

**Chemically Resistant Self-Priming Magnetic Drive Pumps  
Which Can Tolerate Abnormal Operation**

Main material  
**CFRETFE**



# 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 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



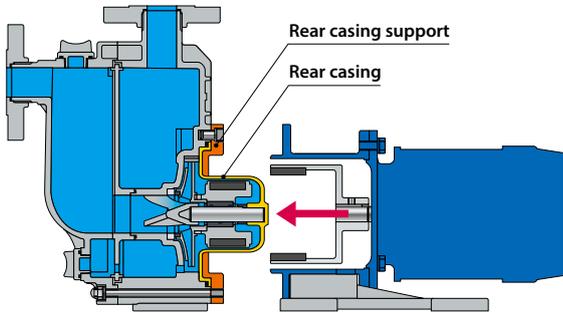
### Excellent Corrosion Resistance

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.



### 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.



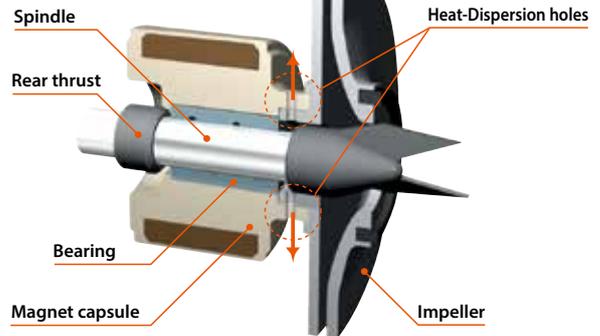
#### Rear casing support

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.



### Enhanced Durability Under Abnormal Operation

Our original self-radiation structure 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.



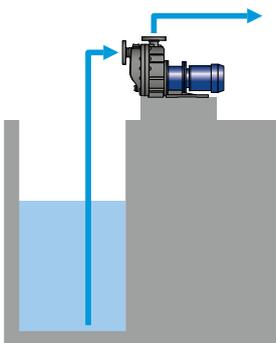
### Expanded Versatility

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

## Examples of application

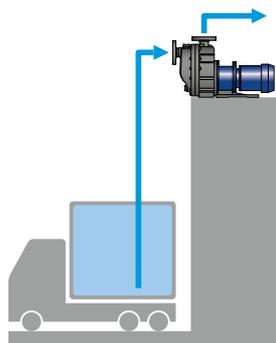
#### Pumping up from underground tank

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



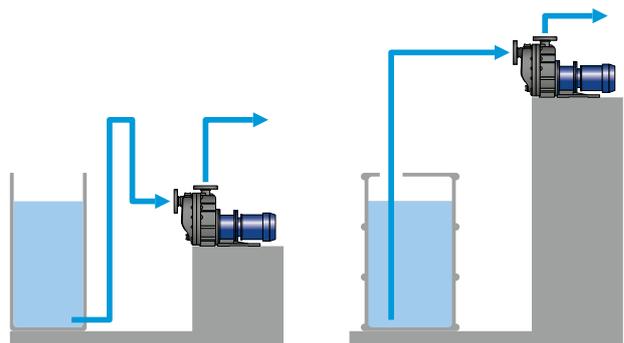
#### Pumping up and out from top of tank and tanker truck

