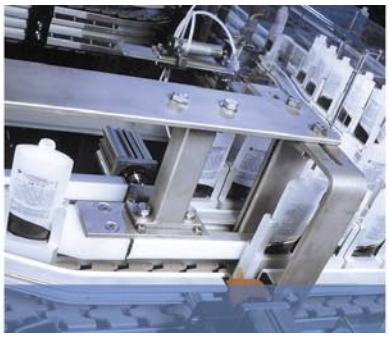
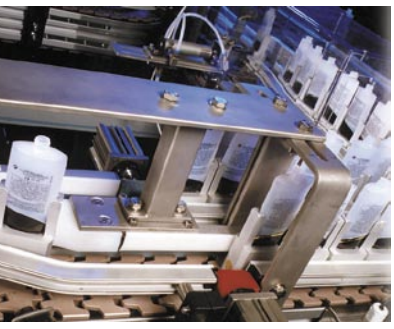
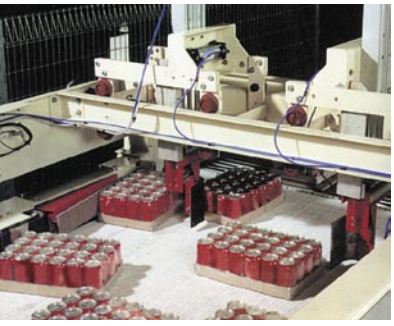



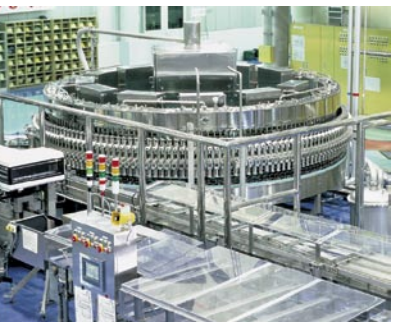
# SMC Food & Packaging Industry

"Partners in Packaging" Dedicated to product innovation for the Food Processing and Packaging Industry

EMC-FOOD-A-UK







# SMC Food & Packaging Industry

The development of sophisticated automation in the industrial world has been a spark for the rapid growth, in the use of pneumatic components. From a mainstay of core industries such as automotive, electrical, food and **packaging processing**, pneumatic components have moved into a wide range of other industrial fields. High technology applications are growing fast, making pneumatics indispensable in **high-tech industries** such as Information Technology. Additionally, pneumatic components are playing an increasing role in the field of medicine, nursing care and consumer applications.

SMC has built an organisation that listens carefully to our customers and responds quickly and specifically to their needs.

In these fast-moving and competitive times customer satisfaction can only be achieved by having a clear understanding of our customer´s goals and objectives.

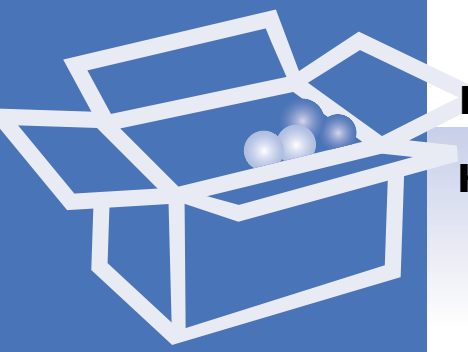
To this end, we have established a global network of highly skilled engineers to focus their activities specifically on both the Food and Packaging Industries.

We know the strict regulations that govern the production process within these industry sectors, and meet these market demands by providing solutions which often combine today´s most advanced technologies.

**SMC offers our European customers:**

- Fully trained specialist sales and engineering teams in all our European subsidiaries
- Special products designed and built to meet the challenges of both the Food and Packaging Industries
- Special customised solutions to meet even the most demanding applications

# Index Food & Packaging Industry



# SMC is pursuing customer satisfaction and supporting automation worldwide through the design and production of the worlds most advanced pneumatic and fluidic control technologies

The 21st century — with the revolution in global information technology, business methods are undergoing great changes. In these quickly developing, ever changing times, customer satisfaction can only be achieved by a clear understanding of our customers' goals and objectives. Therefore, SMC has built an organization that listens carefully to our customers, then responds quickly, and specifically, to their needs. SMC has established a widespread global network of locations in all major countries of the America's, Europe and Asia showing our active commitment to the world market. SMC supports this global network with a stable supply chain of global products, a high level of technical service and solid communications network to meet our customers' needs and expectations.

## Technical Development

**Our engineering staff now exceeds 1,000 and are located in Technical centres in Japan, United States and Europe.**

Quick, clear and detailed responses to customer requests are communicated through our sales group, and our engineers are constantly on the alert for new trends that lead to world class new products.

## Sales and Communication Network

**Local subsidiaries have been established in 43 countries worldwide, with over 230 sales offices.**
**Our sales force of over 4,000 maintains close communication with customers.**

By establishing a strong base in each country and region with a large experienced sales force, SMC provides the best possible service in the industry. Maintaining close communication with our customers throughout the world keeps our engineering teams and our products at the leading edge of industry.

## Production and Supply

**Our product line offers 10,000 basic models with over 560,000 variations. Global production facilities provide a stable supply of products to customers in all markets.**

The vast array of products satisfies nearly every application. Fast delivery of these high quality products at competitive costs is accomplished through our unique production system, and by maximizing our local production capabilities, a stable supply of product is guaranteed.

# Technical Development

## To provide a global engineering network technical centres have been established in the United States and Europe, together with Japan

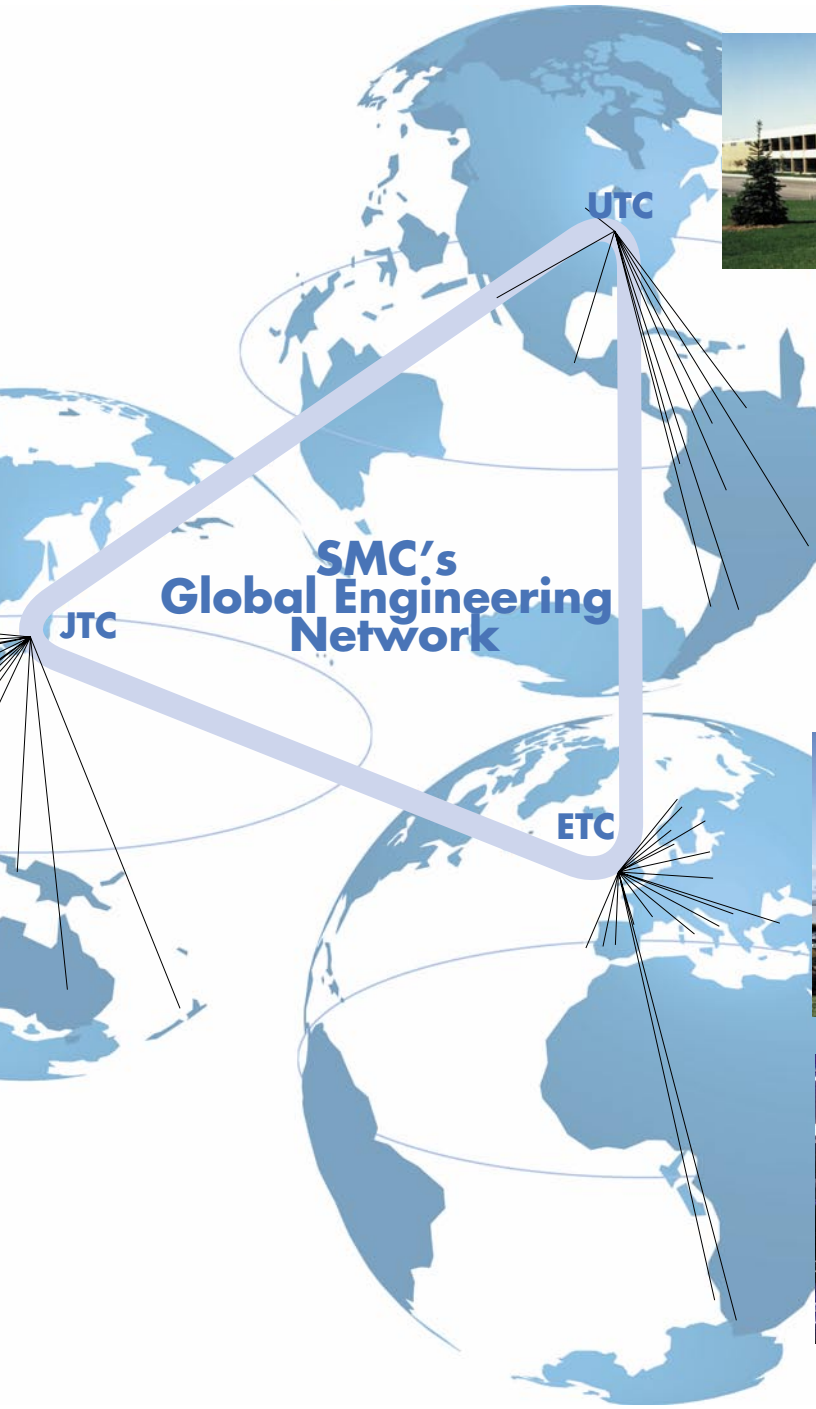
Following the basic concept of developing products from the customer's standpoint, SMC is dedicating a large staff and large financial resources to research and development. This is undertaken to promote research on basic technology with future potential and to produce products that are adapted to the needs of the marketplace in a timely manner. To provide positive and speedy response to the problems presented by customers throughout the world, technical centers have been established in the United States and Europe, creating a powerful global engineering network with Japan as its nucleus. All of the technical centers share information and maintain close contact in order to quickly respond to requirements locally, and to offer the same high quality of technical service throughout the world.

**The Tsukuba Technical Center has expanded to a new twin-tower building from where it will oversee worldwide technical development.**

The Tsukuba Technical Centre has expanded into its newly completed twin-tower building.
At the center of SMC's research and development division, a staff of 1,000 is engaged in research and development activities for the entire world.

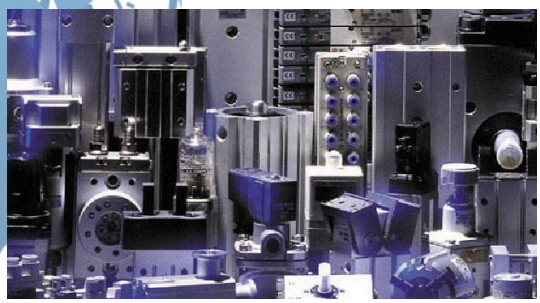
**UTC (US Technical Centre) U. S. A.**

The UTC has been established to meet the project requirements of customers in North America. The UTC has approximately 100 engineers available for customer support.


**ETC (European Technical Centre) U. K.**

The ETC is located close to SMC's UK factory in Milton Keynes. Here, approximately 100 experienced engineers from SMC European subsidiaries are gathered to work on projects from their respective countries. This has enabled improved communication, faster and more accurate information exchange, and a higher level of customer satisfaction.

# Production and Supply

## A global production network supports a stable and continuous supply of high quality products throughout the world.

SMC delivers products for world markets from five key factory locations in Japan, in the Tsukuba district of Ibaragi prefecture and the Soka district of Saitama prefecture, as well as from other key locations in China and Singapore. Additionally, to respond quickly and with increased flexibility to the demands of the local market, overseas production facilities have been established in SMC subsidiaries around the world.

**Production Facilities (Japan)**

Soka Factory #1, New Building



**Soka Area (13 Factories/Saitama Prf.)**

Soka #1 Factory & #2 Factory
Total Land Area: 24,945m²
Floor Space: 30,050m²


**Overseas Local Production Facilities**



**Canada** SMC Pneumatics(Canada)Ltd.


**U.S.A** SMC Corporation of America (Indianapolis)

**U.S.A** SMC Corporation of America(Los Angeles)

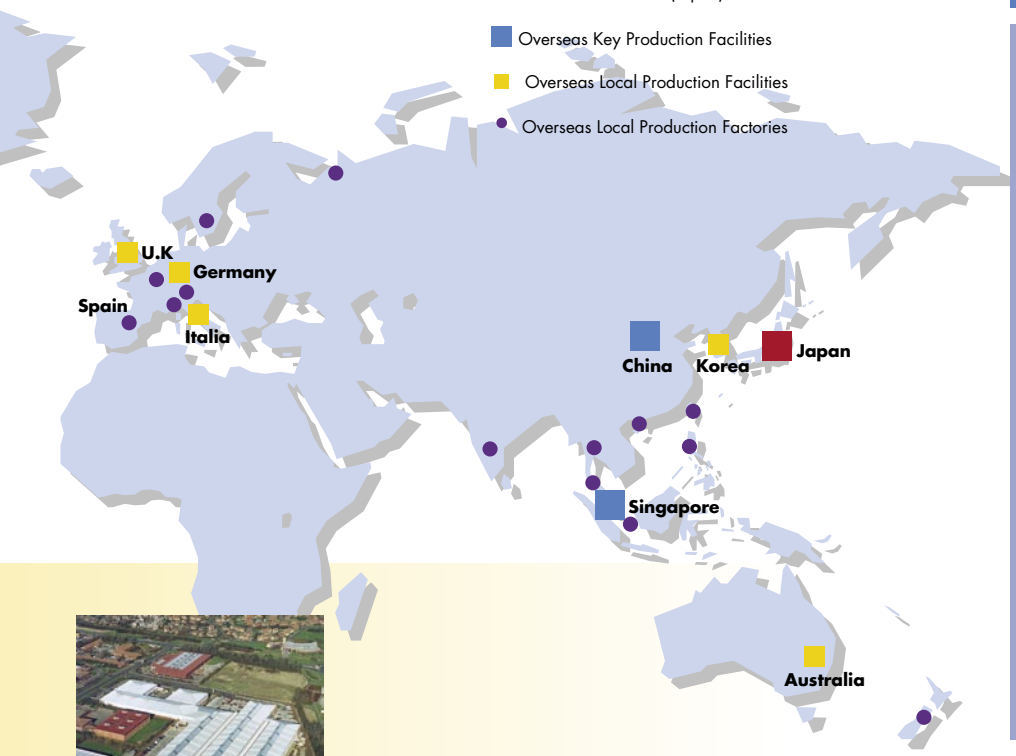
**Tsukuba Factory (Ibaragi Prf.)**
Tsukuba #1 Factory & #2 Factory
Total Land Area: 57,191m²
Floor Space: 45,094m²

