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Standard offering (pumps)

This outlines what we typically supply.

Any information given with a quotation, such as an MDM pump data sheet, MDM 'Documents and Nameplates' sheet, quotation cover letter or e-mail, will supersede this information.

1. Pricing

All quoted prices are nett, ex works, VAT extra. Delivery prices quoted to 'UK mainland' exclude the Scottish Highlands.

Equipment in Ireland and The Netherlands will only be supported locally if it is ordered through our distributor in the country in question. For this reason, if equipment is required for one of these countries, then a quotation should be obtained from our distributor, not directly from MDM Pumps Ltd.

For quotations involving more than one off pump, prices are based on the assumption that all pumps will be ordered. Carriage and despatch are based on all pumps being delivered in a single consignment.

2. Metal parts (excluding motor)

All wetted metal parts will be stainless steel to *AISI 316L* (1.4404) except for those in the mechanical seal, which will typically be stainless steel 316. See 'Materials of construction' document.

3. Non-metal parts (excluding motor)

Mechanical seals

See section 4.

Joint rings (static seals)

Pump range	Joint rings	Section	Material
H, CH	Cover joint ring + impeller joint ring	L	Silicone 70 FDA
D1 - D6, GP, TWO-WAY	Cover joint ring only	'O' ring	Silicone 70 FDA
CR	Cover joint ring + impeller joint ring	'O' ring	EPDM (not FDA*)

*FDA-compliant EPDM available on request.

Sacrificial seals

The user should assume that seals will *not* withstand a passivation/degreasing process. Contact MDM Pumps Ltd for advice. Spare/sacrificial seals are not supplied as standard but can be supplied for an extra charge.

Other

Acoustic cowls will be lined with acoustic foam. Details available on request.

4. Mechanical seal

Each pump will be fitted with a single internal mechanical seal with bellows (non-pusher design).

	Rotating component		Stationary component	
Pump range	**Bellows**	**Face**	**Seat**	**Seat type / material**
H with John Crane T2100	EP FDA	Carbon	Silicon carbide	Cup EP FDA
CH with John Crane 515H	Inconel (Alloy 718)	Carbon	Silicon carbide	'O' ring EP FDA
D2 - D6 with John Crane T2	EP FDA	Carbon	Silicon carbide	Cup EP FDA
D1X with John Crane 6J	Nitrile (not FDA)	Carbon	Ceramic	Cup EP (not FDA)
GP, TWO-WAY with John Crane 6D	Butyl (not FDA*)	Carbon	Ceramic	Cup EP
CR with Roten T82	EP FDA	Ceramic	Carbon	'O' ring EP FDA

*FDA-compliant EP available on request.

5. Connections and fittings

Suction (inlet) and discharge (outlet)

Pump size*	Suction (inlet)	Discharge (outlet)	Fittings type
1" (D or GP range)	1"	1"	RJT male BS 4825 : 1991, Part 5†
25 (H range)	1.5"	1"	
1.5"/40	1.5" or 2"	1.5"	
2"/50	2", 2.5" or 3"	2"	
3"/80	3" or 4"	3"	
4"/100	4"	3" or 4"	
5"/125	5"	5"	Flanged BS EN 1092-1‡
6"/150	6"	6"	
8"/200	8"	8"	

*The pump size gives an indication of the size of pipework for which the pump was designed. For D and GP pumps imperial measurements (eg 1.5") are used whereas for H and CH pump metric measurements (eg 40) are used. The pump size is the beginning of the pump model name so, for example, both the 1.5"D6A and 40H261 pump models have been designed for duty flows typical of 1.5"/40mm pipework.
†BS 4825 : 1991, Part 5 supersedes BS 1864 : 1966.
‡BS EN 1092-1 supersedes BS 4054.

Connection sizes shown are for guideline purposes only. On occasions it may be necessary to supply different connection sizes in order to meet other requirements.

