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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ED-155-3
E335088

ISO 9001 : 2008

QAC/R91/1264
QAC/R91/1382

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

ISO 9001 : 2015 Company

CIN NO. : U74999MH1991PTC061109

FLP.458/488/Rev-02/01-03-2025

EMCO-Simplatroll®

Spring Applied Flame Proof **Brakes**

Type **FLP.458/488.xx**

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

ISO 9001 : 2015 Company

Emco-Simplatroll *flame proof brakes have been specially designed for high toxic & hazardous environment in industries where non flame proof equipments are not recommended for safety reasons. Our products have approval & certification by Central Institute of Mining & Fuel Research (**C.I.M.F.R.**) for **Gas Group II-B** for **Zone 1** & **2** areas, suitable for **T6** temperature zone.*

Type FLP.458 *&* ***FLP.488*** *are DC Spring Applied brake units designed to perform holding as well as emergency stopping functions (Normally On), making it particularly well-suited for brake motor applications. 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 no power or in event of power failure condition.*

Brake are available in various version as per application need. Special version like brake with micro switch, tacho mounting provision etc. can be also supplied. Brake also available for low temperature (-20°C) application.

Salient Features of **FLP.458**.xx / **FLP.488**.xx

- IP 65 protection
- Fail Safe
- Torque upto 800 Nm.
- Power saver (FLP.488 only)
- Low heating of the brake (FLP.488 only)
- Compact Robust Unit
- Simple Installation
- Twin friction surfaces
- German Non asbestos friction linings
- Low rotor inertia
- Class with 'F' coil insulation
- High Operating Frequency & Reliability
- Fast Switching Times
- Hard chrome plated armature plate & flanges
- Dust Protecting Seal
- Rust protection to all metal parts
- Screw type manual hand release available on request

