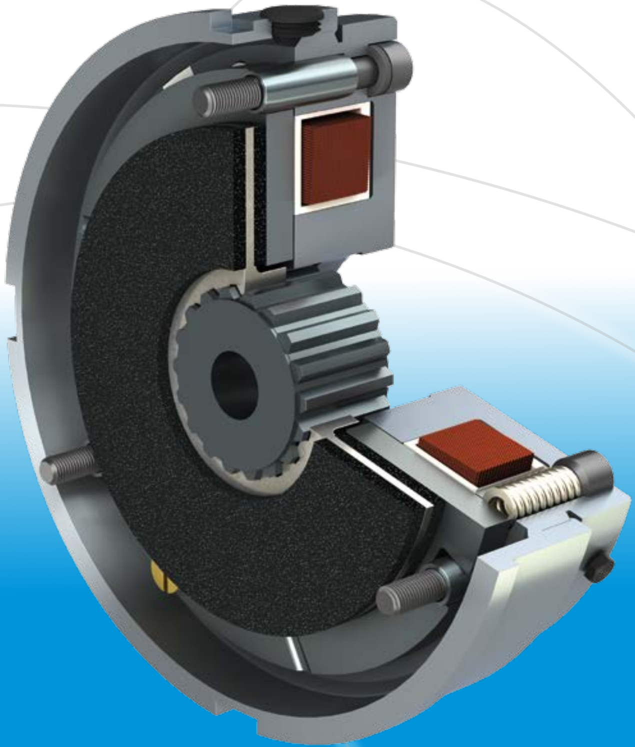
your reliable partner



ROBA-stop®

K.800.V09.EN

www.mayr®.com

Your Advantages When Using ROBA-stop®

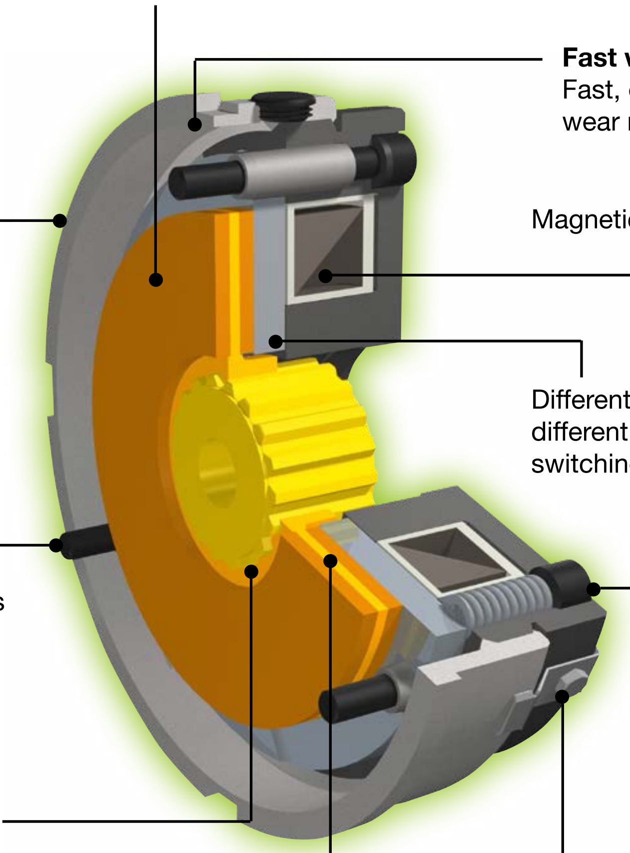
ROBA-stop® brakes attract customers because of their decided advantages in relation to operational safety and ease of maintenance.

For most applications, the enclosed structural shape can provide high functional brake safety without requiring additional protective measures.
The product's high reliability further improves the functional safety and increases the efficiency of the entire machine or system in which it is used.

The sensitive braking torque adjustment shows its value when exact positioning is required or when drives are to be adapted to changing production procedures.
It simplifies production procedure optimization immensely, increases production, maximises flexibility and improves product quality.

A further, outstanding characteristic of the ROBA-stop® brake is the central wear re-adjustment. This minimises the danger of adjustment errors, simplifies maintenance, saves time and maintenance costs and therefore also reduces machine downtimes.

Your Customized Solution - Our Universal Brake



E189728

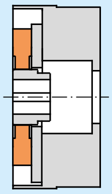
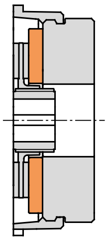
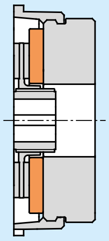
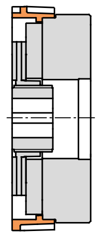
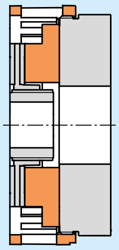
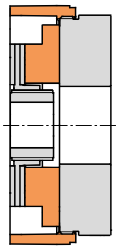
On request ROBA-stop® safety brakes can also be delivered with UL approval.

Wide Variety of Application Possibilities for ROBA-stop® safety brake

- **ROBA-stop® safety brakes** offer a complete range of the many and various designs needed for different applications. Nearly 30 years of experience with spring applied safety brakes and detailed knowledge of the multiple demands on electrical power transmission technology support our program. Our tried and tested technology and our continual advances with regard to user-specific optimization of our palette of structural shapes guarantee the perfect brake for each individual application.
- **ROBA-stop®-positioning brakes** provide high positioning and repetitive accuracy even at high switching frequencies. Sensitive adjustment of the braking torque is possible. This structural shape can be adapted to many different applications using different armature disks.
- **ROBA-stop®-holding brakes** can reach very high braking torques. They are suitable for holding masses or loads without friction work, although braking at low speeds with low friction work in suitable application conditions is also permitted.
- **ROBA-stop®-tacho brakes** feature a centering recess and tapped holes on the back of the brake for mounting a tacho-generator. This brake also allows exact positioning with high repetitive accuracy using its sensitive braking torque adjustment.
- **ROBA-stop®-tacho peak load brakes** have the same basic functions as the tacho brake. They are, however, additionally equipped with an extremely strong armature disk which permits high friction work.
- **ROBA-stop®-peak load brakes** come in two further variations. These are both equipped with an extremely strong armature disk for high friction work. The design with an open distance ring dissipates brake heat very quickly into the surrounding area. The design with a closed distance ring is used when high friction work must be absorbed and when higher protection against outer influences is required.
- **ROBA-stop®-sealed** and
- **ROBA-stop®-S** comply with Protection IP67. They are fully enclosed, sealed and protected against corrosion.

Contents

Summary of Constructional Designs ROBA-stop®

ROBA-stop®- positioning brake Size 2 	Braking torque: 1.1 Nm Size 2 Type 800.45_.0	• Design with a central brake spring and a friction lining rotor. • Hand release and flange plate available on request as additional parts. **Page 7**
ROBA-stop®- positioning brake 	Braking torque: 3 to 800 Nm Sizes 3 to 11 Type 80_.41_._	• For braking and for exact positioning. Consistent repetitive accuracy, even at higher switching frequencies. The braking torque can be sensitively adjusted using adjusting screws. • Most application requirements can be met by means of different armature disks. **Page 8**
ROBA-stop® - holding brake 	Braking torque: 5 to 1250 Nm Sizes 3 to 11 Type 820.61_._	• The holding brake reaches a higher braking torque than the positioning brake. It is suitable for holding masses or loads without friction work. • Braking at low speeds with low friction work is sometimes possible on request. • We recommend operation with the fast acting rectifier ROBA®-switch (see pages 35 – 40, 42). **Page 10**
ROBA-stop® - tacho brake 	Braking torque: 3 to 800 Nm Sizes 3 to 11 Type 83_.41_._	• The tacho brake has a fixed distance ring and, on the back of the coil carrier, a centering recess as well as three tapped holes. The centering recess is centered with the outer diameter of the distance ring. This simplifies the attachment of tacho-generators. **Page 12**
ROBA-stop® - peak load brake 	Braking torque: 50 to 800 Nm Sizes 7 to 11 Type 863.41_._	• Heat is dissipated efficiently by the high-strength armature disk and the open threaded distance ring. The peak load brake can therefore absorb a very high amount of friction work e.g. on EMERGENCY STOP. In normal switching operation, the brake functions in the same way as a positioning brake. **Page 14**
ROBA-stop®-peak load brake with closed distance ring 	Braking torque: 50 to 800 Nm Sizes 7 to 11 Type 866.41_._	• The peak load brake can absorb very high friction work e.g. on EMERGENCY STOP via the high-strength armature disk. In normal switching operation, the brake functions in the same way as a positioning brake. • The closed threaded distance ring guarantees protection against ambient influences together with good heat dissipation. **Page 16**

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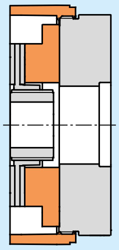
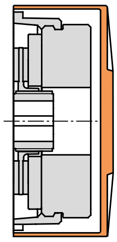
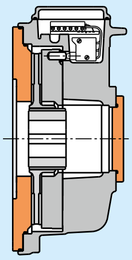
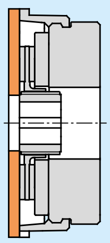
Summary of Constructional Designs ROBA-stop®

ROBA-stop® - tacho peak load brake 	Braking torque: 50 to 800 Nm Sizes 7 to 11 Type 883.41_._	• Friction work is absorbed efficiently e.g. on EMERGENCY STOP by the high-strength armature disk and the closed distance ring, meaning that heat is dissipated efficiently. A centering recess and three tapped holes on the back of the coil carrier make attachment of the tacho-generator easy. **Page 18**
ROBA-stop®-sealed 	Braking torque: 3 to 26 Nm Sizes 3 to 6 Type 80_.418.3	• This design is completely enclosed and sealed by a cover. • It complies with Protection IP67. **Page 19**
ROBA-stop®-S 	Braking torque: 100 to 800 Nm Sizes 8 to 11 Type 856.41_._	• Corrosion-resistant, sealed design used for extreme ambient conditions. • It complies with Protection IP 67. **Page 20**

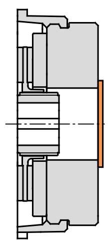
Additional Parts

Flange plate



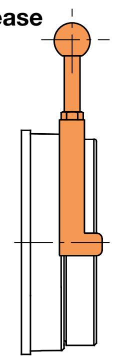
If no suitable friction surface is available customer-side for the brake linings, our flange plate can be used.

Cover plate



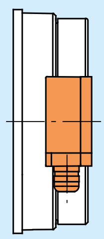
The brake is enclosed by the cover plate and complies with Protection IP54.
This function has been TÜV- (German Technical Inspectorate) approved in several tests.

Hand Release



This function is used for mechanical release of the ROBA- stop® brake when the magnetic coil is de-energised (e.g. on power failure).

Terminal box



The terminal box serves as an interface for the supply cable and for housing the terminal, a spark quenching unit or a rectifier.

ROBA-stop® electromagnetic safety brake

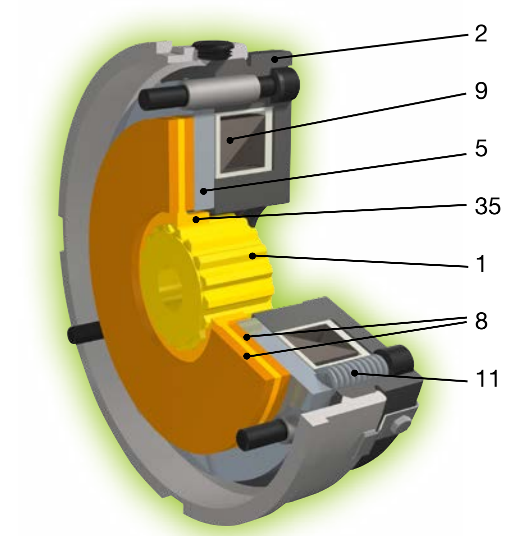
Function

ROBA-stop® brakes are spring applied, electromagnetic safety brakes.

Spring applied function:
In de-energised condition, helical springs (11) press against the armature disk (5). The rotor (35) friction linings (8), which are connected via a toothed hub (1) with the drive shaft, are clamped between the armature disk (5) and the brake mounting surface.

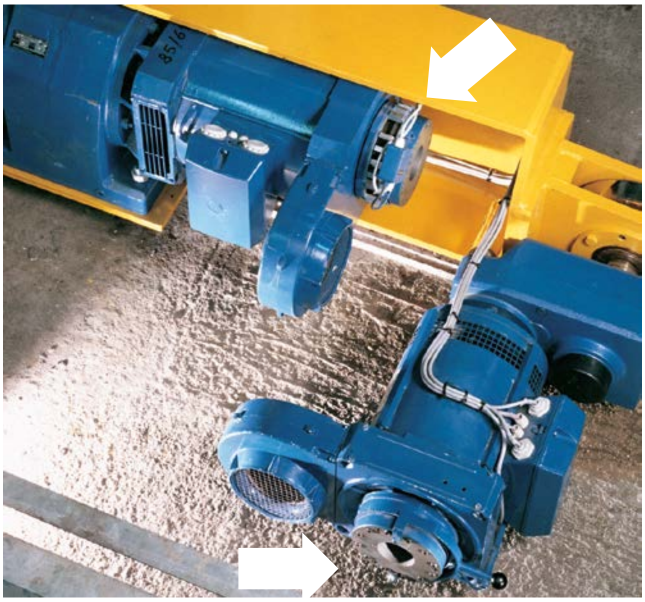
Electromagnetic function:
If the coil (9) is energised, a magnetic field is built up which attracts the armature disk (5) to the coil carrier (2), thereby releasing the rotor (35) with the friction linings (8).
The brakes are released if voltage is applied.

Safety brake function:
If the brake is de-energised, it is closed, thereby complying with the relevant safety demands e.g. on power failure or on EMERGENCY STOP.



Installation Example

ROBA-stop®: Application in a high rack warehouse



Hoist drives and traction drives on narrow aisle material handling systems are equipped with ROBA-stop® brakes. The ROBA-stop® positioning brake at the rear of the drive motor brakes the drive at slow speeds exactly at the required position. The ROBA-stop®-peak load brake on the hoist motor usually provides the same functions during normal operation – braking at slow speeds and exact positioning. This brake is additionally able to brake safely at high speeds and with downward-moving loads in case of EMERGENCY STOP or power failure. It is capable of absorbing extremely high friction work and of dissipating it quickly into the surrounding area.

Total Quality Management

Product Quality

Every delivery which leaves our firm has been subjected to a careful quality inspection, meaning that you are able to rely 100 % on *mayr*® products. If required, we pre-adjust our clutches and brakes accurately to the requested values and confirm the **product characteristics with an Inspection Report.**

Quality Management

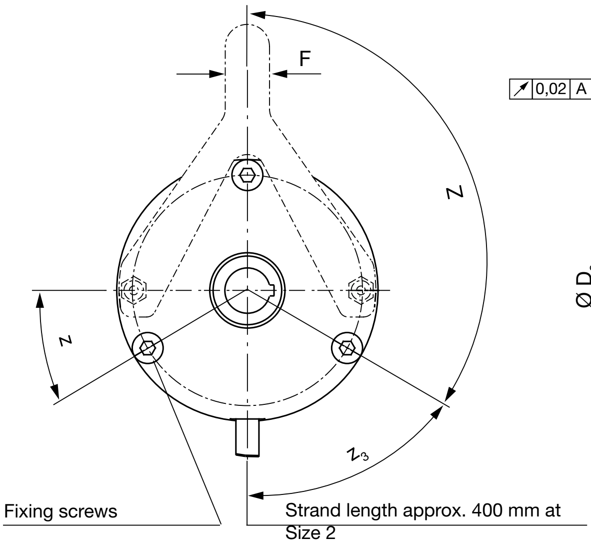
mayr® uses the term quality to describe its products and services. Certification of our quality management confirms the quality-consciousness of our employees at every level of the company.

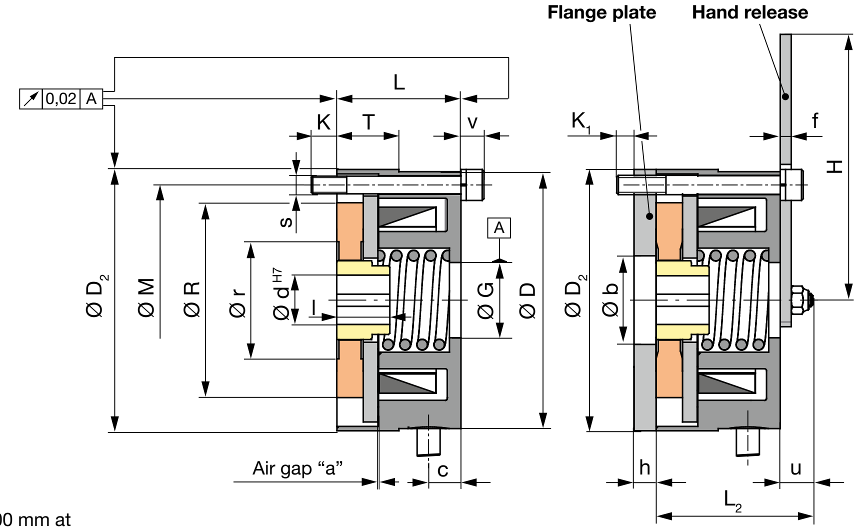
Our integrated management system is certified according to **DIN EN ISO 9001:2008 (Quality)** and **DIN EN ISO 14001 (Environment)** and complies with the **OHSAS 18001/ OHRIS (Occupational Health and Safety)** demands.

ROBA-stop®- positioning brake Type 800.45_.0 Size 2

Type 800.450.0
without accessories

Type 800.455.0
with flange plate
and hand release





We reserve the right to make dimensional and constructional alterations.

Technical data			Size 2
Braking torque [1]	M_N	[Nm]	1.1
Electrical power	P_{20}	[W]	12
Max. speed [2]	n_{max}	[rpm]	7000
Weight		[kg]	0.4

Dimensions [mm]			Size 2
Bores	$Ød_{min}$	DIN 6885/1	6
	$Ød_{max}$	DIN 6885/1	10
		Special keyway	11 [3]
		Preferred bores H7	9; 10

a	b	c	D	$D_{2\ h8}$	F	f	G^{H8}	H	h	K	K_1	L
0.15	20	4.5	58	59	10	2.5	17	60	5	6	6	28

L_2	l	M	R	r	s	T	u	v	Z	z	z_3
35.2	12	52	44	29	3 x M4	14	7.5	5.2	3 x 120°	30°	60°

The robust and simplified form of the ROBA-stop®-brake Size 2 guarantees problem-free installation and reliability in operation

To ensure compact overall dimensions, the wear re-adjustment and braking torque adjustment are not included in the design.

In contrast to the other ROBA-stop® brakes, the braking force is generated by a central spring.

The rotor and hub toothing guarantee reliable braking torque transmission and prevent all but minimal torsional backlash between the hub and the rotor.

If no suitable counter friction surface for the friction lining rotor is available customer-side, our flange plate can be used.

The hand release is used for mechanical release of the brake.

The brake can easily be supplied with DC voltage using our comprehensive range of electrical accessories.

Design as tacho-generator brake available on request.

Order Number

2 / 8 0 0 . 4 5 __ . 0 / __ / __ / __

Size			Voltage [4] [VDC] ±10 %	Bore Ø d H7 (Dimensions page 7)	Keyway acc. DIN 6885/1
2	without accessories	0	24		
	Flange plate	1	104		
	Hand release	3			
	Flange plate / hand release	5			

Example: 2 / 800.451.0 / 104 / 10 / 6885/1

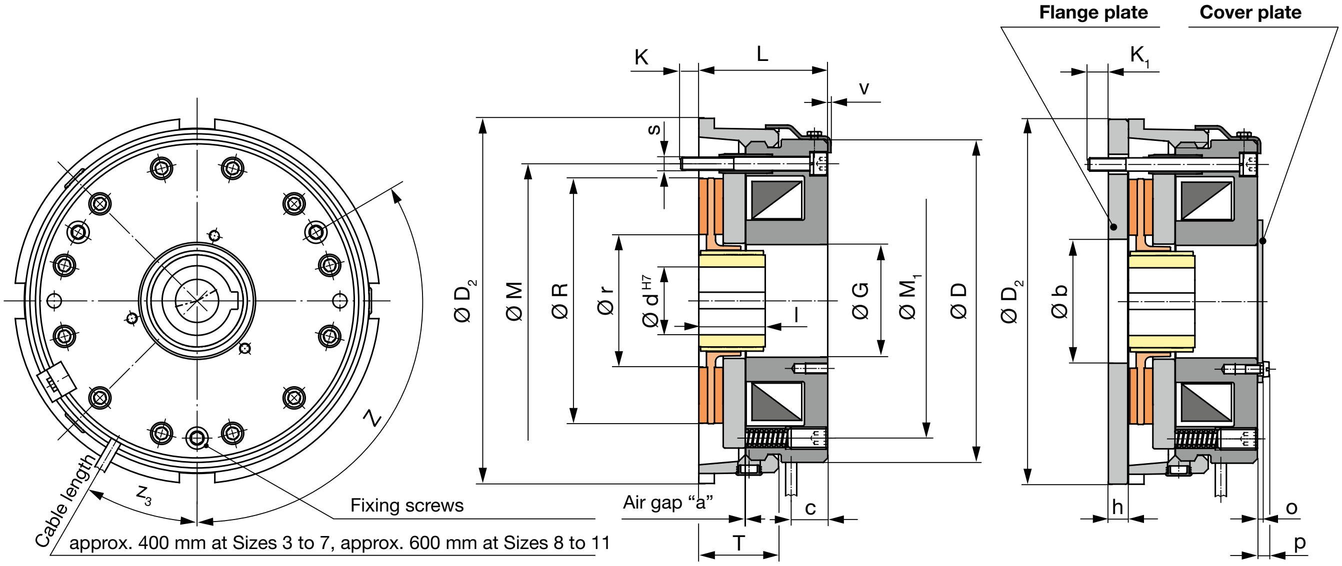
1) Braking torque tolerance: +40 % / -20 %,
other braking torques available on request
2) Higher speeds on request

3) Over Ø10 special keyway: width b = 4 ^{JS9}, depth t = 1.2 $^{+0.1}$
4) Standard voltages [VDC]: 24; 104
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038

ROBA-stop®- positioning brake Type 80_.41_._ Sizes 3 – 11

Type 80_.410.3
without accessories

Type 80_.414.3
with flange plate
and cover plate



Technical data			Size								
			3	4	5	6	7	8	9	10	11
Braking torque [1]	M_N	[Nm]	3	6	12	26	50	100	200	400	800
Electrical power	P_{20}	[W]	17	24	33	50	70	87	102	134	196
Max. speed [2]	n_{max}	[rpm]	6000	5000	4800	4000	3800	3400	3000	3000	3000
Weight		[kg]	0.6	0.95	1.8	3.1	5.4	9.4	15.5	30	55

This brake is an electromagnetic safety brake for braking and exact positioning. A high repetitive accuracy is guaranteed, even at high switching frequencies.

