



AMCAL
INDUSTRIAL PUMP SOLUTIONS

Tweelindenstraat 13
8810 Lichtervelde

pompen@amcal.be
+32 51 72 44 72

Magnetic Drive Process Pump Resistant to Dry Run Damage



Magnetic Drive Pumps
MDM

The Heart of Industry

Magnetic Drive Process Pump Resistant to Dry Run Damage

The MDM Series of Magnetic drive process pumps have wet-end parts made of fluororesin. Natural PFA and CFRETFE being standard materials of construction. The MDM features a unique mechanism which gives a greatly improved performance against dry running (Non contact system). Applications cover a wide range of chemical process duties from acid to alkali together with high purity chemicals for the semiconductor industry.



ETFE and PFA Available In Standard Models

Carbon fibre reinforced CFRETFE and PFA linings can be supplied to meet many varying duties. PFA being a natural unfilled material generates fewer contaminants and makes it ideally suited for transfer of high purity chemicals.

Note1: Long coupling type is only PFA version.

Note2: MDM40-2 and MDM50-2 are only CFRETFE version.



Compliance with ISO Standards (ISO2858/DIN EN22858)

The pump with a common base complies with ISO Standards in regard to piping connection.

Note 1: For compatibility in size with other series of our magnet pumps, please call us.

Note2: ANSI and JIS standards are also available.

For details, please call us.



Highly Durable Structure

The low head (maximum head of 65 m or less) series has a two-layer structure (pressure resistance 1.0 MPa) in which the rear casing is reinforced with an FRP (fiber reinforced plastic) rear casing cover. The high head models MDM25-3 and 32-2 types have a special three-layer structure (pressure resistance of 1.6 MPa) with one layer added to the rear casing and FRP rear casing cover. MDM40-2 and 50-2 models have a two-layer structure (withstand pressure of 1.6 MPa) in which the rear casing cover is reinforced with a CFRP (carbon fiber reinforced plastic) rear casing cover.



Unique Design Prevents Dry Running

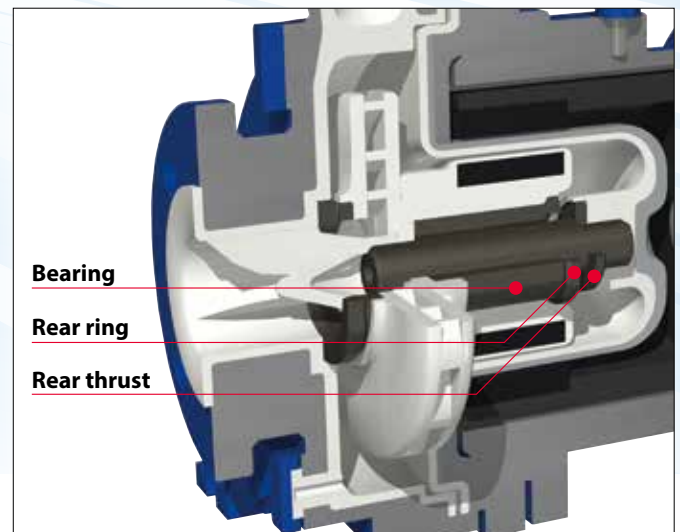
The pump design features a mechanism to withstand dry running. High magnet power of the rare earth magnets prevents the magnet capsule coming into contact with the thrust ring of the rear casing, thus preventing melting of fluororesin components due to heat generation. This greatly improves resistance against dry running in comparison with conventional magnetic drive pumps made of fluororesin.

