



The Heart of Industry

**IWAKI**

IWAKI  
MAGNETIC  
DRIVE  
PUMPS

**MX-F**



Solution for chemical handling applications

# Chemically resistant magnetic drive pumps which can tolerate abnormal operation

The MX-F series development was based on the concept of optimum reliability under severe operating conditions and features our unique self radiation structure as well as our well-established non contact system.

The MX-F retains excellent durability under abnormal operation such as dry running, cavitation and closed-discharge operation.

High grade materials including ETFE, are utilized as the main wetted materials.

The MX-F series is an excellent choice for reliably handling a wide range of chemicals in various manufacturing processes.

- An improved mechanical strength design allows operation under abnormal conditions and results in reduction of running cost and maintenance cost.
- The adoption of a volute casing divided into two raises efficiency.
- Simply constructed, it is robust and facilitates maintenance.
- Fluororesin, excellent resistance to chemicals.
- Lap joint construction



MX-F403



MX-F401



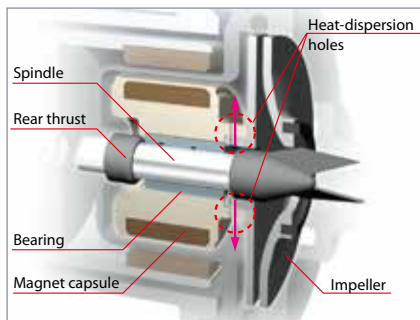
MX-F250



MX-F100

**Self-radiating structure**

Through heat-dispersion holes provided in the fixed portions of the impeller and the magnet capsule, liquid is circulated under pressure between the spindle and bearing to reduce friction heat transmission and prevent thermal deformation.  
(Except MX-F100)

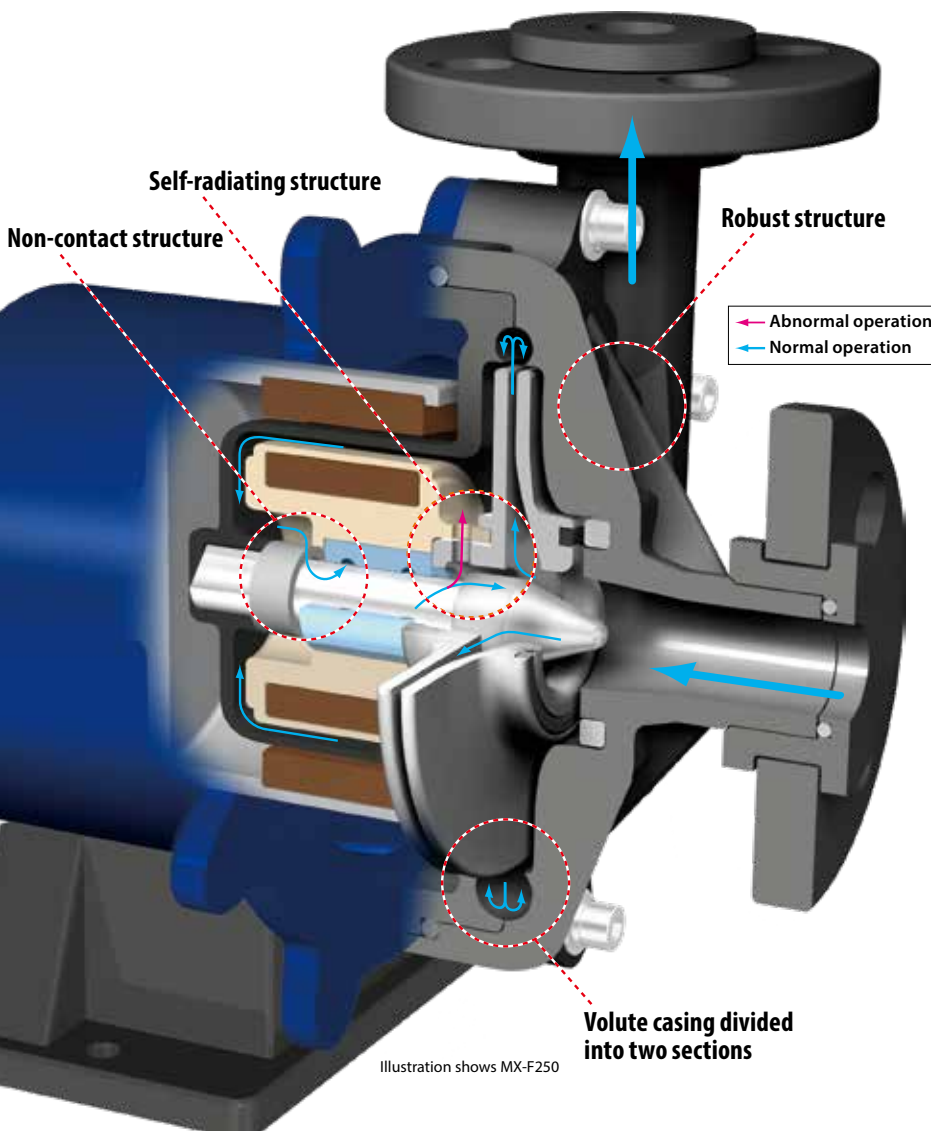
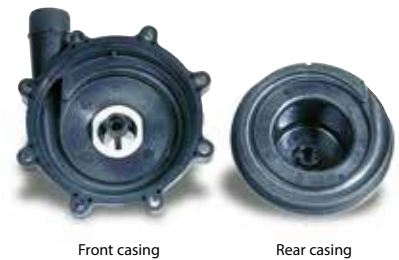


