

PW

Digital Setting

Multi Functions

- PW** Digital-input/output
- PWM** Digital-input/output & Analog-input
- PWT** Digital-input/output & Timer Control

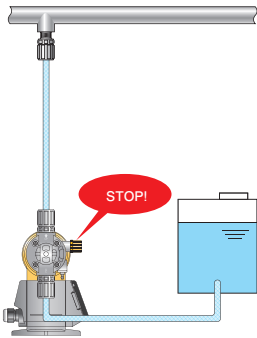


+ Higher Safety

Three types of safety functions that realize higher rank risk management

SAFE mode for preventing abnormal pressure buildup

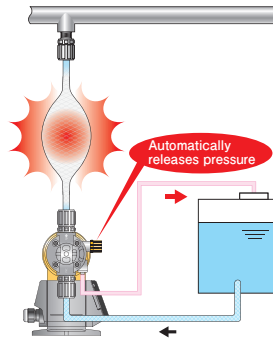
While the discharge valve is closed, the liquid transfer force is controlled to prevent pressure buildup.



- * To use the SAFE mode, set the stroke length to 100%.
- * The SAFE mode is not available for PW-200, boiler type and high-pressure type.
- * The function is disabled at the factory default setting.

Relief valve function for releasing abnormal pressure

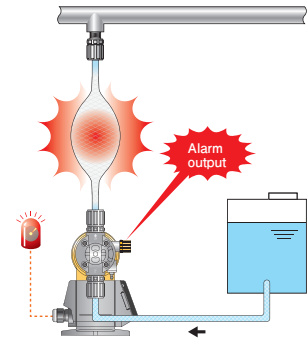
When the pressure exceeds the setting value, the relief valve operates automatically.



- * Standard type pump discharge pressure: 0.7MPa.
- * Boiler-type pump discharge pressure: 1.5MPa.
- * The Relief valve function cannot be selected for SUS type, high-viscosity type, and high-pressure type pumps.

Alarm function for notifying abnormal pressure

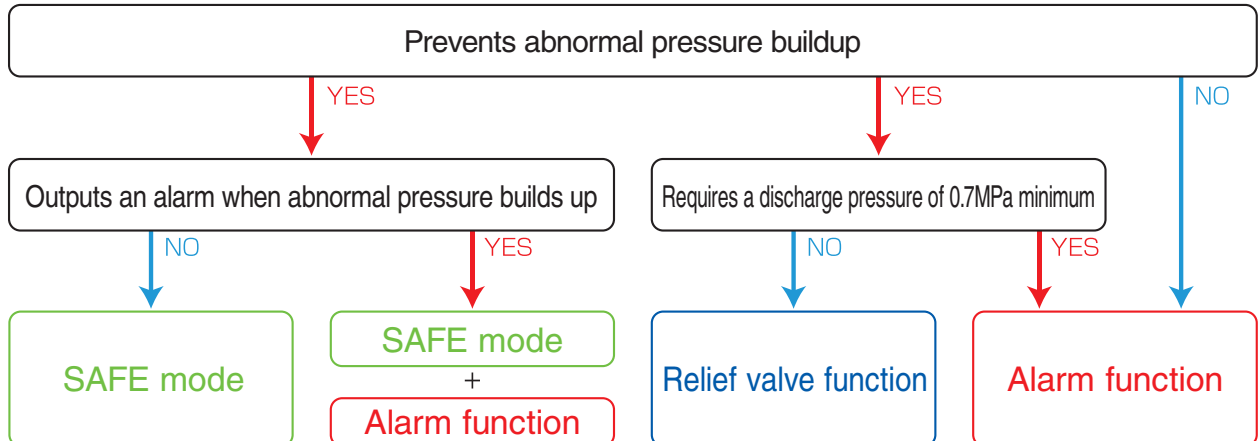
When abnormal pressure builds up due to clogging of the pipes or while the discharge valve is closed, an alarm is emitted to warn this condition.



- * When the alarm function is used together with the SAFE mode, an alarm is emitted for pressure lower than the normal pressure.
- * This function is disabled at the factory default setting.