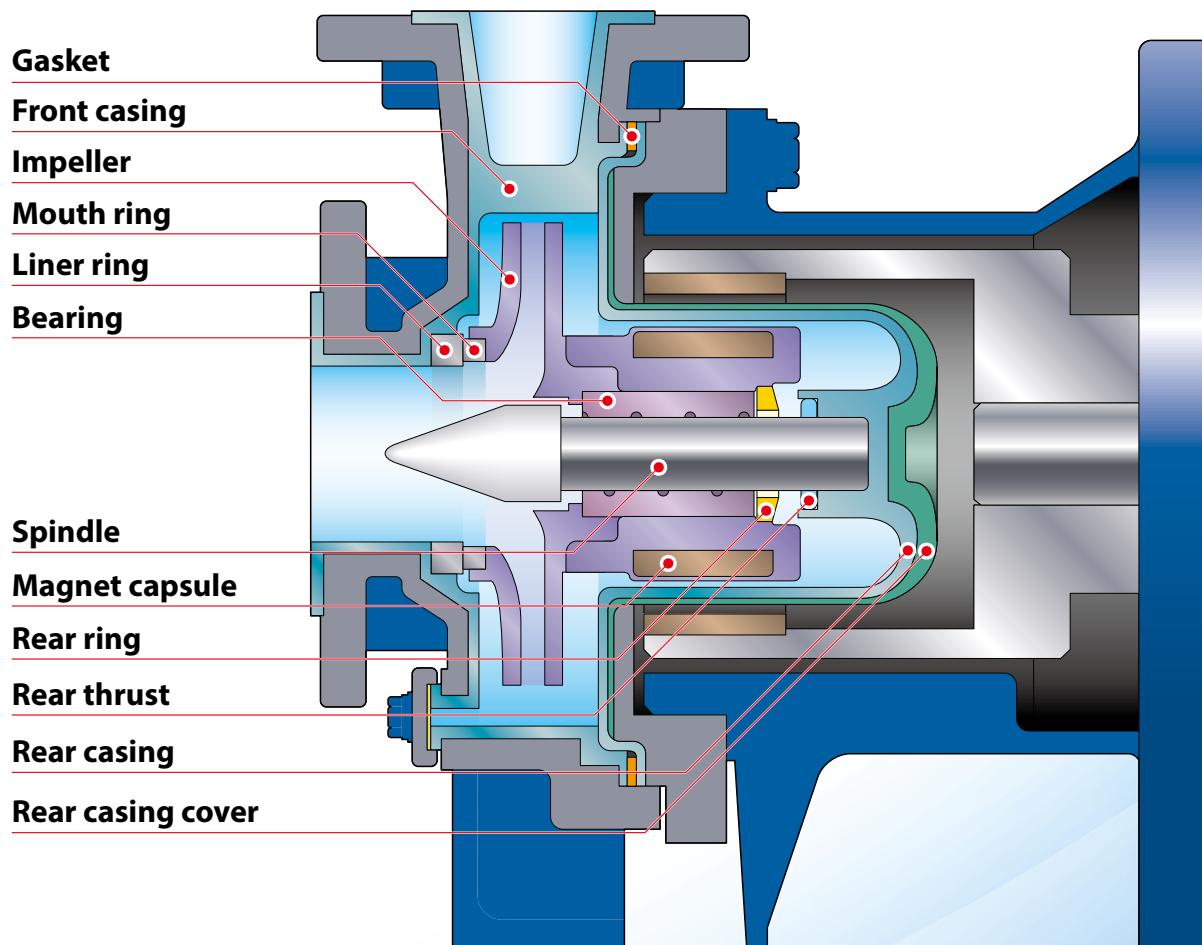
Note: Only CF type (fitted with high density carbon bearing) can cope with dry running. Dry running is not permitted in the case of KK type.



Back Pullout System

Even if the bracket is back-pulled, the rear casing is fixed with the rear casing support and bolts to the front casing side, so there is no leakage of the used liquid. A 2-step disassembly structure that considers safety.



