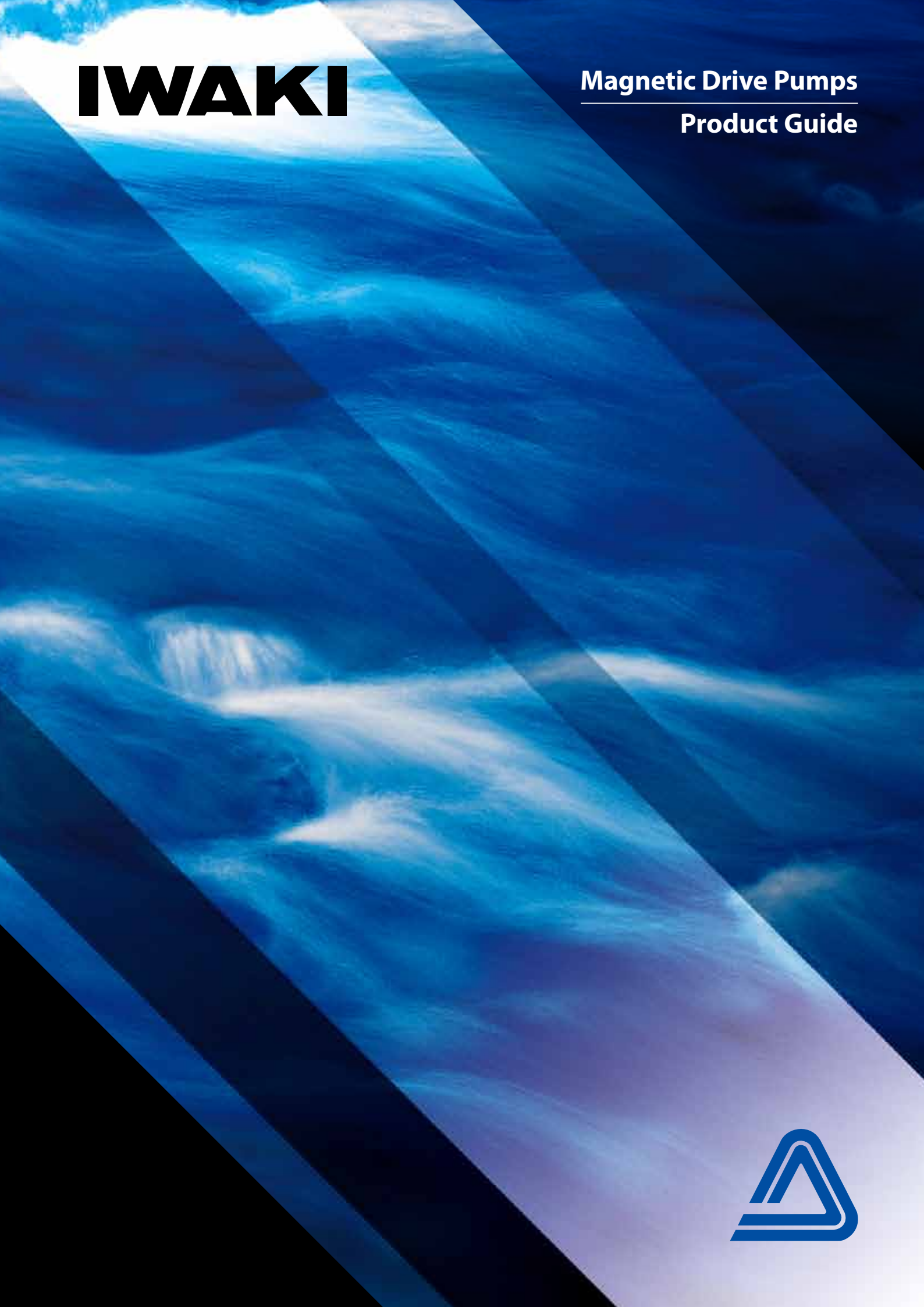
IWAKI

Magnetic Drive Pumps

Product Guide



An Overview of Iwaki's World Leading Magnetic Drive Pumps

Magnetic drive technology is fast becoming the pump choice for corrosive applications.

Iwaki offers a wide range of magnetic drive pumps from fractional horsepower

for OEM applications to large pumps for chemical processing.

No other manufacturer can offer such a wide breadth of technology.

This brochure in an overview of Iwaki's large chemical process pumps.
For information on our smaller pump technology
please contact Iwaki or visit www.iwakipumps.jp

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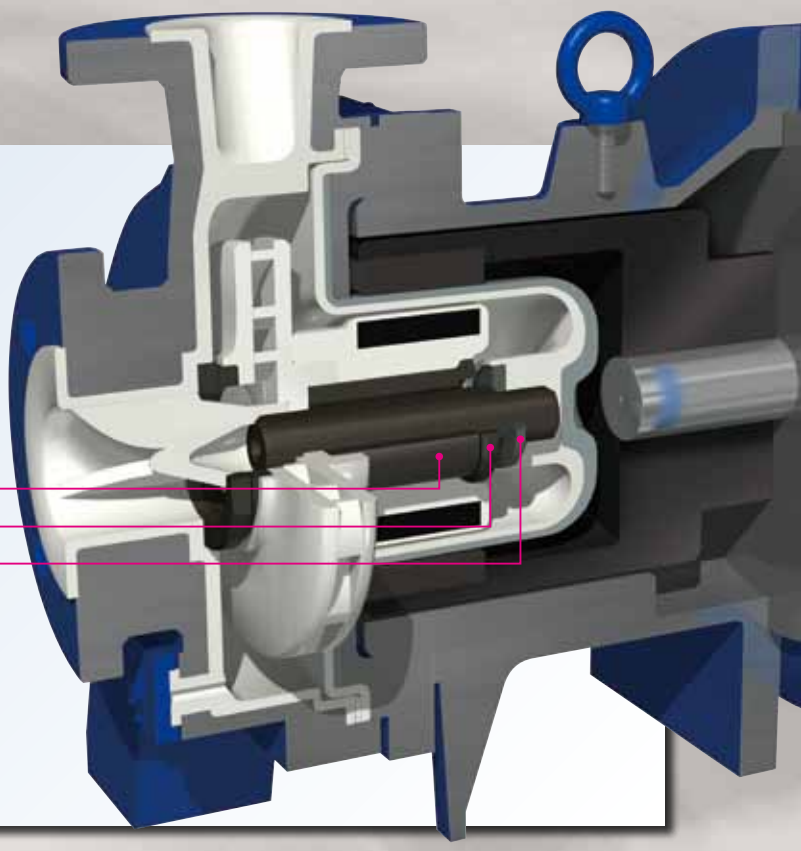
Magnetic Drive Pumps

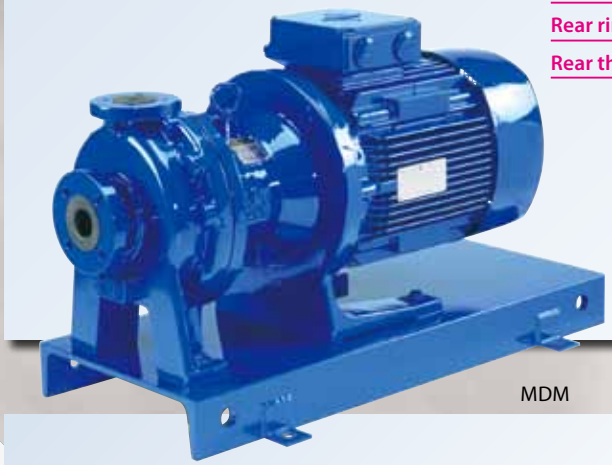
(MDM, MXM, SMX-F, MX-F)

Unique design prevents dry running
Non contact system (PAT. PEND.)

High powered rare earth magnets prevent the magnet capsule from coming in contact with the rear casing., thus preventing heat generation. This improves the dry running resistance and increases pump life in comparison to other fluororesin pumps.

MDM





MDM

ETFE and PFA available in standard models

Carbon fiber reinforced CFRETFE and PFA liners are available for varying applications. The unfilled PFA liners are ideal for high purity chemical applications.

MDM

Modular design and low maintenance cost

The pumps modular design leads to easy maintenance. There is no need to check clearances or align any liquid end parts. All wetted parts can be replaced individually reducing maintenance costs.

MDM

MXM

Highly durable structure

The ductile cast iron body of the pump provides strength and durability. The rear casing utilizes a secondary pressure containment cover made of fiber reinforced plastic. This allows for higher pressures as well as temperatures without the efficiency loss of eddy current generation. Should the drive magnet come in contact with the rear casing cover its non-metallic design will not generate sparks.

MDM MXM

SMX-F

Fast self-priming

The SMX-F requires no external self-priming chambers or valves. The gas-liquid separation design ensures fast self-priming of up 4 meters in under 90 seconds.

SMX-F

Self-radiating structure (PAT.)

Heat dispersion holes in the magnet capsule and impeller allow liquid circulation that cools the radial bearing and spindle. This design prevents melting due to excessive friction. (Except MX-F100)

Non-contact structure

Precise alignment of the drive magnet and magnet capsule creates a non-contact system that prevents friction during dry running.

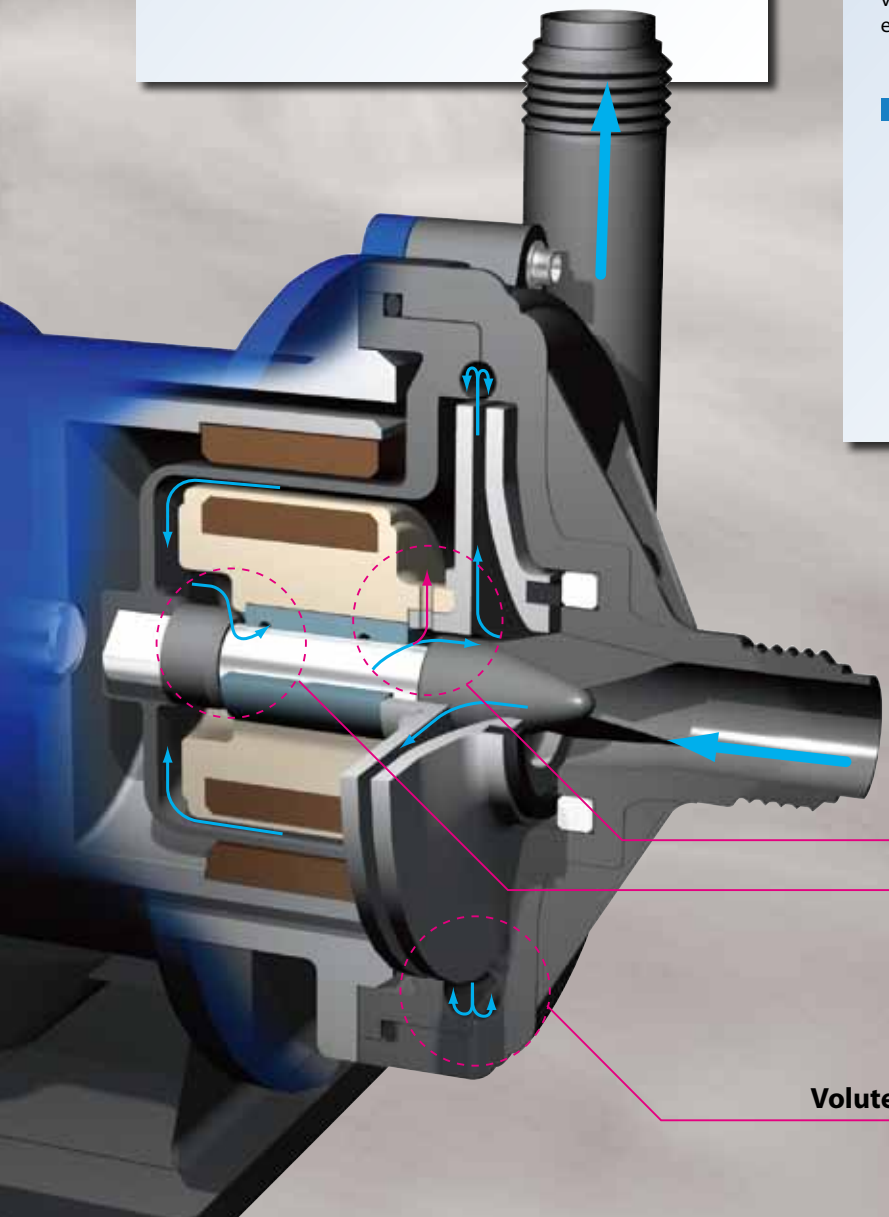
MXM SMX-F MX-F

Volute casing divided into two sections (PAT.)

The first non-metallic magnetic drive pump to incorporate a vortex chamber in the front and rear casings to increase pump efficiencies. (Except MX-F400)

MX-F

MX-F



Self-radiating structure (PAT.)

Non-contact design

Volute casing divided into two sections (PAT.)

Large Magnetic Drive Pumps

(MDW, MDM)

The world's largest fluoroplastic magnetic drive pump

The MDW series are the largest fluoroplastic magnetic drive pumps in the world, offering high efficiency and durability for chemical process applications. Using larger motors for even higher output, the MDW series opens up performance potential in previously unexplored areas.

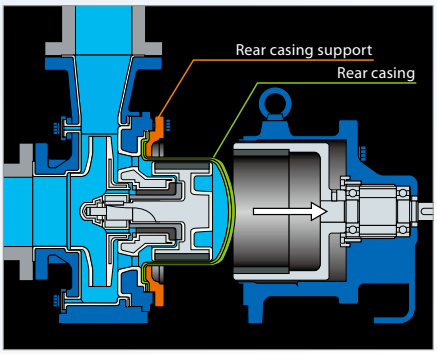
MDW

MDW

Back pullout system

The back pullout system allows easy maintenance and inspection without removing the pump from the piping. Integrated components and a sealed rear casing support structure allow motor removal without chemical leakage.

MDW MDE



MDE

Compliant with ISO

The performance and dimensions standards of the pumps are in compliance with the international standard (ISO2858, 3661, 5199*). They are interchangeable with general-purpose centrifugal pumps.

