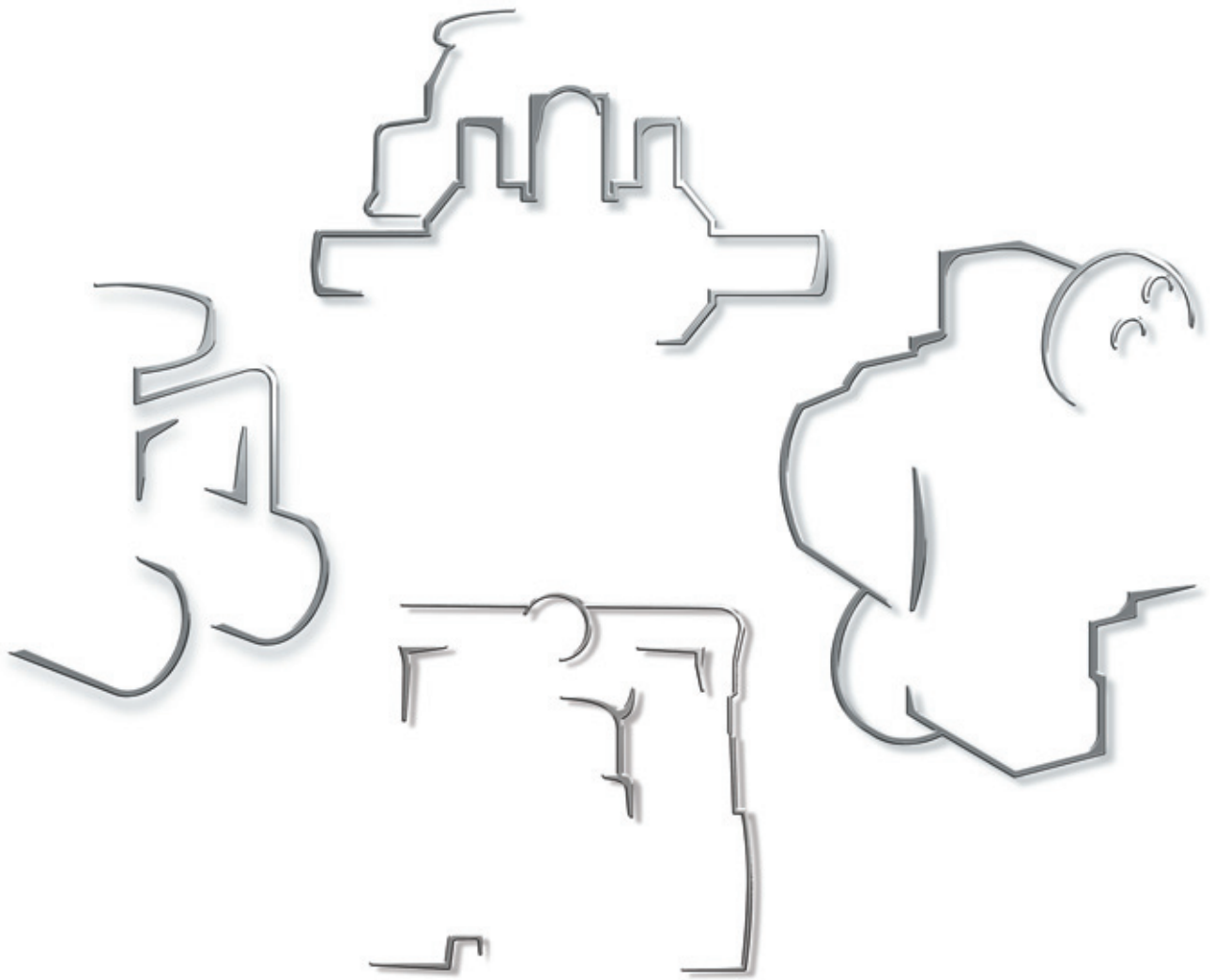
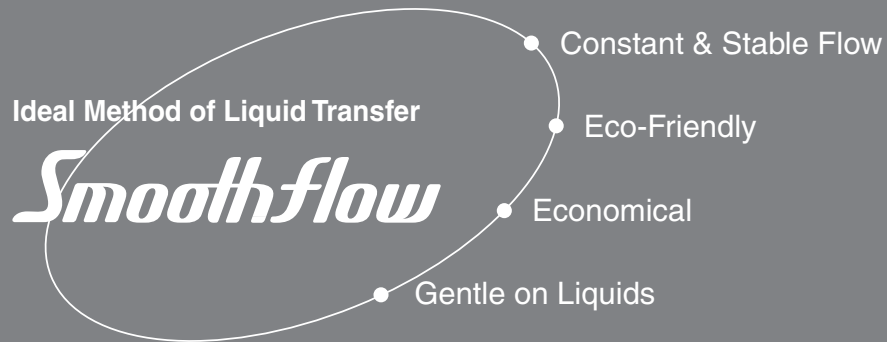


