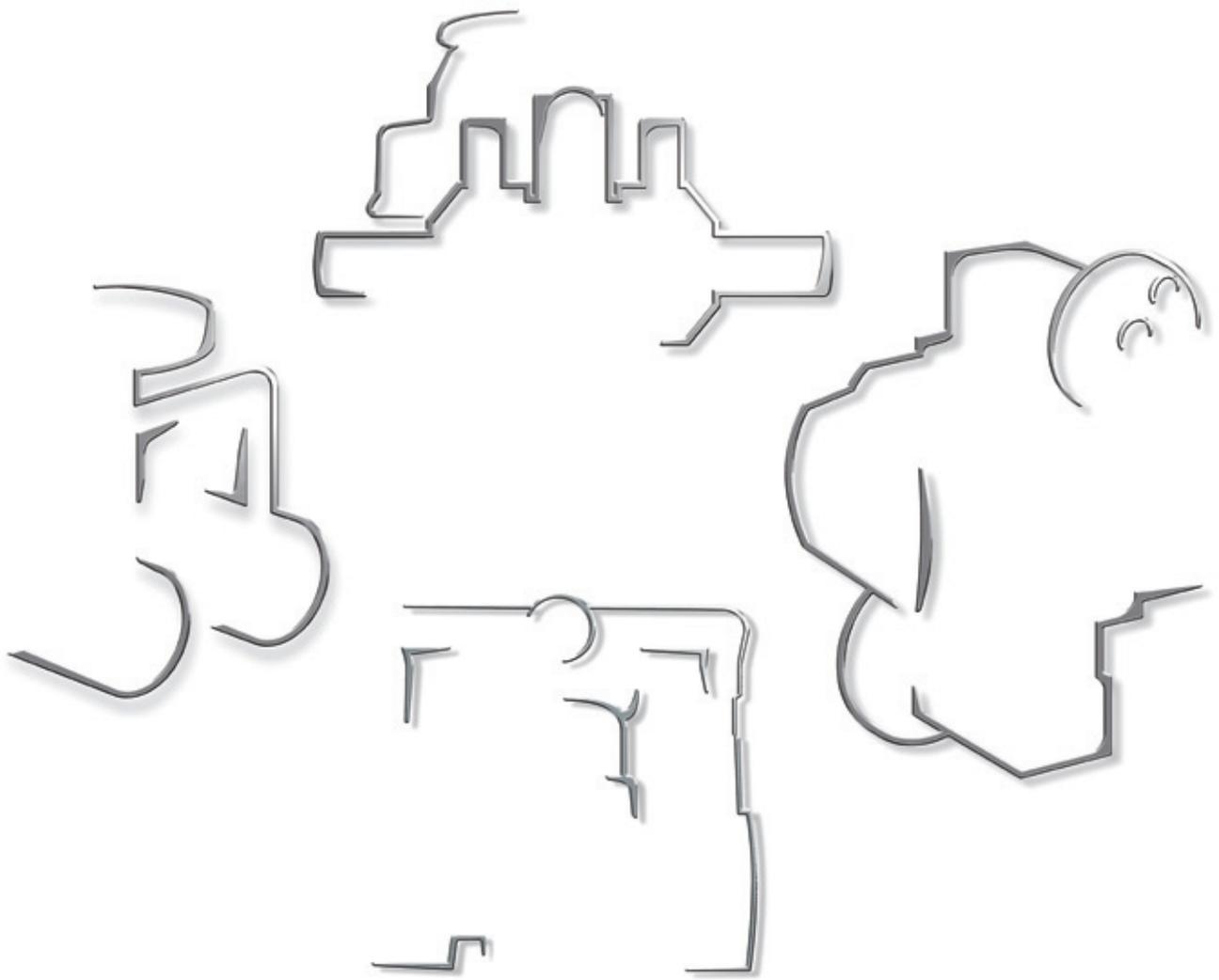
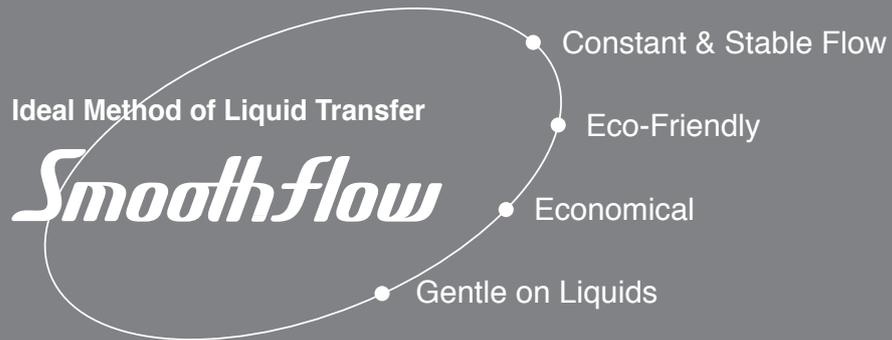


