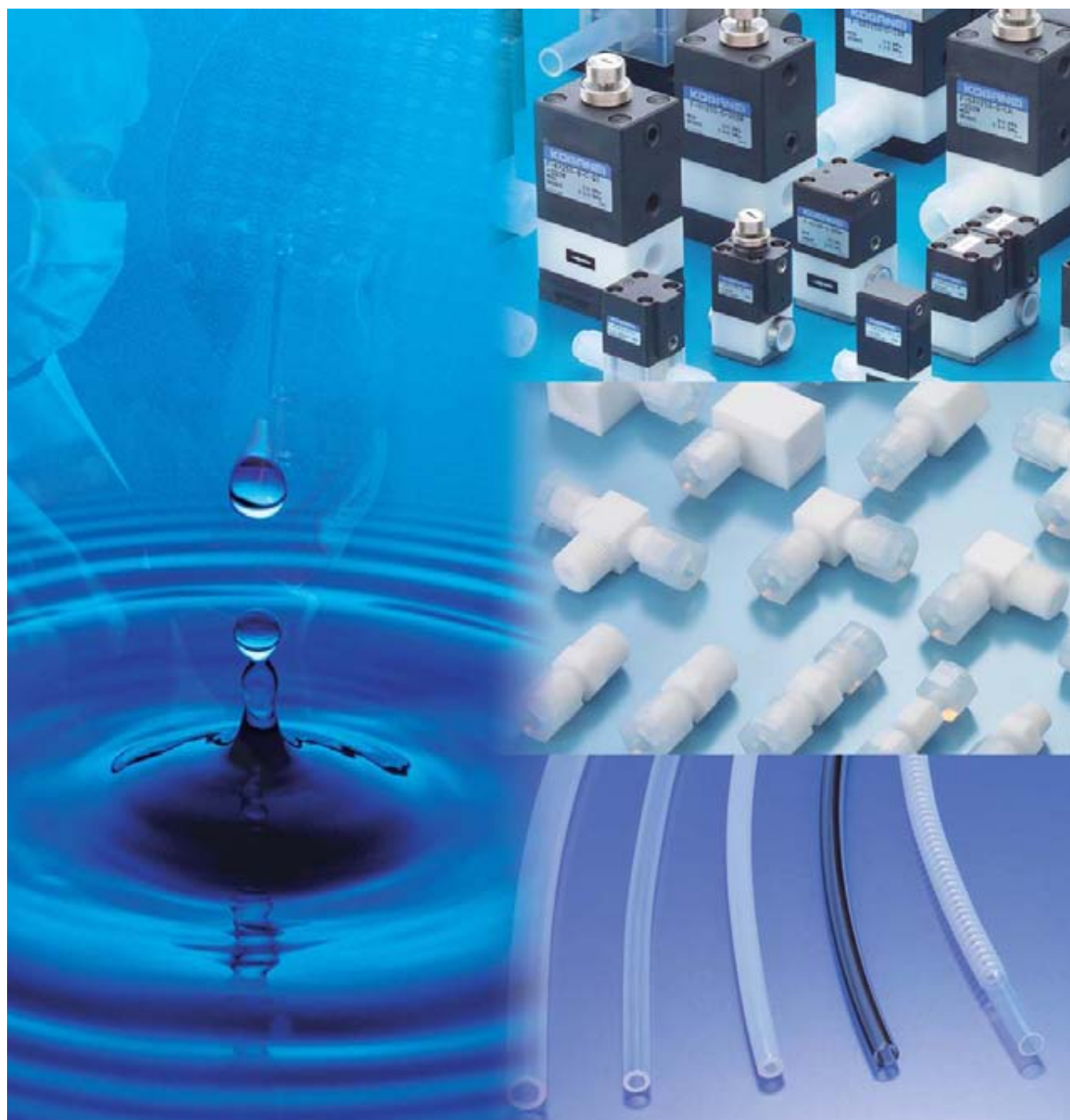


Fluororesin Products

Pure Process Series



Fluororesin Products

Pure Process Series

Among various plastic materials, fluororesin exhibits particularly superior chemical resistance, heat resistance, low friction, electrical insulation, low tackiness, weather resistance, and other features. This superior material is fabricated using micro-machining technology for PTFE products, and Koganei's independently developed injection molding method for PFA products, all under Koganei's rigorous quality control. These products are used in the semiconductor, liquid crystal, and other electronics sectors, as well as in chemicals, food products, medical equipment, chemical plants, and a wide variety of other industrial sectors.

Fluororesin Valve Series



- Compact series line-up suitable for control of small chemical flows now offers even more variety.
- In addition to diverse piping specifications and valve functions, the line-up offers a wide selection of options, such as automatic flow adjustment.

