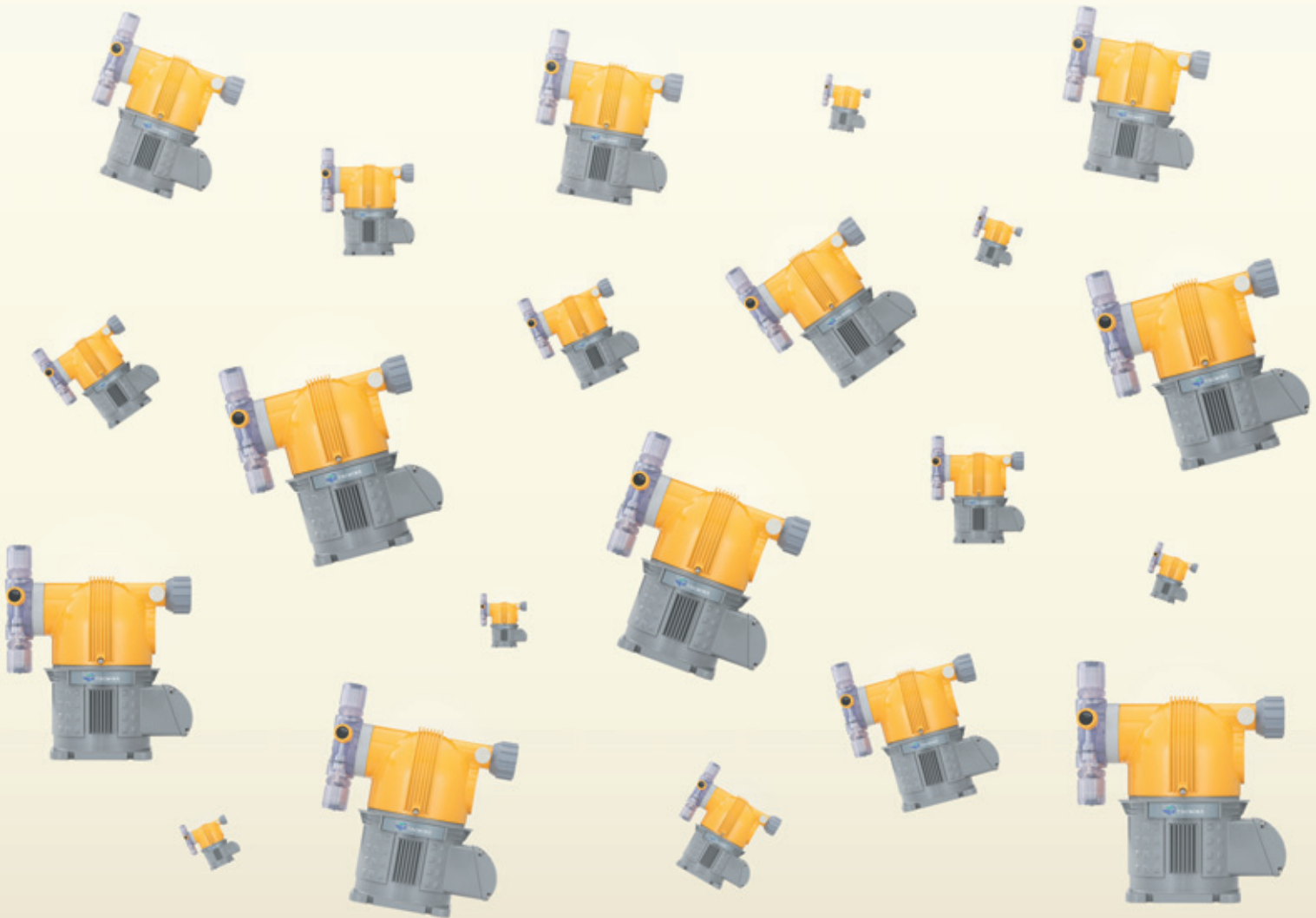


TACMINA

Motor-driven
Diaphragm Metering Pump

CSII



Easy, Tough and Safe

This stylishly designed safe TACMINA metering pump is easy-to-use and user-friendly developed with excellent utility, functionality and durability.



Application Examples



[Air-conditioning]

- Algicides
- Corrosion/rust inhibitors
- Slime inhibitors
- Scale inhibitors



[Water Treatment]

- Sulfuric acid
- Hydrochloric acid
- Caustic soda
- Polyaluminum chloride (PAC)
- Polymer molecule flocculants



[Boiler]

- Rust inhibitors
- Deoxidizers
- pH conditioners
- Corrosion/rust inhibitors



[Sterilization]

