

## Magnetic drive pumps MDH series



### Patent

JAPAN / U.S.A. / EU / TAIWAN / KOREA



Caution for safety use: Before use of pump, read instruction manual carefully to use the product correctly. Actual pumps may differ from the photos. Specifications and dimensions are subject to change without prior notice. For further details please contact us.



# The patented pin point contact system gives dry running capabilities to the pump.

Iwaki's pump technology has produced an innovative magnetic drive pump which incorporates an extremely high resistance to dry running. By employing the newly developed pin point contact system, dry running which was unavailable with previous models is now a feature on the new magnetic drive pump series.

The MDH/-F series, with its increased durability and reliability, will further demonstrate its usefulness and convenience as corrosion resistant pumps for the middle flow ranges.

## **Dry running is possible with a pin point contact system**

Up to one hour of continuous dry running is possible due to the pin point contact system which minimizes the heat generated by bearing surfaces during dry running.

Note: Dry running is possible with carbon bearing type (D type) only.

## **Excellent corrosion resistance**

The casings, impeller assembly and magnet capsule of MDH pump are made of polypropylene and those of MDH-F are made of fluororesin.

Other wet-end parts are made of highly corrosion resistant materials such as carbon, ceramics and the like. The pumps can handle most types of chemicals including acids and alkalis.

## **Excellent durability**

The resin parts for MDH are reinforced with glass fiber and MDH-F is reinforced with carbon fiber for the purpose of enhancing durability. In addition, sufficient consideration was given to the mechanical strength and the safety of the spindle.

## **Simple structure**

The pump unit's simple structure consists of only a few parts. The assembly and disassembly procedures for maintenance purposes are very easy and simple.



MDH-F401

MDH-400

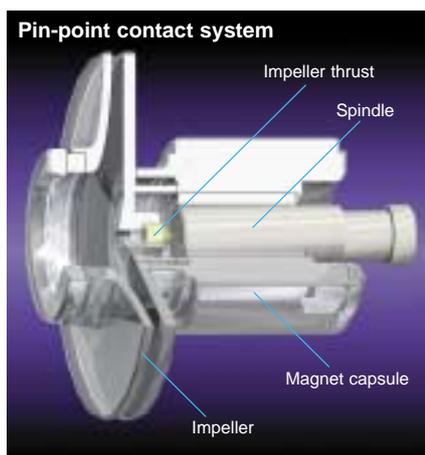


**Pin-point contact system**

In a no-thrust condition due to dry run, only the impeller thrust surface and spindle fore edge come in contact. The magnet capsule never touches the rear casing. This "pin point" contact between impeller and spindle thrust surfaces significantly minimizes friction, and therefore heat generation.



Actual pumps may differ from the photos.



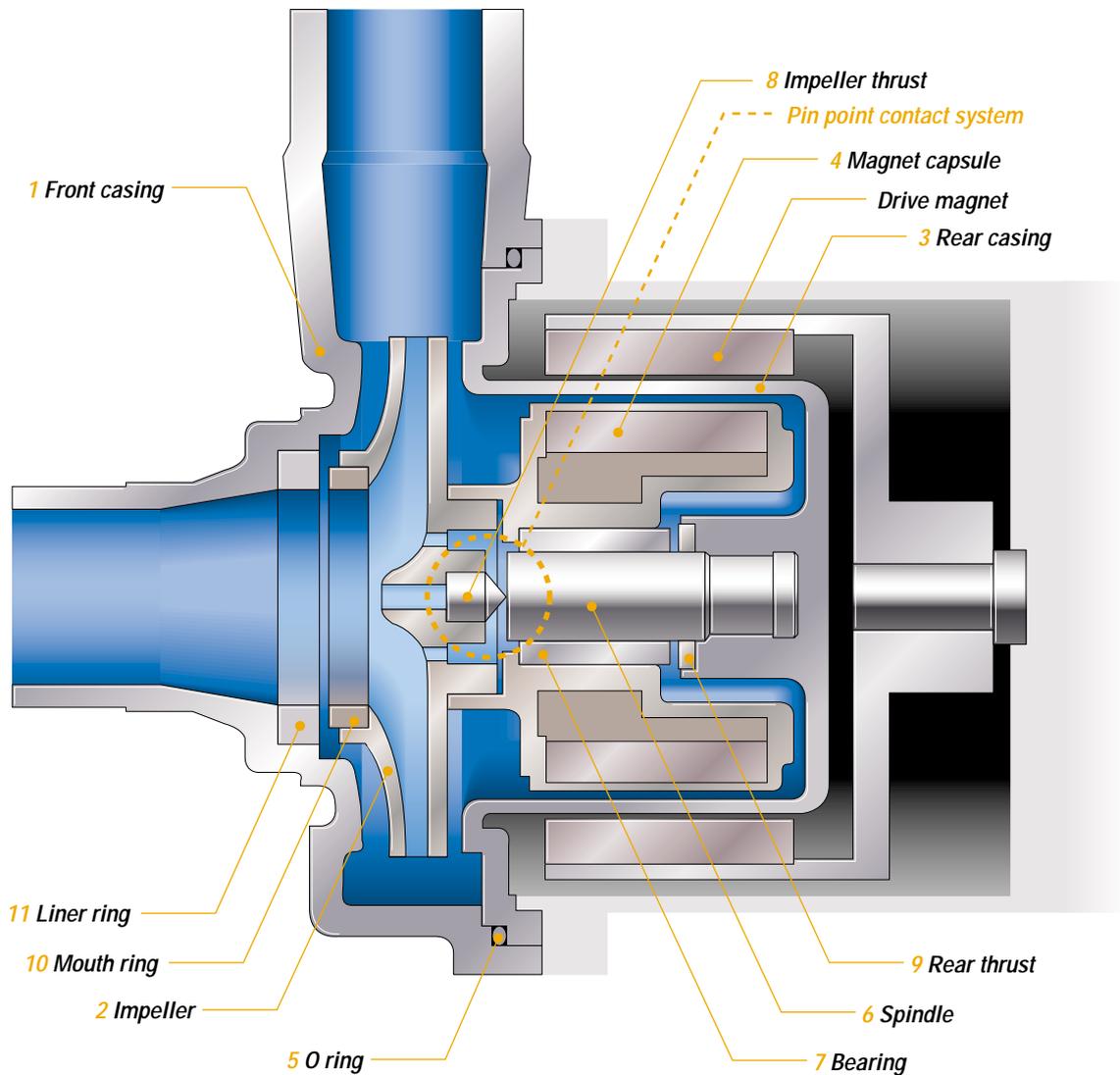
Patents  
Japan/Taiwan/U.S.A./Europe/Korea



