

**EMCO® & EMC0-Simplatroll®**

*making machines friendly*

The brands **Emco** & **Emco-Simplatroll** stand for uncompromised quality in products as well the services. Products that are safe & reliable and service that makes our products and your machines perform efficiently.



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 แขวงคลองเตย เขตคลองเตย กรุงเทพฯ 10250

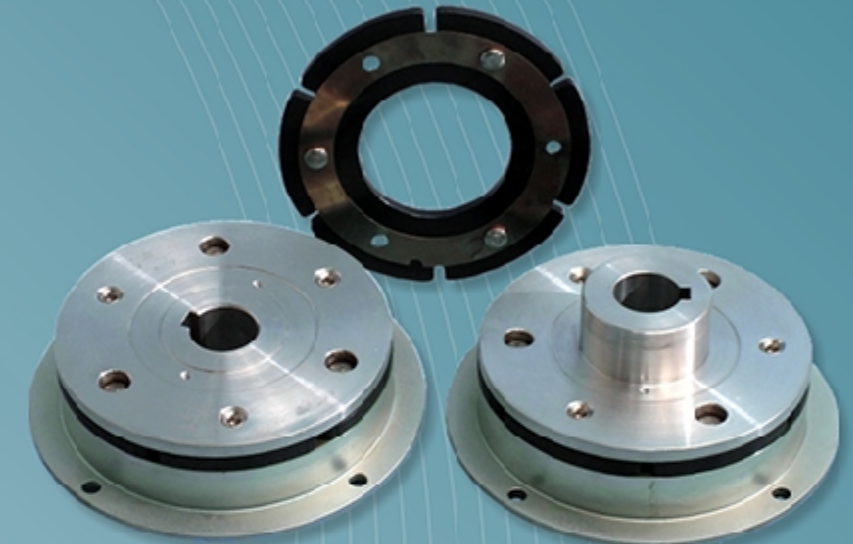


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**EMC0-Simplatroll®**

## DC Electromagnetic Brakes & Clutches

Type 14.115  
Flange Mounted Brakes  
(Normally OFF)



CE

Type 14.105  
Flange & Shaft Mounted Clutches  
(Normally OFF)



**Emco Dynatorq Pvt. Ltd.**  
 (Formerly Emco Lenze Pvt. Ltd.)

ISO 9001:2008 Company



**Emco Simplatroll DC Electromagnetic Brakes (Flange Mounted) and Clutches (Flange & Shaft Mounted)** are designed for high consistent operating characteristic with a torque range of 7.5-2500 Nm. They are available in 3 different designs to stop/connect the drive or load side either shaft, pulley and sprocket. They are maintenance free and provided with a unique pre-stressed spring made from German spring steel and a coil with class 'F' insulation to give million of operations without fatigue.

### Salient Features of Type 14.115

- ▶ Torque : 75 Nm to 2500 Nm
- ▶ Single Plate Dry Type
- ▶ Zero Backlash
- ▶ Residual-free
- ▶ Fast Switching Times
- ▶ High Operating Reliability
- ▶ High Operating Frequency
- ▶ Compact Dimensions
- ▶ Simple Construction
- ▶ Maintenance Free
- ▶ Long Life
- ▶ Unique Pre-stressed Spring
- ▶ Coil with Class 'F' Insulation#
- ▶ Stationery Field (No Slip Rings)
- ▶ Non Asbestos Special Friction Material\*
- ▶ Consistent Operating Characteristics
- ▶ Simple Wear Compensation Adjustment
- ▶ Simple Installation
- ▶ Low Inertia of Rotating Parts
- ▶ No Restriction on Mounting Position

### Salient Features of Type 14.105

- ▶ Torque : 75 Nm to 2500 Nm
- ▶ Single Plate Dry Type
- ▶ Zero Backlash
- ▶ Residual-free
- ▶ Fast Switching Times
- ▶ High Operating Reliability
- ▶ High Operating Frequency
- ▶ Compact Dimensions
- ▶ Simple Construction
- ▶ Long Life
- ▶ Unique Pre-stressed Spring
- ▶ Stationery Field (No Slip Rings)
- ▶ Consistent Operating Characteristics
- ▶ Simple Wear Compensation Adjustment
- ▶ Coil with Class 'F' Insulation#
- ▶ Asbestos-free Friction Materials\*
- ▶ Simple Installation
- ▶ Low Inertia of Rotating Parts
- ▶ Raw Materials to DIN Standards
- ▶ No Restriction on Mounting Position