■ Safety function selection flow

START



Function correspondence table

	PW/PWM/PWT							DCLPW/DCLPWM/DCLPWT CLPW/CLPWM/CLPWT	
	General chemical model			High-viscosity	Boiler		High-pressure	Sodium hypochlorite	
	30R/60R/100R	30/60/100	200	60/100	30R	30	30	30R/60R/100R	30/60/100
Relief valve function	○	—	—	—	○	—	—	○	—
SAFE mode	○	○	×	○	×	×	×	○	○
Alarm function	○	○	○	○	○	○	○	○	○
ECO mode	○	○	×	○	○	○	○	×	×

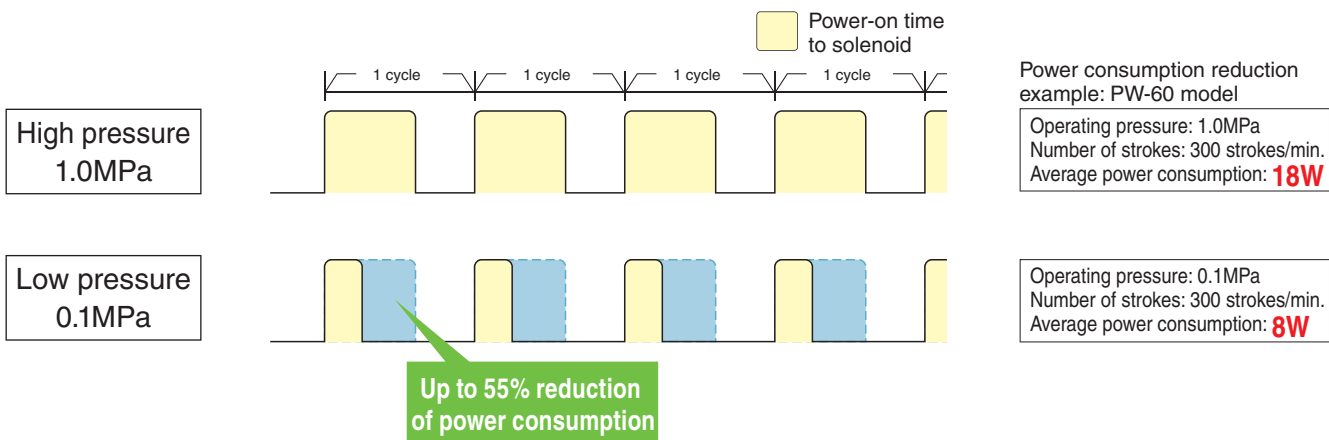
* A circle (○) is indicated for the corresponding function that can be set. A cross (×) is indicated for the corresponding function that must not be set even though it is technically possible.



Superior Eco-friendly Performance

Automatically cuts power-on time in accordance with the discharge pressure

The power of conventional pumps was always turned on for a specific period regardless of the discharge pressure. The ECO mode of PW pumps always monitors operation conditions and automatically shortens the power-on time during low-pressure operation in order to reduce power consumption.



PW



Optimal Ease of Use

Operability

Simple key operations and user interface enable intuitive operation.

Wide power supply range

Operation can be performed using a voltage between AC100 and 240V (±10%).

Water-&Dust-proof structure

IEC standard: IP65 or equivalent

Easy maintenance

The liquid-end parts are easy to disassemble and replace by simply detaching four bolts.

Flexible installation methods

The head can be moved in three directions.

High-brightness display

The high-brightness LED is clearly visible even in low-light environments.

Wide variety of liquid-end components

PVC, PVDF, Stainless steel, PVC (For high-viscosity liquids), PVC (For boiler), PVC (For high-pressure liquids), Acrylic (for sodium hypochlorite)

Wide-ranging Control Functions Realize Ideal Chemical Injection Systems



Common functions

PW

PWM

PWT

Manual operation

Strokes/minute control

The stroke speed can be set in increments of 1 stroke per minute.

Discharge volume control (PW only)

The discharge volume can be set in increments of 0.1mL per minute.

External operation & stop control

The pump can be turned on and off using a input signal from an external device.

