

General notes

Dry-running/wet-running		4.3.00
Electrical circuits		4.3.00
Rectifier units		4.3.00
Coil connections		4.4.00
Spark quenching		4.4.00
Protection against induced current peaks		4.4.00
Response times		4.5.00
Rapid engagement/application		4.5.00
Slow engagement		4.6.00
Rapid disengagement		4.6.00
Application examples		4.7.00

Product data sheets

Multi-plate clutches and brakes

Operation and installation		4.9.00
Stationary field multi-plate clutches	Series 0810 (0010*)	4.11.00
Slipping multi-plate clutches	Series 0011-05.	4.13.00
Slipping multi-plate clutches	Series 0011-100	4.14.00
Multi-plate brakes	Series 0011-300	4.15.00
Slipping multi-plate clutches	Series 0006-05.	4.16.00

Single-face clutches and brakes combined units

Operation		4.19.00
Installation		4.20.00
Single-face clutches	Series 0008-10.	4.23.00
Single-face clutches	Series 0808-3.. (0008-30.*)	4.24.00
Single-face brakes	Series 0009-10.	4.26.00
Single-face clutch/brake combined units	Series 0008-102	4.27.00
Single-face clutch/brake combined units in housing	Series 0081	4.28.00

Tooth clutches

Design characteristics and properties		4.31.00
Installation		4.32.00
Actuation		4.32.00
Application examples		4.33.00
Slipping tooth clutches	Series 0812 (0012*)	4.35.00
Stationary field tooth clutches	Series 0813 (0013*)	4.38.00

Spring-applied multi-plate and twin-face brakes

Operation and installation		4.40.00
Application and installation		4.41.00
Proposals for the working together of clutch and brake		4.41.00
Spring-applied multi-plate brakes	Series 0028/0228	4.42.00
Spring-applied twin-face brakes	Series 0207	4.44.00

* for replacement only - for new machines please refer to series 08 . .

Contents	Page EN 4.1.00	Edition 02.2010
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SEMO-Brake

Electromagnetically spring applied brake, backlash-free **Series 0208** 4.47.00

Accessories

Plug connections, flat plugs **for series 0010, 0013, 0028** 4.49.00

Brushholders and accessories 4.50.00

Caliper-type brushholders **for series 0006, 0011, 0012** 4.49.00

Rectifier units 4.52.00

Electronic load relays 4.53.00

Fast starting devices 4.54.00

Special-varistors 4.55.00

Spark-quenching capacitors 4.55.00

General notes

The coil is designed for continuous duty. A temperature of between 40 °C and 80 °C will be established due to electrical losses, the particular temperature will depend on the cooling conditions and the way in which the clutch or brake is installed. In the standard version the operating voltage is 24 V DC and the rated torque capacity will only be available if this voltage is maintained across the coil. Voltage losses in cables etc. must be compensated for by a correspondingly higher voltage at the power supply unit. The nominal voltage as measured at the clutch terminals may be exceeded by 10%.

The electrical circuit has a great influence on the switching characteristics of the clutch or brake and should be designed carefully to match the particular requirements.

Switching times and the build-up of torque can be influenced by the use of suitable devices as described in the "Electrical circuits" and "Accessories" chapters.

Clutches and brakes with flux-type plate stacks can be used only with the friction combination steel/steel; for this reason they are only suitable for wet-running.

When fitted vertically, the clutch or brake should be mounted in such a way that the armature plate is at the bottom in order to avoid increased idling drag and heat generation brought about by the effects of gravity.

Dry-running clutches and brakes

The friction plates must be kept free of lubricants and adjoining bearings should be adequately sealed. Proper ventilation is essential for heat dissipation. The covers should be provided with suitable openings to ensure proper ventilation. Dry running clutches and brakes should not be used for applications where there is a high risk of corrosion.

Wet-running clutches and brakes

Splash or mist lubrication is usually sufficient; however, internal lubrication through the shaft should be provided in the case of high speeds or high thermal loading. In the case of splash lubrication, the depth of immersion should not exceed 1/10 of the diameter. Excessive immersion can lead to undesirable heat generation.

Recommendations on oils are given in section 1 "Technical information".

Electrical circuits

Ortlinghaus electromagnetic clutches and brakes are operated with direct current and the standard coils are designed for 24 V DC

+ 10 % at 100 % duty factor.

Special requirements in terms of response times can be fulfilled by the use of suitable devices. When carrying out control measurements, it should be noted that the rectifier voltage falls under load so that measurements must be carried out with the clutch or brake engaged/applied. In addition it should be noted that the coil resistance increases with increasing temperature so that the current decreases in accordance with Ohm's law $U = I \cdot R$.

Measurement of voltage and current

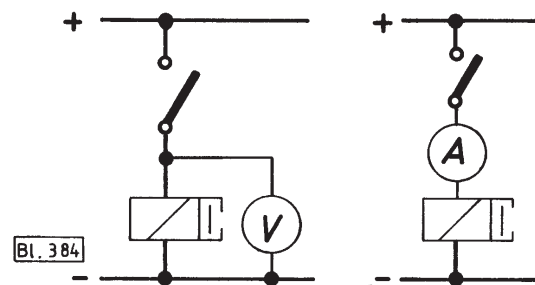


Fig. 1: Voltage measurement Fig. 2: Current measurement

Rectifier units

Electrical power from the mains AC power line is converted to direct current by a transformer-rectifier. This has a number of connection terminals to enable local variation in the mains voltage or voltage losses in long cables supplying the power to be compensated for. Enclosed or open transformer-rectifier units are available in 3 sizes.

The size of the rectifier must be selected in accordance with the total amperage required.

Example:

1 clutch 0006-057-43-004000:
 $U = 24\text{ V}$ $P_{20^\circ\text{C}} = 57\text{ W}$ $I_{20^\circ\text{C}} = 2,4\text{ A}$

1 brake 0028-100-23-002000:
 $U = 24\text{ V}$ $P_{20^\circ\text{C}} = 108\text{ W}$ $I_{20^\circ\text{C}} = 4,5\text{ A}$

$$-\Sigma I_{20^\circ\text{C}} = 6,9\text{ A}$$

For a total load of 6.9 A, rectifier unit 0085-000-24-120000 should be selected.

Coil connections

On clutches and brakes with coil bodies which do not rotate, power is supplied by means of plug connections, connection boxes or by means of a built-in cable on the coil body. Where the coil body rotates, power supply is by means of hardened and ground sliprings. A difference exists between the following versions, namely plugtype brushholders and calipertype brushholders, these being used with coppergraphite brushes for dry-running and woven bronze brushes for wet-running.

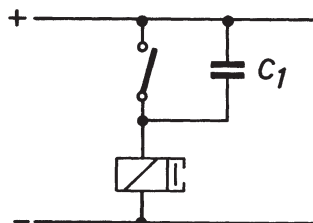
One supply line per slipring suffices in the case of dry-running models. With wet-running models, however the sliprings can receive too much oil, the resulting oil film interrupting the power supply. In order to prevent this interruption, it is advisable (and necessary at speeds of 18 m/s and above) to install two power feeds one after the other. Caliper-type brushholders can also be used up to 15 m/s. Power connections must be secured in such a way that they will not be affected by vibration. In order to obtain correct brush pressure, the gap between the brushholder and the slipring must be maintained (approx. 2 mm). Wear should be monitored. Sets of brushes for dry and wet-running models can be supplied separately as spares.

Spark quenching

Due to inductive load, sparks tend to occur between the relay or contacts when the coil is de-energized. In order to prevent erosion, a spark quenching capacitor should be wired parallel to the contacts (circuit in accordance with Fig. 1). Do not use electrolyte capacitors!

More precise switching is obtained when this is carried out on the DC side. The reason for this is that if switching is carried out on the AC side the rectifier must absorb the inductive voltage.

In addition a separate rectifier must then be fitted for each clutch or brake. Spark quenching capacitors are available in two sizes.



Bl. 387

Fig. 1: Connection of the capacitor

Protection against induced current peaks

Induction voltage peaks occurring during disengagement of the clutch/brake can be suppressed by the installation of special varistors, these providing effective protection for insulation and switching elements.

Possible circuits

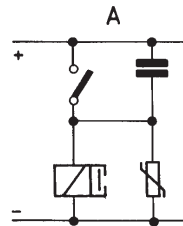


Fig. 2: with varistor

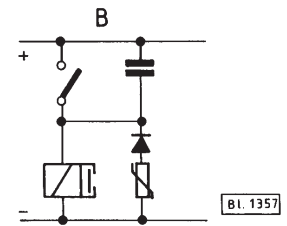


Fig. 3: with varistor and diode in series

The special varistor keeps the peak loading low while ensuring rapid disengagement. There is no heating effect and the rectifier is protected against additional loads. The version illustrated is suitable for all types and sizes of clutches and brakes.

If the operating voltage is to exceed 40 V, the varistor must be wired in series with a diode (1.5 to 2 A - 1000 V).

Effect of the protective elements on the induced current peaks and the disengagement times

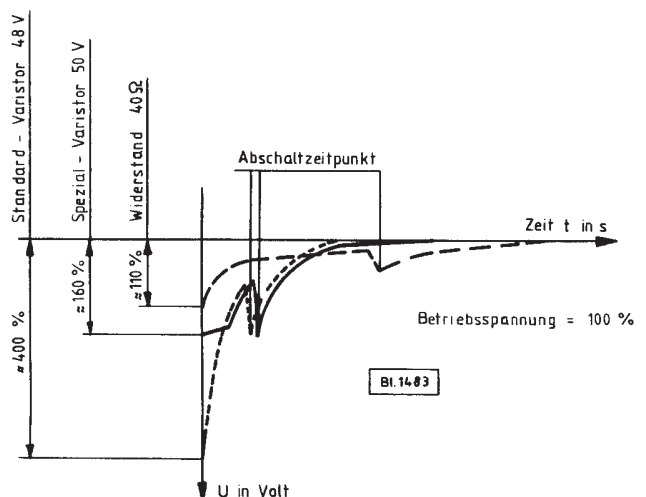


Fig. 4
Abschaltzeit = Disengagement point
Zeit t in s = Time t in s
Betriebsspannung = Circuit voltage
Widerstand = Resistor

Response times

The response times of clutches and brakes can be improved by the use of suitable control circuits and components.

Rapid engagement/application

In order to accelerate torque build-up in electromagnetic clutches and brakes, additional electrical circuits can be installed.

The alternatives are:

Rapid excitation (Fig. 1b)

Excitation of the coil by increased voltage using a series of resistors with an increased voltage. By increasing the circuit resistance, the electromagnetic time constants are reduced.

Over-excitation

Excitation of the coil by increased, time controlled voltage using a bridged series resistor (Fig. 1c), series resistor and capacitor (Fig. 1d) or capacitor with high charging voltage (Fig. 1e).

The coil experiences a momentary high current which gives rise to a steep torque curve.

The comparison shows that the optimum result is obtained with a capacitor with high charging voltage. With the circuits in accordance with Fig. 1b, c and d, the series resistor must be sized in such a way that the voltage drops to the normal operating voltage after engagement.

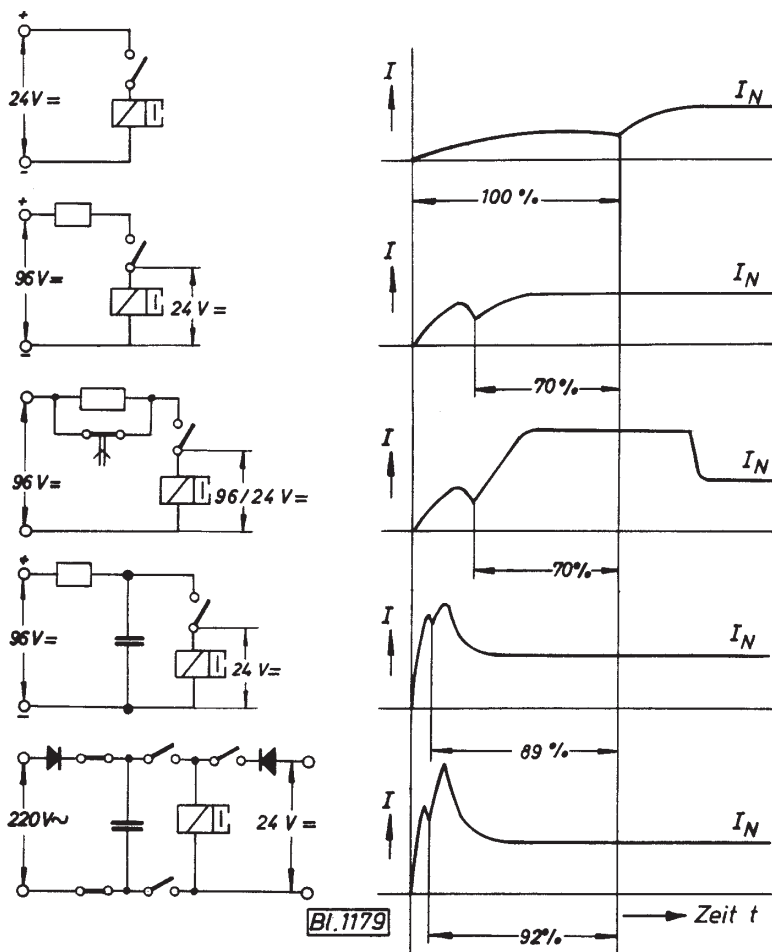


Fig. 1a: Standard excitation

Fig. 1b: Rapid excitation via series resistor

Fig. 1c: Over-excitation via bridged resistor

Fig. 1d: Over-excitation with series resistor and capacitor

Fig. 1e: Over-excitation via capacitor with high charging voltage

Zeit t = Time t

Slow engagement

In some applications smooth acceleration, even of small rotating masses, is required. Controlled torque build-up can be achieved with voltage control, via a variable resistor and single-wave rectification, during the acceleration period. Slow engagement units on request.

Rapid disengagement

When the actuating voltage is switched off, a certain amount of residual magnetism will remain. Particularly in the case of clutches and brakes with flux-type plate stacks, this will cause a delay in disengagement.

The residual magnetism can be eliminated very quickly by a short electric impulse with reversed polarity, i.e. counter-excitation.

The effect on the disengagement time of a clutch with flux-type plate stack is shown by way of example in Fig. 2.

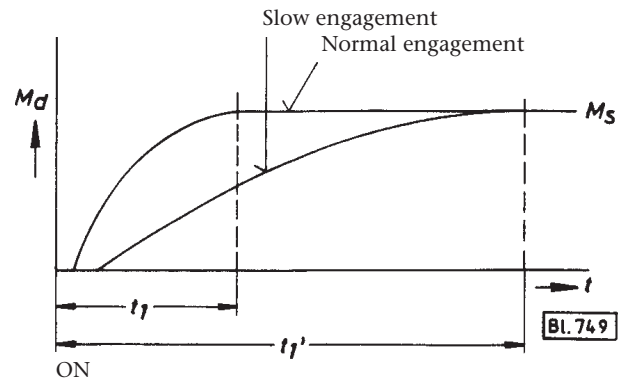
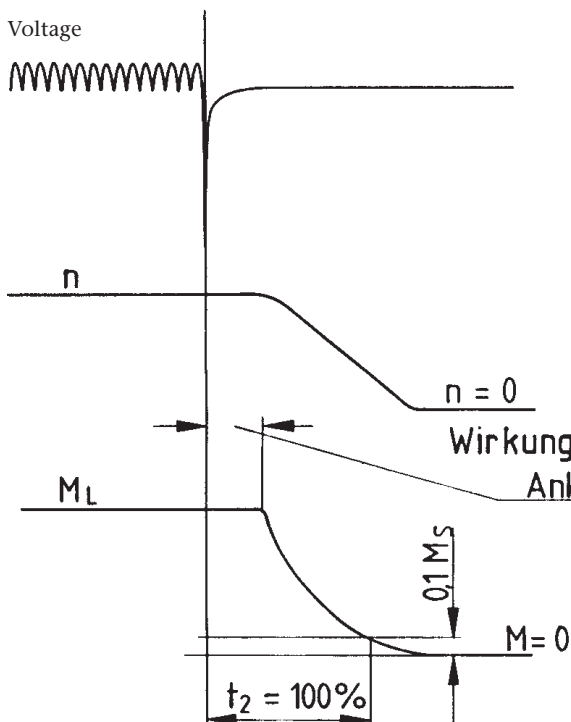


Fig. 1

Standard disengagement

Self-induction



Disengagement by counter-excitation

Capacitor impulse (counter-excitation)

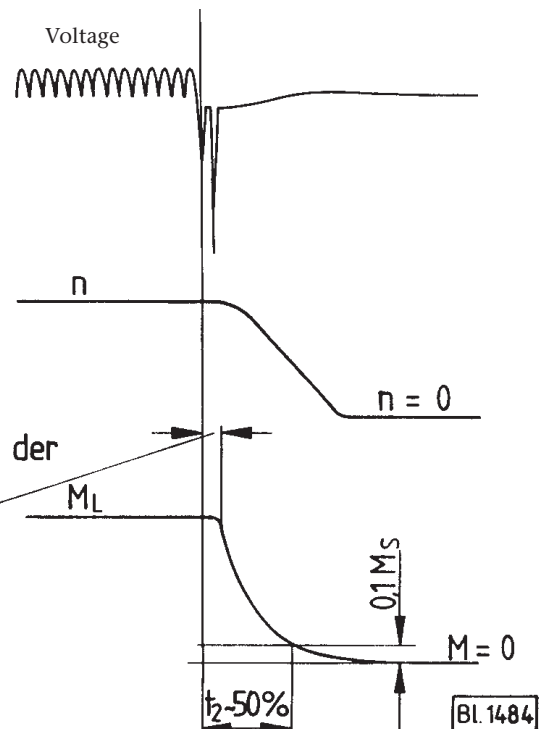
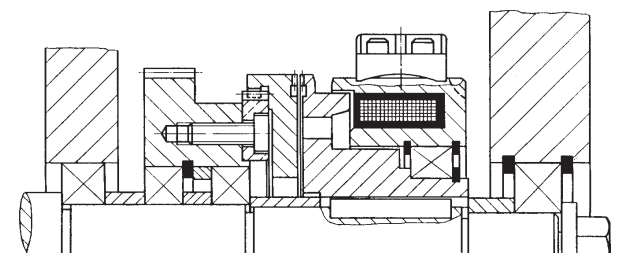


Fig. 2

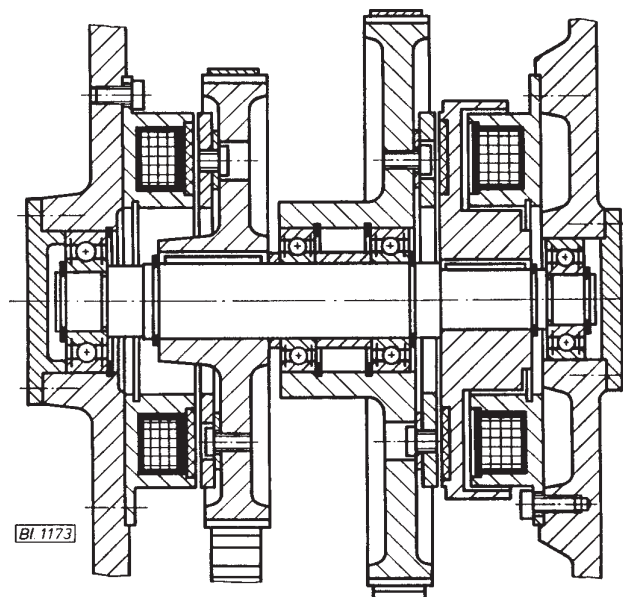
Wirkung auf Abfall der Ankerscheibe = Effect on armature plate drop-off

Application examples



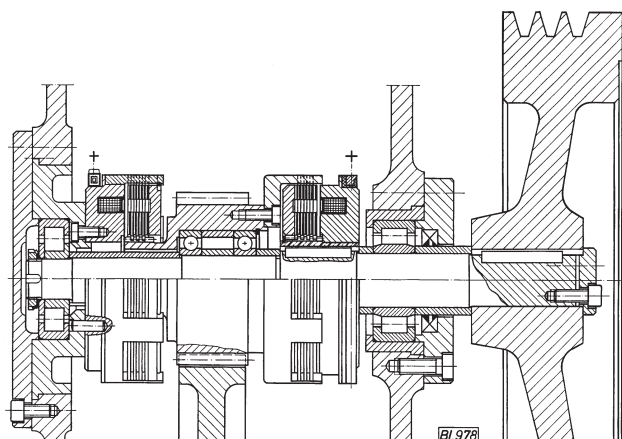
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Electromagnetic stationary field tooth clutch with drive section flanged to gearwheel, series **0013**



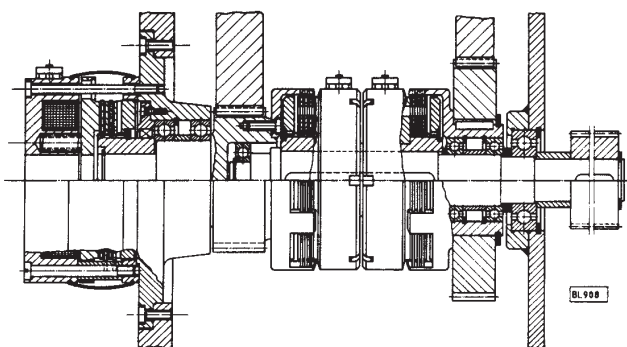
Bl.1173

Electromagnetic single-face clutch, series **0008-100**, employed in conjunction with an electromagnetic single-face brake, series **0009-100**



Bl.978

Electromagnetic Sinus® multi-plate clutch with slipping, series **0011**, and electromagnetic Sinus® multi-plate brake, series **0011-300**

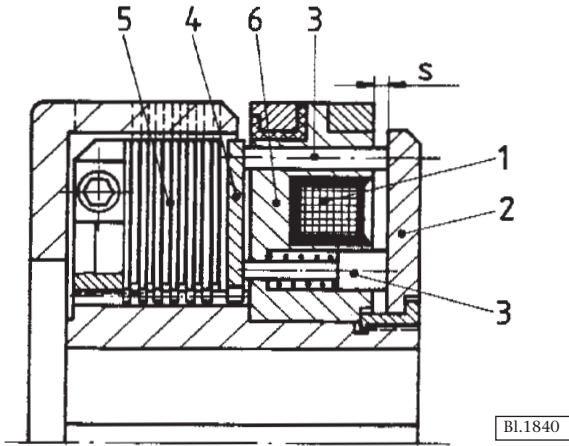


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Electromagnetic stationary field Sinus® multi-plate clutches, series **0010**, friction combination steel/steel, in conjunction with an electromagnetic, spring-applied multi-plate brake, series **0028**, friction combination steel/organic lining.

Multi-plate clutches and brakes

Operation and installation



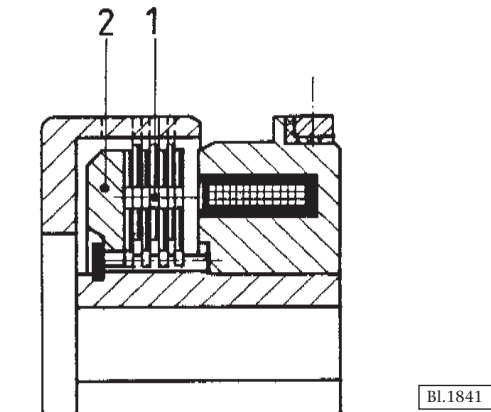
Slipping clutches series 0006

With cup housing, thickness S1: series 0006-057-..004
With cup housing, thickness S2: series 0006-057-..003

Slipping clutches series 0006

This series is available with various friction combinations for wet or dry-running.

The engagement pressure exerted by the coil (1) on the armature plate (2) is transferred to the plate stack (5) by means of pressure pins (3) and via a thrust plate (4). In order to achieve full torque capacity and accurate operation, it is essential that the air gap (s) is present when the clutch is engaged. It is recommended that this gap is checked regularly. Access must be given to enable this measurement to be made and to allow adjustment for wear to be carried out if necessary. It may be necessary for an inspection hole to be provided.