Typical Applications

Oil Rigs

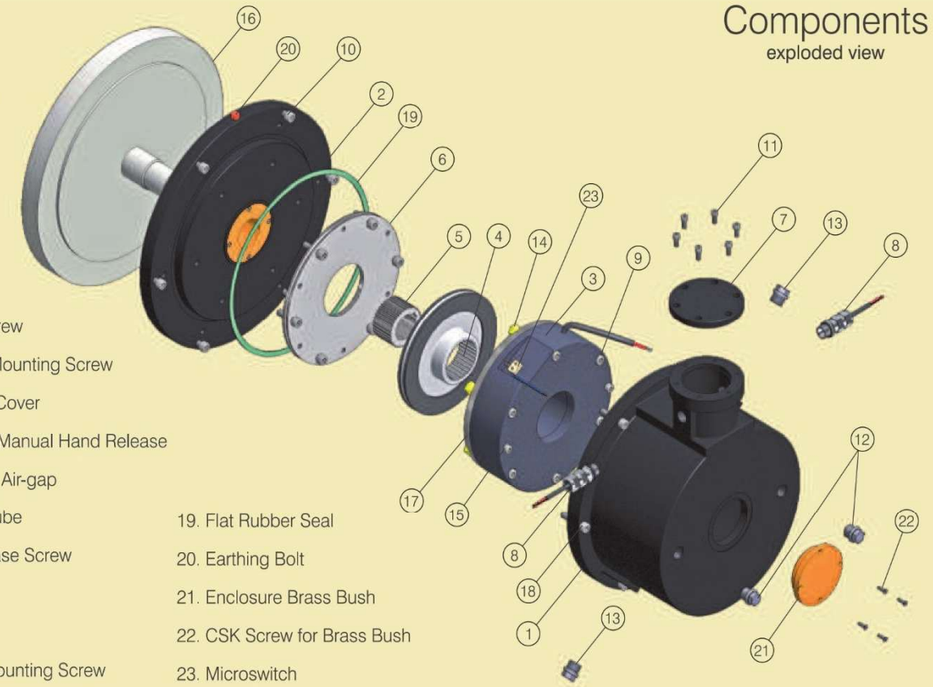
Petro-chemical Plants

Mines

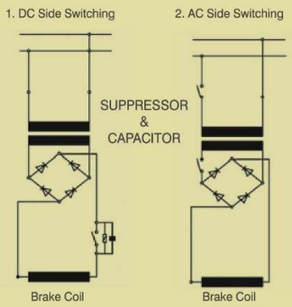
Cranes & Hoists

Components
exploded view

1. Enclosure Cover
2. Enclosure Flange
3. Brake 14.458 / 488
4. Rotor
5. Hub
6. Flange
7. Terminal Cover
8. Cable Gland
9. Brake Mounting Screw
10. Enclosure Flange Mounting Screw
11. Screw for Terminal Cover
12. Plug for accessing Manual Hand Release
13. Plug for accessing Air-gap
14. Wear Adjustment Tube
15. Manual Hand Release Screw
16. Motor End Shield
17. Armature Plate
18. Enclosure Cover Mounting Screw
19. Flat Rubber Seal
20. Earthing Bolt
21. Enclosure Brass Bush
22. CSK Screw for Brass Bush
23. Microswitch



Switching Type **FLP.458**



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.	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
Use over excitation rectifiers UM series for all brakes involved in hoisting or application related to gravity.	190 VDC	415 VAC	2 Amp	UM 101/VM-101-AV
	96 VDC	230 VAC	2 Amp	UM 101 A
For brake size 18 and above use UM rectifiers. UM series rectifier are over excitation rectifiers.	190 VDC	415 VAC	1 Amp	UM 201
	96 VDC	230 VAC	1 Amp	UM 201 A

Rectifiers made by **Usha Medisales**

Working Type **FLP.458**

Braking

During braking, the rotor (4) which is axially movable on the hub (6), is pressed against the friction surface-via the armature plate(20) - by means of inner and outer springs. The friction linings ensure a high brake torque. The brake torque is transmitted between hub and rotor via splines.

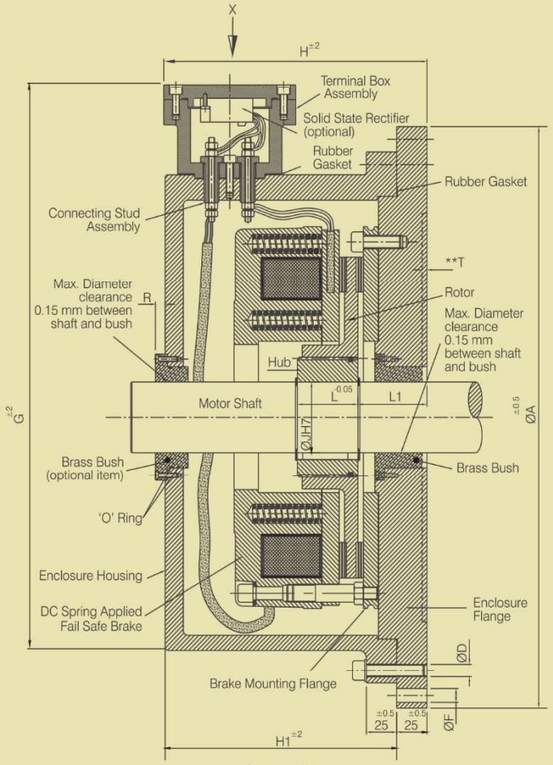
Releasing

When the brake is applied, there is an air gap between stator and armature plate. For releasing the brake, D.C.voltage is applied to the stator coil (3), a magnetic force is generated which attracts armature towards the stator against the spring force & rotor is released to rotate freely.