- Sodium hypochlorite

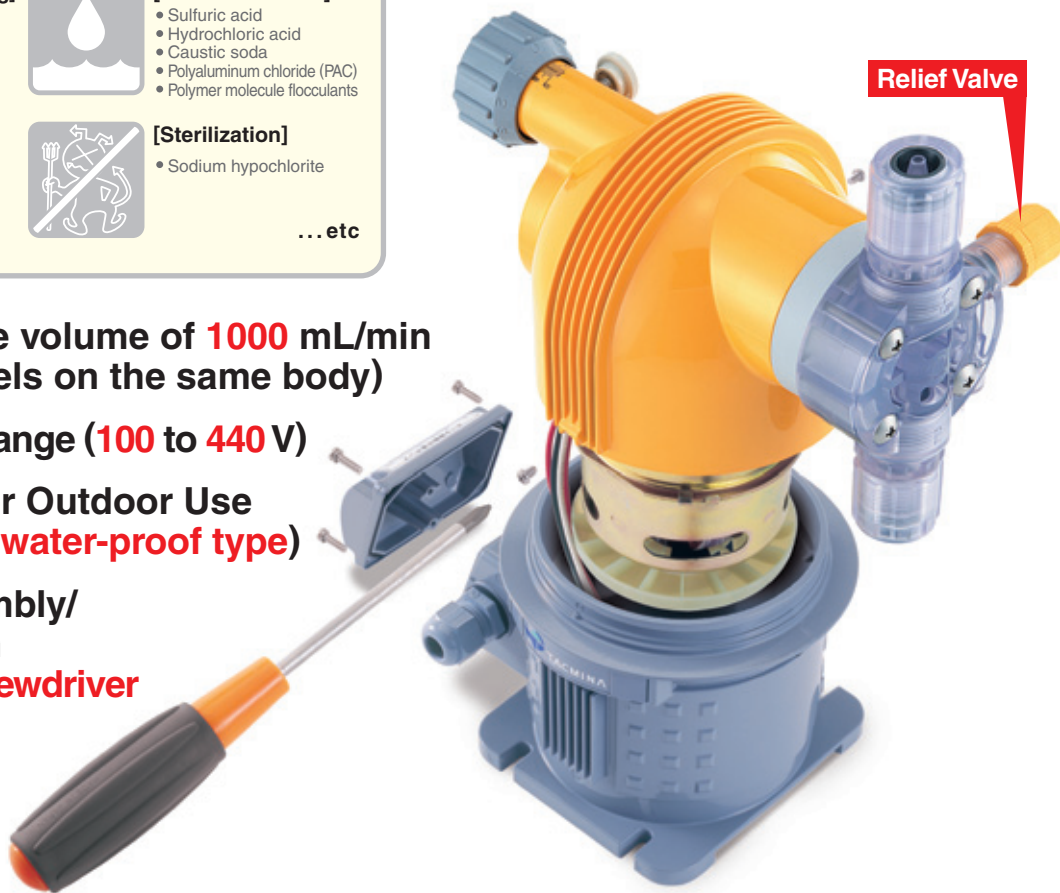
... etc

■ Max. discharge volume of **1000 mL/min**
(Totally **7** models on the same body)

■ Wide Voltage Range (**100 to 440 V**)

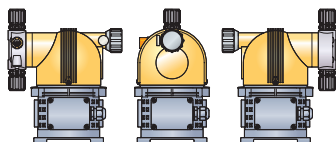
■ Tough Body for Outdoor Use
(**IEC529-IPX3 : water-proof type**)

■ Easy Disassembly/
Assembly with
Just **Single Screwdriver**



■ 3-directional Pump Head

The pump adopts a swivel head that allows you to change the direction the liquid end section faces to suit the installation site. This is handy when incorporating the pump into other equipment or installing the pump in confined locations.



■ Easy Flow Rate Adjustment

The CSII is equipped with an easy-to-grip stepless flow rate adjusting dial so that you can easily fine-adjust the flow rate during pump operation.



■ Extensive Range of Liquid-end Materials

For Injection of General Chemicals



VTCE/VTCF
Material: PVC
Application: Transfer/injection of general chemicals



FTCE/FTCF/FTCT
Material: PVDF
Application: Transfer/injection of special chemicals (e.g. strong and mixed acids)



STCT/6TCT
Material: Stainless steel (SUS304/316)
Application: Transfer/injection of solutions/special chemicals

For Injection of Boiler Chemicals



VTCE
Material: PVC
Application: Transfer/injection of boiler chemicals

For Injection of High-viscosity Chemicals



VT6E
Material: PVC
Application: Transfer/injection of high-viscosity chemicals (e.g. polymer coagulants)

For Injection of Sodium Hypochlorite



ATCF (CLCSI)
Material: PMMA
Application: Transfer/injection of chemicals that easily cause gas lock (e.g. sodium hypochlorite)

Model Code

* When selecting the pump model, refer to the "Liquid-end Material & Corrosion-resistance Table".

CS II - **10** - **VTCE** - **HW** - **100V1** - **Y** - **S** - **S**

1 Series name **2** Model (discharge volume standard) **3** Liquid-end material **4** Joint specification **5** Motor specification (voltage + phases) **6** Paint color **7** Power supply connection **8** General specification

For injection of general chemicals

CS II

w/ Relief Valve

10R : 10 mL
30R : 30 mL
60R : 60 mL
100R : 100 mL
300R : 300 mL



VTCE
VTCF

HW: PVC braided hose
FW: Flange

* Relief Valve is not provided in the flange specification.

