



IWAKI  
SELF-PRIMING  
MAGNETIC DRIVE  
PUMPS

**SMX-F**

Main material  
**CFRETFE**



PATENT

JAPAN / U.S.A. / EU / CHINA / TAIWAN

Solutions for chemical handling applications

# Chemically resistant self-priming magnetic drive pumps which can tolerate abnormal operation



The SMX-F is a horizontal self-priming magnetic drive pump made from fluororesin. Our original self-radiation structure (Patented) enhances resistance to dry running, cavitation, and closed-discharge operation. In addition, the use of standard motors extends the range of application.



SMX-F543

SMX-F441

SMX-F221

**Excellent corrosion resistance**

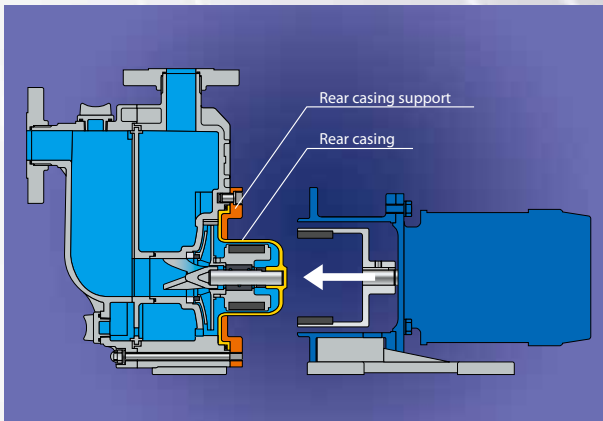
The casings, impeller assembly and magnet capsule are made of fluororesin(CFRETFE). Other wet-end parts are made of highly corrosion resistant materials such as carbon, ceramic and the like. The pumps can handle almost type of chemicals including strong acid/alkali.

**Expanded versatility**

The SMX-F has a modular structure to handle liquids with high specific gravities. Use of standard motors extends the range of liquid application.

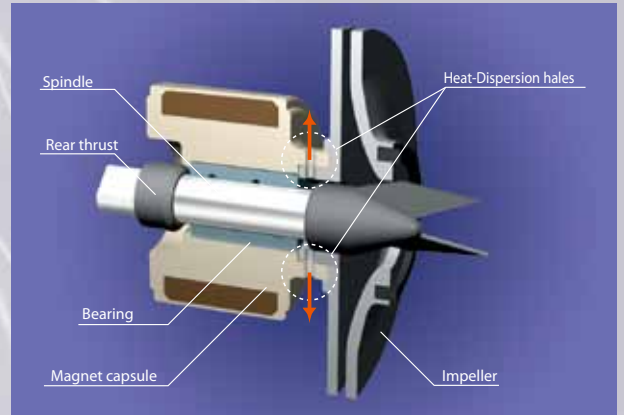
**Easy maintenance**

The pump wet end can be removed from the motor as a complete assembly without dismantling, thanks to an additional rear casing support. The pump wet end comprises the minimum number of parts for easy maintenance.



**Enhanced durability under abnormal operation**

Our original self-radiation structure (Patented) efficiently disperses bearing friction heat to protect the pump under abnormal operating conditions. In addition, our non-contact structure prevents contact between rear thrust face and bearing, to eliminate heat buildup during dry running.



**Fast self-priming**

The SMX-F requires no external self-priming chambers or valves. The gas-liquid separation design ensures fast self-priming. An exceptional self-priming duration of up to 4m in only 90 seconds is now possible.

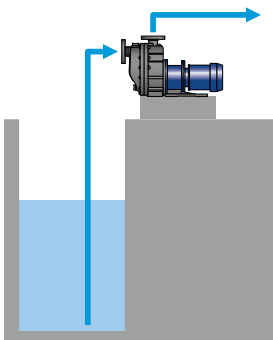
**Rear casing support**

The pump wet end is easily removed from the motor by removal of 4 mounting bolts on the motor bracket. The rear casing support performs easy maintenance and draining of any residual liquid at other place.

