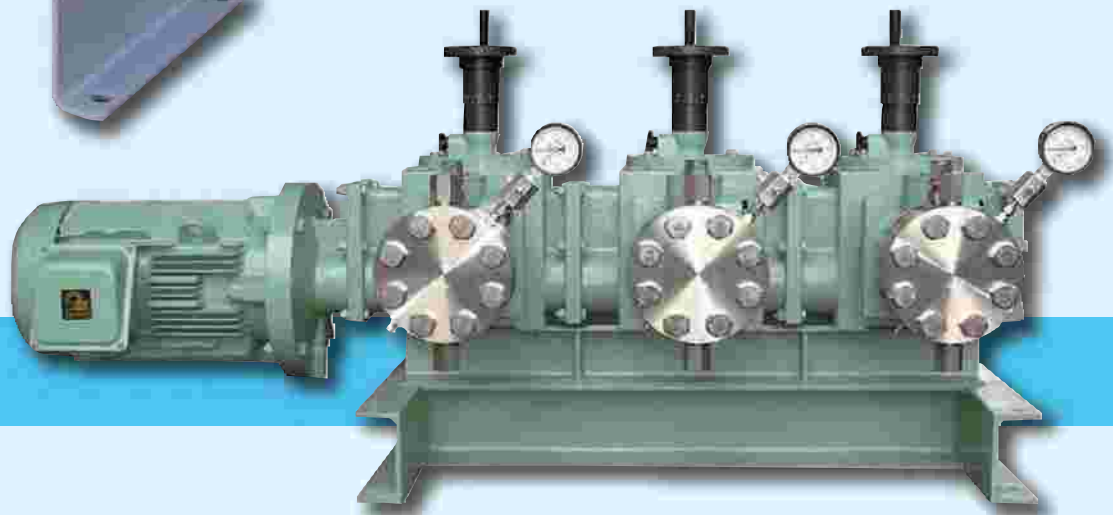


Technology Gentle to the Ecology
TEIKOKU Metering Pump

TEIKOKU METERING PUMPS



TEIKOKU ELECTRIC MFG. CO., LTD.

Specifications and Properties

Teikoku has accumulated various kinds of expertise as a pump manufacturer with main focus on sealless pump technology and one significant item is the reciprocating pump on the listings. Thousands of units have already been delivered to the market with the reputation of one of the finest ultra-high precision metering pumps in the world. Now, after the dissolution of licence contract with the original developer from Germany, Teikoku Metering pump has emerged with her unique design like a phoenix. Ultimate satisfaction and a peace of mind guaranteed !

《Specifications》

Discharge capacity	0.005~3,900 L/h per pumphead
Discharge pressure	Max. 50 MPaG
Temperature	Max. 200°C Diaphragm pump Max. 280°C Plunger pump
Viscosity	Max. 25,000 mPa · s
Solid size	Max. 1.0 mm
Standard to apply	API 675

Please contact us if the required duty is out of above range.

《Advantage》

- Best class suitability for handling toxic, flammable & dangerous fluids, strong odor fluids, solidifying fluids, deteriorating fluids in exposure to atmosphere (It is compliant to The High Pressure Gas safety Law, KHK Japan).
- Solid suspension fluid and high viscosity fluid can be handled.
- Its state-of-art stroke length adjustment enables high precision metering in very wide range of flow-rate.
 - ◎ Reciprocating accuracy $\pm 1\%$ or less
 - ◎ Repeatability accuracy $\pm 3\%$ or less
 - ◎ Linearity $\pm 3\%$ or less
- The most durable check valves shall be outfitted to be the best suited for given conditions.
- Diaphragm rupture detector is a standard outfit of PTFE diaphragm pump.
- Reengineered stroke length adjustment, combination & replenishing valve, etc., has accomplished the diminished number of constituent parts and the enhanced maintainability.
- Its unique sealing design and the production know-hows has accomplished very reliable safety feature and reliability.
- Pneumatic actuator to remotely perform flow control can be installed as an option.
- If some leakage to the outside is acceptable, plunger pump can be selected.



