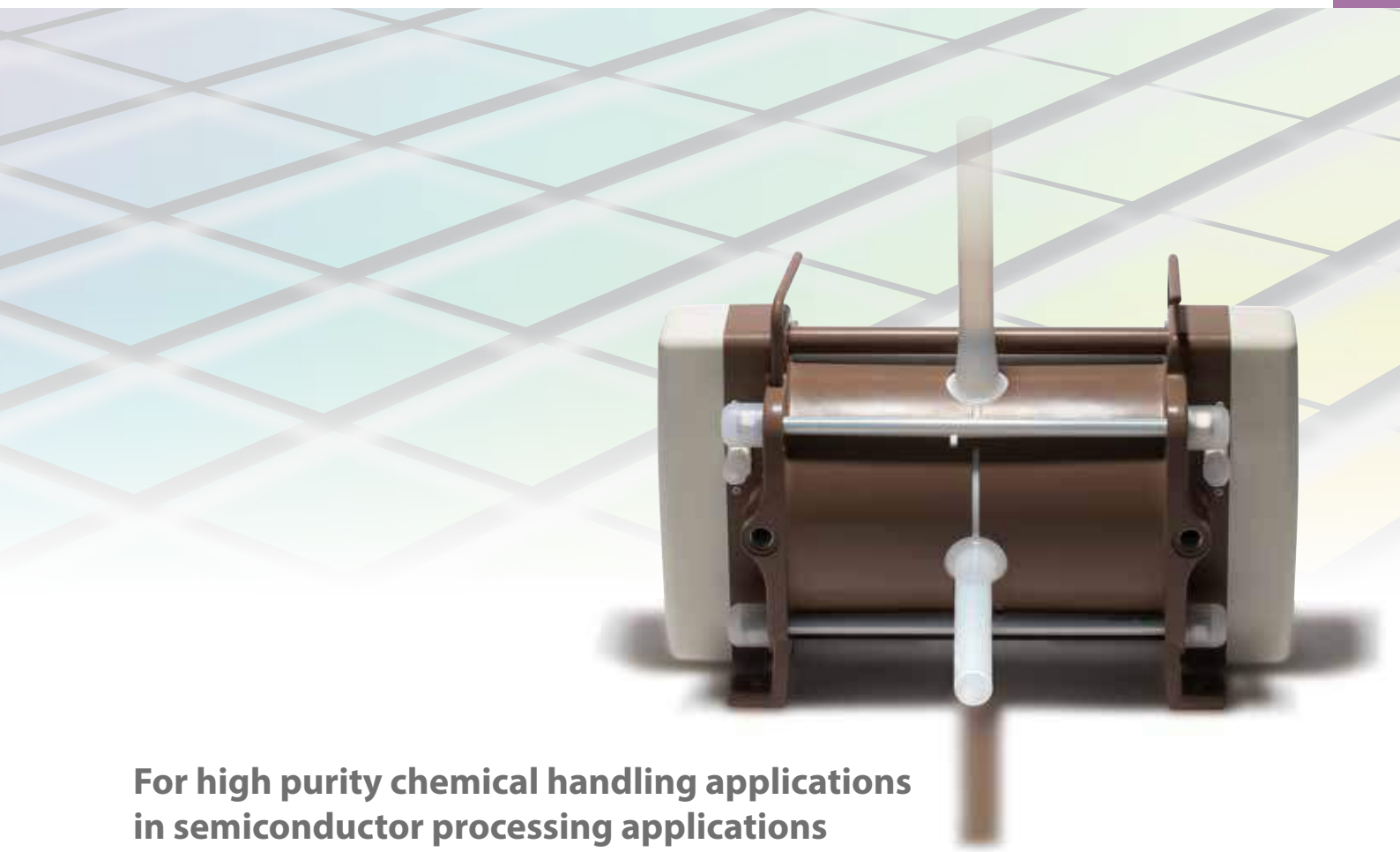
IWAKI

Pneumatic drive bellows pumps

F



For high purity chemical handling applications
in semiconductor processing applications

The Heart of Industry

For high purity chemical handling applications in semiconductor processing applications

The F-Series includes pneumatic drive bellows pumps that are designed for use in the semiconductor manufacturing processes. Iwaki introduced the first designs over 20 years ago and has continually developed new products to keep up with rapidly changing market needs. With over 20 different models available the quality and performance of our products has made them the preferred solution by device manufactures all over the world. Their quality and performance are recognized and highly rated by device manufacturers all over the world.
We offer not only pump solutions, but also accessories including controllers, dampeners, and liquid chemical supply systems that have been developed to compliment a comprehensive portfolio of quality equipment for wet process and surface preparation applications.

Guideline for pump selection

Max. discharge capacity (L/min)	Max. supplied air pressure (MPa)	Max. air consumption (NL/min)	Temperature range (˚C)
55	0.5	670	180 - 5
100	0.5	1210	180 - 10
100	0.7	1495	60 - 5
80	0.5	820	100 - 10
40	0.5	480	180 - 10
22	0.3	180	100 - 5
40	0.2	200	180 - 20
40	0.4	200	100 - 5

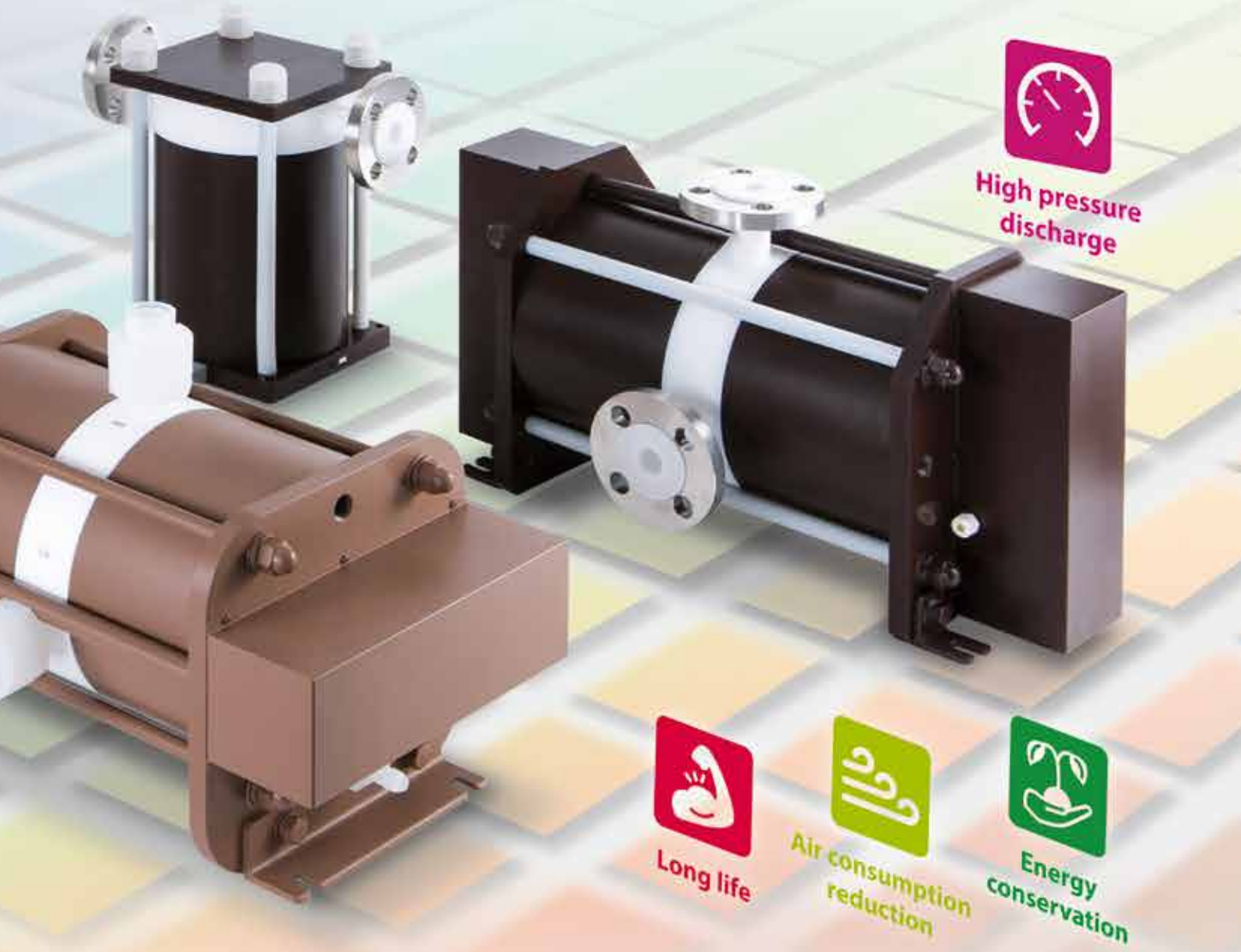
Note: Please check the specifications of each pump for liquid temperature and maximum supply air pressure.

