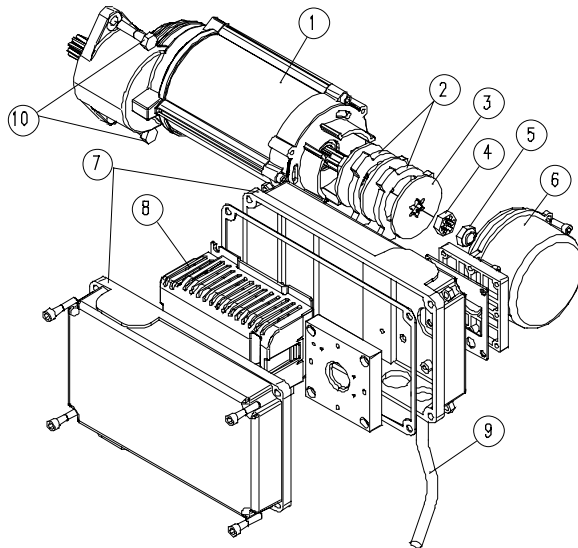


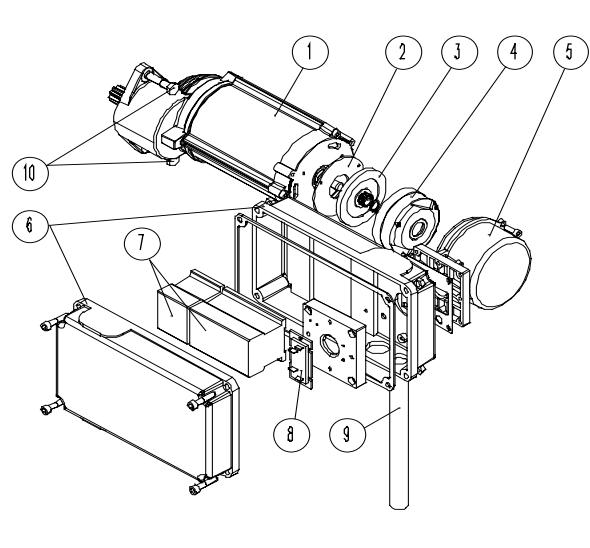


- Humidity: 90%RH (no condensation)
- Vibration: 0.2g_n (2m/s²)
- Sound level: 70 dB at 3 feet [1m]

3 TMU Drive



TMU Variable Frequency Drive



TMU Two-speed Motor

1. Gear/motor unit	6. Brake cover	1. Gear/motor unit	6. Control enclosure
2. Compact Brake	7. Control enclosure	2. Friction plate	7. Contactors
3. Brake disc	8. Variable frequency drive	3. Brake disc	8. Rectifier
4. Sleeve	9. Electrical cable	4. Brake	9. Electrical cable
5. Nut	10. Mounting screw	5. Brake cover	10. Mounting screws

*See Section 6.2 for Spare Part information

3.1 Motor

The motor insulation is class F and the degree of protection is IP55.

3.2 Description of the Gear Reducer

3.2.1 TMU VFD Gear Reducer

A single reduction gear reducer is used together with the 100/120 Hz inverter motor. Generally, this gear motor reducer is used when the capacity of the hoist is greater than 1 ton [1000 kg]. The output pinion is cut into the output shaft of the gearbox. Gears are lubricated with semi-fluid grease.

The 35 Hz inverter motor is used without a gear reducer. Generally, this gearless motor is used when the capacity of the hoist is 1 ton [1000 kg] or less. The trolley wheels are directly driven from the motor.

3.2.2 TMU Two-speed Motor Gear Reducer

A single reduction gear reducer is always used together with the two-speed motor regardless of load capacity. The output pinion is cut into the output shaft of the gearbox. Gears are lubricated with semi-fluid grease.

3.3 Description of the Brakes

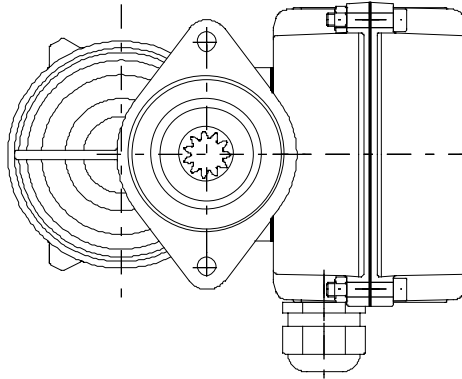
3.3.1 Compact Brake

The Compact brake is integrated into the design of the MF06 inverter motor and is AC operated - without a separate coil for the brake. An electromagnetic force produced from the energized motor stator winding releases the brake. Since the MF06 inverter motor is always operated with a TMU VFD that provides dynamic braking, the Compact brake is essentially a holding brake. The brake sets when the motor decelerates to zero and a spring applies a clamping force.

3.3.2 D.C. Disc Brake

The D.C. Disc brake is mounted to the two-speed motor and utilizes a D.C. coil. The coil releases the brake disc. Several springs apply the clamping force.

3.4 Mounting Position of Drive Unit



The TMU drive unit is to be positioned so that the control enclosure is located to the side of the motor, with the power cable outlet pointing down as shown above.

Other mounting positions of the drive are not recommended because they reduce the cooling effectiveness and may cause overheating of the controls.

3.5 Mounting the Drive Unit

- Be sure the main power supply is switched off - to avoid electrical hazard.
- Align the pinion teeth with the wheel gear teeth. Push the drive unit against the trolley side plate.
- Rotate the machinery to the proper mounting position. Note: the motor brake prevents the free rotation of the motor. So either release the brake or raise the drive wheels off the rail.
- Insert the mounting bolts. Use lock washers
- Tighten the mounting bolts by hand until snug.
- If the drive wheels are raised up, lower the wheels down before beginning the final tightening of the mounting bolts. Note: Wheels must lie on the track when tightening the mounting bolts to ensure that no excessive loads are directed toward the secondary shaft. Recommended tightening torque for M8 bolt is 18 ft-lbs [24 Nm].
- Connect the power cable plug to the hoist.

