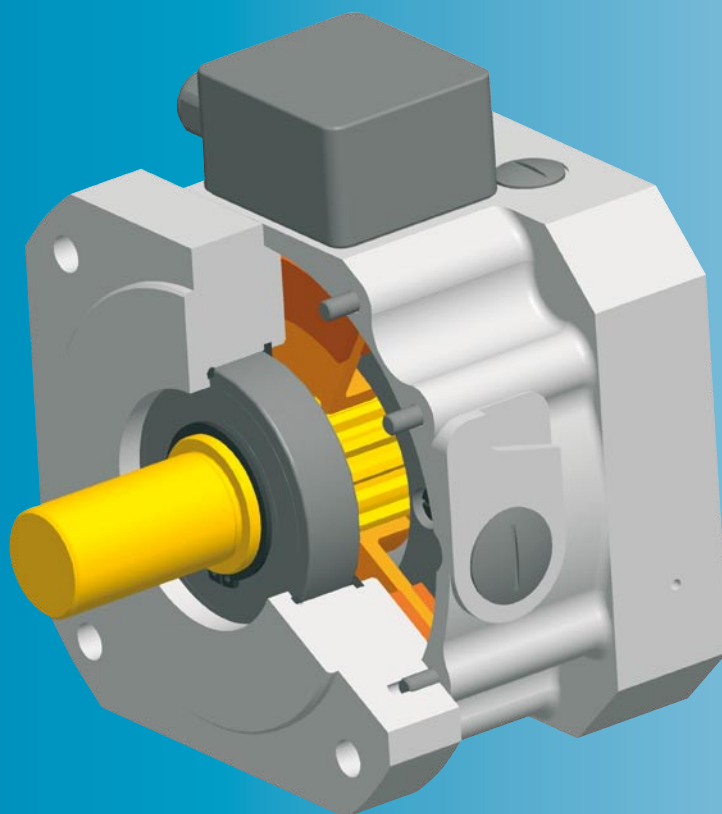


ROBA[®]-topstop[®]

Brake systems for
gravity loaded axes



ROBA-stop[®]
The best
choice for
safe brakes



- *Reliable protection in all operating modes*
- *Maximum safety due to redundant systems and integrated function monitoring*
- *Easy way to retrofit existing axes*
- *Patent pending*

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mayr[®]
your reliable partner

Safe brake systems for gravity loaded axes

mayr® ROBA-stop® brakes prevent unintentional vertical axes drops or crashes!

- ❑ **Reliable safety protecting people in all operating modes**
- ❑ **Maximum safety due to redundant brake concept**
- ❑ **Controlled operational safety due to an integrated brake function monitoring system**
- ❑ **Minimal braking distances due to short reaction times and high brake performance density**
- ❑ **Optimum adaptation for individual axes construction due to different brake concepts**
- ❑ **Economic and problem-free to retrofit pre-existing axes**



Additional measures are required to minimise the potential risk of a falling load on vertical axes in areas where personnel might be endangered. These measures have been demanded by the Technical Committee for Mechanical Engineering, Production Systems and Steel Construction in their Information sheet “gravity loaded axes”. mayr® power transmission has developed various new brake systems which guard against all critical danger situations which can occur during operation of vertical axes.

The operation of vertical axes represents a particular problem. Switching off the drive energy due to an error in the machine control or a power failure can lead to an axis crash. Unpredictable mechanical wear as a result of the design, due for example to emergency OFF brakings or to contamination of the friction linings caused by oil, drastically reduce the braking torque. Often, motor-integrated brakes are equipped with insufficient braking torque reserves, and the possibility of brake failure can therefore not be excluded. On linear motors, braking in emergency OFF situations or in the event of power failure via a brake integrated into the motor is not possible. In order to avoid critical situations, further measures must be taken to minimise any risks.

Safety systems working redundantly are to be provided according to DIN EN 954-1 (Category 3) for workplaces where people work frequently or for longer time periods in a vertical axis danger area.

The safety brake product range:
ROBA®-topstop®,
ROBA®-alphastop®,
ROBA®-pinionstop®,
ROBA®-linearstop® and
ROBA-stop®-M

fulfils the requirements for a safe holding and braking system and minimises the endangerment of people and machines. These brakes are used as safe single brakes for protection according to the Danger Category 2 or as a component of a redundant safety system (Category 3), as well as for independent, redundant dual circuit brake systems.

Please Observe:

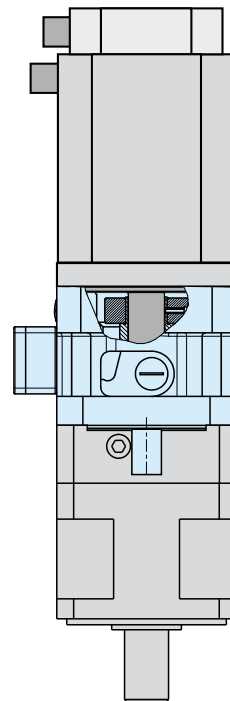
According to German notation, decimal points in this catalogue are represented with a comma (e.g. 0,5 instead of 0.5).

We reserve the right to make dimensional and constructional alterations.

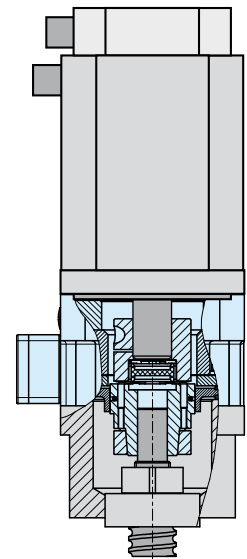
**ROBA®-topstop®
Modular safety brake system for a mounted servo motor
on the A-bearing side**

Characteristics and advantages

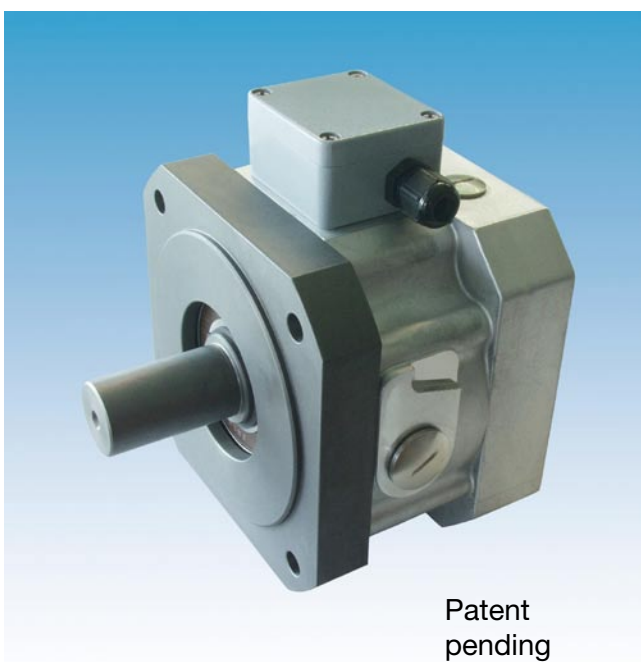
- The axis is held safely in any position, even with a dismantled servomotor, e.g. during machine maintenance
- Safe braking on emergency OFF and power failure
- Long lifetime even after frequent emergency OFF brakings
- Sealed brake housing prevents penetration of coolants and lubrication
- Indication of the operating condition (released/braked) via an integrated switch
- Integrated wear monitor option available
- Short, compact design
- Low weight
- Low self-induced heat production even at 100 % duty cycle



ROBA®-topstop® with output shaft for direct mounting onto a gearbox with a hollow shaft.



Brake system with integrated, plug-in shaft coupling. Separate coupling and coupling housing are no longer necessary. Very short design.