# Higher coil insulation available on request. \* Standard Indian liner. German liner available on request.

### Applications



Cranes & Hoists



Machine Tools



Packaging Machines



Textile Machines



Wire Drawing Machines



Pharmaceutical Industry



Conveyors



Printing Machines



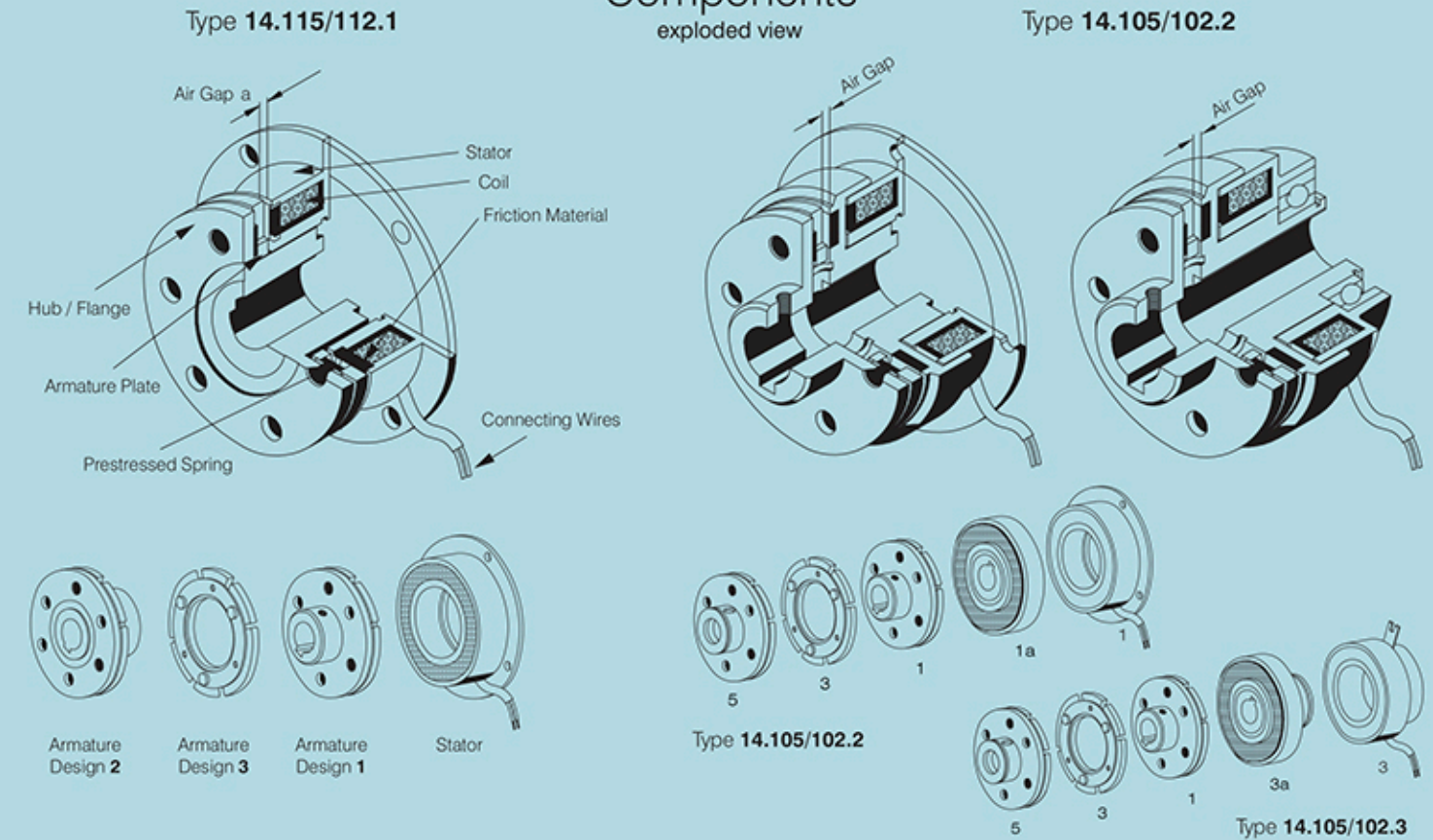
Special Purpose Machinery



Special Test Rigs

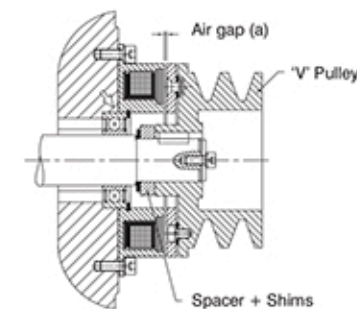
### Components

exploded view



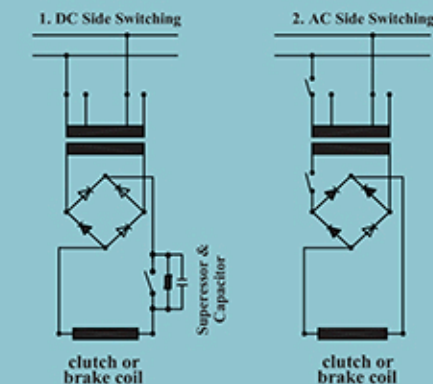
### Mounting

Type 14.115



Combination of the 115-1.3 and 'V' Pulley

### Switching



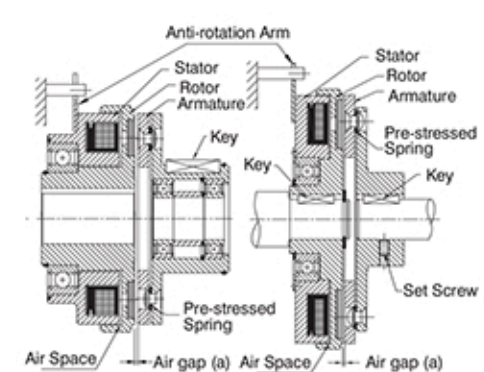
Our Brakes & clutches require DC supply voltage which is obtained through AC/DC rectification. Normally switching is carried out on the AC side.

However, for much faster engagement /disengagement time switching is carried out on the DC side for which a suitable arc suppressor and a capacitor is a must to protect the coil, switches etc. from high induction voltages produced during switching off power supply.