[1-phase]

100V1 : 100 V/110 V
120V1 : 115 V/120 V
200V1 : 200 V/220 V
230V1 : 230 V/240 V

Y : Yellow

S : Standard
(w/out cable or terminal block)

C : w/ cable
(2 m)

T : w/ terminal block

S : Standard

w/out Relief Valve

10N : 10 mL
30N : 30 mL
60N : 60 mL
100N : 100 mL
300N : 300 mL
600 : 600 mL
1000 : 1000 mL



w/ Relief Valve

10R : 10 mL
30R : 30 mL
60R : 60 mL
100R : 100 mL
300R : 300 mL



FTCE
FTCF

HW: FEP tube

w/out Relief Valve

10 : 10 mL
30 : 30 mL
60 : 60 mL
100 : 100 mL
300 : 300 mL



w/ Relief Valve

10R : 10 mL
30R : 30 mL
60R : 60 mL
100R : 100 mL
300R : 300 mL



FTCT

HW: FEP tube

w/out Relief Valve

10 : 10 mL
30 : 30 mL
60 : 60 mL
100 : 100 mL
300 : 300 mL
600 : 600 mL
1000 : 1000 mL



w/out Relief Valve

10 : 10 mL
30 : 30 mL
60 : 60 mL
100 : 100 mL
300 : 300 mL



6TCT

HW: PTFE tube

w/out Relief Valve

600 : 600 mL
1000 : 1000 mL



STCT

HW: PTFE tube

For Injection of Boiler Chemicals

CS II

w/ Relief Valve

10R : 10 mL
30R : 30 mL
60R : 60 mL
100R : 100 mL



VTCE

BW: PVC braided hose and Nylon tube

w/out Relief Valve

10N : 10 mL
30N : 30 mL
60N : 60 mL
100N : 100 mL



For Injection of High-viscosity Chemicals

CS II

w/out Relief Valve

30N : 30 mL
60N : 60 mL
100N : 100 mL
300N : 300 mL
600 : 600 mL
1000 : 1000 mL



VT6E

HW: PVC braided hose

For Injection of Sodium Hypochlorite

CLCS II

w/ Relief Valve

10R : 10 mL
30R : 30 mL
60R : 60 mL
100R : 100 mL



ATCF

HW: PVC braided hose

w/out Relief Valve

10N : 10 mL
30N : 30 mL
60N : 60 mL
100N : 100 mL



Specification

Model		For Injection of General Chemicals w/ Relief Valve									
		10R		30R		60R		100R		300R	
		VTCE/ VTCF	FTCE/ FTCF/ FTCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT
Max. discharge volume* ¹ (mL/min)	50 Hz	10		30		60		100		300	
	60 Hz	12		36		72		120		360	
Max. discharge pressure* ¹	MPa	0.7* ²									
Stoke speed (strokes/min)	50 Hz	56				104				102	
	60 Hz	67				125				122	
Stroke length (mm)		0 to 2				0 to 3				0 to 6	
Connection (hose/tube: I.D x O.D)	Discharge side	4 x 9	6 x 8	4 x 9	6 x 8	6 x 11	6 x 8	6 x 11	6 x 8	6 x 11	6 x 8
	Suction side	4 x 6									
	Relief Valve/Air Release	100 mPa·s									
Max. allowable viscosity		100 mPa·s									
Allowable temperature	Ambient	0 to 40 °C									
	Liquid	VTCE/VTCF: 0 to 40 °C / FTCE/FTCF/FTCT: 0 to 60 °C (no freezing allowed)									
Environmental protection		IEC529-IPX3 (water-proof)									
Weight (kg)		5.0	5.2	5.0	5.2	5.0	5.2	5.0	5.2	5.0	5.2

*1 Conditions: Clean water, room temperature *2 Though the max. discharge pressure of the pump is 1.0 MPa, the Relief Valve operates when 0.7 MPa is exceeded. In applications requiring a discharge pressure of 0.7 MPa or more, ask for a model w/out the Relief Valve, and install a separate relief valve for extra safety.

Model		For Injection of General Chemicals w/out Relief Valve																								
		10N		10		30N		30		60N		60		100N		100		300N		300		600		1000		
		VTCE/ VTCF	FTCE/ FTCF/ FTCT	6TCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT	6TCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT	6TCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT	6TCT	VTCE/ VTCF	FTCE/ FTCF/ FTCT	6TCT	VTCE/ VTCF	FTCF	STCT	VTCE/ VTCF	FTCF	STCT				
Max. discharge volume* ¹ (mL/min)	50 Hz	10		30		60		100		300		600		1000												
	60 Hz	12		36		72		120		360		720		1200												
Max. discharge pressure* ¹	MPa	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	0.5	0.3											
Stoke speed (strokes/min)	50 Hz	56				104				102																
	60 Hz	67				125				122																
Stroke length (mm)		0 to 2				0 to 3				0 to 6																
Connection (hose/tube: I.D x O.D)	Discharge side	4 x 9	6 x 8	4 x 9	6 x 8	6 x 11	6 x 8	6 x 11	6 x 8	6 x 11	6 x 8	12 x 18	12 x 15	12 x 18	12 x 15											
	Suction side	4 x 6																								
	Air Release	4 x 6	—	4 x 6	—	4 x 6	—	4 x 6	—	4 x 6	—	—														
	Flange	JIS 10K15A	—	JIS 10K15A	—	JIS 10K15A	—	JIS 10K15A	—	JIS 10K15A	—	JIS 10K15A	—	JIS 10K15A	—	JIS 10K15	—									
Max. allowable viscosity		100 mPa·s								50 mPa·s																
Allowable temperature	Ambient	0 to 40 °C																								
	Liquid	VTCE/VTCF: 0 to 40 °C / FTCE/FTCF/FTCT/6TCT/STCT: 0 to 60 °C (no freezing allowed)																								
Environmental protection		IEC529-IPX3 (water-proof)																								
Weight (kg)	Hose	5.0	5.2	6.3	5.0	5.2	6.3	5.0	5.2	6.3	5.0	5.2	6.3	5.6	5.7	7.3	6.2	6.3	7.9							
	Flange	5.1	—	5.1	—	5.1	—	5.1	—	5.1	—	5.1	—	5.7	—	6.3	—									

