

Lenze electromagnetic clutches and brakes

The original modern pole face design with unbeaten performance and quality

Stationary field without slip rings for easy installation and zero maintenance

Sophisticated friction material developed over 30 years, gives excellent stability with the lowest wear rate

Specially prepared friction surfaces eliminates the need for running in

Totally backlash-free without splines or pins to wear resulting in high reliability and long life

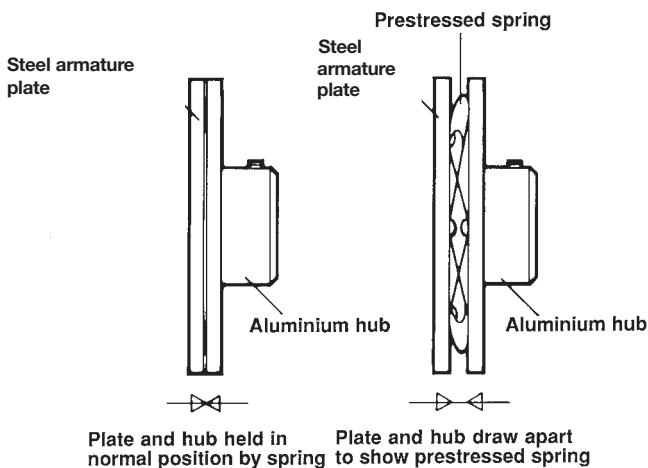


The pre-stressed spring

As part of the armature, Lenze fits a flat pre-stressed spring which allows the armature plate to move across the airgap when the coil is energised.

On de-energisation the plate is rapidly withdrawn by the spring allowing mounting in any position and ensuring there is no residual torque.

Pre-stressed spring



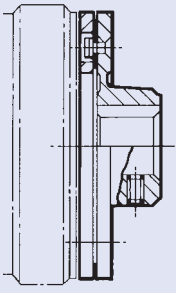
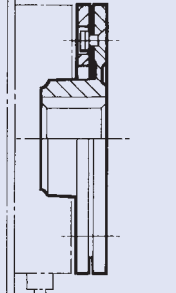
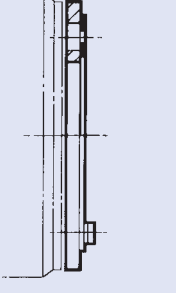
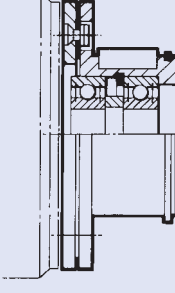
Magneta

Magneta GmbH are a new company established in 1999 working with the Lenze group. They manufactured the established Lenze designs of miniature clutches and brakes, also volume specials and magnetic particle units.

How they work

Lenze brakes consist of two parts, the stator (coil part) and armature assembly. These two parts are mounted concentrically and fixed axially with the air gap set between them. When the coil is energised with a d.c. voltage, the armature plate is pulled onto the stator. Plate axial movement is achieved by the pre-stressed spring. Lenze clutches have a rotor fitted around the stator (stationary field coil). The rotor connects to the shaft. Stator, rotor and armature are fixed axially with the air gap set between rotor and armature. On energisation flux passes radially from stator to rotor and then pulls the armature through the airgap and onto the rotor by flexing of the pre-stressed spring.

Armature types

 <p>Type 1</p>	 <p>Type 2</p>	 <p>Type 3</p>	 <p>Type 5</p>
<p>1. For in line drive with clutches or external hub with brakes.</p>	<p>2. For brakes only, internal hubs.</p>	<p>3. Custom design for adaption to your own design.</p>	<p>5. For clutches only, bearing mounted for offset drives.</p>

Selection

Clutches		Torque Nm	Features	Page
14.100.□□.3	Miniature bearing mounted	0.3 – 3.6	Easy mount, 1500 r/min max.	412
14.100.□□.1	Miniature flange mounted	0.6 – 3.6	For higher speeds, compact length	414
14.105.□□.3	Standard bearing mounted	7.5 – 480	Easy mount, general duty	416
14.105.□□.1	Standard flange mounted	7.5 – 480	Compact flange mounted	418

Brakes		Torque Nm	Features	Page
14.110	Miniature	0.6 – 3.6	Energise to engage	420
14.115	Standard	7.5 – 480	Energise on, all purpose	422

See also spring applied brakes page 439

Size selection

1. Torque method – If fitting near a motor drive, it is often sufficient to size the clutch or brake on the motor torque, using a suitable factor, typically 1.5 to 2.0. Otherwise we recommend a factor of 2.0 minimum.

$$\text{Drive torque } T \text{ (Nm)} = \frac{9550}{\text{r/min}} \times \text{kW} \times \text{factor}$$

$$T \text{ (Nm)} = \frac{7124}{\text{r/min}} \times \text{hp} \times \text{factor}$$

2. Torque and inertia – If load inertia is significant, you must allow for additional torque to accelerate the load.

$$\text{Acceleration torque } T \text{ (Nm)} = \frac{J \times \text{r/min}}{9.55 \times t}$$

3. Work done – With significant inertia you must also check that the work done in starting or stopping does not exceed the thermal capacity of the clutch or brake selected.

$$\text{Work per operation } Q = \frac{J \times (\text{r/min})^2}{182.5}$$

Where Q = Work per operation (joules)
J = Inertia (kgm²)

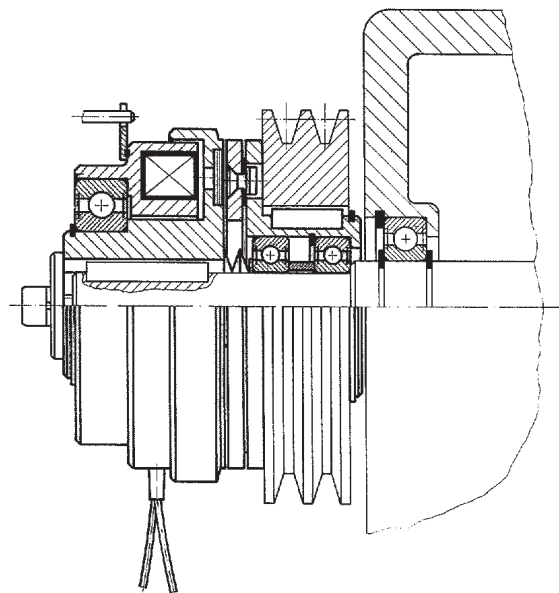
From the work per operation, the maximum frequency of operation can be calculated. Data and worked examples are given in the relevant product brochures, available on request from Bedford.

4. Stopping distances and times – If the total inertia to be stopped or started is known, it is often useful to calculate the time taken to achieve this mechanically by the clutch or brake.

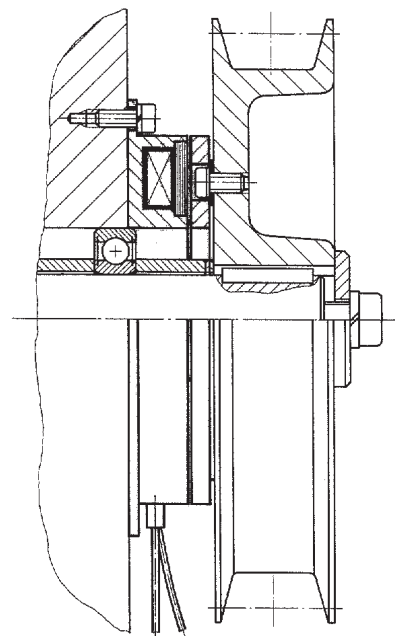
$$t = \frac{J \times \text{r/min}}{9.55 \times T}$$

Where t = stopping time in seconds.

From the stopping time, the distance or number of revolutions can be calculated remembering that the average speed during the stop is one half of the initial speed.