Applications

●: Usable ○: Usable depend on condition

Model		FS-H	FS-N	FW	FW-H	FF	FF-H	FA	CFD
Wafer wet-bench	Cleaning (Batch process)	●	●	●	●	●	●	●	—
	Cleaning (Single wafer)	●	●	●	●	●	●	●	—
Chemical supply equipment		●	●	●	—	○	—	○	—
CMP process	Mixed-liquid circulation/Transfer	●	●	●	—	○	—	○	—
	Cleaning	●	●	●	—	●	—	●	—
Chemical replenishing equipment		—	—	—	—	—	—	—	●

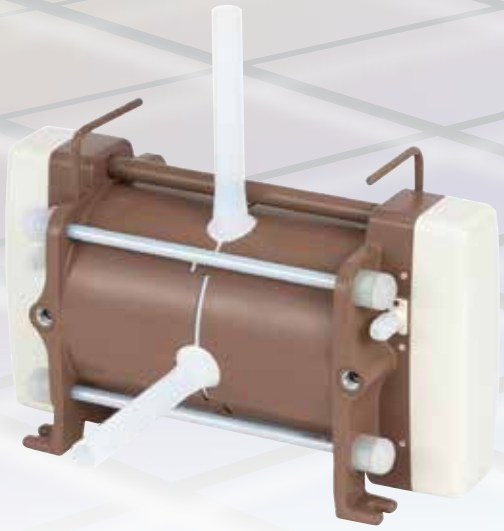
Note: Liquid temperature conditions vary depending on pump specifications.



FS-15/30/60H

Small & light-weight | Low cost | High tempera-ture transfer

A small, lightweight and cost effective solution



- Using a higher stroke rate (240 spm maximum) has resulted in a reduction in size, weight and cost.
  Note: The maximum stroke rates are dependent on model and application; please refer to the specification table for details.
- All liquid contact components are constructed of high purity fluororesin materials. The exterior of the units are also coated in fluororesin so that no metallic components are exposed. FS-H pumps also utilize our own shaft seal design (patent pending) resulting in a marked reduction in particle generation.
- The pumps are rated for liquid temperatures ranging from 5 - 180 °C with discharge pressure to 0.45 MPa. Applications include wet process circulation and CMP processes, as well as chemical distribution feed systems.
- The pump uses a proximity sensor drive system which opens/closes an external air solenoid valve providing easy performance control capabilities that are compatible with a variety of controller options.

Pump identification

FS	-	15	H	T	1	-	01
1		2	3	4	5		6

1 Series code

2 Pump size
15 : Max. discharge capacity 15L/min
30 : Max. discharge capacity 30L/min
60 : Max. discharge capacity 55L/min

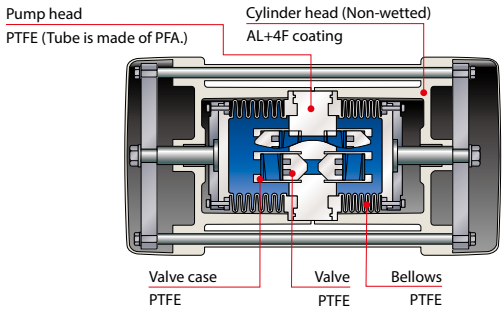
3 Liquid temperature
H : High liquid temperature (5 - 180˚C)

4 Pump connection (suction/discharge)
T : Tube connection

5 Sealing structure of pump head/bellows
1 : Bellows separation type
2 : Welded one-piece structure

6 Special specification
Without code : Standard specification
01 (Serial number) : Special specification

Construction and materials



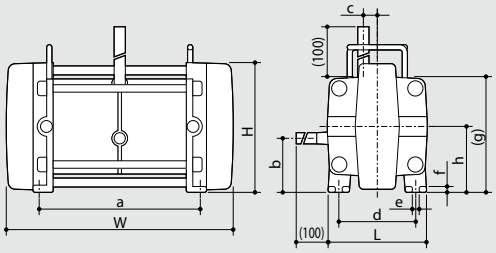
Specification

Model		FS-15HT1/T2			FS-30HT1/T2			FS-60HT/T2		
Max. discharge capacity	L/min	15			30			55		
Air supply pressure range	MPa	0.15 - 0.5	0.15 - 0.3	0.15 - 0.2	0.15 - 0.5	0.15 - 0.3	0.15 - 0.2	0.15 - 0.5	0.15 - 0.3	0.15 - 0.2
Liquid temperature range	˚C	5 - 50	51 - 100	101 - 180	5 - 50	51 - 100	101 - 180	5 - 50	51 - 100	101 - 180
Max. air consumption	NL/min	200	160	110	370	280	170	670	440	300
Max. stroke speed Note	spm	Max. 240			Max. 220			Max. 200		
Pump connection size		1/2" PFA tube			Ø19×Ø16mm PFA tube			Ø25×Ø22mm PFA tube		
Supply air connection size		Rc1/4			Rc1/4			Rc3/8		
Ambient temperature	˚C	0 - 40			0 - 40			0 - 40		
Drive system		By proximity switch			By proximity switch			By proximity switch		

Note: 180 spm maximum with feed air pressures between 0.3 and 0.5 MPa.
• Max. discharge capacity shows when pumping clear water at 20˚C.

Dimension in mm

Model	W	L	H	a	b	c	d	e	f	g	h
FS-15HT1/T2	315	120	166	213	77	15.5	96	10	8	144	84
FS-30HT1/T2	390	151	208	272	93	23	115	10	9	180	105
FS-60HT1/T2	441	194	251	317	107	27	152	12	11	224	127



FS-100H

High temperature transfer

Large flow transfer

Flow and temperature capabilities offer improved process efficiencies

- Maximum flow rate of up to 100 L/min with 180˚C liquid. This allows delivery of CARO (SPM) or H3PO4 at a flow rate 1.8 times higher than our existing pumps (55 L/min).
- Higher flow rates improve cleaning efficiency and removal of containments during wafer processing. Cleaning times are also reduced in systems with multiple processing lines.
- In addition to the use of fluoroplastic wet ends (PTFE and PFA), a fluorine coating on the pump's outer surfaces offers the best resistance to vapors from acid, alkali and hydrogen peroxide chemistries used in semiconductor manufacturing.
- Optimization of design has resultind in reduced weight of about 15% of our existing 80-100L models making installation and replacement work easier.
- The pump uses a proximity sensor drive system which opens/closes an external air solenoid valve providing easy performance control capabilities that are compatible with a variety of controller options.

Pump identification

FS	-	100	H	T	2	-	01
1		2	3	4	5		6

1 Series code

2 Pump size
100 : Max. discharge capacity 100L/min

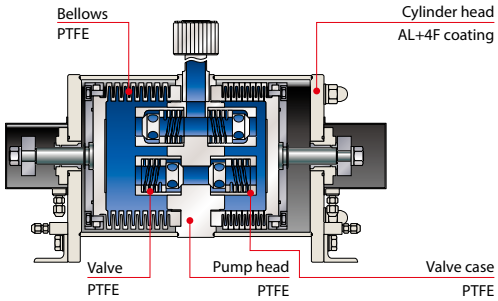
3 Liquid temperature
H : 10 - 180˚C

4 Pump connection (suction/discharge)
T : Tube connection

5 Sealing structure of pump head/bellows
2 : Welded one-piece structure

6 Special specification
Without code : Standard specification
01 (Serial number) : Special specification

Construction and materials

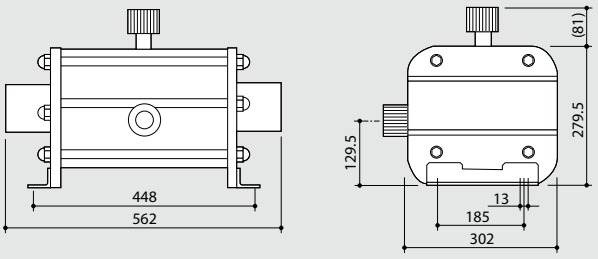


Specification

Model		FS-100HT2		
Max. discharge capacity	L/min	100		
Air supply pressure range	MPa	0.15 - 0.5	0.15 - 0.4	0.15 - 0.3
Liquid temperature range	˚C	10 - 100	101 - 140	141 - 180
Max. air consumption	NL/min	1210		
Max. stroke speed Note	spm	Max. 120		
Pump connection size		1 1/4" fittings (SUPER 300-type PILLAR FITTING manufactured by Nippon Pillar Packaging Co., Ltd.)		
Supply air connection size		Rc1/2		
Ambient temperature	˚C	0 - 60		
Drive system		By proximity switch		

• Max. discharge capacity shows when pumping clear water at 20˚C.

Dimension in mm



FS-N

Small and lightweight | Low cost | High pressure discharge | Large flow transfer

Max. 100L/min. High flow design for chemical distribution applications

- Perfectly suited to high flow & pressure chemical distribution requirements.
- The high stroke rate (Max 200 SPM:FS-80NT) provides for a compact, lightweight and lower cost option without sacrificing flow and pressure capability.
- All liquid contact materials are made of high purity fluororesin resulting in contamination-free construction. Our unique patented shaft seal (FS- 80NT...PAT.) also dramatically reduces particle generation.
- The pump utilizes a built in proximity sensor driven control system to switch an external air solenoid valve. Leak sensors are also included as standard equipment.
- Seal welded pump head and bellows eliminate leakage.