TACMINA

Smoothflow Pump





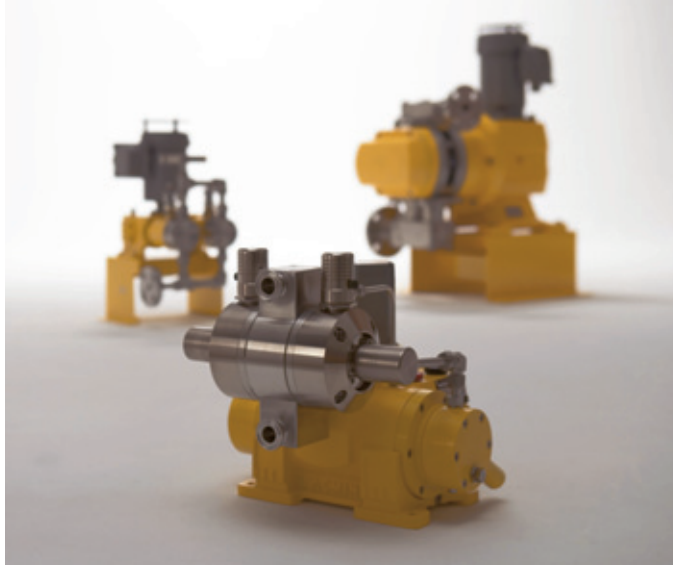
For Those Who Want Total Control in Liquid Flow

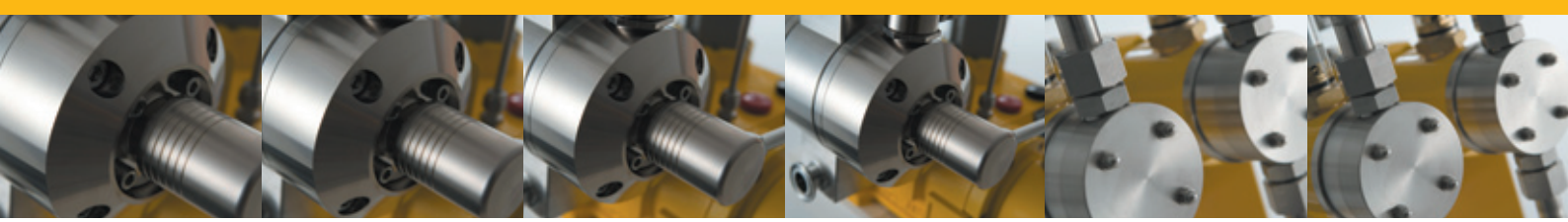
Smoothflow — the ideal method of liquid transfer. This innovative method not only meets your liquid transfer needs, but provides optimal solutions to Man, liquids and the environment as well.

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.

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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.



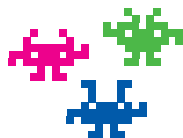
No contact with the open air

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 45 liters per minute (2700 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.



