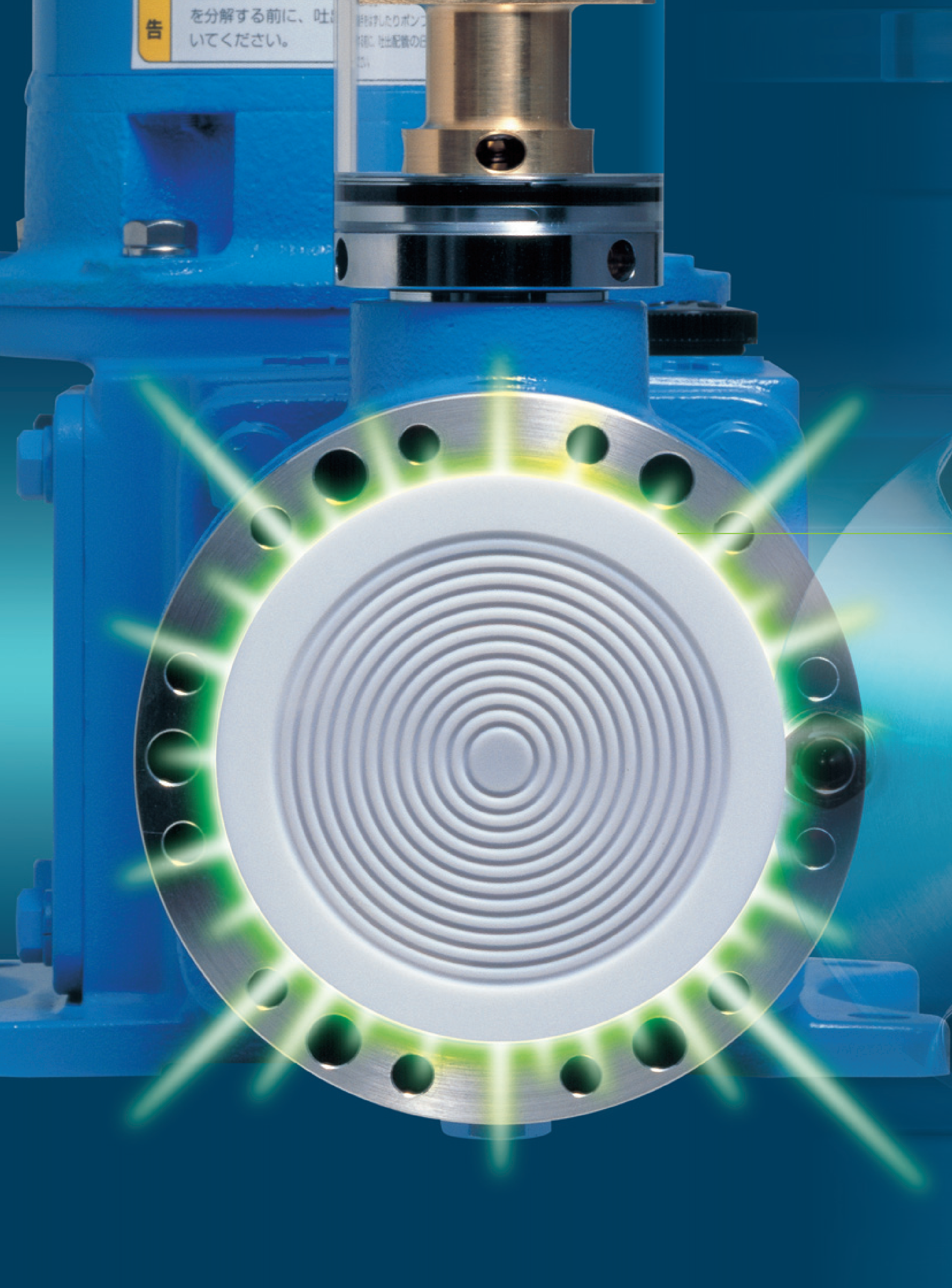
TACMINA

Diaphragm-Type Process Metering Pump

Z


告
を分解する前に、吐
いてください。

TACMINA Core Technology

Diaphragm Pump Technology

TACMINA is a specialist manufacturer of chemical pumps that incorporate "diaphragms" as their core technology. For about 50 years now, we have worked to perfect high-precision and advanced pump technology. So that we can respond to diverse liquid transfer needs, we have developed the new-concept Z Series of Process Metering Pumps. TACMINA delivers "Safety and Assurance" through proprietary diaphragm technology for your ever-evolving chemical process lines.

TACMINA provides a line-up of five pump mechanisms to support our customers' ideal process lines.

Direct drive diaphragm type

Direct drive double-diaphragm type

Hydraulic diaphragm type

Hydraulic double-diaphragm type

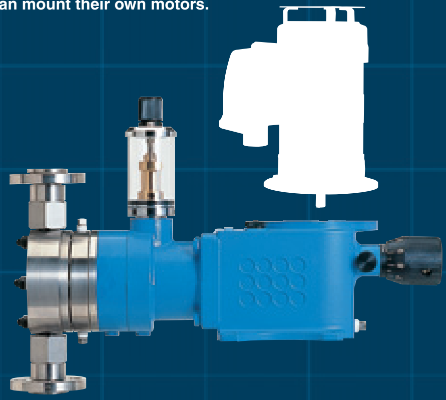
Plunger type

Born from Customer Feedback— Z Series

TACMINA listens closely to its valued customers' requests. That is why TACMINA has incorporated "operator ease" in its well-received series of process pumps — the Z series — to augment its basic functions. The features of this series of pumps are a direct result of TACMINA paying attention to details from a customer standpoint based upon a "commitment to creation."

General-purpose Motor Included as Standard

Various general-purpose flange motors are installed. Pumps can also be shipped without a motor attached so that users can mount their own motors.



Easy-to-operate Flow Rate Adjusting Dial

The flow rate adjusting dial has been made large so as to be more visible and easier to handle. Its dial scale is also made of resin, making it resistant to corrosive liquids, and can be replaced in a simple one-touch operation.


Dial


Dial scale

Drain Cock with pipe thread

The drain hole is Rc 3/8. External piping can be connected to this hole, preventing the environment from being contaminated during oil replacement. This small but important feature is a direct result of valuable user feedback.

Detailed New Design

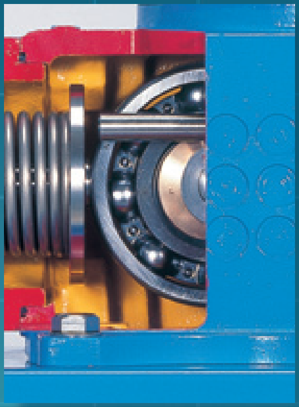
We have improved the design of pump details so that Z series pumps have longer lasting appeal. Chamfered corners on the casing and curved lines on the mounting base also have resulted in a lighter pump weight.

Sealed Type Lubrication Cap

A newly developed drive box has eliminated the ventilation port on the lubrication cap, enabling sealed type lubrication. This prevents rain or dirt and dust from entering when the pump is installed for use outdoors.

Proprietary Simple Mechanism

We have further strengthened the tried-and-tested high-durability drive unit, and have remodeled it into an new, simple mechanism. This mechanism has almost no replacement parts, which means less time required during maintenance.