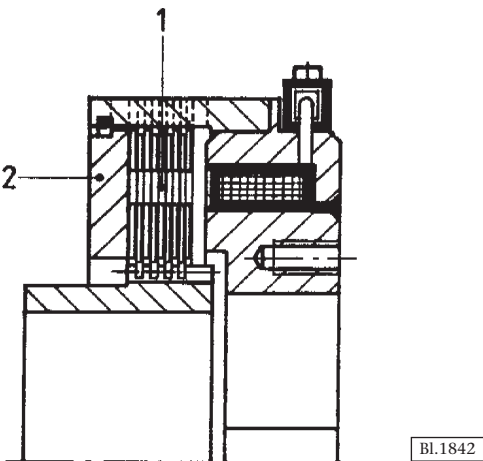


Slipping clutches series 0011

With cup housing, thickness S1: series 0011-057-..004
With cup housing, thickness S2: series 0011-057-..003

Slipping clutches series 0011 and brakes series 0011-300

This series with a flux-type plate stack (1) is suitable only for wet-running. There is no permanent air gap and wear is compensated for automatically by the movement of the armature plate (2). No adjustments are necessary.

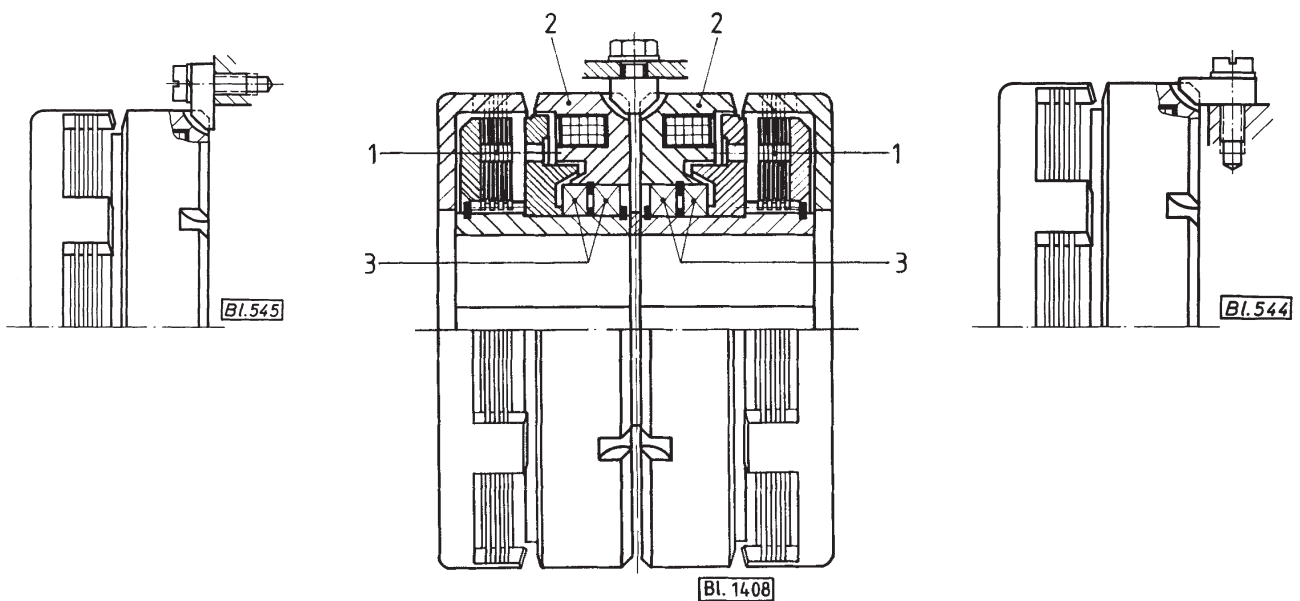


Multi-plate brake series 0011-300

Stationary field clutches series 0010

Thanks to the absence of sliprings and the fact that any wear of the flux-type plate stack (1) is compensated for automatically, this type of clutch requires no maintenance.

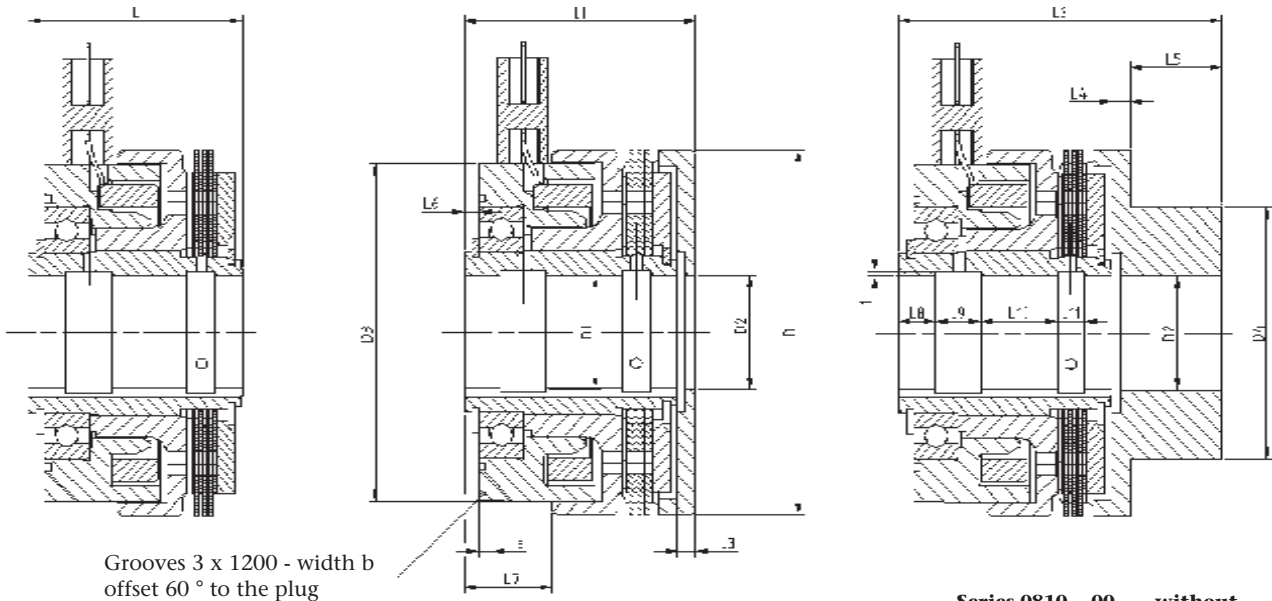
The coil body (2), which does not rotate, must be secured to prevent rotation in such a way that no axial or radial stresses arise. Care should be taken that the integrated bearings (3) are adequately lubricated. Direct spraying or internal lubrication through the shaft is recommended in the case of higher speeds. The lowest bearing temperatures are achieved with relatively low quantities of oil.



Securing of the coil body to prevent rotation

You will find further information on installation in the technical product information notes for the particular series.

**Stationary field
electromagnetic Sinus® multi-plate clutches**
with flux-type plate stack, maintenance-free,
for wet-running only



Series 0810- . 00 without

housing
Series 0810-00 . Open bearing
Series 0810-10 . Closed bearing

Series 0810- . 01 with cup housing
Series 0810- . 02 with hub housing 1)

Series Size		07	0810- . 0 . -Size-000000			31
			11	15	23	
M _s	Nm	15	30	60	140	300
DC voltage	V	24 2)				
Current consumption	20 °C A	0.60	1.25	1.85	2.05	2.45
	80 °C A	0.50	1.05	1.50	1.65	2.00
Power consumption	20 °C W	14.5	30.5	44.1	49.0	58.5
	80 °C W	11.8	24.5	35.7	40.0	47.0
n max	min ⁻¹	4000	4000	3800	3100	2500
n max with internal oiling	min ⁻¹	4000	4000	3800	3700	3300
Weight	cup housing	1,30	1,92	2,78	4,36	8,60
	hub housing	1,46	2,27	3,25	5,16	10,00
Recommended bores	D1 max Keyway DIN 6885	25 8x3,3	30 8x2	35 10x3,3	42 12x2,2	60 18x4,4
	D1 Keyway DIN 6885	22 6x2,8	25 8x3,3	30 8x3,3	40 12x3,3	55 16x4,3
	D1 Keyway DIN 6885	20 6x2,8	22 6x2,8	28 8x3,3	35 10x3,3	50 14x3,8
	D1 Keyway DIN 6885	18 6x2,8	20 6x2,8	25 8x3,3	30 8x3,3	45 14x3,8
Diameters	D	80	95	114	134	165
	D2 min.	-	-	-	61	-
	D3	74	90	106	122	154
	D4	55	70	80	90	110
External keyway	ax45°	3	5	5	5	5
	b	8	10	10	10	10
Length dimensions	L	46,7	52	58,5	68	76
	L1 -0,1	50,7	56	63	73	82,5
	L2	70,7	86	93	113	122,5
	L3	4	5	6	6	8
	L4	4	5	5	6	6
	L5	20	30	30	40	40
	L6	3,2	3,8	3,5	9,3	4,5
	L7	19,2	22	26	27,6	31,5
	L8	8	10	7	6,5	9
	L9	10	34,5	18	17	20
	L10	16,7	-	13,5	23,5	24,5
L11	6	-	13	14,5	16	

1) Version with flange housing on request.

2) other voltages on request

Friction combination
Tolerances

Steel/steel for **wet-running**.
For bores and keyways see section 1 "Technical information"

Plug connection

See chapter "Accessories" page 4.49.00

Sale through Ortlinghaus AG, Zug/Switzerland.

**Stationary field
electromagnetic Sinus® multi-plate clutches
with flux-type plate stack, maintenance-free,
for wet-running only**



**Version with hub housing
Series 0010-055-Size-code number 100**

3 keyways spaced at 120°, offset relative to plug connection by 60° (up to size 47).

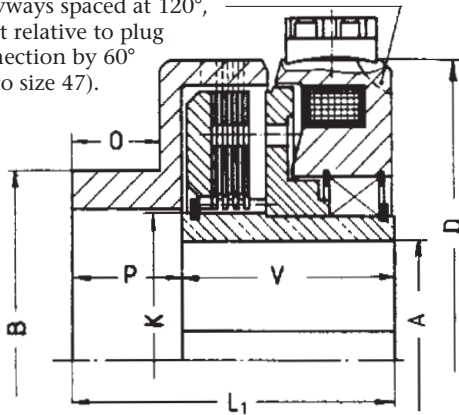


Fig. 1: 1 Bearing up to size 43

**Version with cup housing
Thickness S1 series 0010-057-size-004000
Thickness S2 series 0010-057-size-003000**

6 keyways spaced at 60°, offset relative to plug connection by 30° (from size 47).

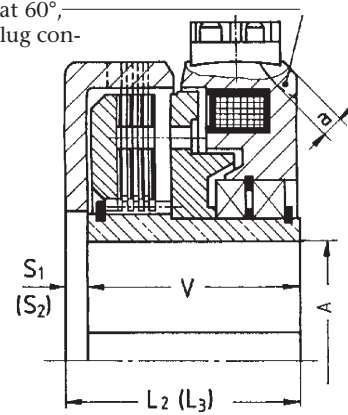


Fig. 2: 2 Bearings from size 47

Series			0010-05.-Size-... 100000 (Fig. 1)							0010-05.-Size-...000000 (Fig. 2)					
Hub housing		Size Code number	07	11	15	23	27	31	32	43	47	51	55	59	
Cup housing		Size	07	11	15	23	27	31	32	43	47	51	55	59	
Mdyn	Nm		12	25	60	120	200	240	360	480	720	1200	2000	3000	
DC voltage	V		24							24					
Power consumption	20 °C W		26	37	42	63	53	85	98	86	112	116	178	210	
	80 °C W		21	30	34	51	43	69	79	70	91	94	144	170	
n max	min ⁻¹		4000	4000	3800	3100	2800	2500	2500	2100	2000	1700	1450	1350	
n max with internal oiling	min ⁻¹		4000	4000	3800	3700	3700	3300	3300	3000	2700	2200	2000	1750	
J	hub housing	internal	kgcm ²	3	7	18	34	61	94	98	257	395	778	1640	2383
		external	kgcm ²	3	11	21	46	81	88	113	283	439	845	2108	2675
	cup housing S1	external	kgcm ²	2	9	13	31	53	61	78	186	289	533	1458	1880
		external	kgcm ²	4	12	20	44	74	91	116	248	344	633	1728	2223
Weight	hub housing	kg	1,74	3,11	4,76	6,06	7,86	10,1	12,6	18,9	25,5	35,1	63,6	77	
	cup housing S1	kg	1,585	2,764	4,289	5,26	6,83	8,69	11,18	16,32	21,92	29,35	51,7	67,6	
	cup housing S2	kg	1,738	2,912	4,513	5,743	7,46	9,461	11,93	17,36	22,71	30,61	54	69,7	
Recommended bores ²⁾	Amax	H7	22	30	35	42	42	55	55	65	70	78 ¹⁾	98 ¹⁾	98 ¹⁾	
	Keyway DIN 6885		6x1,6	8x2	10x2,4	12x2,2	12x2,2	16x4,3	16x4,3	18x2,3	20x2,7	22x3,1	28x3,2	28x3,2	
	A	H7	20	25	30	40	40	50	50	60	60				
	Keyway DIN 6885		6x2,8	8x3,3	8x3,3	12x3,3	12x3,3	14x3,8	14x3,8	18x4,3	18x4,3				
	A	H7	18	22	28	35	35	45	40	55	50				
Keyway DIN 6885		6x2,8	6x2,8	8x3,3	10x3,3	10x3,3	14x3,8	12x3,3	16x4,3	14x3,8					
A	H7		20	25	25	30	40		50						
Keyway DIN 6885			6x2,8	8x3,3	8x3,3	8x3,3	12x3,3		14x3,8						
A	H7					35		45							
Keyway DIN 6885						10x3,3		14x3,8							
Diameters	D		80	95	114	134	147	165	165	195	210	240	295 ³⁾	310	
	B		55	70	80	90	100	110	110	130	145	170	195	205	
	K		32	45	55	60	60	80	80	90	100	120	140	145	
External keyway	keyway width x a		6x3	6x3	6x4	8x5	8x5	8x6	8x6	10x8	12x9	12x10	14x11	14x12	
Length dimensions	L1		70,5	87	92	106	111	113	128	153	180	174	197	232	
	L2		50,5	57	62	66	71	73	88	93	115	109	129	145	
	L3		55,5	61	66	72	77	79	94	99	119	113	134	149	
	O		20	30	30	40	40	40	40	60	65	65	68	87	
	P		24	35	35	46	46	46	46	68	75	75	80	100	
S1		4	5	5	6	6	6	6	8	10	10	12	13		
S2		9	9	9	12	12	12	12	14	14	14	17	17		
V		46,5	52	57	60	65	67	82	85	105	99	117	132		

1) 2 keyways offset at 180° to each other.
2) Bore diameters in bold print are available ex stock.
3) Housing external diameter = 290.

Version with flange housing on request.
Friction combination Steel/steel for wet-running

Tolerances For bores and keyways see section 1 "Technical information"

Plug connection and flat plug See chapter "Accessories", page 4.49.00

**Slipping
electromagnetic Sinus® multi-plate clutches
with flux-type plate stack, for wet-running only**

Hub version: Coil body is connected to the hub

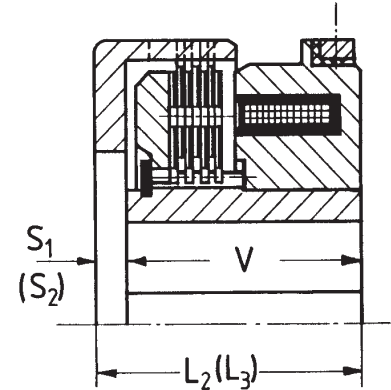
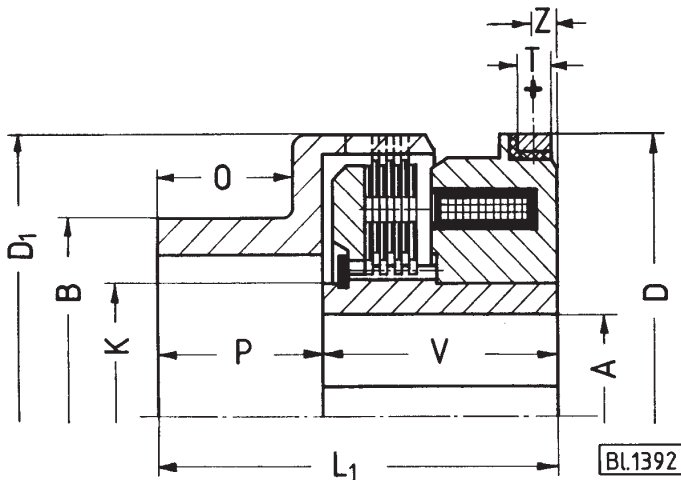


Fig. 1 with hub housing
Series 0011-055-Size-Code number

Fig. 2 with cup housing
Thickness S1 series 0011-057-Size-004
Thickness S2 series 0011-057-Size-003

Series with hub housing		0011-055-Size-000000 Code number (Fig. 1)										
Size	Code number	07	11	15	23	31	43	47	51	55	59	
Series with cup housing		0011-057-Size-000 (Fig. 2)										
Size	Code number	07	11	15	23	31	43	47	51	55	59	
Mdyn	Nm	12	25	60	120	240	480	720	1200	2000	3000	
DC voltage	V	24										
Power consumption	20 °C W	7,5	15	25	40	42	77	88	90	115	147	
	80 °C W	6	12	20	32	34	62	71	73	93	119	
n max	1 power feed	2300	2000	1700	1400	1150	1000	900	800	700	650	
	2 power feeds	4600	4000	3400	2800	2300	2000	1800	1600	1400	1300	
J	hub housing	internal	8	13	33	70	185	445	610	1408	3235	5370
		external	3	10	20	45	88	283	440	828	1755	2798
	cup housing S1	external	2	9	13	30	60	185	288	568	1268	2080
		external	3	11	19	43	90	248	343	675	1515	2378
Weight	hub housing	1,189	2,175	3,384	5,31	8,35	15,33	19,31	28	46,95	63,7	
	cup housing S1	1,034	1,829	2,913	4,51	6,94	12,45	15,73	23,21	40,43	54,9	
	cup housing S2	1,187	1,977	3,137	4,993	7,711	13,49	16,52	24,33	42,33	56,8	
ØA	prebored	15	18	20	20	30	40	40	40	60	70	
ØAmax	H7	22	32	40	45	60	70	75	90	105	115	
Keyway	DIN 6885	6x1,6	10x2,4	12x2,2	14x3,8	18x4,4	20x4,9	20x4,9	25x5,4	28x6,4	32x7,4	
Diameters	D/D1	82/80	95	114	134	165	195	210	240	290	310	
	B	55	70	80	90	110	130	145	170	195	205	
	K	32	45	55	60	80	90	100	120	138	145	
Length dimensions	L1	55,5	74	83,5	100	106,5	140	152	158	187	218	
	L2	35,5	44	53,5	60	66,5	80	87	93	119	131	
	L3	40,5	48	57,5	66	72,5	86	91	97	124	135	
	O	20	30	30	40	40	60	65	65	68	87	
	P	24	35	35	46	46	68	75	75	80	100	
	S1	4	5	5	6	6	8	10	10	12	13	
	S2	9	9	9	12	12	14	14	14	17	17	
	T	8	8	8	8	8	8	8	8	10	10	
V	31,5	39	48,5	54	60,5	72	77	83	107	118		
Z	6	6	6	7	7	7	8,5	8,5	8,5	8,5		

Version with flange housing on request.

Friction combination Steel/steel for wet-running
Tolerances For bores and keyways see section 1 "Technical information"

Accessories From page 4.49.00

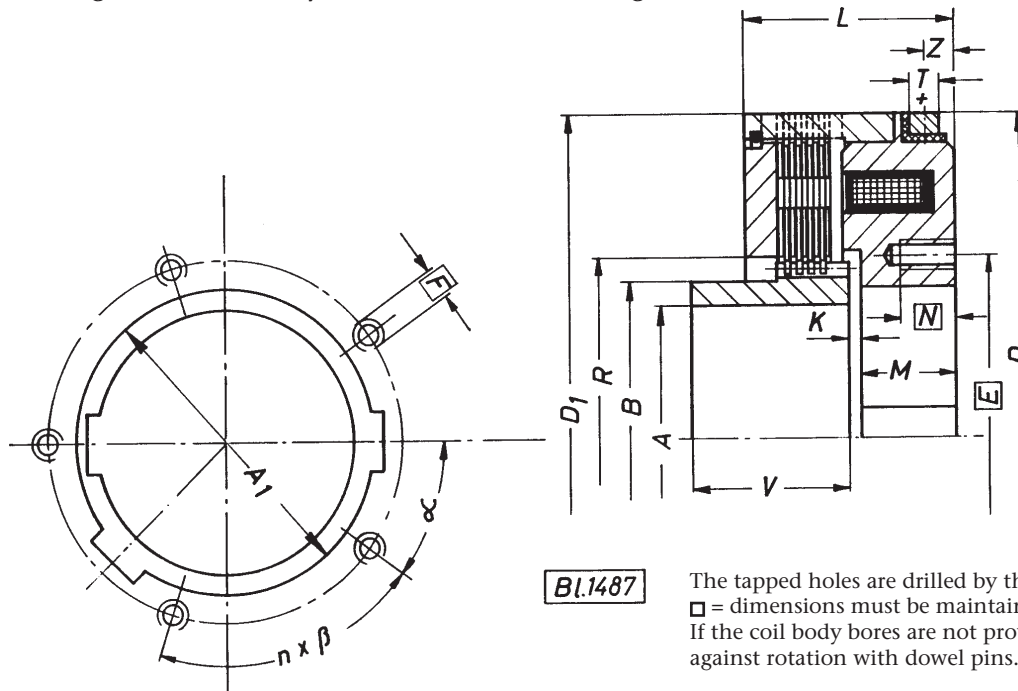
Series 0011-05.

Page
EN 4.13.00

Edition 02.2010

Slipring
electromagnetic Sinus® multi-plate clutches
with flux-type plate stack, for wet-running only

Housing version: Coil body is connected to the housing



The tapped holes are drilled by the customer at installation.
 □ = dimensions must be maintained.
 If the coil body bores are not provided with keyways, secure against rotation with dowel pins.

Series Size	0011-100-Size-001000										
	07	11	15	23	31	43	47	51	55	59	
Mdyn Nm	12	25	60	120	240	480	720	1200	2000	3000	
DC voltage V	24										
Power consumption 20 °C W	7,5	15	24	40	42	77	88	90	115	147	
80 °C W	6	12	19	32	34	62	71	73	93	119	
nmax 1 power feed min ⁻¹	2300	2000	1700	1400	1150	1000	900	800	700	650	
nmax 2 power feeds min ⁻¹	4600	4000	3400	2800	2300	2000	1800	1600	1400	1300	
J internal kgcm ²	0,5	1	5	10	28	79	96	225	433	704	
external kgcm ²	9	16	39	86	221	515	711	1570	3947	6396	
Weight kg	0,821	1,297	2,413	3,776	6,146	10,94	13,54	21,74	37,26	51,13	
Coil body	ØA1 prebored	18	20	25	30	40	40	60	70	70	
	ØA1 max ¹⁾ H7	35	44	55	65	80	90	98	115	145	
	Keyway ²⁾ DIN 6885	8x2	12x3,3	16x4,3	18x4,4	22x5,4	25x5,4	25x5,4	32x7,4	32x7,4	36x8,4
Hub	ØA prebored	12	20	20	20	30	40	40	50	60	70
	ØA max H7	25	38	44	48	65	75	78	95	110	115
	Keyway DIN 6885	8x2	10x2,4	12x3,3	14x3,8	16x4,3	20x4,9	22x5,4	25x5,4	28x6,4	32x7,4
Diameters	D/D1	82/80	95	114	134	165	195	210	240	290	310
	B	32	47	55	62	80	95	100	120	138	145
	E	41	50	60	72	92	110	120	150	160	190
	F	M4	M6	M6	M8	M10	M10	M10	M12	M16	M16
	R	40	54	64	74	92	108	113	134	155	166
Bores	α°	60	45	45	45	36	36	36	36	36	36
	n x β°	3x120	4x90	4x90	4x90	5x72	5x72	5x72	5x72	5x72	5x72
Length dimensions	K	2	3	3	3	3	2,5	3	3	3	4
	L	29,5	36	45,5	52	58,5	68,5	73,5	80	104	114
	M	16,5	20	23	26	30	33,5	35	37	48	49
	N	10	10	12	15	15	18	20	20	25	25
	T	8	8	8	8	8	8	8	10	10	10
	V	25	35	40	45	55	65	75	85	90	100
	Z	5,5	5,5	6	7	7	7	8,5	8,5	8,5	8,5

1) Maximum bore up to size 31 for version without tapped holes F.