*MDW is ISO2858, 3661 only
• Model MDE 125-250 is excluded

MDW MDE

Robust structure

The ductile cast iron body of the pump provides strength and durability. The rear casing utilizes a patented triple layer structure for high pressure resistance. A metal shaft is incorporated in the MDW & MDE design to withstand high radial forces and allow continuous operation even under difficult service conditions.

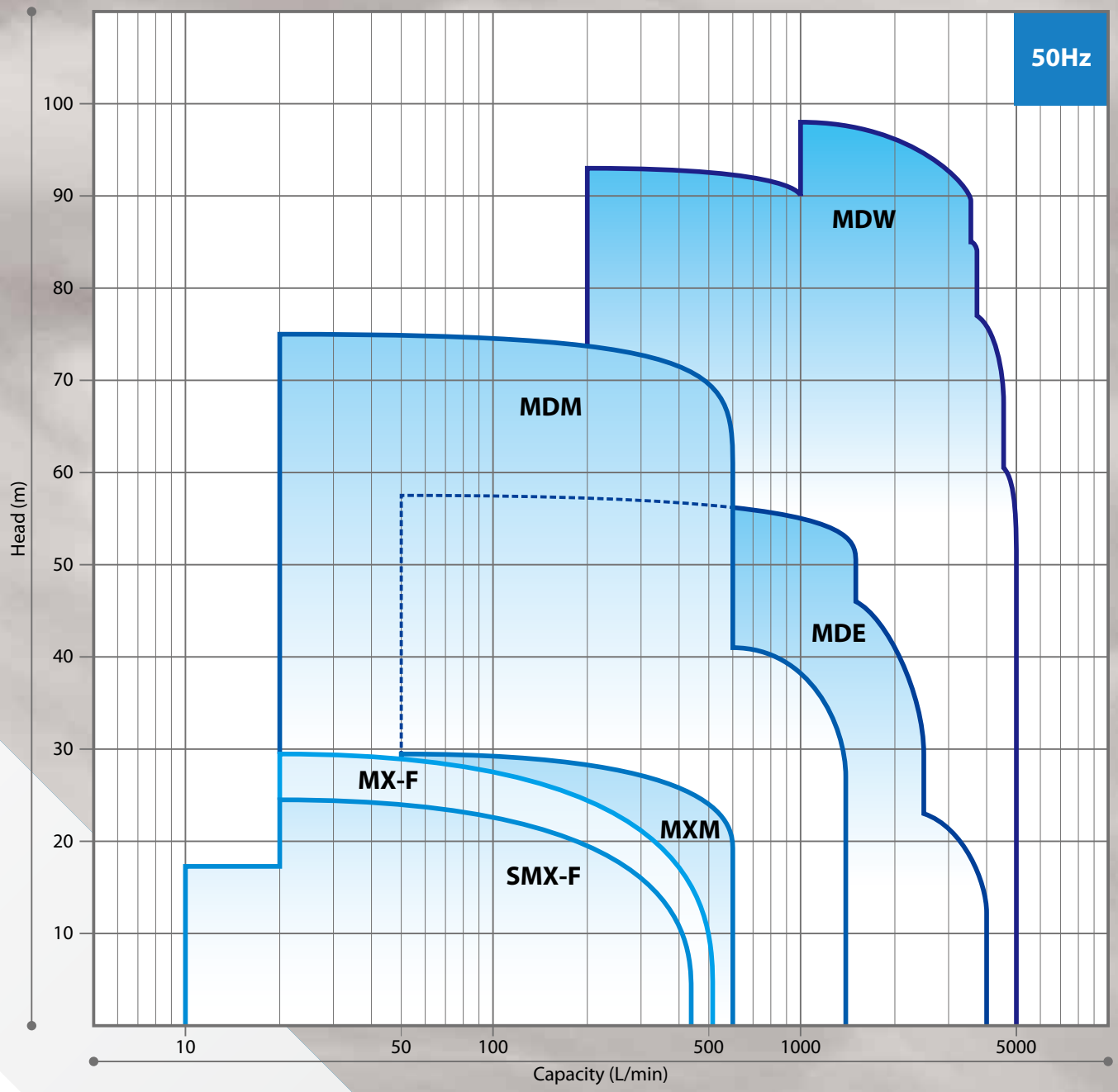
MDW MDE

Liquid end materials

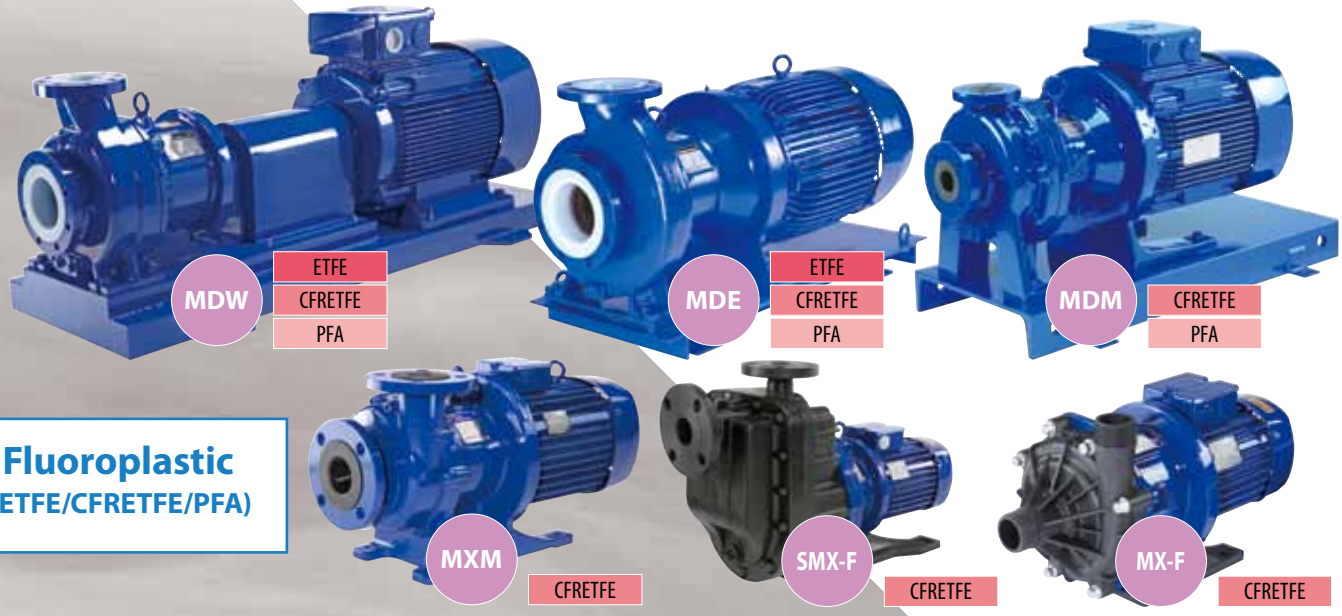
ETFE
CFRETFE
P F A

Performance Comparison for Iwaki Magnetic Drive Pumps

Materials: Fluoroplastic (ETFE/CFRETFE/PFA)



Liquid end Materials



Fluoroplastic
(ETFE/CFRETFE/PFA)

Materials

Model	Molded				Bearing system		Static sealing parts	
	Front casing	Rear casing	Impeller	Magnet capsule	Bearing	Spindle	Gasket	O ring
MDW	ETFE / PFA	PFA	CFRETFE / PFA	PFA	SiC	—	PTFE	Kalrez®
MDE	ETFE	PFA	CFRETFE	PFA	SiC	—	PTFE	Kalrez® / FKM / EPDM
MDM	CFRETFE / PFA	CFRETFE / PFA	CFRETFE / PFA	CFRETFE / PFA	High density carbon / SiC	High purity alumina ceramic / SiC	PTFE	—
MXM	CFRETFE	CFRETFE	CFRETFE	CFRETFE	High density carbon / High purity alumina ceramic / SiC	High purity alumina ceramic / SiC	AFLAS® / DAI-EL PERFLUORO® / FKM / EPDM	AFLAS® / DAI-EL PERFLUORO® / FKM / EPDM
SMX-F	CFRETFE	CFRETFE	CFRETFE	CFRETFE	High density carbon / PTFE / SiC	High purity alumina ceramic	FKM / EPDM	FKM / EPDM
MX-F	CFRETFE	CFRETFE	CFRETFE	CFRETFE	High density carbon / PTFE / SiC	High purity alumina ceramic / SiC	—	FKM

Material index

Plastic materials	
PFA	Tetrafluoroethylene/perfluoroalkoxy vinyl ether copolymer
ETFE	Ethylenetetrafluoroethylene copolymer (“Fluon®,” etc.)
CFRETFE	Carbon fiber-reinforced ETFE
PTFE	Polytetrafluoroethylene (“Teflon®,” etc.)

Rubber	
FKM	Fluorine rubber
EPDM	Ethylene propylene rubber

Materials for sliding parts/bearings	
High-density carbon	Hard carbon
Highly pure ceramics	Alumina ceramic with a purity of 99.5% or more
SiC	Silicon carbide ceramic

Liquid end materials
ETFE/CFRETFE/PFA

MDW series

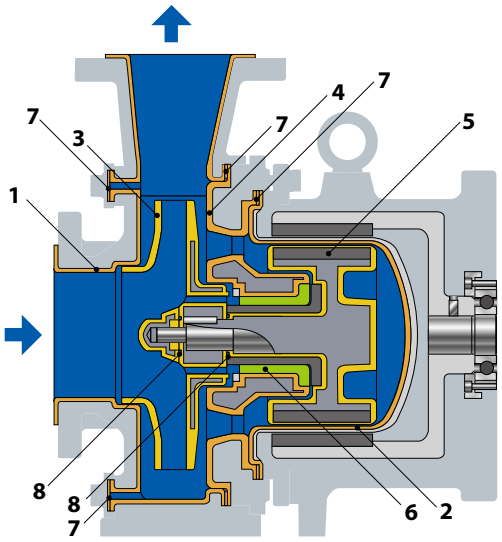
- High discharge capacity, high head and high efficiency
- Excellent chemical resistance
- Robust structure
- Back pullout design

Specifications

Max. discharge capacity	300 m³/hr
Max. discharge head	98 m
Materials	ETFE, CFRETFE, PFA
Power range	11 to 75kW
Pump size (Discharge)	50 to 100 A
Liquid temp. range	MDW80/100: -10 to 100°C* MDW50: -10 to 120°C*
Specific-gravity limit	3.0 (For details, please contact Iwaki.)
Sealing method	Seal-less construction

*Fluid dependent.

Liquid end materials

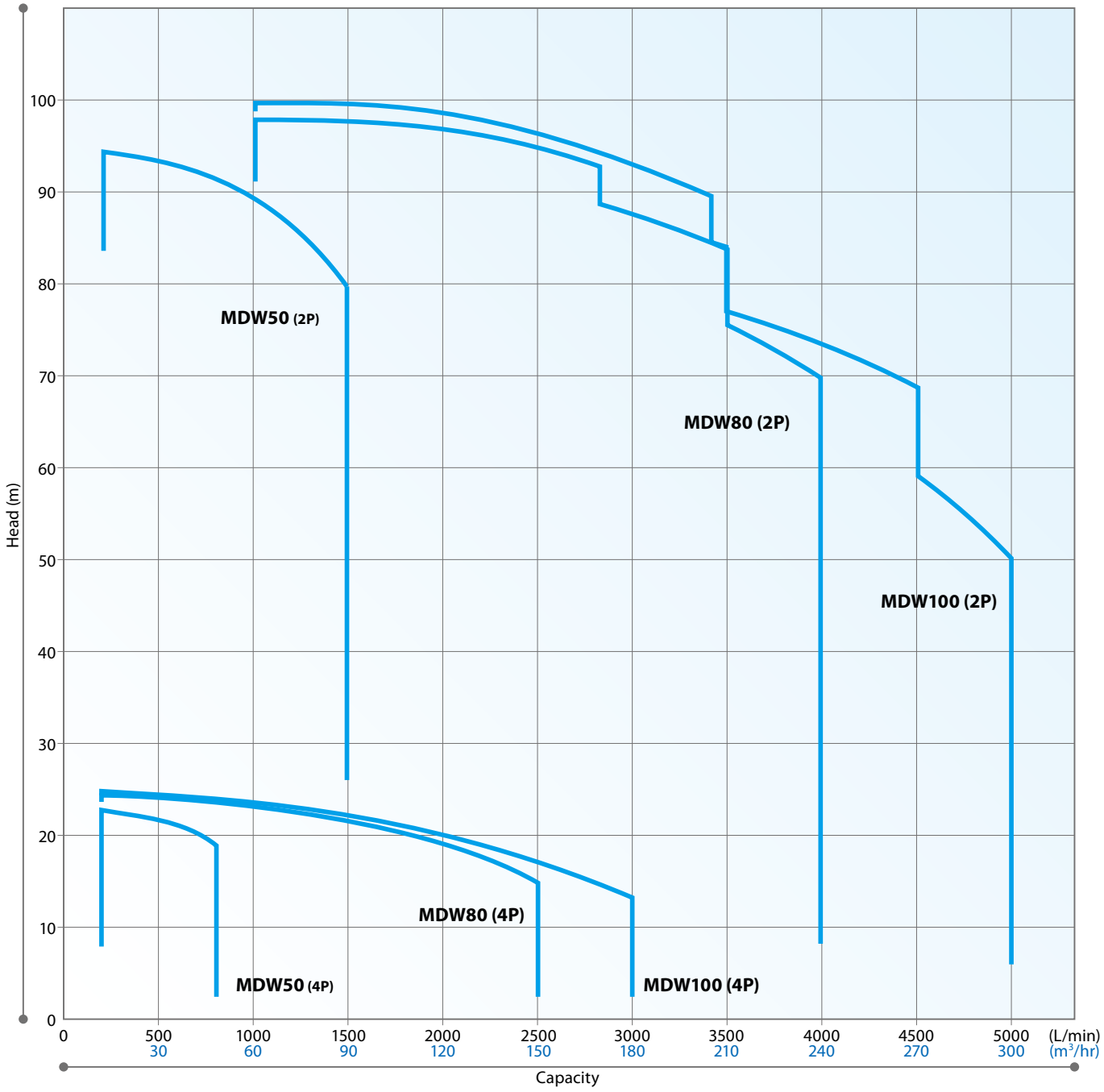


1	Front casing	ETFE, PFA
2	Rear casing	PFA
3	Impeller	CFRETFE, PFA
4	Split plate	PFA
5	Magnet capsule	PFA
6	Bearing	SiC
7	Gasket	PTFE
8	O ring	Kalrez®