14.105.06.3.5 clutch driving V belt pulley



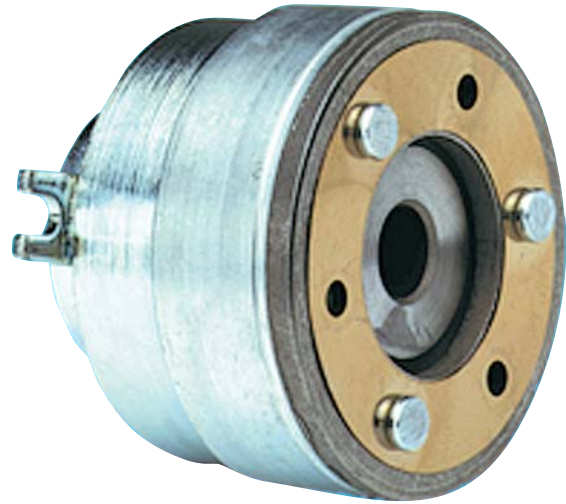
14.115.20.1.3 brake stops shaft & pulley

Magneta miniature clutches – bearing mounted

Type 14.100.□□.30□

0.3 to 3.6 Nm

- High torque capacity
- No running-in required
- Maximum speed 1500 r/min
- Bearing mounted coil for easy mounting
- No residual torque when disengaged
- Very long life
- Bores 5 to 15mm



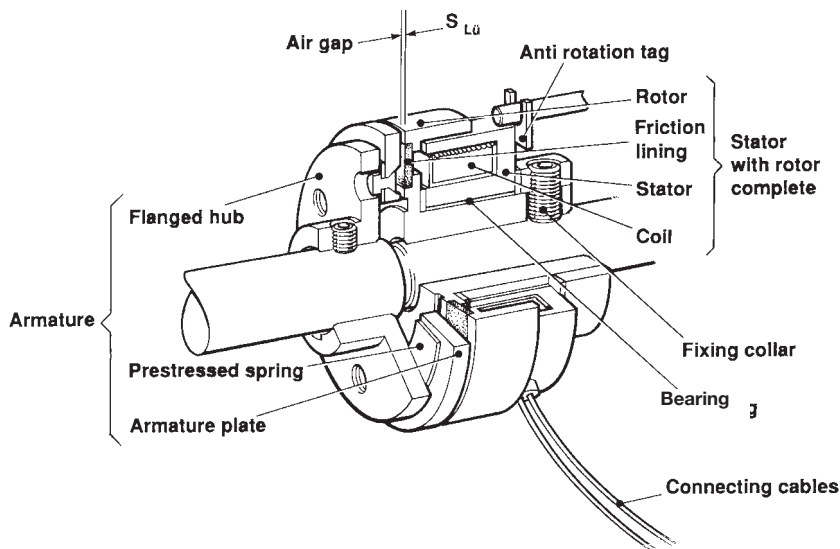
Select the assembly with type 1 armature for in-line shaft to shaft drives noting the required shaft alignment limit ± 0.2 . Select armature type 3 for direct connection of pulleys, gears or sprockets which must be bearing supported from the shaft.

Armature 1 assemblies			Armature 3 assemblies		
Type no.	Bores d, d11 H7, H9	Stockline No.	Type no.	Bore H9	Stockline No.
14.100.02.301	5	A7-94 201	14.100.01.303	5	A7-97 550
	6	A7-94 34X		6	A7-97 648
14.100.03.301	6	A7-95 53X	14.100.02.303	5	A7-97 577
14.100.04.301	8	A7-94 559	14.100.03.303	6	A7-77 263
	10	A7-95 032		8	A7-77 350
14.100.05.301	10	A7-97 76X	14.100.04.303	10	A7-99 598
	15	A7-97 849		15	A7-77 255

Stockline numbers in black – delivery time on request.

Operation

Bearing mounted clutches can be readily assembled on shafts without the need of mounting surfaces. The stator should be prevented from rotating by a loose fitting pin. The magnetic field generated by the coil pulls the armature plate across the air gap. Axial movement is achieved by means of a pre-stressed spring which also transmits the torque generated at the friction surface.



Ordering example

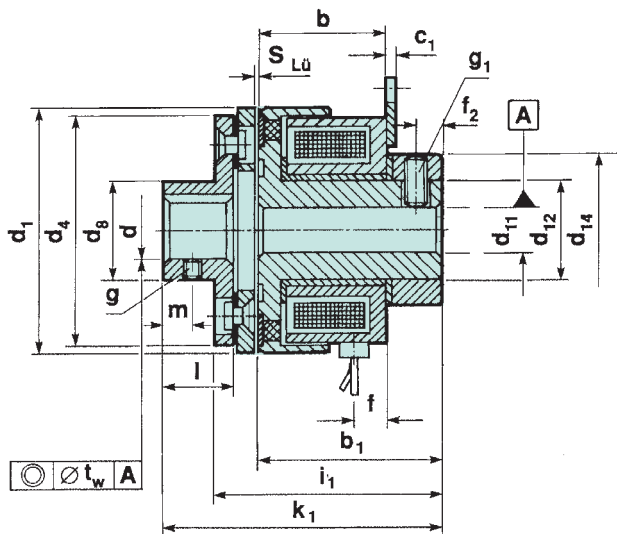
(6) off clutches type 14.100.03.303
24V, 6mm bore

Stockline No. **A7-77 263**

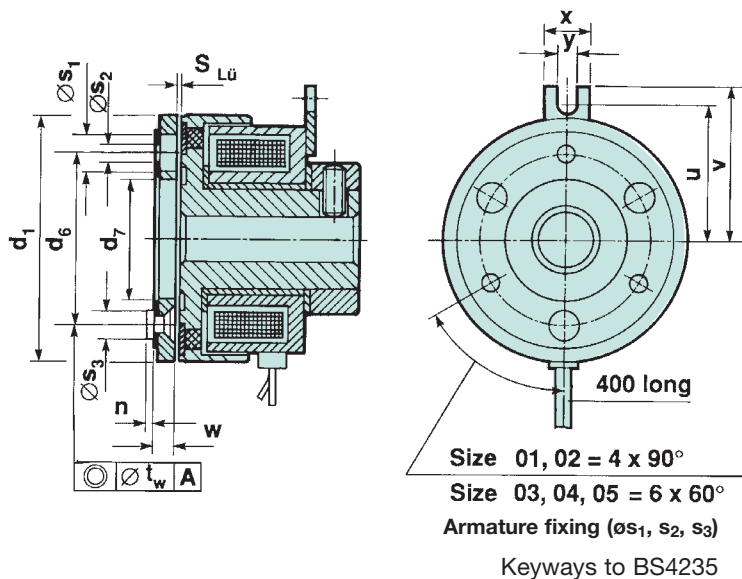
Magneta miniature clutches – bearing mounted

Type 14.100.□□.30□

Type 14.100.□□.301



Type 14.100.□□.303



Size	Torque M Nm	P 20°C W	b	b ₁	c ₁	d (H7) standard	d ₁	d ₄	d ₆	d ₇	d ₈	d ₁₁ (H9) standard	d ₁₂	d ₁₄	f	f ₂	g	g ₁				
01	0.3	4	15.7	22	1		24.5	17.5	10			5	6	7.9	14	5	2.7	M3				
02	0.6	6	15.7	22.5	1.5	5	6	8	31	28	19.5	12.5	13	5	6	8.9	16	4	2.5	M3	M3	
03	0.9	6	18.7	26	1.5	5	6	8	34	32	23	15	15	5	6	10.9	18	4.5	2.5	M3	M3	
04	1.8	8	22	31	1.5	6	8	10	43	40	30	21	17	6	8	10	16.9	25	5.5	3	M3	M4
05	3.6	10	23.2	34	1.5	10	12	15	54	50	38	29	24	10	12	15	22.9	32	5.5	4.5	M4	M5

Size	i ₁	k ₁	l	m	n	s ₁	s ₂	s ₃	S _{Lü}	u	v	w	x	y	t _w	Stator (kg) 300	Armature (kg) 001 003
01					0.8	2x4.5	2x2.1	2x3.7	0.1	13.8	14.5	2.1	8	3.5	0.03	0.040	0.005
02	26.85	32.85	8	3.5	0.8	2x5	2x2.1	2x3.7	0.1	18	21	2.25	8	3.5	0.03	0.064	0.015 0.009
03	30.55	38.55	10	4	1.2	3x6	3x2.6	3x4.5	0.15	20	23	2.4	8	3.5	0.03	0.094	0.026 0.011
04	37.1	46.1	12	5	1.6	3x6.5	3x3.1	3x5	0.15	23	26	2.95	8	3.5	0.03	0.180	0.037 0.023
05	40.2	49.2	12	5	1.6	3x6.5	3x3.1	3x5	0.2	28	31	3	8	3.5	0.03	0.297	0.056 0.033

Mounting

- To avoid alignment difficulties, offset drives using timing belts or gears and armature 3 are best.
- Clutch type 301 suits in-line drives, ensure parallel shaft alignment of t_w with respect to datum A.
- Tolerance shafts to h7. Stator/rotors are fixed with 2 off grubscrews.
- Fix components axially using shims/spacer to set air gap S_{Lü}. Wear adjustment is usually not necessary on these miniature clutches.
- Armature type 3 is fitted to 3 off concentric tapped holes ø2 (2 off on sizes 01 and 02) using the screws and shakeproof washers provided. We recommend the use of thread adhesive. Counterbore ø3 to clear the rivet heads.
- Armature type 1 has a keyway to BS4235 with a grubscrew for axial fixing. Note alignment comment above.
- Secure the stator from rotating using a loose fitting pin in the torque arm slot of width y.
- As with all pole face clutches, keep the friction surfaces free from oil and grease.
- These clutches are controlled by a 24V d.c. signal. For a suitable power supply use of Simplavolt units.

