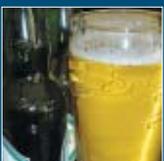


# F O R P U R I T Y O F P R O D U C T

Manufacturers of Stainless Steel Centrifugal Pumps, Liquid Ring Pumps, Vent Valves and Strainers for Hygienic Applications



BREWING



SOFT DRINKS



DAIRY



FOOD



PHARMACEUTICALS



# STAINLESS STEEL CENTRIFUGAL PUMPS FOR HYGIENIC APPLICATIONS

# THE NEW GENERATION - H AND CH RANGE

**Flows up to 360m<sup>3</sup>/hr, pressures up to 160m head (15bar),  
powers up to 75kW**

For ultimate purity of product, MDM PUMPS LTD recommends the new generation 'H' and 'CH' range, complementing the highly successful 'D' range and the general purpose 'GP' range. These tailor-made pumps are built to last.

### There are two types of pump:

For delivery pumps (where the pump is flooded with liquid), specify the Flooded Suction Pump.

For emptying product from road tankers, or for scavenging of vessels and pipelines in a CIP (Cleaning In Place) system, specify the 'AS' (Air Separator) pump. This pump has been designed to handle a mixture of air and liquid.



Flooded Suction Pump cowled

### Setting the standard for Hygienic Pumps

- CE marked.
- Standard motors and seals.
- Easy change pump stub shaft and seals.
- Simple to maintain and reassemble.
- Low noise.
- Low NPSH.
- High efficiency.
- Competitively priced spares.
- Every pump is hydraulically and performance tested.

### Hygienic design

- 316L stainless steel - low ferrite available.
- Smooth surfaces with minimum 3mm radii.
- No castings (no porosity), no pressings, no crevices.
- No rubbing metal parts.
- Excellent surface finishes better than 0.5µm Ra available.

### Additional benefits of the CH range

EHEDG in-place cleanability assessed, and therefore:

- Meets the new European standards in hygiene and minimises liability.
- Cleanable in place, ensuring product is microbiologically safe.
- Shortens the cleaning time, extends the production time and minimises the cleaning costs.
- Minimises cleaning chemicals.



Founded in 1922 to supply hygienic equipment to the food and drink industries, **MDM PUMPS LTD** has been designing, manufacturing and marketing their range of Centrifugal Pumps, Liquid Ring Pumps, Vent Valves and Strainers since 1952.

**MDM PUMPS LTD** manufactures in Britain and is registered to BS EN ISO 9001.

## THE RANGE

### 'H'

The Hygienic Range, which is a new generation of high quality stainless steel pumps utilising advanced design concepts.

### 'CH'

The Cleanability assessed Hygienic range, which is the ultimate in hygiene. The range is fitted with a John Crane 515H metal bellows seal and has been independently assessed to the EHEDG (European Hygienic Equipment Design Group) in-place cleanability protocol.

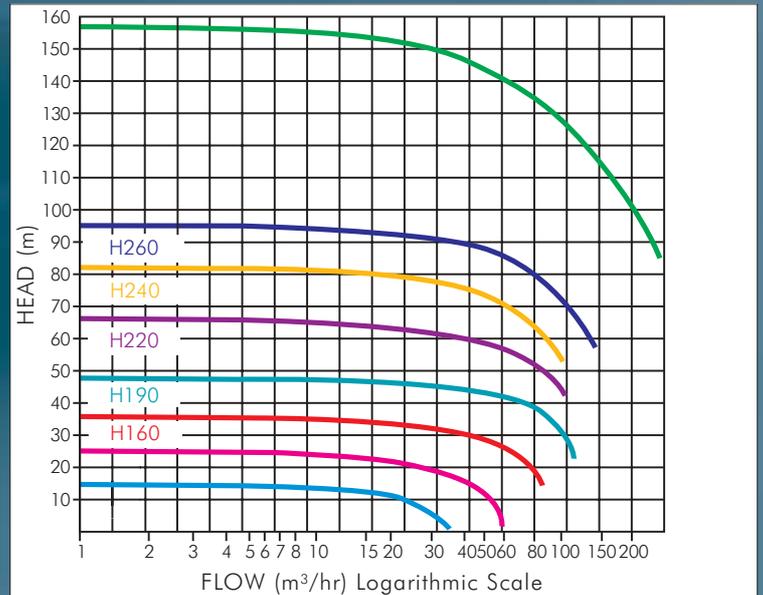
### 'D'

The standard range of hygienic pumps, which have an excellent track record.

