



The Heart of Industry

**IWAKI**

IWAKI  
SELF-PRIMING  
MAGNETIC DRIVE  
PUMPS

**SMX**

Main material

**GFRPP**



Patent

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

Solutions for chemical handling applications

# Versatile self-priming magnetic drive pump with enhanced durability under abnormal operation



The SMX is a horizontal self-priming magnetic drive pump made from reinforced plastic. 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-543

SMX-441

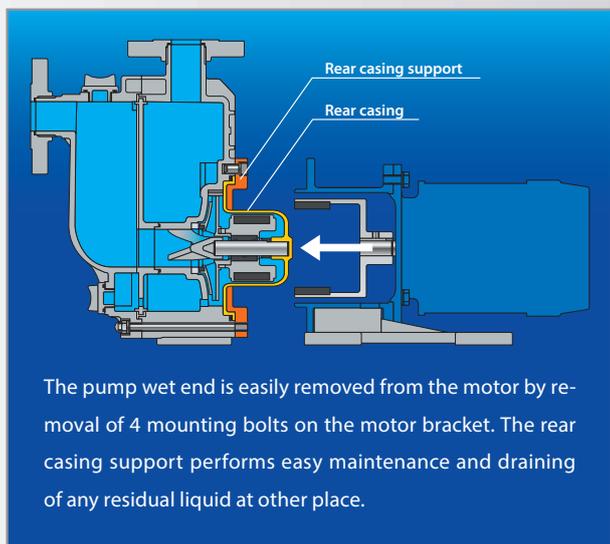
SMX-220

**Expanded versatility**

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

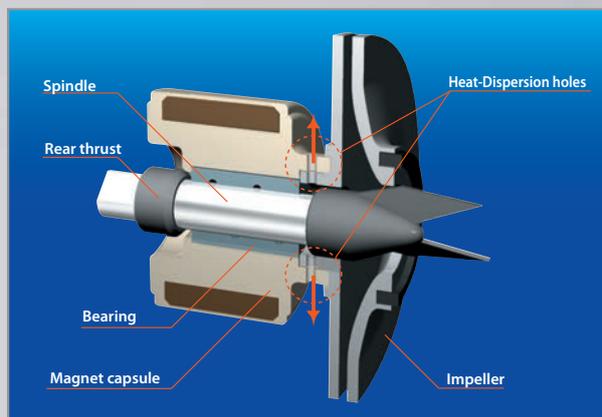
**Easy maintenance**

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.



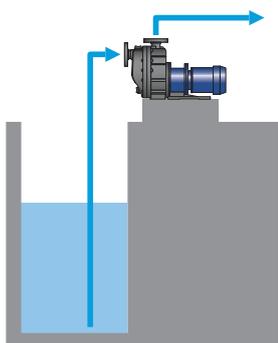
**Fast self-priming**

The SMX 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.

**Examples of application**

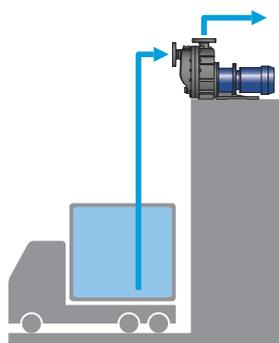
**Pumping up from underground tank**

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



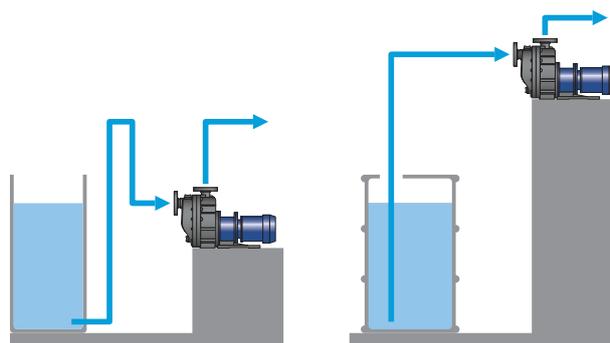
**Pumping up and out from top of tank and tanker truck**