Max. discharge capacity 300 m³/hr and Max. discharge head of 98 m. The world's largest fluoroplastic magnetic drive pump

Performance curves (50Hz)

- Pump size (Suction×Discharge) MDW50: 80A×50A, MDW80: 125A×80A, MDW100: 125A×100A
- 2P: 2P poles motor, 4P: 4P poles motor



Liquid end materials
ETFE/CFRETFE/PFA

MDE series

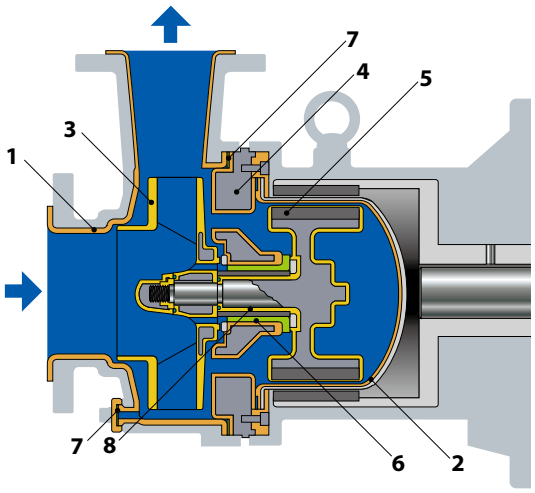
- Strong corrosion resistance
- High durability
- Compliant with ISO standards
- Back pullout design

Specifications

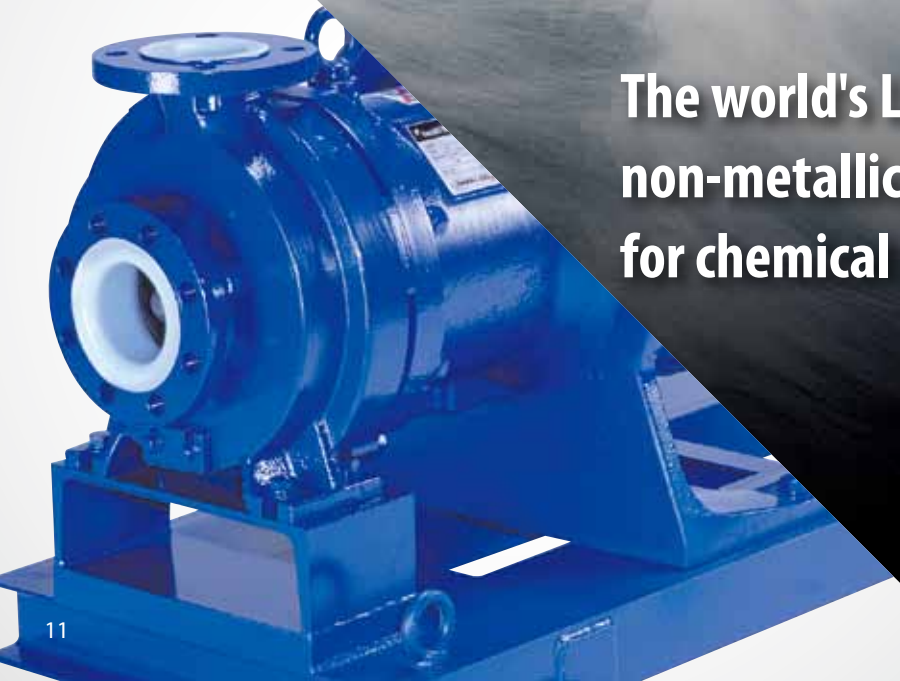
Max. discharge capacity ..... 240 m^3/hr
Max. discharge head ..... 55 m
Materials ..... ETFE, CFRETFE, PFA
Power range ..... 11 to 37kW
Pump size (Discharge) ..... 50 to 125 A
Liquid temp. range ..... 0 to 100°C*
Specific-gravity limit 3.0
(For details, please contact Iwaki.)
Sealing method ..... Seal-less construction

*Fluid dependent.

Liquid end materials



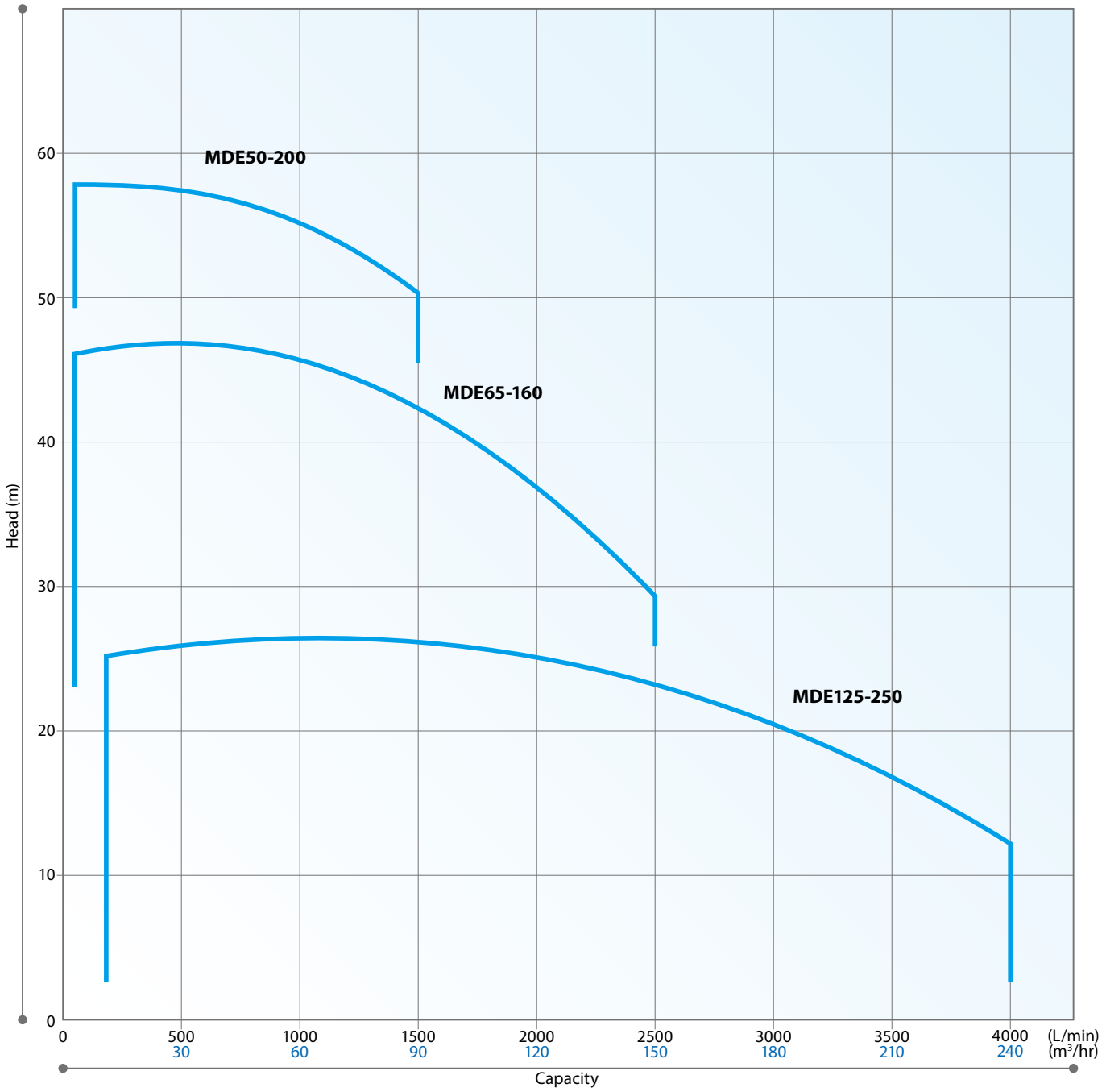
1	Front casing	ETFE
2	Rear casing	PFA
3	Impeller	CFRETFE
4	Split plate	PFA
5	Magnet capsule	PFA
6	Bearing	SiC
7	Gasket	PTFE
8	O ring	Kalrez®, FKM, EPDM

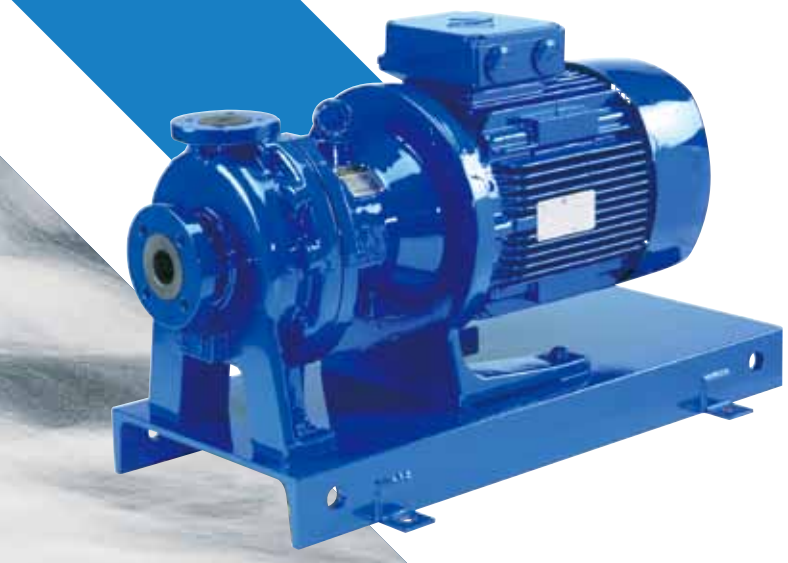


The world's Largest-class non-metallic magnetic drive pumps for chemical processing

Performance curves (50Hz)

• Pump size (Suction×Discharge) MDE50: 80A×50A, MDE65: 100A×65A, MDE125: 150A×125A





Liquid end materials
CFRETFE/PFA

MDM series

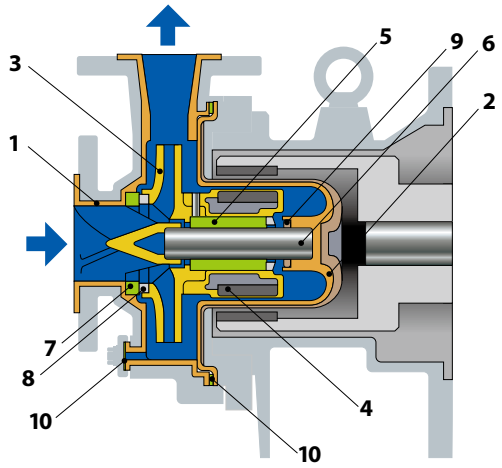
- CFRETFE and PFA available in standard models
- Durable design
- High head models available
- Back pullout design

Specifications

Max. discharge capacity ..... 84 m^3/hr
Max. discharge head ..... 74 m
Materials ..... CFRETFE, PFA
Power range ..... 1.5 to 15kW
Pump size (Discharge) ..... 25 to 50 A
Liquid temp. range ..... CFRETFE: -20 to 100°C*
PFA: -20 to 150°C*
Specific-gravity limit 2.0
(For details, please contact Iwaki.)
Sealing method ..... Seal-less construction

*Fluid dependent.

Liquid end materials

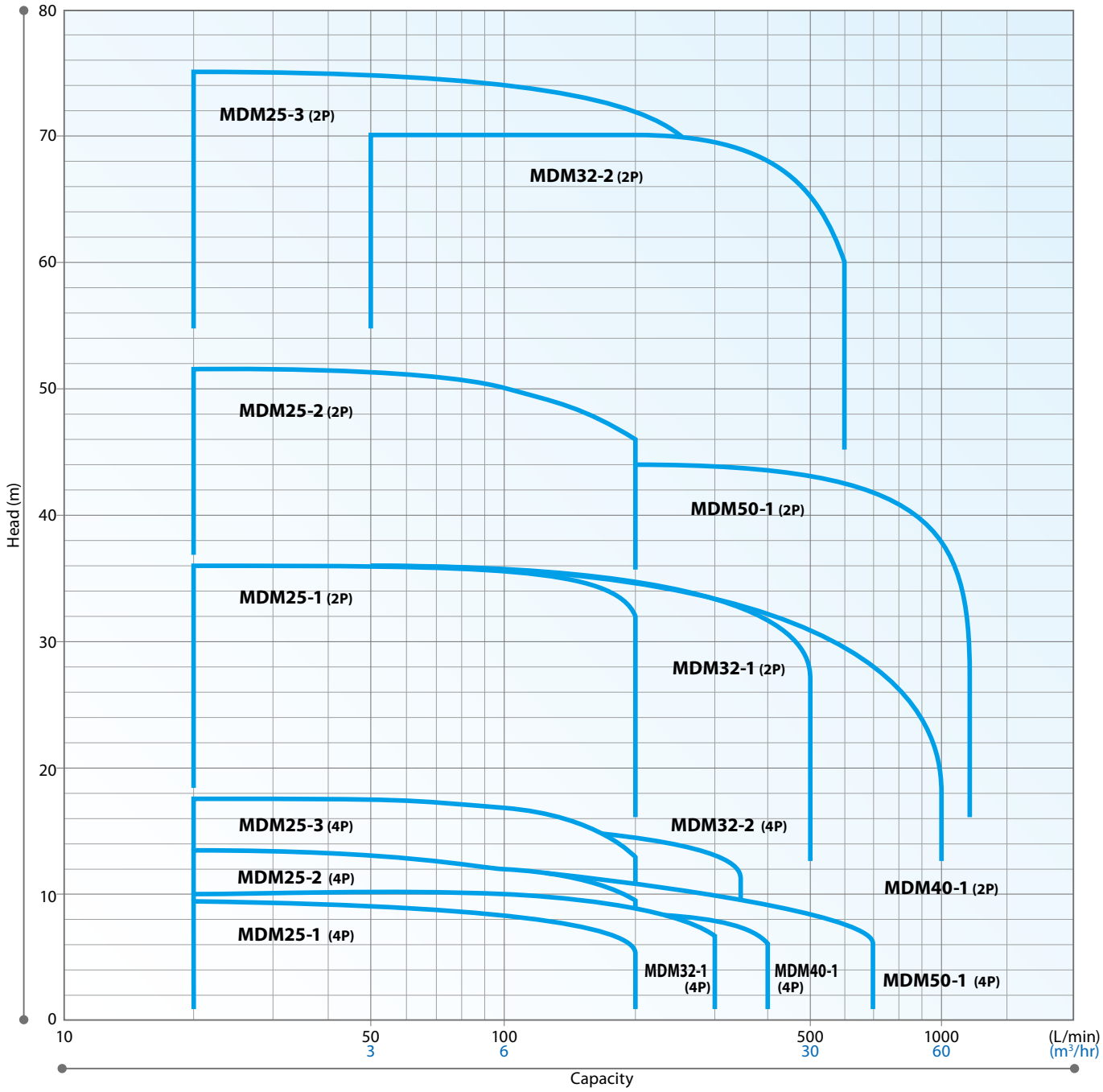


1	Front casing	CERETFE, PFA
2	Rear casing	CFRETFE, PFA
3	Impeller	CFRETFE, PFA
4	Magnet capsule	CFRETFE, PFA
5	Bearing	High density carbon, SiC
6	Spindle	High purity alumina ceramic, SiC
7	Liner ring	High purity alumina ceramic, SiC
8	Mouth ring	PTFE (with filler), SiC
9	Rear thrust	PTFE (with filler), SiC, PTFE
10	Gasket	PTFE

