



ROBA-stop®-S

K.856.V18.EN

www.mayr.com

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 IP 67.

Permanent protection against corrosion

Protection IP 67, a high-quality brake body primary coating, chromed interior parts or use of stainless steel ensure protection against corrosion.

Easy handling

Compact construction and small outer diameters mean easy brake handling.

Minimum maintenance expenditure

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.

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.

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 sea water 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.

Motors with self-ventilation

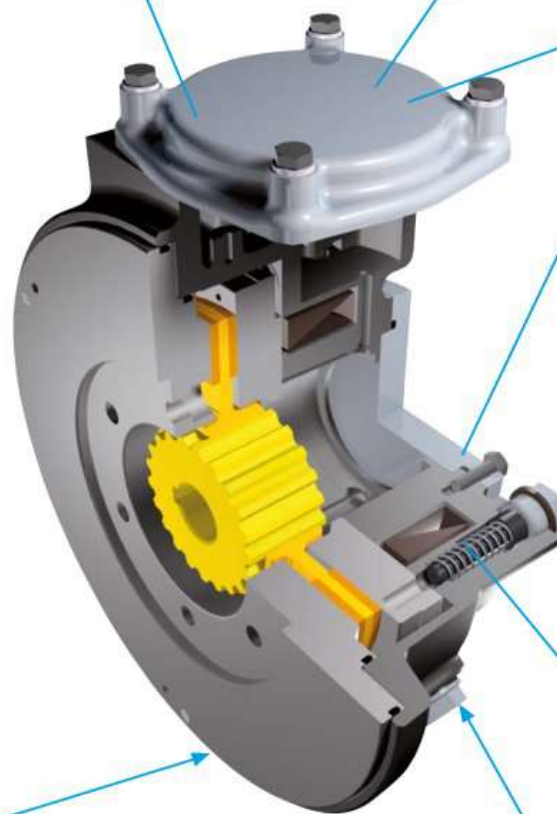
In order to assemble the **ROBA-stop®-S** onto motors with continuous shafts on the B-bearing side, the closed standard cover on the brake rear side is exchanged for the open cover with integrated radial shaft sealing ring.

Anti-condensation heating

The heater avoids condensation water inside the brake. This 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 system-specific requirements.

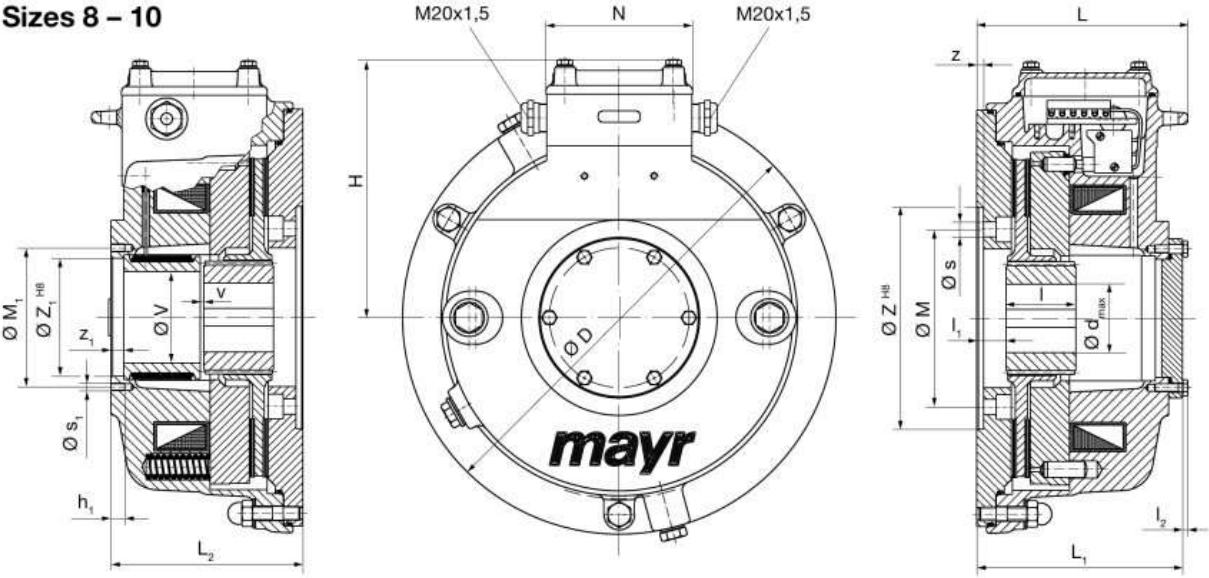


Quality, Experience, Competence



Dimensions [mm]