**Kamaishi Factory (Iwate Prf.)**
Total Land Area: 82,657m²
Floor Space: 41,623m²

**Tohno Factory (Iwate Prf.)**
Total Land Area: 79,428m²
Floor Space: 10,737m²

**Yamatsuri Factory (Fukushima Prf.)**
Total Land Area: 124,227m²
Floor Space: 26,298m²

Production Facilities (Japan)
Overseas Key Production Facilities
Overseas Local Production Facilities
Overseas Local Production Factories




## Overseas Key Production Facilities

**SMC (China) Co., Ltd.**
Total Land Area: 82,940m²
Floor Space: 55,352m²

**SMC Manufacturing (Singapore) Pte. Ltd.**
Total Land Area: 23,942m²
Floor Space: 18,424m²



**U.K** SMC Pneumatics (U.K) Ltd.

**Italy** SMC Italia S.p.A

**Germany** SMC Pneumatik GmbH

**Korea** SMC Pneumatics Korea Co.,Ltd.

**Australia** SMC Pneumatics (Australia) Pty.Ltd.

## Overseas Local Production Factories

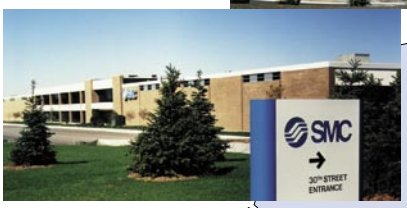
| | |
|---|---|
| **North/South America** | |
| **Chile** | SMC Pneumatics (Chile) S.A. |
| **Mexico** | SMC Corporation (Mexico), S.A.de C.V. |
| **Argentina** | SMC Argentina S.A. |
| **Europa/Africa** | |
| **Switzerland** | SMC Pneumatik AG |
| **Austria** | SMC Pneumatics GmbH (Austria) |
| **Sweden** | SMC Pneumatics Sweden AB |
| **France** | SMC Pneumatique S.A. |
| **Spain** | SMC España, S.A. |
| **Asia/Oceania** | |
| **Australia** | SMC Pneumatics (Aust.)Pty.Ltd. |
| **Singapore** | SMC Pneumatics (S.E.A.)Pte.Ltd. |
| **Malaysia** | SMC Pneumatics (S.E.A.)Sdn.Bhd. |
| **New Zealand** | SMC Pneumatics (N. Z.) Ltd. |
| **Hong Kong** | SMC Pneumatics (Hong Kong) Ltd. |
| **Taiwan** | SMC Pneumatics (Taiwan)Co.,Ltd. |
| **Philippines** | SMC Pneumatics (Phils.),Inc. |
| **Thailand** | SMC Thailand Ltd. |
| **India** | SMC Pneumatics (India) Pvt.Ltd. |

# Sales and Communication Network

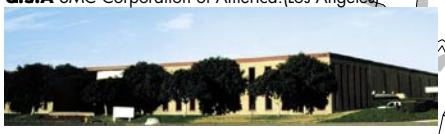
## Our goal of 20% global market share has been achieved, with local subsidiaries in 43 countries across the world.

Taking its first step in Australia in 1967, SMC continued to move quickly into the international marketplace, and has steadily established local subsidiaries in the major countries around the world. The current total has reached 230 locations in 43 countries. With the expansion of its international network, SMC has earned a solid reputation as a reliable international brand, and has exceeded the goal of "20% global market share". We will continue to view the world as a single market and further develop our sales organization with even greater energy to provide "customer satisfaction" by responding accurately to individual demands of different customers in countries and regions around the world.

**Canada** SMC Pneumatics (Cnada) Ltd.




**U.S.A** SMC Corporation of America (Indianapolis)



**U.S.A** SMC Corporation of America.(Los Angeles)


**Mexico** SMC Corporation (Mexico), S.A.de

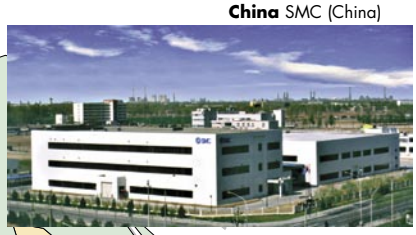
### North/South America

| | |
|---|---|
| **U.S.A** | SMC Corporation of America |
| **Chile** | SMC Pneumatics(Chile) S.A. |
| **Mexico** | SMC Corporation(Mexico), S.A.de C.V. |
| **Canada** | SMC Pneumatics(Canada)Ltd. |
| **Argentina** | SMC Argentina S.A. |
| **Bolivia** | SMC Pneumatics Bolivia S.r.l. |
| **Venezuela** | SMC Neumática Venezuela S.A. |
| **Brazil** | SMC Pneumáticos do Brasil Ltda. |

**U.K** SMC Pneumatics (U.K)

**Germany** SMC Pneumatik

**China** SMC (China)



**Italy** SMC Italia

**Korea**
SMC Pneumatics Korea Co.,Ltd.

**France** SMC Pneumatique

**Spain** SMC España, S.A.

**Taiwan** SMC Pneumatics (Taiwan)Co.,Ltd.

**Singapore** SMC Pneumatics

## Europa/Africa

| | |
|---|---|
| **Italy** | SMC Italia S.p.A |
| **U.K** | SMC Pneumatics (U.K) Ltd. |
| **Germany** | SMC Pneumatik GmbH |
| **Switzerland** | SMC Pneumatik AG |
| **Austria** | SMC Pneumatics GmbH (Austria) |
| **Sweden** | SMC Pneumatics Sweden AB |
| **France** | SMC Pneumatique S.A. |
| **Ireland** | SMC Pneumatics (Ireland) Ltd. |
| **Spain** | SMC España, S.A. |
| **Czech Republic** | SMC Industrial Automation CZ s.r.o. |
| **Hungary** | SMC Hungary kft. |
| **Romania** | SMC Romania S.r.l. |
| **Slovenia** | SMC Industrijska Avtomatika d.o.o. |
| **Slovakia** | SMC Priemyselna Automatizacia Spol s.r.o. |
| **Finland** | SMC Pneumatics Filand OY |
| **Norway** | SMC Pneumatics Norway AS |
| **Russia** | SMC Pneumatik LLC |
| **Denmark** | SMC Pneumatik A/S |
| **Poland** | SMC Industrial Automation Polska Sp.z.o.o |
| **Latvia** | SMC Pneumatics Latvia SIA |
| **Estonia** | SMC Pneumatics Estonia Oü |
| **The Netherlands** | SMC Pneumatics B.V. |
| **Greece** | S. Parianopoulos S.A. (Distributor) |
| **South Africa** | Hyflo Southern Africa(Pty.)Ltd.(Distributor) |

## Asia/Oceania

| | |
|---|---|
| **Australia** | SMC Pneumatics (Aust.) Pty.Ltd. SMC |
| **Singapore** | Pneumatics (S.E.A.)Pte.Ltd. |
| **Malaysia** | SMC Pneumatics (S.E.A.)Sdn.Bhd. |
| **New Zealand** | SMC Pneumatics (N. Z.) Ltd. |
| **Hong Kong** | SMC Pneumatics (Hong Kong) Ltd. |
| **Taiwan** | SMC Pneumatics (Taiwan)Co.,Ltd. |
| **Philippines** | SMC Pneumatics (Phils.),Inc. |
| **China** | SMC (China) Co.,Ltd. |
| **Thailand** | SMC Thailand Ltd. |
| **India** | SMC Pneumatics (India) Pvt.Ltd. |
| **Korea** | SMC Pneumatics Korea Co.,Ltd. |
| **Indonesia** | PT SMC Pneumatics Indonesia |
| **Israel** | Baccara Geva (Distributor) |
| **Turkey** | Entek Pnömatik San.ve Tic.Ltd.Sti. (Distributor) |
| **Japan** | SMC Corporation |

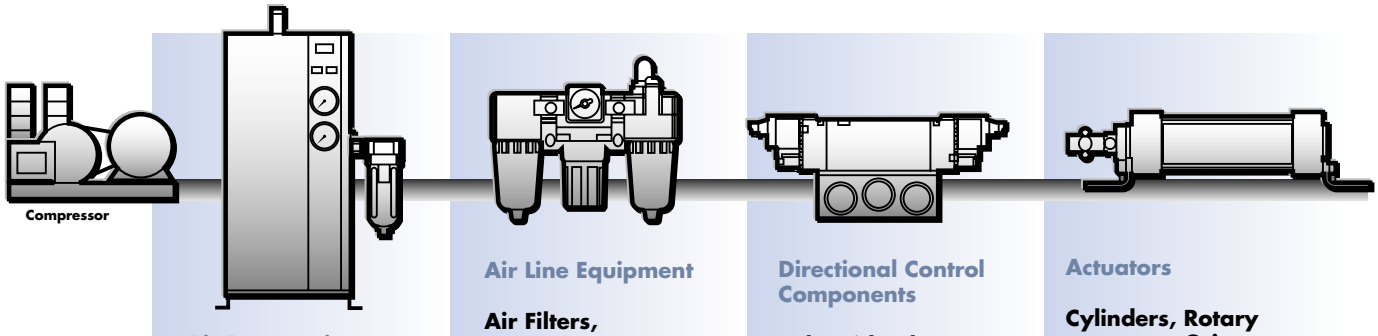
SMC Pneumatics (Australia) Pty. Ltd.

● Head office
● Branch office

# 10,000 basic models, and 560,000 variations. A wide range of variations to accommodate diverse applications.

## A complete line-up of pneumatic control systems

Customers' needs, today, are in a state of transition, from standardization to diversification. As a general supplier of pneumatic components, SMC provides the ideal products for multiple applications and complete systems. Therefore, a broad range of pneumatic variations is offered for each system component. This complete array of products results in SMC pneumatic systems that are capable of specifically meeting infinitely diverse requirements.




### Air Preparation Equipment

**Air Dryers, Mist Separators**
This equipment provides clean dry air through dehumidification and filtration.

Air cleaning equipment

### Air Line Equipment

**Air Filters, Regulators & Lubricators**
This equipment removes foreign particles from compressed air and pressure control to extend life and reduce compressed air costs.

Air line equipment

### Directional Control Components

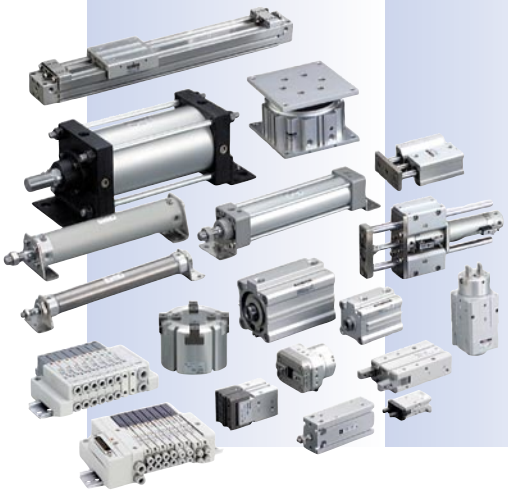
**Solenoid valves**
These components direct the flow of compressed air that is supplied to cylinders and other actuators.

Solenoid valves

### Actuators

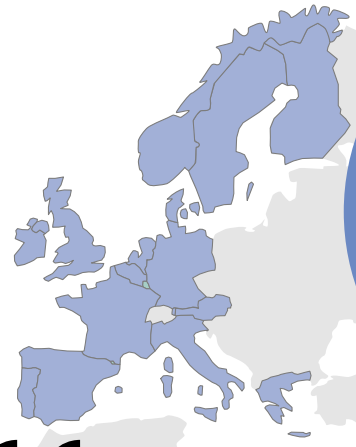
**Cylinders, Rotary actuators, Grippers**
These components use the compressed air switched by directional control components to create force for linear and rotary action.

Air cylinders, Air grippers



# SMC Product Conforming to International Standards

SMC products complying with EN/ISO, CSA/UL standards are supporting you to comply with EC directives and CSA/UL standards.



CE Mark

The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied.
It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU.
Once "A manufacturer himself" declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

## ■ CE Mark

SMC provides CE marking to products to which EMC and Low Voltage Directives have been applied, in accordance with CETOP (European hydraulics and pneumatics committee) guide lines.

## ■ As of February 1998, the following 18 countries will be obliged to conform to CE mark legislation

Iceland, Ireland, United Kingdom, Italy, Austria, Netherlands, Greece, Liechtenstein, Sweden, Spain, Denmark, Germany, Norway, Finland, France, Belgium, Portugal, Luxembourg

## ■ EC Directives and Pneumatic Components

### • Machinery Directive

The Machinery Directive contains essential health and safety requirements for machinery, as applied to industrial machines e.g. machine tools, injection molding machines and automatic machines. Pneumatic equipment is not specified in Machinery Directive. However, the use of SMC products that are certified as conforming to EN Standards, allows customers to simplify preparation work of the Technical Construction File required for a Declaration of Conformity.

