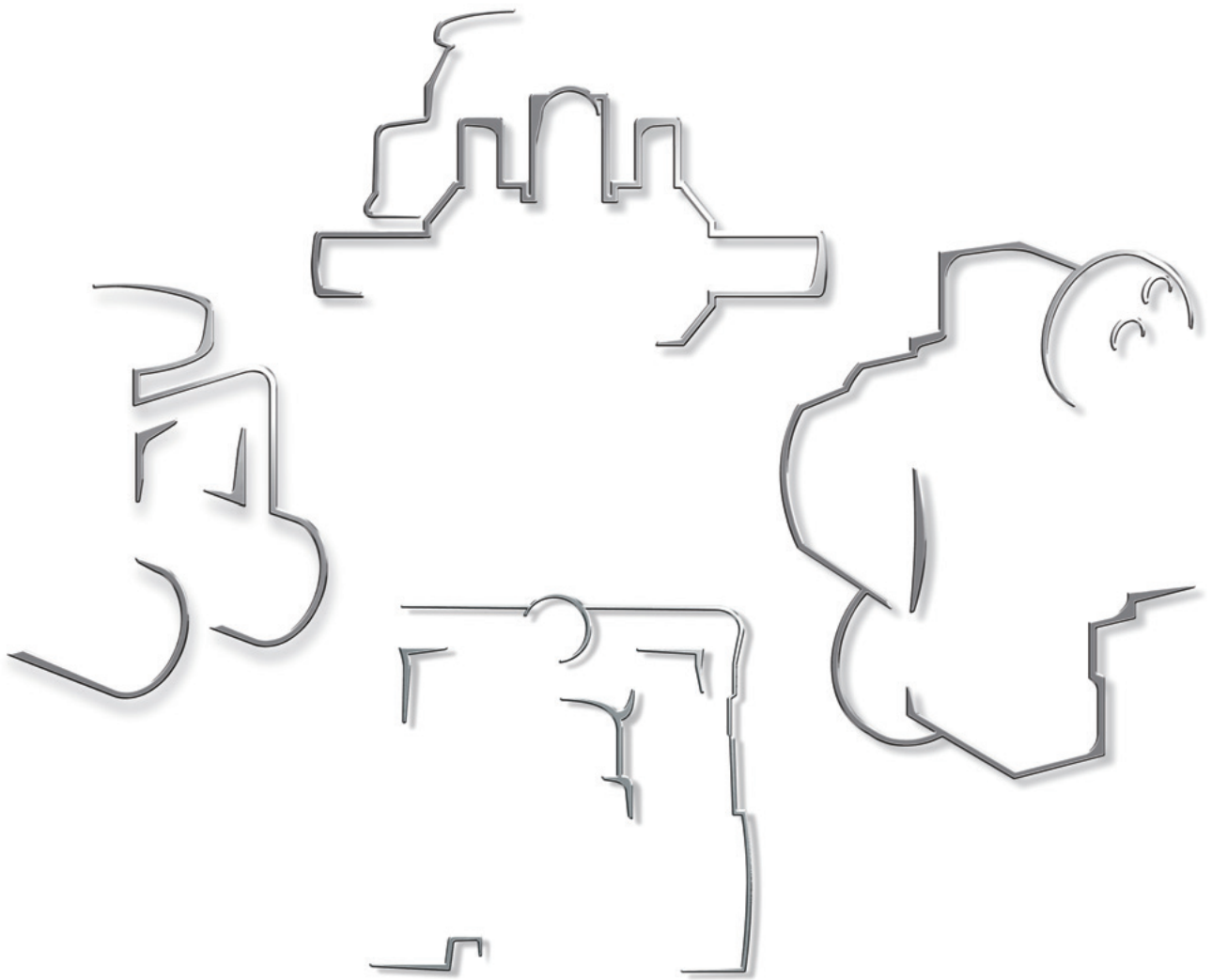
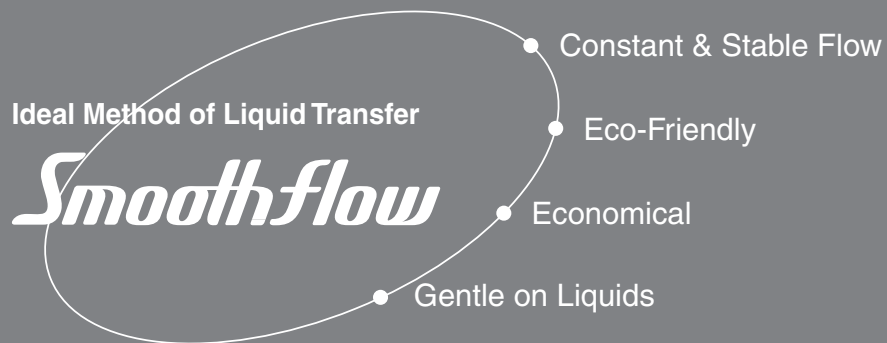


