Emco Dynatorq Pvt. Ltd.

Operating, Installation & Servicing Instructions Manual

EMCO – Simplatroll

Spring Applied Brake with
Explosion Proof Enclosure
Type FLP.458/488.xx

Contents

1 Preface and general information

1.1 How to use these operating instructions

- These operating instructions are intended for safety-relevant operations on and with the spring-applied brake with electromagnetic release. They contain safety instructions which must be observed.
- All personnel working on and with the spring-applied brake with electromagnetic release must have the Operating instructions available and observe the information and notes relevant for them.
- The operating instructions must always be complete and perfectly readable.

1.1.1 Terminology used

Brake
For "spring –applied brake with electromagnetic release" the term "Spring-applied Brake" will be used in the following text.

Drive system
For drive systems with spring-applied brake with electromagnetic release and other drive components the term "drive system" will be used in following text.

1.2 Scope of delivery

- The drive systems are combined individually according to a modular design. The scope of delivery can be obtained form the relevant papers.
- After receipt of the delivery, check immediately whether it corresponds to the accompanying papers. Emco Dynatorq does not grant any warranty for subsequent claims. Claim for any

  - Visible transport damage inform immediately to the forwarder.
    Visible deficiencies/incompleteness inform immediately to the responsible Emco-Dynatorq engineer/agency.

1.3 Emco Dynatorq Spring applied brake

1.3.1 Manufacturer

Regd. & Marketing office:
EMCO DYANATORQ PVT. LTD.
1ST Floor, Sita Mauli, above Bank of Maharashtra
Panch Pakhadi, Thane (W)-400 602
Phone: 022-25405490/25452244
Fax: 022-25452233
E-mail: mktg@emco-dyanatorq.in
URL: www.emco-dynatorq.in

UNIT-II
1002 & 1003, GIDC Waghodia Indl. Estate,
Dist, Baroda-391 760
Phone : 02268-263089/262186
Fax : 02268-26218

UNIT-IV
1426, GIDC Waghodia Indl. Estate,
Dist, Baroda-391 760

1.4 Nameplate

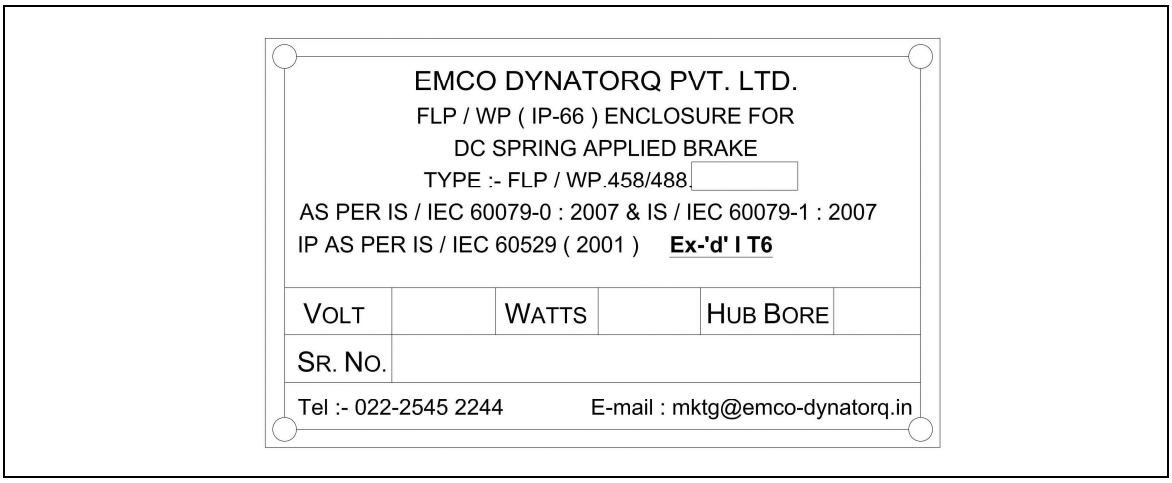


Fig.2: Nameplate

1.5 Application as directed

- Emco- Dynatorq spring applied brake with explosion proof enclosure
  - Are intended for use in machinery and system.
  - Must only be used for the purpose ordered and confirmed.
  - Must only be operated under the ambient conditions prescribed in these Operating instructions.
  - Must not be operated beyond their corresponding power limit.

Any other use shall be demand inappropriate!

1.6 Legal regulations

Liability

- The information, data and notes in these operating instructions met the state of the art at the time of printing, claims referring to drive systems which have already been supplied cannot be derived from the information, illustrations and descriptions.
- We do not accept any liability for damage or operating interference caused by:
  - In-appropriate use
  - Un-authorized modifications to the drive system
  - Improper working on and with drive system
  - Operating faults
  - Disregarding these Operating instructions

Warranty

- Conditions of warranty: see General terms & conditions of sale of Emco Dynatorq Pvt.Ltd
- Warranty claims must be made immediately after detecting defects or faults.
- The warranty is void where liability claims cannot also be made.

2 Safety information

2.1 Personnel responsible for safety

Operator

- An operator is any natural or legal person who uses the drive system or on behalf of whom the drive system is used.
- The operator or his safety officer must ensure
  -that all relevant regulations, instructions and legislation are observed.
  -that only qualified personnel work with and on the drive system.
  -that the personnel have the operating instructions available for corresponding operations.
  -that non-qualified personnel are prohibited from working with and on the drive system.

Skilled personnel

Skilled personnel are persons who- because of their education, experience, instructions and knowledge about corresponding standards and regulations, rules for the prevention of accidents and operating conditions are authorized by the person responsible for the safety of the plant to perform the required actions and who are able to recognize Potential hazards.

2.2 General safety information

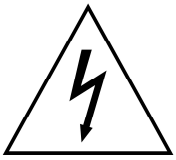
- This safety information is not claimed to be complete. In case of questions and problems please contact your Emco Dynatorq representative.
- At the time of delivery the spring-applied brakes meets the state of the art and ensures basically safe operation.
- The spring-applied brakes is a source of danger for persons, for the spring – applied brakes itself, and for other material assets of the operator, if
  - unqualified personnel work with and on the spring –applied brakes.
  - the spring-applied brakes are used inappropriately.
- The spring-applied brakes must be designed such that they perform their functions after proper installation and with application as directed in fault free operation and that they do not cause hazards for persons. This also applies for their interaction with the complete system.
- Operate the spring-applied brake only when it is in a proper state.
- Retro fittings, modifications; or redesigns of the springs –applied brake are basically prohibited. Emco Dynatorq must be contacted in all cases.
- Protect the mounting flange, friction surfaces and armature against dirt. They must be kept free from oil and grease at all cases. Even small dirt particles can considerably reduce the brake torque

Application conditions of the spring-applied brake without explosion proof Enclosure FLP.458/488

- Not suitable to explosive or aggressive environment without explosion proof enclosure.
- Humidity, no restriction.
- Ambient temperature:5^0C to +55^0C
- With high humidity and low temperature:
- Take measures against freezing of armature plate and rotor (Use cartridge heater).
- Protect the electrical connections against short circuit.