Two different armature disks are available to cope with different demands on friction work and on brake switching times.

Standard armature disk:
Short attraction time (brake release), longer drop-out time from power switch-off to the point at which the braking torque comes into effect. Solid structural shape allows high friction work absorption.

Fast acting armature disk:
This disk has the same characteristics as the standard armature disk; however, it has a slightly longer attraction time but a much shorter drop-out time.

The electrical switching and the type of power supply have a large influence on the switching times. Our wide range of electrical accessories allows a simple DC voltage brake supply connection (see pages 33 – 42).

Order Number

__ / 8 0 __ . 4 1 __ . __ / __ / __ / __

Size
3
4
5
6
7
8
9
10
11

Standard armature disk **0**
Fast acting armature disk **2**

Without additional parts **0**
Flange plate **1**
Cover plate **2**
Hand release [3] **3**
Flange plate/cover plate **4**
Flange plate/hand release [3] **5**
Cover plate/hand release [3] **6**
Flange plate/cover plate/hand release [3] **7**

1 Terminal box with terminal
3 Cable
4 Terminal box with half-wave rectifier
5 Terminal box with bridge rectifier
6 Terminal box with spark quenching unit

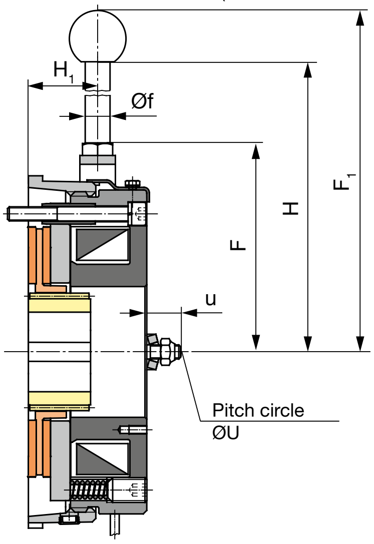
Voltage [4] [VDC] ±10 %
24
104
180
207

Bore Ø d H7
(Dimensions page 9)

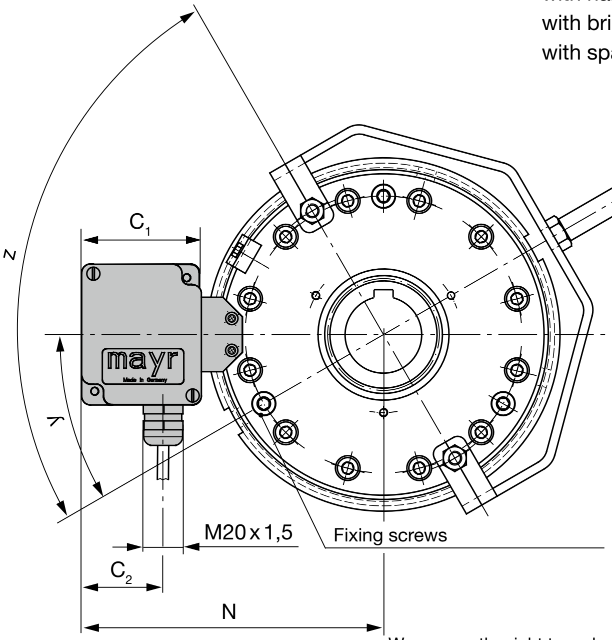
Keyway acc.
DIN 6885/1
DIN 6885/2
DIN 6885/3

Example: 6 / 800.411.3 / 104 / 20 / 6885/1

Type 80_.413.3
with hand release (Size 11 differs from the figure)

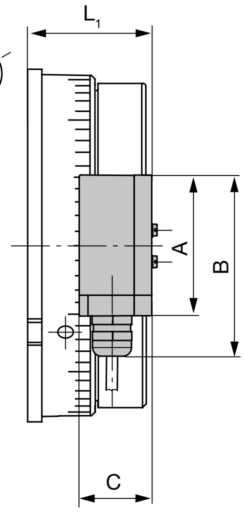


Type 80_.41_._
with terminal box



Terminal box

with terminal	**Type 80_.41_.1**
with half-wave rectifier	**.4**
with bridge rectifier	**.5**
with spark quenching unit	**.6**



We reserve the right to make dimensional and constructional alterations.

Dimensions [mm]			Size								
			3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Bores	**Ød**$_{min}$	DIN 6885/1	8	10	10	15	20	25	25	25	30
	Ød$_{max}$	DIN 6885/1	11	13	18	23	30	45	47	57	76
		DIN 6885/2	12 [5)]	-	-	-	-	-	-	-	-
		DIN 6885/3	-	15	20	25	32	-	50	60	80
	Preferred bores H7		10; 11; 12	12; 15	15; 20	20; 25	25; 30	30; 40	40; 45	45; 50	60; 70

	Size								
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
A	64	64	64	64	79.5	79.5	79.5	79.5	79.5
a	0.2	0.2	0.25	0.25	0.35	0.35	0.4	0.4	0.5
B	77	77	77	77	92.5	92.5	92.5	92.5	92.5
b	22	26	35	40	48	68	75	90	120
C	36	36	36	36	42	42	42	42	42
C_1	58	58	58	58	66.5	66.5	66.5	66.5	66.5
C_2	29	29	29	29	45.5	45.5	45.5	45.5	45.5
c	8	8	9	10.5	16.5	18	18	25	30
D	72	86	104.5	131.5	146	183	201	255	330
D_2	79	98	114	142	165	199	220	275	360
F	48.3	55.8	68.2	84.6	96.8	117.8	125.6	158	-
F_1	104.3	111.8	133.2	158.6	191.8	210.3	245.6	427	-
f	6	6	8	10	12	14	15	15	-
G^{H7}	21.9	26.9	30.9	38.9	50.9	73.9	80.4	90	129
H	86.3	93.8	115.2	136.1	169.3	181.3	208.6	390	-
H_1	19	21	22.5	27.5	38	38	50	65	-
h	6	7	8	8	8	10	12	14	16
K	6	5	6	8	8	12	9	12	24
K_1	5	8	8	10	10	12	12	18	18
L	30.2 [6)]	32.2 [7)]	39.3	43.2	58.2	66.7	74.3	96.3	116.3

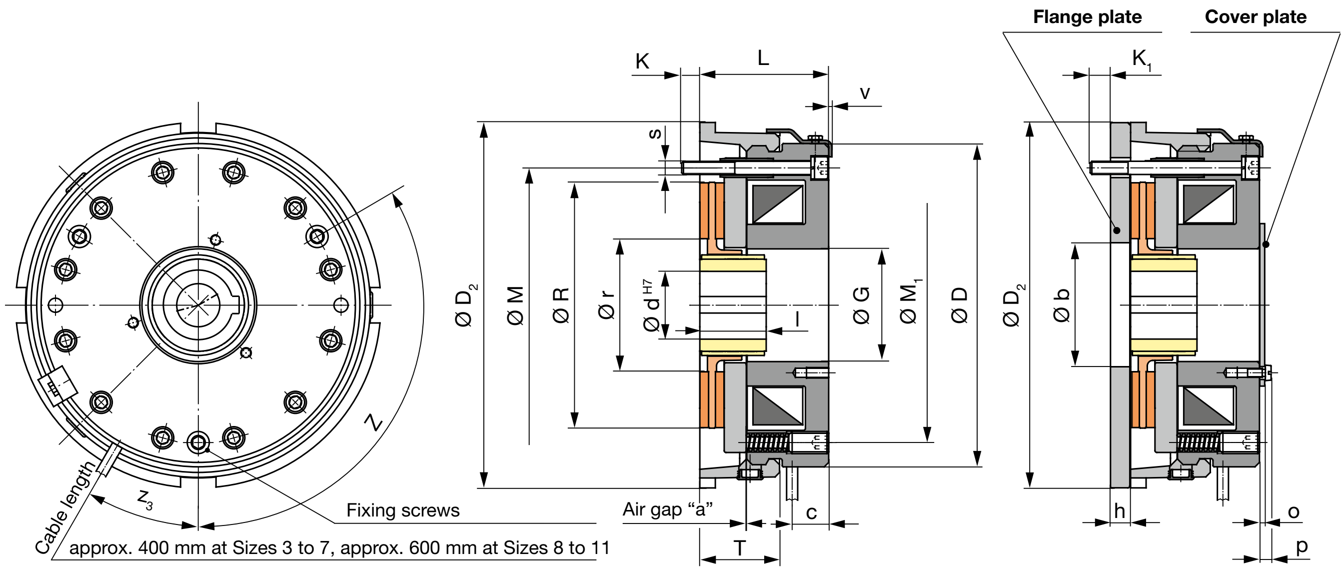
	Size								
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
L_1	38.2	40.2	47.3	51.2	61.2	69.7	77.2	99.3	119.3
l	15	20	20	25	30	35	35	50	60
	Please observe the load on the shaft or key!								
M	58	72	90	112	124	156	175	215	280
M_1	58	72	89	112	124	156	175	215	280
N	102	109	118.5	132	151.5	170	179	206	243.5
o	1.5	2.5	2.5	3.5	3.5	2	2	2	2
p	3.5	5.1	5.1	6.1	6.8	5.3	5.9	5.9	7
R	50	62.5	79.5	99	110.5	139	158	188	253
r	25	32	40	45	60	77	83	94	128
s	3xM4	3xM4	3xM5	3xM6	3xM6	3xM8	6xM8	6xM8	6xM12
T	17	19	25	27	36	38	47	56	74
U	60.5	75	91	115.5	129	161	175	215	-
u	6.5	7	9	11.5	13.5	19	21.5	29	-
v	1	1	1	1.5	1.5	1.5	2	2	2
y	33°	32°	32°	32°	30°	30°	30°	30°	22.5°
Z	3 x 120°						6x60°	6x60°	6x60°
z	98°	98°	105°	90°	90°	90°	90°	90°	90°
z_3	33°	32°	33°	33°	30°	30°	30°	30°	22.5°

1) Braking torque tolerance: +40 % / -20 %, other braking torques available on request
2) Higher speeds on request
3) A rotating hand release is used as a hand release for Size 11 (dimensions on request)
4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038
5) Width $b = 4^{JS9}$, depth $t = 1.2^{+0.1}$
6) Fixing screws protruding 3.2 mm
7) Fixing screws protruding 2.2 mm

ROBA-stop®- holding brake
Type 820.61_._
Sizes 3 – 11

Type 820.610.3
without accessories

Type 820.614.3
with flange plate
and cover plate



Technical data			Size								
			3	4	5	6	7	8	9	10	11
Braking torque [1)]	M_N	[Nm]	5	10	22	48	90	180	360	620	1250
Electrical power	P_{20}	[W]	17	24	33	50	70	87	102	134	196
Max. speed [2)]	n_{max}	[rpm]	6000	5000	4800	4000	3800	3400	3000	3000	3000
Weight		[kg]	0.6	0.95	1.8	3.1	5.4	9.4	15.5	30	55

The holding brake is designed to hold large masses or loads without friction work.
Braking at low speeds with low friction work can be made possible, but if this is required, the application conditions should first be discussed with the manufacturer.

A higher braking torque is achieved by placing more pre-tension on the brake springs located at the external pole of the magnetic part.

A standard hand release for Sizes 9 – 11 cannot be supplied due to the high spring forces. Special hand release available on request.

The brake can easily be connected to a DC voltage supply via our comprehensive range of electrical accessories (see pages 33 – 42).
We recommend operation with the fast acting rectifier ROBA®-switch (see pages 35 – 40, 42).

Order Number

__ / 8 2 0 . 6 1 __ . __ / __ / __ / __

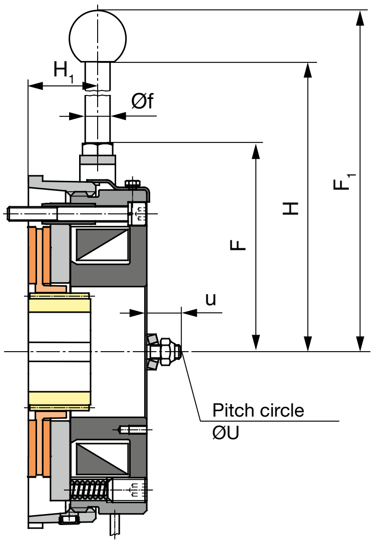
Size				Voltage [4)] [VDC] ±10 %	Bore Ø d H7	Keyway acc.
3 4 5 6 7 8 9 10 11	without accessories Flange plate Cover plate Hand release [3)] Flange plate / cover plate Flange plate / hand release [3)] Cover plate / hand release [3)] Flange plate / cover plate / hand release [3)]	0 1 2 3 4 5 6 7	1 3 4 5 6	24 104 180 207	(Dimensions page 11)	DIN 6885/1 DIN 6885/2 DIN 6885/3

1	Terminal box with terminal
3	Cable
4	Terminal box with half-wave rectifier
5	Terminal box with bridge rectifier
6	Terminal box with spark quenching unit

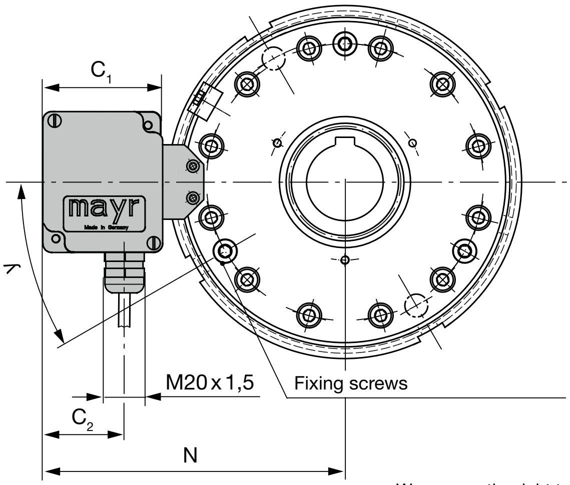
Example: 6 / 820.611.3 / 104 / 22 / 6885/1

your reliable partner

Type 820.613.3
with hand release (Sizes 3 – 8)

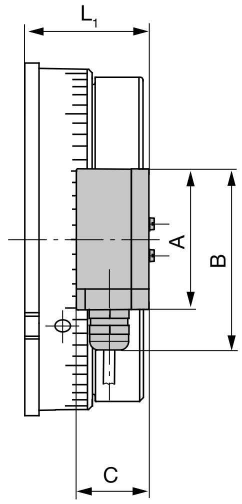


Type 820.61_._
with terminal box



Terminal box

with terminal	**Type 820.61_.1**
with half-wave rectifier	**.4**
with bridge rectifier	**.5**
with spark quenching unit	**.6**



We reserve the right to make dimensional and constructional alterations.

Dimensions [mm]			Size								
			3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Bores	**Ød$_{min}$**	DIN 6885/1	8	10	10	15	20	25	30	30	30
	Ød$_{max}$	DIN 6885/1	11	13	18	23	30	45	47	57	76
		DIN 6885/2	12 [5]	-	-	-	-	-	-	-	-
		DIN 6885/3	-	15	20	25	32	-	50	60	80
	Preferred bores H7		10; 11; 12	12; 15	15; 20	20; 25	25; 30	30; 40	40; 45	45; 50	60; 70

	Size								
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
A	64	64	64	64	79.5	79.5	79.5	79.5	79.5
a	0.2	0.2	0.25	0.25	0.35	0.35	0.4	0.4	0.5
B	77	77	77	77	92.5	92.5	92.5	92.5	92.5
b	22	26	35	40	48	68	75	90	120
C	36	36	36	36	42	42	42	42	42
C_1	58	58	58	58	66.5	66.5	66.5	66.5	66.5
C_2	29	29	29	29	45.5	45.5	45.5	45.5	45.5
c	8	8	9	10.5	16.5	18	18	25	30
D	72	86	104.5	131.5	146	183	201	255	330
D_2	79	98	114	142	165	199	220	275	360
F	48.3	55.8	68.2	84.6	96.8	117.8	-	-	-
F_1	104.3	111.8	133.2	158.6	191.8	210.3	-	-	-
f	6	6	8	10	12	14	-	-	-
G^{H7}	21.9	26.9	30.9	38.9	50.9	73.9	80.4	90	129
H	86.3	93.8	115.2	136.1	169.3	181.3	-	-	-
H_1	19	21	22.5	27.5	38	38	-	-	-
h	6	7	8	8	8	10	12	14	16
K	6	5	6	8	8	12	9	12	24
K_1	5	8	8	10	10	12	12	18	18
L	30.2 [6]	32.2 [7]	39.3	43.2	58.2	66.7	74.3	96.3	116.3

	Size								
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
L_1	38.2	40.2	47.3	51.2	61.2	69.7	77.2	99.3	119.3
l	15	20	20	25	30	35	35	50	60
	Please observe the load on the shaft or key!								
M	58	72	90	112	124	156	175	215	280
M_1	58	72	89	112	124	156	175	215	280
N	102	109	118.5	132	151.5	170	179	206	243.5
o	1.5	2.5	2.5	3.5	3.5	2	2	2	2
p	3.5	5.1	5.1	6.1	6.8	5.3	5.9	5.9	7
R	50	62.5	79.5	99	110.5	139	158	188	253
r	25	32	40	45	60	77	83	94	128
s	3xM4	3xM4	3xM5	3xM6	3xM6	3xM8	6xM8	6xM8	6xM12
T	17	19	25	27	36	38	47	56	74
U	60.5	75	91	115.5	129	161	-	-	-
u	6.5	7	9	11.5	13.5	19	-	-	-
v	1	1	1	1.5	1.5	1.5	2	2	2
y	33°	32°	32°	32°	30°	30°	30°	30°	22.5°
Z	3 x 120°						6x60°	6x60°	6x60°
z	98°	98°	105°	90°	90°	90°	90°	90°	90°
z_3	33°	32°	33°	33°	30°	30°	30°	30°	22.5°

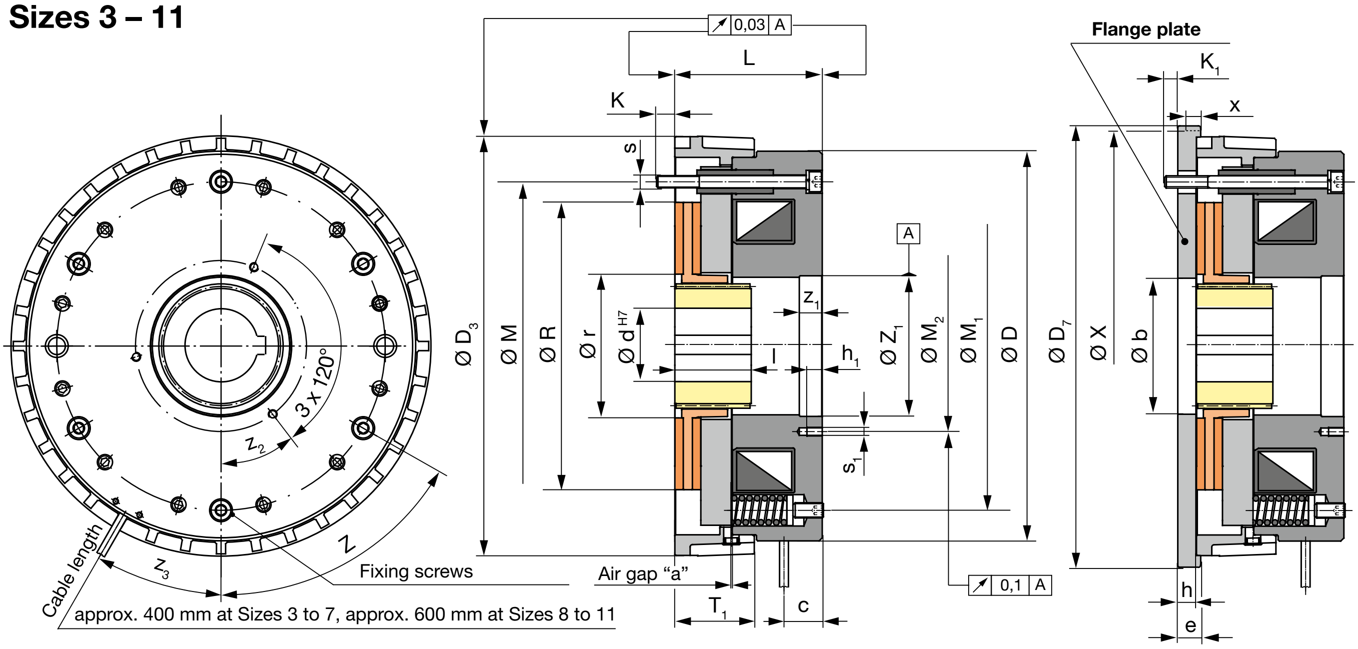
1) Braking torque tolerance: +40 % / -20 %,
other braking torques available on request
2) Higher speeds on request
3) Standard hand release for Sizes 9 – 11 not possible

4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038
5) Width b = 4 ^{JS9}, depth t = 1.2 $^{+0.1}$
6) Fixing screws protruding 3.2 mm
7) Fixing screws protruding 2.2 mm

ROBA-stop® - tacho brake
Type 83_.41_._
Sizes 3 – 11

Type 83_.410.3
without accessories

Type 83_.411.3
with flange plate



Technical data			Size								
			3	4	5	6	7	8	9	10	11
Braking torque 1)	M_N	[Nm]	3	6	12	26	50	100	200	400	800
Electrical power	P_{20}	[W]	17	24	33	50	70	87	102	134	196
Max. speed 2)	n_{max}	[rpm]	6000	5000	4800	4000	3800	3400	3000	3000	3000
Weight		[kg]	0.6	0.95	1.8	3.1	5.4	9.4	15.5	30	55

The tacho brake has a fixed distance ring as well as a centering recess and three tapped holes on the rear side of the coil carrier. The centering recess is centered with the outer diameter of the distance ring.