TACMINA

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.

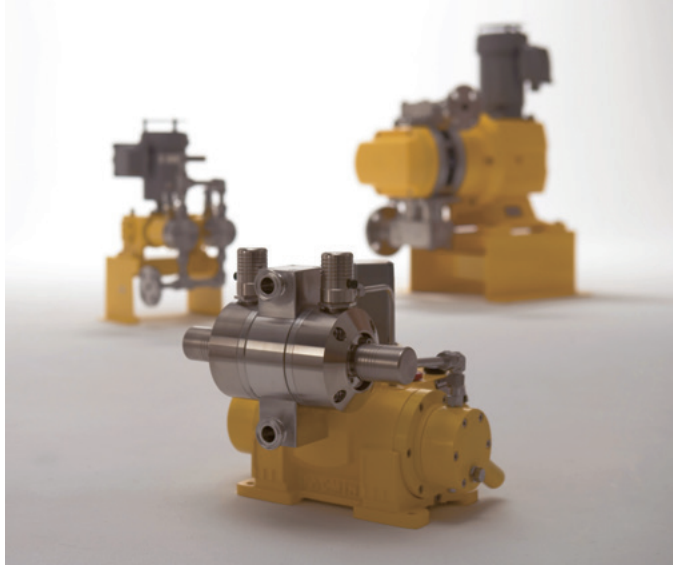
TACMINA's Smoothflow technology, based on unique know-how cultivated over 50 years, delivers you ultimate performance and provides complete satisfaction.

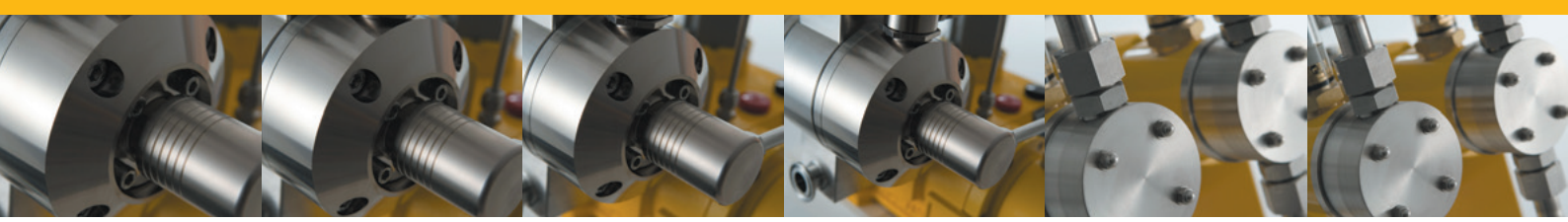
TACMINA is a specialist manufacturer of high-precision and functional metering pumps, and has, for over 50 years, been driven by the desire to perfect liquid transfer technology.

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.



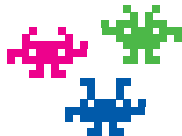
No Contact With the Open Air

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.