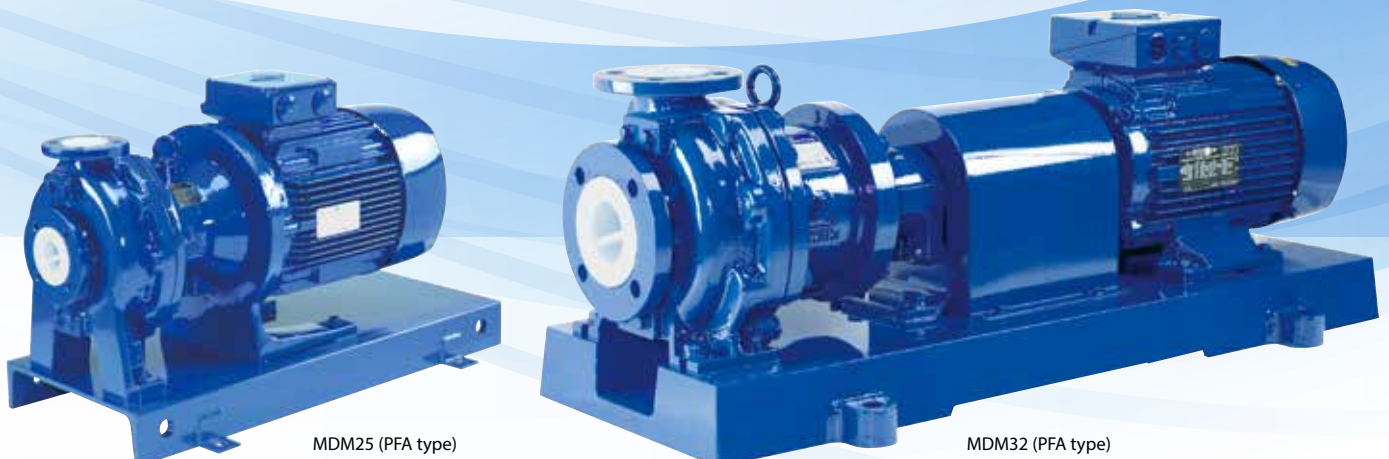


Wet End Materials

Mark	ECF	EKK	PKK/NKK
Front casing	CFRETFE	CFRETFE	PFA
Rear casing	CFRETFE	CFRETFE	PFA
Impeller	CFRETFE	CFRETFE	PFA
Magnet capsule	CFRETFE	CFRETFE	PFA
Bearing	High density carbon	SiC	SiC
Spindle	High purity alumina ceramic	SiC	SiC
Liner ring	High purity alumina ceramic	SiC	SiC
Mouth ring	PTFE (with filler)	SiC	SiC
Rear ring	High purity alumina ceramic	SiC	SiC
Rear thrust	PTFE (with filler)	PTFE (with filler)	PTFE
Gasket	PTFE	PTFE	PTFE

Note1: Rear casing support is used on MDM25-3 and MDM32-2 for applications over 80°C.

Note2: MDM40-2 and MDM50-2 have no rear ring. Material code PKK / NKK type is not available.



MDM25 (PFA type)

MDM32 (PFA type)

Construction and Materials

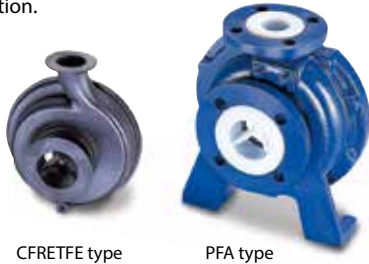
Front casing

CFRETFE type

A moulding made of carbon fibre reinforced CFRETFE. It has both a high mechanical strength and excellent corrosion resistance. The outer peripheral surfaces are reinforced by a ductile cast iron outer casing in order to achieve excellent strength and durability.

PFA type

Natural PFA fluoro-resin is adapted as wetted parts. This construction is free from contamination and ideal for transfer of clean liquids or with less particle generation.

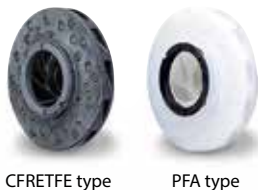


CFRETFE type

PFA type

Impeller

Closed type impellers are designed to give high efficiency. To ensure positive fixing of impeller to magnet capsule a spline system together with a pin fixing is employed. This prevents the impeller from moving axially off the magnet capsule. MDM25 and 32 models now have impellers capable of reaching max. heads of 74 meters (50Hz) to widen the range of application.



CFRETFE type

PFA type

Magnet capsule

High strength rare earth magnets are totally encapsulated with fluoro-resin mouldings. Magnets are small and lightweight which increases the efficiency of the pump. Taking advantage of the high magnetic strength its new design of "Non contact system" was developed to protect pump from dry running. This enables us to offer pumps that will withstand dry running operation. (CF type only)



CFRETFE type

PFA type

Rear Thrust

The rear thrust withstands axial loads encountered from abnormal operation, it also minimizes heat generation.

