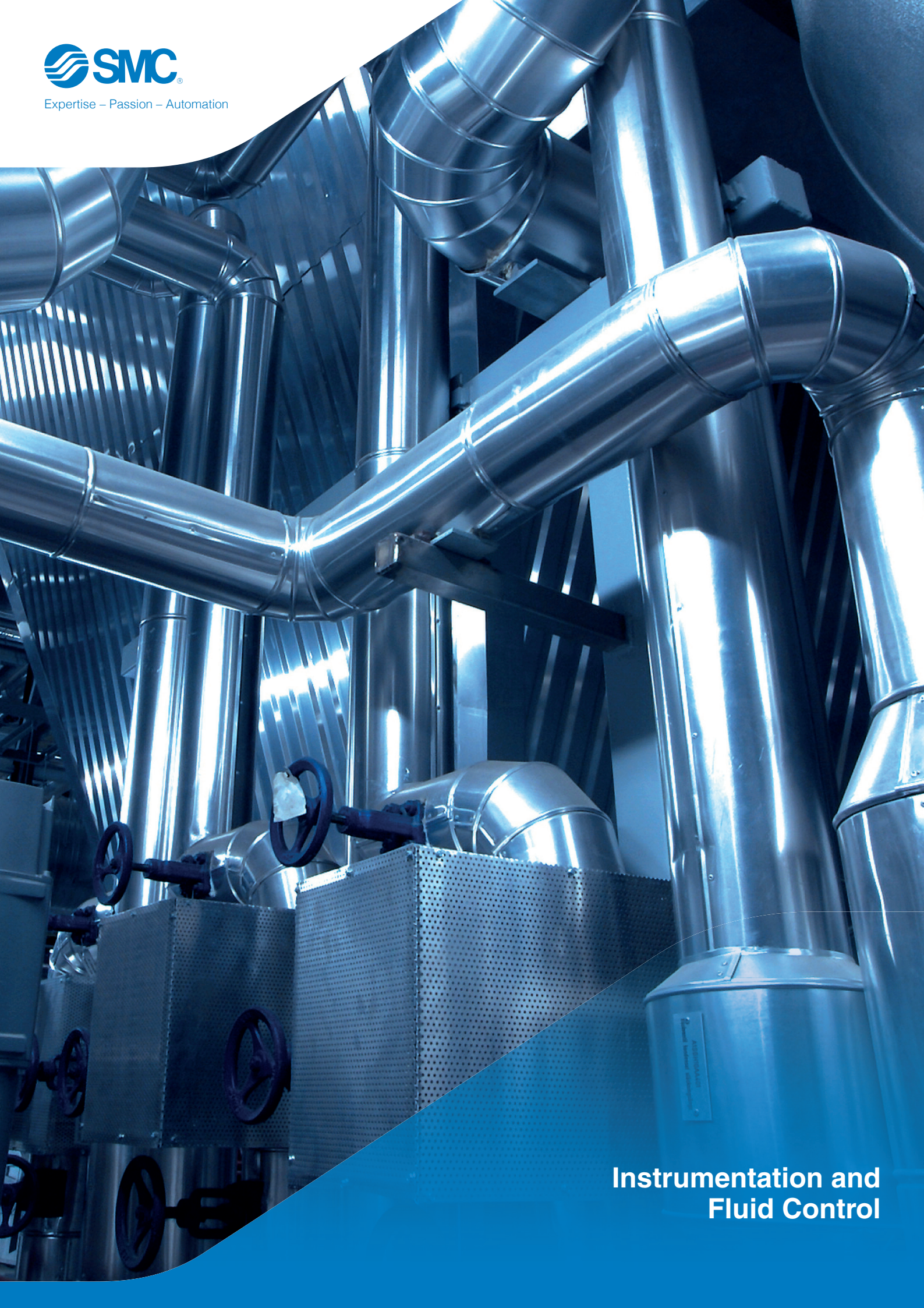




Expertise – Passion – Automation



**Instrumentation and
Fluid Control**



Fluid Control and Instrumentation

Since the development of the principle of automatic manufacture in the early 1800s, and the subsequent dramatic advances in machine tooling and manufacturing methods over the past two hundred years, today's machine builders now have a vast array of standard and specialist products to help ensure accurate and efficient automated assembly line manufacturing.

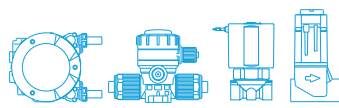
This unabated strive for improved mass production methods, plus the development of improved measuring and analytical instruments and advanced computer technology for control applications has created a unique engineering sector which is now known as the Process Control Industry (PCI).

As the leading expert in pneumatics, our organisation has been at the forefront of innovative factory automation solutions for over 50 years, and our impressive knowledge and portfolio of process control products is second to none.

Demonstrating this expertise, our new Fluid Control and Instrumentation Leaflet has been specifically designed to provide you with an easy-to-reference overview of our key products for use in PCI applications.

If you would like to know more about our Process and Instrumentation products including customised options, please contact your nearest SMC office using the address, phone and e-mail details shown on this leaflet back page.

With 400 sales offices in 81 countries and with nearly 8,000 fully trained sales engineers - the largest in our industry - supported by more than 1,500 R&D engineers, we are never far away and always on-hand ready to help you find the perfect PCI solution.