For more detailed mounting information view Publication No. 251.

Magneta miniature clutches – flange mounted

Type 14.100.□□.11□

0.6 to 3.6 Nm

New design with 50% torque increase

Speed up to 10,000 r/min

Bores 5 to 15mm

Stationary field and maintenance-free

Without backlash

No running-in required

Very fast operating times



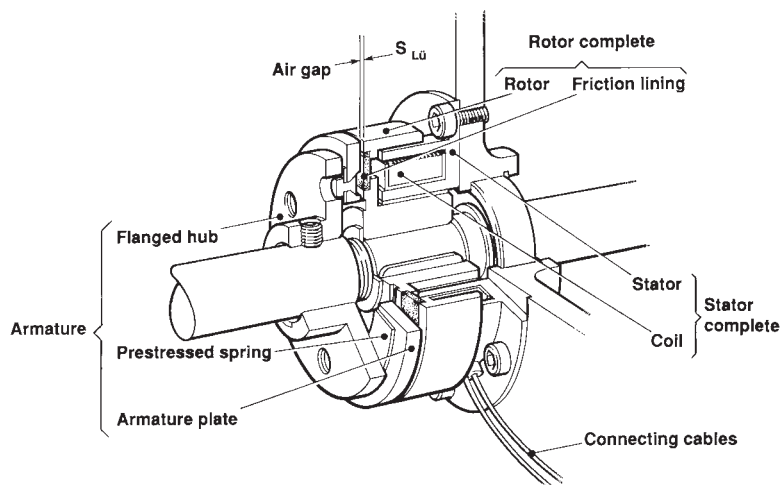
Clutches type 14.100.□□.1.□ comprise three parts, the stator, the rotor and the armature of design 1 or 3. The assembly is axially compact and suits high speed running but see also bearing mounted clutches 14.100.□□.3 which are simpler to install.

Select armature type 1 for in-line shaft to shaft drives but observe the necessary shaft alignment limit t_w .

Armature type 3 is designed to be mounted onto pulleys, gears or sprockets which must in turn be bearing supported from the shaft.

Armature 1 assemblies			Armature 3 assemblies		
Type No.	Bores d, d11 H7, H9	Stockline No.	Type No.	Bore H9	Stockline No.
14.100.02.111	5	A7-90 470	14.100.02.113	5	A7-90 533
	6	A7-91 076		6	A7-91 321
14.100.03.111	6	A7-90 68X	14.100.03.113	6	A7-92 668
14.100.04.111	8	A7-92 755	14.100.04.113	8	A7-290 012
	10	A7-90 872		10	A7-290 020
14.100.05.111	10	A7-93 823	14.100.05.113	10	A7-290 039
	15	A7-93 953		15	A7-290 055

Stockline numbers in black – delivery time on request.



Operation

The coil is supplied with D.C. voltage generating a magnetic field which passes through air gaps to the rotor and then pulls in the armature plate. Armature movement is achieved by the backlash-free spring. If the current supply is interrupted the magnetic field collapses and the spring pulls back the armature plate leaving no residual torque.

Ordering example

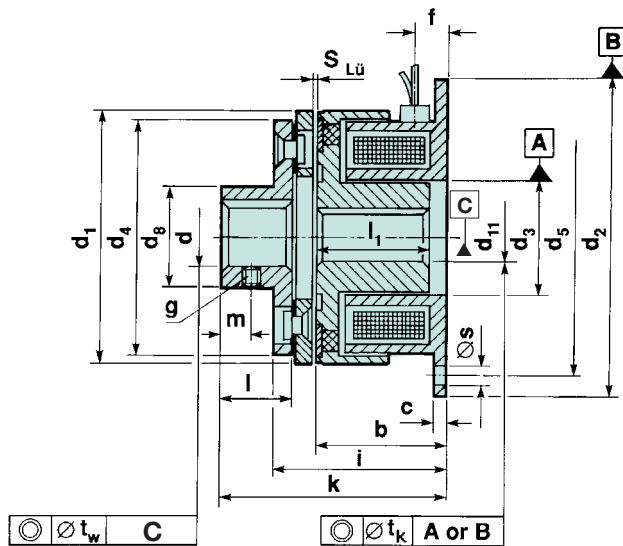
(6) off clutches type 14.100.05.113 24V, 10mm bore

Stockline No. **A7-290 039**

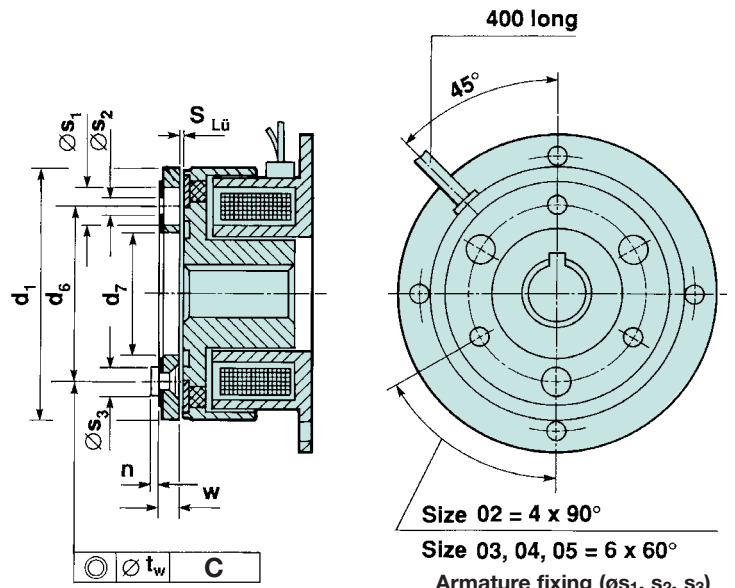
Magneta miniature clutches – flange mounted

Type 14.100.□□.11□

Type 14.100.□□.111



Type 14.100.□□.113



Keys to BS4235

Size	Torque		P 20°C W	b	c	d (H7) standard			d ₁	d ₂ h9	d ₃ H9	d ₄	d ₅	d ₆	d ₇	d ₈	d ₁₁ (H9)	f	i standard		k
	M	Nm				6	8	10											4	20.35	
02	0.6		6	16	1.5	5	6	8	31	39	11	28	33.5	19.5	12.5	13	5	6	4	20.35	26.35
03	0.9		6	19	2	5	6	8	34	45	13	32	38	23	15	15	5	6	4.5	23.55	31.55
04	1.8		8	22.3	2	6	8	10	43	54	19	40	47	30	21	17	6	8	5.5	28.4	37.4
05	3.6		10	23.5	2	10	12	15	54	65	26	50	58	38	29	24	10	12	5.5	29.7	38.7

Size	l	l ₁	m	n	s	s ₁	s ₂	s ₃	S _{Lü}	t _k	t _w	w	g	Stator m (kg)	Rotor m(kg)	Armature m (kg)	
																001	003
02	8	14	3.5	0.8	3.4	2x5	2x2.1	2x3.7	0.1	0.06	0.03	2.25	M3	0.036	0.021	0.015	0.009
03	10	17	4	1.2	3.4	3x6	3x2.6	3x4.5	0.15	0.06	0.03	2.4	M3	0.058	0.034	0.026	0.011
04	12	19.3	5	1.6	3.4	3x6.5	3x3.1	3x5	0.15	0.06	0.03	2.95	M3	0.100	0.070	0.037	0.023
05	12	20.5	5	1.6	3.4	3x6.5	3x3.1	3x5	0.2	0.06	0.03	3.0	M3	0.150	0.110	0.056	0.033

Mounting

1. Provide shafts to h7 with keyways to BS4235.
2. Mount the stator (coil part) square and concentric to the shaft with a maximum runout of tk. Secure using the 4 holes diameter s.
3. Fit the key and set the rotor in the correct axial position using circlips, spacer or other means.
4. Align armature type 1 on the second shaft with a maximum runout tw. Secure it axially and secure it to shaft through a keyway.
5. Armature type 3 should be supported concentric to the shaft to dimension tw. Counterbore to clear rivet heads, dimensions s3 and n. Fix the armature using screws and shakeproof washers provided (top of cone under screw head.) Use screw adhesive.
6. Provision must be made to set the air gap SLü between the armature and rotor, although wear adjustment is usually not necessary on these clutches. Axial runout must not exceed one half of SLü.
7. These clutches are controlled by a 24V d.c. signal and required a power supply such as our Simplavolt units. The coils are not polarity conscious.