- Air operated valves
- Suck back valves
- Air operated valves with suck back
- Solenoid valve
- Check valve
- Drain valves

Page 7

Fluororesin H Series Fittings

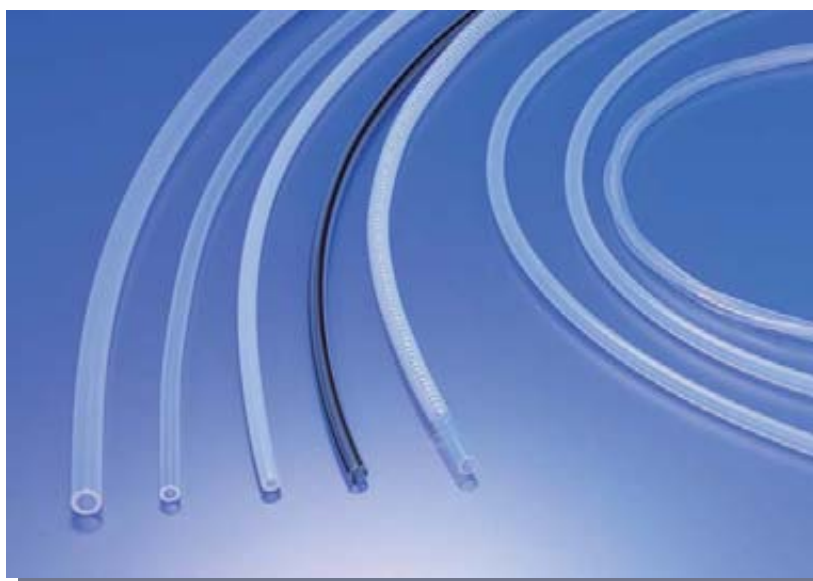


- Simple construction eliminates the need for dedicated tools. Ease of operation during piping is boosted dramatically.
- Tapered seal type offers superior pressure resistance, sealing ability, and heat resistance.

- Straight type
- Elbow type
- T type
- Reducing type

Page 47

Fluororesin Tube Series



- Size variations for the field-proven fluororesin tube have expanded.
- The high-grade HG tube and NE tube that demonstrates effectiveness against anti-static charges, have been added to the line-up.

- PFA tubes
- PFA-HG tubes
- PFA-NE tubes
- BT tubes
- RPL tubes

Page 59

CONTENTS

Features	1	Large Flow Series, Drain Valve Series	43
Safety Precautions	3	Other Related Products	45
Flow Rate Conversion Graph	5	Fluororesin H Series Fittings	
Fluororesin Valve Series		Features, Specifications	47
Features	7	Fitting Types and Parts	49
Valve Selection Guides	9	Dimensions	50
Handling Instructions and Precautions	11	Fluororesin Tube Series	
Air Operated Diaphragm Type 2-port Valves	13	Features, Application Examples	59
Air Operated Diaphragm Type 3-port Valves	23	Maximum Tube Operating Pressure	60
Suck Back Valves	29	Tube Size and Flow Rate	60
Air Operated Valves with Suck Back	32	PFA Tubes	61
Solenoid Valve	39	PFA-HG Tubes	63
Check Valve	40	PFA-NE Tubes	65
Air Operated Valves with Suck Back		BT Tubes	67
High Viscosity Specification	41	RPL Tubes	68
Air Operated Valve Diaphragm Type with Dual Flow Rate Switching Mechanism	42		



Caution

Before use, always read the "Safety Precautions" on p. 3, 48, 60





Before selecting and using products, please read all the Safety Precautions carefully to ensure proper product use.

The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury or damage to you, other people, and assets beforehand.

Follow the Safety Precautions for: ISO4414 (Pneumatic fluid power—Recommendations for the application of equipment to transmission and control systems), JIS B 8370 (Pneumatic system regulations).

The directions are ranked according to degree of potential danger or damage:

“DANGER!”, “WARNING!”, “CAUTION!” and “ATTENTION!”

 DANGER	Expresses situations that can be clearly predicted as dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
 WARNING	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
 CAUTION	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in light or semi-serious injury. It could also result in damage or destruction of assets.
 ATTENTION	While there is little chance of injury, this content refers to points that should be observed for appropriate use of the product.

■ This product was designed and manufactured as parts for use in General Industrial Machinery.

■ In the selection and handling of equipment, the system designer or other person with fully adequate knowledge and experience should always read the Safety Precautions, Catalog, User's Manual and other literature before commencing operation. Making mistakes in handling is dangerous.

■ After reading the Instruction Manual, Catalog, etc., always place them where they can be easily available for reference to users of this product.

■ If transferring or lending the product to another person, always attach the Instruction Manual, Catalog, etc., to the product where they are easily visible, to ensure that the new user can use the product safely and properly.

■ The danger, warning, and caution items listed under these “Safety Precautions” do not cover all possible cases. Read the Catalog and User's Manual carefully, and always keep safety first.

DANGER

- Do not use for the purposes listed below:
 1. Medical equipment related to maintenance or management of human lives or bodies.
 2. Mechanical devices or equipment designed for the purpose of moving or transporting people.
 3. Critical safety components in mechanical devices.
 This product has not been planned or designed for purposes that require advanced stages of safety. It could cause injury to human life.
- Do not use solenoid valves in locations with or near dangerous substances such as flammable or ignitable substances. The products are not explosion-proof. They could ignite or burst into flames.
- Do not allow flammable gases or ignitable chemicals to flow the solenoid valves. Moreover, do not use the solenoid valve in atmospheres containing flammable gases. There is a chance of explosion or ignition.
- Persons who use a pacemaker, etc., should keep a distance of at least one meter [3.28ft.] away from the solenoid valve. There is a possibility that the pacemaker will malfunction due to the strong magnet built into the solenoid valve.
- Do not use any media other than those shown in the specifications table. Use of non-specified media could lead to early shutdown of function or a sudden drop in performance, and result in a reduced operating life. Media leakage on the outside of the product could pose a risk to human life.
- When using chemicals, always check compatibility with the structural materials of the product before use. Use of incompatible media could lead to early shutdown of function or a sudden drop in performance, and result in a reduced operating life. Fluid leakage on the outside of the product could pose a risk to human life.
- When attaching the product, always ensure that it is securely mounted in place. Dropping or falling the product or improper operation could result in injury.
- While the product is in operation, avoid touching it with your hands or otherwise approaching too close. In addition, do not make any adjustments to the interior or to the attached mechanisms (manual override, connecting and disconnecting of wiring connectors, disconnection or connection of piping