**Non-contact structure**

The drive magnet and driven magnet are carefully positioned so that their strong magnetic field limits rear thrust contact of the magnet capsule parts, even during dry running. As a result, heat generation is greatly reduced and liquid circulation is maintained.  
(Except MX-F100)

**Volute casing divided into two sections**

The MX-F series is the first resin magnet pump which uses the pump casing divided into the front casing and the rear casing to form a vortex chamber as an ideal form. Therefore, internal leakage is kept to a minimum and overall hydraulic efficiency is enhanced.  
(Except MX-F400)



**Robust structure**

All stress bearing portions, such as the front and rear casings, are reinforced by means of ribs to improve the pressure resistance and the mechanical strength of the pump.

The bearing is not only fixed by conventional press fit but is also sandwiched between the abutting portion in the depth of the magnet capsule and the rear end of the impeller to improve its reliability under high temperature.  
(Except MX-F100)

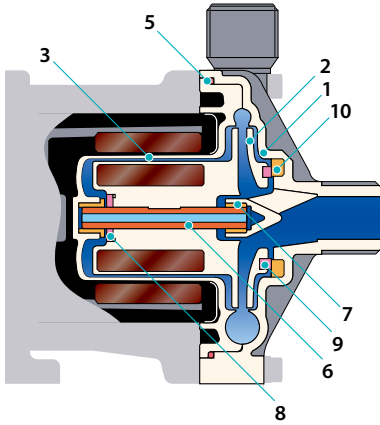
MX-F402 and F403 models: an unplugging preventive lock pin is adopted for ensuring more steady securing.



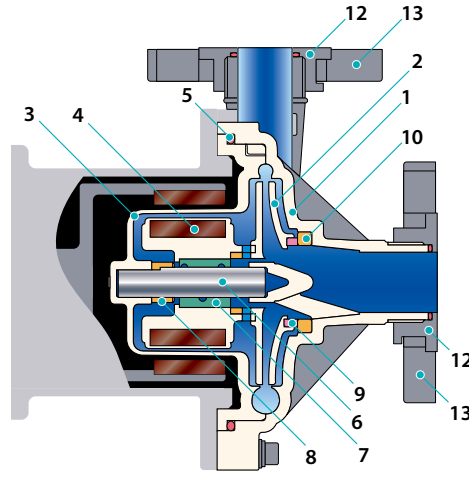
Front casing of type MX-F100 and MX-F402/403

