

EMCO-Simplatroll®

DC Spring Applied Brakes

Type **14.450**
Sealed Design
(IP 56 Enclosure)
(Normally ON)



CE

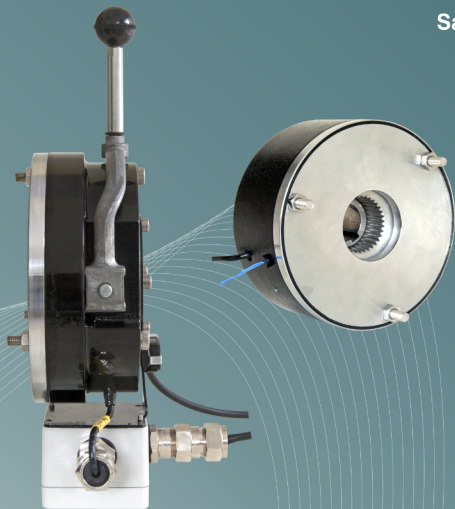


Type **14.461**
Sealed Design
(IP 65 Enclosure)
(Normally ON)



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

Emco-Simplatroll DC Spring Applied **Fail Safe Brake Type 14.450/14.461** are "Normally On" brake with IP 65 protection. These brakes can be used for all applications where rotating machines must be stopped quickly when switched off or when power fails ensuring the SAFETY.



Salient Features of Type 14.450/14.461

- ▶ 'Deadman Type' Manual Release
- ▶ Brake outer diameter completely enclosed (Higher protection can be easily realised)
- ▶ Compact Size
- ▶ Easy Installation
- ▶ Rust Protection to All Metal Parts
- ▶ Coil with 'F' Class Insulation[#]
- ▶ Non Asbestos friction liner^{*}
- ▶ Use of Special Bonding Agent
- ▶ Tacho Mounting provision possible
- ▶ Microswitch available on request
- ▶ Low rotor inertia
- ▶ Cold climate versions available

[#] Higher coil insulation available on request.

^{*} Standard Indian liner. German liner available on request.

Applications



Cranes & Hoists



Machine Tools



Packaging Machines



Textile Machines



Construction Machinery



Windmills



Conveyors



Printing Machines



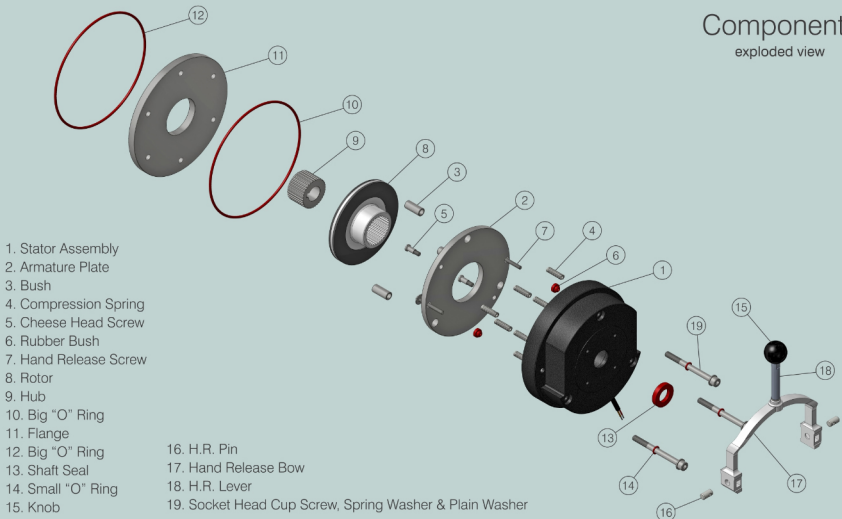
Elevators



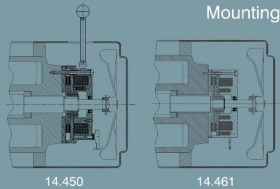
Pallet Truck Drives

Components

exploded view



- 1. Stator Assembly
- 2. Armature Plate
- 3. Bush
- 4. Compression Spring
- 5. Cheese Head Screw
- 6. Rubber Bush
- 7. Hand Release Screw
- 8. Rotor
- 9. Hub
- 10. Big "O" Ring
- 11. Flange
- 12. Big "O" Ring
- 13. Shaft Seal
- 14. Small "O" Ring
- 15. Knob
- 16. H.R. Pin
- 17. Hand Release Bow
- 18. H.R. Lever
- 19. Socket Head Cup Screw, Spring Washer & Plain Washer