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

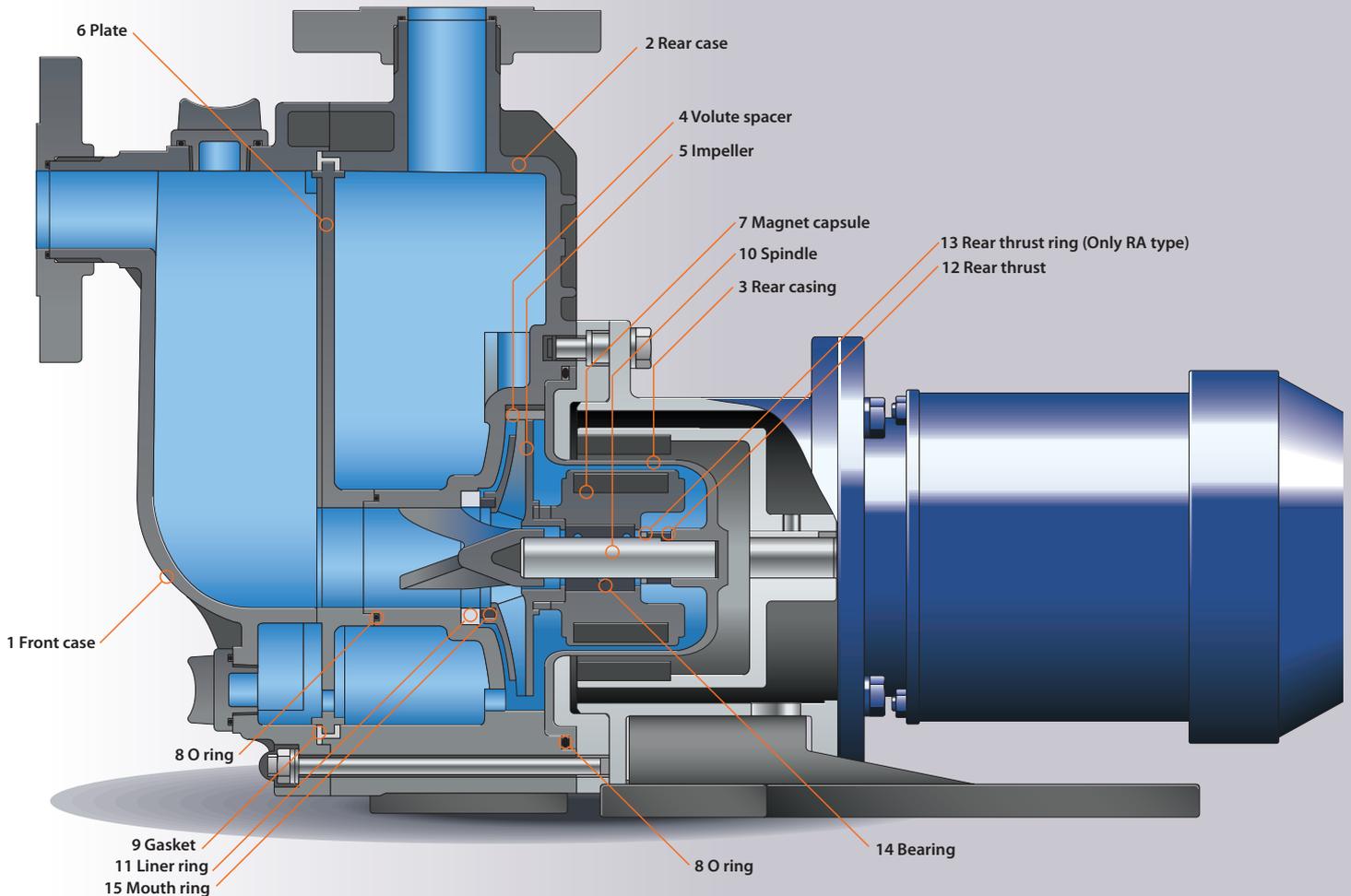


**Transferring chemical from tank to tank**

- 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

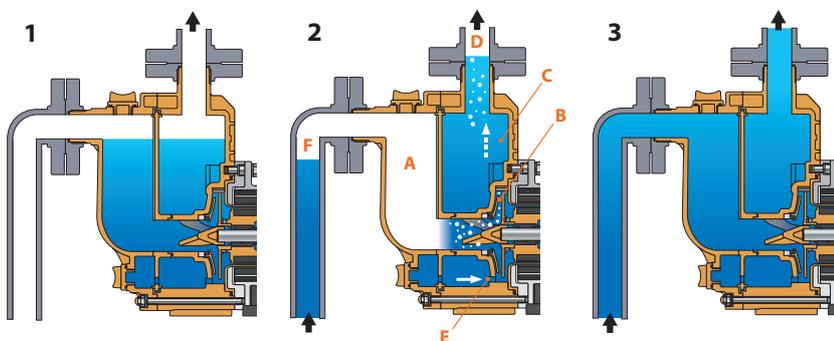
Name of part	Model		
	CA	RA	KA
1 Front case			
2 Rear case			
3 Rear casing		GFRPP	
4 Volute spacer <small>Note1</small>			
5 Impeller			
6 Plate			
7 Magnet capsule		PP	
8 O ring		FKM/EPDM	
9 Gasket			
10 Spindle	High purity alumina ceramic		SiC
11 Liner ring		Alumina ceramic	
12 Rear thrust <small>SMX-22, 44</small>		CFRPPS	
<small>SMX-54</small>	High purity alumina ceramic		SiC
13 Rear thrust ring <small>Note2</small>	-	Alumina ceramic	-
14 Bearing	Carbon	PTFE (With filler)	SiC
