

*Smoothflow Pump*  
**APLS**

Sanitary

Direct-driven type

Metered supply



# The Arrival of a Metering Transfer Pump with an Innovative Mechanism Ideal for Sanitary Processes!

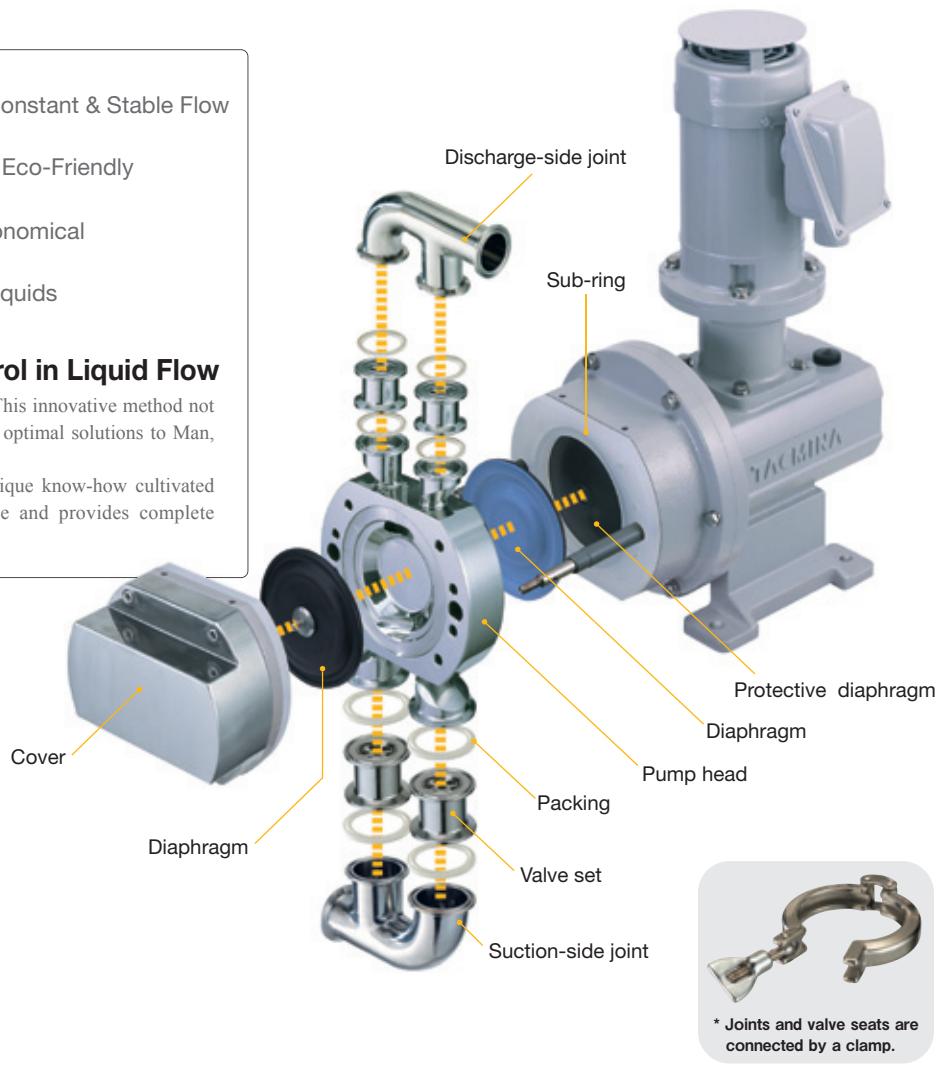
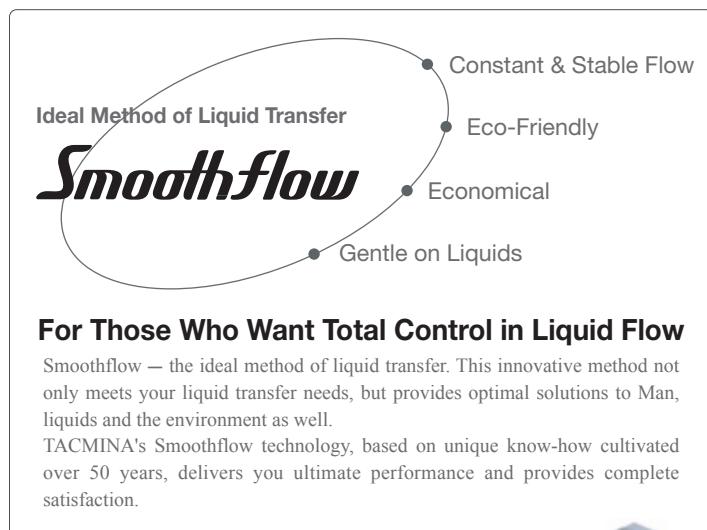
The APLS Series transfers liquids gently as it is a diaphragm pump.