# Wet end materials

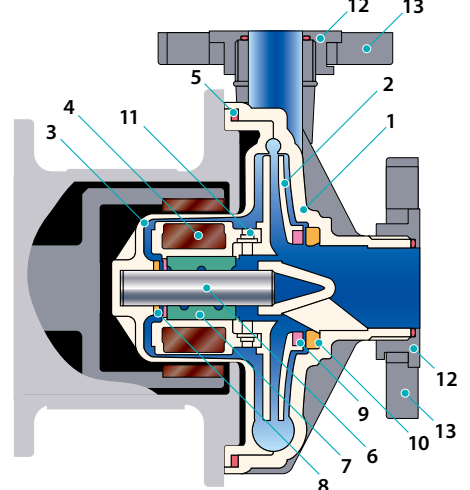
## ■MX-F100



## ■MX-F250 to F401



## ■MX-F402 to F403



Model	MX-F100		MX-F250 to F401			MX-F402 to F403		
	RV	KV	CFV	RFV	KKV	CFV	RFV	KKV
1 Front casing	CFRETFE		CFRETFE			CFRETFE		
2 Impeller	CFRETFE		CFRETFE			CFRETFE		
3 Rear casing	CFRETFE		CFRETFE			CFRETFE		
4 Magnet capsule	CFRETFE		CFRETFE			CFRETFE		
5 O ring <small>Note 1</small>	FKM		FKM			FKM		
6 Spindle	High purity alumina ceramic	SiC	High purity alumina ceramic	SiC	High purity alumina ceramic	SiC	High purity alumina ceramic	SiC
7 Bearing	PTFE(with filler)	SiC	High density carbon	PTFE(with filler)	SiC	High density carbon	PTFE	SiC
8 Rear thrust	High purity alumina ceramic	SiC(Front & Rear)	CFRETFE			CFRETFE		
9 Mouth ring	PTFE(with filler)	-	PTFE(with filler)	SiC	PTFE(with filler)	SiC	PTFE(with filler)	SiC
10 Thrust/Liner ring	High purity alumina ceramic	-	High purity alumina ceramic	SiC	High purity alumina ceramic	SiC	High purity alumina ceramic	SiC
11 Lock pin	-		-			CFRETFE		
12 Inner flange	-		CFRETFE			CFRETFE		
13 Outer flange	-		GFRPP			GFRPP		

Note 1: O-ring made of AFLAS® and EPDM are also available

# Pump identification

### ■ MX-F100

**MX-F 100 RV M Y - 32**

- Pump size**  
100: G1X G1 260W
- Series symbol**  
MX-F: Material of Casing/CFRETFE
- Materials**  
MX-F: PTFE(with filler)/FKM (Bearing/O-ring)  
KV: SiC/FKM (Bearing/O-ring)
- Connection**  
M: Thread connection  
Not for Lap joint type
- Connection**  
MX-F Y: 50Hz/60Hz  
Z: 60Hz only
- Motor**  
No mark: 1 phase 100V  
11: 1 phase 110V  
13: 1 phase 220V/240V  
32: 3 phase 200V/220V  
34: 3 phase 400/440V

### ■ MX-F250 to F403

**MX-F 400 CFV T C - L 2 S**

- Pump size**  
250: 25A X 25A 0.4kW  
251: 25A X 25A 0.75kW  
400: 40A X 40A 0.4kW  
401: 40A X 40A 0.75kW  
402: 50A X 40A 1.5kW  
403: 50A X 40A 2.2kW
- Series symbol**  
MX-F: Material of Casing/CFRETFE
- Impeller mark**  
MX-F T,V,W 5: 50Hz only  
X,Y,Z 6: 60Hz only
- Motor specification**  
No mark: TEFC indoor  
C: TEFC outdoor  
A: Increased safety type (Except 2.2kW type)
- Material of Bearing/Spindle/O-ring**  
MX-F CFV: High density carbon/High purity alumina ceramic/FKM  
CFE: High density carbon/High purity alumina ceramic/EPDM  
RFV: PTFE(with filler)/High purity alumina ceramic/FKM  
RFE: PTFE(with filler)/High purity alumina ceramic/EPDM  
KKV: SiC/SiC/FKM  
KKE: SiC/SiC/EPDM
- Flange type**  
No mark: Flange type  
L: Lap joint type
- Special specification:**  
No mark: Standard  
S: Order-made specification
- Motor**  
2: 3phase 200/200/220V  
3: 3phase 220/380V (Only 250, 251, 400, 401)<sup>Note1</sup>  
4: 3phase 380 to 440V<sup>Note2</sup> (Only 250, 251, 400, 401)<sup>Note1</sup>  
6: 3phase 380V (Only 402, 403)  
7: 3phase 400/400/440V (Only 402, 403)  
8: 3phase 415V (Only 402, 403)  
9: 3phase 460V  
Note1: 3 and 4 are reserved for a dedicated motor, while a general-purpose motor is assigned an ID number from among 6 through 8.  
Note2: Frequency 380: 50/60Hz, 400: 50/60Hz, 415: 50Hz, 440: 60Hz

# Specifications

50/60Hz

Model	Connection Suction X Discharge	Limit of specific gravity <sup>Note1</sup>	Standard capacity L/min - m	Maximum capacity L/min	Motor kW	Mass kg
MX-F100 Y	G1 x G1 <sup>Note2</sup>	1.9 / 1.2	70 - 5.8 / 9.0	110 / 125	0.26	8.5
MX-F100 Z		- / 1.8	70 - - / 5.8	- / 110		
MX-F250 T/X	25A x 25A	1.2	50 - 11.7 / 11.8	150/160	0.4	13.5
MX-F250 V/Y		1.5	50 - 9.1 / 9.5	145/150		
MX-F250 W/Z		1.8 to 2.0	50 - 6.4 / 7.5	126/132		
MX-F251 T/X	25A x 25A	1.2	80 - 15.7 / 17.7	150	0.75	22
MX-F251 V/Y		1.5	80 - 12.2 / 14.1	150		
MX-F251 W/Z		1.8 to 2.0	80 - 9.4 / 11.5	120 / 140		
MX-F400 T/X	40A x 40A	1.2	100 - 10.1 / 9.3	250	0.4	13.5
MX-F400 V/Y		1.5	100 - 8.1 / 7.6	230		
MX-F400 W/Z		1.8 to 2.0	100 - 5.5 / 6.3	210		
MX-F401 T/X	40A x 40A	1.2	150 - 12.8 / 12.6	270/280	0.75	22
MX-F401 V/Y		1.5	150 - 10.8 / 10.4	260		
MX-F401 W/Z		1.8 to 2.0	150 - 8.1 / 6.9	240/230		
MX-F402 T/X	50A x 40A	1.2	200 - 18.3 / 18.5	440	1.5	38
MX-F402 V/Y		1.5	200 - 16 / 15.2	430		
MX-F402 W/Z		1.8 to 2.0	200 - 12.5 / 11.7	410/400		
MX-F403 T/X	50A x 40A	1.2	250 - 22.8 / 23.1	510	2.2	43
MX-F403 V/Y		1.5	250 - 19.4 / 19.2	500		
MX-F403 W/Z		1.8 to 2.0	250 - 15.3 / 14.7	470/480		