**Examples of application**

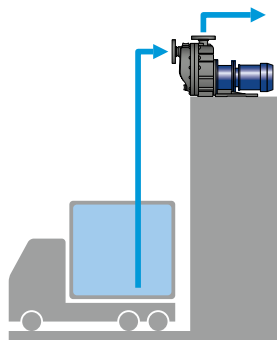
**Pumping up from underground tank**

- Underground tank at chemical plant.
- Underground tank or pit of waste plant.



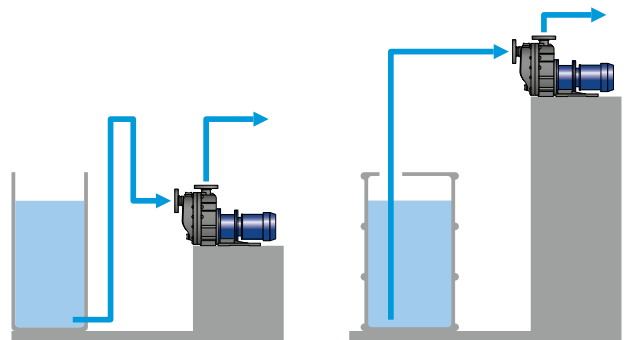
**Pumping up and out from top of tank and tanker truck**

- Transferring etching and plating chemical from chemical bath.
- Sucking up chemical from truck.
- Pumping up from top of tank.