### 'GP'

The General Purpose range, which offers hygiene at good value and with a simple design.

## FLOODED SUCTION PUMPS



Model	H160	H190	H220	H240	H260
Max impeller diameter (mm)	162	188	216	240	260
Typical inlet/eye sizes (mm)	40-80	40-100	40-100	40-100	40-125
Typical powers (kW)	1.5-11	2.2-15	3-18.5	5.5-22	11-37



Flooded Suction Pump on free standing base



Flooded Suction Pump standard



Pump components

## BREWING

Beer  
Wort  
Spirits  
Vinegar  
Cider  
Wine  
CIP

## SOFT DRINKS

Spring water  
Fruit juice  
Carbonated beverage  
Syrup  
Cordial  
CIP

## DAIRY

Raw milk  
Skimmed milk  
Evaporated milk  
Whey  
CIP

## FOOD

Soup  
Ketchup  
Sauce  
Syrup  
Mayonnaise  
Vegetable oil  
CIP

## PHARMACEUTICALS

Purified water  
Water for injection  
Pyrogen-free water  
Demineralised/deionised water  
Liquid antibiotic  
CIP

# 'AS' AIR SEPARATOR CENTRIFUGAL PUMPS

# SCAVENGING IN A CIP (CLEANING IN PLACE) SYSTEM



'AS' Pump on free standing base



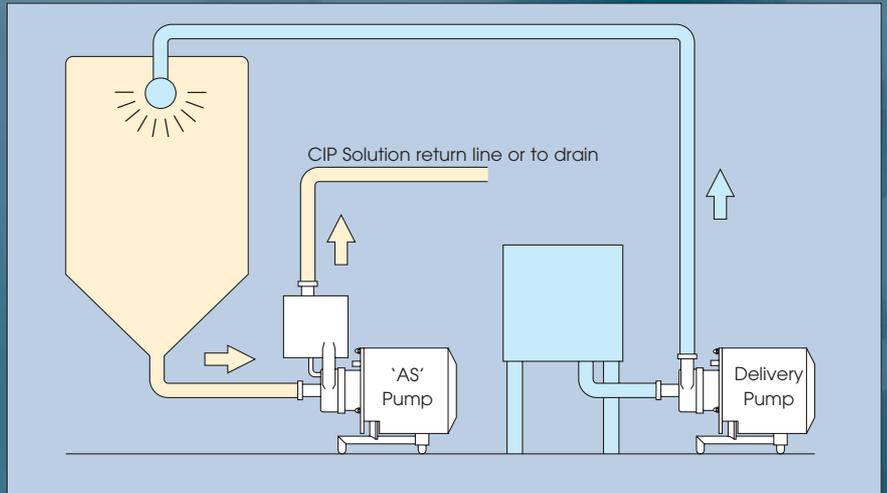
'AS' Pump standard

**Flows up to 200m<sup>3</sup>/hr, pressures up to 15bar, powers up to 75kW, viscosities up to 200cP**

The 'AS' range of stainless steel pumps is designed to:

- 1) Scavenge vessels and pipelines in a CIP (Cleaning In Place) system.
- 2) Unload liquids from road tankers.

The pumps are similar to the flooded suction centrifugal pumps, but are fitted with integral air separation chambers. They have all the advantages of centrifugal pumps, with the added capability of efficiently pumping mixtures of air and liquid.



The 'AS' pump is widely used in CIP systems to scavenge vessels and pipelines.

## ADVANTAGES

### Low cost and long life

A simple design, consisting of a rotating impeller driven directly by a motor. Pressure relief valves, non-return valves and gearboxes are not required.

### Trouble free and low maintenance costs

There are no close running components and the only wearing part is the mechanical seal. Hence minimal servicing is needed, the performance does not deteriorate with use and soft solids will not damage the pump.