15 Mouth ring		PTFE (With filler)	

Note1 : SMX-22□T, 54□T, 54□X do not have a Volute spacer

Note2 : Exclusive for SMX-22RA, 44RA



## 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.

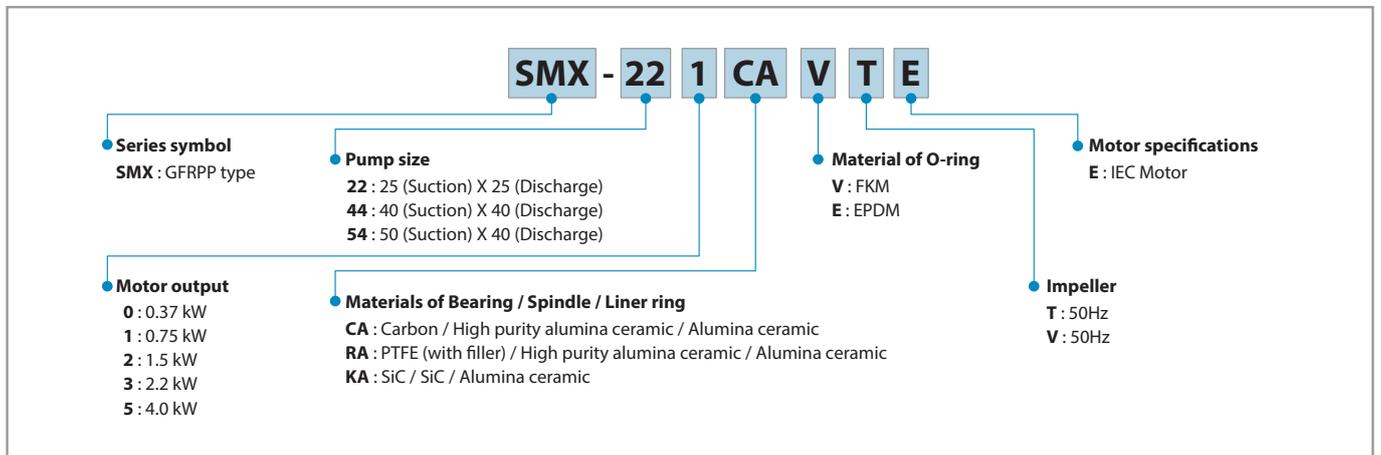
# Specifications

50Hz

Model	Connection Suction X Discharge (mm)	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-220	25 X 25	V	10	80 - 8.5	90	0.37	0.28	13
SMX-221		T		100 - 13.0	105	0.75		15.5
SMX-222		V		80 - 8.5	140	1.5		16
SMX-441	40 X 40	T	10	100 - 14.0	115	0.75	0.33	16
SMX-442		T		150 - 12.4	280	1.5		16.5
SMX-542	50 X 40	V	20	100 - 20.5	210	1.5	0.43	24
SMX-543		T		250 - 18.0	440	2.2		
		V		200 - 17.0	410			
		T		250 - 18.0	440	4.0		32
SMX-545		V		200 - 17.0	410			