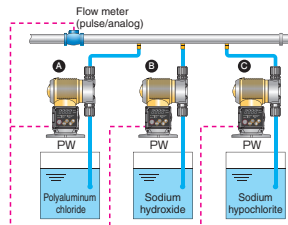
Alarm output

When the pump is used in combination with a level meter and checker, an alarm is output during abnormal pressure buildup.

Synchronous pulse control

A single pulse can be output for a single pump operation. The output pulse can be input to a second pump to perform synchronous operation.

Example: For a single stroke (Pump A), controls such as three strokes (Pump B) and 2 strokes (Pump C) can be enabled.

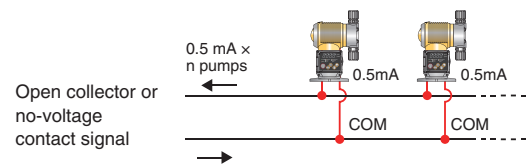


Signal distribution

The following connections are possible without using a signal distributor.

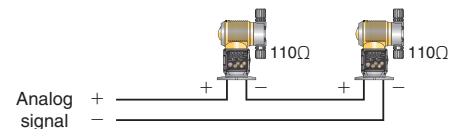
Pulse signal

You can connect multiple instances of this pump in parallel.



Analog signal

You can connect multiple instances of this pump in parallel.



* The pumps operate in a linked manner. To operate pumps separately, install a signal distributor.

Pulse input-based proportional control

PW

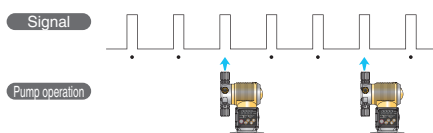
PWT^{*1}

*1 For PWT, this is available only when using timer function.

Pulse frequency-division

The pump performs a single injection operation for 'n' times of input pulse signals. Setting range: n = 1 to 999

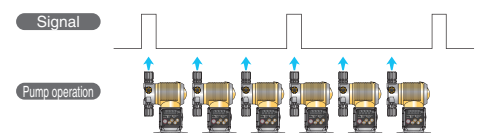
Setting example: n = 3



Pulse frequency-magnification

The pump performs the injection operation 'n' times for a single input pulse signal. Setting range: n = 1 to 999

Setting example: n = 3



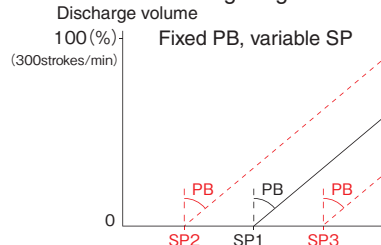
Analog input signal-based proportional control

PWM

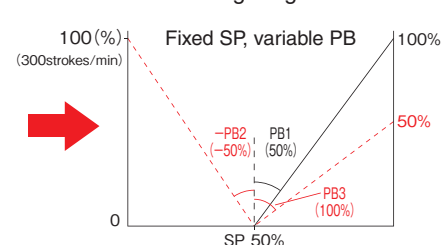
Automatic operation

The pump operates for a specified number of strokes in the range of 0 to 300 strokes per minute in accordance with the setting value (set point, proportional band), upon receiving an analog input signal (4 to 20mA).

(1) Set point (SP) setting
SP setting range: 0 to 100%



(2) Proportional band (PB) setting
PB setting range: -999 to 999%



Item		PW (pulse type)	PWM (analog type)	PWT (timer type)	
Input signal	Number of ports	Digital	2	1	
		Analog	—	1	
	Type		Stop signal, pulse signal	Stop signal, pulse signal	
Output signal	Number of ports	Digital	2	2	
	Type		Sync pulse, alarm output	Sync pulse, alarm output	
Control	Manual operation	Number of strokes	1 to 300 (Enables setting in 1-stroke units)		
		Discharge volume control	0.1 to maximum discharge volume (Enables setting in 0.1mL/minute units)	—	—
	Pulse proportional control	●	—	●	
	Analog proportional control	—	●	—	
	Timer control	—	—	●	
	External operation & stop input signal	●	●	●	

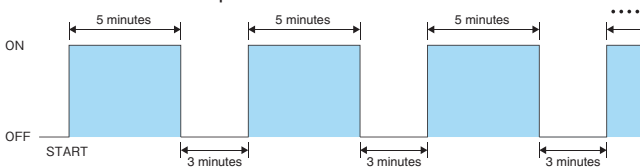
Timer control

PWT

Interval mode

Pump operation can be turned on and off in accordance with the setting of the timer. You can set any ON and OFF period for one pattern each in the range of 1 to 9999 minutes.