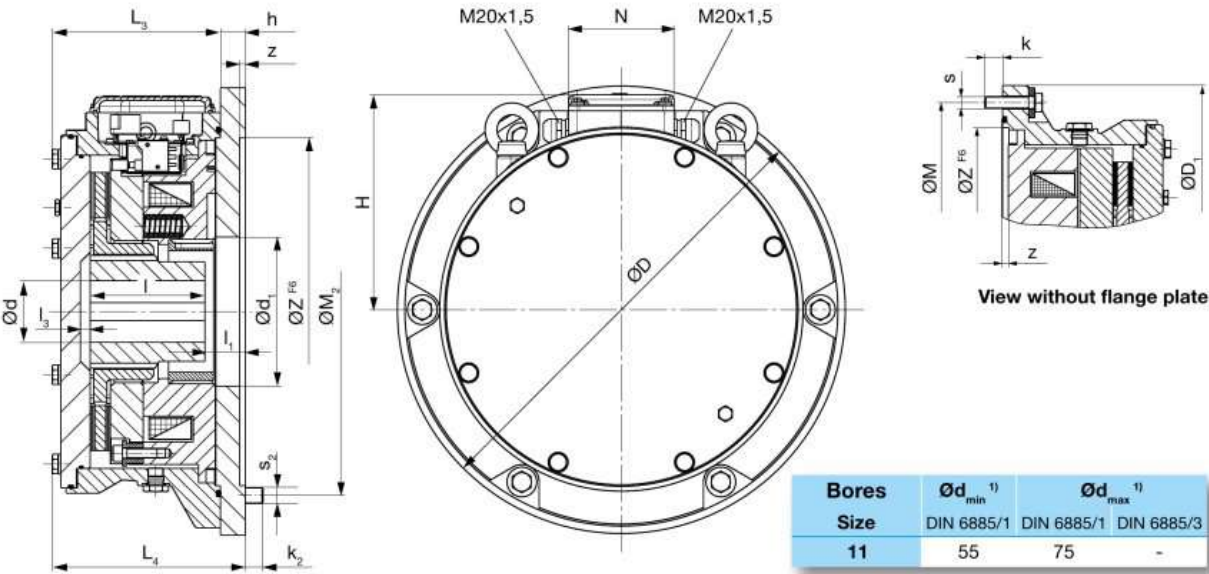
Sizes 8 – 10



Size	ØD	H	h ₁	L	L ₁	L ₂	I ¹⁾	I ₁	I 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

Bores	Ød _{min} ¹⁾		Ød _{max} ¹⁾	
	Size	DIN 6885/1	DIN 6885/1	DIN 6885/3
8		25	45	-
9		25	47	50
10		25	57	60

Size 11



Bores	Ød _{min} ¹⁾		Ød _{max} ¹⁾	
	Size	DIN 6885/1	DIN 6885/1	DIN 6885/3
11		55	75	-

Size	Ød ₁	ØD	ØD ₁	H	h	k	k ₂	L ₃	L ₄	I ¹⁾	I ₁	I ₂	ØM	ØM ₂	N	s	s ₂	Z	z
11	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

1) Please observe load on shaft or key!

Technical Data and Order Number

Technical Data			Size			
			8	9	10	11
Braking torque ²⁾	M ₁	[Nm]	100	200	400	800
Max. speed	n _{max}	[rpm]	3400	3000	3000	3000
Input power	P ₂₀	[W]	85	100	120	268
	ACH ³⁾	[W]	15	15	21	on request
Moment of inertia rotor and hub for d _{max}	I	[10 ⁻⁴ kgm ²]	17,9	33,7	84,8	360,6
Tightening torque fixing screws	s	[Nm]	23	23	46	61
	s ₂	[Nm]	-	-	-	122
Friction work	per 0,1 mm wear	Q _{0,1}	44 x 10 ⁶	54,5 x 10 ⁶	70 x 10 ⁶	95 x 10 ⁶
	up to re-adjustment	Q _N	132 x 10 ⁶	272 x 10 ⁶	420 x 10 ⁶	475 x 10 ⁶
	up to wear on rotor	Q _{tot.}	308 x 10 ⁶	545 x 10 ⁶	770 x 10 ⁶	1900 x 10 ⁶
Weight	with flange plate	[kg]	19	26	42	95
	without flange plate	[kg]	-	-	-	86

2) Tolerance = + 40 % / - 20 %. Other braking torques available on request.