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

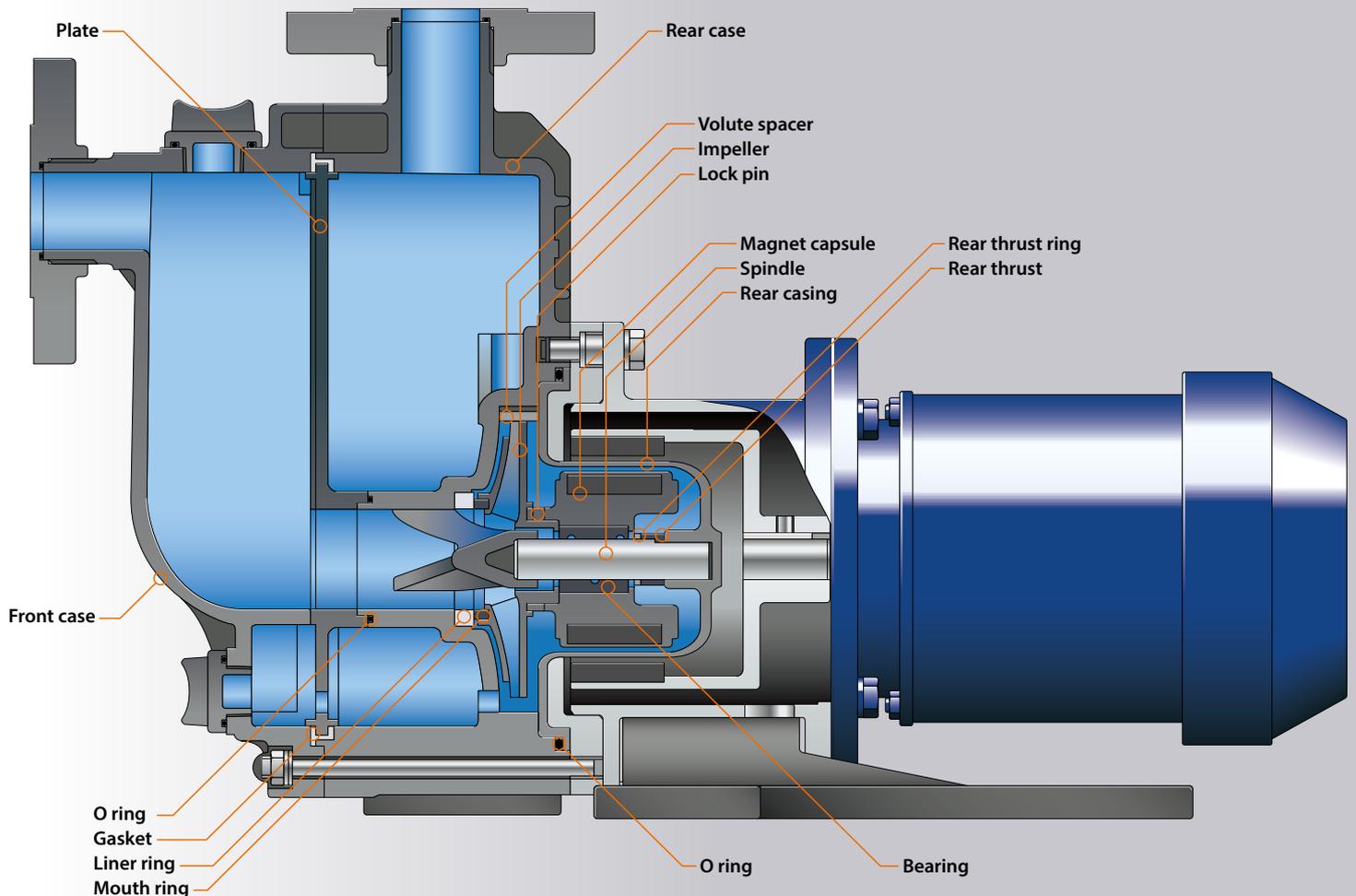


#### Transferring chemical from tank to tank

- 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

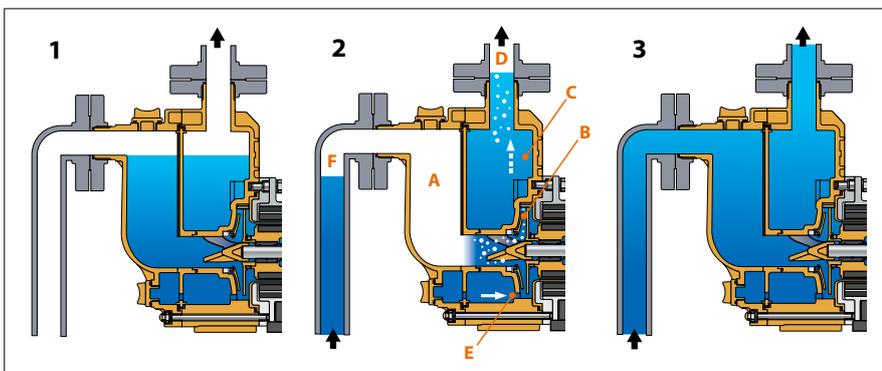
Name of part	Model		
	CF	RF	KK
Front case			
Rear case			
Rear casing			
Volute spacer		CFRETFE	
Impeller			
Plate			
Magnet capsule			
O ring		FKM/EPDM	
Gasket			
Spindle		High purity alumina ceramic	SiC
Liner ring			
Rear thrust	SMX-F22, 44 SMX-F54	CFRETFE	
Rear thrust ring <sup>Note2</sup>		High purity alumina ceramic	SiC
Bearing	High density carbon	High purity alumina ceramic PTFE (With filler)	-
Mouth ring		PTFE (With filler)	SiC
Lock pin <sup>Note1</sup>		CFRETFE	

Note1: 54 type only

Note2: Exclusive for SMX-F22RF, 44RF



### Principles of Self-Priming



- 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 (50Hz)