Setting example: ON period: 5 minutes
OFF period: 3 minutes

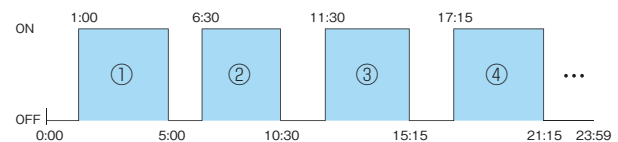


DAY mode

The pump operates automatically everyday using the same ON and OFF timing that is set. You can set up to nine program patterns within the range of 0:00 to 24:00 in 1-minute unit.

* DAY mode cannot be used together with the WEEK mode.

Setting example: ON time: ① 1:00 ② 6:30 ③ 11:30 ④ 17:15
OFF time: ① 5:00 ② 10:30 ③ 15:15 ④ 21:15



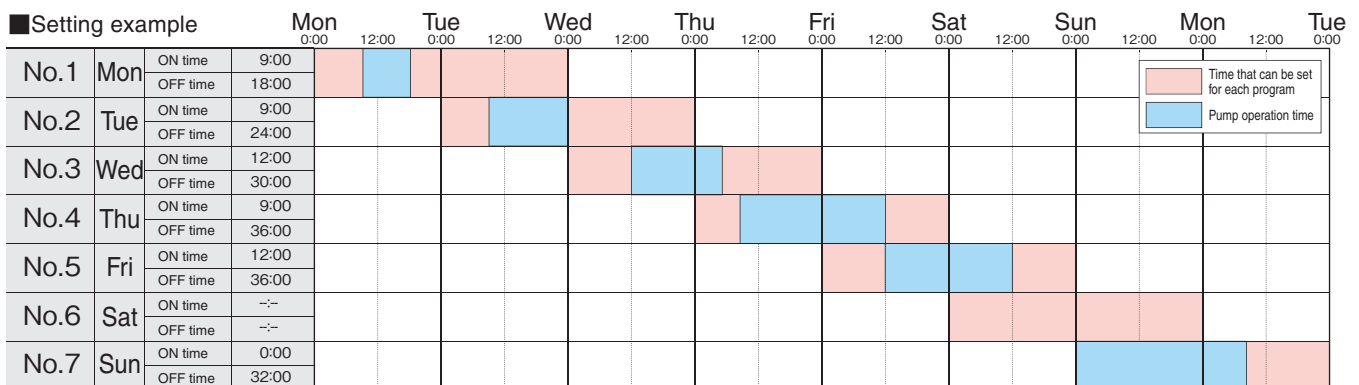
● When both interval mode and pulse operation are simultaneously set, the pump will operate in accordance with pulse frequency-division or pulse frequency-magnification setting within the ON time set for the DAY mode and interval mode.

WEEK mode

The pump automatically operates every week at the same ON and OFF time being set for the day of the week.

You can set one program pattern for each day of the week. You can set the ON time from 0:00 to 24:00 and OFF time within the range 0:00 to 48:00 in 1-minute unit.

* WEEK mode cannot be used together with DAY mode.



● When the pulse proportional control operation is set, the pump will operate in accordance with the pulse frequency-division or pulse frequency-magnification set for this operation.

● When both interval mode and pulse proportional control operation are simultaneously set, the pump will operate in accordance with pulse frequency-division or pulse frequency-magnification set for this operation.*1

*1 The number of strokes will be the value set in each program.

The following combination of functions can also be used besides the abovementioned combination.



Model code *Not all model combinations are possible. When selecting the pump model, first check "Specification" and "Liquid-end material".