For more detailed mounting information view Publication No. 251.

Lenze standard clutches – bearing mounted

7.5 to 480Nm

Type 14.105.□□ .3.□

No running-in required and free of backlash

Fast engagement and release

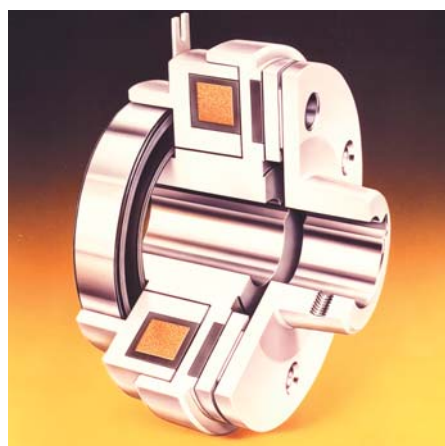
No residual torque

Suits all industrial and commercial machinery

Selection

Simplatroll bearing mounted clutches come in two parts with the stator bearing mounted onto the rotor for easy installation.

Shaft to shaft drives with armature 1 should be avoided, particularly at higher speeds, unless a bell housing provides alignment. Instead we recommend offset drives with belts or gears. Use, for example, the armature 5 to mount a pulley or gear onto the clutch.



Alternatively use the armature 3 and customise the pulley or gear with bearings to run on the shaft.

Armature 5 can also be used for inline drives with the Simplaflex adapter and coupling, ask for details.

Armature 1 Assemblies			Armature 3 Assemblies			Armature 5 Assemblies			
Type No.	Bores d, d ₁₁ H7	Stockline No.	Type No.	Bore d ₁₁ H7	Stockline No.	Type No.	Rotor bore d ₁₁ H7	Armature bore d ₁₂	Stockline No.
14.105.06.3.1	10 15	A1-45 301 A1-40 009	14.105.06.3.3	10 15	A1-45 257 A1-40 707	14.105.06.3.5	12 15	12 12	A1-86 985 A1-40 076
14.105.08.3.1	20	A1-40 017	14.105.08.3.3	15 20	A1-86 19X A1-40 715	14.105.08.3.5	15 20	15 15	A1-85 787 A1-40 084
14.105.10.3.1	20 25	A1-44 643 A1-40 025	14.105.10.3.3	20 25 30	A1-44 564 A1-40 723 A1-44 556	14.105.10.3.5	20 25 30	20 20 20	A1-40 092 A1-44 548 A1-44 53X
14.105.12.3.1	25 30	A1-44 493 A1-40 033	14.105.12.3.3	20 25 30	A1-44 442 A1-44 434 A1-40 731	14.105.12.3.5	25 30	25 25	A1-40 104 A1-44 418
14.105.16.3.1	30 40	A1-44 371 A1-40 041	14.105.16.3.3	30 40	A1-44 312 A1-40 74X	14.105.16.3.5	30 40	30 30	A1-40 112 A1-44 292
14.105.20.3.1	40 50	A1-44 284 A1-40 05X	14.105.20.3.3	40 50	A1-44 209 A1-40 758	14.105.20.3.5	40 50	40 40	A1-40 120 A1-44 170
14.105.25.3.1	50 60	A1-44 103 A1-40 068	14.105.25.3.3	45 50 60	A1-44 075 A1-40 766 A1-44 083	14.105.25.3.5	45 50	45 45	A1-40 139 A1-44 059

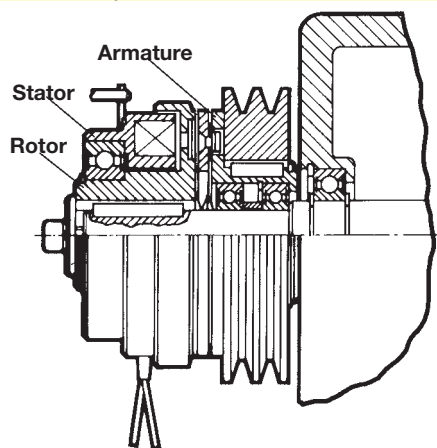
Other combinations of bores are possible.
Stockline numbers in black – delivery time on request.

Electrical supply

These clutches are controlled by a 24 Vd.c. signal and require a power supply such as our Simplavolt d.c. power units.

Armature type 5 details

Clutch size	Bearing	Key height	Key width
06	2 x 6001 2 RS	2.5	10
08	2 x 6002 2 RS	2.2	14
10	2 x 6004 2 RS	2.5	16
12	2 x 6005 2 RS	2.4	18
16	2 x 6006 2 RS	2.8	20
20	2 x 6008 2 RS	3.1	25
25	2 x 6009 2 RS	3.7	32