And without the pulsation generally associated with diaphragm pumps, too.

This ideal form of pump is based on a completely new concept.

Two opposite diaphragms gently and reliably transfer liquids as if they are softly caressing them with both hands.

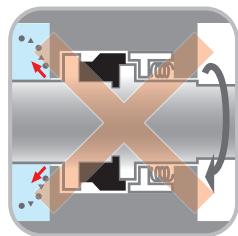
Also, the mechanical seal-free completely sealed structure makes the APLS Series hygienic and extremely easy to disassemble and clean.



## Performance

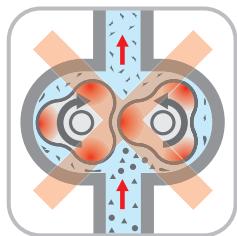
### No entry of foreign matter!

Abrasion that creates powder does not arise as Smoothflow pump has no sliding parts at liquid-end sections. This means that you no longer need to worry about powder or foreign matter entering the pump, or install filters, for example, on the discharge side.



### No damage to liquids!

Unlike other types of pumps, the APL Series does not stir or apply excessive pressure locally on liquids. This makes it ideal for transferring delicate liquids whose properties are easily changed by shear, abrasion, pressure, and temperature change.



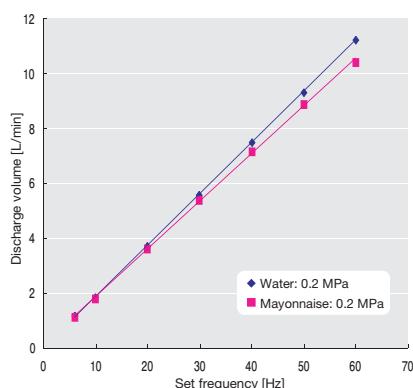
## High-viscosity liquids

Up till now, the transfer of high-viscosity liquids has been generally regarded as difficult. However, thanks to a special pump head structure designed to minimize resistance and contamination, Smoothflow pump can transfer high-viscosity liquids such as mayonnaise without any problem.

### Examples

- Mayonnaise
- Shampoo
- Tomato ketchup
- Yoghurt ... etc.

### Mayonnaise (non-Newtonian liquid): APLS-10



## Slurry liquids

As Smoothflow pumps have no sliding or mating parts, there is no risk of slurry being crushed and slurry damaging the pump.

Also, the diaphragms - the liquid-end parts - are coated with PTFE, a highly durable material. This makes them highly wear-resistant and reduces their replacement frequency.

### Examples

- Liquid foundation
- Salad dressing
- Concentrated fruit juice
- Dips (sauces) ... etc.



## Delicate liquids

Even delicate liquids, whose properties are changed by shear or excessive pressure, can be transferred carefully as Smoothflow pump neither has seals nor generates shear.



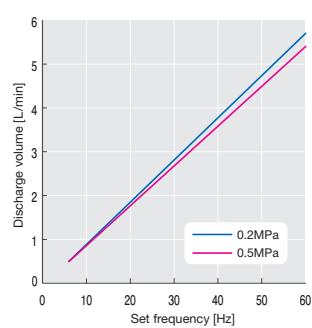
## Low-viscosity liquids

You do not have to worry about transferred liquid leaking to the outside as Smoothflow pump is completely free of mechanical seals. What's more, check valves installed above and below the pump heads reliably suppress backflow. This means that there is no risk of big drops in the flow rate even during transfer of low-viscosity liquids.

### Examples

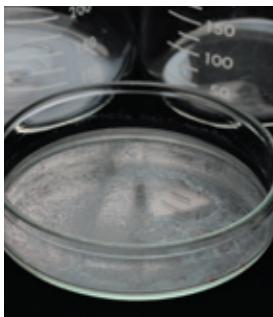
- Soy bean milk
- Soy sauce
- Food additives
- Water-based paint ... etc.

### Clean water : APLS-10



## Liquids that easily vaporize, harden or crystallize

On Smoothflow pumps, liquid end sections are not exposed to air. This means that you can safely transfer liquids that are likely to vaporize, harden or crystallize immediately through contact with air.



Transfer capabilities differ according to the transfer conditions. For details, contact your TACMINA dealer.

