

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



Main material  
**GFRPP**

# 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 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



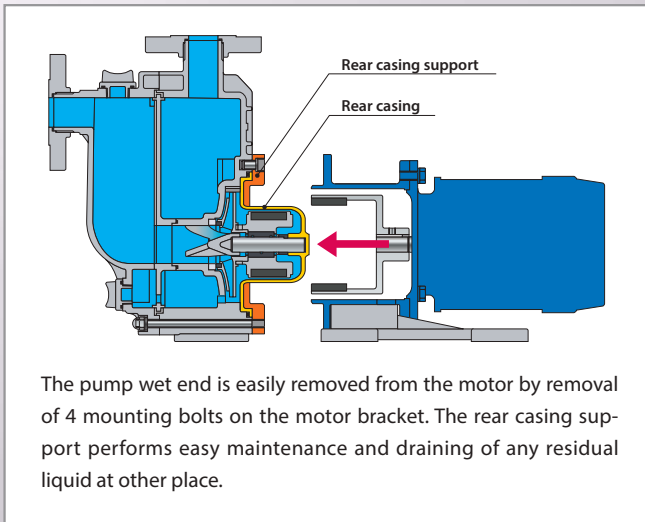
**Expanded versatility**

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



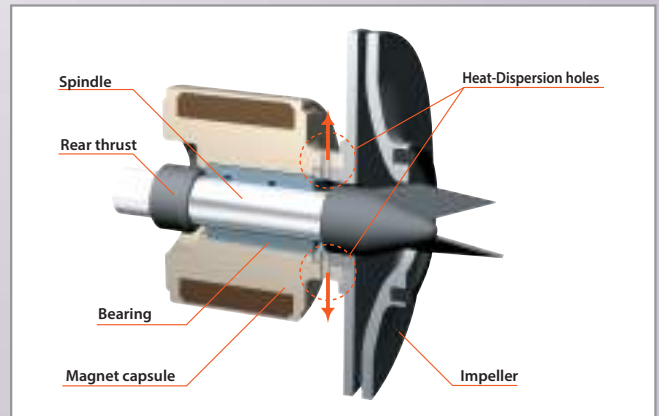
**Easy maintenance**

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 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.



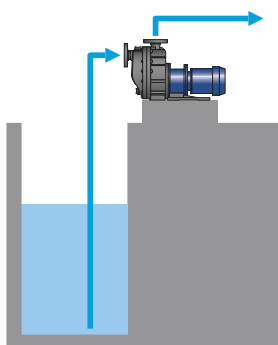
**Fast self-priming**

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**

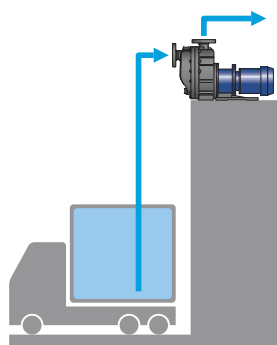
**Pumping up from underground tank**

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



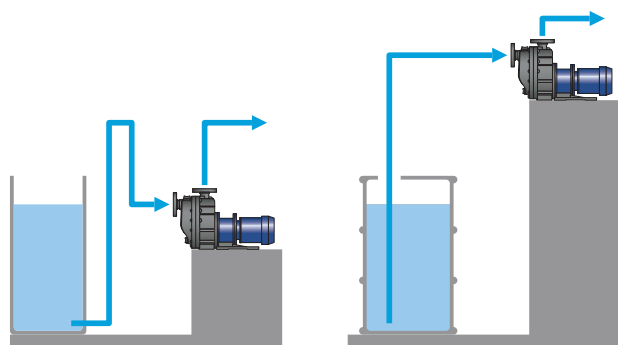
**Pumping up and out from top of tank and tanker truck**