3) ACH = Anti-condensation heating, standard voltages [VAC]: 115; 230.

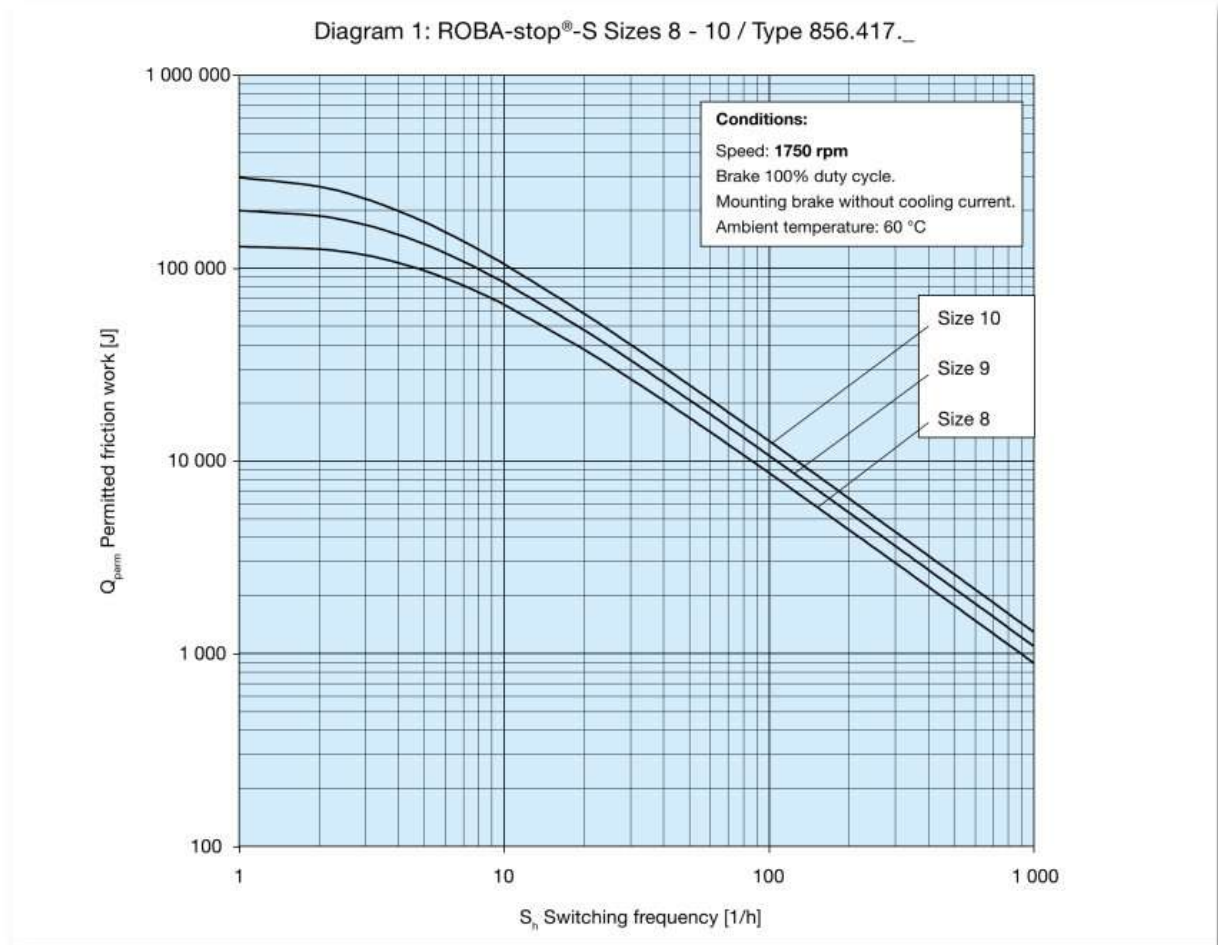
Order Number – Sizes 8 - 10

— / 8 5 6 . 4 1 7 . — / — / — / —																
△		△					△		△		△					
Size	Terminal box:					with terminal	1	Voltage * [VDC]	Bore		Keyway					
8						with half-wave rectifier	4	± 10 %	Ø d ^{H7}		acc.					
9						with bridge rectifier	5									
10																
		Options:						24	(Dimensions		DIN 6885/1					
		- Anti-condensation heating						104	page 4)		or					
		- Microswitch for wear monitoring						180			DIN 6885/3					
		- Other Types available on request						207								

Friction Power Diagrams

Permitted Brake Friction Work