2) Provide a key which must support along the whole length M! From size 31 upwards two keyways offset by 135°.

Friction combination Steel/steel for wet-running
Tolerances

For bores and keyways see section 1 "Technical information"

Accessories

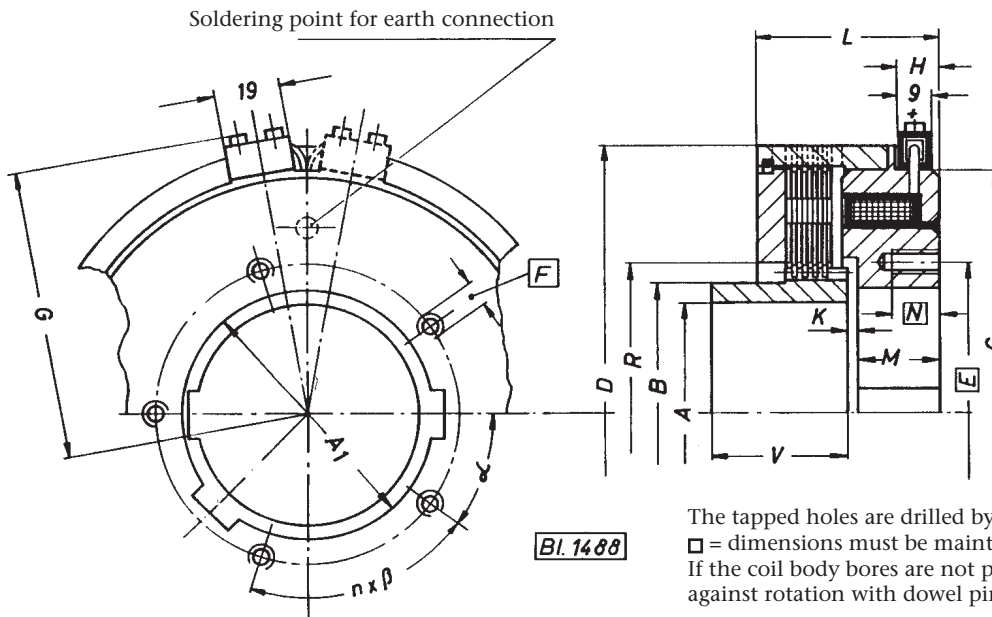
From page 4.49.00

Version without hub: series **0011-100-...-101**

Version with face keyway on coil body side on request.

Electromagnetic Sinus® multi-plate brakes
with flux-type plate stack, for wet-running only

Housing version: Coil body is connected to the housing



The tapped holes are drilled by the customer at installation.
□ = dimensions must be maintained.
If the coil body bores are not provided with keyways, secure against rotation with dowel pins.

Series Size	0011-300-Size-000000										
	07	11	15	23	31	43	47	51	55	59	
Mdyn Nm	12	25	60	120	240	480	720	1200	2000	3000	
DC voltage V	24										
Power consumption	20 °C W	7,5	15	24	40	42	77	88	90	115	147
	80 °C W	6	12	19	32	34	62	71	73	93	119
n max min ⁻¹		4000	4000	3800	3100	2500	2100	2000	1700	1450	1350
n max with internal oiling min ⁻¹		4000	4000	3800	3700	3300	3000	2700	2200	2000	1750
J internal kgcm ²		0,5	1	5	10	28	79	96	225	433	704
Weight kg		0,821	1,297	2,413	3,776	6,146	10,94	13,54	21,74	37,26	51,13
Coil body	ØA1 prebored	18	20	25	30	40	40	40	60	70	70
	ØA1 max ¹⁾ H7	35	44	55	65	80	90	98	115	130	145
	Keyway ²⁾ DIN 6885	8x2	12x3,3	16x4,3	18x4,4	22x5,4	25x5,4	25x5,4	32x7,4	32x7,4	36x8,4
Hub	ØA prebored	12	20	20	20	30	40	40	50	60	70
	ØA max H7	25	38	44	48	65	75	78	95	110	115
	Keyway DIN 6885	8x2	10x2,4	12x3,3	14x3,8	16x4,3	20x4,9	22x5,4	25x5,4	28x6,4	32x7,4
Diameter	D	80	95	114	134	165	195	210	240	290	310
	B	32	47	55	62	80	95	100	120	138	145
	C	72	84	103	122	150	180	192	220	264	284
	E	41	50	60	72	92	110	120	150	160	190
	F	M4	M6	M6	M8	M10	M10	M10	M12	M16	M16
	R	40	54	64	74	92	108	113	134	155	166
Bores	α°	60	45	45	45	36	36	36	36	36	36
	n x β°	3x120	4x90	4x90	4x90	5x72	5x72	5x72	5x72	5x72	5x72
Length dimensions	G ~	49	55	64,5	74	88	103	109	127	145	160
	H	10,5	11	12	13	13	13	14,5	16,5	16,5	16,5
	K	2	3	3	3	3	2,5	3	3	3	4
	L	29,5	36	45,5	52	58,5	68,5	73,5	80	104	114
	M	16,5	20	23	26	30	33,5	35	37	48	49
	N	10	10	12	15	15	18	20	20	25	25
	V	25	35	40	45	55	65	75	85	90	100

1) Maximum bore up to size 31 for version without tapped holes F.

2) Provide a key which must support along the whole length M! From size 31 upwards two keyways offset by 135°.

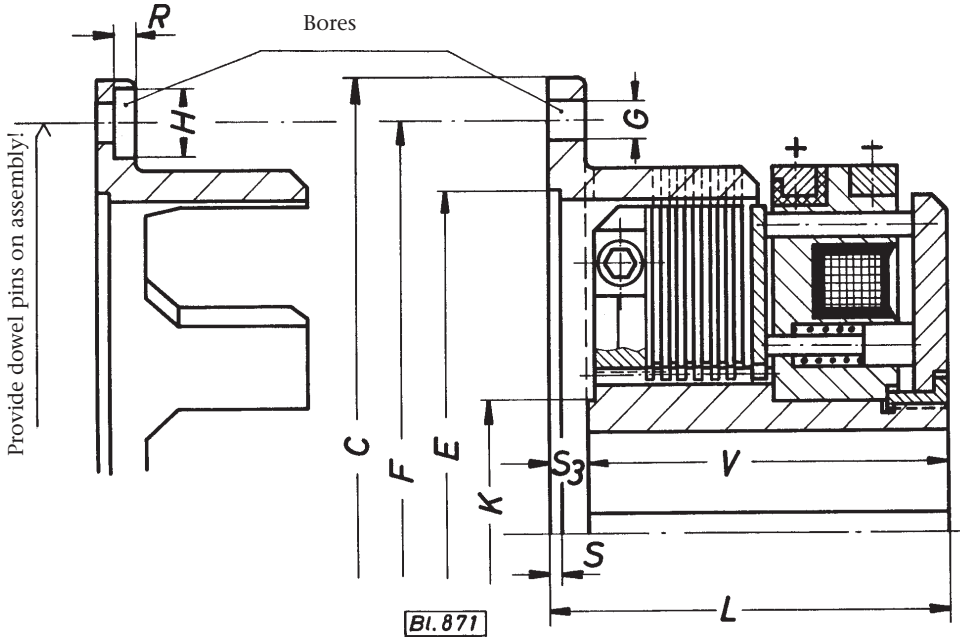
Friction combination Steel/steel for wet-running
Tolerances For bores and keyways see section 1"Technical information"
Accessories From page 4.49.00

Standard version (with hub):
Series **0011-300...-001** with 1 insulated terminal
Series **0011-300...-002** with 2 insulated terminals

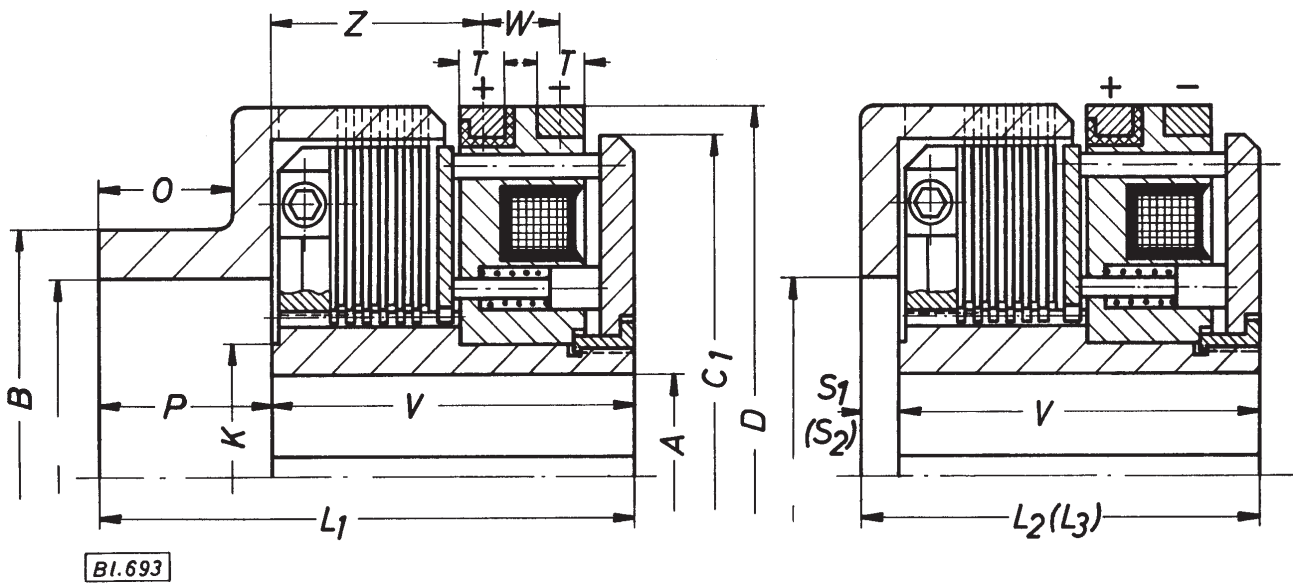
Version without hub:
Series **0011-300...-101** with 1 insulated terminal
Series **0011-300...-102** with 2 insulated terminals

Version with face keyway on coil body side on request.

Slipring
electromagnetic Sinus® multi-plate clutches
 with adjustable air gap, non-flux plate stack



with flange housing
 Series 0006-051-...-000000



with hub housing
 Series 0006-055-...-...

with cup housing
 Thickness S1, series 0006-057-...-004
 Thickness S2, series 0006-057-...-003

Slipring
electromagnetic Sinus® multi-plate clutches
with adjustable air gap, non-flux plate stack



Series with flange housing			0006-051-Size-000000							
Size			07	11	15	23	31	43	51	59
Series with hub housing			0006-055-Size-Code number							
Size-code number			07-028	11-034	15-056	23-067	31-070	43-096	51-073	59-094
Series with cup housing			0006-057-Size-000000							
Size			07	11	15	23	31	43	51	59
M _{dyn}	dry-running	Nm	15	30	60	120	240	600	1200	2400
M _{dyn}	wet-running	Nm	12	25	50	100	200	500	1000	2000
DC voltage		V	24							
Power consumption		20 °C W	15	15,5	25	27	49	57	86	105
		80 °C W	12	12,5	20	22	40	46	70	85
n _{max}	dry-running	min ⁻¹	4400	3800	3400	3000	2400	1900	1500	1300
n _{max}	wet-running	1 power feed	2200	1900	1700	1500	1200	950	750	650
n _{max}	wet-running	2 power feeds	4400	3800	3400	3000	2400	1900	1500	1300
J	flange housing	internal	11	20	45	85	233	660	1738	4183
		external	7	13	20	65	115	310	825	2250
	hub housing	external	7	10	15	35	70	238	625	1475
	cup housing S1	external	3	5	8	19	48	125	348	870
	cup housing S2	external	4	8	13	30	73	195	455	1145
Weight	flange housing	kg	1,7	2,9	4,6	6	10	19	32	57
	hub housing	kg	2	3	4,7	6,2	10,8	21	33	60
	cup housing S1	kg	1,8	2,7	4,4	5,65	10	19	30,5	57,5
	cup housing S2	kg	2	2,9	4,7	6	10,8	20,5	33,5	62,5
ØA	prebored		12	15	18	20	20	30	40	50
Recommended bores ¹⁾	A _{max}	H7	20	22	30	40	48	65	80	105
	Keyway	DIN 6885	6x2,8	6x2,8	8x2	10x2,4	12x3,3	18x4,4	22x5,4	28x6,4
	A	H7		20	28	35	45	60	60	
	Keyway	DIN 6885		6x2,8	8x3,3	10x2,4	14x3,8	18x4,4	18x4,4	
	A	H7			25	30	35	50/45		
Keyway	DIN 6885			8x3,3	8x3,3	10x3,3	14x3,8			
A	H7			20	25	30	40			
Keyway	DIN 6885			6x2,8	8x3,3	8x3,3	12x3,3			
A	H7					28/25				
Keyway	DIN 6885					8x3,3				
Diameter	D		85	100	110	128	154	200	245	295
	B		55	55	60	70	80	120	140	160
	C		115	135	150	170	195	240	295	360
	C1		78	90	100	115	140	184	225	270
	E _{H7}		80	95	105	125	145	190	230	280
	F		100	120	130	150	175	220	270	325
	G		6,5	8,5	8,5	8,5	10,5	10,5	13	15
	H		-	-	-	-	-	-	19,5	23,5
	K		30	30	36	45	60	80	100	120
	Number of bores	Number x Ø		3	3	3	3	3	6	6
Dowel pins		2x6	2x6	2x6	2x6	2x8	2x10	2x13	3x13	
Length dimensions	L		49	61	71	80	85	102	120	145
	L1		70	90	100	116	121	158	180	210
	L2		50	60	70	76	81	98	115	142
	L3		54	64	74	82	87	104	119	147
	O		20	30	30	40	40	60	65	68
	P		25	35	35	46	46	68	75	80
	R		-	-	-	-	-	-	7,5	7,5
	S		1,5	3	3	4	4	4	6	6
	S1		5	5	5	6	6	8	10	12
	S2		9	9	9	12	12	14	14	17
	S3		4	6	6	10	10	12	15	15
	T		7	7	8	8	8	8	10	10
	V		45	55	65	70	75	90	105	130
	W		9,5	11	13	13	13	13	16	17
	Z		24,5	31,5	34,5	37	41,5	48	55,5	64,5

¹⁾ Bore diameters in bold print are available ex stock.

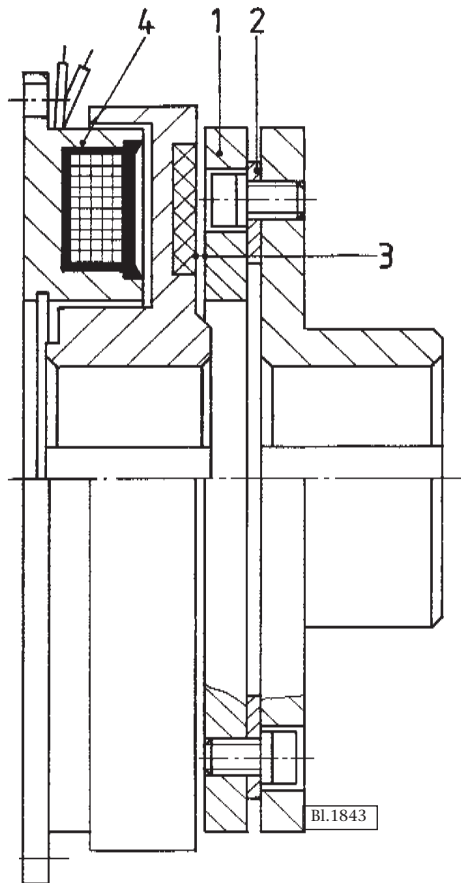
Friction combination Standard version steel/sintered lining for wet- and dry-running. On request steel/organic lining for dry-running (**the plate chamber must be sealed to prevent entry of lubricants**).

Tolerances For bores and keyways see section 1 "Technical information"

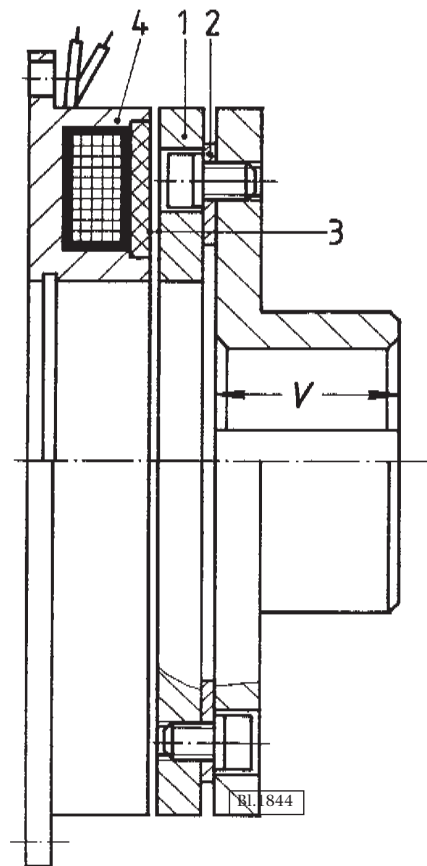
Accessories From page 4.49.00

Single-face clutches and brakes, combined units

Operation



Clutch series 0008-101
Armature section with driving flange



Brake series 0009-101

Clutch and brake

Torque is transferred from the armature plate (1) to the component being connected (gear wheel, pulley etc.) via a spring disc (2), which guarantees axial freedom of movement. After disengagement, the friction surfaces (3) are precisely separated by means of the spring disc (2) with the result that no idling torque occurs and high idling speeds are possible. These clutches and brakes are suitable for both vertical and horizontal installation. Electrical connection is by means of two insulated cables, which all approx. 200 mm in length from the coil body (4).

Installation

Mounting the coil body

The coil body, which does not rotate, must be carefully centered. It is best mounted to the machine frame, the bore diameters or the outside diameter can be used for centering. The coil body is provided with a groove for the acceptance of a circlip in accordance with DIN 472. This allows axial location of the centering ball bearing.

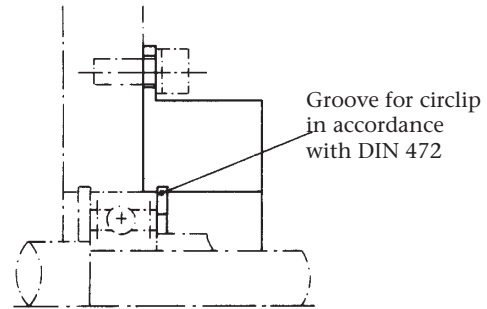
In the case of series 0008-30., the coil body is located on the support plate and must be secured against rotation in such a way that no radial or axial loads are produced.

If it is not possible to mount the coil body to the machine frame, it can be secured to a bearing located flange as shown in Fig. 2.

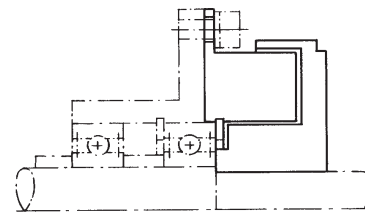
Mounting of the armature

If ordered without drive flange, the armature plate is mounted to the input or output pulley etc. with socket screws to DIN 6912 or DIN 7984 (DIN 84), it is necessary to counterbore the mating part (1x45°). The screws must be secured (Fig. 3).

Series **0008-10.-...-002000**
Series **0009-10.-...-002000**



Bl.1205
Fig. 1



Bl.1073
Fig. 2

Size	00 ¹⁾	01 ¹⁾	05	09	13	17	25	33
n x G	2xM2,5	3xM3	3xM4	3xM5	3xM6	3xM8	3xM10	4xM12

DIN 84¹⁾
DIN 7984 (DIN 6912)

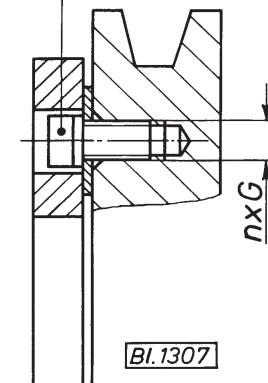
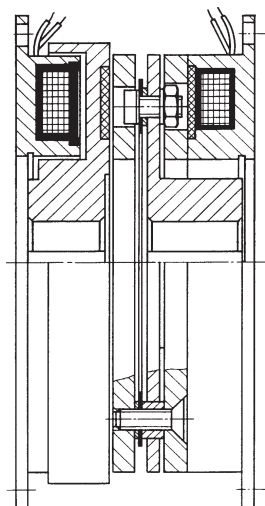


Fig. 3

Clutch-brake combined units

The electromagnetic single-face clutches, series 0008-10., and single-face brakes, series 0009-10., are also available as combined units, series **0008-102.**

**Clutch
Brake**



Bl.1845

Clutch-brake combined units in housing

These pre-assembled units are intended for stop-start applications, i.e. for applications in which rotating masses must be alternately accelerated and decelerated.

The fully enclosed housing protects the clutch, brake or combined unit from dust and dirt while the ribbing permits improved dissipation of the heat generated in each switching process.

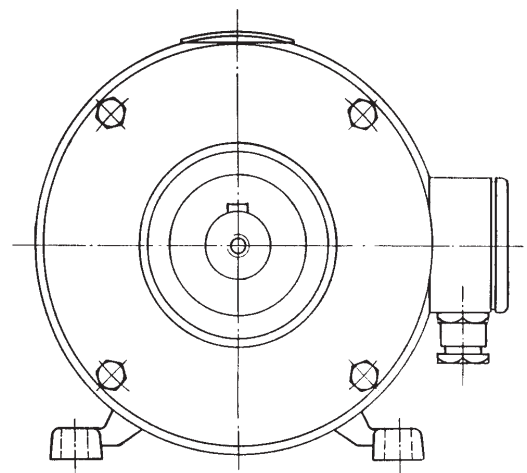
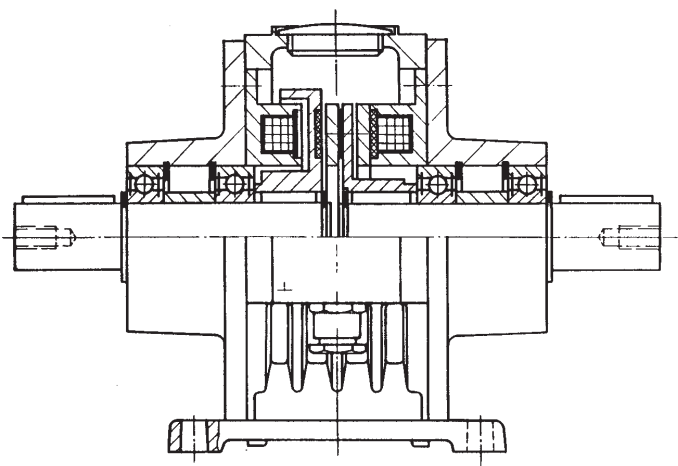
The input and output shaft centre heights of the units have been selected in accordance with DIN 747, the dimensions for the shaft ends in accordance with DIN 748.