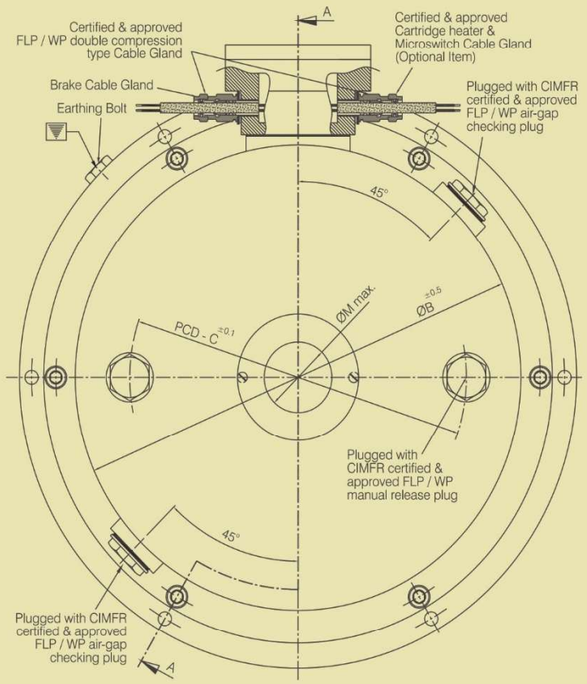
Brake Torque Reduction

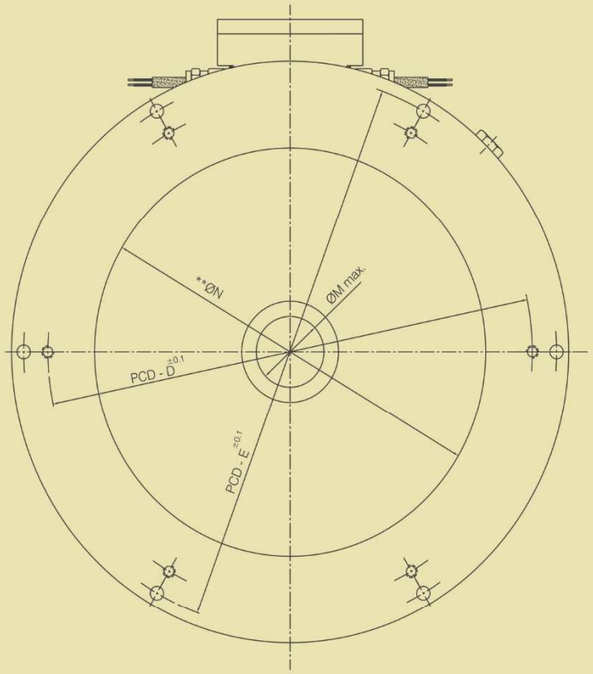
Brake torque can be reduced by unscrewing the torque adjusting ring. At the time of checking air gap, power to brake & motor are to be disconnected.

Dimensions

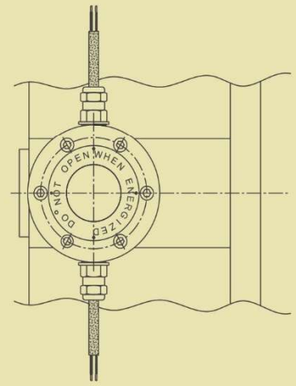


Sec. - AA





Flange Detail



View for 'X'

Parameters

All dimensions in mm

Size	Torque (Nm)	Input power P 20	±0.5 ØA	±0.5 ØB	±0.1 PCD - C	±0.1 PCD - D	±0.1 PCD - E	ØD	ØF	ØJ H7 (Max)	±0.5 L	±0.2 L1	ØM (Max)	**ØN	**T	±0.2 G	±0.2 H	±0.2 H1	±0.2 R
FLP.458.06	5	22	294	194	77	226	274	6 x M10	6 x Ø11	15	18	56	15.2	205 (Max.)	6 (Max.)	292	160	125	8
FLP.488.06		10																	
FLP.458.08	10	28			93.5					20	20		20.2						
FLP.488.08		12																	
FLP.458.10	20	35			112					20	20		20.2						
FLP.488.10		14																	
FLP.458.12	40	45	306	214	136	246	286	6 x M10	6 x Ø11	25	25	50	25.2	230 (Max.)	6 (Max.)	312	160	127.5	8
FLP.488.12		18																	
FLP.458.14	60	50	321	229	150	261	301	6 x M10	6 x Ø11	32	30	53	32.2	245 (Max.)	6 (Max.)	327	175	144	8
FLP.488.14		24																	
FLP.458.16	100	76	346	254	174.5	286	326	6 x M10	6 x Ø11	35	30	53	35.2	270 (Max.)	6 (Max.)	352	181	150	8
FLP.488.16		35																	
FLP.458.18	150	85	373	281	196	313	353	6 x M10	6 x Ø11	45	35	54	45.2	300 (Max.)	6 (Max.)	380	200	169	8
FLP.488.18		38																	
FLP.458.20	260	100	410	318	235	350	390	6 x M10	6 x Ø11	50	40	55	50.2	335 (Max.)	6 (Max.)	416	216	185	8
FLP.488.20		45																	
FLP.458.25	400	110	460	368	278	400	440	6 x M10	6 x Ø11	65	50	57	65.2	380 (Max.)	6 (Max.)	466	223	191.2	8
FLP.488.25		50																	
FLP.458.31	600 / 800	140 /180	460	368	278	400	440	6 x M10	6 x Ø11	65	50	57	65.2	380 (Max.)	6 (Max.)	466	223	191.2	8