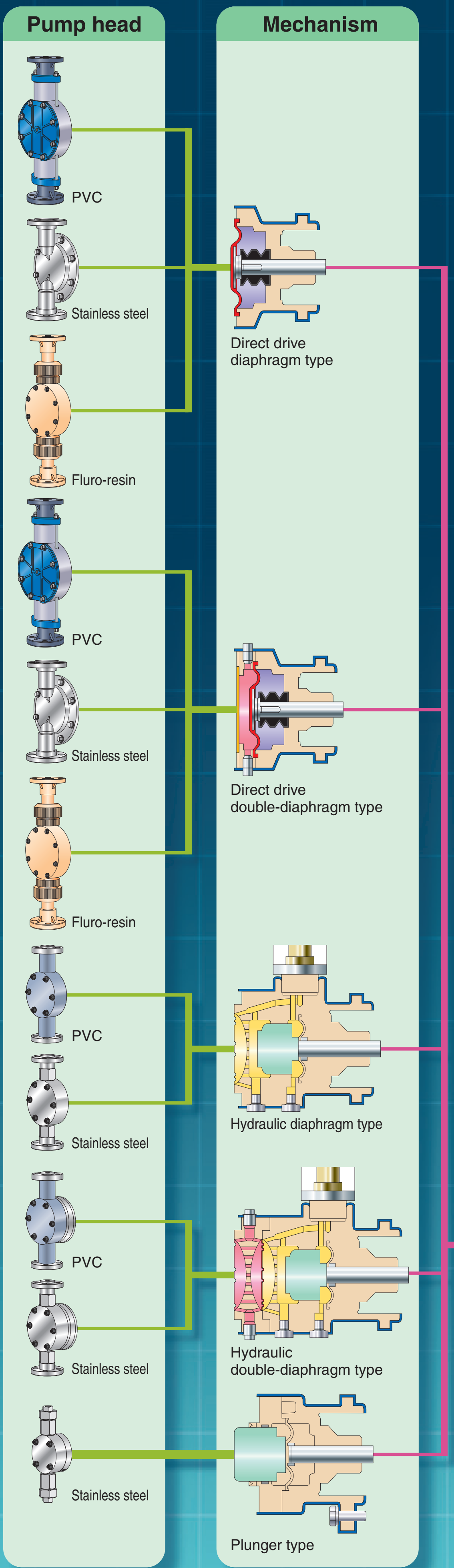


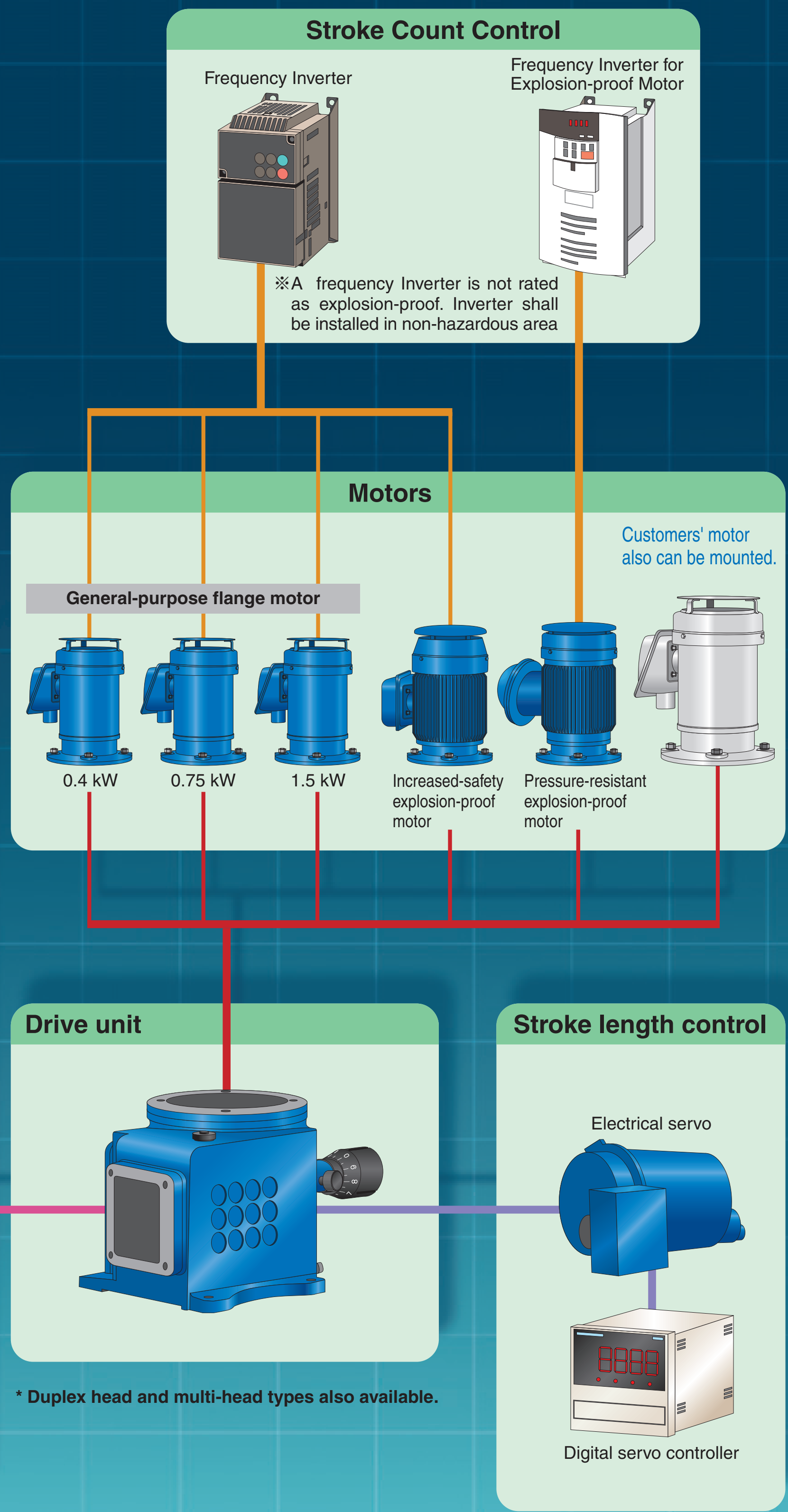
Packaged Entirely in Cardboard

We have reviewed the structure of the cardboard packaging to make it stronger, and have done away with use of wooden frame packaging and foam inserts.

Series Configured to Meet Diverse Needs

General-purpose Flange Motor Incorporated as Standard (0.4, 0.75 and 1.5 kW)
We have enhanced the line-up of improved-safety/explosion-proof and pressure-resistant motors, and now provide users with five types of pump structures. Users can also choose from two types of control, inverter or electrical server, and a variety of special materials such as titanium and hastelloy for liquid end materials compatible with all kinds of applications.





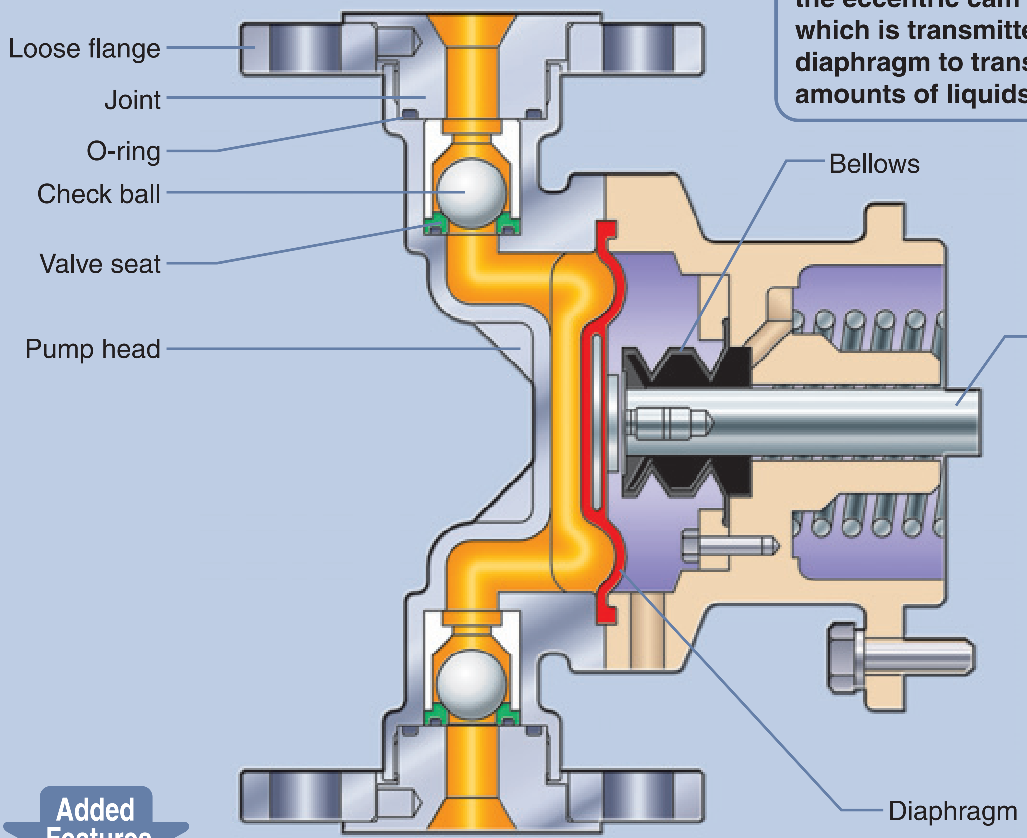
*** Duplex head and multi-head types also available.**

Direct Drive
Diaphragm Type
ZD・ZW TYPE

- ●Highly corrosion-resistant. Operable in severe operating environments
- ●Simple mechanism facilitates maintenance.
- ●High corrosion-resistant molded diaphragm used
- ●Operable at a wide range of sites ranging from water treatment through to manufacturing processes

■Structure of Pump Head

Direct drive diaphragm type **ZD**



■Mechanism

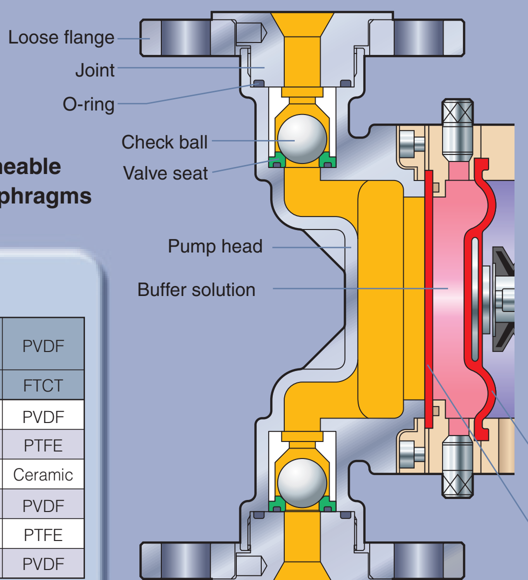
The motor's rotary motion is converted to reciprocal motion by the eccentric cam mechanism, which is transmitted to the diaphragm to transfer fixed amounts of liquids.