Ordering example

(10) off clutches type 14.105.20.3.5, 24 volts, 40mm bore

Stockline No. **A1-40 120**

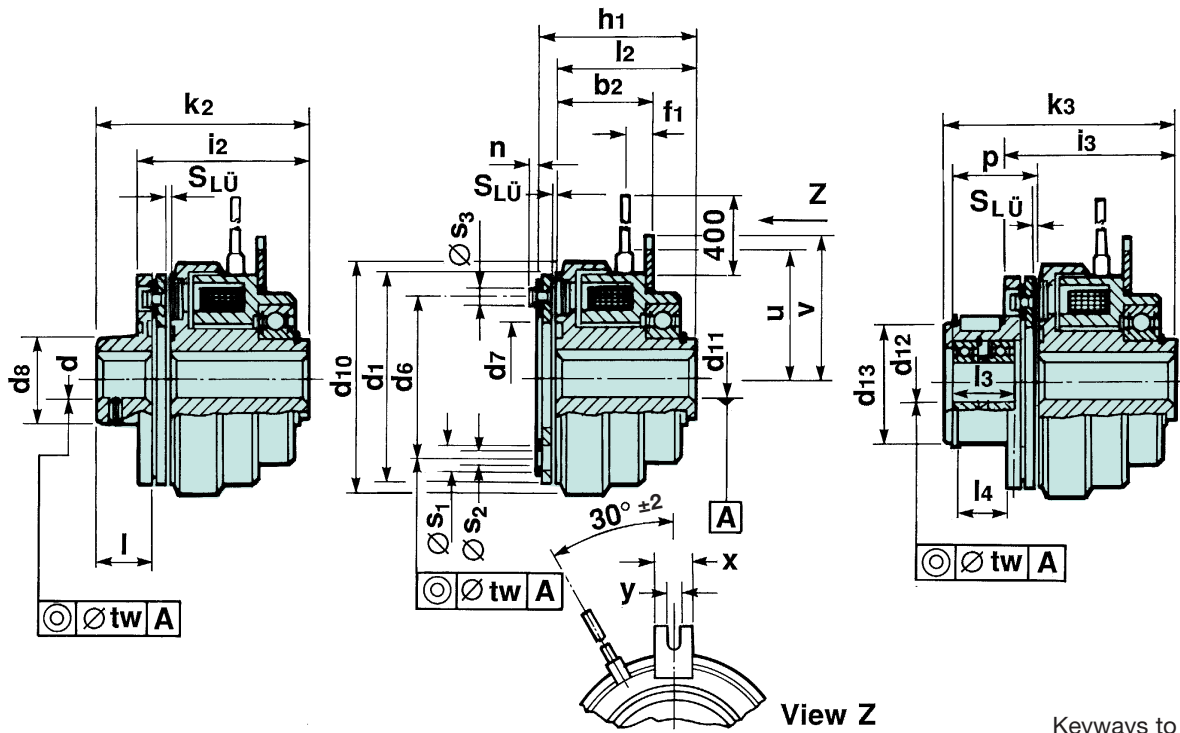
(10) off spacer kits

Stockline No. **A1-52 915**

Type 14.105.□□.3.1

Type 14.105.□□.3.3

Type 14.105.□□.3.5



Keyways to BS4235

Size	Torque M _k Nm	P 20°C W	Max speed r/min	b ₂	d H7	d ₁	d ₆	d ₇	d ₈	d ₁₀	d ₁₁ H7	d ₁₂ H7	d ₁₃ k6	f ₁	h ₁	i ₂		
06	7.5	15	8000	26	10	17	63	46	34.5	27	68	10	20	12	38	7.7	44	47.5
08	15	20	6000	28	10	20	80	60	41.7	32	85.5	12	25	15	45	8.2	48	52
10	30	28	5000	32.5	14	30	100	76	51.5	42	107	15	30	20	55	9.2	54.9	60
12	60	35	4000	36	14	35	125	95	61.5	49	134.3	20	40	25	64	9.8	62	68
16	120	50	3000	41.7	20	45	160	120	79.5	65	170	25	50	30	75	15.2	70.5	77.5
20	240	68	3000	48.1	25	60	200	158	99.5	83	214.3	35	60	40	90	16.5	85.4	94.4
25	480	85	2000	55.2	25	80	250	210	124.5	105	266.5	40	60	45	115	19.2	93.9	105

Size	i ₃	k ₂	k ₃	l	l ₂	l ₃	l ₄	n	p	s ₁	s ₂	s ₃	sLü	tw	u	v	x	y	m kg		
																			3.1	3.3	3.5
06	47	59	67	15	40	18	17	1.4	22	3x6.3	3x3.1	3x5.5	0.2	0.1	36	41	10	4.1	0.83	0.79	0.99
08	52	68	77	20	43.5	25	22	1.7	30.5	3x8	3x4.1	3x7	0.2	0.1	45	50	10	4.1	1.28	1.2	1.56
10	60	80	90	25	49	31.5	26.5	2.1	37.9	3x10.5	3x5.15	3x9	0.2	0.1	56	60	10	4.1	2.4	2.24	2.85
12	68	92	108	30	55	43	36.5	2.5	50	3x12	3x6.1	3x10	0.3	0.1	68.5	72.5	10	4.1	4.15	3.86	4.9
16	77.5	108.5	127.5	38	61.5	54	44.5	3	63	3x15	3x8.2	3x13	0.3	0.2	87.5	93.5	20	8.1	7.3	7	8.8
20	95.4	133.5	155.4	48	74	64	53.5	4	78.4	3x18	3x10.2	3x16	0.5	0.2	107.5	113.5	20	8.1	14.5	13.3	17
25	105	149	175	55	81	76	64	4.3	88.9	4x22	4x12.2	4x20	0.5	0.2	135	141	20	8.1	22.9	21.2	27.8

Mounting

1. Provide shafts to h7 with keyways to BS 4235.
2. Clutch type 3.1 suits in-line drives. Ensure parallel alignment between shafts of tw with respect to dimension A.
3. Clutch type 3.3 can be customised to either in-line drives (observe alignment tw) or offset drives. Counterbore to clear rivet heads s3. Fix the armature using the screws and shakeproof washers provided. Fit the top of the cone against the screw head. Use screw adhesive.
4. Armature 5 runs on ball bearings. Tolerance that section of the shaft to j6. Spacer kits are ideal to set the air gap sLü. Bore the pulley or gear to tolerance G7.

Armature bore d12	Spacer kit Stockline No.
12	A1-52 765
15	A1-52 773
20	A1-52 781
25	A1-52 79X
30	A1-52 907
40	A1-52 915

5. The stator/rotor and armature must be fixed axially to achieve the air gap sLü. Make provision for air gap adjustment using shims or spacer kits. Axial runout must not exceed one half of the value of sLü.
6. Secure the torque arm using a loose fitting pin.

Lenze standard clutches – flange mounted

7.5 to 480Nm

Type 14.105.□□ .1.□

Axially compact design

Backlash-free operation

Very fast response times

No residual torque

No running-in required

Selection

Whilst the bearing mounted clutches 14.105.□□ .3.□ are often the most economical selection, these 3-part flange mounted designs suit where axial space is limited or where the clutch can be effectively built into a machine design. Wherever possible shaft to shaft drives with armature 1 should be avoided particularly at high speed. Offset drives are the recommended option with pulleys or gears. Use armature type 3 for compact custom mounting to existing components, or armature type 5 to directly mount pulleys or gears.



Armature 1 Assemblies			Armature 3 Assemblies			Armature 5 Assemblies			
Type No.	Bore d, d11 H7	Stockline No.	Type No.	Bore d11 H7	Stockline No.	Type No.	Rotor bore d11	Armature bore d12	Stockline No.
14.105.06.1.1	15	A1-45 415	14.105.06.1.3	12 15	A1-41 503 A1-45 352	14.105.06.1.5	12 15	12 12	A1-87 505 A1-45 328
14.105.08.1.1	20	A1-45 194	14.105.08.1.3	15 20	A1-309 44X A1-45 135	14.105.08.1.5	15 20	15 15	A1-82 489 A1-45 100
14.105.10.1.1	20 25	A1-44 844 A1-44 801	14.105.10.1.3	20 25	A1-44 722 A1-44 714	14.105.10.1.5	20 25	20 20	A1-44 686 A1-44 678
14.105.12.1.1	25 30	A1-43 733 A1-43 697	14.105.12.1.3	20 25 30	A1-43 646 A1-43 638 A1-43 62X	14.105.12.1.5	20 25 30	25 25 25	A1-43 603 A1-80 129 A1-43 583
14.105.16.1.1	30 40	A1-43 532 A1-43 496	14.105.16.1.3	25 30 40	A1-43 445 A1-43 437 A1-43 429	14.105.16.1.5	30 40	30 30	A1-43 390 A1-43 382
14.105.20.1.1	40 50	A1-43 366 A1-43 295	14.105.20.1.3	40 50	A1-43 244 A1-43 228	14.105.20.1.5	40 50	40 40	A1-43 201 A1-43 181
14.105.25.1.1	60	A1-43 157	14.105.25.1.3	60	A1-43 078	14.105.25.1.5	60	45	A1-43 043

Pilot and other bores are available on request.
Stockline numbers in black – delivery time on request.

[Keyways to BS4235](#)

Electrical supply

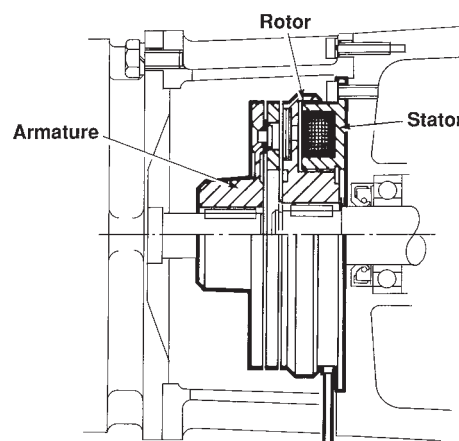
These units require a 24V d.c. unsmoothed supply.
The Simplavolt units can be used.

Details of spacer kits for armature 5 are available on the previous page.

Ordering example

(25) off clutches type 14.105.20.1.5-24V, 50mm bore rotor, 40mm bore armature.