The tacho-generator, the encoder or other components can be mounted via an intermediate flange. This flange must be manufactured according to the connection dimensions of the brake and the components, which are to be mounted.

When selecting a component to be mounted, the technical parameters and influences of the brake, such as the speed, the steady-state temperature, stray magnetic fields around the brake etc., must be taken into consideration by the customer.

The brake can easily be connected to a DC voltage supply via our comprehensive range of electrical accessories (see pages 33 – 42).

Order Number

__ / 8 3 __ . 4 1 __ . __ / __ / __ / __

Size
3
4
5
6
7
8
9
10
11

Standard armature disk 0
Fast acting armature disk 2

Without additional parts 0
Flange plate 1
Hand release 3) 3
Flange plate/hand release 3) 5

Terminal box with terminal 1
Cable 3
Terminal box with half-wave rectifier 4
Terminal box with bridge rectifier 5
Terminal box with spark quenching unit 6

Voltage 4) [VDC] ±10 %
24
104
180
207

Bore Ø d H7
(Dimensions page 13)

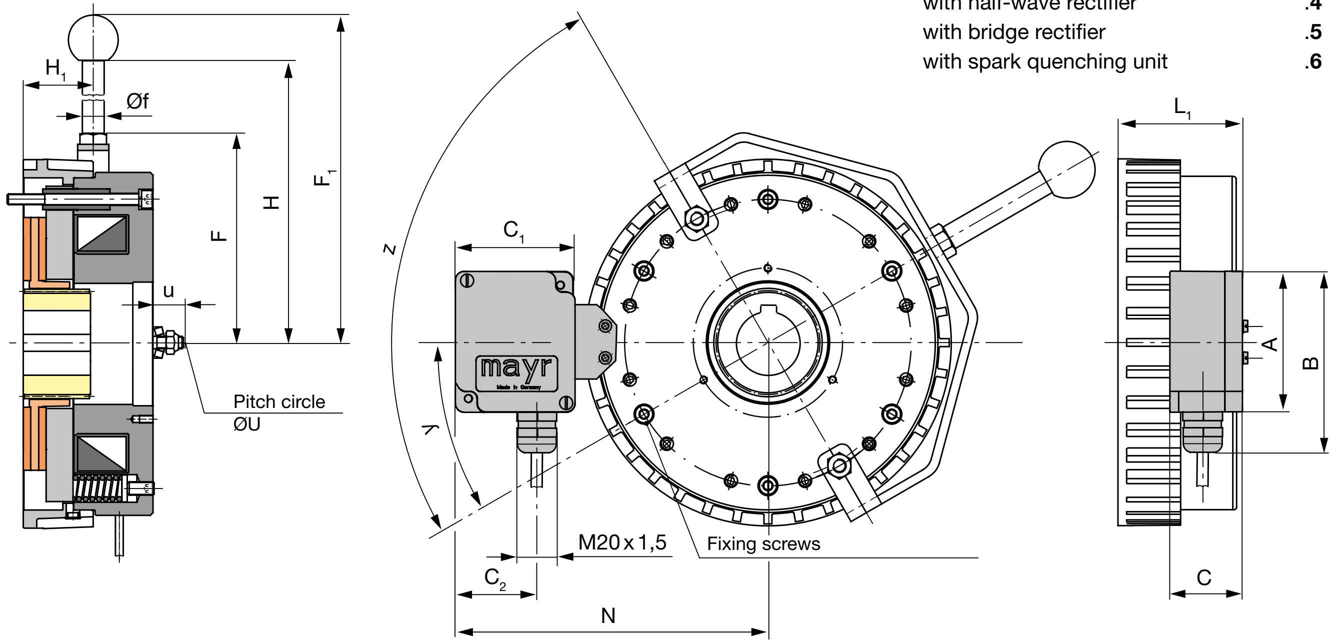
Keyway acc.
DIN 6885/1
DIN 6885/2
DIN 6885/3

Example: 6 / 830.410.3 / 104 / 20 / 6885/1

Type 83_.413.3
with hand release (Size 11 differs from the figure)

Type 83_.41_._
with terminal box

Terminal box	
with terminal	**Type 83_.41_.1**
with half-wave rectifier	**.4**
with bridge rectifier	**.5**
with spark quenching unit	**.6**



We reserve the right to make dimensional and constructional alterations.

Dimensions [mm]			Size								
			3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
	$Ød_{min}$	DIN 6885/1	8	10	10	15	20	25	25	25	30
Bores	$Ød_{max}$	DIN 6885/1	11	13	18	23	30	45	47	57	76
		DIN 6885/2	12 [5]	-	-	-	-	-	-	-	-
		DIN 6885/3	-	15	20	25	32	-	50	60	80
	Preferred bores H7		10; 11; 12	12; 15	15; 20	20; 25	25; 30	30; 40	40; 45	45; 50	60; 70

	Size								
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
A	64	64	64	64	79.5	79.5	79.5	79.5	79.5
a	0.2	0.2	0.25	0.25	0.35	0.35	0.4	0.4	0.5
B	77	77	77	77	92.5	92.5	92.5	92.5	92.5
b^{H7}	22	26	35	40	48	68	75	90	120
C	36	36	36	36	42	42	42	42	42
C_1	58	58	58	58	66.5	66.5	66.5	66.5	66.5
C_2	29	29	29	29	45.5	45.5	45.5	45.5	45.5
c	8	8	9	10.5	16.5	18	18	25	30
D	72	86	104.5	131.5	146	183	201	255	330
$D_{3\,g7}$	78.5	97.5	113.5	141.5	164.5	198	219	274	358
$D_{7\,h6}$	85	105	122	150	175	210	230	285	370
e	8.5	8.5	9.5	10	10	13	15	17	19
F	48.3	55.8	68.2	84.6	96.8	117.8	125.6	158	-
F_1	104.3	111.8	133.2	158.6	191.8	210.3	245.6	427	-
f	6	6	8	10	12	14	15	15	-
H	86.3	93.8	115.2	136.1	169.3	181.3	208.6	390	-
H_1	19	21	22.5	27.5	38	38	50	65	-
h	6.5	6.5	7.5	8	8	10	12	14	16
h_1	6	10	10	10	10	10	10	10	13
K	6	5	6	8	8	12	9	12	24
K_1	5	8	8	10	10	12	12	18	18
L	30.2 [6]	32.2 [7]	39.4	43.2	58.3	66.8	74.4	96.4	116.4
L_1	38.2	40.2	47.3	51.2	61.2	69.7	77.2	99.3	119.3

	Size								
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
I	15	20	20	25	30	35	35	50	60
	Please observe the load on the shaft or key!								
M	58	72	90	112	124	156	175	215	280
M_1	58	72	89	112	124	156	175	215	280
M_2	29	35	41	52	61	88	100	112	145
N	102	109	118.5	132	151.5	170	179	206	243.5
R	50	62.5	79.5	99	110.5	139	158	188	253
r	25	32	40	45	60	77	83	94	128
s	3xM4	3xM4	3xM5	3xM6	3xM6	3xM8	6xM8	6xM8	6xM12
s_1	3xM3	3xM4	3xM4	3xM4	3xM5	3xM5	3xM6	3xM6	3xM8
T_1	15	16	20	23	34	38	40	52	77.5
U	60.5	75	91	115.5	129	161	175	215	-
u	6.5	7	9	11.5	13.5	19	21.5	29	-
X	84.5	104.5	121.5	149.5	-	-	-	-	-
x	4	4	4.5	5	-	-	-	-	-
y	33°	32°	32°	32°	30°	30°	30°	30°	22.5°
Z	3 x 120°						6x60°	6x60°	6x60°
Z_1^{H7}	23.5	28.5	32.5	40.5	52.5	75.5	82.5	92	131
z	98°	98°	105°	90°	90°	90°	90°	90°	90°
z_1	8	8	8	9	9	10	15	15	15
z_2	22°	22,5°	15°	30°	45°	60°	0°	0°	0°
z_3	33°	32°	33°	33°	30°	30°	30°	30°	22,5°

1) Braking torque tolerance: +40 % / -20 %,
other braking torques available on request
2) Higher speeds on request
3) A rotating hand release is used as a hand release for Size 11 (dimensions on request)

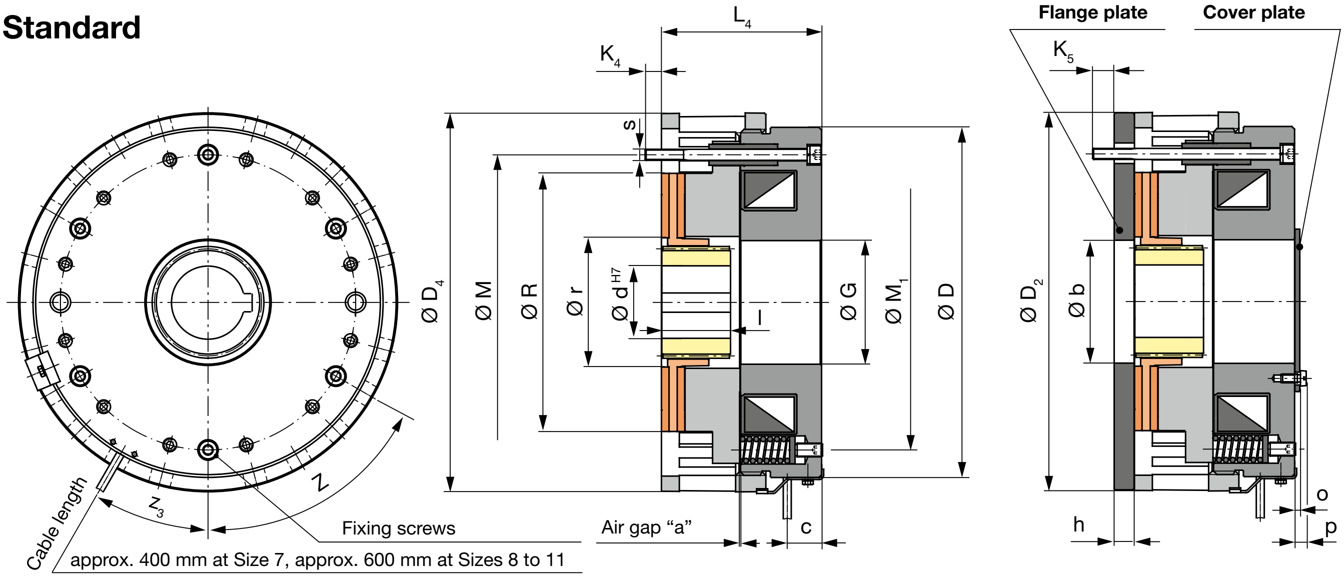
4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038
5) Width b = 4 ^{JS9}, depth t = 1.2 $^{+0.1}$
6) Fixing screws protruding 3.2 mm
7) Fixing screws protruding 2.2 mm

ROBA-stop® - peak load brake Type 863.41_._ Sizes 7 – 11

Standard

Type 863.410.3
without accessories

Type 863.414.3
with flange plate and cover plate



Technical data			Size				
			7	8	9	10	11
Braking torque [1]	M_N	[Nm]	50	100	200	400	800
Electrical power	P_{20}	[W]	70	87	102	134	196
Max. speed [2]	n_{max}	[rpm]	3800	3400	3000	3000	3000
Weight		[kg]	6	10.4	17	33	61

The peak load brake can be used in normal switching operation for braking and exact positioning. Additionally, it is designed to absorb extremely high friction work which may occur, for example, during EMERGENCY STOP.

Several peak loads occurring in short succession can be dealt with problem-free by the brake.

The openings in the distance ring allow removal of the occurring friction dust, additional heat dissipation via convection and surface radiation as well as comfortable checking on the brake rotor or the air gap.

The brake can easily be connected to a DC voltage supply via our comprehensive range of electrical accessories (see pages 33 – 42).

Order Number

__ / 8 6 3 . 4 1 __ . __ / __ / __ / __

Size
7
8
9
10
11

without accessories	0
Flange plate	1
Cover plate	2
Hand release [3]	3
Flange plate / cover plate	4
Flange plate / hand release [3]	5
Cover plate / hand release [3]	6
Flange plate / cover plate / hand release [3]	7

1	Terminal box with terminal
3	Cable
4	Terminal box with half-wave rectifier
5	Terminal box with bridge rectifier
6	Terminal box with spark quenching unit

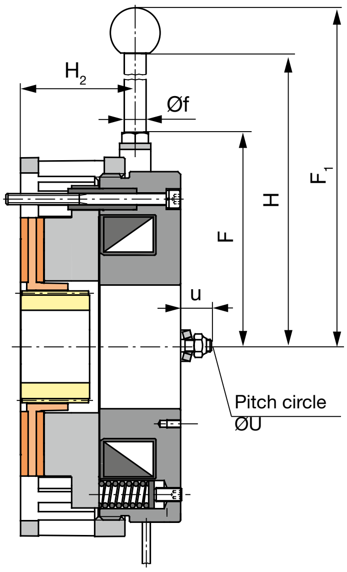
Voltage [4] [VDC] ±10 %
24
104
180
207

Bore
Ø d H7
(Dimensions page 15)

Keyway acc.
DIN 6885/1
DIN 6885/3

Example: 8 / 863.411.3 / 104 / 45 / 6885/1

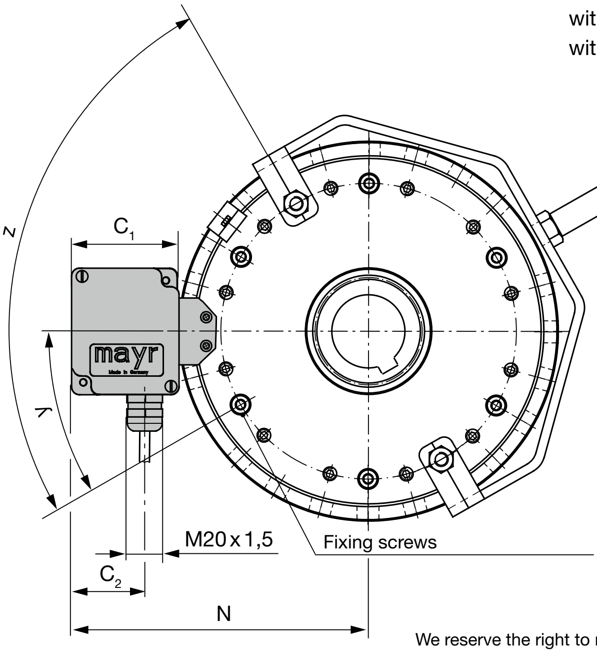
Type 863.413.3
with hand release (Size 11 differs from the figure)

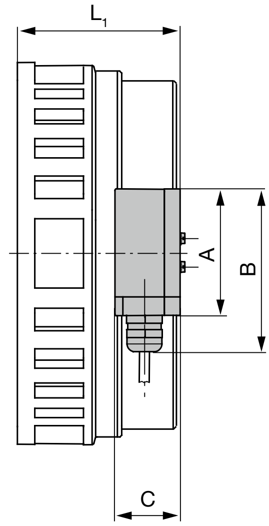


Type 863.41_._
with terminal box

Terminal box

with terminal	Type 863.41_.1
with half-wave rectifier	.4
with bridge rectifier	.5
with spark quenching unit	.6





We reserve the right to make dimensional and constructional alterations.

Dimensions [mm]			Size 7	Size 8	Size 9	Size 10	Size 11
Bores	$Ød_{min}$	DIN 6885/1	20	25	25	25	30
	$Ød_{max}$	DIN 6885/1	30	45	47	57	76
		DIN 6885/3	32	-	50	60	80
		Preferred bores H7	25; 30	30; 40	40; 45	45; 50	60; 70

	Size 7	8	9	10	11
A	79.5	79.5	79.5	79.5	79.5
a	0.35	0.35	0.4	0.4	0.5
B	92.5	92.5	92.5	92.5	92.5
b	48	68	75	90	120
C	42	42	42	42	42
C_1	66.5	66.5	66.5	66.5	66.5
C_2	45.5	45.5	45.5	45.5	45.5
c	16.5	18	18	25	30
D	146	183	201	255	330
D_2	165	199	220	275	360
D_4	166	199	220	276	360
F	96.8	117.8	125.6	158	-
F_1	191.8	210.3	245.6	427	-
f	12	14	15	15	-
G^{H7}	50.9	73.9	80.4	90	129
H	169.3	181.3	208.6	390	-
H_2	48	49	63	85	-
h	8	10	12	14	16
K_4	8.2	10.8	11.3	12.2	22.2

	Size 7	8	9	10	11
K_5	10.2	10.8	19.3	18	26.2
L_4	68.2	77.7	87.3	116.3	138.3
L_5	71.2	80.7	90.2	119.3	141.3
l	30	35	35	50	60
	Please observe the load on the shaft or key!				
M	124	156	175	215	280
M_1	124	156	175	215	280
N	151.5	170	179	206	243.5
o	3.5	2	2	2	2
p	6.8	5.3	5.9	5.9	7
R	110.5	139	158	188	253
r	60	77	83	94	128
s	3xM6	3xM8	6xM8	6xM8	6xM12
U	129	161	175	215	-
u	13.5	19	21.5	29	-
y	30°	30°	30°	30°	22.5°
Z	3x120°	3x120°	6x60°	6x60°	6x60°
z	90°	90°	90°	90°	90°
z_3	30°	30°	30°	30°	22.5°

1) Braking torque tolerance: +40 % / -20 %,
other braking torques available on request
2) Higher speeds on request
3) A rotating hand release is used as a hand release for Size 11 (dimensions on request)

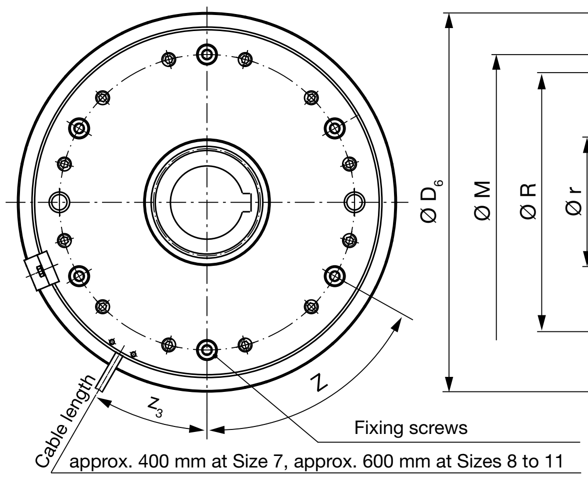
4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038

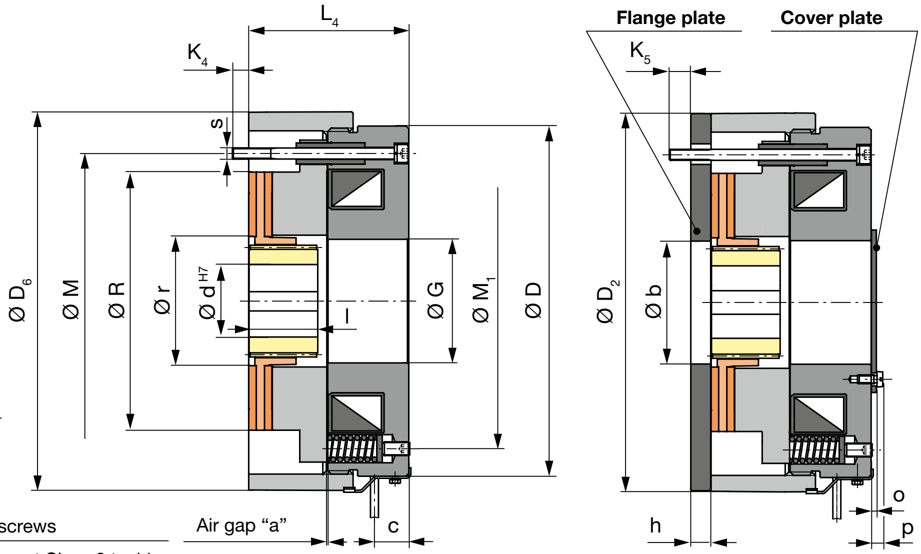
ROBA-stop® - peak load brake
Type 866.41_._
Sizes 7 – 11

Distance ring closed

Type 866.410.3
without accessories

Type 866.414.3
with flange plate
and cover plate





Technical data			Size				
			7	8	9	10	11
Braking torque [1]	M_N	[Nm]	50	100	200	400	800
Electrical power	P_{20}	[W]	70	87	102	134	196
Max. speed [2]	n_{max}	[rpm]	3800	3400	3000	3000	3000
Weight		[kg]	6	10.4	17	33	61

The peak load brake can be used in normal switching operation for braking and exact positioning. Additionally, it is designed to absorb high friction work which may occur, for example, during EMERGENCY STOP.

Peak loads occurring in short succession can be dealt with problem-free by the brake.

The peak load brake is protected by the closed distance ring against dust and dirt. The brake in connection with the cover plate corresponds to Protection IP54.

The brake can easily be connected to a DC voltage supply via our comprehensive range of electrical accessories (see pages 33 – 42).