Dry run capable magnetic drive process pump design

Performance curves (50Hz)

- Pump size (Suction×Discharge) MDM25: 40A×25A, MDM32: 50A×32A, MDM40: 65A×40A, MDM50: 80A×50A
- 2P: 2P poles motor, 4P: 4P poles motor



Liquid end material
CFRETFE

MXM series

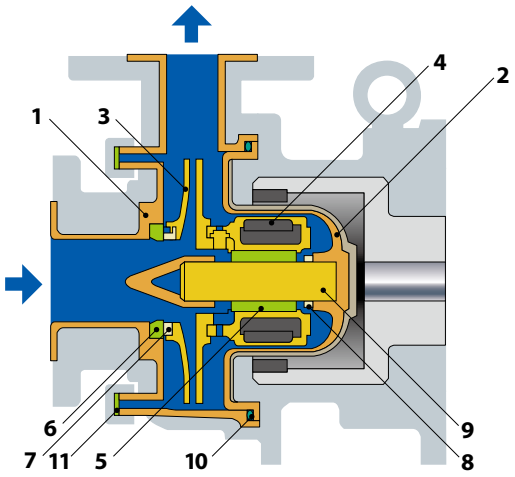
- Withstands difficult operation
- Superior corrosion resistance
- Robust structure
- Enhanced safety

Specifications

Max. discharge capacity ..... 600 L/min
Max. discharge head ..... 29 m
Material ..... CFRETFE
Power range ..... 0.4 to 3.7kW
Pump size (Discharge) 25A, 40A
Liquid temp. range* ..... -10 to 100°C
Specific-gravity limit 2.0
(For details, please contact Iwaki.)
Sealing method ..... Seal-less construction

*Operating temperature for the pumps with an Aflas® O-ring should be 10°C or more. Fluid dependent.

Liquid end materials

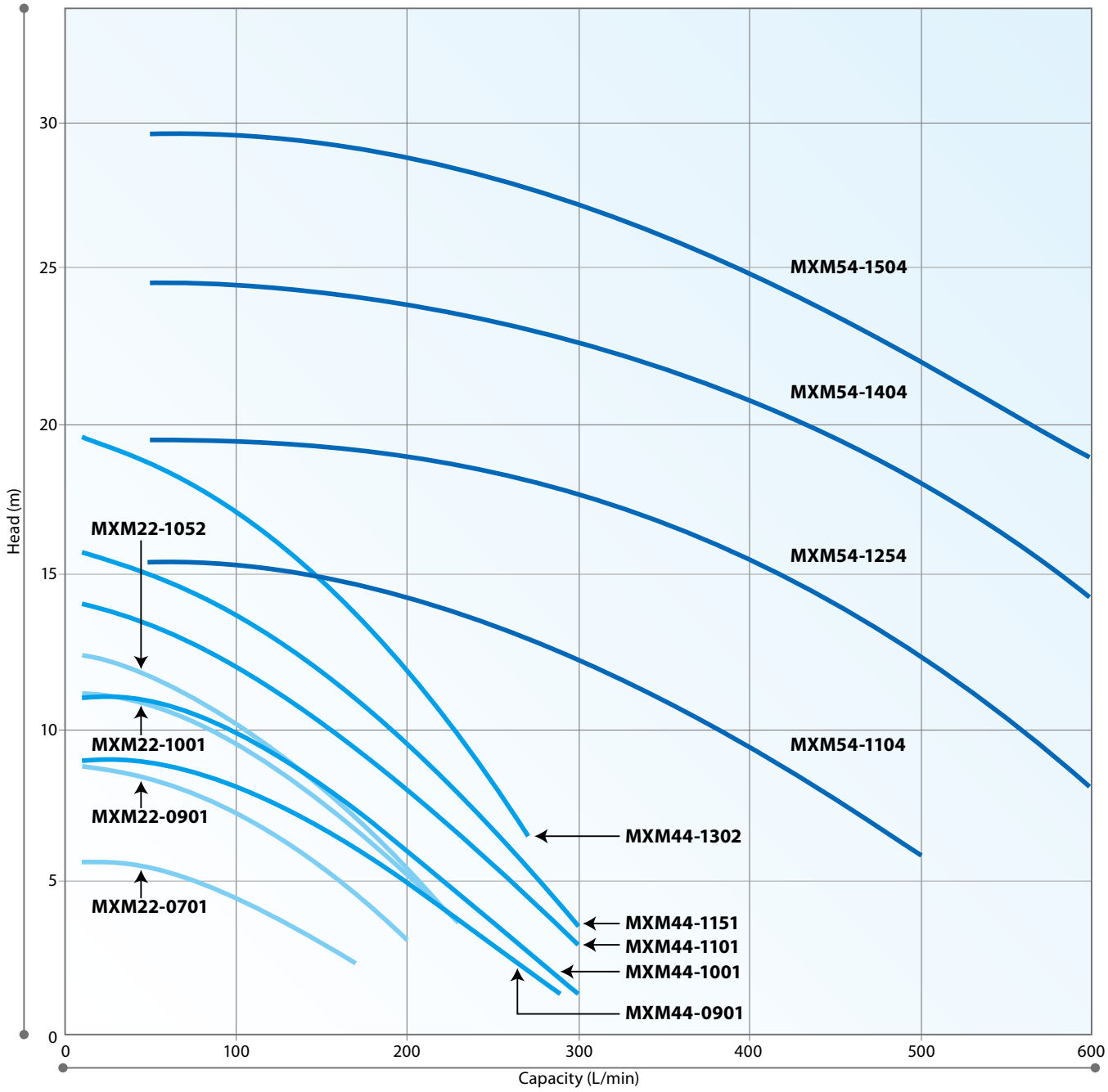


1	Front casing	CFRETFE
2	Rear casing	CFRETFE
3	Impeller	CFRETFE
4	Magnet capsule	CFRETFE
5	Bearing	High density carbon, High purity alumina ceramic, SiC
6	Liner ring	High purity alumina ceramic, SiC
7	Mouth ring	PTFE (with filler), SiC
8	Rear thrust	CFRETFE, CFRPFA
9	Spindle	High purity alumina ceramic, SiC
10	O ring	FKM, EPDM, AFLAS®, DAI-EL PERFLUORO®
11	Gasket	FKM, EPDM, AFLAS®, DAI-EL PERFLUORO®

Magnetic drive pumps with an excellent balance of features and performance

Performance curves (50Hz)

• Pump size (Suction×Discharge) MXM22: 25A×25A, MXM44: 40A×40A, MXM54: 50A×40A



• High-lift/small-flow impellers are also available. Please contact us for more information.

CFRETFE
SMX-F

Liquid end material
CFRETFE

SMX-F series

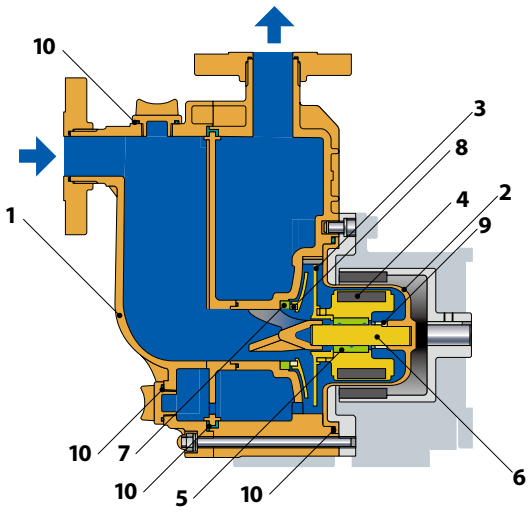
- Excellent corrosion resistance
- Expanded versatility
- Easy maintenance
- Able to withstand abnormal operation
- Fast self-priming

Specifications

Max. discharge capacity ..... 440 L/min
Max. discharge head ..... 24.5 m
Rated self-priming height 4m
Material ..... CFRETFE
Power range ..... 0.4 to 3.7kW
Pump size (Discharge) 25A, 40A
Liquid temp. range ..... 0 to 80°C*
Specific-gravity limit 2.0
(For details, please contact Iwaki.)
Sealing method ..... Seal-less construction

*Fluid dependent.

Liquid end materials

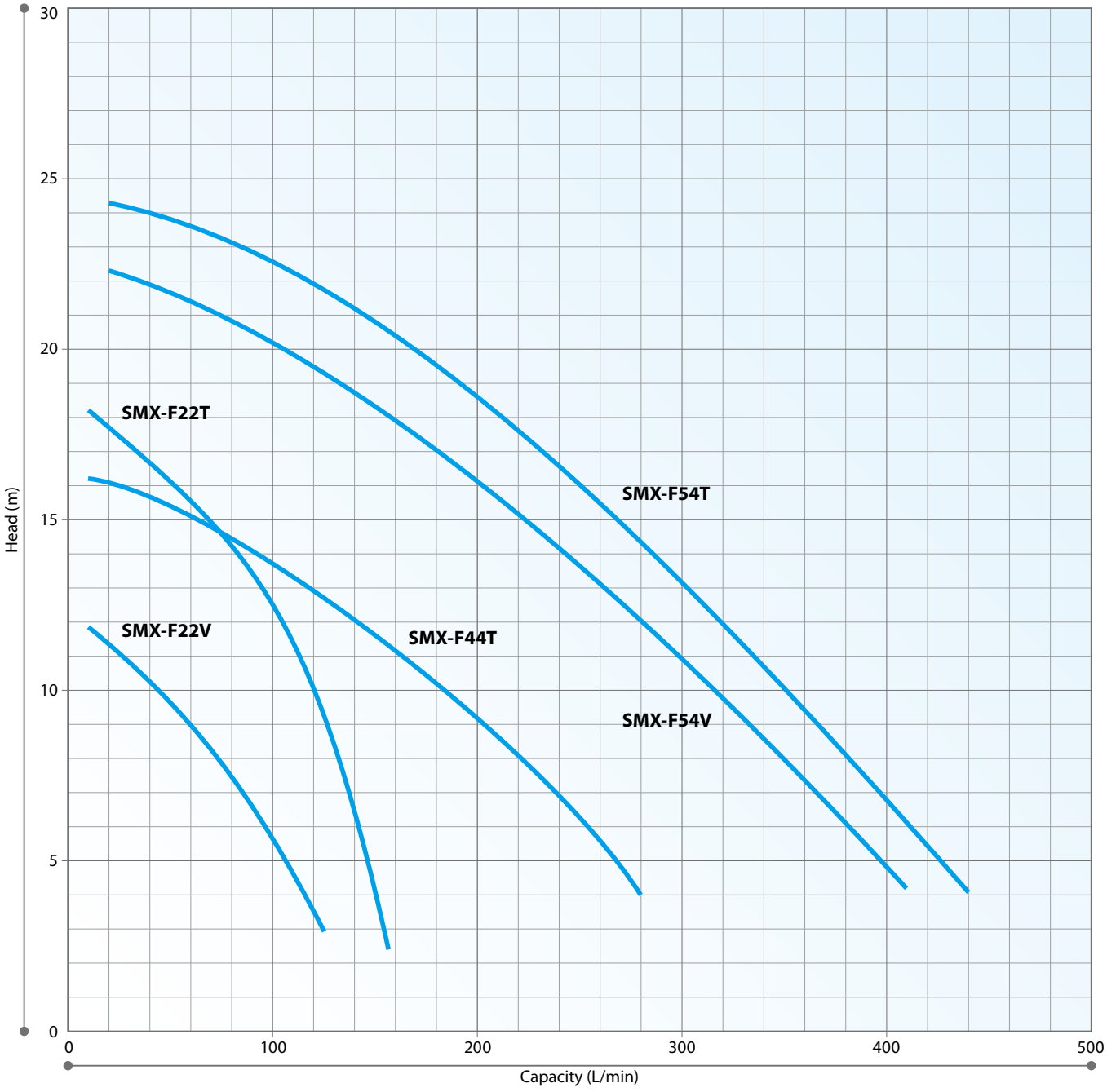


1 Front / Rear case ..... CFRETFE
2 Rear casing ..... CFRETFE
3 Impeller ..... CFRETFE
4 Magnet capsule ..... CFRETFE
5 Bearing ..... High density carbon, SiC, PTFE
6 Spindle ..... High purity alumina ceramic, SiC
7 Liner ring ..... High purity alumina ceramic, SiC
8 Mouth ring ..... PTFE (with filler), SiC
9 Rear thrust ..... High purity alumina ceramic, SiC, CFRETFE
10 Gasket ..... FKM, EPDM

Chemically resistant self-priming magnetic drive pumps built to withstand abnormal operation

Performance curves (50Hz)

• Pump size (Suction×Discharge) SMX-F22: 25A×25A, SMX-F44: 40A×40A, SMX-F54: 50A×40A



Liquid end material
CFRETFE

MX-F series

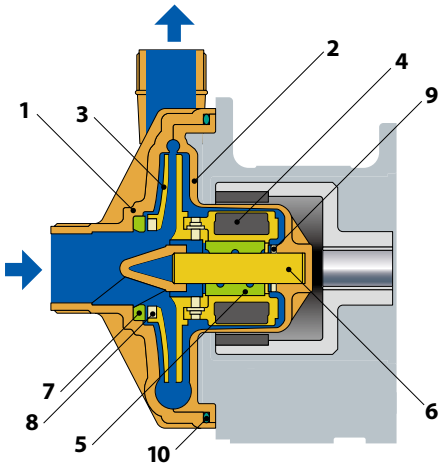
- Self-radiating structure (PAT.)
- Dual section volute casing (PAT.)
- Robust structure
- Excellent chemical resistance

Specifications

Max. discharge capacity	510 L/min
Max. discharge head	29.5 m
Material	CFRETFE
Power range	0.26 to 2.2kW
Pump size (Discharge)	G1 to 40A
Liquid temp. range	0 to 80°C*
Specific-gravity limit	2.0 (For details, please contact Iwaki.)
Sealing method	Seal-less construction

*An Aflas® O-ring is 10 to 80°C.
Fluid dependent.