Mounting

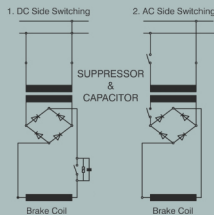
Working

In the "power off" state the compression springs (5) press the armature disc (3) and rotor (7) against attachment surface.

Hub (8) is firmly locked on the shaft and rotor slides over the hub.

On applying rated direct current voltage to the stator (2) the magnetic field produced will pull the armature disc (3) over air-gap 'a' towards stator against spring force. Thus the rotor is released allowing shaft to rotate.

In the event of continuous power failure, rotor (7) can be freed by pulling the hand release of "deadman type". The hand release goes back automatically to its original position and brake will immediately revert to its safe action.



Switching

Brake coils are operated with DC voltage. Generally when braking time is not critical AC side switching is done. This method is often used with brake motors, where brake is switched with motor contacts. Due to the inductance of the brake coil, engagement time can be 3 to 6 times longer than with DC switching. Therefore this arrangement is not suitable for hoist applications.

For falling loads such as hoist, lifts and cranes, also the high inertia loads, a brake motor to some extent

regenerate the supply and hold off the brake. Here it is essential to switch on the DC side of the rectifier. DC side switching requires provision of universal spark suppressor and capacitor to protect the coil and switches against inductive voltages.

For normal rectifier converting AC to DC you can use separate universal spark suppressor and capacitor across the switch. Rectifier supplied by us are designed to include suppressor and capacitor suitable for DC switching.

For optimum performance we suggest the following Rectifiers (Power supply).

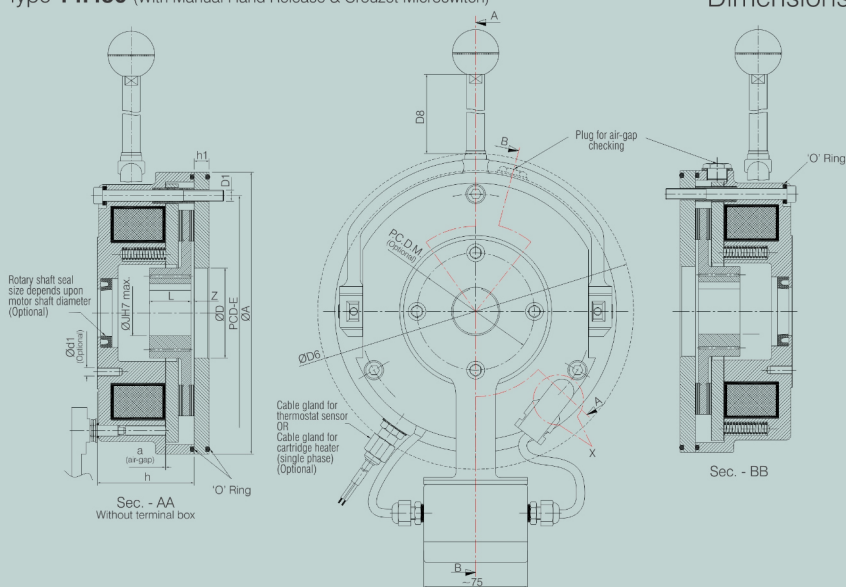
Brake Coil Voltage	AC Input Voltage	Current Rating	Rectifier Type
190 VDC	415 VAC	2 Amp	EH 720 HHD
	230 VAC	2 Amp	EH 720 AD
96 VDC	230 VAC	2 Amp	EH 720 CD
	110 VAC	2 Amp	EH 720 BD
190 VDC	415 VAC	1 Amp	UM 101
	415 VAC	3 Amp	UM 101 B
96 VDC	230 VAC	1 Amp	UM 101 A
	230 VAC	3 Amp	UM 101 C

All rectifiers offered by us are with inbuilt DC switching protection circuit. Use of inferior quality and cheap rectifiers may damage your costly brake coils.