Patent pending

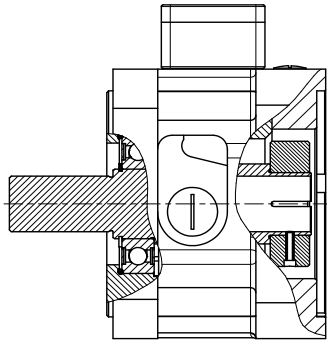
Brake designs:

- Single circuit brake with a bearing-supported output shaft: i.e. suitable for toothed belt drives
- Single circuit brake with an integrated plug-in shaft coupling
- Single circuit brake with a shaft coupling and an installed EAS®-smartic® safety clutch
- Redundant dual circuit brake system with a bearing-supported output shaft
- Basic brake module for special brake configurations

Due to their adaptable flange dimensions, ROBA®-topstop® safety brakes can easily be integrated into pre-existing constructions between the servomotor and the counterflange. If necessary, the design can be easily adapted to any installation situation by changing the standard flange. Three standard sizes for braking torques of 12 to 170 Nm are available for delivery at short notice.

Structural Shapes

ROBA®-topstop® with shaft design

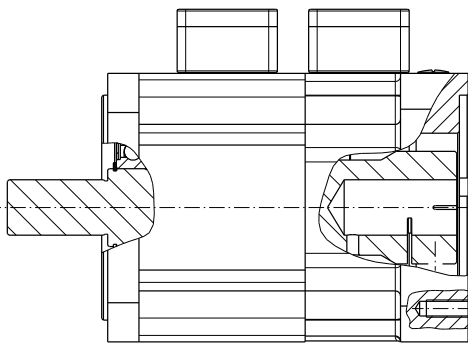


Type 899.000.0_
Single circuit brake with bearing-supported clamping hub shaft

Type 899.000.0_

This brake type can be integrated into existing drives without any additional constructive work, or can be retrofitted. The output-side brake flange connection dimensions and the shaft dimensions equal the servo-motor connection dimensions.

A bore positioned above the terminal box allows access to the clamping screw on the motor-side clamping hub construction. Radial forces can be absorbed by the ball bearing brake shaft, so that mounting belt pulleys and therefore operation in belt pulley drive systems is easily possible.



Type 899.200.01
Dual circuit brake with bearing-supported clamping hub shaft

Type 899.200.01

This dual circuit brake with bearing-supported clamping hub shaft is equipped with two independent brake circuits. Each braking circuit is individually electrically controllable. In accordance with the single brake circuit system, the operating condition of each brake circuit is scanned and signalled. This redundant brake system meets all demands for Danger Category 3 according to EN 954-1.



Application Example

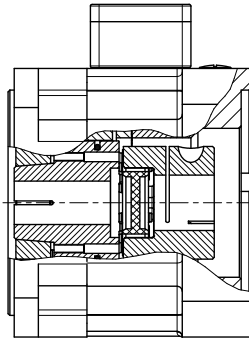
Due to its adapted flange dimensions, it was possible to integrate the ROBA®-topstop® with a minimum of effort into the pre-existing Z-axis of a handling system (see photo) between the servomotor and gearbox, thereby ensuring increased safety.

Often, the integrated permanent magnet brakes integrated into servomotors are unable to provide sufficient safety. Wear or lubrication can mean that the nominal holding torque on the brakes falls below the permitted level. In emergency OFF situations, the brakes must take on very high friction work. High operating temperatures – not unusual in servomotors – can also lead to brake malfunctions or can reduce the braking torque.

ROBA®-topstop® safety brakes protect against all critical danger situations which can occur during operation of vertical axes. They guarantee full security, even when the servomotor is dismantled e.g. during maintenance work.

Structural Shapes

ROBA®-topstop® with plug-in coupling for mounting directly onto ball screw spindles



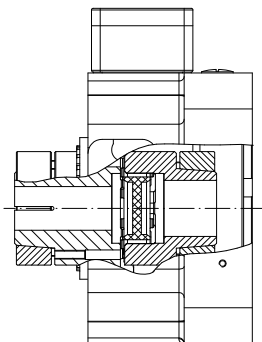
Type 899.01 _ _ _
Single circuit brake (with standard output flange)

Types 899.011 _ _ _ and 899.012 _ _ _

The brake Types 899.01 _ _ _ are specially conceived for direct mounting onto ball screw spindles. A backlash-free, plug-in ROBA®-ES Type series shaft coupling is integrated into the brake housing to compensate for axial, radial and angular shaft misalignment. This makes separate coupling housing and shaft couplings unnecessary.

The coupling hub to be mounted motor-side is offered in standard design as a ROBA®-ES clamping hub and as a ROBA®-ES shrink disk hub. The output-side coupling hub is connected securely to the spindle shaft via a shrink disk-clamping connection.

The short brake construction length requires very little more space than the usual clutch housing designs (see Fig. below). For safety reasons, the braking torque is transferred directly via the shrink disk-clamping connection onto the spindle instead of via the coupling.



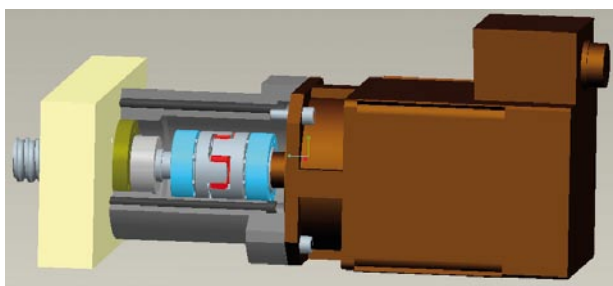
Type 899.1 _ _ _ _
Single circuit brake module (without output flange)
Type 899.3 _ _ _ _
Single circuit module (with special output flange)
Example on page 11

Types 899.11 _ _ _ and 899.31 _ _ _

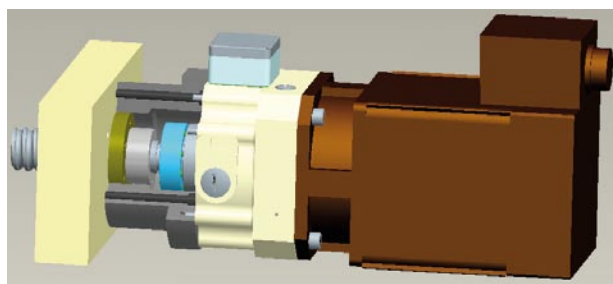
The brake module Type series 899.1 _ _ _ _ and the brake Type 899.3 _ _ _ _ were conceived for specific customer-tailored mounting situations.

Depending on the individual mounting conditions, these brakes can be mounted directly onto a pre-existing friction flange (Type 899.11 _ _ _) or can be delivered with a mounting flange specially adapted for the application (Type 899.31 _ _ _). On Type 899.11 _ _ _, the friction flange is not included in standard delivery.

On Type 899.31 _ _ _, the mounting flange is included in delivery. The brake module can be equipped with the standard clamping hub shaft and ROBA®-ES shaft couplings or with special coupling constructions which can be optimally adapted for individual mounting conditions.



Upper Illustration: a typical servomotor attachment with a shaft coupling on an axis with a ball screw drive. The coupling housing ensures the necessary distance between machine and servomotor.



Lower Illustration: the same design; but this time with an additional brake. The ROBA®-topstop® single circuit brake with integrated ROBA®-ES shaft coupling is especially conceived for mounting on a ball screw spindle. The coupling housing is much shorter, meaning that the total construction increases only minimally in length. The shaft coupling becomes a brake component.

The brake function also maintains its effect if the servomotor is dismantled. The axis dynamic remains, because the total mass moments of inertia increase minimally on this integrated construction. The coupling housing can be ordered as part of the delivery Type 899.31 _ _ _ and produced according to the customer's request, or just the brake module can be delivered Type 899.11 _ _ _.