MDH-425

MDH-F422

## Construction and materials



### Wet-end materials

| Name of part      | Model  | MDH-400, 401, 422, 423, 425 |      |                             | MDH-F400, 401, 422, 423     |                             |
|-------------------|--------|-----------------------------|------|-----------------------------|-----------------------------|-----------------------------|
|                   |        | CV-D                        | RV-E | FE-D                        | CFV-D                       | AAV-E                       |
| 1 Front casing    |        | GFRPP                       |      |                             | CFRETFE                     |                             |
| 2 Impeller        |        | GFRPP                       |      |                             | CFRETFE                     |                             |
| 3 Rear casing     |        | GFRPP                       |      |                             | CFRETFE                     |                             |
| 4 Magnet capsule  |        | PP                          |      |                             | CFRETFE                     |                             |
| 5 O ring          | Note 1 | FKM                         |      | EPDM                        | FKM                         |                             |
| 6 Spindle         |        | Alumina ceramic             |      | High purity alumina ceramic |                             | High purity alumina ceramic |
| 7 Bearing         |        | Carbon                      | PTFE | Carbon                      | High density carbon         | High purity alumina ceramic |
| 8 Impeller thrust |        | Alumina ceramic             |      | Carbon                      | High purity alumina ceramic |                             |
| 9 Rear thrust     |        | High purity alumina ceramic |      |                             |                             |                             |
| 10 Mouth ring     |        | PTFE                        |      |                             | PTFE                        |                             |
| 11 Liner ring     |        | Alumina ceramic             |      | High purity alumina ceramic |                             | Alumina ceramic             |

Note 1. AFLAS® and EPDM O ring can be included upon request. For more details, inquire at your nearest Iwaki representative or dealer.

Note 2. The material for MDH-F400,401AA is alumina ceramic.

### Impeller thrust

When dry running happens, the impeller thrust and the spindle front face come into contact.



Alumina ceramic High-purity Alumina ceramic

### Spindle

The spindle is integrally molded with the rear casing to form a cantilever structure. Without any supporting boss in the suction port, the operational efficiency of the pump is increased and the NPSHr is reduced.



High-purity Alumina ceramic Alumina ceramic

### Bearing

The bearing is a one-piece and press-fit type.



PTFE Carbon High-purity Alumina ceramic

### Magnet capsule

High-power magnets are totally encased in the resin to provide sufficient corrosion resistance and torque.



For MDH For MDH-F

### Impeller

The impeller is a closed type designed for maximum efficiency. Three different impeller sizes are designed as standard for MDH-F, which adds greater latitude in handling liquids of high specific gravity.