### • Electromagnetic Compatibility (EMC) Directive

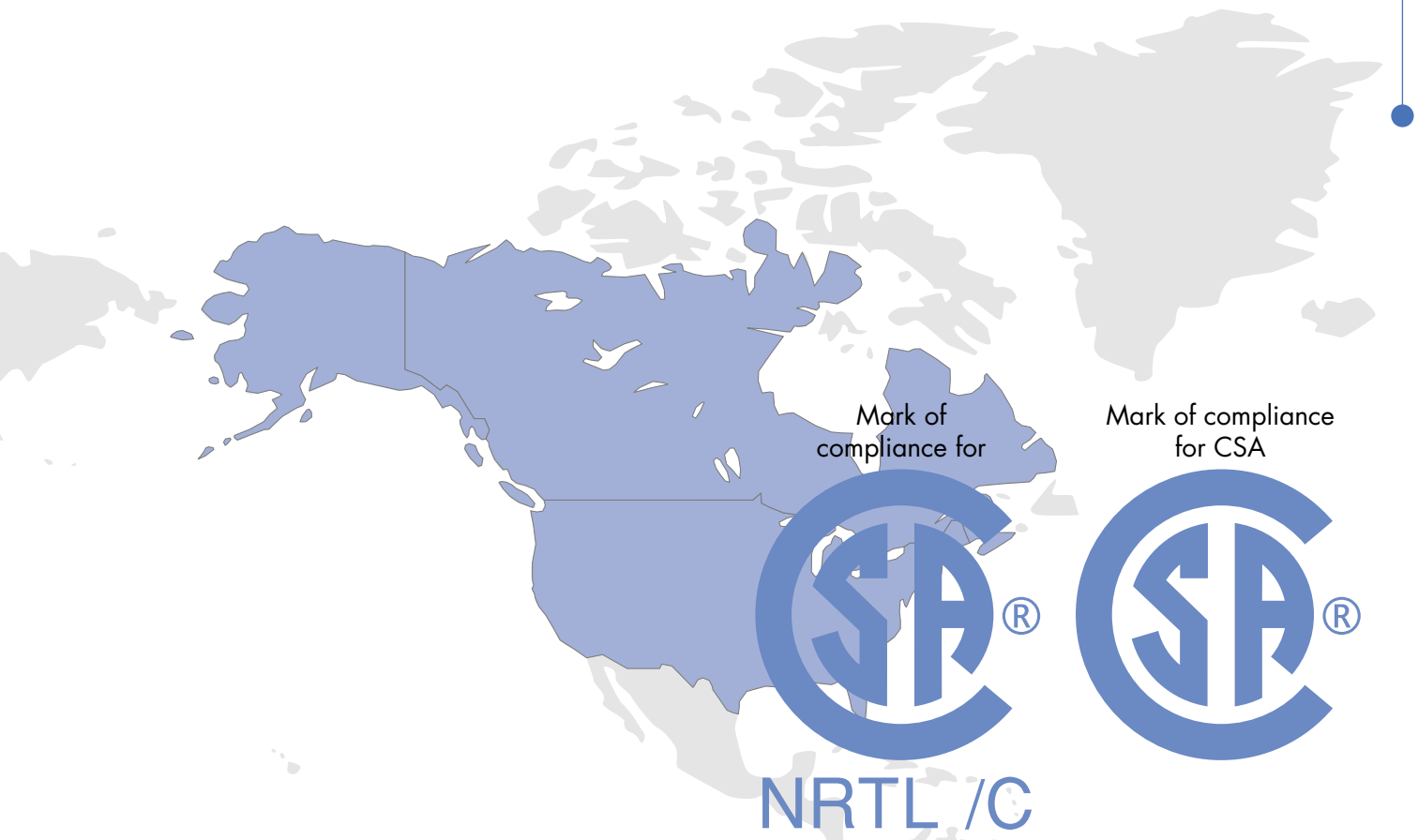
The EMC Directive specifies electromagnetic compatibility. Equipment which may generate electromagnetic interference or whose function may be compromised by electromagnetic interference is required to be immune to electromagnetic affects (EMS/immunity) without emitting excessive electromagnetic affects (EMI/emission).

### • Low Voltage Directive

This directive is applied to products, which operate above 50 VAC to 1000 VAC and 75 VDC to 1500 VDC operating voltage, and require electrical safety measures to be introduced.

### • Simple Pressure Vessels Directive

This directive is applied to welded vessels whose maximum operating pressure (PS) and volume of vessel (V) exceed 50 bar/L. Such vessels require EC type examination and then CE marking.




## ■ CSA Standards & UL Standards

UL and CSA standards have been applied in North America (U.S.A. and Canada) symbolizing safety of electric products, and are defined to mainly prevent danger from electric shock or fire, resulting from trouble with electric products. Both UL and CSA standards are acknowledged in North America as the first class certifying body. They have a long experience and ability for issuing product safety certificate. Products approved by CSA or UL standards are accepted in most states and governments beyond question.
Since CSA is a test certifying body as the National Recognized Testing Laboratory (NRTL) within the jurisdiction of Occupational Safety and Health Administration (OSHA), SMC was tested for compliance with CSA Standards and UL Standards at the same time and was approved for compliance with the two Standards. The above CSA NRTL/C logo is described on a product label in order to indicate that the product is approved by CSA and UL Standards.

## ■ TSSA (MCCR) Registration Products

TSSA is the regulation in Ontario State, Canada. The products that the operating pressure is more than 5 psi (0.03 MPa) and the piping size is bigger than 1 inch. fall into the scope of TSSA regulation.

**Products conforming to CE Standard**

**With CE symbol for simple visual**

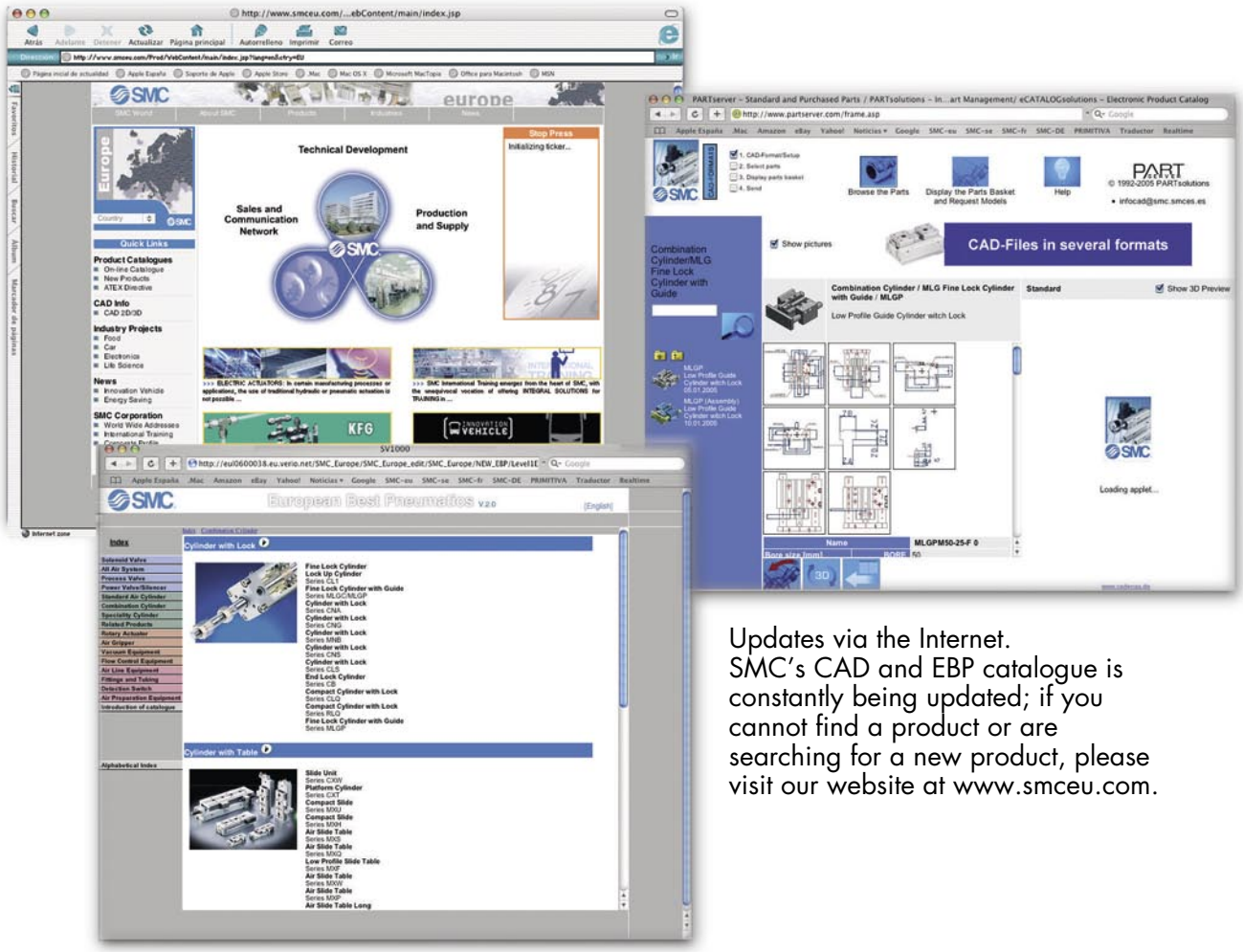
In this catalog each accredited product series is indicated with a CE mark symbol. However, in some cases, every available models may not meet CE compliance. Please visit our web site for the latest selection of available models with CE mark.

**http://www.smcworld.com**

# SMC Corporation's Web Site Information

SMC's improved Web Site—offering "easy-to-use" options!.
http://www.smcworld.com
http://www.smceu.com

Simply access our latest information for all your business - delivered without delay!.




Updates via the Internet.
SMC's CAD and EBP catalogue is constantly being updated; if you cannot find a product or are searching for a new product, please visit our website at www.smceu.com.

CAD and European Best Pneumatics catalogue on CD.

# Thread Designations

Port and fitting threads used on SMC equipment are all defined by international standards, there are two basic types, metric threads and imperial threads.

Metric threads used are M3, M5 and M6, standard pitches and parallel form. These seal using a washer.
The imperial threads vary in size from 1/16" to 2", with the range 1/8" to 1/2" most common.

The female threads shown in this catalogue are mainly G form parallel threads to ISO 228, which seal using a washer face. The other female thread form commonly used by SMC is the Rc, which is a taper thread form.

Below is a list of common female imperial thread designations and notes.

| Designation | Taper or parallel | Note |
|---|---|---|
| G | Parallel | As used in this catalogue |
| Rc | Taper | Also common in SMC products. Defined in ISO 7/1 |
| BSP | Parallel | Obsolete designation to BS84. Use G instead. |
| BSPT | Taper | Obsolete designation to BS21. Use Rc instead |
| NPT | Taper | American standard, incompatible with Rc, BSP or BSPT due to different flank angles. Available from SMC to special order but not common in EU |
| Rp | Parallel | Defined in ISO 7/1 |

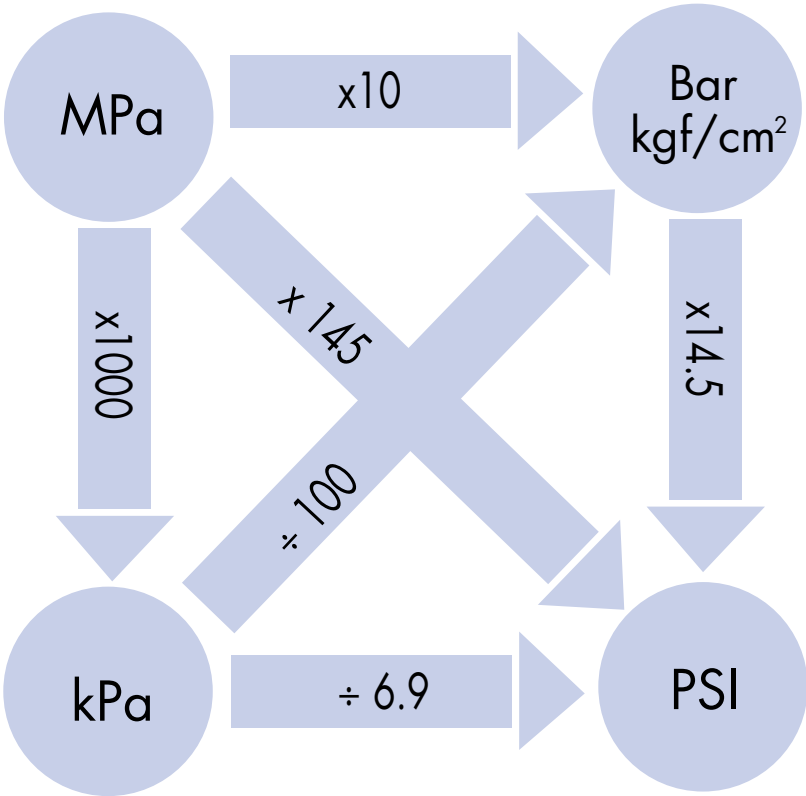
# Pressure Measurement

The SI unit of pressure is the Pascal (Pa); one Pascal is defined as one Newton of force per square metre of area.
Pressures in this catalogue are shown using Pascals.

Because one Pascal is a very low pressure the unit is normally quoted as kilopascals (kPa) or megapascals (MPa).
1 MPa = 1000 kPa = 1,000,000 Pa

Vacuum levels are also measured in Pascals, normally as negative kilopascals (-kPa).

SMC have historically used kgf/cm$^2$ or bar, a conversion graphic is shown below. This includes lbf/in$^2$ (psi), which is still widely understood.




Example.
A typical industrial compressed air main has a working pressure of 0.5Mpa. This equals 5 bar, 500kPa, 5kgf/cm$^2$ (approx) or 72.5 psi (approx).

Note: The conversions involving kgf/cm$^2$ and psi are approximations, maximum errors should not exceed ±2%.

# Flow Characteristics and Measurement

## Introduction to Flow

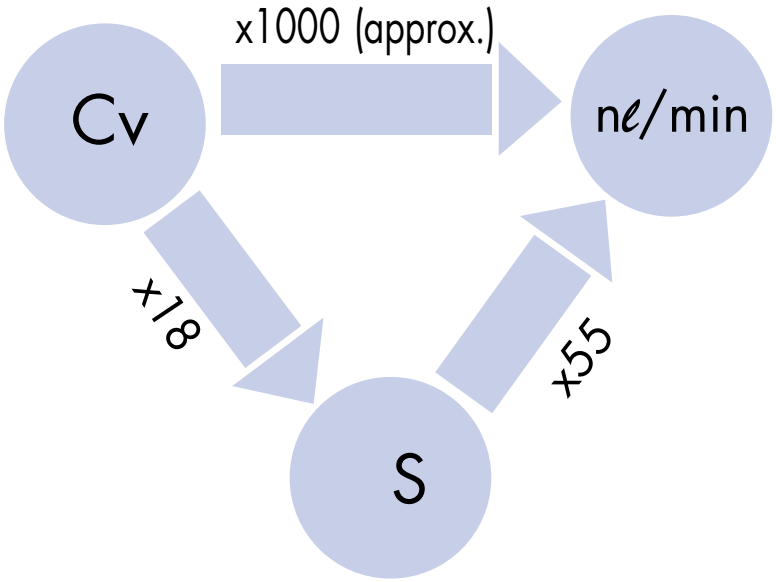
The flow through a valve or fitting is expressed in many ways, according to different international and manufacturer standards. Many units of measurement have been used. Also the allowable pressure loss, testing methodology and other assumptions were not consistent between different makers.

Commonly used measurement units are Cv, litres/minute (ANR) and effective area (S) for air applications. In addition Cv, Kv, kv and Av can be used for liquid applications.

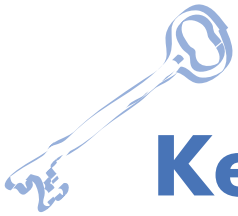
The ISO standard 6358: 1989 defines compressed air flow in terms of conductance and critical pressure ratio, C and b respectively. This measure is used for most compressed air products within this catalogue. For valves designed for use with liquids, Cv or Av is used in this catalogue.

**Conversions between flow units**

For most purposes, an approximate conversion between S (effective area), Cv and nl/min can be made as follows.




* Details of the applicable standards, calculation and test methods can be found at the back of this book.