Order number

__ / 8 6 6 . 4 1 __ . __ / __ / __ / __

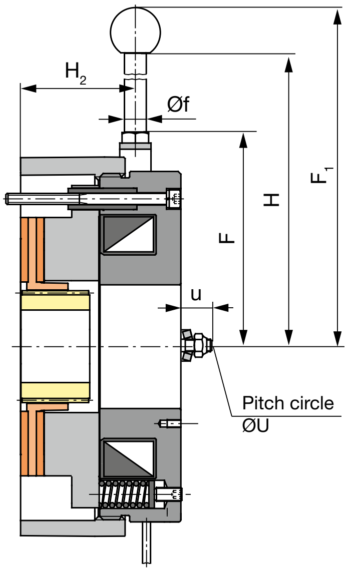
Size				Voltage [4] [VDC] ±10 %	Bore Ø d H7	Keyway acc.
7	without accessories	0		24	(Dimensions page 17)	DIN 6885/1
8	Flange plate	1		104		DIN 6885/3
9	Cover plate	2		180		
10	Hand release [3]	3		207		
11	Flange plate / cover plate	4				
	Flange plate / hand release [3]	5				
	Cover plate / hand release [3]	6				
	Flange plate / cover plate / hand release [3]	7				

1	Terminal box with terminal
3	Cable
4	Terminal box with half-wave rectifier
5	Terminal box with bridge rectifier
6	Terminal box with spark quenching unit

Example: 8 / 866.411.3 / 104 / 45 / 6885/1

Type 866.413.3

with hand release (Size 11 differs from the figure)

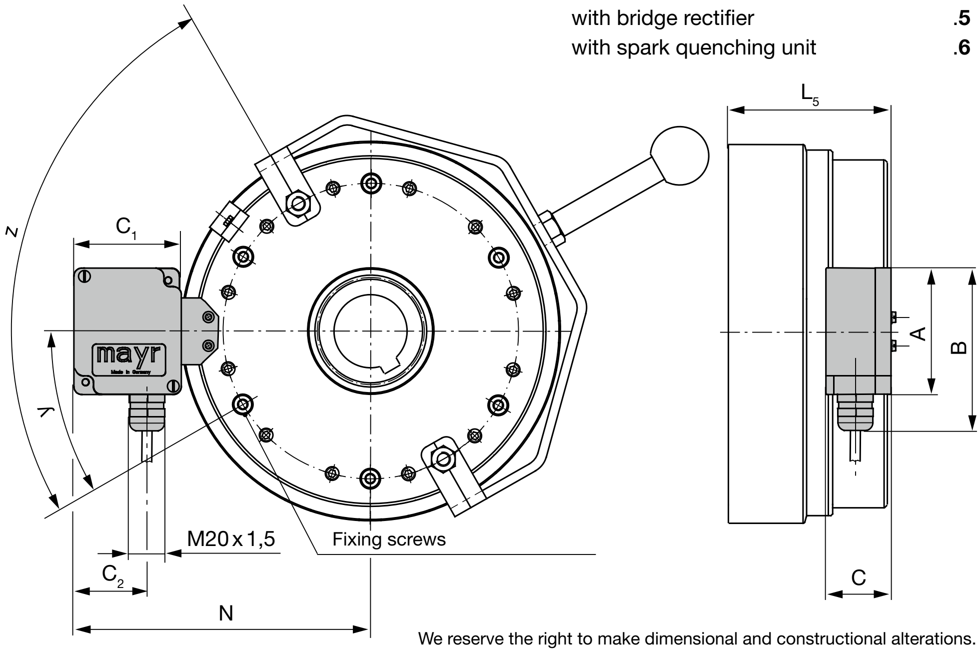


Type 866.41_._

with terminal box

Terminal box

with terminal	**Type 866.41_.1**
with half-wave rectifier	**.4**
with bridge rectifier	**.5**
with spark quenching unit	**.6**



We reserve the right to make dimensional and constructional alterations.

Dimensions [mm]			Size				
			7	8	9	10	11
Bores	$Ød_{min}$	DIN 6885/1	20	25	25	25	30
	$Ød_{max}$	DIN 6885/1	30	45	47	57	76
		DIN 6885/3	32	-	50	60	80
		Preferred bores H7	25; 30	30; 40	40; 45	45; 50	60; 70

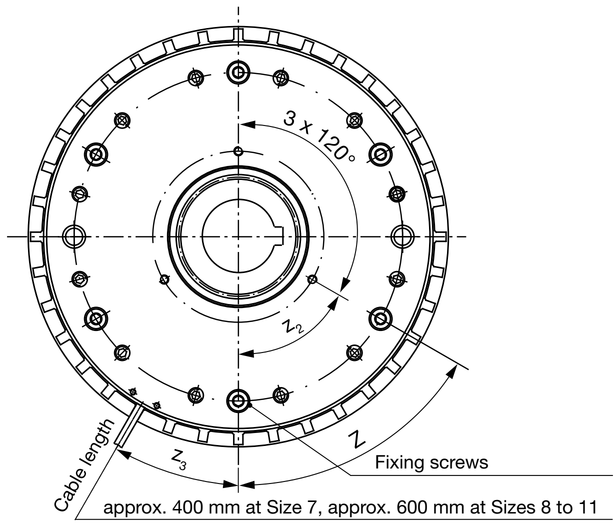
	Size				
	7	8	9	10	11
A	79.5	79.5	79.5	79.5	79.5
a	0.35	0.35	0.4	0.4	0.5
B	92.5	92.5	92.5	92.5	92.5
b	48	68	75	90	120
C	42	42	42	42	42
C_1	66.5	66.5	66.5	66.5	66.5
C_2	45.5	45.5	45.5	45.5	45.5
c	16.5	18	18	25	30
D	146	183	201	255	330
D_2	165	199	220	275	360
D_6	166	199	220	276	360
F	96.8	117.8	125.6	158	-
F_1	191.8	210.3	245.6	427	-
f	12	14	15	15	-
G^{H7}	50.9	73.9	80.4	90	129
H	169.3	181.3	208.6	390	-
H_2	48	49	63	85	-
h	8	10	12	14	16
K_4	8.2	10.8	11.3	12.2	22.2

	Size				
	7	8	9	10	11
K_5	10.2	10.8	19.3	18	26.2
L_4	68.2	77.7	87.3	116.3	138.3
L_5	71.2	80.7	90.2	119.3	141.3
l	30	35	35	50	60
	Please observe the load on the shaft or key!				
M	124	156	175	215	280
M_1	124	156	175	215	280
N	151.5	170	179	206	243.5
o	3.5	2	2	2	2
p	6.8	5.3	5.9	5.9	7
R	110.5	139	158	188	253
r	60	77	83	94	128
s	3xM6	3xM8	6xM8	6xM8	6xM12
U	129	161	175	215	-
u	13.5	19	21.5	29	-
y	30°	30°	30°	30°	22.5°
Z	3x120°	3x120°	6x60°	6x60°	6x60°
z	90°	90°	90°	90°	90°
z_3	30°	30°	30°	30°	22.5°

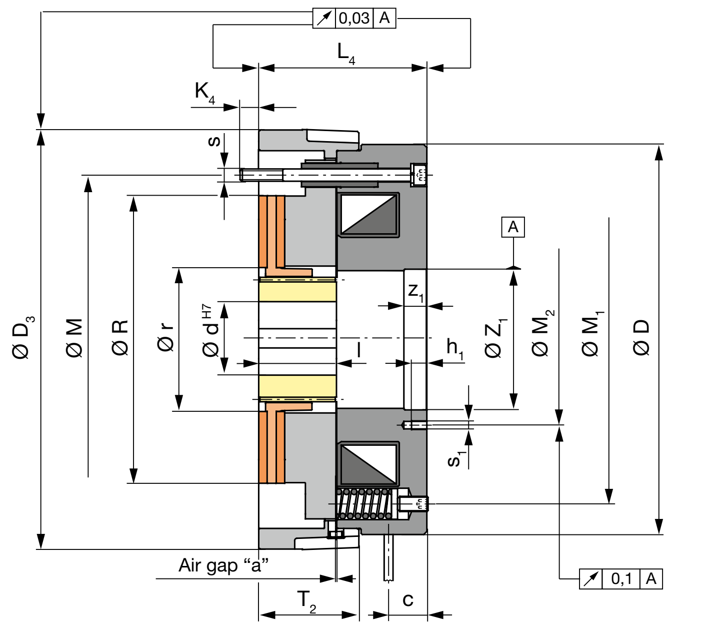
1) Braking torque tolerance: +40 % / -20 %, other braking torques available on request
2) Higher speeds on request
3) A rotating hand release is used as a hand release for Size 11 (dimensions on request)

4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038

ROBA-stop®-tacho peak load brake
Type 883.41_._
Sizes 7 – 11



Type 883.410.3
without accessories



We reserve the right to make dimensional and constructional alterations.

Technical Data			Size				
			7	8	9	10	11
Braking torque [1]	M_N	[Nm]	50	100	200	400	800
Electrical power	P_{20}	[W]	70	87	102	134	196
Max. speed [2]	n_{max}	[rpm]	3800	3400	3000	3000	3000
Weight		[kg]	6	10.5	17.2	33.8	62.7

Dimensions [mm]			Size				
			7	8	9	10	11
Bores	$Ød_{min}$	DIN 6885/1	20	25	25	25	30
	$Ød_{max}$	DIN 6885/1	30	45	47	57	76
		DIN 6885/3	32	-	50	60	80
	Preferred bores H7		25; 30	30; 40	40; 45	45; 50	60; 70

	Size				
	7	8	9	10	11
a	0.4	0.4	0.45	0.45	0.55
c	16.5	18	18	25	30
D	146	183	201	255	330
$D_{3\ g7}$	164.5	198	219	274	358
h_1	10	10	10	10	13
K_4	8.2	10.8	11.3	12.2	22.2
L_4	68.3	77.8	87.4	116.4	138.4
l	30	35	35	50	60
	Please observe the load on the shaft or key!				
M	124	156	175	215	280
M_1	124	156	175	215	280

	Size				
	7	8	9	10	11
M_2	61	88	100	112	145
R	110.5	139	158	188	253
r	60	77	83	94	128
s	3xM6	3xM8	6xM8	6xM8	6xM12
s_1	3xM5	3xM5	3xM6	3xM6	3xM8
T_2	44	49	53	72	99.5
Z	3x120°	3x120°	6x60°	6x60°	6x60°
Z_1^{H7}	52.5	75.5	82.5	92	131
z_1	9	10	15	15	15
z_2	45°	60°	0°	0°	0°
z_3	30°	30°	30°	30°	22.5°

Order Number

__ / 8 8 3 . 4 1 __ . __ / __ / __ / __

Size			Voltage [4] [VDC] ±10 %	Bore Ø d^{H7}	Keyway acc.
7 8 9 10 11	without accessories Hand release [3]	0 3	24 104 180 207	(Dimensions page 18)	DIN 6885/1 DIN 6885/3
	Terminal box with terminal Cable Terminal box with half-wave rectifier Terminal box with bridge rectifier Terminal box with spark quenching unit	1 3 4 5 6			

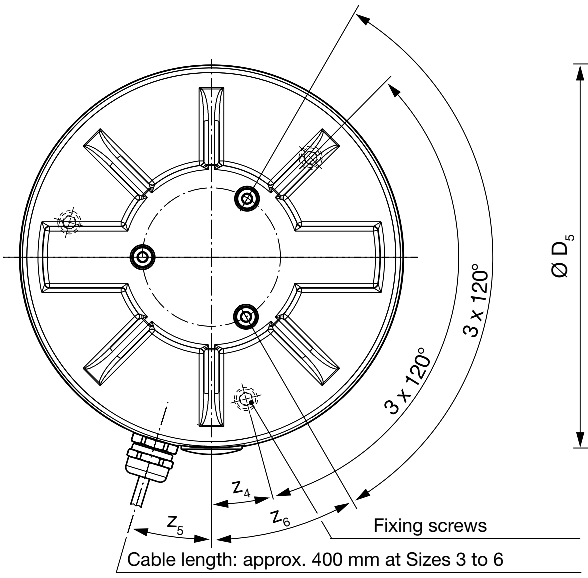
Example: 7 / 883.410.3 / 104 / 25 / 6885/1

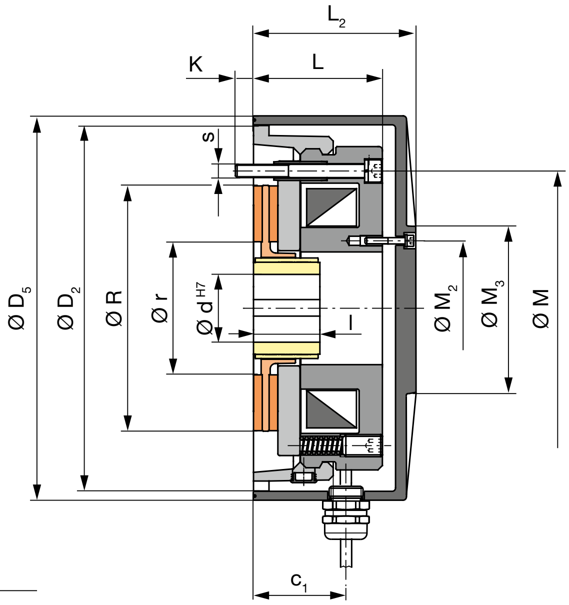
1) Braking torque tolerance: +40 % / -20 %, other braking torques available on request
2) Higher speeds on request

3) A rotating hand release is used as a hand release for Sizes 10 and 11 (dimensions on request)
4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038

ROBA-stop®-sealed
Type 80_.418.3
Sizes 3 – 6

Type 80_.418.3





We reserve the right to make dimensional and constructional alterations.

Technical Data			Size 3	Size 4	Size 5	Size 6
Braking torque 1)	M_N	[Nm]	3	6	12	26
Electrical power	P_{20}	[W]	17	24	33	50
Max. speed 2)	n_{max}	[rpm]	6000	5000	4800	4000

Dimensions [mm]			Size 3	Size 4	Size 5	Size 6
Bores	$Ød_{min}$	DIN 6885/1	8	10	10	15
Bores	$Ød_{max}$	DIN 6885/1	11	13	18	23
Bores	$Ød_{max}$	DIN 6885/2	12 3)	-	-	-
Bores	$Ød_{max}$	DIN 6885/3	-	15	20	25
Bores	Preferred bores H7		10; 11; 12	12; 15	15; 20	20; 25

This positioning brake design is completely enclosed and corresponds to Protection IP67 (TÜV- (German Technical Inspectorate) approved).

Installation of the sealing cover is simple.

An aluminium cover is screwed onto the pre-installed standard positioning brake.

The cable outlet is protected by a completely watertight screw connector.

The brake magnetic coil can easily be connected to a DC voltage supply via our comprehensive range of electrical accessories (see pages 33 – 42).

Special variations of this sealed brake which are suitable for a continuous shaft can be designed and produced on request.

	Size 3	Size 4	Size 5	Size 6
c_1	24	25	30	33
D_2	79	98	114	142
D_5	91	110	125	155
K	6	5	6	8
L	30.2	32.2	39.3	43.2
L_2	45	50	58	62
l	15	20	20	25
l	Please observe the load on the shaft or key!			

	Size 3	Size 4	Size 5	Size 6
M	58	72	90	112
M_2	29	35	41	52
M_3	48	55	60	75
R	50	62.5	79.5	99
r	25	32	40	45
s	3xM4	3xM4	3xM5	3xM6
z_4	8°	8°	15°	0°
z_5	25°	24°	17°	32°
z_6	30°	30.5°	30°	30°

1) Braking torque tolerance: +40 % / -20 %, other braking torques available on request
2) Higher speeds on request
3) Width b = 4 ^{JS9}, depth t = 1.2 $^{+0.1}$
4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038

Order number

__ / 8 0 __ . 4 1 8 . 3 / __ / __ / __

Size		Cable	Voltage 4) [VDC] ±10 %	Bore Ø d H7 (Dimensions page 19)	Keyway acc.
3 **4** **5** **6**	Standard armature disk **0** Fast acting armature disk **2**	Cable **3**	24 104 180 207		DIN 6885/1 DIN 6885/2 DIN 6885/3

Example: 5 / 802.418.3 / 104 / 15 / 6885/1

mayr® your reliable partner

ROBA-stop®-S

ROBA-stop®-S have two functions. During standard operation they work as holding brakes. When the drives have been switched off the brakes hold the system safely in position. During critical operational situations, e.g. with EMERGENCY STOP or power failure, ROBA-stop®-S are designed to absorb peak loads with high friction work. These brakes are designed for vertical and horizontal operations.

Dust and waterproof

Completely enclosed brake design corresponds to Protection IP67.

Permanent protection against corrosion

Protection IP67, a high-quality brake body primary coating, chrome or nickel-coated interior parts or use of rustproof steels ensure protection against corrosion.

Easy handling

Compact construction and small outer diameters mean easy brake handling.

Minimum maintenance requirements

Should the friction linings be worn, just readjust the air gap or replace the rotor with its friction linings.

Minimum operating expenses

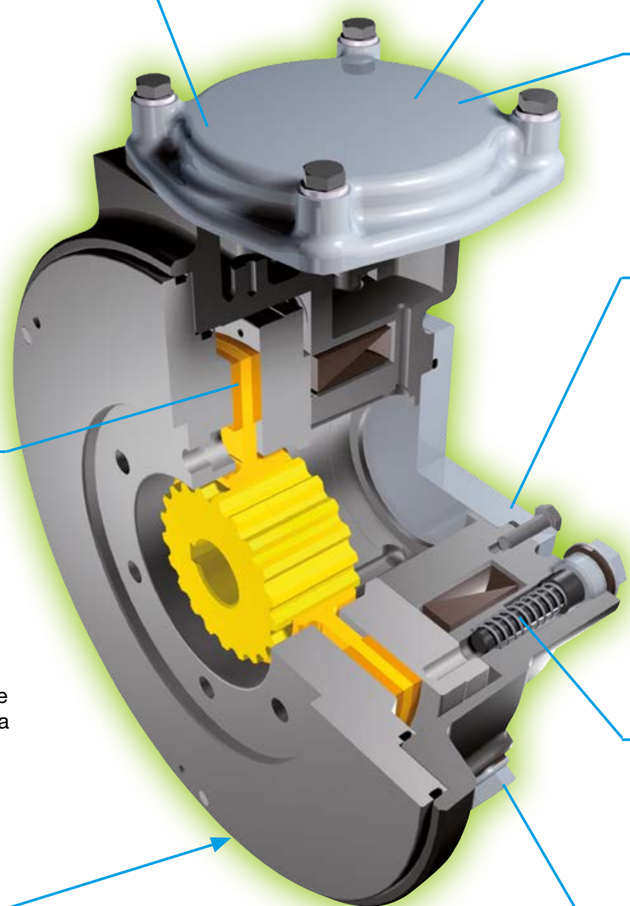
High working reliability and low maintenance expenditure reduce the operating expenses of the brake to a minimum.

Condensation water inspection

Regular inspection is possible via a drain plug.

Brake housing and integral terminal box

The one-piece cast iron housing with integrated terminal box is extremely robust and, therefore, protected against mechanical damages.



Optimum protection for electrical equipment

The electrical supply and the inspection and monitoring function microswitches are completely protected inside the cast terminal box.

Release monitoring

The ROBA-stop®-S is fitted with a microswitch for release monitoring. The microswitch emits a signal when the brake is opened.

Tacho attachment

The brake body can be fitted with a tacho attachment. If no tacho is used, the coil carrier is closed by a cover.

Emergency Hand Release

The seawater brake is fitted with an emergency hand release. The brake can be released mechanically via two screws (bracket hand release available on request).

Inspection without system downtimes

A threaded hole allows fast inspection of the air gap without dismantling the brake or system stoppage.

Rectifier

A rectifier integrated in the terminal box allows a brake connection to AC-supply. The magnetic coil is designed as a DC-coil.

Wear monitoring

An additional microswitch can be installed into the ROBA-stop®-S which monitors the wear on the friction linings.

Anti-condensation heating

This heating system prevents condensation water inside the brake. Its usage is especially recommended at temperatures under zero degrees Celsius or in high air humidity.

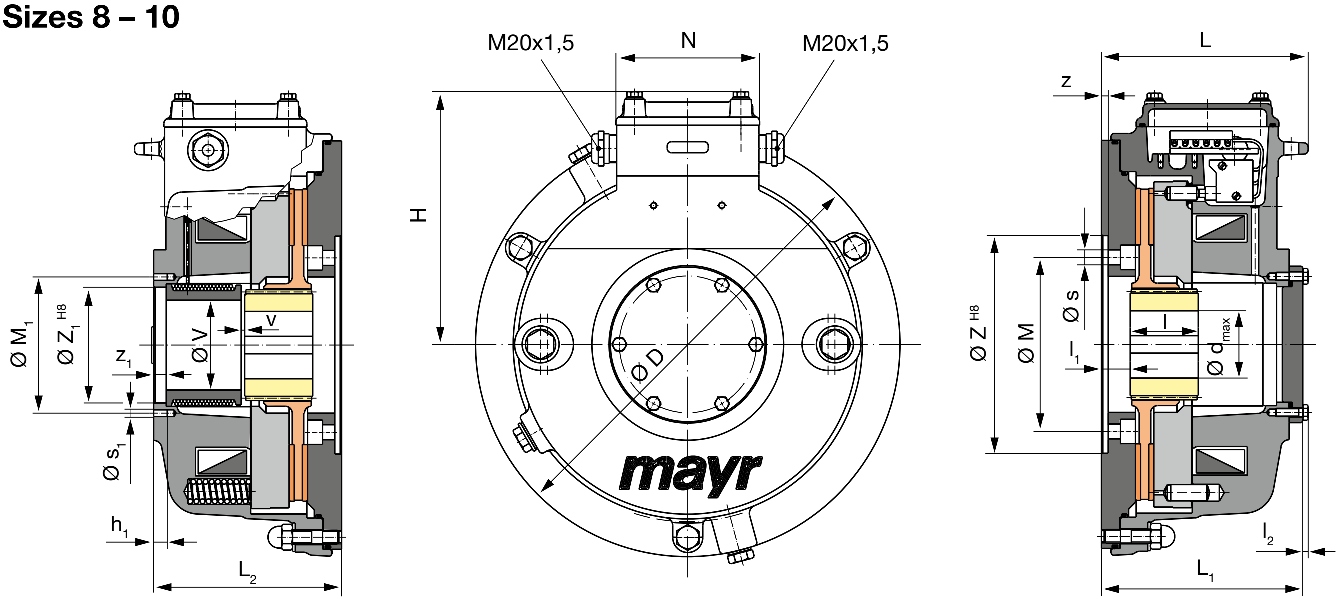
Braking torque

By changing the number of springs, the braking torque can be adapted to the customer's requirements.