2.3 Layout of the safety information

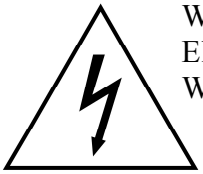
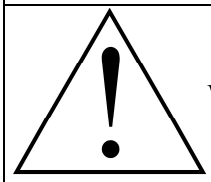
- All safety information in these operating instructions has a uniform layout;



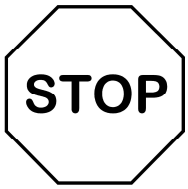
Signal ward
Notes

-The icon designates the kind of danger.
-The signal word designates the severity of the danger.
-The notes describe the danger and suggest how to avoid the danger.

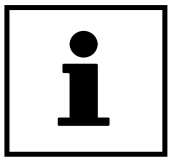
Warning of personal injury

Icon used	Signal wards	
 Warning of Hazardous Electrical voltage. Warning of a general danger	Danger!	Warns of impending danger. Consequences if disregarded: Death or very severe injuries.
	Warning!	Warns of a potential, very hazardous situation.Consequences if disregarded: Death or very severe injuries.
 Warning of a general danger	Caution!	Warns of a potential material damage. Consequences if disregarded: Light or minor injuries.

Warning of material damage

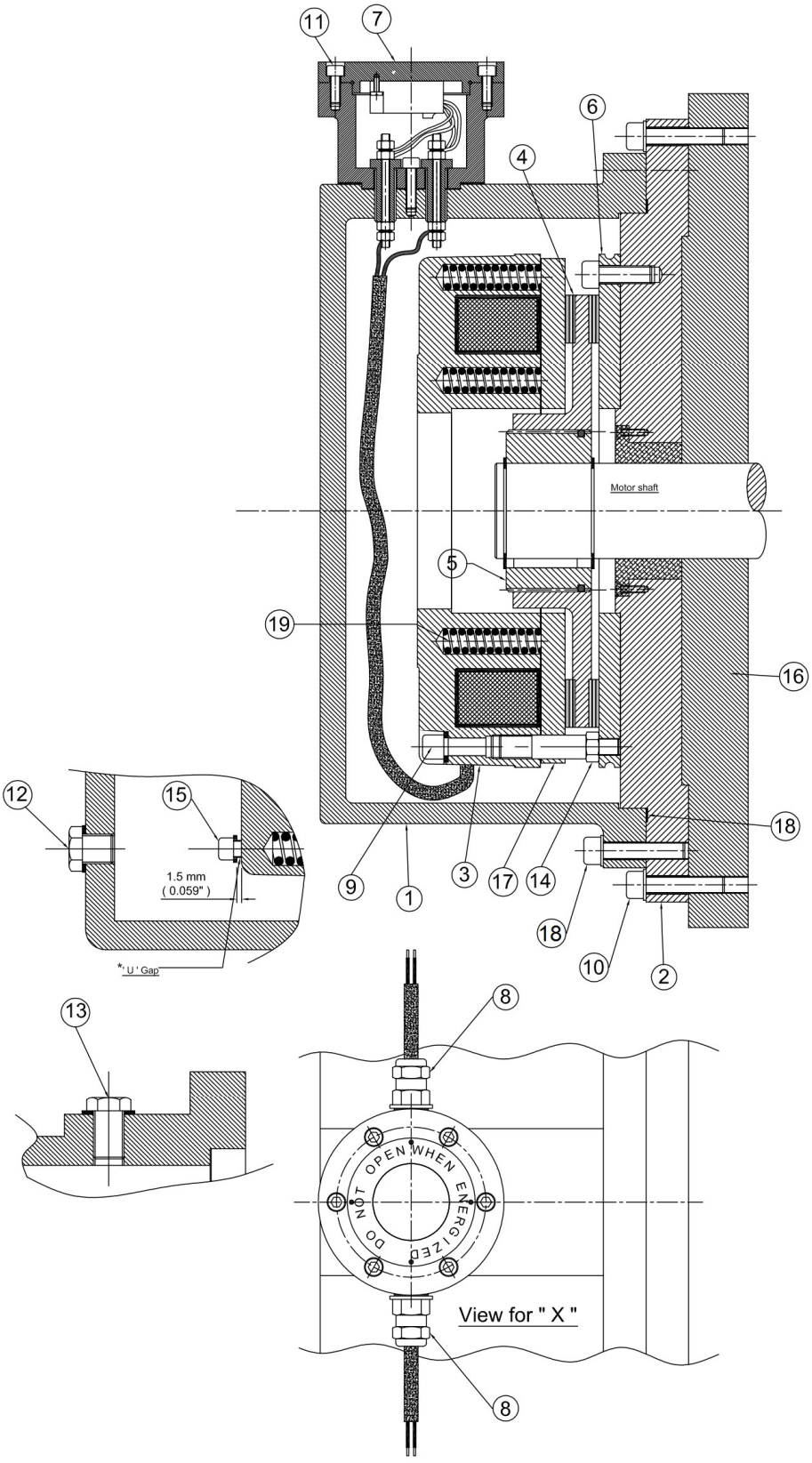
Icons used	Signal wards	
	Stop!	Warns of potential material damage. Consequences if disregarded: Damage of the drive system/device or its environment.

Other information

Icons used	Signal wards	
	Note!	Designates a general, useful note. If you observed it, handling of the drive system/device is made easier.

3.1 Product Description

SPRING APPLIED BRAKE WITH EXPLOSION PROOF ENCLOSURE



3. Technical Data

Sr.no.	Description	Sr.no.	Description
1	Enclosure cover	14	Wear adjustment tube
2	Enclosure flange	15	Manual hand release screw
3	Brake 14.458 / 488	16	Motor end shield
4	Rotor	17	Armature Plate
5	Hub	18	Enclosure cover mounting screw
6	Flange	19	Compression Spring
7	Terminal cover	20	Flat Rubber Seal
8	Cable gland	21	Earthing Bolt
9	Brake mounting screw	22	Enclosure Brass Bush
10	Enclosure flange mounting screw	23	CSK Screw for Brass Bush
11	Screw for terminal cover	24	Microswitch
12	Plug for accessing manual hand release bolt		
13	Plug for accessing air gap		

Figure: Spring Applied Brake Type: FLP.458/488 with Explosion proof enclosure.