# Key Industry Products

## Stainless Cylinders

Corrosion resistant

| Series | Action | Bore size (mm) |
|---|---|---|
| **CJ5·S** | Double acting | 10, 16 |
| **CG5·S** | | 20, 25, 32, 40, 50, 63, 80, 100 |
| Features | Material<br>• External metal parts: Stainless steel 304<br>Seal parts: NBR or FKM are selectable.<br>Ambient and fluid temperature: –10 to 70°C (without auto switch)<br>–10 to 60°C (with auto switch)<br>Grease for food processing machines FDA | |

## Stainless Steel Cylinder with ISO 6432 Dimensions

Made to Order Corrosion resistant Hygienic

| Series | Action | Bore size (mm) |
|---|---|---|
| — | Double acting | 16, 20, 25, 32, 40, 50 |
| Features | Hygienic design for splash area<br>Material<br>• External metal parts: Stainless steel 304<br>Seal parts: NBR or FKM are selectable.<br>Ambient and fluid temperature: –10 to 70°C (without auto switch)<br>–10 to 60°C (with auto switch) | |

## Stainless Speed Controller

Corrosion resistant

| Series | Applicable tubing O.D. (mm) | Connection thread |
|---|---|---|
| **ASG** | 4, 6, 8, 10, 12 | M5, 1/8, 1/4, 3/8, 1/2 |
| Features | Material<br>• Metal parts: Stainless steel 316<br>Seal parts: Special FKM<br>Ambient and fluid temperature: –5 to 60°C | |

## Stainless Steel 316 One-touch Fittings

Corrosion resistant Heat resistant

| Series | Applicable tubing O.D. (mm) | Connection thread |
|---|---|---|
| **KQG** | 4, 6, 8, 10, 12 | M5, 1/8, 1/4, 3/8, 1/2 |
| Features | Material<br>• Metal parts: Stainless steel 316<br>Seal parts: Special FKM<br>Operating fluid temperature: –5 to 150°C<br>Grease-free<br>Can be used with steam.<br>Certified to meet current Food Sanitation Law standards. | |

## Stainless Steel 316 Insert Fittings

Corrosion resistant Heat resistant

| Series | Applicable tubing O.D. (mm) | Connection thread |
|---|---|---|
| **KFG** | 4, 6, 8, 10, 12 | 1/8, 1/4, 3/8, 1/2 |
| Features | Material: Stainless steel 316<br>Operating fluid temperature: –5 to 150°C<br>Grease-free<br>Can be used with steam. | |

## Stainless Steel 316 Miniature Fittings

Corrosion resistant

| Series | Applicable tubing O.D. (mm) | Connection thread |
|---|---|---|
| **M** | 3.2, 4, 6 | M5, 1/8 |
| Features | Material: Stainless steel 316<br>Operating fluid temperature: 0 to 60°C | |

## S Couplers / Stainless Type

Corrosion resistant Heat resistant

| Series | Connection thread |
|---|---|
| **KKA** | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1¼, 1½ |
| Features | Material<br>• Metal parts: Stainless steel 304<br>Seal parts: Special FKM<br>Operating fluid temperature: –5 to 150°C<br>Grease-free |

## Air Operated Chemical Valve

Corrosion resistant Heat resistant

| Series | | Actuation | Port size | Orifice diameter mmø |
|---|---|---|---|---|
| Thread type | **LVA** | N.C./N.O./C.O. | 1/8 to 1 | 2 to 22 |
| Features | | Body material: Stainless steel<br>Diaphragm material: PTFE, NBR, EPR are selectable.<br>Operating fluid temperature:<br>0 to 100°C (when the diaphragm is PTFE.)<br>0 to 60°C (when the diaphragm is NBR or EPR.) | | |

## Clean Regulator (Contamination Controlled Steel Regulator)

Corrosion resistant

| Series | Body size | Connection thread |
|---|---|---|
| **SRH** | 3.2, 4, 6 | 1/8, 1/4, 3/8, 1/2 |
| Features | Outstanding corrosion resistance. All metal parts in contact with fluid use stainless steel SUS316<br>Oil free. Parts assembled without any use of oils.<br>Depending upon the application, PTFE (Grade A) or fluororubber (Grade B) can be selected for the diaphragm material. | |

## Floating Joint (Stainless Steel Type)

Corrosion resistant

| Series | Body size | Connection thread |
|---|---|---|
| **JS** | 10, 16, 20, 32, 40, 63 | M4, M5, M8, M10 x 1.25, M14 x 1.5, M18 x 1.5 |
| Features | Centering is unnecessary. A high level of machining accuracy is unnecessary. It is compact and is suitable for high tensile stresses.<br>Long service life (with dustproof cover). Rotating angle... ±5°. Also Absorbs radial misalignment. | |

# ISO

## Profile Design ISO/VDMA Cylinder Piston Rod and End Nut Made of Stainless Steel (-XC6)

Made to Order Corrosion resistant

| Series | Action | Bore size (mm) |
|---|---|---|
| **CP95 (-XC6)** | Double acting | 32, 40, 50, 63, 80, 100 |
| Features | Piston rod and rod end nut are changed from standard materials to stainless steel. | |

## Hygienic Design Cylinders

Hygienic

| Type | Series | Action | Bore size (mm) |
|---|---|---|---|
| Round type | **HYB** | Double acting | 20, 25, 32, 40, 50, 63, 80, 100 |
| Basic type | **HYQ** | | 20, 25, 32, 40, 50, 63 |
| ISO standard type | **HYC** | | 32, 40, 50, 63 |
| With guide | **HYG** | | 20, 25, 32, 40, 50, 63 |
| Features | Water resistant cylinders configured for easy cleaning<br>Five times increase in service life, compared to other water resistant cylinders<br>Grease for food is available.<br>Ambient and fluid temperature: 0 to 70°C (without auto switch)<br>0 to 60°C (with auto switch)<br>FDA grease as option. | | |

## Hygienic NAMUR Interface Valve 3/5 Port Solenoid Valve

Made to Order

Hygienic

| Series | Port size | Cv factor | Power consumption |
|---|---|---|---|
| **VFN (-X19)** | NPT1/4" | 1.4 | 0.5 W |
| Features | Conformed to VDMA standard.<br>IP67 (for M12 connector)<br>Ambient and fluid temperature: –10 to 60°C<br>3 and 5 port can be changed by changing the function plate.<br>Electrical entry: M12, DIN terminal | | |

# Related Products

## Water Resistant Cylinders

| Type | Series | Bore size (mm) |
|---|---|---|
| Air cylinder | **CM2** | 20, 25, 32, 40 |
| Air cylinder | **CG1** | 20, 25, 32, 40, 50, 63, 80, 100 |
| Compact cylinder | **CQ2** | 20, 25, 32, 40, 50, 63, 80, 100 |
| Air cylinder | **CA2** | 40, 50, 63, 80, 100 |
| Compact guide cylinder | **MGPM** | 20, 25, 32, 40, 50, 63, 80, 100 |
| Guide cylinder | **MGGM** | 32, 40, 50, 63, 80, 100 |
| Features | Using a special scraper improved water resistance, compared to standard cylinders | |

### Related Made to Order

| | |
|---|---|
| XC4 | With heavy duty scraper |
| XC35 | With coil scraper |

## Cylinder / Made to Order

| | | |
|---|---|---|
| XB6 | Heat resistant cylinder (–10 to 150°C) | Heat resistant |
| XB14 | Cylinder with heat resistant auto switch (0 to 150°C) | Heat resistant |
| XB7 | Cold resistant cylinder (–40 to 70°C) | |

| | | |
|---|---|---|
| XC6 | Piston rod and rod end nut made of stainless steel | Corrosion resistant |
| XC7 | Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel | Corrosion resistant |
| XC27 | Double clevis pin and double knuckle pin made of stainless steel | Corrosion resistant |

# Resin Products

## Clean One-touch Fittings

Corrosion resistant

| Series | Applicable tubing O.D. | Connection thread |
|---|---|---|
| **KP** | 4, 6, 8, 10, 12 | 1/8, 1/4, 3/8, 1/2 |
| Features | Material<br>• Resin parts: Polypropylene<br>Seal parts: EPDM<br>Operating fluid temperature: –20 to 80°C | |

## FEP Tubing

Corrosion resistant Heat resistant

| Series | Tubing O.D. | | Color |
|---|---|---|---|
| | Metric size | Inch size | |
| **TH/TIH** | 4, 6, 8, 10, 12 | 1/8, 3/16, 1/4<br>3/8, 1/2, 3/4 | Translucent, Black,<br>Red, Blue |
| Features | Material: FEP (Fluororesin)<br>Maximum operating temperature: 200°C<br>(This can vary depending on the operating conditions.)<br>Certified to meet current Food Sanitation Law standards. | | |

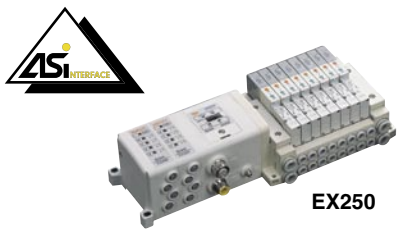
## Air Operated Chemical Valve

Corrosion resistant Heat resistant

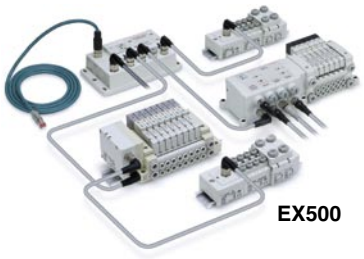
| Series | | Actuation | Applicable tubing O.D. | Orifice diameter mmø |
|---|---|---|---|---|
| Integral fitting | **LVC** | N.C./N.O./C.O. | mm: 4 to 25<br>inch: 1/8 to 1 | 4 to 22 |
| Features | Body material: PFA<br>Diaphragm material: PTFE<br>Operating fluid temperature: 0 to 100°C | | | |

# Serial Transmission

## Serial Transmission



EX250



EX500

| Series | Enclosure | Communication protocol | Applicable valve |
|---|---|---|---|
| **EX250** | IP67 | DeviceNet | SV1000/2000/3000<br>VQC1000/2000/4000 |
| | | PROFIBUS-DP | |
| | | CC-Link | |
| | | Actuator Sensor interface (AS-I, ASI) | |
| | | CAN Open | |
| Features | • IP67 compliant<br>• Input/Output available | | |
| **EX500** | IP65 | Remote I/O (Rockwell Automation Inc.) | SV1000/2000/3000/4000<br>VQC1000/2000/4000 |
| | | DeviceNet | |
| | | PROFIBUS-DP | |
| | | CC-Link | |
| | | EtherNet/IP™ | |
| Features | • IP65 compliant<br>• Input/Output available | | |

## Pilot Operated 2 Port Solenoid Valve

High-pressure

| Series | Maximum operating pressure (MPa) | Port size |
|---|---|---|
| **VCH41 (N.C.)** | 5.0 | 3/4, 1 |
| **VCH42 (N.O.)** | | |
| Features | Service life: 10 million cycles (based on SMC's test condition)<br>Adopting a polyurethane elastomer poppet in a valve seat<br>Improved durability under a high-pressure environment | |

## Pilot Operated 3 Port Solenoid Valve

High-pressure

| Series | Maximum operating pressure (MPa) | Port size |
|---|---|---|
| **VCH410** | 5.0 | 1/2, 3/4, 1 |
| Features | Service life: 10 million cycles (based on SMC's test condition)<br>Adopting a polyurethane elastomer poppet in a valve seat<br>Improved durability under a high-pressure environment | |

Made to Order

**Manifold unit**

## Check Valve

High-pressure

| Series | Maximum operating pressure (MPa) | Port size |
|---|---|---|
| **VCHC40** | 5.0 | 3/4, 1 |
| Features | Service life: 10 million cycles (based on SMC's test condition)<br>Adopting a polyurethane elastomer poppet in a valve seat<br>Improved durability under a high-pressure environment | |

## Direct Operated Regulator (Relieving type)

High-pressure

| Series | Maximum operating pressure (MPa) | Port size |
|---|---|---|
| **VCHR30** | Inlet pressure 5.0<br>Set pressure 0.5 to 5.0 | 3/4, 1 |
| **VCHR40** | | 1, 1 1/2 |
| Features | Service life: 10 million cycles (based on SMC's test condition)<br>Adopting a polyurethane elastomer poppet in a valve seat<br>Improved durability under a high-pressure environment | |

Made to Order

**6.0 MPa pilot operated regulator (Air operated type)**

## Silencer

High-pressure

| Series | Maximum operating pressure (MPa) | Port size |
|---|---|---|
| **VCHN3** | 5.0<br>(Relief valve release pressure: 1.8) | 3/4, 1 |
| **VCHN4** | | 1, 1 1/4, 1 1/2 |
| Features | Noise reduction 35 dB(A)<br>Clogging-reduction with double-layer construction | |

# 5.0 MPa Compatible

## 5.0 MPa Pressure Sensor

Made to Order | High-pressure

| Series | Rated pressure range (MPa) | Proof pressure (MPa) |
|---|---|---|
| **PSE (X512)** | 0 to 5.0 | 10.0 |

## Related Equipment/ Digital Pressure Switch

High-pressure

| Series | Rated pressure range (MPa) | Proof pressure (MPa) |
|---|---|---|
| **ISE75** | 0.4 to 10.0 | 30.0 |
| **ISE75H** | 0.5 to 15.0 | 45.0 |
| Features | 2-color display<br>IP67 | |

# High Frequency, High Speed Response and Long Service Life

## 5 Port Solenoid Valve / Metal Seal Type

| Series | Sonic conductance: C | Applicable cylinder size (mm) | Power consumption (W) |
|---|---|---|---|
| **VQC1000** | 0.72 dm³/(s·bar) | 50 | 0.5 |
| **VQC2000** | 2.6 dm³/(s·bar) | 80 | |
| **VQC4000** | 6.9 dm³/(s·bar) | 140 | |
| Features | Response time 10 ms (VQC1000) 20 ms (VQC2000) 17 ms (VQC4000)<br>Dispersion accuracy ±2 ms (VQC1000/2000) ±3 ms (VQC4000)<br>Long service life 200 million cycles (VQC1000/2000) 100 million cycles (VQC4000) (based on SMC's test condition)<br>IP67. Metal seal available. | | |