• The self-priming height limit noted above refers to a liquid equivalent to fresh water at 20°C. The self-priming height limit varies with the liquid temperature and the type of liquid.  
 • Temperature range of handled liquid: 0 to 80°C (The self-priming height limit decreases at high temperatures.)

## Pump identification



### Precautions on the selection of pumps

- 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.
- The magnetic pump cannot run continuously with a closed-discharge. Be sure to observe the minimum flow rate.  
 The minimum flow rate SMX-22□: 10L/min  
 SMX-44□: 10L/min  
 SMX-54□: 20L/min
- Select a pump model according to liquid specific gravity. Always keep 10% allowance to motor output.  

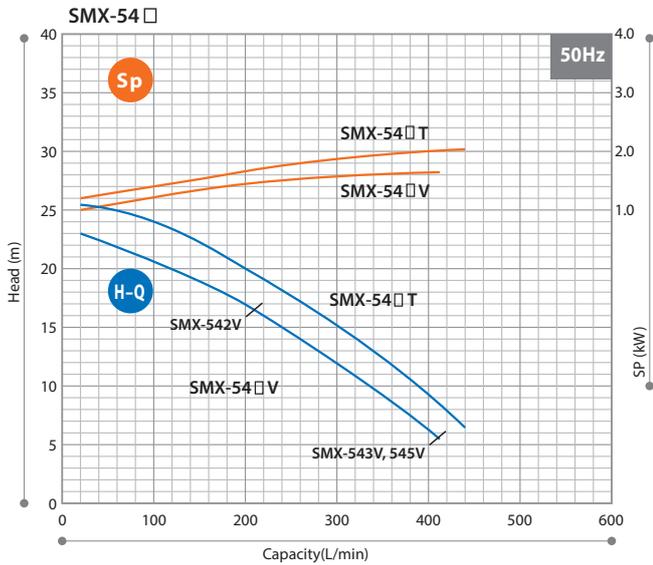
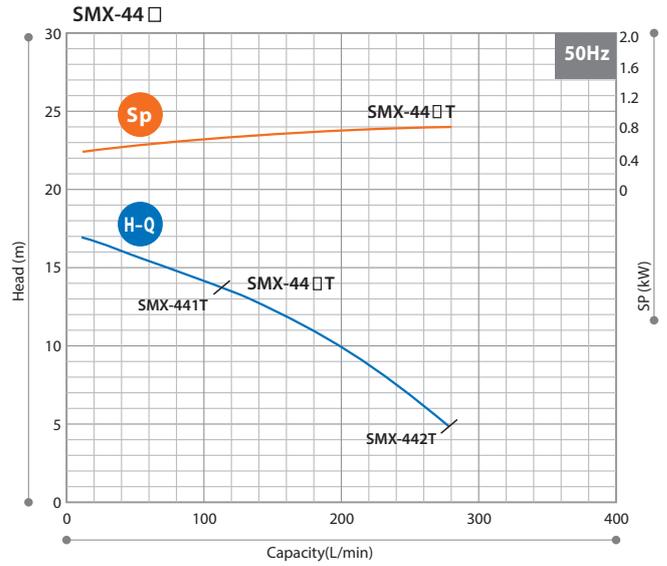
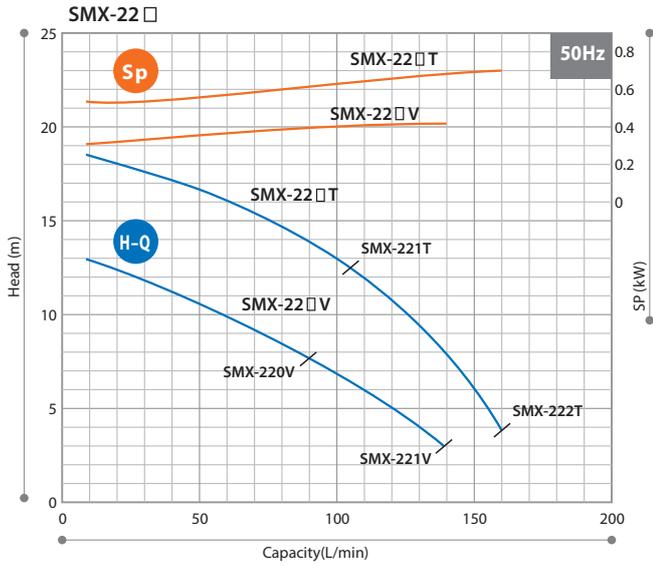
$$\text{Pump shaft power } S_p \times \text{Specific gravity} \times 1.1 (\text{margin}) \leq \text{Motor output}$$
- The self-priming performance (4m in 90 seconds) is based on the operation with 20°C clean water on the right piping condition. Self-priming performance varies with liquid temperature, characteristics and piping conditions. Obtain a rough guide of the highest possible self-priming height at each liquid specific gravity by the following formula.  

