

# EMCO-Simplatroll®

## Spring Applied Marine Duty Brake



Type WP.458.xx (IP 66)

Type WP.488.xx (IP 66)



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

ISO 9001:2015 Company



Emco-Simplatroll marine duty brakes stand approved for **IP 66** degree of protection by 'The Electrical Research & Development Association'(ERDA). These are specially designed and recommended for applications where protection is required against water and dust - especially in marine environment. These brakes are electromagnetically actuated single disk with two friction surfaces. The braking power is applied by means of compression springs. The braking torque is generated in the power off state or in event of power failure condition.

### Salient Features of Type WP.458.xx & 14.488.xx



- ▶ IP 65, IP 66 and IP 56 protection.
- ▶ IP 67 protection available on request.
- ▶ Fail safe.
- ▶ Torque up to 2500 Nm.
- ▶ German Non asbestos friction linings.
- ▶ Twin friction surfaces.
- ▶ Low inertia rotors.
- ▶ Class 'F' coil insulation.#
- ▶ Hard chrome plated armature plates & flanges.
- ▶ German low-wear non asbestos lining available on request.
- ▶ Microswitch available on request.
- ▶ Cold climate version available.
- ▶ Screw type manual release.

# Higher coil insulation available on request.

### Typical Applications



Tower Cranes



Port Cranes



Gantry Cranes



Machine Tools



Windmills



Cement Plants



Mining Equipment



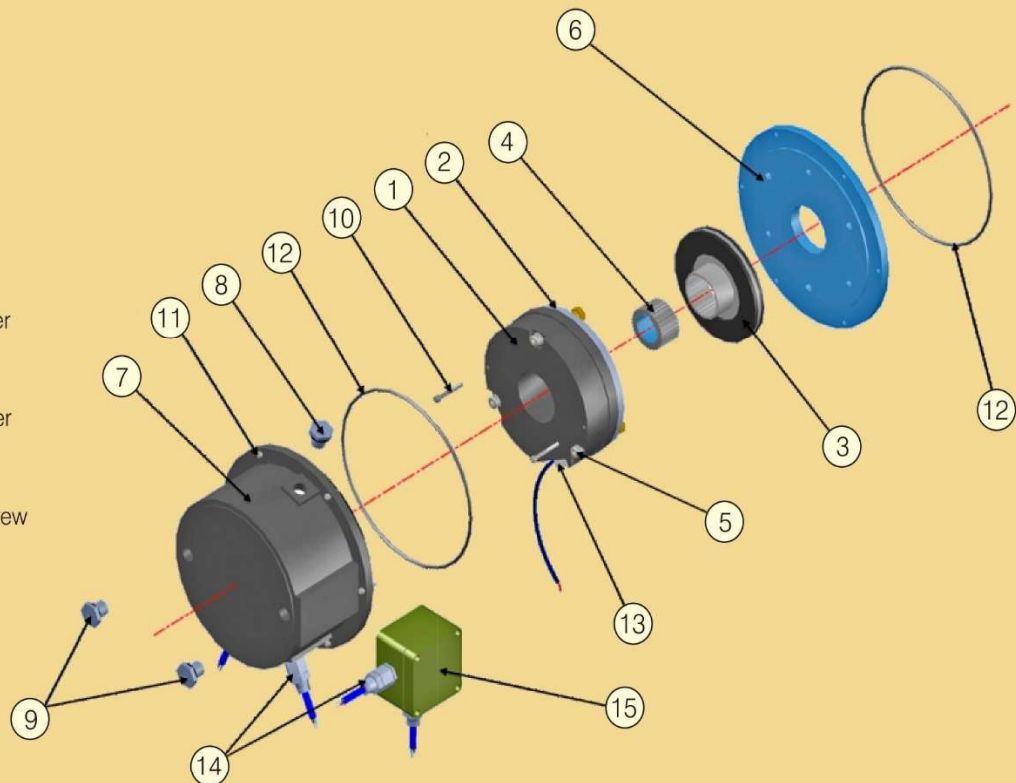
Mooring Winches



# Components

exploded view

1. Stator
2. Armature Plate
3. Rotor
4. Hub
5. A/B, Mounting Bolt & Washer
6. Mounting Flange
7. Marine Duty Enclosure Cover
8. Air Gap Checking Screw
9. Manual Release Access Screw
10. Manual Release Screw
11. Cover Mounting Screw
12. 'O' Ring
13. Microswitch (Optional)
14. Cable Gland
15. Terminal Box (Optional)