tubes or plugs, or adjustment of mounting locations) while in operation. The chemicals could leak out, possibly resulting in injury.

- Do not splash water on the product. Spraying it with water, washing it, or using it underwater could result in malfunction of the product leading to injury, electric shocks, fires, etc.
- Never attempt to remodel the product. It could result in abnormal operation leading to injury, electric shocks, fires, etc.
- Never attempt inappropriate disassembly, assembly or repair of the product relating to basic construction, or to its performance or to functions. It could result in injury, electric shocks, fires, etc.

WARNING

- Do not use the product in excess of its specification range. Such use could result in product breakdowns, function stop or damage or drastically reduce the operating life.
- Before supplying chemicals, gases, or pilot air to the product, and before beginning operation, check that the piping is connected correctly. Careless supply of chemicals, gases, or pilot air could result in chemicals, etc. flowing to an unintended location or leaking out, and causing injury.
- For repairs, inspections, maintenance, replacement, or any other operations related to the product (particularly when the media used are chemicals), check that the chemicals have been completely drained from inside of the equipment, and that pilot air has been shut off and pressure inside the piping completely released. Neglecting this check could lead to leaks of chemicals, etc., that could cause injury.
- When installing a fluororesin fitting, always perform a leak test before supplying chemicals or gases through it, to check that there are no leaks, and then start passing the media. Neglecting this check could lead to leaks of chemicals, etc., that could cause injury.
- Do not pull on tubes that are connected to the fittings. The tube(s) could pull out, leaking chemicals or gases.
- When using fittings and tubes, always use compatible screw sizes and tube sizes. Use of incompatible sizes could lead to leaks or disconnections.
- Always check the Catalog etc. to ensure that solenoid valve

wiring and piping is installed correctly. Errors in wiring and piping could lead to abnormal operation.

- Do not use the solenoid valves or the wiring to control them, at locations close to power lines where large electrical currents are flowing, or in locations subject to strong magnetic fields or power surges. Such applications could lead to unintended operation.
- Do not install solenoid valves inside control panels. Heat inside the control panels could cause leakage on the piping or other areas.
- When energizing the solenoid valve for long periods, provide heat radiation measures to ensure that ambient temperature of the solenoid valve always remain within the specified temperature range. When energizing the unit for long periods, consult us.
- The solenoid valve could generate surge voltage and electromagnetic waves when the switch is turned off, affecting the operations of surrounding equipment. Use solenoids with surge suppression, or take countermeasures in the electrical circuits for surges or electromagnetic waves.
- Always shut off the power when performing wiring work. Leaving the power on could result in electric shocks.
- After completing wiring work, always check to ensure that no wiring connection errors exist before turning on the power.
- Apply the specified voltage to the solenoid. Using the wrong voltage level will prevent the solenoid from performing its function, and could lead to breakage or burning damage of the product itself.
- Avoid scratching the solenoid valve lead wires. Letting the lead wires be subject to scratching, excessive bending, pulling, rolling up, or being placed under heavy objects or squeezed between two objects, may result in current leaks or defective continuity that lead to fires, electric shocks, or abnormal operation.
- Do not touch terminals and miscellaneous switches, etc., while the solenoid valve is powered on. There is a possibility of electric shocks and abnormal operation.
- Design devices so as to ensure safety even when equipment shuts down due to emergency stops, power outages, or other system problems, to prevent damage to the devices or personal injury.
- In the first operation after the equipment has been idle for 48 hours or more, or has been in storage, there is a possibility that contacting parts have been stuck, resulting in equipment operation delays or sudden movements. For these first operations, always run a test operation before use to confirm that the movement is normal.
- In low frequency use (more than 30 days between uses), there is a possibility that contacting parts have been stuck, resulting in equipment operation delays or sudden movements that could lead to personal injury. Run a test operation at least once every 30 days to confirm that movement is normal.
- Do not sit on the product, place your foot on it, or place other objects on it. Accidents such as falling and tripping over could result in injury. Dropping the product may result in injury, or also damage or break the product resulting in abnormal or erratic operation, or runaway, etc.
- Do not allow the product to be thrown into fire. The product could explode and/or release toxic gases.

CAUTION

- Do not use in locations that are subject to direct sunlight (ultraviolet rays), in locations with high temperatures or high humidity, in locations subject to dust, salt, or iron powder, or when the media or ambient atmosphere include components that are incompatible with the product structural materials. It could lead to early shutdown of function or a sudden degradation of performance, and result in a reduced operating life. For the material, see the Major Parts and Materials.
- When mounting the product, leave room for adequate working space around it. Failure to ensure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- For installing or transporting heavy products, use a lift, supporting tool, or several people, to provide firm support, and proceed with due caution to ensure personal safety.