Model	Connection Suction×Discharge	Impeller	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	25×25	V	10	50 - 9.6	85	0.37	0.28	14
SMX-F221		T		100 - 12.5	115	0.75		
SMX-F222		V		80 - 7.5	125	1.5		
SMX-F441	40×40	T	10	100 - 13.5	135	0.75	0.33	15.5
SMX-F442		T		150 - 11.8	280	1.5		19
SMX-F542	50×40	V	20	100 - 19.8	155	1.5	0.40	28
SMX-F543		T		250 - 16.0	440	2.2		
		V		200 - 16.0	410	4.0		
SMX-F545		T		250 - 16.0	440	4.0		36
		V		200 - 16.0	410			

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

## Pump Identification

**SMX-F - 22 0 CF V V E**

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**1 Series symbol**  
SMX-F : CFRETFE type

**2 Pump size (Suction×Discharge)**  
22 : 25×25  
44 : 40×40  
54 : 50×40

**3 Motor output**  
0 : 0.37kW  
1 : 0.75kW  
2 : 1.5kW  
3 : 2.2kW  
5 : 4.0kW

**4 Materials of Bearing / Spindle / Liner ring)**  
CF : High density carbon / High purity alumina ceramic / High purity alumina ceramic  
RF : PTFE (with filler) / High purity alumina ceramic / High purity alumina ceramic  
KK : SiC/SiC/ SiC

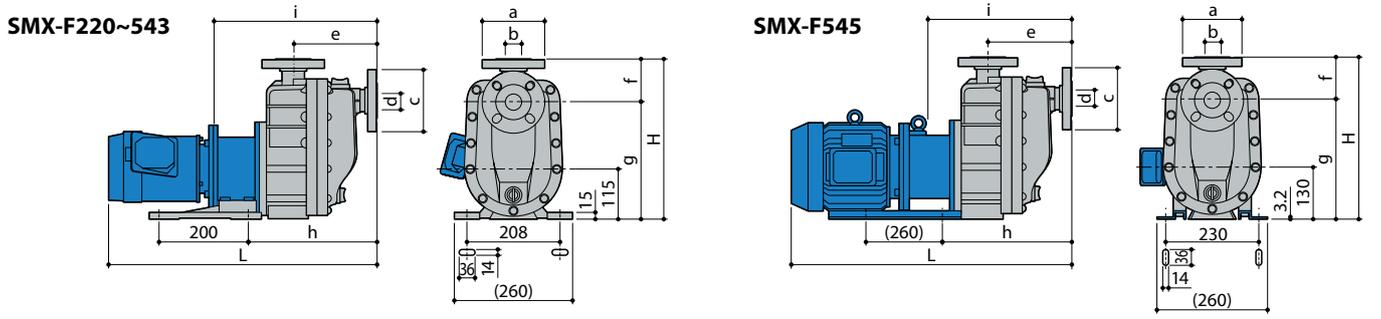
**5 Materials of O-ring**  
V : FKM  
E : EPDM

**6 Impeller**  
T, V : 50Hz

**7 Motor specifications**  
E : IEC motor

Note: All combination of impeller and motor size are not available. Please contact Iwaki for detail.