We reserve the right to make changes in specifications.

Certifications

Size	Torque (Nm)	Input power P 20	CIMFR No.	DGFASLI No.
FLP.458.06	4	20	CIMFR / TC / P / H766	66 / 4(F) / 2014 - Tech
FLP.488.06		10		
FLP.458.08	8	25		
FLP.488.08		12		
FLP.458.10	16	30		
FLP.488.10		14		
FLP.458.12	32	40	CIMFR / TC / P / H517	66 / 4(B) / 2014 - Tech
FLP.488.12		18		
FLP.458.14	60	50	CIMFR / TC / P / H516	66 / 4(A) / 2014 - Tech
FLP.488.14		24		
FLP.458.16	100	76	CIMFR / TC / P / H767	66 / 4(G) / 2014 - Tech
FLP.488.16		35		
FLP.458.18	150	85	CIMFR / TC / P / H521	66 / 4(E) / 2014 - Tech
FLP.488.18		38		
FLP.458.20	260	100	CIMFR / TC / P / H520	66 / 4(D) / 2014 - Tech
FLP.488.20		45		
FLP.458.25	400	110	CIMFR / TC / P / H518	66 / 4(C) / 2014 - Tech
FLP.488.25		50		
FLP.458.31	600 / 800	140 /180		

Important :

- For vertical mounting contact us.
- For applications with motor operated with VFD contact us for special circuit.
- Standard voltages :
  FLP.458 - 24 VDC; 96 VDC; 190 VDC (*Other voltages on request*)
  FLP.488 - 96 VDC & 190 VDC
- Use rectifier UM-201 only for operating FLP.488 Brake
- 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
- Type of Ex Protection - Flameproof Ex "d"
- Type of Ingress Protection - IP 66
- CIMFR & DGFASLI Approved Certificate
- Temperature Class - T6
- Zones - I & II
- Gas Group - IIB, EPL, Gb & Db

Note : **ØN & T Depth as per customer requirement.

FLP Enclosure with UL approved Brake available on request.

Working Type **FLP.488**

In the "power off" state the compression springs (19) press the armature plate (17) and rotor (4) against mating surface (6).

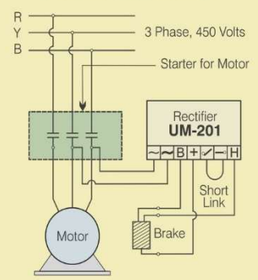
Hub (5) is firmly locked on the shaft and rotor slides over the hub.

On applying rated direct current voltage to the stator (2) the magnetic field produced will pull the armature plate (17) over air-gap 'a' towards stator against spring force. Thus the rotor is released allowing shaft to rotate.

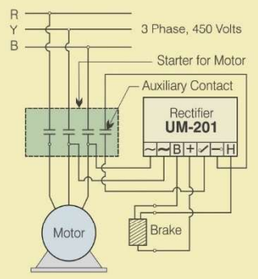
In the event of continuous power failure, rotor (4) can be made free by pulling the hand release (14) - the hand release of " deadman type". The hand release goes back automatically to its original position and brake will immediately revert to its safe hold action.

Switching Type **FLP.488**

Rectifier Connection Diagram
(with purely AC switching)



Rectifier Connection Diagram
(DC switching ' Preferred Switching)



CAUTION : 14.488 BRAKES HAVE TO BE CONNECTED AS PER ABOVE DIAGRAMS ONLY OR ELSE FAILURE WILL OCCUR!

