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IWAKI

Magnetic drive pumps

MDE series

The world's largest-class non-metalic magnetic drive pumps for chemical processing

The MDE Series comprises the world's largest-class non-metalic magnetic drive pumps for chemical processing, with a maximum delivery of 4.0m^3/min. and a maximum head of over 50 meters. The liquid end parts, plastics are made of advanced corrosion-resistant materials such as fluororesins and fine ceramic, and the major fluoroplastic-made parts are reinforced with special metal inserts for added mechanical strength and durability. These pumps have a maximum casing-pressure resistance of 1.6 MPa and a maximum operating temperature of 120˚C.

Note: The maximum casing-pressure resistance and maximum operating temperature vary by pump model. For details, please refer to the common specifications on page 6.

Strong corrosion resistance

Fluoroplastic and fine ceramic are used in the liquid end parts. These materials enable strong acids, strong alkalines, and virtually all chemical solutions to be handled. Type PFA in particular is capable of handling high-purity chemicals and high-temperature liquids (Max. 120˚C).

High levels of durability

The exterior of the pumps is covered with ductile cast iron (FCD450). Ample pressure resistance has been provided in the rear casing through the adoption of a unique shape that prevents the concentration of stress, and a dual structure reinforced with an FRP cover. In addition, the spindle and magnet capsule, which are subject to the repetitive stress of rotational vibration, are made of fluororesin with special metal inserts. These are thus built to withstand sustained operation over an extended period under harsh service conditions.

Compliant with standards ISO

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

Note: Model MDE 125-250 is excluded.

Back pullout construction

The pumps have back pullout construction, enabling their internals to be inspected or their component parts to be replaced without disconnecting associated piping. Moreover, the simplified construction consisting of unit components makes maintenance and inspection easy.

MDE50

Examples of applications

• CHEMICALS

Soda industry (manufacture of hydrochloric and hypochlorous acids, as well as their secondary products), manufacture of hydrofluoric acids and fluorides, manufacture of chemical fertilizers, circulation of reaction liquid in gas-absorption towers, oil refining (sulfuric acid), use in waste-acid recovery and regeneration facilities, and transfer and supply of strong acids to tank trucks at general chemical plants

• PHARMACEUTICALS

Manufacture of high purity chemicals for semiconductors, manufacture of agricultural chemicals, use in factories for the synthes is of medicine, and manufacture of chemicals for water treatment

• PLATING

Recycle filtration of plating liquid for various plating systems

• ELECTRICAL APPLIANCES

Manufacture of electrolytic capacitors (etching of aluminum film), hydrofluoric-acid treatment of braun tubes, transfer of electrolytic liquid for storage batteries and dry cells, etching of printed wiring boards, and transfer of pure chemicals for semiconductors

• METAL INDUSTRY

Use in alumite treatment facilities, degreasing and pickling at wire elongation plants and steel-rolling mills, use in facilities for the prepainting treatment of vehicles (degreasing and acid washing), and use in factories for the manufacture of titanium oxide, rare-earth elements, etc.

• MINING

Metal smelting (transfer and circulation of electrolytic liquid) and scrubber treatment of waste gases

• FOOD INDUSTRY

Manufacture of monosodium glutamate (hydrochloric acid), refining of edible oils (sulfuric acid), and use in fruit-canning plants (hydrochloric acid)

• WATER TREATMENT

Washing of ion-exchange resins, and use in pure-water production facilities and salt-to-fresh brine distillation facilities