For brake size 18 and above use UM rectifiers. UM series rectifiers are over excitation rectifiers.

Type 14.450 (With Manual Hand Release & Crouzet Microswitch)

Dimensions



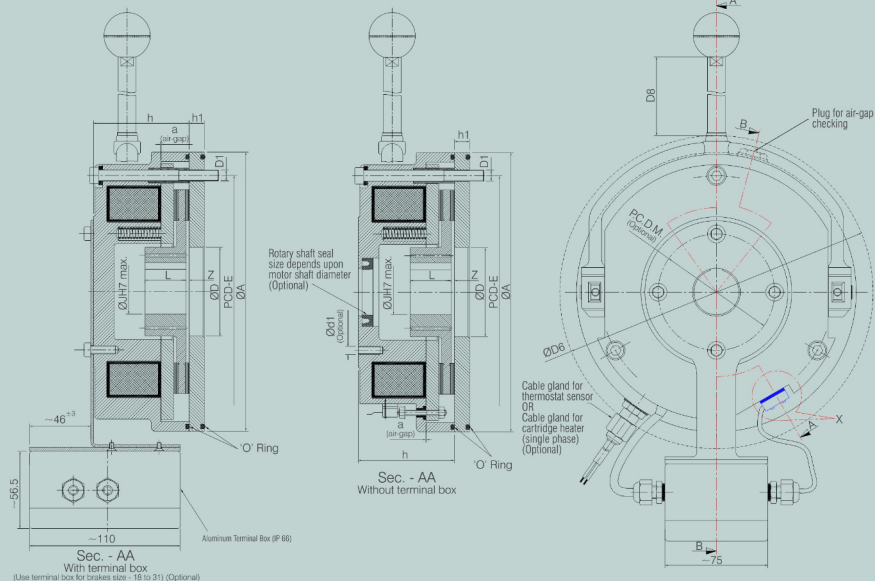
Parameters

All dimensions are in mm

Brake Size	Torque M.RAT. (Nm)	Input Power P20 [w]	± 0.5 ØA	± 0.5 ØD HB	± 0.1 PC-D-E	± 0.1 PC-D-M (Optional)	ØJH7	D1	d1	h	$+2$ ± 0.1 h1	$+0.2$ ± 0.1 L	± 0.3 Z	± 2 Ød6	D8	± 0.05 a (air-gap)
14.450.06	4	20	100	31	72	37	10,11,12,14,15	M4 x 3 Nos.	M4 x 4 Nos.	36	6	18	1	120	30	0.2
14.450.08	8	25	120	41	90	49	11,12,14,15,19,20	M5 x 3 Nos.	M5 x 4 Nos.	41	7	20	1.5	140	50	0.2
14.450.10	16	30	145	40	112	54	11,12,14,15,19,20	M6 x 3 Nos.	M5 x 4 Nos.	50	9	20	2	160	33.5	0.2
14.450.12	32	40	166	45	132	64	20,24,25	M6 x 3 Nos.	M5 x 4 Nos.	55	9	25	2	185	52.5	0.3
14.450.14	60	50	180	55	145	75	20,24,25,28,30,32	M8 x 3 Nos.	M6 x 4 Nos.	63.3	11	30	2	210	62.5	0.3
14.450.16	100	76	204	65	170	85	25,28,30,32,34,35	M8 x 3 Nos.	M6 x 4 Nos.	72.5	11	30	2.25	235	95	0.3
14.450.18	150	85	233	75	196	95	30,35,38,40,42	M8 x 6 Nos.	M8 x 4 Nos.	83	11	35	3	270	120	0.4
14.450.20	260	100	271	90	230	110	35,40,42,45,48	M10 x 6 Nos.	M10 x 4 Nos.	96	11	40	3.5	308	239	0.4
14.450.23	315	105	271	90	230	110	35,40,42,45,48	M10 x 6 Nos.	M10 x 4 Nos.	96	11	40	3.5	308	239	0.4
14.450.25	400	110	325	120	278	140	45,48,50,52,55,60,65	M10 x 6 Nos.	M10 x 4 Nos.	108	12.5	50	4.5	360	239	0.5
14.450.31	600 / 800	140 / 180	325	120	278	140	45,48,50,52,55,60,65	M10 x 6 Nos.	M10 x 4 Nos.	121	16	50	4.5	-	-	0.5
14.450.40	1600	340	390	145	325	160	50,52,55,60,65,70 75,80,85,90	M10 x 6 Nos.	M10 x 4 Nos.	133.8	20	64	4.5	-	-	0.5
14.450.50	2500	440	552	210	480	-	60,65,70,75,80,85,90 95,100,110	M16 x 6 Nos.	-	183.1	30	83	6.5	-	-	0.8