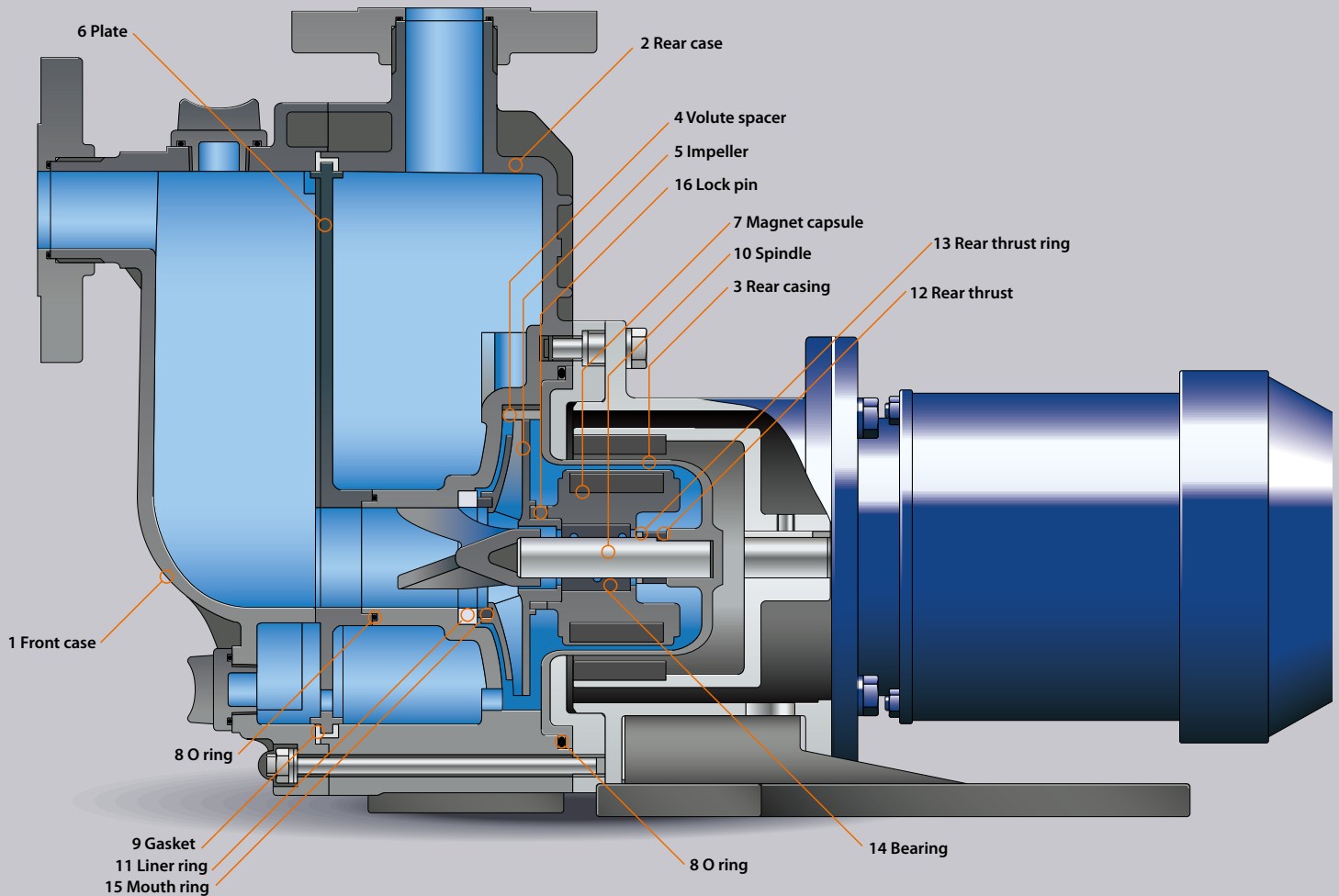


**Transferring chemical from tank to tank**

- Transferring from main tank to daily tank.
- Refilling chemical from drum to tank.



# Reliability and performance are enhanced by our unique design

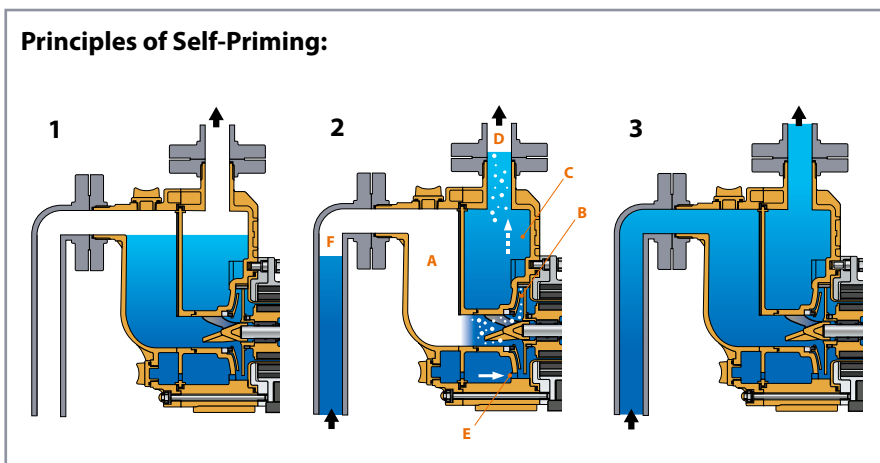


## Wet-end materials

Name of part	Model	CF	RF	KK
1 Front case				
2 Rear case				
3 Rear casing			CFRETFE	
4 Volute spacer				
5 Impeller				
6 Plate				
7 Magnet capsule				
8 O ring			FKM/EPDM	
9 Gasket				
10 Spindle		High purity alumina ceramic		SiC
11 Liner ring				
12 Rear thrust	SMX-F22,44 SMX-F54		CFRETFE High purity alumina ceramic	SiC
13 Rear thrust ring	Note:2	—	High purity alumina ceramic	—
14 Bearing		High density carbon	PTFE (With filler)	SiC
15 Mouth ring			PTFE (With filler)	
16 Lock pin	Note:1		CFRETFE	

Note1: 54 type only

Note2: Exclusive for SMX-F22RF, 44RF



- 1** Prime the pump with liquid.
- 2** On starting, the pump will suck both gas and liquid into its inlet. This mixture moves through front case **A** to the front casing, where it is agitated by the impeller. The mixture is discharged through pump chamber **B** to rear case **C**, where gas and liquid separation then occurs. Gas is bled from the discharge port **D** while some liquid is retained. Liquid in the rear case **C** is fed back through circulation hole **E** to the front casing, where it is again mixed with entrained gas by the impeller. This recirculation & bleeding process continues until gas from the suction side **F** is completely expelled.