The design and operation of the units is the same as that for series 0008 and 0009.

For installation details see page 4.20.00.

Clutch

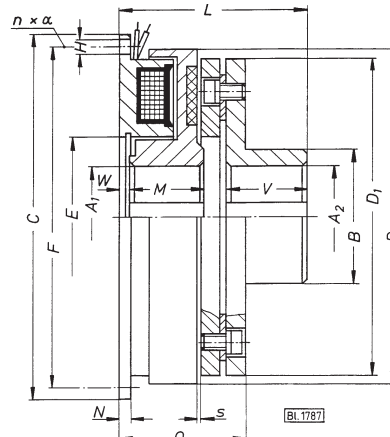
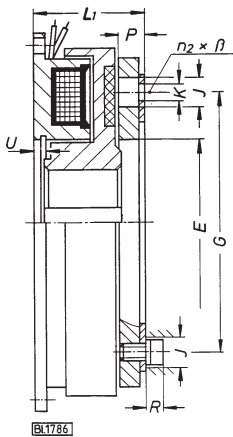
Brake



Bl 1846

Series **0081**

Electromagnetic single-face clutches for dry-running only



Series 0008-100 armature section without driving flange

Series 0008-101 armature section with driving flange

Series Size		00	01	0008-10.-Size-002000					
		05	09	13	17	25	33 ¹⁾		
M _{dyn} at n	Nm min ⁻¹	1,7 450	7,5 300	15 240	30 200	60 150	120 120	240 100	480 80
n max	min ⁻¹	8000	7000	6000	5000	4000	3000	2500	2000
DC voltage	V	24							
Power consumption	20 °C W	6	16	21,5	29,5	44,5	60	66	83
	80 °C W	5	13	17,5	24	36	48,5	53,5	67
J support plate armature section	kgcm ²	0,19	0,9	3	9	23	82	195	550
	kgcm ⁻²	0,12	0,3	1	3	9	30	128	368
	kgcm ²	0,14	0,8	2	8	21	67	267	793
Weight	kg	0,285	0,46	0,85	1,64	2,9	5,6	10,1	18,8
	kg	0,33	0,57	1,06	2,05	3,6	6,9	13,1	24,3
Recommended bores ²⁾	A1 max H7 Keyway DIN 6885	10 3x1,4	15 5x2,3	25 8x3,3	30 8x3,3	40 12x3,3	50 14x3,8	70 20x4,9	80 22x5,4
	A2 max H7 Keyway DIN 6885	8 2x1	15 5x2,3	20 6x2,8	30 8x3,3	35 10x3,3	50 14x3,8	65 18x4,4	80 22x5,4
	A1/A2 H7 Keyway DIN 6885		10 3x1,4	20 6x2,8	25 8x3,3	30 8x3,3	40 12x3,3	50 14x3,8	70 20x4,9
	A1/A2 H7 Keyway DIN 6885			15 5x2,3	20 6x2,8	25 8x3,3	30 8x3,3	40 12x3,3	60 18x4,4
Diameter	D	45	68	85,5	107	134,5	170,5	214	266,5
	D1	42	63	80	100	125	160	200	250
	B	14,5	28	33	43	50	66	84	106
	C h9	60	80	100	125	150	190	230	290
	E H8 ³⁾	18	35	42	52	62	80	100	125
	F	52	72	90	112	137	175	215	270
G	29	46	60	76	95	120	158	210	
Bores	H	4,3	4,5	5,5	6,5	6,5	9	9	11
	n1 x alpha	3x120°	4x90°	4x90°	4x90°	4x90°	4x90°	4x90°	4x90°
	J	6	6,5	8	10,5	12	15	18	22
	K	2,8	3,1	4,1	5,2	6,2	8,2	10,2	12,2
n2 x beta	2x180°	3x120°	3x120°	3x120°	3x120°	3x120°	3x120°	4x90°	
Length dimensions	L	38,5	43	51	61	70,5	84,5	103,5	119
	L1	26,5	28	31	36	40,5	46,5	55,5	64
	M	20	22	24	27	30	34	40	47
	N	2	2	2,5	3	3,5	4	5	6
	O	29,5	31,5	35	41	46,5	53,5	64,5	75
	P	3,8	3,8	5,2	6,7	7,7	10,1	13	15,4
	R	2,5	2,5	3,3	4,1	4,7	5,8	7	8
	s ⁴⁾ air gap	0,2	0,2	0,3	0,3	0,3	0,4	0,5	0,6
	U	-	3,5	4,3	5	5,5	6	7	8
	V	12	15	20	25	30	38	48	55
	W	2,5	2	2,5	3	3,5	3,5	4	4

1) Further sizes on request.

2) Bore diameters in bold print are available ex stock.

3) H8 only for coil bodies.

4) Up to size 09 s + 0,1; size 13 and upwards s + 0,2.

Tolerances

For bores and keyways see section 1 "Technical information"

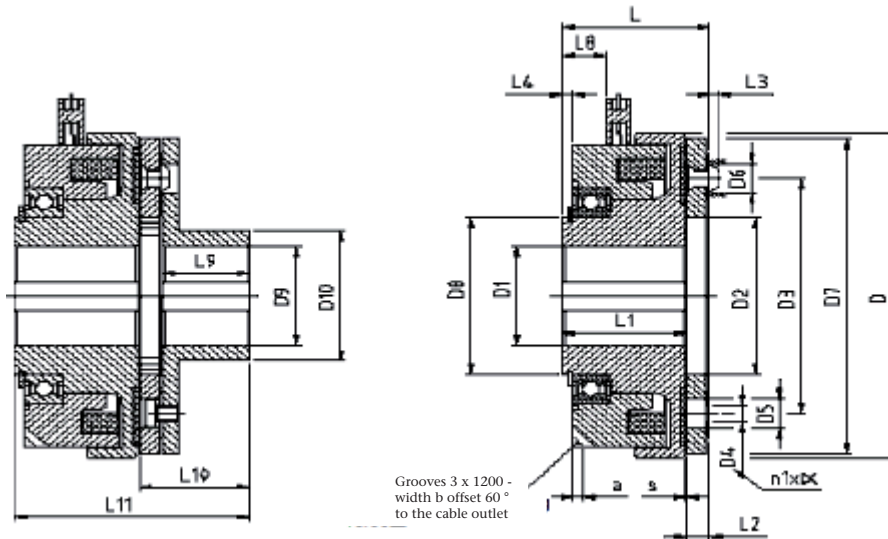
Accessories

From page 4.49.00

For dry-running only; it is essential to keep the friction surface free of lubricants.

Sale through Ortlinghaus AG, Zug/Switzerland.

Electromagnetic single-face clutches for dry-running only



Series 0808-30. Solenoid body with leads
Series 0808-35. Solenoid body with plug

Series 0808-3.1 armature section with driving flange
Series 0808-3.0 armature section without driving flange

Series Size	0808-3..Size-000000		
	05	13	17
Ms	20	90	180
at n	240	150	120
n max	6000	4000	3000
DC voltage	24 ¹⁾		
Current consumption	20 °C A	0,60	2,05
	80 °C A	0,50	1,65
Power consumption	20 °C W	14,5	49
	80 °C W	11,8	40
Weight	0808-3.0 kg	1,10	3,8
	0808-3.1 kg	1,31	4,5
ØD1 max	25	40	50
Keyway	DIN 6885 8x3,3	12x3,3	14x3,8
ØD9 max	20	35	50
Keyway	DIN 6885 6x2,8	10x3,3	14x3,8
Diameter	D	82	134
	D2	42	62
	D3	60	95
	D7	80	125
	D8	74	122
	D10	33	50
Bores	D4	4,1	6,2
	D5 and D6	8	12
	n1 x α	3x120°	3x120°
Length dimensions	L	44	62
	L1	38,5	54
	L2	5,2	7,7
	L3	1,8	2,7
	L4	6,5	15
	L5	-	-
	L6	-	-
	L7	-	-
	L8	10,7	21
	L9	20	30
	L10	25,2	37,7
	L11	64	92
	a	3x45°	5x45°
	b	8	10
	s air gap ²⁾	0,3	0,3

1) other voltages on request

2) Up to Size 05 s +0,1, Size 13 upwards s +0,2.

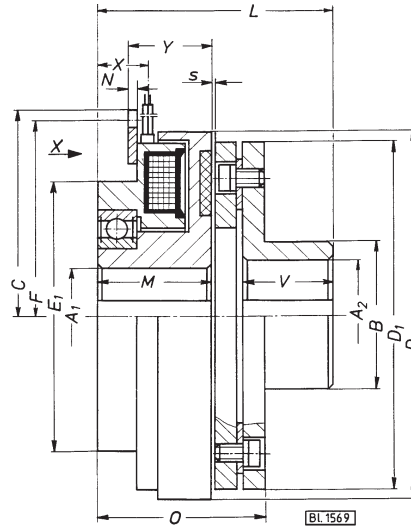
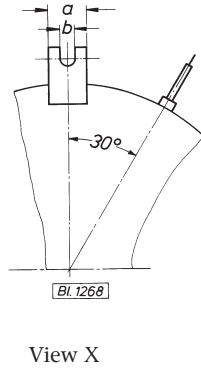
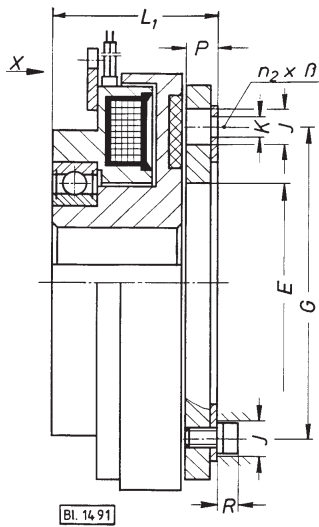
Tolerances For bores and keyways see section 1
"Technical information"

Accessories From page 4.49.00

For dry-running only; it is essential to keep the friction surface free of lubricants.

Sale through Ortlinghaus AG, Zug/Switzerland.

Electromagnetic single-face clutches for dry-running only



Series 0008-300 armature section without driving flange

Series 0008-301 armature section with driving flange

Series Size	0008-30.-Size-002000								
	01	05	09	13	17	25	33		
Mdyn at n	Nm min ⁻¹	7,5 300	15 240	30 200	60 150	120 120	240 100	480 80	
n max	min ⁻¹	7000	6000	5000	4000	3000	2500	2000	
DC voltage	V	24							
Power consumption	20 °C W 80 °C W	16 13	21,5 17,5	29,5 24	44,5 36	60 48,5	66 53,5	83 67	
J	support plate armature section	kgcm ² kgcm ² kgcm ²	0,9 0,3 0,8	3 1 2	9 3 8	23 9 21	82 30 67	195 128 267	550 368 793
Weight	kg kg	0,61 0,72	1,09 1,3	2,16 2,57	3,6 4,3	6,8 8,2	12,5 15,5	21,4 26,9	
ØA1 max Keyway	H7 DIN 6885	15 5x2,3	20 6x2,8	30 8x3,3	40 12x3,3	50 14x3,8	60 18x4,4	60 18x4,4	
ØA2 max Keyway	H7 DIN 6885	15 5x2,3	20 6x2,8	30 8x3,3	35 10x3,3	50 14x3,8	65 18x4,4	80 22x5,4	
Diameter	D	68	85,5	107	134,5	170,5	214	266,5	
	D1	63	80	100	125	160	200	250	
	B	28	33	43	50	66	84	106	
	E	35	42	52	62	80	100	125	
	E1	52	64	85	100	125	155	155	
G	46	60	76	95	120	158	210		
Bores	J	6,5	8	10,5	12	15	18	22	
	K	3,1	4,1	5,2	6,2	8,2	10,2	12,2	
	n2 x beta	3x120°	3x120°	3x120°	3x120°	3x120°	3x120°	4x90°	
Length dimensions	a	10	10	10	10	20	20	20	
	b	4,1	4,1	4,1	4,1	8,1	8,1	8,1	
	C	41	50	61	76	99	119	145	
	F	37	46	57	71	93	113	139	
	L	55	64	77	86,5	102,5	125,5	145	
	L1	40	44	52	56,5	64,5	77,5	90	
	M	36	38,5	45	48,5	54	64	74	
	N	1,5	2,5	2,5	2,5	3,5	3,5	3,5	
	O	43,5	48	57	62,5	71,5	86,5	101	
	P	3,8	5,2	6,7	7,7	10,1	13	15,4	
	R	2,5	3,3	4,1	4,7	5,8	7	8	
	s ¹⁾ air gap	0,2	0,3	0,3	0,3	0,4	0,5	0,6	
	V	15	20	25	30	38	48	55	
	X	17	18	22	23	24,5	29	34	
Y	25,5	28	31,5	35	39,5	45,5	51,5		

1) Up to Size 09 s +0,1, Size 13 upwards s +0,2.

For dry-running only; it is essential to keep the friction surface free of lubricants.

Tolerances

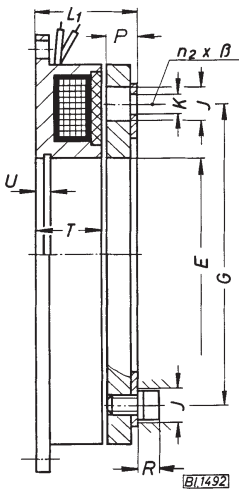
For bores and keyways see section 1 "Technical information"

Accessories

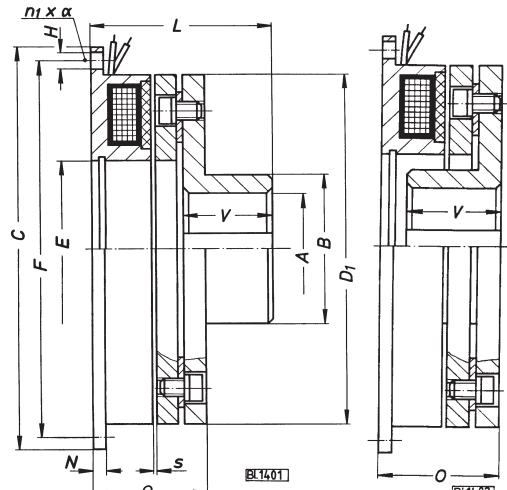
From page 4.49.00

Sale through Ortlinghaus AG, Zug/Switzerland.

Electromagnetic single-face brakes for dry-running only



Series 0009-100
Armature section without driving flange



Series 0009-101 **Series 0009-102**
Armature section with driving flange
External hub Internal hub

Series Size	0009-10.-Size-002000							
	00	01	05	09	13	17	25	33 ¹⁾
Mdyn at n	Nm 450	7,5 300	15 240	30 200	60 150	120 120	240 100	480 80
n max	min ⁻¹							
DC voltage	V							
Power consumption	20 °C W 80 °C W	5 4	11 9	15,5 12,5	20 16,5	28 23	35 28,5	48 39
J armature section	0009-100 kgcm ² 0009-101/102 kgcm ²	0,12 0,14	0,3 0,8	1 2	3 8	9 21	30 67	128 267
Weight	0009-100 kg 0009-101/102 kg	0,165 0,21	0,26 0,37	0,49 0,69	0,91 1,31	1,69 2,38	3,2 4,5	6,3 9,3
Recommended bores ²⁾	Amax H7 Keyway DIN 6885	8 2x1	15 5x2,3	20 6x2,8	30 8x3,3	35 10x3,3	50 14x3,8	65 18x4,4
	A H7 Keyway DIN 6885		10 3x1,4	15 5x2,3	25 8x3,3	30 8x3,3	40 12x3,3	50 14x3,8
	A H7 Keyway DIN 6885				20 6x2,8	25 8x3,3	30 8x3,3	40 12x3,3
Diameter	D1	42	63	80	100	125	160	200
	B	14,5	28	33	43	50	66	84
	C h9	60	80	100	125	150	190	230
	E H8 ³⁾	18	35	42	52	62	80	100
	F	52	72	90	112	137	175	215
	G	29	46	60	76	95	120	158
Bores	H	4,3	4,5	5,5	6,5	6,5	9	9
	n1 x alpha	3x120°	4x90°	4x90°	4x90°	4x90°	4x90°	4x90°
	J	6	6,5	8	10,5	12	15	18
	K	2,8	3,1	4,1	5,2	6,2	8,2	10,2
	n2 x beta	2x180°	3x120°	3x120°	3x120°	3x120°	3x120°	3x120°
Length dimensions	L	33	37	44,5	53	61	73	89,5
	L1	21	22	24,5	28	31	35	41,5
	N	2	2	2,5	3	3,5	4	5
	O	24	25,5	28,5	33	37	42	50,5
	P	3,8	3,8	5,2	6,7	7,7	10,1	13
	R	2,5	2,5	3,3	4,1	4,7	5,8	7
	s ⁴⁾ air gap	0,2	0,2	0,3	0,3	0,3	0,4	0,5
	T	17	18	19	21	23	24,5	28
	U	-	3,5	4,3	5	5,5	6	7
	V	12	15	20	25	30	38	48

1) Further sizes on request.

2) Bore diameters in bold print are available ex stock.

3) H8 only for coil bodies.

4) Up to size 09 s + 0,1; size 13 and upwards s + 0,2.

Tolerances

For bores and keyways see section 1 "Technical information"

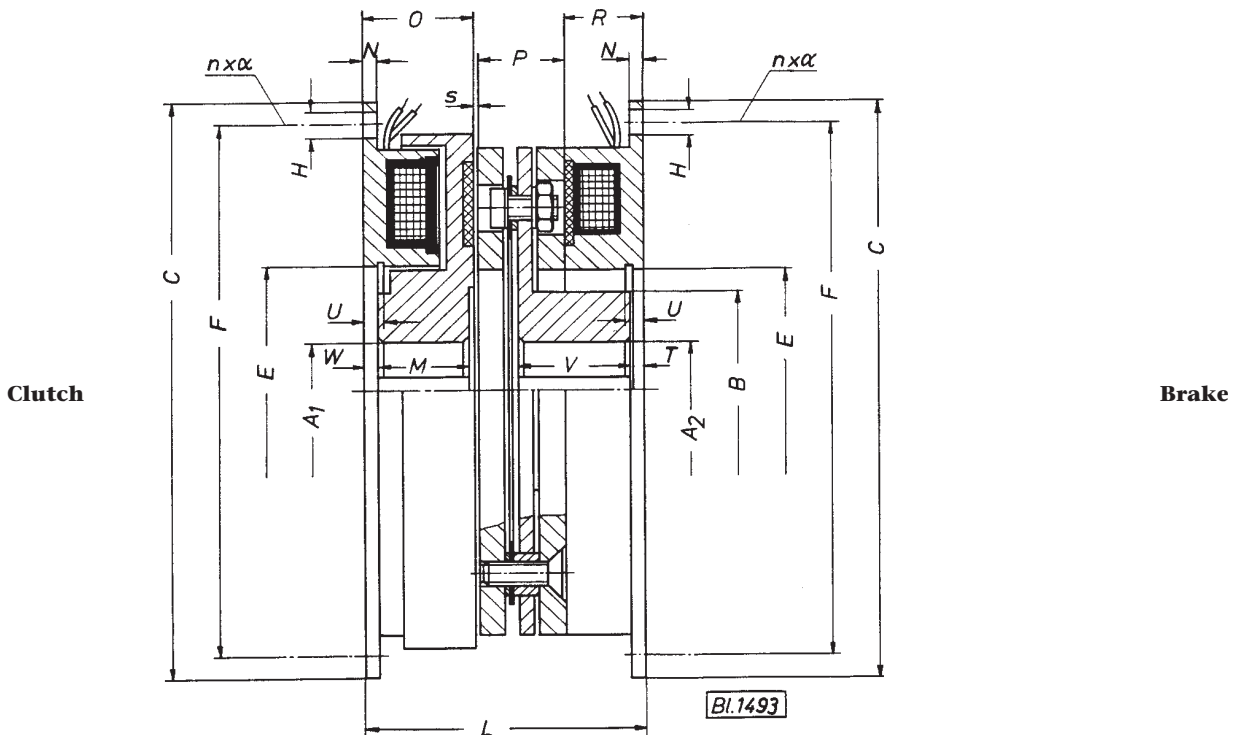
Accessories

From page 4.49.00

For dry-running only; it is essential to keep the friction surface free of lubricants.

Sale through Ortlinghaus AG, Zug/Switzerland.

**Electromagnetic single-face
clutch/brake combined units
for dry-running only**



Series Size		0008-102-Size-002000						
		01	05	09	13	17	25	33 ¹⁾
Mdyn at n	Nm min ⁻¹	7,5 300	15 240	30 200	60 150	120 120	240 100	480 80
n max	min ⁻¹	7000	6000	5000	4000	3000	2500	2000
DC voltage	V	24						
Power consumption	Clutch 20 °C W	16	21,5	29,5	36,5	50	66	83
	80 °C W	13	17,5	24	29,5	40,5	53,5	67
J	Support plate kgcm ²	0,9	3	9	23	82	195	550
	Armature section kgcm ²	1,1	3,2	10,5	30	96	395	1160
Weight	kg	0,83	1,55	2,96	5,3	10,1	19,4	36
ØA1 max	H7	15	25	30	40	50	70	80
Keyway	DIN 6885	5x2,3	8x3,3	8x3,3	12x3,3	14x3,8	20x4,9	22x5,4
ØA2 max	H7	15	20	30	35	50	65	80
Keyway	DIN 6885	5x2,3	6x2,8	8x3,3	10x3,3	14x3,8	18x4,4	22x5,4
Diameter	B	28	33	43	50	66	84	106
	C h ⁹	80	100	125	150	190	230	290
	E H8 ²⁾	35	42	52	62	80	100	125
	F	72	90	112	137	175	215	270
	H	4,5	5,5	6,5	6,5	9	9	11
	n x alpha	4x90°	4x90°	4x90°	4x90°	4x90°	4x90°	4x90°
Length dimensions	L	53,4	59,5	69	77,5	88,5	106	123
	M	19,5	22	24,5	27	31	37	43,5
	N	2	2,5	3	3,5	4	5	6
	O	24	25,5	29	32,5	36	42	48
	P	11,2	14,7	18,7	21,7	27,6	35,5	42,4
	R	18	19	21	23	24,5	28	32
	s air gap ³⁾	0,2	0,3	0,3	0,3	0,4	0,5	0,6
	T	10,5	8,5	8	7	4	2,4	4
	U	3,5	4,3	5	5,5	6	7	8
	V	13,6	18	22,8	27,6	35	44,1	51,2
	W	2	2,5	3	3,5	3,5	4	4

1) Further sizes on request.

2) H8 only for coil bodies.

3) Up to size 09 s + 0,1; size 13 and upwards s + 0,2.

For dry-running only; it is essential to keep the friction surface free of lubricants.