Engagement /disengagement time is a function of nominal release distance (airgap) and type of switching.

### Mounting

Type 14.105



Structure of the Bearing mounted type (105 model)

### Working

Type 14.105

When supplied with DC voltage the armature is attracted towards the friction material of the stator and the friction causes the rotating component to stop. When the supply is interrupted, the pre-stressed spring pulls the armature back into its original position free of residual torque even when mounted vertically.

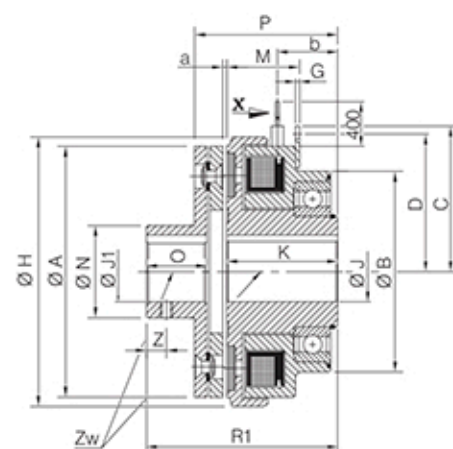
### Working

Type 14.115

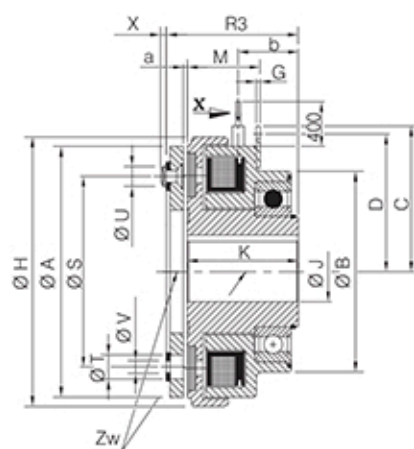
When supplied with DC voltage the armature is attracted towards the friction material of the rotor and transmits the torque free of back-lash. When the supply is interrupted, the pre-stressed spring pulls the armature back into its original position free of residual torque even when mounted vertically.