• POLLUTION CONTROL

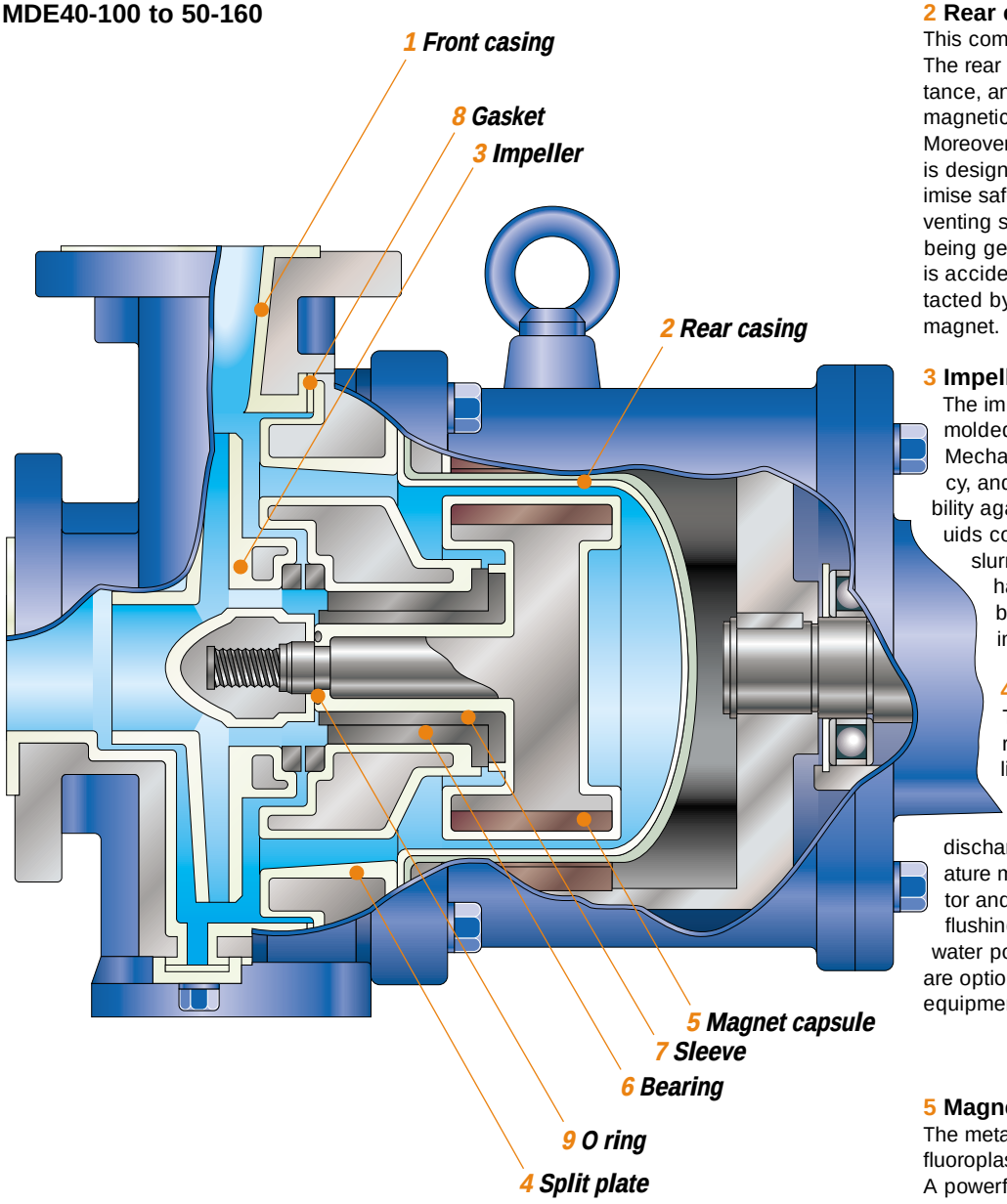
Charging of wastewater treatment chemicals into injection tanks, collection and transfer of waste liquid, and use in gas adsorption facilities (deodorization equipment, desulfurization of flue gas, etc.)

MDE65

MDE125

Construction and materials

MDE40-100 to 50-160



2 Rear casing

This component is made of fluoroplastic. The rear casing has high pressure resistance, and eddy currents caused by rotary magnetic fields have been eliminated. Moreover, the cover is designed to maximise safety by preventing sparks from being generated if it is accidentally contacted by the drive magnet.

3 Impeller

The impeller with integral shroud has a molded-in metal reinforcing insert. Mechanical strength, pumping efficiency, and durability against liquids containing slurries have all been improved over existing designs.


PFA type ETFE type

4 Split plate

This has a back-flow port configuration for the forced circulation of liquid through the pump (PAT.). It is effective in cooling bearings, performing lubrication, and discharging slurries. A bearing temperature monitor and flushing water port are optional equipment.