Motors with self-ventilation

In order to assemble the ROBA-stop®-S onto motors with continuous shafts on the B-bearing side, the closed standard-cover on the brake rear side is exchanged for the open cover with integrated radial shaft sealing ring.

ROBA-stop®- S
Type 856.417._
Sizes 8 – 10



We reserve the right to make dimensional and constructional alterations.

Technical data			Size		
			8	9	10
Braking torque 1)	M_N	[Nm]	100	200	400
Electrical power	P_{20}	[W]	85	100	120
	ACH 2)	[W]	15	15	21
Max. speed	n_{max}	[rpm]	3400	3000	3000
Tightening torque Fixing screws	s	[Nm]	23	23	46
Weight with flange plate		[kg]	19	26	42

Dimensions [mm]			Size		
			8	9	10
Bores	$Ød_{min}$ 3)	DIN 6885/1	25	25	25
	$Ød_{max}$ 3)	DIN 6885/1	45	47	57
		DIN 6885/3	-	50	60

1) Braking torque tolerance: +40 % / -20 %, other braking torques available on request
2) ACH = Anti-condensation heating, standard voltages [VAC]: 115; 230
3) Please observe the load on the shaft or key!
4) Standard voltages [VDC]: 24; 104; 180; 207
Permitted voltage tolerance: ±10 % acc. DIN IEC 60038

Sizes	ØD	H	h_1	L	L_1	L_2	l 3)	l_1	l_2	ØM	$ØM_1$	N	s	s_1	ØV	v	Z	Z_1	z	z_1
8	240	155	10	143.5	118	108	35	12	4	100	100	109	6 x ø9	M6	46	6.5	130	85	5	5.5
9	270	167	10	138.5	128.5	118.5	35	18	4	110	100	109	8 x ø9	M6	50	6.5	140	85	5	6
10	310	185	10	152.0	148	138	50	21_{-10}	4	128	100	109	8 x ø11	M6	66	2.0^{+10}	160	85	5	9

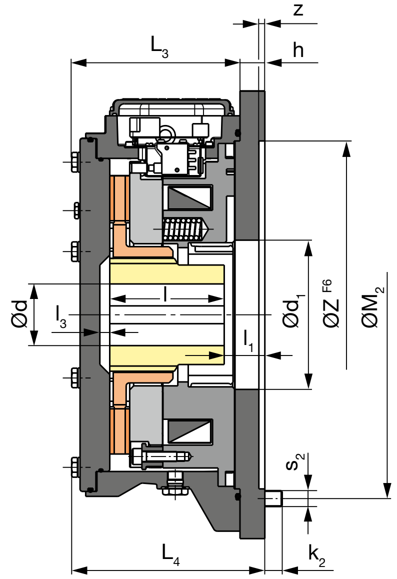
Order number

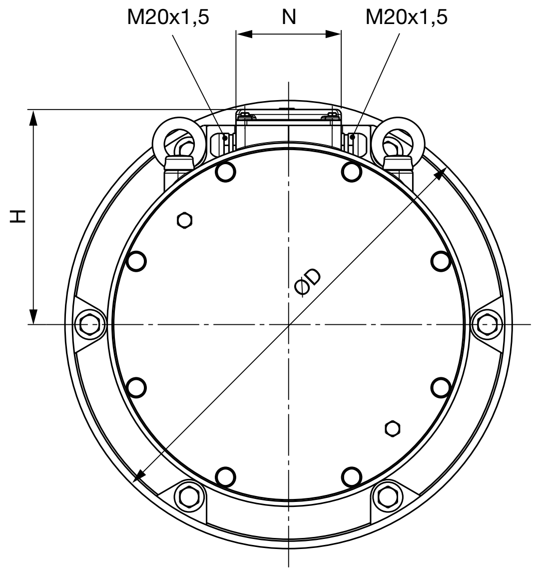
__ / 8 5 6 . 4 1 7 . __ / __ / __ / __

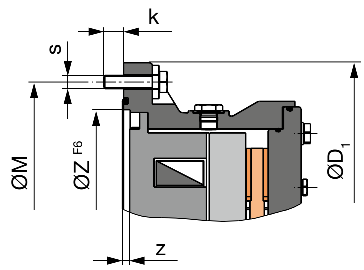
Size	Terminal box / Options	Voltage 4) [VDC] ±10 %	Bore Ø d H7 (Dimensions page 21)	Keyway acc.
8 9 10	**Terminal box:** with terminal 1; with half-wave rectifier 4; with bridge rectifier 5 **Options:** - Anti-condensation heating - Microswitch for wear monitoring - Other Types available on request	24 104 180 207		DIN 6885/1 DIN 6885/3

Example: 9 / 856.417.4 / 104 / 30 / 6885/1

ROBA-stop®- S Type 856.41_._ Size 11







View without flange plate

We reserve the right to make dimensional and constructional alterations.

Technical data				Size 11
Braking torque [1]		M_N	[Nm]	800
Electrical power		P_{20}	[W]	268
		ACH [2]	[W]	on request
Max. speed		n_{max}	[rpm]	3000
Tightening torque	Fixing screws	s	[Nm]	61
		s_2	[Nm]	122
Weight	with flange plate		[kg]	95
	without flange plate		[kg]	86

Dimensions [mm]			Size 11
Bores	$Ød_{min}$ [3]	DIN 6885/1	55
	$Ød_{max}$ [3]	DIN 6885/1	75

1) Tolerance: +40 % / -20 %, other braking torques available on request
2) ACH = Anti-Condensation heating, standard voltages [VAC]: 115; 230
3) Please observe the load on the shaft or key!
4) Standard voltages [VDC]: 104; 180; 207 Permitted voltage tolerance ±10 % acc. DIN IEC 60038

Ø D_1	ØD	ØD_1	H	h	k	k_2	L_3	L_4	l [3]	l_1	l_3	ØM	ØM_2	N	s	s_2	Z	z
150	450	435	217	25	24	17.5	169.1	194.1	115	40.8	10	400	400	106	6 x M12	8 x M16	350	6

Order number

11 / 8 5 6 . 4 1 __ . __ / __ / __ / __

Size
11

Additional Parts:
without accessories **3**
Flange plate **5**
Flange plate + wear monitoring **6**
Wear monitoring **8**

Options:
- Anti-condensation heating
- Tacho attachment possibility
- Other Types available on request

Terminal box:
1 with terminal
4 with half-wave rectifier
5 with bridge rectifier

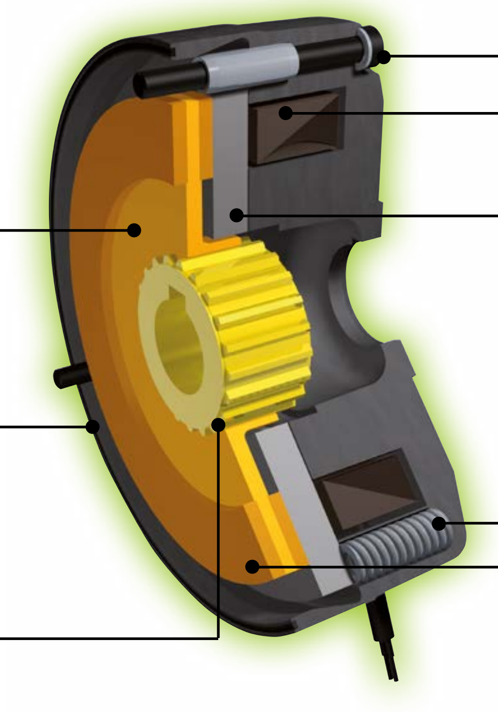
Voltage [4] [VDC]
±10 %
104
180
207

Bore
Ø d H7
(Dimensions page 22)

Keyway acc.
DIN 6885/1

Example: 11 / 856.415.5 /180 / 60 / 6885/1

ROBA-stop®-M
The robust, cost-effective motor brake



Easy installation

Class of insulation F;
Can be used for 100 % duty cycle

Short switching times

Different torque variants
due to variable equipment

Long service lifetime
Low wear

Maintenance-free over the entire service lifetime of the rotor (no re-adjustment)

Completely enclosed brake housing acc. Protection IP54 or IP65

Minimum torsional backlash due to accurate toothing

Designs

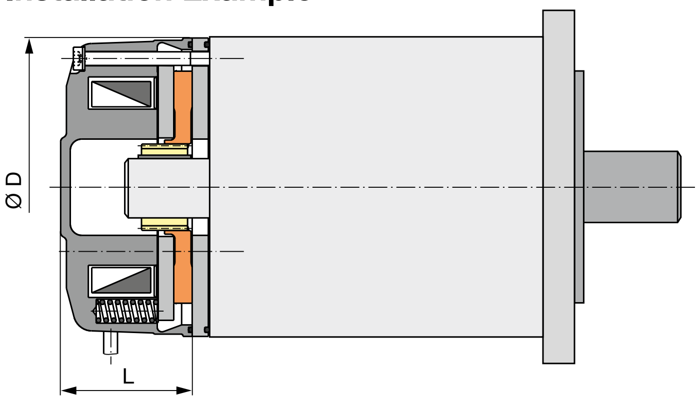
- **ROBA-stop®-M standard brake**
  As a working brake it brakes from movement, and positions at the required point.
- **ROBA-stop®-M holding brake**
  Holds drives safely in position when they are not running and brakes from movement on EMERGENCY STOP.

E189728

On request ROBA-stop®-M safety brakes can also be delivered with UL approval.

ROBA-stop®-M safety brakes are also available in ATEX design according to the directive 2014/34/EU.
(Please contact the manufacturer separately for this).

Installation Example



ROBA-stop®-M safety brake on the B-bearing side of an electromotor. The design with flange plate is used if there is no suitable counterfriction surface for the brake linings available motor-side.

Technical Data and Dimensions				Size										
				2	4	8	16	32	60	100	150	250	500	1000
Braking torque	Standard brake [1]	M_N	[Nm]	2	4	8	16	32	60	100	150	250	500	1000
	Holding brake [2]	M_N	[Nm]	4	8	16	32	64	100	180	250	450	800	1600
Shaft Ø	Standard brake		[mm]	8 – 15	10 – 15	11 – 20	14 – 25	19 – 30	22 – 35	24 – 45	30 – 50	40 – 60	50 – 80	75 – 90
	Holding brake		[mm]	8 – 15	10 – 15	11 – 20	14 – 25	19 – 30	22 – 35	24 – 45	30 – 50	40 – 55	50 – 75	75 – 90
Brake	Outer Ø	ØD	[mm]	76	87	103	128	148	168	200	221	258	310	382
	Length	L	[mm]	39	41.5	45.2	55.7	61.7	72.5	84	97	116	114	135

1) Tolerance +30 % / -10 %   2) Tolerance +40 % / -20 %

For detailed technical data and dimensions, please see catalogue: ROBA-stop®-M K.891.V_ _._ _

ROBA-stop® – Short Description Installation

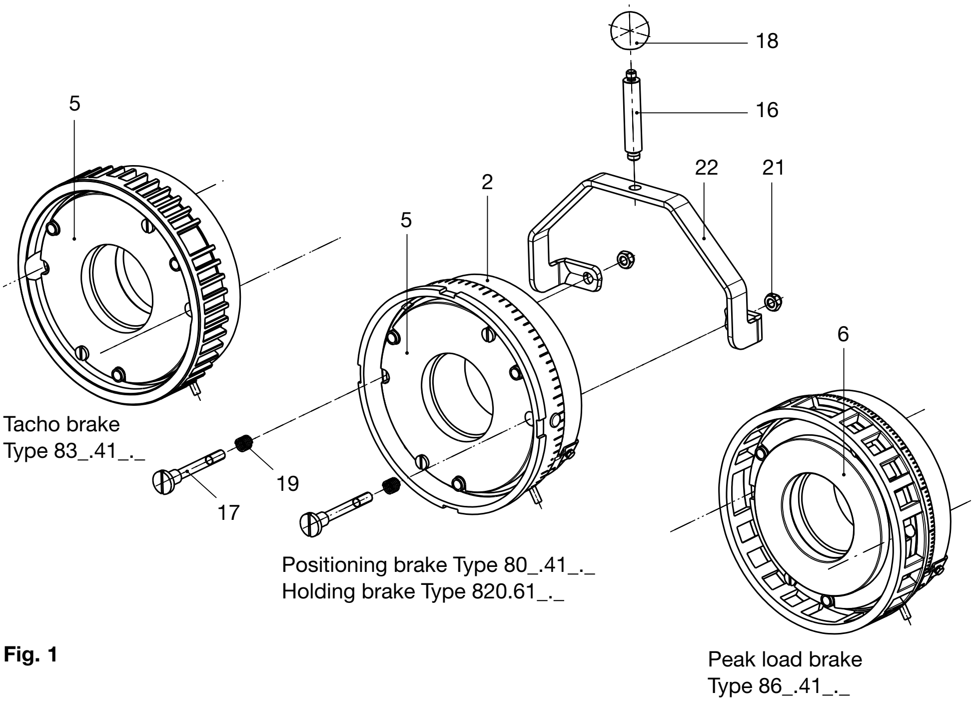


Fig. 1

Parts List

(Only use *mayr*® original parts)

- 1 Hub
- 2 Coil carrier
- 5 Armature disk
- 6 Fast-acting peak-load armature
- 11 Brake spring
- 13 Fixing screw
- 14 Set screw
- 29 Flange plate
- 30 Cover plate
- 31 Distance ring
- 35 Rotor
- 58 Lock washer

Hand release

- 16 Threaded bolt
- 17 Restoring bolt
- 18 Spherical button
- 19 Restoring spring
- 21 Locking nut
- 22 Hand release bracket

Installation Conditions

- The eccentricity of the shaft end in relation to the mounting pitch circle must not exceed 0,2 mm (on brakes sizes 3 – 6) and on larger brakes, 0,4 mm.
- The positional tolerance of the threads for the cap screws (13, Fig. 2) 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 acc. DIN 42955. The reference diameter is the pitch circle diameter for securement of the brakes.
  Larger deviations can lead to a drop in torque, to continuous grinding of the rotor and to overheating.
- The rotor and brake surfaces must be oil and grease-free.
- A suitable counter friction surface made of steel or grey cast iron must be provided for the rotor (35). Sharp-edged interruptions on the friction surfaces must be avoided.
  If no suitable counter friction surface is available, our flange plate (29, Fig. 2, lower half) can be used.

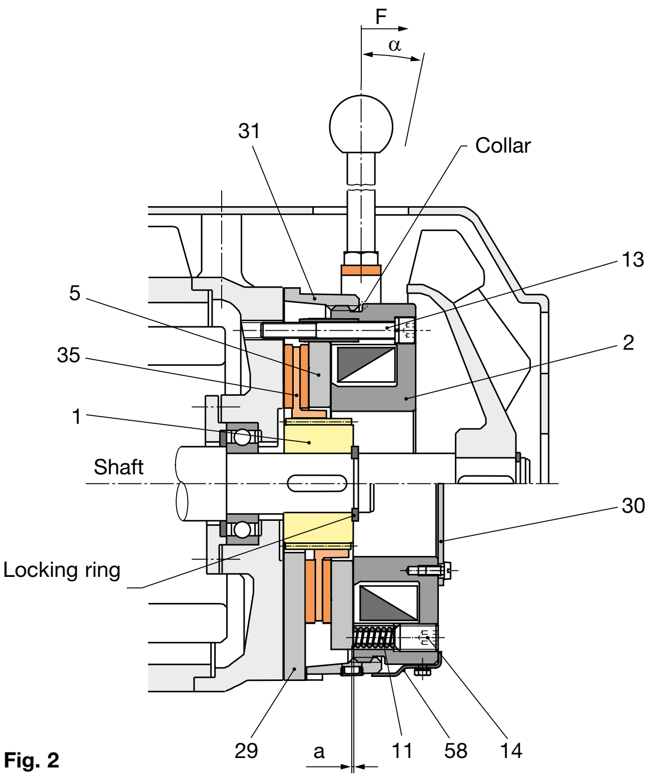


Fig. 2

Short Description

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

ROBA-stop® brakes are particularly easy to install:

1. Mount the hub (1) onto the shaft and secure it axially (e.g. using a locking ring).
   – Recommended tolerance for the shaft-hub connection H7 / k6.
   – Avoid too tight hub-shaft connections (particularly on maximum bores). They lead to the rotor (35) jamming on the hub (1) and therefore to brake malfunctions.
2. Push the rotor (35) onto the toothed hub (1) by hand.
3. Attach the brake onto the motor bearing shield or the machine wall using the fixing screws (13) to the tightening torque T_A (acc. Table 1, page 25).

Installation is possible vertically or horizontally.

In the design with a mounted cover plate (30, Fig. 2, lower half), the brake is completely enclosed and corresponds to Protection IP54.

ROBA-stop® – Short Description Installation

Braking Torque

Definition

The braking torque stated in the Technical Data is the torque effective in the shaft train on slipping brakes, with a sliding speed of 1 m/s referring to the mean friction radius (acc. DIN VDE 0580).

Please observe on using the brake for different applications that braking torque deviations of up to approx. +40 % / -20 % can occur (if necessary, please contact the manufacturers).

The load torque on the machine should be max. 50 % of the given braking torque.

Adjustment

The ROBA-stop® brakes are set manufacturer-side to the braking torque stipulated on order. By turning the set screws (14, Fig. 2, page 24) to the left, the braking torque is reduced. By turning them to the right, the braking torque is increased.

When adjusting the braking torque, all set screws (14, Fig. 2, page 24) must be adjusted evenly.

If the braking torque is to be decreased to a larger extent, some springs (11, Fig. 2, page 24) must be removed. To do this, it is necessary to remove two springs which lie opposite to each other, to guarantee an even load on the armature disk (5).

Please order the respective Adjustment Diagrams from the manufacturer if changing the braking torque customer-side.

Hand Release Installation

The hand release is to be installed and set according to the Instructions.

When adjusting the locking nuts (21, Fig. 3), please observe that the restoring bolts (17) limit the armature disk (5) stroke in the direction of the brake.

> The restoring bolts (17) may only be tightened using the locking nuts (21) so much that at least the adjustment dimension "x" acc. Table 1 and Fig. 3 remains between the armature disk (5) and the coil carrier (2). While doing this, please adjust both restoring bolts (17) evenly!

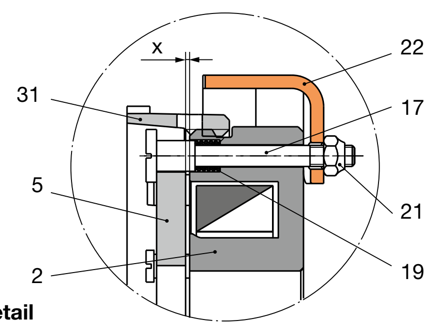


Fig. 3: Detail

Air Gap Adjustment

The working air gap between the armature disk (5) and the coil carrier (2) is set manufacturer-side to the nominal dimension "a", Fig. 2, page 24 and Table 1, page 25.
However, as the rotor (35) wears down, the air gap "a" increases. The nominal air gap can be re-established by turning the threaded distance ring (31).

Re-adjustment

1. Remove a sealing plug of the threaded distance ring (31). Measure the air gap before adjustment in de-energised conditions using a feeler gauge. The difference from the measured air gap to the nominal air gap "a" acc. Table 1 must be re-adjusted.

2. Loosen the fixing screws (13) and the lock washer (58).

3. Turn the threaded distance ring (31) anti-clockwise (facing direction towards the rear side of the brake).
Turning the distance ring (31) **one graduation line** on the engraved scale equals:
- an air gap re-adjustment of **0.05 mm**
  on Sizes 3 to 6 for Types 80_.41_._ / 820.61_._ ,
  on Sizes 7 to 11 for Types 86_.41_._ ,
- an air gap re-adjustment of **0.1 mm**
  on Sizes 7 to 11 for Types 80_.41_._ / 820.61_._

4. Tighten the fixing screws (13) (tightening torques acc. Table 1) and attach the lock washer (58).

5. Check the air gap, nominal air gap "a" acc. Table 1 must be given.

Re-adjustment can be repeated until the threaded distance ring (31) lies against the coil carrier (2) collar, Fig. 2, page 24. This contact prevents unpermitted wear on the rotor (35). Replace the rotor (35) if re-adjustment is no longer possible.

Maintenance

At specific intervals, the air gap between the armature disk and the coil carrier must be inspected and re-adjusted.
When the rotor has reached the maximum permitted degree of wear, it must be replaced.
Please make sure that on replacement the friction surfaces and brake linings are oil and grease-free.
Apart from this, the brake is maintenance-free.