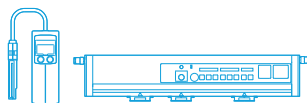
① Process valves and fluid pumps

Process valves
Fluid pumps



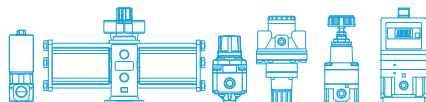
② Pressure, vacuum and flow switches

Digital pressure switches
Mechanical pressure switches
Pressure gauges
Digital flow switches
Mechanical flow switches



③ Ionizers

Ionizer
Electrostatic sensor, meter and monitor



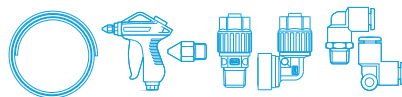
④ Proportional valves and pressure regulators

Electro-pneumatic regulators
Precision regulators
Clean regulators
Booster regulator and air tank
Proportional valves



⑤ Industrial filters

Low maintenance filter
Vessel series



⑥ Fittings and tubing

Fittings for general purposes, special environments
Tubing
Nozzles for blowing



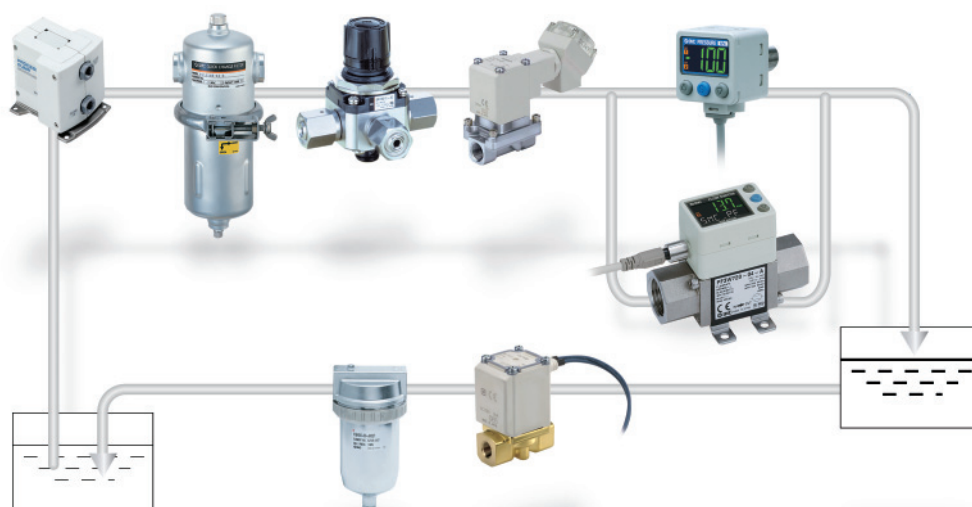
Fluid Control

SMC's impressive product range can offer nearly any product for controlling various fluids in lines up to 2" like the following:

Compressed Air Line

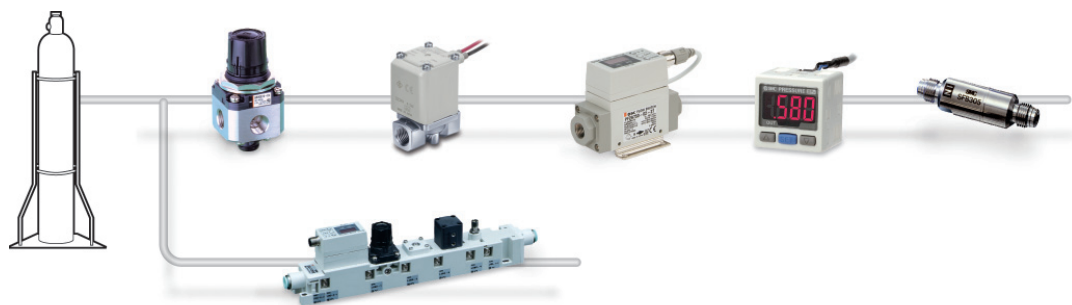


Fluid Control Line





Inert Gas Line



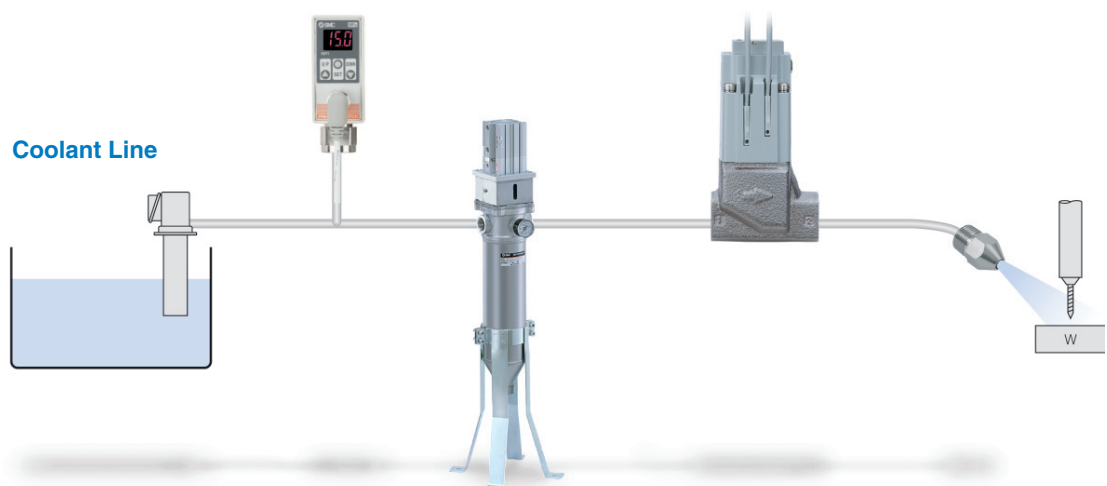
Application examples: noble gases (helium, argon) are used in research laboratories, chemical/pharmaceutical production, with medical purposes or welding. Inert gases are also used to create inert atmospheres for food packaging (nitrogen) or electronic device manufacturing.