3.1.1 General

The spring applied brake type 14.458 /488 is a single disc brake with two friction surfaces. Several springs generate the brake torque by friction. The brake is released Electro magnetically.

The spring applied brake Type 14.458/488 is designed for conversion of mechanical work and kinetic energy into heat. By means of the static brake torque it is possible to hold loads without a speed difference. Emergency braking at high speeds is possible; however it results in increased wear.

3.1.2 Braking

During braking, the rotor which is axially movable on the hub, is pressed against the friction surface-via the armature plate- 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.

3.1.3 Releasing

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

At the time of checking air gap, power to brake & motor are to be disconnected.

3.2 Rated Data

Type	Rated Brake torque	Air Gap-'a' (mm)		Release Gap-U
	Nm	Rated +/- 0.05mm	Max	(MM)
14.458/488.06	4	0.2	0.5	1
14.458/488.08	8	0.2	0.5	1
14.458/488.10	16	0.2	0.5	1
14.458/488.12	32	0.3	0.7	1
14.458/488.14	60	0.3	0.8	1
14.458/488.16	80	0.3	1.0	1.5
14.458/488.18	150	0.4	1.0	1.5
14.458/488.20	260	0.4	1.2	1.5
14.458/488.25	400	0.5	1.4	2
14.458/488.31	600	0.5	1.4	2

Type	Dimensions (mm)				Screws for flange fixing
	Rotor Thickness		Mounting PCD	Tapped Holes X Nos.	X nos.
	Rated	Min			
14.458/488.06	6	4.3	72	M4 x 3	M4 x 3
14.458/488.08	7	5.3	90	M5 x 3	M5 x 3
14.458/488.10	9	7.3	112	M6 x 3	M6 x 3
14.458/488.12	10	6.0	132	M6 x 3	M6 x 3
14.458/488.14	10	7.0	145	M8 x 3	M8 x 3
14.458/488.16	11.5	7.0	170	M8 x 3	M8 x 3
14.458/488.18	13	8.0	196	M8 x 6	M8 x 4
14.458/488.20	16	9.6	230	M10 x 6	M8 x 6
14.458/488.25	20	12.5	278	M10 x 6	M10x 6
14.458/488.31	20	12.5	278	M10 x 6	M10x 6

3. Technical Data

Type & Brake Size	Power Watts	DC Voltage	Coil Resistance (Ω)		Rated torque Nm
			Min	Max	
14.458.06	20	24 96 110 190	27.5 430.5 569 1660	30.5 491 647 1950	4
14.458.08	25	24 96 110 190	22 346 456 1336	24.5 391 513 1552	8
14.458.10	30	24 96 110 190	18.24 280.9 381.1 1125	20.16 313.7 425.5 1282	16
14.458.12	40	24 96 110 190	13.8 218.8 287.5 848.4	15 241.9 319 956.7	32
14.458.14	50	24 96 110 190	11 175.1 230.18 682.3	12 193.5 256.82 761.7	60
14.458.16	76	24 96 110 190	7.25 116 152 456	7.9 126 166 494	100
14.458.18	85	24 96 110 190	6.48 103.5 133.94 403.5	7.1 113.5 151 446	150
14.458.20	100	24 96 110 190	5.5 88.01 111.3 311.8	6.0 96.5 130.7 344.6	260
14.458.25	110	24 96 110 190	5.0 80.0 105 311.0	5.5 87.6 115 343.0	400
14.458.31	140	24 96 110 190	3.95 62.5 82 235.6	4.28 69 90.8 269.5	600

3.3 Operating Times

Disengagement Time:

The disengagement time is not changed by switching on the AC or DC side. It can be reduced by special devices which work with fast excitation.

Engagement Time:

The Engagement time is extremely prolonged when switching on the AC side. It is prolonged by approximately factor 10. The connection of rectifier and brake parallel to motor additionally prolongs the engagement time. A reduction of the brake torque via the adjustment ring prolongs the engagement time and reduces the disengagement time.

The operating time listed below are valid for DC switching at nominal air gap and coil at nominal temperature. These are average values which may vary depending on the method of rectification and the air gap

	Engagement Time		
Brake size 14.458	**AC Switching in ms**	**DC switching in ms**	**Disengagement Time in (ms)**
6	50	7	35
8	80	10	50
10	150	15	90
12	220	22	120
14	250	25	150
16	250	25	180
18	300	30	300
20	500	50	400
25	700	70	500
31	700	70	500

Note: Engagement time is the time when armature is fully released from the brake stator after voltage is withdrawn.
Disengagement time is the time when brake is released after voltage is applied to the coil

4.1 Preparation

1. Unpack Spring Applied Brake with Explosion Proof Enclosure.
2. Check if delivery arrived as ordered.
3. Check name plate data, especially rated voltage.
4. Remove the enclosure cover (1) by unscrewing the mounting screws (18)

4.2 Assembly

4.2.1 Mounting of Enclosure Flange on Motor End Shield.

Stop !
Check the motor end shield. It must be free from Grease and Oil

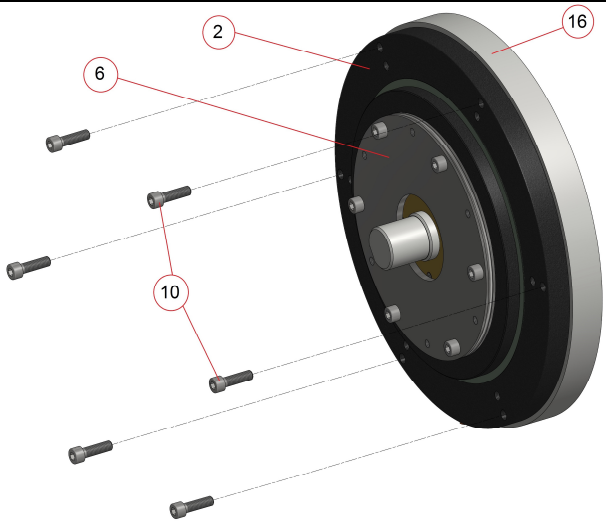
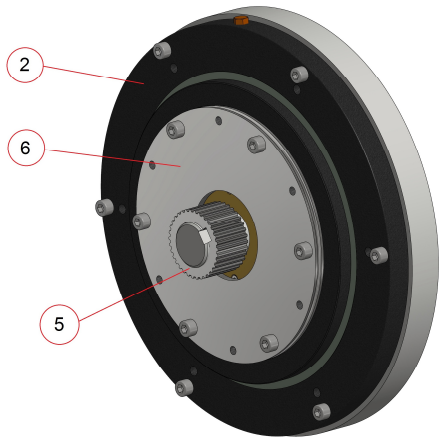
(2) Enclosure flange (16) Motor end shield (10) Enclosure Mounting Screw	

Fig (1) : Mounting of Enclosure flange on motor end shield.