Bearing

Two standard bearing materials are available. SiC gives high resistance to abrasion. High density carbon withstands dry running operation. Bearings can be individually replaced.



SiC type

High density carbon type

Spindle

Both ends of the spindle are supported by the front casing and the rear casing (the fixed spindle type). There are two types of spindle; one is made of high purity alumina ceramic and the other made of SiC.



SiC type

High purity alumina ceramic type

Rear ring

To protect the pump against abnormal operation, such as cavitation or entrained air, where the magnet capsule could experience reverse axial thrust, a rear ring and rear thrust ring are used. The rear ring is designed to minimize heat generation compared to conventional designs. This prevents surrounding fluoro-resin from melting.

Note: except MDM40-2 and MDM50-2.

Gasket

A PTFE shrouded gasket is used to enhance sealing performance and corrosion resistance.

Rear casing / Rear casing cover

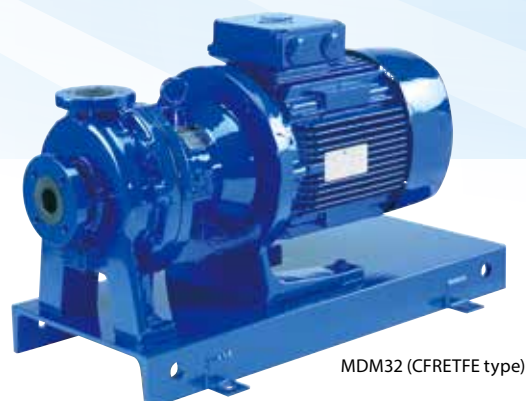
The fluoro-resin rear casing is strengthened by the outer rear casing cover which is manufactured in fibre reinforced plastic capable of withstanding a pressure of 1.0 MPa. (For long coupling type, maximum pressure is 1.6MPa.) This structure also eliminates any eddy current losses due to a rotating magnetic field. It also prevents sparks from being produced should the rear casing come into contact with the drive magnet unit.

A newly developed triple-layer casing is used for the high head models MDM25-3 and 32-2 when liquid temperature exceeds 80°C. This new design allows a rated 1.6MPa casing pressure overall temperature range. Since the front and rear casings are bolted together from the front casing side liquid does not leak out when the foot support (bracket) is pulled back.