$$\text{The highest possible self-priming height [m]} = \frac{\text{Self-priming height with clean [m]} \times \text{Liquid specific gravity}}{\text{Liquid specific gravity}}$$

### Self-priming considerations

- The diameter of the piping on the suction side should be the same as that of the pumps inlet port.  
 SMX-22□: 25mm  
 SMX-44□: 40mm  
 SMX-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.
- In cases where the liquid level fluctuates, take the height from the lowest liquid level as the maximum self-priming height.
- Always perform priming before first operation, and start the pump only after the pump chamber has been filled with the handled liquid.
- To prevent early deterioration, avoid frequent start/stop of the pump.
- If a foot valve is installed on the suction pipe, pipe resistance may increase so that the pump cannot suck liquid enough.

Performance curves



Dimensions in mm

**SMX -220, 221, 222  
-441, 442  
-542, 543**

**SMX -545**

model	H	L	a	b	c	d	e	f	g	h	i
SMX-220	(329)	(539)	ø125	ø25	ø125	ø25	(162)	(74)	255	(240)	(308)
SMX-221	(329)	(553)	ø125	ø25	ø125	ø25	(162)	(74)	255	(240)	(320)
SMX-222	(329)	(607)	ø125	ø25	ø125	ø25	(162)	(74)	255	(240)	(332)
SMX-441	(364)	(599)	ø140	ø40	ø140	ø40	(188)	(93)	271	(285)	(366)
SMX-442	(364)	(652)	ø140	ø40	ø140	ø40	(188)	(93)	271	(285)	(378)
SMX-542	(390)	(668)	ø140	ø40	ø155	ø50	(205)	(100)	290	(315)	(393)
SMX-543	(390)	(668)	ø140	ø40	ø155	ø50	(205)	(100)	290	(315)	(393)
SMX-545	(390)	(736)	ø140	ø40	ø155	ø50	(205)	(100)	290	(315)	(413)

The dimensions L 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 50Hz 10VA	
Operating temperature	0-40°C	
Operating humidity	35-85%RH	

## Iwaki process magnetic drive pump series

### MX/MX-F SERIES

Withstands difficult operating conditions and offers high efficiency



MX-401

MX-250

#### Specifications

- Max.discharge capacity: 500 L/min
- Max.head: 35 m
- Main materials: GFRPP (MX-F: CFRETFE)
- Liquid temp. range: 0 to 80 °C

### MXM SERIES

Magnetic drive pumps with an excellent balance of features and performance



MXM542

#### Specifications

- Max.discharge capacity: 600 L/min
- Max.head: 29 m
- Main materials: CFRETFE
- Liquid temp. range: -10 to 105 °C



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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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