Added Features

If you want durability and safety...

Direct drive double-diaphragm type **ZW**

This type is ideal for the transfer of highly permeable organic solvents (e.g. halogen liquids). Two diaphragms considerably improve durability and safety.



PTFE Corrugated Diaphragm

A uniform thickness PTFE corrugated diaphragm is used as the front diaphragm to improve durability and stability.

●Liquid end materials (ZD/ZW common)

Materials / Part name	PVC				Stainless steel	PVDF
	VTCE	VT6E	VTCF	VT6F	6T6T	FTCT
Pump head	PVC	PVC	PVC	PVC	SCS14	PVDF
Diaphragm	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
Check ball	Ceramic	SUS316	Ceramic	SUS316	SUS316	Ceramic
Valve seat	PVC	PVC	PVC	PVC	SUS316	PVDF
O-ring	EPDM	EPDM	Fluoro-rubber	Fluoro-rubber	PTFE	PTFE
Joint	PVC	PVC	PVC	PVC	SUS316	PVDF

Model Code

Z	D	1	–	153		–	V	T	C	E	–	F	W	
❶	❷	❸		❹	❺		❻-ⓐ	ⓑ	ⓒ	ⓓ		❼	❽	❾

❶ Series name
Z : TACMINA metering pump Z series

❷ Pump head type
D : Direct drive diaphragm type
W : Direct drive double-diaphragm type

❸ Number of pump heads
1 : Simplex type

* Duplex and triplex types also available. Contact us for details.

❹ Discharge volume standard
15 3 15000 mL/min
Number of 0 digits

❺ Drive and pressure specification
None : Standard
L : Low-pressure specification

❻ Liquid end material
ⓐ Pump head
V : PVC
6 : SCS14
F : PVDF
X : Special

ⓑ Diaphragm
T : PTFE
X : Special

ⓒ Check ball
C : Ceramic
6 : SUS316
X : Special

ⓓ O-ring
E : EPDM
F : Fluoro-rubber
T : PTFE
X : Special

❼ Specifications
Connection type
F : Flange

❽ Valve structure
W : Standard
X : Special

❾ Other specifications
None : Standard
X : Special

* -24, -24L and -34 type double-diaphragm types are not available.

Performance Specifications (ZD/ZW common)

Item		Model	33	63	83	14L	14	153	24L	24	34
Max. discharge volume (L/min)		50 Hz	3.0	5.6	7.2	10.0	10.0	13.3	17.5	17.5	25
		60 Hz	3.6	6.8	8.6	12.0	12.0	16.0	21.0	21.0	30
Max. discharge pressure (MPa)			0.7	0.5	0.5	0.3	0.5	0.5	0.3	0.5	0.4
Strokes per minute (spm)		50 Hz	105	105	105	81	81	105	105	105	81
		60 Hz	126	126	126	97	97	126	126	126	97
Stroke length (mm)			10	8	10	15	15	15	20	20	25
Connection type/aperture (flange type)			JIS10K25A	JIS10K25A	JIS10K25A	JIS10K40A	JIS10K40A	JIS10K40A	JIS10K40A	JIS10K40A	JIS10K50A
Transferrable temperature			Pump head material: Stainless steel·PVDF, 0 to 60°C, PVC, 0 to 40°C No freezing allowed								
Transferrable viscosity			Ceramic check ball: 100 mPa·s, Stainless steel check ball: 3000 mPa·s (2000 mPa·s on the 34 type)*								
Standard motor	Power (V)/frequency (Hz)/number of poles (P)		3-phase, 200 V/50 Hz, 200 V/60 Hz, 220 V/60 Hz, totally enclosed fan-cooled outdoor type (vertical flange installation)/4 poles								
	Output (kW)		0.4	0.4	0.4	0.4	0.75	0.75	0.75	1.5	1.5
	Rated current value/startup current value (A)	200 V/50 Hz	2.3/10.2	2.3/10.2	2.3/10.2	2.3/10.2	3.6/19.5	3.6/19.5	3.6/19.5	6.1/38.0	6.1/38.0
		200 V/60 Hz	2/9.07	2/9.07	2/9.07	2/9.07	3.2/17.4	3.2/17.4	3.2/17.4	5.9/34.2	5.9/34.2
		220 V/60 Hz	2/9.98	2/9.98	2/9.98	2/9.98	3.1/19.4	3.1/19.4	3.1/19.4	5.5/37.0	5.5/37.0
Pump paint color			Acrylic urethane resin paint (Munsell 10B 5/10)								
Weight (kg)	Motor-integrated type	VT□□	25	27	27	31	47	47	47	56	65
		FT□□									
		6T□□	27	29	29	34	49	49	49	58	67

* In case of high-polymer coagulants. Contact for details of other chemicals.
- The discharge volume on duplex and triplex types is twice and three times the above indicated numerical values, respectively.
- When using a TACMINA standard motor/inverter, the control range becomes 6 to 60 Hz (15 to 60 Hz on products not specified by TACMINA). Consult us for details because wider control ranges are available.
- Weights indicated in the above table are for the ZD type only. Consult TACMINA for weights for the ZW type.

Main Applicable Chemicals and Recommended Materials

Liquid name	Concentration	Temperature	Liquid end material	Liquid name	Concentration	Temperature	Liquid end material
Hydrochloric acid	to 30%	0 to 40°C	VTCF	Sodium hyposulfate	Satu.	0 to 40°C	VTCE
	to 38%	0 to 40°C	FTCT	Sodium phosphate, soda phosphate	Satu.	0 to 40°C	VTCE
Sulfuric acid	to 80%	0 to 40°C	VTCF	Ferrous chloride	Satu.	0 to 40°C	VTCE
	98%	0 to 40°C	FTCT *	Ferric chloride	Satu.	0 to 40°C	VTCE
Nitric acid	to 30%	0 to 40°C	VTCF	Calcium carbonate	Satu.	0 to 40°C	VTCE
Acetic acid	to 20%	0 to 40°C	VTCE	Polychlorinated aluminum	Aqueous solution to pure	0 to 40°C	VTCE
	to 80%	0 to 40°C	6T6T	Polychrorinated iron	Satu.	0 to 40°C	VTCE
Phosphoric acid	to 80%	0 to 40°C	VTCE	Aliminum sulfate, sulfuric acid-band	Satu.	0 to 40°C	VTCE
Sodium hydroxide, caustic soda	to 50%	0 to 40°C	VT6E	High-polymer coagulant	Aqueous solution	0 to 40°C	VT6E
Sodium hypochlorite	to 12%	0 to 40°C	VTCF	Hydrogen peroxide	to 30%	0 to 20°C	VT6F
Soda chlorite	to 25%	0 to 40°C	VTCE		to 90%	0 to 80°C	6T6T

Remarks

❈The table of recommended materials does not guarantee complete safety. When selecting materials in important processes, perform verification tests in advance.

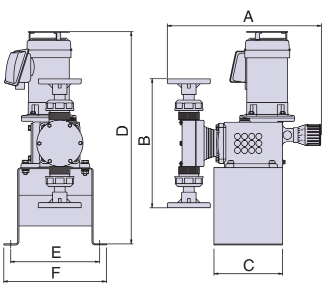
❈About concentration
Satu: Indicates a saturated aqueous solution. When the indicated concentration is exceeded, crystals will form in the solution (slurry), requiring separate measures.

* 6T6T can be used only in the case of 98% sulfuric acid.