### Fast and thorough

The 'AS' pump quickly starts pumping and empties the vessel or tanker, unlike a conventional flooded suction centrifugal pump which often air locks both when initially priming and as the liquid falls to the bottom of the vessel or tanker.

### Hygienic and easy to clean

There are no dead areas in the pump where bacteria can lodge and multiply, and no wearing metal components.

## BREWING

Beer tanker unloading  
CIP

## SOFT DRINKS

Tanker unloading  
CIP

## DAIRY

Milk tanker unloading  
CIP

## FOOD

Product unloading  
CIP

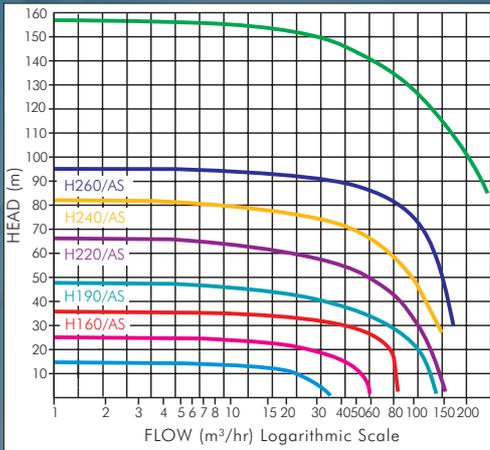
## PHARMACEUTICALS

CIP

## PRINCIPLES OF OPERATION

## TANKER UNLOADING

## INSTALLATION CONSIDERATIONS



To pump a mixture of air and liquid without air locking, the pump has an integral air separation chamber. This is connected to the impeller casing by two pipes. The liquid carrying entrained air flows up the discharge pipe into the chamber and is expelled through the outlet. To keep the pump primed, sufficient liquid is returned into the impeller casing by the recirculation pipe.



Principles of operation

### ADVANTAGES

See the advantages described on the left plus:

#### Gentle to the product

Independent tests on milk demonstrate that the pump causes minimal shear and stress to the liquid, thereby ensuring a top quality product. "... the MDM pump has not caused an increase in Free Fatty Acids."

#### High pressures available

The pump can fill the tallest silos.

#### Minimal loss of liquid

The tanker is emptied minimising the loss of liquid when disconnecting the tanker hose.

#### Hygienic

The pump is cleanable in place, ensuring the product is microbiologically safe.

#### Cost effective

A separate air eliminating vessel is not required.

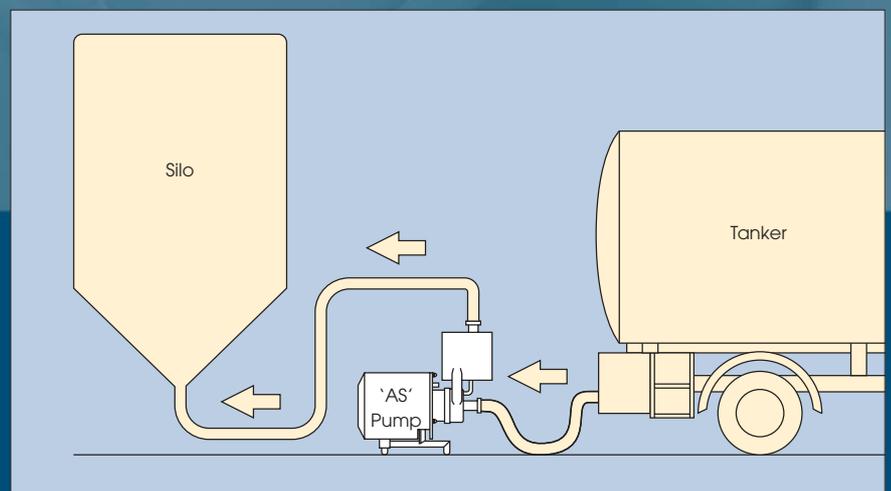
- The pump should be installed with the air separator mounted vertically.
- The suction line should be as short as possible.
- The level of the liquid must be above the centre line of the pump inlet.
- A non-return valve should NOT be fitted in the outlet pipeline as it prevents air from escaping and the pump from priming. Where one is fitted the pipeline should be vented with a vent valve. Alternatively the return valve could be replaced with an automatic valve set to open when the pump starts.