## 5 Port Solenoid Valve / Metal Seal Type

| Series | Sonic conductance: C | Applicable cylinder size (mm) | Power consumption (W) |
|---|---|---|---|
| **VQZ1000** | 0.7 dm³/(s·bar) | 40 | 0.35 |
| **VQZ2000** | 1.9 dm³/(s·bar) | 63 | |
| **VQZ3000** | 3.0 dm³/(s·bar) | 80 | |
| Features | Response time 17 ms (VQZ1000) 18 ms (VQZ2000) 21 ms (VQZ3000)<br>Dispersion accuracy ±2 ms<br>Long service life 200 million cycles (based on SMC's test condition) | | |

## Low Friction Cylinders / Metal Seal Type

| Series | Type | Bore size (mm) | Minimum operating pressure (MPa) |
|---|---|---|---|
| **MQQ** | Compact | 10, 16, 20, 25, 30, 40 | 0.005 |
| **MQM** | Anti-lateral load | 6, 10, 20, 25 | ø6: 0.02, ø10 to 25: 0.005<br>(MQML□□H: 0.01) |
| **MQP** | Low friction | 4, 6, 10, 16, 20 | 0.001 to 0.7<br>(Except for moving parts weight) |
| Features | Long service life of 10,000 km or 100 million full cycles (based on SMC's test condition)<br>Achieves speeds up to 3,000 mm/s or continuous actuation up to 50 cpm (MQML□□H) | | |

## 3 Port Solenoid Valve

Made to Order

| Series | Port size | Sonic conductance: C |
|---|---|---|
| **XT323** | 1/8 | 2 dm³/(s·bar) |
| Features | Operating frequency 300 to 1500 C.P.M | |

## Low Torque Metal Seal Type Rotary Joint

| Series | Number of circuits | Connection diameter |
|---|---|---|
| **MQR** | 1, 2, 4, 8, 12, 16 | M5 |
| Features | Rotational torque unaffected by supply pressure and temperature fluctuations.<br>Use of metal seals prevents the spool from sticking to the rotating surface even after a long period of non-oeration.<br>Operating pressure: -100kPa to 1MPa.<br>Piping ports are aligned in a spiral line for easy piping. | |

## Mechanical Joint Type Rodless Cylinder

| Series | Bore size (mm) | Maximum available Stroke (mm) |
|---|---|---|
| **MY2C** | 16, 25, 40 | 5000 (3000 for ø16) |
| **MY2H** | 16, 25, 40 | 1500 (1000 for ø16) |
| Features | A complete reduction in height of the cylinder allows mounting in a narrow space.<br>The low profile design of the cylinder built with with a high precision single or double axis guide, provides same load capacity as the earlier Series MY1.<br>Three types of guide options to suit a variety of applications. | |

# Ionizer

## Suface Potenciometric Sensor
### *Series IZD10*

Electrostatic removal

*The importance of the static electric control is put on confirming the "actual status".*

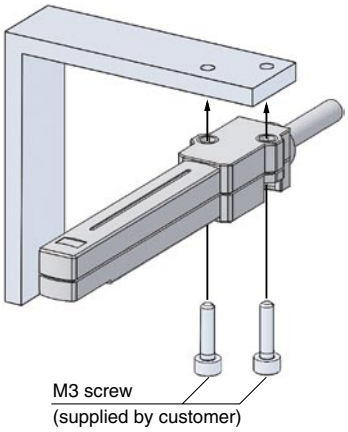
○ **Detects the electric potential difference applied on a work piece, and outputs in an analog voltage.**
• Output voltage: 1 to 5 V (output impedance: approx. 100 Ω )
○ **Measurement potential difference: ±0.4 kV (detected at a 25 mm distance)**

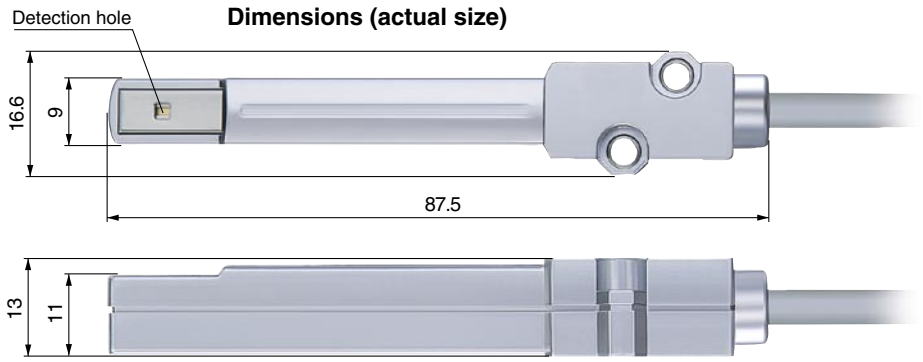
## Surface potentiometric sensor monitor
### *Series IZE11*

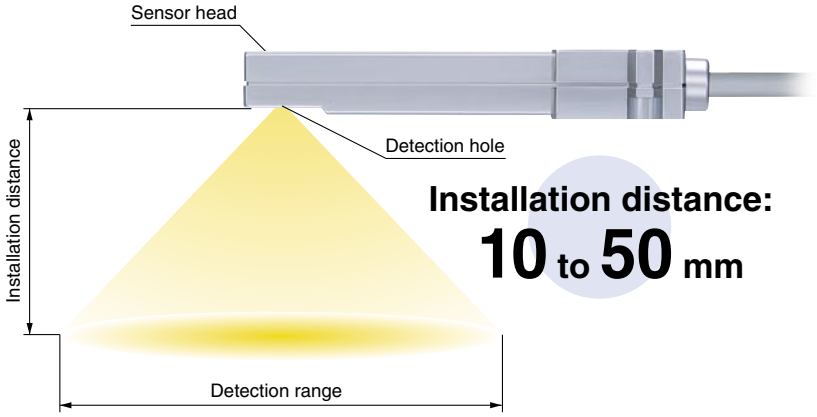

○ Output: Switch output x 2 + Analog output (1 to 5 V, 4 to 20 mA)
○ Minimum unit setting: 0.001 kV
○ Display accuracy: ±0.5% F.S. ±1 digit or less
○ Detection distance correction function (adjustable in 1 mm increments)

# Surface Potentiometric Sensor / Series IZD10

## Small and easy to mount




**Installation distance:**
**10 to 50 mm**

**Installation Distance and Detection Range**

| Installation distance (mm) | Detection range (mm) |
|---|---|
| 10 | 45 |
| 20 | 85 |
| 25 | 100 |
| 30 | 120 |
| 40 | 150 |
| 50 | 180 |

# Surface Potentiometric Sensor Monitor / Series IZE11

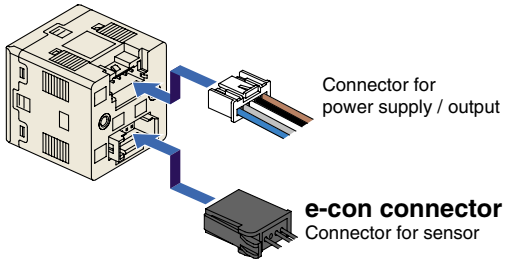
## 2-color display (red/green)

Able to set the display color in 4 patterns.



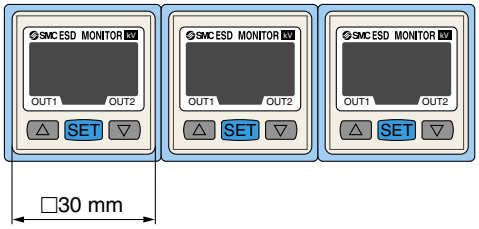
| Pattern | ON | OFF |
|---|---|---|
| ① | Red | Green |
| ② | Green | Red |
| ③ | Red | Red |
| ④ | Green | Green |

## Connection by connector




## Mountable even with a sensor touched with each other

Able to reduce the man-hour for cutting a panel.




## Functions

- Detection distance correction
- Peak / Bottom value displayable
- Key lock
- Zero-adjust
- Error display
- Switch output anti-chattering

# Ionizer

## *Series IZS31*

Electrostatic removal


# Ionizer

## Controlled ion balance by sensor

*~ The choice of 2 types of the sensors are available. ~*

*• Rapid elimination of static electricity by a feedback sensor*

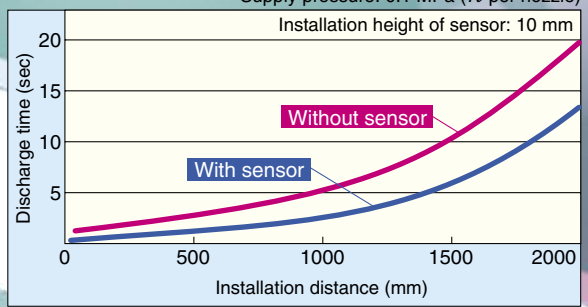
*• Ion balance control by an auto-balance sensor*

**Discharge time 0.3 seconds**

*Conditions / Static buildup decreased from 1000 V to 100 V*
*Discharged object: Charged plate monitor (150 mm x 150 mm, capacitance 20 pF)*
*Installation distance: 200 mm (Tungsten electrode with air purge)*

## Continuously emits ions in accordance with the polarity applied onto a work piece.

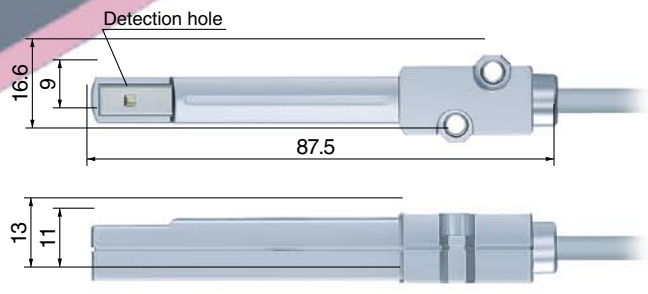
Supply pressure: 0.1 MPa (7ℓ per nozzle)




<Conditions> Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3, 1-2000). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.

## Compact feedback sensor

### Dimensions



**Featuring the stain-detection on an electrode needle provided as a standard equipment.**

Detects a poor performance in the static electricity removal and lets you know the timing of maintenance.


LED display for maintence

**Bracket**
(Optional)

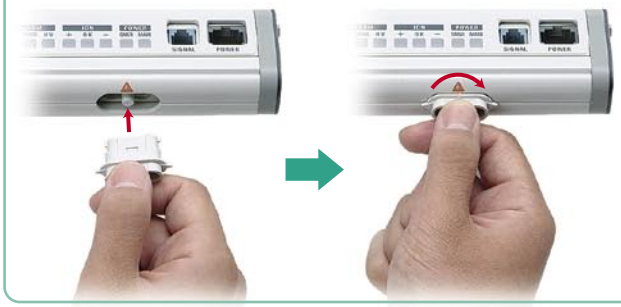
**One-touch fitting**




**Detachable electrode cartledge**

**Electrode needle drop prevention function**

Ensures firm locking by double-action.



**Feedback sensor**

Detects the polarity of a discharged object and measures the charged voltage.

**Auto-balance sensor**

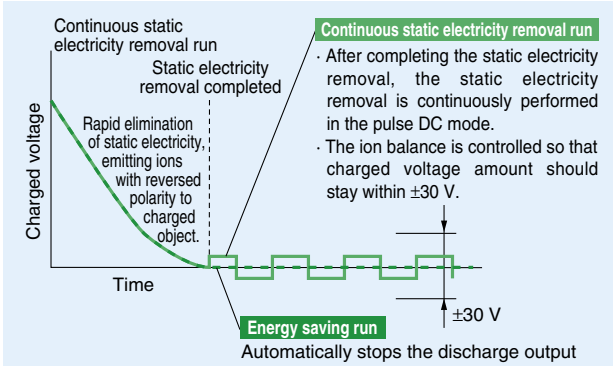
Measures the ion balance condition.

## Static electricity elimination mode by application and its features

### 1 Sensing DC mode

**Detects the charged voltage amount by a feedback sensor, emitting ions with reversed polarity to charged objects. Suited for a rapid elimination of a work piece with a higher amount of charged voltage.**

1) **Continuous static electricity removal run mode:** Continously eliminates static electricity with pulse DC by controlling the ion balance so that the charged potential on a work piece would be within ±30 V even after completing the static electricity removal.
2) **Energy saving run mode:** Automatically stops emitting electricity even after completing the static electricity removal.

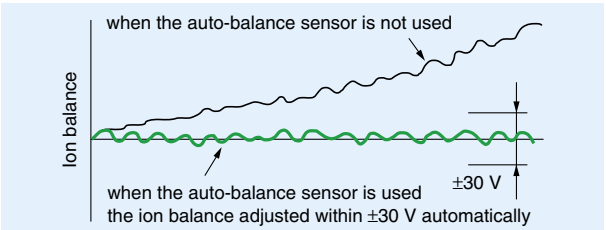



Note) Feedback sensor height at 25 mm

### 2 Pulse DC mode ∗operable even when a sensor is not used.

**Automatically adjusts the ion balance by an auto-balance sensor. Suitable for eliminating static electricity in space, and preventing a work piece from being charged.**

- **Ion balance automatic adjustment:** The auto-balance sensor detects the ion balance to adjust the ion balance automatically. The ion balance is not affected by the height of an ionizer by positioning an auto-balance sensor near a work piece.
- **Selection of a wide range of frequency:** Frequency is selectable from 1 Hz to 60 Hz.



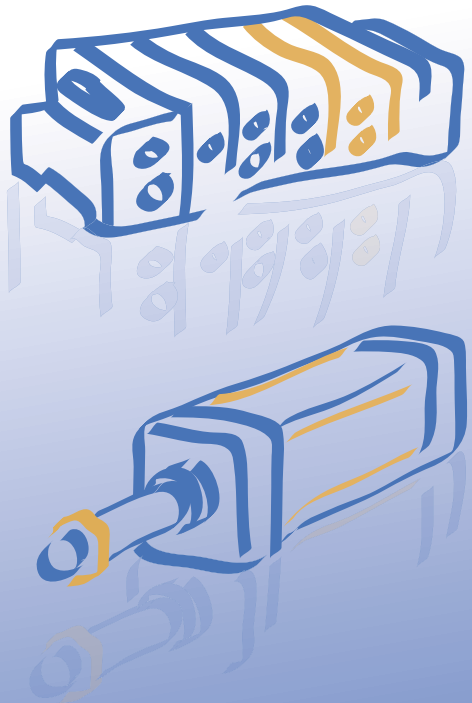

### 3 DC mode

**Makes the positive / negative ion generated.**

- **Suitable for a work piece whose charged polarity is predetermined, running at faster speed or for eliminating static electricity roughly out of a work piece.**
- **Possible to make a work piece charged intentionally in such a static electricity painting.**

∗ However, please take measures such as an earthing since there is a possibility of facilities other than a work piece being charged unintentionally.