External Dimensions

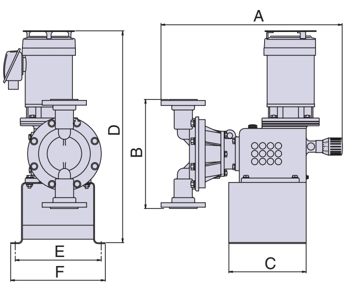
* Consult TACMINA separately for dimensions of the ZW type.

PVC type



	A	B	C	D	E	F
ZD-33	448.5	376	200	621	260	300
ZD-63	453.5	406	200	621	260	300
ZD-83	455.5	406	200	621	260	300
ZD-14L	507	557	200	621	260	300
ZD-14L	572	557	270	702	300	330
ZD-153	572	557	270	702	300	330
ZD-24L	577	557	270	702	300	330
ZD-24	577	557	270	742	300	330
ZD-34	613.5	596	270	742	300	330

Stainless steel (SUS) type



	A	B	C	D	E	F
ZD-33	464.5	222	200	621	260	300
ZD-63	464.5	254	200	621	260	300
ZD-83	466.5	254	200	621	260	300
ZD-14L	522	300	200	621	260	300
ZD-14	587	300	270	702	300	330
ZD-153	587	300	270	702	300	330
ZD-24L	592	300	270	702	300	330
ZD-24	592	300	270	742	300	330
ZD-34	632.5	380	270	742	300	330

Hydraulic

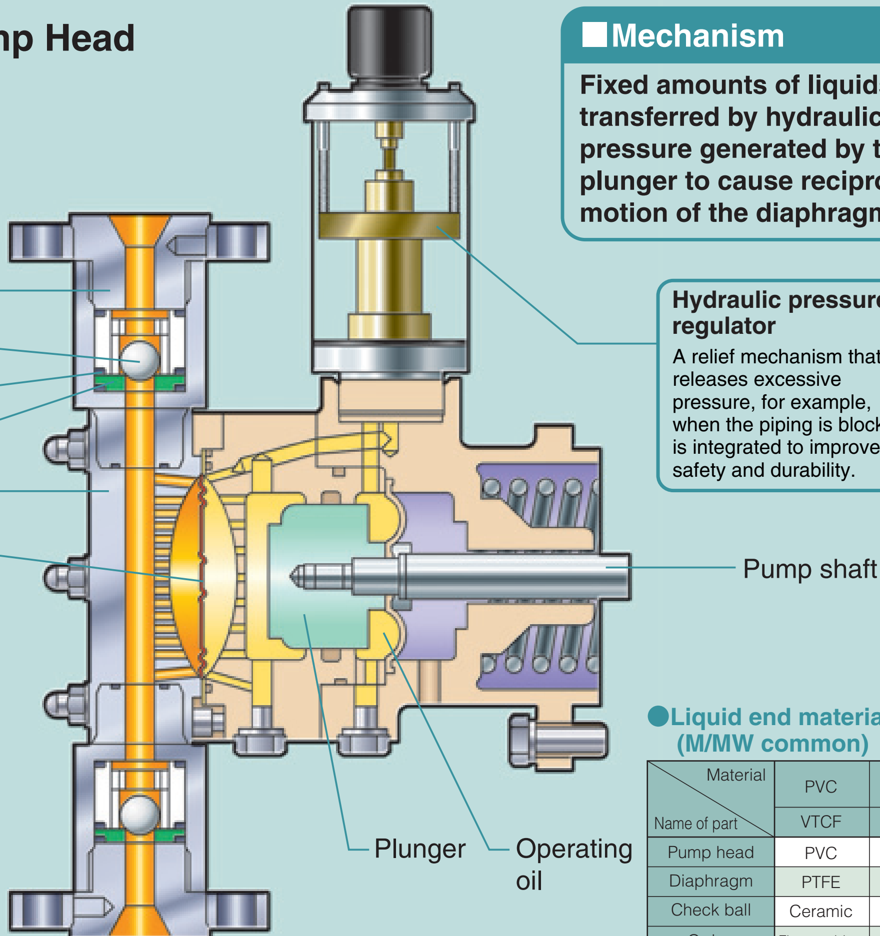
Diaphragm Type
Double-diaphragm Type

ZM・ZMW TYPE

- Integrated relief mechanism prevents pump malfunctions and accidents to ensure safe and secure on-site operation.
- High-precision injection achieves stable quality on production lines.
- High corrosion-resistant molded diaphragm used
- Transfer of liquids containing slurry and hazardous liquids (e.g. liquids that change by contact with air)
- High-pressure injection possible.

■Structure of Pump Head

Hydraulic diaphragm type **ZM**



■Mechanism

Fixed amounts of liquids are transferred by hydraulic pressure generated by the plunger to cause reciprocal motion of the diaphragm.

Hydraulic pressure regulator

A relief mechanism that releases excessive pressure, for example, when the piping is blocked is integrated to improve safety and durability.

PTFE Corrugated Diaphragm

A uniform thickness PTFE corrugated diaphragm is used as the front diaphragm to improve durability and stability.

●Liquid end materials (M/MW common)

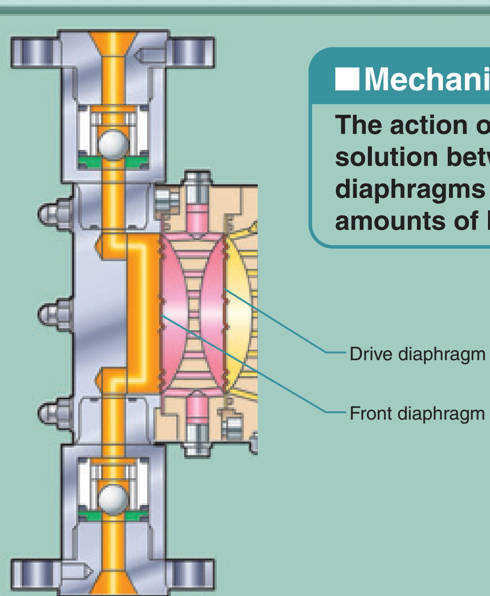
Material / Name of part	PVC	Stainless Steel
	VTCF	STST
Pump head	PVC	SUS304
Diaphragm	PTFE	PTFE
Check ball	Ceramic	SUS304
O-ring	Fluoro-rubber	PTFE
Joint	PVC	SUS304

Added Features

If you want durability...

Hydraulic double-diaphragm **ZMW**

This type is ideal for the transfer of highly permeable organic solvents (e.g. halogen containing liquids). Two diaphragms considerably improve durability and discharge precision. Performance is demonstrated in the transfer of liquids containing slurry and high-viscosity liquids.



■Mechanism

The action of the buffer solution between the two diaphragms transfers fixed amounts of liquids.

Model Code

Z	M	1	–	028		–	S	T	S	T	–	F	W	
❶	❷	❸		❹	❺		❻-ⓐ	ⓑ	ⓒ	ⓓ		❼	❽	❾

❶Series name
Z : TACMINA metering pump
Z series

❷Pump head type
M : Hydraulic diaphragm type
MW: Hydraulic double-diaphragm type

❸Number of pump heads
1 : Simplex type
* Duplex and triplex types also available. Contact us for details.

❹Model (piston diameter standard)
028 : Piston diameter 28 mm

❺Drive and pressure specification
None : Standard
P : High-pressure specification

❻Liquid end material
ⓐ Pump head
V : PVC
6 : SUS304
X : Special

ⓑ Diaphragm
T : PTFE
X : Special

ⓒ Check ball
C : Ceramic
6 : SUS304
X : Special

ⓓ O-ring
F : Fluoro-rubber
T : PTFE
X : Special

❼Specifications
Connection type
F : Flange

❽Valve structure
W : Standard
V : High-viscosity
X : Special

❾Other specifications
None : Standard
X : Special

Performance Specifications (ZM/ZMW common)