TACMINA

Smoothflow Pump





For Those Who Want Total Control in Liquid Flow

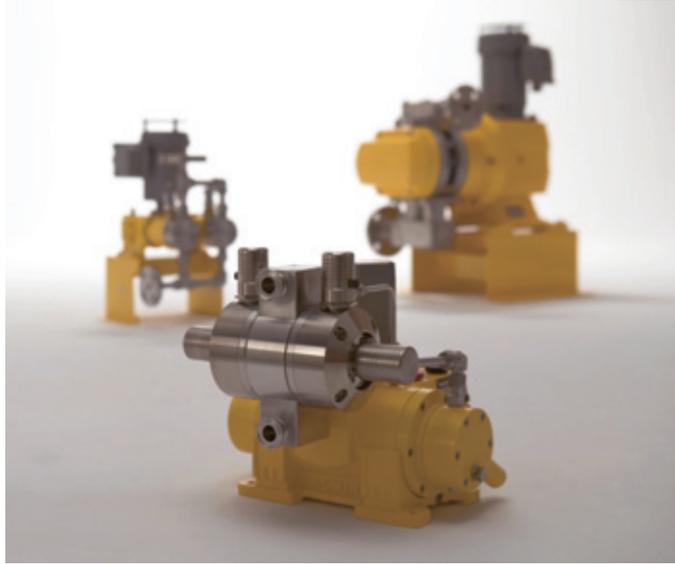
Smoothflow — the ideal method of liquid transfer. This innovative method not only meets your liquid transfer needs, but provides optimal solutions to Man, liquids and the environment as well.

TACMINA's Smoothflow technology, based on unique know-how cultivated over 50 years, delivers you ultimate performance and provides complete satisfaction.

TACMINA is a specialist manufacturer of high-precision and functional metering pumps, and has, for over 50 years, been driven by the desire to perfect liquid transfer technology. TACMINA's approach to manufacturing is based on a thorough understanding of customers' needs. We apply valuable feedback from our customers to providing top-quality, value-added and unique products and services in keeping with the meaning of our company's name implying "master skills".

TACMINA strives to become a company that people around the world can trust and rely on for its products and services.

TACMINA CORPORATION





Smoothflow Pump – this provides high precision and outstanding capabilities, as well as performance above and beyond your expectation.



No Liquid Leakage

Liquids transferred do not leak outside the pump. This makes it possible to prevent high-value chemicals from being wasted and poisonous chemicals from harming people or the environment. Furthermore, you can always keep your factory clean.



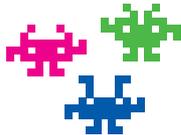
No Contact With the Open Air

The full sealing construction of the Smoothflow Pump ensures the safe transportation of liquids that easily solidify or evaporate when they are exposed to the open air, thus protecting them from deterioration.



No Damage to Liquid

As the pump does not stir or put excessive local pressure on the liquid, there is no fear of a deterioration in the quality of the liquid due to shearing, friction, pressurization, or a rise in temperature.



No Entry of Foreign Matter

The Smoothflow Pump has neither sealing components in which foreign matter may enter nor sliding components that generates abrasion powder. For its excellent sanitary performance, the Smoothflow Pump is suitable for the transfer of food materials and medical supplies.



Constant and Stable Flow Rate

The Smoothflow Pump ensures constant flow rate performance, and is not affected by any pressure change at the injection point or in piping on the discharge side. Furthermore, the Smoothflow Pump ensures the transfer of low-viscosity liquids without any drop in the flow rate, thus constantly maintaining excellent productivity and product quality.



