CAT-W 0015-06

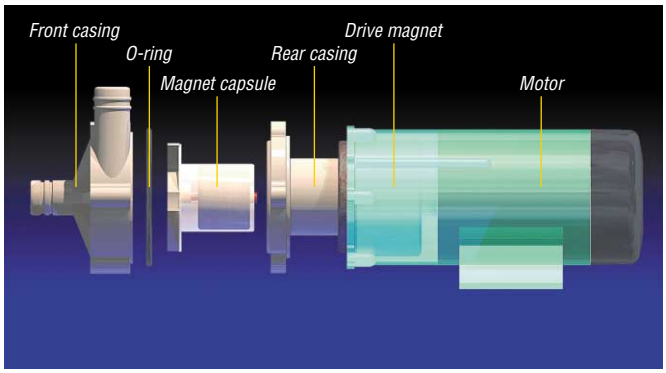
MD SERIES

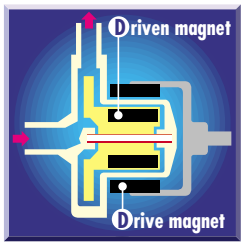
Iwaki magnetic drive pumps

advanced pump technology

MD series, the world best-selling pumps

The MD series features small, high-performance magnetic drive pumps with a leakproof structure that are in wide use in more than 30 countries. The series is well known for its corrosion resistance and durability provided by its corrosion-resistant materials. In particular, E-TFE material type as its primary material, is specifically designed for highly corrosive fluids and can be used to pump virtually all chemicals, with only a few exceptions. The MD series can transfer nearly all chemicals safely, and is suitable for OEM photo processer and other equipments.





Operating Principle

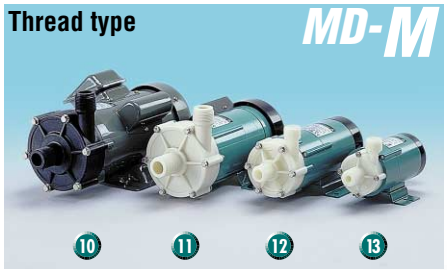
The centrifugal pump is driven by a pair of magnets which are incorporated in the impeller and motor shaft. The sealless pump structure eliminates shaft seals such as conventional mechanical seals because the pump chamber is shielded by the casings and the impeller is operated by the magnets. The combined coupling torque of the drive magnet and impeller magnet gives sufficient driving power against the motor torque.

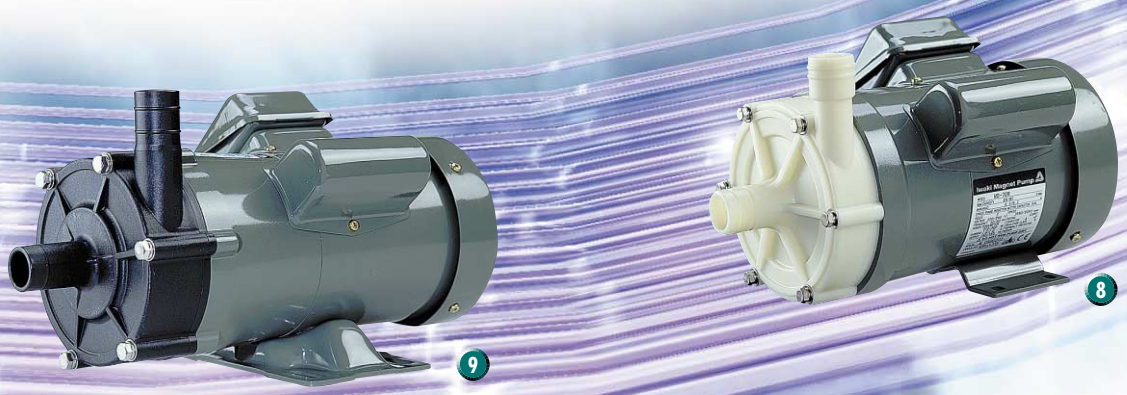
No leakage

The magnetically driven sealless pump prevents corrosion caused by fluid leakage through the pump assembly, which means contamination around the pump is prevented without seal replacement. Therefore, it is most suitable for incorporation in the equipment.