For MDH For MDH-F

## Pump identification

**MDH-F 422 CFV T - C D**

**Pump size (Suction side X Discharge side) / Motor output**  
**400:** 40(G1 1/2) X 40(G1 1/2) / 0.4kW  
**401:** 40(G1 1/2) X 40(G1 1/2) / 0.75kW  
**422:** 50(G2) X 40(G1 1/2) / 1.5kW  
**423:** 50(G2) X 40(G1 1/2) / 2.2kW  
**425:** 50(G2) X 40(G1 1/2) / 3.7kW

**Series symbol**  
**MDH:** Casing material-GFRPP  
**MDH-F:** Casing material-CFRETFE

**Material of parts**  
**MDH:** (Bearing/Spindle/O ring)  
**CV:** Carbon/Alumina ceramic/FKM  
**RV:** PTFE/Alumina ceramic/FKM  
**FE:** Carbon/High purity alumina ceramic/EPDM  
**MDH-F:** (Bearing/Spindle/O ring)  
**CFV:** High-density carbon/High-purity alumina ceramic/FKM  
**AAV:** Alumina ceramic/Alumina ceramic/FKM (For 400 and 401 types)  
: High-purity alumina ceramic/High-purity alumina ceramic/FKM (For 422 and 423 types)

**Impeller symbol**  
**MDH**  
**5:** 50Hz, **6:** 60Hz  
**MDH-F**  
**T, V, W:** For 50Hz  
**X, Y, Z:** For 60Hz

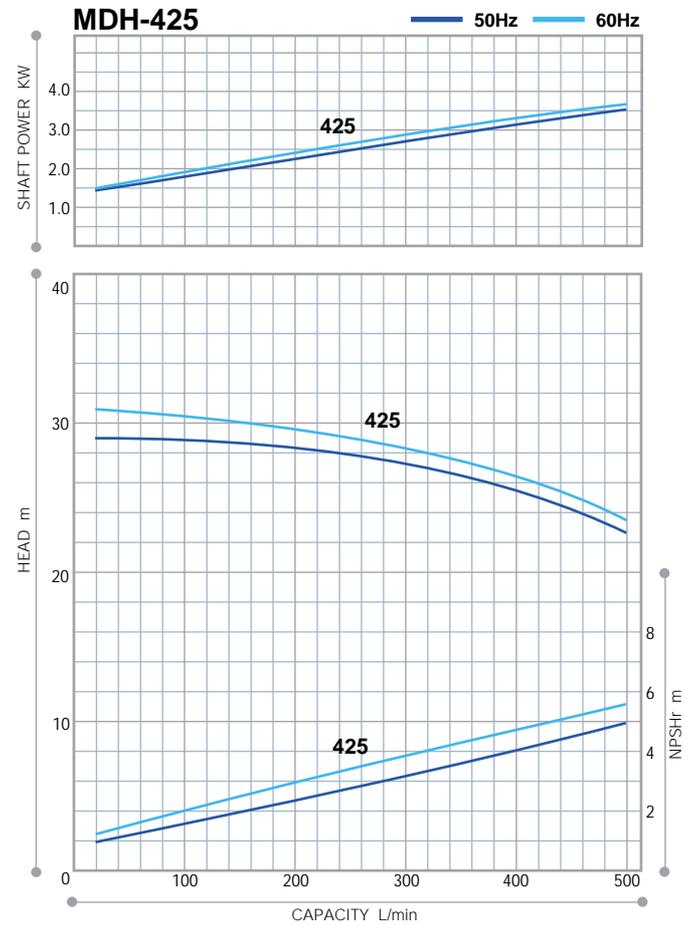
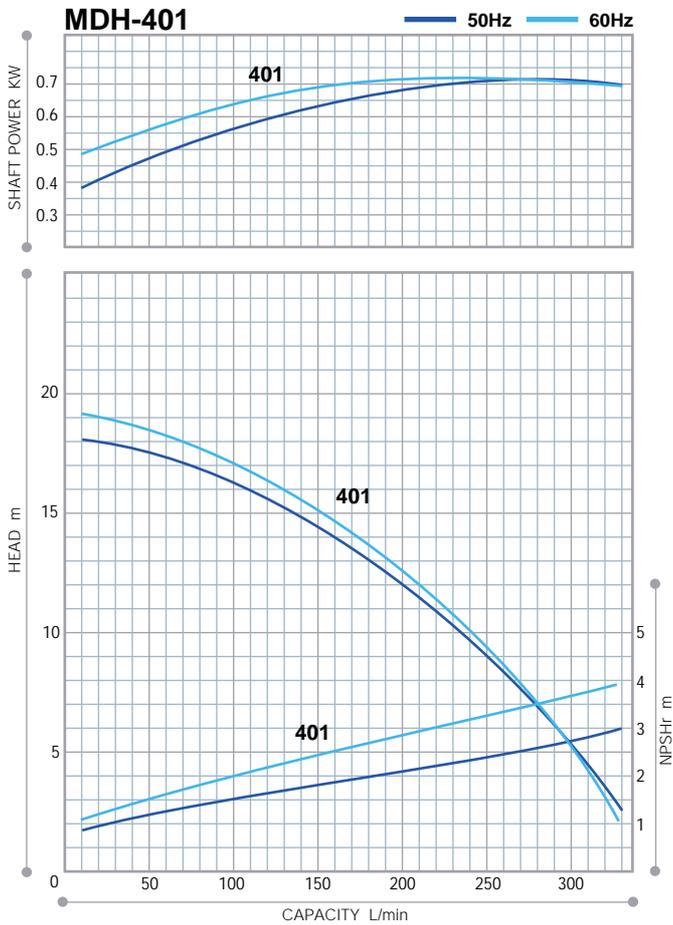
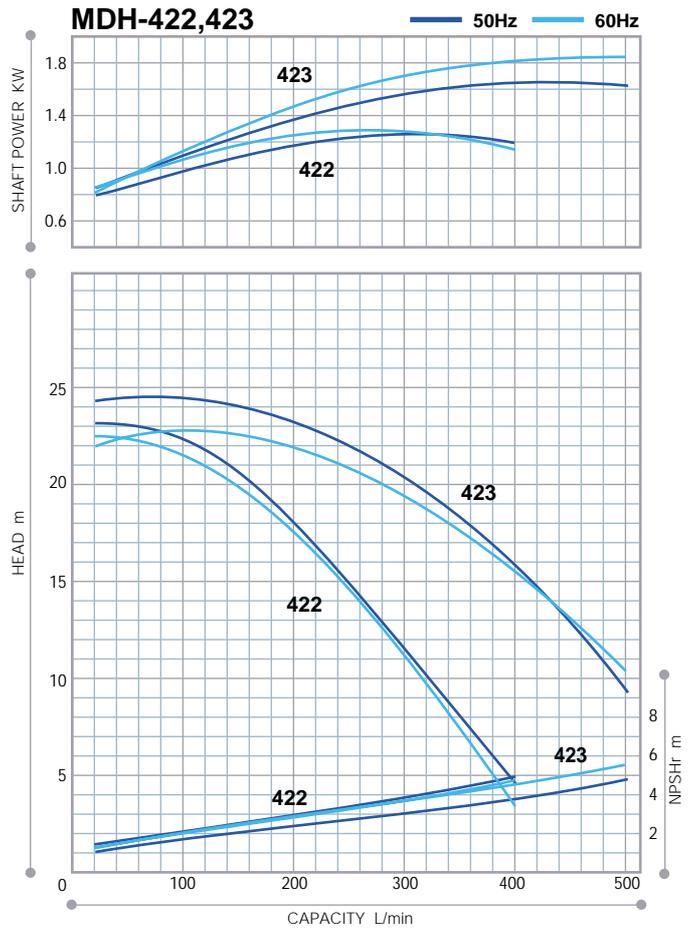
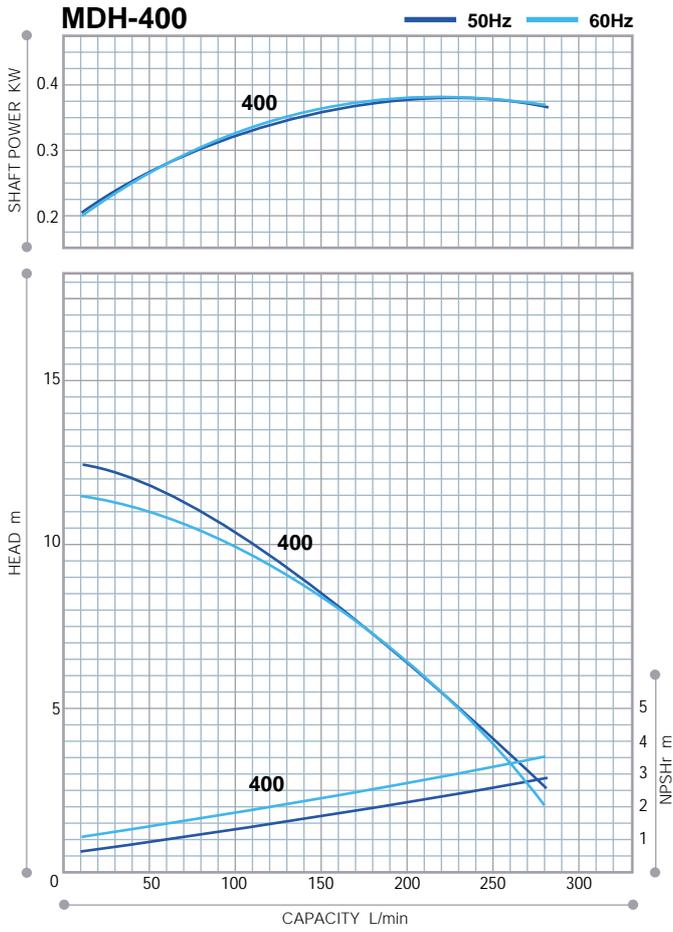
**Pin point contact system**  
**D:** Dry running operation for one hour is permissible. (MDH: CV type only, MDH-F: CFV type only)  
**E:** Dry run is not possible.  
**Type of motor**  
No symbol: TEFC, indoor type  
**C:** TEFC, outdoor type  
**A:** Increased safety type (422 and 423 types do not have increased safety types)