#### For CIP scavenging applications:

- For the best cleaning of vessels, the scavenge pump should pump a little faster than the delivery pump. This ensures that the liquid level doesn't rise in the tank.

#### For tanker unloading:

- To avoid foaming and damage to the liquid, the pump should only be run whilst unloading.
- Experience has shown that flow velocities through the suction pipe should be limited to about 2.5m/s to avoid deterioration of the liquid.



The 'AS' pump has proved to be ideally suited as a tanker unloading pump, and is used extensively in creameries and breweries.

# OPTIONS – THE PUMPS ARE DESIGNED AND MANUFACTURED BY US TO YOUR INDIVIDUAL REQUIREMENTS

## Pump type

### ● Flooded suction

For delivery pumps, where the pump is flooded with liquid, specify the Flooded Suction range of Pumps.

### ● 'AS' (Air Separator)

For CIP scavenging applications and tanker unloading specify the 'AS' range of pumps. These pumps are similar to the flooded suction centrifugal pumps, but are fitted with integral air separation chambers. They have all the advantages of centrifugal pumps, with the added capability of efficiently pumping mixtures of air and liquid.

### ● Self-priming

For pumps where the liquid level is below the inlet of the pump, a liquid reservoir can be supplied to make the 'AS' pump self-priming.



## Free standing base

- Raises pump and electric motor clear of liquid on floor.
- Easier to install as no fixing down or special base is needed.
- Adjustable leg(s) simplifies lining up of pipe connections.
- With no bolts to disconnect, maintenance time is reduced.



## Cowls

- Available for motors up to 75kW.
- Same advantages of the free standing base plus:
- Extra motor safeguard and protection.
- Easier to keep clean, and therefore improved hygiene.
- Maintains an attractive, functional appearance.



## Uniform finish, Pure finish or Electropolished finish

The choice depends on the pumping application. CIP (Cleaning In Place) pumps are typically Uniform finish (less than 3.6µm Ra), whilst the more hygienic Pure finish (less than 0.8µm Ra) pumps are used for pumping product. The Electropolished finish (less than 0.5µmRa) is typically used for purified water applications.

## Materials Certification

Mill test certificates for wetted metal parts and certificates of conformity to FDA can be provided if required.

Full traceability to BS EN 10204 3.1b is available on request.

## Standards

If required the pump can comply with specific standards such as:

- The EU ATEX directive.
- The bioprocessing equipment standard: ASME BPE.
- The American sanitary standards: 3-A.

## Acoustic cowls

Designed to reduce noise levels. These either cover the motor or the complete unit.

## Trolley mounted

- Manufactured from stainless steel to give long life and resistance to corrosion.
- Suitable for standard and cowed pumps.

## Fittings

Your pump can be fitted with different types of inlet/outlet connections (eg RJT, IDF, ISS, DIN, BSP, Flange, Triclamp, ILC, SMS) and other items, eg drain, drain valve, air vent, water jacket.

## Prime movers

- Can either be electric, petrol or diesel. Electric motors can be supplied to different specifications, eg different voltages, 50Hz or 60Hz, two speed, variable speed, 3 phase or single phase, 2 or 4 pole, flameproof, tropicalised, energy efficient.
- Can be speed controlled by using an inverter to give variable duties or for constant pressure or flow.

## EUROPEAN HYGIENIC EQUIPMENT DESIGN GROUP

The EHEDG is an independent consortium formed in 1989 to develop guidelines and test methods for the safe and hygienic processing of food. The group includes representatives from research institutes, the food industry, equipment manufacturers and government organisations in Europe. They have developed a standard test procedure for assessing cleanability based on comparing the cleanability of a test item with that of a straight length of pipe with a surface roughness of 0.5µm Ra.



# SEAL ARRANGEMENTS

## Seal materials

Typical face / seat materials are carbon, silicon carbide, ceramic, tungsten carbide, PTFE.