* Conditions: Clean water, room temperature

Model		For Injection of Boiler Chemicals								For Injection of High-viscosity Chemicals						For Injection of Sodium Hypochlorite (CLCSII)											
		w/ Relief Valve				w/out Relief Valve				w/out Relief Valve						w/ Relief Valve				w/out Relief Valve							
		10R	30R	60R	100R	10N	30N	60N	100N	30N	60N	100N	300N	600	1000	10R	30R	60R	100R	10N	30N	60N	100N				
Max. discharge volume* ¹ (mL/min)	50 Hz	10	30	60	100	10	30	60	100	30	60	100	300	600	1000	10	30	60	100	10	30	60	100				
	60 Hz	12	36	72	120	12	36	72	120	36	72	120	360	720	1200	12	36	72	120	12	36	72	120				
Max. discharge pressure* ¹	MPa	1.5								1.0						0.5		0.3		0.7* ²				1.0			
Stoke speed (strokes/min)	50 Hz	56		104		56		104		56		104		102		56		104		56		104					
	60 Hz	67		125		67		125		67		125		122		67		125		67		125					
Stroke length (mm)		0 to 2		0 to 3		0 to 2		0 to 3		0 to 2		0 to 3		0 to 6		0 to 2		0 to 3		0 to 2		0 to 3					
Connection (hose/tube: I.D x O.D)	Discharge side	4 x 6		6 x 8		4 x 6		6 x 8		12 x 18				19 x 26				4 x 9		6 x 11		4 x 9		6 x 11			
	Suction side	4 x 9		6 x 11		4 x 9		6 x 11		4 x 6				—				4 x 6									
	Relief Valve/Air Release	4 x 6								4 x 6						—		4 x 6									
Max. allowable viscosity		100 mPa·s								2000 mPa·s* ³						1000 mPa·s* ³		100 mPa·s									
Allowable temperature	Ambient	0 to 40 °C																									
	Liquid	0 to 40 °C (no freezing allowed)																									
Environmental protection		IEC529-IPX3 (water-proof)																									
Weight (kg)		5.0								5.0						5.7		6.3		5.1							

*1 Conditions: Clean water, room temperature *2 Though the max. discharge pressure of the pump is 1.0 MPa, the Relief Valve operates when 0.7 MPa is exceeded. In applications requiring a discharge pressure of 0.7 MPa or more, ask for a model w/out the Relief Valve, and install a separate relief valve for extra safety. *3 When transferring high-viscosity liquids, the max. 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.

Liquid-end Material & Corrosion-resistance Table

Part	Model	For Injection of General Chemicals						For Injection of Boiler Chemicals	For Injection of High-viscosity Chemicals	For Injection of Sodium Hypochlorite (CLCSII)	
		VTCE	VTCF	FTCE	FTCF	FTCT	6TCT	STCT	VTCE	VT6E	ATCF
Pump head		PVC		PVDF			SUS316	SUS304	PVC		Acrylic (PMMA)
Diaphragm		PTFE									
Check ball		Ceramic							SUS316	Ceramic	
O-ring		EPDM	Fluoro-rubber	EPDM	Fluoro-rubber	Special fluoro-rubber Pafulo®**1	PTFE		EPDM		Fluoro-rubber
Valve seat		EPDM	Special fluoro-rubber	EPDM	Special fluoro-rubber	—	—	—	EPDM		Special fluoro-rubber
Joint		PVC		PVDF		PTFE	SUS316	SUS304	PVC		—
Ball stopper		PVC		PVDF		PTFE	PTFE (valve stopper)		PVC	—	PVC
Ball guide		—		—		—	—		—	PVC	—
Compressed coil spring		—		—		—	—		—	SUS304	PVC
Corrosion-resistance Table (0 to 40 °C)											
Hydrochloric acid	HCl	—	to 20 %	—	to 20 %	to 38 %	—		—		
Sulfuric acid	H ₂ SO ₄	to 60 %	to 80 %	to 60 %	to 80 %	to 98 %	98 %		—		
Acetic acid	CH ₃ COOH	—	to 20 %	—	to 20 %	to 80 %	—				
Sodium hydroxide	NaOH	○	—	○	—		○		—		
Aqueous ammonia	NH ₄ OH	○	—	○	—		○		—		
Sodium hypochlorite	NaClO	—	to 12 %	—	to 12 %		—		to 12 %		
Hydrogen peroxide	H ₂ O ₂	—	to 30 %	—	to 30 %		to 90 %		—		
Poly-aluminum chloride (PAC)		—		○	—		—		○		—
Aluminum sulfate	Al ₂ (SO ₄) ₃	—		—		○	—				
Polymer coagulants		—		—		—		—		to 2000 mPa·s**2	

*1 PTFE for 600/1000 *2 To 1000 mPa·s for 1000 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. * The corrosion resistance of materials is greatly affected by temperature, concentration, UV rays, and other environmental conditions. For this reason, this selection table does not completely guarantee safety. ** The above figures are the corrosion resistance for pump liquid-end materials. Consult TACMINA separately regarding the corrosion resistance of hoses and tubes.