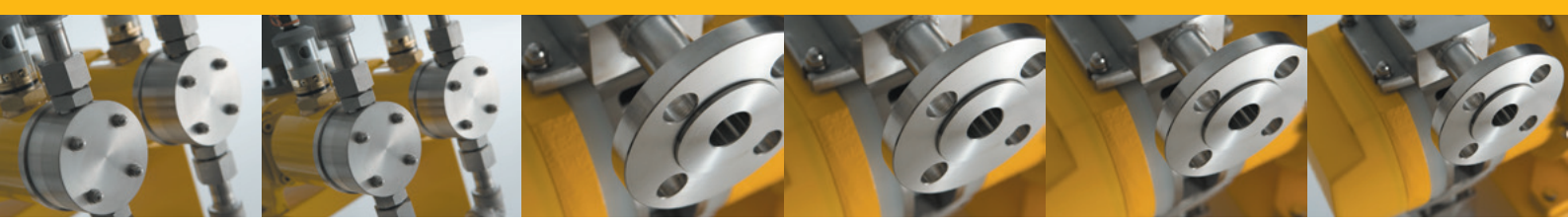
Ideal for Long-Distance Transfer

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

TPL

Hydraulic type

High-precision



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

- Having about half the installation space of other conventional TACMINA pumps, compact and easy to install and carry
- The best fluid transfer precision of all our Smoothflow Pumps
- Side-opening system allows replacement of parts and maintenance without removal of pipes.

Specification		Model		TPL1ME				TPL2ME					
		008	014	018	028	028	032	040	056	080	095		
Max. discharge volume	L/min	0.1	0.3	0.5	1.2	2.6	3.4	5.3	10.5	20	30		
	L/h	6	18	30	72	156	204	318	630	1200	1800		
	US G/h	1.58	4.75	7.92	19	41.18	53.85	83.95	166.32	316.8	475.2		
Max. discharge pressure	MPa	0.5											
	bar	5											
	psi	72.5											
Transferable viscosity		Max. 20mPa·s / Max. 1000mPa·s (for high-viscosity specifications) *1											
Transferable temperature		15 to 60°C (no freezing allowed)											
Weight (kg)		41		51		93		94		109		142	

*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.

APL/APLS

Direct-driven type

Sanitary



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

- 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)

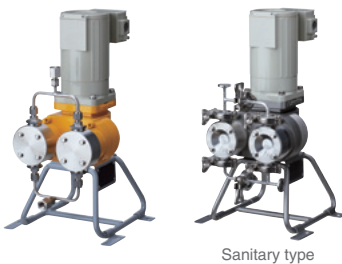
Specification		Model		APL/APLS					
		1*2	3*2	5	10	20	35	50	
Max. discharge volume	L/min	1	2.5	5	10	20	35	45	
	L/h	60	150	300	600	1200	2100	2700	
	US G/h	15.84	39.6	79.2	158.4	316.8	554.4	712.8	
Max. discharge pressure	MPa	0.5							
	bar	5							
	psi	72.5							
Transferable viscosity		20,000 mPa·s or less							
Transferable temperature		SUS : 0 to 60°C / PVC : 0 to 40°C (no freezing allowed) *3							
Weight (kg)	APL	-		69		135		166	
	APLS	55		60		115		151	

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

XPL

Direct-driven type

Compact



Precise supply of a wide range of fluids ranging from general chemicals to delicate fluids in water treatment processes, device embedding, and key process lines

- Reduced installation space requirements thanks to a compact body.
- Simple disassembly and maintenance.
- Fluid transfer rates from 0.009 L/min to 3 L/min.

Specification		Model		XPL				
		001	003	01	03	1	3	
Max. discharge volume	L/min	0.009	0.025	0.1*4	0.3	1	3	
	L/h	0.54	1.5	6*4	18	60	180	
	US G/h	0.14	0.39	1.58*4	4.75	15.84	47.52	
Max. discharge pressure	MPa	1.5		1.0		0.5		
	bar	15		10		5		
	psi	217.5		145		72.5		
Transferable viscosity	Standard type	50mPa·s or less						
	High-viscosity type	2,000mPa·s or less						
Transferable temperature		SUS : 0 to 60°C / PVC : 0 to 40°C (no freezing allowed)						
Weight (kg)		12.3			16.4		17.4	

*4 0.09 L/min (5.4 L/h) for the high-viscosity type

BPL

Direct-driven type

Wide Range



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

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

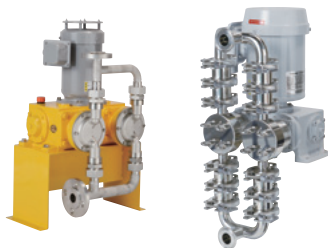
Specification		Model		BPL												
		005	01	02	03	06	1	2	3	5	10	20	30	80		
Max. discharge volume	L/min	0.05	0.14	0.2	0.3	0.6	1	2	3	5	10	20	30	80		
	L/h	3	8.4	12	18	36	60	120	180	300	600	1200	1800	4800		
	US G/h	0.79	2.21	3.16	4.75	9.5	15.84	31.68	47.52	79.2	158.4	316.8	475.2	1267.2		
Max. discharge 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			
Transferable viscosity	Standard type	50mPa·s or less														
	High-viscosity type	2,000mPa·s or less *5														
Transferable temperature		PVC:0 to 40°C/SUS:0 to 60°C(no freezing allowed)														
Weight (kg)		15			16		18		25		64		91		212	