# Handy Unit Types That Are Easy to Move, Install and Handle!



## Handy unit type

Thanks to the integrated hopper and control panel, you are free from troublesome wiring and piping work. Rearrangement of the line and maintenance is also made easier as the unit is very easy to clean.



## APLS Series

Max. discharge volume : 47 L/min  
Max. discharge pressure : 0.5 MPa



## Trolley type

The trolley type unit with casters can be easily moved for installation at different sites and easily integrated into other equipment.

※ Specifications can be changed as required to suit customer specifications.  
For details, contact TACMINA.

## Options

### Refiner



- If you require higher precision performance, we recommend installing this refiner.

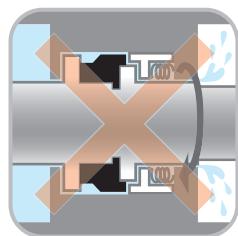
### Pulse Counter



- Use of the pulse counter allows you to calculate the approximate discharge volume, for example, the number of shots output by the pump per minute.
- It is also handy for batch injection and for checking the pump's running status.

## No leakage!

Smoothflow pumps are completely sealed structures free of mechanical seals. As there is no risk of liquids leaking to the outside, this means that you can use the APLS Series for the safe transfer of expensive drug solutions and dangerous chemicals.



## No pulsation!

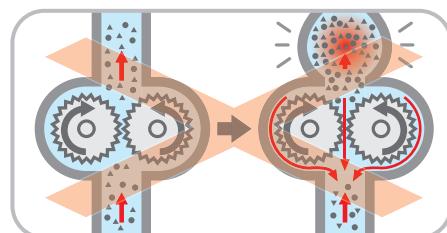
The APL Series uses a 1-cam, 1-head, 2-diaphragm mechanism, unlike anything else on the market, to suppress pulsation that is a characteristic of diaphragms.

Continuous pulseless flow results in excellent metering characteristics and response to flow rate control. What's more, as chemicals can be transferred smoothly, there is little piping resistance. In this respect, the pump excels in the transfer of chemicals over long distances.



## Excellent linearity (little flow rate fluctuation)

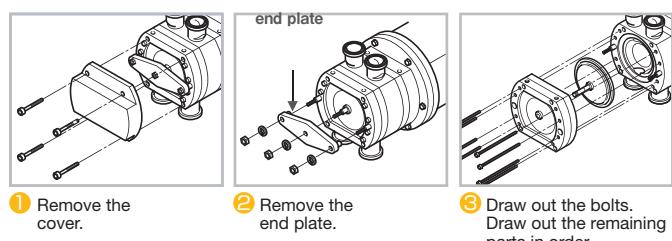
Backflow of transferred liquid is reliably suppressed by valve seats with excellent sealing performance. This eliminates big drops in flow rate even if the pressure in the discharge-side piping changes.



## Maintainability & Installation

### Simple disassembly/assembly!

The APLS Series is compatible with CIP cleaning and is extremely easy to maintain. All you need is two tools: an Allen key and a spanner. With these tools, anybody can easily disassemble and assemble liquid-end sections.



1 Remove the cover.

2 Remove the end plate.

3 Draw out the bolts.  
Draw out the remaining parts in order.

### Long-lasting and low-cost!

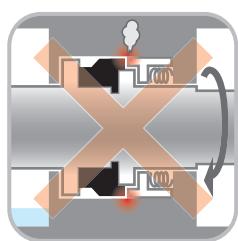
The only consumables required on the APLS are the diaphragms, valve set, packing and O-rings. What's more, this limited number of parts needs to be replaced only once a year or after 4000 hours of operation.\* This enables big reductions in maintenance and running costs.

\* The recommended replacement cycle for consumables is sometimes reduced on some models depending on the properties of the transferred liquid and the operating conditions.



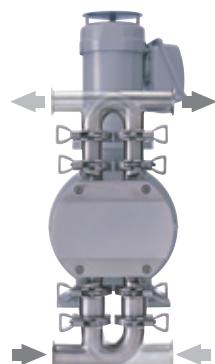
### Dry-running possible!

Reciprocating pumps have no sliding parts which used to be required in rotary pumps due to their structure. This means that there is no risk of seals wearing or seizing during idling.



### Easy piping!

The joints on both the suction and discharge sides can be changed to face the opposite direction. This allows you to install the pump to conform to the piping conditions, for example, when it is integrated in a system.