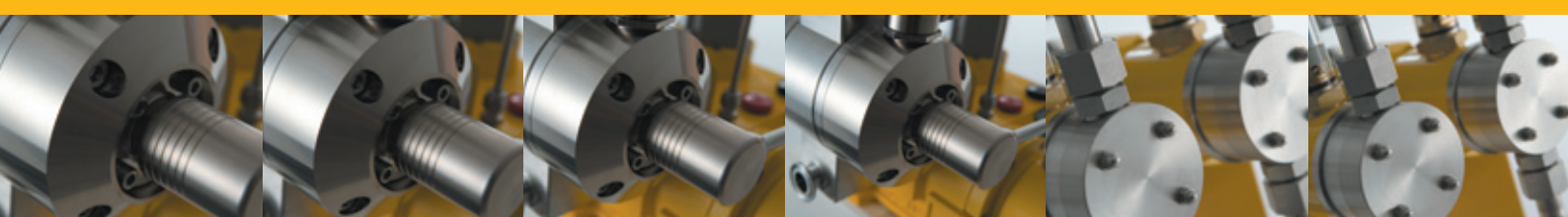
Compatible with a variety of liquids

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

The efficiency of the Smoothflow Pump is an astounding 98%. 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.



APL

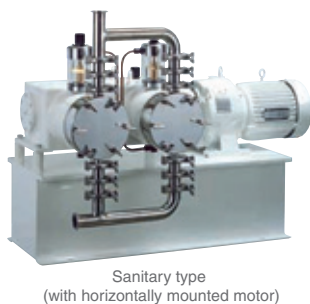


APLS

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)



Sanitary type
(with horizontally mounted motor)

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)



Sanitary type

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-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 5 l/min.



Specification		Model	TPL									
			-008	-014	-018	-028	-028	-032	-040	-056	-080	-095
Max. discharge volume	L/min	0.1 *1	0.3	0.5	1.2	2.6	3.4	5.3	10	21	30	
	L/H	6	18	30	72	156	204	300	600	1260	1800	
	US G/H	1.5	4.7	7.9	19	41.1	53.8	79.2	158.4	332.6	475.2	
Max. discharge pressure	MPa	3.0			1.5	3.0		2.5	1.5	0.5		
	bar	30			15	30		25	15	5		
	psi	435			217	435		362	217	72		
Transferrable viscosity (mPa·s)		50 mPa·s or less										
Transferrable temperature (°C)		0 to 50°C (no freezing allowed)										
Connection type		Flange, ferrule, screw, or special type										
Motor	Type & supply voltage	Totally enclosed fan-cooling outdoor type, 3-phase, 200V(50Hz·60Hz)/220V(60Hz)										
	Power/No. of poles	0.2kW/4P					1.5kW/4P					
Weight (kg)		30				80			95	120		

*1 is values at 1.0Mpa.

Specification		Model	APL/APLS					
			-1 *2	-3 *2	-5	-10	-20	-35
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						
Transferrable viscosity (mPa·s)		20,000 mPa·s or less						
Transferrable temperature (°C)		SUS:0 to 60°C / PVC:0 to 40°C (no freezing allowed)						
Connection type		Flange or special type						
Motor	Type & supply voltage	Totally enclosed fan-cooling outdoor type, 3-phase, 200V(50Hz·60Hz)/220V(60Hz)						
	Power/No. of poles	0.2kW/4P		0.4kW/4P		0.75kW/4P		1.5kW/4P
Weight (kg)		55	45(58)		80(120)		110(140)	110(145)

*2 for APLS

Specification		Model	PLS(M)			PLZ(M)			PLR(M)			
			-014	-020	-030	-028	-040	-056	-028	-040	-056	-080
Max. discharge volume	L/min	0.2	0.5	1.2	1.6	3.3	6.4	1.95	4	7.9	16	24.8
	L/H	12	30	72	96	198	384	117	240	474	960	1488
	US G/H	3.1	7.9	19	25.3	52.2	101.3	30.8	63.3	125.1	253.4	392.8
Max. discharge pressure	MPa	2.5		1.5	2.5		1.7	2.5		1.2	0.7	0.6
	bar	25		15	25		17	25		12	7	6
	psi	362.5		217.5	362.5		246.5	362.5		174	101.5	87
Transferrable viscosity (mPa·s)		50 mPa·s or less										
Transferrable temperature (°C)		SUS:0 to 50°C / PVC:0 to 40°C (no freezing allowed)										
Connection type		Hose, flange, union, ferrule, or special type										
Motor	Type & supply voltage	Totally enclosed fan-cooling outdoor type, 3-phase, 200V(50Hz·60Hz)/220V(60Hz)										
	Power/No. of poles	0.2kW/2P			0.75kW/2P			0.75kW/4P			1.5kW/4P	
Weight (kg)		26		86			109			130		