PFA type ETFE type

5 Magnet capsule

The metal shaft has a hermeticary molded fluoroplastic cover. A powerful rare-earth magnet that produces a high magnetic torque and provides good thermal shock resistance is used.

6 Bearing / 7 Sleeve

Materials for the bearing and the sleeve have been standardised and the most suitable for the liquid to be handled can be selected.

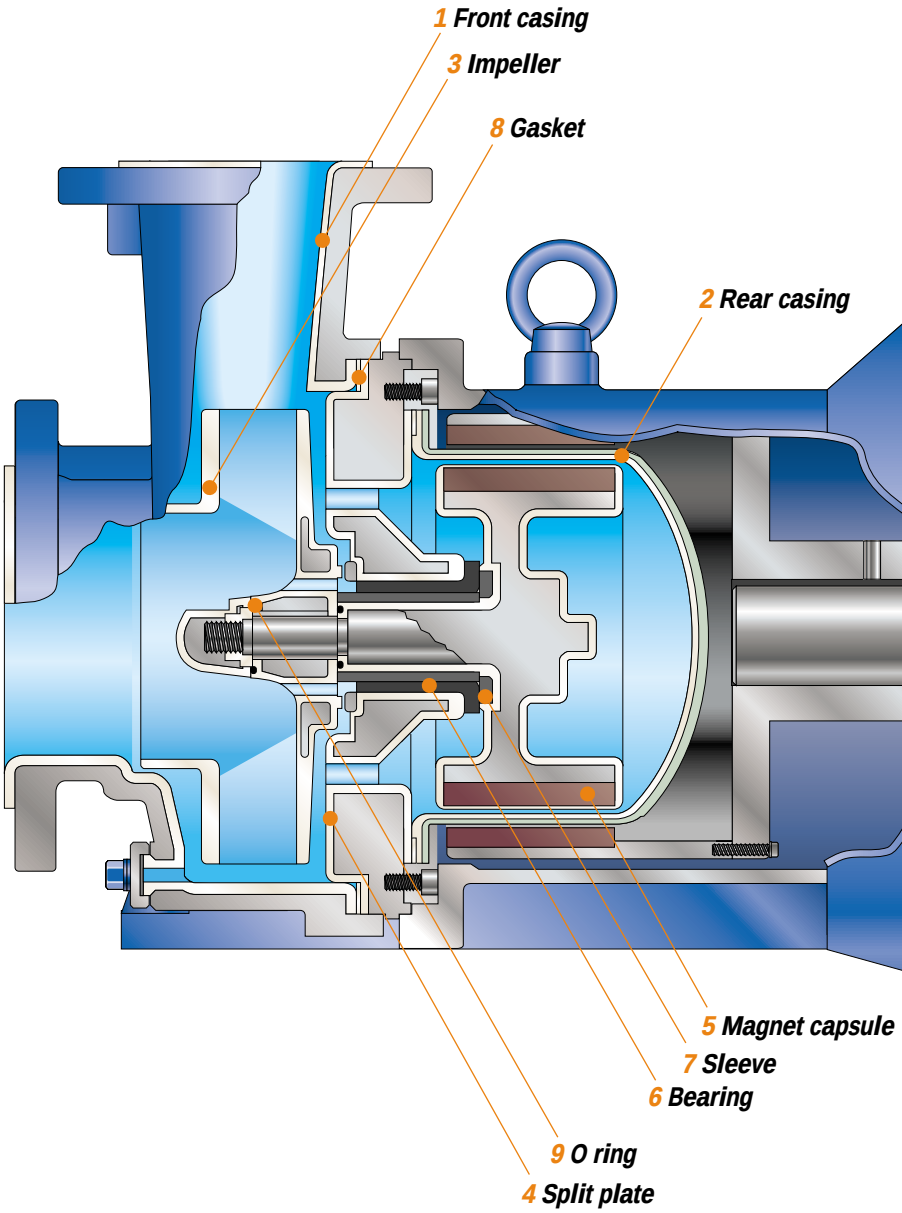
Liquid end materials of the models MDE40-100 to 50-160

	Part name	Material
1	Front casing	ETFE/PFA Note 1
2	Rear casing	
3	Impeller	
4	Split plate	
5	Magnet capsule	
6	Bearing Note 2	SiC
7	Sleeve Note 3	SiC
8	Gasket	PTFE
9	O-Ring Note 4	Kalrez ®

Note 1: PVDF material is also available on request.
Note 2: PTFE is also available as option.
Note 3: High-purity alumina ceramic is also available as option.
Note 4: FKM/EPDM are also available on request.