- Always post an “operations in progress” sign for installations, adjustments, or other operations, to avoid accidental supply of chemicals, gases, pilot air, or electrical power, etc. Accidental supplying of chemicals, gases, pilot air, or electrical power, etc., could result in injury to operators due to sudden movement of the product, or to electrical shocks.
- Do not bring floppy disks or magnetic media, etc., within one meter [3.28ft.] of the product. There is the possibility that the data on the floppy disks will be destroyed due to the magnetism of the magnet.
- Do not use the solenoid valve in locations subject to large electrical currents or magnetic fields. It could result in erratic operation.
- If leakage current is occurring in the control circuit, there is a possibility of the product performing an unintended operation. Take measures against leakage current in the control circuit, to ensure that the leakage current value does not exceed the allowed range in the product specifications.
- Do not block the product's breathing holes. Pressure changes occur due to changes in volume during operation. Blocking the breathing holes destroys the pressure balance, and could cause failure of the intended operation, equipment damage, or personal injury.

ATTENTION

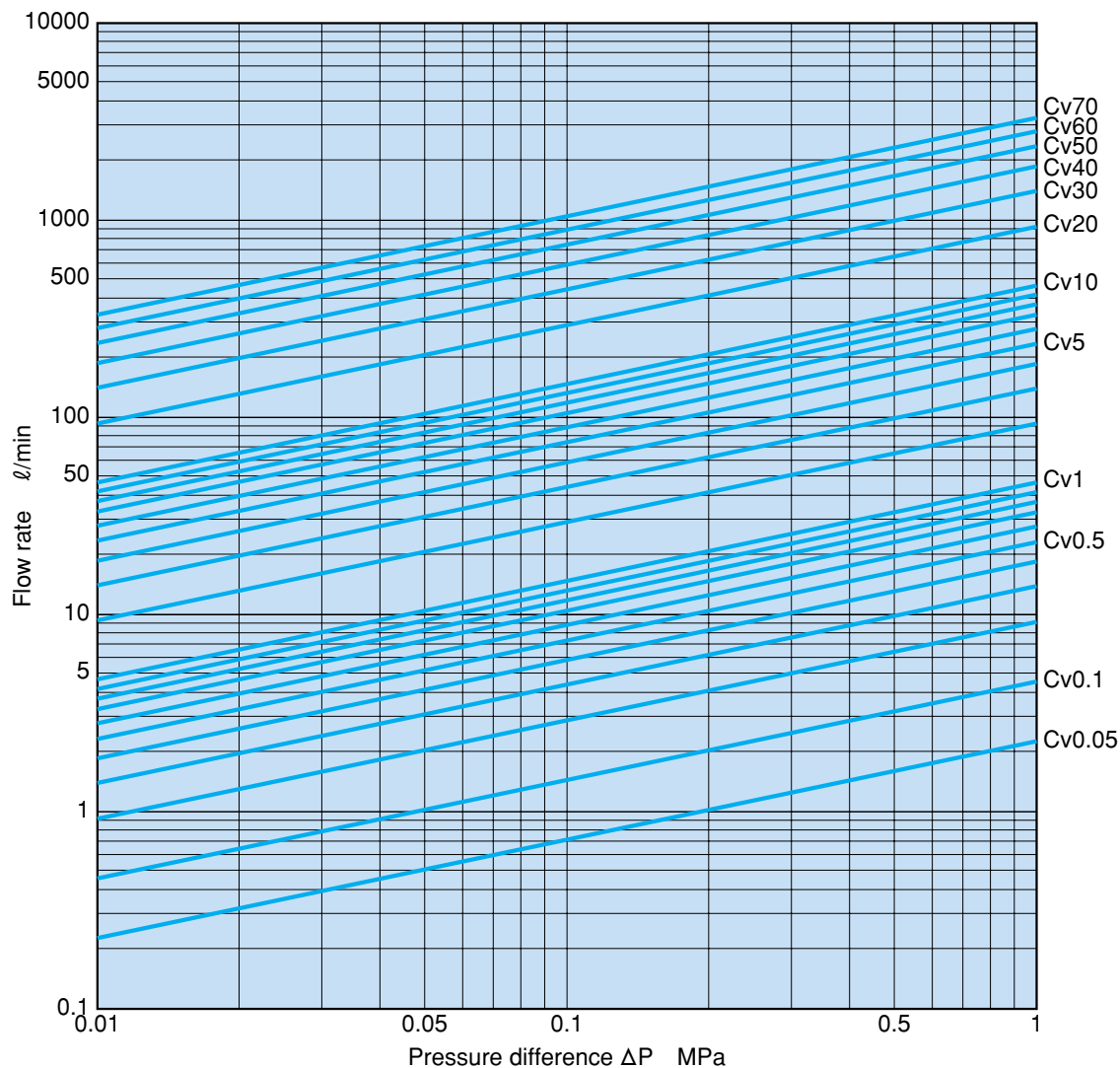
- When considering the possibility of using this product in situations or environments not specifically noted in the Catalog or User's Manual, or in applications where safety is an important requirement, such as in an airplane facility, combustion equipment, leisure equipment, safety equipment and other places where human life or assets may be greatly affected, take adequate safety precautions such as application with enough margins for ratings and performance or fail-safe measures. Be sure to consult us with such applications.
- The properties of fluororesin products mean that they may sometimes not be used with certain acid, alkaline or toxic fluids due to penetration or permeation. For use in such applications, consult us.
- Always check the Catalog and other reference materials for product wiring and piping.
- Use protective covers, etc., to ensure that the operating parts of mechanical devices, etc., are isolated and do not come into direct contact with human bodies.
- When handling the product, wear protective gloves, safety glasses, safety boots, etc. to keep safety.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- Fluororesin products can show deterioration in performance or function as operating span lengthens. Perform daily inspections of fluororesin products, to check that they satisfy the required functions for the system, and to prevent accidents.
- For inquiries about the product, consult your nearest Koganei sales office or Koganei overseas department. The address and telephone number is shown on the back cover of this catalog.