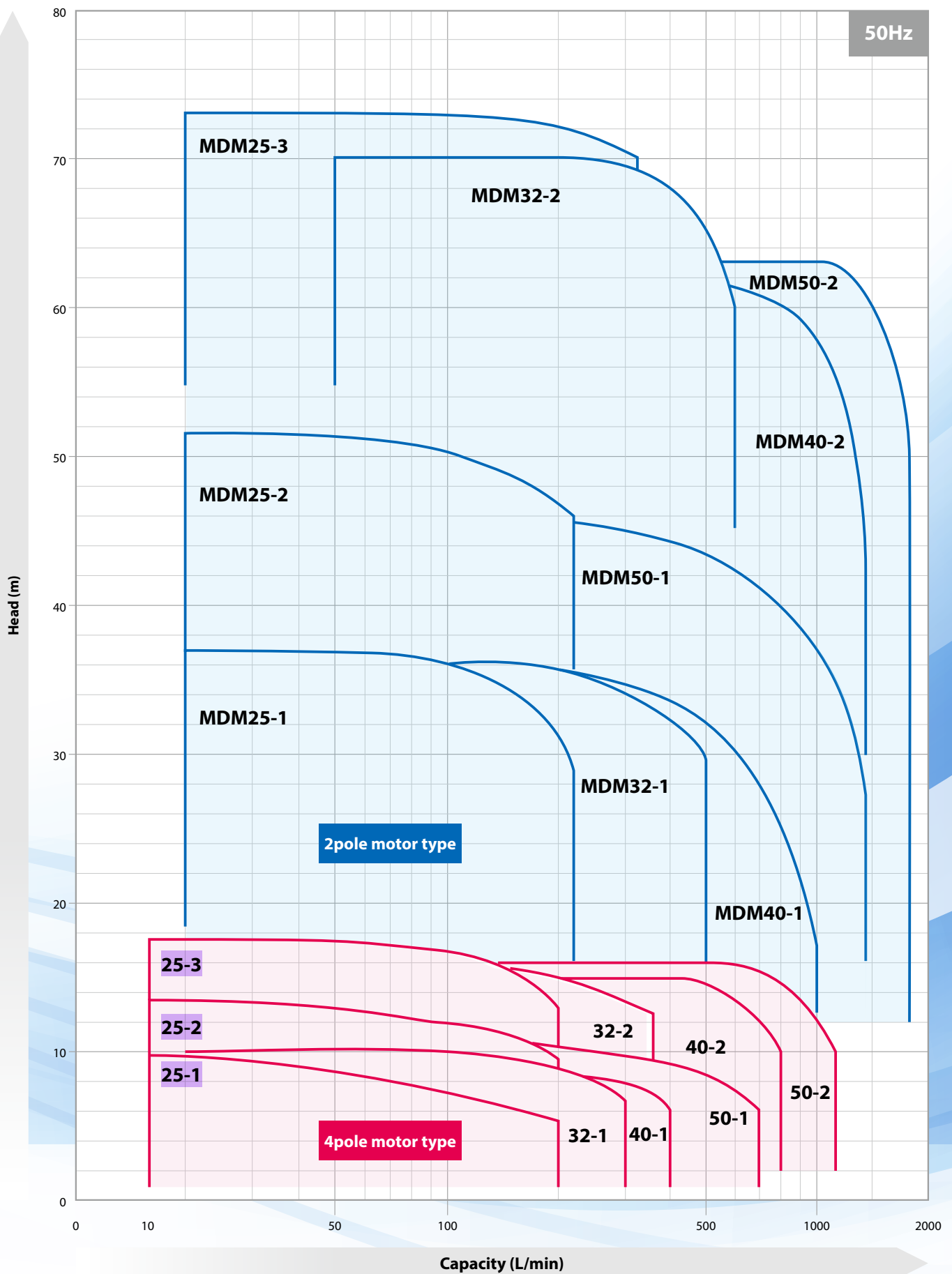
FRP/CFRP type
Note: MDM40-2, 50-2 only

PFA type
(with rear casing cover)



MDM32 (CFRETFE type)

Performance Curves



Specifications

Note: Other than standard specifications are also available. Please contact us for details.

2P motor

Model	Pump size Suction × Discharge	Impeller size	50Hz Capacity L/min	Head m	Motor kW
MDM25-1 (Impeller range 1)	40mm × 25mm	165	100	35.5	1.5, 2.2
		160		33.5	
		150		29.0	
		140		25.0	
		130		20.5	
MDM25-2 (Impeller range 2)	40mm × 25mm	195	100	50.5	4.0, 5.5, 7.5
		190		47.5	
		180		42.5	
		170		37.0	
		160		32.5	
MDM25-3 (Impeller range 3)	40mm × 25mm	225	100	74.0	5.5, 7.5, 11, 15
		220		69.0	
		210		61.0	
		200		55.0	
		190		48.5	
MDM32-1 (Impeller range 1)	50mm × 32mm	180	208	42.5	4.0, 5.5, 7.5
		165		35.0	
		160		32.5	
		150		28.5	
		140		25.0	
MDM32-2 (Impeller range 2)	50mm × 32mm	130	208	20.5	5.5, 7.5, 11, 15
		120		17.0	
		225		70.0	
		220		67.5	
		210		60.0	
MDM40-1 (Impeller range 1)	65mm × 40mm	200	417	54.0	4.0, 5.5, 7.5
		190		47.0	
		180		41.5	
		170		38.0	
		160		32.0	
MDM40-2 (Impeller range 2)	65mm × 40mm	210	417	62.0	5.5, 7.5, 11, 15 18.5, 22, 30
		205		58.0	
		200		51.0	
		190		48.0	
		180		42.0	
MDM50-1 (Impeller range 1)	80mm × 50mm	170	833	36.5	5.5, 7.5, 11, 15
		160		32.0	
		150		27.0	
		140		26.5	
		130		22.0	
MDM50-2 (Impeller range 2)	80mm × 50mm	120	833	17.5	5.5, 7.5, 11, 15 18.5, 22, 30
		110		13.5	
		210		63.5	
		205		58.5	
		200		51.0	
		190		48.0	
		180		42.0	
		170		36.0	
		160		30.5	
		150		27.0	