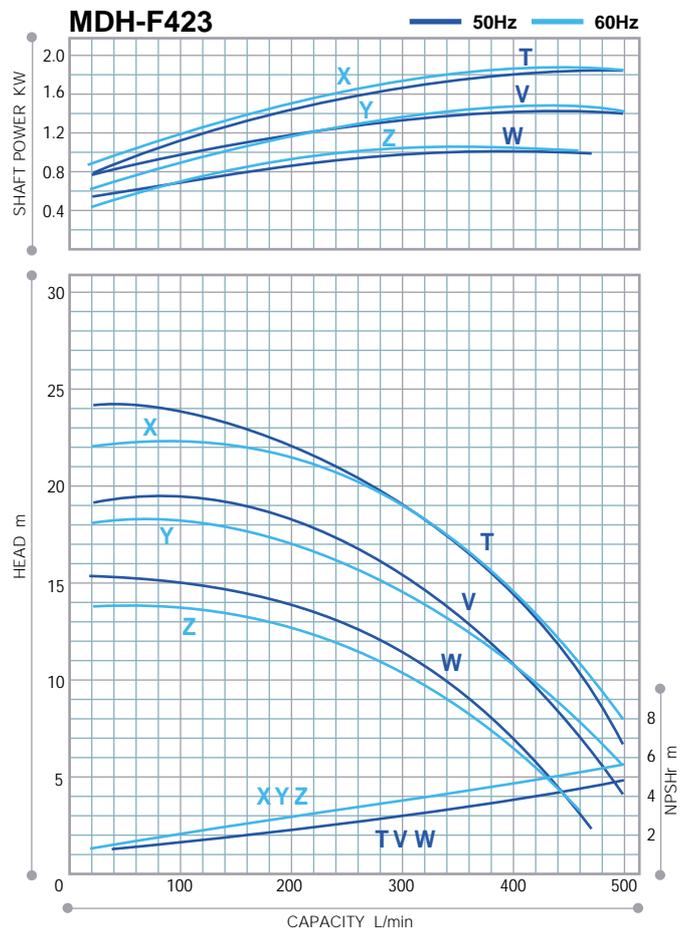
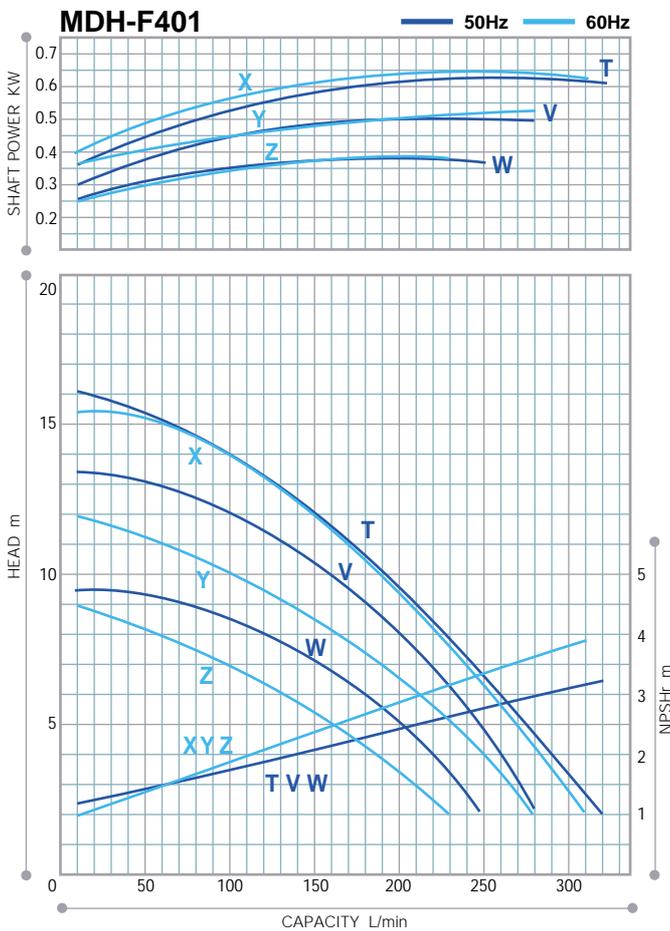