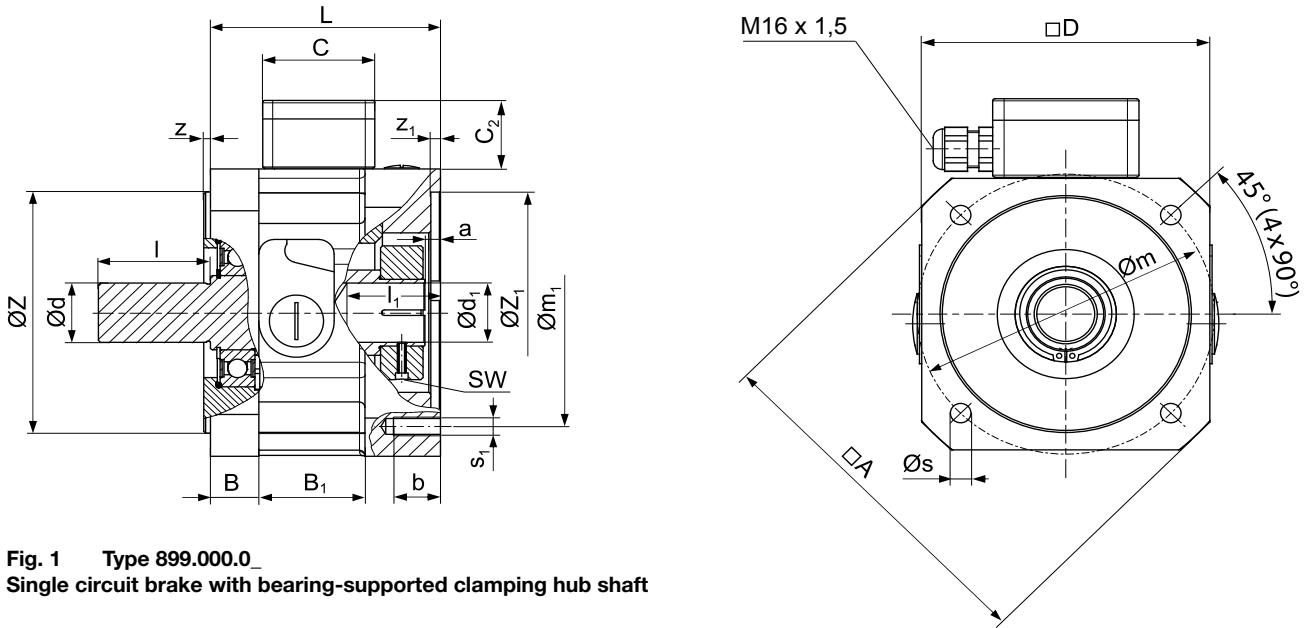


Fig. 1 Type 899.000.0_ Single circuit brake with bearing-supported clamping hub shaft

Technical Data and Dimensions

Size	Braking torque ¹⁾		Input power			Max. speed n Type 899.000.0_ [rpm]	Mass moment of inertia J Type 899.000.0_ [kgm ²]	Mass m Type 899.000.0_ [kg]
	Type 899.000.01 [Nm]	Type 899.000.02 [Nm]	Type 899.000.01 [W]	Type 899.000.02 A ²⁾ [W]	Type 899.000.02 B ³⁾ [W]			
120	12	30	31,5	102	26	4000	0,00055	7,5
150	45	90	44	125	32	4000	0,0013	13
200	100	170	60	148	38	3000	0,0043	24

1) Braking torque tolerance +40 % / -20 % 2) Coil capacity on overexcitation 3) Coil capacity for holding voltage

Correlation of bore diameter d₁, dependent on respective transmittable torques (without key)

Size	Preferred bores d ₁ and associated frictional locking transmittable torques [Nm]			
	Ø 19	Ø 24	Ø 32	Ø 38
120	64	81	-	-
150	-	150	199	-
200	-	-	199	237

The transmittable torques for the clamping connection allow for the max. tolerance backlash on a solid shaft: tolerance k6/bore (d₁): tolerance F7. If the tolerance backlash is larger, the torque decreases.

Size	A	a	B	B ₁	b	C	C ₂	D	L	Shaft Ø d _{k6} x l		(Shaft) bore ⁴⁾ Ø d _{1 F7} x l ₁	
120	160	5	20	52	20	58	37	126	104	19 x 40	24 x 50	19 x 55	24 x 55
150	190	6,5	25	55	24	58	37	155	119	24 x 50	32 x 58	24 x 68	32 x 68
200	246	10	20	71	28	58	37	194	138.5	32 x 58	38 x 80	32 x 90	38 x 90

4) The transmittable torques in bore d₁ are dependent on the diameter, see Table above.

Size	m	m ₁	s	s ₁	SW	Z ₁₆	Z _{1 F8}	z	z ₁		
120	130	130 (115*)	9	4 x M8	5	110	95	110	95	3	5
150	165	165	11	4 x M10	6	130	110	130	110	3,5	5
200	215	215	13,5	4 x M12	6	180	130	180	130	4	6

*) Optionally available with pitch circle m₁ = 115

We reserve the right to make dimensional and constructional alterations

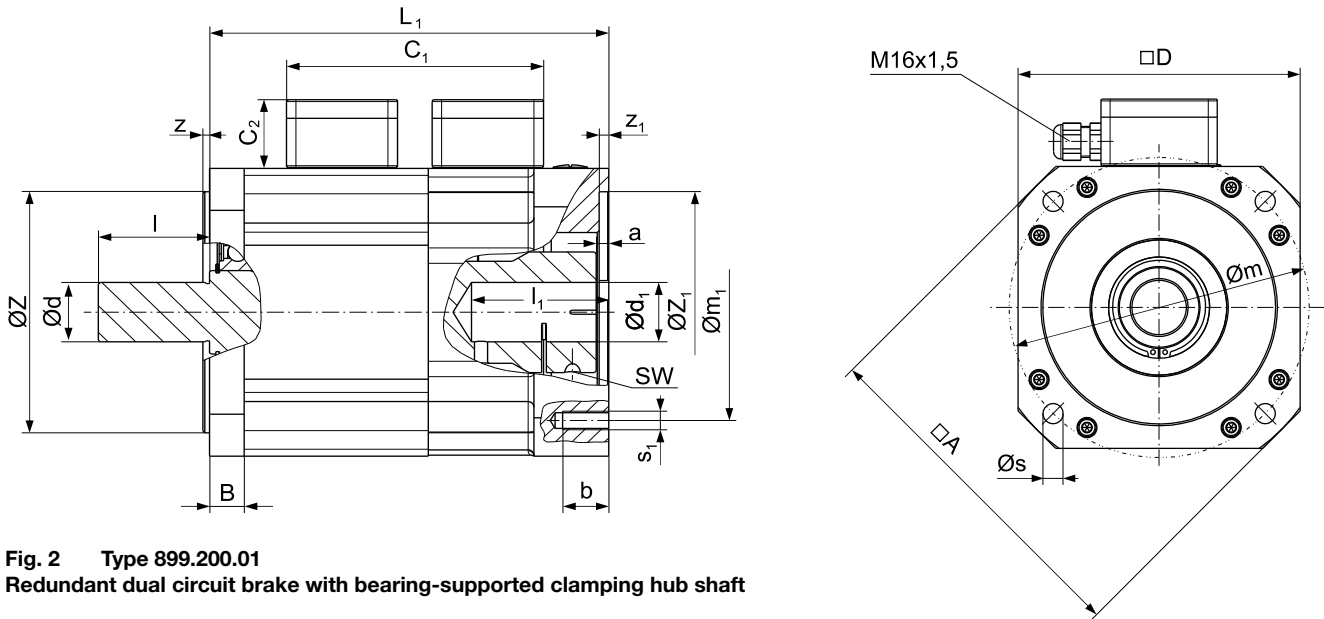


Fig. 2 Type 899.200.01
Redundant dual circuit brake with bearing-supported clamping hub shaft