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

PL

Direct-driven type

Flexible



Sanitary type

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

- 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).

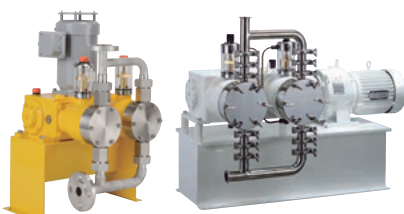
Specification	Model	PL								
		01	03	06	08*6	1	2	3P	6	14
Max. discharge volume	L/min	0.24	0.72	1.44	2	2.4	3.6	6	13.2	28
	L/h	14.4	43.2	86.4	120	144	216	360	792	1680
	US G/h	3.8	11.4	22.8	31.68	38.01	57.02	95.04	209.08	443.52
Max. discharge pressure	MPa	1			0.5			0.7	0.5	
	bar	10			5			7	5	
	psi	145			72.5			101.5	72.5	
	Transferable viscosity	Standard type	50mPa·s or less						100mPa·s or less	
	High-viscosity type	2000mPa·s or less			1000mPa·s or less			3000mPa·s or less		—
Transferable temperature		PVC : 0 to 40°C / SUS·PVDF : 0 to 60°C (no freezing allowed) *7								
Weight (kg)	D type	21			27			75	77	166
	W type	24			30			79	81	171

*6 D type is PVC type only. *7 W type PVDF · SUS is 0 to 80°C.

PL

Hydraulic type

High Pressure



Sanitary type (with horizontally mounted motor)

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

- Hydraulic mechanism that supports high-pressure injection.
- Relief mechanism for preventing pump failures and accidents caused by excessive pressure.
- High-pressure injection for slurry and highly viscous fluids

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		3.3		6.4	7.8	15.8		31		
	L/h	13.8	28.2	72	96		198		384	468	948		1860		
	US G/h	3.64	7.44	19	25.34		52.27		101.37	123.55	250.27		491.04		
Max. discharge pressure	MPa*8	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	362.5		217.5	232	362.5	232	362.5	174	362.5	145	290	116	217.6	
	Transferable viscosity	50mPa·s or less													
Transferable temperature		PVC : 0 to 40°C / SUS·PVDF : 0 to 80°C (no freezing allowed)													
Weight (kg)	M type	28			77		81		201		226		241		
	MW type	29			81		83		85		206		231		

*8 Applies to the SUS type.

PL

Plunger type

High Pressure



Ideal for high-accuracy, high-pressure injection

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

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	0.88	2.21	4.43	8.87	13.3	25.97	53.85	104.54	123.55	250.27	491.04	
Max. discharge pressure	MPa	3			2			10	5	2.5	1.2	4	2	1.5	
	bar	30			20			100	50	25	12	40	20	15	
	psi	435			290			1450	725	362.5	174	580	290	217.5	
Transferable viscosity		50mPa·s or less													
Transferable temperature		0 to 80°C (no freezing allowed)													
Weight (kg)	Flange	20			22		—		71		—		191		246
	Union	19			21		63		—		186		—		—

Q

Direct-driven type

Trace Amount



Q-5

Q-100

Usable for precision transferral of trace amounts of chemicals in laboratory processes such as addition, mixing, and reactions.