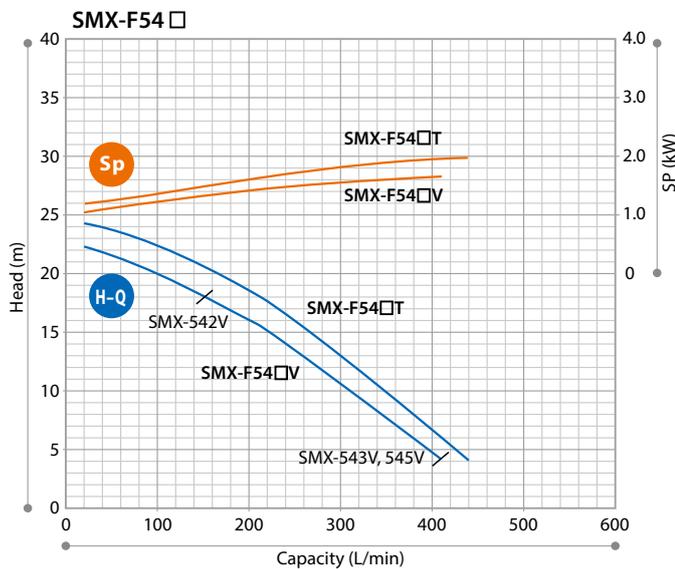
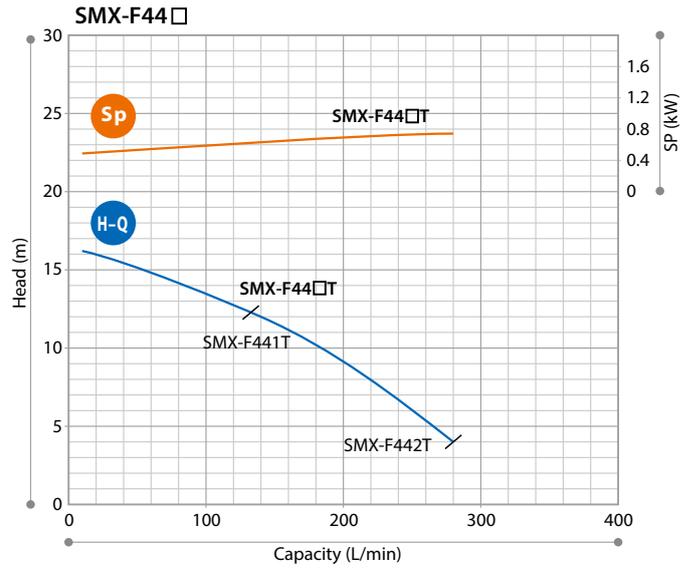
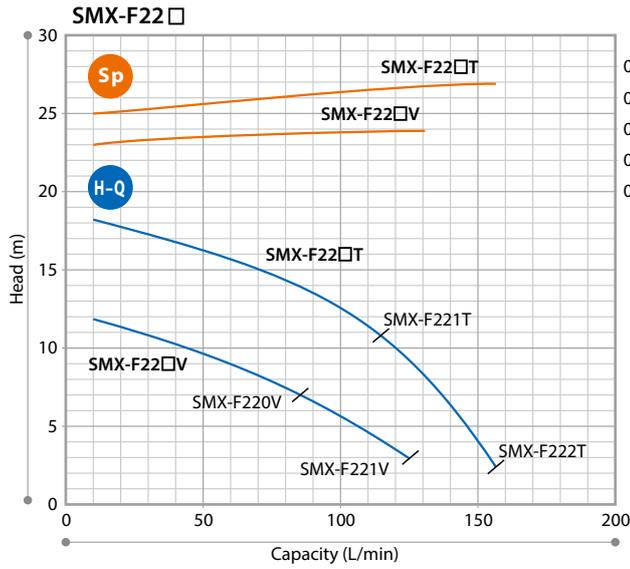
## Dimensions (mm)



Model	(H)	(L)	a	b	c	(d)	(e)	(f)	g	(h)	(i)
SMX-F220	329	539	Ø125	Ø25	Ø125	Ø25	162	74	255	240	308
SMX-F221		553									320
SMX-F222		607									332
SMX-F441	364	599	Ø140	Ø40	Ø140	Ø40	188	93	271	285	366
SMX-F442		652									378
SMX-F542	389	663	Ø140	Ø40	Ø155	Ø50	204	100	289	310	388
SMX-F543		731									408
SMX-F545											

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

## Performance Curves



## 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.

- 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. (Refer to the figure below)
- Logging Capability** Data log feature for preventative maintenance scheduling.
- Communication** RS485 external communication capability.
- Clamp-Type Current Sensor for Ease of Installation** No modification of motor leads necessary.

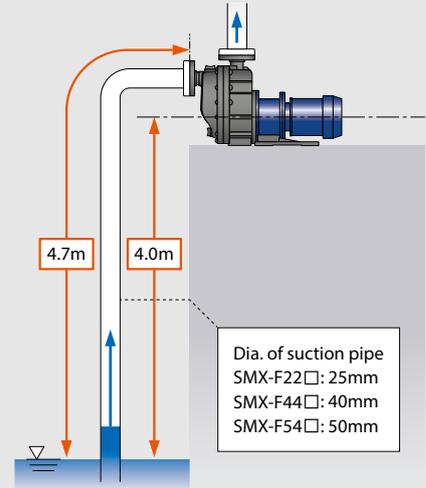


#### Specifications

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	

**Self-priming considerations**

- 1.The diameter of the piping on the suction side should be the same as that of the pumps inlet port,  
SMX-F22□: 25mm  
SMX-F44□: 40mm  
SMX-F54□: 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.
- 6.When installing a check valve, install an air vent line to release the air.
- 7.Pipe support  
If piping weight loads the pump, plastic parts are deformed. Be sure to install a pipe support.



**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. Always keep 10% allowance to motor output.  
Pump shaft power Sp x Specific gravity x 1.1 (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

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**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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