Pump identification

FS	-	80	N	T	-	01
1		2	3	4		5

1 Series code

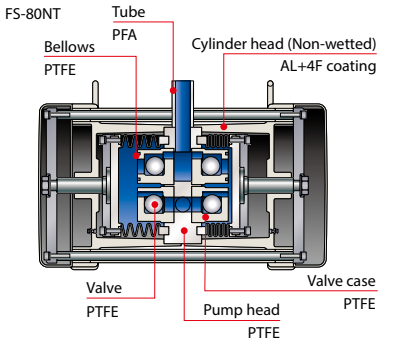
2 Pump size
80 : Max. discharge capacity 80L/min
100 : Max. discharge capacity 100L/min

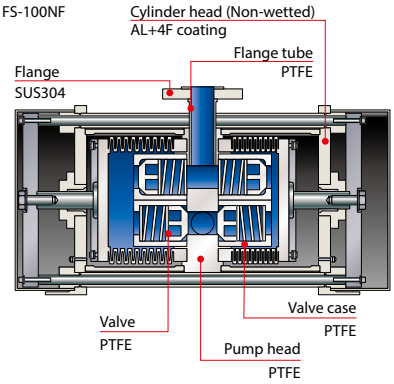
3 Liquid temperature
N : 5 - 60˚C

4 Pump connection (suction/discharge)
T : Tube connection
F : Flange connection
Sealing structure of pump head/bellows: Welded one-piece structure

5 Special specification
Without code : Standard specification
01 (Serial number) : Special specification

Construction and materials



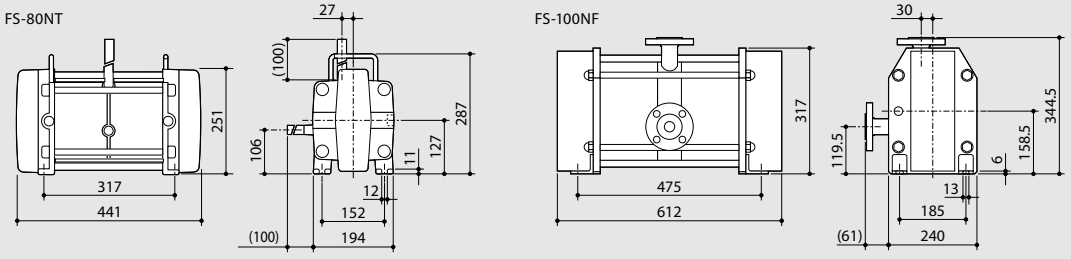


Specification

Model		FS-80NT			FS-100NF
Max. discharge capacity	L/min	80			100
Air supply pressure range	MPa	0.2 - 0.5	0.5 - 0.6	0.6 - 0.7	0.2 - 0.7
Liquid temperature range	˚C	5 - 60			5 - 60
Max. air consumption	NL/min	1029	938	787	1495
Max. stroke speed	spm	Max. 200	Max. 150	Max. 110	Max. 100
Pump connection size		Ø25×Ø22mm PFA tube			JIS 20K 25A Flange
Supply air connection size		Rc3/8			Rc1/2
Ambient temperature	˚C	0 - 40			0 - 40
Drive system		By proximity switch			By proximity switch

• Max. discharge capacity shows when pumping clear water at 20˚C.

Dimensions in mm

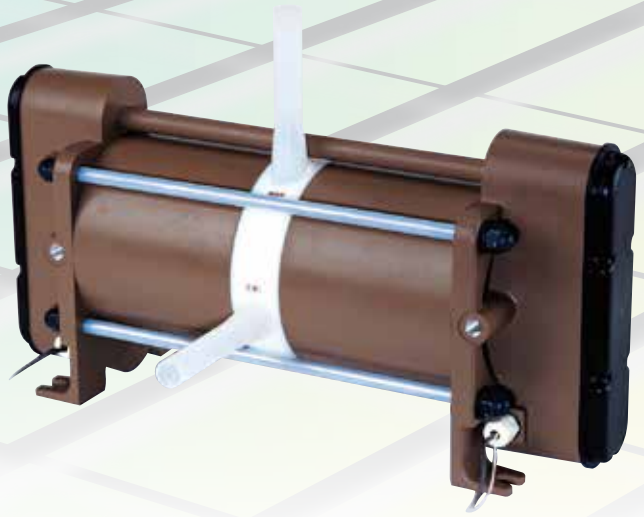


FW/FW-H

High tempera-ture transfer | High pressure discharge | Long life

Robust bellows design provides for high pressure capability and extended service life

- The use of a thick bellows increases the pumps discharge pressure rating to as high as 0.45 MPa maximum.
  In addition, the bellows have three to four times longer service life than a diaphragm. This results lower case a substantially reduced downtime.
- This design is commonly used for chemical feed, the FW series can be used in high pressure and medium temperature (10 - 100 °C) cleaning systems as well as for the circulation of CMP slurry liquids. The FW-H with its higher temperature capability (10 - 180 °C) is ideal for chemical circulation in wafer cleaning applications.
- Easily adaptable fitting capability, the internally formed PFA suction and discharge tubes prevent the accumulation of particles.
- When connected to a special controller, the discharge can be monitored and controlled easily.
- The pump utilizes a built in proximity sensor driven control system to switch an external air solenoid valve. Leak sensors are also included as standard equipment.



Pump identification

FW	-	20	H	T	1	-	01
1		2	3	4	5		6

1 Series code

2 Pump size
- **20** : Max. discharge capacity 20L/min
- **40** : Max. discharge capacity 40L/min
- **80** : Max. discharge capacity 80L/min

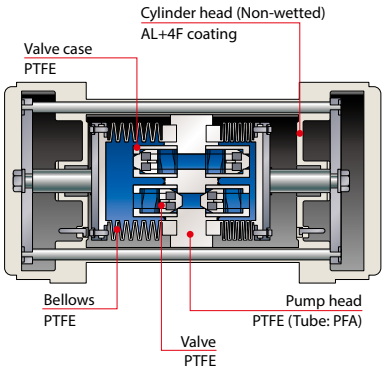
3 Liquid temperature
- Without code : Medium-liquid temperature (10 - 100˚C)
- **H** : High liquid temperature (10 - 180˚C)

4 Pump connection (suction/discharge)
- **T** : Tube connection

5 Sealing structure of pump head/bellows
- **1** : Bellows separation type
- **2** : Welded one-piece structure

6 Special specification
- Without code : Standard specification
- **01** (Serial number) : Special specification

Construction and materials



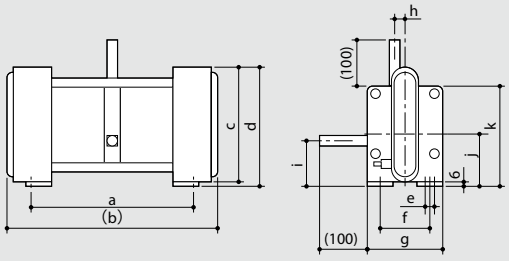
Specification

Model		FW-20	FW-40	FW-80	FW-20H			FW-40H		
Max. discharge capacity	L/min	20	40	80	20			40		
Air supply pressure range	MPa	0.2 - 0.5			0.2 - 0.5	0.15 - 0.3	0.15 - 0.2	0.2 - 0.5	0.15 - 0.3	0.15 - 0.2
Liquid temperature range	˚C	10 - 100	10 - 100	10 - 80	10 - 100	101 - 150	151 - 180	10 - 100	101 - 150	151 - 180
Max. air consumption	NL/min	330	480	820	330	200	140	480	300	220
Max. stroke speed Note	spm	Max. 120	Max. 80	Max. 80	Max. 120			Max. 80		
Pump connection size	mm	Ø19×Ø16 PFA tube	Ø25×Ø22 PFA tube		Ø19×Ø16 PFA tube			Ø25×Ø22 PFA tube		
Supply air connection size		Rc1/4	Rc3/8	Rc1/2	Rc1/4			Rc3/8		
Ambient temperature	˚C	0 - 40			0 - 40			0 - 40		
Drive system		By proximity switch			By proximity switch			By proximity switch		

• Max. discharge capacity shows when pumping clear water at 20˚C.

Dimensions in mm

Model	a	(b)	c	d	e	f	g	h	i	j	k
FW-20/20H	347	458	218	221	10	105	140	22	90	112	182
FW-40/40H	435	542	240	250	12	143	183	25.5	102	130	220
FW-80	464	600	302	317	13	185	240	27	119.5	158.5	317



FF/FF-H

Energy efficient design consumes less air

- The FF series is designed for use with medium temperature liquids (Al cylinder type: 5 to 100˚C, PVC cylinder type: 5 to 50˚C) and the FF-H series is designed for temperatures ranging from 20 to 180˚.
- All liquid contact components are constructed of high purity fluororesin materials with no metal or elastomers. The bellows are welded to the center eliminating leaks associated with heat cycles. The efficient design minimizes dead air volume surrounding the bellows to minimize air consumption.
- Suction and discharge fluid connections are PFA tubes and for FF models PFA tubes with special fittings are available.
- The pump utilizes a built in proximity sensor driven control system to switch an external air solenoid valve. Leak sensors are also included as standard equipment.