Deionised Water/Chemicals Line



Application examples: production of electronic chips and devices, lab research, pharmaceutical production, drug dosing and medical appliance.

Coolant Line



Application examples: drilling, milling, cutting, machining in general.

1 Process Valves and Fluid Pumps



Process Valves

Air Operated



VXA2/3

- 2/3 port valve for air, vacuum, water, oil
- VXA2 valve type: NC, NO; Port size: 1/8" to 1/2"; Orifice size: 3 to 10 mm
- VXA3 valve type: CO; Port size: 1/8" to 3/8"; Orifice size: 1.5 to 4 mm



VN□

- 2 port valve **for general purpose**
- VNA: air, gas, air-hydro
- VNB: air, inert gas, low vacuum, water, heated water, oil
- VND: steam



VXB

- Compact angle seat valve for air, water, steam
- Body material: stainless steel (316L) and bronze available
- Operating pressure range up to 1.6 MPa
- Valve type: NC, NO
- Option: with indicator

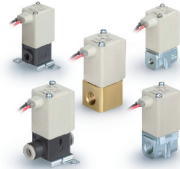


Direct Operated



VX2

- **General purpose**
- 2 port solenoid valve for air, vacuum, water, oil, steam
- Reduced power consumption, built-in full-wave rectifier
- Valve type: NC, NO; Port size: 1/8" to 1/2"; One-touch fitting: 6 to 12 mm; Orifice size: 2 to 10 mm



VDW

- Compact 2 Port Solenoid Valve for air, vacuum and water
- Compact and lightweight
- Improved durability, high flow rate
- Port size: M5 to 1/8"; One-touch fitting: 3.2 to 6 mm; Orifice size: 1 to 3.2 mm



VXK

- 2 port solenoid valve **with built-in strainer** for air, water, oil, steam
- Built-in strainer enabling the removal of contaminants
- Valve type: NC, NO; Port size: 1/8" to 3/8"; Orifice size: 2 to 8 mm



VX3

- 3 port solenoid valve for air, vacuum, water, oil, steam
- Reduced power consumption, built-in full-wave rectifier
- Valve type: NC, NO, CO; Port size: 1/8" to 3/8"; Orifice size: 1.5 to 4 mm



VDW30/40-XF

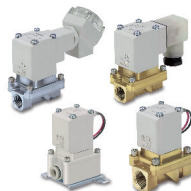
- 2 Port Solenoid Valve for air and water
- Compact and lightweight
- Reduced power consumption
- Valve type: NC; One-touch fitting: Ø 4 to Ø 10; Quick fastener: P7 to P10; Orifice size: 1 to 6 mm

Pilot Operated



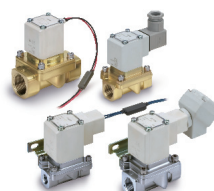
VXD

- **General purpose**
- 2 port solenoid valve for air, water, oil
- Reduced power consumption, built-in full-wave rectifier
- Valve type: NC, NO; Port size: 1/4" to 1", 32 to 50 A; One-touch fitting: 10 to 12 mm; Orifice size: 10 to 50 mm



VXZ

- **Zero differential pressure** type, 2 port solenoid valve for air, water, oil
- Reduced power consumption, built-in full-wave rectifier
- Valve type: NC, NO; Port size: 1/4" to 1"; One-touch fitting: 10 to 12 mm; Orifice size: 10 to 25 mm



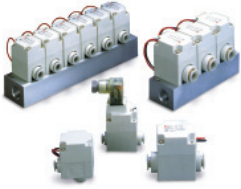
VXS

- **Zero differential pressure** operation, 2 port solenoid valve **for steam**
- Compact and lightweight, built-in full-wave rectifier, internal leakage of 1 cm³/min
- Valve type: NC; Port size: 1/4" to 1"; Orifice size: 10 to 25 mm



VXH

- 2 port solenoid valve **for high pressure** (2 MPa) air, water, oil
- Valve type: NC; Port size: 1/4" to 1/2"; Orifice size: 10 mm



VQ20/30

- 2 port solenoid valve pilot operated, for dry air
- **High frequency operation:** high speed response 7 ms or less (VQ20), 20 ms or less (VQ30)
- Compact and lightweight with large flow capacity: VQ20: 46 g, 9 NI/min; VQ30: 80 g, 17.5 NI/min