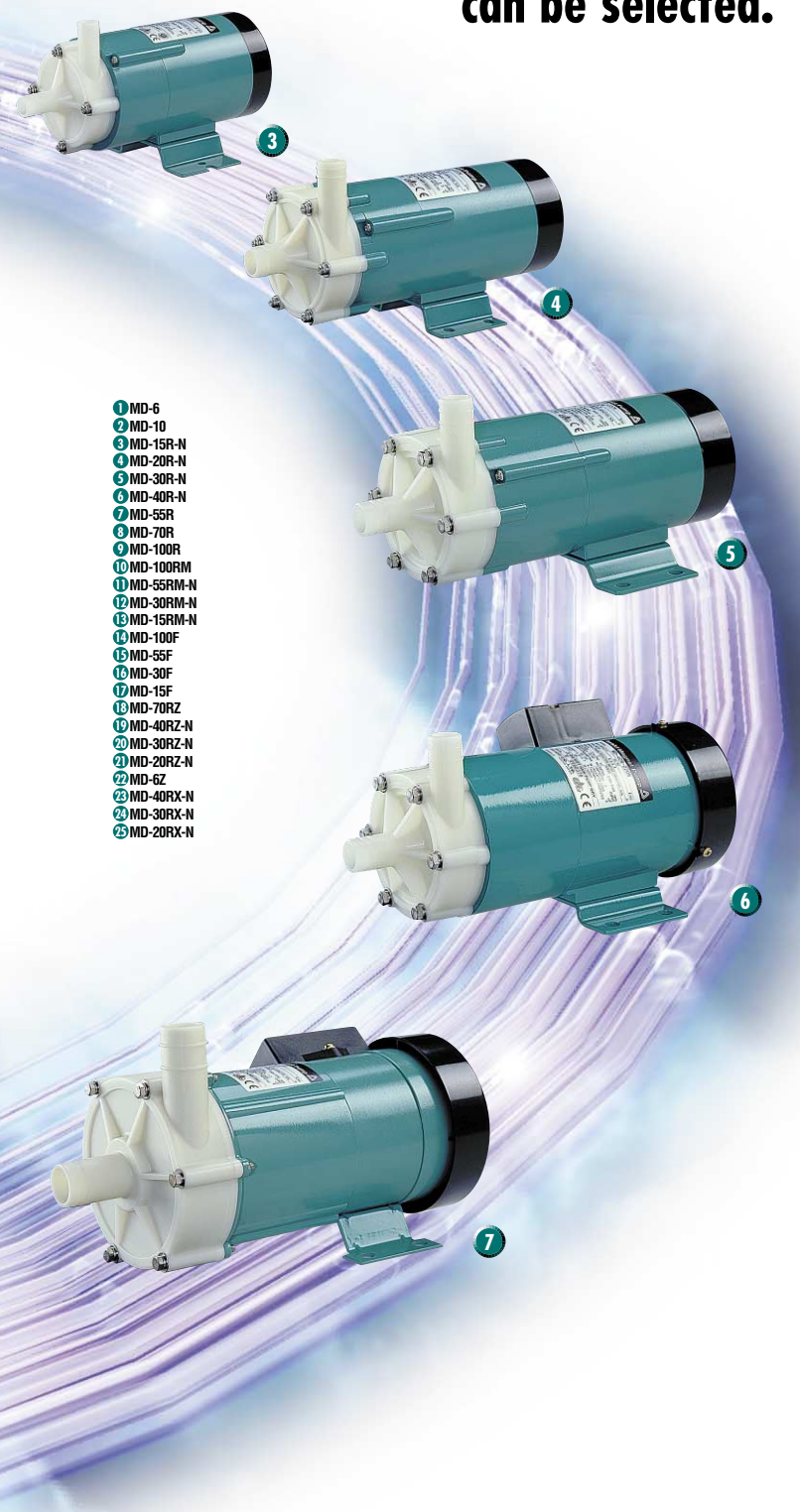
Good durability

As special-purpose design to handle highly corrosive fluids, corrosion resistant E-TFE and SiC are used for the main part of the MD-F pump. It can be used to pump almost all chemical fluids. Also, MD and MD-M, made of polypropylene, have also good corrosion resistance.





A variety of models from 5L/min to 130L/min can be selected.



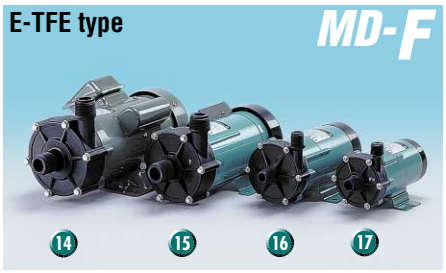
1 MD-6
2 MD-10
3 MD-15R-N
4 MD-20R-N
5 MD-30R-N
6 MD-40R-N
7 MD-55R
8 MD-70R
9 MD-100R
10 MD-100RM
11 MD-55RM-N
12 MD-30RM-N
13 MD-15RM-N
14 MD-100F
15 MD-55F
16 MD-30F
17 MD-15F
18 MD-70RZ
19 MD-40RZ-N
20 MD-30RZ-N
21 MD-20RZ-N
22 MD-6Z
23 MD-40RX-N
24 MD-30RX-N
25 MD-20RX-N

Various models

The MD series can be selected for every application because about forty models from maximum flow of 5L/min till 130 L/min are available.

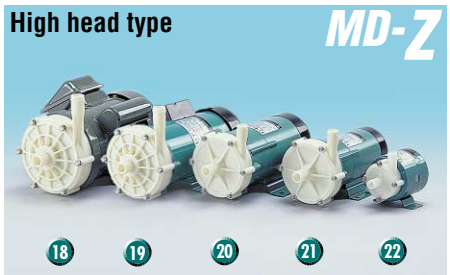
Applicable to high density acids

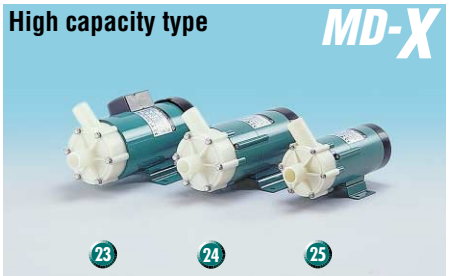
The MD-F is designed for pumping strong acids. Three sizes of impeller are available according to the liquid specific gravity and power frequency. It can be used for high density strong acids such as concentrated sulphuric acid without overload.



High efficiency, economical type

Special-purpose high head and high capacity models are available respectively for such services as low flow and high head or low head and high flow. Selection of an economical model may be possible depending on duty point.

