



Durco® Mark 3™ ISO

ISO 2858/5199

► Maintenance Checklist



⚠ DANGER

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

Specific requirements apply relating to the Product Certification, Permit or Conformity; refer to Conformity document provided with the machine and always consider during change management on the machine, e.g., when changing a seal.



Impeller Clearance¹, mm (in)

| Temp, °C (°F) | Impellers up to 210 mm | Impellers 211 to 260 mm | Impellers > 260 mm | |
|---------------|------------------------|-------------------------|--------------------|--|
| | | | Standard | 150 to 400 200 to 400 150 to 500 |
| 50 (122) | 0.3 (0.012) | 0.4 (0.016) | 0.5 (0.020) | 1.0 (0.040) |
| 100 (212) | 0.4 (0.016) | 0.5 (0.020) | 0.6 (0.024) | 1.0 (0.040) |
| 150 (302) | 0.5 (0.020) | 0.6 (0.024) | 0.7 (0.028) | 1.1 (0.044) |
| 200 (392) | 0.6 (0.024) | 0.7 (0.028) | 0.8 (0.032) | 1.2 (0.048) |
| 250 (482) | 0.7 (0.028) | 0.8 (0.032) | 0.9 (0.036) | 1.3 (0.052) |

1. OP impellers are adjusted from the casing; RV impellers are adjusted from the cover. CL impellers do not require adjustments.

Shaft Data, mm (in)

| | |
|---------------------------------------|---------------|
| Max. shaft deflection at seal chamber | 0.050 (0.002) |
| Max. shaft runout at seal chamber | 0.025 (0.001) |
| Max. shaft end play axially | 0.050 (0.002) |

ISO Frame Sizes

| ISO Frame Size | Impeller Drive Thread | | Shaft Diameter at the Coupling |
|----------------|-----------------------|-----|--------------------------------|
| | OP and RV | CL | |
| 1 | M22 | M16 | 24 mm (0.945 in) |
| 2 | M30 | M16 | 32 mm (1.260 in) |
| 3 | M39 | M20 | 42 mm (1.654 in) |
| 4 | M48 | - | 48 mm (1.890 in) |

Recommended Torques

| Fastener | Screw Size | Torque, Nm (lbf-ft) |
|-----------------------------------|------------|---------------------|
| All except where otherwise stated | M8 | 16 (12) |
| | M10 | 25 (18) |
| | M12 | 35 (26) |
| | M16 | 80 (59) |
| | M20 | 130 (96) |
| Impeller nut | M12 | 16 (12) |
| | M16 | 41 (31) |
| | M20 | 80 (59) |
| | M24 | 106 (79) |

Oil-Lubricated Bearing Types

| ISO Frame Size | Medium Duty | | Heavy Duty | | Heavy Duty (Optional) | | Approx. Oil Capacity ² , L (US fl. oz) |
|----------------|-------------|-----------|------------|------------------------|-----------------------|------------------------|---|
| | Pump End | Drive End | Pump End | Drive End | Pump End | Drive End | |
| 1 | 6207 C3 | 3306 C3 | 6207 C3 | 7306 pair back-to-back | NUP 207 C3 | 7306 pair back-to-back | 0.5 (17) |
| 2 | 6309 C3 | 3309 C3 | 6309 C3 | 7309 pair back-to-back | NUP 309 C3 | 7309 pair back-to-back | 1.0 (34) |
| 3 | 6311 C3 | 3311 C3 | 6311 C3 | 7311 pair back-to-back | NUP 311 C3 | 7311 pair back-to-back | 0.8 (27) |
| 4 | 6313 C3 | 3313 C3 | 6313 C3 | 7313 pair back-to-back | NUP 313 C3 | 7313 pair back-to-back | 1.6 (54) |

2. Sump volume only. Does not include oil in the constant level oiler.

Grease-Lubricated Bearing Types

| ISO Frame Size | Medium Duty | | Heavy Duty | | Capacity, g (oz) | |
|----------------|-------------|-----------|------------|------------------------|------------------|-----------|
| | Pump End | Drive End | Pump End | Drive End | Pump End | Drive End |
| 1 | 6207 Z C3 | 3306 Z C3 | 6207 Z C3 | 7306 pair back-to-back | 6 (0.2) | 14 (0.5) |
| 2 | 6309 Z C3 | 3309 Z C3 | 6309 Z C3 | 7309 pair back-to-back | 13 (0.5) | 25 (0.9) |
| 3 | 6311 Z C3 | 3311 Z C3 | 6311 Z C3 | 7311 pair back-to-back | 18 (0.6) | 35 (1.2) |
| 4 | 6313 Z C3 | 3313 Z C3 | 6313 Z C3 | 7313 pair back-to-back | 20 (0.7) | 46 (1.6) |