OTHERS

- Always observe the following items.
 1. When using this product in fluid system or pneumatic systems for pilot, always use genuine KOGANEI parts or compatible parts (recommended parts).
When conducting maintenance and repairs, always use genuine KOGANEI parts or compatible parts (recommended parts). Always observe the required methods and procedure.
 2. Never attempt inappropriate disassembly or assembly of the product relating to basic construction, or to its performance or to functions.

Koganei cannot be responsible if these items are not properly observed.

Water: Flow rate conversion graph



Note: The pressure difference ΔP in the graph shows the pressure difference between the primary (upstream) gauge pressure P_1 and secondary (downstream) gauge pressure P_2 .
 $\Delta P = P_1 - P_2$ (MPa)

Flow rate equation (in the equation, pressures P_h and P_l show absolute pressure)

$$Q = 45.62 C_v \frac{\sqrt{P_h - P_l}}{\sqrt{G}}$$

Q : Flow rate ℓ/min
 C_v : Flow rate coefficient
 P_h : Primary (upstream) absolute pressure (Mpa)
 P_l : Secondary (downstream) absolute pressure (Mpa)
 G : Specific gravity (for water, this equals 1)

$$Q' = 0.1338 C_v \frac{\sqrt{P_h' - P_l'}}{\sqrt{G}}$$

Q' : Flow rate ft^3/min .
 C_v : Flow rate coefficient
 P_h' : Primary (upstream) absolute pressure (psi.)
 P_l' : Secondary (downstream) absolute pressure (psi.)
 G : Specific gravity (for water, this equals 1)

How to use the graph

When there is no diagram for the valve flow rate coefficient (C_v) in the above graph: Multiply the C_v of the valve being used to the flow rate at $C_v = 1$ read out from the graph to calculate the flow.

Example: At $C_v = 1$, value read out from the graph:

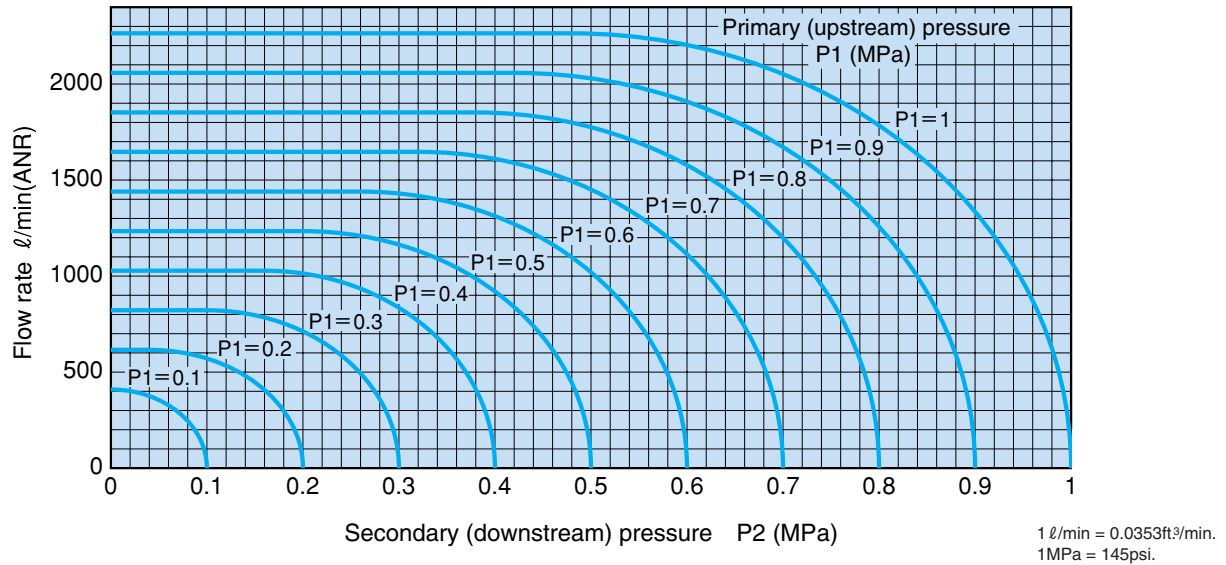
$Q = 20 \ell/\text{min}$ [0.706 ft^3/min .] for the desired pressure difference

When flow rate coefficient for the valve being used is

$C_v = 0.31$

Seeking flow rate $= Q \times C_v = 20 \times 0.31 = 6.2 \ell/\text{min}$ [0.219 ft^3/min .]