Motor Specification

1-phase													
Item	Model	50 Hz					60 Hz						
		100 V	120 V	200 V	220 V	230 V	240 V	100 V	110 V	115 V	120 V	200 V	220 V
Output		10 W					10 W						
Rated motor current		0.62 A	0.52 A	0.30 A	0.35 A	0.26 A	0.28 A	0.62 A	0.65 A	0.59 A	0.61 A	0.30 A	0.32 A
Starting current		1.22 A	1.00 A	0.59 A	0.67 A	0.51 A	0.54 A	1.12 A	1.26 A	0.92 A	0.97 A	0.56 A	0.64 A
Number of poles		4					4						
3-phase													
Item	Model	50 Hz					60 Hz						
		200 V	346 V	380 V	400 V	415 V	200 V	220 V	230 V	380 V	400 V	440 V	
Output		10 W					10 W						
Rated motor current		0.23 A	0.14 A	0.15 A	0.16 A	0.17 A	0.19 A	0.21 A	0.22 A	0.13 A	0.13 A	0.15 A	
Starting current		0.56 A	0.33 A	0.36 A	0.38 A	0.40 A	0.53 A	0.58 A	0.61 A	0.34 A	0.36 A	0.40 A	
Number of poles		4					4						

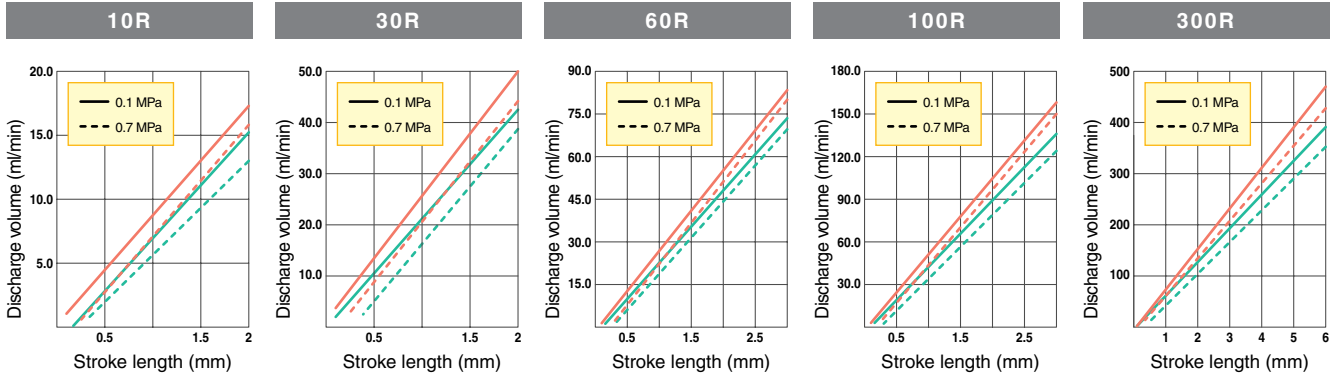
Accessory

Item	Model	For Injection of General Chemicals				For Injection of Boiler Chemicals	For Injection of High-viscosity Chemicals	For Injection of Sodium Hypochlorite (CLCSII)			
		VTCE/VTCF	FTCE/FTCF	FTCT	6TCT/STCT	VTCE	VT6E	ATCF			
Hose/Tube*		PVC braided hose (3 m) * Not available on flange model	FEP tube (3 m)	FEP tube (3 m) * PTFE on 600/1000	PTFE tube (3 m)	PVC braided hose (1 m) Nylon tube (2 m)	PVC braided hose (3 m)	PVC braided hose (3 m)			
Soft PVC hose for Relief Valve/Air Release		1 m (installed only on w/ Relief Valve) * Not available on 600/1000			—	1 m (installed only on w/ Relief Valve)	1 m * Not available on 600/1000	1 m (installed only on w/ Relief Valve)			
Anti-siphonal check valve		1 set (R1/2)			1 set (R1/2 or R3/8)	1 set (R1/2)	—	1 set (R1/2)			
Foot valve		1 set			—	1 set	—	1 set			
Ceramic weight		1 set			—	—	—	—			
Hose pump for Air Release		—			1 piece * Not available on 600/1000	—	—	—			
INSULOK for Relief Valve/Air Release hose		1 m (w/ Relief Valve only)			—	1 m (w/ Relief Valve only)	—	1 m (w/ Relief Valve only)			
Pump installation nut/bolt		4 sets (M5 x 30: w/ spring washer, plain washer, flange nut)									
Operation Manual		1 set									
Performance curve sticker		1 sheet									