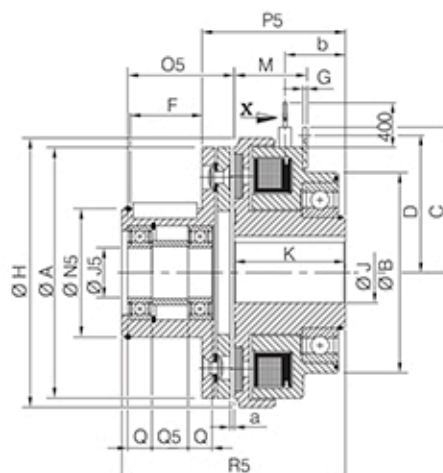
Design 3.1



Design 3.3



Design 3.5



Tapped holes shown on dimension 'Z' on request.

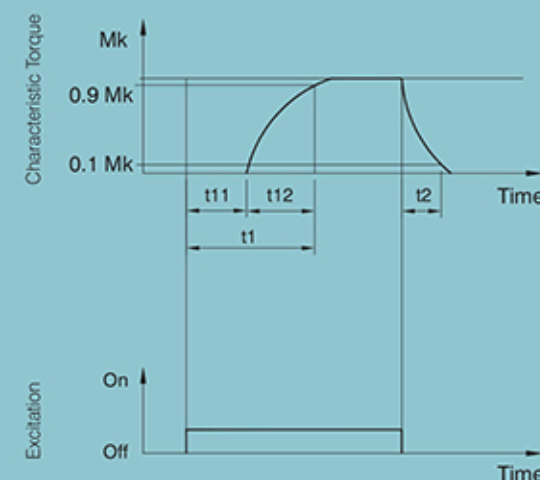
## Parameters

All dimensions are in mm

Size	06	08	10	12	16	20	25
Torque M RAT. (Nm)	7.5	15	30	60	120	240	480
Max Speed (min <sup>-1</sup> )	8000	6000	5000	4000	3000	3000	2000
Input Power P20 (w)	15	20	25	35	50	68	85
Inertia [kg cm <sup>2</sup> ]	Rotor	1.33	2.94	8.66	24.6	69	215
	1	0.6	1.71	6.64	18	63.3	190
	Armature	3	0.42	1.18	4.72	13	48
	5	0.92	2.82	9.2	25.8	86.8	258
Permissible Misalignment	Zw (mm)	0.05	0.05	0.05	0.05	0.1	0.1
<b>Important :</b> <ul style="list-style-type: none"> <li>Standard voltages : <b>24 VDC; 96 VDC; 190 VDC</b> (Other voltages on request.)</li> <li>P : Coil Power at 20° C</li> <li>Permissible voltage change <b>+5% to -10%</b></li> <li>@Circlip grooves to DIN 472</li> <li>Keyways to IS : 2048 wherever possible otherwise to DIN Standard</li> <li>Also available following Brakes</li> </ul>	ØA	63	80	100	125	160	200
	ØB	64	68	85	100	127	151.5
	C	41	50	61	72.5	99	119
	D	37	46	57	68.5	93	113
	E	4.1	4.1	4.1	4.1	8.1	8.1
	E <sub>1</sub>	10	12	14	14	20	20
	F	17	22	27	36.5	44.4	53.4
	G	1.5	1.5	2.5	2.5	3.5	3.5
	ØH	68	85.5	107	134.3	170	214.3
	K	40	43.5	49	55	61.5	74
	M	26	28	32.5	36	41.7	48.1
	ØN	27	32	42	49	65	83
	ØN <sub>K</sub>	38	45	55	64	75	90
	O	15	20	25	30	38	48
	O <sub>1</sub>	22.7	32.2	39.4	51.5	63	77.9
	P	47.5	52	60	68	77.5	94.4
	P <sub>1</sub>	47	52	60	68	77.5	95.4
	Q	8	9	12	12	13	15
	Q	4	5.5	6.5	18	28	34
	R <sub>1</sub>	59	68	90	92	108.5	133.5
	R <sub>1</sub>	44	48	54.9	62	70.5	85.4
Size Torque 31 630 40 1250 50 2500  * pilot bore, no keyway ** Standard bores *** Max. bores	R <sub>1</sub>	67	77	90	108	127.5	155.4
	ØS	46	60	75	95	120	158
	ØT	3 x 6.3	3 x 8	3 x 10.5	3 x 12	3 x 15	3 x 18
	ØU	3 x 5.5	3 x 7	3 x 9	3 x 10	3 x 13	3 x 16
	ØV	3 x 3.1	3 x 4.1	3 x 5.15	3 x 6.1	3 x 8.2	3 x 10.2
	X	1.4	1.7	2.1	2.5	3	4
	Z	5	6	6	10	10	15
	a	0.2	0.2	0.2	0.3	0.3	0.5
	b	22	24	27.5	29.5	35	42.5
	ØJ <sup>***</sup>	** 10,15	17, 20	20, 25, 30	20, 25, 30	25, 30, 40	38, 42, 48
		*** 20	25	30	40	50	65
	ØJ <sub>1</sub> <sup>**</sup>	* 10	10	14	14	20	25
		** 10,12,15	14,17, 20	20, 25, 28	25, 28, 30	25, 28, 40	40, 45, 50
		*** 17	20	30	35	45	60
	ØJ <sub>1</sub> <sup>***</sup>	12	15	20	25	30	40
							45