Note1: The specific gravity limit varies with the discharge. For details, please contact us.  
 Note2: 26mm tube connection option available on the MX-F100.

## Common specifications

• Range of liquid temperature : 0 to 80°C (10 to 80°C in case AFLAS<sup>®</sup> O-rings are used.) • Range of ambient temperature : 0 to 40°C.

## Precautions for pump selection

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

2. For the MX-F250, select a proper impeller size according to specific gravity. Always keep 10% allowance to motor output.

### Applicable motor output

$$Sp \times S.G \times (1.1) \leq \text{Motor output}$$

Allowance

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.

$$NPSHa \geq NPSHr + 0.5 \text{ m}$$

Allowance

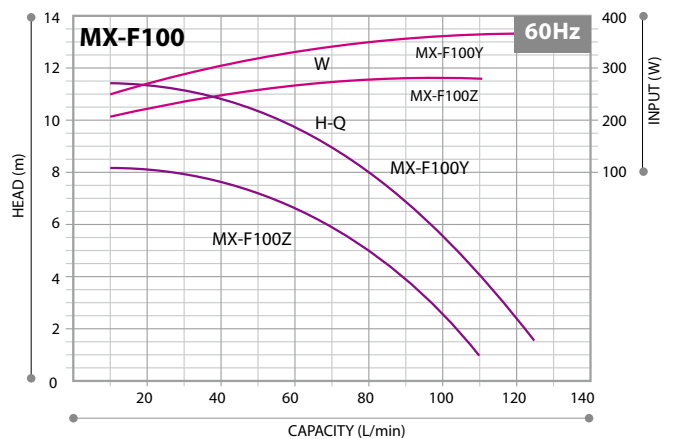
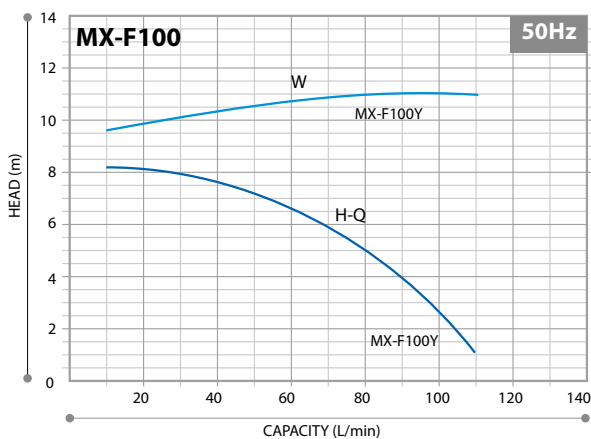
$$NPSHa = 10^6 \times (Pa - Pv) \div g - h_s - h_{fs}$$