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

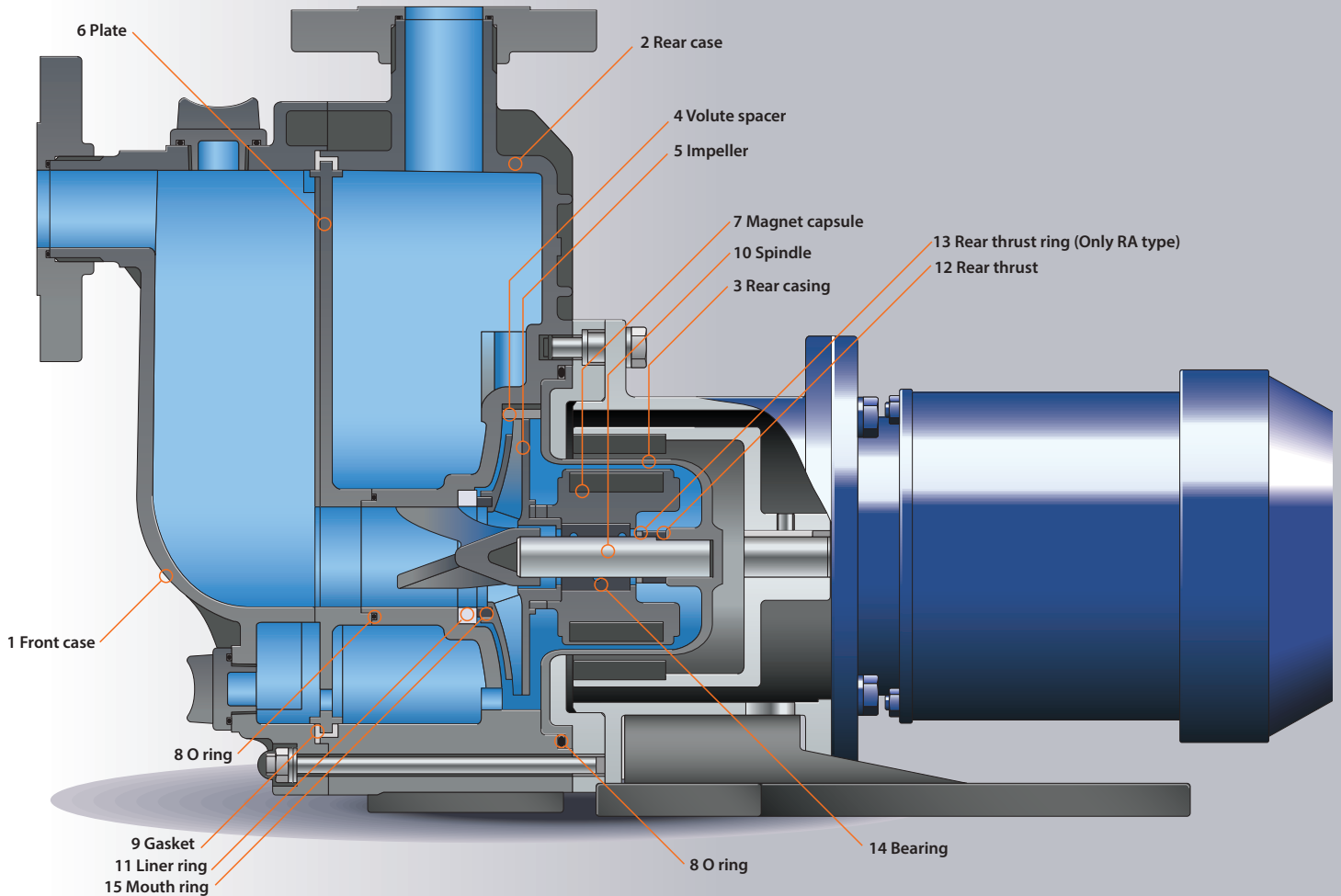


**Transferring chemical from tank to tank**

- 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

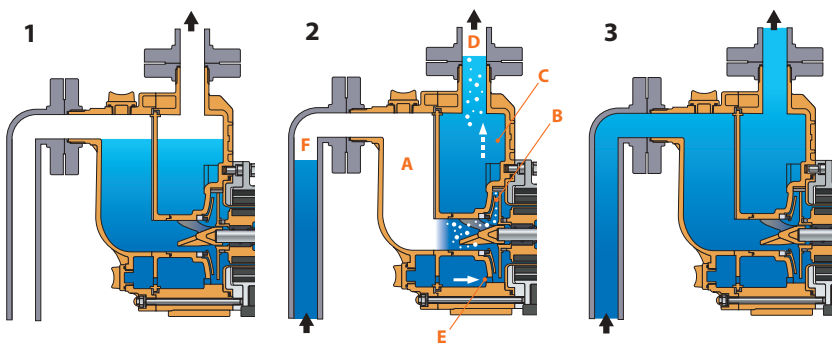
| Name of part                             | Model                       |                    |     |
|--|-----------------------------|--------------------|-----|
|  | CA                          | RA                 | KA  |
| 1 Front case                             |                             |                    |     |
| 2 Rear case                              |                             |                    |     |
| 3 Rear casing                            |                             |                    |     |
| 4 Volute spacer <small>Note1</small>     |                             | GFRPP              |     |
| 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

| Model   | Connection Suction×Discharge | Impeller   | Cycle (Hz) | Min. capacity (L/min) | Standard specification (L/min-m) | Max. capacity (L/min) | Motor (kW 2P) | Resisting pressure limit (MPa) | Mass (kg) |      |
|---------|------------------------------|------------|------------|-----------------------|----------------------------------|-----------------------|---------------|--------------------------------|-----------|------|
| SMX-220 | 25A×25A                      | V          | 50         | 10                    | 80 - 8.5                         | 90                    | 0.4           | 0.28                           | 22        |      |
|         |                              | Y          | 60         |                       | 80 - 8.0                         | 85                    |               |                                |           |      |
| T       |                              | 50         | 100 - 13.0 |                       | 105                              | 0.75                  |               |                                |           |      |
| V       |                              |            | 80 - 8.5   |                       | 140                              |                       |               |                                |           |      |
| SMX-221 |                              | X          | 60         |                       | 100 - 13.0                       |                       | 170           |                                |           |      |
|         |                              | Y          |            |                       | 80 - 8.0                         |                       | 135           |                                |           |      |
| SMX-222 |                              | T          | 50         | 100 - 13.0            | 160                              | 1.5                   |               |                                |           |      |
|         |                              | X          | 60         |                       | 170                              |                       |               |                                |           |      |
| SMX-441 |                              | 40A×40A    | T          | 50                    | 10                               | 100 - 14.0            | 115           | 0.75                           | 0.33      | 31.5 |