The permitted friction work dependent on the switching frequency, as shown in the characteristic curves (pages 6 and 7) must not be exceeded. Diagrams 1 and 2 show the permitted friction work Q_{perm} for the various brake sizes and speeds (**1750 rpm** with brake Sizes 8 – 10 and **1000 rpm** with brake Size 11) with reference to the switching frequency on which it is based.



For higher speeds than 1750 rpm (Sizes 8 – 10): Please contact the manufacturers for information on the permitted friction work Q_{perm} !

Diagram 2: ROBA-stop®-S Size 11 / Type 856.417._

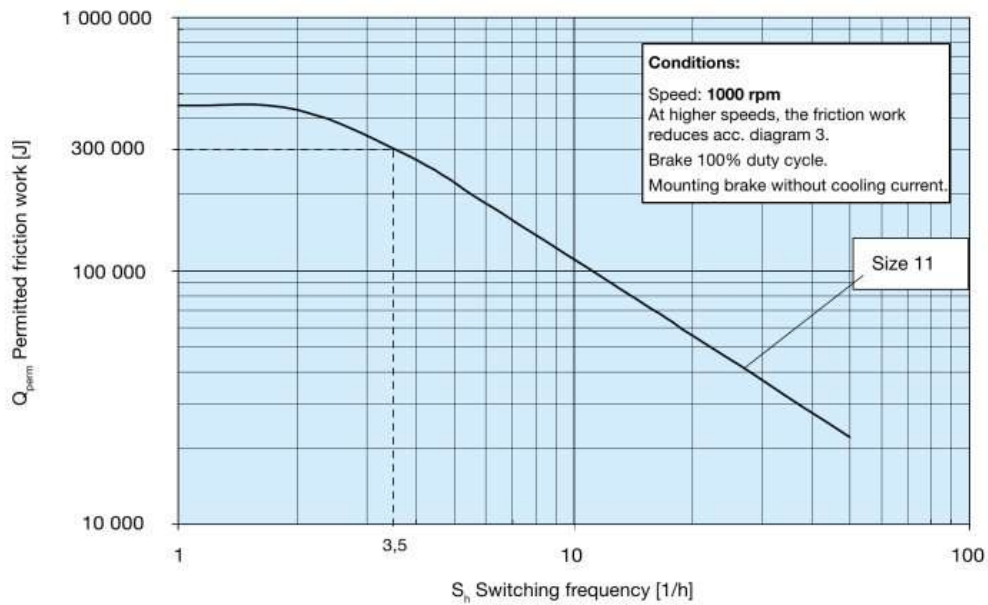
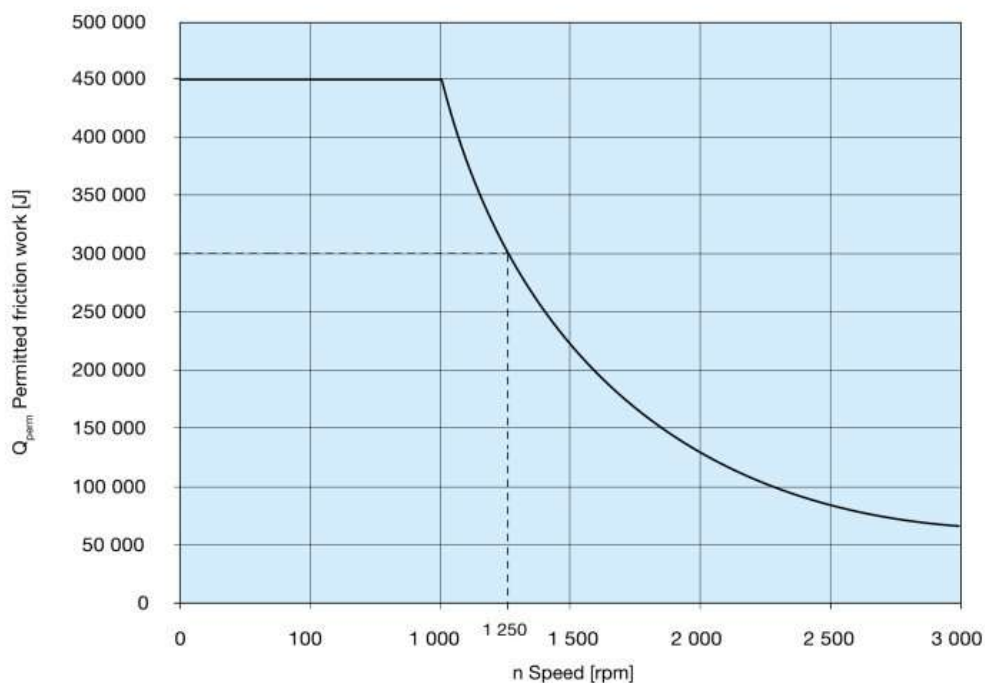