### 5. Maximum withstand pressure

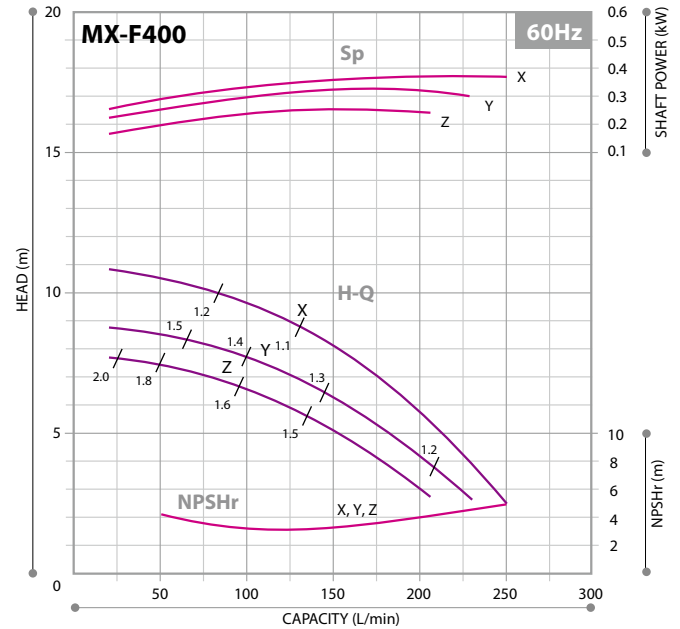
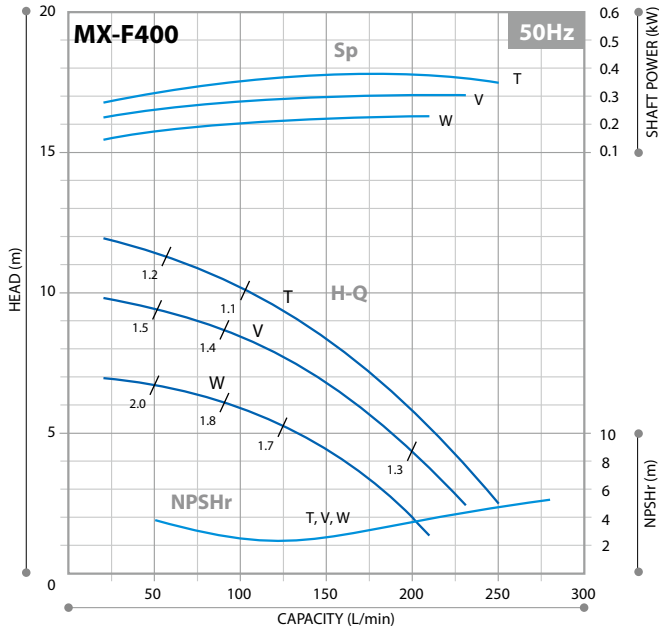
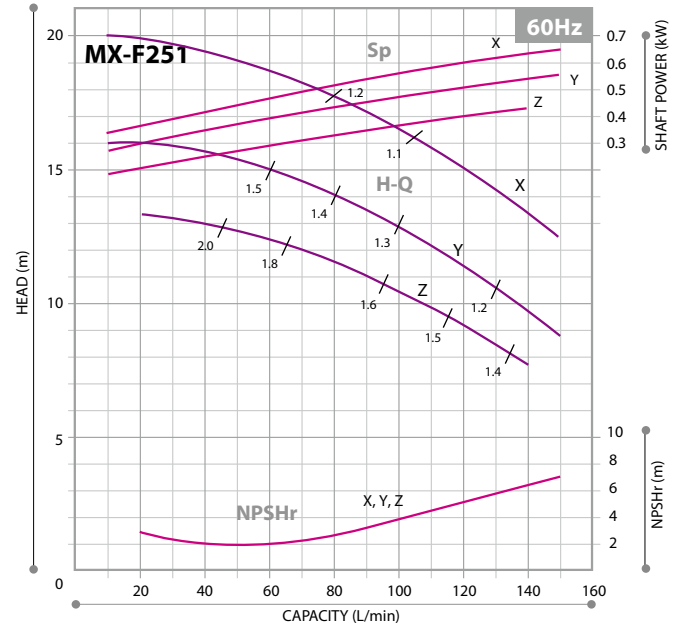
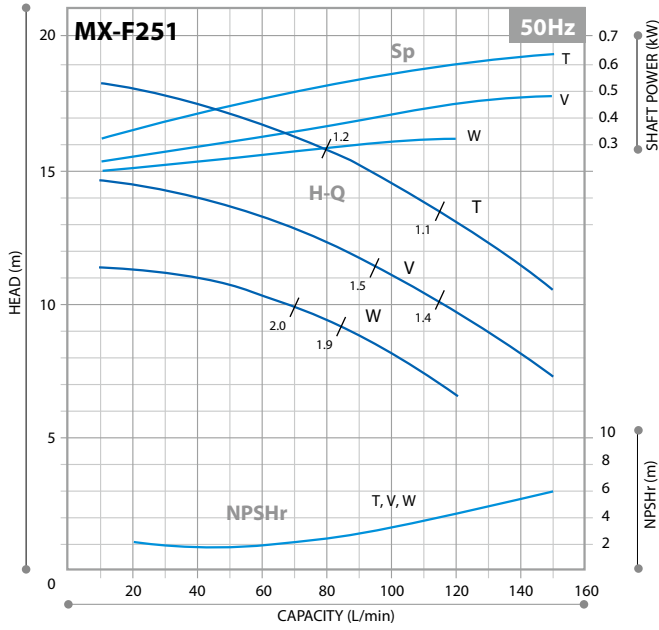
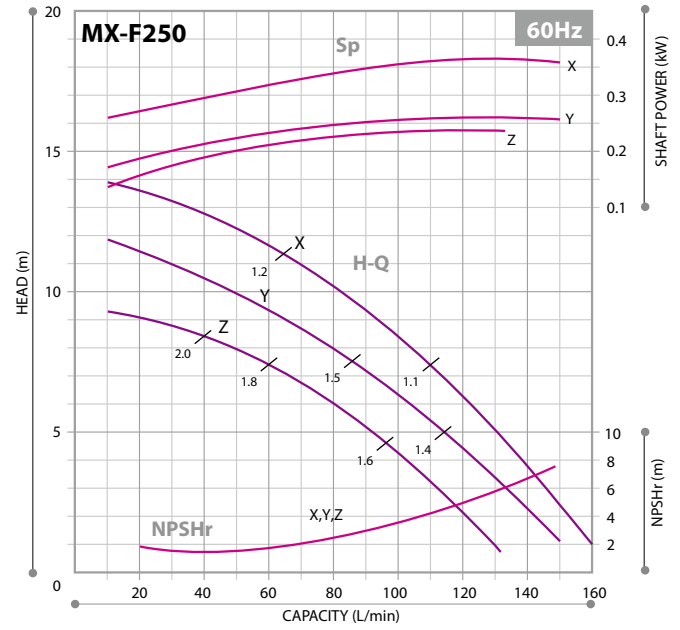