## Mounting

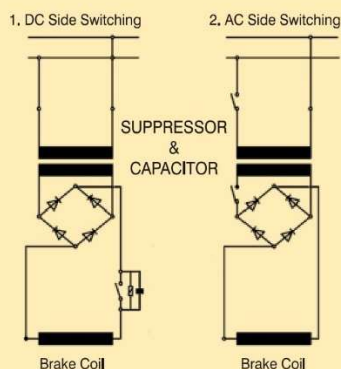


## Working

**Braking** During braking, the rotor(3) which is axially movable on the hub(4), is pressed against the friction surface via the armature plate(2) by means of inner & outer springs. The friction linings ensure a high brake torque. The brake torque is transmitted between hub(4) & rotor(3) via splines.

**Releasing** When the brake is applied, there is an air gap between stator(1) & armature plate(2). For releasing the brake, a DC voltage is applied to the stator coil. The Magnetic force generated attracts the armature towards the stator against the spring force. The rotor(3) is then released and can rotate freely.

**Brake Torque Reduction** The spring force & the brake torque can be reduced by unscrewing the torque adjusting ring.



## 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

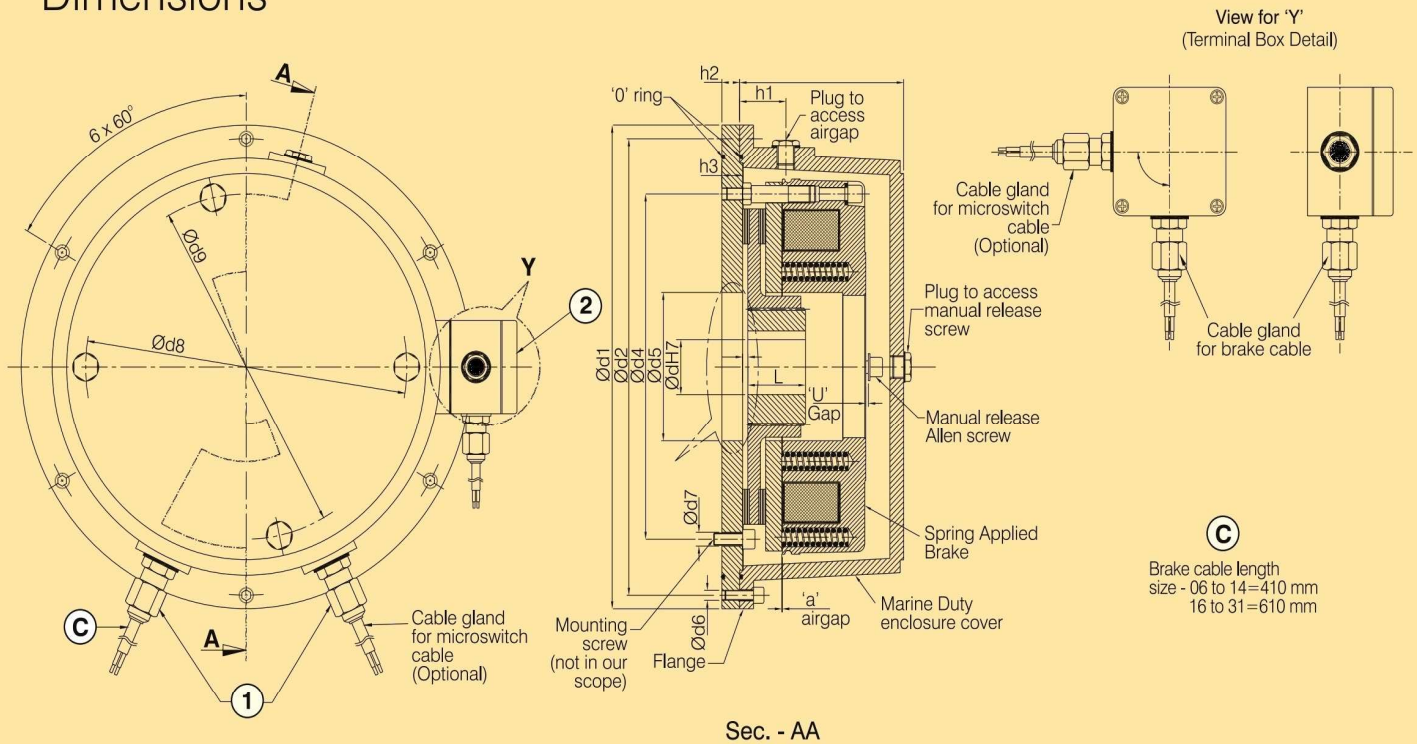
essential to switch on the DC side of the rectifier. DC side switching requires provision of universal spark suppressor & capacitor to protect the coil & switches against inductive voltages.

