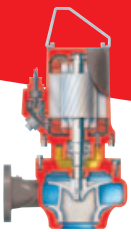
FLOWSERVE

MSX

Solids-Handling, Submersible Pumps

▸ Maintenance Checklist



MSX-Series 1 (Low Capacity)

MSX-Series 2 & 3 (Medium/High Capacity)

⚠DANGER

Read User Instructions **before** installing, operating or maintaining this pump. Copies available from Flowserve pump representatives.

Start-up Procedure

Preliminary Steps:

1. Ensure the motor is filled with fluid per the fluid requirements specifications table and that the moisture detection sensor and thermal disconnects are functioning properly.
2. Check that all plugs are secure and no fluid is leaking from the unit.
3. Check the direction of the driver's rotation to confirm it coincides with the arrow on the casing.

Start-up:

1. Verify that the pump rotor turns freely. If it is bound, do not operate the pump until the cause of trouble is located.
2. If the pump is in a wet-pit application, make sure the pump is submerged. Follow the checklist guidelines for discharge elbow and guide rail systems listed below:
   a. Upper guide rail bracket(s) bolted securely
   b. Slide rail base(s) properly bolted down
   c. Guide rails exactly vertical
   d. Base elbow exactly level
   e. Debris in bottom of station removed
3. Start the driver.
4. If the discharge valve is closed, open the valve slowly as pressure is built up on the discharge side of the pump.
5. Monitor noise and power consumption for several hours. After starting a unit and current equalizes to a steady state, the ammeter may, for a short time, indicate a higher current than given on the motor data sheet.

Cabling Specifications

Cable Purpose	Color
Power	Red
	Black
	White
Ground	Green
Thermal switches	Blue
	Orange
Moisture probe	White/Black

For sales and product information, go to www.flowserve.com

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Electrical Maintenance Checklist

Main Sensors

Sensor Type	Condition	Alarm
Moisture detection	Increased conductivity in oil due to contamination	Light appears on pump motor control panel
Thermal switches	Winding temperature within motor exceeds 135°C (275°F)	Three thermal switches wired to motor starter trips motor in the event of overheating

Optional Sensors

Sensor Type	RTD Monitor Conditions	
	Alarm	Trip
Stator RTDs	At 132°C (270°F)	At 138°C (280°F)
Upper bearing RTDs	At 99°C (210°F)	At 104°C (220°F)
Lower bearing RTDs	At 77°C (170°F)	At 82°C (180°F)
Vibration sensor	Non-standard – refer to Flowserve	

Seal Failure and High Temperature Relay[1]

Alarm	Chan	LED Color	Condition
Seal failure	A	Orange	<= A resistance of 125k ohms for a minimum of 15 seconds, 3 times in a 24-hour period (OR) <= A resistance of 125k ohms for a minimum of 45 seconds
High temperature[2]	B	Red	An open circuit for a minimum of 2 seconds, 3 times in a 24-hour period (OR) An open circuit for a minimum of 7 seconds

1. When the alarm condition clears, the Chan A LED will flash to indicate an alarm existed and flashing stops when the reset push-button is pressed.
2. Once an alarm has occurred on either channel once in a 24-hour period and cleared, any subsequent occurrence will not be restricted to the time delay.

Mechanical Maintenance Checklist

Fluid Requirements

Series	Size	Barrier/Cooling Fluid		Bearing Grease[3]	
		Brand and Type	Quantity, L (gal)	Brand and Type	Quantity, L (oz)
1	11	Chevron Lubricating Oil FM ISO 68	1.892 (0.5)	Mobile (Exxon) Infinitec EP2	0.04 (1.4)
	12		1.892 (0.5)		0.047 (1.6)
2	23	Royal Purple Barrier Fluid BF GT22	9.46 (2.5)		0.151 (5.1)
	24		13.25 (3.5)		0.195 (6.6)
	25		18.93 (5)		0.195 (6.6)
3	36	Dow Dowfrost HD (30% Propylene Glycol/70% Water)	26.5 (7)		0.414 (14)
	37		45.42 (12)		0.828 (28)
	38		75.71 (20)		1.242(42)

3. The grease should have a viscosity of 14.1 cSt at 100°C (212°F) and a minimum Timken OK load rating of 27.22 kg (60 lbs).

Wear Ring Clearances[4]

Size, mm (inches)	Clearance, mm (inches)
<= 152.4 (6)	0.305 (0.012)
152.4 to 203.2 (6 to 8)	0.356 (0.014)
203.2 to 279.4 (8 to 11)	0.406 (0.016)
279.4 to 330.2 (11 to 13)	0.457 (0.018)
>= 330.2 (13)	0.508 (0.020)

4. Recommend replacing or overhauling wear rings when pump performance has decreased appreciably due to excessive wear ring clearance or when the diametrical clearance exceeds 0.25 mm (0.01 in) per inch of ring diameter.