Air: Flow rate conversion graph Cv=1



Note: Pressures P_1 and P_2 in the graph show the gauge pressure (MPa).

Flow rate equation

(in the equation, pressures P_h and P_l show absolute pressure)

1) When $P_l / P_h > 0.5283$

$$Q = 4119 C_v \frac{\sqrt{(P_h - P_l) P_l}}{\sqrt{G}}$$

2) When $P_l / P_h \leq 0.5283$

$$Q = 2056 C_v P_h \frac{1}{\sqrt{G}}$$

Q : Flow rate l/min (ANR)

C_v : Flow rate coefficient

P_h : Primary (upstream) absolute pressure (Mpa)

P_l : Secondary (downstream) absolute pressure (Mpa)

G : Specific gravity (conversion specific gravity, when air is 1)

How to use the graph

The above graph shows the flow rate when the flow rate coefficient $C_v = 1$.

When $C_v \neq 1$, multiply the C_v of the valve being used to the flow rate read out from the graph to calculate the flow.

Example: Value read out from the graph:

$Q = 500$ l/min [17.7 ft^3/min .] (ANR) for the desired P_1 and P_2

When flow rate coefficient for the valve being used is $C_v = 0.31$

Seeking flow rate $= Q \times C_v = 500 \times 0.31 = 155$ l/min [5.47 ft^3/min .] (ANR)

1) When $P_l' / P_h' > 0.5283$

$$Q' = 1.0 C_v \frac{\sqrt{(P_h' - P_l') P_l'}}{\sqrt{G}}$$

2) When $P_l' / P_h' \leq 0.5283$

$$Q' = 0.5 C_v P_h' \frac{1}{\sqrt{G}}$$

Q' : Flow rate ft^3/min . (ANR)

C_v : Flow rate coefficient

P_h' : Primary (upstream) absolute pressure (psi.)

P_l' : Secondary (downstream) absolute pressure (psi.)

G : Specific gravity (conversion specific gravity, when air is 1)

Fluororesin Valve Series

Air Operated Diaphragm Type 2-port Valves



- Compact series line-up, suitable for control of small flow rate of chemicals, now offers even more variety.
- For the valve body materials, select from PFA, PTFE, and SUS.
- In addition to the highly reliable Koganei H series fitting, a monoblock Flowell 60 series fitting integrated type has been added to the product range. Now, other manufacturers fittings are available to suit various applications.
- A flow rate adjustment mechanism employing a differential screw method to enable micro flow rate adjustment can be selected as an option.

Air Operated Diaphragm Type 3-port Valves



- Compact series line-up, suitable for control of small flow rate of chemicals, now offers even more variety.
- For the valve body materials, select from PFA, PTFE, and SUS.
- In addition to the highly reliable Koganei H series fitting, a monoblock Flowell 60 series fitting integrated type has been added to the product range. Now, other manufacturers fittings are available to suit various applications.
- Can be used as either a divider valve or selector valve by only changing the piping direction.

Air Operated Valves with Suck Back



Page 32

- The highly reliable diaphragm-type 2-port valve is combined with a suck back valve to achieve space savings. Ease of use is improved through opposite-position piping ports.
- A low sliding resistance type enabling fine adjustment is also available.
- For the valve body materials, select from PFA, PTFE, and SUS.
- In addition to the highly reliable Koganei H series fitting, a monoblock Flowell 60 series fitting integrated type has been added to the product range. Now, other manufacturers fittings are available to suit various applications.
- A flow rate adjustment mechanism employing a differential screw method to enable micro flow rate adjustment can be selected as an option.

Solenoid Valve



Page 39

- The highly reliable compact solenoid used in the pneumatic solenoid valves is combined with fluororesin valve technology. Energizing the solenoid enables easy control of chemicals even in locations without a pilot air supply.
- The square, compact design achieves space savings, and is suitable for control of micro flow rate chemicals.

High Viscosity Specification Valves



Page 41

- New high viscosity specification valves are now added to our line-up of field-proven air operated valves with suck back.
- Improved valve airtightness boosts reliability during both positive pressure and vacuum, and enables the valves to control discharges of high viscosity chemicals. Employs a special construction that prevents micro-bubbles due to inlet vacuum from growing during suck back operation.

Suck Back Valves



Page 29

- Use in combination with an air operated valve easily prevents dripping of chemicals.
- Adjustment of the suck back volume is easy using an adjusting screw.

Valve with Dual Flow Rate Switching Mechanism



Page 42

- Allows switching between 2 stages of flow rate in a single valve. Flow rates can be switched easily without making a complex circuit.
- A highly reliable diaphragm valve construction ensures high durability.

Check Valve



Page 40

- Compact and lightweight unit prevents fluid leakage.
- A choice of different seal materials is available, depending on the media used.

Large Flow Series, Drain Valve Series



Page 43

- Air operated valve (Diaphragm type, bellows type)
- Check valve
- Drain valve (2-port, 3-port)

Other Related Equipment



Page 45

- PTFE ejector
- PTFE needle valve
- PTFE, PFA lever valves
- Speed controller for pilot air control

Large Flow Series

● For details of order codes and specifications, consult us.