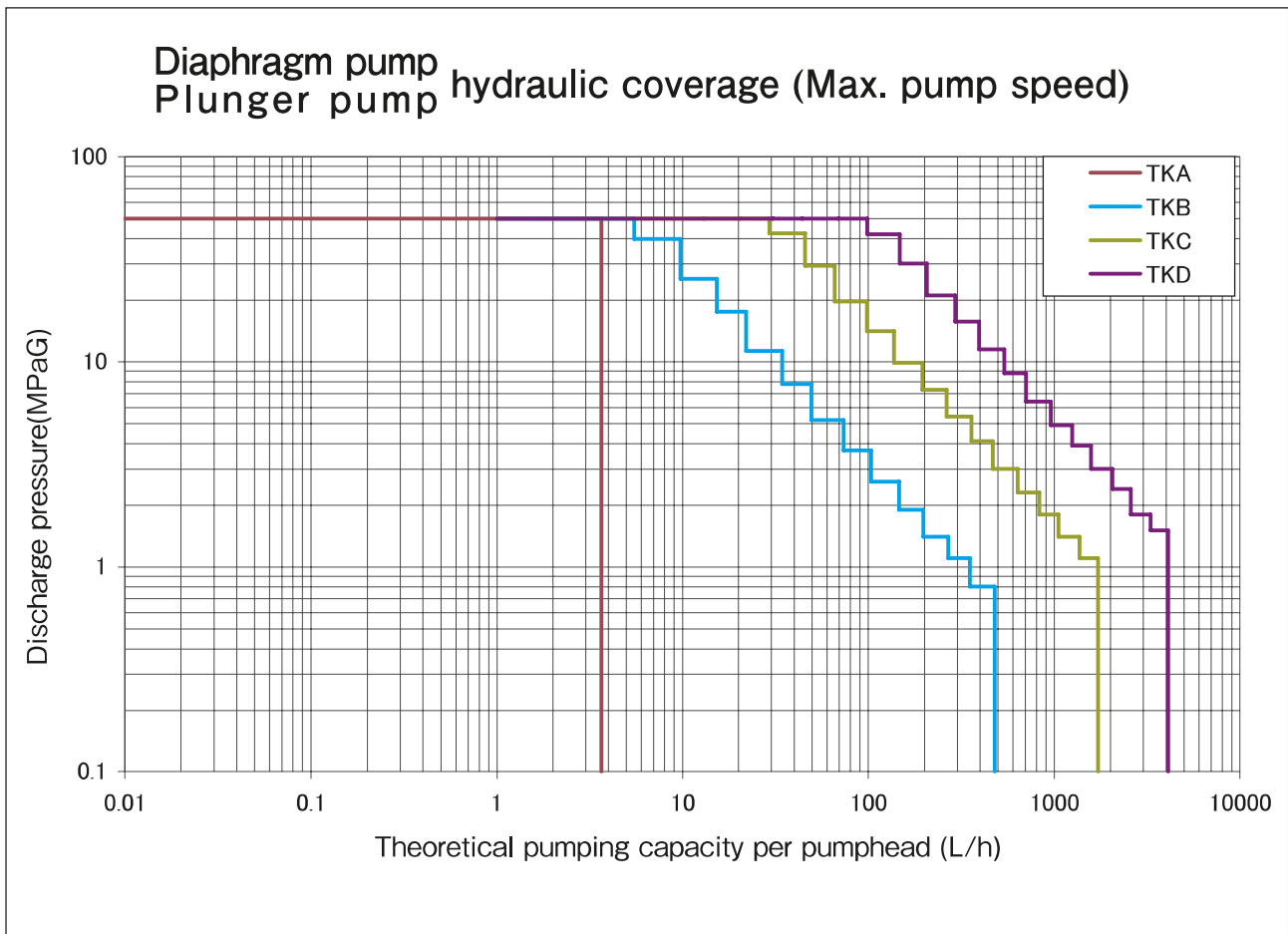
Material Construction & Production Range

《Material construction》

	Standard	Semi-standard
Pump body	SUS304	SUS316
valve body	SUS304/SUS316	SUS316
Diaphragm	PTFE/SUS316	PTFE/SUS316
Check valve	SUS316	SUS316
Non-wetted part	SS, FC & others	SS, FC & others