Ideal for Long-Distance Transfer

The Smoothflow Pump ensures a constant flow with no pulsation, thus causing almost no vibration, noise, or burden on facilities, regardless of the length of the piping.



Less Equipment Cost

The Smoothflow Pump ensures a smooth flow with minimal pressure loss in the piping, thus not requiring large pipes, valves, or auxiliary parts. The Smoothflow Pump greatly reduces the equipment costs of large-scale plants and sites that require expensive piping materials, such as Teflon linings.



Ease of Precise Control

The Smoothflow Pump possesses excellent linearity and responsiveness, thus achieving precise flow control without suffering any undue influence from pressure changes. Furthermore, the Smoothflow Pump transfers liquid continuously at a fixed flow rate, thus the flow can be easily controlled using a flow meter.



Safe and Reliable

The Smoothflow Pump maintains the stable inner pressure of the piping, thus ensuring site safety for even narrow or long pipes. The Smoothflow Pump makes it possible to minimize the number of required auxiliary parts that must be installed.



Dry-Running OK

Unlike conventional rotary positive displacement pumps, the Smoothflow Pump does not have the sliding parts that may wear out or seize even while idling. Since you don't need to worry about how much of the liquid left in the tank, the volume of liquid and tank size can be minimized.



Transfer of Slurry

The Smoothflow Pump transfers slurry without damaging the pump and without biting or crushing the slurry.



A Wide Range of Capacities

TACMINA has a broad lineup of Smoothflow Pump units with various discharge capacities, ranging up to units that are capable of discharging 80 liters per minute (4,800 l/h), thus making it possible for customers to select the model that best suits their application needs.



Easy Maintenance

The Smoothflow Pump is easily disassembled and reassembled with only a minimum number of consumable parts. Furthermore, through its use of long-life components, the Smoothflow Pump greatly reduces the time and cost for maintenance.



Compatible With a Variety of Liquids

To meet customers' needs, pump heads are available in a wide variety of materials, such as stainless steel, PVC, and PVDF. The Smoothflow Pump makes it possible to transfer a variety of chemical liquids, such as acids, alkalis, and organic solvents.



Energy Saving

Compared to volute pumps with an equivalent capacity, a smaller motor can be used. Therefore, the Smoothflow Pump greatly reduces power consumption and the burden on the environmental.



Responding to all your process needs by a versatile lineup



Ideal for process lines that require strict control, such as optical film, IT, and high-purity pharmaceutical process lines.

TPL Accuracy (repeatability) | ★★★★★
High-precision
Hydraulic type

- Having about half the installation space of other conventional TACMINA pumps, compact and easy to install and carry
- Wide operating range (temperature: 0 to 80°C, discharge pressure: up to 3MPa)
- Side-opening system allows replacement of parts and maintenance without removal of pipes.



Ideal for the metered transfer of difficult-to-transfer chemical liquids and fluids, such as slurries, and materials used in foodstuffs, cosmetics and toiletries.

APL/APLS Accuracy (repeatability) | ★★★★★☆
Direct-driven type

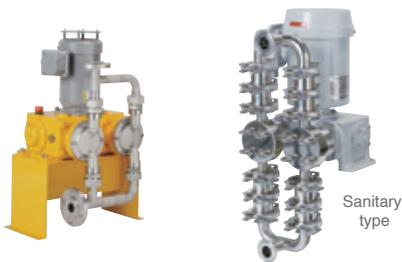
- Equipped with a diagonal diaphragm that contributes to the downsizing of the pump without losing its high capacity.
- Can transfer a wide range of viscous liquids, up to a viscosity of 20,000 mPa · s, within a temperature range between 0 to 60°C.
- Compatible with hazard analysis critical point (HACPP) systems.
Conforms to sanitary specifications, and ensures ease of disassembly and cleaning. (APLS)



Ideal for the high-pump-head transfer of chemical liquids and fluids, such as water-treating chemicals and high-molecular-weight coagulants over long distances.

BPL Accuracy (repeatability) | ★★★☆☆
Direct-driven type

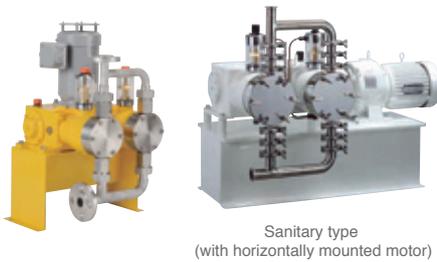
- Compact and lightweight units for easy incorporation into equipment.
- Simple construction to assure reliable cost effectiveness.
- Injection and transfer of chemical liquids at flow rates of 0.05 l/min. to 80 l/min.