The seal materials depend on the liquid to be pumped. The majority of applications use EP (Ethylene Propylene) rubber parts, a carbon face and a silicon carbide seat. Some customers (especially pharmaceutical companies) specify that all the materials in contact with the liquid must be FDA (Food and Drug Administration) approved.

## Seal Arrangements

(eg single, low pressure flush, high pressure flush, double, external.)

### ● Single Internal Seal

This is used in the majority of cases. Refer to diagram H Pump Single Internal Seal.

### ● Low Pressure Flush (LPF)

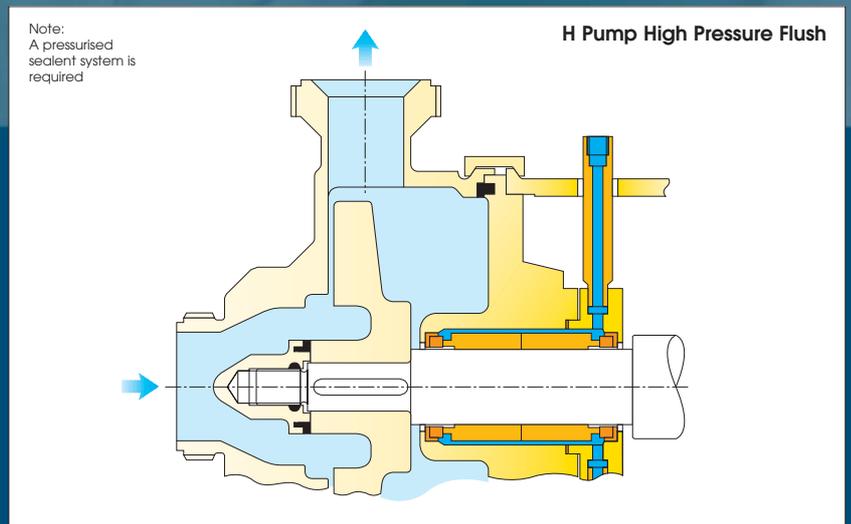
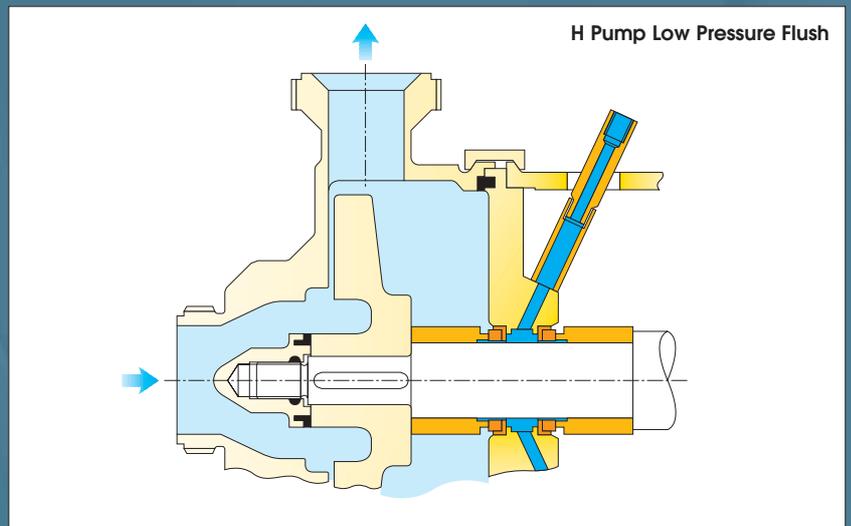
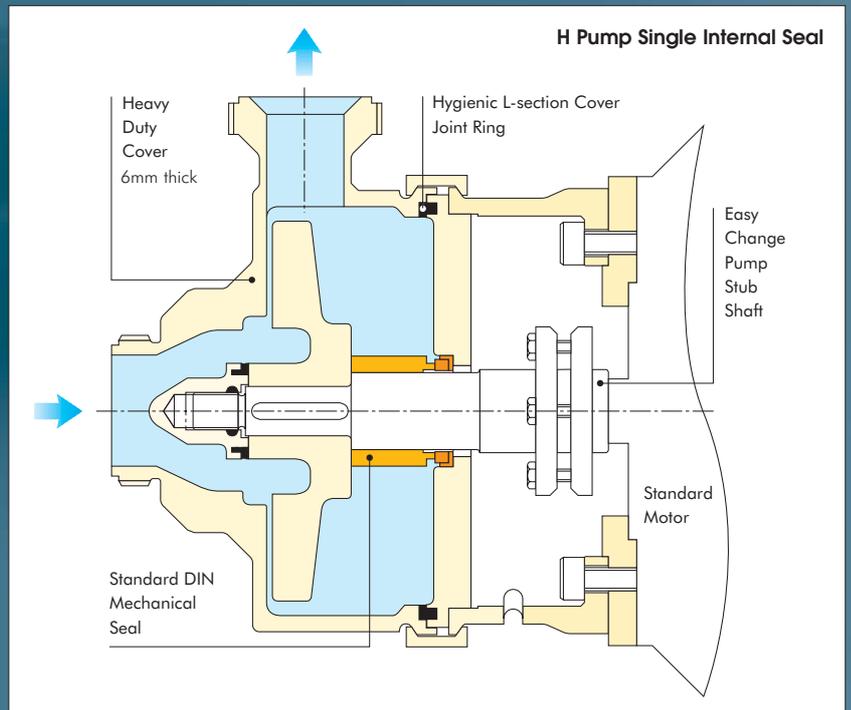
This is used in applications in which either the pump runs dry, the liquid is liable to crystallise (eg syrups), the product is sticky, or a barrier is required to prevent the product picking up oxygen from the atmosphere. Refer to diagram H Pump Low Pressure Flush.