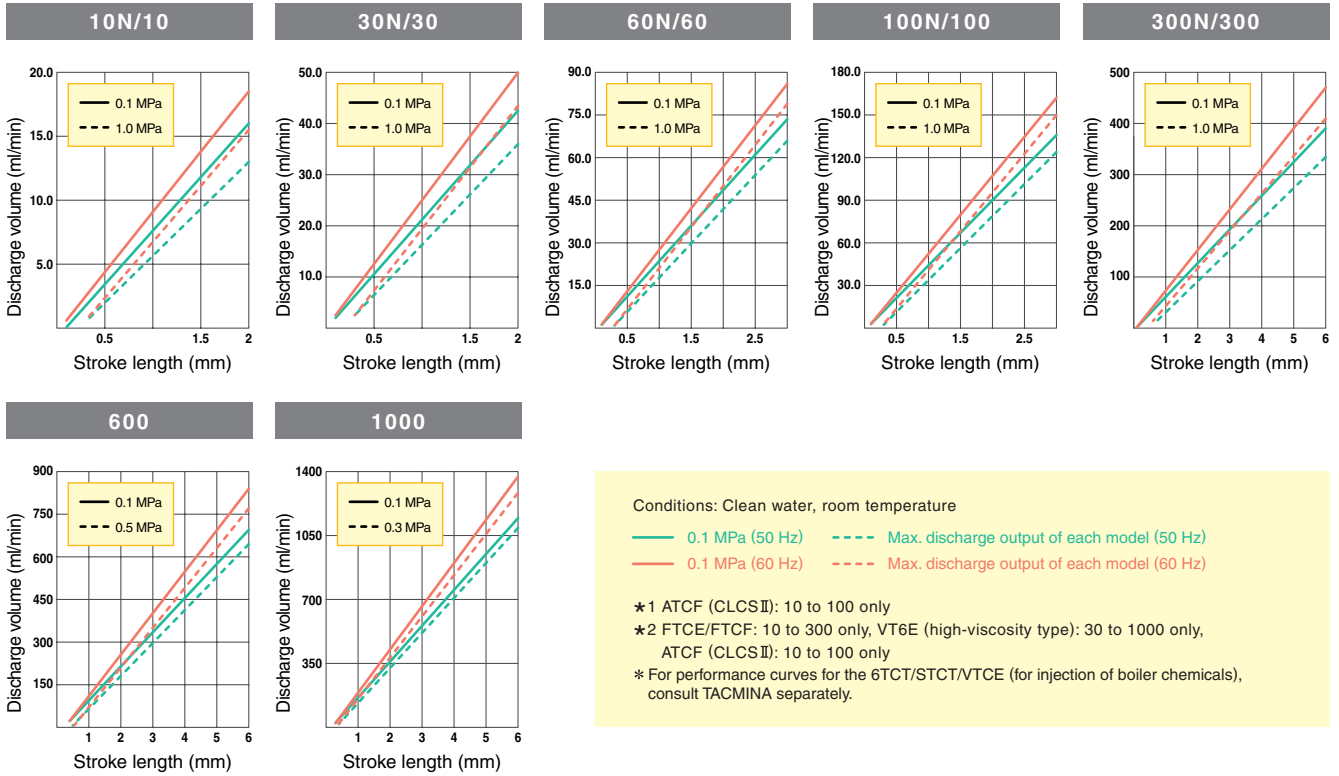
* For details on hose/tube aperture, see "Connection" for the respective model in "Specification" table.

Performance Curve

w/ Relief Valve : VTCE/VTCF/FTCE/FTCF/FTCT/ATCF (CLCS II)*1

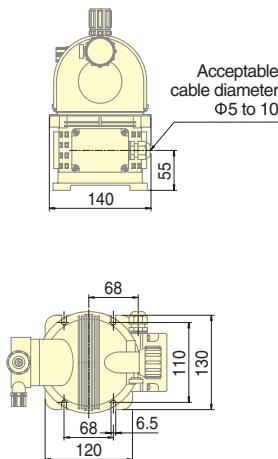


w/out Relief Valve : VTCE/VTCF/FTCE/FTCF/FTCT/VT6E (high-viscosity type) /ATCF (CLCS II)*2

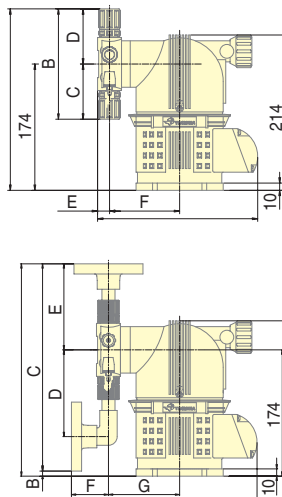


External Dimension (mm)

All models



[Example] VTCE/VTCF



	VTCE/VTCF (HW: hose/tube connection)						
	10□	30□	60□	100□	300□	600	1000
(A)	250	250	250	250	250	271	279
B	152	152	152	152	152	176	192
C	76	76	76	76	76	79	87
D	76	76	76	76	76	97	105
E	16.5	16.5	16.5	16.5	16.5	23.6	22.6
F	96.5	98.5	98	98	98.5	107	109
(G)	220.5	222.5	222	222	222.5	238	239

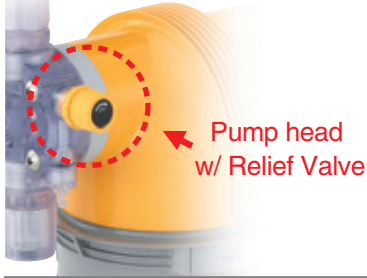
	VTCE/VTCF (FW: flange connection)						
	10N	30N	60N	100N	300N	600	1000
(A)	292.5	292.5	292.5	292.5	292.5	315	323
B	7	7	7	7	7	2.5	5.5
C	285.5	285.5	285.5	285.5	285.5	312.5	328.5
D	119.5	119.5	119.5	119.5	119.5	124	149
E	118.5	118.5	118.5	118.5	118.5	141	51
F	51	51	51	51	51	51	22.6
G	96.5	98.5	98	98	98.5	107	109
(H)	255	257	256.5	256.5	257	265.5	267.5

* The figure is for the VTCE/VTCF type. Sizes are as indicated above. However, the shape of the pump head and joint differ slightly depending on model and liquid-end materials.