Item		Model	028	028P	040	040P	056	056P
Max. discharge volume (L/min)		50 Hz	0.67	0.67	1.37	1.37	2.7	2.7
		60 Hz	0.80	0.80	1.65	1.65	3.2	3.2
Max. discharge pressure (MPa)		VTCF	1.0	—	1.0	—	1.0	—
		STST	1.6	2.5	1.6	2.5	1.2	1.7
Strokes per minute (spm)		50 Hz	81	81	81	81	81	81
		60 Hz	97	97	97	97	97	97
Stroke length (mm)			15	15	15	15	15	15
Connection type/aperture (flange type)	Discharge side	VTCF	JIS10K15A	—	JIS10K15A	—	JIS10K20A	—
		STST	JIS16K15A	JIS30K15A	JIS16K15A	JIS30K15A	JIS16K20A	JIS30K20A
	Suction side	VTCF	JIS10K15A	—	JIS10K15A	—	JIS10K20A	—
		STST	JIS16K15A	JIS16K15A	JIS16K15A	JIS16K15A	JIS16K20A	JIS16K20A
Transferrable temperature			Pump head material: Stainless steel, 0 to 50°C, PVC, 0 to 40°C No freezing allowed					
Transferrable viscosity			50 mPa·s or less					
Standard motor	Power (V)/frequency (Hz) /number of poles (P)		3-phase, 200 V/50 Hz, 200 V/60 Hz, 220 V/60 Hz, totally enclosed fan-cooled outdoor type (vertical flange installation)/4 poles					
	Output (kW)		0.4	0.4	0.4	0.4	0.4	0.75
	Rated current value/startup current value (A)	200 V/50 Hz	2.3/10.2	2.3/10.2	2.3/10.2	2.3/10.2	2.3/10.2	3.6/19.5
		200 V/60 Hz	2/9.07	2/9.07	2/9.07	2/9.07	2/9.07	3.2/17.4
		220 V/60 Hz	2/9.98	2/9.98	2/9.98	2/9.98	2/9.98	3.1/19.4
Pump paint color			Acrylic urethane resin paint (Munsell 10B 5/10)					
Weight (kg)	Motor-integrated type	VTCF	24	—	25	—	25	—
		STST	30	31	30	31	30	43
	Motorless type	VTCF	14	—	15	—	15	—
		STST	20	21	20	21	20	29

* In case of high-polymer coagulants. Contact for details of other chemicals.
• The discharge volume on duplex and triplex types is twice and three times the above indicated numerical values, respectively.
• When using an inverter, the control range becomes 15 to 60 Hz (6 to 60 Hz also is possible by increasing the capacity of the motor/inverter). Consult us for details because wider control ranges are available.
• Weights indicated in the above table are for the ZD type only. Consult TACMINA for weights for the ZW type.

Main Applicable Chemicals and Recommended Materials

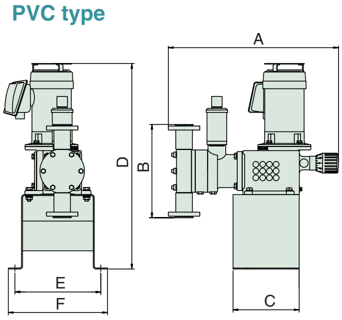
Liquid name	Concentration	Temperature	Liquid end material
Hydrochloric acid	to 30%	0 to 40°C	VTCF
	to 38%	0 to 40°C	VTCF
Sulfuric acid	to 80%	0 to 40°C	VTCF
	98%	0 to 40°C	FTCT *1
Nitric acid	to 30%	0 to 40°C	VTCF
Acetic acid	to 20%	0 to 40°C	VTCF
	to 80%	0 to 40°C	STST
Phosphoric acid	to 80%	0 to 40°C	VTCF
Sodium hydroxide, caustic soda	to 50%	0 to 40°C	STST
Sodium hypochlorite	to 12%	0 to 40°C	VTCF
Soda chlorite	to 25%	0 to 40°C	VTCF

Liquid name	Concentration	Temperature	Liquid end material
Sodium hyposulfate	Satu.	0 to 40°C	VTCF
Sodium phosphate, soda phosphate	Satu.	0 to 40°C	STST
Ferrous chloride	Satu.	0 to 40°C	VTCF
Ferric chloride	Satu.	0 to 40°C	VTCF
Calcium carbonate	Satu.	0 to 40°C	VTCF
Polychlorinated aluminum	Aqueous solution to pure	0 to 40°C	VTCF
Polychrorinated iron	Satu.	0 to 40°C	VTCF
Aliminum sulfate, sulfuric acid-band	Satu.	0 to 40°C	VTCF
High-polymer coagulant	Aqueous solution	0 to 40°C	STST *2
Hydrogen peroxide	to 30%	0 to 20°C	VTCF
	to 90%	0 to 80°C	STST

Remarks
*1 STST can be used only in case of 98% sulfuric acid.
*2 The valve structure is for high-viscosity applications.
※ The materials and other information recommended in this table do not completely guarantee safety. When selecting materials for important processes, make sure to perform substantive testing before actual operation.
※ About concentration
Satu.: Saturated aqueous solution
When the solution exceeds this concentration, the liquid contains crystals (slurry), and other measures are required.

External Dimensions

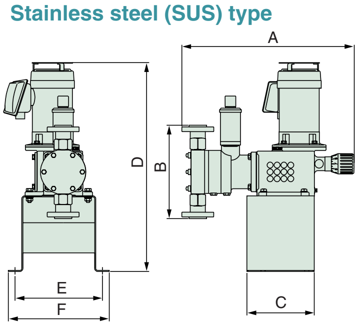
PVC type



	A	B	C	D	E	F
ZM-028	510.5 (541.5)	310	200	621	260	300
ZM-040	514.5 (545.5)	282	200	621	260	300
ZM-056	517 (548)	282	200	702	260	300

* Figures in parentheses are the dimensions for the MW type.

Stainless steel (SUS) type



	A	B	C	D	E	F
ZM-028	512.5 (543.5)	314	200	621	260	300
ZM-028P	522.5 (553.5)	314	200	621	260	300
ZM-040	512.5 (543.5)	278	200	621	260	300
ZM-040P	522.5 (553.5)	340	200	621	260	300
ZM-056	515 (546)	278	200	621	260	300
ZM-056P	590 (621)	340	270	702	300	330

* Figures in parentheses are the dimensions for the MW type.

TACMINA Z Series Selection Check List

Check each of the items in the following four steps when selecting your pump.

These four steps are important points in pump selection. This check list not only allows you to improve manufacturing process efficiency and fully demonstrate the performance of metering pumps; it is also vital for selecting the appropriate model to prevent piping and pump trouble or accidents.

Let's start selection of the Z series pump best suited for your particular requirements.

Step 1
Quality of Liquid to Transfer

Name of chemical?
Check liquid to transfer.

Characteristics?
Check characteristics of liquid.
(specific gravity, corrosion, concentration)

Temperature?
Check temperature of liquid.
Z series can handle temperatures up to 80°C.
When this range is exceeded... See "High-temperature liquid compatibility" on page 11.

Viscosity?
Check viscosity of liquid.
Z series can handle viscosity up to 3,000 mPa·s
When this range is exceeded... See "High viscosity compatibility" on page 11.

Presence and size of slurry?
Check presence of slurry in liquid and concentration of liquid.
Z series can handle liquids containing slurry having a concentration up to 20wt%.
When this range is exceeded... See "Slurry compatibility" on page 11.

Step 2
Piping?

Suction/discharge piping?

1. Piping aperture
2. Piping length
3. Head
4. Height from tank liquid level to injection point

* Provide design drawings if available.

Check the following items, and contact TACMINA. We shall select the optimum pump for you.
We also have a line-up of pumps that meet required specifications outside of the performance ranges of the Z series.

Step 3 Performance

Required discharge volume?
Z series can handle up to **30 L/min**.

When this range is exceeded...

Required discharge pressure?
Z series can handle up to **10 MPa**.

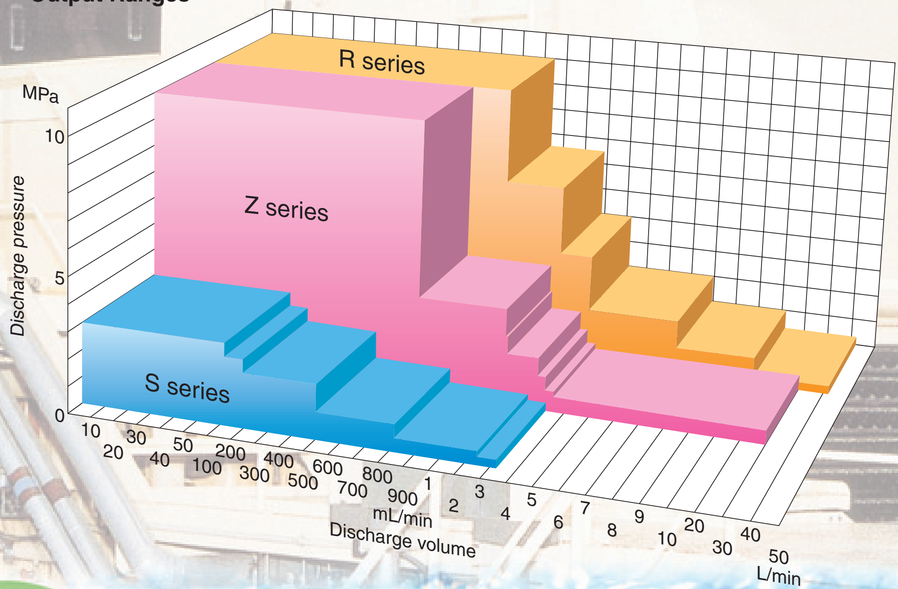
Other series

On a single-head type:
- up to **52 L/min** is handled by the large-capacity R series.
- up to **4 L/min** is handled by the small-capacity S series.