PW - **30** - **VTCE** - **4x9PVC** - **W** - **S** - **JPL**

1 **2** **3** **4** **5** **6** **7**

1 Series name	2 Model(discharge volume standard)	3 Liquid-end material	4 Hose standard (size/material)	5 Joint specification	6 Applicable standard	7 Power plug
PW: Standard (pulse input) type PWM: Analog input type PWT: Timer control type	[General chemical liquid injection model w/relief valve] 30R : 30mL/min 60R : 60mL/min 100R : 100mL/min [General chemical liquid injection model] 30 : 30mL/min 60 : 60mL/min 100 : 100mL/min 200 : 220mL/min*1	VTCE VTCE FTCE FTCE FTCT 6TCT	4x9 PVC 6x11 PVC 6x8 PE/FEP/PTFE 1/4"x3/8" PE/FEP	W : Standard	S : Standard CE : CE marking -compatible	EUP : Euro plug ULP : UL plug AUP : Australia plug UKP : UK plug JPL : Japan lead wire
	[Boiler chemical liquid injection model w/relief valve*2] 30R : 28mL/min [Boiler chemical liquid injection model*2] 30 : 28mL/min	VTCE VTCE FTCE FTCE FTCT 6TCT	4x6 PA	BW : Boiler		
	[High-pressure chemical liquid injection model *2] 30 : 25mL/min	VTCE VTCE FTCE FTCE FTCT 6TCT	4x6 PA FNPT 1/4	PW : High-pressure		
	[High-viscosity chemical liquid injection model] 60 : 60mL/min 100 : 100mL/min	VTCE VTCE FTCE FTCE FTCT 6TCT	12x18 PVC	V : High-viscosity		

*1 SAFE mode and ECO mode cannot be used. The information pertaining to liquid-end parts only applies to the VTCE/VTCE type. *2 SAFE mode cannot be used.

Performance specifications

Specification		Model	PW/PWM/PWT										
			30R/30			30	30R/30	30	60R/60			60	60
			VTCE/VTCE	FTCE/FTCE	FTCT	6TCT	VTCE(boiler)	VTCE(high-pressure)	VTCE/VTCE	FTCE/FTCE	FTCT	6TCT	VTCE(high-viscosity)
Max. discharge volume*1	mL/min		30			27	28	25	60			55	60
	L/H		1.8			1.62	1.68	1.5	3.6			3.3	3.6
Max. discharge pressure*1	MPa		0.7/1.0 *2			0.5	1.5	2	0.7/1.0 *2			0.5	0.7
	bar		7/10 *2			5	15	20	7/10 *2			5	7
Stroke speed			1 ~ 300 strokes/min (Enables setting in 1-stroke units)										
Stroke length			0.5 ~ 1 mm (Enables adjustment using the dial)										
Connection (hose/tube: I.D x O.D)	Discharge side	4 x 9(PVC braided hose) 6 x 8(PE)	6 x 8(PE)	6 x 8(FEP)	6 x 8(PTFE)	4 x 6(PA)	4 x 6(PA)	6 x 11(PVC braided hose) 6 x 8(PE)	6 x 8(PE)	6 x 8(FEP)	6 x 8(PTFE)	12 x 18 (PVC braided hose)	
	Suction side	1/4"x3/8"(PE)	1/4"x3/8"(PE)	1/4"x3/8"(FEP)		4 x 9(PVC braided hose)	4 x 9(PVC braided hose)	1/4" x 3/8"(PE)	1/4"x3/8"(PE)	1/4"x3/8"(FEP)			
	Air-release	4 x 6 (soft PVC hose)				-	4 x 6 (soft PVC hose)				-		
Viscosity of transfer liquid			50mPa · s or less									3,000mPa · s or less ³	
Temperature of transfer liquid			0 ~ 40°C (no freezing allowed)										
Ambient temperature			0 ~ 40°C										
Environmental resistance			IEC standard: IP65 or equivalent (water-&dust-proof)										
Insulation class			B										
Power supply	Rated voltage		AC 100 to 240 V (±10%)										
	No. of phases/Frequency		1-phase/50 or 60 Hz										
	Max. current		2 A				2.5 A						
	Max. power consumption		200 VA				250 VA						
	Avg. power consumption		15 W				18 W						
Cable			Cabtyre cable (φ5~10)										
Weight	kg		1.8	1.8	1.8	3.2	1.9	1.9	1.9	1.9	1.9	3.3	1.9

*1 Conditions: Clean water, room temperature. *2 0.7MPa (7bar) for models w/relief valve(R type) whereas 1.0MPa (10bar) for models w/o relief valve.