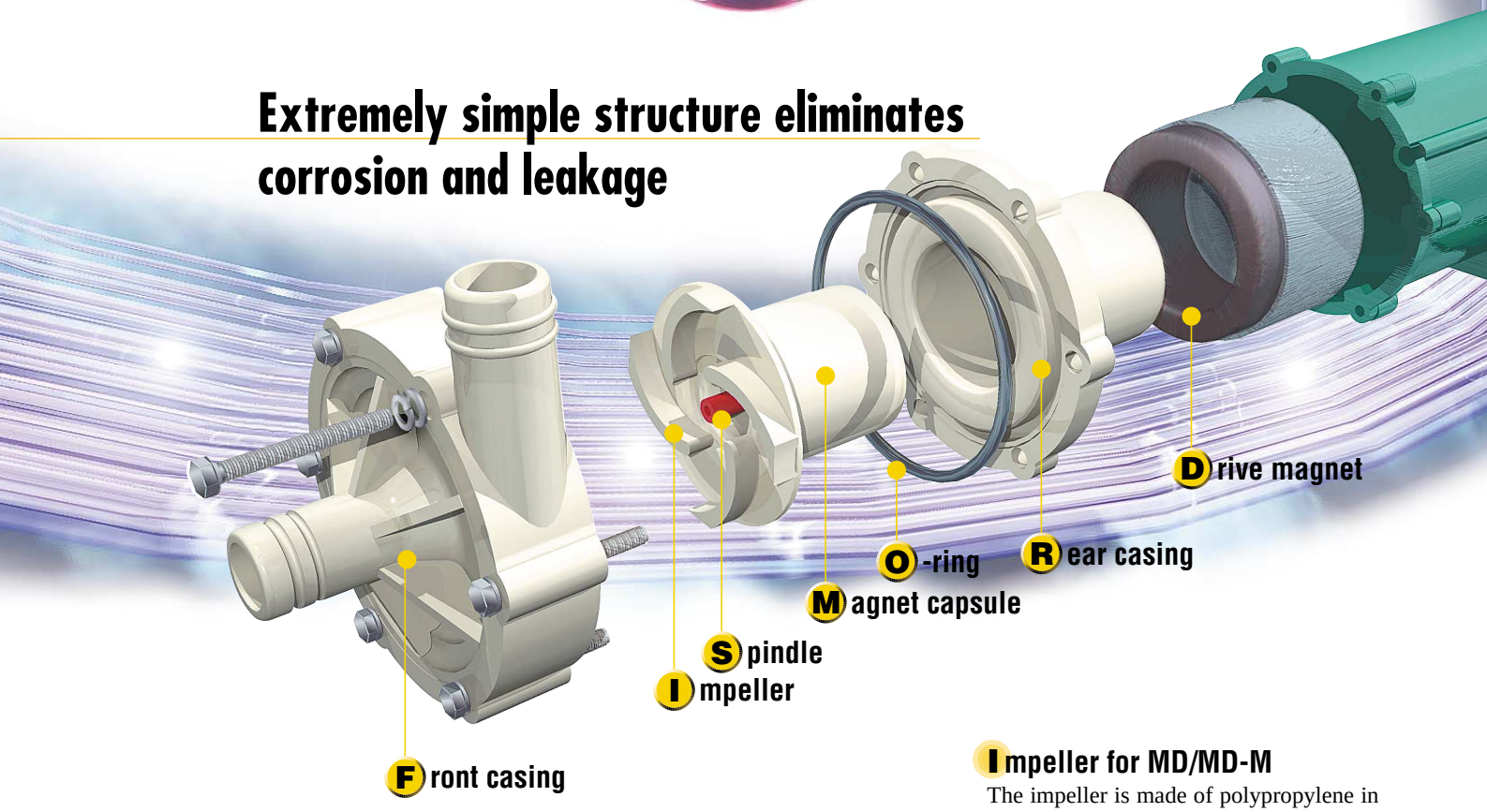




Ease of operation and maintenance

The pump assemble consists of only a few unitized simple parts. Therefore, maintenance, disassembly and inspection are very easy to perform.

Extremely simple structure eliminates corrosion and leakage



Front casing for MD (hose connected type)

To increase mechanical strength, polypropylene is formed by integral moulding with a filler. PTFE bearing is provided in the centre of the casing (except Models MD-6 through MD-10). This type features ease of connection with flexible PVC hose.

Front casing for standard type | Front casing for high head type | Front casing for high capacity type

Front casing for MD-M (Thread type)

3/4" and 1" thread connections are used. Reliability is further improved by adoption of a union joint. Piping can be done neatly when the casing is incorporated in the system.

Front casing for thread type

Front casing for MD-F (E-TFE type)

The front casing is moulded of carbonfibrefilled E-TFE which has high corrosion resistance. Applications are further extended to acids, alkalis and organic solvents by integral moulding with an SiC bearing. Taper thread connection with a PTFE tubing connector available on the market.

Front casing for E-TFE type

Impeller for MD/MD-M

The impeller is made of polypropylene in which a ferrite magnet is incorporated. A spindle is integrated (except MD-6 through MD-10). Open, closed, and semi closed impeller pumps are available to meet the performance and characteristics required.