1. Remove enclosure cover by unscrewing allen screw (18)
2. Remove brake (3) unscrewing brake mounting screw (9).
3. Hold the enclosure flange (2) to the motor end shield (16).
4. Allign the mounting holes & tight mounting screw (10) firmly to the motor end shield (16).

4.2.2 Mounting of Hub(5) on motor shaft.

(2) Enclosure flange (5) Hub (6) Brake mounting flange	

Fig(2) : Mounting of hub on motor shaft.

1. Insert the hub on motor shaft aligning with the key & key slot.
2. Insert circlip on the motor shaft to secure axial movement of hub.

4.2.3 Assembly of Rotor

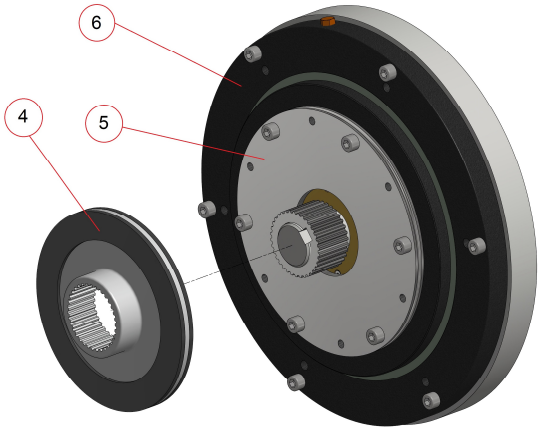
(4) Rotor (5) Hub (6) Brake mounting flange	

Fig (3): Mounting of Rotor

1. Push the rotor onto the hub and check that it slides to and fro easily by hand.

4.2.4 Assembly of Brake Stator

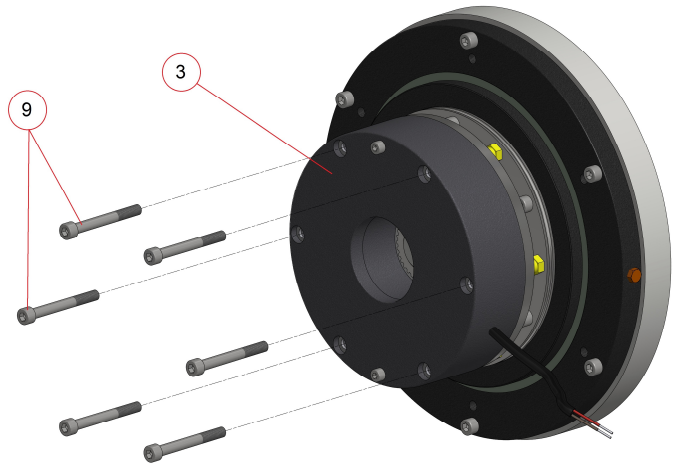
(3) Brake Stator (9) Brake mounting screw	

Fig (4): Mounting of Brake Stator

1. Push the spring washers on the screws (9) and screw the complete stator (3) on to the brake mounting flange fitted on the enclosure flange.
2. Tighten the screws (9) evenly & firmly. On doing all these activity take care that the adjustment tube (14) is not disturbed.
3. Check the rated air gap near the bolts by means of the feeler gauge (for air gap see rated data table-chapter 3.2)

4.2.5 Setting & Re adjustment of air gap

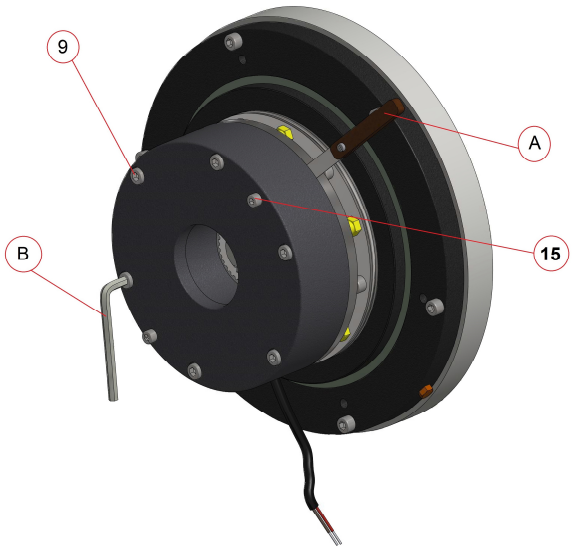
(A) Feeler gauge (B) Allen key (9) Brake mounting screw (15) Manual release screw	

Fig (5): Setting of Air gap.

(14) Adjustment Tubes
(9) Brake mounting screw

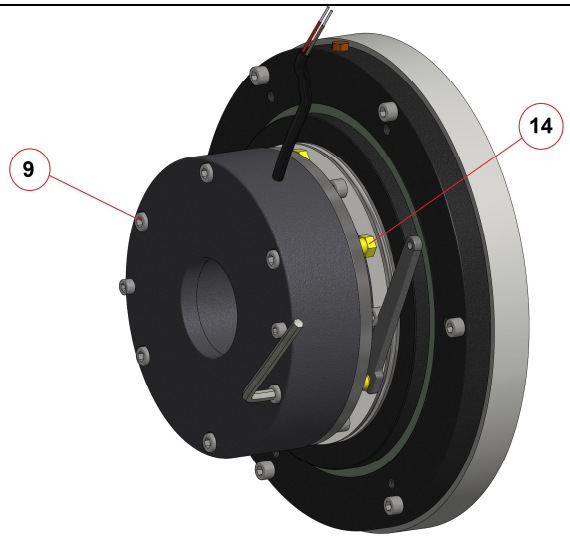


Fig (6): Readjustment of Air gap.

Note: If the air gap deviates too much from rated air gap ‘a’ re-adjust as follows.