Diagram 3: ROBA-stop®-S Size 11 / Type 856.417._



For higher speeds than 1000 rpm (Size 11): Please observe diagram 3!

Design example for a speed of 1250 rpm:

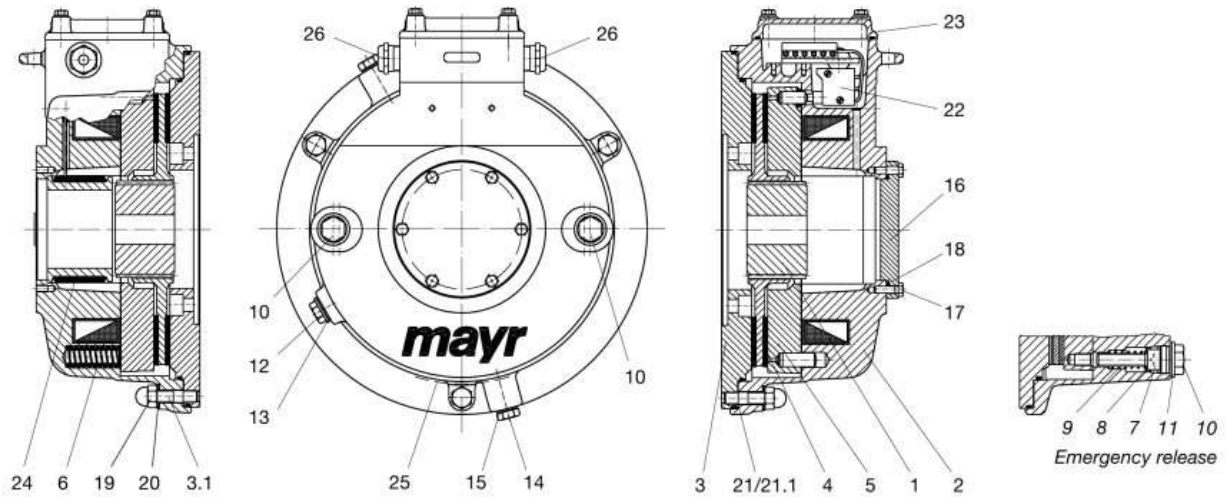
Permitted friction work Q_{perm} for 1250 rpm from diagram 3: 300 000 J.

This value limits the permitted friction work Q_{perm} acc. diagram 2 for low switching frequencies (here up to 3,5 switchings per hour).