Liquid end materials

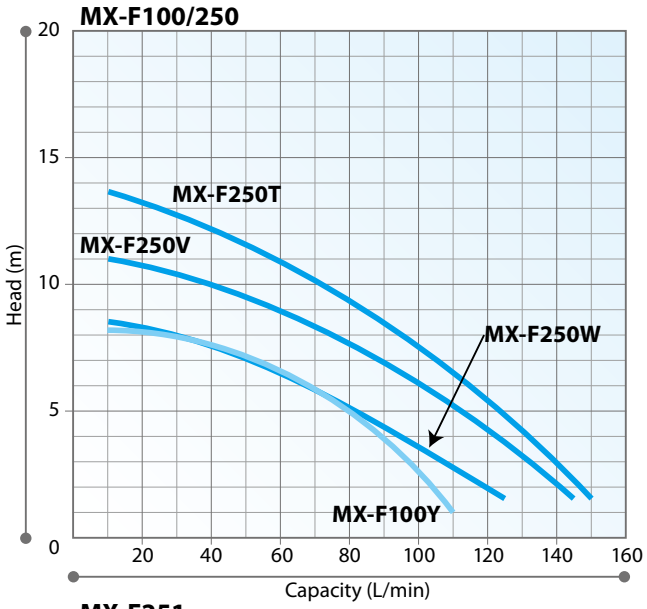


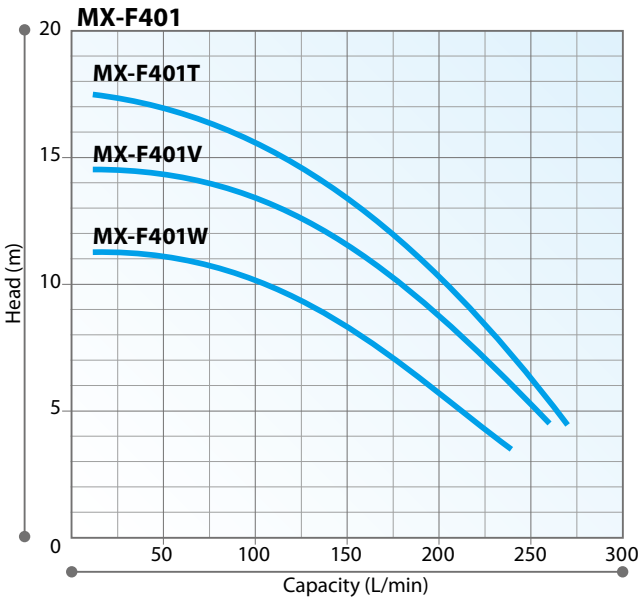
1	Front casing	CFRETFE
2	Rear casing	CFRETFE
3	Impeller	CFRETFE
4	Magnet capsule	CFRETFE
5	Bearing	PTFE, High density carbon, SiC
6	Spindle	High purity alumina ceramic, SiC
7	Liner ring	High purity alumina ceramic, SiC
8	Mouth ring	PTFE (with filler), SiC
9	Rear thrust	High purity alumina ceramic, SiC, CFRETFE, CFRPFA
10	O ring	FKM, EPDM, AFLAS®

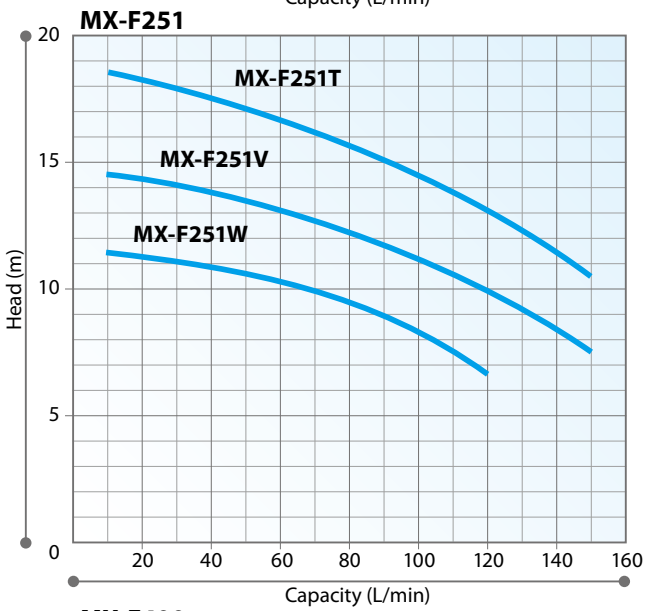
Chemically resistant magnetic drive pumps built to withstand abnormal operation

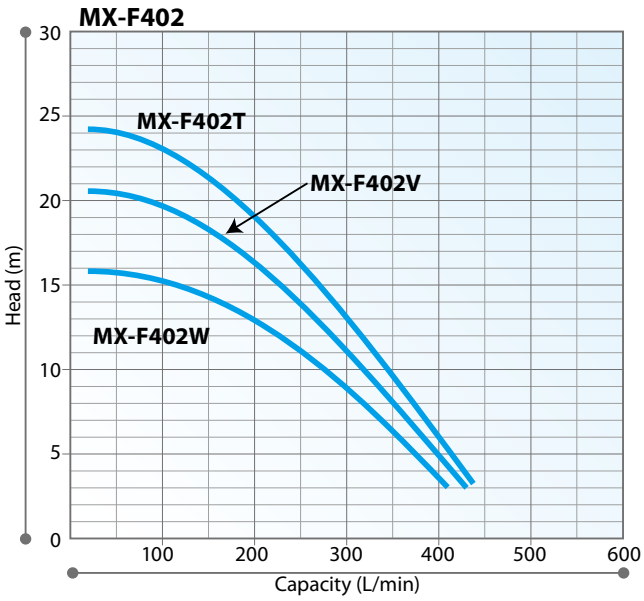
Performance curves (50Hz)

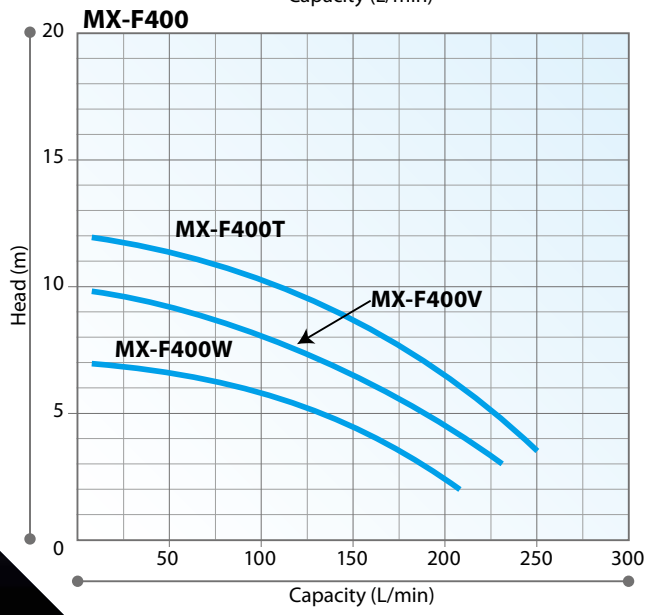
• Pump size (Suction×Discharge) MX-F100: G1×G1, MX-F250/251: 25A×25A, MX-F400: 40A×40A
MX-F401: 40A×40A, MX-F402/403: 50A×40A

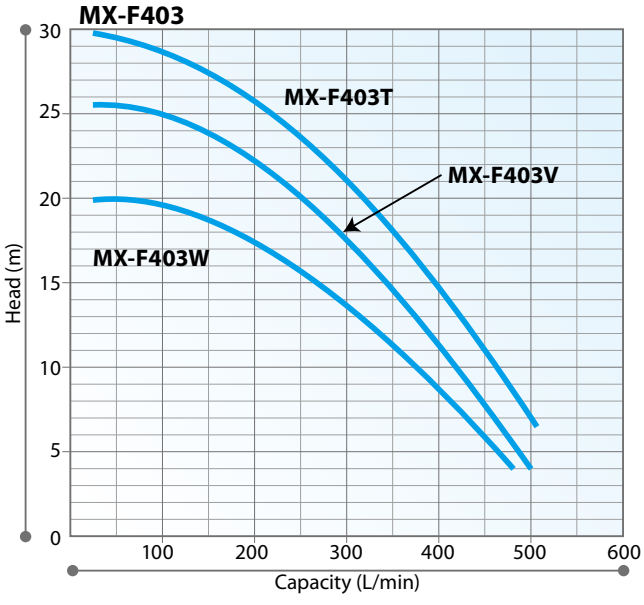












Precautions for pump selection

• MXM

(1) The performance curves in this catalogue represent the data measured using clear water at 20 °C.
(2) Choose the pump model suited to the liquid gravity.
Make sure that the motor output is at least ten percect higher than theoretically required.
Shaft power (Sp) × liquid gravity × 1.1 < Motor output
(Note) The shaft power (Sp) increases in proportion to the liquid gravity.
As the viscosity rises, the shaft power is higher while the head and the discharge are lower.
The power and the performance need to be adjusted.
(3) No magnetic drive pump supports continuous closed running. Be sure to ensure the mininum flow volume.
• Minimum flow volume

MXM22/44		: 10 L/min.
MXM54	Impeller range 1 and 3	: 20 L/min.
	Impeller range 4	: 50 L/min.

(4) FF material models
• Liquid should be 1m Pa·s (cP) or more.
• HQ performance is somewhat different from CF/KK models. If you need to know the detail, please contact with us.

(5) Deliberate prolonged dry running or entrained air operation is not recommended.
• The CF type has a degree of tolerance to dry running and operation with entrained air in the liquid.
• The KK type has the same degree of tolerance as the CF type under operation with entrained air in the liquid, but not allowed to run dry.
• The FF type is not allowed to run dry or operation with entrained air.

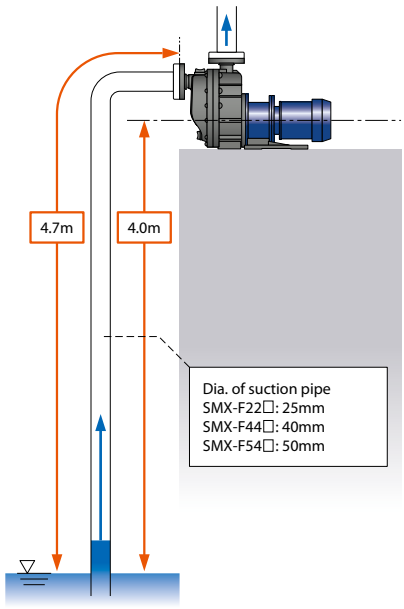
• SMX-F

(1) The performance curves on this catalogue are based on the operation with 20 °C clean water in flooded suction. Keep a margin (3% of the curves) when selecting the pump.

(2) The magnetic pump cannot run continuously with a closed-discharge. Be sure to observe the minimum flow rate.
• The minimum flow rate SMX-F22□: 10L/min
SMX-F44□: 10L/min
SMX-F54□: 20L/min

(3) Select a pump model according to liquid specific gravity. Keep a margin (5% or more) for motor output.
• Pump shaft power Sp x Specific gravity x 1.05 or more (margin) ≦ Motor output

(4) The self-priming performance (4m in 90 seconds) is based on the operation with 20 °C clean water on the right piping condition. Self-priming performance varies with liquid temperature, characteristics and piping conditions. Obtain a rough guide of the highest possible self-priming height at each liquid specific gravity by the following formula.
• The highest possible self-priming height[m] = Self-priming height with clean[m] / Liquid specific gravity



Self-priming considerations

(1) The diameter of the piping on the suction side should be the same as that of the pumps inlet port (22□: 25mm, 44□: 40mm, 54□: 50mm), and the length of the piping should be limited to less than 4.7m. A larger pipe diameter or longer piping could adversely affect the self-priming performance, or could even hinder the self-priming process itself.

(2) In cases where the liquid level fluctuates, take the height from the lowest liquid level as the maximum self-priming height.

(3) Always perform priming before first operation, and start the pump only after the pump chamber has been filled with the handled liquid.

(4) To prevent early deterioration, avoid frequent start/stop of the pump.

(5) If a foot valve is installed on the suction pipe. pipe resistance may increase so that the pump cannot suck liquid enough.

• MX-F

(1) The performance curves on this catalogue are based on clean water of 20 °C.

