should 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, such as other foreign substances.
- 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 PE conductor on the fixed installation. If the basic insulation fails, no contact voltage will remain. Please carry out a standardized inspection of the PE conductor connections to all contactable metal parts!

### Protection

**(mechanical) IP10:** Protected against large body surfaces and against large foreign bodies > 50 mm diameter. Not waterproof.

**(electrical) IP54:** Dust-proof and protected against contact as well as against splashing water from all directions.

## Appointed Use

*mayr*® brakes have been developed, manufactured and tested in compliance with the VDE 0580 standard, in accordance with the EU Low Voltage Directive. During installation, operation and maintenance of the product, the standard requirements 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.

## Regulations, Standards and Directives Used

VDE 0580	Electromagnetic devices and components, general directives
2006/95/EC	Low voltage directive
95/16/EC	Elevator directive
EN 81-1	Safety regulations for the construction and installation of elevators and small goods elevators
BGV C1	(previously VGB 70) Safety regulations for theatre stage technical systems
CSA C22.2 No. 14-2010	Industrial Control Equipment
UL 508 (Edition 17)	Industrial Control Equipment

## Please Observe the Following Standards:

EN ISO 12100-1 and 2	Machine safety
EN ISO 14121-1	Risk assessment
EN 61000-6-4	Noise emission
EN 12016	Interference resistance (for elevators, escalators and moving walkways)
EN 60204-1	Electrical machine equipment

## 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 malfunction will not be taken when
  - 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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