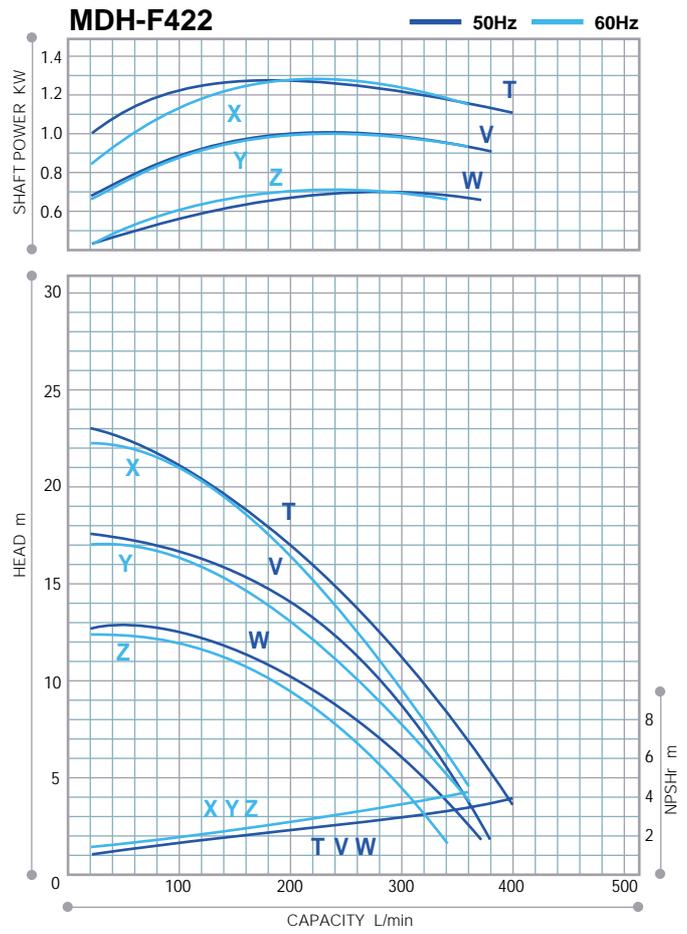
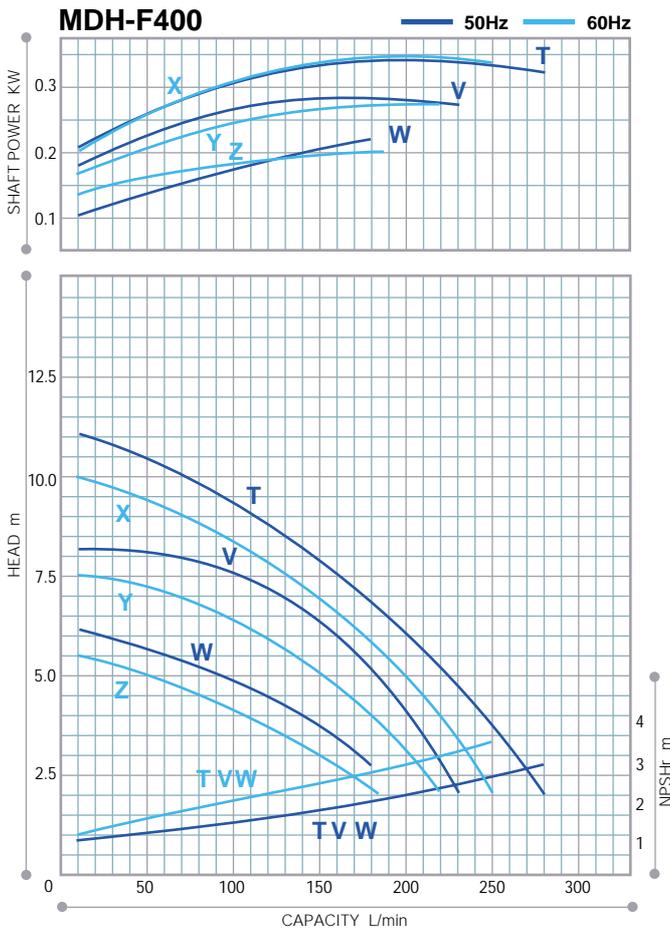
## Specifications