Larger capacities can be handled by multi-head types.

* For a 60 Hz motor specification

■Discharge Volumes and Discharge Pressure Output Ranges



Step 4 Application

Discharge precision?
Z series can handle **±1 to ±5%**.

If better precision is required...

Presence of pulsation?
Generally, pulsation is rectified by an air chamber or an accumulator. However...

We recommend the Smoothflow Pump.

Smoothflow Pump

Go to "Smoothflow Pump TPL Series"
- Discharge precision can be kept to **±0.1% or less**.
- Pulsation rate can be kept to **±1% or less**.

See "High-precision injection compatibility" on page 11.

Go to "Smoothflow Pump PL Series"
- Pulsation rate can be kept to **±5% or less**.

See "Pulses compatibility" on page 11.

* For details, refer to the separate Smooth Flow Pump catalog.

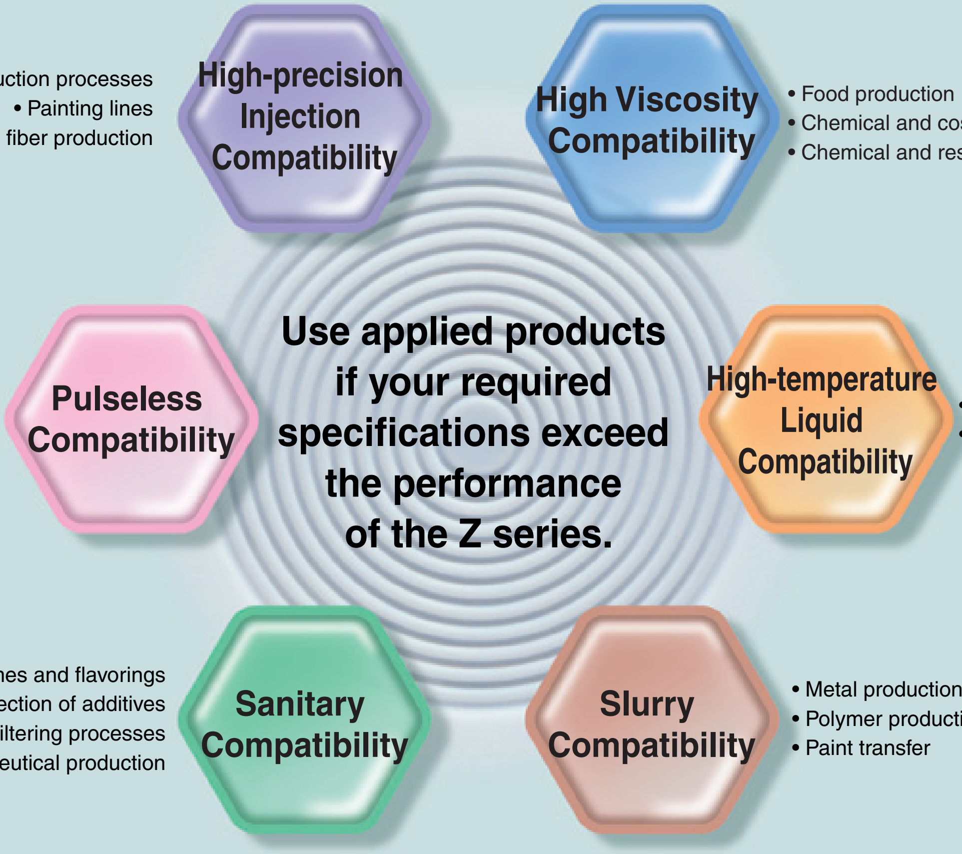
* When Smoothflow pump are used, keep the pipe design simple to effectively suppress pulsation. This will also help reduce the time required for performing maintenance on auxiliary apparatus.

The Potential of Diaphragm Technology Is Infinite

An extensive mix of liquids are used in production lines — high-viscosity liquids, liquids containing slurry, and high-temperature liquids to mention but a few. Liquid transfer and injection requirements are also equally diverse as characterized by high-precision injection, pulseless injection, high-pressure injection and sanitary transfer. TACMINA Z series pumps respond to these and other diverse applications and user needs through the infinite potential of diaphragm technology.

■Process Metering Pump Applied Products

* For details of applied products, refer to the separate catalogs.



High-precision Injection Compatibility
- Film production processes
- Painting lines
- Chemical fiber production

High Viscosity Compatibility
- Food production
- Chemical and cosmetics production
- Chemical and resin production lines

Pulseless Compatibility
- Beer and milk processing production processes
- Urethane production
- Chemical production
- Application of adhesives

High-temperature Liquid Compatibility
- Chemical production
- Resin production

Sanitary Compatibility
- Injection of perfumes and flavorings
- Injection of additives
- Beer filtering processes
- Medicine/pharmaceutical production

Slurry Compatibility
- Metal production
- Polymer production
- Paint transfer

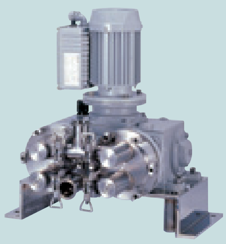
High-precision Injection Compatibility
Smoothflow Pump TPL Series

This completely new type of diaphragm pump achieves high-precision metering injection of a reproducability of ±0.1% or less and a pulsation rate of ±1% or less.
- ●In-line high-precision injection
- ●Space-saving design (1/2, TACMINA product comparison)

Pulseless Compatibility
Smoothflow Pump PL Series

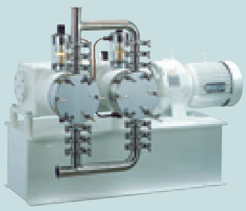
Elimination of pulsation in discharge enables processes to be made continuous and inline, and helps improve product quality.
- ●Uniform injection and quality
- ●Simple piping configuration
- ●Can handle high-viscosity liquids.

High Viscosity Compatibility
Smoothflow Pump APLS Series



This diaphragm type pump is free of seals, allowing the transfer of high-viscosity liquids, and does not produce any liquid leakage.
- ●Gentle transfer of liquids without liquid degradation
- ●Easy maintenance

Sanitary Compatibility
Sanitary Metering Pumps

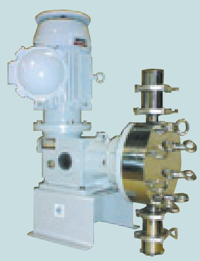


This sanitary metering pump uses a diaphragm system, and is in a shaft seal-free hygienic liquid end structure.
- ●CIP cleaning possible
- ●Clamp system for facilitating disassembly and assembly

High-temperature Liquid Compatibility
Remote Head Type

Ideal for metered injection of high-temperature liquids in the range 100 to 180℃
- ●Metered transfer of liquids that must be kept in a hot state
- ●Ideal when cleaning by steam and hot water is required

Slurry Compatibility
Slurry Pomp



This pump has no sliding parts, which allows the mixing of transferred liquids and friction-less metering transfer of liquids.

●Combination pumps
A single motor drives two or more pump heads having different discharge volumes, thus achieving extensive simultaneous injection with specified feed-ratio.

●Multi-head pumps
Proportional injection of multiple liquids and simultaneous injection of the same liquid into multiple lines are possible on a single pump. This reduces installation space, and helps save on wiring, piping and other installation costs.

●Pulse sensors
A reed switch is used to detect the pump's strokes per minute as a pulse signal. By interlocking operation with a pulse counter, you can build an automatic measurement injection system.

●Diaphragm breakage damage alarm; leak monitor
Should the pump diaphragm become damaged during use, this is immediately detected by the electrode mounted in the buffer solution and you are notified of the abnormality.

Examples of Process Metering Pump Applied Products

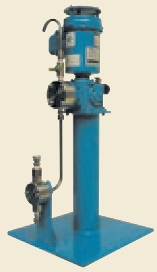
TACMINA can supply order-made process metering pumps matched to specific customer specifications in response to individual site requirement.

Slurry Compatibility

Application Water-absorbent polymer production test plants

Problem You want to feed soft slurry (600 µm, 50 wt%) without breaking it up, however the slurry precipitates at a rate of 0.1 m/sec and tests so far using a snake pump have failed.

Proposal Use of a T-branch remote head type pump allows you to transfer the slurry without it building up in the pump head.