|         |                              |            | Y          | 60                    |                                  | 150 - 11.5            | 200           |                                |           |      |
| T       |                              |            | 50         | 150 - 12.4            |                                  | 280                   | 1.5           |                                |           |      |
| SMX-442 |                              |            | X          | 60                    |                                  | 200 - 18.0            |               | 335                            |           |      |
|         | Y                            |            | 150 - 11.5 |                       |                                  | 290                   |               |                                |           |      |
| SMX-443 | X                            |            | 200 - 18.0 | 345                   |                                  | 2.2                   |               |                                |           |      |
|         | Y                            |            | 200 - 18.0 | 345                   |                                  |                       |               |                                |           |      |
| SMX-542 | V                            |            | 50         | 20                    | 100 - 20.5                       | 210                   | 1.5           | 0.43                           | 48        |      |
| SMX-543 | T                            |            |            |                       | 250 - 18.0                       | 440                   |               |                                |           |      |
|         | V                            |            | 200 - 17.0 |                       | 410                              | 2.2                   |               |                                |           |      |
| Z       | 60                           |            | 250 - 18.0 |                       | 440                              |                       |               |                                |           |      |
| SMX-545 | T                            |            | 50         |                       | 250 - 18.0                       | 440                   | 3.7           |                                |           |      |
|         | V                            | 200 - 17.0 | 410        |                       |                                  |                       |               |                                |           |      |
|         | X                            | 60         | 300 - 26.0 | 520                   |                                  |                       |               |                                |           |      |
|         | Y                            |            | 300 - 22.3 | 500                   |                                  |                       |               |                                |           |      |
| Z       | 250 - 18.0                   | 440        |            |                       |                                  |                       |               |                                |           |      |