Pump identification

FF - 20 B T 1 - 01
(1) (2) (3) (4) (5) (6)

(1) Series code
FF : Medium-liquid temperature (5 - 100˚C)

(2) Pump size
10 : Max. discharge capacity 10L/min
20 : Max. discharge capacity 22L/min

(3) Cylinder material
B : Al+4F coating
C : PVC

(4) Pump connection (suction/discharge)
T : Tube connection

(5) Sealing structure of pump head/bellows
1 : Bellows separation type

(6) Special specification
Without code : Standard specification
01 (Serial number) : Special specification

FF - 20 H 1 T - 01
(1) (2) (1) (3) (4)

(1) Series code
FF-H : High-liquid temperature (20 - 180˚C)

(2) Pump size
20 : Max. discharge capacity 20L/min
40 : Max. discharge capacity 40L/min

(3) Pump connection (suction/discharge)
T : Tube connection
Sealing structure of pump head/bellows:
Welded one-piece structure

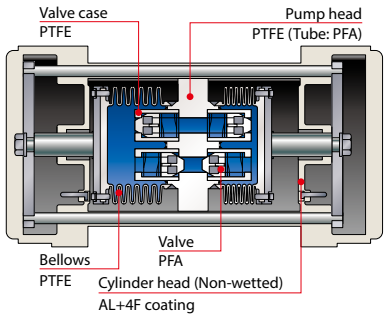
(4) Special specification
Without code : Standard specification
01 (Serial number) : Special specification

Specification

Model		FF-10BT/CT1	FF-20BT/CT1	FF-20HT	FF-40HT1
Max. discharge capacity	L/min	10	22	20	40
Air supply pressure range	MPa	0.15 - 0.3	0.15 - 0.3	0.15 - 0.2	0.15 - 0.2
Liquid temperature range	˚C	B type: 5 - 100, C type: 5 - 50[Note]		20 - 180	20 - 180
Max. air consumption	NL/min	90	180	150	200
Max. stroke speed	spm	Max. 120	Max. 120	Max. 120	Max. 80
Pump connection size		1/2" PFA tube	3/4" PFA tube	3/4" PFA tube	Ø25×Ø22mm PFA tube
Supply air connection size		Rc1/4	Rc1/4	Rc1/4	Rc3/8
Ambient temperature	˚C	0 - 40	0 - 40	0 - 40	0 - 40
Drive system		By proximity switch	By proximity switch	By proximity switch	By proximity switch

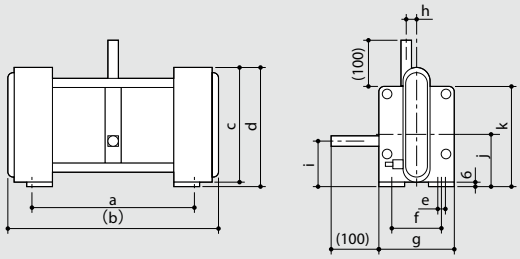
Note: The cylinder of the "B" type is made of aluminum and tetrafluororesin and that of the "C" type is of PVC.
• Max. discharge capacity shows when pumping clear water at 20˚C.

Construction and materials



Dimension in mm

Model	a	(b)	c	d	e	f	g	h	i	j	k
FF-10	266	361	188	191	10	84	114	14.5	82	97	154
FF-20/20H	288	400	218	221	10	105	140	20	91/80	112	182
FF-40H	431	533	240	250	12	143	183	23.5	97	130	220



FA

Long life

Designs for circulating moderate temperature fluids

- There are two standard models available In the FA series; the FA-2E, a horizontal type for lower flow requirements and the FA-40VEW, a vertical type for a higher flow rates. A typical application for the FA-2E is in a spray system for single wafer processing while the FA-40VEW is suitable for batch cleaning of 200/300 mm wafers.
- The FA-40VEW is designed for a long service life and uses a robust bellows design suitable for continuous operation at higher discharge pressures.
- Discharge rates can be easily monitored and controlled when used with a dedicated controller
- The pump utilizes a built in proximity sensor driven control system to switch an external air solenoid valve. Leak sensors are also included as standard equipment.

FA-2

FA-40VEW

Pump identification

FA	-	2	E-1	-	01
1		2	3		4

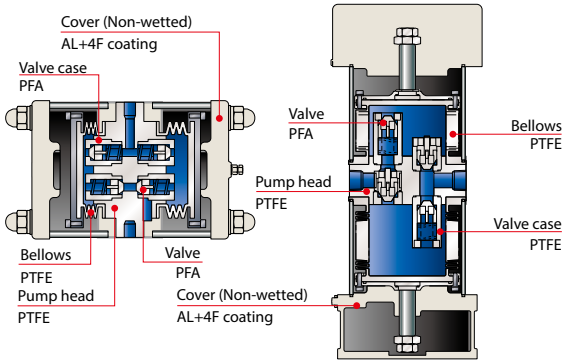
1 Series code

2 Pump size
2 : Max. discharge capacity 2L/min
40 : Max. discharge capacity 40L/min

4 Special specification
Without code : Standard specification
01 (Serial number) : Special specification

3 Pump drive system
• **FA-2**
-1: Air pulse timer switching valve system+Electrodes
E-1 : Controller system+Electrodes
• **FA-40**
VEW : Controller system+Electrodes
Pump head and bellows welded into one piece

Construction and materials

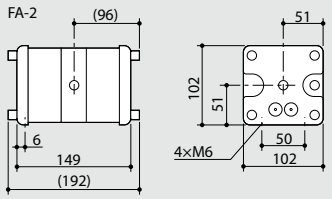


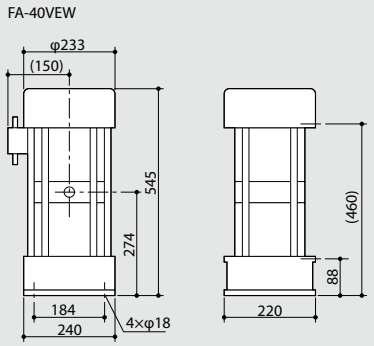
Specification

Model		FA-2E-1	FA-40VEW
Max. discharge capacity	L/min	2	40
Air supply pressure range	MPa	0.2 - 0.4	0.1 - 0.4
Liquid temperature range	˚C	5 - 100	5 - 100
Max. air consumption	NL/min	50	200
Max. stroke speed	spm	Max. 150	Max. 80
Pump connection size		Rc1/8	Rc1
Supply air connection size		Rc1/4	Rc3/8
Ambient temperature	˚C	0 - 40	0 - 40
Drive system		By proximity switch	By proximity switch

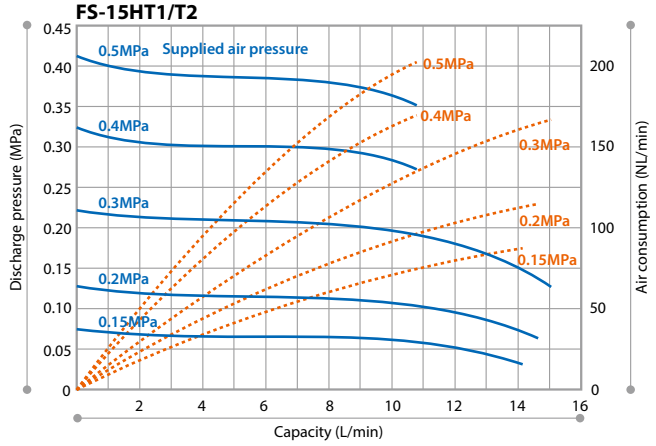
• Max. discharge capacity shows when pumping clear water at 20˚C.