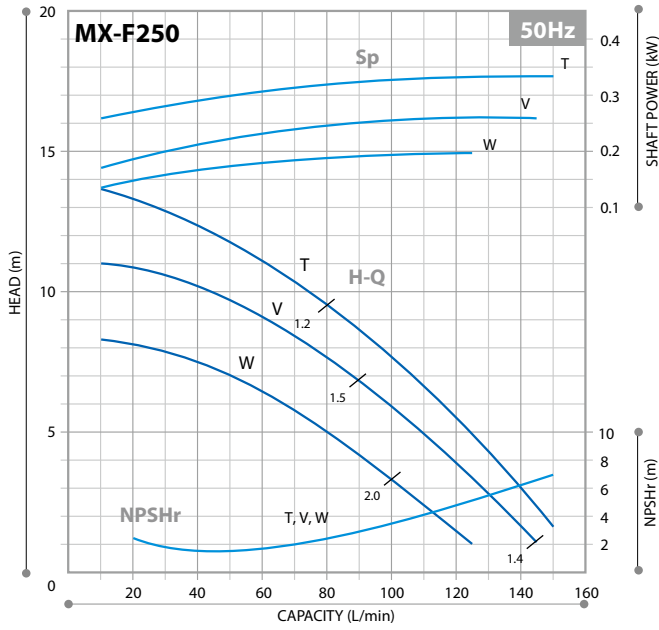
MX-F100: 0.19MPa      MX-F400: 0.22MPa  
 MX-F250: 0.25MPa      MX-F401: 0.28MPa  
 MX-F251: 0.33MPa      MX-F402: 0.43MPa  
                                     MX-F403: 0.43MPa