Air Operated Valve

F-AVB400~1000

Bellows type 2-port valve

Model	Operating temperature range °C [°F]		Operating pressure range MPa [kgf/cm ²] [psi.]		Orifice mm [Cv]	Port size	
	Media	Atmosphere	A→B	B→A		Main	Operating port
F-AVB400	5~60 [41~140]	0~50 [32~122]	0~0.44 {0~4.5} [0~63.8]	0~0.03 {0~0.3} [0~4.4]	10 [1.8]	Rc3/8	Rc1/8
F-AVB500					12 [2.5]	Rc1/2	
F-AVB600					16 [6.5]	Rc3/4	
F-AVB750				20 [7.0]			
F-AVB1000				0~0.2 {0~2.0} [0~29]	0~0.02 {0~0.2} [0~2.9]	25 [11.0]	

● For details of order codes and specifications, consult us.



Air Operated Valve

F-AVP500, 750

Diaphragm type 2-port valve

Model	Operating temperature range °C [°F]		Operating pressure range MPa {kgf/cm ² } [psi.]		Orifice mm [Cv]	Port size	
	Media	Atmosphere	A→B	B→A		Main	Operating port
F-AVP500	5~60 [41~140]	0~50 [32~122]	0~0.5 {0~5.1}	0~0.3 {0~3.1}	12 ^{Note 2} [2.5]	Outer dia. 1/2" tube	Rc1/8
F-AVP750	(5~100 [41~212] ^{Note 1})				20 ^{Note 2} [7.0]	Outer dia. 3/4" tube	

● For details of order codes and specifications, consult us.

Notes: 1. For medium temperature specifications

2. Valve seat orifice



Check Valve

F-C375, 500

Model	Operating temperature range °C [°F]		Operating pressure range MPa {kgf/cm ² } [psi.]	Effective area mm ² [Cv]	Port size
	Media	Atmosphere			
F-C375	5~60 [41~140]	0~50 [32~122]	0.07~0.9 {0.7~9.2}	74 [3.7]	Rc3/8
F-C500					Rc1/2

● For details of order codes and specifications, consult us.



Drain Valve Series

● For details of order codes and specifications, consult us.

Drain Valve Union Type (2-port, 3-port)

F-AVE1000~4000

Model	Operating temperature range °C [°F]		Operating pressure range MPa (kgf/cm ²) [psi.]	Orifice mm	Port size	
	Media	Atmosphere			Main	Operating port
F-AVE1000	5~40 [41~104]	5~40 [41~104]	0~0.02 {0~0.2} [0~2.9]	25	25A	Rc1/8
F-AVE1500				30	32A	
F-AVE2000				40	40A	
F-AVE2500				50	50A	
F-AVE3000				65	65A	
F-AVE4000				78	75A	
F-AVE4000				100	100A	

Body material: PVC, PP

O-ring material: FKM, EPDM, perfluorinated rubber. Other types of O-ring materials are also available upon request.

● For details of order codes and specifications, consult us.



Drain Valve Flange Type (2-port)

F-AVE4000, 5000, 6000

Model	Operating temperature range °C [°F]		Operating pressure range MPa (kgf/cm ²) [psi.]	Orifice mm	Port size	
	Media	Atmosphere			Main	Operating port
F-AVE4000	5~40 [41~104]	5~40 [41~104]	0~0.02 {0~0.2} [0~2.9]	100	100A	Rc1/8
F-AVE5000				125	125A	
F-AVE6000				150	150A	

Body material: PVC, PP

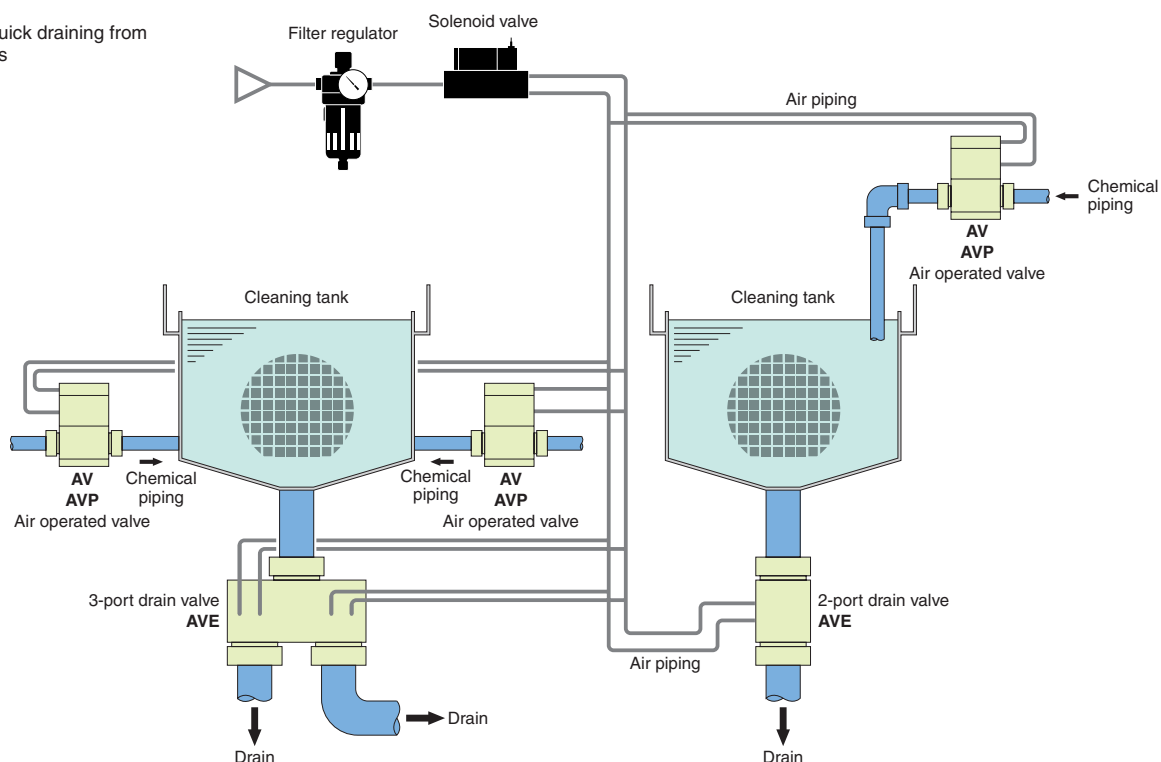
O-ring material: FKM, EPDM, perfluorinated rubber. Other types of O-ring materials are also available upon request.