| Model           | Nominal bore size<br>Suction X Discharge | Impeller size | Specific gravity limit | Min. capacity - Max. Head<br>L/min - m |           | Standard capacity<br>L/min - m |            | Max. capacity<br>L/min |      | Motor output<br>kW |
|-----------------|--|---------------|------------------------|--|-----------|--------------------------------|------------|------------------------|------|--------------------|
|                 |  |               |                        | 50Hz                                   | 60Hz      | 50Hz                           | 60Hz       | 50Hz                   | 60Hz |                    |
| <b>MDH-400</b>  | G 1 1/2 X G 1 1/2<br>(40 X 40)           | 5             | 1.0                    | 10 - 12.5                              | 10 - 11.5 | 150 - 8.5                      | 150 - 8.5  | 280                    | 280  | 0.4 2P             |
| <b>MDH-401</b>  |  |               | 1.0                    | 10 - 18.0                              | 10 - 18.5 | 200 - 12.0                     | 200 - 12.5 | 330                    | 320  | 0.75 2P            |
| <b>MDH-422</b>  | G 2 X G 1 1/2<br>(50 X 40)               |               | 1.2                    | 20 - 23.0                              | 20 - 22.0 | 200 - 18.5                     | 200 - 18.5 | 400                    | 400  | 1.5 2P             |
| <b>MDH-423</b>  |  |               |                        | 20 - 24.0                              | 20 - 22.5 | 300 - 20.5                     | 300 - 19.0 | 500                    | 500  | 2.2 2P             |
| <b>MDH-425</b>  |  |               | 1.0                    | 50 - 29.0                              | 50 - 31.0 | 400 - 25.5                     | 400 - 26.5 | 600                    | 600  | 3.7 2P             |
| <b>MDH-F400</b> | G 1 1/2 X G 1 1/2<br>(40 X 40)           | T             | 1.2                    | 10 - 11.0                              | 10 - 10.0 | 150 - 8.0                      | 150 - 7.0  | 280                    | 250  | 0.4 2P             |
|                 |  | V             | 1.5                    | 10 - 8.1                               | 10 - 7.5  | 150 - 6.5                      | 150 - 5.0  | 230                    | 220  |                    |
|                 |  | W             | 2.0                    | 10 - 6.3                               | 10 - 5.5  | 150 - 4.0                      | 150 - 3.0  | 210                    | 185  |                    |
| <b>MDH-F401</b> | G 1 1/2 X G 1 1/2<br>(40 X 40)           | T             | 1.2                    | 10 - 16.0                              | 10 - 15.5 | 200 - 9.5                      | 200 - 9.5  | 320                    | 310  | 0.75 2P            |
|                 |  | V             | 1.5                    | 10 - 13.2                              | 10 - 12.0 | 200 - 8.0                      | 200 - 6.5  | 280                    | 280  |                    |
|                 |  | W             | 2.0                    | 10 - 9.5                               | 10 - 9.0  | 200 - 5.0                      | 200 - 3.5  | 250                    | 230  |                    |
| <b>MDH-F422</b> | G 2 X G 1 1/2<br>(50 X 40)               | T             | 1.2                    | 20 - 23.0                              | 20 - 23.0 | 200 - 17.5                     | 200 - 17.0 | 400                    | 360  | 1.5 2P             |
|                 |  | V             | 1.5                    | 20 - 18.0                              | 20 - 18.0 | 200 - 15.0                     | 200 - 13.5 | 380                    | 360  |                    |
|                 |  | W             | 2.0                    | 20 - 12.5                              | 20 - 12.5 | 200 - 10.0                     | 200 - 9.5  | 370                    | 340  |                    |
| <b>MDH-F423</b> | G 2 X G 1 1/2<br>(50 X 40)               | T             | 1.2                    | 20 - 24.0                              | 20 - 22.0 | 300 - 19.5                     | 300 - 19.0 | 500                    | 500  | 2.2 2P             |
|                 |  | V             | 1.5                    | 20 - 19.0                              | 20 - 18.0 | 300 - 15.5                     | 300 - 14.5 | 500                    | 500  |                    |
|                 |  | W             | 2.0                    | 20 - 15.0                              | 20 - 14.0 | 300 - 11.5                     | 300 - 10.5 | 470                    | 460  |                    |