Tolerances

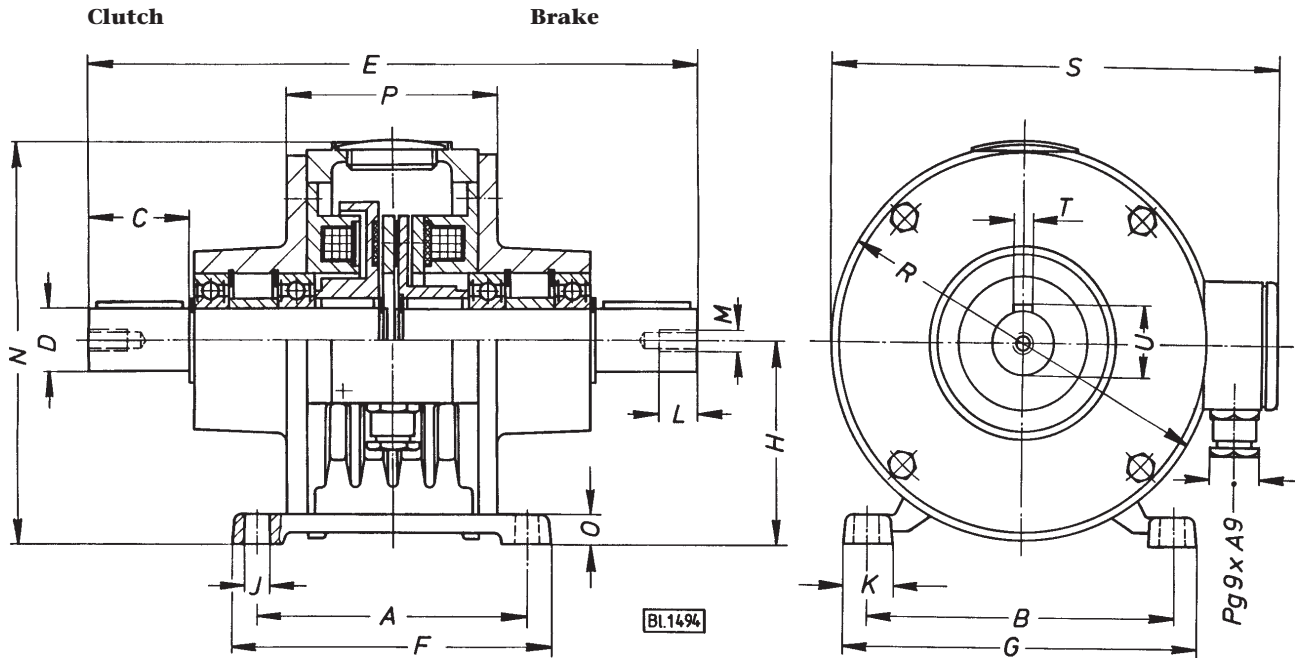
For bores and keyways see section 1 "Technical information"

Accessories

From page 4.49.00

Sale through Ortlinghaus AG, Zug/Switzerland.

**Electromagnetic single-face
clutch/brake combined units in housing
for dry-running only**



Series Size		0081-000-Size-002000				
		01	05	09	13	17
M _{dyn} at n	Nm min ⁻¹	7,5 300	15 240	30 200	60 150	120 120
DC voltage		24				
Power consumption	Clutch 20 °C W	16	21,5	29,5	36,5	50
	80 °C W	13	17,5	24	29,5	40,5
	Brake 20 °C W	11	15,5	20	28	35
	80 °C W	9	12,5	16,5	23	28,5
J	input kgcm ²	0,9	2,7	9,1	24	89
	output kgcm ²	1,1	3,4	11	31	100
Weight		3,3	5,2	9	15	30
Dimensions	A	90	100	110	120	140
	B	85	105	125	140	216
	C	18	36	42	58	82
	D j _s	14	20	25	30	40
	E	152	204	250	302	385
	F	105	120	130	150	170
	G	105	125	145	165	246
	H	63	71	80	100	132
	J	7,5	9,5	9,5	12	12
	K	20	20	20	25	30
	L	10	12	16	20	20
	M	M5	M6	M8	M10	M10
	N	123	140	158	197,5	257
	O	10	11	12	12	20
P	66	74	85	96	111	
R	120	138	156	195	250	
S ~	145	164	182	222	277	
T h ⁹	5	6	8	8	12	
U	16	22,5	28	33	43	

For dry-running only; it is essential to keep the friction surface free of lubricants.

Accessories

From page 4.49.00

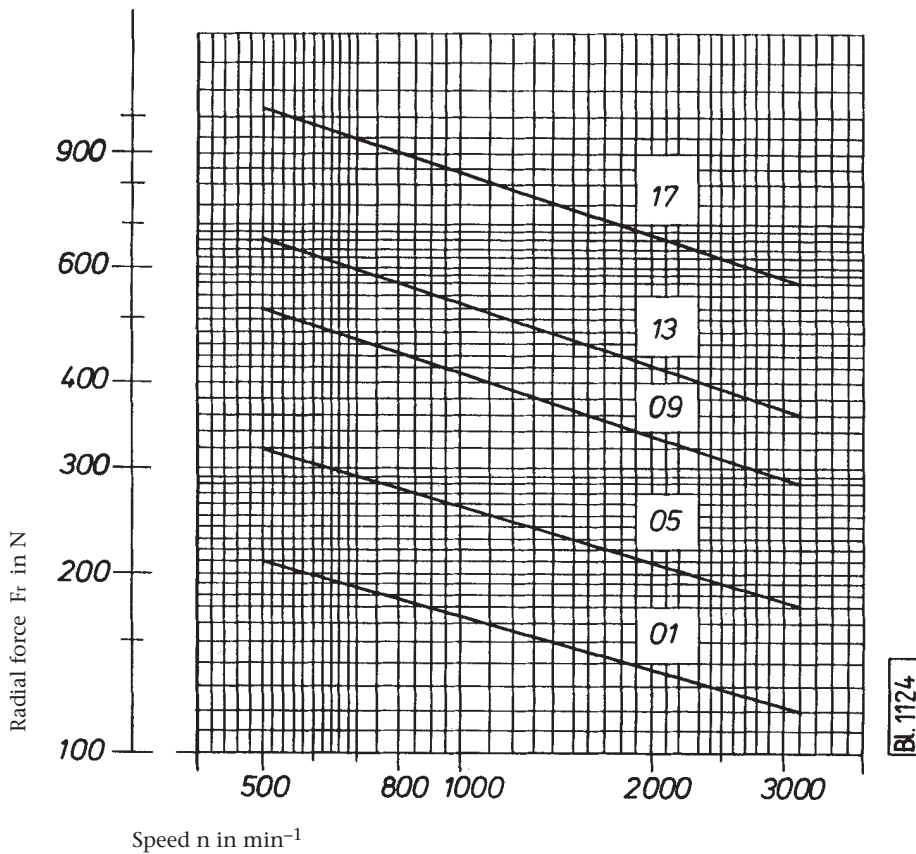
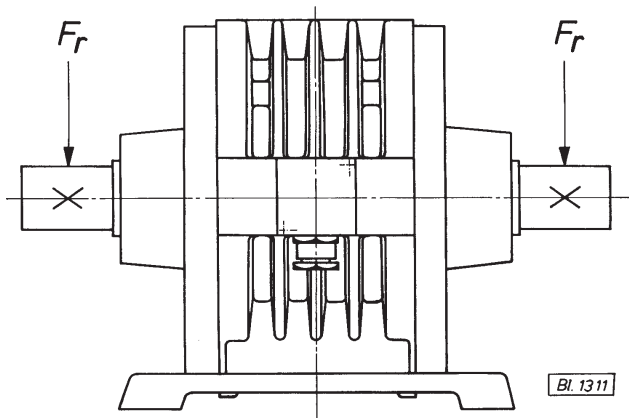
Sale through Ortlinghaus AG, Zug/Switzerland.

Series 0081

Page
EN 4.28.00

Edition 02.2010

**Electromagnetic single-face
clutch/brake combined units in housing**
Permissible max. load on bearings

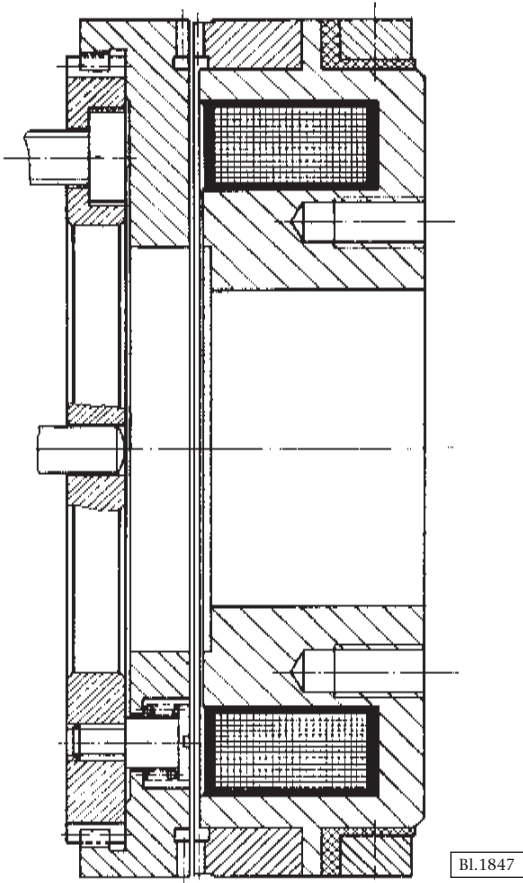


Size	01	05	09	13	17
n max*	3500	3000	2600	2200	2000

* Assuming a service life of the sealed-for-life bearings of 10,000 h

Tooth clutches

Design characteristics and properties



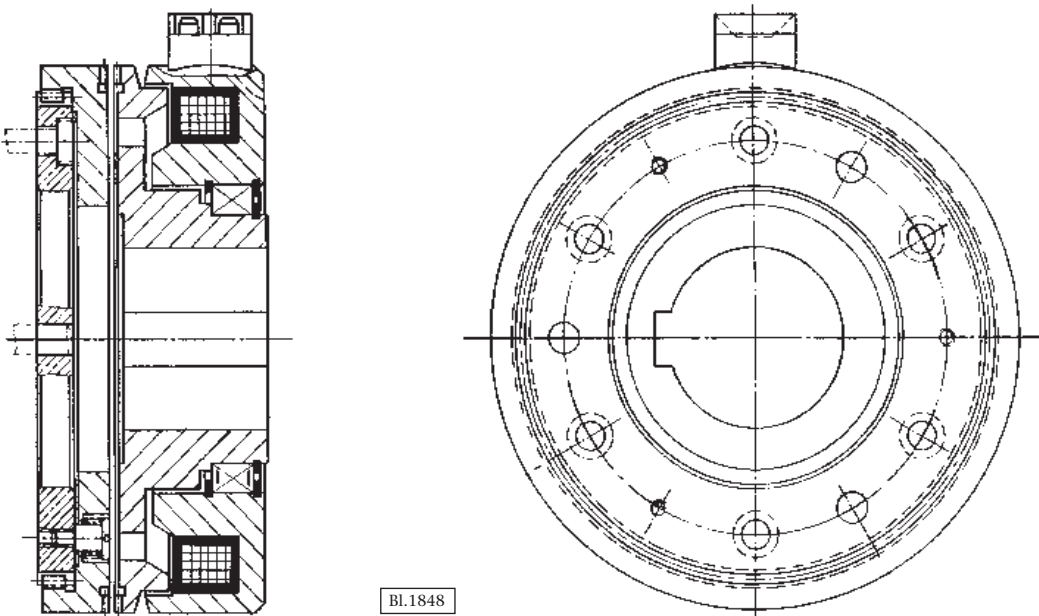
Series 0012 with slipping

Tooth clutches transmit torque via two meshing sets of teeth. Size for size they can transmit larger torques than multi-plate clutches and their moments of inertia are low. In addition there is no idling friction so that high idling speeds are possible.

The clutches can only be engaged when they are stationary or when there are only small differences in the relative speeds.

Disengagement can be carried out at full speed and under load. When two tooth clutches are being switched alternately (in the stationary state) the response time for the clutch to be disengaged can be reduced considerably by counter-excitation.

Since tooth clutches cannot transmit peak torques over their rated value, particular caution must be used when selecting the unit. In addition to the static requirements of the input or output side, the dynamic characteristics of the complete system must be considered including such factors as motor starting torques and the engagement of friction clutches.



Series 0013
stationary field

Installation

Coil body and armature plate with drive plate must be securely located axially and must run true relative to one another axially and radially. Eccentricity can reduce the torque that can be transmitted. Correct meshing of the teeth is essential. Tooth clutches may be fitted horizontally or vertically. When installed vertically, the armature plate should lie at the bottom if possible.

The following points should be observed when securing the drive plate to the input or output part:

1. After drilling the dowel holes, fit spring bolts and springs, secure against rotation (Fig. 1a).
2. Where a tooth clutch is supplied without the drive plate, the hexagonal nuts must be removed before installation (Fig. 1b). Fit spring bolts and springs, secure against rotation (Fig. 1c).

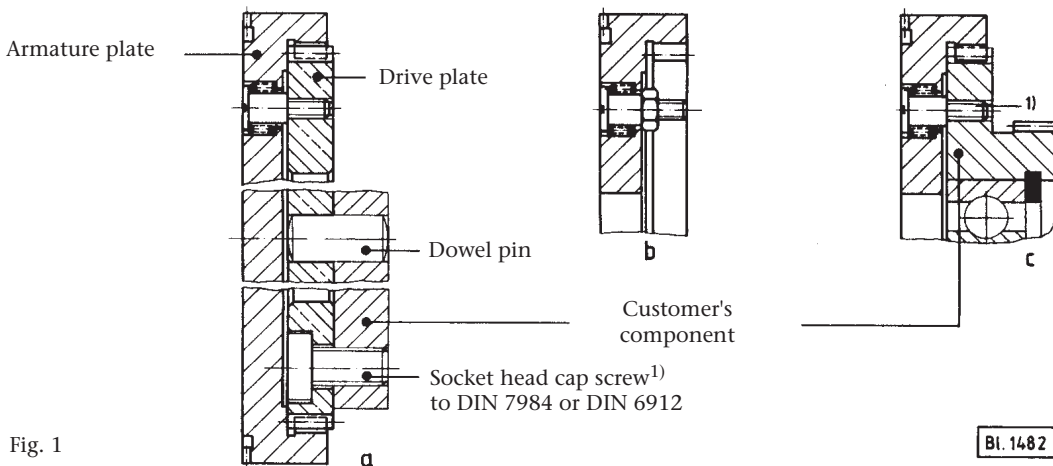


Fig. 1

¹⁾ Secure all screws with Loctite 262!

Actuation

Fig. 2 shows the basic control circuit diagram for a tooth clutch used in conjunction with a friction clutch or a motor, the tooth clutch is always engaged before the other components.

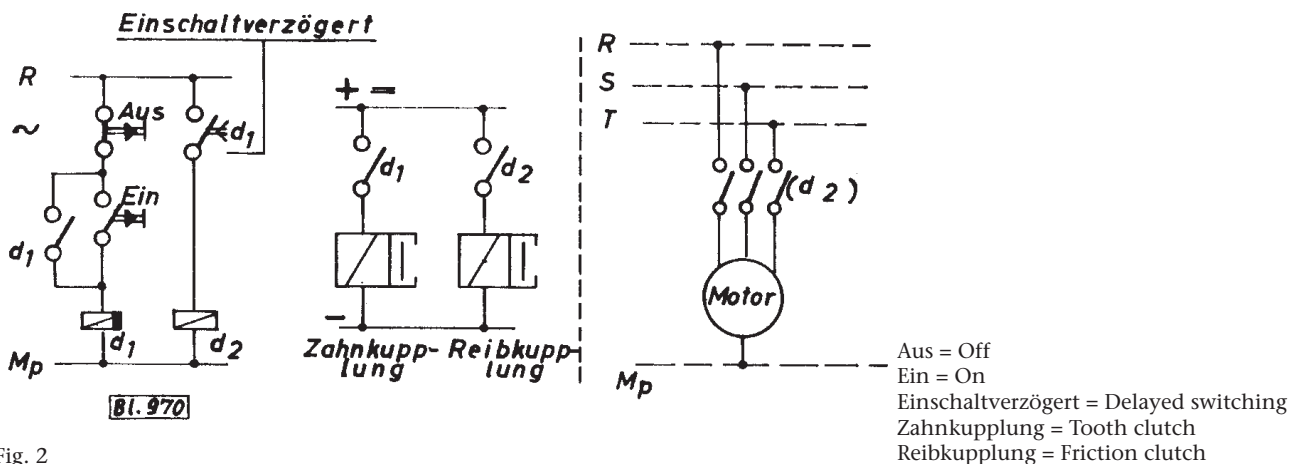


Fig. 2

Application examples

Example a):

A tooth clutch is fitted between a motor and a gearbox which drives a machine (Fig. 3). Here the torque of the tooth clutch must be greater than the starting or pull-out torque of the motor, otherwise the clutch will slip.

M_{statZ} = Static torque of the tooth clutch
 M_N = Nominal motor torque
 M_{KM} = Motor pull-out torque

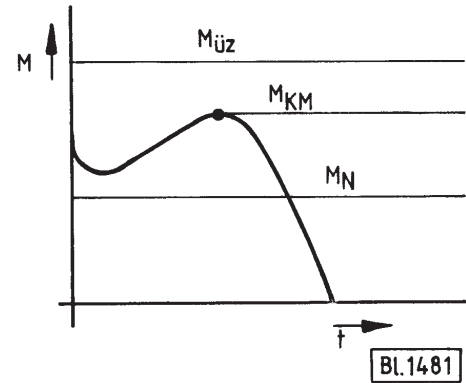
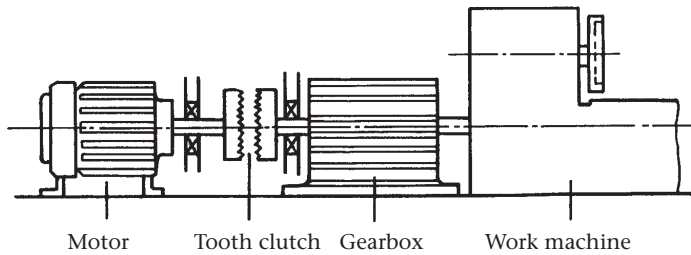


Fig. 3: Drive layout incorporating tooth clutch (Load by M_{KM})

Example b):

If a tooth clutch is used together with a friction clutch as shown in Fig. 4, the torque behaviour of the friction clutch as well as the masses upstream and downstream of the tooth clutch and the stiffness/elasticity of the system must be known.

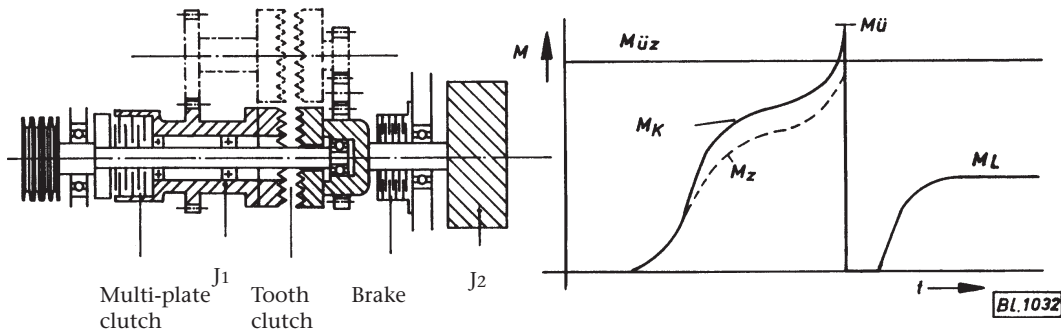


Fig. 4: Drive layout with tooth and multi-plate clutch (Torques during engagement)

The torque of the tooth clutch can be calculated from the following formula taking into account the processes between the friction clutch and the tooth clutch as well as the downstream masses:

M_{statZ} = Static torque of the tooth clutch
 M_Z = Torque on tooth clutch
 M_{stat} = Static torque of the multi-plate clutch
 M_K = Torque on multi-plate clutch
 M_L = Load torque

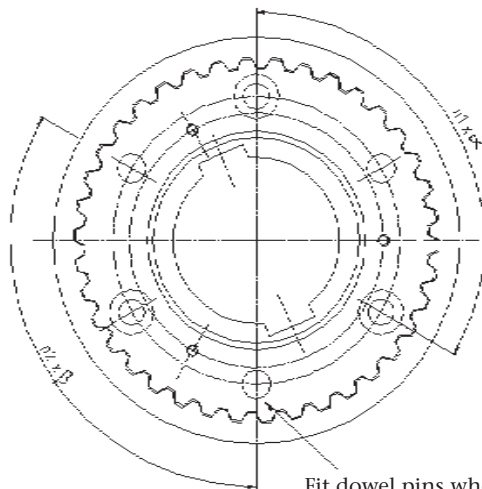
$$M_Z = M_{stat} \cdot \left[1 - \frac{J_1}{J_1 + J_2} \right] \quad \text{in Nm}$$

For reasons of safety M_{statZ} must be greater than M_Z .

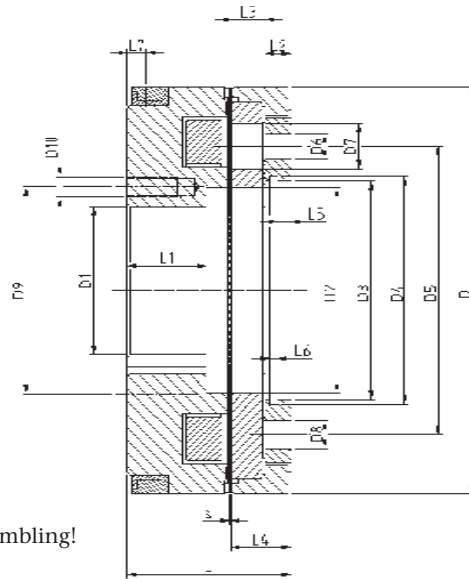
In certain cases the damping effect from elasticity in the system can be taken into consideration.

Electromagnetic slipping tooth clutches for dry- or wet-running

If the coil body bores are not provided with keyways, secure against rotation with dowel pins. Tapped holes are drilled by the customer at installation. Dimensions D9 and D10 must be maintained.



Fit dowel pins when assembling!



Material pair steel / brass ³⁾:

Series 0812-000 Normal splining

Series 0812-001 Fixed point splining 1x360°

Series 0812-002 Fixed point splining 2x180°

Series 0812-003 Fixed point splining 4x90°

Series Size		07	0812-00 . -Size-000000			31
			11	15	23	
Mü	Nm	100	200	400	600	1200
n max dry-running	min ⁻¹	4600	4000	3400	2800	2300
n max wet-running 1 Power feed	min ⁻¹	2300	2000	1700	1400	1150
n max wet-running 2 Power feeds	min ⁻¹	4600	4000	3400	2800	2300
DC voltage	V	24 ¹⁾				
Current consumption	20 °C A	0,30	0,45	0,65	0,55	0,50
	80 °C A	0,25	0,40	0,50	0,45	0,40
Power consumption	20 °C W	7,5	11,0	15,5	13,6	12,5
	80 °C W	6,0	9,0	12,5	11,0	10,0
Weight	kg	0,98	1,52	2,60	4,14	7,50
ØD1 prebored		18	20	20	20	38
Recommended bores ¹⁾	D1 max H7 Keyway ²⁾ DIN 6885	30 8x2	35 10x3,3	45 12x3,3	55 16x4,3	70 16x4,3
	D1 H7 Keyway DIN 6885	25 8x3,3	30 8x3,3	40 12x3,3	52 14x3,8	
Number of keyways		2x180°	2x180°	2x180°	3x120°	3x120°
Diameter	D	82	95	114	134	166
	D2	36,5	46	55	68	80
	D3 H7	42	52	62	72	90
	D4	44,5	55	65	75	93,5
	D5	60	70	80	95	120
	D9	41	47,5	57,5	68	87,5
Bores	D10	M4	M6	M6	M8	M10
	D6	5,8	6,8	6,8	8,5	8,5
	D7	10	12	13	15	15
	n1 x α	3x120°	3x120°	3x120°	3x120°	6x60°
	D8 prebored for dowel pins	4,5	5,5	7,8	9,5	9,5
	n2 x β	3x120°	3x120°	3x120°	3x120°	3x120°
Length dimensions	L	33	41	46	54	63,5
	L1 -0,1	16,5	20	23	26	30
	L2	4,6	6	6,5	8,4	11,4
	L3	6,3	8,7	9	11	13,1
	L4	11	15	16	20	25
	L5	2,3	3	3,5	4,5	5,5
	L6	1,85	2,15	2,15	2,65	3,15
	L7	5,5	5,5	6	7,5	8
	s air gap	0,3	0,4	0,4	0,4	0,5

1) other bores and voltages on request

2) Provide a key which must support along the whole length L1!

