



INNOMAG® TB-MAG™ ASME and ISO Sealless

Horizontal Close Coupled, Long Coupled and Vertical
ETFE Lined, Sealless Chemical Process Pumps



► Maintenance Checklist

⚠ DANGER

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



TB-MAG pumps contain extremely strong permanent neodymium magnets which could affect the functioning of pacemakers and implanted heart defibrillators. If you wear these devices, keep a sufficient distance to magnets.

Preventative Maintenance Guidelines

| Routine (Daily/Weekly) | Periodic (Every Six Months) |
|--|--|
| Check operating behavior. Ensure noise, vibration and bearing temperatures are normal. | Check foundation bolts for security of attachment and corrosion. |
| Check that there is no abnormal fluid or lubricant leaking. | |
| Check level and condition of lubricant. ¹ | Check level and condition of lubricant. ¹ |
| Check hourly usage to determine if bearing lubricant requires changing. ^{1,2,3} | Check hourly usage to determine if bearing lubricant requires changing. ^{1,2,3} |

1. Long coupled pumps only
2. For preventative maintenance schedule recommendations that are specific to your application, please contact your local distributor.
3. If abrasive solids are present in the fluid, inspections should be shortened compared to usual times.

Typical Sound Pressure Level (Pump and Motor) LpA at 1 m (3.3 ft) Reference 20 µPa, dBA

| Pump Series | rpm | | | | | |
|--------------|------|------|------|------|----------|---------|
| | 3550 | 2900 | 1750 | 1450 | 1180/960 | 880/720 |
| A/V/E | 75 | 69 | 65 | 60 | 58 | 57 |
| B/W/F | 77 | 70 | 68 | 65 | 63 | 62 |
| C/G | 80 | 76 | 71 | 65 | 63 | 62 |

Notes: (1) Values are for the maximum useable motor size. (2) Choosing a fan-cooled motor will increase noise levels. (3) Placing valves, orifices or flow meters near a pump will increase noise levels inside the pump. (4) For estimating sound power level L_{wa} (re 1 pW), add 14 dBA to the sound pressure value.

Maximum Bearing Housing Temperature = 82°C (180°F)

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

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INNOMAG pumps are manufactured in: Addison, IL (USA).

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Vibration Velocity

| Vibration Velocity, Unfiltered | mm/s (in/sec) r.m.s. | | |
|-----------------------------------|-------------------------------|-----------------|-------------------------------|
| | Horizontal and Vertical Pumps | | Horizontal Pumps ⁴ |
| | ≤ 15 kW (20 HP) | > 15 kW (20 HP) | |
| Normal N | ≤ 3.0 (0.12) | ≤ 4.5 (0.18) | ≤ 7.1 (0.28) |
| Alarm N x 1.25 | ≤ 3.8 (0.15) | ≤ 5.6 (0.22) | ≤ 9.0 (0.35) |
| Shutdown Trip N x 2.0 | ≤ 6.0 (0.24) | ≤ 9.0 (0.35) | ≤ 14.2 (0.56) |

4. Where a horizontal unit is utilized in a vertical shaft configuration with a duck-foot bend (an elbow with a base) mounted onto the pump suction.
Note: Alarm and trip values for installed pumps should be based on the actual measurements taken on the pump in the fully commissioned as-new condition. Measuring vibration at regular intervals will then show any deterioration in pump or system operating conditions.

Operating Limits

| | |
|------------------------------------|---------------|
| Normal maximum ambient temperature | +40°C (104°F) |
| Normal minimum ambient temperature | -20°C (-4°F) |

Stop/Start Frequency

| Motor Rating kW (hp) | Max Stop/Starts per Hour |
|----------------------|--------------------------|
| Up to 15 (20) | 15 |
| 15 (20) to 90 (120) | 10 |
| Above 90 (120) | 6 |

Recommended Lubricant Specifications and Intervals

| | |
|--|---|
|  The unit must be filled to the center of the site glass before starting. Do not overfill. The oil level should be checked when the pump is stopped. | |
| Viscosity cSt @ 40°C (104°F) | 46 |
| Temperature range ⁵ | -5 to 78°C (23 to 172°F) |
| Designation to ISO3448 and DIN51524 part 2 | ISO VG46 |
| Mineral Oil | Quality mineral oil with rust and oxidation inhibitors ISO VG46 |
| Synthetic Oil | ISO VG46 |
| Oil Change Interval | 4000 hours or at least every six months ⁶ |

5. It normally takes two hours for bearing temperature to stabilize, and the final temperature will depend on the ambient, rpm, pumpage temperature and pump size.
6. The unit must be filled to the center of the site glass before starting. Do not overfill. The oil level should be checked when the pump is stopped.

Recommended Torques

| Screw Size (in.) | Torque Nm (lbf-ft) | |
|------------------|--------------------------|---------------------|
| | Wet End Casing Fasteners | All Other Fasteners |
| 5/16 | | 16 (12) |
| 3/8 | 27 (20) | 25 (18) |
| 1/2 | 61 (45) | 35 (26) |
| 5/8 | 122 (90) | 80 (59) |
| 3/4 | | 130 (96) |

Caution: Non-metallic gaskets incur creep relaxation. Before commissioning the pump, check and retighten fasteners to stated tightening torques.

Final Shaft Alignment

| Pump Type | Parallel Alignment | Angular Alignment |
|---------------------------------|---------------------|------------------------------|
| Long coupled pumps ⁷ | <0.05 mm (0.002 in) | <0.0005 mm/mm (0.0005 in/in) |

7. In pump installations involving high liquid temperatures greater than 100°C (212°F), the unit should be run at actual operating temperature, shut down and the alignment checked immediately.

Pressure-Temperature Rating

| | Temperature °C (°F) | | | | |
|-----------------------|---------------------|------------|------------|------------|------------|
| | -29 (-20) | -18 (0) | 38 (100) | 93 (200) | 121 (250) |
| | Pressure bar (psi) | | | | |
| ASME B16.42 Class 150 | 17.2 (250) | 17.2 (250) | 17.2 (250) | 16.2 (235) | 15.5 (225) |
| ASME B16.42 Class 300 | 25 (362) | 25 (362) | 25 (362) | 20.7 (300) | 20.7 (300) |
| EN 1092-2 (ISO) PN 16 | 16 (232) | 16 (232) | 16 (232) | 16 (232) | 16 (232) |
| EN 1092-2 (ISO) PN 25 | 25 (362) | 25 (362) | 25 (362) | 20.7 (300) | 20.7 (300) |
| JIS B2239 10K | 14 (203) | 14 (203) | 14 (203) | 14 (203) | 14 (203) |

Note: PN 16 flanges are standard for the ISO models. Class 150 flanges are standard for the ASME models. Find the maximum allowable pressure for the supplied pump, given the flange drilling pattern and operating temperature.
Caution: The maximum discharge pressure must be less than or equal to the P-T rating. Discharge pressure may be approximated by adding the suction pressure to the differential pressure developed by the pump.