Stockline No. **A1-43 181**

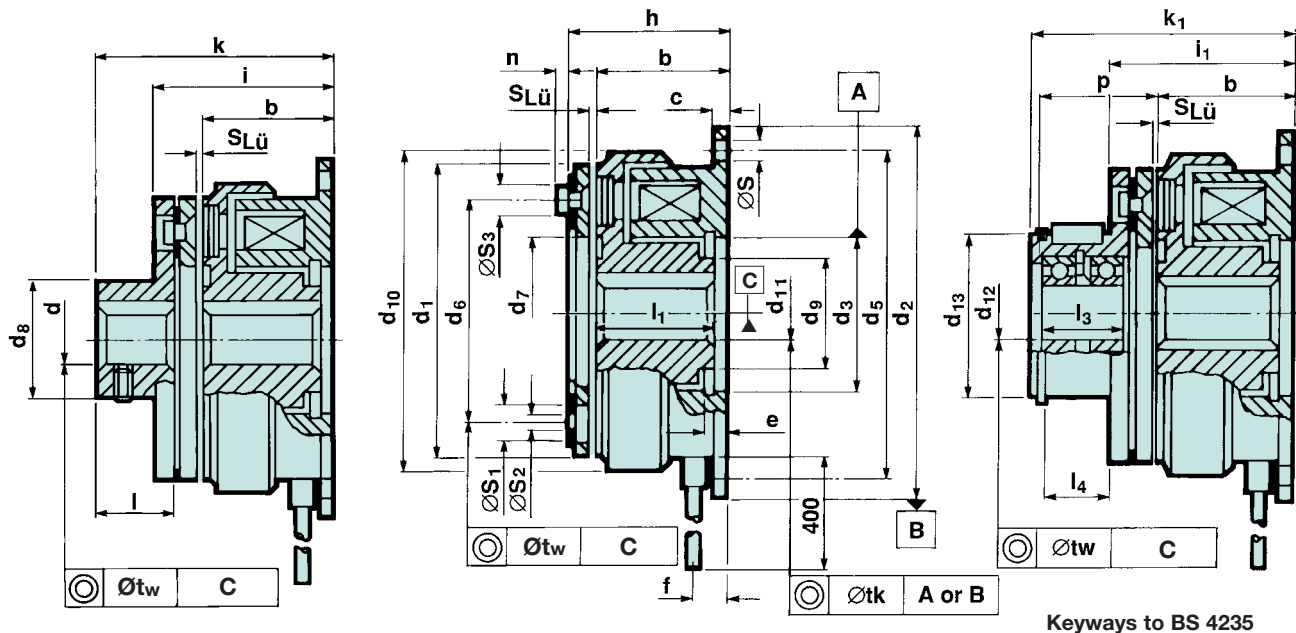


Bellhousing used to align shafts accurately

Type 14.105.□□.1.1

Type 14.105.□□.1.3

Type 14.105.□□.1.5



Size	Torque Mk Nm	P 20°C W	Max speed r/min	b	c	d (H7)		d1 h8	d2 h9	d3 H8	d5	d6	d7	d8	d9	d10	d11 (H7)		d12	d13 k6	e	f
						min	max										min	max				
06	7.5	15	8000	24	2	10	17	63	80	35	72	46	34.5	27	23	68	10	17	12	38	3.5	5.5
08	15	20	6000	26.5	2.5	10	20	80	100	42	90	60	41.7	32	28.5	85.5	10	25	15	45	4.3	6.5
10	30	28	5000	30	3	14	30	100	125	52	112	76	51.5	42	40	107	14	30	20	55	5	6.5
12	60	35	4000	33.5	3.5	14	35	125	150	62	137	95	61.5	49	45	134.3	14	40	25	64	5.5	7.1
16	120	50	3000	37.5	4	20	45	160	190	80	175	120	79.5	65	62	170	20	50	30	75	6	8.6
20	240	68	3000	44	5	25	60	200	230	100	215	158	99.5	83	77	214.3	25	65	40	90	7	12.4
25	480	85	2000	51	6	25	80	250	290	125	270	210	124.5	105	100	266.5	25	80	45	115	8	14.9

Size	h	i	i1	k	k1	l	l1	l3	l4	n	p	s	s1	s2	s3	sLü	tk	tw	m kg		
																			1.1	1.3	1.5
06	28	31.5	31	43	51	15	22	18	17	1.4	22	4x4.5	3x6.3	3x3.1	3x5.5	0.2	0.2	0.1	0.53	0.49	0.69
08	31	35	35	51	60	20	24	25	22	1.7	30.5	4x5.5	3x8	3x4.1	3x7	0.2	0.3	0.1	0.96	0.88	1.24
10	35.9	40.9	40.9	60.9	70.9	25	27	31.5	26.5	2.1	37.9	4x6.6	3x10.5	3x5.15	3x9	0.2	0.3	0.1	1.84	1.68	2.29
12	40.5	46.5	46.5	70.5	86.5	30	30	43	36.5	2.5	50	4x6.6	3x12	3x6.1	3x10	0.3	0.3	0.1	3.24	2.95	3.99
16	46.5	53.5	53.5	84.5	103.5	38	34	54	44.5	3	63	4x9	3x15	3x8.2	3x13	0.3	0.4	0.2	5.79	5.49	7.29
20	55.4	64.4	65.4	103.4	125.4	48	40	64	53.5	4	78.4	4x9	3x18	3x10.2	3x16	0.5	0.4	0.2	11.4	10.2	13.9
25	63.9	74.9	74.9	118.9	144.9	55	47	76	64	4.3	88.9	4x11	4x22	4x12.2	4x20	0.5	0.5	0.2	20.4	18.7	25.3

Mounting

1. Provide shafts to h7 with keyways to BS4235.
2. Mount the stator (coil part) square and concentric to the shaft with a maximum runout of tk. Two tolerated location diameters are available (d2 & d3). Secure using the 4 holes diameter s.
3. Fit the key and set the rotor in the correct axial position using circlips, spacers or other means.
4. Align armature type 1 on the second shaft with a maximum runout tw. Secure it axially and secure it to shaft through key.
5. Armature type 3 should be supported concentric to the shaft to dimension tw. Counterbore to clear rivet heads, dimensions s3 and n. Fix the armature using screws and shakeproof washers provided (top of cone under screw head). Use screw adhesive.
6. Provision must be made to set the air gap sLü between the armature and rotor, usually with shims for adjustment. Axial runout must not exceed one half of sLü.
7. Armature 5 is supplied complete with low profile key (for details see clutch type 14.105.□□.3.□) for mounting pulleys, gears, etc. Tolerance that section of the shaft to j6. Spacer kits with shims are ideal to set the air gap sLü. Bore pulley or gear to tolerance G7.

Further information view Publication No. 150.

Magneta miniature brakes

0.6 to 3.6 Nm

Type 14.110.□□.10□

New design with 50% torque increase

Energise to engage, 100% duty rated

Backlash-free

No running-in required

Bores 5 to 15mm

Long life, maintenance-free

Fast response



Select the type 1 armature assembly for connection direct to the shaft required to be braked.

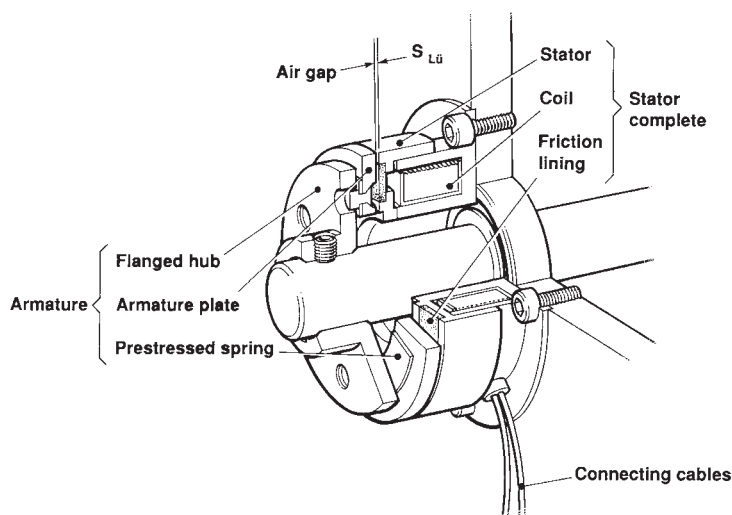
Select the type 3 armature assembly for mounting directly to a disc, gear, sprocket, pulley, etc., to be braked. This forms a more compact and economical assembly.

Armature 1 assemblies			Armature 2 assemblies			Armature 3 assemblies	
Type No.	Bore d	Stockline No.	Type No.	Bore d	Stockline No.	Type No.	Stockline No.
14.110.02.101	5	A7-78 768	Not available			14.110.02.103	A7-79 879
	6	A7-78 839					
	8	A7-79 075					
14.110.03.101	6	A7-73 221	Not available			14.110.03.103	A7-73 378
	8	A7-73 256					
14.110.04.101	8	A7-75 20X	14.110.04.102	8	A7-475 816	14.110.04.103	A7-75 565
	10	A7-99 634		10	A7-85 760		
14.110.05.101	10	A7-75 975	14.110.05.102	10	A7-90 27X	14.110.05.103	A7-76 065
	15	A7-75 991		15	A7-91 269		

Stockline numbers in black – delivery time on request.