Recommended Oil Lubricants

| Centrifugal Pump Lubrication | Oil | Splash/Force Feed/Purge Oil Mist/Pure Oil Mist Lubrication | | |
|---|---|--|-------------------------------|-------------------------------|
| | Viscosity cSt @ 40°C | 32 | 46 | 68 |
| Oil Temperature Range ³ | -5°C to 65°C (23°F to 149°F) | -5°C to 78°C (23°F to 172°F) | -5°C to 80°C (23°F to 176°F) | |
| Designation to ISO 3448 and DIN51524 part 2 | ISO VG 32 32 HLP | ISO VG 46 46 HLP | ISO VG 68 68 HLP | |
| Oil Companies and Lubricants | BP Castrol ⁴ | Energol HLP-HM 32 | Energol HLP-HM 46 | Energol HLP-HM 68 |
| | ESSO ⁴ | NUTO HP 32 | NUTO HP 46 | NUTO HP 68 |
| | ELF/Total ⁴ | ELFOLNA DS 32 Azolla ZS 32 | ELFOLNA DS 46 Azolla ZS 46 | ELFOLNA DS 68 Azolla ZS 68 |
| | LSC (for oil mist) | LSO 32 (Synthetic oil) | LSO 46 (Synthetic oil) | LSO 68 (Synthetic oil) |
| | ExxonMobil (mineral oil) ⁴ | Mobil DTE 24 | Mobil DTE 25 | Mobil DTE 26 |
| | ExxonMobil (oil bath only — long life) ⁴ | Mobil SHC 524 (synthetic oil) ⁵ | Mobil SHC 525 (synthetic oil) | Mobil SHC 526 (synthetic oil) |
| | Q8 ⁴ | Q8 Haydn 32 | Q8 Haydn 46 | Q8 Haydn 68 |
| | Shell ⁴ | Shell Tellus 32 | Shell Tellus 46 | Shell Tellus 68 |
| | Chevron Texaco ⁴ | Rando HD 32 | Rando HD 46 | Rando HD 68 |
| | Wintershall (BASF Group) ⁴ | Wiolan HS32 | Wiolan HS46 | Wiolan HS68 |
| Fuchs ⁴ | Renolin CL 32 | Renolin CL 46 | Renolin CL 68 | |

- Allow two hours for bearing temperature to stabilize. The final temperature will depend on the ambient, r/min, pumpage temperature and pump size. Check the grade capability where the ambient is less than -5°C (23°F).
- Use LSC for oil mist. Oil parameters provide flash point > 166°C (331°F), density > 0.87 @ 15°C (59°F), pour point of -10°C (14°F) or lower.
- ExxonMobil SHC 524 synthetic oil has a pour point temperature of -54°C (-65°F). This oil can be used for ambient temperatures as low as -50°C (-58°F).

Recommended Grease Lubricants

NLGI grade 2 is generally advised for horizontal bearing housings and NLGI 3 where the bearing housing is used vertically. The bearings are pre-greased. The NLGI 2 grade fitted in the factory with grease nipples is Mobil Polyrex EM grease which has a Polyurea soap incorporating a mineral oil. NLGI 3 grade is recommended for vertical applications, if vertical orientation was specified with order, then the NLGI 3 grease fitted in the factory for vertical application is Mobil Polyrex EM103 grease or equivalent which has a Polyurea soap incorporating a mineral oil. These greases are suitable for high bearing and ambient temperatures and ambient down to at least -20°C (-4°F). Below this ambient, specialist greases may be required and Shell Aeroshell 22 is normally required for the minimum ambient down to nitrile limitation of -45°C (-49°F). Different types or grades of greases must never be mixed. When applicable, food grade grease NSF H1 Klubersynth UH1 64-62 may be used and is NLGI grade 2.

Nomenclature

ISO Frame Size 1 **K 80 - 50 - *200 A - RV**

1 = Frame 1 with two-piece bearing housing
 2 = Frame 2 with two-piece bearing housing
 3 = Frame 3 with two-piece bearing housing
 4 = Frame 4 with two-piece bearing housing
 C = Close Coupled

Durco Mark 3 Range _____

Suction Branch Diameter (mm) _____

Discharge Branch Diameter (mm) _____

Configuration _____

* Blank = Standard
 R = Recessed
 P = Unitized Self-Primer
 N = Centerline Mounted High-Pressure 25 bar (363 psi)
 H = Foot Mounted High-Pressure 25 bar (363 psi)

Nominal Impeller Diameter (mm) _____

Hydraulics _____

A = Extended Flow Hydraulic
 B = ISO 2858 Standard Hydraulic
 C = ISO 2858 Hydraulic

Impeller Design _____

RV = Reverse Vane Impeller
 OP = Open Impeller
 CL = Closed Impeller

Vibration

Maximum bearing housing level:
 4.5 mm/s rms (0.177 in/sec rms)

IPS Beacon™2 Condition Monitor

Each Durco Mark 3 ISO pump is supplied with an IPS Beacon2 Condition Monitoring unit mounted on the bearing housing of the pump. The Beacon2 features a system of LED indicator lights that allow operators to ascertain overall pump health at a glance.

| Indication | Pump Health Status |
|-----------------------------|--|
| Blinking green | Current normal operation |
| Blinking red | Current alert condition |
| Blinking green and red | Current normal operation but previously occurred alert condition |
| Rapid flashing or solid red | Battery is depleted |

Please note there are no user serviceable parts in this unit and it is not possible to replace the battery. Once the battery is depleted or exhausted, the complete unit must be replaced. Please consult the IPS Beacon2 User Instructions manual (26999949) available from Flowserve.com.

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

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