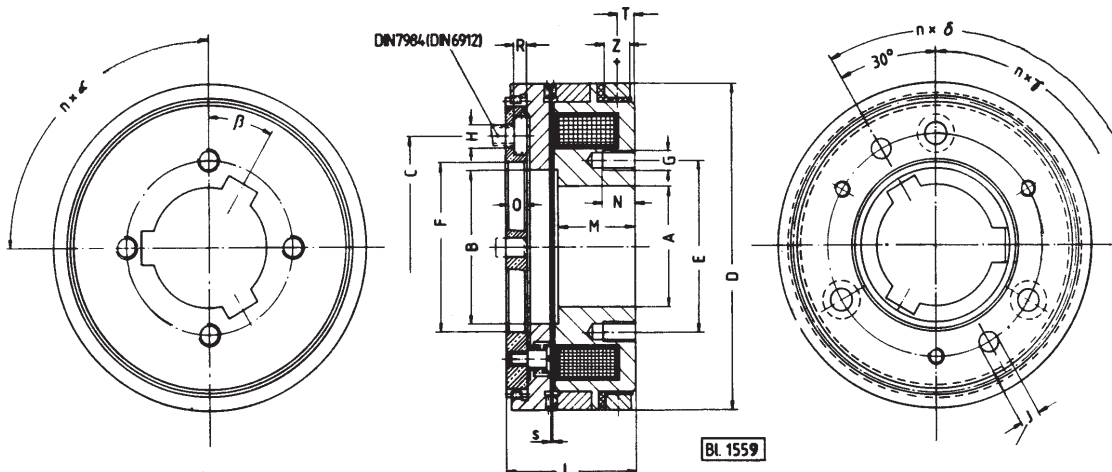
3) other material pairs on request

Passungen For bores and keyways see section 1 "Technical information"

Accessories From page 4.49.00

Sale through Ortlinghaus AG, Zug/Switzerland.

Electromagnetic slipping tooth clutches for dry- or wet-running



Important: Secure screwed unions with Loctite type 262!

Tapped holes are drilled by the customer at installation. Dimensions E, G and N must be maintained.

J: Fit dowel pins at installation!

If the coil body bores are not provided with keyways, secure against rotation with dowel pins.

Series Size		0012-005-Size-000000							
		03	07	11	15	23	31	43	51 ⁴⁾
Mstat	Nm	40	100	200	350	600	1200	2200	4000
n max dry-running	min ⁻¹	5400	4600	4000	3400	2800	2300	2000	1600
n max wet-running	1 Power feed min ⁻¹	2700	2300	2000	1700	1400	1150	1000	800
n max wet-running	2 Power feeds min ⁻¹	5400	4600	4000	3400	2800	2300	2000	1600
DC voltage	V	24							
Power consumption	20 °C W	11,5	23,5	28	47,5	58,5	78,5	80,5	100
	80 °C W	9,5	19	22,5	38,5	47,5	63,5	65	81
J	Coil body kgcm ²	3	7	14	31	65	185	415	1215
	Drive armature kgcm ²	2	4	7	19	40	114	215	705
Weight	kg	0,602	1,038	1,581	2,603	4,045	7,276	11,32	21,5
ØA prebored		16	18	20	20	20	38	40	50
Recommended bores ³⁾	A max ¹⁾ H7	25	30	35	45	52	70	78	98
	Keyway ²⁾ DIN 6885	8x2	8x2	10x3,3	12x2,2	14x3,8	16x4,3	20x4,9	22x5,4
	A H7	20	25	30	40				
	Keyway DIN 6885	6x2,8	8x3,3	8x3,3	12x3,2				
	A H7			28	30				
	Keyway DIN 6885			8x3,3	8x3,3				
	A H7			25					
	Keyway DIN 6885			8x3,3					
Number of keyways offset by β relative to tapped hole		1x	2x180°	2x180°	2x180°	3x120°	3x120°	3x120°	3x120°
		30°	30°	22,5°	22,5°	22,5°	18°	18°	18°
Diameter	D	70	82	95	114	134	165	195	240
	B	28	35	45	53	63	80	90	112
	C	44	55	65	80	95	120	150	170
	E	32	41	50	60	72	92	110	140
	F H7	32	40	50	60	70	90	100	130
Bores	G	M4	M4	M6	M6	M8	M10	M10	M12
	n x α	3x120°	3x120°	4x90°	4x90°	4x90°	5x72°	5x72°	5x72°
	H	4,5	5,5	6,5	6,5	8,5	8,5	10,5	13
	n x γ	3x120°	3x120°	3x120°	3x120°	3x120°	6x60°	6x60°	6x60°
	J prebored for dowel pins	4,5	4,5	5,5	7,5	9,5	9,5	11,5	13,5
	n x δ	2x180°	2x180°	2x180°	2x180°	2x180°	3x120°	3x120°	3x120°
Length dimensions	L	27,5	37	38	43	50	60	68	81
	M	17	22	23	24	30	36	40	46
	N	8	10	10	12	15	15	18	20
	O	4,5	6	6	7,5	9	11	11	14
	R	2,8	3,5	4	4	5	5	6,5	7,5
	s air gap	0,4	0,5	0,5	0,5	0,6	0,6	0,8	1
	T	3,5	5,5	5,5	6	7	7	7	8,5
	Z	6	8	8	8	8	8	8	10

1) Smaller bores on request.

2) Provide a key which must support along the whole length M!

3) Bore diameters in bold print are available ex stock.

4) Larger sizes on request

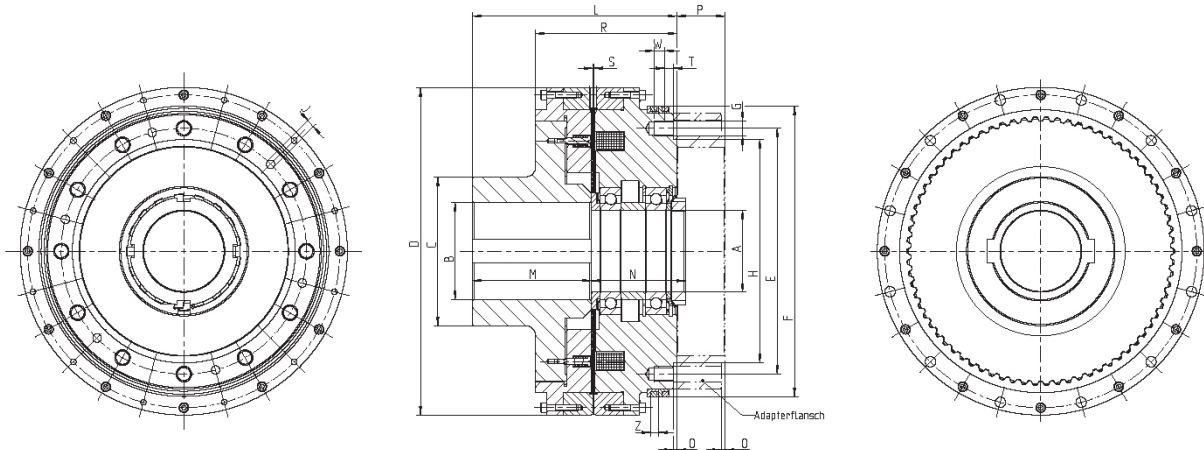
Tolerances

For bores and keyways see section 1 "Technical information"

Accessories

From page 4.49.00

**Electromagnetic stationary field tooth clutches
bearing version
for dry and wet-running**



**Compact design /
High power density**

Static engagement only, or in very low low speed

Series Size			0012-365-Größe-000000				
			66	77	84	90	94
Mü	Nm		4.000	7.600	16.000	55.000	100.000
n max	dry-running	min ⁻¹	1230	1230	970	810	610
n max	wet-running (1 brush/ slip ring)	min ⁻¹	610	610	480	400	300
n max	wet-running(2 brushes/ slip ring)	min ⁻¹	1230	1230	970	810	610
DC voltage			110 V DC ³⁾				
power consumption at DC voltage	at 80 °C	W	121	121	110	191	260
	at 20 °C	W	149	149	145	236	320
J	Coil body	ca.kgm ²	0,67	0,70	2,45(3,01 ²⁾)	4,36	32,0(35,8 ²⁾)
	Drive armature	ca.kgm ²	0,45	0,46	2,01	7,33	29,8
Weight	ca.kg		89	92	186(207 ¹⁾)	352	885(952 ¹⁾)
Diameter	A	mm	85	100	110	120	190
	B	mm	120	120	130	140	300
	C	mm	180	180	200	220	400
	D	mm	322	322	440	510	740
	E	mm	230	230	330	410	530
	F	mm	310	310	390	470	621
	G		M16	M16	M20	M24	M30
	G (partition)		12x30°	12x30°	12x30°	16x22,5°	16x22,5°
	H	mm	210	210	300	370	490
	J	mm	16	16	12	20	20
J (partition)		6x60°	6x60°	6x60°	8x45°	8x45°	
Length dimensions	L	mm	260	290	275	429	491
	M	mm	114	129	160	193	260
	N	mm	151	166	127	249	252
	O	mm	5	5	5	6	6
	P	mm	/	/	65	/	89
	R	mm	170	185	190	294	330
	S ^{-0,2}	mm	1	1	1	1	2
	W	mm	20	20	15	25	25
	T	mm	30	45	11	64	12
	Z	mm	10	10	10	17	17

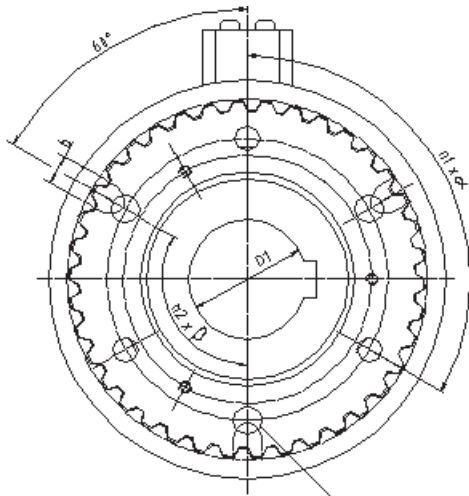
accessories caliper-type brushholder, dry-running:
high-speed switching device SSG 110V:
high-speed switching device SSG 24V:
Transformator Prim. 400V Sek. 230V/115V:
Transformator Prim. 400V Sek. 230V/24V:

2993-134-90-000000
0085-609-05-161000
0085-609-05-002000
0085-099-00-035151
0085-099-00-050151

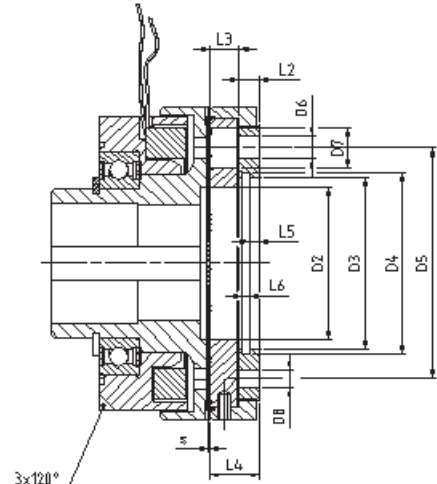
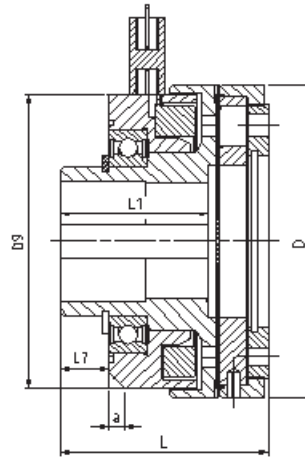
¹⁾ with adapterring
²⁾ other Ø on request
³⁾ other on request

Electromagnetic stationary field tooth clutches

For dry- or wet-running



Fit dowel pins at installation



offset 60° relative to plug connection

Series 0813-0 . .
Series 0813-5 . .

Closed bearing
Open bearing

Series 0813- . 0 .
Series 0813- . 5 .

Solenoid body with leads
Solenoid body with plug

Material pair steel / brass ³⁾:

Series 0813- . . 0
Series 0812- . . 1

Normal splining
Fixed point splining 1x360°

Series 0812- . . 2
Series 0812- . . 3

Fixed point splining 2x180°
Fixed point splining 4x90°

Series Size		0813- . . . -Size-000000				
		07	11	15	23	31
Mü	Nm	80	120	350	600	1000
n max	min ⁻¹	4000	4000	3800	3700	3300
DC voltage	V	24 ¹⁾				
Current consumption	20 °C A	0.60	1.25	1.85	2.05	2.45
	80 °C A	0.50	1.05	1.50	1.65	2.00
Power consumption	20 °C W	14.5	30.5	44.1	49.0	58.5
	80 °C W	11.8	24.5	35.7	40.0	47.0
Weight	kg	1.1	1.9	2.9	4.9	9.6
Recommended bores ^{1) 4)}	D1 max	25	30	35	40 ²⁾	60 ²⁾
	Keyway	8x3,3	8x2	10x3,3	12x3,3	18x4,4
	D1	22	25	30	35	55 ²⁾
	Keyway	6x2,8	8x3,3	8x3,3	10x3,3	16x4,3
Diameter	D1	20	22	25	30	50 ²⁾
	Keyway	6x2,8	6x2,8	8x3,3	8x3,3	14x3,8
	D	82	95	114	134	166
	D2	36,5	46	55	68	80
	D3 H7	42	52	62	72	90
	D4	44,5	55	65	75	93,5
Bores	D5	60	70	80	95	120
	D6	5,8	6,8	6,8	8,5	8,5
	D7	10	12	13	15	15
	n1 x α	3x120°	3x120°	3x120°	3x120°	6x60°
External groove	D8 prebored for dowel pins	4,5	5,5	7,8	9,5	9,5
	n2 x β	3x120°	3x120°	3x120°	3x120°	3x120°
Length dimensions	ax45° / b	3 / 8	5 / 10	5 / 10	5 / 10	5 / 10
	L	55	63	69	83	93,5
	L1 -0,1	42	45	50	61	66
	L2	4,6	6	6,5	8,4	11,4
	L3	6,3	8,7	9	11	13,1
	L4	11	15	16	20	25
	L5	2,3	3	3,5	4,5	5,5
	L6	1,85	2,15	2,15	2,65	3,15
	L7	11,3	14,5	16,5	22,7	14
	s air gap s±/0.1	0,3	0,4	0,4	0,4	0,5

¹⁾ other bores and voltages on request

²⁾ 2 keyways spaced at 180°.

³⁾ other material pairs on request

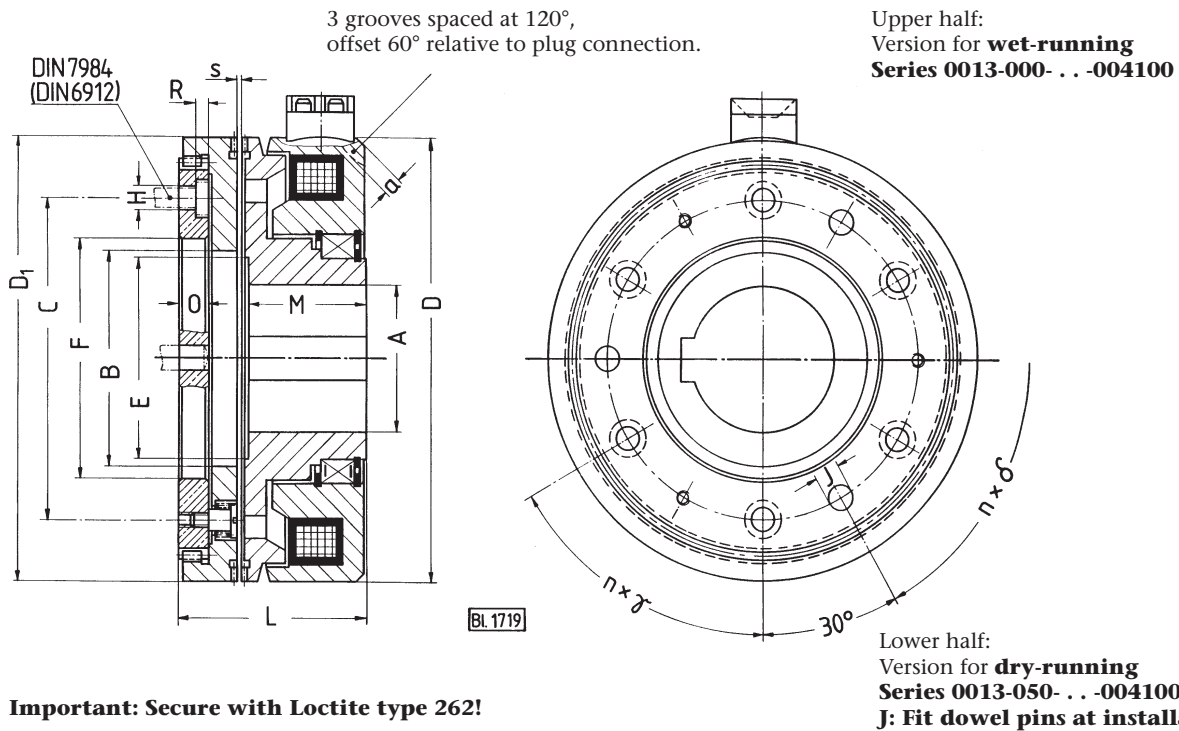
⁴⁾ Bore diameters in bold print are available ex stock

Tolerances For bores and keyways see section 1 "Technical information"

Plug connection See chapter "Accessories"

Sale through Ortlinghaus AG, Zug/Switzerland.

Electromagnetic stationary field tooth clutches For dry- or wet-running



Series Size	0013-0.0-Size-004100							
	07	11	15	23	31	43		
Mstat	Nm		40	80	200	400	800	1600
n max	min ⁻¹		4000	4000	3800	3700	3300	3000
DC voltage	V		24					
Power consumption	20 °C W		26	37	42	63	85	86
	80 °C W		21	30	34	51	69	70
J	coil body	kgcm ²	5	10	18	60	108	181
			drive armature	4	7	19	40	114
Weight	kg		1,6	2,5	3,8	5,9	8,8	14
Recommended bores ²⁾	A max	H7	22	30	35	42¹⁾	55¹⁾	65 ¹⁾
	Keyway	DIN 6885	6x1,6	8x2	10x2,4	12x2,2	16x4,3	18x2,3
	A	H7	20	25	30	40	50¹⁾	
	Keyway	DIN 6885	6x2,8	8x3,3	8x3,3	12x3,3	14x3,8	
	A	H7			25	35	40¹⁾	
	Keyway	DIN 6885			8x3,3	10x3,3	12x3,3	
Diameter	D/D1		80/81,5	95	114	134	165	195
	B		35	45	53	63	80	90
	C		55	65	80	95	120	150
	E		28	38	50	55	80	90
	F H7		40	50	60	70	90	100
Bores	H		5,5	6,5	6,5	8,5	8,5	10,5
	n x gamma		3x120°	3x120°	3x120°	3x120°	6x60°	6x60°
	J prebored for dowel pins		4,5	5,5	7,5	9,5	9,5	11,5
External groove	n x delta		2x180°	2x180°	2x180°	2x180°	3x120°	3x120°
	groove width x a		6x3	6x3	6x4	8x5	8x6	10x8
Length dimensions	L		51	53	56	61	70	84
	M		28	31	30	37	45	55
	O		6	6	7,5	9	11	12
	R		3,5	4	4	5	5	7
	s air gap		0,5	0,5	0,5	0,6	0,6	0,8

1) 2 keyways spaced at 180°.

2) Bore diameters in bold print are available ex stock.

Tolerances

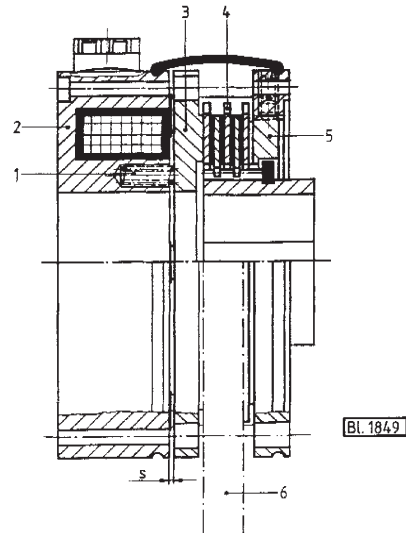
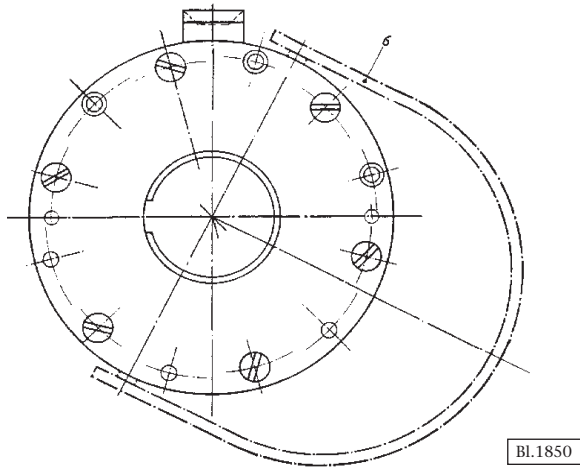
For bores and keyways see section 1 "Technical information"

Plug connection and flat plug

See chapter "Accessories"

Spring-applied multi-plate brakes and twin-face brakes

Operation and installation

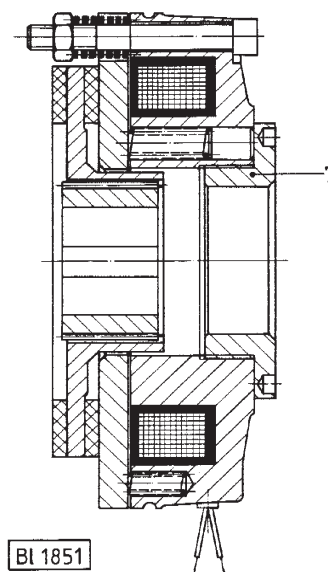
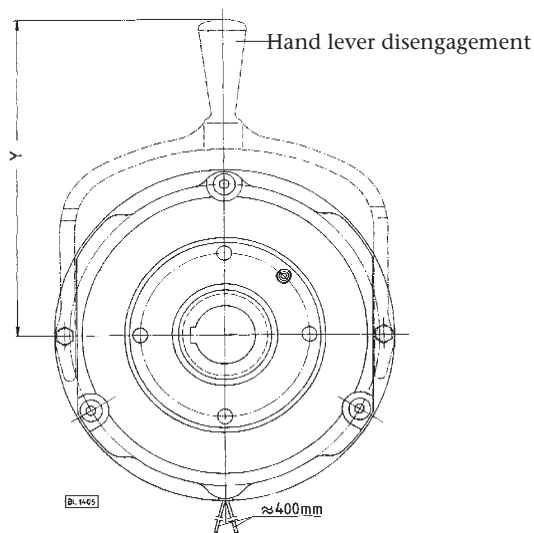


Spring-applied multi-plate brakes, series 0028, 0228

The braking torque is generated by springs (1), which are inserted in the coil body (2). These press the plate stack (4) against the stop plate (centering ring) (5), which is secured to the machine frame, via the armature plate (3), hence applying the brake. When the operating voltage is applied to the coil, this attracts the armature plate (3) to the coil body and the brake is released.

If it is important that the braking time remains constant as far as possible, the wear on the friction linings can be compensated for by adjusting the air gap (s).

The following devices are available to enable the brake to be released manually in the case of the operating voltage failing: push-off or pull-off screws in accordance with the fitting situation or hand lever (6).



Spring-applied two-face brakes series 0207

The operation of these brakes is the same as for the brake described above.

These brakes are also available with a facility for setting the braking torque. With the aid of an

adjusting ring (7), the initial pressure in the springs can be varied within certain limits.