(2) For the MX-F250 or larger models, select a proper impeller size according to specific gravity. Always keep 5 - 10% allowance to motor output.
Applicable motor output
$Sp \times S.G \times \underbrace{(1.05 - 1.1)}_{\text{Allowance}} \leqq$ Motor output

(3) The magnetic drive pump is not durable for a long time in closed-discharge operation. Always keep the minimum flow.
• Minimum flow
MX-F100, 250, 251, 400, 401: 10 L/min
MX-F402, 403: 20 L/min

(4) NPSH validation
Observe the following for the prevention of cavitation.

$$NPSHa \leqq NPSHr + \underbrace{0.5\ m}_{\text{Allowance}}$$

$$NPSHa = 10^6 \times \frac{(Pa - Pv)}{\rho g} \pm hs - hfs$$

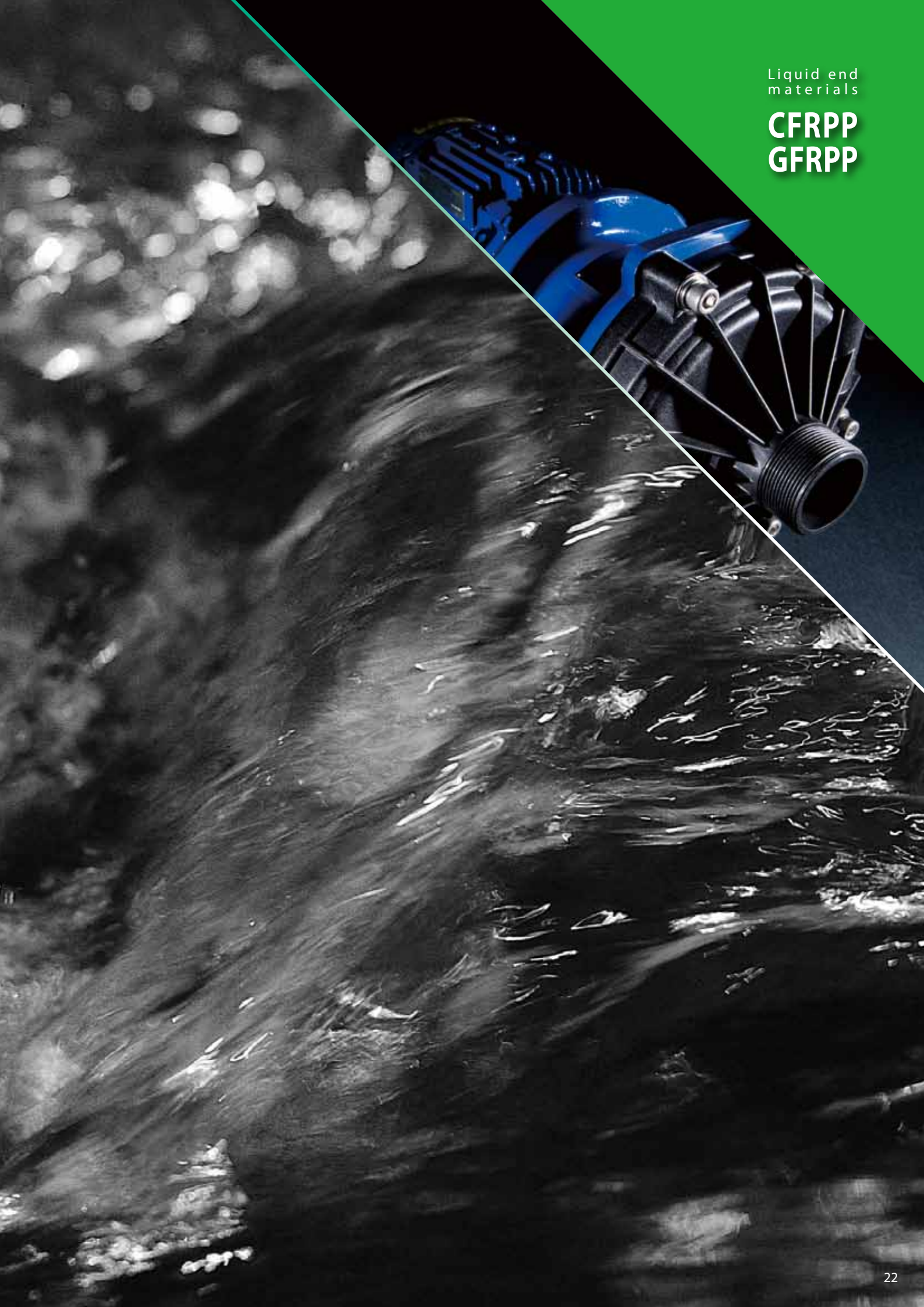
(5) Maximum withstand pressure

MX-F100: 0.19MPa	MX-F400: 0.22MPa
MX-F250: 0.25MPa	MX-F401: 0.28MPa
MX-F251: 0.33MPa	MX-F402: 0.43MPa
	MX-F403: 0.43MPa

NPSHa:	Net Positive Suction Head Available (m)
NPSHr:	Net Positive Suction Head Required (m)
Pa:	Pressure on the suction liquid level (MPa) (Absolute pressure)
Pv:	Pressure of saturated vapor (MPa)
hs:	Static suction head (m)
hfs:	Suction pipe resistance (m)
ρ:	Liquid density (kg/m^3)
g:	G-force (9.8m/sec^2)

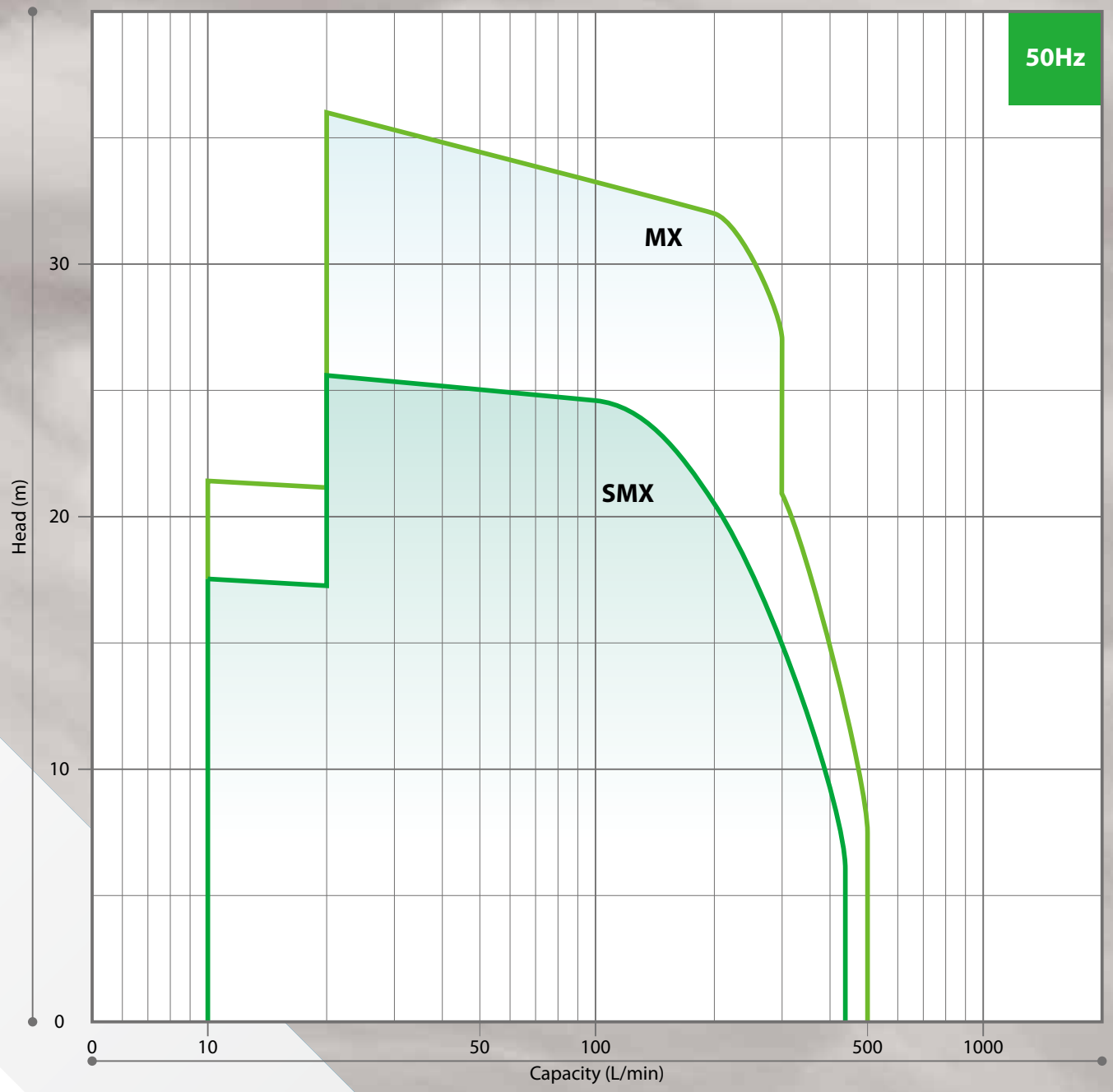
Liquid end materials

CFRPP GFRPP



Performance Comparison for Iwaki Magnetic Drive Pumps

Materials: Polypropylene (CFRPP/GFRPP)



Liquid end Materials

Polypropylene
(GFRPP)

Materials

Model	Resin parts				Sliding parts		Sealing parts	
	Front casing	Rear casing	Impeller	Magnet capsule	Bearing	Spindle	Gasket	O ring
SMX 	GFRPP	GFRPP	GFRPP	PP	Carbon	High purity alumina ceramic	FKM	FKM
					PTFE		EPDM	EPDM
					SiC	SiC		
MX 	GFRPP	GFRPP	CFRPP	PP	CFRPPS	Alumina ceramic	—	FKM
					PTFE			
			GFRPP		Carbon	High purity alumina ceramic		EPDM
					Alumina ceramic			

Material index

Plastic materials	
PP	Polypropylene
CFRPP	Carbon fiber-reinforced PP
GFRPP	Fiberglass-reinforced PP

Rubber	
FKM	Fluorine rubber
EPDM	Ethylene propylene rubber

Materials for sliding parts/bearings	
Carbon	Carbon
High-density carbon	Hard carbon
Ceramic	Alumina ceramic
Highly pure ceramic	Alumina ceramic with a purity of 99.5% or more
SiC	Silicon carbide ceramic

Liquid end material
GFRPP

SMX series

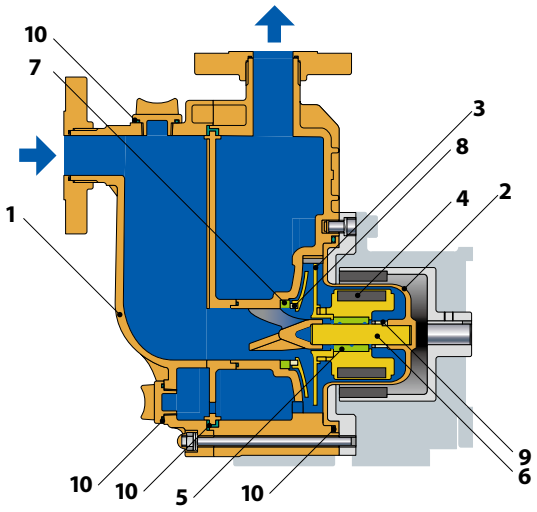
- Expanded versatility
- Easy maintenance
- Able to withstand abnormal operation
- Fast self-priming

Specifications

Max. discharge capacity ..... 440 L/min
Max. discharge head ..... 25.5 m
Rated self-priming height 4m
Material ..... GFRPP
Power range ..... 0.4 to 3.7kW
Pump size (Discharge) 25A, 40A
Liquid temp. range ..... 0 to 80°C*
Specific-gravity limit 2.0
(For details, please contact Iwaki.)
Sealing method ..... Seal-less construction

*Fluid dependent.

Liquid end materials

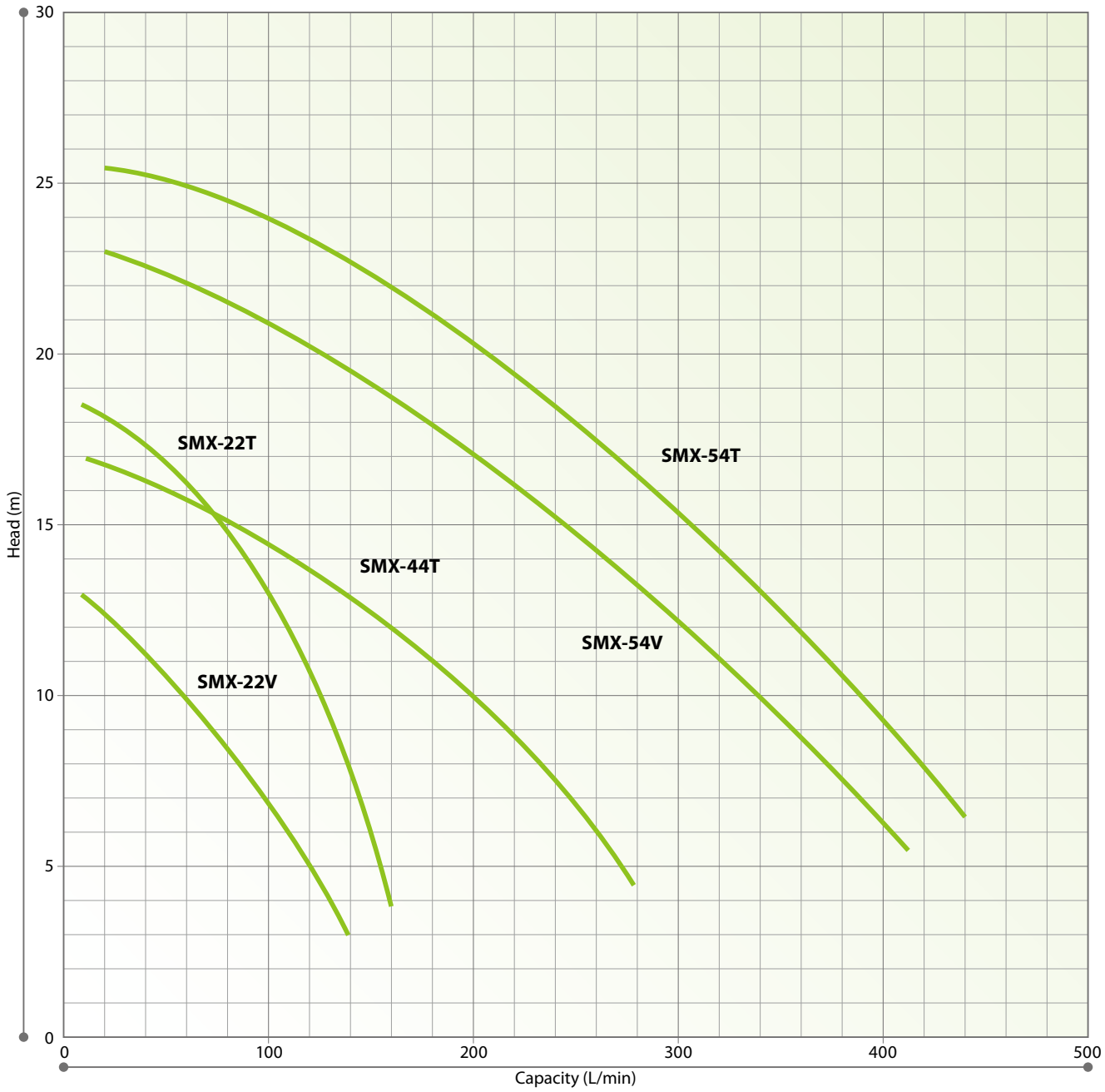


1 Front / Rear case ..... GFRPP
2 Rear casing ..... GFRPP
3 Impeller ..... GFRPP
4 Magnet capsule ..... PP
5 Bearing ..... High density carbon, SiC, PTFE
6 Spindle ..... High purity alumina ceramic, SiC
7 Liner ring ..... High purity alumina ceramic
8 Mouth ring ..... PTFE (with filler)
9 Rear thrust ..... High purity alumina ceramic, SiC, CFRPPS
10 O ring ..... FKM, EPDM