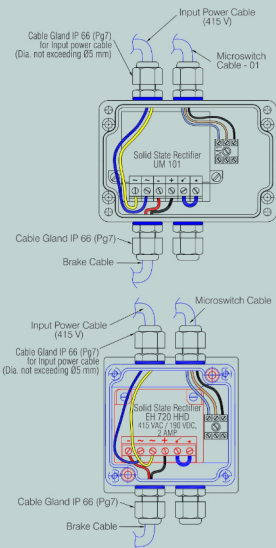
Type 14.450 (With Manual Hand Release & Saia-Burgess Microswitch)

Dimensions



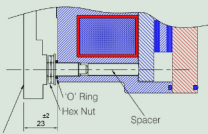
Important :

- For vertical mounting contact us.
- For applications with motor operated with VFD contact us for special circuit.
- Standard voltages : **24 VDC, 96 VDC, 190 VDC, & 220 VDC** (Other voltages on request.)
- P. Coil Power at 20° C
- Permissible voltage change : **+5% to -10%**
- Recommended ISO shaft tolerances
 Up to Ø50 mm = k6
 Over Ø50 mm = m6
- Keyways to DIN 6885 / IS : 2048
- Brake Controller can not fit in terminal box. Please mount Brake Controller in the Control Panel.
- Brake to be operated with over excitation voltage rectifier.
- Class of Insulation : "F" / "H"
- Armature Plate & Flange : SS with Zinc plated Olive Green Passivation.
- All other components Zinc plated Olive Green Passivation.



Microswitch Lead Wire details :

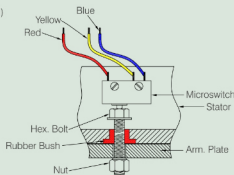
- Black : C (Common)
- Brown : N.C. (Normally Closed)
- Grey : N.O. (Normally Open)
- Sealed : IP 56 Protection
- Specifications :
 Make : Crozet
 Current/Voltage : 5A / 250 V
 Thermal Current (A) : 12



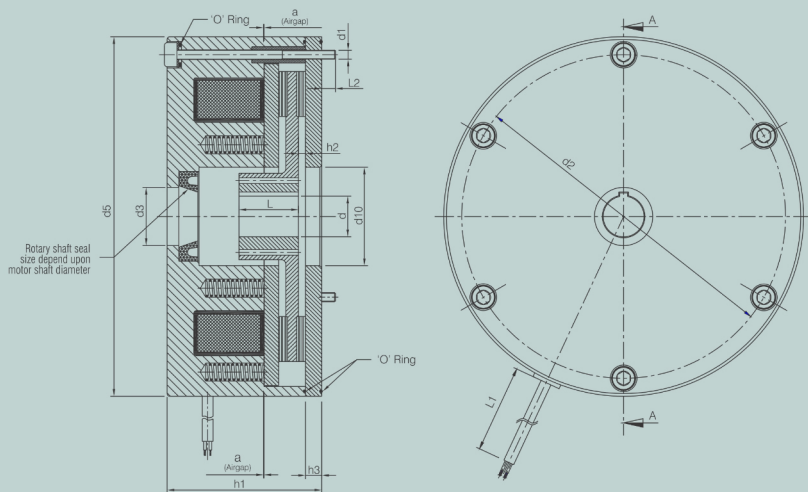
"X" View for Crozet Microswitch Detail

Microswitch Lead Wire details :