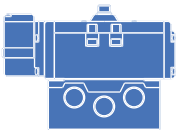
# General Catalogue Overview



## 3 Port Solenoid Valve

| Series | Type | Flow (Cv) 1 → 2 (P → A) | Port size | Applicale in vacuum use | |
|---|---|---|---|---|---|
|  | **V100**<br>3 port direct operated solenoid valve - Rubber seal | | | | |
| | • Sub-plate<br>• Manifold | 0.008~0.024 | M5 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **S070**<br>3 port compact direct operated solenoid valve | | | | |
| | • Body ported<br>• Sub-plate<br>• Manifold | 0.011~0.021 | M3, M5<br>ø2, ø4 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **SYJ300/500/700**<br>3 port pilot operated solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Sub-plate<br>• Manifold | 0.086~0.77 | M3, M5<br>1/8, ø4<br>ø6, ø8 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **SY300/500**<br>3 port solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Manifold | 0.13~0.61 | M5, 1/8<br>ø4, ø6, ø8 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVT307/317**<br>3 port direct operated solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Manifold | 0.12~0.62 | 1/8, 1/4 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VT325**<br>3 port direct operated solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Manifold | 1.4 | 1/4, 3/8 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVP300/500/700**<br>3 port pilot operated poppet solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Sub-plate<br>• Manifold | 0.26~3.5 | 1/8, 1/4,<br>3/8, 1/2 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VKF300**<br>3 port direct operated poppet solenoid valve | | | | |
| | • Body ported<br>• Sub-plate<br>• Manifold | 0.13~0.15 | M5, 1/8<br>ø4, ø6 | -101.2 kPa | SEE IN BEST PNEUMATICS CATALOGUE |

## 5 Port ISO Solenoid Valve



| Series | Type | Flow (Cv) 1 → 2 (P → A) | Port size | Manifold station * | |
|---|---|---|---|---|---|
|  | **VQ7-6/7-8**<br>ISO solenoid valve - Rubber seal/Metal seal<br>• ISO5599/1 sizes: 1 and 2<br>• Sub-base<br>• Manifold | 0.9~3.3 | 1/4, 3/8, 1/2 | 1~10 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVS7-6/7-8/7-10**<br>ISO solenoid valve with M12 connector - Rubber seal/Metal seal<br>• ISO5599/1 sizes: 1, 2 and 3<br>• Sub-base<br>• Manifold | 0.9~4.0 | 1/4, 3/8, 1/2, 3/4, 1 | 1~10 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVS1-01/1-02**<br>ISO solenoid valve with M8, M12 connector - Rubber seal/Metal seal<br>• ISO15407-1 sizes: 1 and 2<br>• Sub-base<br>• Manifold ** | 0.60~1.0 | 1/8, 1/4 | ** | |
|  | **VP7-6/7-8**<br>ISO solenoid valve - Rubber seal<br>• ISO5599/1 sizes: 1 and 2<br>• Sub-base<br>• Manifold | 1.1~3.3 | 1/4, 3/8, 1/2 | 1~10 | SEE IN BEST PNEUMATICS CATALOGUE |

* It is possible to make longer manifolds but the wiring for each station must be specified on a configuration table. Please contact SMC for clarification.
** SMC do not currently offer manifolds for series EVS1 valves, as they are a commodity item on the open market.

## 5 Port Solenoid Valve

| Series | Type | Flow (Cv) 1 → 2 (P → A) | Port size | Manifold station * | |
|---|---|---|---|---|---|
|  | **SV1000/2000/3000/4000**<br>5 port solenoid valve - Rubber seal | | | | |
| | • Sub-base<br>• Manifold | 0.24~2.2 | 1/8, 1/4, 3/8, 1/2, ø3.2, ø4, ø6, ø8, ø10, ø12 | 2~20 | |
|  | **SY3000/5000/7000/9000**<br>5 port solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Sub-base<br>• Manifold | 0.13~2.5 | M5, 1/8, 1/4, 3/8, 1/2, ø4, ø6, ø8, ø10, ø12 | 2~20 | |
|  | **SY3000/5000/7000**<br>5 port solenoid valve - Rubber seal- Cassette type | | | | |
| | • Manifold<br>Cassette type | 0.14~0.98 | M5, 1/8, 1/4, ø4, ø6, ø8, ø10 | 2~20 | |
|  | **SYJ3000/5000/7000**<br>4/5 port solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Sub-base<br>• Manifold | 0.10~0.74 | M3, M5, 1/8, 1/4, ø4, ø6, ø8 | 2~20 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **SX3000/5000/7000**<br>5 port solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Sub-base<br>• Manifold | 0.13~1.3 | M5, 1/8, 1/4, 3/8, ø4, ø6, ø8, ø10 | 2~20 | SEE IN BEST PNEUMATICS CATALOGUE |

* It is possible to make longer manifolds but the wiring for each station must be specified on a configuration table. Please contact SMC for clarification.

## SI (Serial Interface) Systems Overview

• SMC can offer many interfaces to connect to different systems.

## 5 Port Solenoid Valve

| Series | Type | Flow (Cv) 1 → 2 (P → A) | Port size | Manifold station * | |
|---|---|---|---|---|---|
|  | **VQC1000/2000/4000**<br>5 port solenoid valve - Rubber seal/Metal seal | | | | |
| | • Manifold | 0.16~2.1 | M5, ø4, ø6, ø8 | 1~12 | |
|  | **SQ1000/2000**<br>5 port solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Manifold | 0.14~0.56 | M5, ø4<br>ø6, ø8 | 1~12 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VQ0000/1000/2000**<br>5 port solenoid valve - Rubber seal/Metal seal | | | | |
| | • Body ported<br>• Manifold | 0.07~0.80 | M5, ø4<br>ø6, ø8 | 1~12 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VQ4000/5000**<br>5 port solenoid valve - Rubber seal/Metal seal | | | | |
| | • Sub-base<br>• Manifold | 1.5~4.4 | 1/4, 3/8, 1/2<br>ø8, ø10, ø12 | 1~12 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VQD1000**<br>4 port direct operated poppet solenoid valve - Rubber seal | | | | |
| | • Body ported<br>• Sub-base<br>• Manifold | 0.05~0.07 | M5 | 1~20 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VQZ1000/2000/3000**<br>3/5 Port Solenoid Valve - Body Ported Type | | | | |
| | • High speed and long life<br>• IP65 DIN Connector<br>Metal Seal construction | | M5, 1/4, ø3.2, ø4, ø6, ø8, ø10 | 2~20 | |

* It is possible to make longer manifolds but the wiring for each station must be specified on a configuration table. Please contact SMC for clarification.

## Air Operated Valves

| Series | Type | | Flow (Cv) 1 → 2 (P → A) | Port size | |
|---|---|---|---|---|---|
|  | **SYA3000/5000/7000**<br>5 port air operated valve | 5 port valve | • Body ported<br>• Sub-plate<br>• Manifold | 0.15~1.3 | M5, 1/8, 1/4<br>ø4, ø6, ø8, ø10 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVFA3000/5000**<br>5 port air operated valve | 5 port valve | • Body ported<br>• Sub-plate<br>• Manifold | 0.64~2.7 | 1/8, 1/4,<br>3/8, 1/2 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **SYJA300/500/700**<br>3 port air operated valve | 3 port valve | • Body ported<br>• Sub-plate<br>• Manifold | 0.086~0.77 | M3, M5<br>1/8, 1/4 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVPA300/500/700**<br>3 port air operated valve | 3 port valve | • Body ported<br>• Sub-plate<br>• Manifold | 0.74~3.8 | 1/8, 1/4,<br>3/8, 1/2 | SEE IN BEST PNEUMATICS CATALOGUE |

## Mechanical Valves

| Series | Type | Effective area ($mm^2$) | Port size | |
|---|---|---|---|---|
|  | **VM1000**<br>2, 3 port micro mechanical valve | 2, 3 port, N.C. | 1 | Barbed connection to suit ø4mm tube | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVM100/200/400**<br>2, 3 port mechanical valve | EVM100: 2, 3 port, N.C.<br>EVM200: 2, 3 port, N.C.<br>EVM400: 3 port, N.C. | EVM100: 2.5<br>EVM200: 19<br>EVM400: 7 | VM100: 1/8<br>VM200: 1/4<br>VM400: 1/8 | SEE IN BEST PNEUMATICS CATALOGUE |

## Mechanical Valves

| Series | Type | Effective area ($mm^2$) | Port size | |
|---|---|---|---|---|
|  | **EVM800**<br>Heavy duty 3 port mechanical valve | | | |
| | 3 port, universal porting | 6 | 1/8 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **EVZM550/450, VFM350/250**<br>5 port mechanical valve | | | |
| | EVZM550: 5 port, rubber spool<br>EVZM450: 5 port, metal spool<br>EVFM350: 5 port, rubber spool<br>EVFM250: 5 port, metal spool | EVZM550: 10.8<br>EVZM450: 9.9<br>EVFM350: 5<br>EVFM250: 5 | EVZM550: 1/8<br>EVZM450: 1/8<br>EVFM350: 1/8<br>EVFM250: 1/4 | SEE IN BEST PNEUMATICS CATALOGUE |

## Hand Valves

| | | | | |
|---|---|---|---|---|
|  | **VHK**<br>2, 3 port finger valve | | | |
| | 2, 3 port, In-line | 2.0~17.5 | M5, 1/8, 1/4, 3/8, 1/2<br>ø4, ø6, ø8, ø10, ø12 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VH**<br>4 port hand valve | | | |
| | 4 port, robust construction | 7.5~194 | 1/4, 3/8, 1/2, 3/4, 1 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **VHS**<br>3 port hand valve, residual pressure relief | | | |
| | 3 port air isolating valve | 21~93 | 1/4, 3/8, 1/2, 3/4 | SEE IN BEST PNEUMATICS CATALOGUE |

## Silencers/Exhaust Cleaners

| Series | Type | Effective area ($mm^2$) | Port size | |
|---|---|---|---|---|
|  | **AN/25**<br>Silencer standard type | | | |
| | noise reductions up to 30dB | 35~960 | M3, M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2<br>Stem for ø6, 8, 10, 12 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **AN□1**<br>Silencer high noise reduction type | | | |
| | High noise attenuation (40dB) | 10~610 | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **AMC**<br>Exhaust cleaner (reclassifier) | | | |
| | Removes oil for exhaust air<br>99.9% of mist removed | 16~550 | Male thread:<br>3/8, 3/4, 1, 1 1/2, 2<br>Female thread:<br>1/4, 3/8, 1/2, 3/4 | SEE IN BEST PNEUMATICS CATALOGUE |
|  | **AMP**<br>Exhaust cleaner for clean rooms | | | |
| | An exhaust cleaner that can be used inside a clean room.<br>Equivalent to Class 10. | 15~55 | 1/4, 3/8, 1/2, 3/4 | SEE IN BEST PNEUMATICS CATALOGUE |

| Series | Type | Orifice size (mmø) [Flow (Cv)] | Port size | Valve * type | |
|---|---|---|---|---|---|
|  | **VCA20/30/40**<br>Direct operated 2 port solenoid valve for air | | | | |
| | • Body ported<br>• Manifold | 3~10<br>[0.29~1.9] | 1/4, 3/8,<br>1/2, 3/4 | N.C. | |
|  | **VCB20/30/40**<br>Direct operated 2 port solenoid valve for heated water | | | | |
| | • Body ported | 2~10<br>[0.16~2.1] | 1/8, 1/4,<br>3/8, 1/2,<br>3/4 | N.C. | |
|  | **VCL20/30/40**<br>Direct operated 2 port solenoid valve for oil | | | | |
| | • Body ported<br>• Manifold | 2~10<br>[0.16~2.1] | 1/8, 1/4,<br>3/8, 1/2,<br>3/4 | N.C. | |
|  | **VCS20/30/40**<br>Direct operated 2 port solenoid valve for steam | | | | |
| | • Body ported<br>• Manifold | 2~10<br>[0.16~2.1] | 1/8, 1/4,<br>3/8, 1/2,<br>3/4 | N.C. | |
|  | **VCW20/30/40**<br>Direct operated 2 port solenoid valve for water | | | | |
| | • Body ported<br>• Manifold | 2~10<br>[0.16~2.1] | 1/8, 1/4,<br>3/8, 1/2,<br>3/4 | N.C. | |
|  | **VDW10/20/30**<br>Compact direct operated 2 port solenoid valve for water and air | | | | |
| | • Body ported<br>• Manifold | 1~4<br>[0.04~0.44] | M5, 1/8, 1/4 | N.C. | |
|  | **VDW200/300**<br>Compact direct operated 3 port solenoid valve for water and air | | | | |
| | • Body ported | 1~4<br>[0.03~0.44] | M5, 1/8, 1/4 | COM. | |
|  | **VQ20/30**<br>2 port solenoid valve for air | | | | |
| | • Body ported<br>• Manifold | 3.4~4.8<br>[0.33~0.81] | ø6, ø8,<br>ø10, ø12 | N.C. | |

* N.C.: normally closed; N.O.: normally open; COM.: common

| Series | Type | Orifice size (mmø) [Flow (Cv)] | Port size | Valve * type | |
|---|---|---|---|---|---|
|  | **VX21/22/23**<br>Direct operated 2 port solenoid valve for air, gas, vacuum, water, steam, oil | | | | |
| | • Body ported<br>• Manifold | 2~10<br>[0.17~2.20] | 1/8, 1/4,<br>3/8, 1/2 | N.C./N.O. | |
|  | **VXD21/22/23**<br>Pilot operated 2 port solenoid valve for air, gas, water, oil | | | | |
| | • Body ported | 10~25<br>[1.9~13] | 1/4, 3/8,<br>1/2, 3/4, 1 | N.C./N.O. | |
|  | **VXZ22/23**<br>Pilot operated 2 port for zero pressure differential/For air, gas, vacuum, water, oil | | | | |
| | • Body ported | 10~25<br>[1.9~12] | 1/4, 3/8,<br>1/2, 3/4, 1 | N.C./N.O. | |
|  | **VXH22**<br>Pilot operated 2 port for hihg pressure/For air, water, oil | | | | |
| | • Body ported | 10<br>[2.0~2.3] | 1/4, 3/8,<br>1/2 | N.C. | |
|  | **VX31/32/33**<br>Direct operated 3 port for air, gas, vacuum, water, steam, oil | | | | |
| | • Body ported<br>• Manifold | 1.5~4<br>[0.08~0.38] | 1/8, 1/4,<br>3/8 | N.C./N.O.<br>COM. | |
|  | **VXA21/22, VXA31/32**<br>Direct operated 2/3 port for air, gas, vacuum, water, oil | | | | |
| | • Body ported<br>• Manifold | VXA21/22:<br>3~10 [0.38~2.8]<br>VXA31/32:<br>1.5~4 [0.08~0.38] | VXA21/22:<br>1/8, 1/4, 3/8, 1/2<br>VXA31/32:<br>1/8, 1/4, 3/8 | VXA21/22:<br>N.C./N.O.<br>VXA31/32:<br>COM. | |