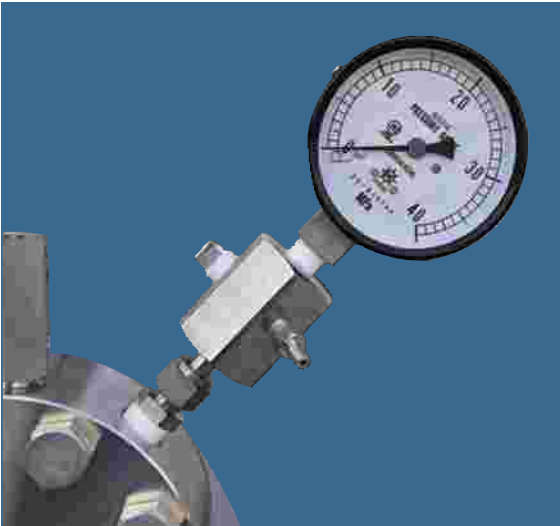
※ Please contact us for other material options.

《Production Range》



※ Multiple pumpheads up to six(6) can be built and a manifold to tie those heads is available upon request.

Pump Construction



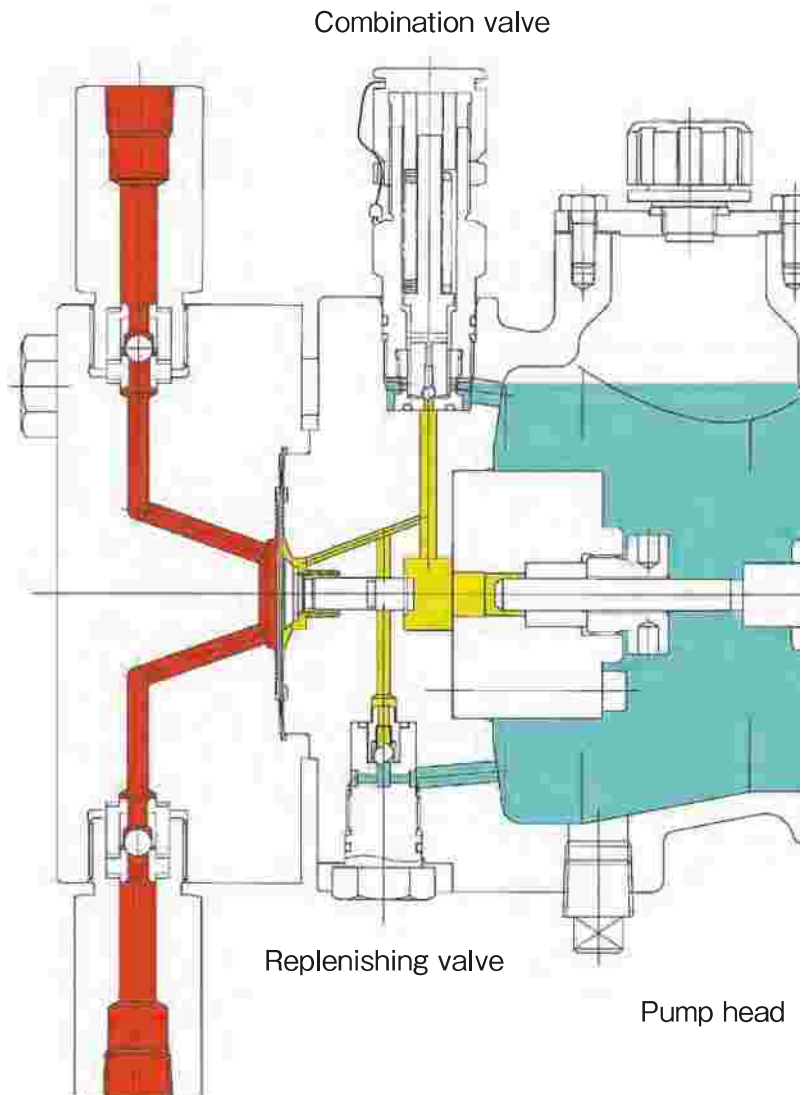
Diaphragm rupture detector
(Standard)