Mating connections are not supplied as standard but can be supplied for an extra charge.

Drain

Drains are not supplied as standard but can be supplied for an extra charge. See 'Options' document.

Self-Priming ('SP') reservoir

'CR' liquid ring pumps have a built-in self-priming reservoir as standard. Centrifugal air separator ('AS') pumps are not self-priming as standard, but can be manufactured with self-priming reservoirs for an extra charge.

Impeller

Impeller type	Pump model
Fully open	GP, CR
Radial (semi-open)	TWO-WAY, D1X, D2, D121, 40-150H141-H261 All centrifugal Air Separator ('AS') pumps
Closed*	D3, D4A, D5A, D6A, 25H141-H261

*Volute pumps (pumps whose model name contains a 'V') will typically be fitted with radial impellers when run on 4-pole or 6-pole motors.

6. Surface finish

Standard finishes are shown below:

Pump model	Internal finish (wetted parts)	External finish
H, CH, D, GP	'Uniform' (as machined, max.* 3.6µm R_a, 140µin R_a)	As machined
CR	'Uniform' (as cast, approx. 3.2µm R_a, 125µin R_a)	Electropolished

*Not guaranteed unless requested.

'Pure' or electropolished internal finishes are not supplied as standard but can be supplied for an extra charge. See 'Options' document.

7. Pump duty

Duty point tolerances

For flooded suction centrifugal pumps and for liquid ring pumps, we guarantee that at the duty flow the pump will deliver a differential head that is:

- Within ±5% of the duty head, if the head is greater than or equal to 28.2m (40 psi of water at 22°C);
- Within ±1.4m (±2 psi of water at 22°C) of the duty head, if the head is less than 28.2m.

For centrifugal air separator ('AS') pumps, we guarantee that at the duty head the pump will deliver a flow that is *at least* as great as the duty flow.

Tolerances will be shown in the test box on the MDM pump data sheet.

Design pressure / maximum allowable working pressure

The maximum allowable working pressure will be as indicated in section A of the generic instruction manual. Copies are available on request.

Upper temperature limits

Design temperature*

Unless otherwise stated, standard pump-and-motor units have a design temperature of 140°C, which means that they will be suitable for steam sterilisation up to 140°C with the pump stationary.

Maximum allowable working temperature*

The *upper limit* on the maximum allowable working temperature is 95°C for a standard pump-and-motor unit.

*See 'Upper temperature limits' document.

Pumping of solids

The maximum size of *deformable* particles (eg lumps of yeast) than can be handled by a centrifugal pump is typically equal to the impeller vane width (except for GP pumps), and the maximum size of *non-deformable* particles (eg hop seeds) is half this. The impeller vane width will be shown on the MDM pump data sheet.

As a guideline, all of our centrifugal pumps can handle *deformable* particles up to at least 6mm and *non-deformable* particles up to at least 3mm, unless the vane width on the impeller has been trimmed. (D pump vane

widths are occasionally trimmed.)

See the 'Pumping solids' document for further information.

Liquid ring pumps are generally not recommended for pumping solids unless the particles are very fine, because of the small clearances between the impeller and pump casing.

8. Motors and mounting

Mounting

Mounting will be 'standard' (motor foot only). Motor feet will have bolt holes.

Free-standing bases, cowls or trolleys are not supplied as standard but can be supplied for an extra charge. See 'Options' document.

Dimensions and orientation

General arrangement drawings are available.

We assume that pumps will be mounted with the pump inlet (suction) and shaft oriented horizontally and with the pump outlet (discharge) oriented vertically, pointing upwards. In this orientation the pump outlet will be on the right-hand side when viewed from the front.