Technical Data – Installation			Size									
			2	3	4	5	6	7	8	9	10	11
Nominal air gap	a	[mm]	0.15	0.2	0.2	0.25	0.25	0.35	0.35	0.4	0.4	0.5
Adjustment dimension	x	[mm]	0.8	1.0	1.1	1.2	1.6	1.4	1.5	1.5	2.0	-
Actuation angle Hand release	α	[°]	10	15	15	11	11	8	7	7	15	-
Release force	F	[N]	10	17	30	50	80	160	200	350	350	-
Tightening torque Fixing screws item 13	T_A	[Nm]	3	3	3	6	8	8	10	10	10	40

Table 1

ROBA-stop® – Brake Dimensioning

Brake Size Selection

1. Brake selection

$$M_{NA} = \frac{9550 \times P}{n} \quad [Nm]$$

$$M_{erf.} = M_{NA} \times K \leq M_N \quad [Nm]$$

$$t_v = \frac{J \times n}{9.55 \times M_v} \quad [s]$$

$$J_1 = J_2 \times \left(\frac{n_2}{n_1}\right)^2 \quad [kgm^2]$$

$$M_v = M_N + (-)^* M_L \quad (M_L \leq 0.5 \times M_N) \quad [Nm]$$

2. Inspection of thermic load

$$Q_r = \frac{J \times n^2}{182.4} \times \frac{M_N}{M_v} \quad [J]$$

The permitted friction work (switching work) $Q_{r\,zul.}$ or $Q_{rs\,zul.}$ per braking for the specified switching frequency can be taken from the friction-power diagrams (pages 28 – 30).

If the friction work (switching work) per braking is known, the max. switching frequency can also be taken from the friction-power diagrams (pages 28 – 30).

3. Lifetime calculation

$$Z_{0.1} = \frac{Q_{r\,0.1}}{Q_r} \quad [-]$$

$$Z_N = Z_{0.1} \times V_N \quad [-]$$

$$Z_g = Z_{0.1} \times V_g \quad [-]$$

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

Key:

J	[kgm²]	Mass moment of inertia
J_1	[kgm²]	Reduced mass moment of inertia
K	[-]	Safety factor (1.5 – 3 x according to conditions)
M_{NA}	[Nm]	Nominal torque on drive
$M_{erf.}$	[Nm]	Required braking torque
M_v	[Nm]	Deceleration torque
M_L	[Nm]	Load torque on system * sign in brackets (-) is valid if load is braked during downward movement
M_N	[Nm]	Nominal torque (Technical Data pages 7 – 22)
n	[rpm]	Speed
P	[kW]	input power
t_v	[s]	Braking action
Q_r	[J]	Friction work present per braking
$Q_{r\,0.1}$	[J]	Friction work per 0.1 mm wear (Table 2)
$Q_{r\,ges.}$	[J]	Friction work up to rotor replacement (Table 2)
$Q_{r\,zul.}$	[J]	Permitted friction work per braking (Diagrams 1, 3 - 5)
$Q_{rs\,zul.}$	[J]	Perm. friction work per braking on peak load (Diagram 2)
Q_N	[-]	Friction work up to re-adjustment (Table 2)
V_N	[-]	Wear factor up to re-adjustment (Table 2)
V_g	[-]	Wear factor for total wear (Table 2)
z	[braking/min.]	Number of brakings per minute
Z_N	[-]	Number of brakings up to re-adjustment
$Z_{0.1}$	[-]	Number of brakings up to 0.1 mm wear
Z_g	[-]	Total number of brakings

Friction Work / Wear Factor				Sizes									
				2	3	4	5	6	7	8	9	10	11
Friction Work **per 0.1 mm wear**	ROBA-stop®- positioning brake	$Q_{r\,0.1}$	[10^6 J]	6.0	7.0	11.0	17.9	29.4	33.3	46.6	57.5	76.9	111
	ROBA-stop® - tacho brake	$Q_{r\,0.1}$	[10^6 J]	-	7.0	11.0	17.9	29.4	33.3	46.6	57.5	76.9	111
	ROBA-stop® - peak load brake	$Q_{r\,0.1}$	[10^6 J]	-	-	-	-	-	33.3	46.6	57.5	76.9	111
	ROBA-stop®-tacho peak load brake	$Q_{r\,0.1}$	[10^6 J]	-	-	-	-	-	33.3	46.6	57.5	76.9	111
	ROBA-stop®-sealed	$Q_{r\,0.1}$	[10^6 J]	-	7.0	11.0	17.9	29.4	-	-	-	-	-
	ROBA-stop®-S	$Q_{r\,0.1}$	[10^6 J]	-	-	-	-	-	-	44	54.5	70	95
Wear factor V_N Friction work Q_N **up to re-adjustment**	ROBA-stop®- positioning brake	V_N	[-]	-	1.5	2	4.5	5	5	5	5	5	9
	ROBA-stop® - peak load brake	V_N	[-]	-	-	-	-	-	5	5	5	5	9
	ROBA-stop®-sealed	V_N	[-]	-	1.5	2	4.5	5	-	-	-	-	-
	ROBA-stop®-S	Q_N	[10^6 J]	-	-	-	-	-	-	132	272	420	475
Wear factor V_g Friction work $Q_{r\,ges.}$ **up to rotor replacement** (for total wear)	ROBA-stop®- positioning brake	V_g	[-]	2.5	15	16.5	18	19.54	21	22.5	30	36	39
	ROBA-stop® - tacho brake	V_g	[-]	-	2.5	3.5	4.5	5.5	6	6.5	9	12	13
	ROBA-stop® - peak load brake	V_g	[-]	-	-	-	-	-	21	22.5	30	36	39
	ROBA-stop®-tacho peak load brake	V_g	[-]	-	-	-	-	-	6	6.5	9	12	13
	ROBA-stop®-sealed	V_g	[-]	-	15	16.5	18	19.54	-	-	-	-	-
	ROBA-stop®-S	$Q_{r\,ges.}$	[10^6 J]	-	-	-	-	-	-	308	545	770	1900

Table 2: Wear values (guideline values for n = 1500 rpm and mean friction work)

ROBA-stop® – Calculation Example

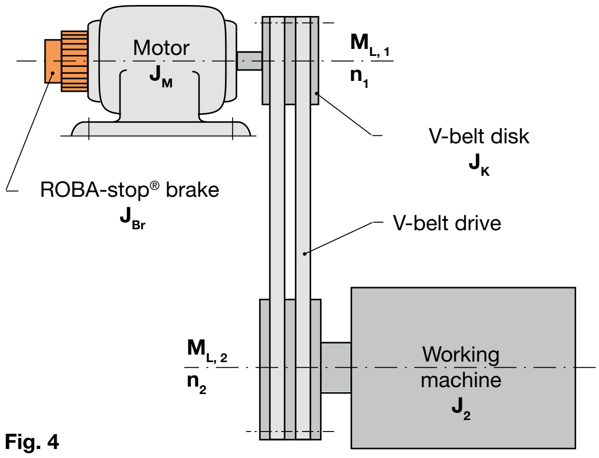


Fig. 4

Data

Electric motor

input power	P	= 3 kW
input speed	n_1	1400 rpm
Mass moments of inertia:		
Motor	J_M	= 0.0068 kgm²
V-belt disk	J_K	= 0.0035 kgm²

Working machine

Load torque	$M_{L,2}$	= 50 Nm
Speed	n_2	= 370 rpm
Mass moment of inertia	J_2	= 0.3 kgm²
Number of brakings per minute	z	= 5 brakings/min

1. Brake selection

Nominal torque on drive: $M_{NA} = \frac{9550 \times 3}{1400} = \mathbf{20.5}$ [Nm]

Required braking torque: $M_{erf.} = 20.5 \times K \leq M_N$ [Nm]

ROBA-stop®- positioning brake Size 6 with M_N = 26 Nm is selected.

M_N see Tech. Data, page 8

Transmission: $i = \frac{n_1}{n_2} = \frac{1400}{370} = \mathbf{3.8}$ [-]

Calculation of the load torque $M_{L,1}$ referring to the motor shaft: $M_{L,1} = \frac{M_{L,2}}{i} = \frac{50}{3.8} = \mathbf{13.1}$ [Nm]

Deceleration torque: $M_v = M_N + (-)^* M_{L,1} = 26 - 13.1 = \mathbf{12.9}$ [Nm]

** The load torque $M_{L,1}$ has an accelerating effect*

The mass moment of inertia referring to the motor shaft: $J_{red.} = J_M + J_{Br} + J_K + J_2 \times \left(\frac{n_2}{n_1}\right)^2$ [kgm²]

J_{Br} see Table 3, page 27

$J_{red.} = 0.0068 + 0.000199 + 0.0035 + 0.3 \times \left(\frac{370}{1400}\right)^2 = \mathbf{0.031}$ [kgm²]

From this, the braking time can be calculated: $t_v = \frac{J \times n}{9.55 \times M_v} = \frac{0.031 \times 1400}{9.55 \times 12.9} = \mathbf{0.35}$ [s]

Please Observe: t_v [s] refers only to the friction time of the brake. The switching times are to be taken into consideration.

see Switching Times page 31, Table 4

2. Inspection of thermic load

Friction work per braking: $Q_r = \frac{J \times n^2}{182.4} \times \frac{M_N}{M_v} = \frac{0.031 \times 1400^2}{182.4} \times \frac{26}{12.9} = \mathbf{671}$ [J]

$Q_r = 671$ [J] $< Q_{r\,zul.}$

$Q_{r\,zul.}$ see Diagram 1, page 28
$Q_{r\,zul.}$ = 1500 J
with z = 5 brakings/min
(switching frequency= 300/h)

The thermic load is permitted.

3. Lifetime calculation

$Z_{0.1} = \frac{Q_{r\,0.1}}{Q_r} = \frac{29.4 \times 10^6}{671}$ = 43 815 brakings up to 0.1 mm wear

$Q_{r\,0.1}$ see Table 2, page 26

$Z_N = Z_{0.1} \times V_N = 43\,815 \times 5$ = 219 075 brakings up to re-adjustment

V_N see Table 2, page 26

$Z_g = Z_{0.1} \times V_g = 43\,815 \times 19.54$ = 856 145 brakings up to total wear

V_g see Table 2, page 26

$\frac{856\,145 \text{ brakings}}{5 \text{ brakings / min}}$ = 171 229 min. = 2 854 hours

The rotor must be replaced after 2 854 operating hours.

Mass Moment of Inertia				**Sizes**									
Rotor + hub with d_{max}				**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
ROBA-stop®- positioning brake	Types 800.45_.0 / 80_.41_._	J_{R+H}	[10^{-4} kgm²]	0.045	0.077	0.23	0.68	1.99	4.02	13.2	24.2	56.4	242
ROBA-stop® - holding brake	Types 820.61_._	J_{R+H}	[10^{-4} kgm²]	-	0.077	0.23	0.68	1.99	4.02	13.2	24.2	56.4	242
ROBA-stop® - tacho brake	Types 83_.41_._	J_{R+H}	[10^{-4} kgm²]	-	0.077	0.23	0.68	1.99	4.02	13.2	24.2	56.4	242
ROBA-stop® - peak load brake	Types 863.41_._ / 866.41_._	J_{R+H}	[10^{-4} kgm²]	-	-	-	-	-	4.02	13.2	24.2	56.4	242
ROBA-stop®-tacho peak load brake	Types 883.41_._	J_{R+H}	[10^{-4} kgm²]	-	-	-	-	-	4.02	13.2	24.2	56.4	242
ROBA-stop®-sealed	Types 800.418.3	J_{R+H}	[10^{-4} kgm²]	-	0.077	0.23	0.68	1.99	-	-	-	-	-
ROBA-stop®-S	Types 856.41_._	J_{R+H}	[10^{-4} kgm²]	-	-	-	-	-	-	17.9	33.7	84.8	360.6

Table 3

ROBA-stop® – Friction Power Diagrams

ROBA-stop®-positioning brake / ROBA-stop®-tacho brake

ROBA-stop®
Type 800.45_.0,
Type 800.41_._,
Type 802.41_._,
Type 800.418.3
Type 802.418.3
(positioning brake)
and
Type 830.41_._
Type 832.41_._
(tacho brake)

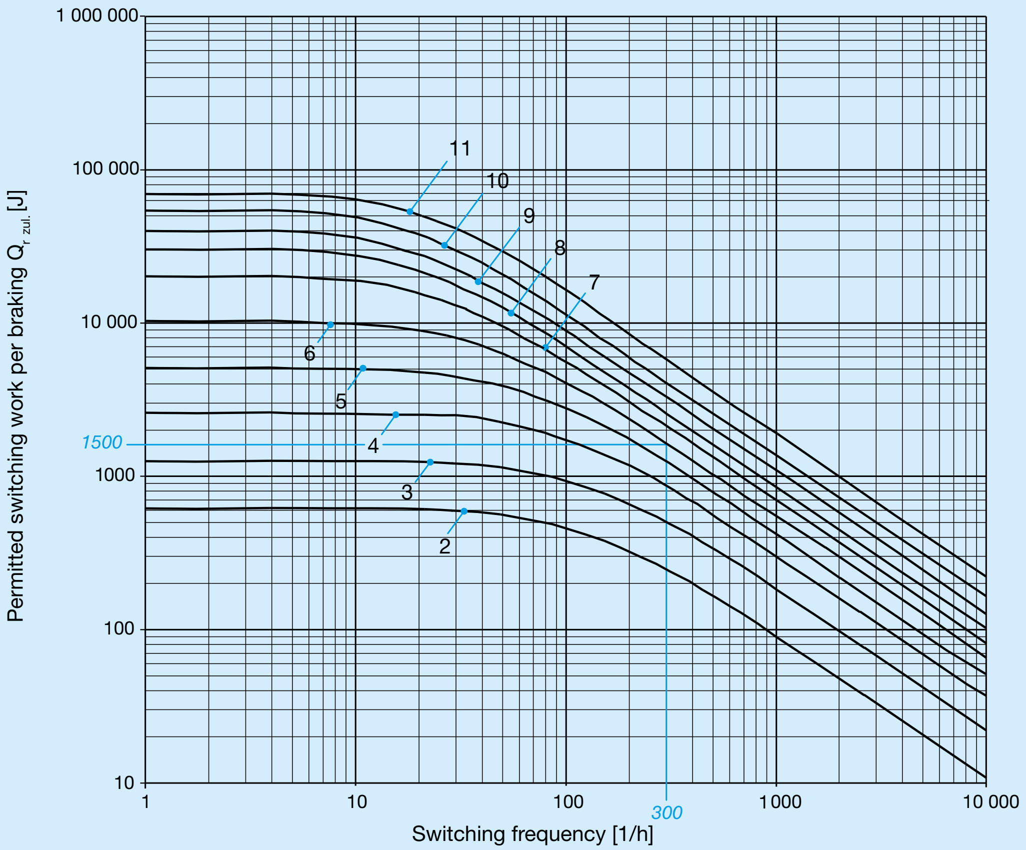


Diagram 1

ROBA-stop®-peak load brake / ROBA-stop®-tacho peak load brake

ROBA®-stop®
Type 8636.41_._
(peak load brake)
and
Type 863.41_._
Type 866.41_._
(tacho peak load brake)

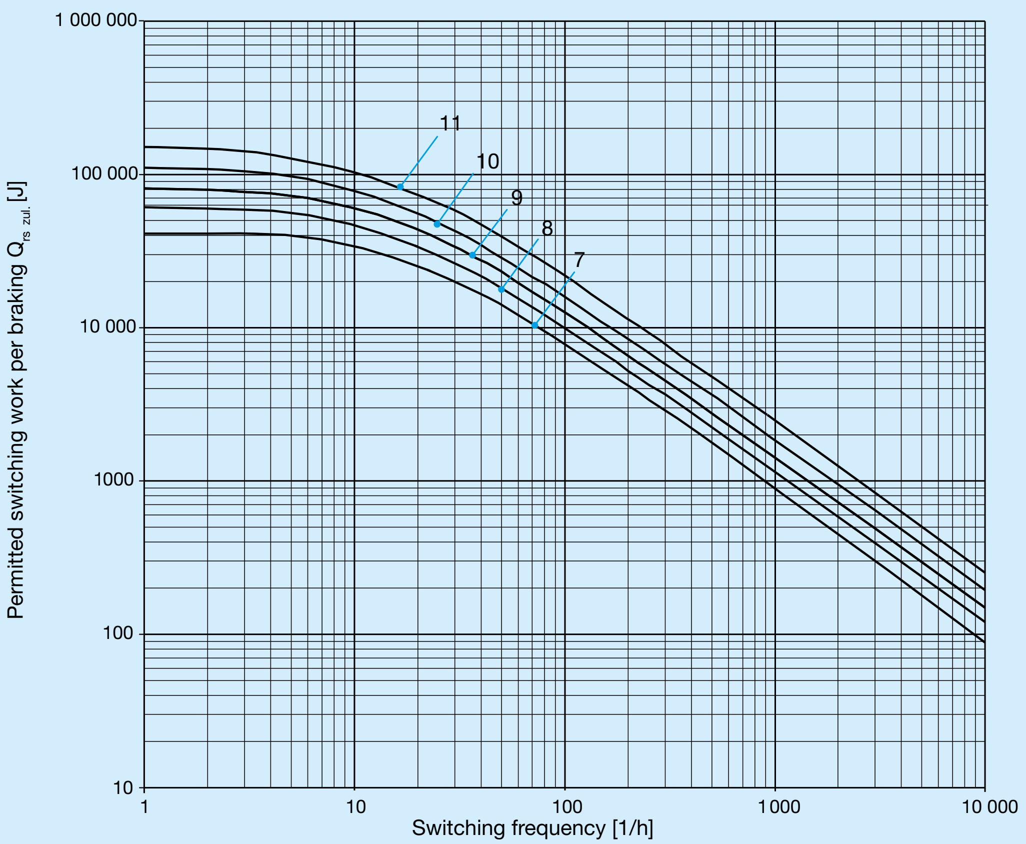


Diagram 2

ROBA-stop® – Friction Power Diagrams

ROBA-stop®-holding brake

ROBA®-stop®-S
Type 820.61_._

n = 1500 rpm
for Sizes 3 to 6

n = 750 rpm
for Sizes 7 to 11

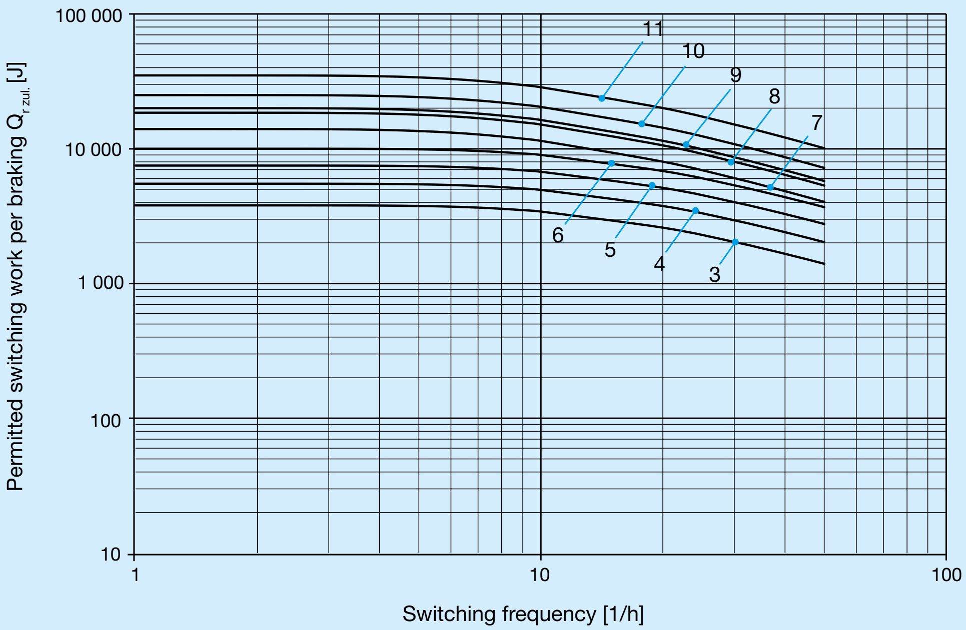


Diagram 3

ROBA-stop®-S Sizes 8 – 10

ROBA®-stop®-S
Type 856.417._

n = 1750 rpm
for Sizes 8 to 10

Brake: 100 % duty cycle

Mounting brake without heat dissipation

Ambient temperature: 60 °C

For higher speeds than 1750 rpm (Sizes 8 – 10):
Please contact the manufacturers for information on the permitted friction work $Q_{r\,zul.}$

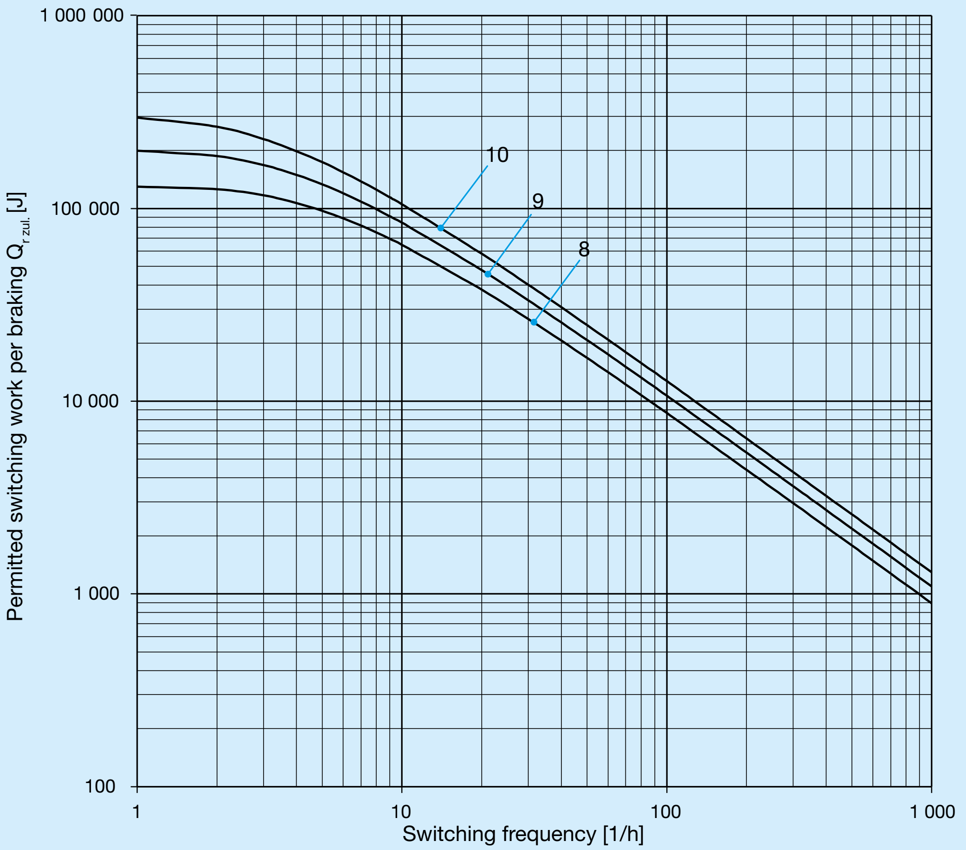


Diagram 4

ROBA-stop® – Friction Power Diagrams

ROBA-stop® - S Size 11

ROBA-stop®-S
Type 856.41_._

n = 1000 rpm
for Size 11

Brake: 100 % duty cycle

Mounting brake without heat dissipation

For higher speeds than 1000 rpm (Size 11):
At higher speeds, the friction work reduces acc. diagram 5 (see also design example, below).