Combination valve
Air filter
Sight glass (Standard)



Pump body

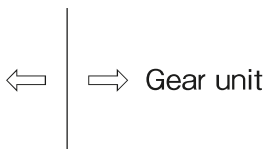
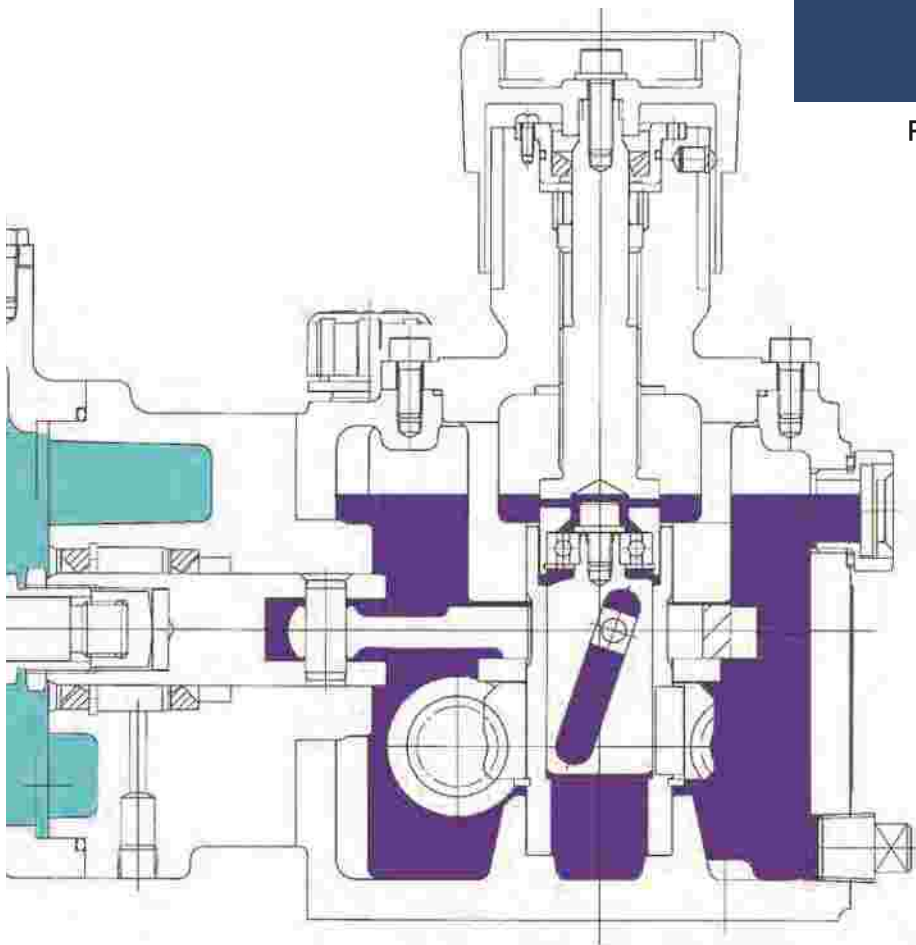




Manual Stroke length adjustment dial knob
(Standard)



Pneumatic actuator (Option)