Impeller for standard type

Impeller for high capacity type

Impeller for high head type

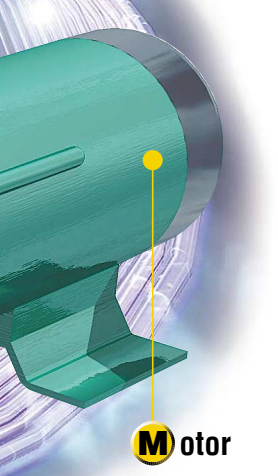
Special accessories

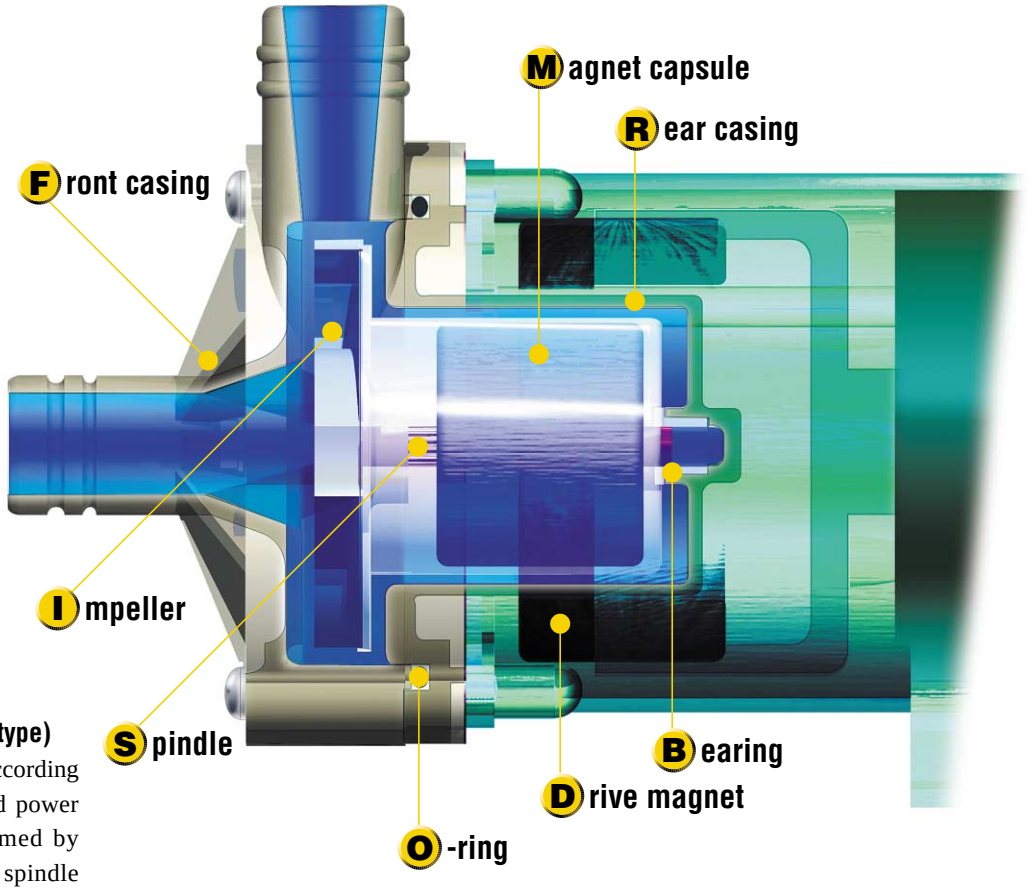
Special-purpose union joints are available to cope with three types (13mm, 16mm and 20mm dia.) of PVC piping. Tight sealing O-rings are used to prevent thread damage caused by over tightening.

MD-30RM-N

Construction and materials

Illustrations show MD-30R-N





Impeller for MD-F (E-TFE type)

There are three standard sizes according to the liquid specific gravity and power frequency. The impeller is formed by integral moulding with the SiC spindle and thrust ring incorporated. Although compact, the pumps can perform pumping of strong acids such as hydrofluoric acid and concentrated sulphuric acid.


Impeller for E-TFE type

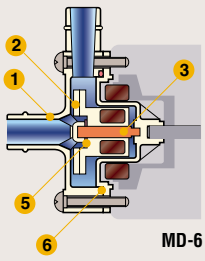
Drive magnet

The drive magnet is magnetized barium ferrite for 4-, 6-, or 8-poles.
It rotates the impeller by using the magnetic field from the outside of the rear casing.

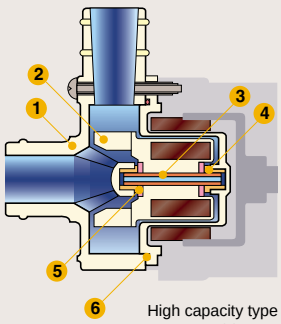
Motor

To ensure long service life, ball bearings are adopted. Single-phase motors are used for all the models. Also, three-phase motors can be used for Model MD-70R or over. The single-phase motors have a built-in thermal protector.

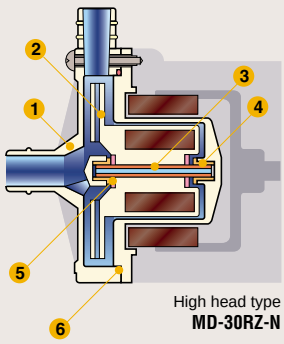
Wet-end materials



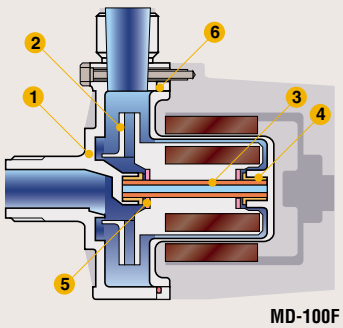
MD-6



High capacity type
MD-20RX-N



High head type
MD-30RZ-N



MD-100F

MD/MD-M Materials

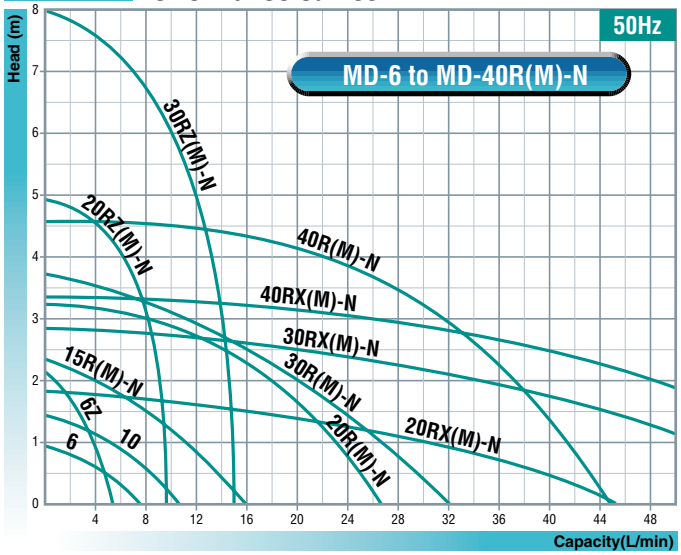
	Part	Material
1	Casing	GFRPP
2	Impeller	GFRPP or CFRPP
3	Spindle	Alumina ceramic
4	Bearing	PTFE ⋆
5	Thrust ring	Alumina ceramic or PE
6	O-ring	FKM or EPDM