● For details of order codes and specifications, consult us.



Drain valve (2-port, 3-port) application example

Suitable for quick draining from cleaning tanks



Other Related Products

■ PTFE Ejector

Suitable for suction of corrosive gases



■ PTFE Needle Valve

Suitable for adjustment of flow rate
from shut down to micro flow



■ PTFE, PFA Lever Valves

Manual lever ensures easy opening and closing.



Speed Controller for Pilot Air Control

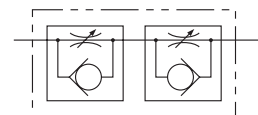
TSC-60W



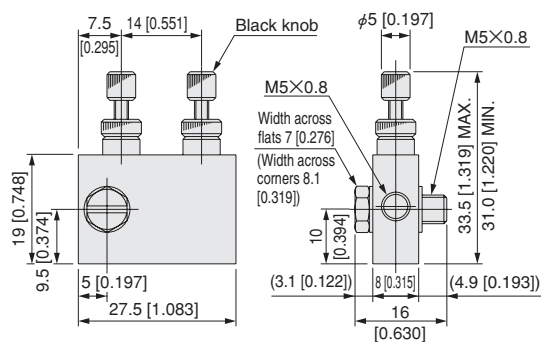
■ Specifications

Item	Model	TSC-60W
Media		Air
Operating pressure range	MPa {kgf/cm ² } [psi.]	0~0.9 {0~9.2} [0~131]
Operating temperature range	°C [°F]	5~60 [41~140]
Cracking pressure	MPa {kgf/cm ² } [psi.]	0.05 {0.51} [7.3]
Description		Both directions adjustment speed controller
		Low flow rate type
		Special piping direction
		Black knob on one side

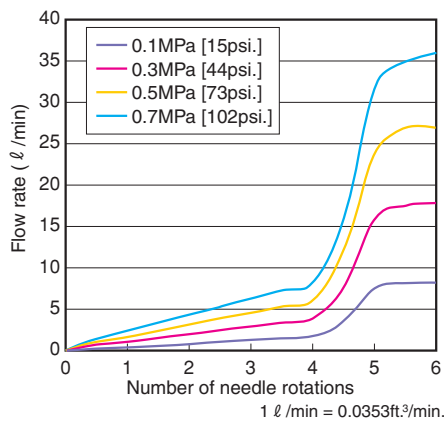
Symbol



■ Dimensions mm [in.]



■ Flow rate characteristics



Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

Limitations

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.

- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.

- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.

- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.

- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

Koganei also handles many related items. Please feel free to consult us.

— High-performance control of dispensing and quantitative discharges for semiconductors, liquid crystals, biotechnology, medical products, etc. industries—

High-Performance Dispensing and Quantitative Discharge Pump Series

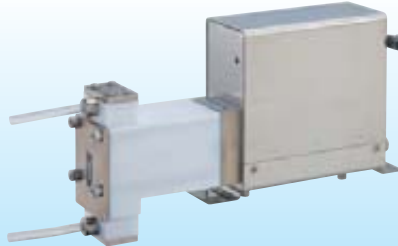
Achieves high reliability and high accuracy.

Electric CT Pump PATENTED. F-EPT Series



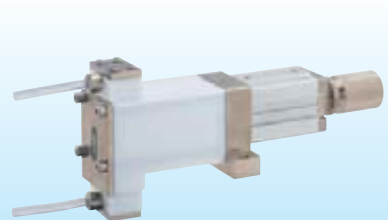
Easy-to-use stepping motor drive method.

Electric Bellows Pump F-EPB Series



Low-cost type air cylinder actuator.

Pneumatic Bellows Pump F-APB Series



— For electric CT pump and electric bellows pump —

Pump Controller



ISO9001
ISO14001



- ISO 9001 certified offices are Main Office, Komagane Plant, and Sales Offices.
- ISO 14001 certified offices are Main Office, and Komagane Plant.

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