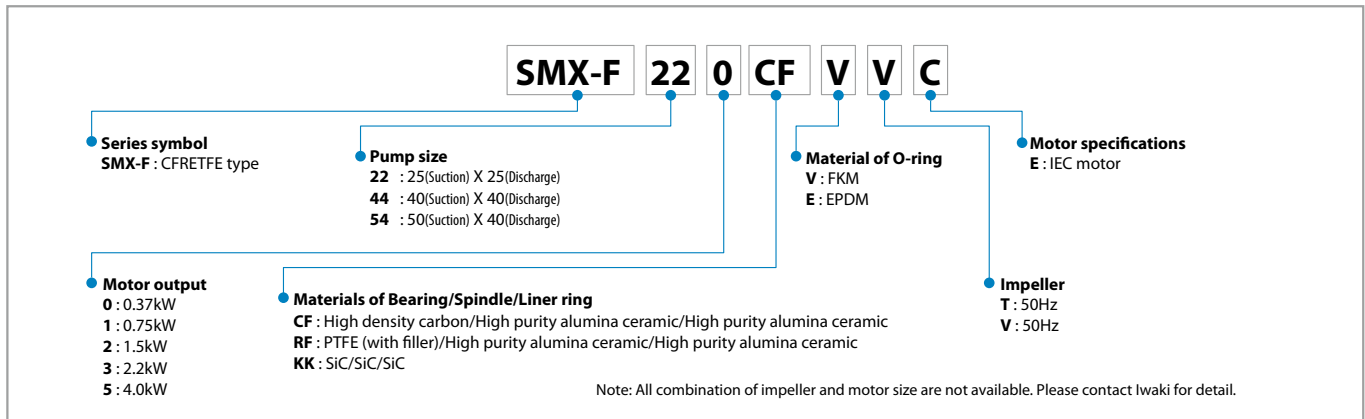
- 3** Once all gas is expelled, normal centrifugal pump operation is resumed. Sufficient liquid remains in the casing for subsequent self-priming once the pump is stopped.

## Specifications

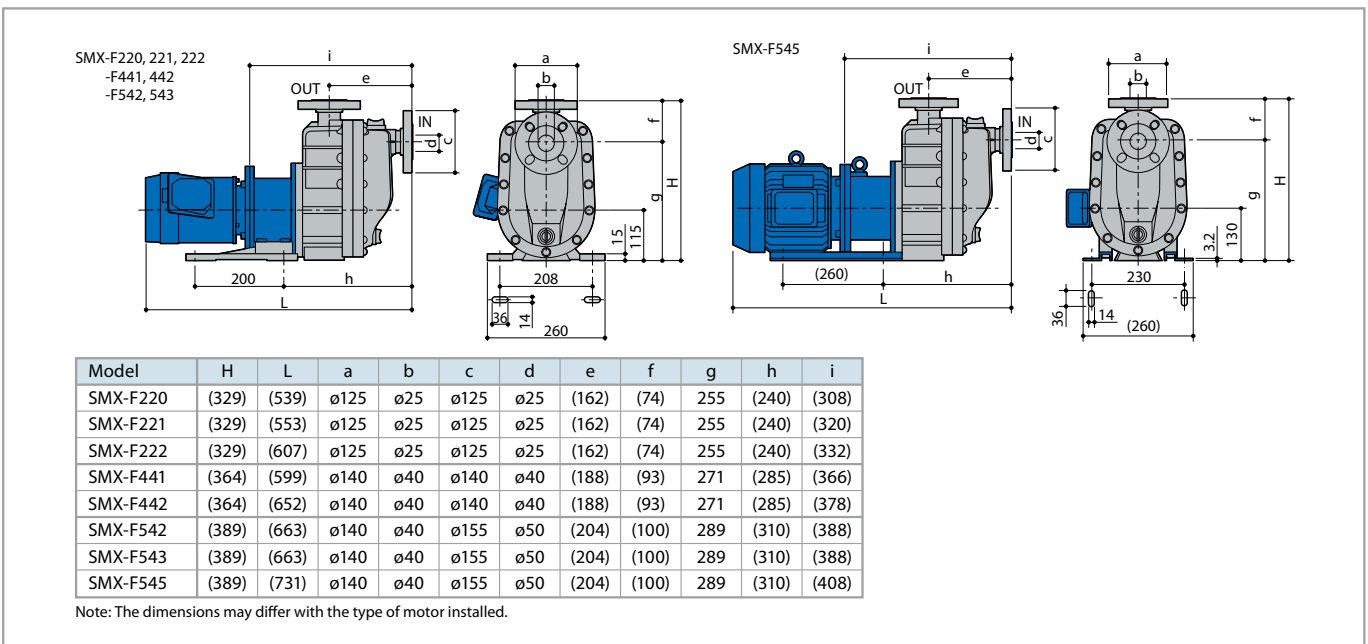
Model	Connection Suction X Discharge (mm)	Impeller	Cycle (Hz)	Min. capacity (L/min)	Standard specification (L/min-m)	Max. capacity (L/min)	Motor (kW 2p)	Resisting pressure limit (MPa)	Mass Less motor (kg)
SMX-F220	25 X 25	V	50	10	80 - 7.5	90	0.37	0.28	14
SMX-F221	25 X 25	T	50		100 - 12.5	155	0.75		
		V	50		80 - 7.5	125			
SMX-F222	25 X 25	T	50		100 - 12.5	155	1.5		
SMX-F441	40 X 40	T	50		150 - 11.8	190	0.75		
SMX-F442	40 X 40	T	50	150 - 11.8	280	1.5			
SMX-F542	50 X 40	V	50	20	200 - 16.0	230	1.5	0.40	28
		T	50		250 - 16.0	440	2.2		
SMX-F543	50 X 40	V	50		200 - 16.0	410	2.2		
		T	50		250 - 16.0	440	4.0		
SMX-F545	50 X 40	V	50		200 - 16.0	410	4.0		