SGC

- 2 port, air operated/ external pilot solenoid valve for controlling **cutting oils and coolant** used in machine tools
- Low power consumption: 0.35 W
- Operating pressure range: 0 to 0.5 MPa / 0 to 1 MPa / 0 to 1.6 MPa
- Service life: 5 million cycles or more



SGH

- 2 and 3-port **coolant valve for high pressure** applications (3 MPa / 7 MPa)
- Low power consumption: 0.35 W
- Service life: 3 million cycles
- Water hammer reduced
- High flow rate



VCH

- **5.0 MPa Pneumatic Equipment Series**
- VCH40/400: pilot operated 2/3 port solenoid valve - Response time variation within ± 2 ms, service life: 10 million cycles
- VCHC40: check valve - service life: 10 million cycles
- VCHR30/40: direct operated regulator (relieving type)
- VCHN3/4: silencer - 35 dB(A) noise reduction



VXF

- 2 Port solenoid valve for dust collector
- Reduced power consumption, built-in fullwave rectifier
- Port size: 3/4" to 3"; Flange type: 65 A to 100 A; Orifice size: 22 to 100 mm



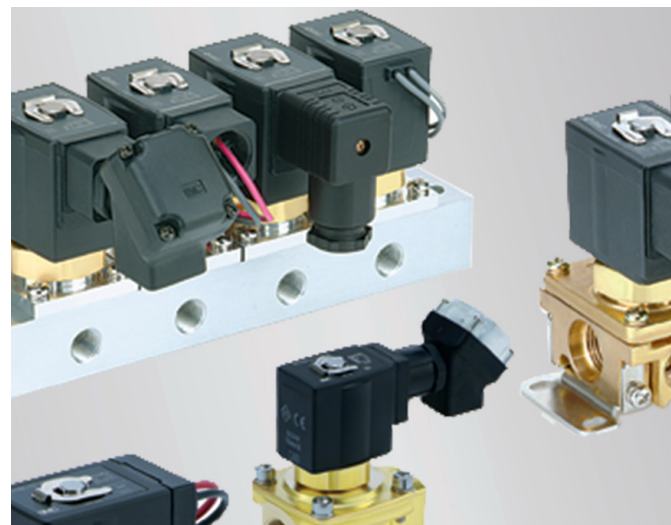
VXFA

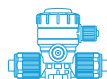
- 2 Port air operated valve for dust collector
- Port size: 3/4" to 3"; Flange type: 65 A to 100 A; Orifice size: 22 to 100 mm



VXE

- **Energy saving type** of the VX2, VXD and VXZ 2 port solenoid valve series
- Power consumption is reduced down to 1/3 of the original
- Coil heat reduction
- Valve type: NC; Port size: 1/8" to 1", 32 to 50 A; Orifice size: 2 to 50 mm





High Purity Chemical Valves - Clean Wet Series



LVA

- Air operated valve
- Threaded type, tubing extension type, double-ferrule fittings, metal gasket seal fittings
- Diaphragm material PTFE, EPDM, NBR is selectable
- Body material: new PFA, stainless steel, PPS
- ATEX compliant



LVQ

- Non-metallic construction without using metal screws to fasten the body of the actuator
- Variation: air / manually operated; insert bushing / flare and integral fitting types



LVP

- Vinyl Chloride Air Operated Valve with PVC unfixed union
- Diaphragm material: PTFE
- Body material: CPVC



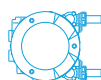
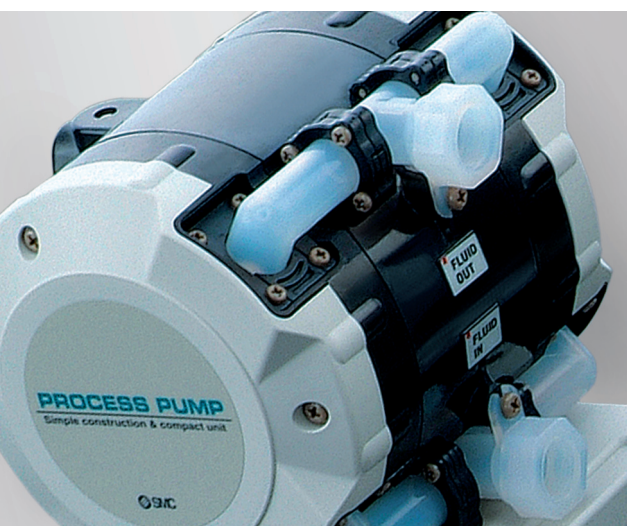
LVM

- Compact direct operated 2/3 port solenoid valve for chemicals
- Variation: orifice diameter 1.1, 1.4, 1.6 and 2 mm. Wetted part material: PEEK, EPDM, FKM, FFKM



LVMK

- 2/3 Port Media Separated Valve
- 2 models: Base mounted and Body ported
- Seal material: EPDM, FKM
- Body material: PPS
- Valve type: NC, universal;
- Orifice size: 2 mm



Diaphragm Fluid Pumps



PB1000

- Single acting pump; built-in solenoid valve / air operated type
- Compact, high capacity diaphragm pump to transfer and deliver a wide variety of fluids
- Discharge flow rate: max. 2 l/min