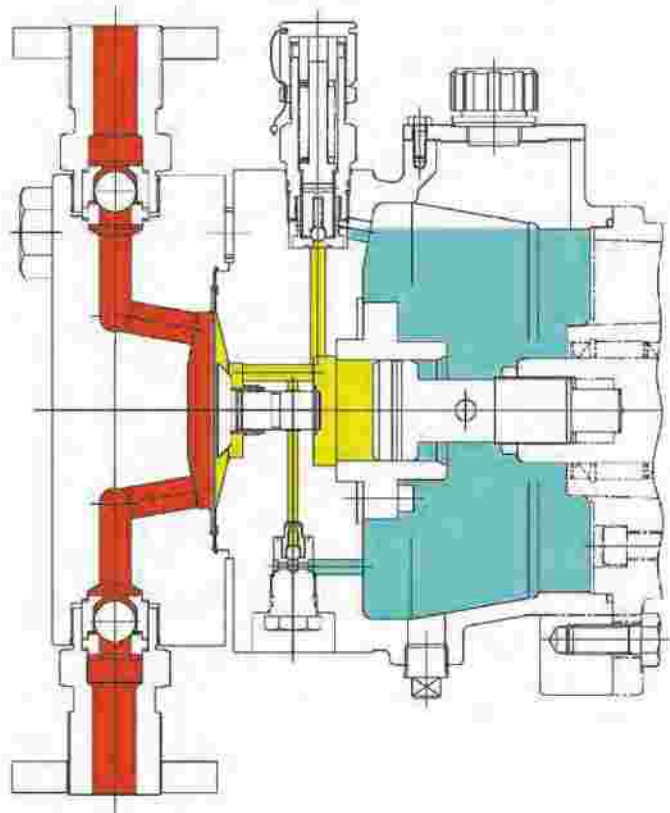


- Liquid pumped
- Hydraulic oil in hydraulic chamber
- Hydraulic oil in the reservoir
- Gear lub oil

Diaphragm Pump

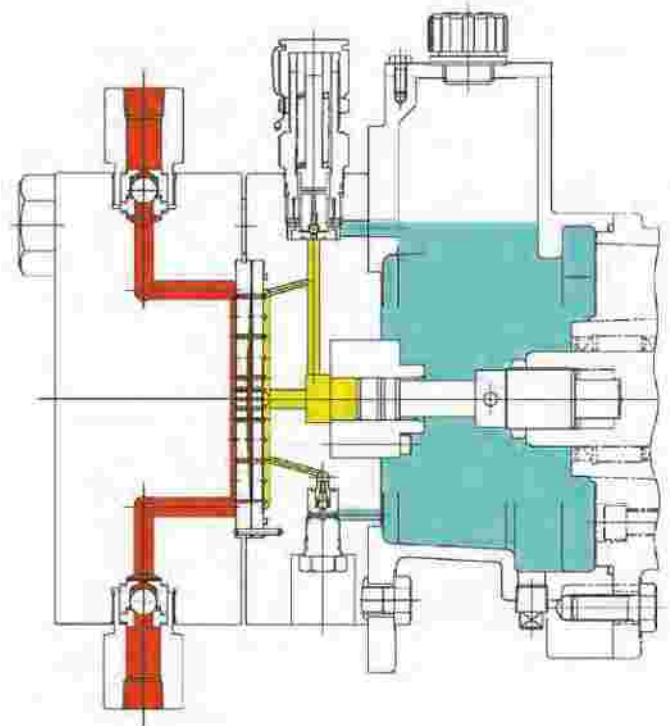
PTFE Diaphragm type

- Maximum discharge pressure up to 35MPaG
- Withstand long-term operation by specially treated PTFE diaphragm
- Diaphragm rupture detector (Local monitoring) is mounted as standard



Metal diaphragm type

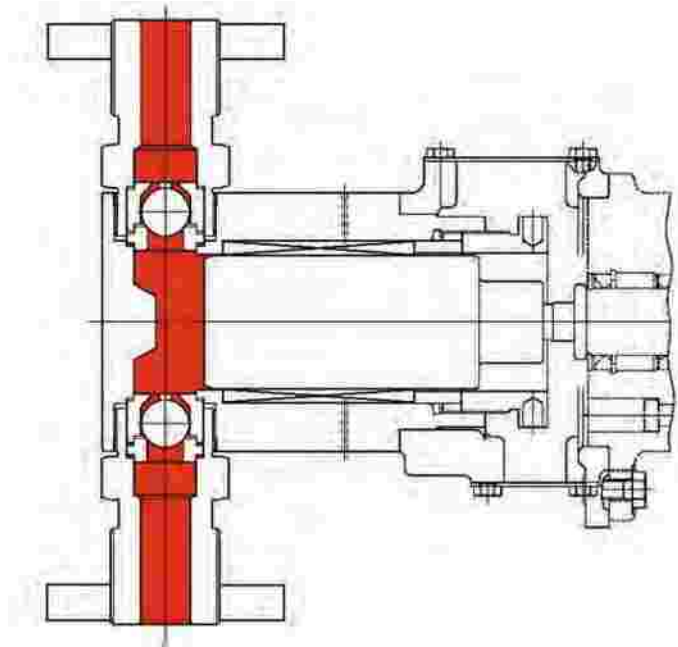
- Maximum discharge pressure up to 50MPaG
- Pumped liquid temperature up to 200°C
- Metal diaphragm disallows permeation of liquid into hydraulic chamber