Technical Data and Dimensions

Size	Braking torque ¹⁾ Type 899.200.01 [Nm]	Input power Type 899.200.01 [W]	Max. speed n_{max} Type 899.200.01 [rpm]	Mass moment of inertia J Type 899.200.01 [kgm ²]	Mass m Type 899.200.01 [kg]
120	2 x 12	2 x 31,5	4000	0,0009	12
150	2 x 45	2 x 44	4000	0,0022	24
200	2 x 100	2 x 60	3000	0,0085	39

1) Braking torque tolerance +40 % / -20 %

Correlation of bore diameter d_1 dependent on respective transmittable torques (without key)

Size	Preferred bores d_1 and associated frictional locking transmittable torques [Nm]			
	Ø 19	Ø 24	Ø 32	Ø 38
120	64	81	-	-
150	-	150	199	-
200	-	-	199	237

The transmittable torques for the clamping connection allow for the max. tolerance backlash on a solid shaft: tolerance k_6 /bore (d_1): tolerance F7. If the tolerance backlash is larger, the torque decreases.

Size	A	a	B	b	C ₁	C ₂	D	L ₁	Shaft Ø d_{k6} x l	(Shaft) bore ²⁾ Ø d_1^{F7} x l ₁
120	160	5	20	20	118	37	126	164	19 x 40 24 x 50	19 x 55 24 x 55
150	190	6,5	25	24	134	37	155	195	24 x 50 32 x 58	24 x 68 32 x 68
200	246	10	20	28	144	37	194	225	32 x 58 38 x 80	32 x 90 38 x 90

2) The transmittable torques in bore d_1 are dependent on the diameter, see Table above.

Size	m	m ₁	s	s ₁	SW	Z _{j6}	Z ₁ ^{F8}	z	z ₁		
120	130	130 (115*)	9	4 x M8	5	110	95	110	95	3	5
150	165	165	11	4 x M10	6	130	110	130	110	3.5	5
200	215	215	13,5	4 x M12	6	180	130	180	130	4	6

*) Optionally available with pitch circle $m_1 = 115$

We reserve the right to make dimensional and constructional alterations

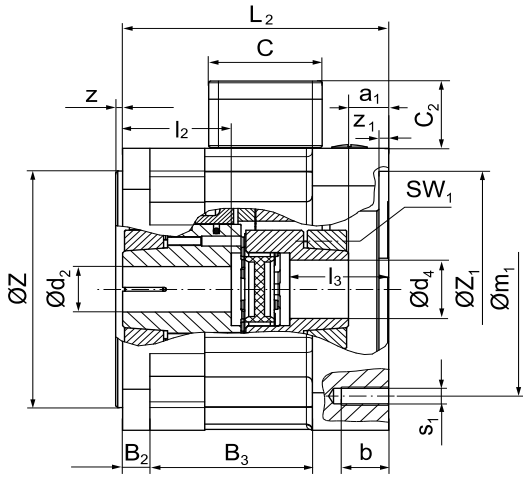


Fig. 3
Type 899.012. __ Single circuit brake with plug-in shaft coupling
(Shrink disk hub motor-side)

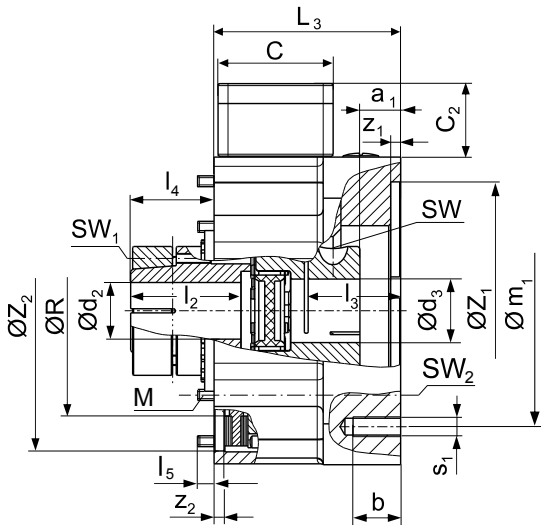
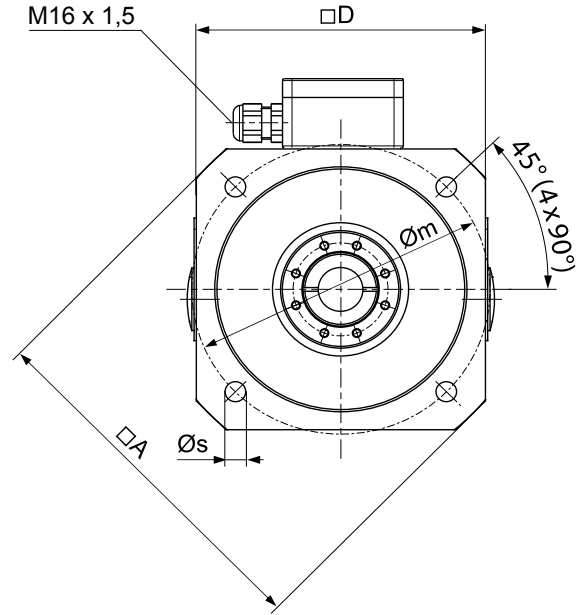


Fig. 4
Type 899.111. __ Brake module without output flange with plug-in shaft coupling
(clamping hub motor-side)

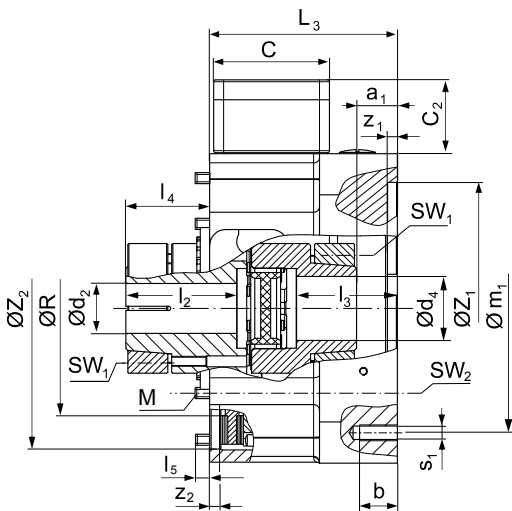
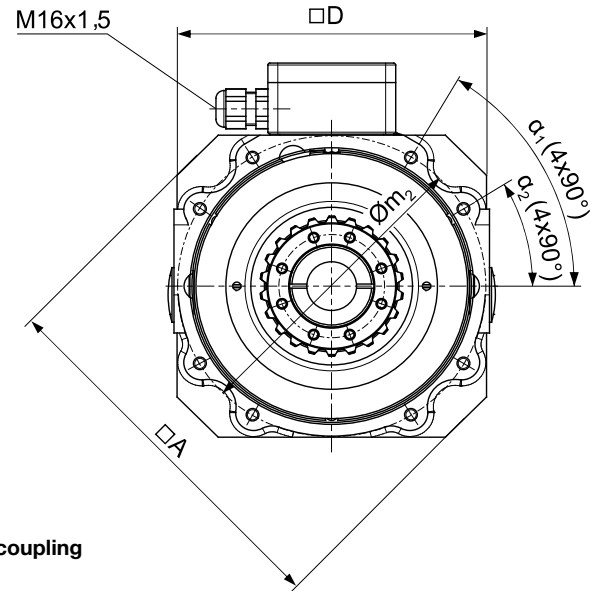
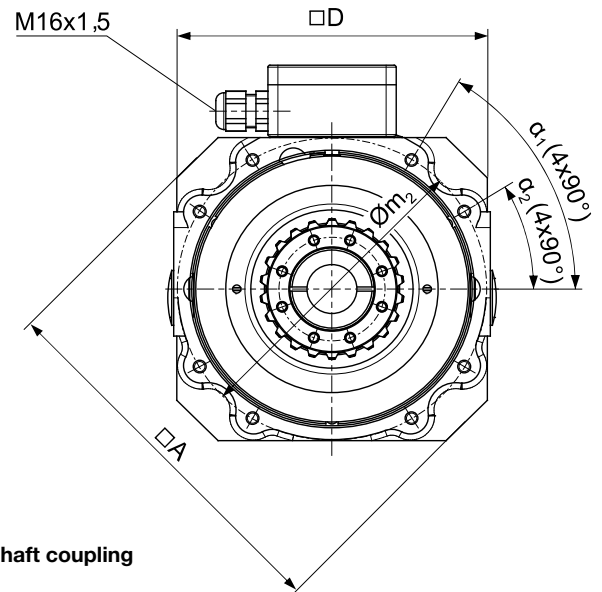