PA3000/5000

- Double acting pump, automatically operated type/air operated type
- Compact, high capacity diaphragm pump to transfer and deliver a wide variety of fluids
- Automatically operated (discharge flow rate: max. 45 l/min) / Air operated (discharge flow rate: max. 34 l/min)
- ATEX compliant



PAF3000/5000

- Excellent corrosion resistance - Body material: new PFA; Diaphragm, seal material: PTFE
- Automatically operated (discharge flow rate max. 45 l/min) / air operated (discharge flow rate max. 38 l/min)

2 Pressure, Vacuum and Flow Switches



Digital Pressure Switches (Integrated Type)



ZSE30A(F) / ISE30A IP40

- 2-colour display high-precision digital pressure switch
- Settings can be copied to up to 10 slave sensors at once
- Rated pressure range: vacuum/compound: 0.0 to -101.0 kPa, -100 to 100 kPa; positive: -0.1 to 1.0 MPa



ZSE40A(F) / ISE40A IP65

- 2-colour display high-precision digital pressure switch
- Settings can be copied to up to 10 slave sensors at once
- Rated pressure range: vacuum/compound: 0.0 to -101.3 kPa, -100 to 100 kPa; positive: -0.1 to 1.0 MPa

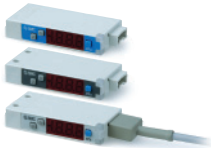


ZSE80 / ISE80 IP65

- Digital pressure switch for accurate sensing of a variety of fluids
- Stainless steel construction
- Pressure range: vacuum: [-0.1, 0] MPa; compound: [-0.1, +0.1] MPa positive: [-0.1, 1] and [-0.1, 2] MPa



For Air : **IP1**
For General Fluids : **IP0**



ZSE10(F) / ISE10 IP40

- Space saving due to its very compact width, 9.8 mm, and reduced depth: mounting space reduced to approximately 1/2
- Can copy up to 10 switches simultaneously
- Improved multiangle direction visibility



ISE70/75(H) IP67

- 2-colour display type digital pressure switch
- Rated pressure: 1 MPa for air (ISE70); 10 MPa (ISE75) and 15 MPa (ISE75H) for general fluids
- Metal body type (die-cast aluminium)



PS1000/1100/1200 IP40

- Pressure/vacuum switch
- LED switch point display
- Miniature design
- For mounting directly to one-touch fittings
- Piezo sensor gives long service life
- Can be plugged straight into a Ø 6 mm one-touch fitting



Pressure Gauges



G36/46-L

- Pressure gauge with limit indicator, colour zone type: the indicator adjusts to highlight preferred range
- Pressure range: 0 to 0.2, 0 to 0.4 and 0 to 1.0 MPa



GD40-2-01

- Differential pressure gauge: ideal for the maintenance control of filters
- Compact and lightweight
- Accuracy: ± 0.006 MPa





Digital Pressure Switches (Remote Type)



PSE530

IP40

- A single controller (PSE200) monitors up to 4 pressure sensors (PSE530)
- Space saving (76 % reduction in installation space), simplified application
- Pressure range: high pressure [0, 1] MPa, vacuum [0, -101] kPa, low pressure [0, 101] kPa, compound pressure [-101, 101] kPa



PSE540

IP40

- Compact pressure sensor for pneumatics (controller: PSE300)
- Weight: 2.9 g
- Pressure range: vacuum [0, -101] kPa, compound pressure [-100, 100] kPa



PSE560

IP65

- Pressure sensor for general purpose fluids (controller: PSE300)
- Wetted material: SUS316L
- Pressure range: positive pressure [0, 500] kPa and [0, 1] MPa, vacuum [0, -101] kPa, compound pressure [-100, 100] kPa



PSE200

- Sensor controller unit
- Controller for 4 sensor inputs
- Automatic sensor recognition
- Auto shift function



PSE300

- Sensor controller unit
- 2 colour display determined by switching status
- 2 switch outputs and analogue output



PSE570

IP65

- Pressure sensor for general purpose fluids (controller PSE300)
- Proof pressure: 3 times higher than the rated pressure
- Rated pressure range: compound: -100 to 100 kPa; positive: 0 to 500 kPa, 0 to 1 MPa, 0 to 2 MPa, 0 to 5 MPa, 0 to 10 MPa



PSE300AC

IP65

- Sensor monitor unit
- 3-screen display
- NPN/PNP switch function
- IP65 enclosure
- M12 connector



Mechanical Pressure Switches



IS10

IP40

- Compact and lightweight mechanical pressure switch, reed type
- Set pressure: 0.1 to 0.6 MPa



IS3000

IP40

- Pneumatic pressure switch
- Can be used for small electrical loads (10 mA) e.g. relays, programmable controllers, etc.
- Set pressure: 0.1 to 0.7 MPa



ISG

IP44

- General purpose pressure switch
- Pressure range: positive [0.02, 0.3] MPa, [0.05, 0.7] MPa, [0.1, 1] MPa; vacuum [-10, -100] kPa



Digital Flow Switches for Air



PFM

IP40

- 2-colour display digital flow switch
- Variation: PFM7 = Integrated display; PFM5 = Remote sensor unit; PFM3 = Flow sensor monitor
- Compact size: the use of MEMS technology makes possible to achieve a small dimensional space and additionally a lightweight product
- Flow rate range: 10, 25, 50, 100 l/min
- Applicable fluids: dry air, N₂, Ar, CO₂