If clutch is engaged at 0 RPM, torque will be 30% - 35% than the rated torque

Specifications are subject to change without notice.



t1 Engagement Time      t11 Delay Time  
t2 Disengagement Time      t12 Torque Rise Time

\* Average times measured with rated air-gaps.

## 14.115

Brake Size	t11ms	t12ms	t1ms	t2ms
06	10	20	35	10
08	15	25	40	20
10	20	40	60	30
12	25	55	80	45
16	30	70	100	60
20	35	80	115	70
25	40	90	130	80

## 14.105

Clutch Size	t11ms	t12ms	t1ms	t2ms
06	15	30	45	10
08	20	55	75	15
10	25	85	110	25
12	35	105	140	40
16	45	125	170	50
20	60	140	200	60
25	75	155	230	70

## Selection

1. Select basic brake according to the torque.

$$\text{Torque (Nm)} = 9550 \times (\text{Motor kW} / \text{RPM}) \times \text{Safety factor (K)}$$

Load Condition	Safety Factor (K)
Low masses, equal loading & non - intermittent operation	2.0
Low masses, light shock load & intermittent operation	2.5
Medium masses, light shock load & intermittent operation	3.0
Large masses, light shock load & intermittent operation	3.0
Diesel engine drive	4-5
Compressor drive	5-6
Non overhauling Loads	2-3
Overhauling Loads	3-4

2. Describe the brake with the ordering parameter. (Type, size, operating voltage and hub bore)

3. Choose optional extras required (G pcd, tacho mounting provision, friction plate (instead of mounting flange), with microswitch).

4. Choose appropriate safety factor for the hoist, lift, inclined conveyors or equipment where holding against gravity is required.

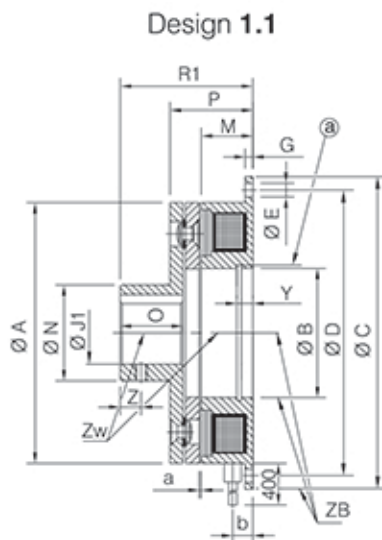
5. Select proper Rectifier considering rated voltage of the brake. If coil operating voltage is 96 or 190 VDC you can use our rectifier (Call for product details).

6. Choose correct input AC voltage for rectifier

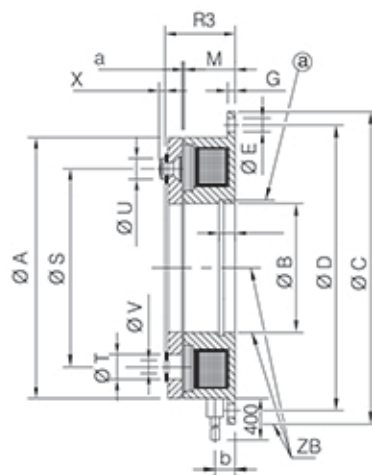
## Life

The life of friction liner depends on number of factors like, the inertia to be retarded or stopped, the relative speed, the operating frequency, the temperature at the friction surface etc. This brake must run dry. Oil, grease foreign materials, similar such lubricant affects the life and characteristics of friction materials. No general statement can be made about the life of friction materials.