Specification		Model	PLS(D)					PLZ(D)	
			-12	-32	-62	-13	-23	-33	-53
Max. discharge volume	L/min	0.24	0.72	1.44	2.4	3.6	6.4	13	
	L/H	14.4	43.2	86.4	144	216	384	780	
	US G/H	3.8	11.4	22.8	38	57	101.3	205.9	
Max. discharge pressure	MPa	1.0			0.5		0.7		0.5
	bar	10			5		7		5
	psi	145			72		101.5		72
Transferrable viscosity (mPa·s)		Standard specification: 50 mPa·s or less High-viscosity specifications: 2,000 mPa·s or less			Standard specification: 50 mPa·s or less High-viscosity specifications: 1,000 mPa·s or less		Standard specification: 100 mPa·s or less High-viscosity specifications: 3,000 mPa·s or less		
Transferrable temperature (°C)		SUS:0 to 50°C / PVC:0 to 40°C (no freezing allowed)							
Connection type		Hose, flange, union, ferrule, or special type							
Motor	Type & supply voltage	Totally enclosed fan-cooling outdoor type, 3-phase, 200V(50Hz·60Hz)/220V(60Hz)							
	Power/No. of poles	0.2kW/2P				0.75kW/2P			0.75kW/4P
Weight (kg)		16	17	18	20		62	64	

Specification		Model	BPL								
			005	01	02	03	06	1	2	3	5
Max. discharge volume	L/min	0.05	0.14	0.2	0.3	0.6	1	2	3	5	
	L/H	3	8.4	12	18	36	60	120	180	300	
	US G/H	0.79	1.58	3.1	4.7	9.4	15.8	31.6	47.4	79.2	
Max. discharge pressure	MPa	1.0				0.5			0.3		
	bar	10				5			3		
	psi	145				72			43.5		
Transferrable viscosity (mPa·s)		50mPa·s or less	Standard specification: 50mPa·s or less High-viscosity specification: 2,000mPa·s or less				Standard specification: 50mPa·s or less High-viscosity specification: 1,000mPa·s or less				
Transferrable temperature (°C)		SUS:0~60°C/PVC:0~40°C(no freezing allowed)									
Connection type		Hose,flange,union,screw									
Motor	Type & supply voltage	Totally enclosed fan-cooling outdoor type,3-phase,200V(50Hz·60Hz)/220V(60Hz)									
	Power/No. of poles	0.2kW/4P									
Weight (kg)		11			12			13	15		

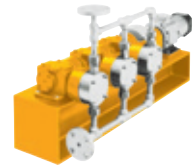
* The above performance specifications are examples for typical models. For details, see the catalog of each model.

Other Models



Plunger Model

- Capable of injecting small amounts of liquids at high pressure and at high precision without being affected by pressure fluctuations.
- A sturdy oil-bath system is used for the drive unit, which ensures excellent durability.



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.



Exclusive Controller

Low-capacity Model

- A compact, low-capacity model resistant to slurry.
- Oil-free, completely sealed structure, easy to disassemble.



Units and Systems

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

TACMINA CORPORATION

Head Office:

2-2-14 Awajimachi, Chuo-ku, Osaka 541-0047 Japan
Tel.+81(0)6-6208-3974 Fax.+81(0)6-6208-3978
URL <http://www.tacmina.com>
E-mail trade@tacmina.com

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

EC-043 (4) 05

2009/4/ASS



ISO 9001 Registration
JQA-274 Production Division



ISO 14001 Registration
JQA-EM0657 Production Division



We are using environmentally friendly materials.



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