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
All rectifiers offered by us are with inbuilt DC switching protection circuit. Use of inferior quality & cheap rectifiers may damage your costly brake coils. <b>Use over excitation rectifiers UM series for all brakes involved in hoisting or application related to gravity.</b> <b>For brake size 18 and above use UM rectifiers. UM series rectifier are over excitation rectifiers.</b>	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
	190 VDC	415 VAC	1 Amp	UM 201
	96 VDC	230 VAC	1 Amp	UM 201 A

Note : WP488.xx brakes are to be operated with UM 201 rectifier only.

# Dimensions



## Parameters

Size	Input power P 20	Torque (Nm)	ØdH7	Ød1	Ød2	Ød4	Ød6 H8	Ød6	Flange Mounting Holes Ød7	Ød8	Ød9	L	Z	h	h1	h2	h3	±0.05 a (Airgap)	±0.1 U Gap	Flange Mounting Screw	
																				Without Microswitch	With Microswitch
WP458.06	22	5	10, 11, 12, 14 15	140	125	72	31	M5 x 12 (4 Nos.)	3 x Ø4.5	77	-	18	1	61	17	7.5	10	0.2	1	M4 x 16 (3 Nos.)	M4x 16 (3 Nos.)
WP488.06	10																				
WP458.08	28	10	11, 12, 14,15 19, 20, 24	160	148	90	41	M5 x 16 (4 Nos.)	3 x Ø5.5	93.5	-	20	1.5	68	18	8.8	11	0.2	1	M5 x 20 (3 Nos.)	M5 x 20 (3 Nos.)
WP488.08	12																				
WP458.10	35	20	11, 12, 14,15 19, 20, 24	185	166	112	40	M5 x 16 (4 Nos.)	3 x Ø6.6	112	-	20	2	76	21	9	11.5	0.2	1	M6 x 20 (3 Nos.)	M6 x 20 (3 Nos.)
WP488.10	14																				
WP458.12	45	40	20, 24, 25, 28	205	192	132	45	M6 x 16 (6 Nos.)	3 x Ø6.6	132	-	25	2	86	23	9	11.5	0.3	1	M6 x 25 (3 Nos.)	M6 x 25 (3 Nos.)
WP488.12	18																				
WP458.14	50	60	20, 24, 25, 28 30, 32, 34	225	212	145	55	M6 x 16 (6 Nos.)	3 x Ø9	150	-	30	2	100	34	10	12.5	0.3	1	M8 x 30 (3 Nos.)	M8 x 30 (3 Nos.)
WP488.14	24																				
WP458.16	76	100	25, 28, 30, 32, 34, 35, 38	250	236	170	65	M6 x 16 (6 Nos.)	3 x Ø9	170	-	30	2.25	105	25	10	12.5	0.3	1.5	M8 x 30 (3 Nos.)	M8 x 30 (3 Nos.)
WP488.16	35																				
WP458.18	85	150	30, 35, 38, 40, 42, 45	285	268	196	75	M6 x 20 (6 Nos.)	6 x Ø9	196	-	35	2.75	122	29	12.5	15	0.4	1.5	M8 x 35 (6 Nos.)	M8 x 35 (6 Nos.)
WP488.18	38																				
WP458.20	100	260	35, 40, 42, 45, 48, 50	330	314	230	90	M8 x 20 (6 Nos.)	6 x Ø11	230	-	40	3.5	131	35	12.5	15	0.4	1.5	M10 x 35 (6 Nos.)	M10 x 35 (6 Nos.)
WP488.20	45																				
WP458.25	110	400	45, 48, 50, 52, 55, 60, 65, 70	390	368	278	120	M8 x 20 (6 Nos.)	6 x Ø11	278	-	50	4.5	142	40	12.5	15	0.5	2	M10 x 35 (6 Nos.)	M10 x 35 (6 Nos.)
WP488.25	50																				
WP458.31	140	600	45, 48, 50, 52, 55, 60, 65, 70	390	368	278	120	M8 x 20 (6 Nos.)	6 x Ø11	278	-	50	4.5	168	37	12.5	15	0.5	2	M10 x 35 (6 Nos.)	M10 x 35 (6 Nos.)