* N.C.: normally closed; N.O.: normally opem; COM.: common

| Series | Type | Orifice size (mmø) [Flow (Cv)] | Port size | Valve * type | |
|---|---|---|---|---|---|
|  | **VNA**<br>2 port valve for compressed air and air-hydro circuit control | | | | |
| | • Body ported | 10~50<br>[0.88~43] | 1/8, 1/4, 3/8,<br>1/2, 3/4, 1,<br>1 1/4, 1 1/2, 2 | N.C./N.O.<br>COM. | |
|  | **VNB**<br>2 port valve for flow control | | | | |
| | • Body ported | 7~50<br>[0.80~43] | 1/8, 1/4, 3/8,<br>1/2, 3/4, 1,<br>1 1/4, 1 1/2, 2 | N.C./N.O.<br>COM. | |

* N.C.: normally closed; N.O.: normally opem; COM.: common

| Series | Type | Orifice size (mmø) [Flow (Av x $10^{-5}$)] | Port size | Valve * type | |
|---|---|---|---|---|---|
|  | **VNC**<br>2 port valve for coolant applications | | | | |
| | • Body ported | 7~50 [30~1500] | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 | N.C./N.O. COM. | |
|  | **VND**<br>2 port valve for steam | | | | |
| | • Body ported | 7~50 [26~1500] | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2 | N.C./N.O. | |

* N.C.: normally closed; N.O.: normally open; COM.: common

## Equipment for Fluids Control/Related Products (Please contact SMC)

■ High purity chemical valve/Integrated fitting
Type: **LVC**

■ High purity chemical valve/Threaded
Type: **LVA**

■ High purity chemical valve/Manually operated
Type: **LVH**

■ High purity chemical valve/Compact
Type: **LVD**

■ Air operated chemical valve/Non-metallic exterior
Type: **LVQ**

■ High purity fluoropolymer/Fittings
Type: **LQ**½

■ High purity fluoropolymer/Needle valve
Type: **LVN**

■ High purity fluoropolymer/Tubing
Type: **TL/TIL**

■ Process pump/Automatically switching/Air operated type: **PA**
■ Process pump/Automatically switching with built-in pulsation attenuator/Air operated type: **PAX**
■ Process pump/Built-in solenoid valve/Air operated type: **PB**

## Standard Cylinders

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **CJ1**  | Air cylinder | ø4 | ø4 | | | | | | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **CJP**  | Pin cylinder | | | M5 | | M5 | | 15 M5 | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **CG1**  | Air cylinder | | | | | | | | | | | | | | | | | | | | | | |
| **CS1**  | Air cylinder | | | | | | | | | | | | | | | 1/2 | 1/2 | 3/4 | 3/4 | 3/4 | 1 | 1 | SEE IN BEST PNEUMATICS CATALOGUE |
| **C76**  | Air cylinder | | | | | | | | | 1/8 | 1/4 | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **C85**  | ISO cylinder | | | M5 | M5 | M5 | M5 | 1/8 | 1/8 | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **C95**  | ISO/VDMA cylinder | | | | | | | | | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | 1/2 | 1/2 | | 3/4 | | 3/4 | 1 | | SEE IN BEST PNEUMATICS CATALOGUE |
| **CP95**  | ISO/VDMA cylinder | | | | | | | | | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | 1/2 | | | | | | | | |

## Compact Cylinders

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **CUJ**  | Mini-free mount cylinder | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | | M3 | M3 | M3 | M3 | | | | | | | | | | | | | | | | | | |
| **CU**  | Free mount cylinder | | ● | | ● | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | | | M5 | | M5 | | M5 | M5 | M5 | 3/8 | | | | | | | | | | | | | |
| **CU□□-□A**  | Free mount cylinder with air cushion | | | | | | | | ● | ● | ● | | | | | | | | | | | | |
| | | | | | | | | | M5 | M5 | 1/8 | | | | | | | | | | | | |
| **CQS**  | Compact cylinder | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | | | | | | | M5 | M5 | M5 | M5 | | | | | | | | | | | | | |
| **CQM**  | Compact cylinder guide rod type | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | M5 | M5 | M5 | M5 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | | | | | | | |
| **C55**  | ISO 21287 Standard Compact cylinder | | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | | | M5 | M5 | 1/8 | 1/8 | 1/8 | 1/8 | | | | | | | | | |
| **CQ2**  | Compact cylinder | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | | | | | | | M5 | M5 | M5 | M5 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 1/2 | | | |
| **RQ**  | Compact cylinder with air cushion | | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | | | M5 | M5 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | | | | | | | |
| **MU**  | Plate cylinder | | | | | | | | | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | | | | M5 | 1/8 | 1/8 | 1/4 | 1/4 | | | | | | | | | |

## Slide table (Compact Slide)

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **MXH**  With linear guide | | | ● M5 | | ● M5 | | ● M5 | ● M5 | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MXU**  With miniature linear guide | | | ● M5 | | ● M5 | | ● M5 | | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |

## Slide table (Compact Slide)

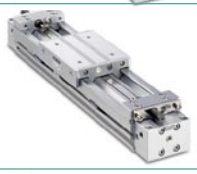
| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **MXJ**  Compact air slide table | | ● M3 | ● M3 | ● M3 | | | | | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MXS**  With cross roller guide | | | ● M3 | ● M5 | | ● M5 | ● M5 | ● 1/8 | ● 1/8 | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MXQ**  With recirculating linear guide | | | ● M5 | ● M5 | | ● M5 | ● M5 | ● 1/8 | ● 1/8 | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MXF**  Low profile table unit, with cross roller guide | | | | ● M3 | | ● M5 | ● M5 | ● M5 | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MXW**  Long strokes available, with recirculating linear guide | | | | ● M5 | | ● M5 | ● M5 | ● 1/8 | ● 1/8 | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MXP**  Super compact table unit, with linear guide | | | ● M3 | ● M5 | ● M5 | ● M5 | ● M5 | | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MXY**  Super compact table unit, long stroke type, with linear guide | | | ● M5 | ● M5 | | | ● M5 | | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |

Actuators

## Precision Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
| | Port size | | | | | | | | | | | | | | | | | | | | | |
| **MTS**  | With internal guide function | | | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | | | | M5 | | M5 | M5 | M5 | M5 | 1/8 | 1/8 | | | | | | | | | | | |

## Mechanically Jointed Rodless Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
| | Port size | | | | | | | | | | | | | | | | | | | | | |
| **MY1B**  | Basic type | | | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | M5 | | M5 | M5 | 1/8 | 1/8 | 1/4 | 3/8 | 3/8 | 1/2 | 1/2 | | | | | | | |
| **MY1M**  | Slide bearing guide type | | | | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | M5 | M5 | M5 | 1/8 | 1/8 | 1/4 | 3/8 | | | | | | | | | |
| **MY1C**  | Cam follower guide type | | | | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | M5 | M5 | M5 | 1/8 | 1/8 | 1/4 | 3/8 | | | | | | | | | |
| **MY1H**  | High precision guide type | | | | ● | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | | | | | M5 | | M5 | M5 | 1/8 | 1/8 | 1/4 | | | | | | | | | | | |
| **MY1HT**  | High rigidity/High precision guide type | | | | | | | | | | | | ● | ● | | | | | | | | |
| | | | | | | | | | | | | | 3/8 | 3/8 | | | | | | | | |
| **MY1□W**  | With protective cover | | | | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | M5 | M5 | 1/8 | 1/8 | 1/4 | 3/8 | 3/8 | | | | | | | | | |
| **MY2C/H/HT**  | Compact and low profile design | | | | | | ● | | ● | | ● | | | | | | | | | | | |
| | | | | | | | M5 | | 1/8 | | 1/4 | | | | | | | | | | | |
| **MY3A/3B**  | Short type | | | | | | ● | | ● | | ● | | ● | | | | | | | | | |
| | | | | | | | M5 | | 1/8 | | 1/4 | | 3/8 | | | | | | | | | |



SMC

Recommended for Food and Packaging Industry

## Magnetically Coupled Rodless Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
| | Port size | | | | | | | | | | | | | | | | | | | | | |
| **CY3B/3R**  | Basic type | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | M5 | | M5 | | M5 | 1/8 | 1/8 | 1/8 | 1/4 | 1/4 | 1/4 | | | | | | | | | |

## Compact Guide Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
| | Port size | | | | | | | | | | | | | | | | | | | | | |
| **MGJ**  | Miniature guide rod cylinder | | ● | | ● | | | | | | | | | | | | | | | | | |
| | | | M3 | | M3 | | | | | | | | | | | | | | | | | |
| **MGP**  | Compact guide cylinder | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | | | | | | | | M5 | M5 | 1/8 | 1/8 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | | | | | |
| **MGP□□A**  | With air cushion | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | | | | | | | | M5 | 1/8 | 1/8 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | | | | | | |

More MGP variations continue on the next page.

## Compact Guide Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **MGP**  | End Lock type | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | | 1/8 | 1/8 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | | | | | | | | |
| **MGPS**  | Heavy duty guide rod type | | | | | | | | | | | ● | | ● | | | | | | | | | |
| | | | | | | | | | | | | 1/4 | | 3/8 | | | | | | | | | |
| **MGPA**  | High precision guidance type | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | |
| | | | | | | | | M5 | M5 | 1/8 | 1/8 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | | | | | | |

## Guide Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **MGF**  | Compact guide table | | | | | | | | | | | ● | | ● | | ● | | | | | | | |
| | | | | | | | | | | | | 1/8 | | 1/4 | | 1/4 | | | | | | | |
| **MGT**  | Guide cylinder and manually operated turntable | | | | | | | | | | | | | ● | ● | ● | | | | | | | |
| | | | | | | | | | | | | | | 1/4 | 3/8 | 3/8 | | | | | | | |

## Double Power Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **MGZ/MGZR**  | Double power cylinder | | | | | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | | M5 | 1/8 | 1/8 | 1/4 | 1/4 | 1/4 | 3/8 | | | | | | | | | |



SMC

Recommended for Food and Packaging Industry

## Slide Unit

| Series | | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **CXW** |  | Built-in shock absorber | | | | ● | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | | | | | | M5 | | M5 | M5 | 1/8 | 1/8 | | | | | | | | | | | | | |

## Dual Rod Cylinder

| Series | | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2,5 | 4 | 6 | 8 | 10 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 | |
| | | Port size | | | | | | | | | | | | | | | | | | | | | | |
| **CXSJ** |  | Compact type | | ● | | ● | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | | | | M3 | | M5 | | M5 | M5 | M5 | 1/8 | | | | | | | | | | | | | |
| **CXS** |  | Basic type | | ● | | ● | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | | | | M5 | | M5 | | M5 | M5 | 1/8 | 1/8 | | | | | | | | | | | | | |
| **CXS□□A** |  | With air cushion | | | | | | | ● | ● | ● | | | | | | | | | | | | | |
| | | | | | | | | | M5 | 1/8 | 1/8 | | | | | | | | | | | | | |
| **CXS□□R** |  | With end lock. For retraction side | | ● | | ● | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | | | | M5 | | M5 | | M5 | M5 | 1/8 | 1/8 | | | | | | | | | | | | | |
| **CXSW** |  | Double rod cylinder | | ● | | ● | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | | | | M5 | | M5 | | M5 | M5 | 1/8 | 1/8 | | | | | | | | | | | | | |

## Compact Cylinder with Lock

| Series | | Locking method | Locking direction | Description/Bore Sizes (mm) 16 20 25 32 40 50 63 80 100 125 140 160 180 200 250 ( ): Locking port — Port size | |
|---|---|---|---|---|---|
| **CLQ** |  | Cam plate | One direction | Compact cylinder with lock<br>● ● ● ● ● ● ● ●<br>M5 (M5) \| M5 (M5) \| 1/8 (1/8) \| 1/8 (1/8) \| 1/4 (1/8) \| 1/4 (1/8) \| 3/8 (1/8) \| 3/8 (1/4) | SEE IN BEST PNEUMATICS CATALOGUE |
| **MLGP** |  | Cam plate | One direction | Compact guide cylinder with lock<br>● ● ● ● ● ● ● ●<br>1/8 (M5) \| 1/8 (M5) \| 1/8 (1/8) \| 1/8 (1/8) \| 1/4 (1/8) \| 1/4 (1/8) \| 3/8 (1/8) \| 3/8 (1/4) | SEE IN BEST PNEUMATICS CATALOGUE |

## Cylinder with spring locking

| Series | | Locking method | Locking direction | Description/Bore Sizes (mm) 16 20 25 32 40 50 63 80 100 125 140 160 180 200 250 ( ): Locking port — Port size | |
|---|---|---|---|---|---|
| **RLQ** |  | Spring locking | One direction | Compact cylinder with air cushion & lock<br>● ● ● ●<br>1/8 (M5) \| 1/8 (M5) \| 1/4 (M5) \| 1/4 (M5) | SEE IN BEST PNEUMATICS CATALOGUE |
| **MLU** |  | Spring locking | One direction | Plate cylinder with lock<br>● ● ● ●<br>M5 (M5) \| 1/8 (1/8) \| 1/8 (1/8) \| 1/4 (1/8) | SEE IN BEST PNEUMATICS CATALOGUE |
| **ML1C** |  | Spring locking | Both directions | Hy-rodless cylinder<br>● ● ●<br>1/8 (1/8) \| 1/8 (1/8) \| 1/4 (1/4) | SEE IN BEST PNEUMATICS CATALOGUE |