Ideal for the metered transfer of difficult-to-transfer chemical liquids and fluids, such as high-temperature, high-viscosity resins and inflammable chemicals.

PL Accuracy (repeatability) | ★★★☆☆
Direct-driven type

- Highly durable, ideal for demanding use in processes.
- Simple mechanism, ensuring easy replacement of parts and maintenance.
- Specifications can be flexibly changed to suit liquid types and applications, such as the attachment of heat insulation and cooling jackets, and the separation of liquid end part.
- Cleaning-in-place (CIP) compatible (sanitary type only).



Ideal for the high-pressure and metered injection of highly volatile chemicals, such as emulsions, latex and slurry.

PL Accuracy (repeatability) | ★★★★★☆
Hydraulic type

- Hydraulic mechanism that supports high-pressure injection.
- Relief mechanism for preventing pump failures and accidents caused by excessive pressure.
- Specifications can be flexibly changed to suit liquid types and applications, such as the attachment of heat insulation and cooling jackets, and the separation of liquid end part.
- Sterilization-in-place (SIP) and cleaning-in-place (CIP) compatible (sanitary type only)



Ideal for high-accuracy, high-pressure injection

PL Plunger type

- Capable of high-accuracy, high-pressure injection that is unaffected by pressure fluctuations.
- Excellent durability with a robust construction.



Specification		Model	TPL1ME				TPL2ME				
			008	014	018	028	028	032	040	056	
Max. discharge volume	L/min		0.1	0.3	0.5	1.2	2.6	3.4	5.3	10.5	
	L/h		6	18	30	72	156	204	318	630	
	US G/h		1.5	4.7	7.9	19	41.1	53.8	83.9	166.3	
Max. discharge pressure	MPa		0.5			0.5		0.5		0.5	
	bar		5			5		5		5	
	psi		72.5			72.5		72.5		72.5	
Transferrable viscosity			Max. 20mPa · s / Max. 1000mPa · s (for high-viscosity specifications) *1								
Transferrable temperature			15 to 60°C (no freezing allowed)								
Weight (kg)			41			51		93		94	109

*1 As there are cases where a liquid with higher viscosity than the indicated specification value can be transferred, contact your dealer or TACMINA for further information.

Specification		Model	APL/APLS							
			1 *2	3 *2	5	10	20	35	50	
Max. discharge volume	L/min		1	2.5	5	10	20	35	45	
	L/h		60	150	300	600	1200	2100	2700	
	US G/h		15.8	39.6	79.2	158.4	316.8	554.4	712.8	
Max. discharge pressure	MPa		0.5							
	bar		5							
	psi		72.5							
Transferrable viscosity			20,000 mPa · s or less							
Transferrable temperature			SUS : 0 to 60°C / PVC : 0 to 40°C (no freezing allowed) *3							
Weight (kg)			55		45(58)		80(120)		110(140)	110(145)

*2 for APLS *3 APLS is SUS type only.

Specification		Model	BPL															
			005	01	02	03	06	1	2	3	5	10	20	30	80			
Max. discharge volume	L/min		0.05	0.14	0.2	0.3	0.6	1	2	3	5	10	20	30	80			
	L/h		3	8.4	12	18	36	60	120	180	300	600	1200	1800	4800			
	US G/h		0.79	1.58	3.1	4.7	9.4	15.8	31.6	47.4	79.2	158.4	316.8	475.2	1267.2			
Max. discharge pressure	MPa		1.0				0.5			0.3		0.5		0.3				
	bar		10				5			3		5		3				
	psi		145				72.5			43.5		72.5		43.5				
Transferrable viscosity		50mPa · s or less	2,000mPa · s or less *4															
Transferrable temperature			PVC: 0~40°C / SUS: 0~60°C (no freezing allowed)															
Weight (kg)			11		12		13		15		46		64		70		190	

*4 The transferable viscosity is 1,000mPa · s or less for models 1,2,3,5 and 80.