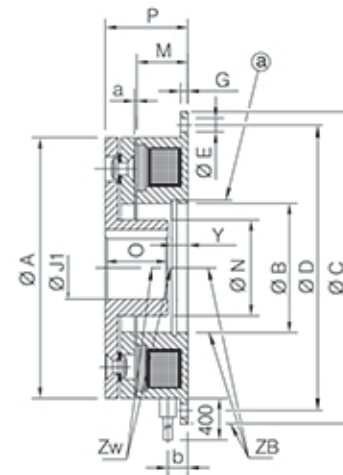




Design 1.3



Design 1.2



Tapped holes shown on dimension 'Z' on request,

## Parameters

All dimensions are in mm

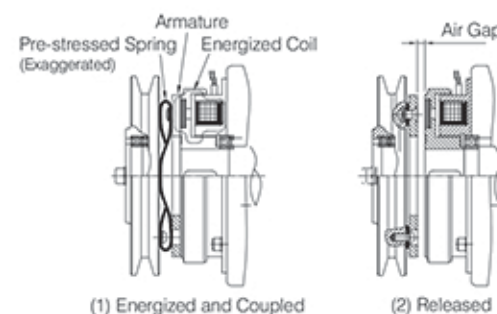
Size		06	08	10	12	16	20	25								
Torque	M RAT. (Nm)	7.5	15	30	60	120	240	480								
Max Speed	[min <sup>-1</sup> ]	8000	6000	5000	4000	3000	3000	2000								
Input Power	P20 [w]	11.5	16	21	28	38	45	70								
Inertia	[kg cm <sup>2</sup> ]	Armature ½ 3	0.6	1.71	6.64	18.0	63.3	190	480							
			0.42	1.18	4.72	13	48	137	358							
Permissible Misalignment	Zw (mm)	0.08	0.08	0.08	0.1	0.1	0.1	0.15								
	ZB (mm)	0.2	0.2	0.2	0.2	0.3	0.3	0.3								
<b>Important :</b> <ul style="list-style-type: none"><li>• Standard voltages : <b>24 VDC; 96 VDC; 190 VDC</b> (Other voltages on request.)</li><li>• <b>P</b> : Coil Power at 20° C</li><li>• Permissible voltage change <b>+5% to -10%</b></li><li>• Keyways to IS : 2048 wherever possible otherwise to DIN Standard</li><li>• @Circlip grooves to DIN 472</li><li>• Also available following Brakes <table><tr><th>Size</th><th>Torque</th></tr><tr><td>31</td><td>630</td></tr><tr><td>40</td><td>1250</td></tr><tr><td>50</td><td>2500</td></tr></table></li><li>• <b>Please call us for more details.</b>  * pilot bore, no keyway ** Standard bores *** Max. bores</li></ul>	Size	Torque	31	630	40	1250	50	2500	ØA	63	80	100	125	160	200	250
	Size	Torque														
	31	630														
	40	1250														
	50	2500														
	ØB H8	35	42	52	62	80	100	125								
	ØC H9	80	100	125	150	190	230	290								
	ØD	72	90	112	137	175	215	270								
	ØE	4 x 4.5	4 x 5.5	4 x 6.6	4 x 6.6	4 x 9	4 x 9	4 x 11								
	G	2	2.5	3	3.5	4	5	6								
	M	18	20	22	24	26	30	35								
	ØN	27	32	42	49	65	83	105								
	O	15	20	25	30	38	48	55								
	P	25.5	28.5	32.9	37	42	50.4	58.9								
	R 1	37	44.5	52.9	61	73	89.4	102.9								
	R 3	22	24.5	27.9	31	35	41.4	47.9								
	ØS	46	60	76	95	120	158	210								
	ØT	3 x 6.3	3 x 8	3 x 10.5	3 x 12	3 x 15	3 x 18	4 x 22								
	ØU	3 x 5.5	3 x 7	3 x 9	3 x 10	3 x 13	3 x 16	4 x 20								
	ØV	3 x 3.1	3 x 4.1	3 x 5.1	3 x 6.1	3 x 8.2	3 x 10.2	4 x 12.2								
X	1.4	1.7	2.1	2.5	3	4	4.3									
Y	3.5	4.3	5	5.5	6	7	8									
Z	5	6	6	10	10	15	20									
a	0.2	0.2	0.2	0.3	0.3	0.5	0.5									
b	6.3	6.3	6.3	6.8	8.8	12.4	14.9									
ØJ <sub>1</sub> <sup>10*</sup>	10	10	14	14	20	25	25									
***	10,12,15	15,17, 20	20, 25, 28	25, 28, 30	30, 35, 40	40, 50, 55	40, 50, 60									
***	17	20	30	35	42	60	60									