Operation

D.C. voltage applied to the coil creates a magnetic field which passes from the stator across the air gap and attracts the armature plate. The armature plate moves axially away from the flanged hub by means of pre-stressed spring. The rated torque is generated. On removal of the supply, the magnetic field collapses and the spring pulls back the armature leaving the brake free of residual torque.



Ordering example

(20) off brakes type 14.110.05.101
24V, 10mm bore

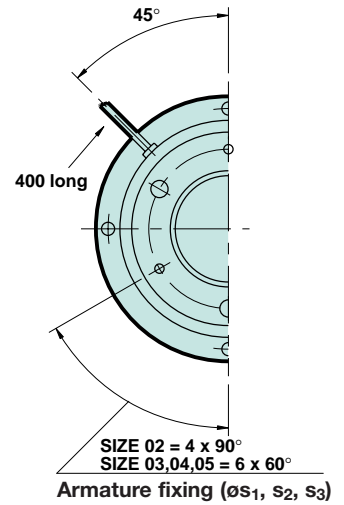
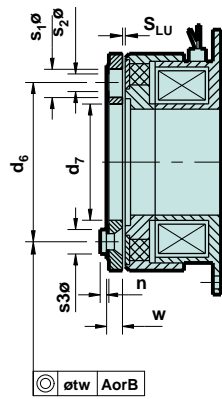
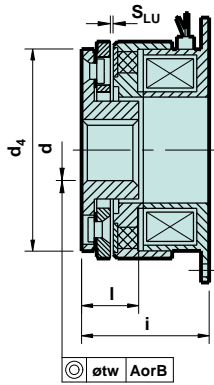
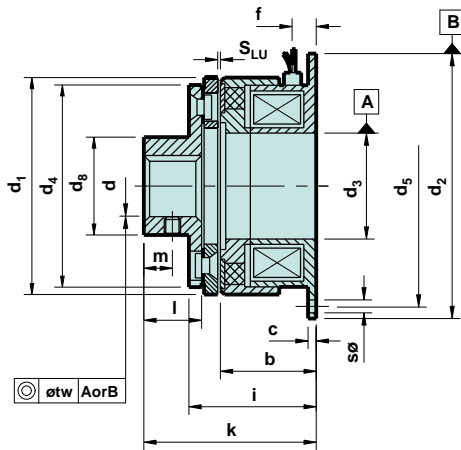
Stockline No. **A7-75 975**

Magneta miniature brakes

Type 14.110.□□.10□

Type 14.110.□□.101

Type 14.110.□□.102 Type 14.110.□□.103



Keyways to BS4235

Size	Torque M Nm	P 20°C W	b	c	d (H7)	d ₁	d ₂ h9	d ₃ H9	d ₄	d ₅	d ₆	d ₇	d ₈	f	i	k		
02	0.6	6	16	1.5	5	6	8	31	39	11	28	33.5	19.5	12.5	13	4	20.35	26.35
03	0.9	6	19	2	5	6	8	34	45	13	32	38	23	15	15	4.5	23.55	31.55
04	1.8	8	22.3	2	6	8	10	43	54	19	40	47	30	21	17	5.5	28.4	37.4
05	3.6	10	23.5	2	10	12	15	54	65	26	50	58	38	29	24	5.5	29.7	38.7

Size	l	m	n	s	s ₁	s ₂	s ₃	S _{Lü}	t _w	W	g	Stator m (kg)	Armature 001 m (kg)	Armature 003 m (kg)
02	8	3.5	0.8	3.4	2x5	2x2.1	2x3.7	0.1	0.03	2.25	M3	0.054	0.015	0.009
03	10	4	1.2	3.4	3x6	3x2.6	3x4.5	0.15	0.03	2.4	M3	0.083	0.026	0.011
04	12	5	1.6	3.4	3x6.5	3x3.1	3x5	0.15	0.03	2.95	M3	0.140	0.037	0.023
05	12	5	1.6	3.4	3x6.5	3x3.1	3x5	0.2	0.03	3	M3	0.220	0.056	0.033

Mounting

1. Mount the stator concentric and square to the shaft. The armature should run concentric to the stator with a maximum runout value t_w .
2. If armature 3 is selected, arrange it to be fully supported, square and concentric to the stator with maximum runout t_w . Counter bore diameter s_3 to clear the rivet heads. Use the screws and shakeproof washers provided, cone under the screw head. We recommend the use of thread adhesive.
3. Armature 1 can be fixed axially with the grub screw. Additional security from shims/spacers is not absolutely necessary. For armature 3 shims are necessary to set the air gap $S_{Lü}$. There should be no axial movement of the armature in excess of $1/2 S_{Lü}$.
4. Magneta miniature series brakes in practice, never need wear adjustment except on the most severe duties. Keep the friction surface free from oil and grease.
5. A 24V d.c. power supply is required, either smoothed or unsmoothed. Simplavolt units can be used. These brakes are not polarity sensitive.

For more detailed mounting information refer to Publication No. 251 – available on request, or on the web: www.lenze.co.uk under 'Downloads' and Lenze download area.

Lenze brakes – standard series

Energise to engage 7.5 to 480Nm

Type 14.115.□□ .1.□

- Backlash-free
- Needs no running-in
- Without residual torque
- Stable torque and long life

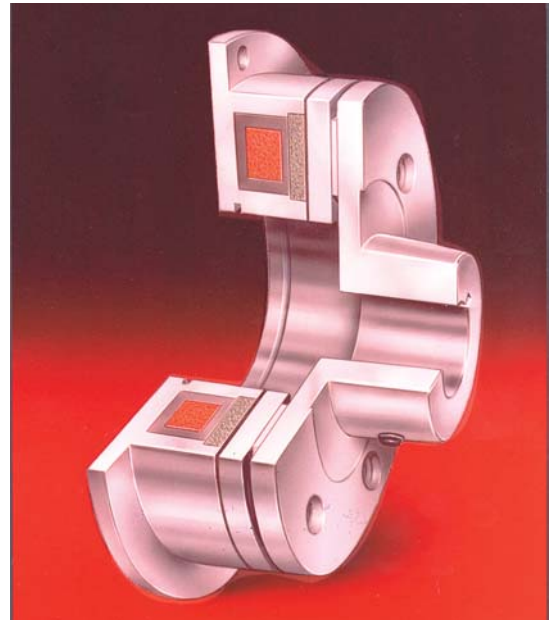
Selection

Selection between the 3 types of armature usually based on suitability for the installation. Where axial space is available use armature type 1. Where the space available is limited, use armature type 2 which requires shims to set the air gap. Use armature 3 where it is more economical to connect directly to a pulley, sprocket or gear rather than to the shaft.

Ordering example

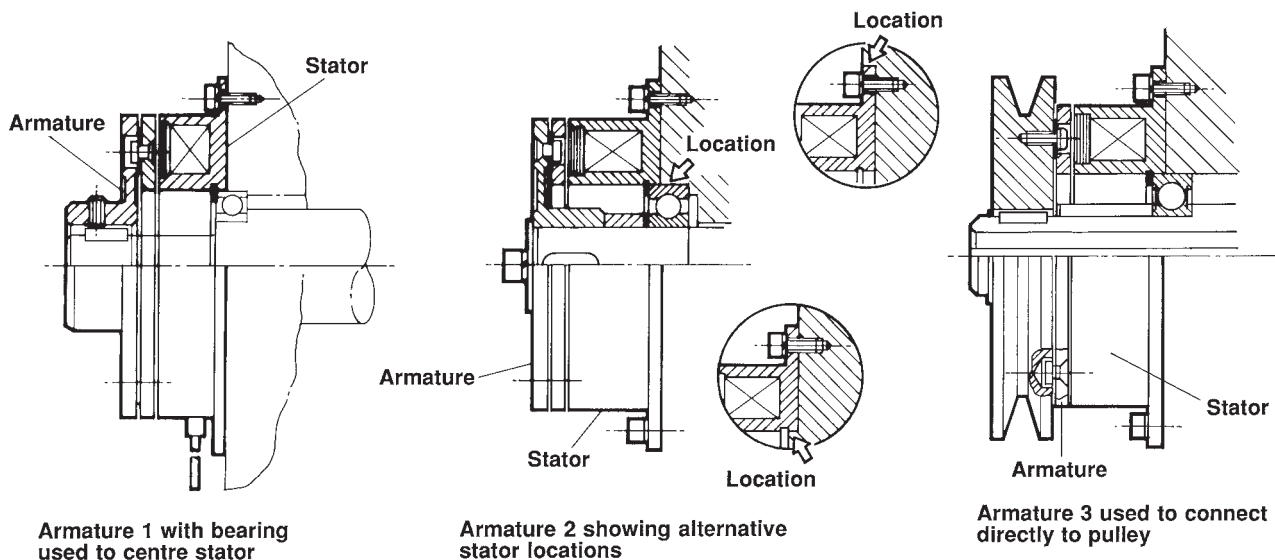
(5) off brakes type 14.115.20.1.1, 24 volts, 50mm bore