1. Loosen the allen screws. (9)
2. Turn the threaded adjustment tubes by means of a spanner.
   - Screw the adjustment tubes (14) into (turn in anti clockwise) the stator (3) if the air gap is too large.
   - Screw the adjustment tubes (14) out (turn in clockwise) of the stator (3) if air gap is too small.
   - The width of the air gap changes by approx 0.15mm when turning the adjustment tube by 1/6 revolution.
3. Tighten the screws (9) firmly.
4. Check the air gap again and repeat the adjustment if necessary.

4.2.6 Assembly of Enclosure Cover

(1) Enclosure cover
(18) Screw for fitting cover
(12) Plug for accessing manual release screw
(13) Plug for accessing air gap

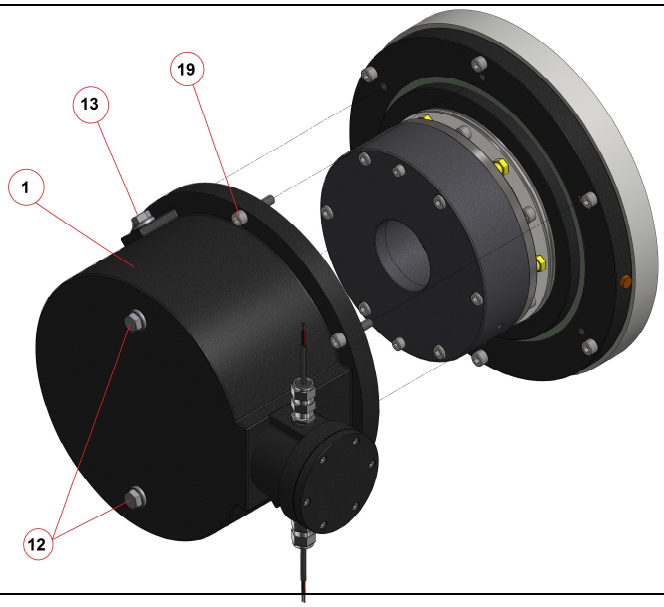


Fig (7): Assembly of cover.

1. Place the enclosure cover (1) on the enclosure flange (2) & connect the brake cable to the terminal screw fitted on enclosure cover.
2. Allign the mounting holes of cover with the tapping holes of enclosure flange.
3. Tighten the allen screw(18) firmly on enclosure flange.
4. Ensure that all rubber seals fixed on the enclosure flange is intact.

4.3 Exploded View of Spring Applied Brake with Explosion Proof Enclosure FLP.458/488

Fig (8) Exploded view

4.4 Electrical Connection

Warning!

The Electrical connection of the brake must only be carried out when no voltage is applied.

(1) Rectifier- Type EH720 AD
Input voltage 230 volt A.C.
Output voltage 190 VDC
Brake coil voltage 190 VDC
Or
Rectifier- Type EH 720 BD
Input voltage 110 volt A.C.
Output voltage 96 VDC
Brake coil voltage 96 VDC
Or
Rectifier- Type EH 720 CD
Input voltage 230 volt A.C.
Output voltage 96 VDC
Brake coil voltage 96 VDC

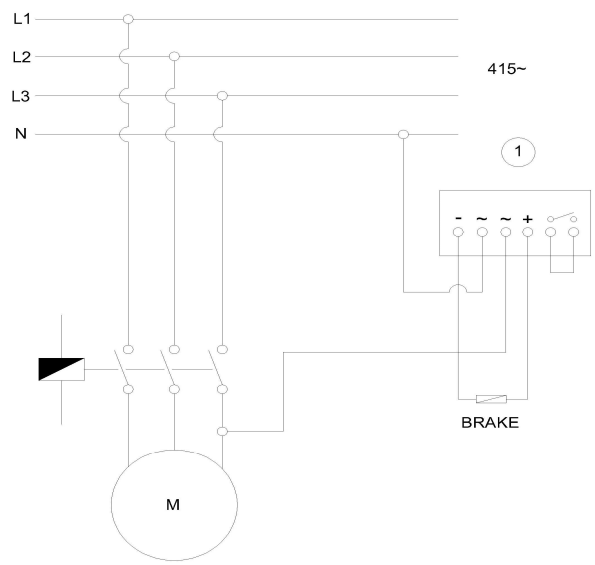


Fig (9): Switching on the AC side- Extremely Delayed Engagement.

(1) Rectifier- Type EH 720 HHD
Input voltage 440 volt A.C.
Out voltage 190 VDC
Brake coil voltage 190 VDC

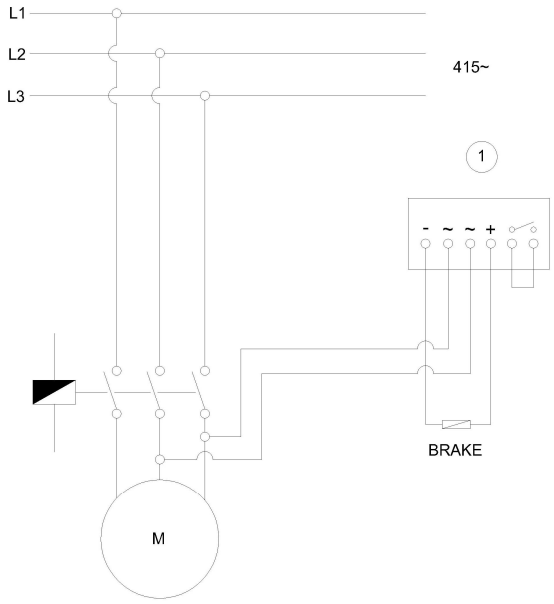


Fig (10): Switching on the AC side- Extremely Delayed Engagement.

Note: above circuit diagram are also applicable for star connection.

(1) Rectifier- Type EH720 Ad
Input voltage 230 volt A.C.
Output voltage 190 VDC
Brake coil voltage 190 VDC
or
Rectifier- Type EH 720 BD
Input voltage 110volt A.C.
Output voltage 96volt D.C.
Brake coil voltage 96volt D.C.
or
Rectifier Type EH 720 CD
Input voltage 230volt A.C.
Output voltage 96volt D.C.
Brake coil voltage 96volt D.C.

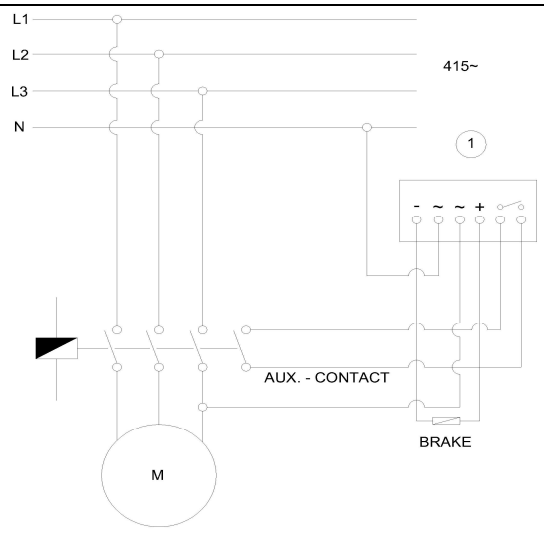


Fig (11): Switching on the DC side- fast engagement slightly delayed Disengagement.