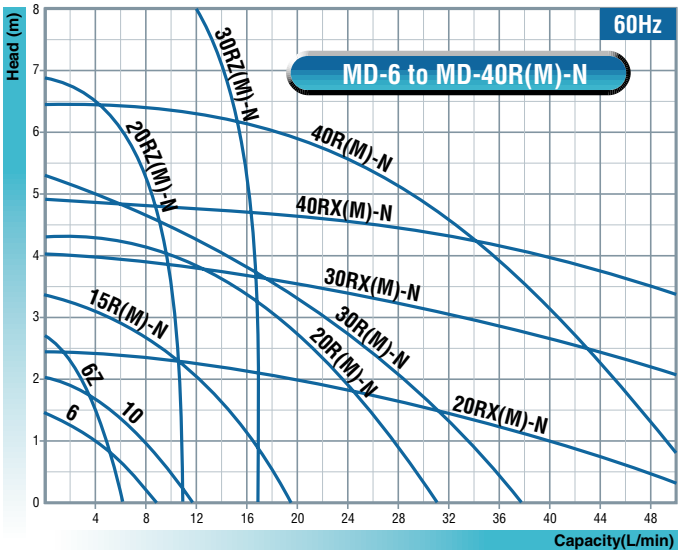
⋆PPS for MD-70RZ, 40RZ

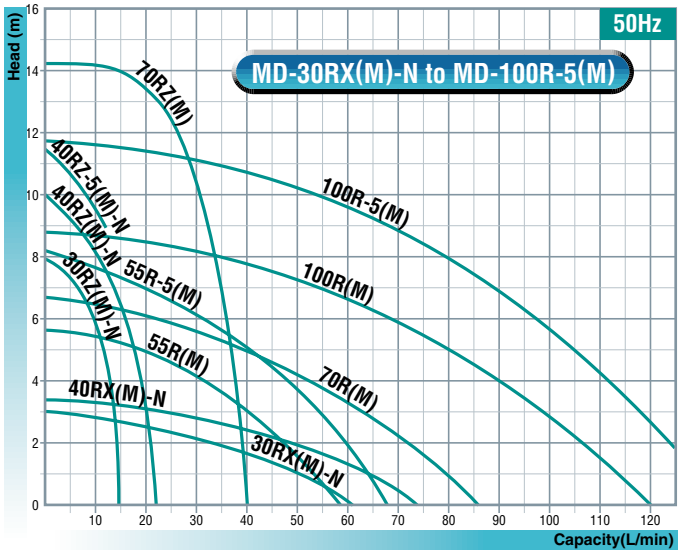
MD-F Materials

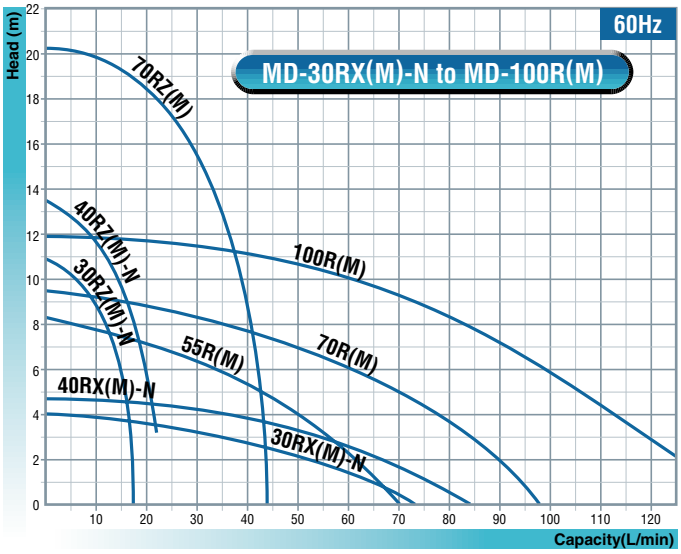
	Part	Material
1	Casing	CFRETFE
2	Impeller	CFRETFE
3	Spindle	Silicon carbide
4	Bearing	Silicon carbide
5	Thrust ring	Silicon carbide
6	O-ring	FKM (fluoroelastomer)