Specification		Model	PL										
			01	03	06	08 *5	1	2	3P	6	14		
Max. discharge volume	L/min		0.24	0.72	1.44	2	2.4	3.6	6	13.2	28		
	L/h		14.4	43.2	86.4	120	144	216	360	792	1680		
	US G/h		3.8	11.4	22.8	31.7	38	57	95	209.1	443.5		
Max. discharge pressure	MPa		1			0.5			0.7		0.5		
	bar		10			5			7		5		
	psi		145			72.5			101.5		72.5		
Transferrable viscosity	Standard type		50mPa · s or less						100mPa · s or less		50mPa · s or less		
	High-viscosity type		2000以下			1000mPa · s or less			3000mPa · s or less		—		
Transferrable temperature			PVC : 0~40°C / SUS · PVDF : 0~60°C (no freezing allowed) *6										
Weight (kg)	D type		21		27			75		77		166	
	W type		24		30			79		81		171	

*5 D type is PVC type only. *6 W type PVDF · SUS is 0 to 80°C.

Specification		Model	PL													
			01	02	06	08	08P	1	1P	3	4P	8	8P	15	15P	
Max. discharge volume	L/min		0.23	0.47	1.2	1.6	1.6	3.3	6.4	7.8	15.8	15.8	31			
	L/h		13.8	28.2	72	96	96	198	384	468	948	948	1860			
	US G/h		3.6	7.4	19	25.3	25.3	52.3	101.4	123.6	250.3	250.3	491			
Max. discharge pressure	MPa		2.5	1.5	1.6	2.5	1.6	2.5	1.2	2.5	1	2	0.8	1.5		
	bar		25	15	16	25	16	25	12	25	10	20	8	15		
	psi		362.6	217.6	232.1	362.6	232.1	362.6	174	362.6	145	290.1	116	217.6		
Transferrable viscosity			50mPa · s or less													
Transferrable temperature			PVC : 0~40°C / SUS · PVDF : 0~80°C (no freezing allowed)													
Weight (kg)	M type		28		77			81		201		226		241		
	MW type		29		81			83		85		206		231		246

Specification		Model	PL														
			0005	001	002	006	01	02	04	08	1	3	4P	8P	15P		
Max. discharge volume	L/min		0.011	0.024	0.056	0.14	0.28	0.56	0.84	1.64	3.4	6.6	7.8	15.8	31		
	L/h		0.66	1.44	3.36	8.4	16.8	33.6	50.4	98.4	204	396	468	948	1860		
	US G/h		0.17	0.38	0.89	2.22	4.44	8.87	13.3	26	53.9	104.5	123.6	250.3	491		
Max. discharge pressure	MPa		3			2		10		5		1.2		4		1.5	
	bar		30			20		100		50		12		40		20	
	psi		435.1			290.1		1450.4		725.2		362.6		174		580.2	
Transferrable viscosity			50mPa · s or less														
Transferrable temperature			0~80°C (no freezing allowed)														
Weight (kg)	Flange		20		22			—		71		—		191		246	
	Union		19		21			63		—		186		—		—	

* The above performance specifications are examples for typical models. For details, see the catalog of each model.

* The weight is for the stainless steel type.

* The PL is for duplex models. For details on triplex models, contact your dealer or TACMINA.

Other Models



Smoothflow pump for supplying coating liquid

- Ideal for high-precision supply of a fixed volume of various coating liquids such as UV-cured resin, filler dispersion liquids, and electrode materials to die coaters and gravure coaters.



Diaphragm Model
Max.15MPa

Plunger Model
Max.10MPa

Smoothflow pump for supplying liquid with high discharge pressure

- Ideal for ultra high-discharge pressure applications in facilities such as chemical plants and supercritical fluid process lines.
- Performs high-precision and high-pressure injection of small volumes of liquids without being affected by the injection-side pressure.



Extremely small volume type
1 to 10mL/min

Smoothflow pump for injecting a small volume of liquid

- Ideal for research and development applications and micro-chemical plants that manufacture a variety of products in small lots.
- Performs high-precision injection of extremely small volumes of chemical liquids.



Triplex Model

- Capable of transferring liquids in a pulseless state on not only the discharge side but also the suction side.
- Capable of large-volume discharge.



Units and Systems

- TACMINA designs and manufactures custom-made units and systems on request.

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

TACMINA CORPORATION

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