PFMV

IP40

- Variation: PFMV5 = Flow Sensor; PFMV3 = Voltage Monitor for PFMV5
- Precise suction confirmation of very small work pieces
- Flow rate range (PFMV5): [0, 0.5], [0, 1.0], [0, 3.0], [-0.5, 0.5], [-1.0, 1.0], [-3.0, 3.0] l/min
- Applicable fluids: dry air, N₂



PF2A

IP65

- Integrated and remote type
- PF2□ 200 = 4-channel flow monitor
- Flow rate setting and monitoring are possible with the digital display
- Flow rate range from 1 up to 500 l/min
- Applicable fluids: dry air, N₂



PFMB

IP40

- 2-colour digital flow switch
- Compact size
- Integrated flow adjustment valve
- Reverse display function
- Flow range: 2 to 200 l/min, 5 to 500 l/min, 10 to 1000 l/min, 20 to 2000 l/min
- Applicable fluids: dry air, N₂



PFMC

IP65

- 3-colour digital flow switch
- Compact size
- Bypass structure
- Rotary display
- Flow range: 5 to 500 l/min, 10 to 1000 l/min, 20 to 2000 l/min
- Applicable fluids: dry air, N₂



PF3A

IP65

- 3-colour digital flow switch
- Reverse display function
- Rotary display
- Bypass structure
- Flow range: 30 to 3000 l/min, 60 to 6000 l/min, 120 to 12000 l/min
- Applicable fluids: Air, N₂



Flow Switches for Fluids



IFW5

IP42

- Diaphragm type flow switch
- Low flow setting possible: 1 l/min
- Flow range: 1 to 10 l/min, 10 to 20 l/min, 20 to 50 l/min



IF3

IP44

- Paddle type flow switch
- Wide range of applicable fluids
- Flow range: 14 to 60 l/min, 20 to 1500 l/min, 36 to 2600 l/min



PF3W

IP65

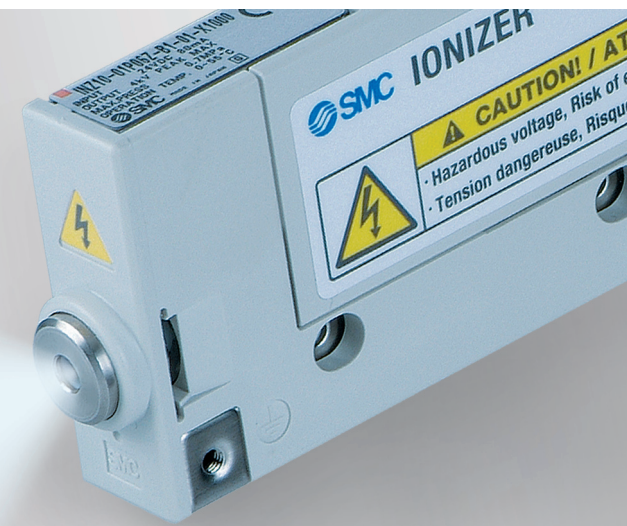
- 3-colour display Digital Flow Switch for fluids
- Integrated flow adjustment valve and temperature sensor
- Integrated and remote type
- PVC piping type
- Flow range: Up to 250 l/min
- Applicable fluids: water, deionized water, chemical, etc.



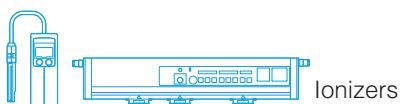
LFE

IP65

- 3-colour electromagnetic digital flow switch
- Integrated and remote type
- Compact size
- Reverse flow detection function
- Flow range: 0.5 to 20 l/min, 2.5 to 100 l/min, 5 to 200 l/min
- Applicable fluids: Water, Water-soluble coolant
- Piping connection parts material: Stainless steel 304 (-X8)



3 Ionizers



Ionizers



IZS40/41/42

- Bar type ionizer
- Controlled ion balance with sensors: feedback, autobalance (high precision type) and autobalance (body mounting type)
- Electrode cartridges: high speed static removal type and low maintenance type



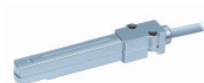
IZN10

- Nozzle type and high frequency AC type ionizer
- With built-in power supply substrate: 16 mm thickness
- Nozzle selectable: energy saving and large flow types
- ± 10 V ion balance
- Contaminated electrode needle detection function



IZF10

- Compact fan type ionizer
- Two fan models: rapid elimination of static electricity / low noise
- ± 13 V ion balance
- Alarm function: high-voltage error, electrode needle contamination detector



IZD10

- Electrostatic sensor
- Potential measurement: ± 20 kV (detected at a 50 mm distance), ± 0.4 kV (detected at a 25 mm distance)
- Analogue output: The measured electrostatic potential is converted into a 1 to 5 V output that can be used with the IZE11



IZE11

- Electrostatic Sensor (IZD10) Monitor
- Supports two types of sensors: ± 0.4 kV and ± 20 kV
- Minimum unit setting: 0.001 kV (at ± 0.4 kV), 0.1 kV (at ± 20 kV)
- Display accuracy: ± 0.5 %