*3 When transferring high-viscosity liquids, the maximum discharge volume may be lower than the specified volume depending on the characteristics of the liquid and operating conditions. Consult TACMINA separately when transferring high-viscosity liquids.

Specification		Model	PW/PWM/PWT					
			100R/100	100	100	200	VTCE/VTCE	VTCE/VTCE
			VTCE/VTCE	FTCE/FTCE	FTCT	6TCT	VTCE(high-viscosity)	VTCE/VTCE
Max. discharge volume*1	mL/min		100			95	100	220
	L/H		6			5.7	6	13.2
Max. discharge pressure*1	MPa		0.7			0.5	0.7	0.2
	bar		7			5	7	2
Stroke speed			1 ~ 300 strokes/min (Enables setting in 1-stroke units)					
Stroke length			0.5 ~ 1 mm (Enables adjustment using the dial)					
Connection (hose/tube: I.D x O.D)	Discharge side	6 x 11(PVC braided hose) 6 x 8(PE)	6 x 8(PE)	6 x 8(FEP)	6 x 8(PTFE)	12 x 18 (PVC braided hose)	6 x 11(PVC braided hose) 6 x 8(PE)	
	Suction side	1/4" x 3/8"(PE)	1/4" x 3/8"(PE)	1/4" x 3/8"(FEP)			1/4" x 3/8"(PE)	
	Air-release	4 x 6 (soft PVC hose)				-	-	
Viscosity of transfer liquid			50mPa · s or less				3,000mPa · s or less ²	50mPa · s or less
Temperature of transfer liquid			0 ~ 40°C (no freezing allowed)					
Ambient temperature			0 ~ 40°C					
Environmental resistance			IEC standard: IP65 or equivalent (water-&dust-proof)					
Insulation class			B					
Power supply	Rated voltage		AC 100 to 240 V (±10%)					
	No. of phases/Frequency		1-phase/50 or 60 Hz					
	Max. current		2.5 A					
	Max. power consumption		250 VA					
	Avg. power consumption		18 W					
Cable			Cabtyre cable (φ5~10)					
Weight	kg		1.9	1.9	1.9	3.3	1.9	4

*1 Conditions: Clean water, room temperature.

*2 When transferring high-viscosity liquids, the maximum discharge volume may be lower than the specified volume depending on the characteristics of the liquid and operating conditions. Consult TACMINA separately when transferring high-viscosity liquids.

Control function specifications

Item		PW	PWT	PWM
Signal	Analog input	—		
	Digital	Input	One port: pulse signal (no-voltage contact or open collector, maximum no. of pulses: 1200 pulses/minute, minimum pulse width: 25 ms [ON period]) One port: pump stop signal (no-voltage contact or open collector, maximum no. of pulses: 1200 pulses/minute, minimum pulse width: 25 ms [ON period])	
		Output	One port: solenoid sync pulse signal (DC 25 V, 10 mA or less) One port: batch warning signal (DC 25 V, 10 mA or less)	
Control	Manual operation	Number of strokes	1 to 300 (Enables setting in 1-stroke units)	
	Pulse proportional control	Discharge volume control	0.1 to maximum discharge volume (Setting in 0.1mL/min. units enabled)	
		Division	1/999~1/1	
	Analog proportional control	Magnification	1~999	
				Proportional band/set point method
	Timer	Interval	1 pattern (1~9999min.)	
		DAY	9pattern	
		WEEK	7pattern	
		DAY + Interval	○	
		WEEK + Interval	○	
	Timer + Pulse proportional control	Division	1/999~1/1	
		Magnification	1~999	
	External operation signal	○		○
External stop signal	○		○	
Operation sync pulse	○		○	
Alarm output	○		○	