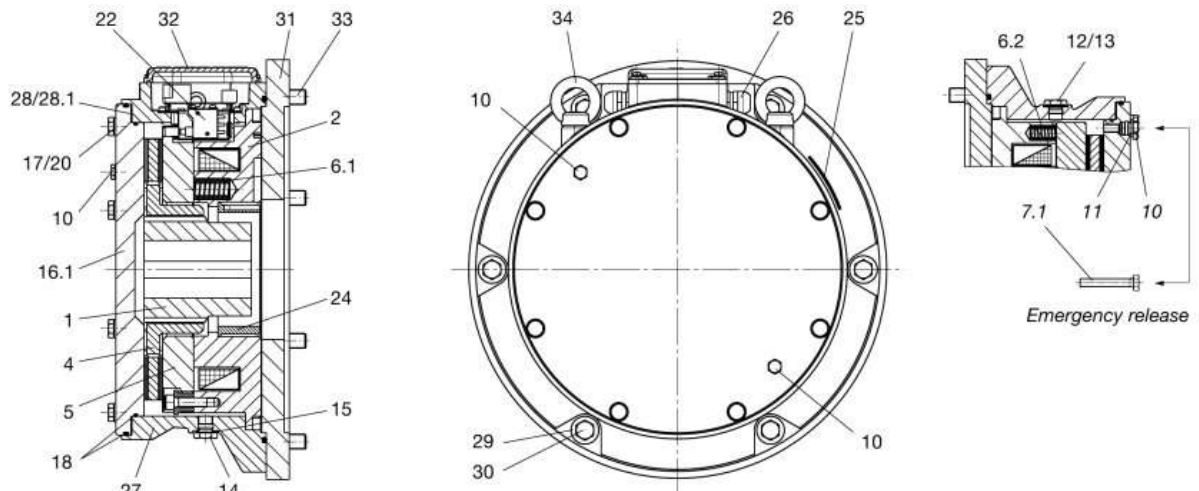
The permitted friction work Q_{perm} reduces acc. diagram 2 with higher switching frequencies.

Technical Explanations

Sizes 8 – 10



Size 11



Parts List

1	Gear hub	10	Screw plug	DIN 7604	22	Microswitch (assembly)
2	Coil carrier (assembly)	11	Copper sealing ring	DIN 7603 A	23	Terminal box (assembly)
3	Flange plate (assembly)	12	Screw plug	DIN 7604	24	Heating (assembly) (option)
3.1	Double end studs	13	Copper sealing ring	DIN 7603 A	25	Type tag
4	Rotor (assembly)	14	Screw plug	DIN 7604	26	Cable gland
5	Armature disk (assembly)	15	Copper sealing ring	DIN 7603 A	27	Housing
6	Thrust spring	16	Sealing cover		28	Adjusting plate (28.1 Cap screw)
6.1	Thrust spring internal pole	16.1	Brake plate		29	Washer
6.2	Thrust spring external pole	17	Hexagon head screw	DIN EN ISO 4017	30	Hexagon head screw
7	Cap screw	18	O-ring	DIN 3771	31	Flange plate (option)
7.1	Emergency release screw (loose in delivery)	19	Cap nut	DIN 1587	32	Cover (assembly)
8	Washer	20	Washer	DIN EN ISO 7089	33	Cap screw
9	Thrust spring	21	Distance washer (21.1 Cap screw)		34	Eyebolt

Design

Standard

- Release monitoring
- Emergency hand release
- Terminal block
- Condensation drain screw
- Air gap inspection hole
- Protection IP 67
- Corrosion protection

Options

- Wear monitoring
- Bracket hand release
- Built-in rectifier
- Anti-condensation heating
- Tacho attachment possibility (standard on Sizes 8 – 10)
- Available without flange plate (only on Size 11)

Installation Conditions

The following points must be observed before installing the ROBA-stop®-S:

- The eccentricity of the shaft end in relation to the mounting pitch circle must not exceed 0,4 mm.
- The run-out deviation of the screw-on surface to the shaft must not exceed the permitted run-out tolerance according to DIN 42955. Larger deviations can lead to a drop in torque, to continuous slipping on the rotor and to overheating.
- The rotor and brake surfaces must be oil and grease-free.

Brake Installation

Please find a detailed installation description in the Installation and Operational Instructions for each product.