Construction and materials

MDE50-200 to 125-250



2 Rear casing
The base of this component has a unique downed shape that prevents stress concentration. In addition, this component is reinforced with an FRP cover to provide the required pressure resistance. It is also designed to maximise safety by preventing sparks from being discharged if it is accidentally contacted by the drive magnet.

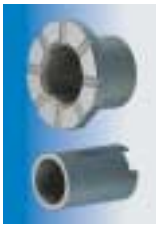
3 Impeller
The impeller with integral shroud has a molded-in metal reinforcing insert.

Mechanical strength and pumping efficiency have been improved over previous types.

4 Split plate
This is made of fluororesin with a molded-in ductile cast steel insert. Its sturdy construction supports the rotor assembly rigidly. Moreover, it has a back-flow port that is effective in cooling the bearing parts and discharging slurry (PAT.No.2116798).

5 Magnet capsule
The metal shaft and rare-earth magnet have a hermetically molded fluoroplastic cover. It has excellent durability and produces high torque.

6 Bearing / 7 Sleeve
The use of SIC for these parts maximises their abrasion resistance, impact resistance, and heat resistance. The sleeve system has been adopted to ease maintenance and replacement and reduce costs.

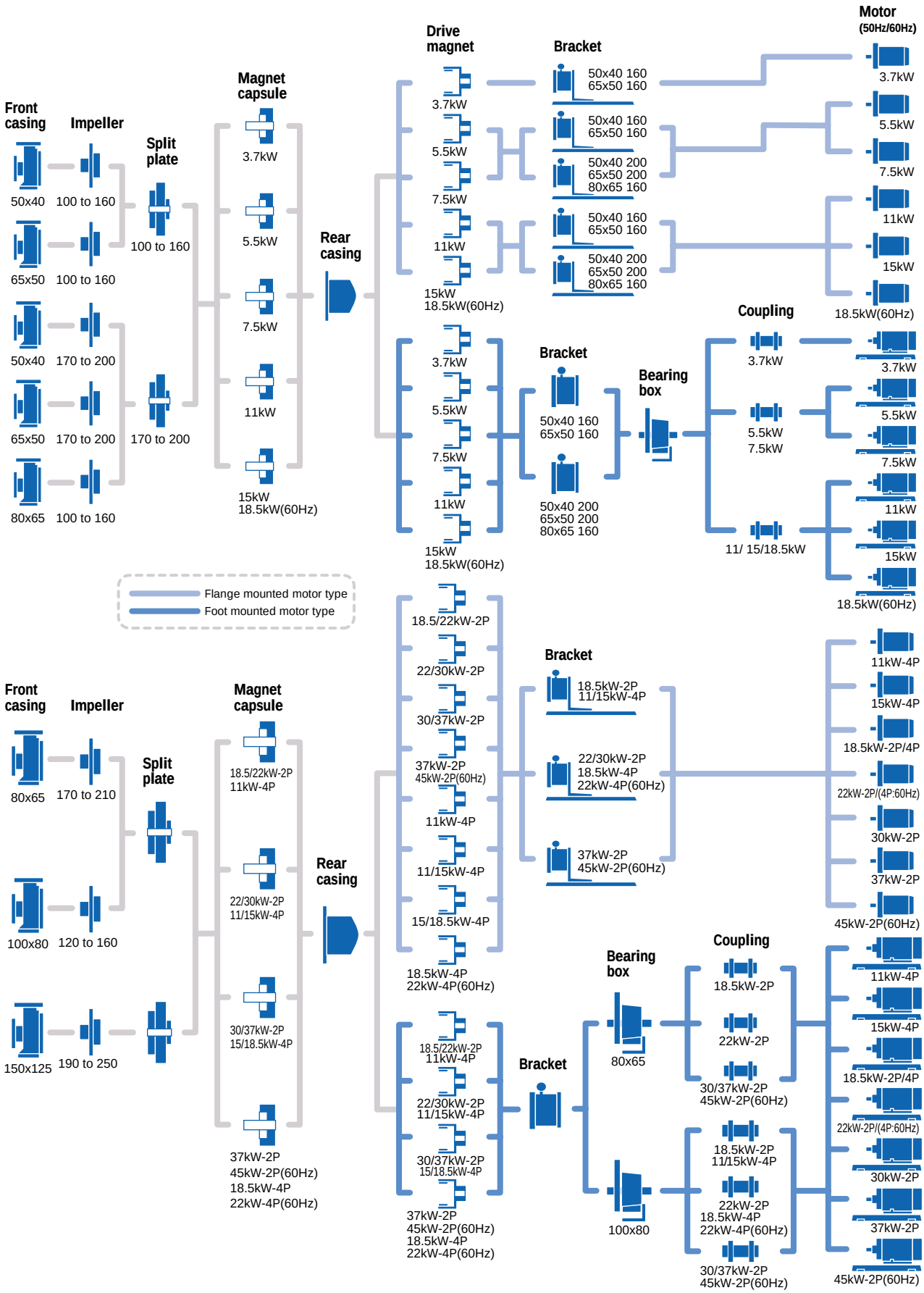


Liquid end materials of the models MDE50-200 to 125-250

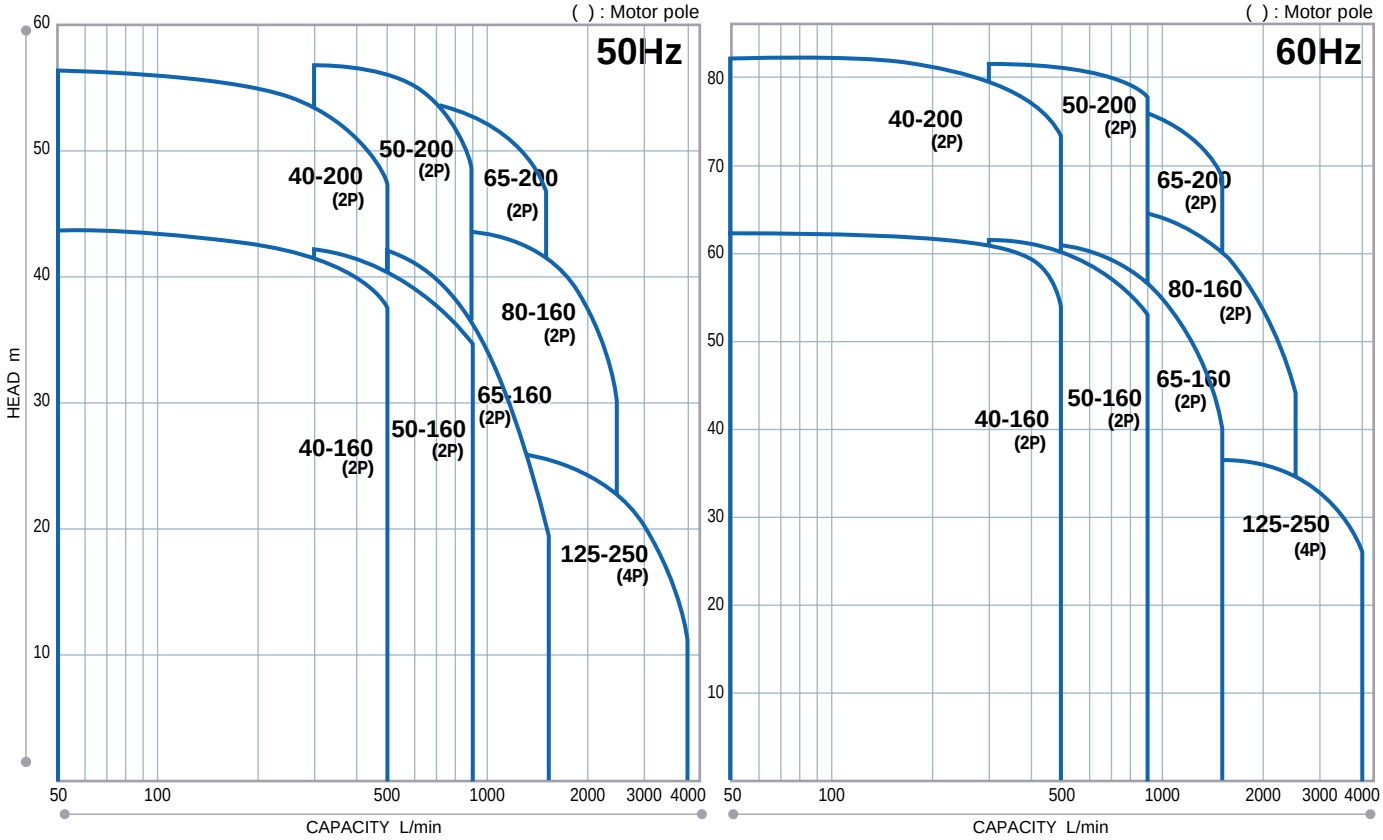
	Part name	Material
1	Front casing Note 1	ETFE
2	Rear casing	PFA
3	Impeller Note 1	CFRETFE
4	Split plate	PFA
5	Magnet capsule	
6	Bearing	SiC
7	Sleeve	
8	Gasket	PTFE
9	O-Ring Note 2	Kalrez®