(1) Rectifier- Type EH 720 HHD
Input voltage 440volt A.C.
Output voltage 190volt D.C.
Brake coil voltage 190volt D.C.

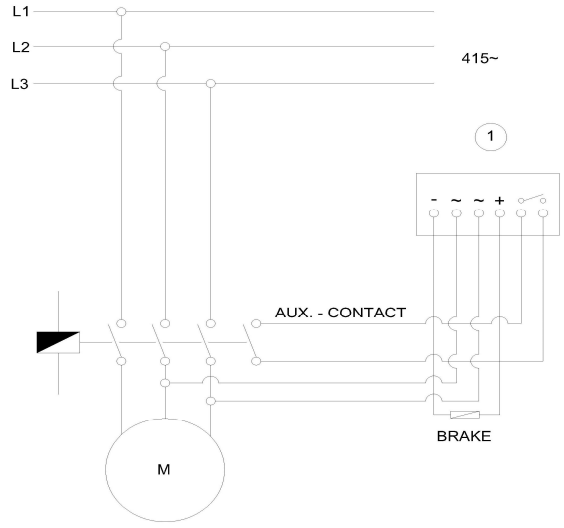


Fig (12): Switching on the DC side- Fast Engagement, slightly Delayed disengagement

(1) Rectifier-Type EH 720 AD
Input voltage 230 volt A.C.
Output voltage 190volt D.C.
Brake coil voltage 190volt DC
or
Rectifier- Type EH720 BD
Input voltage 110 volt A.C.
Output voltage 96volt D.C.
Brake coil voltage 96volt D.C.
or
Rectifier- type EH 720 CD
Input voltage 230 volt A.C.
Output voltage 96volt D.C.
Brake coil voltage 96volt D.C.

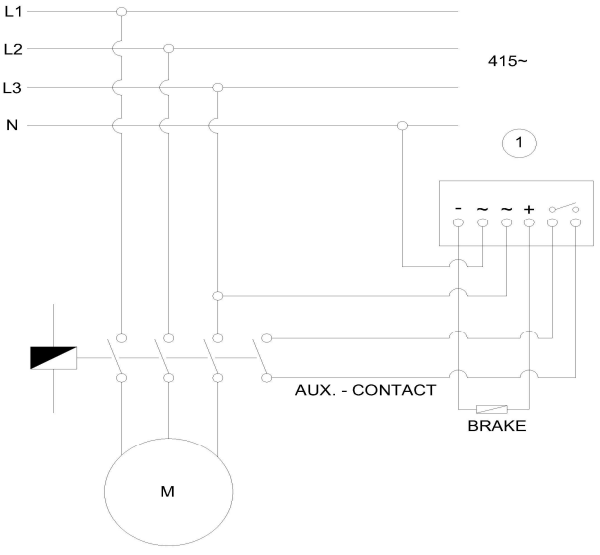


Fig (13): Switching on the DC side- Fast Engagement, Fast Disengagement
Note: Above circuit diagram are also applicable for star connection.

(1) Rectifier- Type EH 720 HHD
Input voltage 440 volt A.C.
Output voltage 190volt D.C.
Brake coil voltage 190volt DC

Circuit diagram also applicable for star Connection

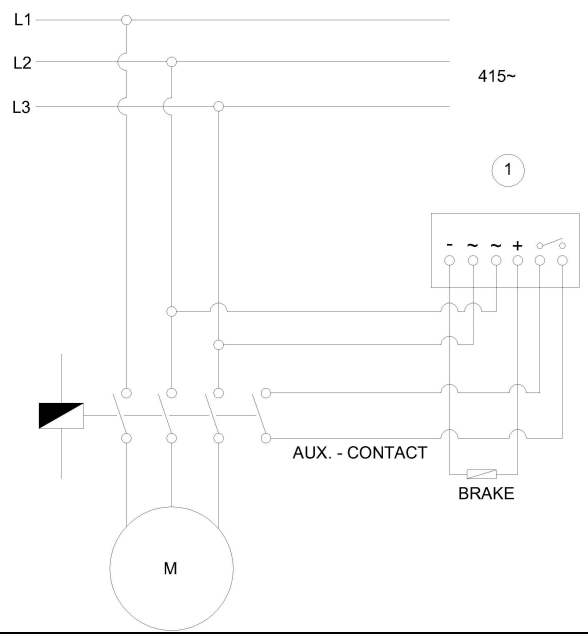


Fig (14): Switching on the DC side- Fast engagement, Fast disengagement.

(1) Transformer Rectifier

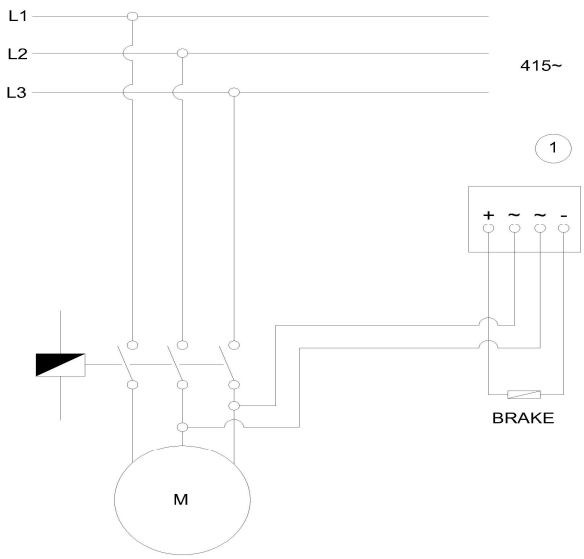


Fig (15): Separate DC voltage- Switching on the AC side extremely delayed Disengagement.