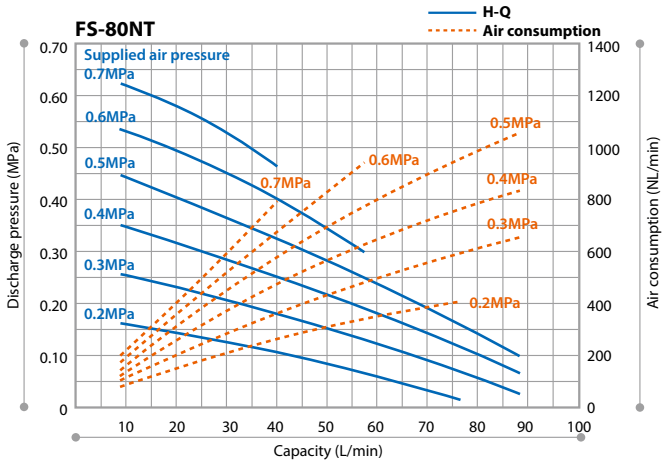
Dimension in mm

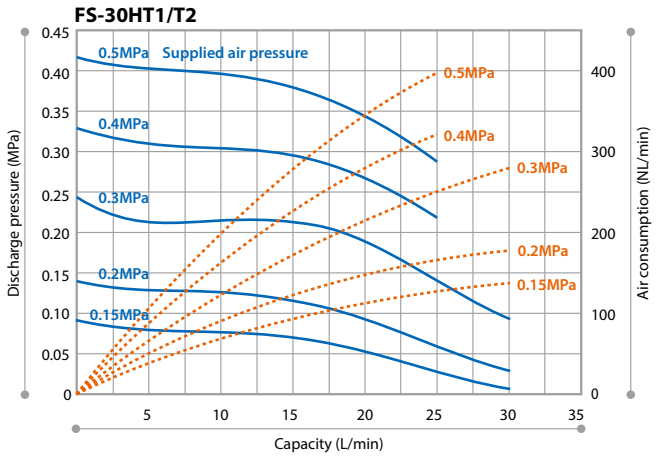


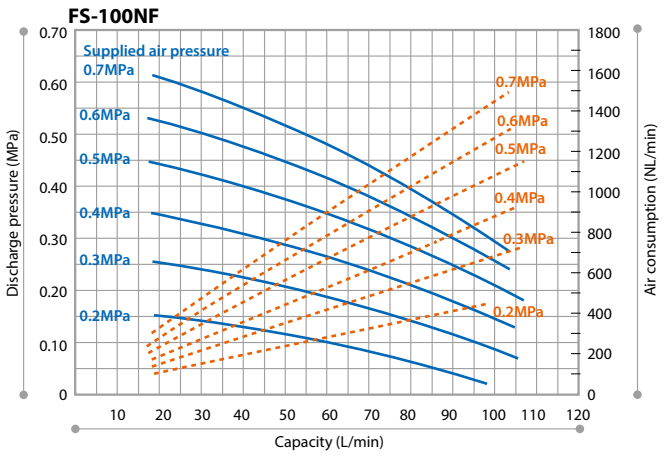


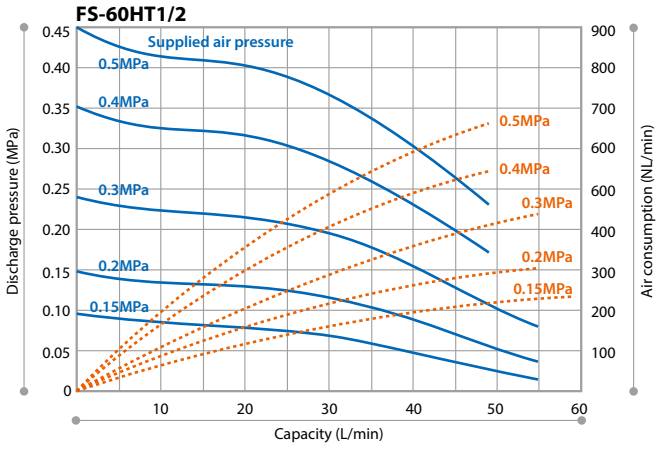
Performance curves

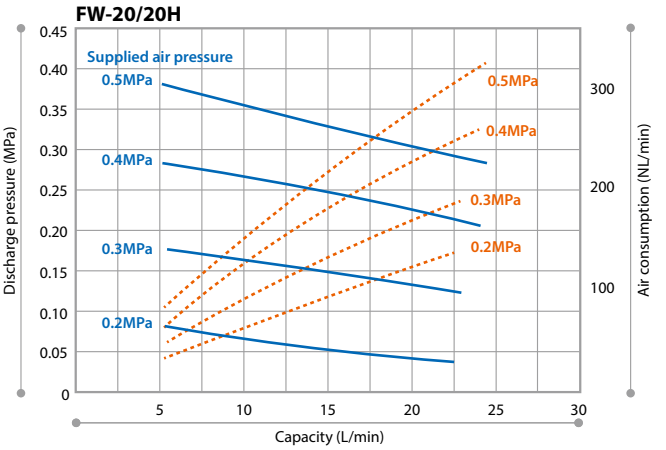


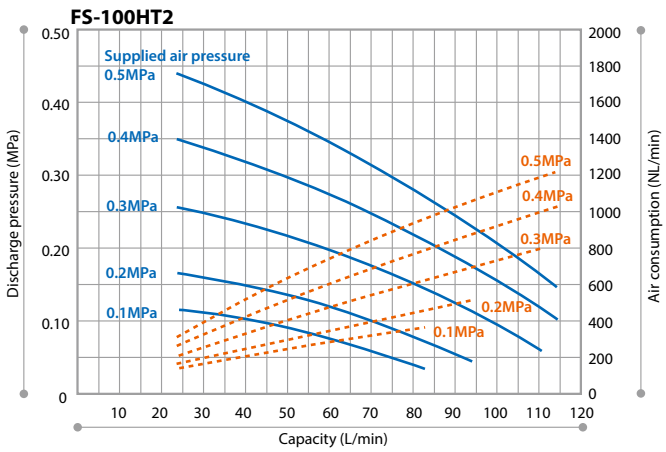


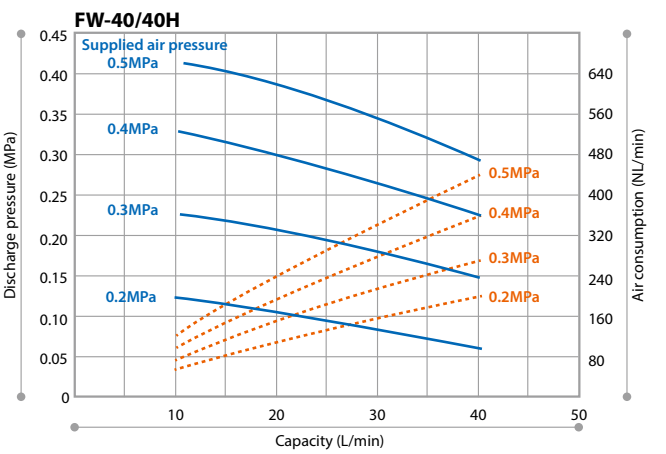




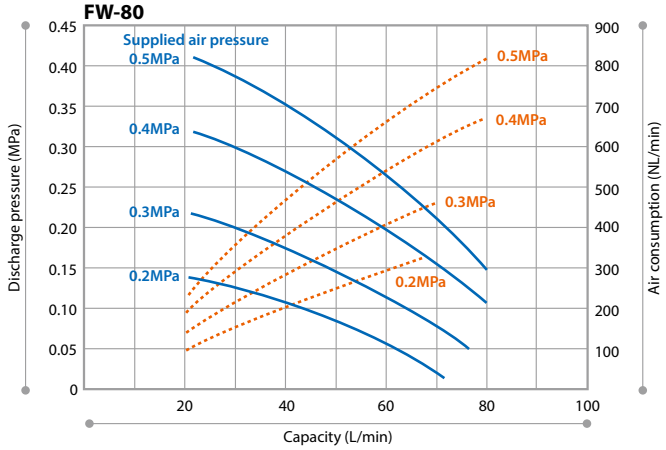




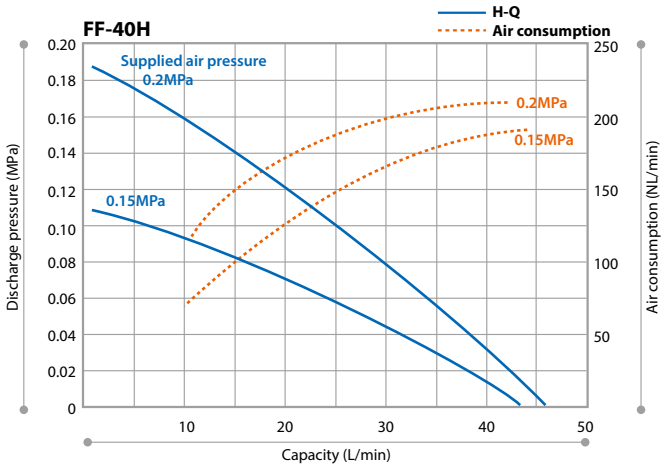




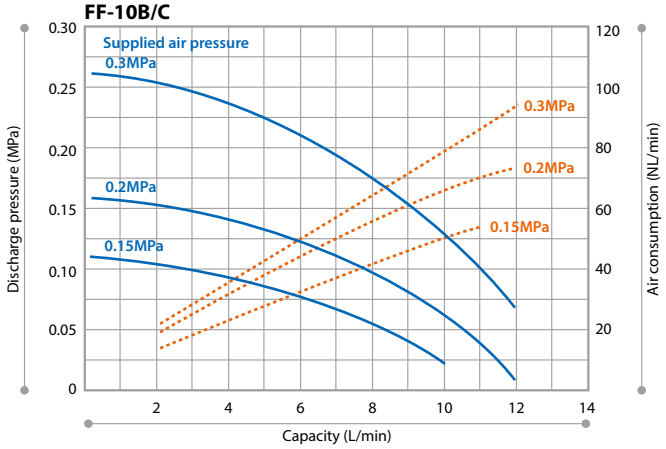
FW-80



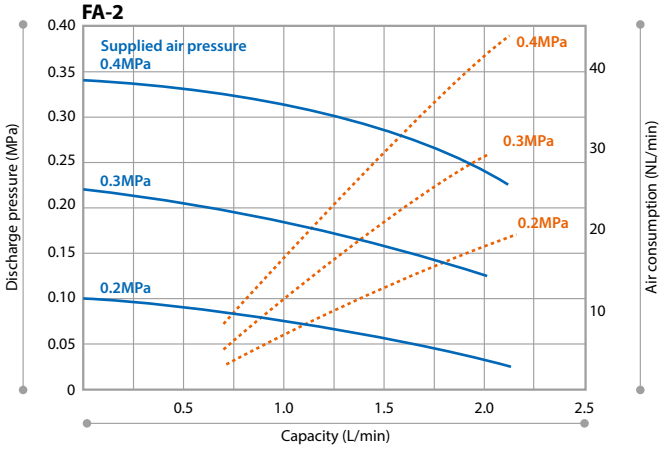
FF-40H



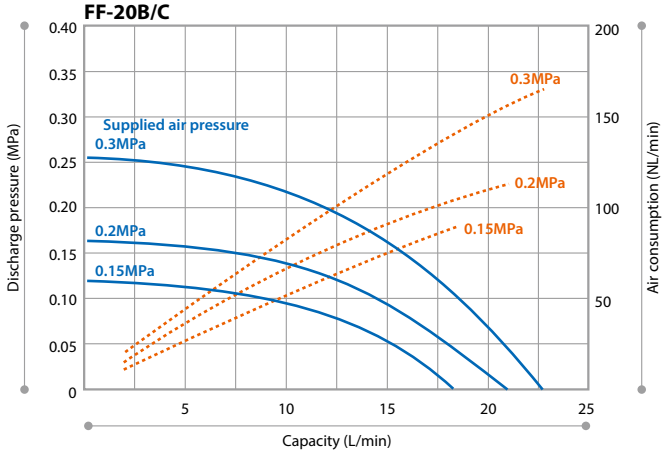
FF-10B/C



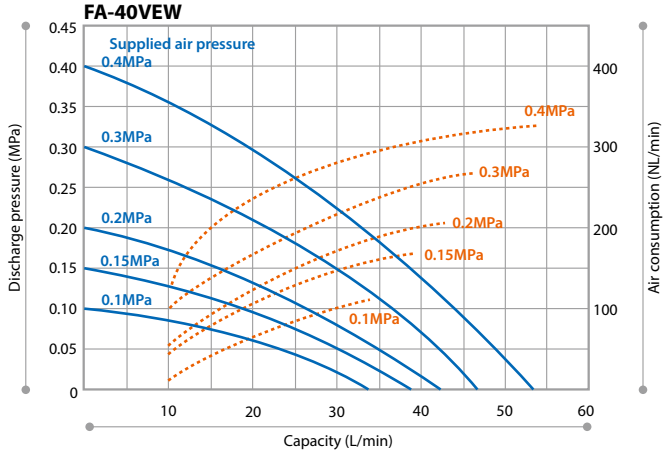
FA-2



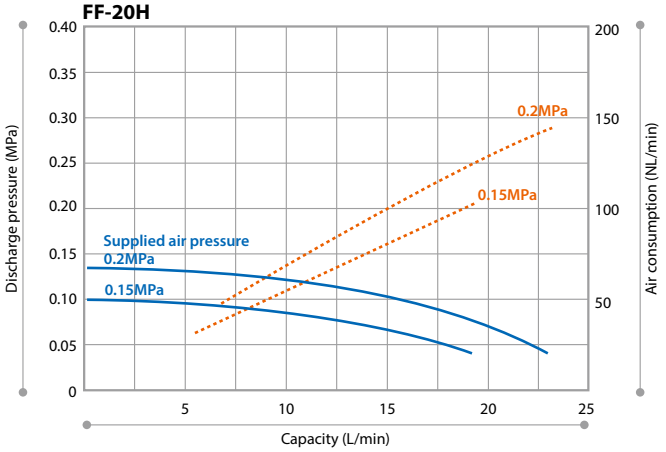
FF-20B/C



FA-40VEW



FF-20H



Options

Pulsation reduction

Dampener

The Installation of a dampener on the discharge side of the pump will reduce pulsation and prevent particle release through filters as well as from pipe vibration.

Automatic dampeners PDA-H1/WB/W

FS-H | FW | FW-H | FF | FF-H | FA

- Automatic pressure adjustment minimizes downtime, eliminates manual adjustments.
- Liquid inside the bellows can be easily drained. (PDA-WB/W model)
- The PDA-H1 is a medium pressure design for use with the FF, FF-H, and FA pumps. The PDA-WB/W is a high-pressure design suitable for use with the FW, FW-H, and FS-H pumps. Typical applications include drug delivery and dispensing.
- The PDA-WB/W includes a leak sensor as standard. (For the PDA-H1, a leak sensor is available through special order.)
- For the PDA-WB/W, only the specified liquid pipe joint can fit the model. Please contact us before use to check if your joint is applicable.

Model		PDA-20WB/W, PDA-40WB/W			PDA-80WB/W
Applicable pumps		FW-20/FW-20H, FS-15/FS-30 (PDA-20WB/W) FW-40/FW-40H/FS-60 (PDA-40WB/W)			FW-80
Liquid temperature range	˚C	10 - 100	101 - 150	151 - 180	10 - 80
Supply air pressure range	MPa	0.5	0.3	0.2	0.5
Pulsation pressure range	MPa	Less than 0.06 Note			
Connection size		1/2" PFA tube	Ø25×Ø22mm PFA tube		
Supply air connection size		Rc1/4			
Wet-end materials		PTFE/PFA			

Note: In case that liquid viscosity is less than 1 - 50 mPa·s.
• Cannot be used above the working pressure of the pump.