MD/MD-M Performance curves









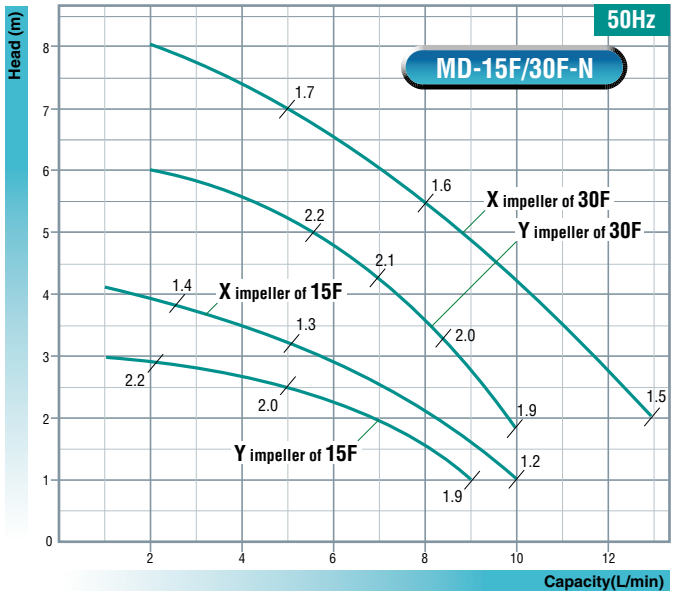
MD/MD-M Specifications

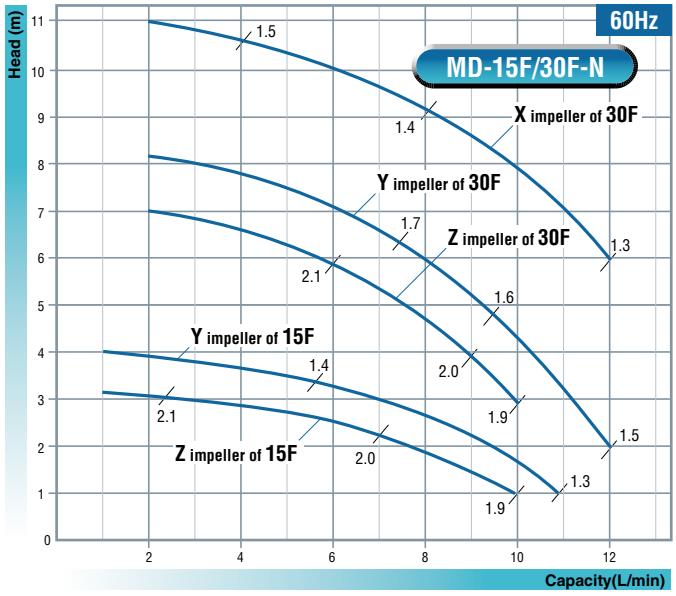
50Hz/60Hz

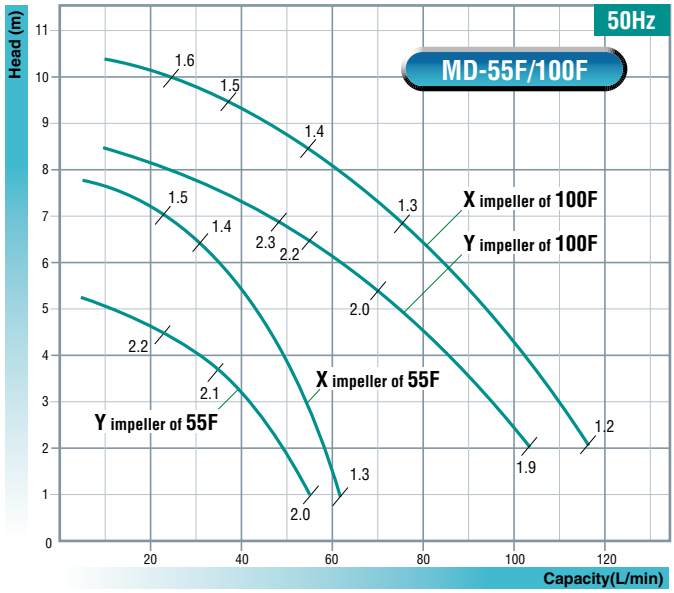
Model	Hose connected		Screwed connected		Max. Capacity L/min	Max. Head m	Standard duty point m-L/min	Temp.limit	S.G.＊	Motor		
	Inlet	Outlet	Inlet/Outlet	Union						Output W	Input W	Phase
MD-6	14mm	14mm	-	-	8/9	1/1.4	0.8-2.8/0.8-5.0	0 to 80℃	1.2	3/3	22/22	1
MD-6Z	14mm	14mm	-	-	5.5/6.0	2.1/2.7	1.5-3.2/1.5-4.5	0 to 80℃	1.1	3/3	24/23	1
MD-10	14mm	14mm	-	-	11/12	1.5/2.1	1-5/1-8	0 to 75℃	1.1	6/6	35/35	1
MD-15R(M)-N	14mm	14mm	G 3/4 inch	13mm	16/19	2.4/3.4	1.5-8/1.5-12	0 to 80℃	1.3	10/10	26/31	1
MD-20R(M)-N	18mm	17mm	G 3/4 inch	16mm	27/31	3.1/4.3	2-17/2-22	0 to 80℃	1.1	20/20	40/50	1
MD-20RX(M)-N	26mm	26mm	G 1 inch	20mm	46/52	1.8/2.5	1-30/1-40	0 to 80℃	1.3	20/20	40/50	1
MD-20RZ(M)-N	18mm	18mm	G 3/4 inch	13mm	10/11	4.9/6.9	4-6/4-9	0 to 80℃	1.1	20/20	40/50	1
MD-30R(M)-N	20mm	20mm	G 3/4 inch	16mm	32/38	3.8/5.4	2.5-16/2.5-24	0 to 80℃	1.3	45/45	60/80	1
MD-30RX(M)-N	26mm	26mm	G 1 inch	20mm	62/72	2.9/4.1	2-32/2-46	0 to 80℃	1.1	45/45	70/90	1
MD-30RZ(M)-N	18mm	18mm	G 3/4 inch	13mm	15/17	8/11	6-10/6-14	0 to 80℃	1.0	45/45	70/90	1
MD-40R(M)-N	20mm	20mm	G 3/4 inch	16mm	45/52	4.6/6.5	4-22/4-34	0 to 80℃	1.1	65/65	90/130	1
MD-40RX(M)-N	26mm	26mm	G 1 inch	20mm	75/85	3.3/4.7	2-47/2-65	0 to 80℃	1.1	65/65	85/120	1
MD-40RZ(M)-N	22mm	22mm	G 3/4 inch	16mm	22/22	10/13.5	8-10/11-12	0 to 80℃	1.1	65/65	110/140	1
MD-40RZ-5(M)-N	22mm	22mm	G 3/4 inch	16mm	12/—	11.5/—	10-8/—	0 to 80℃	1.1	65/—	110/—	1
MD-55R(M)	26mm	26mm	G 1 inch	20mm	60/70	5.6/8.2	4-30/4-45	0 to 80℃	1.2	90/90	130/170	1
MD-55R-5(M)	26mm	26mm	G 1 inch	20mm	70/—	8.2/—	4-45/—	0 to 80℃	1.2	90/—	170/—	1
MD-70R(M)	26mm	26mm	G 1 inch	20mm	86/97	6.7/9.7	4-50/4-72	0 to 80℃	1.0	150/180	265/365	1 or 3
MD-70RZ(M)	20mm	20mm	G 3/4 inch	16mm	40/43	14.3/20.3	12-24/17-25	0 to 80℃	1.0	180/216	275/395	1 or 3
MD-100R(M)	26mm	26mm	G 1 inch	20mm	120/135	8.6/11.9	6.5-60/9-70	0 to 80℃	1.2	260/265	245/365	1 or 3
MD-100R-5(M)	26mm	26mm	G 1 inch	20mm	135/—	11.7/—	9-60/—	0 to 80℃	1.1	260/—	365/—	1 or 3