Sizes 8 – 10:

- 1) Loosen the cap nuts (19) and remove the washers (20).
- 2) Remove the flange plate (3) from the brake by lightly beating on the double end studs (3.1) with a plastic hammer.
- 3) Screw the flange plate (3) onto the machine wall (must be sealed customer-side; if you have any questions concerning the sealing, please contact the manufacturer).
- 4) Mount the gear hub (1) onto the shaft and secure it axially.
- 5) Push the rotor (4) onto the gear hub (1) by hand.
- 6) Push the brake over the double end studs (3.1) and arrange it on the flange plate (3).
- 7) Screw on the brake with the cap nuts (19) and the washers (20) placed under them.
- 8) Screw out the screw plugs (10) incl. copper sealing rings (11).
- 9) Screw out both emergency release screws (7) from the armature disk (5).
- 10) Screw in the screw plugs (10) with the copper sealing rings (11) again, whereby the emergency release screws (7) are to be spring-contacted.
- 11) Check the air gap: 0,2 on Size 8; 0,25 on Sizes 9 – 10.

Size 11:

- 1) Only for designs with flange plate (Item 31/option): Loosen the hexagon head screws (30) and remove the flange plate from the brake. Screw the flange plate to the machine wall using the cap screws (33) (must be sealed customer-side).
- 2) Remove the brake plate (16.1) by loosening the hexagon head screws (17).
- 3) Remove the rotor (4) from the brake.
- 4) Mount the gear hub (1) onto the shaft and secure it axially.
- 5) Screw the brake onto the flange plate (31) or a customer-side brake surface.
- 6) Push the rotor (4) onto the gear hub (1) by hand.
- 7) Mount the brake plate (16.1), observe the correct angular position of the emergency release.
- 8) Check the air gap: 0,45 on Size 11.

Braking Torque Adjustment

The ROBA-stop®-S are set manufacturer-side to the nominal torque or the braking torque requested on order. In order to reduce the braking torque, the brake must be dismantled and the thrust springs must be removed. This prevents unintended or unpermitted external torque adjustment.

Braking torque adjustment takes place via different configuration variants of the thrust springs in the coil carrier.

Sizes 8 – 10:

Two springs (6) lying opposite each other must always be removed or inserted to make sure that the armature disk (5) is evenly loaded.

Size 11:

Braking torque adjustment takes place by evenly removing or inserting thrust springs (6.1 and 6.2) on the internal and external pole of the coil carrier (2).

Air Gap Inspection

The nominal air gap between the armature disk (5) and the coil carrier (2) is set manufacturer-side to 0,2 on Size 8, to 0,25 on Sizes 9 – 10 and to 0,45 on Size 11.

However, the air gap between the armature disk (5) and the coil carrier (2) is increased due to wear on the friction linings. The wear condition of the rotor (4) must be monitored by regular air gap inspections. Only carry out air gap inspections on a de-energised brake!

- 1) Unscrew the screw plug (12) incl. copper sealing ring (13).
- 2) Check the air gap by means of a feeler gauge. The air gap must lie between the nominal air gap and the max. air gap. (Max. air gap: Size 8 = 0,75; Size 9 = 1,0; Size 10 = 1,1; Size 11 = 1,65 – values refer to the nominal braking torque). If the max. air gap is reached, re-adjust the air gap.

Air Gap Re-adjustment

Sizes 8 – 10:

The air gap can be re-adjusted once by removing the distance rings (21) between the flange plate (3) and the coil carrier (2).

- 1) Unscrew the screw plugs (10) incl. copper sealing rings (11).
- 2) Screw in both emergency release screws (7) evenly until they contact the coil carrier (2).
- 3) Loosen the cap nuts (19) with washers (20).
- 4) Remove the brake from the flange plate (3).
- 5) Unscrew the distance washers (21) from the flange plate (3).
- 6) Push the brake over the double end studs (3.1) and set it on the flange plate (3).
- 7) Screw on the brake using the cap nuts (19) or the washers (20).
- 8) Procedure as described in "Brake Installation, Sizes 8 – 10", according to points 9) – 11).

If the air gap exceeds the max. values again and the distance washers (21) have already been removed, the rotor (4) must be replaced.

Size 11:

The air gap can be re-adjusted twice. This is carried out by removing one layer of the adjusting plate (28) on the housing (27).

- 1) Remove the brake plate (16.1) by loosening the hexagon head screws (17).
- 2) Loosen the cap screws (28.1), remove one layer of the adjusting plate (28). Tighten the cap screws (28.1).
- 3) Procedure as described in "Brake Installation, Size 11", according to points 7) – 8).