Fig. 5
Type 899.112. __ Brake module without output-side flange with plug-in shaft coupling
(shrink disk hub motor-side)



Technical Data and Dimensions

Size	Braking torque ¹⁾		Input power			Max. speed n Type 899.01_... 899.11_... [rpm]
	Type 899.01_..._1 899.11_..._1 [Nm]	Type 899.01_..._2 899.11_..._2 [Nm]	Type 899.01_..._1 899.11_..._1 [W]	Type 899.01_..._2 899.11_..._2 A ²⁾ [W] B ³⁾ [W]		
	120	12	30	31,5	102	
150	45	90	44	125	32	4000
200	100	170	60	148	38	3000

1) Braking torque tolerance +40 % / -20 %

2) Coil capacity on overexcitation

3) Coil capacity for holding voltage

Size	Mass moment of inertia J [kgm ²]		Mass m [kg]			
	Type 899.011_... and 899.111_... [Nm]	Type 899.012_... and 899.112_... [Nm]	Type 899.011_... [W]	Type 899.012_... [W]	Type 899.111_... [W]	Type 899.112_... [W]
120	0,00075	0,00085	7,2	7,5	4,2	4,5
150	0,00189	0,00213	13,5	14	8	8,5
200	0,00676	0,00768	24,5	25,5	13,5	14,5

Size	Flexible coupling torque (ROBA®-ES ⁴⁾) [Nm]						Size of flexible coupling (ROBA®-ES ⁴⁾)
	Type 899_1_3_92 Sh A		Type 899_1_2_98 Sh A		Type 899_1_1_64 Sh D		
	M _{nom}	M _{max}	M _{nom}	M _{max}	M _{nom}	M _{max}	
120	35	70	60	120	75	150	24
150	95	190	160	320	200	400	28
200	190	380	325	650	405	810	38

4) For further information on flexible coupling e.g. angle misalignments, spring stiffness or temperature resistance please see ROBA®-ES Catalogue K.940.V_...

Correlation of bore diameters d₂, d₃, d₄ dependent on respective transmittable torques (without key)

Size	Preferred bores Ø d ₂ / Ø d ₄ (shrink disk hub) and associated frictional locking transmittable torques [Nm]														
	Ø 15	Ø 16	Ø 19	Ø 20	Ø 22	Ø 24	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	Ø 42	Ø 45
120	56	62	81	87	100	112	118	135	-	-	-	-	-	-	-
150	-	-	141	153	177	203	216	256	282	308	343	373	-	-	-
200	-	-	-	197	228	261	279	332	368	405	460	513	547	577	617

The transmittable torques for the clamping connection allow for the max. tolerance backlash on a solid shaft: tolerance k6/bore (d₂/d₄): tolerance H6 (d₂/d₄). If the tolerance backlash is larger, the torque decreases.

Size	Preferred bores Ø d ₃ (clamping hub) and associated frictional locking transmittable torques [Nm]														
	Ø 15	Ø 16	Ø 19	Ø 20	Ø 22	Ø 24	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	Ø 42	Ø 45
120	34	36	43	45	50	54	57	63	-	-	-	-	-	-	-
150	-	-	79	83	91	100	104	116	124	133	145	-	-	-	-
200	-	-	-	83	91	100	104	116	124	133	145	158	166	174	187

The transmittable torques for the clamping connection allow for the max. tolerance backlash on a solid shaft: tolerance k6/bore (d₃): tolerance F7. If the tolerance backlash is larger, the torque decreases.

Size	A	a ₁	B ₂	B ₃	b	C	C ₂	D	L ₂	L ₃	Ø Bores ⁵⁾		I ₂	I ₃	I ₄	I ₅	M	
												d ₂ H6/d ₄ H7	d ₃ F7					
												from - to	from - to					
120	160	20	12	76	20	58	37	126	120	84	15-28	15-28	47	45	36	7	8 x M5	
150	190	20,5	14	83	24	58	37	155	136	94	19-38	19-35	55,5	50,5	42	10	8 x M6	
200	246	16	20	92,5	28	58	37	194	160	107,5	20-45	20-45 *	70	56	52,5	12	8 x M8	

Size	m	m ₁	m ₂	R	s	s ₁	SW	SW ₁	SW ₂	Z ₆	Z ₁ F8	Z ₂ H7	z	z ₁	z _{2-0.03}	α ₁	α ₂		
120	130	130 (115**)	122	75	9	4 x M8	5	4	4	110	95	110	95	111	3	5	5,5	30°	60°
150	165	165	154	95	11	4 x M10	6	4	5	130	110	130	110	141	3,5	5	5,5	31°	59°
200	215	215	200	130	13,5	4 x M12	6	5	6	180	130	180	130	186	4	6	6	30°	60°

5) The transmittable torques in bores d₁, d₂, d₃ and d₄ are dependent on the diameter, see Table above.

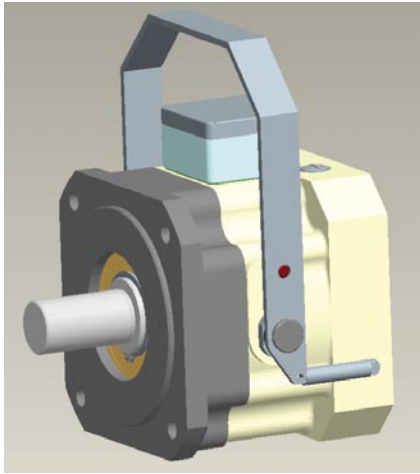
*) On shaft lengths of over 60 mm; max. bore 38 mm/up to shaft length 60 mm; max. permitted bore 45 mm!

***) Optionally available with pitch circle m₁ = 115

We reserve the right to make dimensional and constructional alterations

Examples: Customer-tailored Special Designs

ROBA®-topstop® single circuit brake with hand release lever as special accessory



A hand release lever is available for the ROBA®-topstop® single circuit brake standard design as a special accessory. Please note that the hand release prevents the safety brake from functioning during operation.

Voltage: 104 V

Output-side: $\varnothing d = 24 / \varnothing Z = 130$

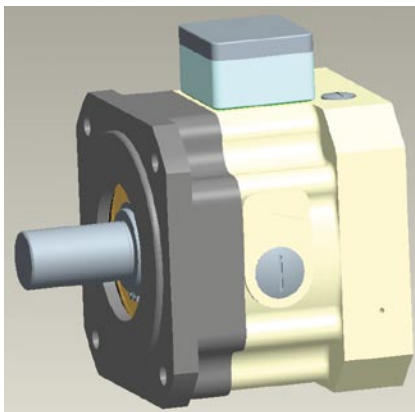
Motor-side: $\varnothing d_1 = 24 / \varnothing Z_1 = 130$

Electrical connection: standard configuration

Further details: hand release lever

Fig. 6: Special Type 899.000.01 SO / 104 V / $\varnothing Z = 130 / \varnothing Z_1 = 130 / \varnothing d = 24 / \varnothing d_1 = 130$

ROBA®-topstop® single circuit brake with a bearing-supported output shaft output-side and an integrated ROBA®-ES shaft coupling



On the ROBA®-topstop® single circuit brake with bearing-supported output shaft and integrated, plug-in ROBA®-ES shaft coupling, the servomotor can be mounted or dismantled in any shaft position. The shaft coupling compensates for shaft misalignment. To install this Type, a second bearing machine-side is necessary.