IZH10

- Handheld electrostatic meter: a portable sensor that detects the electrostatic potential of an object and outputs a digital readout
- Rated charge amount range: ± 20.0 kV
- Compact and lightweight



IZF21/31

- Fan type ionizer
- ± 5 V ion balance
- Rapid static neutralisation: 0.5 seconds
- Automatic balance adjustment function
- Contaminated electrode needle detection function
- Flow Rate Adjustment Function
- Cleaning function



ZVB

- Desktop Duster Box
- 3 functions in 1 unit: Static neutralisation, Dust removal, Dust collection - ± 10 V ion balance

4 Proportional Valves and Pressure Regulators



Electro-Pneumatic Regulators



ITV0000

- Compact (15 mm) and lightweight (100 g)
- 4 pressure ranges [0.1, 0.5, 0.9 MPa and -100 kPa]
- High speed response time (0.1 s) and stability (sensitivity 0.2 % f.s.)



ITV1000/2000/3000

- Stepless control of air pressure proportional to an electrical signal
- With added Fieldbus protocol compatibility: CC-Link, DeviceNet™ and Profibus
- Serial communication RS-232C available



ITVX

- High Pressure Electro-Pneumatic Regulator
- Applicable fluids: air, nitrogen, oxygen, argon
- Maximum supply pressure: 5.0 MPa
- Flow rate up to 3000 l/min



ITVH

- High Pressure Electro-Pneumatic Regulator
- Maximum supply pressure: 3.0 MPa
- Flow rate up to 3000 l/min
- Port size: 1/4" to 3/8"



Process Gas Equipment - APTech



AP

- Diaphragm valves for ultra high purity
- Suitable for UHP gas supply line
- Body material: 316L SS secondary remelt
- Air operated type / Manually operated type
- High pressure type: Max. 3000 psig (20.7 MPa)



AK

- Single or two stage regulator for general applications
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Body material: stainless steel and brass available
- Ni-Cr-Mo Alloy (2.4602) internals available for corrosion resistance



AKPA

- Pneumatic actuation pressure regulator
- Actuation control pressure isolated from process gas by two seals
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Body material: 316 SS
- Ni-Cr-Mo Alloy (2.4602) internals available for corrosion resistance



KT

- Single stage regulator
- Inlet pressure : Max. 10000 psig (69 MPa)
- Body material: Stainless steel or brass
- Self relieving or non-relieving available



VBA/VBAT

- Increase factory air pressure by up to twice
- No need of an electrical supply
- Major energy savings
- ATEX compliant



Clean Regulators



SRH

- Contamination controlled stainless steel regulator
- Consistent clean room production



SRP

- High precision, low flow consumption stainless steel regulator
- Consistent clean room production
- Setting sensitivity: 0.3 % F.S.



SRF

- Clean regulator, fluoro resin type
- Wetted part materials: body: new PFA, diaphragm: PTFE
- 2, 5 and 20 l/min type
- Increases the main circuit pressure to an adjustable value



Proportional Valves



PVQ

- Compact proportional solenoid valve
- Smooth control of the flow rate by electric current adjustment
- Flow rate control range: PVQ10: 0 to 6 l/min; PVQ30: 0 to 100 l/min



5 Industrial Filters



FN1/FN4

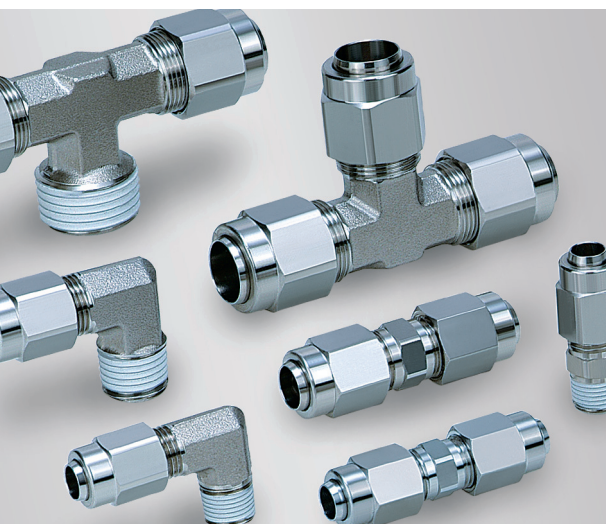
- Low maintenance filter: environmentally-friendly filter for coolants and detergents with back-flushing performance that allows normal operation with no need to replace the element
- Flow rate: FN1: 40 and 80 l/min; FN4: 250 l/min
- Nominal filtration rating: 5, 20 μ m

FG□

- Industrial filters: vessel series [FGD, FGE, FGG, FGA, FGC, FGF, FGH]
- Nominal filtration rating: 0.2 to 105 μ m
- Flow rate: 60 to 3800 l/min

FQ1

- Filter for cleaning solvent
- Quick change filter: no tools required
- Nominal filtration rating: 0.2 to 105 μ m
- Port size: 1/2" to 1"



6 Fittings and Tubing



Fittings (for General Purposes)



KQ2

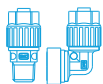
- One-touch fittings
- Port size: M3 to 1/2"
- Applicable tubing O.D.: Metric: \varnothing 3.2 mm to \varnothing 16 mm
Inch: \varnothing 1/8" to \varnothing 1/2"