- 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.)
- Mass weight includes a outdoor motor.

# Pump identification

**SMX - 22 0 CA V V C**

①      ②      ③      ④      ⑤      ⑥      ⑦

① **Series symbol**  
SMX : GFRPP type

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

③ **Motor output**  
0 : 0.4kW  
1 : 0.75kW  
2 : 1.5kW  
3 : 2.2kW  
5 : 3.7kW

④ **Materials of Bearing / Spindle / Liner ring**  
CA : Carbon / High purity alumina ceramic / Alumina ceramic  
RA : PTFE (with filler) / High purity alumina ceramic / Alumina ceramic  
KA : SiC/SiC / Alumina ceramic

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

⑥ **Impeller**  
T, V : 50Hz  
X, Y, Z : 60Hz

⑦ **Motor specifications**  
C : TFEC outdoor  
A : Increased safety type, outdoor (Except SMX-443)

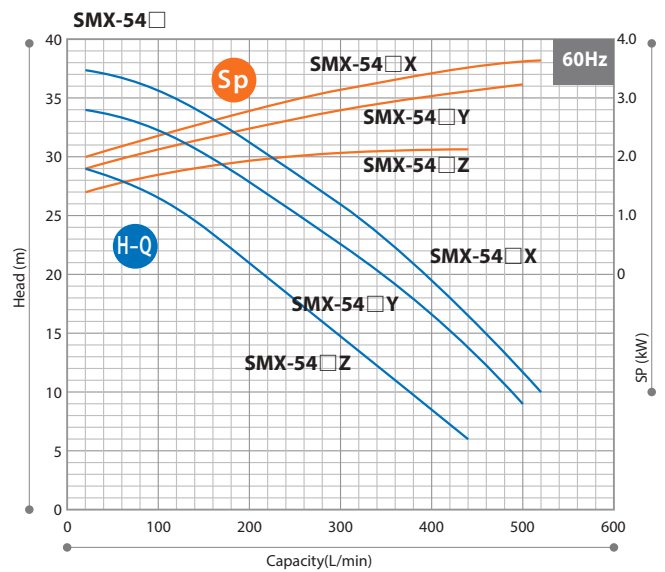
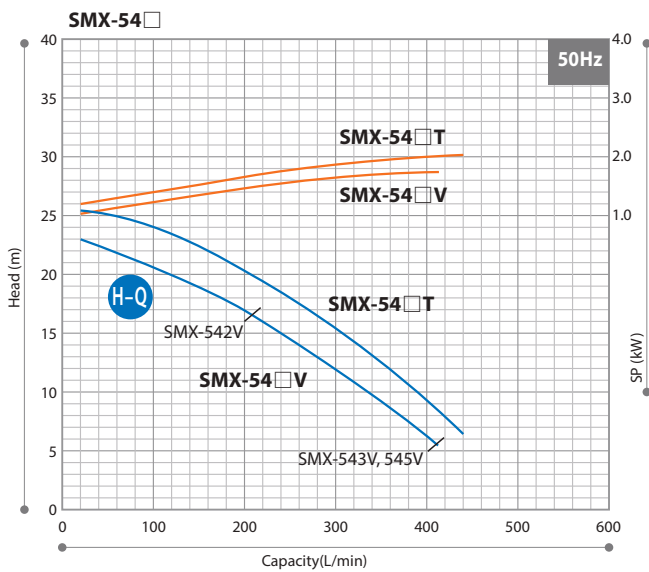
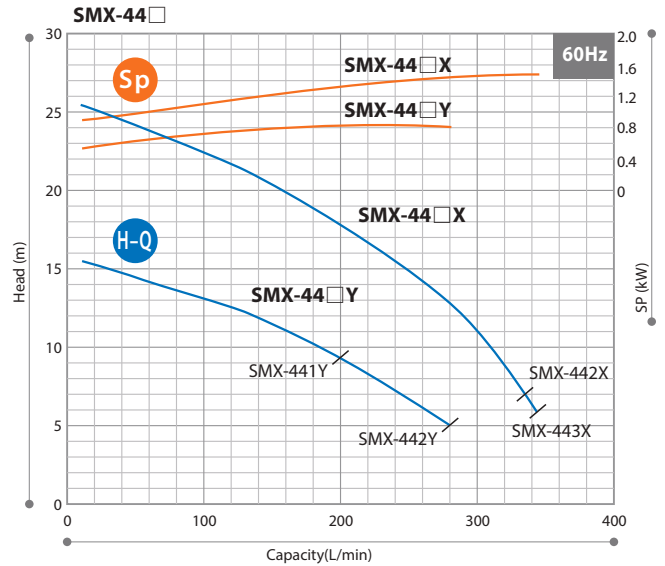
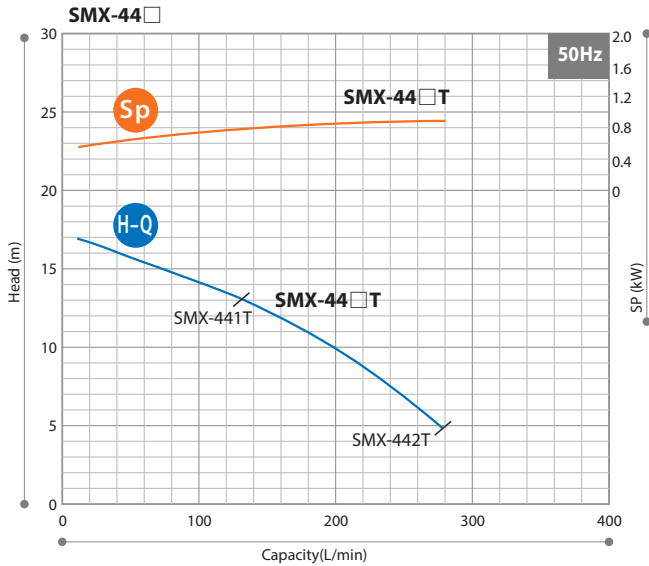
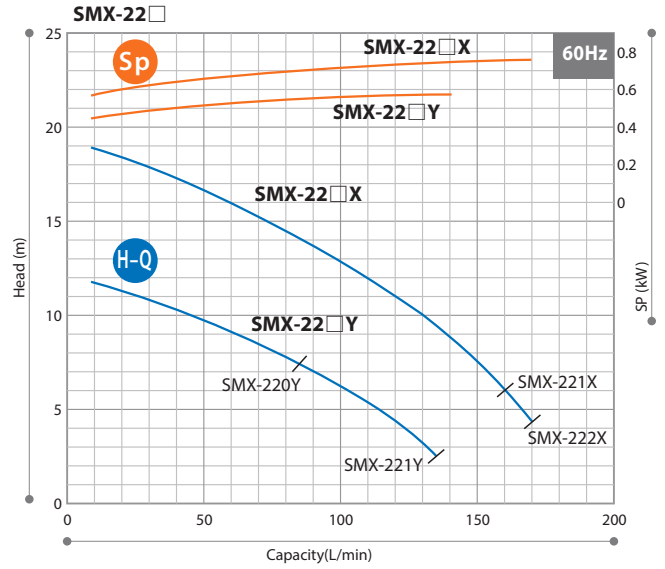
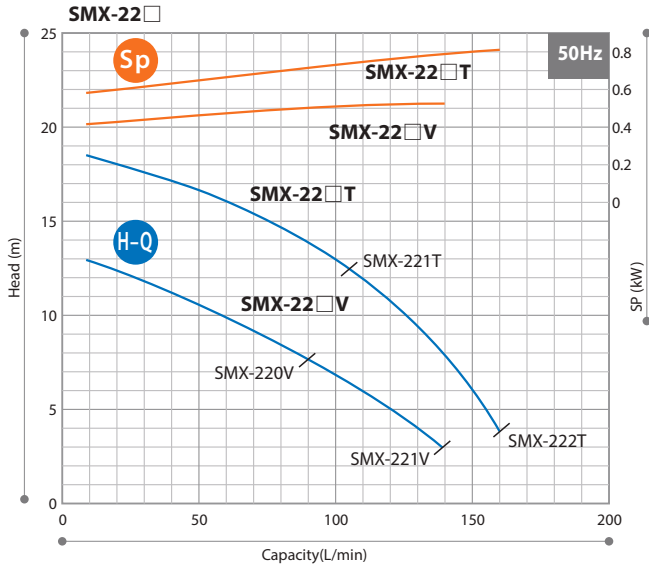
### Precautions on the selection of pumps