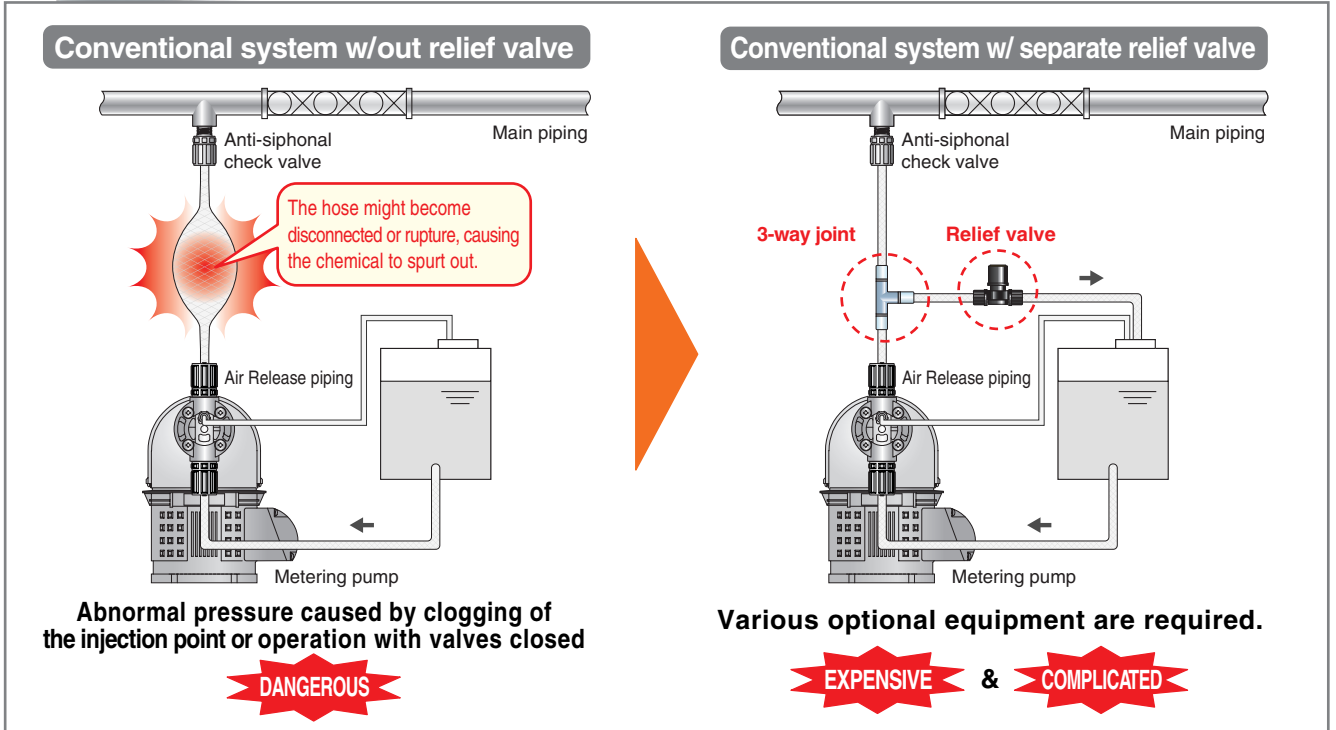
* The shape and dimensions differ slightly depending on the liquid-end material and connection type. For details on the external dimensions of other models, consult TACMINA separately.