### ● High Pressure Flush (HPF)

This is used in applications with potentially hazardous liquids (toxic, corrosive or oxidising, eg some acids) or with abrasive liquids. Refer to diagram H Pump High Pressure Flush.

### ● External Seal

This is rarely used as it is generally for applications involving highly corrosive liquids.



## STAINLESS STEEL LIQUID RING SELF-PRIMING PUMPS



'CR' Liquid Ring Self-priming Pump

A competitively priced pump specifically designed to handle a wide range of liquids including liquids with air bubbles and foam. It is ideally suited for scavenging applications.

### 'CR' Pump

- hygienic self-priming pump.
- 316L (1.4404) stainless steel.
- robust design - casings 6mm thick.
- extensive range of models.
- choice of motors and seals.
- quick to dis-assemble and easy to service.

## STAINLESS STEEL VENT VALVES FOR HYGIENIC APPLICATIONS



'AE' Vent Valve

The vent valve is used to vent air from an enclosed pipe or vessel. Manufactured from stainless steel and polished internally and externally, the vent valve has been designed to be easy to dismantle for cleaning and sterilising. It is available in two versions:

### 'AE' (Air Escape)

Allows air to escape, but not to re-enter. Typically used on pipework for scavenging applications.

### 'AP' (Air Pass)

Allows air to escape and to re-enter. Typically used for tank venting or syphon breaking.

## STAINLESS STEEL STRAINERS FOR HYGIENIC APPLICATIONS



K2-20 right-angle Strainer

These Strainers are ideal for applications where ease of cartridge removal and a robust construction are required. They are designed to:

- Prevent foreign bodies damaging or blocking process equipment, eg flow meters, valves and pumps.
- Remove undesirable material, eg pips, fruit skins, wasps and gaskets.
- Control the maximum size of solids and undissolved ingredients.

The strainers are available in various sizes and for either a right-angle or in-line flow. They can be supplied with standard interchangeable filtering cartridges from 3mm to 0.07mm aperture, or with 2mm or 3mm diameter holes.

ISS 4, 8/04



### MDM PUMPS LTD

Spring Lane, Malvern, Worcestershire  
England  
WR14 1BP

Tel: +44 (0) 1684 892678  
Fax: +44 (0) 1684 892841

E-mail: info@mdmpumps.co.uk  
Web Site: www.mdmpumps.co.uk

Manufacturers of Stainless Steel  
Centrifugal Pumps, Liquid Ring  
Pumps, Vent Valves and Strainers  
for Hygienic Applications



FM20542  
BS EN ISO 9001