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<sup>3</sup>)  
 g: G-force (9.8m/sec<sup>2</sup>)

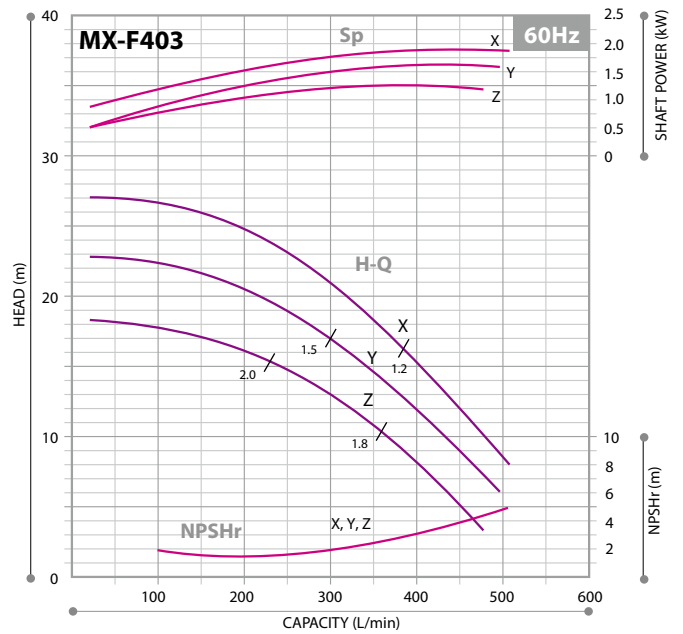
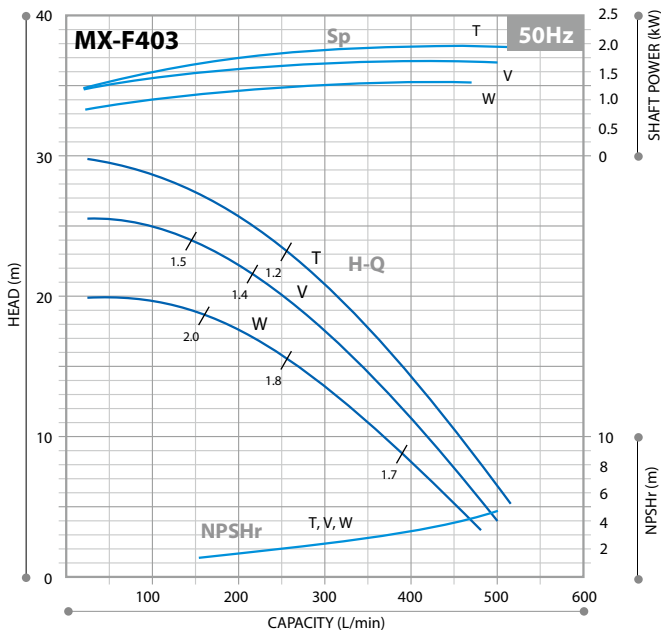
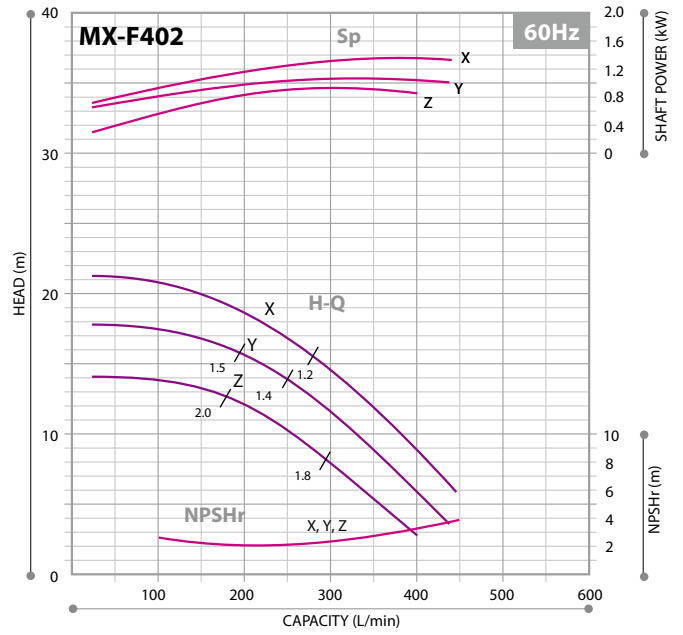
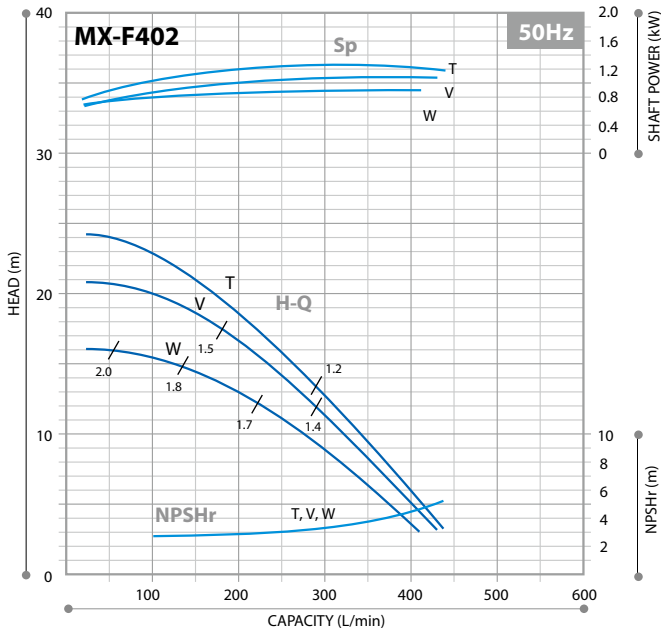
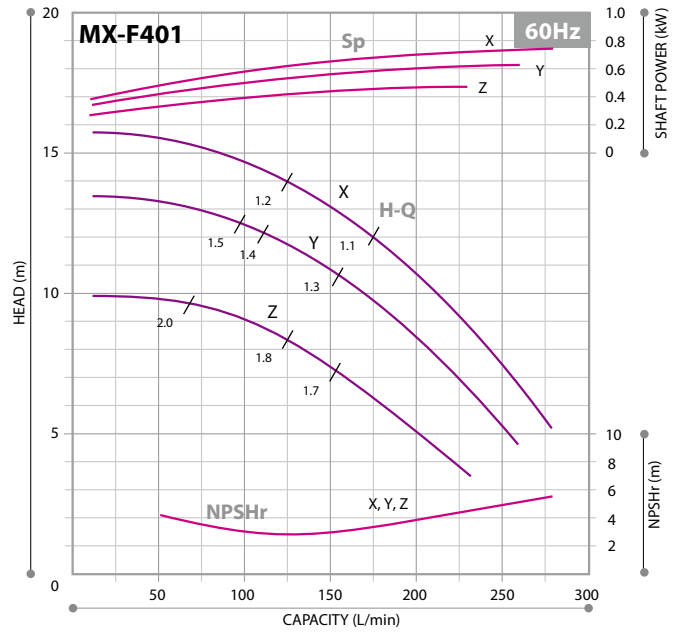
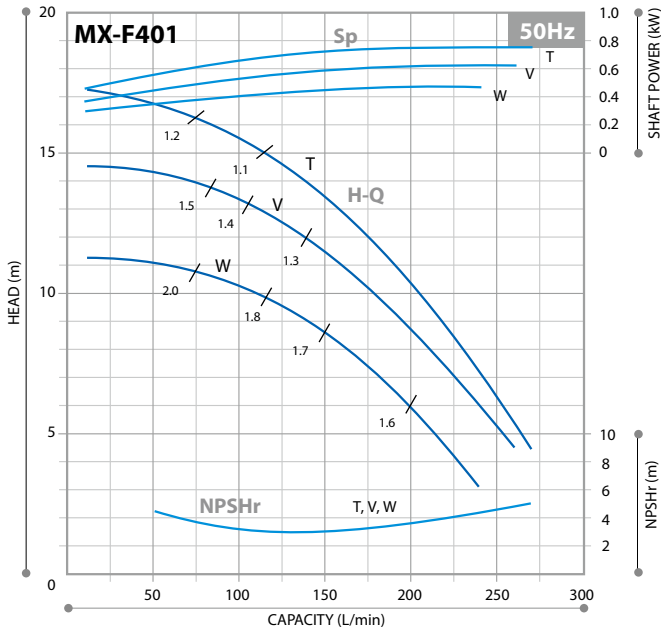
## Performance curves