• Temperature range of handled liquid: 0 to 80°C (The self-priming height limit decreases at high temperatures.)

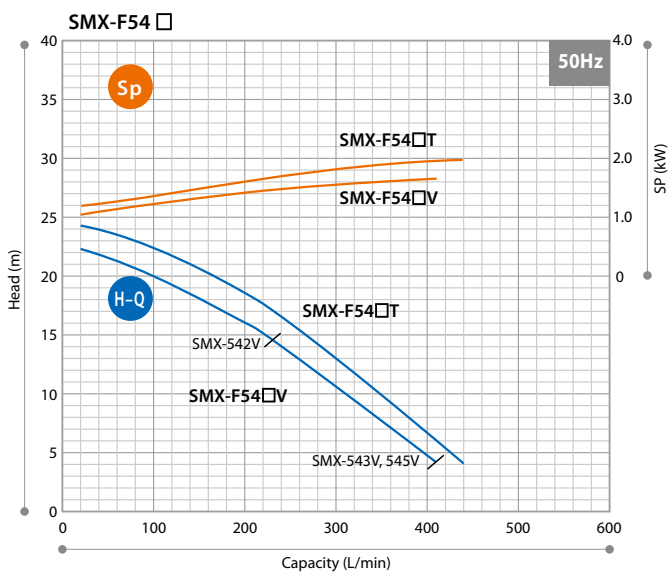
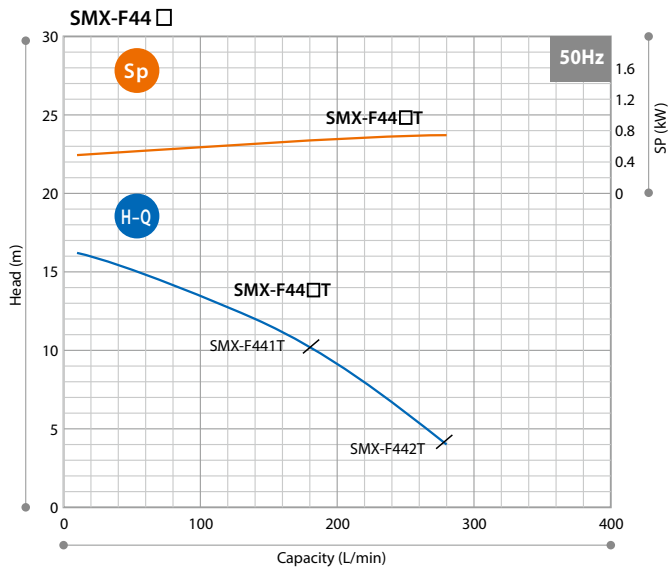
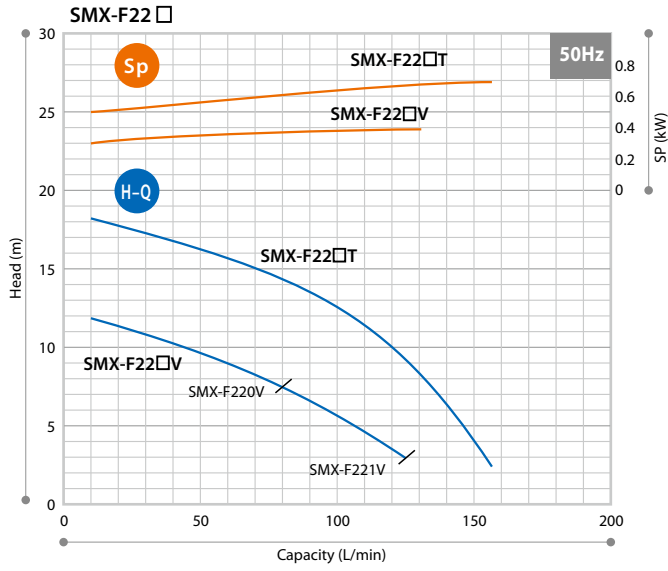
## Pump identification