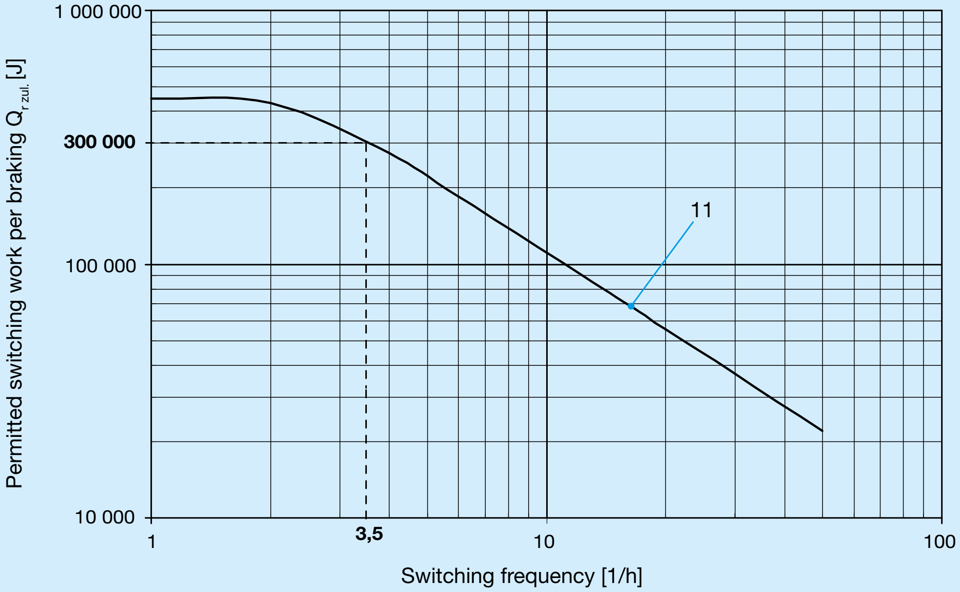


Diagram 4

ROBA-stop®-S
Type 856.41_._

Size 11

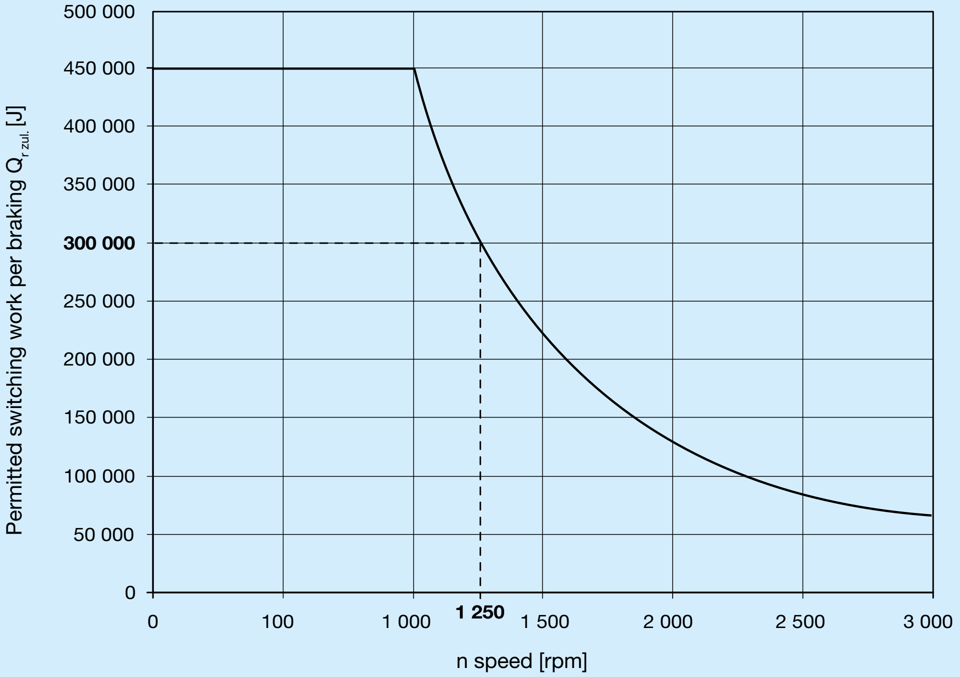


Diagram 5

Design example for a speed of 1250 rpm:

Permitted friction work $Q_{r\ zul.}$ for 1250 rpm from diagram 5: 300 000 J.
This value limits the permitted friction work $Q_{r\ zul.}$ acc. diagram 4 for low switching frequencies (here up to 3.5 switchings per hour).
The permitted friction work $Q_{r\ zul.}$ reduces acc. diagram 4 with higher switching frequencies.

ROBA-stop® – Switching Times / Electrical Connection

Switching times

These values stated in the Tables 4 and 5 are mean values which refer to the nominal air gap and the nominal torque on a warm brake. The brake switching times are influenced by the temperature, by the type of quenching circuit and by the air gap between the armature disk and the coil carrier, which depends on the wear status of the linings.

Switching times	**Brake with standard armature disk**			**Size**									
				2	3	4	5	6	7	8	9	10	11
Nominal torque		M_N	[Nm]	1.1	3	6	12	26	50	100	200	400	800
connection time	DC-side switching	t_1	[ms]	13	20	26	46	78	100	200	250	400	500
	AC-side switching	t_1	[ms]	80	120	200	260	650	700	1000	1300	3000	3100
Separation time		t_2	[ms]	20	25	30	40	60	80	100	150	200	300

Table 4

Switching times	**Brake with fast acting armature disk**			**Size**									
				2	3	4	5	6	7	8	9	10	11
Nominal torque		M_N	[Nm]	-	3	6	12	26	50	100	200	400	800
connection time	DC-side switching	t_1	[ms]	-	13	20	26	33	50	80	120	250	350
	AC-side switching	t_1	[ms]	-	90	100	200	330	310	600	800	1800	2000
Separation time		t_2	[ms]	-	30	35	50	70	85	110	170	230	350

Table 5

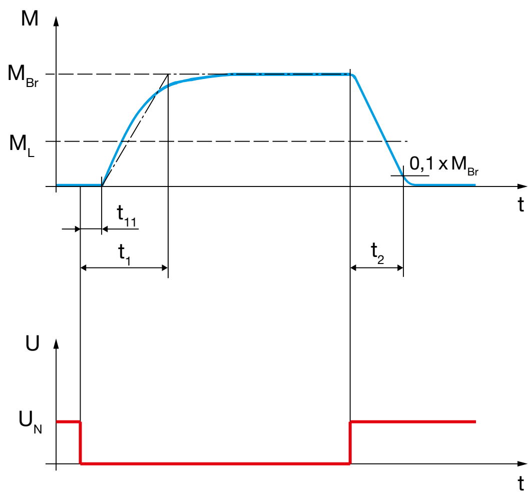


Diagram 6: Torque-Time Diagram

Key:

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

Explanation of terms:

The **braking torque** (switching torque) is the **torque effective** in the shaft train on slipping brakes, with a sliding speed of 1 m/s referring to the mean friction radius (acc. DIN VDE 0580).

The **transmittable torque** is the largest torque, with which the closed brake can be loaded without slipping occurring.

Electrical Connection and Wiring

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

Earthing Connection

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

Device Fuses

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

Switching Behaviour

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

Magnetic Field Build-up

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

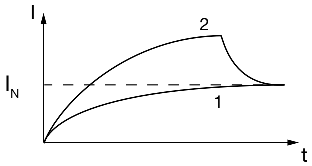
• Field Build-up with Normal Excitation

If the magnetic coil is energised with nominal voltage, the coil current does not immediately reach its nominal value. The coil inductivity causes the current to increase slowly as an exponential function. Accordingly, the build-up of the magnetic field takes place more slowly and the braking torque drop (curve 1, Fig. below) is also delayed.

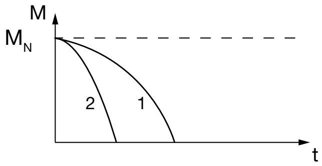
• Field Build-up with Overexcitation

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, it needs to be switched over to the nominal voltage (curve 2, Fig. below). The relationship between overexcitation and separation time t_2 is roughly indirectly proportional. This means that, using overexcitation voltage U_O (= doubled nominal voltage U_N), the separation time t_2 for release of the brake is halved.
The ROBA®-switch fast acting rectifier works on this principle.

Current path



Braking torque path



Operation with overexcitation requires an inspection of :
- the required overexcitation time *
- as well as the RMS coil capacity ** with a cycle frequency higher than 1 cycle per minute.

* **Overexcitation time t_o**

Increased wear, and therefore an increasing air gap as well as coil heating lengthen the separation times t_2 for the brake. For this reason, at least double the separation time t_2 at nominal voltage must be selected as overexcitation time t_O on each brake size

**** RMS coil capacity P**

$P \leq P_N$
The coil capacity P must not be larger than P_N. Otherwise the coil may fail due to thermal overload.

Calculations:

P [W] RMS coil capacity dependent on switching frequency, overexcitation, reduction in capacity and duty cycle

$$P = \frac{P_O \times t_O + P_H \times t_H}{T}$$

P_N [W] Coil nominal capacity (catalogue values, Type tag)
P_O [W] Coil capacity on overexcitation

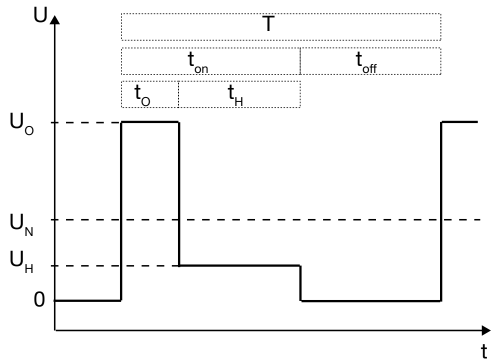
$$P_O = \left(\frac{U_O}{U_N}\right)^2 \times P_N$$

P_H [W] Coil capacity at reduced capacity

$$P_H = \left(\frac{U_H}{U_N}\right)^2 \times P_N$$

t_O [s] Overexcitation time
t_H [s] Time of operation with reduction in capacity
t_{off} [s] Time without voltage
t_{on} [s] Time of operation ($t_O + t_H$)
T [s] Total time ($t_O + t_H + t_{off}$)
U_O [V] Overexcitation voltage (bridge voltage)
U_H [V] Holding voltage (half-wave voltage)
U_N [V] Coil nominal voltage

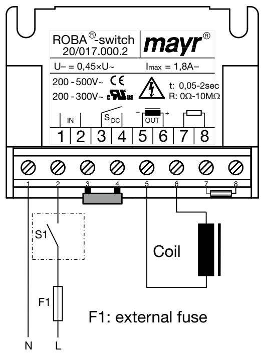
Time Diagram:



For brakes, which do not require overexcitation, the holding voltage U_H may be lower than the nominal voltage U_N, e.g. on power reduction to reduce the coil temperature.

Magnetic field removal

• AC-side Switching

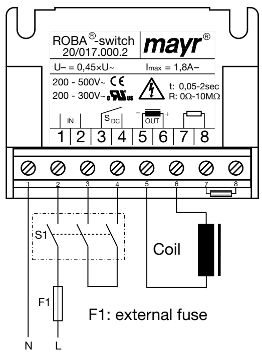


The power circuit is interrupted in front of the rectifier. The magnetic field slowly reduces. This delays the rise in braking torque.

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

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

• DC-side Switching



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

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

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

• Protection circuit

When using DC-side switching, the coil must be protected by a suitable protection circuit according to VDE 0580, which is integrated in *mayr*®-rectifiers. To protect the switching contact from consumption when using DC-side switching, additional protective measures 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*®-spark quenching unit), although this may of course then alter the switching times.

Electrical Accessories

Functions of the DC Voltage Modules

no overexcitation and no power reduction		overexcitation (short separation time) and / or power reduction (reduction in coil capacity and temperature)						**Protection circuit**	**Safe Brake Control**
		variable output voltage					fixed output voltage		
		without DC-side dis-connection	integrated DC-side disconnection						
Type 024.000.6 **Half-wave Rectifier**	**Type 025.000.6** **Bridge Rectifier**	**Type 017._00.2** **ROBA®-switch**	**Type 017.110.2** **ROBA®-switch**	**Type 018.000.2** **ROBA®-switch 24V**	**Type 018.100.2** **ROBA®-switch 24V**	**Type 028.100.2** **ROBA®-brake-checker**	**Type 019._00.2** **ROBA®-multiswitch**	**Type 070.000.6** **Spark Quen-ching Unit**	**Type 021.100.2** **ROBA®-SBCplus**

Application

Standard application Compact design	Standard application, preferred for noise-damped brakes Compact design	Allows short separation time	Allows short separation time + short connection time no wear on contacts	Allows short separation time + short connection time For input voltage 24 VDC max. output current 2.5 A no wear on contacts	Allows short separation time + short connection time For input voltage 24 VDC max. output current 5 A no wear on contacts	Allows short separation time + short connection time + integrated release and drop-out recogni-tion for permitted brakes For input voltages 24 VDC / 48 VDC max. output current 10 A / 5 A no wear on contacts	Allows short separation time + consistently controlled output voltage with variable input voltage	Reductions in switch-off voltage and wear on contacts	Controls and monitors up to two ROBA-stop® safety brakes, especially in applications, which have to fulfill requirements regarding person protection according to the standards for functional reliability, such as for example ISO 13849 and IEC 62061 Patent pending

For detailed information on our DC voltage modules, please go to: www.mayr.com

Half-wave and bridge rectifiers Type 02_.000.6

c UL us E189728 CE

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.

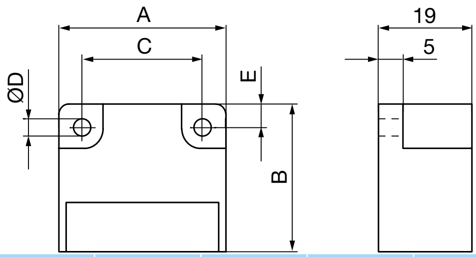
Function

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)

Dimensions (mm)



Size	A	B	C	ØD	E
1	34	30	25	3.5	4.5
2	54	30	44	4.5	5.0
3/4	64	30	54	4.5	5.0

Accessories: Mounting bracket set for 35 mm rail acc. EN 60715: Artikel-Nr. 1803201.

Order Number

__ / 0 2 __ . 0 0 0 . 6

Sizes	
1 up to 4	4 Half-wave rectifier 5 Bridge rectifier

Technical data

				Bridge rectifier		Half-wave rectifier			
Calculation output voltage				VDC = VAC x 0.9		VDC = VAC x 0.45			
Type				**1/025**	**2/025**	**1/024**	**2/024**	**3/024**	**4/024**
Max. input voltage	±10 %	U_{AC}	[VAC]	230	230	400	400	500	600
Max. output voltage		U_{DC}	[VDC]	207	207	180	180	225	270
Output current	≤ 50°C	I_{RMS}	[A]	2.5	2.5	3.0	4.0	4.0	4.0
	at max. 85 °C	I_{RMS}	[A]	1.7	1.7	1.8	2.4	2.4	2.4
Max. coil nominal capacity at U_{AC} = 115 VAC	≤ 50 °C	P_N	[W]	260	260	-	-	-	-
	up to 85 °C	P_N	[W]	177	177	-	-	-	-
U_{AC} = 230 VAC	≤ 50 °C	P_N	[W]	517	517	312	416	416	416
	up to 85 °C	P_N	[W]	352	352	187	250	250	250
U_{AC} = 400 VAC	≤ 50 °C	P_N	[W]	-	-	540	720	720	720
	up to 85 °C	P_N	[W]	-	-	324	432	432	432
U_{AC} = 500 VAC	≤ 50 °C	P_N	[W]	-	-	-	-	900	900
	up to 85 °C	P_N	[W]	-	-	-	-	540	540
U_{AC} = 600 VAC	≤ 50 °C	P_N	[W]	-	-	-	-	-	1080
	up to 85 °C	P_N	[W]	-	-	-	-	-	648
Peak reverse voltage			[V]	1600	1600	2000	1600	2000	2000
Rated insulation voltage		U_{RMS}	[V_{RMS}]	320	320	500	500	630	630
Pollution degree (insulation coordination)				1	1	1	1	1	1
Device Fuses				To be included in the input voltage line.					
Recommended microfuse switching capacity H The microfuse corresponds to the max. possible connection capacity. If fuses are used corresponding to the actual capacities, the permitted limit integral I²t must be observed on selection.				FF 3.15 A	FF 3.15 A	FF 4 A	FF 5 A	FF 5 A	FF 5 A
Permitted limit integral		I^2t	[A^2s]	40	40	50	100	50	50
Protection				IP65 components, encapsulated / IP20 terminals					
Terminals				Cross-section 0.14 – 1.5 mm² (AWG 26-14)					
Ambient temperature			[°C]	- 25 up to + 85					
Storage temperature			[°C]	- 40 up to + 85					
Conformity markings				UL, CE	UL, CE	UL, CE	UL, CE	UL, CE	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!					

ROBA®-switch Type 017._00.2

E189728

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, 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 is used for operation at an input voltage of between 100 and 500 VAC, depending on the size. It 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_{ext}).

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 rectification time 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 mm² (AWG 22-14)
Ambient temperature	- 25 °C up to + 70 °C
Storage temperature	- 40 °C up to + 70 °C

ROBA®-switch Sizes, Table 1

			Size			
			Type 017.000.2		Type 017.100.2	
			10	20	10	20
Input voltage ±10 %	U_{AC}	[VAC]	100–250	200–500	100–250	200–500
Output voltage	U_{bridge}	[VDC]	90–225	180–450	90–225	180–450
	$U_{half\text{-}wave}$	[VDC]	45–113	90–225	45–113	90–225
Output current						
at ≤ 45 °C	I_{eff}	[A]	2.0	1.8	3.0	2.0
at max. 70 °C	I_{eff}	[A]	1.0	0.9	1.5	1.0
Conformity markings			c UL us, CE	c UL us up to 300 V, CE	c UL us, CE	c UL us, CE

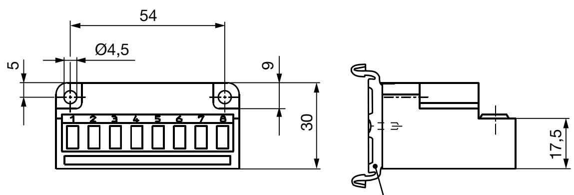
Order Number

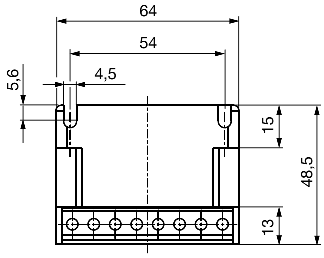
__ / 0 1 7 . __ 0 0 . 2

Size	UL-approved
10	0 up to 300 V
20	1 up to 500 V

Dimensions (mm)

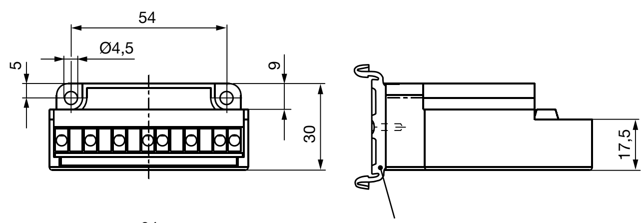
Type 017.000.2

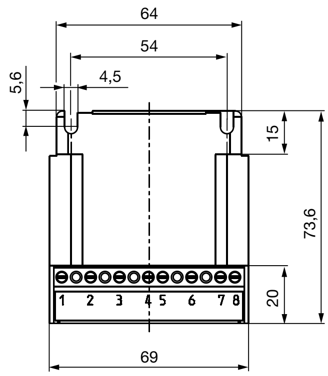




Accessories:
Mounting bracket set for
35 mm rail acc. EN 60715:
Article No. 1802911

Type 017.100.2





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

ROBA®-switch Type 017.110.2

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, electrovalves, etc.

