*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.
- 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.*
** Standard Indian liner. German liner available on request.*

## Typical Applications

Tower Cranes

Port Cranes

Gantry Cranes

Machine Tools

Windmills

Cement Plants

Mining Equipment

Mooring Winches

## 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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ISO 9001 : 2008

QAC/R91/1264
QAC/R91/1382

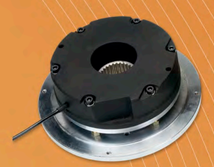
**Emco Dynatorq Pvt. Ltd.**
(Formerly **Emco Lenze Pvt. Ltd.**)
ISO 9001:2008 Company

CAT No. 458 IP 66 / Rev. 0

# EMCO-Simplatroll®

## Spring Applied Marine Duty Brake

Type WP.458.xx (IP 66)
Type WP.488.xx (IP 66)

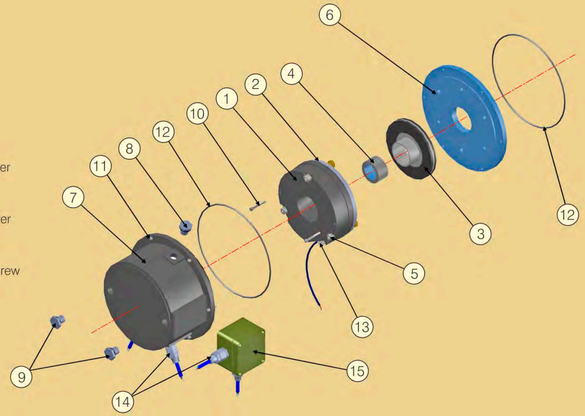


**Emco Dynatorq Pvt. Ltd.**
(Formerly **Emco Lenze Pvt. Ltd.**)
ISO 9001:2008 Company

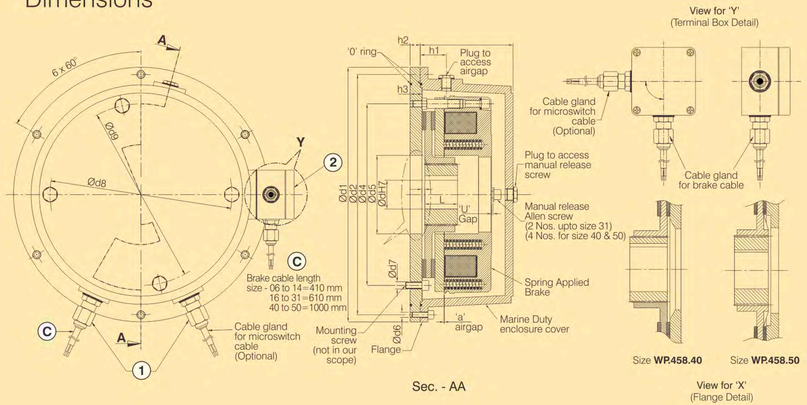
# Components

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)




# Dimensions




Sec. - AA

## Parameters

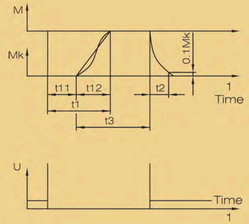
| Size | Input power P 20 | Torque (Nm) | ØdH7 | Ød1 | Ød2 | Ød4 | Ød6 H8 | Ød6 | Flange Mounting Holes Ød7 | Ød8 | Ød9 | L | Z | h | h1 | h2 | h3 | ±0.05 a (Airgap) | ±0.1 U Gap | Flange Mounting Screw | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | Without Microswitch | With Microswitch |
| WP458.06 | 20 | 4 | 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 | 8 | | | | | | | | | | | | | | | | | | | | |
| WP458.08 | 25 | 8 | 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 | 10 | | | | | | | | | | | | | | | | | | | | |
| WP458.10 | 30 | 16 | 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 | 12 | | | | | | | | | | | | | | | | | | | | |
| WP458.12 | 40 | 32 | 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 | 16 | | | | | | | | | | | | | | | | | | | | |
| 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 | 20 | | | | | | | | | | | | | | | | | | | | |
| 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 | 22 | | | | | | | | | | | | | | | | | | | | |
| 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 | 34 | | | | | | | | | | | | | | | | | | | | |
| 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 | 40 | | | | | | | | | | | | | | | | | | | | |
| 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 | 44 | | | | | | | | | | | | | | | | | | | | |
| 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.) |
| WP458.40 | 340 | 1600 | 30, 50, 52, 55, 60, 65, 70, 75, 85, 90 | 450 | 420 | 325 | 145 | M10 x 35 (6 Nos.) | 6 x Ø11 | 335 | 325 | 64 | 4.5 | 172 | 41 | 21.5 | 24 | 0.5 | 2.5 | M10 x 45 (6 Nos.) | M10 x 45 (6 Nos.) |
| WP458.50 | 440 | 2500 | 40, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110 | 630 | 608 | 480 | 210 | M10 x 40 (6 Nos.) | 6 x Ø16.5 | 488 | 475 | 83 | 6.5 | 230 | 56 | 30 | 33 | 0.8 | 2.5 | M16 x 65 (6 Nos.) | M16 x 65 (6 Nos.) |

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

All dimensions are in mm.

We reserve the right to make changes in specifications.

# Operating times



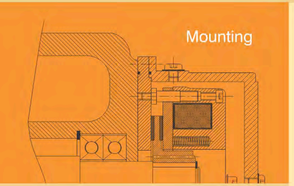

The engagement times are valid for switching on DC side. The table shows the delay during engagement t11, the rise time of brake torque t12 and the engagement time t1=t11 + t12. Disengagement time is not influenced by DC or AC side switching. However it can be reduced by suitable excitation or over excitation.

| 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 |

# Mounting

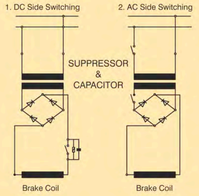


# Working

**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 |
|---|---|---|---|---|
| | 190 VDC | 415 VAC | 2 Amp | EH 720 HHD |
| | | 230 VAC | 2 Amp | EH 720 AD |
| All rectifiers offered by us are with inbuilt DC switching protection circuit. Use of inferior quality & cheap rectifiers may damage your costly brake coils. | 96 VDC | 230 VAC | 2 Amp | EH 720 CD |
| | | 110 VAC | 2 Amp | EH 720 BD |
| For brake size 18 and above use UM rectifiers. UM series rectifiers are over excitation rectifiers. | 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 |

Rectifiers made by **Usha Medisales**

Note : WP.488.xx brakes are to be operated with UM 201 rectifier only.

**Important :**

- For vertical mounting contact us.
- For applications with motor operated with VFD contact us for special circuit.
- Standard voltages :
  **WP.458.xx** - 24 VDC.; 96 VDC.; 190 VDC
  **WP.488.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

1. Select basic brake according to the torque.
   **Torque (Nm) = 9550 X (Motor kW / RPM) X 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 parameters.
   (Type, size, operating voltage & hub bore)
3. For brake size 06, 08, 10 & 12 terminal box with cover will not be provided.
   Only cable gland will be provided.
4. Choose appropriate safety factor for the hoist, lift, inclined conveyors or equipment where holding against gravity is required.
5. Choose correct input AC voltage for rectifier.
6. For brake size 14 to 50 terminal box will be provided on request. (optional item)
7. Microswitch will be provided on request. (optional item)
8. Brake enclosure will be provided with either item 1 or 2. (Refer dimension drawing)