Specifications

Details of custom order
- T-branch remote head type
- Increased-safety explosion-proof motor

Name of liquid: Solvent (containing slurry)

Slurry: 600 µm

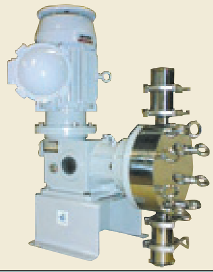
Slurry concentration: 50 wt%

Slurry/Sanitary Compatibility

Application Transfer of fluoro-resin paint containing mica slurry

Problem You have conducted various studies using snake pumps, rotary pumps and other pumps, but there is the risk that the mica might be damaged during transfer.

Proposal Diaphragm pumps do not have mechanisms that agitate or rub against transferred liquids. Adoption of a sanitary type pump also facilitates cleaning.



Specifications

Details of custom order
- Sanitary type
- Pressure-resistant explosion-proof motor

Name of liquid: Fluoro-resin paint

Slurry: 0.2 mm

Slurry concentration: 10 wt%

High-temperature Liquid/Pulseless Compatibility

Application Transfer of 180℃ machine oil

Problem There have not been any pumps capable of metered transfer of high-temperature machine oil under high pressure.

Proposal A T-branch remote head type pump can transfer liquids even at 180℃ without any problem. Moreover, liquids can be fed without any pulsation.

Specifications

Details of custom order
- T-branch remote head type

Name of liquid: Machine oil

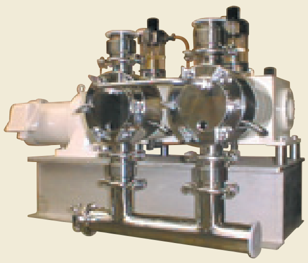
Liquid temperature: 180℃

High-viscosity Liquid Compatibility

Application Transfer of cheese (max. viscosity 40,000 mPa·s)

Problem You have been using a snake pump, however, rubber on the stator wears down and mixes in with the product.

Proposal A diaphragm pump has no worn parts, which frees you from your fear of foreign matter mixing in with the product. Consumables also last longer.



Specifications

Details of custom order
- High-viscosity valve seat
- W/ heat-insulated jacket
- W/ diaphragm breakage damage alarm

Name of liquid: Cheese

Viscosity: 10,000 mPa•s or more

Liquid temperature: 80℃

High-viscosity Liquid Compatibility

Application Metered transfer of unsaturated polyester resin (max. viscosity 30,000 mPa·s) in film production processes

Problem You must change over six times per day since there are 6 change-color processes, which requires frequent disassembling and cleaning of the pump chamber. You have conducted studies using snake pumps and rotary pumps, but disassembly and re-assembly have proved difficult, and the transferred liquid has become degraded due to shearing of sliding parts.

Proposal Use a diaphragm pump. Diaphragm pumps do not have seals or sliding parts, so this eliminates the problem of liquid degradation cause by shearing. Also, disassembly is improved as the valve seat has been designed in the form of a clamp and a hinge has been attached on the pump head. Inner surfaces have been buff-ground to make them easier to clean.

Specifications

Details of custom order
- High-viscosity joint
- Hinged pump head

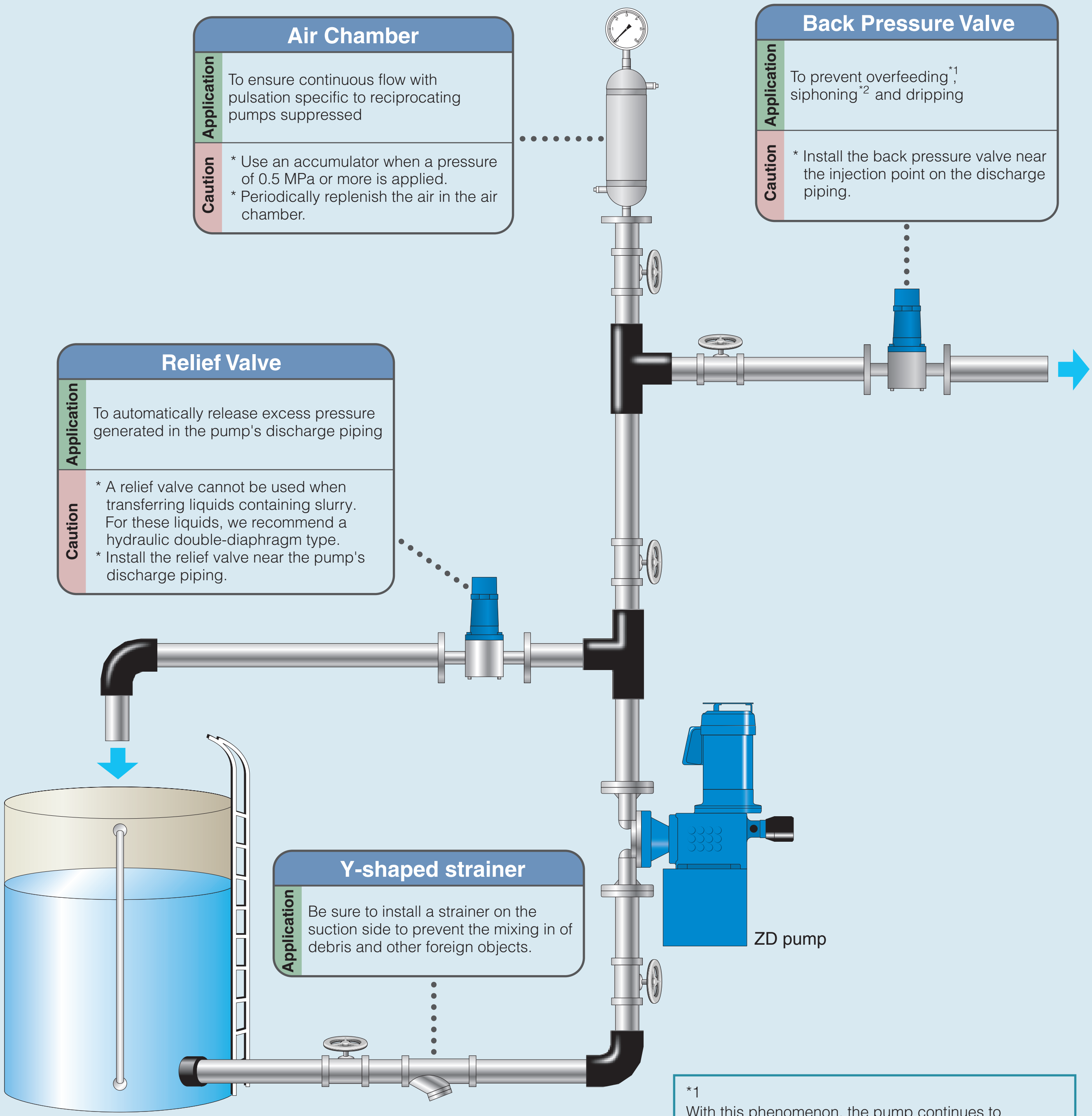
Name of liquid: Non-saturated polyester resin

Viscosity: 30,000 mPa•s

Example of Recommended Piping

To get the best performance from your metering pump (in terms of metering characteristics, discharge precision, etc.), you must design the correct piping system and install auxiliary apparatus. Appropriate piping design also helps prevent piping and pump accidents and trouble, and ensures that your production line operates safely.
The following piping recommendations for each pump mechanism type will bring out the performance of your metering pump to its full.