Specifications are subject to change without notice.

### Pre-stressed Spring

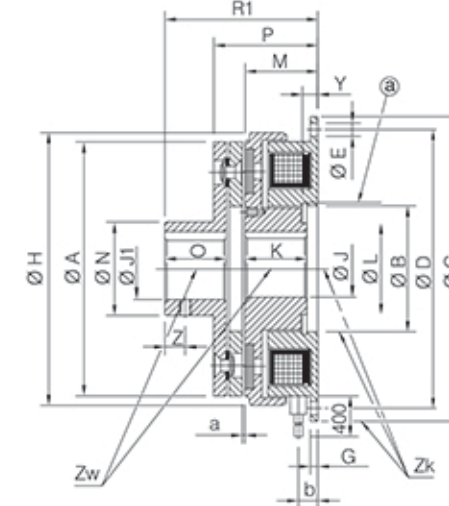
This is a ring shaped thin plate spring of simple construction. Tens of millions of ON-OFF operations will not cause permanent set in fatigue or cracking. Nor will it be broken by rust or erosion, being fabricated out of special steel material.

It is pre-stressed and of a special WVE shape design, providing strong spring force that is durable against long-term use, and stable performance.

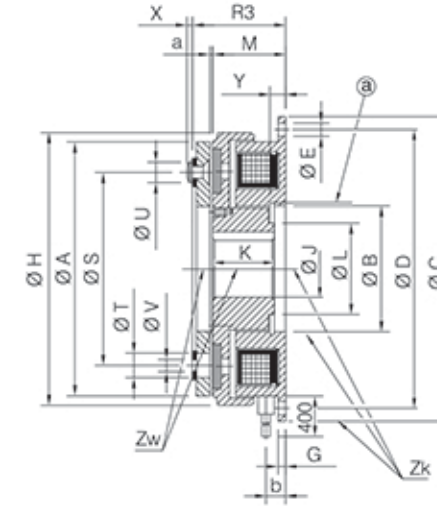


Operation of Clutch

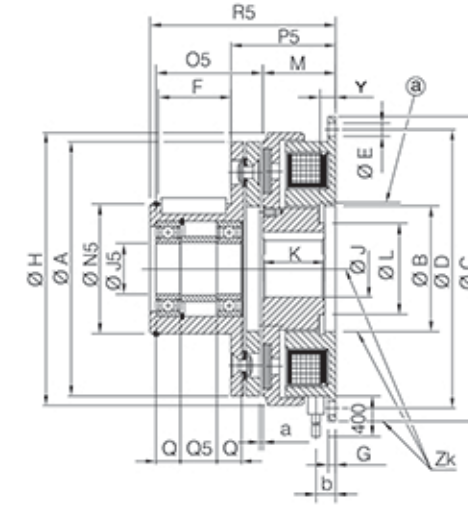
Design 1.1



Design 1.3



Design 1.5



Tapped holes shown on dimension 'Z' on request,

## Parameters

All dimensions are in mm

Size		06	08	10	12	16	20	25								
Torque	M RAT. (Nm)	7.5	15	30	60	120	240	480								
Max Speed	[min <sup>-1</sup> ]	8000	6000	5000	4000	3000	3000	2000								
Input Power	P20 [w]	15	20	25	35	50	68	85								
Inertia	[kg cm <sup>2</sup> ]	Rotor	1.19	2.66	7.8	22.6	63	205	547							
		1	0.6	1.71	6.64	18	63.3	190	480							
		3	0.42	1.18	4.72	13	48	137	358							
		5	0.92	2.82	9.2	25.8	86.8	258	720							
Permissible Misalignment	Zw (mm)	0.05	0.05	0.05	0.05	0.1	0.1	0.1								
	Zk (mm)	0.1	0.15	0.15	0.1	0.2	0.2	0.25								
<b>Important :</b>  • Standard voltages : <b>24 VDC; 96 VDC; 190 VDC</b> (Other voltages on request.)  • <b>P</b> : Coil Power at 20° C  • Permissible voltage change <b>+5% to -10%</b>  • (*) J : 55 & 60  • J <sub>1</sub> : 55  • @Circlip grooves to DIN 472  • Keyways to IS : 2048 wherever possible otherwise to DIN Standard  • Also available following Brakes <table><tr><th>Size</th><th>Torque</th></tr><tr><td>31</td><td>630</td></tr><tr><td>40</td><td>1250</td></tr><tr><td>50</td><td>2500</td></tr></table>  • Please call us for more details.	Size	Torque	31	630	40	1250	50	2500	ØA	63	80	100	125	160	200	250