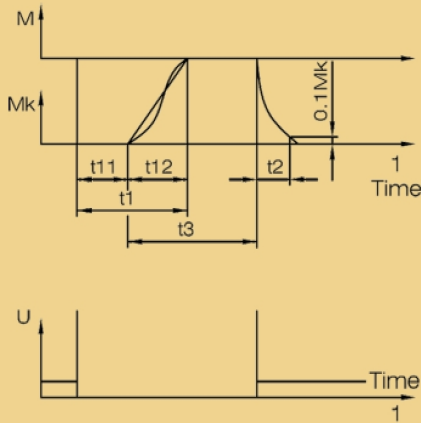
Liner wear is directly proportional to the speed at which braking takes place.

All dimension are in mm.

We reserve the right to make changes in specifications.



## 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.

Brake Size	WP458 Brake		WP488 Brake	
	t1ms	t2ms	t1ms	t2ms
06	17	35	4	12
08	35	65	6	18
10	40	90	8	30
12	50	120	10	45
14	65	150	11	55
16	90	180	12	75
18	110	300	15	105
20	200	400	22	130
25	270	500	28	170

t1 Engagement time  
t2 Disengagement time

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 :  
**WP458.xx** - 24 VDC.; 96 VDC.; 190 VDC  
**WP488.xx** - 190 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  
\* Non std. Keyway
- Contact us for Manual Cranking application

## Selection

- 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

- Describe the brake with the ordering parameters.  
(Type, size, operating voltage & hub bore)
- For brake size 06, 08, 10 & 12 terminal box with cover will not be provided.  
Only cable gland will be provided.
- Choose appropriate safety factor for the hoist, lift, inclined conveyors or equipment where holding against gravity is required.
- Choose correct input AC voltage for rectifier.
- For brake size 14 to 50 terminal box will be provided on request. (optional item)
- Microswitch will be provided on request. (optional item)
- Brake enclosure will be provided with either item 1 or 2. (Refer dimension drawing)



## 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.*



### Regd. Office :

1st Floor, Sita Mauli, above Bank of Maharashtra, Madanlal Dhingra Road  
Panch Pakhadi, Thane (West), 400 602, INDIA  
Tel : +91 (0) 22 2540 5490 / 2545 2244 / 2541 5913 / 2541 5914  
Fax : +91 (0) 22 2545 2233  
Email : [mktg@emco-dynatorq.in](mailto:mktg@emco-dynatorq.in)

### Unit I :

Shivam Industrial Estate, Bldg. No. 3, Gala No. 12A & 12B  
Tungareshwar Phata Road, Satali, Vasai (E), Thane - 401208  
Tel : +91 (0) 250 2694 777 / 6294 888 / 6063 999 • Fax : +91 (0) 250 2481 086  
Email : [vasai@emco-dynatorq.in](mailto:vasai@emco-dynatorq.in)

### Unit II :

1003, GIDC, Waghodia, Dist. Baroda 391 760, Gujarat  
Tel : +91 (0) 2668 262186 / 263089 • Telefax : +91 (0) 2668 262180  
Cell : +91 90990 78735  
Email : [dynatorq@gmail.com](mailto:dynatorq@gmail.com) / [marketing.dynatorq@gmail.com](mailto:marketing.dynatorq@gmail.com)

### Unit III :

Gala No. 6A & 8, Kedarnath Bldg. Tungareshwar Indl. Estate, Satali, Vasai (E)  
Tel : +91 (0) 250 2480 178 / 2480 921

### Unit IV :

1426, GIDC Waghodia, Dist. Baroda 391 760, Gujarat  
Tel : +91 (0) 2668 290761



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**Emco Dynatorq Pvt. Ltd.**  
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CIN NO. : U74999MH1991PTC061109

Website : [www.emco-dynatorq.in](http://www.emco-dynatorq.in)