Voltage: 104 V

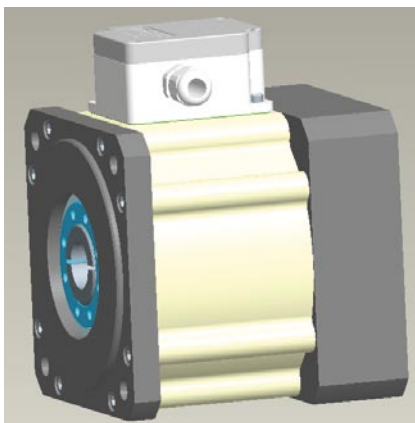
Output-side: $\varnothing d = 24 / \varnothing Z = 130$

Motor-side: $\varnothing d_4 = 24 / \varnothing Z_1 = 130$

Electrical connection: standard configuration

Fig. 7: Special Type 899.002.21 SO / 104 V / $\varnothing Z = 130 / \varnothing Z_1 = 130 / \varnothing d = 24 / \varnothing d_4 = 24$

ROBA®-topstop® single circuit brake with integrated ROBA®-ES shaft coupling and EAS®-smartic® safety clutch



This ROBA®-topstop® single circuit brake has an integrated ROBA®-ES shaft coupling and additionally an EAS®-smartic® safety clutch. If the set limit torque is exceeded, the EAS®-smartic® clutch disengages and the drive torque drops immediately.

The overload must be recognised machine-side, so that the brake can be switched and the axis can be held safely. Reliable overload protection and a securely-held axis offer maximum protection for people and machines.

Voltage: 104 V

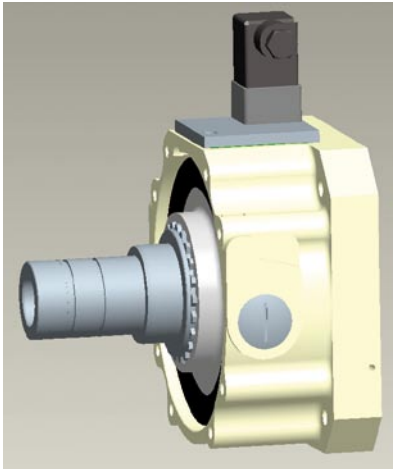
Output-side: $\varnothing d_2 = 15 / \varnothing Z = 130$

Motor-side: $\varnothing d_5 = 24 / \varnothing Z_1 = 130$

Electrical connection: standard configuration

Fig. 8: Special Type 899.013.21 SO / 104 V / $\varnothing Z = 130 / \varnothing Z_1 = 130 / \varnothing d_2 = 15 / \varnothing d_5 = 24$

ROBA®-topstop® single circuit brake with integrated ROBA®-ES shaft coupling and shaft connection



This ROBA®-topstop® single circuit brake module is mounted directly onto a gearbox. The gearbox input side is adapted to the brake module interface. The special shaft bearing is located in the gearbox and carries the input pinion. The ROBA®-ES shaft coupling is integrated into the brake module. The respective centering diameter and screw-on pitch circles for the servomotor are mounted in the housing flange.

Voltage: 24 V

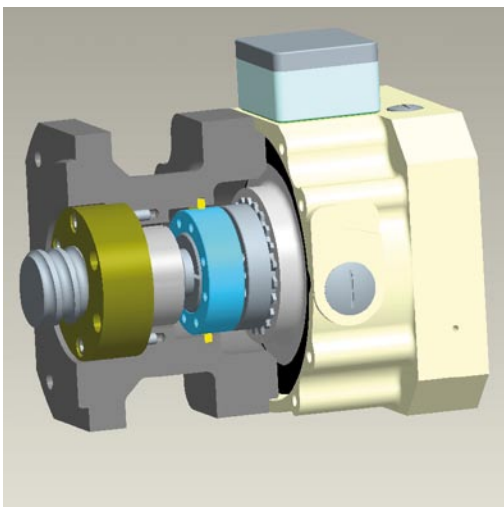
Output-side: $\text{Ø}d = 20$

Motor-side: $\text{Ø}d_4 = 24 / \text{Ø}Z_1 = 110$

Electrical connection: special configuration, without terminal box, without release monitoring, with mounted plug

Fig. 9: Special Type 899.102.21 SO / 24 V / $\text{Ø}Z_1 = 110 / \text{Ø}d = 20 / \text{Ø}d_4 = 24$

ROBA®-topstop® single circuit brake with integrated ROBA®-ES shaft coupling and special friction flange



The ROBA®-topstop® single circuit brake with integrated ROBA®-ES shaft coupling is conceived for mounting onto a ball screw spindle. The special friction flange is adapted to the machine tool. The ball screw spindle bearing is integrated into this special flange, and at the same time serves as the friction surface for the brake. This compact construction is only minimally longer than a construction without the brake.

The friction flange can be included in the delivery on request and is produced according to customer specifications. The brake can however also be delivered without a friction flange (Type 899.112.22 SO).

Voltage: 104 V

Output-side: $\text{Ø}d_2 = 15 / \text{Ø}Z = 130$

Motor-side: $\text{Ø}d_4 = 24 / \text{Ø}Z_1 = 130$

Electrical connection: standard configuration

Fig. 10: Special Type 899.312.22 SO / 104 V / $\text{Ø}Z = 130 / \text{Ø}Z_1 = 130 / \text{Ø}d_2 = 15 / \text{Ø}d_4 = 24$

Order Example

Please state on order:	Size	Type	Voltage [V DC]	Centering-Ø ØZ / ØZ ₁	Output-side Ød / Ød ₂	Motor-side Ød ₁ / Ød ₃ / Ød ₄	Electrical connection	Further details
Order number:		899 . _ _ _ . _ _						

120; 150; 200

Single circuit brake (with standard output flange) ...0

Single circuit brake module (without output flange) 1

Dual circuit brake (only with nominal torque)2

*Single circuit brake module3

(with special output flange)

Shaft design0 Output-side

Shrink disk hub.....1 Output-side

Shaft bore with clamping0 Motor-side

ROBA®-ES clamping hub1 Motor-side

ROBA®-ES shrink disk hub2 Motor-side

Without elastomeric element0

Elastic element hardness 64 Sh D (green)1

Elastic element hardness 98 Sh A (red)2

Elastic element hardness 92 Sh A (yellow)3

Nominal torque1

Maximum torque (requires overexcitation,
only available with 104 VDC, other voltages on request)2

According to catalogue
Special dimensions available on request

24; 104; 180; 207 V-coil

- Standard configuration: Terminal box, release monitoring, terminal

- Special configuration: Please contact our field service e.g.:
With plug (without terminal box, without release monitoring)
or terminal box with plug, release monitoring etc.

- None

- Please contact our field service e. g.:
Hand release
Spark quenching unit
etc.

Examples:

ROBA®-topstop® single circuit brake with shaft design – nominal torque

Order number: 120 / 899.000.01 / 24 V / ØZ = 110 / ØZ₁ = 110 / Ød = 24 / Ød₁ = 24

Electrical connection: standard configuration

Further details: none

ROBA®-topstop® single circuit brake module with shrink disk hub – max. braking torque without release monitoring

Order number: 150 / 899.112.22 / 104 V / ØZ₁ = 130 / Ød₂ = 25 / Ød₄ = 32

Electrical connection: special configuration; terminal box, terminal

Further details: none

Special configurations SO only available after consultation with our office or field personnel.