14.488 Series Double Coil Brakes are designed with two coils. 1. Booster Coil and 2. Holding Coil

The specially designed rectifier UM-201 is required for operating these brakes. Initially when AC power is applied to the rectifier the booster coil with high wattage and high magnetic force is switched 'ON' and the armature plate gets attracted very quickly to the stator, hence the brake gets released very quickly. After a few hundred milliseconds, the booster coil is disconnected electronically and the holding coil takes over. This holding coil is designed with much lower wattage, which however is sufficient to keep the armature plate to hold on to the stator and keep the brake released.

The brake can be operated with either AC switching or AC cum DC switching. With pure AC switching the brake is released very fast but the engagement is much slower (because of reverse emf generated by the motor and the brake coil). This delay in engagement can be somewhat improved by doing the AC switching through the auxiliary contact of the motor starter (where only the reverse emf of the brakes's holding coil with lower magnetic force is present) With AC and DC combined switching the brake release as well as the brake engagement is very fast.

Brake Coil Voltage	AC Input Voltage	Current Rating	Rectifier Type
190 VDC	415 VAC	1.0 Amp	UM-201
96 VDC	230 VAC	1.0 Amp	UM-201 A
Note : 14.488 brakes are to be operated with UM-201 rectifier only.			

Rectifiers made by **Usha Medisales**

Operating times*

Brake Size	t1ms		t2ms	
	FLP.458	FLP.488	FLP.458	FLP.488
06	17	4	35	12
08	35	6	65	18
10	40	8	90	30
12	50	10	120	45
14	65	11	150	55
16	90	12	180	75
18	110	15	300	105
20	200	22	400	130
25	270	28	500	170

t_{11} **Engagement time**
(Time taken by armature to get released from stator)

t_2 **Disengagement time**
(Time taken by armature to get attracted towards the stator i.e. release of brake)

The engagement times are valid for DC switching through auxiliary contact or relay. The disengagement times are valid AC side switching (Rectifier should not be supplied with AC input voltage continuously). AC voltage should only be supplied to the rectifier, at the same time AC voltage is supplied to motor.

* *Average times measured with rated air-gaps.*

Advantages of **FLP.488**.xx

The holding coil is designed for much lower power consumption (35 to 45% of the rated wattage of the standard 14.458 series brakes). Because the holding coil is "ON" most of the time (while the motor is running), there is quite a good amount of power saving as well as the following additional advantages.

- **Lower heating of the brake.**
- **Very fast engagement of the brake.**
- **The booster coil provides very fast release of the brake with the following additional advantages.**
  - Friction liner wear is greatly reduced.
  - Lower liner wear means lower maintenance costs and longer time period between resetting of the air gap.
  - Motor starting current is reduced substantially hence lower temperature rise of the motor and longer motor life.
  - Higher operating frequency is possible.

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 parameter. (Type, size, operating voltage and hub bore)
3. Choose appropriate safety factor for the hoist, lift, inclined conveyors or equipment where holding against gravity is required.
4. Select proper Rectifier considering rated voltage of the brake. If coil operating voltage is 96 or 190 VDC you can use our rectifier.
5. Choose correct input AC voltage for rectifier.

Our other products

Custom clutches & brakes manufactured

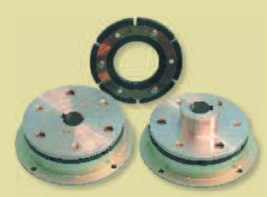
EMCO - Simplatroll®
Electromagnetic D.C. Spring Applied Brakes
Normally On, Type 14.458 / 14.488

EMCO-Simplatroll®
Electromagnetic DC Spring Applied Brakes
Normally ON, Type 14.450 / Type 14.461

EMCO®
Electr-hydraulic Disc Brakes
Type EHT1/2/3 & EHT21

EMCO - Simplatroll®
Electromagnetic DC Clutch Brake Combinations
Type 14.125 / Type 14.800 (Foot Mounted) / Type 14.800 (Flange Mounted)

EMCO - Simplatroll®
Electromagnetic D.C. Clutches
Normally Off, Type 14.105



EMCO - Simplatroll®
Electromagnetic DC Brakes
Normally Off, Type 14.115