(1) Transformer Rectifier
(2) Spark Suppressor & Capacitor

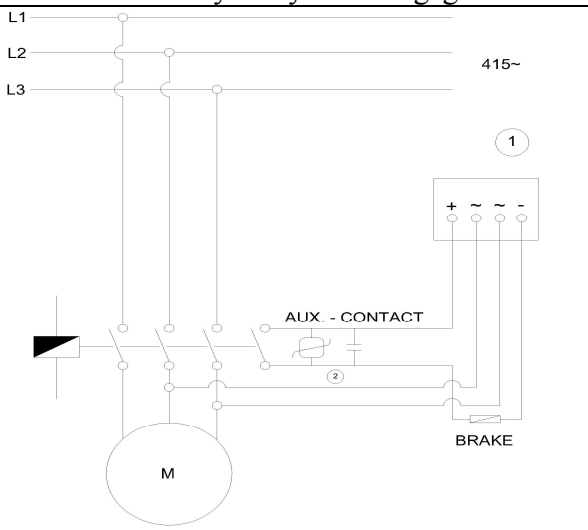


Fig (16): Separate DC voltage- Switching on DC Side – fast engagement, slightly delayed Disengagement.

(1) Transformer Rectifier
(2) Spark Suppressor & Capacitor

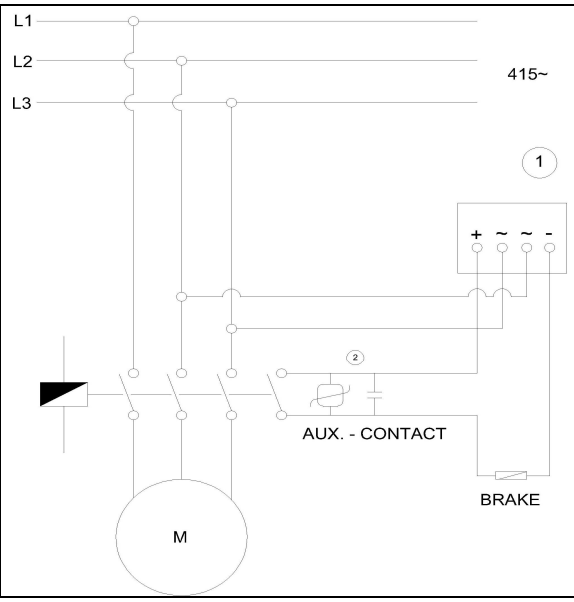
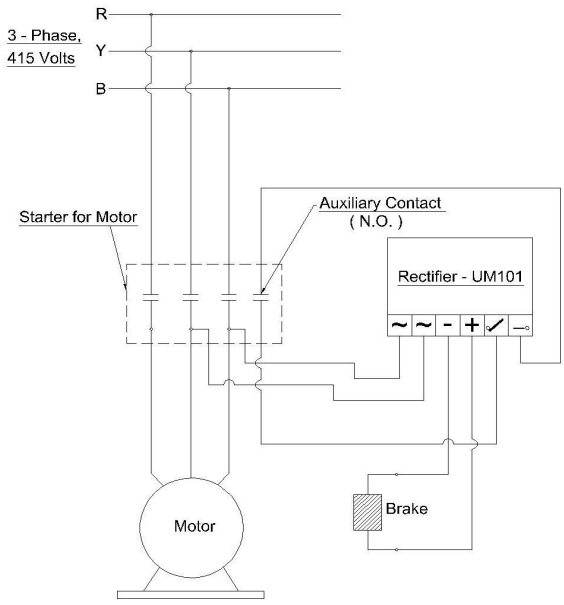


Fig (17): Separate DC voltage: Switching on DC side- fast engagement, fast disengagement

(1) Rectifier- Type UM - 101
Input voltage 415 / 230 volt A.C.
Output voltage 190 / 96 volt D.C.
Brake coil voltage 190 / 96 volt DC



Note!

1. Install the rectifier in the terminal box (not applicable to Transformer Rectifier). For motors with insulation class H, the rectifiers must be installed in the control cabinet .The permissible ambient temperature for the rectifier should not exceed 60^0 c.

2. Compare the coil voltage of the brake stator (3) to the DC voltage of installed rectifier.

3. Select the suitable circuit diagram considering input & output of Rectifier & Brake coil operating voltage.

4. Motor and brake must be wired according to the requirements of engagement time.

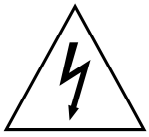
Warning!
The live connections and the rotating rotor must not be touched! The rotor must not rotate while checking the brake operation.

5.1 Operation Test.

For Faults see chapter7- Trouble shooting and Fault Elimination

5.1.1 Release/ voltage check.

Only for brakes without microswitch.



Warning!
Live connection must not be touched.

1. Remove two of the links to the motor terminals. Do not switch off the voltage for the brake.
2. Connect the main supply.
3. Measure the Dc voltage at the brake
4. Compare the measured DC voltage indicated on the name plate. A deviation of max 10% is permissible.
5. Check the air gap ‘a’. It must be zero and the rotor must rotate freely.
6. Disconnect the mains supply.
7. Bolt the links to the motor terminals

6.1 Inspection intervals

The wear of the rotor friction, lining depends upon the operating conditions. The Time until readjustment, does not only depends on the friction work. The friction work per operation decreases steadily until readjustment takes place. High speed differences additionally reduce the friction work until readjustment. The inspection intervals must be adapted to the operating conditions and can be prolonged if the wear is small.

6.2 Inspection

6.2.1 Rotor thickness

Warning !
The motor must not rotate while checking the rotor thickness.

1. Remove the Enclosure cover and brake.
2. Measure the rotor thickness by using a vernier caliper.
3. Compare the measured rotor thickness to the minimum permissible rotor thickness (For values refer rated data table chapter 3.2)
4. If necessary, replace the rotor. For Description see chapter 6.3.2.

6.2.2 Air gap

Warning!
The motor must not rotate while checking the air gap.

1. Unplug the plug (13) for accessing air gap from the enclosure housing.

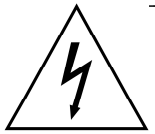
2. Measure the air gap between the armature plate and stator by inserting feeler gauge.

3. Compare the measured air gap to the maximum permissible air gap (for values refer Rated data table chapter 3.2).

4. If necessary, adjust the air gap to the rated air gap. For description on how to re-adjust the air gap chapter 6.3.1

6.2.3 Release/ voltage

Warning !
The rotating rotor must not be touched.



Warning!
The live connections must not be touched.

1. Observe the air gap “a” during operation. It must be zero.
2. Measure the DC voltage at the brake during operation. It must be the same as the voltage indicated on the name plate. A deviation of maximum 10% is permissible.

6.3 Maintenance

6.3.1 Readjustment of Air gap

Warning!
Disconnect the brake from Mains.The motor must not rotate.