- 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.  
Pump shaft power Sp x Specific gravity x 1.1 (margin) ≤ 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.  
The highest possible self-priming height[m] = Self-priming height with clean[m] / 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.
- When installing a check valve, install an air vent line to release the air.
- Pipe support  
If piping weight loads the pump, plastic parts are deformed. Be sure to install a pipe support.

Performance curves



The shaft power curves shown above are calculated by using our standard test motor. Contact us for detail.

Dimensions in mm

| Model   | (H) | (L) | a    | (b) | c    | (d) | (e) | (f) | g   | (h) | (i) | j   |
|---------|-----|-----|------|-----|------|-----|-----|-----|-----|-----|-----|-----|
| SMX-220 | 329 | 539 | Ø125 | Ø25 | Ø125 | Ø25 | 162 | 74  | 255 | 240 | 308 | 115 |
|         |     | 556 |      |     |      |     |     |     |     |     | 320 |     |
|         |     | 605 |      |     |      |     |     |     |     |     | 332 |     |
| SMX-222 |     | 602 |      |     |      |     |     |     |     |     | 366 |     |
| SMX-441 | 364 | 651 | Ø140 | Ø40 | Ø140 | Ø40 | 188 | 93  | 271 | 285 | 378 | 115 |
| 680     |     |     |      |     |      |     |     |     |     |     |     |     |
| 666     |     |     |      |     |      |     |     |     |     |     |     |     |
| SMX-542 | 390 | 695 | Ø140 | Ø40 | Ø155 | Ø50 | 205 | 100 | 290 | 315 | 393 | 130 |
| 739     |     | 413 |      |     |      |     |     |     |     |     |     |     |

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                |            |

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IWAKI has global net work. Please find your distributor location at

[www.iwakipumps.jp](http://www.iwakipumps.jp)

|  |                        |                      |  |                       |                   |
|--|------------------------|----------------------|--|-----------------------|-------------------|
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| Germany : IWAKI Europe GmbH                              | TEL: (49)2154 9254 50  | FAX: 2154 9254 55    | Argentina : IWAKI America Inc. (Argentina Branch)              | TEL: (54)11 4745 4116 |                   |
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| Italy : IWAKI Europe GmbH (Italy Branch)                 | TEL: (39)0444 371115   | FAX: 0444 335350     | Singapore : IWAKI Singapore Pte Ltd.                           | TEL: (65)6316 2028    | FAX: 6316 3221    |
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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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