Application and installation

Spring-applied multi-plate brakes

Series 0028 and 0228 are available with friction combinations for dry- or wet-running. For this reason these brakes are well suited for machine drives of all types where a high braking torque and high thermal capacity are important. In the case of dry-running brakes, the friction linings must be protected against penetration of grease and other contamination. For this reason an dust cover for the plate chamber is available.

Power is supplied to the coil body either in the form of 24 V DC via a flat plug or connection box or as 220 V AC at a connection box with integrated rectifier.

Magnetic leakage flux can affect the switching behaviour of the brakes and must be kept as small as possible. If the brake is mounted on a through shaft, an annular gap of adequate size must be provided between the coil body, armature plate bore and the shaft in order to prevent deflection of the magnetic field. This is particularly important in connection with electric motors where magnetization of the shaft can lead to the releasing of the brake being delayed.

Sufficient space must be provided for maintenance work such as setting the air gap and replacing the plates as well as for actuating the hand brake-releasing lever.

Spring-applied twin-face brakes

Supplied for dry-running (generally in open arrangements), the series 0207 brakes can be used universally thanks to their simple construction and the low level of maintenance they require. However, account must be taken of the somewhat lower range of braking torques they provide. They are extensively used as safety brakes on electric motors.

With these brakes the power is supplied via cables which are connected to the coil body.

Here again care must be taken that sufficient space is left for maintenance work, e.g. for the setting of the braking torque, and in particular for the actuation of the hand lever disengagement.

Separate clutch and brake working together

A spring-applied brake is often installed in conjunction with an electromagnetically actuated clutch. The spring pressure causes the brake to release slowly, therefore to prevent the clutch engaging before the brake is released (Fig. a), a microswitch can be mounted on the brake (Fig. b). When the armature plate is attracted to the coil body, the microswitch sends a pulse to the clutch contactor. The microswitch can also be replaced by a time relay (Fig. c). The clutch will then not receive power until the brake has been released (approx. 0.1 - 0.2 s), this being controlled via the microswitch or time relay.

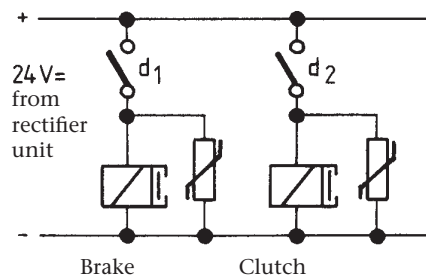


Fig. a

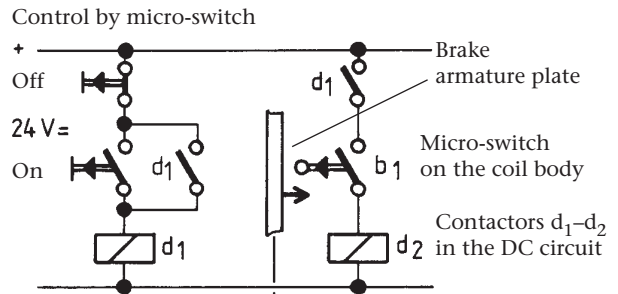


Fig. b

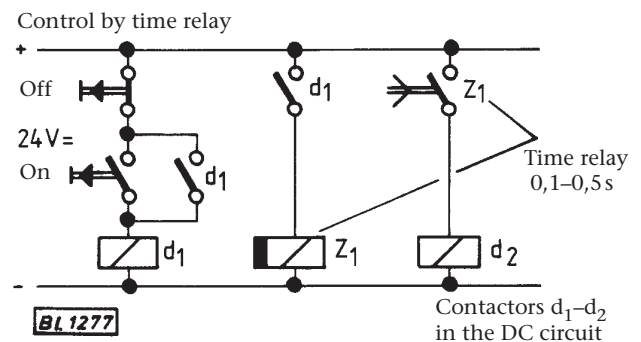
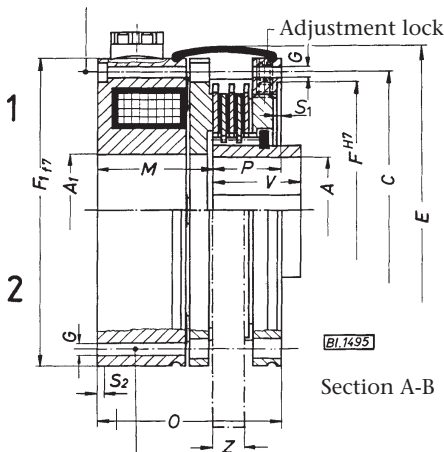


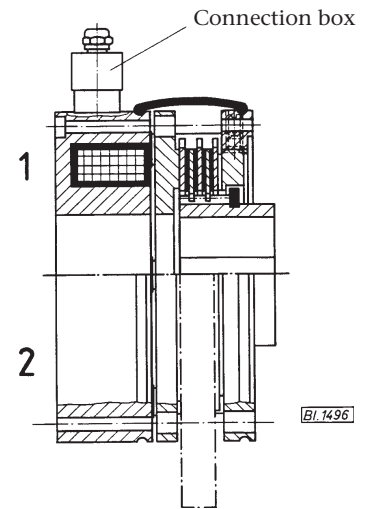
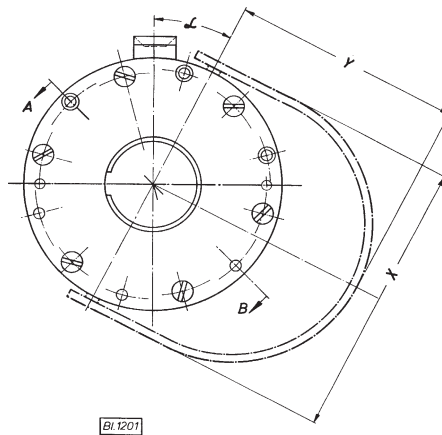
Fig. c

Electromagnetic spring-applied multi-plate brakes For dry-running

6 holes spaced at 60°



6 holes spaced at 60°



Series 0028-0.-...-002

Upper half 1: Version for centering in centre ring (F).
Screws are included.

Lower half 2: Version for centering on coil body (F₁).

Series 0228-0.-...-002

Connection box 220 V AC
and built-in rectifier or
connection box with terminal
for 24 V DC.

Series Size	0028-0.-Size-002/0228-0.-Size-002000							
	03	07	11	15	23	31	43	
M _{dyn}	Nm	7,5	17,5	35	75	150	300	600
n _{max}	min ⁻¹	4000	3200	2700	2100	1800	1600	1450
DC voltage	V	24						
Power consumption	20 °C W	28	39	43	54	108	124	139
	80 °C W	22	31	35	44	87	101	113
J	internal kgcm ²	1	2	5	16	24	43	115
Weight	kg	2	3,5	5,5	11	16	26	42
ØA prebored		16	18	18	20	25	25	30
ØA ₁ ¹⁾		31	39	45	62	67	72	80
Recommended bores ²⁾	A max H7	28	36	44	60	65	70	78
	Keyway DIN 6885	8x2	10x2,4	12x2,2	18x2,3	18x2,3	20x4,9	22x5,4
	A H7	25	35	40	50	60	60	70
	Keyway DIN 6885	8x3	10x3,3	12x3,2	14x3,8	18x4,3	18x4,3	20x4,7
	A H7	20	30	30	40	50	50	60
	Keyway DIN 6885	6x2,8	8x3,3	8x3	12x3,2	14x3,6	14x3,8	18x4,4
Diameter	A H7				40	40		45
	Keyway DIN 6885				10x3,3	12x3,2		14x3,8
	C	88	100	120	150	170	195	222
	E	106	125	142	175	200	235	265
	F H7	75	90	110	140	160	180	205
Length dimensions	F _{1 f7}	100	115	135	165	190	220	250
	G	5,5	5,5	6,5	6,5	8,5	10,5	12,5
	M	41	41,5	48	60,5	67,5	75	84
	O	61	65	75	95	105	120	138
	P	20	23,5	27	34,5	37,5	45	54
	S ₁	2,5	2,5	2,5	2,5	3	3	5
	S ₂ ³⁾	1,5	1,5	1,5	2	3	3	4
	V	30	35	40	45	55	60	70
	X	111	127	149	179	206	236	270
	Y	90	100	120	145	200	265	290
Z	12	12	15	15	16	16	18	
α°	29	28	26	27	27	27	26	

1) With a continuous shaft, the shaft-Ø must be at least 6 mm less than the coil body bore A₁.

2) Bore diameters in bold print are available ex stock.

3) Only for version with centering on the coil body.

Plug connection and flat plug

See chapter "Accessories", page 4.49.00

Friction combinations

Standard version steel/organic friction lining for dry-running.

The plate chamber must be sealed to prevent entry of lubricants.

On request steel/brass for wet-running.

Tolerances

For bores and keyways see section 1

**Electromagnetic spring-applied multi-plate
brakes**
For dry-running



Key for design variations

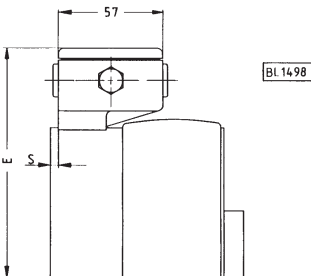
0028-. 0 .- size-002000 0228-. 0 .- size-002000			Terminals or connection box no.
-.00- -.01-	Without dust protection	Without hand lever disengagement with hand lever disengagement	
-.02- -.03-	with dust protection	Without hand lever disengagement with hand lever disengagement	
0028-00 .- 0028-20 .- 0028-40 .-	Centering on coil body	Plug connection 24VDC Connection box 220 V AC, with integrated rectifier Connection box and terminal 24 V DC	0085-330-00-00. 2028-140-Size-010 2028-140-Size-000
0028-10 .- 0028-30 .- 0028-50 .-	Centering on centre ring	Plug connection 24 VDC Connection box 220 V AC, with integrated rectifier Connection box and terminal 24 V DC	0085-330-00-00. 2028-140-Size-010 2028-140-Size-000
0228-00 .- 0228-40 .-	Centering on coil body	Connection box 220 V AC, with integrated rectifier Connection box 24 V DC	0085-342-00-0.. 0085-341-00-000
0228-10 .- 0228-50 .-	Centering on centre ring	Connection box 220 V AC, with integrated rectifier Connection box 24 V DC	0085-342-00-0.. 0085-341-00-000

Example of order: Electromagnetic spring-applied multi-plate brake, size 31 centering in centre ring, with plug connection without dust protection, without hand lever disengagement } **Series 0028-100-31-002000**

Connection boxes

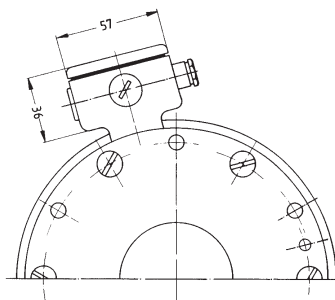
2028-140-Size-000000

Connected voltage 24 V DC
Type of protection IP 54



2028-140-Size-010000

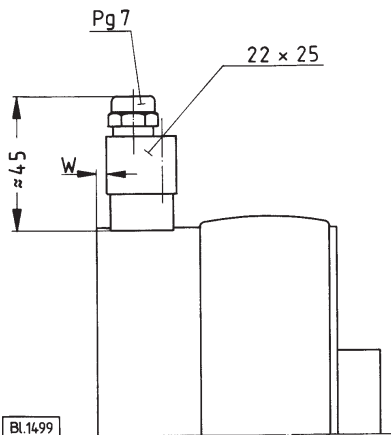
Connected voltage 220 V AC and integrated rectifier
Type of protection IP 54



Series	0028-.0.-Size-002000						
Size	03	07	11	15	23	31	43
E	95	102	113	128	141	156	171
S	-	-	2	2,5	4,5	6,5	10,5

0085-341-00-000000

Connected voltage 24 V DC



0085-342-00-001200 0085-342-00-030000

Max. load to 1.2 A Max. load to 3 A
Connected voltage 220 V AC, with integrated rectifier

Series	0228-.0.-Size-002000						
Size	03	07	11	15	23	31	43
W	1,5	1,5	3	4,5	5,5	7,5	11,5

**Electromagnetic spring-applied twin-face
brakes**
For dry-running

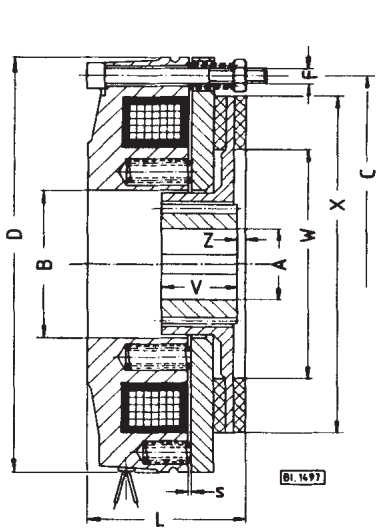


Key for design variations

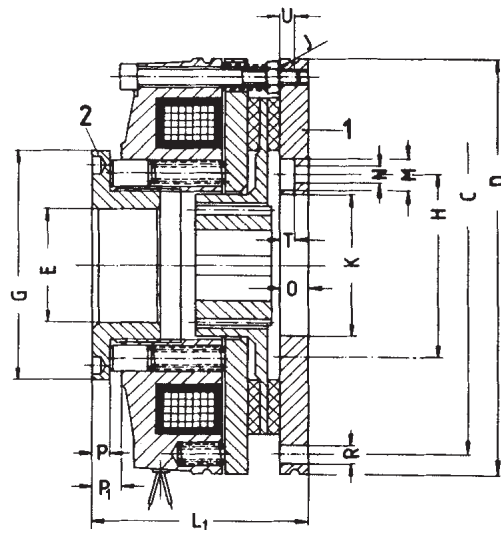
0207-.0.- size-000000			
-00.- -10.-	Without support plate With support plate	With flying leads 24 V DC	
-.00- -.01-	Without hand lever disengagement With hand lever disengagement	Without dust protection	
-.02- -.03-	Without hand lever disengagement With hand lever disengagement	With dust protection	
-.04- -.05-	Without hand lever disengagement	Without dust protection With dust protection	With torque adjustment
-.06- -.07-	With hand lever disengagement	Without dust protection With dust protection	With torque adjustment

Example of order: Electromagnetic spring-applied twin-face brake, size 31,
without support plate, with leads lead out, 24 V DC,
with hand lever disengagement, with dust protection } **Series 0207-003-31-000000**

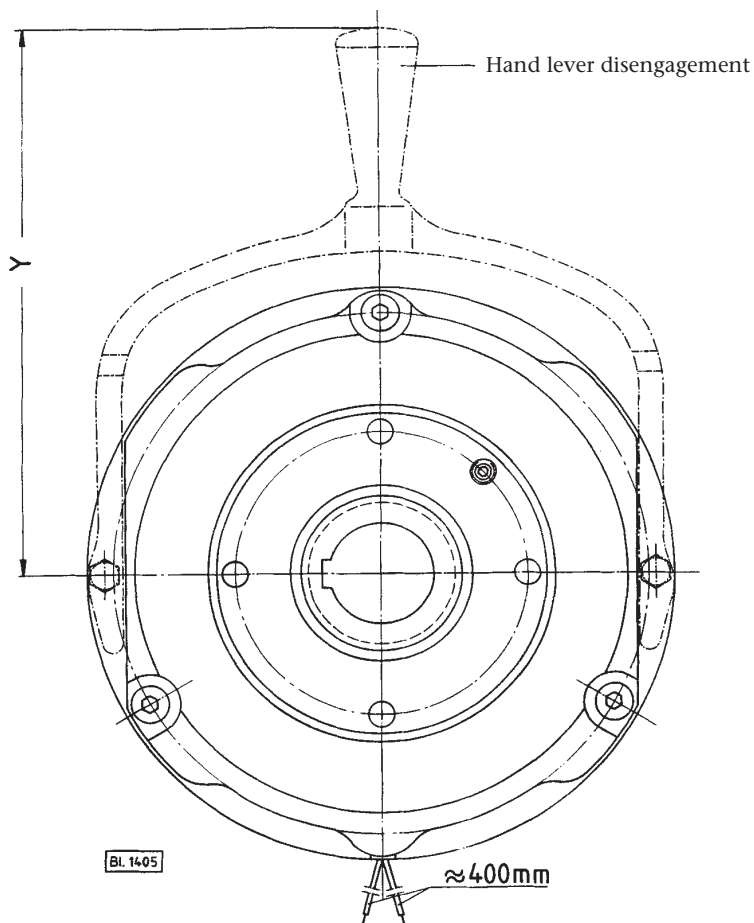
**Electromagnetic spring-applied twin-face
brakes**
For dry-running



Series 0207-000
Standard version



Series 0207-104
With support plate (1) and central torque adjustment (2)



**Electromagnetic spring-applied twin-face
brakes**
For dry-running

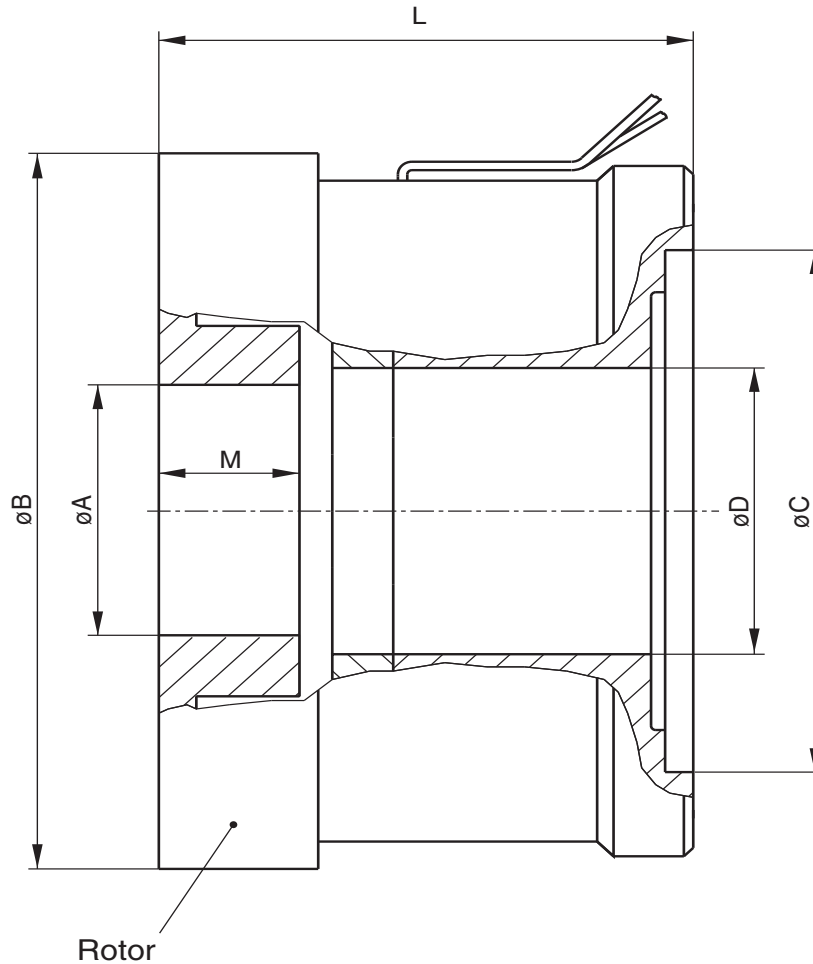


Series Size	0207-.0.-Size-000000									
	02	03	07	11	15	17	23	31		
Mdyn	Nm		4	8	16	32	60	80	150	240
n max	min ⁻¹		3000	3000	3000	3000	3000	3000	3000	2500
DC voltage	V		24							
Power consumption	20 °C W		23	26	30	40	52	61	65	70
	80 °C W		18,5	21	24	32	42	49	53	57
J	internal	kgcm ²	0,3	0,8	2	4,5	17	36	40	99
Weight	kg		1	1,5	3,5	5,2	8,5	10,2	15	25
ØA	prebored		8	10	12	15	18	20	25	30
ØA max	H7		11	15	24	28	34	38	45	50
Keyway	DIN 6885		4x1,8	5x2,3	8x2	8x2	10x2,4	10x2,4	14x2,1	14x3,8
Diameter	B		27	35	45	52	60	67	78	90
	C		72	90	112	132	145	170	196	230
	D		83	100	125	145	160	185	212	250
	E		-	25	35	40	48	55	62	72
	F		3xM4	3xM5	3xM6	3xM6	3xM8	3xM8	3xM8	6xM8
	G		-	52	68	80	90	102	115	135
	H		30	45	56	62	74	84	100	120
	K H7		20	30	40	45	55	65	75	90
	M		8	10	11	11	15	15	15	15
	N		3x4,5	3x5,5	3x6,6	3x6,6	3x9	3x9	3x9	6x9
	R		3x4,3	3x5,3	3x6,4	3x6,4	3x8,4	3x8,4	3x8,4	6x8,4
	W		47	54	66	80	90	104	124	148
X		62	77	96	117	127	152	176	210	
Length dimensions	J		-	1,5	1,5	1,5	2	2	2	2
	L		34,5	39,5	48	54	63	69	83	96
	L1		-	53	66	73	86	92	107	120
	O		6	7	9	9	11	11	11	11
	P		-	4	5	6	7	7	7	7
	P1		-	6,5	9	10	12	12	13	13
	s air gap		0,2	0,2	0,2	0,3	0,3	0,3	0,3	0,4
	T		3,5	4,2	4,8	4,8	6	6	6	6
	U		-	3,5	4,5	4,5	5,5	5,5	5,5	5,5
	V		18	20	20	25	30	30	35	40
	Y		-	108,5	123	134	158	183	224	264
	Z		1,8	2,5	3,5	3	3	3	4,5	6,5

The brakes can also be supplied with spacer bushes, series **0207-.0.-...-010**

Sale through Ortlinghaus AG, Zug, Switzerland

Friction combinations **Only for dry-running;** the friction linings must be kept free of lubricants!
Tolerances For bores and keyways see section 1 "Technical information"
Accessories From page 4.49.00



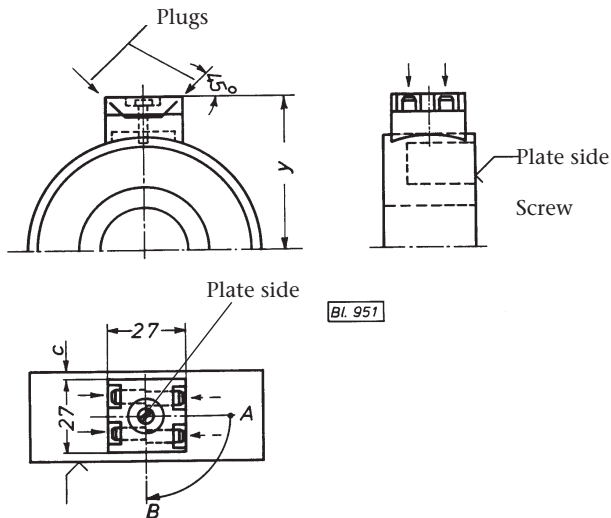
Order no.	M _{stat} Nm	M _{dyn} Nm	P20 W ¹⁾	P80 W ¹⁾	A mm	B mm	C mm	D mm	L mm	M mm
0208-001-03-001000	2	1,8	11,5	9,3	15	57		23	27	10
0208-000-05-011000	10	9	24	19,6	24	100	66	40	42	20
0208-000-04-002000	13,5	12	21	17	30	85	62	34	57	15
0208-000-04-003000	14	12	26	21	25,5	85	62	34	40	15
0208-001-05-001000	40	35	32	26		84			74	
0208-000-07-001000	35	31	48	39	80	134		60	42	

Other design variations and sizes on request.

1) Voltage 24 DCV

Plug connections Flat plugs

Plug connections 0085-330-00-00.000



The plug connection shown is the standard version (A). It can be turned 90° (to position B) to meet the particular fitting conditions.

Take care when carrying out adjustment of the plug connection!

Loosen the screw, turn the terminal **only in the direction of the arrow** and tighten up the screw again. Take care not to squeeze the connection wires or to draw them around the thread of the screw!