Plunger Pump

Plunger type

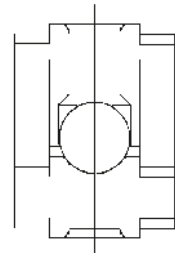
- Maximum discharge pressure up to 35 MPaG
- Pumped liquid temperature up to 280°C
- Operation under negative pressure is available



Check Valve

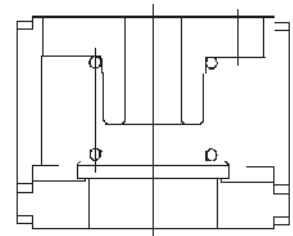
《Check valve》

- Ball valve
 - Most commonly used type of valve
 - Keep high accurate flow
 - Preferably used for slurry handling



Ball valve

- Disc valve
 - Spring loaded plate disc is better suitable to handle high viscous fluid and to larger size valves for higher flow.



Disc valve

- Special design
 - Individually designed for special application upon request

Accessories

Safety valve / Relief valve

Install in pump discharge line for protection of the piping.

Back pressure valve

Install in the discharge line when differential pressure between suction and discharge is small.

Diaphragm rupture detector pressure switch/transmitter

Pressure switch/transmitter can be mounted for remote monitoring of diaphragm rupture.

Calibration pot

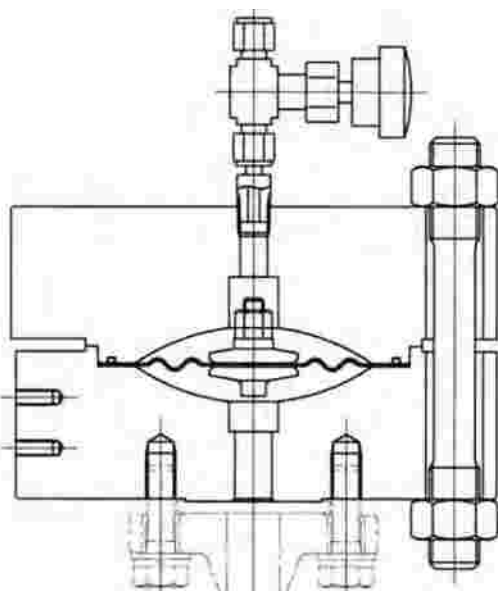
Install calibration pot to check the actual discharge flow.

Pulsation damper (Diaphragm type, Air chamber type, Bladder type and Metal bellows type)

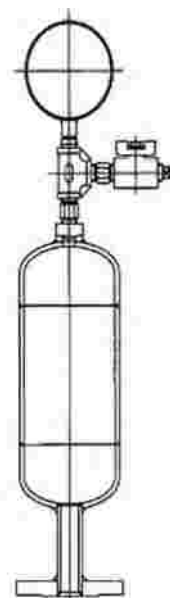
Install in pump suction line when pressure-loss by hydraulic pulsation needs to be reduced.

Install it in discharge line when pulsation is required to be suppressed.

PTFE diaphragm type

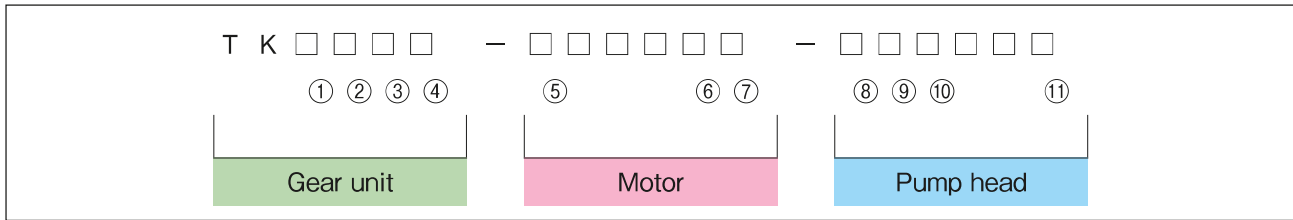


Air chamber type



Teikoku manufactures pulsation damper of PTFE diaphragm type and air chamber type. PTFE diaphragm type is compliant to the High Pressure Gas Safety Law , KHK Japan.