If the max. air gap is reached again, the rotor (4) must be replaced. Please keep a replacement rotor in stock in order to avoid system downtimes.

Replacing Worn Parts

The rotor (4), the armature disk (5) and the gear hub (1) are parts which are subject to wear.

- 1) At first, please follow the same procedure as in "Air Gap Re-Adjustment":
 - Sizes 8 – 10 according to points 1 – 4
 - Size 11 according to point 1
- 2) Check the parts subject to wear and replace them if necessary.
 - Replacing the rotor:
 - Size 11: Attach the adjusting plate (28) to the housing (27) using the cap screws (28.1). (Adjusting plate and cap screws are part of the replacement rotor delivery).
 - Sizes 8 – 11: Replace the rotor (4).
 - Sizes 8 – 10: Screw the distance rings (21) onto the flange plate (3) using the cap screws (21.1). (Distance washers and cap screws are part of the replacement rotor delivery).
- 3) Mount the brake according to "Brake Installation":
 - Sizes 8 – 10 according to points 6 – 7 and points 9 – 10
 - Size 11 according to point 7
- 4) Check the air gap.

Release Monitoring

The ROBA-stop®-S is equipped with a microswitch for release monitoring as part of the standard delivery. It emits a signal when the brake is opened. The microswitch is completely enclosed inside the terminal box. It can easily be replaced, re-adjusted and tested by removing the terminal box cover and the terminal block/rectifier.

Wear Monitoring (Option)

An additional microswitch for wear monitoring can be integrated into the ROBA-stop®-S. It emits a signal before the max. permitted wear is exceeded.

Anti-Condensation Heating (Option)

The ROBA-stop®-S can be equipped with an anti-condensation heating. An AC coil installed inside the brake prevents condensation and its consequences.

Please Observe!

The projecting key must not collide with the heating.

Condensation Drain Screw

Condensation water draining can be carried out via the drain screw (14) at the bottom of the brake. The hole is normally closed.

Emergency Release

In case of a malfunction or power failure, the brake remains closed and cannot be released electrically. In this case, a manual emergency release can be carried out.

- Unscrew the screw plugs (10) with the copper sealing rings (11).
- - Sizes 8 – 10: Screw both emergency release screws (7) evenly into the armature disk (5).
 - Size 11: Screw in both emergency release screws (7.1) evenly.
- The brake is released and the rotor is free.

Electrical Connection

The ROBA-stop®-S is equipped with a DC coil. Inside the terminal box, a terminal block or rectifier is installed.


Guidelines on the Declaration of Conformity:

A conformity evaluation has been carried out for the product (electromagnetic safety brake) according to the EC Low Voltage Directive 2006/95/EC. The conformity evaluation is set out in writing in a separate document and can be requested if required.

Guidelines on the EMC Directive (2004/108/EC):

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

Guidelines on the Machinery Directive (2006/42/EC):

The product is a component for installation into machines according to the Machinery Directive 2006/42/EC. The brakes can fulfil the specifications for safety-related applications in coordination with other elements. The type and scope of the required measures result from the machine risk analysis. The brake then becomes a machine component and the machine manufacturer assesses the conformity of the safety unit to the directive. It is forbidden to put the product into initial operation until it has been ensured that the machine accords with the stipulations in the directive.

Guidelines on the ATEX Directive:

Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion. In order to use this product in areas where there is a danger of explosion, classification and marking according to the directive 94/9/EC must be carried out.

Safety Guidelines

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



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

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

Application Conditions


The catalogue values are guideline values which have been determined in test facilities. It may be necessary to carry out your own tests for the intended application.

When dimensioning the brakes, please remember that installation situations, braking torque fluctuations, permitted friction work, run-in behaviour and wear as well as general ambient conditions can all affect the given values. These factors should therefore be carefully assessed, and alignments made accordingly.

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

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

Earthing Connection

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

Protection

IP67: Dust-proof and protected against contact as well as against temporary immersion in water.

Intended Use

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

Guidelines for Electromagnetic Compatibility (EMC)

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

Regulations, Standards and Directives Used

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

Liability

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

Guarantee

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



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