Stockline No. **A1-41 101**



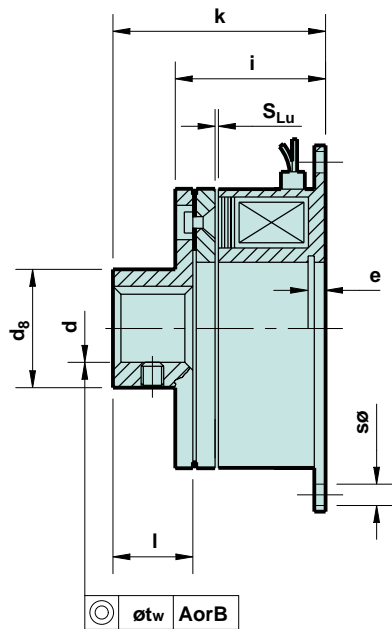
Armature 1 Assemblies			Armature 2 Assemblies			Armature 3 Assemblies	
Type No.	Bore H7	Stockline No.	Type No.	Bore H7	Stockline No.	Type No.	Stockline No.
14.115.06.1.1	10PB 10 15	A1-44 032 A1-44 040 A1-41 057	14.115.06.1.2	10PB 10 15	A1-44 016 A1-44 024 A1-40 932	14.115.06.1.3	A1-40 829
14.115.08.1.1	10PB 20	A1-43 993 A1-41 065	14.115.08.1.2	10PB 20	A1-43 977 A1-40 940	14.115.08.1.3	A1-40 837
14.115.10.1.1	14 PB 20 25	A1-43 950 A1-43 969 A1-41 073	14.115.10.1.2	14PB 20 25	A1-43 934 A1-43 942 A1-40 959	14.115.10.1.3	A1-40 845
14.115.12.1.1	14 PB 25 30	A1-43 918 A1-43 926 A1-41 081	14.115.12.1.2	14PB 25 30	A1-43 898 A1-43 90X A1-40 967	14.115.12.1.3	A1-40 853
14.115.16.1.1	20PB 30 40	A1-43 871 A1-43 88X A1-41 09X	14.115.16.1.2	20PB 30 40	A1-43 855 A1-43 863 A1-40 975	14.115.16.1.3	A1-40 861
14.115.20.1.1	25PB 40 50	A1-43 839 A1-43 847 A1-41 101	14.115.20.1.2	25PB 50	A1-43 812 A1-40 983	14.115.20.1.3	A1-40 87X
14.115.25.1.1	50 60	A1-43 804 A1-41 11X	14.115.25.1.2	50 60	A1-43 784 A1-40 991	14.115.25.1.3	A1-40 888

Stockline numbers in black – delivery time on request.

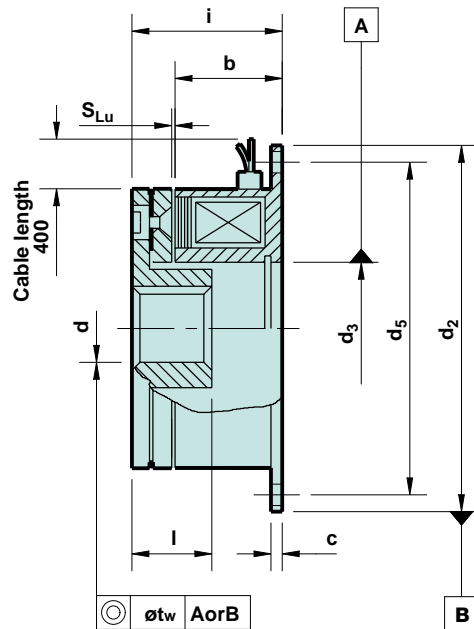


CLUTCHES & BRAKES

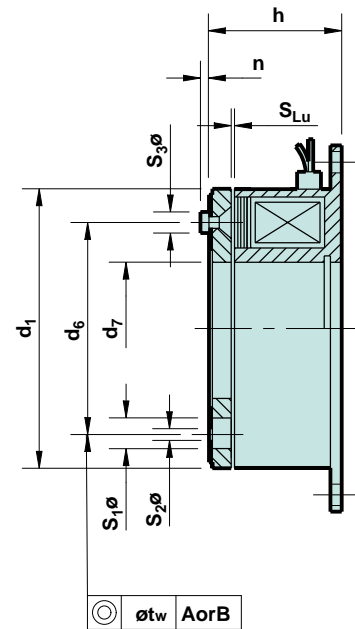
Type 14.115.□□1.1



Type 14.115.□□1.2



Type 14.115.□□1.3



Keyways to BS 4235

Size	Torque M _k Nm	P 20°C W	Max speed r/min	b	c	d H7 min max	d ₁ h8	d ₂ h9	d ₃ H8	d ₅	d ₆	d ₇	d ₈	e	f
06	7.5	11.5	8000	18	2	10 17	63	80	35	72	46	34.5	27	3.5	5.5
08	15	16	6000	20	2.5	10 20	80	100	42	90	60	41.7	32	4.3	6.5
10	30	21	5000	22	3	14 30	100	125	52	112	76	51.5	42	5	6.5
12	60	28	4000	24	3.5	14 35	125	150	62	137	95	61.5	49	5.5	7.1
16	120	38	3000	26	4	20 45	160	190	80	175	120	79.5	65	6	8.6
20	240	45	3000	30	5	25 60	200	230	100	215	158	99.5	83	7	12.4
25	480	60	2000	35	6	25 80	250	290	125	270	210	124.5	105	8	14.9

Size	h	i	k	l	n	s	s ₁	s ₂	s ₃	sLü	t _w	m kg		
												1.1	1.2	1.3
06	22	25.5	37	15	1.4	4x4.5	3x6.3	3x3.1	3x5.5	0.2	0.16	0.32	0.32	0.28
08	24.5	28.5	44.5	20	1.7	4x5.5	3x8	3x4.1	3x7	0.2	0.16	0.59	0.59	0.51
10	27.9	32.9	52.9	25	2.1	4x6.6	3x10.5	3x5.15	3x9	0.2	0.16	1.11	1.11	0.95
12	31	37	61	30	2.5	4x6.6	3x12	3x6.1	3x10	0.3	0.2	2	2	1.71
16	35	42	73	38	3	4x9	3x15	3x8.2	3x13	0.3	0.2	3.5	3.5	3.2
20	41.4	50.4	89.4	48	4	4x9	3x18	3x10.2	3x16	0.5	0.2	7.05	7.05	5.85
25	47.9	58.9	102.9	55	4.3	4x11	4x22	4x12.2	4x20	0.5	0.3	12.7	12.7	11

Mounting

1. If pilot bore armatures are selected, ensure that bores are machined accurately centred and square.
2. Mount the stator concentric and square to the shaft. Fit the armature so that it runs concentric to the stator with a maximum runout value t_w.
3. If armature 3 is selected, arrange it to be square and concentric to the stator with a maximum runout t_w. Counterbore dia. s₃ to clear the rivet heads. Use the screws and shakeproof washers provided. We recommend the use of thread adhesive.
4. Armature 1 can be fixed axially with the grubscrew although additional shims/spacers may be preferred. For armatures 2 and 3 shims are necessary to set the air gap S_{Lü}. Allow for adjustment up to 3 x the air gap. There must be no axial movement of the armature in excess of 1/2 S_{Lü}.
5. These brakes require a 24Vd.c. supply either unsmoothed or smoothed. Simplavolt d.c. power units are ideal.

For more detailed mounting information view Publication No. 150.