Pump model identification



Gear unit	Motor	Pump head
① Gear unit type A : Stroke length 0~10mm B : Stroke length 0~15mm C : Stroke length 0~20mm D : Stroke length 0~30mm ② Numbers of Gear-units Single-head design : Always 1 Multi-heads design : 1, 2, 3, ... ③ Gear ratio J : 54 K : 17 L : 12.5 M : 10 N : 8.33 ④ Stroke length adjustment M : Manual P : Pneumatic type [Electro pneumatic positioner] Q : Pneumatic type [Pneumatic pneumatic positioner]	⑤ Motor rated power (kW) Rated output to be indicated (0.2, 0.4, ...) ⑥ Motor type S : Standard V : VFD motor Z : Others ⑦ Motor pole numbers No. of pole to be indicated (2, 4, ...)	⑧ Pump head D : Metal single diaphragm S : PTFE diaphragm P : Plunger ⑨ Material construction M : SUS304 N : SUS316 Z : Special ⑩ Plunger diameter plunger diameter (mm)to be indicated. ⑪ Special specifications Blank : Nothing F : Full jacketed S : Semi jacketed

Fluid Ever Pumped

A
 Acetaldehyde
 Acetic acid
 Acetone
 Acetonitrile
 Acrylonitrile
 Adipic acid
 Alcohol
 Alkoxysilane
 Aluminium hydroxide
 Aluminium sulfate
 Amino acid
 Aniline
 Aqueous ammonia

B
 Benzene
 Butadiene
 Butanediol
 Butane
 Butylcatechol
 Butyne

C
 Caprolactam
 Carbon tetrachloride
 Caustic soda
 Chlorosilane
 Chlorobenzene
 Chloromethane
 Citric acid
 Cyclohexane
 Cyclopentane

D
 Decane
 Dibutyl peroxide
 Dichlorosilane
 Diethyl sulfate

Diethylene glycol
 Dimethylamine
 Dimethylether
 Dimethylformamide
 Dioctyl phthalate
 Dimethyl sulfate
 Dimethyl disulfide

E
 Edible oil
 Epichlorohydrin
 Ethanol
 Ethyl acetate
 Ethyl acrylate
 Ethylene chloride
 Ethylenediamine
 Ethylen
 Ethyl chloride
 Ethylene glycol
 Ethylene oxide
 Ethylbenzene

F
 Fatty acid
 Ferrous sulfate
 fish oil
 Formalin
 Freon
 Fuming sulfuric acid

G
 Gamma-Butyrolactone
 Glycerin

H
 Heavy oil
 Heptane
 Hexafluoropropylene
 Hexamethylene diamine

Hexane
 Hot Water
 Hydrazine
 Hydrazine hydroxide
 Hydrofluoric acid
 Hydrogen chloride
 Hydrogen peroxide
 Hydrogen sulfide

I
 Insulation oil
 Iodide
 Isobutane
 Isobutylene
 Isophthalonitrile
 Isoprene
 Isopropyl alcohol

K
 Kerosene

L
 Latex
 Lauryl lactam
 Liquid ammonia
 Liquefied CO2
 Liq. sulfur dioxide

M
 m-Xylylenediamine
 Methacrylic acid
 Methanol
 Maleic anhydride
 Methyl cyclohexane
 Methyl chloride
 Methylene chloride
 Monomethylamine
 Methyl ethyl ketone
 Methyl mercaptan

N
 Naptha
 Naphthalene
 n-butane
 Nitric acid
 n-heptane
 n-hexane
 n-pentane
 Nujol