* Type 899.3_ _ _ is the basic Type 899.1_ _ _ with special output flange according to the customer's request. This special output flange is included in delivery.

Switching Times

Size	Type 899. 1				
	Connection time t_1 (DC-switching) [ms]	Response delay t_{11} on connection	Connection time t_1 (AC-switching) [ms]	Response delay t_{11} on connection	Separation time t_2 [ms]
120	76,5	45	370	250	47
150	107	55	540	460	95
200	110	60	747	500	138

Table 1

Size	Type 899. 2				
	Connection time t_1 (DC-switching) [ms]	Response delay t_{11} on connection	Connection time t_1 (AC-switching) [ms]	Response delay t_{11} on connection	Separation time t_2 [ms]
120	42	20	230	125	44
150	74	25	336	240	75
200	80	30	455	300	113

Table 2

Torque – Time Diagram

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

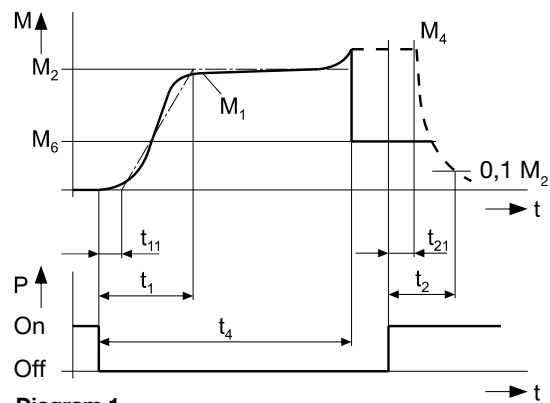


Diagram 1

Friction power diagram

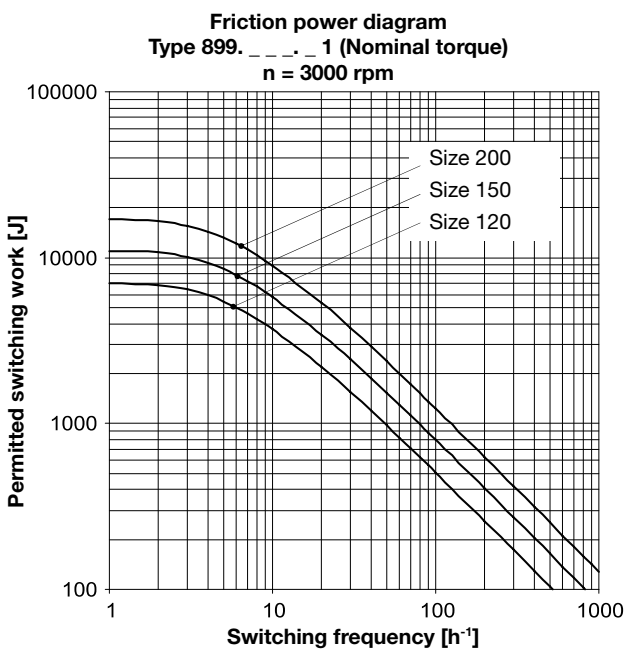


Diagram 2

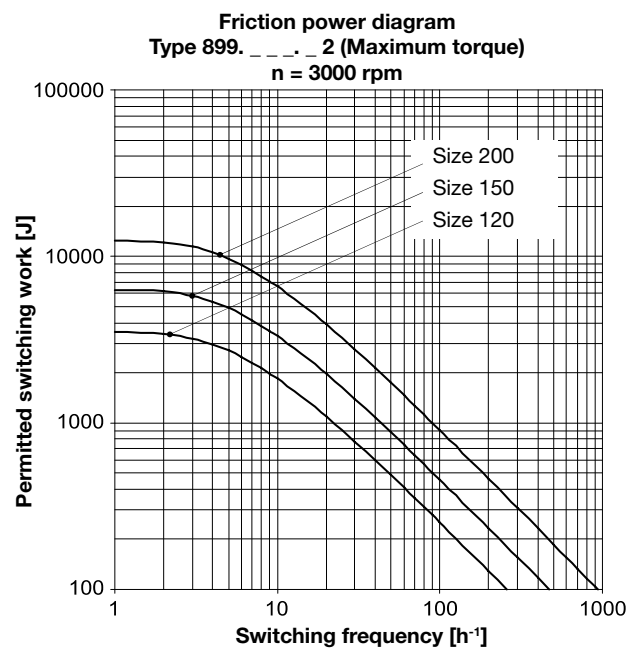


Diagram 3

Permitted motor attachments/Max. permitted breakdown torque

The permitted components of the motor screwed onto the brake module include the static and dynamic loads “F” of motor weight, mass acceleration and vibrations, multiplied by the motor centre of gravity clearance “l_s”.

$$M_k = F \times l_s \leq M_{k \text{ perm.}}$$

Size	Permitted breakdown torque M _{k perm.} [Nm]
120	65
150	150
200	400

Table 3

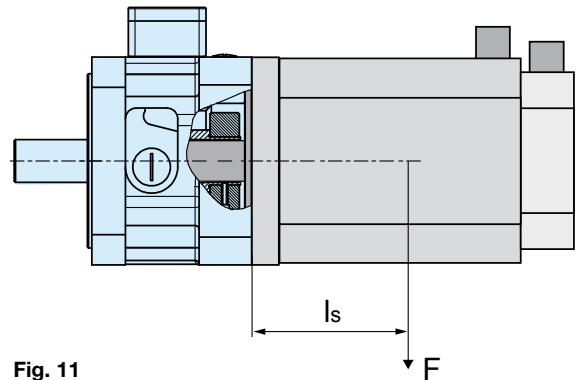


Fig. 11

Permitted outer acceleration and deceleration torques on the brake

	Types	Size 120	Size 150	Size 200
1	Max. permitted acceleration and deceleration torque by the servomotor on the brake	M _{accel} = 45 Nm	M _{accel} = 120 Nm	M _{accel} = 280 Nm
2	*I) Max. dynamic braking torque by the motor on the brake (servomotor with holding brake)	M _{braking} = 22 Nm	M _{braking} = 60 Nm	M _{braking} = 140 Nm
3	Max. dynamic braking torque by the motor on the brake (servomotor with holding brake)	*II) No other braking torque permitted		

Table 4

*I) This restriction applies when the ROBA®-topstop® brake and the motor brake both engage at the same time. The brake times overlap each other and the braking torque adds together. If it is certain that the brake times do not overlap, a braking torque via the holding brake in the servomotor (see Point 1 in the Table) can be permitted.

*II) No other braking torque is permitted. If it is certain that the brake times do not overlap, a braking torque via the holding brake in the servomotor (see Point 1 in the Table) can be permitted.

Shaft load capacity

Max. radial forces on the bearing applicable for:
Type 899.0_ _ _ _ and: Type 899.2_ _ _ _

ROBA®-topstop® brake	Size	120	150	200
Distance „l _R “ (Fig. 12)	[mm]	22,5	25	30
Max. permitted radial force „F _R “ on system l _R	[N]	600	1000	1750

Table 5

The permitted forces are applicable for shaft dimensions according to the catalogue, with a force of application for radial forces in the centre of the output shaft. The values for the permitted forces refer to speeds of n < 3000 rpm.