• The pulsating pressure range depends on the operating conditions. Please contact us for details.
• There are some fittings that cannot be used. Please contact us for details.

Automatic dampeners PDA-100WBN

For the FS-100NF only

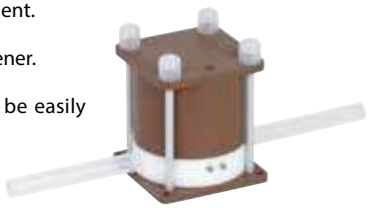
- Automatic pressure adjustment minimizes downtime, eliminates manual adjustments.
- Dampener pressure is automatically adjusted to the minimum pulse pressure even if the pump discharge load changes due to a clogged filter. The unit prevents particles being released from the filter and the pimping vibration.
- A leak sensor is included as a standard.

Model		PDA-100WBN
Applicable pumps		FS-100NF
Liquid temperature range	˚C	5 - 60
Max. supplied air pressure	MPa	0.7
Supply air pressure range	MPa	0.2 - 0.7
Pulsation pressure range	MPa	0.15 Note
Connection size		JIS 20K 25A Flange
Supply air connection size		Rc1/4
Wet-end materials		PTFE

Note: In case that liquid viscosity is less than 1 - 50 mPa·s.
• The maximum working fluid pressure is the pressure generated when the discharge side is closed.
• Please contact us for dampers for FS-80NT.

Pulse dampeners PD-H (for wet use)

for the FS-H only



- No automatic pressure adjustment.
- A low cost and compact dampener.
- Liquid inside the bellows can be easily drained.
- A leak sensor is included as a standard.

Model		PD-15H		PD-30H		PD-60H	
Applicable pumps		FS-15HT1/T2		FS-30HT1/T2		FS-60HT1/T2	
Liquid temperature range	˚C	5 - 100	101 - 180	5 - 100	101 - 180	5 - 100	101 - 180
Max. supplied air pressure	MPa	0.3	0.2	0.3	0.2	0.3	0.2
Supply air pressure range	MPa	0.15 - 0.3	0.15 - 0.2	0.15 - 0.3	0.15 - 0.2	0.15 - 0.3	0.15 - 0.2
Pulsation pressure range	MPa	Less than 0.06 Note					
Connection size		1/2" PFA tube		3/4" PFA tube		Ø25×Ø22mm PFA tube	
Supply air connection size		Rc1/8					
Wet-end materials		PTFE, PFA					

Note: In case that liquid viscosity is less than 1 - 50 mPa·s.
• Cannot be used above the working pressure of the pump.

Pulse dampeners PD-H1

FF | FF-H | FA

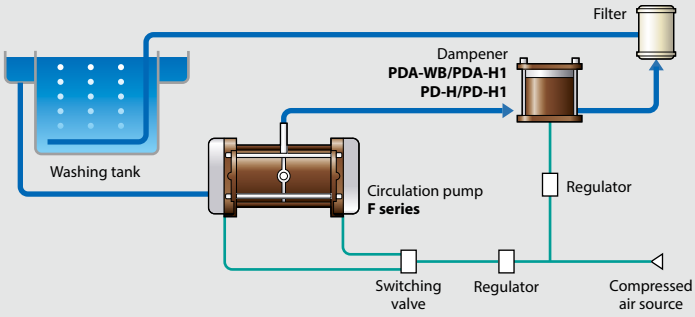
- No automatic pressure adjustment.
- The PD-H1 is a medium-pressure design for use with FF, FF-H and FA pumps.

* Models with leak sensors are available through special order.