O
 o-Cresol
 Octane
 o-Nitrotoluene
 Organosilicon compound

P
 Palm oil
 Paraffin
 Paraxylene
 Pentane
 Phenol
 Phosphorous oxychloride
 Phthalic acid
 Phtalonitrile
 Poly Aluminium chloride
 Polyether
 Propane
 Propylene
 Propylene oxide
 Pyridine

Q
 Quinoline

S
 SAKE soap
 Saline water
 Sea water

Silane
 Silicone oil
 Silicon tetrachloride
 Stearic acid
 Sulfur
 Sulfuric acid

T
 Tetrachloroethylene
 Titanium(IV) chloride
 Toluene
 Transformer Insulation oil
 Trichloroethane
 Trichloroethylene
 Trichlorosilane
 Triethylaluminium
 Trifluorochloroethylene
 Trifluoromethanesulfonic Acid
 Triisobutylaluminium
 Trisodium phosphate
 Turpentine

U
 UDI water
 Urea

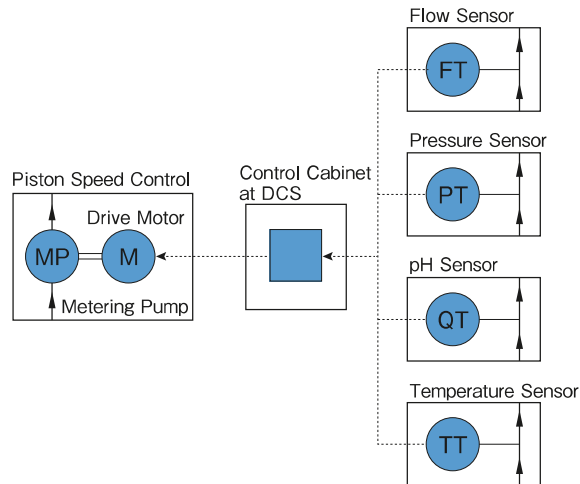
W
 Vegetable juice
 Vinyl acetate
 Vinyl chloride
 Vinylidene fluoride
 Vinyltroethoxysilane

W
 White oil
 White phosphorous

X
 Xylene

System Packaging and Control Variation

Wide range system integration is available with Teikoku Diaphragm Pumps upon request. Such equipments as relief valves, pulsation damper, flowmeter, pressure transmitter, or auxiliary pipes / devices including electric facility and pneumatic system are often integrated into one package on a common skid. Eg., both stroke-length and s.p.m. can be controlled in preset sequence in response to signals of flow-rate, pressure, pH value, or the temperature. The controller can be retrofitted to any existing control-panel or be customized upon request. Please be informed that our production capacity of such C-panels is not limited to the one for our own diaphragm pumps. Touch-panel can make your control or alarm setting even easier. In a nutshell, we are not only a pump manufacturer but also your partner for the best system integration and solution.



Sample Touch-Panel



Typical Application

- Chemical injection in water or sewage treatment.
- Liquefied gas injection into the extruder.
- Additive injection into the fuel, or odorizer injection into the object.
- Production line of coating, detergent, process food, or pharmaceuticals
- Back-flush-liquid injection into our own slurry-seal canned motor pumps.

Request for Quotation

Please contact our sales office with the specifications given below.

We will quote the best metering pump suitable for your specifications.

Provide the following information together with accessory list.

※	Standard/code to apply	
※	Quantity required	
	Liquid name	
※	Temp/Melting point (°C)	/
※	SG / Viscosity (mPa·s)	/
※	Vapor pressure (kPaA)	
	Name of solid/ Concentration (wt%)	/
※	Size of solid / SG (μm) /-	/
※	Discharge flow (Max) (L/h)	
	Discharge flow (Min) (L/h)	
※	Discharge press. (MPaG)	
※	Suction press. (MPaG)	
※	Material of construction	SUS304 SUS316 Others ()
	Material not allowed	

Fill in all ※columns.

Accessories

Name	Q'ty.	Specifications
Inverter		Preferred brand ()
Electric noise Protection device		Noise filter AC/DC Reactor
Pulsation damper		Bladder Diaphragm Belows
		Air chamber
Safety valve / Relief valve		Set press. () MPaG
Press. retaining valve		Set press. 0.2MPaG 0.3MPaG
Calibration pot		Measuring time () sec.



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