	Size	Torque														
	31	630														
	40	1250														
	50	2500														
	ØB H8	35	42	52	62	80	100	125								
	ØC h9	80	100	125	150	190	230	290								
	ØD	72	90	112	137	175	215	270								
	ØE	4 x 4.5	4 x 5.5	4 x 6.6	4 x 6.6	4 x 9	4 x 9	4 x 11								
	F	17	22	27	36.5	44.4	53.4	83.5								
	G	2	2.5	3	3.5	4	5	6								
	ØH	68	85.5	107	134.3	170	214.3	266.5								
	ØJ <sub>s</sub>	12	15	20	25	30	40	45								
	K	22	24	27	30	34	40	47								
	ØL	23	28.5	40	45	62	77	100								
	M	24	26.5	30	33.5	37.5	44	51								
	ØN <sub>96</sub>	27	32	42	49	65	83	105								
	ØN	38	45	55	64	75	90	115								
	O	15	20	25	30	38	48	55								
	O <sub>s</sub>	22.7	32.2	39.4	51.5	63	77.9	91.9								
	P	31.5	35	40.9	46.5	53.5	64.5	74.9								
	P <sub>s</sub>	31	35	40.9	46.5	53.5	65.4	74.9								
	Q	8	9	12	12	13	15	19								
	Q <sub>s</sub>	4	5.5	6.5	18	28	34	38								
	R <sub>i</sub>	43	51	60.9	70.5	84.5	103.4	118.9								
	R <sub>s</sub>	28	31	35.9	40.5	46.5	55.4	63.9								
	R <sub>e</sub>	51	60	70.9	86.5	103.5	125.4	144.9								
	ØS	46	60	76	96	120	158	210								
	ØT	3 x 6.3	3 x 8	3 x 10.5	3 x 12	3 x 15	3 x 18	4 x 22								
	ØU	3 x 5.5	3 x 7	3 x 9	3 x 10	3 x 13	3 x 16	4 x 20								
	ØV	3 x 3.1	3 x 4.1	3 x 5.15	3 x 6.1	3 x 8.2	3 x 10.2	4 x 12.2								
	X	1.4	1.7	2.1	2.5	3	4	4.3								
	Y	3.5	4.3	5	5.5	6	7	8								
	Z	5	6	6	10	10	15	20								
	a	0.2	0.2	0.2	0.3	0.3	0.5	0.5								
	b	5.7	6.5	7.9	7.1	9.1	12.4	14.9								
	ØJ <sup>10</sup>	*	10	10	14	14	20	25	25							
		**	11,14,15	14,19,20	19,24,28	24,34,38	28,38,42	38,42,48	50,60,70							
		***	17	22	30	40	50	65	80							
	ØJ <sub>i</sub> <sup>10</sup>	*	10	10	14	14	20	25	25							
**		11,12,14	14,17,19	19,24,28	25,28,34	28,34,38	38,42,48	40,50,60								
***		17	20	30	35	45	60	80								

\* pilot bore, no keyway  
\*\* Standard bores  
\*\*\* Max. bores

Specifications are subject to change without notice.