KQB2

- Brass (electroless nickel plated) one-touch fittings
- Port size: M5 to 1/2"
- Applicable tubing O.D.: Metric: \varnothing 3.2 mm to \varnothing 16 mm
Inch: \varnothing 1/8" to \varnothing 1/2"

KK130

- Energy saving S coupler
- Port size [thread type (male and female)]: 1/8" to 1/2"
- Applicable hose O.D. [Barb and one-touch fitting types]: 6 to 12 mm / 1/4" to 1/2"
- Applicable hose I.D./O.D. [nut fitting type]: 5/8 mm to 11/16 mm



Fittings (for Special Environments)



KQG2

- Stainless steel 316 one-touch fittings
- Port size: M5 to 1/2"
- Applicable tubing O.D.: Metric: \varnothing 3.2 mm to \varnothing 16 mm
Inch: \varnothing 1/8" to \varnothing 1/2"

KFG2

- Stainless steel 316 insert fittings
- Port size: 1/8" to 1/2"
- Applicable tubing O.D.: Metric: \varnothing 3.2 mm to \varnothing 16 mm
Inch: \varnothing 1/8" to \varnothing 1/2"

KP

- Clean one-touch fittings
- Port size: 1/8" to 1/2"
- Applicable tubing O.D.: \varnothing 4 mm to \varnothing 12 mm

LQ1, LQ3

- Fluoropolymer fittings (new PFA): hyper fittings
- Variation: LQ1, LQ3 (flare type)

KKA

- S couplers stainless steel type
- Port size [thread type (male and female)]: 1/8" to 1 1/2"



Nozzles for Blowing



KN

- Male thread nozzle: nozzle size Ø 1 to Ø 2.5, connection thread 1/4"



KNH

- High efficiency nozzle (air blow thrust: +10 %): nozzle size Ø 1 to Ø 2, connection thread 1/4"



KNS

- Low noise nozzle with male thread: nozzle size Ø 0.75 x 4 to Ø 1.1 x 8, connection thread 1/4"



KNL

- Copper extension nozzle: nozzle size Ø 1.5 to Ø 2, outside diameter Ø 6



Tubing



T

- Nylon tubing
- 6 colour variations
- Tubing O.D. [mm]: 4 to 16
- Tubing I.D. [mm]: 2.5 to 13
- Minimum bending radius [mm]: 13 to 100



TU

- Polyurethane tubing
- 29 colour variations
- Tubing O.D. [mm]: 2 to 16 [metric] / 3.18 to 12.7 [inch]
- Tubing I.D. [mm]: 1.2 to 10 [metric] / 2 to 8.46 [inch]
- Minimum bending radius [mm]: 4 to 45 [metric] / 10 to 35 [inch]



TPH

- Clean tubing: polyolefin tubing
- Tubing O.D. [mm]: 4 to 12
- Tubing I.D. [mm]: 2.5 to 9
- Minimum bending radius [mm]: 15 to 55



TPS

- Clean tubing: soft polyolefin tubing
- Tubing O.D. [mm]: 4 to 12
- Tubing I.D. [mm]: 2.5 to 9
- Minimum bending radius [mm]: 10 to 40



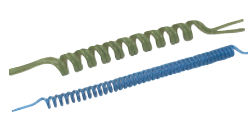
TD/TID

- Soft fluoropolymer tubing (modified PTFE)
- Tubing O.D. [mm]: 4 to 12 [metric] / 3.18 to 12.7 [inch]
- Tubing I.D. [mm]: 2.5 to 9 [metric] / 2.18 to 9.5 [inch]
- Minimum bending radius [mm]: 15 to 75 [metric, inch]



TL/TIL

- Fluoropolymer tubing (super PFA)
- Tubing O.D.: 4 to 19 mm [metric] / 3.18 to 25.4 [inch]
- Tubing I.D.: 3 to 16 mm [metric] / 2.18 to 22.2 [inch]
- Minimum bending radius [mm]: 20 to 160 [metric] / 12 to 290 [inch]



TCU

- Polyurethane coil tubing
- Number of cores: 1, 2, 3
- Tubing O.D. [mm]: 4, 6, 8
- Tubing I.D. [mm]: 2.5, 4, 5



TH

- FEP tubing (fluoropolymer)
- Heat resistant: 200 °C
- Tubing O.D. [mm]: 4 to 12
- Tubing I.D. [mm]: 2 to 10



TLM

- Fluoropolymer tubing (PFA)
- Max. operating temperature: 260 °C
- Tubing O.D. [mm]: 2 to 25
- Tubing I.D. [mm]: 1 to 22



TQ

- 2-Layer soft fluoropolymer tubing
- Outer layer: special nylon resin / Inner layer: special fluoropolymer
- Tubing O.D. [mm]: 4 to 12
- Tubing I.D. [mm]: 2.5 to 9



TRTU

- Flame resistant three-layer polyurethane tubing
- Outer layer: Flame resistant polyolefin (Equivalent to UL-94 standard V-0); Middle layer: Aluminium laminated film; Inner tube: Polyurethane
- Tubing O.D. [mm]: 6 to 12
- Tubing I.D. [mm]: 4 to 8





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