Note 1: PFA is also available for MDE50-200 and MDE65-160 on special request.
Note 2: FKM/EPDM are also available on request.

Modular construction



Performance curves



Pump identification

MDE 40 - 160 E K V F 075 J - D 2 1 A
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)

1 Pump size	40, 50, 65, 80, 125	7 Motor output	037 to 450 : 3.7 to 45kW	10 Motor poles	2 : 2P 4 : 4P
2 Impeller size	100 to 250	8 Pump standard	J : JIS flange+JIS motor I : ISO flange+IEC motor A : ANSI flange	11 Option	No mark : Without option 1 : With leak sensor 2 : With bearing temperature monitor 3 : With bearing wear sensor 4 : With fushing circuit 5 : With inducer 9 : Multi-option setup
3 Wet-end main material	P : PFA, E : ETFE, V : PVDF	9 Special version	A : Without drain, without special arrangement S : Without drain, with some special arrangement D : With drain, without special arrangement X : With drain, with some special arrangement	12 Option IDs	A,B,C For details, please contact us.
4 Material of Sleeve/Bearing	K : SiC/SiC R : High-purity alumina ceramic/ PTFE				
5 Material of O-Ring	Z : Kalrez®, V : FKM E : EPDM				
6 Type of motor	C : Foot mounted type motor F : Flange mounted type motor				

Specifications

Models	Nominal bore size Inlet X Outlet	50Hz		60Hz	
		Capacity L/min	Head m	Capacity L/min	Head m
MDE40-160	50A X 40A	208	42.0	250	61.0
MDE40-200			55.0		81.0
MDE40-200(4P)		105	13.5	125	19.5
MDE50-160	65A X 50A	417	41.5	500	60.0
MDE50-200			56.0		81.0
MDE50-200(4P)		208	13.5	250	19.0

Models	Nominal bore size Inlet X Outlet	50Hz		60Hz	
		Capacity L/min	Head m	Capacity L/min	Head m
MDE65-160	80A X 65A	833	38.5	1000	55.0
MDE65-200			53.0		75.0
MDE80-160	100A X 80A	1670	38.0	2000	53.5
MDE125-250	150A X 125A	2400	22.5	2900	32.0