4P motor

Model	Pump size Suction × Discharge	Impeller size	50Hz Capacity L/min	Head m	Motor kW
MDM25-2 (Impeller range 2)	40mm × 25mm	200	50	12.0	1.5, 2.2, 4.0
MDM25-3 (Impeller range 3)		225		15.0	1.5, 2.2, 4.0, 5.5
MDM32-1 (Impeller range 1)	50mm × 32mm	170	200	7.5	1.5, 2.2, 4.0
MDM32-2 (Impeller range 2)		225		15.0	1.5, 2.2, 4.0, 5.5
MDM40-1 (Impeller range 1)	65mm × 40mm	170	300	7.0	1.5, 2.2, 4.0
MDM40-2 (Impeller range 2)		210	208	15.5	5.5, 7.5, 11, 15
MDM50-1 (Impeller range 1)	80mm × 50mm	170	500	8.0	1.5, 2.2, 4.0, 5.5
MDM50-2 (Impeller range 2)		210	417	16.0	5.5, 7.5, 11, 15

Common Specifications

- Temperature range of liquid handled EKK/ECF: -20 to 105°C, PKK: -20 to 150°C^{Note1}, NKK: -20 to 120°C^{Note2}
- Allowable slurry (KK type only) Please contact us.
- Allowable maximum pressure 1.0MPa (All long coupling type, MDM25-3 and MDM-32-2 and MDM40-2 and MDM-50-2 are 1.6MPa)
- Standard color of paint Ultra marine blue RAL5002

Note1: Please contact us when handling liquid temperature is outside range of 0°C to 120°C.

Note2: Please contact us when handling liquid temperature is higher than 80°C with 50-1NKK type.

Should your requirement be beyond the specs, shown in this catalog, please contact your nearest Iwaki distributor.

Pump Identification

MDM 40 - 150 1 E KK F 075 I - D 2 H

1 2 3 4 5 6 7 8 9 10 11

1 Pump size (Suction × Discharge)

25 : 40mm × 25mm
32 : 50mm × 32mm
40 : 65mm × 40mm
50 : 80mm × 50mm

2 Impeller size

100 - 225 (mm)

3 Impeller range

1, 2, 3

4 Wet-end main material

E : CFRETFE^{Note1}

P : PFA^{Note2}

N : PFA^{Note3}

5 Material of Bearing/Spindle

CF : High density carbon/
High purity alumina ceramic

KK : SiC/SiC

6 Type of motor

C : Long coupling type^{Note4}
F : Flange motor

7 Motor output

015 : 1.5kW
022 : 2.2kW
040 : 4.0kW
055 : 5.5kW
075 : 7.5kW
110 : 11kW
150 : 15kW
185 : 18.5kW
220 : 22kW
300 : 30kW

8 Standard for pipe connection and motor

I : ISO flange+IEC motor

9 Special version^{Note5}

Mark	Drain	Base	Special version
A	Without drain	With base	Standard
S	Without drain	With base	Special
D	With drain	With base	Standard
X	With drain	With base	Special
B	Without drain	Without base	Standard
Y	Without drain	Without base	Special
E	With drain	Without base	Standard
Z	With drain	Without base	Special

10 Motor pole

2 : 2 pole

4 : 4 pole

11 Special code

H : ETFE : 80 - 105°C^{Note6}

PFA : 80 - 120°C^{Note6}

T : 120 - 150°C (PKK type)

• Please refer to the wetted parts quality (page 2) for the combination of material symbols.

Note1: MDM40-2 and MDM50-2 are only E (CFRETFE) type wetted material.

Note2: Long coupling type is only P (PFA) type wetted material.