Motor

Pumps will be fitted to asynchronous squirrel cage AC induction motors of the following specification:

- Zone/Area: Suitable for a safe/non-hazardous area
- Ingress Protection: IP55
- External Finish: Standard (normal paint). Paint will not be FDA-approved*.
- Internal Finish: Standard (no extra internal tropic-proofing)
- Supply: Suitable for a 400V±5%, 3 phase, 50Hz supply.
  These motors can also be used with a 460-480V 60Hz supply.
- Frame Material: Motors with a 180 frame (eg 22kW, 2 poles) or less will typically have an alloy frame.
  Motors with a 200 frame (eg 30kW, 2 poles) or larger will have a cast iron frame.
- Efficiency Class: IE2 for 0.75-5.5kW and IE3 for 7.5kW+ (IE2 if the pump will be run with an inverter)
- Thermal Class: Insulation: Thermal Class F (155°C);
  Temperature rise: Thermal Class B (80°C).
- Vibration Level: N (normal).
- Bearings: C3, ball bearings, suitable to +110°C.
- Lubrication: Bearing grease will not be FDA-approved. Bearings will typically be sealed for life.
- Cooling Method: IC 411 (self-ventilated)
  = TEFV/TEFC (Totally-Enclosed Fan Ventilated/Cooled).
- Shaft Length: Standard†
- Poles: Motors fitted to centrifugal pumps will typically have 2 poles (nominally 2900 rpm). 4-pole (nominally 1450 rpm) and 6-pole motors can also be used on the centrifugal pumps. Motors fitted to liquid ring pumps will always have 4 poles.

*Even if compliance with ASME BPE is requested.
†Motors are purchased with standard shafts, which for some H, CH, D and GP pumps are then modified to suit the pump.

Motors will *not* be fitted with thermistors as standard, but these can be supplied for an extra charge.

Unless you explicitly request a particular motor manufacturer, MDM Pumps Ltd will select whatever manufacturer we believe to be suitable. Our standard offering is typically AEG-Lafert.

Quotations for pump kits (bare-shaft pumps) do not necessarily include the motor adaptor plate. Please enquire if this is not explicitly stated in the quotation.

Lifting points

Pumps will not have lifting lugs. For lifting instructions see page B1 of instruction manual.

9. Documents, nameplates and testing

Documents

Documents supplied as standard

1) MDM data sheet (to be sent with the order acknowledgement). 1 off per data sheet

2) Generic A5-sized instruction manual (tied to pump). 1 off per pump

Section A:	General
Section B:	Transport & Storage
Section C:	Description of Pump
Section D:	Installation & Assembly
Section E:	Operation
Section F:	Maintenance & Servicing
Section G:	Faults – causes & remedies
Section H:	EC declaration of conformity*

3) MDM data sheet (included with the instruction manual). 1 off per pump

4) Parts list (included with the instruction manual). 1 off per pump

Notes:

- All documents, test results and nameplates listed above are included in the quoted price.
- Documents (2), (3) and (4) listed above will be shipped with the pump.
- Documentation will be in the English language only.†
- Documents will be supplied printed and unbound. Electronic documents are not supplied as standard but can be supplied for an extra charge.
- Customisation of documents (eg the addition of title blocks or blank areas) will incur an extra charge.

*Pump kits (bare-shaft pumps) are classified as components, rather than complete equipment, and therefore will be supplied with an EC declaration of incorporation.
†In order for a pump to be CE-marked, documentation must be written in the language of the destination country. If translation is required this will incur an extra charge.

Nameplates

Each pump will be fitted with a standard MDM nameplate, which will show the MDM logo, pump model (includes motor power), pump serial number, year of manufacture, nett weight and CE mark.

Customised nameplates are not included in the quoted price.

Testing

All complete pumps will be hydrostatically and performance tested and will be CE-marked.

Pump kits will be hydrostatically tested, but will not be performance tested as standard. Performance testing can be carried out for an extra charge.

10. Standards

Our quality system conforms to *ISO 9001:2008*. All pumps comply with the relevant essential health and safety requirements of the EU Machinery Directive 2006/42/*EC*.

See ‘Pump Standards’ document.