3.6 Removing the Drive Unit

- Disconnect power and lockout disconnecting means on the crane/hoist.
- Disconnect the power cable plug from the hoist.
- Loosen and remove the mounting bolts.
- Remove the drive unit from the trolley side plate.



3.7 Inspection and Service of the Drive Unit

- Check the tightness of the mounting bolts.
- Check the traveling motion: acceleration and deceleration.
- Check the brake for wear of the friction linings. If necessary, clean the brake and replace the friction linings.
- Check the air gap of the brake.
- Check that the inverter or contactors operate correctly.
- Gears are lubricated with semi-fluid grease. See Preventative Maintenance section for grease type.

3.8 Adjustment of Compact Brake Air Gap

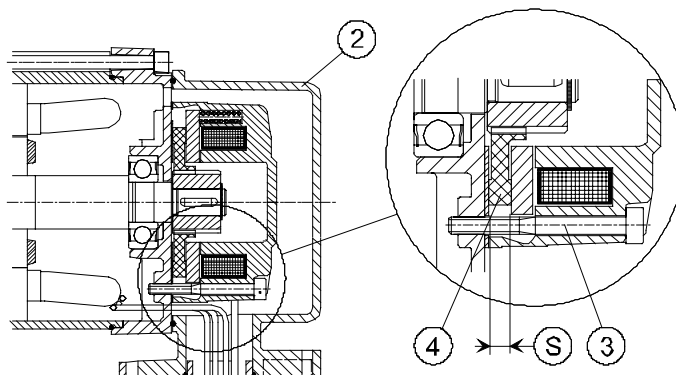
- Disconnect power and lockout disconnecting means on the crane/hoist.
- Disconnect the power cable plug from the hoist.
- Remove brake and motor leads from enclosure.
- Remove the brake cover.
- Push the brake disk and measure the air gap between the adjustment nut and aluminum ring. The air gap must be 0.008 – 0.012 inches [0.2 - 0.3 mm]. Turn the adjustment nut, to adjust the air gap.
- Add the brake cover, install brake and motor leads, and connect the power supply plug to motor.

3.9 Removal and Inspection of the Brake

3.9.1 Compact Brake

- Disconnect power and lockout disconnecting means on the crane/hoist.
- Disconnect the power cable plug from the hoist.
- Remove the brake cover.
- Unscrew and remove the adjustment nut.
- Remove the brake parts. If the thickness of the friction disc is less than 0.197" [5 mm], replace brake discs and friction disc.
- Re-assemble in the reverse order.
- Adjust the brake air gap.

3.9.2 D.C Disc Brake



- 2. Brake cover
- 3. Mounting screws
- 4. Friction disc
- S. Thickness of friction disc

Data below is for NM38710NR#, 2 Nm
brake type and torque size

- Disconnect power and lockout disconnecting means on the crane/hoist.
 - Disconnect the power cable plug from the hoist.
 - Remove the brake cover.
 - Unscrew the mounting screws.
 - Remove the brake. If the thickness of the friction disc is less than 0.23" [5.8 mm], replace brake discs and friction disc.
 - Re-assemble in the reverse order.
 - Recommended tightening torque for mounting screws is 1.8 lb-ft [2.5 Nm]
- The air gap on the D.C Brake is not adjustable.



3.10 Trouble Shooting – Brake

3.10.1 Compact Brake

The Compact brake is used on the MF06 inverter motor only.

Brake will not released:

- ✓ Air gap too large ⇒ adjust air gap
- ✓ Presence of foreign matter ⇒ clean brake
- ✓ Check Motor Parameter setting ⇒ consult Section 4.2.3

Insufficient braking torque:

- ✓ Grease on lining ⇒ replace lining
- ✓ Damaged lining ⇒ replace lining
- ✓ Air gap too large ⇒ adjust air gap
- ✓ Worn friction material ⇒ replace lining

3.10.2 D.C. Disc Brake

The D.C. Disc brake is used on the two-speed motor only.

Brake will not released:

- ✓ Presence of foreign matter ⇒ clean brake
- ✓ Bad rectifier ⇒ replace rectifier

Insufficient braking torque:

- ✓ Grease on lining ⇒ replace lining
- ✓ Damaged lining ⇒ replace lining
- ✓ Air gap too large ⇒ replace friction material
- ✓ Worn friction material ⇒ replace friction material

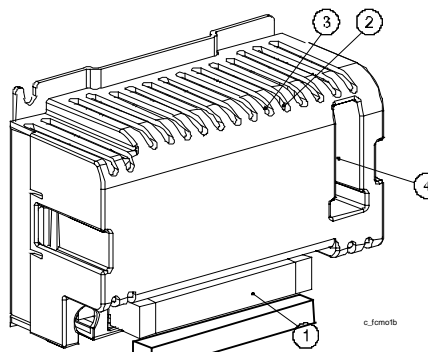
4 TMU Variable Frequency Drive

4.1 Description of the Inverter



Do not touch any circuit components while the main AC power is on. High voltages are supplied to the inverter (including the programming switches). Wait for at least three minutes after the supply voltage has been switched off before performing any service on the unit. Failure to adhere to this warning can result in injury.

1. Terminal X1
2. Red LED (fault)
3. Green LED (ok)
4. Programming switches
5. Capacitor



Inverter cooling is optimal when the air flows through the device from the bottom to the top. If the inverter is mounted sideways, the output current must be de-rated by 40%.