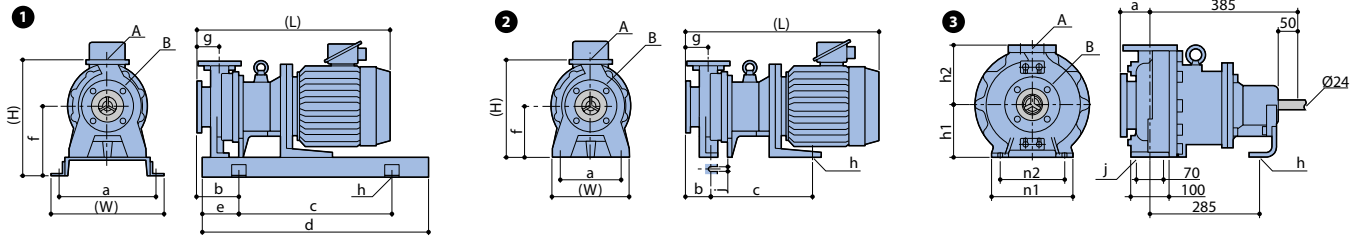
Note3: MDM25-2, 32-1, 40-1, 50-1.

Note4: Long coupling type is designed for 50 cycle area.

Note5: PFA and CFRETFE (MDM40-2 and 50-2) type with drain includes an air vent.

Note6: Applicable model: Flange motor type: MDM25-3, 32-2 All sizes of long coupling type.

Dimensions in mm (2 pole motor type)



1 Flange motor type with base

Model	Motor kW	(W)	(H)	(L)	a	b	c	d	e	f	g	h	A	B	Mass kg Less motor
MDM25-1	1.5	400	400	465	350	135	480	710	115	240	80	4xØ19	25	40	80
	2.2			487											85
	4.0			630											125
MDM25-2	5.5	400	430	698	350	150	540	800	130	250	80	4xØ19	25	40	145
	7.5			718											150
	11			720											152
MDM25-3	7.5	400	428	740	350	172	540	800	130	250	102	4xØ19	25	40	157
	11			820											216
	15	480	485	832	430	192	600	900	150	320					253
	4.0			625											84
MDM32-1	5.5	400	410	689	350	150	540	800	130	250	80	4xØ19	32	50	87
	7.5			698											157
	11			718											162
MDM32-2	7.5	400	430	798	350	150	540	800	130	250	80	4xØ19	32	50	221
	11			810											258
	15	480	500	810	430	170	600	900	150	320					258
	4.0			625											85
MDM40-1	5.5	400	410	689	350	150	540	800	130	250	80	4xØ19	65		88
	7.5			787											225
	11			837											240
MDM40-2	15	490	500	872	440	227.5	740	1120	190	320	100	4xØ23	40	65	255
	18.5			932											270
	22			964											285
	30			1017											320
	5.5			790											230
	7.5			840											245
MDM50-1	11	400	430	872	430	190	600	900	150	320	100	4xØ19	80		260
	15			872											270
	5.5			790											230
	7.5			840											245
MDM50-2	11	490	520	874	440	230	740	1120	190	320	100	4xØ23	50	80	260
	15			934											270
	18.5			966											290
	22			966											320
	30			1019											320
	5.5			790											230

Note: The dimensions may differ with the type of motor installed.

3 Long coupling type without base, coupling, motor

Model	a	h1	h2	n1	n2	A	B	Mass kg Less motor
MDM32-1601	80	132	160	240	190	32	50	70
MDM32-2002		160	180					80
MDM40-1601		132	160			40	65	70
MDM50-1601	100	160	180	265	212	50	80	80

Note: The dimensions may differ with the type of motor installed.

Optional Accessories

Pump Protector DRN Series

Detects Unusual Pump Operating Conditions Including Dry-Running and Overload

The DRN model protects equipment (including pumps) from damage!

Minimizes production downtime. Identifies possible causes of alarms so they can be investigated and addressed.



IWAKI CO., LTD. 6-6 Kanda-Sudacho 2-chome Chiyoda-ku Tokyo 101-8558 Japan TEL: (81)3 3254 2935 FAX: 3 3252 8892

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() Country codes

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.

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