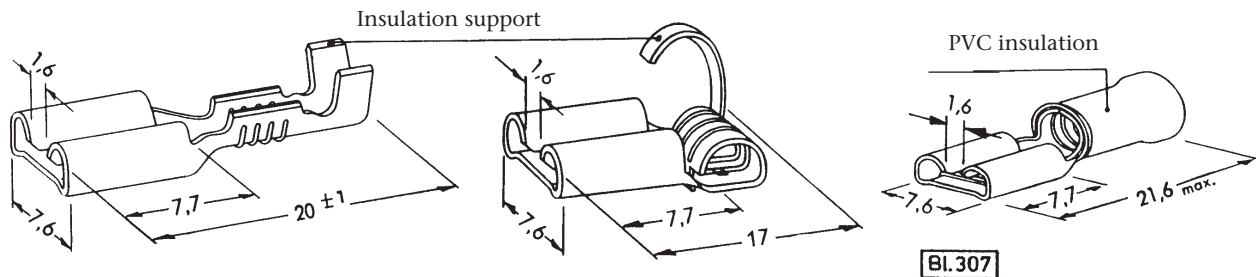
When ordering please state the required plug position:

Position A: 0085-330-00-000000

Position B: 0085-330-00-001000

Size		03	07	11	15	23	27	31	32	43	47	51	55	59
Series 0010	c		1	1,5	1,5	2,5	2,5	4	4	5	7	7,5	9,5	12,5
	y		54	62	72	82	88	97	97	112	120	135	162	170
Series 0013	c		0,5	0,5	1,5	2,5		4		5				
	y		54	62	72	82		97		112				
Series 0028	c	1,5	1,5	3	4,5	5,5		7,5		11,5				
	y	64	72	82	97	110		125		140				

Flat plug 0085-380-00-001000



Flat plug

Right-angle plug

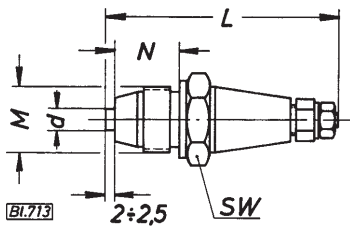
Insulated flat plug

	Order no.	Wire section mm ²	Insulation Ø mm
Flat plug Hand plier	0085-380-00-000000 0085-390-00-000000	1,0 – 2,5 0,3 – 2,5	3,0 – 4,3 —
Right-angle plug Hand plier	0085-380-00-001000 0085-390-00-001000	0,8 – 3,3 0,8 – 3,3	2,8 – 5,3 —
Insulated flat plug Hand plier	0085-380-00-002000 0085-390-00-002000	1,0 – 2,5 1,0 – 2,5	2,6 – 4,0 —

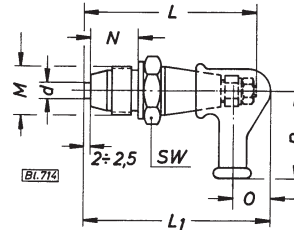
The relevant hand pliers permit solderless, fully crimped connections to be created. The conductor is surrounded completely without any cavities and with high resistance to pulling out, protection against corrosion is also provided. The insulation support on the plug is pressed around the cable insulation in the crimping process and provides

protection against vibration, bending of the conductors and pushing-back of the insulation. It is possible to solder the flat plug and right-angle plug versions after crimping of the connection point and the insulation support has been carried out with conventional hand pliers.

Plug-type brushholders, standard version



Bl.713

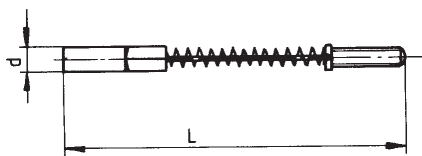


Version with protective cap

Version without protective cap

Protective cap	Order number for plug-type brushholders		Replace. brush Size	Thread M	Brush-Ø d	Dimensions					
	Copper graphite for dry-running	Woven bronze for wet-running				L	L ₁	N	O	P	SW
without	0085-102-00-003	0085-122-00-003	00	M18x1,5	6	66	69	17	13	32	22
	0085-102-01-003	0085-122-01-003	01	M16x1,5	6	69	74	20	13	32	19
	0085-102-03-003	0085-122-03-003	03	M14x1,5	5	55	59	12	13	32	17
with	0085-103-00-003	0085-123-00-003	00	M18x1,5	6	61	64	17	13	32	22
	0085-103-01-003	0085-123-01-003	01	M16x1,5	6	69	74	20	13	32	19
	0085-103-03-003	0085-123-03-003	03	M14x1,5	5	55	59	12	13	32	17

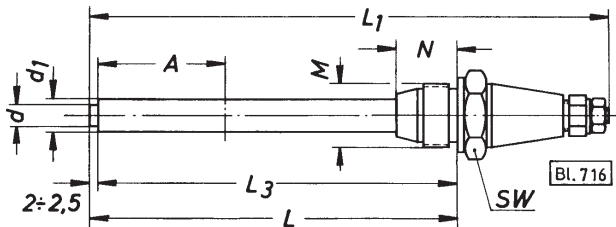
Replacement brushes



Bl.1839

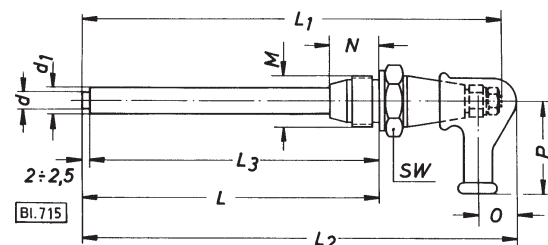
Brush-holders Size	Order number for replacement brushes		Brush-Ø d	
	Copper graphite for dry-running	Woven bronze for wet-running	d	l
00	0085-210-00-003	0085-231-00-003	6	86
03	0085-210-03-003	0085-231-03-003	5	69

Plug-type brushholders, extended version



Bl.716

Version without protective cap



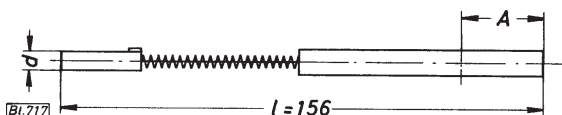
Bl.715

Version with protective cap

Protective cap	Order number for plug-type brushholders		Replace. brush Size	Thread M	Brush-Ø d	Ød ₁	Dimensions							
	Copper graphite for dry-running	Woven bronze for wet-running					L	L ₁	L ₂	L ₃	N	O	P	SW
without	0085-102-00-010	0085-122-00-010	00	M18x1,5	6	9	100	145	150	98	20	13	32	22
	0085-102-01-010	0085-122-01-010	01	M16x1,5	6	9	100	145	150	98	20	13	32	19
with	0085-103-00-010	0085-123-00-010	00	M18x1,5	6	9	100	145	150	98	20	13	32	22
	0085-103-01-010	0085-123-01-010	01	M16x1,5	6	9	100	145	150	98	20	13	32	19

Where required the current leads and brushes can be shortened by the Dimension A (A max. = 70 mm).

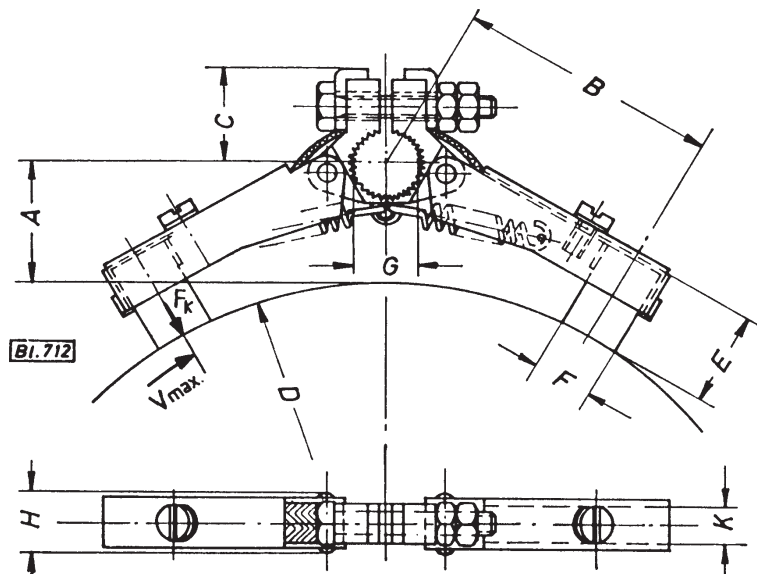
Replacement brushes



Bl.717

Brush-holders Size	Order number for replacement brushes		Brush-Ø d	
	Copper graphite for dry-running	Woven bronze for wet-running	d	l
00/01	0085-210-00-010	0085-231-00-010	6	156

Caliper-type brushholder

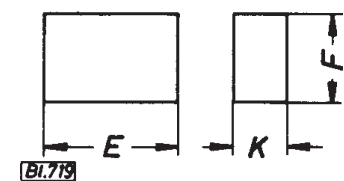


$v_{max} = 15 \text{ m/s}$

$F_k = \text{Contact pressure (N)}$

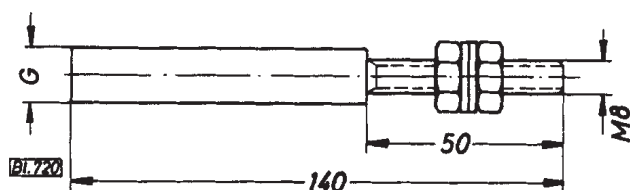
Caliper-type brushholders Order number	Type of running	ØD clutch Series			Clutch Size	Dimensions							Fk in N	
		0006	0011	0012		A	B	C	E	F	G	H		K
0085-134-01-000 0085-144-01-000	dry wet	-	-	70	03	25	~ 42	15	16	10	10	11	6,4	3
		85	82	82	07	22								
		100	95	95	11	21								
		110	114	114	15	20,5								
		128	134	134	23	19,5								
		154	165	165	31	19								
		200	195	195	43	18								
-	210	-	47	18										
0085-134-02-000 0085-144-02-000	dry wet	245	240	240	51	26	~ 50	20	20	16	13	12	8	5
		-	290	-	55	25								
		295	-	-	59	25								
		-	310	-	59	24,5								
		-	-	-	-	-								

Replacement brushes



Replacement brushes Order number	Caliper-type brushes Size	Version	Type of running	Dimensions		
				E	F	K
0085-200-01-000 0085-221-01-000	01	Copper graphite Woven bronze	dry wet	16	10	6,3
0085-200-02-000 0085-221-02-000	02	Copper graphite Woven bronze	dry wet	20	16	8

Mounting pins (insulated)



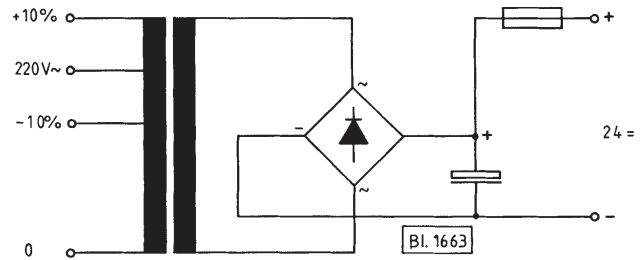
Mounting pins Order number	Caliper-type brushholder size	ØG
0085-370-01-000	01	10
0085-370-02-000	02	13

Rectifier units

Electromagnetic clutches and brakes are mainly designed for 24 V DC. The rectifier units produce this voltage from the AC power supply.

Each device consists of a transformer, Bridge rectifier, smoothing capacitor, connection terminals and fuse.

Adjustment or correction of the DC voltage can be obtained to some extent with the aid of the different transformer connections. The smoothing capacitor serves for the preliminary alignment of the residual ripple in the DC voltage. In order to reduce the residual ripple further, additional capacitors can be fitted parallel to the initial one (rated voltage of the capacitors $U_N \geq 35 \text{ V}$).



Technical data:

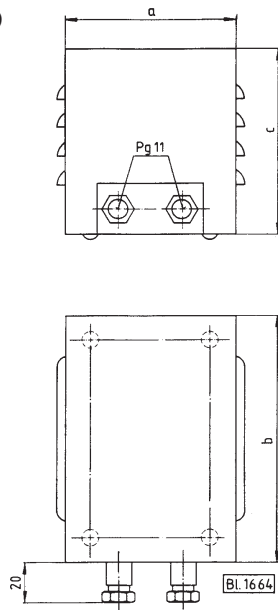
Primary voltage: 220V AC, 50Hz bis 60Hz
 Secondary voltage: 24V DC
 Residual ripple: approx. 20%
 (1,8 A version approx. 10%)

Secondary current: 1,8 A, 5 A, 12 A
 Other voltages and currents on request.

Closed version:

0085-000-24-... 100

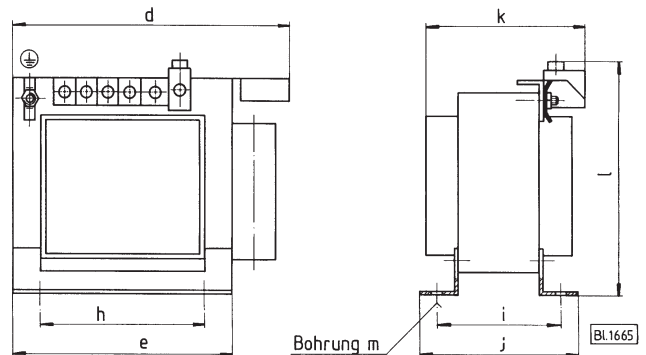
Type of protection to DIN 40050 IP 20



Open version:

0085-030-24-... 100

Type of protection to DIN 40050 IP 20



Rectifier unit 24 V DC Order number	Secondary current in A	Dimensions										
		a	b	c	d	e	h	i	j	k	l	m
0085-0 . 0-24-018100	1,8	110	140	110	102	65	50	52	64	92	82	4,8
0085-0 . 0-24-050100	5	110	140	110	135	97	84	62	76	86	105	5,8
0085-0 . 0-24-120100	12	180	180	150	160	120	90	70	85	113	117	7

Clutch/brake Series	0006	0008	0009	0010	0011	0012	0013	0028	0207	Rectifier unit Order number
Size	07-23	00-13	00-17	07+11	07-23	03-11	07+11	03+07	02-11	0085-0 . 0-24-018100
Size	31-59	17-42	25-42	15-51	31-55	15-51	15-43	11-23	15-31	0085-0 . 0-24-050100
Size				55-59	59			31+43		0085-0 . 0-24-120100

Electronic load relays

Order number 0085-669-04-020000

The electronic load relay is a compact, fully electric, switching element for contactless switching of resistive and inductive DC loads, such as for example electromagnetically actuated clutches, brakes and valves.

It is characterised by a fast, accurately repeatable and wear free switching.

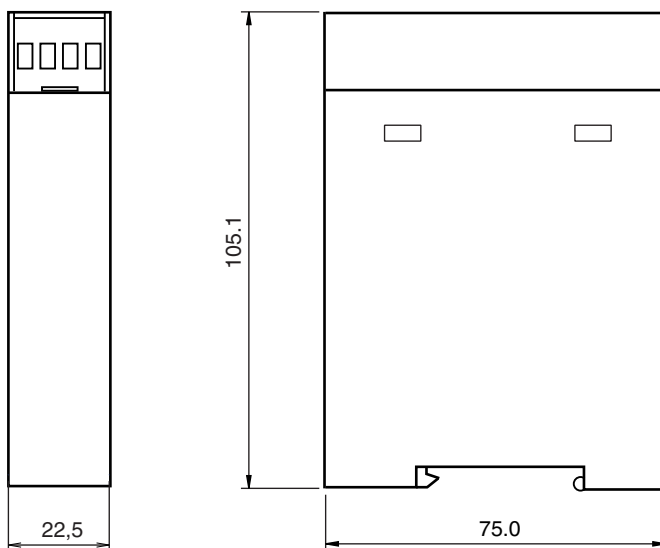
Due to fast demagnetisation of the inductive loads, the negative voltage when switching off is limited to - 30 volts.

The relay has a low voltage fuse and 3 LEDs which indicate the state of the relay. The green LED lights up when the supply voltage is applied and the fuse is in order. The yellow LED lights up when the control voltage is applied and switches the outlet through. When the red LED lights up, the relay is in an unacceptable state.

The control output of the relay recognises an open output in the switched-on state, a short circuit after load voltage and also any unacceptable heating of the relay. In all these cases the control output C switches from high to low and the red LED lights up. If the fuse F fails, output C likewise changes from high to low. In this case the red LED does not light up, and the green LED goes out.

The control and load circuits of the relay are galvanically isolated from each other. The load relay is fitted by simply snapping onto a TS 35 carrier rail.

Dimensions



Technical data

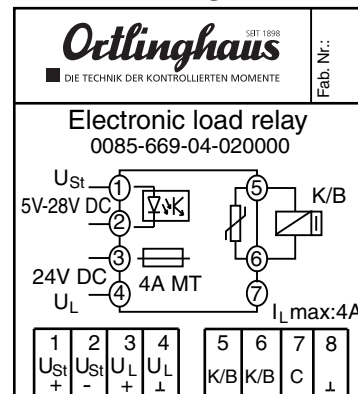
Control voltage	5V - 28V DC (smoothed)
Load voltage	24V DC +/- 10%
Residual ripple (load voltage)	20%
Voltage drop (input/output)	0,5V
Load current	max. 4A
Control out C	24V DC - max. 100 mA
Lead cross-sectional area	max. 2,5mm ²
Fuse	4A MT low voltage glass tube fuse
Ambient temperature	0° - 50° C

Connections

1	U _{St}	control voltage	5V - 28V DC
2	U _{St}	control voltage	Ground
3	U _L	load voltage	24V DC
4	U _L	load voltage	Ground
5	K/B	output	
6	K/B	output	Ground
7	C	Control out	
8			Ground

Further relays on request.

Schematic circuit diagram



Fast starting devices

Order number 0085-609-02-020000

This device serves to shorten the switching time of electromagnetically actuated clutches and brakes.

Operation

Electromagnetically actuated clutches and brakes are designed in the main for operating voltages of 24 V DC. With normal excitation and this voltage, the variation of the current and voltage with time is as shown in Fig. 1. A varistor should be fitted directly to the inductance to be switched in order to limit the negative voltage spikes.

If the inductance is triggered with the rapid starting device, the course of the current and voltage is as shown in Fig. 2. In this case over-excitation of the solenoid coil with approx. 90 V takes place at switching. The increased current resulting from this brings about a shortening of the switching time of up to 75% depending on the particular inductance. The duration of the over-excitation can be set in the range 2 ms to 50 ms with the aid of two trimming resistances on the printed circuit board.

The rapid starting device functions electronically without mechanical relays. The control voltage U_C is separated galvanically from the over-excitation and load voltages with opto-electronic couplers. The state of the device is shown with LEDs:

- LED 1 (green) load switched
- LED 2 (yellow) load voltage present
- LED 3 (red) over-excitation voltage present

Technical data

Control voltage: 6 V–24 V DC (smoothed)
Load voltage: 24 V DC (e.g. rectifier unit)

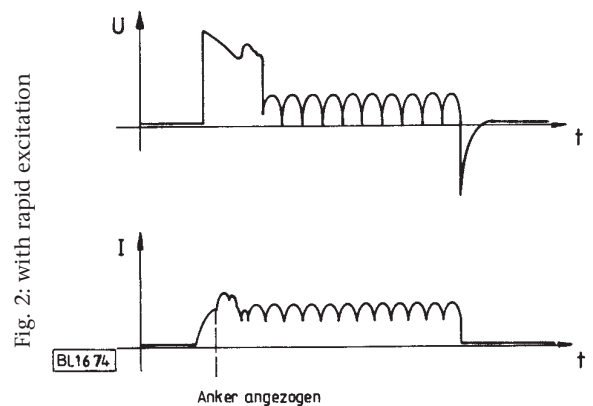
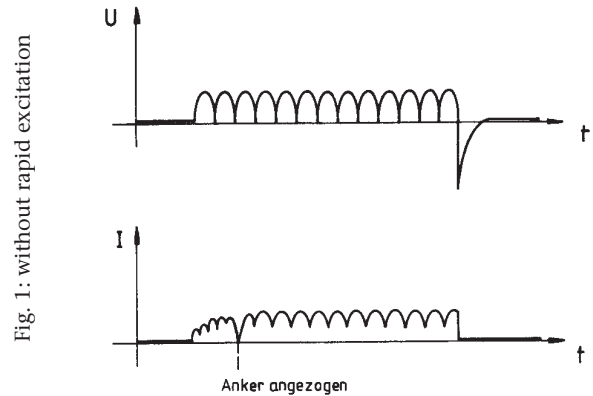
0085-0.0-24-018000)

Over-excitation voltage: approx. 90 V
Max. load current: 2 A (48 W)
Over-excitation time: 2 ms – 50 ms
Ambient temperature: 0°C – 40°C
Max. switching frequency: 200 operations/min.

Terminal loading (on the mounting plate)

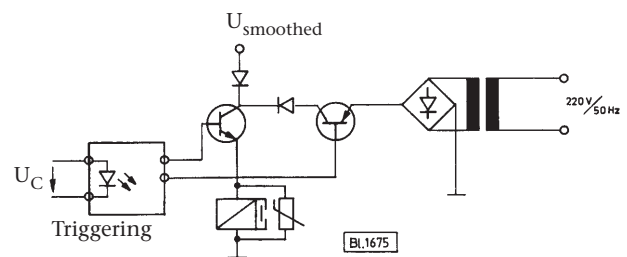
Terminal 1: 1 + 24 V DC	Terminal 2: 1 \bar{E}_1
2 \perp	2 N
3 + U_C	3
4 $\perp U_C$	
5 K/B	
6 K/B	

Schematic diagram for course of voltage and current

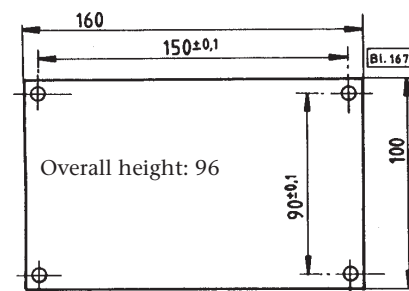


Anker angezogen = armature drawn

Schematic circuit diagram



Mounting plate

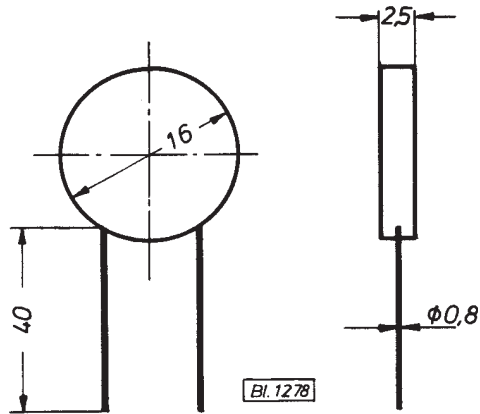


**Special varistors
Spark-quenching capacitors**

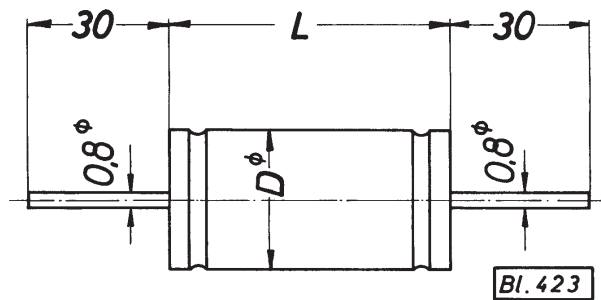
Special varistors

Order number 0085-800-00-000000

50 V, for all series and sizes



Spark-quenching capacitors



Series	Clutch/brake							Spark-quenching capacitor			
	0006 0011	0008 0009 0081	0010	0012	0013	0028 0228	0207	Order number	μF	Dimensions D L	
Size	07-31	00-33 2	07-31 20	03-31 45	07-31	03-23	02-23	0085-500-02-000000			
Size	43-59		32-59	43-51	43	31+43	31	0085-500-04-000000	4	20	75