## Model Code

APLS - **10** - **S T S N** - **C W S**

**1**

**1**

**a**

**b**

**c**

**d**

**2**

**3**

**4**

**5**

**1** Discharge volume

1: 1.1 L/min 20: 22 L/min  
3: 2.6 L/min 35: 36 L/min  
5: 5.5 L/min 50: 47 L/min  
10: 10.5 L/min

**2** Liquid end material

**a** Pump head **c** Check ball/poppet valve  
S: SUS304 S: SUS304  
X: Special X: Special

**b** Diaphragm

T: PTFE  
X: Special

**d** O ring for poppet valve

N: None (when check ball is selected)  
E: EPDM T: PTFE\*  
F: Fluoro rubber X: Special

\* When "H: Special high-viscosity" has been selected for the valve structure, PFA/silicon are the materials used.

**3** Connection type

C: Sanitary clamp  
X: Special

**4** Valve structure

W: Standard H: Special high-viscosity  
V: High-viscosity X: Special

## Performance Specifications

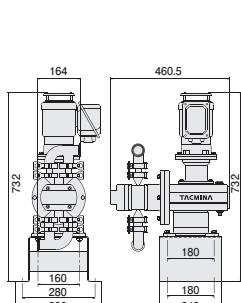
Specifications	Model	APLS-1	APLS-3	APLS-5	APLS-10	APLS-20	APLS-35	APLS-50
Max. discharge volume (L/min) <sup>*1</sup>	1(1.1)	2.5(2.6)	5(5.5)	10(10.5)	20(22)	35(36)	45(47)	
Max. discharge pressure (MPa)				0.5				
Strokes (spm) <sup>*2</sup>		9.6~96			8.9~89			
Stroke length (mm)		6	8		15	16	21	
Connection (sanitary clamp)	Discharge side	1.5S		1.5S		2S		
	Suction side		1.5S	2S		2.5S		
Motor	Power supply (V)/frequency (Hz)	3-phase, 200 V/50 Hz, 200 V/60 Hz, 220 V/60 Hz, totally enclosed fan-cooled outdoor type (vertical flange mounting)						
	Output (kW)	0.2						1.5
	Rated current/ max. startup current (A)	200 V/50 Hz	1.34 / 6.1					
		200 V/60 Hz	1.12 / 5.5					
		220 V/60 Hz	1.17 / 6.0					
	Number of poles (P)	4						
	Wiring conduit connection aperture	G 3/4						
Operating temperature range	Ambient temperature	0 to 40°C						
	Transferrable temperature	0 to 60°C (freezing not allowed)						
Transferrable viscosity		Max. 20000mPa·s <sup>*4</sup>						
Pump paint color		Munsell (approximate) N7						
Weight (kg) <sup>*3</sup>	In the case of APLS-□-STSN	55	58	115	151	151		

\*1 Conditions: room temperature, clean water, standard valve used, inverter frequency 60 Hz \*The maximum discharge volume changes depending on the viscosity of the transferred liquid. Values in parentheses "( )" are the maximum discharge volume at 0.2 MPa. \*2 When TACMINA-specified inverter is used \*3 For details on other specifications and models, contact TACMINA.

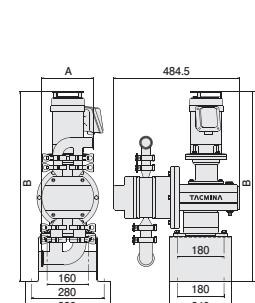
\*4 It may change depending on the liquid property/transfer conditions of the pumping liquid. Contact your dealer or Tacmina.

## External Dimensions

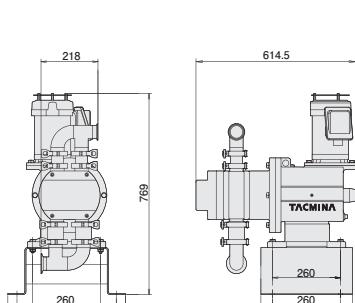
APLS-1/3-STSN-CWS



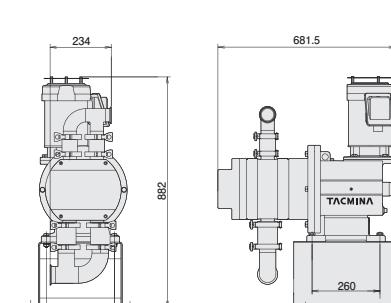
APLS-5/10-STSN-CWS



APLS-20-STSN-CWS



APLS-35/50-STSN-CWS



The above example performance specifications and external dimensions are for a standard model. These can be customized to suit customer specifications. For details, contact TACMINA.

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

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