Accessories

Item	PW/PWM/PWT								
	General chemical model					Boiler	High pressure	High viscosity	
	VTCE	VTCF	FTCE	FTCF	FTCT	6TCT	VTCE	VTCE	VTCE
Hose / Tube	3m	3m	3m	3m	3m	3m	Discharge side: 2m Suction side: 1m		3m
Air purge hose with relief valve*1	1m*2		1m			—		1m	
Anti siphonal check valve	1set(R1/2)		1 set (R1/2 or R3/8)			1set (R1/2)		—	
Foot valve	—					1set			
Ceramic weight	—					1set			
Hose pump	—					1set			
Cable ties (INSULOK®) for relief hose (spare)*3	1					—		1	
Signal cable	2m								
Pump attachment bolts and nuts	2 sets (M5x30)								
Instruction manual	1copy								

*1 This hose is already attached to models with the simple relief valve.

*2 This hose is not supplied with 200-type models.

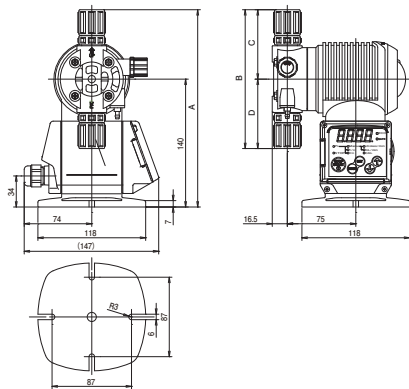
*3 This accessory is supplied with models with the simple relief valve.

* The signal cable is sold separately. The signal cable is included when the PWM and the chemical injection PTS series are purchased as a set.

PW

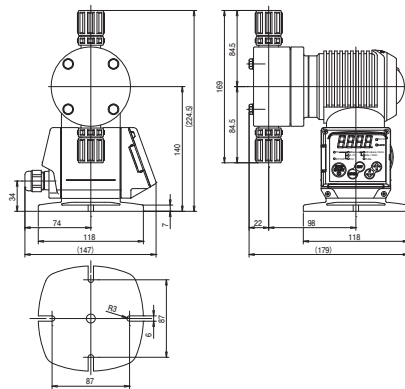
External dimensions

●PW/PWM/PWT/-30□/60□/100□

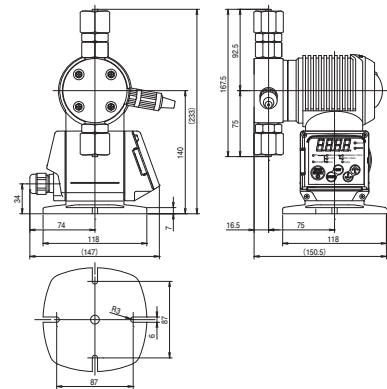


	A	B	C	D
VTCE/VTCF	216	152	76	76
FTCE/FTCF/FTCT	237	195	97.5	97.5
VTCF (High viscosity)	233	167.5	92.5	75
VTCE(BWJ)	230	166	90	76
VTCE(PWJ)	233	169	93	76

●PW/PWM/PWT-200



●PW/PWM/PWT/-30□/60□/100□ (6TCT)



* The shape and dimensions differ slightly depending on the liquid-end material and connection type.

Liquid-end Material

* Also refer to the "Corrosion-resistance Table" on page 26.

Part	Model	VTCE	VTCF	FTCE	FTCF	FTCT	6TCT	VTCF (High-viscosity)	VTCE (Boiler/High-pressure)
Pump head		PVC	PVC	PVDF	PVDF	PVDF	SUS316	PVC	PVC
Diaphragm		PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
Check ball		Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic
O-ring		EPDM	Fluoro rubber	EPDM	Fluoro rubber	Special fluoro rubber	PTFE	Fluoro rubber	EPDM
Valve seat		EPDM	Special fluoro rubber	EPDM	Special fluoro rubber	PTFE	—	—	PTFE
Packing		—	—	—	—	PTFE	—	—	—
Joint		PVC	PVC	PVDF, PP	PVDF, PP	PVDF	SUS316	PVC	PVC, SUS304
Ball stopper		PVC	PVC	PVDF	PVDF	PTFE	—	—	PVC
Valve stopper		—	—	—	—	—	PTFE	PE	—
Compression coil spring		—	—	—	—	—	—	SUS304	—