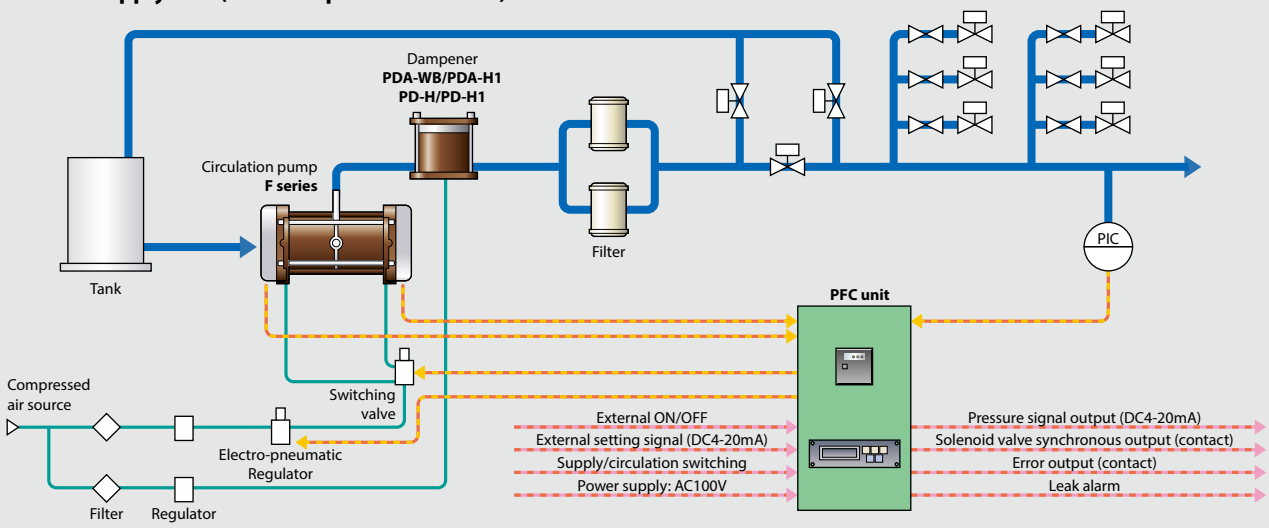
Model		PDA/PD-10H1	PDA/PD-20H1	PDA/PD-40H1
Applicable pumps		FF-10B/CT1	FF-20B/CT1 FF-20HT	FA-40VEW FF-40HT1
Liquid temperature range	˚C	20 - 180		
Supply air pressure range	MPa	0.3		0.4
Pulsation pressure range	MPa	Less than 0.04		
Connection size		1/2" PFA tube	3/4" PFA tube	Ø25×Ø22mm PFA tube
Supply air connection size		Rc1/4		
Wet-end materials		PTFE/PFA		

Example of installation

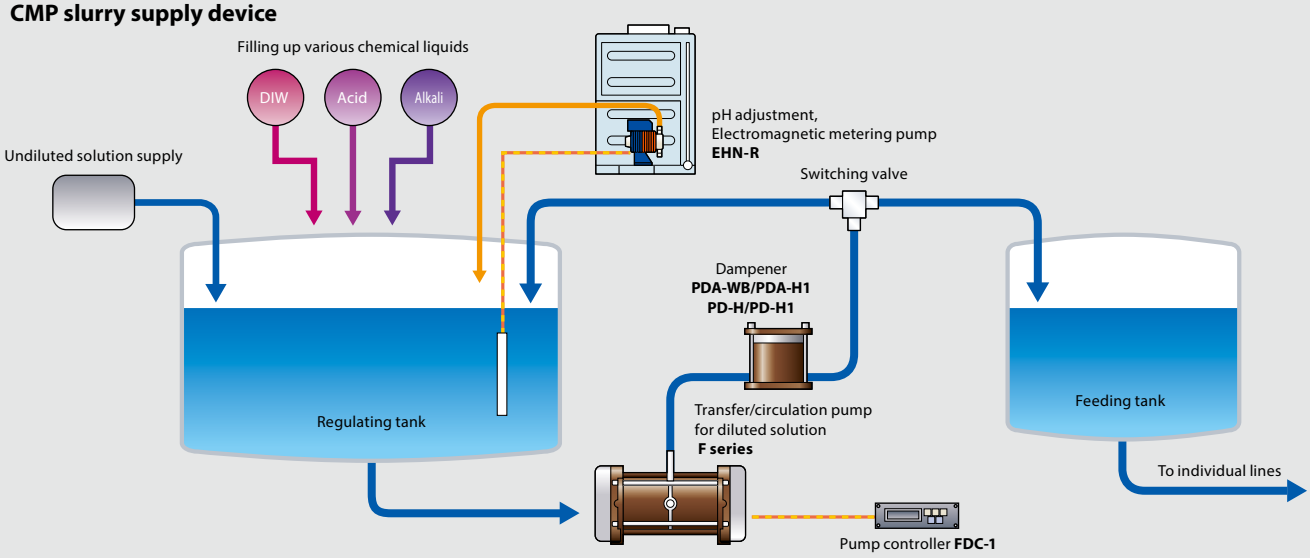
Processing tank circulation



Chemical supply unit (constant pressure control)



CMP slurry supply device



Options

Quick exhaust valve

When installed on the air exhaust lines at the pump the exhaust valve will help to reduce pulsation and prevent particle release from the filter as well as from pipe vibration.

QEV

Quick exhaust valves should be installed between the pump and the external solenoid valve. This helps to prevent corrosion of the solenoid valve from return air. It also reduces exhaust resistance to allow the bellows to move smoothly through each cycle.

Model	Connection size	Applicable pumps
QEV-8V	Rc1/4	FW-20/20H, FF-10/20/20H, FA-2, FS-15/30
QEV-10V	Rc3/8	FW-40/40H, FF-40H, FA-40, FS-60/80N
QEV-15V	Rc1/2	FS-100HT, FS-80NT, FS-100NF

Pump controller/driver

The external solenoid valve is switched in response to signals from the built-in proximity sensors on each side of the bellows to ensure reliable operation of the pump. Two controller options are available along with one driver option.

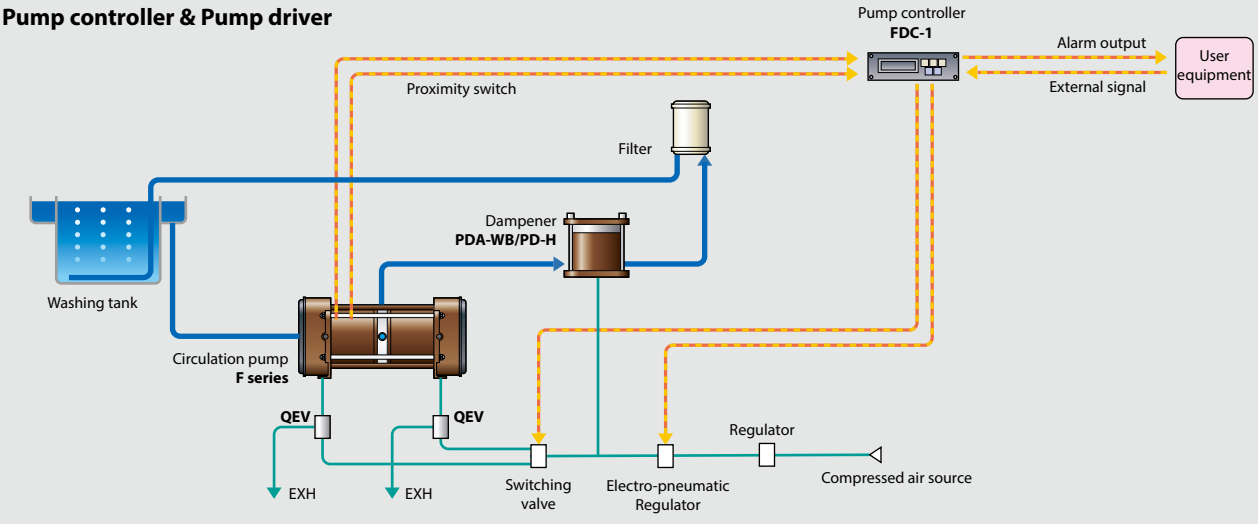
Pump controller FDC-1

FS-H | FS-N | FW | FW-H | FF | FF-H | FA

- The pump discharge rate can be monitored and maintained at a constant level by connecting an electric air regulator (optional) to the pump air supply line. This enables stable flow and filtering even when the discharge load varies due to increased filter resistance.
- The controller can monitor the flow rate, the number of strokes, and the total count.
- The unit operates either in the AUTO mode using external signals or in the MENU mode for manual control.
- The flow rate can be set at two different values as desired.
- In addition to the sensor mode using the proximity sensors, the timer mode is included as a standard feature. This enables continued pump operation in the timer mode in case of the failure of a proximity sensor.
- The unit is equipped with various alarm displays and output functions, including leak alarm and a pump malfunction alarm.

General specification	Power source	DC24V±10%
	Power consumption	24VA max.
	Ambient temperature	0 - 50˚C
	Working atmosphere	Without corrosive gas in surrounding areas
Input specification	Start, Alarm reset	No-voltage contact or open collector Voltage ON: 3V maximum Voltage OFF: 18V maximum
Output specification (External output)	Leak alarm Pump malfunction alarm Life alarm First alarm	Output form: NPN open collector Switching capacity: DC24V 0.4A
Dimensions	W158mm×D152mm×H48mm	

Pump controller & Pump driver



Chemical replenishing system

Chemical replenishing system CFD-1T-B

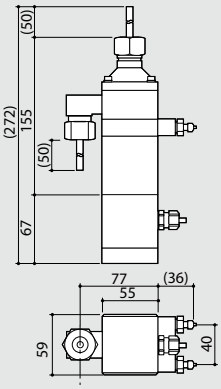
With a resolution of up to 1.0mL/shot fine dispense volumes can be achieved.
8mL type per shot is also available. Please contact us for details.