- Red : C (Common)
- Yellow : N.C. (Normally Closed)
- Blue : N.O. (Normally Open)
- Sealed : IP 67 Protection
- Model No. : V4NSUL
- Make : Sai-Burgess



"X" View for Saia-Burgess Microswitch Detail

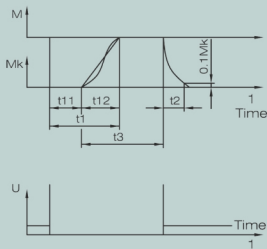


Parameters

All dimensions are in mm

Brake Size	Torque M RAT. (Nm)	Input Power P20 [w]	dH7	d1	± 0.1	± 0.2	± 0.5	d10 H8	± 1	± 0.1	± 0.2	-0.2	± 15	L2	± 0.05
					d2	d3	d5		h1	h2	h3	L	L1		a (air-gap)
14.461.06	4	20	10,11,12,14,15	M4 x 3 Nos.	72	16	87	31	42	1	6	18	410	7	0.2
14.461.08	8	25	11,12,14,15,19,20,24	M5 x 3 Nos.	90	21	103	41	50	1.5	7	20	410	9	0.2
14.461.10	16	30	11,12,14,15,19,20,24	M6 x 3 Nos.	112	21	130	44	58	2	9	20	410	12	0.2
14.461.12	32	40	20,24,25,28	M6 x 3 Nos.	132	26	148	52	63.5	2	9	25	410	12	0.2
14.461.14	60	50	20,24,25,28 30,32,34	M8 x 3 Nos.	145	31	165	55	76	2	11	30	410	12	0.3
14.461.16	100	76	25,28,30,32 34,35,38	M8 x 3 Nos.	170	36	200	70	83	2.25	11	30	610	15	0.3
14.461.18	150	85	30,35,38,40 42,45	M8 x 6 Nos.	196	46	221	77	94	2.75	11	35	610	15	0.4
14.461.20	260	100	35,40,42,45 48,50	M10 x 6 Nos.	230	52	274	90	111	3.5	11	40	610	20	0.4
14.461.25	400	110	45,48,50,52 55,60,65,70	M10 x 6 Nos.	278	72	326	120	122.5	4.5	12.5	50	610	20	0.5

Operating times



The engagement times are valid for switching on DC side. The table shows the delay during engagement t_{11} , the rise time of brake torque t_{12} and the engagement time $t_1 = t_{11} + t_{12}$. Disengagement time is not influenced by DC or AC side switching. However it can be reduced by suitable excitation or over excitation.

t1 Engagement time
t2 Disengagement time

Brake Size	t1ms		t2ms	
	14.450	14.461	14.450	14.461
06	7	10	17	35
08	10	25	35	65
10	10	30	40	90
12	10	40	50	120
14	15	50	65	150
16	20	70	90	180
18	30	80	110	300
20	50	150	200	400
25	70	200	270	500

Brake Size	Average Braking Torque %	Braking Torque at RPM			Maximum Speed (RPM)
		1500	3000	MAX.	
06	100	87	80	65	12400
08	100	85	78	66	10100
10	100	83	76	66	8300
12	100	81	74	66	6700
14	100	80	73	67	6000
16	100	79	72	66	5300
18	100	77	70	66	4400
20	100	75	68	66	3700
25	100	73	66	66	3000

Important :

- For vertical mounting contact us.
- For applications with motor operated with VFD contact us for special circuit.
- Standard voltages : **24 VDC, 96 VDC, 190 VDC, & 205 VDC**
(Other voltages on request.)
- **P** : Coil Power at 20° C
- Permissible voltage change : **+5% to -10%**
- Recommended ISO shaft tolerances
Up to Ø50 mm = k6
Over Ø50 mm = m6
- Keyways to DIN 6885 / IS : 2048 (j9)
- Brake to be operated with over excitation voltage rectifier.
- Class of Insulation : "F" / "H"
- *Non Std. Keyway
- Non adjustable air-gap.
- Armature Plate & Flange : SS with Zinc plated Olive Green Passivation.
- All other components Zinc plated Olive Green Passivation.

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 pod, 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.



EMCO® & EMCO-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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