# Performance curves

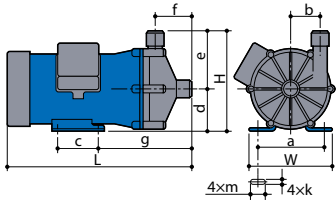


**Performance curves**

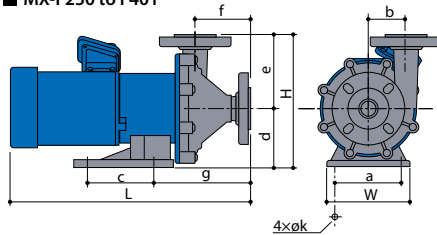


## Dimensions

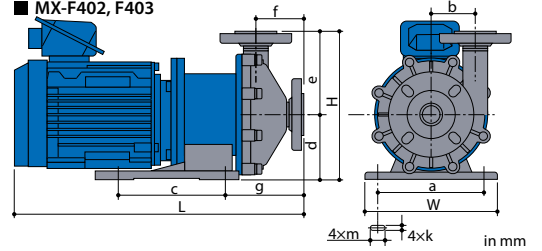
■ **MX-F100**



■ **MX-F250 to F401**



■ **MX-F402, F403**



Models	W	H	L	a	b	c	d	e	f	g	k	m
MX-F100	150	175	319.5	110	51	70	75	100	65	162	9	27
MX-F250	160	255	411	130	65	130	115	140	90	163	12	—
MX-F251	160	255	446	130	65	130	115	140	90	171	12	—
MX-F400	140	225	411	110	54	98	95	130	87	150	12	—
MX-F401	160	255	459	130	72	130	115	140	103	184	12	—
MX-F402	260	280	514	208	80	200	120	160	89	157	14	36
MX-F403	260	280	543	208	80	200	120	160	89	157	14	36

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

## Optional accessories

### Iwaki 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.

- Multiple Input: Two analog, one digital, one temperature input and one current input
- Easy operation: Equipped with EASY setup mode to remember the operation status and set the lower/upper limit values, as well as AUTO setup mode
- Bar graph: Visible indication of current operating status
- Logging capability: Data log feature for preventative maintenance scheduling
- Communication: RS485 external communication capability



#### Specifications

Model	DRN-01	DRN-02
Amperometric range	0.5-30.00A	5.0-200.0A
Unit's source voltage	AC100-240V 50/60Hz 10VA	
Operating temperature	0-40°C	
Operating humidity	35-85%RH	

### Union joint

Special purpose union joints are available. Material : PVC/Heat resistant PVC



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		( )Country codes	Thailand : IWAKI (Thailand) Co., Ltd.	TEL: (66)2 322 2471	FAX: 2 322 2477

**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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