- The resolution of the CFD-1T-B has been greatly improved compared to our existing models. The minimum flow of 1mL/shot offers greater accuracy in chemical condensation control that is required in the wafer cleaning process. The CFD-1T-B always feeds the correct quantity of chemical without overshot eliminating excess liquid wastage. In addition, the anti-siphon mechanism prevents unintentional siphoning.
- The fluoroplastic wet end (PTFE, PFA, PCTFE) is capable of handling strong acids, alkalis and hydrogen peroxide, typical chemicals required for semiconductor processing. PTFE, PFA, PP, PVC external parts and PTFE coated screws provide additional protection against chemical attack from harsh environments.
- Adjustment of the stroke length to give between 1.0-2.7mL/shot is simple by removal of the bottom cover (Factory default is 1.0mL/shot).
- Every unit is equipped with a leakage sensor to immediately detect a leak.

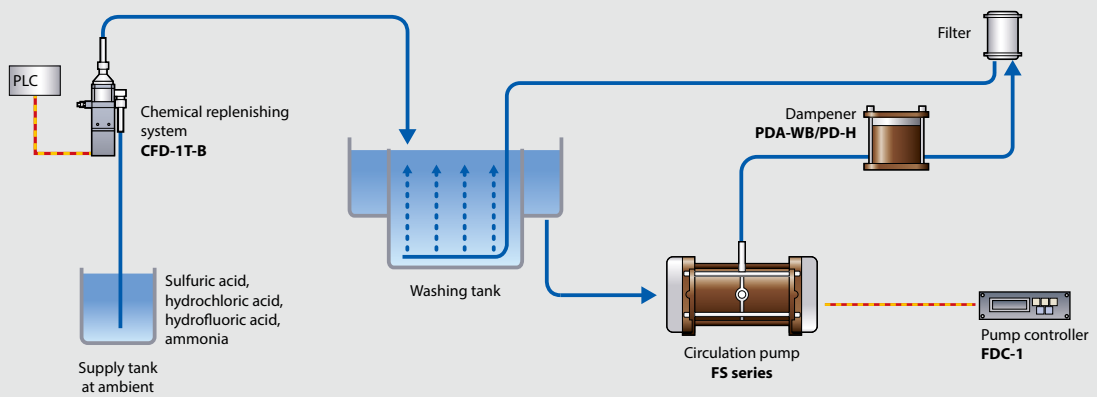
Pump specification	Application		Chemical replenishing
	Discharge capacity	mL/shot	1
	Max. discharge pressure	MPa	0.05
	Liquid temperature range	˚C	20 - 60
	Max. stroke speed	spm	30
	Max. supply air pressure	MPa	0.15 - 0.3
	Max. air consumption	NL/min	2.5
	Wet-end materials		PTFE, PFA, PCTFE
	Liquid port bore		1/4"PFA tube (Ø6.35×Ø4.35mm)
	Supply air port bore		Rc1/8
	Mass	kg	1.1
Photosensor specification	Product name		Transmission type micro photo sensor
	Power voltage		5 - 24V DC±10%
	Output mode		NPN transistor open collector
	Allowable current		50mA or below
	Cord		5m PVC four-core cable (Outer dia. 5.2mm) with 0.5 - round terminal

• Please request a separate drawing for external dimensions.

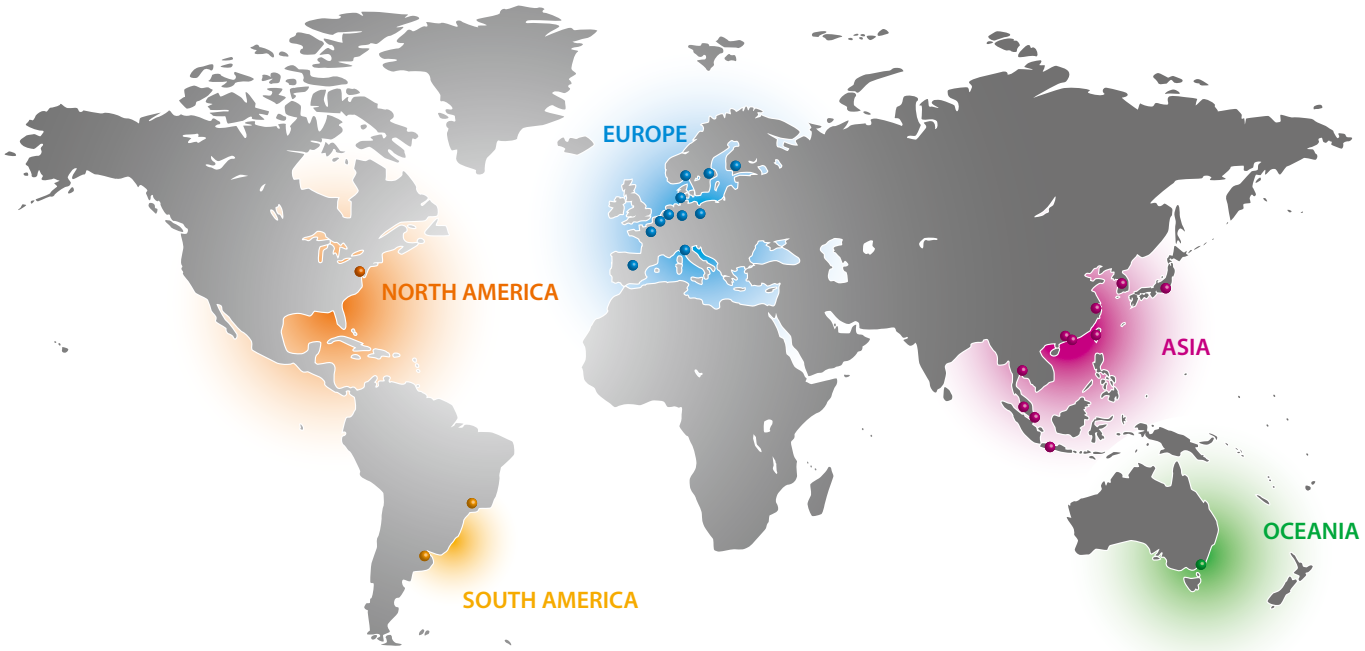
Dimension in mm



Wafer wet-bench



IWAKI world-wide network



Manufacturing locations

Iwaki's production system, namely quality assurance system

Thorough quality-control measures and constant pursuit of efficiency have helped IWAKI establish a superior production system.

Saitama Plant

ISO 14001 JQA-EM4848 ISO 9001 JQA-1173

Miharu Plant

ISO 14001 JQA-EM4848 ISO 9001 JQA-1173

IWAKI CO., LTD. 6-6 Kanda-Sudacho 2-chome Chiyoda-ku Tokyo 101-8558 Japan TEL : (81)3 3254 2935 FAX : 3 3252 8892

IWAKI has global net work.
Please find your distributor location at **www.iwakipumps.jp**

European Headquarter	**: IWAKI Europe GmbH**	TEL: (49)2154 9254 0	FAX: 2154 9254 48
Germany	**: IWAKI Europe GmbH**	TEL: (49)2154 9254 50	FAX: 2154 9254 55
The Netherlands	**: IWAKI Europe GmbH** (Netherlands Branch)	TEL: (31)74 2420011	FAX: (49)2154 925448
Italy	**: IWAKI Europe GmbH** (Italy Branch)	TEL: (39)0444 371115	FAX: 0444 335350
Spain	**: IWAKI Europe GmbH** (Spain Branch)	TEL: (34)93 37 70 198	FAX: 93 47 40 991
Poland	**: IWAKI Europe GmbH** (East Europe Branch)	TEL: (48)12 347 0755	FAX: 13 67 20 30
Belgium	**: IWAKI Belgium N.V.**	TEL: (32)13 67 02 00	FAX: 12 347 0900
Denmark	**: IWAKI Nordic A/S**	TEL: (45)48 24 2345	
Finland	**: IWAKI Suomi Oy**	TEL: (358)9 2745810	
France	**: IWAKI France S.A.**	TEL: (33)1 69 63 33 70	FAX: 1 64 49 92 73
Norway	**: IWAKI Norge AS**	TEL: (47)23 38 49 00	
Sweden	**: IWAKI Sverige AB**	TEL: (46)8 511 72900	( )Country codes

U.S.A.	**: IWAKI America Inc.**	TEL: (1)508 429 1440	FAX: 508 429 1386
Argentina	**: IWAKI America Inc.** (Argentina Branch)	TEL: (54)11 4745 4116	
Brazil	:IWAKI Do Brazil Comercio De Bombas Hidraulicas LTDA.	TEL: (55)19 3244 5900	FAX: 19 3244 5900
Singapore	**: IWAKI Singapore Pte Ltd.**	TEL: (65)6316 2028	FAX: 6316 3221
Indonesia	**: IWAKI Singapore** (Indonesia Office)	TEL: (62)21 6906606	FAX: 21 6906612
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China (Hong Kong)	**: IWAKI Pumps Co., Ltd.**	TEL: (852)2607 1168	FAX: 2607 1000
China (Guangzhou)	**: GFTZ IWAKI Engineering & Trading Co., Ltd.**	TEL: (86)20 84350603	FAX: 20 84359181
China (Shanghai)	**: IWAKI Pumps (Shanghai) Co., Ltd.**	TEL: (86)21 6272 7502	FAX: 21 6272 6929
Korea	**: IWAKI Korea Co.,Ltd.**	TEL: (82)2 2630 4800	FAX: 2 2630 4801
Taiwan	**: IWAKI Pumps Taiwan Co., Ltd.**	TEL: (886)2 8227 6900	FAX: 2 8227 6818
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.

⚠ 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.