■ Relief Valve Function

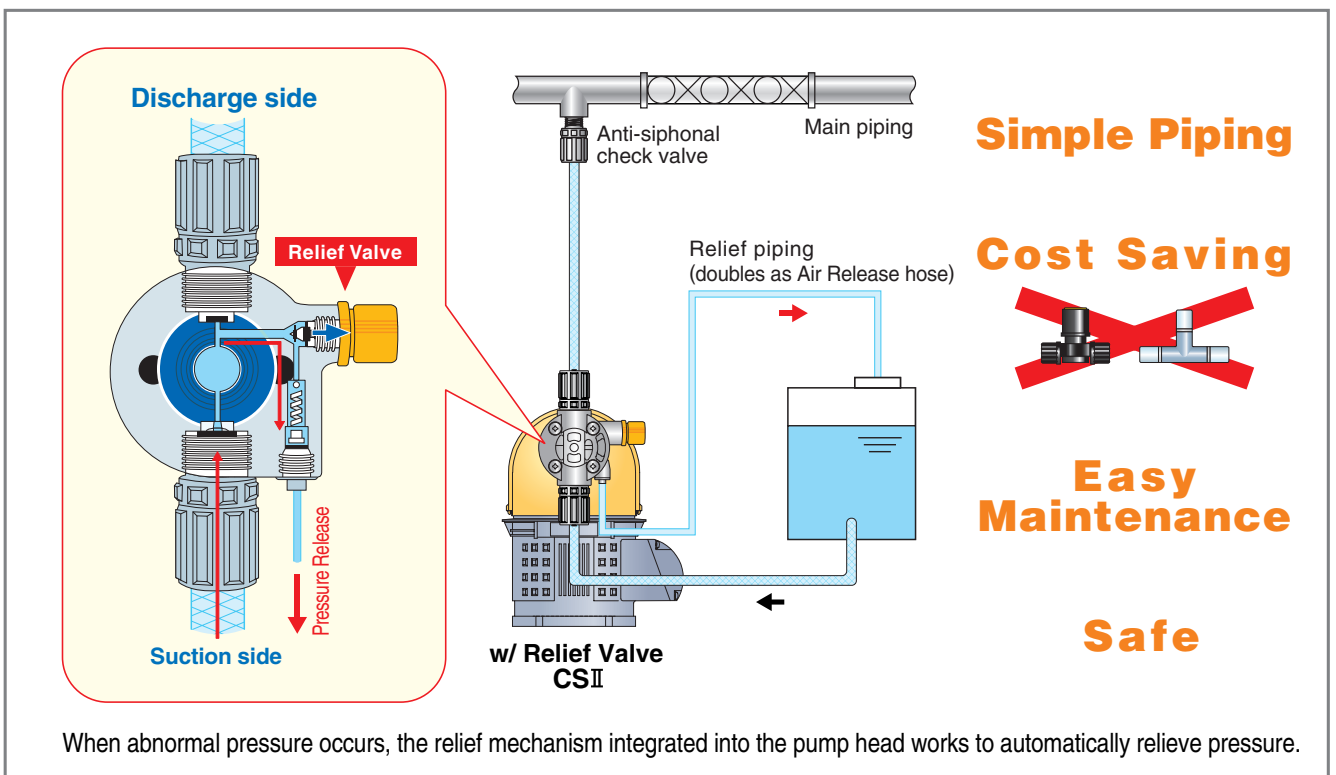
"Abnormal Pressure" Automatically Relieved to Prevent Accidents



Clogging or operation with valves closed generates abnormal pressure in the discharge-side piping, which makes it easier for hoses to become disconnected or ruptured, causing chemicals to spurt out and leading to a major disaster. This Relief Valve function automatically releases this abnormal pressure to prevent possible accidents, such as pump and piping damage. Also, costs and maintenance can be greatly reduced since optional equipment is no longer needed.



The Relief Valve Function Solves All These Problems



■ Related equipment

No More Troublesome Piping Work! Simple Injection of Chemicals!!



Chemical Injection Unit PTU

- Compact design enables simple fitting into equipment and easy installation.
- Just connect the power supply and piping to start operation.
- Ideal layout for preventing defective discharge caused by gas lock, etc.
- Large supply port for easy filling of chemicals
- Reliably protected against chemicals, dirt and dust by pump cover
- Entry of foreign matter prevented by suction valve w/ strainer
- Easy pump removal and maintenance by slide-type pump stand*
... and more

Tank capacity 25/50/100 L

* 50/100 L only

■ Option

● Flow Checker



This highly acid- and alkali-resistant, low-cost flow meter allows you to monitor injection operation of the pump. It can be directly attached on the discharge side of the pump

Applicable pumps

CSII - 30R/60R/100R/30/60/100/300
CLCSII - 30R/60R/100R/30/60/100

● Flow Indicator



Installed on the discharge side of the metering pump, this indicator allows you to visually check discharge operation, which helps in preventing trouble.

● Level Switch



When this sensor detects the low chemical level in the tank, it outputs signal to notify the operator that it is time to fill up the tank. Two models, a 1-point (single-sensor) and a 2-point (double-sensor) model, are available.

● Relief Valve



This valve automatically releases abnormal pressure that occurs in the discharge side piping, due to blockage by foreign objects and tightening of the valve, to prevent accidents or possible damage to the pump and piping.

● Back Pressure Valve



This valve prevents overfeeding^{*1} and siphoning^{*2} phenomena by sealing the chemical outlet with a diaphragm and applying just the right amount of pressure (back pressure) to suppress the inertia force of the fluid.

● Defoaming Joint



Installed on the suction side of the pump, this joint separates air bubbles and fluid to prevent air bubbles from entering the pump head.

● Parts Kit



This kit contains a complete set of all required consumables. It is economical, and an easy way to store and manage the parts you need.

● Tanks (25 to 100 L)



Solution tank



PE tank



PVC tank

● Air Chamber & Hose / Joint



*1 Overfeed: The phenomenon that the force (inertia) of the discharge during chemical flow with pulsation causes chemicals to continue flowing when chemical flow should stop, resulting in excessive chemical discharge beyond the specified volume.
*2 Siphoning: The phenomenon that chemicals continue to be sucked out naturally and continue flowing when the tip of the pump's discharge-side piping is lower than the level of liquid in the suction-side tank.

Product designs and specifications are subject to change without prior notice for product improvement.

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ISO 9001 Registration
JQA-1274 Production Division



ISO 14001 Registration
JQA-EM0637 Production Division



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