Versatile self-priming magnetic drive pumps built to withstand abnormal operation

Performance curves (50Hz)

• Pump size (Suction×Discharge) SMX22: 25A×25A, SMX44: 40A×40A, SMX54: 50A×40A



GFRPP
MX

Liquid end material
GFRPP

MX series

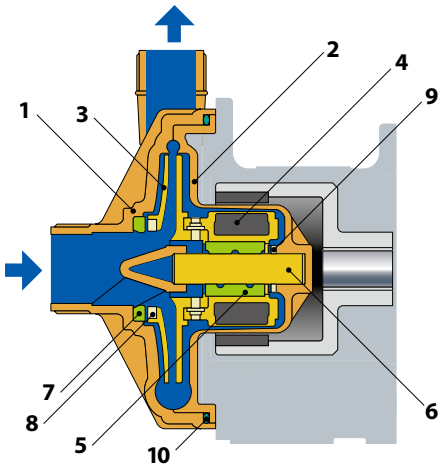
- **Self-radiating structure** (PAT.)
- **Non-contact structure**
- **Dual section volute casing** (PAT.)
- **Robust structure**

Specifications

Max. discharge capacity	500 L/min
Max. discharge head	35 m
Material	GFRPP
Power range	0.15 to 2.2kW
Pump size (Discharge)	G1 to 40A
Liquid temp. range	0 to 80°C*
Specific-gravity limit	2.0 (For details, please contact Iwaki.)
Sealing method	Seal-less construction

*An Aflas® O-ring is 10 to 80°C.
Fluid dependent.

Liquid end materials



1	Front casing	GFRPP
2	Rear casing	GFRPP
3	Impeller	GFRPP
4	Magnet capsule	PP
5	Bearing	CFRPPS, PTFE, High density carbon, High purity alumina ceramic
6	Spindle	High purity alumina ceramic
7	Liner ring	High purity alumina ceramic
8	Mouth ring	PTFE (with filler)
9	Rear thrust	CFRPPS*
10	O ring	FKM, EPDM, AFLAS®

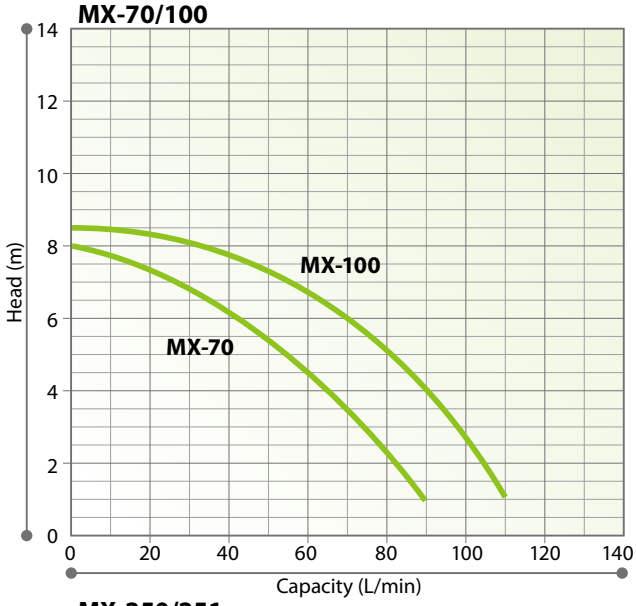
*MX-402, 402H, 403, 403H is CFRPEEK.

Built to withstand abnormal operation and provide high efficiency

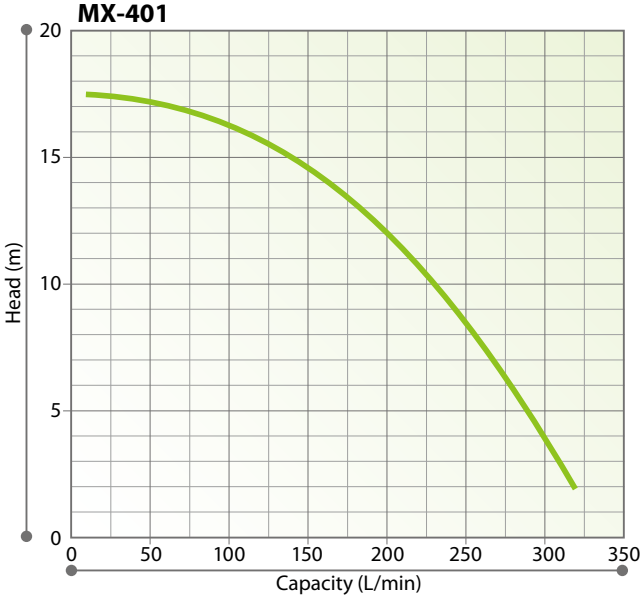
Performance curves (50Hz)

• Pump size (Suction×Discharge) MX-70/100: G1×G1, MX250/251: 25A×25A, MX400: 40A×40A
MX-401: 40A×40A, MX402/402H/403/403H: 50A×40A

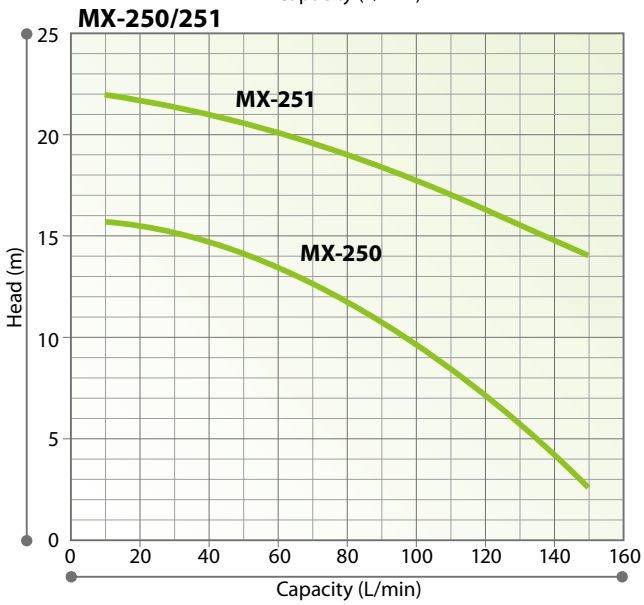
MX-70/100



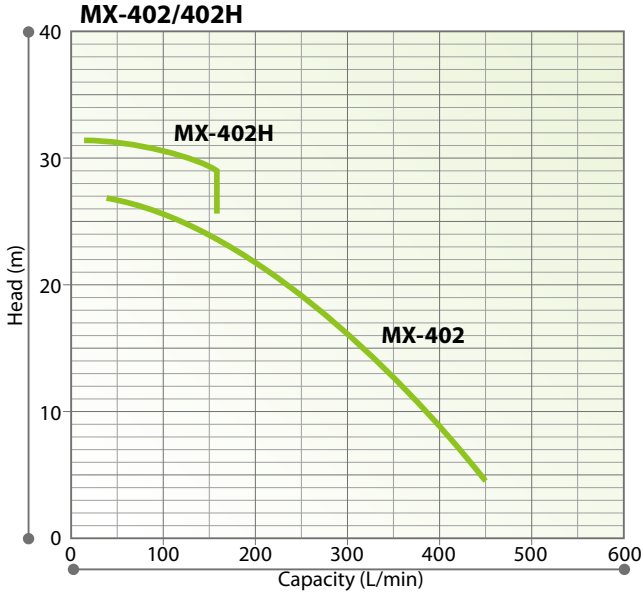
MX-401



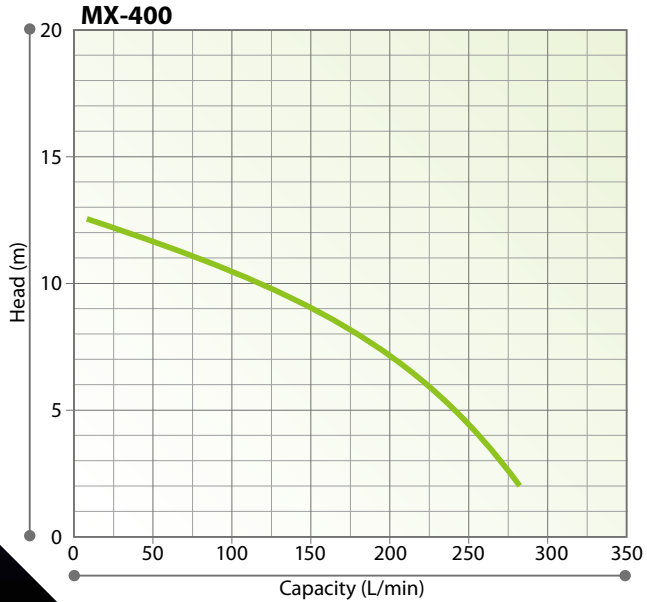
MX-250/251



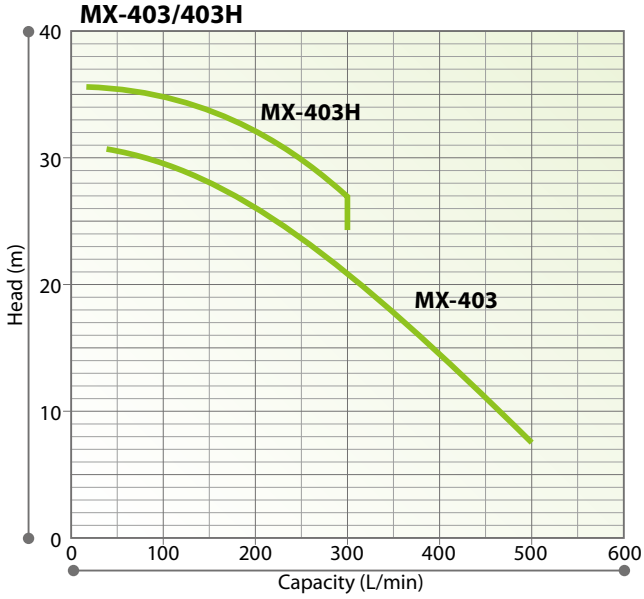
MX-402/402H



MX-400



MX-403/403H



Installation Precautions

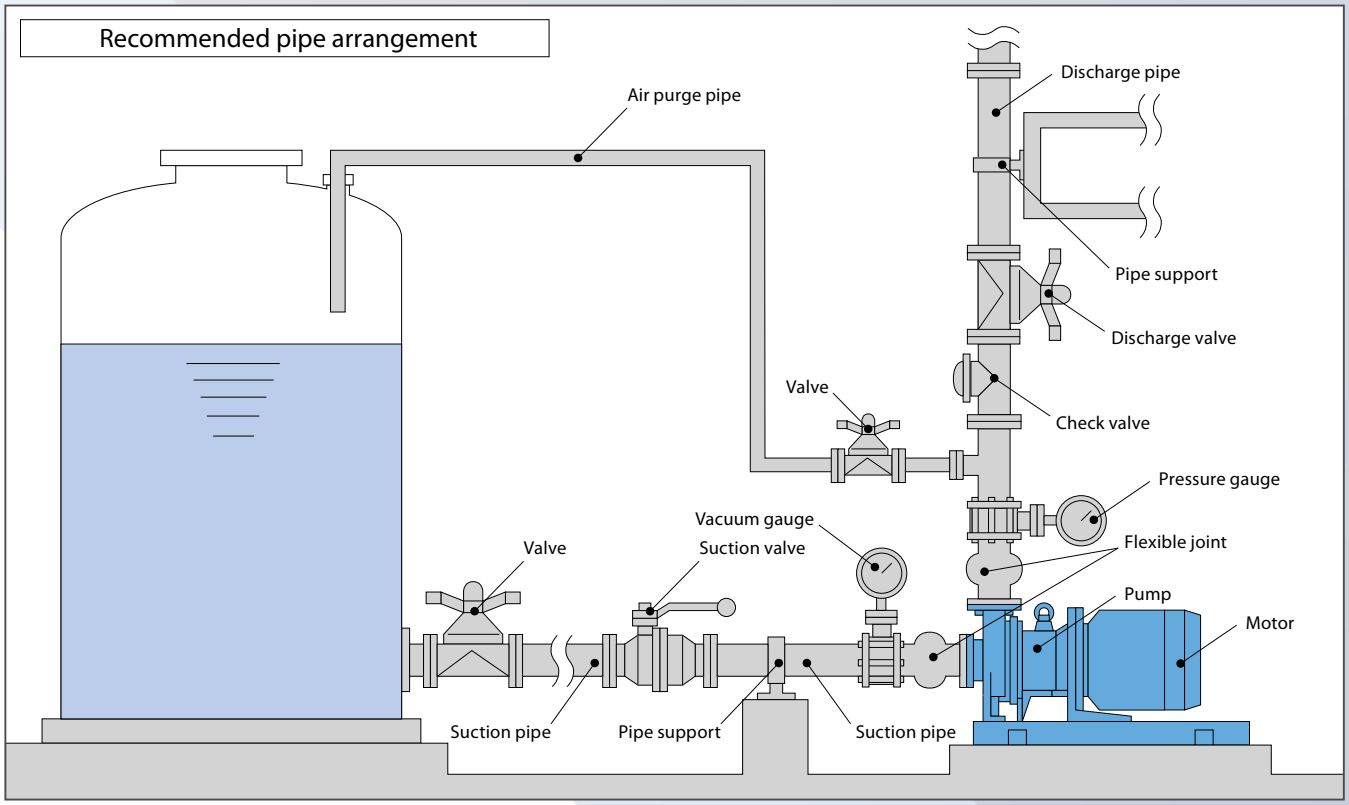
To safely use the full capability of a pump, observe the precautions below when performing installation.
Note that there are restrictions on pipe arrangements for the SMX and SMX-F models, as they are self-suction pumps.
Please contact us for each product individually.