• The specific gravity limit indicated above is the value at the max. shaft power level and the liquid viscosity of 1 mPa·s(1cP). • Liquid temperature range : 0 to 80°C • Slurry : Inquire of your nearest Iwaki representative or dealer. • Flange type is available on request. Nominal size(mm) is shown in ( ).

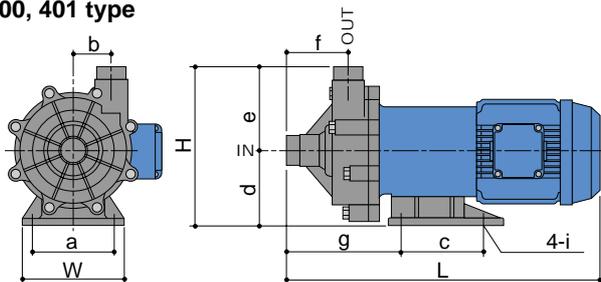
# Performance curves





## Dimensions in mm

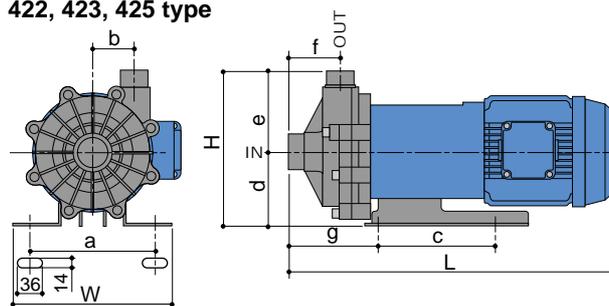
### 400, 401 type



L = The dimension with IWAKI original motor.

| Model     | W   | H   | L   | a   | b    | c   | d   | e   | f    | g   | i      |
|-----------|-----|-----|-----|-----|------|-----|-----|-----|------|-----|--------|
| MDH-F-400 | 140 | 210 | 388 | 110 | 51   | 98  | 95  | 115 | 81   | 136 | O.D.12 |
| MDH-F-401 | 160 | 248 | 482 | 130 | 57.5 | 130 | 115 | 133 | 97.5 | 178 | O.D.12 |

### 422, 423, 425 type



L = The dimension with IWAKI original motor.

| Model     | W   | H   | L   | a   | b  | c   | d   | e   | f  | g   |
|-----------|-----|-----|-----|-----|----|-----|-----|-----|----|-----|
| MDH-F-422 | 260 | 249 | 533 | 208 | 65 | 200 | 115 | 134 | 83 | 148 |
| MDH-F-423 | 260 | 249 | 533 | 208 | 65 | 200 | 115 | 134 | 83 | 148 |
| MDH-425   | 260 | 269 | 601 | 230 | 65 | 261 | 135 | 134 | 83 | 150 |

Base for MDH-425 differs from the illustration above.

## Optional accessories

### Iwaki dry running protector DR series

Model DR is electric current sensing type dry running protector. It detects the decreased load current (lower limit) to stop the pump when it runs dry or runs with air sucking in. It can detect over-load, too.

#### Specification

| Model                   | DR-10                                      | DR-20                          |
|-------------------------|--|--------------------------------|
| Motor power             | 200 to 240V                                | 380 to 440V                    |
| Applied motor           | 0.4 to 7.5kW                               | 0.75 to 15kW                   |
| Power                   | 100V ±10% shingle phase                    | 200 to 240V ±10% shingle phase |
| 45-65Hz                 | Input                                      | 3.5W                           |
| Detective current       | 0.5 to 32.0A                               |                                |
| Current transformer(CT) | Built-in                                   |                                |
| Current range           | Auto                                       | 4.4/17.6/32A                   |
|                         | Manual                                     | 2.2/4.4/8.8/11/17.6/26.4/32A   |
| Ambient                 | Temperature:0 to 40°C Humidity:RH40 to 85% |                                |
| Outer dimension         | D80 X W153 X H122                          |                                |



DR-20

- Current figure to be set is indicated on LCD.
- Both top/bottom figures can be set.  
Top: Over-load  
Bottom: Dry running, air sucking-in operation, operation with suction side closed
- Built-in current transformer
- DIN rail mounting

### Self-priming tank

A PVC self-priming tank is available as an option. Priming is not necessary once liquid is fed into the tank. Three sizes are available, based on the pump selection.



#### Specifications

| Model   | Applicable pumps       | Connection port size INXOUT | Priming height | Suction pipe length |
|---------|------------------------|-----------------------------|----------------|---------------------|
| SC-400V | MDH-F-400              | 40AX40A                     | Max. 2.5m      | Max. 3.8m           |
| SC-401V | MDH-F-401              |                             |                |                     |
| SC-412V | MDH-F422/423 & MDH-425 | 50AX50A                     |                |                     |

The self-priming height and suction pipe length differ with the piping conditions. Contact Iwaki or your dealer for details.

### MD-100R-FL type

The MD-100R-FL uses a flange connection with the small magnetic drive MD pump series. The pump design is similar to that of the MDH and MDH-F series. Since it is sealless, operation is free of leakage. The series can be used in a wide range of applications such as a system component or a stand alone unit.



- Max. capacity: 120/135L/min (50/60Hz)
- Max. Head: 8.5/11.9m (50/60Hz)
- Connection port: 25A X 25A (Suction X Discharge)
- Motor: Single phase AC100, 115, 200 or 220/240V  
Three phase AC200, 220/380 or 400/440V