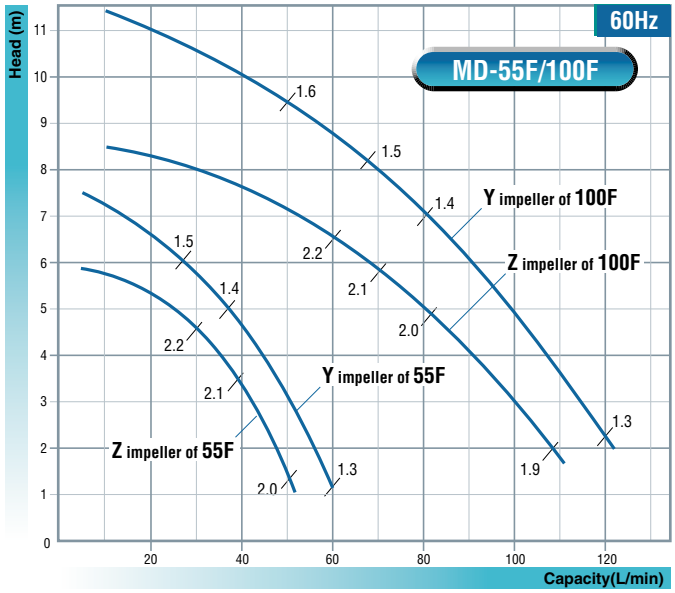
＊Limit of specific gravity shows at the maximum flow and viscosity of fluid 1 mPa•s. Note : Motor input shows when pumping clear water.

MD-F Performance curves









MD-F Specifications

50Hz/60Hz

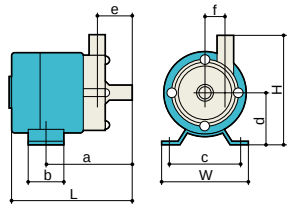
Model	Type of Impeller	Hose connected Inlet • Outlet	Max. Capacity L/min	Max. Head m	Standard duty point m-L/min	Temp.limit	S.G. Note1	Motor		
								Output W	Input W	Phase
MD-15F-N	X	NPT1/2 inch	10/—	4.1/—	3-5/—	0 to 80°C	1.2/—	10/—	38/—	1
	Y	NPT1/2 inch	9/11	3/4	2-5/3-7	0 to 80°C	1.9/1.3	10/10	30/34	1
	Z	NPT1/2 inch	—/10	—/3.1	—/2.5-6	0 to 80°C	—/1.9	—/10	—/31	1
MD-30F-N	X	NPT1/2 inch	13/15	8/11	5.5-8/8.5-9.5	0 to 80°C	1.5/1.3	45/45	70/90	1
	Y	NPT1/2 inch	10/12	6/8	4.5-6.5/6-8	0 to 80°C	1.9/1.5	45/45	70/90	1
	Z	NPT1/2 inch	—/11	—/7	—/5.5-7	0 to 80°C	—/1.9	—/45	—/90	1
MD-55F	X	R1 inch	65/—	7.8/—	6.4-30/—	0 to 80°C	1.3/—	90/—	170/—	1
	Y	R1 inch	60/65	5.4/7.8	3.8-30/6.4-32	0 to 80°C	2.0/1.3	90/90	130/170	1
	Z	R1 inch	—/55	—/6.0	—/4.5-25	0 to 80°C	—/2.0	—/90	—/130	1
MD-100F	X	R1 inch	125/—	10.5/—	7.5-65/—	0 to 80°C	1.2/—	260/—	350/—	1 or 3
	Y	R1 inch	115/135	8.5/11.5	6-60/8-70	0 to 80°C	2.0/1.3	260/265	260/375	1 or 3
	Z	R1 inch	—/115	—/8.5	—/6.5-55	0 to 80°C	—/1.9	—/265	—/285	1 or 3

Note1 : Limit of specific gravity shows at the maximum flow and viscosity of fluid 1 mPa•s. Note : Motor input shows when pumping clear water.