Suction Piping

1. The suction pipe should employ the flooded suction method if possible. The shortest pipe possible, with the minimum number of bends, should be designed. Arrange a proper support on the suction pipe so that load and the thermal stress of the pipe itself are not applied to the pump.
2. Attach the coupling on the suction pipe carefully, so that no air enters the line. The presence of air in the suction pipe may prevent priming of the pump.
3. Avoid installations with poor suction conditions (e.g. vacuum in suction tank, large suction head or long suction piping). NPSHa should always be at least 2 feet greater than NPSHr. For NPSHr values, refer to the standard performance curve for your pump model or contact Iwaki or Your distributor.
4. When using a bend on the suction side, install a straight pipe which is more than 20 inches long or 10 times as long as the suction port diameter before the suction port of the pump. Use the largest possible radius of curvature for the bend.
5. Do not allow any projection where air may be trapped along the suction pipe. The suction pipe should have an ascending gradient toward the pump.
6. If the diameters of the pump suction port and suction pipe are different, use an eccentric reducer pipe. Connect the eccentric reducer pipe such that the upper part of it is level. **Never use a suction pipe with a diameter smaller than that of the pump's suction port.**
7. When using the flooded suction method, the suction pipe should be given a slight ascending gradient toward the pump so that no air pocket is created on the suction side.
8. The end of the suction pipe should be located 24 inches or more below the surface of the liquid.
9. A screen should be provided at the inlet of the suction tank to prevent the entrance of foreign matter into the suction pipe. Foreign matter may cause malfunctioning of and/or damage to the pump. The end of the suction pipe should be a least 1- 1.5D from the bottom of the suction tank. (D=Diameter of suction pipe).
10. When employing the suction lift method, install a foot valve on the suction pipe.
11. When using the flooded suction method, it is recommended that a gate valve be installed on the suction pipe for easier overhaul inspection of the pump. Since this valve is used only in the overhaul inspection of the pump, keep it fully opened during normal pump operation.
12. Pay close attention to the lowest level of the liquid in the suction tank to avoid vortexing, air entrapment and associated suction piping concerns.
    The inflow pipe into the suction tank should be distanced from the suction pipe and positioned below the liquid surface as a means of preventing air entrapment to the suction pipe. If air bubbles are generated in the suction tank, install a baffle.
13. It is recommended that a vacuum/pressure gauge be installed on the suction piping approximately 6 pipe diameters from the pump suction port.

Discharge Piping

1. Use proper pipe supports so that the weight of the piping does not load the pump nozzle.
2. If a method other than flooded suction is used, install a special pipe for priming.
3. If the piping is very long, its diameter should be determined by calculating the piping resistance. Otherwise, the specified performance may not be obtained due to increased piping resistance.
4. A check valve should be installed if any of the following conditions exists in the piping:
   · The discharge piping is very long.
   · The discharge head is 50 feet or more.
   · The end of the discharge pipe is located 30 feet higher than the surface of the suction tank.
   · Several pumps are connected in parallel with the same piping.
5. The installation of a gate valve on the discharge pipe is recommended for the adjustment of discharge quantity and for the prevention of motor overload. When installing both a check valve and a gate valve, the check valve should be positioned between the pump and the gate valve.
6. A pressure gauge must be installed on the discharge piping, prior to the gate valve.
7. An air bleeding valve should be installed if the discharge pipe is very long in the horizontal direction.
8. A drain valve should be installed for the drainage of liquid if there is a chance that the liquid in the discharge pipe will freeze.

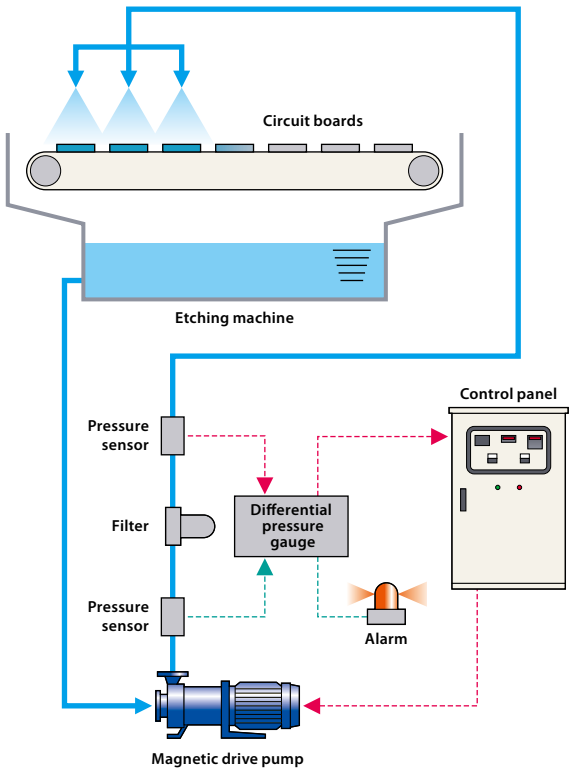


Magnetic Drive Pumps Applications

Pump Control System Examples

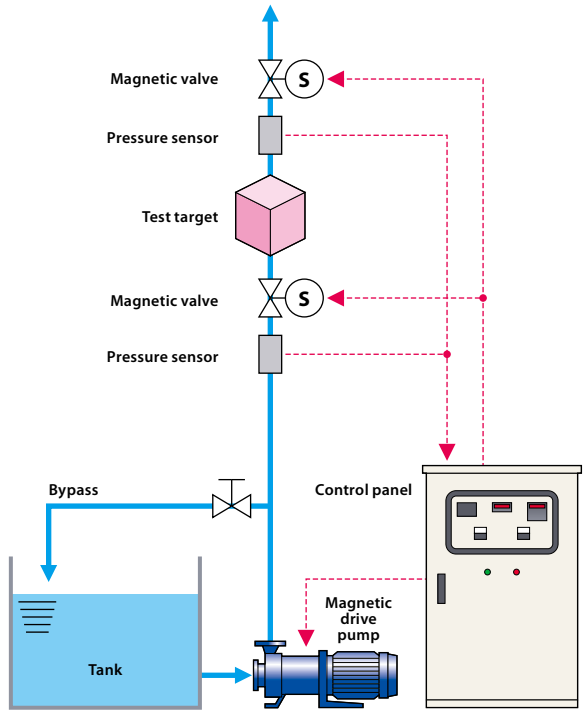
Etching system

- Maintains a constant spray pressure by controlling the pump discharge pressure



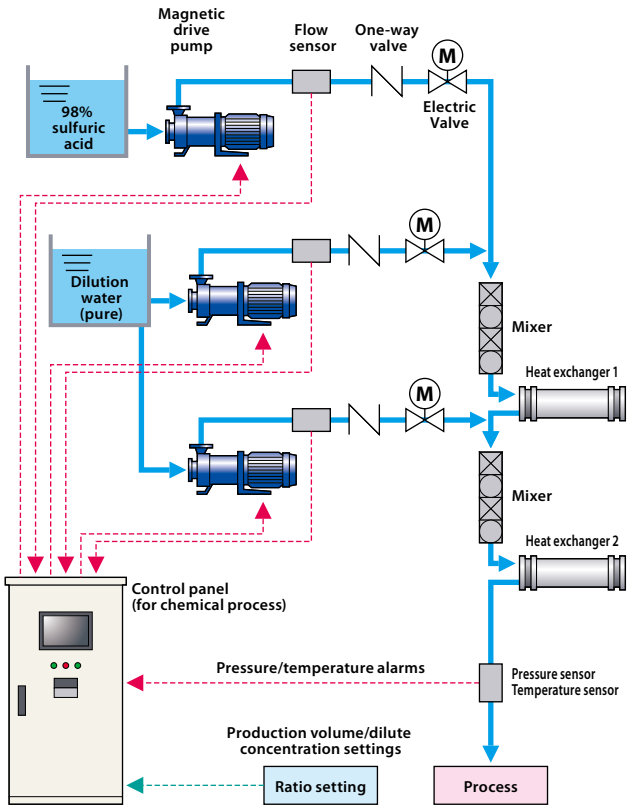
Pressure test/pressure control system

- Serves as a pressure test device for pipes, valves, and containers; controls the water pressure applied to the test target
- Provides fast response time and excellent stability by using PFC to control the pressure

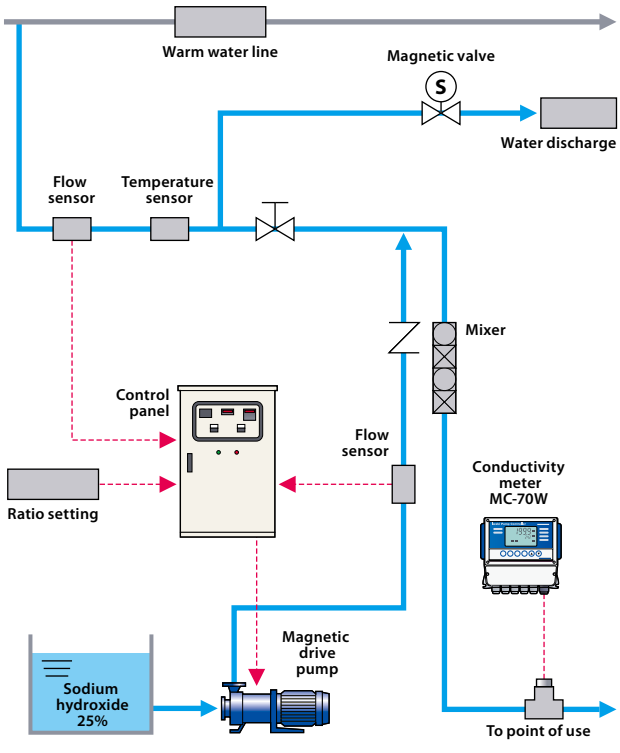


Blending System Examples

System for diluting sulfuric acid



System for diluting sodium hydroxide



Optional Accessories

DR

• Iwaki dry run protection
DR series

The DR series is a dry run protection device that monitors the electric current of the motor. This device will automatically stop the pump when the motor's current draw fall below a set lower limit, runs dry or is overloaded.

- Displays current set value
- Allow upper and lower current control settings
  Upper limit: Overload
  Lower limit: Dry running and cavitation
- Built-in current transformer
- DIN rail mounting

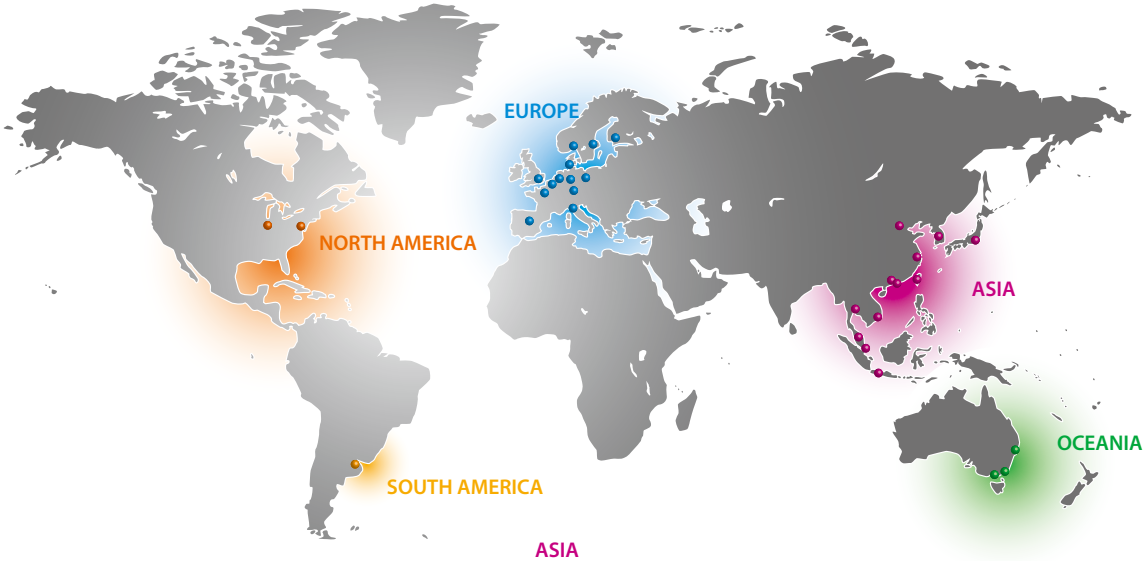
DR-10

Model		DR-10, DR-20		DR-11, DR-21	
Motor power		200 to 240V 3-phase	380 to 440V 3-phase	200 to 240V 3-phase	380 to 440V 3-phase
Applied motor		0.4 to 7.5kW	0.75 to 15kW	11 to 37kW	18.5 to 75kW
Control power		100V to 240V single-phase			
Power	V	DR-10/11: 100V ±10% single-phase, DR-20/21: 200 to 240V ±10% single-phase			
	Input	3.5W			
Detective current		0.5 to 32A		20 to 200A	
Current transformer (CT)		Built-in		Separate	
Dimension		D80×W153×H122			

• Motor output depends on the motor specification. A Both the DR and an inverter cannot be used in the same system.

Current transformer (CT)

IWAKI World-wide Network



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