Fast acting rectifier ROBA®-switch 017.110.2

- Integrated DC-side disconnection (shorter connection time t_1)
- Consumer operation with overexcitation or power reduction
- Input voltage: 100 – 500 VAC
- Maximum output current I_{RMS} : 1.5 A
- UL-approved

c UL us E189728 CE

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

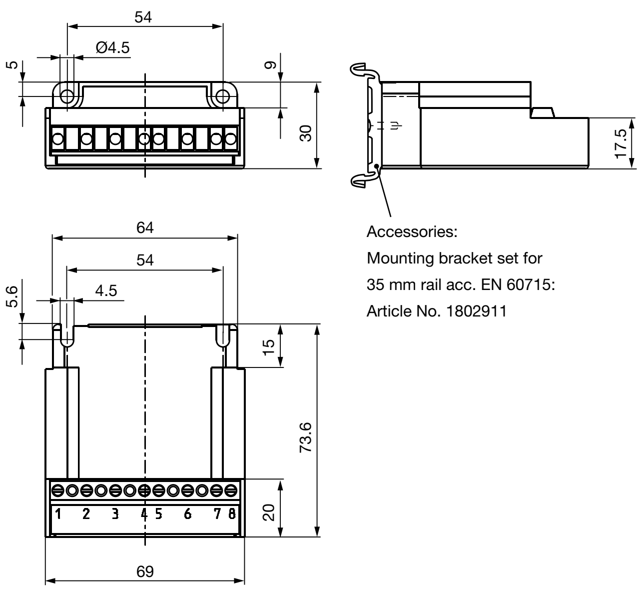
Function

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

In addition, the ROBA®-switch features integrated DC-side disconnection. In contrast to the usual DC-side disconnection, no further protective measures or external components are required. The DC-side disconnection is activated as a standard measure (terminals 3 and 4 are not wired) and causes short switching times on the electromagnetic consumer.

The integrated DC-side disconnection is deactivated by fitting a bridge between the terminals 3 and 4, and the coil is de-energised via the freewheeling diode. This has the advantages of gentler braking actions and quieter switching noise. However, this substantially lengthens the switching times (approx. 6 – 10x).

Dimensions (mm)



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

Electrical connection (Terminals)

1 + 2	Input voltage (fitted protective varistor)
3 + 4	Switching between DC and AC-side disconnection
5 + 6	Output voltage (fitted protective varistor)
7 + 8	R_{ext} for bridge rectification time 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 mm² (AWG 22-14)
Ambient temperature	-25 °C up to +70 °C
Storage temperature	-40 °C up to +70 °C

ROBA®-switch Sizes, Table 1

				Size 10	Size 20
Input voltage ±10 %		U_I	[VAC]	100 – 250	200 – 500
Output voltage		U_O	[VDC]	90 – 225	180 – 450
Output voltage		U_H	[VDC]	45 – 113	90 – 225
Output current	at ≤ 45 °C	I_{RMS}	[A]	1.5	1.5
Output current	at max. 70 °C	I_{RMS}	[A]	0.75	0.75
Conformity markings				c UL us CE	c UL us CE

Order Number

__ / 0 1 7 . 1 1 0 . 2

Size
10
20

![mayr® your reliable partner]

ROBA®-switch 24V Type 018.000.2

CE

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.

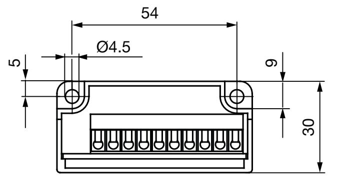
Fast switching module ROBA®-switch 24V 018.000.2

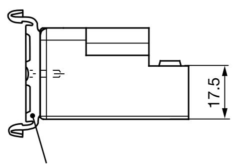
- Consumer operation with overexcitation or power reduction
- Integrated DC-side disconnection (shorter connection time t_1)
- Input voltage: 24 VDC
- Max. output current I_{RMS}: 2.5 A

CAUTION

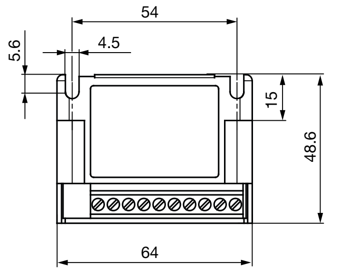
The ROBA®-switch 24V with integrated DC-side disconnection is not suitable for being the only safety disconnection in applications!

Dimensions (mm)





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



Function

The ROBA®-switch 24V units are used for an input voltage of 24 VDC. They can switch internally, meaning that the output voltage switches to holding voltage from the input voltage (= overexcitation voltage) via pulse-width modulation using 20 kHz.
The overexcitation time and holding voltage can be switched.

Electrical Connection (Terminals)

1	Control input
2 + 3	Input voltage, ground
4 + 5	Input voltage +24V
6	Output voltage +
7	Output voltage -
8 + 9	Selection of overexcitation time
9 + 10	Selection ofholding voltage

Technical data

Input voltage U_I	24 VDC (18 – 32 VDC) SELV/PELV
Output voltage U_O	Input voltage U_I
Output voltage U_H	see Table 1
Output current I_{RMS} at ≤ 45 °C	2.5 A
Output current I_{RMS} at max. 70 °C	1.25 A
Protection	IP65 components, IP20 terminals
Terminal nominal cross-section	1.5 mm² (AWG 22-14)
Ambient temperature	-25 °C up to +70 °C
Storage temperature	-40 °C up to +70 °C

ROBA®-switch 24 V, Table 1

Article number	Overexcitation Time t_O [ms]		Holding voltage U_H [VDC]	
	Without	with	Without	with
	Bridge 8+9		Bridge 9+10	
8237581	450	150	½ x U_I	⅔ x U_I

Order Number

__ / 0 1 8 . 0 0 0 . 2

Size
1

Example:
Order number 1 / 018.000.2 and article number 8237581

ROBA®-switch 24V Type 018.100.2

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 switching module ROBA®-switch 24V 018.100.2

- Consumer operation with overexcitation or power reduction
- Integrated DC-side disconnection (shorter connection time t_1)
- Input voltage: 24 VDC
- Max. output current I: 5 A 5 A
- UL-approved

E189728

CAUTION

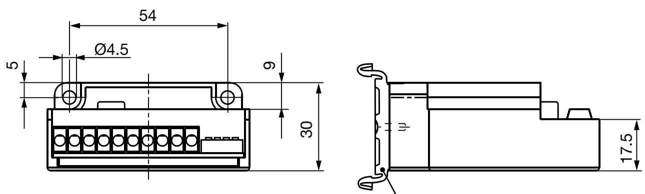
The ROBA®-switch 24V with integrated DC-side disconnection is not suitable for being the only safety disconnection in applications!

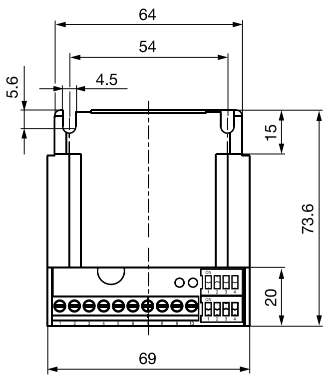
Function

The ROBA®-switch 24V units are used for an input voltage of 24 VDC. They can switch internally, meaning that the output voltage switches to holding voltage from the input voltage (=overexcitation voltage) via pulse-width modulation using 20 kHz. 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 ¼, ¹/₃, ½ and ²/₃ of the input voltage (equals 6 V, 8 V, 12 V and 16 V at an input voltage of 24 V).

In addition, the ROBA®-switch 24V features integrated DC-side disconnection. In contrast to the usual DC-side disconnection, no further protective measures or external components are required. The DC-side disconnection 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 (approx. 6 – 10x).

Dimensions (mm)





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

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_O	Input voltage U_I
Output voltage U_H	¼, ¹/₃, ½, ²/₃ x U_I ±20 % can be selected via a DIP switch
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 mm² (AWG 22-14)
Ambient temperature	-25 °C up to +70 °C
Storage temperature	-40 °C up to +70 °C

Order Number

__ / 0 1 8 . 1 0 0 . 2

△

Size
1

ROBA®-brake-checker Type 028.100.2

Application

ROBA®-brake-checker monitoring modules are used to operate safety brakes with overexcitation while at the same time monitoring the condition.

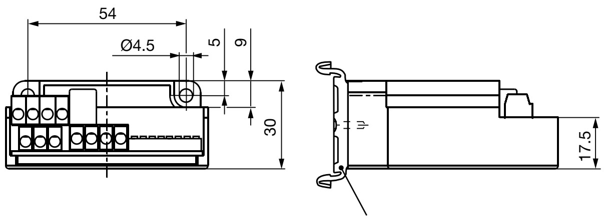
Monitoring module ROBA®-brake-checker 028.100.2

- Consumer operation with overexcitation or power reduction
- Controlled output voltage (on reduction)
- Simple adjustment of holding voltage and overexcitation time via a DIP switch
- Fast or slow switch off
- Brake condition recognition (release and drop-out recognition)
- Wear recognition and error recognition
- Wide input voltage range
- Maximum output current I_{RMS}: 10 A / 5 A
- Maximum overexcitation current I_O = 20 A / 10 A
- Automatic reduction of the holding voltage U_H

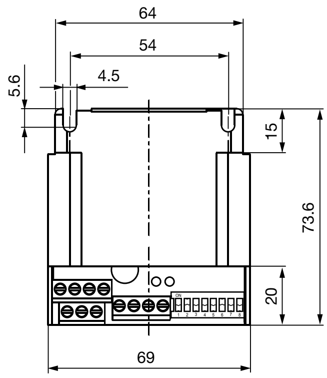
CAUTION

The ROBA®-brake-checker with integrated DC-side disconnection is not suitable for being the only safety disconnection in applications!

Dimensions (mm)



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



Function

The ROBA®-brake-checker monitoring module is intended for use with an input voltage of 24 or 48 VDC. The module monitors the switching condition of the brake and emits a signal to provide information on the respective switching condition.
Critical conditions (line breakages, wear) can be recognised and the respective signal can be emitted via the warning signal output.

Switching of the output voltage to a controlled holding voltage (see "Table 1") is available as an option.

After a brake-specific overexcitation time period, the integrated automatic mode adjusts to the pre-set reduction voltage. The automatic mode can be switched off using a DIP switch.

Electrical Connection (Terminals)

Power Terminal

1 Supply voltage +24 VDC / +48 VDC
2 Output voltage +
3 Output voltage -
4 Supply voltage 0 VDC

Signal Terminal

1 Supply voltage 0 VDC
2 Switch-off fast/slow (input)
3 Signal output (release monitoring)
4 24 V (auxiliary voltage for bridging)
5 Supply voltage +24 VDC
6 Start (input)
7 Error output max. 300 mA

Technical Data

Input voltage	see Table 1
Output voltage	see Table 1
Protection	IP65 components, IP20 terminals, IP20 DIP switch
Terminal nominal cross-section	
Power terminals	4 mm², (AWG 20-12)
Signal terminals	1.5 mm², (AWG 30-14)
Ambient temperature	-25 °C up to +70 °C
Storage temperature	-40 °C up to +105 °C

ROBA®-brake-checker Sizes, Table 1

				Size 2 24 VDC	Size 4 48 VDC
Input voltage, power terminal	SELV/PELV	U_I	[VDC]	18 – 30	42 – 54
Input voltage, signal terminal		U_I	[VDC]	24 (19 – 28)	
Output voltage	±5 %	U_O	[VDC]	Input voltage U_I	
	±5 %	U_H	[VDC]	6 8 12 16	12 16 24 32
Output current	at ≤ 45 °C	I_{RMS}	[ADC]	10.0	5.0
	at max. 70 °C	I_{RMS}	[ADC]	5.0	2.5
Conformity markings				CE	CE

Order Number

__ / 0 2 8 . 1 0 0 . 2

Size
2
4

ROBA®-multiswitch Type 019._00.2

E189728

Application

ROBA®-multiswitch 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, electrovalves, etc.

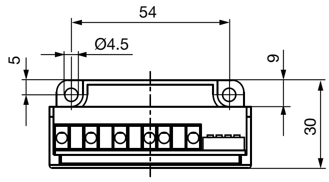
Fast acting rectifier ROBA®-multiswitch 019._00.2

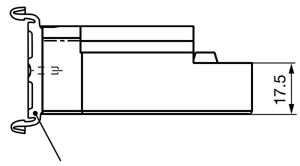
- Consistently controlled output voltage in the entire input voltage range
- Consumer operation with overexcitation or power reduction
- Input voltage: 100 – 500 VAC
- Max. output current I_{RMS} : 2 A; 4.5 A
- UL-approved

ROBA®-multiswitch units are not suitable for all applications, e.g. use of the ROBA®-multiswitch when operating noise-damped brakes is not possible without taking additional measures. The product's suitability should be checked before use.

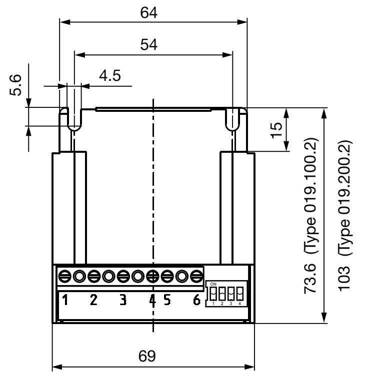
The ROBA®-multiswitch is used for operation at an input voltage of between 100 and 500 VAC, depending on the size. After switch-on, it emits the rectified bridge voltage for 50 ms and then adjusts automatically to a pre-programmed overexcitation voltage. After the overexcitation time ends, it regulates to the permanently programmed holding voltage. For the overexcitation voltage and holding voltage values of the standard design, please see Table 1.
On special designs, deviating values are possible.
The overexcitation time can be adjusted via a DIP switch to 150 ms, 450 ms, 1 s, 1.5 s and 2 s.

Dimensions (mm)





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



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)

Technical data

Input voltage see Table 1	
Frequency	50 – 60 Hz
Output voltage see Table 1	
Output current	
Type 019.100.2	2 A bei ≤ 45 °C; 1 A at max. 70 °C
Type 019.200.2	4.5 A bei ≤ 45 °C; 2.25 A at max. 70 °C
Protection	IP65 components, IP20 terminals, IP20 DIP switch
Terminal nom. cross-section	1.5 mm² (AWG 22-14)
Ambient temperature	-25 °C up to +70 °C
Storage temperature	-40 °C up to +70 °C

ROBA®-multiswitch Sizes, Table 1

Sizes	Type	Input voltage * ±10 % acc. EN 50160 [VAC]	Output voltage * ±10 % U_O** [VDC]	U_O** [VDC]	Article number
10	019.100.2	100 – 275	90	52	8186586
20	019.100.2	200 – 500	180	104	8185591
	019.200.2	200 – 500	180	104	8242954
	019.100.2	230	207	30	8225580
	019.200.2	230	207	30	8237887
	019.100.2	300 – 500	240	52	8220914

* On special designs, deviating values are possible.
The values stated on the Type tag are decisive.

** U_O : overexcitation voltage; U_H : Holding voltage

Order Number

__ / 0 1 9 . __ 0 0 . 2

Size		
10	1	max. 2.0 A I_{RMS}
20	2	max. 4.5 A I_{RMS}

Example:

Order number 20 / 019.100.2 and article number 8225580

your reliable partner

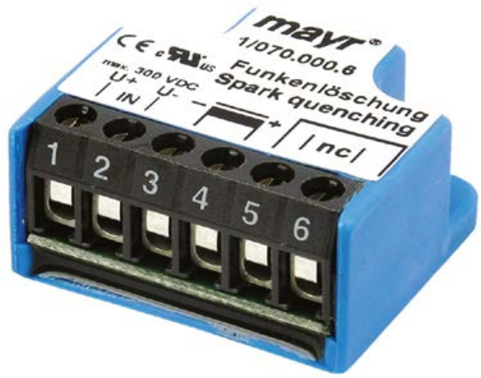
Spark quenching unit Type 070.000.6

E189728

Application

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

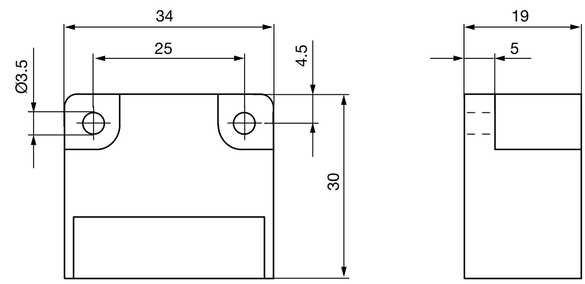
- Voltage limitation according to VDE 0580 2000-07, Item 4.6.
- Reduction of EMC-disturbance by voltage rise limitation, suppression of switching sparks.
- Reduction of brake engagement times by a factor of 2 – 4 compared to freewheeling diodes.



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.

Dimensions (mm)



Electrical Connection (Terminals)

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

Technical data

Input voltage	max. 300 VDC, max. 615 V_{peak} (rectified voltage 400 VAC, 50/60 Hz)
Switch-off energy	max. 9 J / 2 ms
Power dissipation	max. 0.1 Watt
Rated voltage nc terminals	250 V
Protection	IP65 components, IP20 terminals
Ambient temperature	-25 °C up to +85 °C
Storage temperature	-40 °C up to +85 °C
Max. conductor cross-section	2.5 mm², (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

ROBA®-SBCplus
The safe brake control - for use up to PLe and SIL CL3

Application

The safe brake control ROBA®-SBCplus is used to control and monitor two ROBA-stop® safety brakes, especially in applications, which have to fulfill requirements regarding person protection according to the standards for functional reliability, such as for example ISO 13849 and IEC 62061.

Characteristics:

- Safe electronic switching of two brakes
- Input voltage power circuit 24 - 48 VDC
- Connection for up to 2 brakes up to 4.5 A / 24 VDC or 2.25 A / 48 VDC (108 W)
- Output voltage (holding voltage) can be selected 6,8,12,24,48 VDC
  → Power reduction, temperature reduction, electricity costs reduction
- Overexcitation time configurable
- Feedback inputs release monitoring for proximity switch or microswitch
- Monitoring for plausibility of the feedback
  → Error diagnostics of the brake
- Status and error outputs for feedback to the control
- No mechanic contacts for controlling and monitoring
  → High reliability, no wear, independent of cycle frequency and cycle rate
- Fast (“DC-side”) or slow (“AC-side”) switch off possible
- Galvanic separation between the control part and the power part
  → Prevention of EMC issues
- Four integrated functions:
  Contactor, 24 VDC fast-acting rectifier, safety relay, spark quenching
- Safe holding voltage and overexcitation time
- Safety functions are programmed into the ROBA®-SBCplus and only have to be parameterised
  → Plausibility check integrated and must not be programmed and validated
- Applicable up to PLe and SIL CL3, Type examination TÜV Süd (German Technical Inspectorate)

Maximum switching reliability

The brake control must safely interrupt the current in the magnetic coil on switching off the brake. The ROBA®-SBCplus module works with wear-free electronic semiconductors and thus achieves almost unlimited switching frequencies and switching reliability.

Safe inner configuration

Amongst other things, the internal diagnostics inspections for short circuits, earth short-circuits and line breaks as well as safe overexcitation for releasing the brake and switching to reduced holding voltage when the brake is opened are the components required for “fail-safe” inner configuration.

Numerous safety functions

Numerous safety functions permit comprehensive error diagnostics. The brake voltage is monitored. An excessively high voltage could dangerously extend the drop-out time on switch-off, if, for example, this were to cause a vertical axis to drop to an unpermittedly low level. The monitoring of the switching times, which influence the braking distance, is therefore another component of error diagnostics.

Safe switching condition monitoring

The signal evaluation of the release monitoring with plausibility check permits a switching condition monitoring of the brake. The plausibility is controlled as follows: If voltage is applied, the brake must be opened after a defined time and vice versa. The switching condition monitoring can be used to reliably prevent the drive starting up against a closed brake. In this way, creeping errors, such as gradually increasing wear, which affects the switching times, can be detected.

ROBA-stop® – Guidelines

Guidelines on the Declaration of Conformity: A conformity evaluation has been carried out for the product (electromagnetic safety brake) in terms of the EU Low Voltage Directive 2014/35/EU. The Declaration of Conformity is laid out in writing in a separate document and can be requested if required.

Guidelines on the EMC Directive (2014/30/EU): The product cannot be operated independently according to the EMC directive. Due to their passive state, brakes are also non-critical equipment according to the EMC. Only after integration of the product into an overall system can this be evaluated in terms of the EMC. For electronic equipment, the evaluation has been verified for the individual product in laboratory conditions, but not in the overall system.

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

Guidelines on the ATEX Directive: Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion. For application of this product in areas where there is a high danger of explosion, it must be classified and marked according to directive 2014/34/EU.

Safety Regulations

Brakes may generate several risks, among others:


Contact with voltage-carrying components


Contact with hot surfaces


Hand injuries


Danger of seizure


Magnetic fields

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

To prevent injury or damage, only professionals and specialists are allowed to work 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 connection 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 brake.
- ❒ The brakes are only designed for dry running. The torque is lost if the friction surfaces come into contact with oil, grease, water or similar substances or foreign bodies.
- ❒ Manufacturer-side corrosion protection of the metallic surfaces.
- ❒ The rotors may rust up and block in corrosive ambient conditions and/or after long periods of storage.

Ambient temperature-20 °C up to +40 °C

Protection

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

(electrical) IP54: Dust-proof and protected against contact as well as against water spray from any direction.

IP67 (Type 856.41_._): Dust-proof and protected against contact as well as against temporary submersion under water.

Earthing Connection

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

Intended Use

mayr®-brakes have been developed, manufactured and tested in compliance with the VDE 0580 standard and in accordance with the EU Low Voltage Directive as electromagnetic components. During installation, operation and maintenance of the product, the 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 2014/30/EU, the individual components produce no emissions. However, functional components e.g. mains-side energisation of the brakes with rectifiers, phase demodulators, ROBA®-switch devices or similar controls can produce disturbance which lies above the allowed limit values.
For this reason it is important to read the Installation and Operational Instructions very carefully and to keep to the EMC directives.

Standards, Directives and Regulations Used

VDE 0580	Electromagnetic devices and components, general specifications
2014/35/EU	Low Voltage Directive
CSA C22.2 No. 14-2010	Industrial Control Equipment
UL 508 (Edition 17)	Industrial Control Equipment
EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 61000-6-4	Interference emission
EN 61000-6-2	Interference immunity
EN 60204-1	Electrical equipment of machines

Liability

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

Guarantee

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

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

13/03/2017 GF/SC_13/04/2017