## Dimensions in mm



**Performance curves**

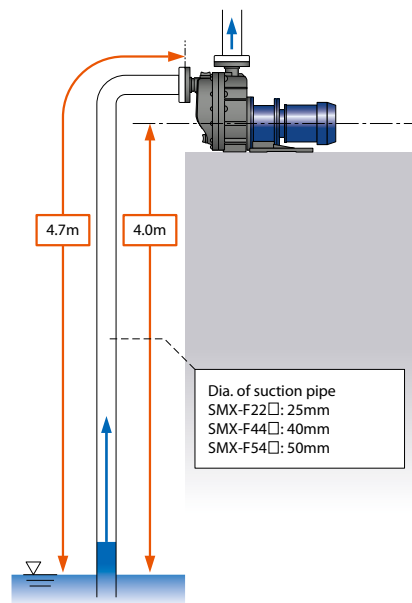


**Precautions on the selection of pumps**

- 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.



**Optional accessories**

**Iwaki dry running protector DR series**

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.

- 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
- DIN rail mounting
- It is unable to use DR when inverter is employed in the system.



**Specification**

50/60Hz

Model	DR-20	
Motor power	380 to 440V three phase	
Applied motor	0.75 to 15kW	
Power control	100 to 240V single phase	
Power	V	200 to 240V ±10% single phase
	Input	3.5W
Detective current	0.5 to 32.0A	
Current transformer(CT)	Built-in	
Outer dimension	D80 X W153 X H122	

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( )Country codes

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[www.iwaki-pumps.jp](http://www.iwaki-pumps.jp)

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Italy : **IWAKI Europe GmbH** (Italy Branch)  
Spain : **IWAKI Europe GmbH** (Spain Branch)  
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Vietnam : **IWAKI Pumps Vietnam Co., Ltd.** TEL: (84)613 933456 FAX: 613 933399

- ⚠ Caution for safety use:  
Before use of pump, read instruction manual carefully to use the product correctly.
- ⚠ Legal attention related to export.

Our products and/or parts of products fall in the category of goods contained in control list of international regime for export control. Please be reminded that export license could be required when products are exported due to export control regulations of countries.

Actual pumps may differ from the photos. Specifications and dimensions are subject to change without prior notice. For further details please contact us.