Common specifications

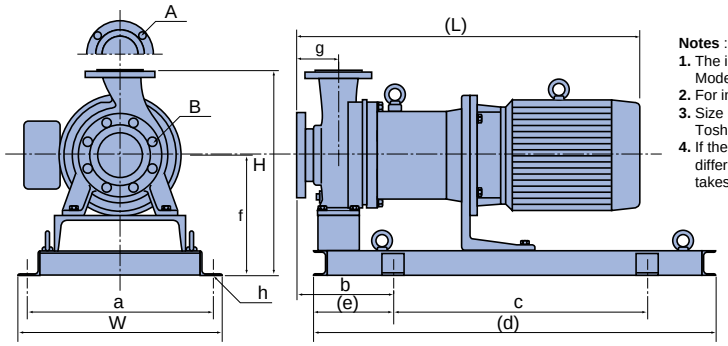
Models	MDE40-100 to 65-160	MDE65-200 to 125-250
Temperature range of liquid handled	ETFE type : 0 to 100˚C, PFA type : 0 to 120˚C	0 to 100˚C
Allowable slurry	For this information, please contact us.	
Pressure-limit Note1	1.0MPa	1.6MPa Note2 : 1.0 Mpa for model MDE125-200
Motor(Standard)	200/220V 50/60Hz Three-phase, Two-pole(four-pole) Totally enclosed, fan-cooled outdoor, flange-mounted type, or totally enclosed, fan-cooled, outdoor, foot-mounted type	

Note1 : The pressure-resistance limit decreases with liquids at temperatures over 100˚C. For details, please contact us.

Special options for models MDE40-100 to 50-160

• Leak sensor : If the rear casing is pierced, the sensor detects the leakage of liquid and stops the operation of the pump. • Bearing wear sensor : The sensor detects any abnormal motion of the drive magnet and stops the operation of the pump before it contacts the rear casing, thereby indicating that the bearings (ball bearings) need to the replaced. • Bearing temperature monitor : This monitor detects the temperature of the bearings and stop operation of the pump. • Flushing circuit : Using water injected from the outside, it forcibly discharges slurry from the interior of the rear casing. • Inducer : Installation of this inducer improves NPSHr (available only on Model MDE50-160).

Dimensions



Notes : Dimensions vary depending on motor installed.
1. The illustrations of left side are outline diagrams of Models MDE65-120 to 125-250.
2. For information on coupling joints, please contact us.
3. Size (L) is the size of the pump when it is coupled with a Toshiba totally enclosed, external-fan, outdoor-type motor.
4. If the dimensions given in the outline drawing of a pump differ from the dimensions given below, the outline drawing takes precedence.

in mm

Models	Motor kW	W	H	(L)	a	b	c	(d)	(e)	f	g	h	A	B	Mass kg
MDE40-160	3.7	400	410	658	350	150	540	800	130	250	80	4 - ø18	40A	50A	135
	5.5			724											165
	7.5														170
	11	480	480	878	430	170	600	900	150	320					240
	15														255
	18.5			922											275
MDE40-200	5.5	400	430	724	350	150	540	800	130	250					170
	7.5														180
	11	480	500	878	430	170	600	900	150	320					250
	15														260
	18.5			922											285
MDE50-160	3.7	400	410	658	350	150	540	800	130	250			50A	65A	135
	5.5			724											165
	7.5														175
	11	480	480	878	430	170	600	900	150	320					245
	15														255
	18.5			922											275
MDE50-200	5.5	400	430	744	350	170	540	800	130	250	100				170
	7.5														180
	11	480	500	898	430	190	600	900	150	320					250
	15														265
	18.5			942											285
MDE65-160	5.5	400	430	744	350	170	540	800	130	250			65A	80A	170
	7.5														180
	11	480	500	898	430	190	600	900	150	320					250
	15														265
	18.5			942											285
MDE65-200	18.5	610	555	994	550	275	740	1200	230	355		4 - ø27			320
	22			1023											355
	30			1061											445
	37			1119											515
	45														
MDE80-160	18.5			994		255							80A	100A	325
	22			1023											355
	30			1061											445
	37			1119											515
	45														
MDE125-250	11		645	994		280					140		125A	150A	350
	15			1038											355
	18.5			1063											410
	22														
	30			1101											470

Iwaki dry running protector DR series (Option)

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-20	DR-21
Motor power		200 to 440V	
Applied motor		0.4 to 7.5kW	11 to 37kW
Power 45-65Hz	V	200 to 240V ±10% single phase	
	Input	3.5W	
Detective current		0.0 to 32.0A	
Current transformar(CT)		Built-in	External
Current range	Auto	4.4/17.6/32A	0 to 200A
	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 H110	

DR-20

Current transformer 200AT(For DR-21)

- 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 (DR-20)
- DIN rail mounting