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Issue 1, August 2005

Options (Pumps)

1. Pricing

Prices for all options are available on request.

2. Metal Parts (Excluding Motor)

Wetted parts made from stainless steel 316L with a maximum of 3% delta ferrite (1.4435) is available on request.

Mechanical Seal

See section 4.

3. Non-metal Parts (Excluding Motor)

Mechanical Seal

See section 4.

Joint Rings (Static Seals)

Commonly-requested options*:

- EP[†] FDA
- Fluorocarbon/FKM (Viton[®]) FDA
- PTFE-encapsulated silicone FDA ('O' rings)

*Other materials are available.

†Pumps that are to be compliant with ASME BPE 2002 will typically be fitted with EP FDA joint rings.

Sacrificial Joint Rings

Available on request.

4. Mechanical Seal

Mechanical Seal Materials

Commonly-requested options*:

- Hard face and seat (usually both silicon carbide).
- Fluorocarbon/FKM (Viton[®]) elastomers. (These will *not* be FDA-compliant.)
- Alloy wetted metal parts.

*Other materials are available.

Mechanical Seal Types

- PTFE wedge seal (pusher design).
- Metal bellows seal with 'O' ring secondary seal (non-pusher design).
- External PTFE bellows seal (non-pusher design) with no wetted metal parts.
- Cartridge seal.

Sacrificial Mechanical Seal

Available on request.

Flush Arrangements

Where a pump is built with a flush arrangement, we will assume that the flushing system will be supplied and fitted by others.

Low-Pressure Flush Arrangement

Two mechanical seals in a face-to-face arrangement.

<i>Mechanical Seals For LPF</i>				Rotating Component		Stationary Component		
Pump	Seal Location	Manufacturer	Type	Face Material	Bellows Material	Seat Type	Seat Material	Seat Ring Material
H	Inboard	As per 'Our Standard Offering' document.						
	Outboard	John Crane	2100	Carbon	EP FDA	Cup (M)	Silicon carbide	EP FDA
D2 - D6	Inboard	As per 'Our Standard Offering' document.						
	Outboard	Roplan	RB05	Carbon	Nitrile (not FDA)	Cup	Ceramic	Nitrile (not FDA)
CR, CF, CA	Inboard and outboard	Roten	Q70	Stainless steel 316	EP (not FDA*)	'O' ring	Carbon	EP (not FDA*)

*FDA-compliant EP available on request.

High-Pressure Flush Arrangement

A double back-to-back mechanical seal.

Available on request.

5. Connections And Fittings

Suction (Inlet) And Discharge (Outlet)

Sizes

Non-standard connection sizes are available, but an inlet (suction) connection that is *smaller* than our standard offering is not generally recommended. See 'Our Standard Offering' document.

Type

Most connection types can be supplied. See table for examples.

Screwed	Flanged*	Other
RJT (BS 4825 : 1991, Part 5**)	BS EN 1092-1***	Triclamp [‡] (BS 4825 : 1991, Part 3)
IDF/ISS (BS 4825 : 1991, Part 4)	BS 1560 [†]	
DIN 11851	BS 10, Table D	
BSP		
SMS		

*Flanges may incur an additional charge.

**Supercedes BS 1864 : 1966

***Supercedes BS 4504

†Equivalent to ANSI B16.5

‡Also known as 'Ladish'.

Mating Connections

Available on request.

Drain

Drains will be fitted at the lowest point of the pump casing.

Two types of drain are available:

- Fitting. Where the size and type has not been stated, we will supply a 1" triclamp fitting with EP FDA joint ring and a cap. A drain valve can be attached to the fitting. Where a horizontal orientation has been requested the drain will be 0.75".
- Valve welded directly into the pump casing.

Drains can either be oriented vertically, coming out of the bottom of the pump casing, or 'horizontally' (inclined downwards at an angle of 3°), coming out of the front of the pump casing. Unless requested otherwise, all drains will be oriented vertically.

0.5" drains (or smaller) are not available for pumps that are to conform to the ASME BPE 2002 standard. 1" drains (or larger) are not available on smaller pumps if a horizontal orientation is required.

Where a drain valve is to be fitted to the pump, then the quotation is based on a *free-issue* drain valve, unless otherwise stated.

Vent

Vents will be fitted vertically at the highest point of the pump casing.

Two types of vent are available:

- Fitting. Where the size and type has not been stated, we will supply a 1/4" BSP/F fitting with EP joint ring. 1" triclamp also available.
- Valve welded directly into the pump casing.

Water-Cooled/Heated Jacket.

This will be supplied with 3/4" BSP/F connections.

Self-Priming ('SP') Reservoir

This is available as an optional extra on the centrifugal air separator ('AS') pumps. Where a centrifugal 'AS' pump is fitted with a self-priming ('SP') reservoir with a 'Pure' internal finish, the 'SP' reservoir will have a removable cover fitted with a joint ring of the same section and material as the main pump cover joint ring.

6. Surface Finish

The options for the internal surface finish (wetted metal parts) are:

- 'Uniform' (See 'Our Standard Offering' document)
- 'Pure'
 - Unless stated otherwise, this will be max. 0.8µm R_a (31.5µin R_a, approx. 150 grit). Better finishes are available. 'Pure' finishes will be achieved mechanically.
 - Centrifugal air separator ('AS') pumps with a 'Pure' internal finish will have a removable cover on the AS vessel and this will be fitted with a joint ring of the same section and material as the main pump cover joint ring.
 - 'Pure' finishes are not available for liquid ring pumps.
- Passivated
- Electropolished (includes passivation)

7. Pump Duty

Upper Temperature Limits

We can supply units of a special design for pumping liquids at higher temperatures (e.g. superheated water up to 135°C or vegetable oil up to 180°C). This applies to centrifugal pumps only.