MD/MD-M Dimensions

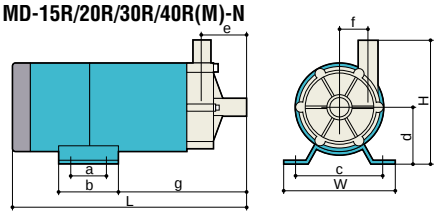
in mm

MD-6/6Z/10



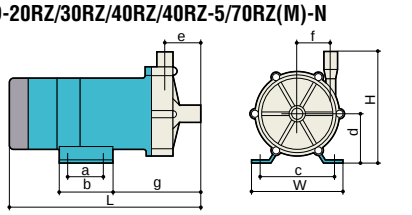
Model	W	H	L	a	b	c	d	e	f
MD-6	74	92	104	73	30	60	45	31	17
MD-6Z	74	92	104	73	30	60	45	31	17
MD-10	74	92	104	73	30	60	45	31	17

MD-15R/20R/30R/40R(M)-N



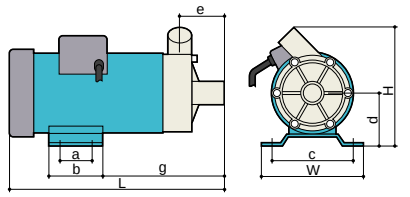
Model	W	H	L	a	b	c	d	e	f	g
MD-15R(M)-N	95	109 (114)	179.5 (179)	-	50	68	55	39 (38.5)	21.5	92
MD-20R(M)-N	85	115 (115.3)	208.5 (203)	30	50	68	55	38.5 (33)	28.5	106.5 (101)
MD-30R(M)-N	120	130	248	40	64	100	60	48	31	137
MD-40R(M)-N	120	130	250	40	64	100	60	48	31	137

MD-20RZ/30RZ/40RZ/40RZ-5/70RZ(M)-N



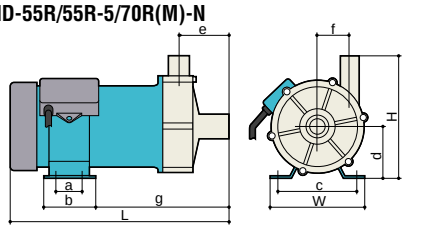
Model	W	H	L	a	b	c	d	e	f	g
MD-20RZ(M)-N	106	125	211	44	60	90	55	39.5	38.5	98
MD-30RZ(M)-N	120	130	230	40	64	100	60	39.5	38.5	120
MD-40RZ(M)-N	120	150	241	40	64	100	60	38.5	44.5	128
MD-40RZ-5(M)-N	120	150	241	40	64	100	60	38.5	44.5	128
MD-70RZ(M)	130	165	247	40	60	110	65	42	47.5	138

MD-20RX/30RX/40RX(M)-N



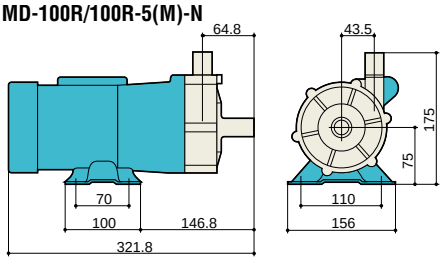
Model	W	H	L	a	b	c	d	e	g
MD-20RX(M)-N	106	119 (122)	220	44	60	90	45	46.5	105
MD-30RX(M)-N	120	137 (140)	254	40	64	100	60	50	143
MD-40RX(M)-N	120	137 (140.4)	256	40	64	100	60	50	143

MD-55R/55R-5/70R(M)-N



Model	W	H	L	a	b	c	d	e	f	g
MD-55R(M)	120	155	273.5	40	64	100	65	61.5 (60.8)	40	166.7 (165.8)
MD-55R-5(M)	120	155	273.5	40	64	100	65	61.5 (60.8)	40	167.5 (165.8)
MD-70R(M)	130	155	258	40	60	110	65	53	43	149

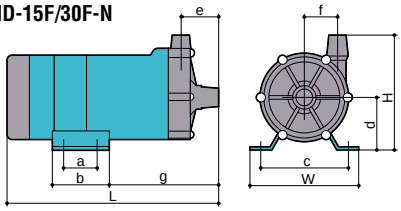
MD-100R/100R-5(M)-N



MD-F Dimensions

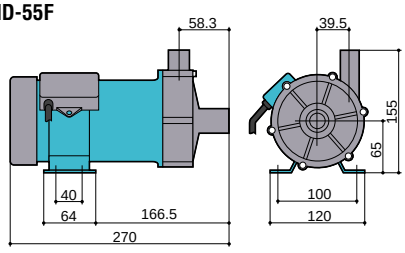
in mm

MD-15F/30F-N

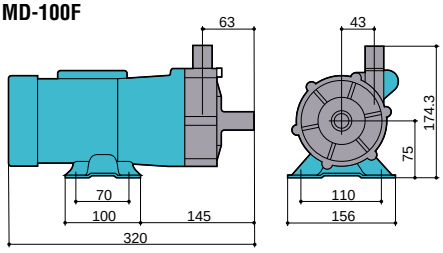


Model	W	H	L	a	b	c	d	e	f	g
MD-15F-N	95	120	186	-	50	68	55	34	28.5	98.5
MD-30F-N	120	130	231	40	64	100	60	39	38.5	120

MD-55F



MD-100F



Some custom-made models of the MD series

Dual head models

The dual head model is rationally designed for double function such as transfer of two fluids. Two pumps are set on the double shaft motor so as to integrate the functions of two pumps.

Specifications 50Hz/60Hz

Model	Connections InletxOutlet	Max. Capacity L/min	Max. Head m	Motor		
				Output	Input	Phase
2MD-6	14mmx14mm	8/9x2	1.0/1.3	6W	40W	1
2MD-15R-N	18mmx18mm	20/23x2	1.9/2.5	20W	42W	1
2MD-20R-N	18mmx18mm	27/31x2	3.1/4.3	45W	65W	1

Self-priming chamber

Self-priming chamber is available for model MD-30RM-N, 40RM-N, 70RM. Once fill up liquid, repriming is not required. It is very easy to use MD pump with self-priming chamber.

Specifications

Model	Connections		Suction lift m	Chamber capacity L	Attached to
	Inlet(Tank side)	Outlet(Pump side)			
SC-4	G3/4	G3/4	0.8	0.8	MD-30RM-N, MD-40RM-N
SC-7	G1	G1	1.2	1.3	MD-70RM