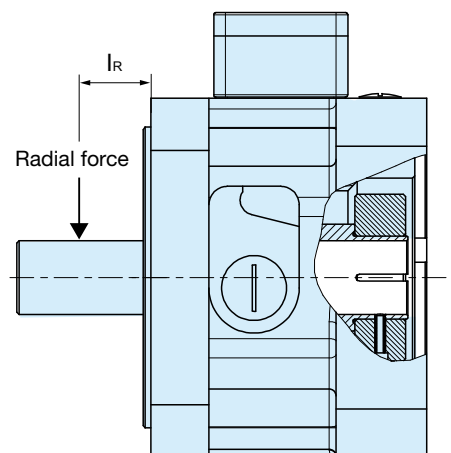


Fig. 12

Guidelines for Electromagnetic Compatibility (EMC)

In accordance with the EMC directives 89/336/EEC, the individual components produce no emissions. However, functional components e.g. rectifiers, phase demodulators, ROBA®-switch devices or similar controls for mains-side energisation of the brake 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.

Device Conditions

The catalogue values are standards which can, in certain cases, vary. 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.

Please Observe!

- Mounting dimensions and connecting dimensions must be adjusted according to the size of the brake at the place of installation.
- The brakes are designed for a relative duty cycle of 100 %.
- 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.
- The braking torque is dependent on the present run-in condition of the brakes.
- Manufacturer-side corrosion protection of the metallic surface is provided.

Protection Class I

This protection can only be guaranteed if the basic insulation is intact and if all conductive parts are connected to the PE conductor. Should the basic insulation fail, the contact voltage cannot remain (VDE 0580).

Protection (Mechanical) IP 54

When installed, protected against dust, contact and splashing water from all directions (dependent on customer-side friction flange).

Protection (Electrical) IP 54

Dust-proof and protected against contact as well as against splashing water from all directions.

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

At temperatures of around or under freezing point, condensation can strongly reduce the torque, or the rotors can freeze up. The user is responsible for taking appropriate countermeasures.

Thermic Class F (+155 °C)

The magnetic coil and the casting compound are suitable for use up to a maximum operational temperature of +155 °C.

Manufacturer's Declaration

This product is intended for installation in a machine or system, based on the machine directive 98/37/EC. It is forbidden to start use of the product until the machine or system into which it should be built is operating in accordance with the EC directives.

The product corresponds to the low voltage directive 73/23/EEC.

The customer is responsible for compliance with the EMC directive 89/336/EEC.

Headquarters

Chr. Mayr GmbH + Co. KG
Eichenstrasse 1, D-87665 Mauerstetten
Tel.: 0 83 41/8 04-241, Fax: 0 83 41/80 44 22
www.mayr.de, eMail: info@mayr.de



mayr[®]

Service Germany

Baden-Württemberg

Roland Hanselmann
Jochen Maurer
Mittlere Holdergasse 5
71672 Marbach
Tel.: 0 71 44/1 80 34+35
Fax: 0 71 44/1 53 20

Bavaria

Manfred Schwarz
Eichenstrasse 1
87665 Mauerstetten
Tel.: 0 83 41/80 41 04
Fax: 0 83 41/80 44 23

Chemnitz

Martin Schlabing
Bornaer Strasse 205
09114 Chemnitz
Tel.: 03 71/4 74 18 96
Fax: 03 71/4 74 18 95

Franken

Jochen Held
Unterer Markt 9
91217 Hersbruck
Tel.: 0 91 51/81 48 64
Fax: 0 91 51/81 62 45

Hagen

Detlef Bracht
Im Langenstück 6
58093 Hagen
Tel.: 0 23 31/78 03 0
Fax: 0 23 31/78 03 25

Kamen

Thomas Kant
Lünener Strasse 211
59174 Kamen
Tel.: 0 23 07/23 63 85
Fax: 0 23 07/24 26 74

North

Bernd Massmann
Schiefer Brink 8
32699 Extertal
Tel.: 0 57 54/9 20 77
Fax: 0 57 54/9 20 78

Rhine-Main

Wolfgang Rattay
Jägerstrasse 4
64739 Höchst
Tel.: 0 61 63/48 88
Fax: 0 61 63/46 47

Branch offices

China

Mayr Zhangjiagang
Power Transmission Co., Ltd.
Changxing Road No. 16,
215600 Zhangjiagang
Tel.: 05 12/58 91-75 62
Fax: 05 12/58 91-75 66
info@mayr.cn

Great Britain

Mayr Transmissions Ltd.
Valley Road, Business Park
Keighley, BD21 4LZ
West Yorkshire
Tel.: 0 15 35/66 39 00
Fax: 0 15 35/66 32 61
sales@mayr.co.uk

France

Mayr France S.A.
Z.A.L. du Minopole
BP 16
62160 Bully-Les-Mines
Tel.: 03.21.72.91.91
Fax: 03.21.29.71.77
contact@mayr.fr

Italy

Mayr Italia S.r.l.
Viale Veneto, 3
35020 Saonara (PD)
Tel.: 0 49/8 79 10 20
Fax: 0 49/8 79 10 22
info@mayr-italia.it

Singapore

Mayr Transmission (S) PTE Ltd.
No. 8 Boon Lay Way Unit 03-06,
TradeHub 21
Singapore 609964
Tel.: 00 65/65 60 12 30
Fax: 00 65/65 60 10 00
info@mayr.com.sg

Switzerland

Mayr Kupplungen AG
Tobelackerstrasse 11
8212 Neuhausen am Rheinfall
Tel.: 0 52/6 74 08 70
Fax: 0 52/6 74 08 75
info@mayr.ch

USA

Mayr Corporation
4 North Street
Waldwick
NJ 07463
Tel.: 2 01/4 45-72 10
Fax: 2 01/4 45-80 19
info@mayrcorp.com

Representatives

Australia

Transmission Australia Pty. Ltd.
22 Corporate Ave,
3178 Rowville, Victoria
Australien
Tel.: 0 39/7 55 44 44
Fax: 0 39/7 55 44 11
info@transaus.com.au

China

Mayr Shanghai
Room 608, No. 1277,
West Zhongshan Road,
Conch Building,
200051 Shanghai, China
Tel.: 0 21/62 95 31 38
Fax: 0 21/62 95 31 37
sales@mayr.com.cn

India

National Engineering
Company (NENCO)
J-225, M.I.D.C.
Bhosari Pune 411026
Tel.: 02 02/7 47 45 29
Fax: 02 02/7 47 02 29
nenco@vsnl.com

Japan

Sumitomo HI-PTC
Sales Co., Ltd.
Kanda Kihara BLDG. 3-5-8
Kandakaji-Cho, Chiyoda-Ku
Tokyo J101-0045
Tel.: 03/52 56 30 91
Fax: 03/52 56 30 98
Gotou.k@sumiju.co.jp

South Africa

Torque Transfer
Private Bag 9
Elandsfontein 1406
Tel.: 0 11/3 45 80 00
Fax: 0 11/9 74 05 24
torque@bearings.co.za

South Korea

Mayr Korea Co. Ltd.
60-11, Woongnam-Dong
ROK Changwon
Rep. of Korea
Tel.: 0 55/2 62-40 24
Fax: 0 55/2 62-40 25
info@mayrkorea.com

Taiwan

German Tech Auto Co. Ltd.
No. 58, Wu Chuan Road
Wu-Ku Industrial Park
Taipei Hsien, Taiwan
Tel.: 02/22 99 02 37
Fax: 02/22 99 0239
steve@zfgta.com.tw

Machine tools

Applications in China
DTC. Co.Ltd.,
Block 5th, No. 1699,
East Zhulu Road,
201700 Shanghai, China
Tel.: 021/59883978
Fax: 021/59883979
dtcshanghai@online.sh.cn

More representatives:

Austria, Benelux States, Brazil, Canada, Czech Republic, Denmark, Finland, Greece, Hongkong, Hungary, Indonesia, Israel, Malaysia, New Zealand, Norway, Philippines, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Thailand, Turkey

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

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