8. Motors And Mounting

Mounting

Options available:

- Standard (motor foot only). (See 'Our Standard Offering' document.)
- Free-Standing Base (FSB). This raises the pump and electric motor clear of liquid on the floor.
- Cowled. Cowls come with their own pedestal (free-standing base).
- Acoustic cowl over pump and motor (AKP&M).
- Standard On Trolley. A trolley allows for a pump to be easily moved from one place to another.
- Cowled On Trolley.

FSB's and cowls can be fitted with any of the following extras:

- Earthing point(s)
- Drip tray
- Mounting plates on feet (with bolt holes)
- Anti-vibration pads

Dimensions And Orientation

In some cases we can alter the dimensions of the pumps to fit existing pipework.

The orientation of the pump discharge (outlet) on flooded suction centrifugal pumps may be altered, but if the pump is to be fitted with a drain or vent, then you must inform MDM Pumps of the orientation you require when you place your order. On 'AS' centrifugal and 'CR' liquid ring scavenge pumps the pump discharge may not be altered: it must be vertical, pointing upwards.

Motor

Options include:

- Thermistors. These are recommended for inverter control. **WARNING: Operation of a motor via an inverter may invalidate ATEX certification. Contact MDM Pumps Ltd for advice.**
- IP65 (dust-protected)
- EFF1 for 1.1kW and above.
- Cast iron frame
- Special external finish (e.g. polyurethane or epoxy paint)
- Special internal finish (e.g. extra internal tropic-proofing)
- Compliance with ATEX directive 94/9/EC:
 - Increased safety (EEx e II T3) suitable for Zone 2 (ATEX Group II, Category 3 gas hazard, Maximum Surface Temperature 200°C)
 - Non-sparking (EEx nA II T3) suitable for Zone 2 (ATEX Group II, Category 3 gas hazard, Maximum Surface Temperature 200°C)
 - Flameproof enclosure (EEx d IIB T4) suitable for Zone 1 (ATEX Group II, Category 2 gas hazard, Maximum Surface Temperature 135°C)
 - Dust Ignition Proof suitable for Zone 22 (ATEX Group II, Category 3 dust hazard, Maximum Surface Temperature 125°C)
 - Dust Ignition Proof with IP65 suitable for Zone 21 (ATEX Group II, Category 2 dust hazard, Maximum Surface Temperature 125°C)
 - Non-sparking (EEx nA) *and* Dust Ignition Proof with IP65, suitable for Zones 2 and 21 (Dual certification: ATEX Group II, Category 3 gas hazard and Category 2 dust hazard, Maximum Surface Temperature 135°C)
 - Flameproof enclosure with increased safety terminals (EEx de IIC T4) *and* Dust Ignition Proof with IP65, suitable for Zones 1 and 21 (Dual certification: ATEX Group II, Category 2 gas and dust hazard, Maximum Surface Temperature 135°C)
- Single-phase (capacitor start, capacitor run) up to 3kW.
- NEMA/CSA for 60Hz supply (230V, 460V or 575V).
- Petrol or diesel-driven motor with optional light lifting frame.
- Air-driven motor (up to 3kW at 3000 RPM or 5.5kW at 1500 RPM).

9. Documents, Name Plates And Testing

If you have requirements for non-standard documents, name plates or testing, then these must be discussed with MDM Pumps Ltd before placing an order. Failure to do so could result in delays in the issuing of documentation.

Documents

Pharmaceutical Documentation Package For A Pump

This is available on request and comprises:

- Pump test certificate, showing the results of the following:
 - Pump performance test when pumping water at ambient temperature using a 50Hz supply
 - Internal surface finish test
 - Hydrostatic test
 - Noise test
 - Static and dynamic impeller balancing
- Standard pump performance curve (differential head in m, against flow in m³/h) when pumping water at ambient temperature using a 50Hz supply
- Letter of conformity to MDM data sheet
- List of recommended spares for 2 years operation (includes prices)
- Material certificates index
- Description of pump (labelled cross-sectional drawing)
- Mill test certificates for wetted metal parts
- Certificates of conformity to *FDA Code of Federal Regulations Title 21, Paragraph 177*, for joint ring(s) and mechanical seal elastomers

Other Documents

Other documentation is available, such as:

- Certified dimensional drawing
- Welding documentation

Extra Sets Of Paper Documents

Available on request. An additional charge will be incurred for each extra set required.

Binders

Available on request.

Non-standard Format

Customisation of documents (e.g. addition of title blocks or blank areas) will incur an extra charge. The charge will reflect the additional work needed to create the customised format. Unless stated otherwise, subsupplier documents (e.g. mill test certificates) will *not* have the customised format.

Electronic Documentation

Electronic copies of the MDM pump data sheet, general arrangement drawing, description of pump (labelled cross-sectional drawing) or BSI certificate of registration can be e-mailed free of charge. Electronic copies of subsupplier documents need to be scanned and will incur an additional charge.

If a CD-ROM is required this will incur an additional charge.

Electronic documents will be in PDF format, except those that have been scanned which will be in JPEG format.

Delivery

1 off MDM instruction manual, MDM data sheet and parts list will be shipped with each pump. The remaining documents will be shipped to the invoice address, unless you request otherwise on your order.

Name Plates

Customised name plates available on request.

Testing

NPSHR Test

Available on request.

Witness Testing

Available on request. There will be a charge on a per-visit basis.

10. Standards

See 'Pump Standards' document.