1. Remove the allen screws (18) of enclosure cover & keep it aside.
2. Slightly loose the allen screws (9) of brake.
3. Turn the threaded adjustment tube (14) by means of a spanner.
   - Screw the adjustment tubes into the stator (clockwise) if the air gap is too large.
   - Screw the adjustment tubes out of the stator (anti clockwise) if air gap is too small.
   - The width of the air gap changes by appprox. 0.15 mm when turning the Adjustment tube by 1/6 revolution.
4. Tighten the brake screws (9).
5 Check the air gap again and repeat the adjustment if necessary.
6 Re-assemble the enclosure cover by fitting allen screw (18) on enclosure flange (2).

6.3.2 Replacement of rotor

Warning!
Disconnect the brake from Mains.The motor must not rotate.

1. Remove the allen screws (18) of enclosure cover & keep it aside.
2. Disconnect the brake supply cable from the terminal screw of the enclosure Housing.
3. Remove the brake allen screws (9).
4. Remove the brake stator completely from the motor. Take necessary precaution to avoid damages to lead wire.
5. Pull the rotor from the hub.
6. Check the splines of the hub.
   - In case of wear, the hub must also be replaced.
7. Check the brake flange. In case of strong scoring & wearing of flange is observed, replace it with a new flange.
8. Measure the rotor thickness (new) and head height of the threaded wear adjustment tubes by means of vernier caliper.
9. Calculate the distance between stator and armature plate as follows:
   Distance= Rotor thickness + Rated air gap- head height
   (For rated air gap see rated data table chapter 3.2)
10. Loosen the threaded adjustment tubes (14) until the calculated distance between stator and armature plate is reached.
11. Install and adjust the new rotor and brake
12. Fit the brake stator with the allen screw (9)
13. Reconnect the brake supply cable to the terminal screw of the enclosure cover.
14. Re-assemble the enclosure cover (1) by fitting allen screw (18) on enclosure flange (2).

6.3.3 Replacement of Armature Plate

Warning!
Disconnect the brake from Mains. The motor must not rotate.

1. Remove the allen screws (18) of enclosure cover & keep it aside.
2. Disconnect the brake supply cable from the terminal screw of the enclosure housing.
3. Remove the brake allen screws (9).
4. Remove the stator completely from the motor. Take necessary precaution to avoid damages to lead wire.
5. Completely unscrew the threaded adjustment tubes (14) from the brake stator assembly (3).
6. Also remove the manual hand release screw (14).
7. Remove the armature plate (17).
8. Check the compression springs (19) if any of it found broken or damaged replace it.
9. Put the new armature plate on the compression spring. Observe the pitch circle of stator and armature plate and ensure tapped holes of stator are matched with armature plate holes.
10. Mount the manual release screw (15) in the same way as it was removed.
11. Measure the rotor thickness and head height of the threaded wear adjustment tubes by means of a vernier caliper.
12. Calculate the distance between stator and armature plate as follows:
    Distance= Rotor thickness + Rated air gap – head height.
    (For rated air gap see rated data table chapter 3.2)
13. Loosen the threaded adjustment tubes until the calculated distance between stator and armature plate is reached.
14. Fit the brake stator with the allen screw (9)
15. Adjust the air gap as per 6.3.1.
16. Reconnect the brake supply cable to the terminal screw of the enclosure cover.
17. Re-assemble enclosure cover by fitting allen screw (18) on enclosure flange (2).

7. Trouble Shooting

Problem	Cause	Remedy
Brake does not release, air gap is not zero	Coil open	• Measure coil resistance using a multimeter. -If resistance is too large replace the entire stator.
	Coil has contact to ground or between the winding	• Measure coil resistance Using a multimeter - Compare measured resistance to rated resistance for values If resistance is too low Replace the stator. • Check the coil for contact to ground using a multimeter -in case of contact to ground, replace entire stator. • Check the brake voltage- Rectifier defectives/ voltage too low.
	Wring wrong or defective	• Check wiring and correct it. • Check cable for continuity using a multimeter - Replace defective cable
	Rectifier defective or wrong	• Measure DC voltage at rectifier using multimeter. If voltage is zero replace rectifier. • Measure AC voltage at rectifier. If AC input voltage is zero -check fuse -check wiring If AC voltage is okay: -check rectifier -replace defective rectifier If DC voltage is too low : -check rectifier • Check coil for contact to ground or between windings. • If a rectifier defect occurs several times replace entire stator, even if a contact to ground or between windings cannot be measured. The fault may occur only in warm state.

7. Troubleshooting and fault elimination

Problem	Cause	Remedy
	Air gap too large	• Readjust the air gap.(chap. 6.3.1)
Rotor cannot rotate freely	Incorrect adjustment of manual release	• Check ‘u’ gap at manual release when current applied to brake. It should be same at both Ends.Correct if necessary.
	Air gap too small	• Check and adjust if necessary. (chapter 6.3.1)
Rotor thickness too small	Rotor was not replaced in time	• Replace the rotor(Chapter 6.3.2)
Voltage too high	Brake voltage does not match with rectifier	• Match brake voltage and rectifier to each other.
Voltage too low	Brake voltage does not match with rectifier	• Match brake voltage and rectifier to each other.
	Diode in the rectifier is defective	• Replace rectifier by suitable new one.
AC voltage is not mains voltage	Fuse is missing or defective	• Select connection where fuse is not missing or defective.

8. Do’s and Dont's

Do’s and Dont’s to get an optimum performance of the Brakes

Do’s	Dont’s
1. Brake manual release should be free of the motor	Don’t operate brake if manual release is not operating.
2. Air gap adjustment has to be done when there is a slippage or brake is not releasing on application of DC voltage. Delay in engagement or disengagement time should be observed.	Don’t operate the Brake without adjusting/resetting the Air gap.
3. Checking the Air gap at regular interval.	Don’t operate the brake if specified air gap is not present or the gap is totally closed.
4.Adjust the air gap to rated air gap as per table 3.2.	Don’t let armature plate to be uneven i.e. one side totally closed while another open beyond permissible limit.
5. Required DC supply voltage to be checked.	Don’t operate the brake once DC supply is +10% or -10% of the rated voltage
6. Check the linear part of the brakes since they Should run dry.	Don’t use any oil, grease, lubricant or any foreign material for lubrication. Friction surface should be free from all the above substances.
7. Check the manual release screw position before operating the brake.(i.e. maintain a “U” gap of 1.5 mm between brake stator surface & washer of manual release screw)	Don’t operate brake when brake manual release screw is closed(i.e. “U” gap of 1.5 mm is zero)

NOTE

NOTE