Direct Drive Diaphragm Type

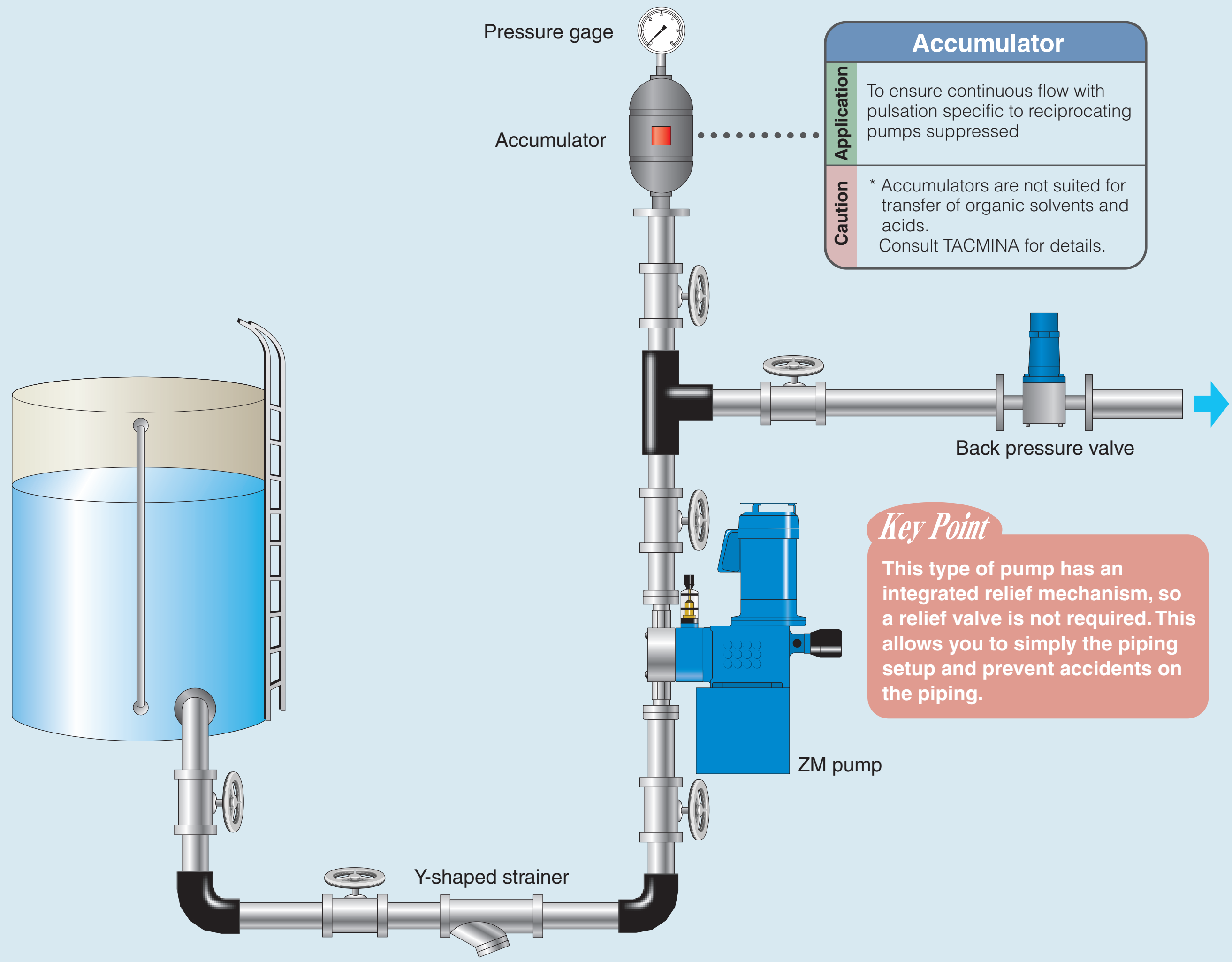


*1
With this phenomenon, the pump continues to discharge even in a non-discharge state due to the inertia of the pressing process in flows where pulsation is present.
*2
With this phenomenon, chemicals are sucked out naturally and continue to flow even with pump operation stopped as the end of the pump's discharge piping is lower than the level of the liquid in the suction side tank.

Hydraulic Diaphragm Type

Incorporating a relief mechanism inside the pump allows you design a slimmed-down piping system. This also helps avoid piping accidents and trouble.

* For details on basic precautions to follow, refer see the descriptions on the left page for a direct drive diaphragm type.



Key Points in Metering Pump Piping

- **If necessary, provide drain piping on the suction side. (example: volatile liquids such as sodium hypochlorite that are likely to generate gas)**
- **When extending the piping on the discharge side, be sure to use an air chamber or accumulator. When the piping is extended, the piping resistance increases, and there is the risk that abnormal pressure might occur, or the diaphragm or eccentric shaft might be damaged.**
- **When an air chamber or accumulator is used, be sure to install a relief valve to prevent pump damage or bursting of the air chamber due to abnormal pressure.**
- **Select a size of piping of the pump aperture or wider on the suction and discharge sides to prevent piping accidents.**
- **Design your piping system so that the piping between the tank and pump on the suction side is short and configured simply.**

* Hydraulic double-diaphragm type pumps are suited for the high-precision transfer and injection of liquids containing slurry and high-viscosity liquids. Consult TACMINA for details of piping design.
* Pulsation-related problems can be solved by using a Smoothflow pump. Consult TACMINA for details, or refer to the "Smoothflow Catalog."

Plunger Type

ZP TYPE

A 2-stage valve seat enables high-precision injection under high pressure. This pump is highly durable and easy to maintain. Longer life seals used on this pump make it ideal for high-precision, high-pressure metered injection of boiler chemicals, for example.

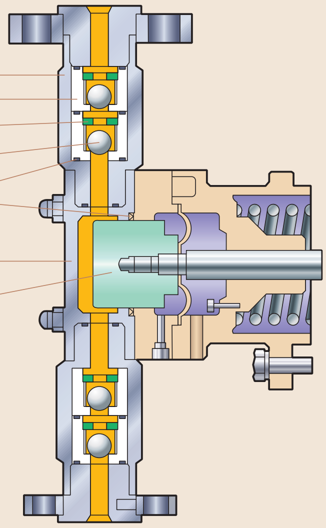
Cautions When Using the ZP Series

- Liquids containing slurry cannot be injected.
- Use for injection of liquids with lubricating property.
- Use in environments where it is OK for liquids to leak to the outside air.
- Use liquids that do not crystallize in contact with the outside air.

Structure of pump head

Mechanism

The reciprocal motion of the plunger causes volumetric changes inside the cylinder to suck in and pressure-feed the liquid.



Liquid end materials

Name of part \ Material	Stainless Steel
	STST
Pump head	SUS304
Plunger seal	PTFE
Check ball	SUS304
O-ring	PTFE
Joint	SUS304

Model Code

Z P 1 – 020 [ ] – S T S T – F W [ ]

❶ ❷ ❸ ❹ ❺ ❻-ⓐ ⓑ ⓒ ⓓ ❼ ❽ ❾

❶ Series name
Z : TACMINA metering pump Z series

❷ Pump head type
P : Plunger

❸ Number of pump heads
1 : Simplex type
* Duplex and triplex types also available. Contact us for details.

❹ Model
020 : Plunger diameter 20 mm

❺ Drive and pressure specification
None : Standard
P : High-pressure specification

❻ Liquid end material
ⓐ Pump head
S : SUS304
ⓑ Plunger seal
T : PTFE
ⓒ Check ball
S : SUS304
ⓓ O-ring
T : PTFE

❼ Specifications
Connection type
U : Union joint
F : Flange

❽ Valve structure
W : Standard
V : High-viscosity
X : Special

❾ Other specifications
None : Standard
X : Special

Performance Specifications

Item		Model	020	028	028P	040	040P	056	056P
Max. discharge volume (L/min)		50 Hz	0.35	0.68	0.68	1.40	1.40	2.75	2.75
		60 Hz	0.42	0.82	0.82	1.68	1.68	3.30	3.30
Max. discharge pressure (MPa)			10	5	7	2.5	3.5	1.2	1.7
Strokes per minute (spm)		50 Hz	81	81	81	81	81	81	81
		60 Hz	97	97	97	97	97	97	97
Stroke length (mm)			15	15	15	15	15	15	15
Connection type/aperture (flange type)	Flange type	VTCF	—	—	—	JIS30K15A	—	JIS16K20A	JIS30K20A
		STST	—	—	—	JIS16K15A	—	JIS16K20A	JIS16K20A
	Union joint type	VTCF	Rc3/8	Rc3/8	Rc3/8	—	Rc1/2	—	—
		STST	Rc3/8	Rc3/8	Rc3/8	—	Rc1/2	—	—
Motor specifications	Power (V)/frequency (Hz)/number of poles (P)		3-phase, 200 V/50Hz, 200 V/60Hz, 220 V/60Hz, totally enclosed fan-cooled outdoor type (vertical flange installation)/4 poles						
	Output (kW)		0.4	0.4	0.75	0.4	0.75	0.4	0.75
	Rated current value/startup current value (A)	200 V/50 Hz	2.3/10.2	2.3/10.2	3.6/19.5	2.3/10.2	3.6/19.5	2.3/10.2	3.6/19.5
		200 V/60 Hz	2.0/9.07	2.0/9.07	3.2/17.4	2.0/9.07	3.2/17.4	2.0/9.07	3.2/17.4
		220 V/60 Hz	2.0/9.98	2.0/9.98	3.1/19.4	2.0/9.98	3.1/19.4	2.0/9.98	3.1/19.4
Pump paint color			Acrylic urethane resin paint (Munsell 10B 5/10)						
Weight (kg)		Motor-integrated type	21	21	38	25	40	25	43
		Motorless type	11	11	24	15	26	15	29

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

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