- Highly precise fluid transfers starting at as little as 0.1 mL/min.
- Equipped with a power cord to eliminate electrical work.
- Intuitive control panel to set the flow rate

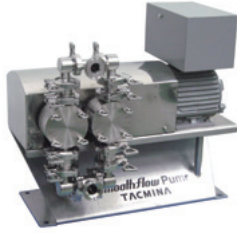
Specification	Model	Q · QI · QT					
		5	10	30	60	100	
Max. discharge volume	L/min	0.005	0.01	0.03	0.06	0.1	
	L/h	0.3	0.6	1.8	3.6	6	
	US G/h	0.07	0.15	0.47	0.95	1.58	
Max. discharge pressure	MPa	3	2	1	0.6	0.3	
	bar	30	20	10	6	3	
	psi	435	290	145	87	43.5	
Transferable viscosity		50mPa·s or less		100mPa·s or less		200mPa·s or less	
Transferable temperature		0 to 40°C (no freezing allowed)					
Weight (kg)		0.92		2.5			

* The above performance specifications are examples for typical models. For details, see the catalog of each model. * The transferable viscosity refers to Newtonian liquids. * The weight is for the stainless steel type(Excluding Q). * The PL is for duplex models. For details on triplex models, contact your dealer or TACMINA.

PLSS

Direct-driven type

High-precision



Ideal for processes where precise amounts of coating solution, electrode material, and other such fluids are supplied to die coaters.

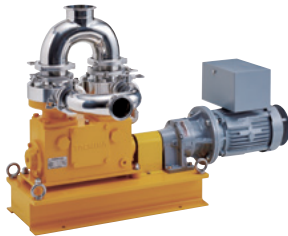
- Diaphragm method ensures that localized shear is not applied, thereby preventing the generation of aggregates and air bubbles.
- Resistant to wear and reduces the risk of metal contamination occurring.
- Easy to disassemble and can be cleaned in an inline manner.

Specification		Model	PLSS				
			01	05	09	1	2
Max. discharge volume	L/min		0.14	0.5	0.9	1.5	2.5
	L/h		8.4	30	54	90	150
	US G/h		2.22	7.92	14.3	23.8	39.6
Max. discharge pressure	MPa		0.5				
	bar		5				
	psi		72.5				
Transferable viscosity (mPa·s)			10.000				
Transferable temperature (°C)			15 to 40 (no freezing allowed)				
Weight (kg)			51			53	

VPL

Direct-driven type

High Viscosity



Ideal for the metered transfer of highly viscous/highly concentrated fluids such as battery material, paints, adhesives, and resins.

- Capable of transferring high-viscosity liquids over 300,000mPa·s
- The absence of sliding components at the liquid end part ensures that there are no changes to the properties of the transfer liquid while also reducing the risk of entry of foreign matter.

Specification		Model	VPL	VPLN	VPL	VPLN
			2	2	10	10
Max. discharge volume	High-viscosity liquid (30,000mPa·s) *1	L/min	1.6		10	
		L/h	96		600	
		US G/h	25.34		158.4	
Max. discharge pressure		MPa	0.5			
		bar	5			
		psi	72.5			
Transferable viscosity (mPa·s) *2			300,000 or more			
Transferable temperature (°C)			15 to 40 (no freezing allowed)			
Weight (kg)			33	44	115	122

*1 This is the value for a Newtonian liquid. *2 This is the value for a non-Newtonian liquid.

* The above performance specifications are examples for typical models. For details, see the catalog of each model.
 • The transferable viscosity refers to Newtonian liquids.

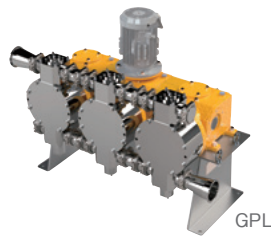
Other Models



HPL

High-pressure pump

- Capable of supplying liquid at high pressures with a continuous constant flow.
 - No liquid leakage thanks to a completely sealed structure.
- Max. discharge volume: 0.8 to 5L/min
 Max. discharge pressure: 50MPa



GPL

Large Capacity Type

- Supports liquids with a high viscosity of 5000 mPa·s.
 - There are no sliding parts, so there is no need to worry about heat caused by friction during dry running.
- Max. discharge volume: 150 L/min
 Max. discharge pressure: 0.3 MPa



Units and Systems

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



Remote head specifications

- Transfers hot fluids that exceed 100°C without heating the pump
- T-junction system to keep the sedimentary slurry and diaphragm from coming into direct contact also available

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 www.tacmina.com
 E-mail trade@tacmina.com

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

EC-058 (12) -
 2020/7/D--



JQA-A-1274
 JQA-EM0637 Production Department