## Sine Cylinder

| Series | Description/Bore Sizes (mm) 2,5 · 4 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 32 · 40 · 50 · 63 · 80 · 100 · 125 · 140 · 160 · 180 · 200 · 250 · 300 — Port size | |
|---|---|---|
| **REA**  | Rodless Cylinder/Basic type | ● 1/8 · ● 1/8 · ● 1/4 · ● 1/4 · ● 1/4 |
| **REAR/REBR** (300 mm/s) (600 mm/s)  | Rodless Cylinder/Direct mount type | ● M5 · ● M5 · ● 1/8 · ● 1/8 · ● 1/4 |
| **REAS**  | Rodless Cylinder/Slider type/Slide bearing | ● M5 · ● M5 · ● 1/8 · ● 1/8 · ● 1/4 |
| **REAL**  | Rodless Cylinder/Slider type/Ball bushing bearing | ● M5 · ● M5 · ● 1/8 · ● 1/8 · ● 1/4 |
| **REAH/REBH** (300 mm/s) (600 mm/s)  | Rodless Cylinder/High precision guide type | ● M5 · ● M5 · ● 1/8 · ● 1/8 · ● 1/8 |
| **REC**  | Sine cylinder | ● 1/8 · ● 1/8 · ● 1/8 · ● 1/4 |

## High Power Cylinder

| | | |
|---|---|---|
| **RHC**  | High power cylinder | ● 1/4 · ● 1/4 · ● 3/8 · ● 3/8 · ● 1/2 · ● 1/2 · ● 3/4 · ● 3/4 |

## Low Friction Cylinder

| | | |
|---|---|---|
| **MQQ/MQM/MQP**  | Low friction cylinder | ● M5 · ● M5 · ● M5 · ● M5 · ● M5 · ● 1/8 · ● 1/8 · ● 1/8 |

## Stopper Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
| | Port size | | | | | | | | | | | | | | | | | | | | | |
| **RSQ**  | Fixed mounting height | | | | | ● | ● | ● | | ● | ● | ● | | | | | | | | | | |
| | | | | | | M5 | M5 | 1/8 | | 1/8 | 1/8 | 1/8 | | | | | | | | | | |
| **RSG**  | Adjustable mounting height | | | | | | | | | | ● | ● | | | | | | | | | | |
| | | | | | | | | | | | 1/8 | 1/8 | | | | | | | | | | |
| **RSH/RS1H**  | Heavy Duty | | | | | | | ● | | ● | | ● | ● | ● | | | | | | | | |
| | | | | | | | | M5 | | 1/8 | | 1/8 | 1/4 | 1/4 | | | | | | | | |
| **RSA**  | | | | | | | | | | | | ● | ● | ● | | | | | | | | |
| | | | | | | | | | | | | 1/8 | 1/4 | 1/4 | | | | | | | | |

## 3 Position Cylinder

| | |
|---|---|
| **RZQ**  | 3 position cylinder |
| | 1/8 1/8 1/4 1/4 |

## Escapements

| | |
|---|---|
| **MIW/MIS**  | Escapements |
| | M3 M5 M5 M5 1/8 |

## Stroke Reading Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
| | Port size | | | | | | | | | | | | | | | | | | | | | |
| **CE1/CEU5**  | CE1: cylinder, CEU5: Multi-counter | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | ● | | ● | | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | M5 | | M5 | | 1/8 | 1/8 | 1/4 | 1/4 | | | | | | | | | |





Recommended for Food and Packaging Industry

## Hygienic Design Cylinder

| Series | Description/Bore Sizes (mm) | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,5 | 4 | 6 | 8 | 10 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
| | Port size | | | | | | | | | | | | | | | | | | | | | |
| **HYB**  | Hygenic design cylinder/ISO standard type | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | | M5 | M5 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 1/2 | | | | | | | |
| **HYQ**  | Hygenic design cylinder/Basic type | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | | M5 | M5 | 1/8 | 1/8 | 1/4 | 1/4 | | | | | | | | | |
| **HYC**  | Hygenic design cylinder/ISO standard type | | | | | | | | | ● | ● | ● | ● | | | | | | | | | |
| | | | | | | | | | | 1/8 | 1/4 | 1/4 | 3/8 | | | | | | | | | |
| **HYG**  | Hygenic design cylinder/ISO standard type | | | | | | | | | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | | | | M5 | M6 | M8 | M8 | M10 | M10 | | | | | | | |

## Stainless Steel Cylinder

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CJ5-S**<br>**CG5-S**  | Stainless steel cylinder | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | | | | | | | | M5 | | M5 | 1/8 | 1/8 | 1/8 | 1/8 | 1/4 | 1/4 | 3/8 | 1/2 | | | | |
| **C5G**  | Stainless steel cylinder with ISO 6432 dimensions | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | ● | | | | | | | | | | | | | |

## Shock Absorber

| Series | | Thread size | M8 | M10 | M14 | M16 | M20 | M25 | M27 | M30 | M32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **RB** |  | Standard | | | | | | | | | |
| | | Max. energy absorption (J) | 2.94 | 5.88 | 19.6 | | 58.8 | | 147 | | |
| | | Stroke absorption (mm) | 6 | 7 | 12 | | 15 | | 25 | | |
| **RBL** |  | Coolant resistant | | | | | | | | | |
| | | Max. energy absorption (J) | | 5.88 | 19.6 | | 58.8 | | 147 | | |
| | | Stroke absorption (mm) | | 7 | 12 | | 15 | | 25 | | |
| **RBQ** |  | Compact type | | | | | | | | | |
| | | Max. energy absorption (J) | | | | 1.96 | 11.8 | 19.6 | | 33.3 | 49.0 |
| | | Stroke absorption (mm) | | | | 4 | 7 | 8 | | 8.5 | 13 |

## Flotating Joint

| Series | | Description/Bore Sizes (mm) | 2,5 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **JA** |  | Standard type | | | ● | | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
| **JAH** |  | Heavy load | | | | | | | | | | | ● | ● | ● | ● | ● | | | | | | | |
| **JB** |  | For compact cylinders | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| **JS** |  | Stainless steel type | | | | | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |

## Vane Style Series Variations

| Series | Sizes: 0.5 | 1 | 2 | 3 | 7 | 10 | 15 | 20 | 30 | 40 | 50 | 63 | 70 | 80 | 100 | 200 | Rotating angle: 90° | 100° | 180° | 190° | 270° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | : Single vane ( ): Double vane — Torque (at 0.5 MPa) N.m | | | | | | | | | | | | | | | | | | | | |
| **CRB2**  | Rotary actuator | | | | | ● 0,12 (0,25) | ● 0,32 (0,65) | ● 0,70 (1,45) | ● 1,83 (3,70) | ● 3,73 (7,59) | | | | | | | ● | | ● | | ● |
| **CRBU2**  | Rotary actuator/Free mount type | | | | | ● 0,12 (0,25) | ● 0,32 (0,65) | ● 0,7 (1,45) | ● 1,83 (3,70) | ● 3,73 (7,59) | | | | | | | ● | | ● | | ● |
| **CRB1**  | Rotary actuator | | | | | | | | | | ● 5,69 (11,8) | ● 10,8 (22,7) | | ● 18 (36,5) | ● 35,9 (72,6) | | ● | | ● | | ● |
| **MSUA**  | Rotary table/High precision type | | ● 0,11 | | | | ● 0,31 | ● 0,69 | | | ● 1,78 | | | | | | ● | | ● | | |
| **MSUB**  | Rotary table | | ● 0,11 (0,23) | | | | ● 0,31 (0,62) | ● 0,69 (1,42) | | | ● 1,78 (3,63) | | | | | | ● | | ● | | |

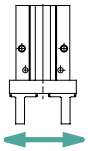
## Rack and Pinion Style Series Variations

| Series | Sizes: 0.5 | 1 | 2 | 3 | 7 | 10 | 15 | 20 | 30 | 40 | 50 | 63 | 70 | 80 | 100 | 200 — Rotating angle: 90° | 100° | 180° | 190° | 270° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | : Single rack pinion ( ): Double rack pinion — Torque (at 0.5 MPa) N.m | | | | | | | | | | | | | | | | | | | |
| **CRJ**  Mini-rotary actuator | ● | ● | | | | | | | | | | | | | | ● | ● | ● | ● | |
| | 0,042 | 0,095 | | | | | | | | | | | | | | | | | | |
| **CRA1**  Rotary actuator | | | | | | | | | ● | | ● | ● | | ● | ● | ● | | ● | | |
| | | | | | | | | | 1,91 | | 9,27 | 17,2 | | 31,7 | 74,3 | | | | | |
| **CRQ2**  Compact rotary actuator | | | | | | ● | ● | ● | ● | ● | | | | | | 80° to 100° | | 170° to 180° | | |
| | | | | | | (0,3) | (0,75) | (1,84) | (3,11) | (5,3) | | | | | | | | | | |
| **MSQ**  Mini rotary table (With adjustment bolt) | | ● | ● | ● | ● | | | | | | | | | | | | | | 0° to 190° | |
| | | (0,09) | (018) | (0,29) | (0,56) | | | | | | | | | | | | | | | |
| **MSQ**  Rotary table (With adjustment bolt, with internal absorber) | | | | | | ● | | ● | ● | | ● | | ● | | ● | | | | 0° to 190° | |
| | | | | | | (0,89) | | (1,84) | (2,73) | | (4,64) | | (6,79) | | (10,1) (19,8) | | | | | |
| **MSQ**  Rotary table (With external absorber) | | | | | | ● | | ● | ● | | ● | | | | | ● | | ● | | |
| | | | | | | (0,89) | | (1,84) | (2,73) | | (4,64) | | | | | | | | | |

## Rotary Cylinder

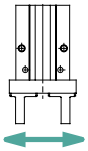
| Series | Bore size (mm): 32 | 40 — Standard stroke (mm): 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 75 | 100 — Rotating angle: 90° | 100° | 180° | 190° | 270° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MRQ**  Rotary Cylinder | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 80° to 100° | | 170° to 190° | |

## Parallel Style Series Variations



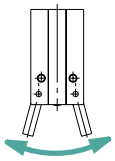
| Series | Sizes: 6 | 8 | 10 | 12 | 15 | 16 | 20 | 25 | 30 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | External gripping force (at 0.5 MPa) N | | | | | | | | | | | | | | | | |
| **MHZA2/MHZAJ2-6**  | Compact series (without auto switch) | | | | | | | | | | | | | | | | |
| | ● 3.3 | | | | | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MHZ2**  | Standard type | | | | | | | | | | | | | | | | |
| | ● 3.3 | | ● 11 | | | ● 34 | ● 42 | ● 65 | | ● 158 | ● 254 | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MHZJ2**  | Standard type with dust cover | | | | | | | | | | | | | | | | |
| | ● 3.3 | | ● 11 | | | ● 34 | ● 42 | ● 65 | | | | | | | | | |
| **MHZL2**  | Long stroke type | | | | | | | | | | | | | | | | |
| | | | ● 11 | | | ● 34 | ● 42 | ● 65 | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MHF2**  | Low profile | | | | | | | | | | | | | | | | |
| | | ● 19 | | ● 48 | | ● 90 | ● 141 | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MHL2**  | Wide opening | | | | | | | | | | | | | | | | |
| | | | ● 14 | | | ● 45 | ● 74 | ● 131 | | ● 228 | ● 396 | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MHR2**  | Rotary actuated (2 finger) | | | | | | | | | | | | | | | | |
| | | | ● 12 | | ● 24 | | ● 33 | | ● 58 | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MHR3**  | Rotary actuated (3 finger) | | | | | | | | | | | | | | | | |
| | | | ● 12 | | ● 24 | | | | | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |
| **MHK2**  | Wedge Cam Operation Slide Guide | | | | | | | | | | | | | | | | |
| | | | | | ● 15 | | ● 31 | ● 46 | ● 80 | | | | | | | | SEE IN BEST PNEUMATICS CATALOGUE |

## Parallel Style Series Variations



| Series | Sizes: 6 | 8 | 10 | 12 | 15 | 16 | 20 | 25 | 30 | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | External gripping force (at 0.5 MPa) N | | | | | | | | | | | | | | | |
| **MHS2**  | Slide guide type - 2 Finger | | | | | ● 21 | ● 37 | ● 63 | | ● 111 | ● 177 | ● 280 | ● 502 | | | |
| **MHS3**  | Slide guide type - 3 Finger | | | | | ● 14 | ● 25 | ● 42 | | ● 74 | ● 118 | ● 187 | ● 335 | ● 500 | ● 750 | ● 1270 |
| **MHSJ3**  | Slide guide type - 3 Finger with dust cover | | | | | ● 14 | ● 25 | ● 42 | | ● 74 | ● 118 | ● 187 | ● 335 | ● 500 | | |
| **MHSH3**  | Slide guide type - 3 Finger, through hole type | | | | | ● 14 | ● 25 | ● 42 | | ● 74 | ● 118 | ● 187 | ● 335 | ● 500 | | |
| **MHSL3**  | Slide guide type - 3 Finger, long stroke type | | | | | ● 14 | ● 25 | ● 42 | | ● 74 | ● 118 | ● 187 | ● 335 | ● 500 | ● 750 | ● 1270 |
| **MHS4**  | Slide guide type - 4 Finger | | | | | ● 10 | ● 19 | ● 31 | | ● 55 | ● 88 | ● 140 | ● 251 | | | |

## Angular Style Series Variations



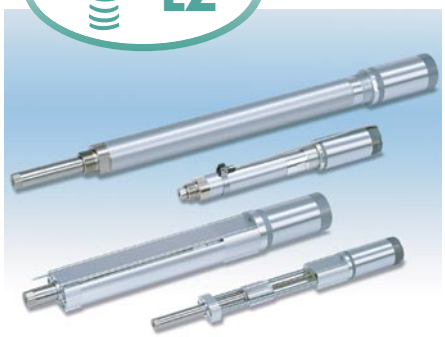
| Series | Sizes: 6 | 7 | 10 | 12 | 15 | 16 | 20 | 25 | 30 | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | External gripping moment (at 0.5 MPa) N.m | | | | | | | | | | | | | | | |
| **MHC2-6/MHCA2-6**  | Short body type | | | | | | | | | | | | | | | |
| | ● 0.038 | | | | | | | | | | | | | | | |
| **MHCM2-7S**  | Compact type | | | | | | | | | | | | | | | |
| | | ● 0.017 | | | | | | | | | | | | | | |
| **MHC2**  | Standard type | | | | | | | | | | | | | | | |
| | | | ● 0.10 | | | | ● 0.39 | ● 0.70 | ● 1.36 | | | | | | | |
| **MHT2**  | Toggle type | | | | | | | | | | | | | | | |
| | | | | | | | | | | ● 12.4 | ● 36 | ● 63 | ● 106 | | | |
| **MHY2**  | 180° angular, cam style | | | | | | | | | | | | | | | |
| | | | ● 0.16 | | | | ● 0.54 | ● 1.10 | ● 2.28 | | | | | | | |
| **MHW2**  | 180° angular, rack and pinion style | | | | | | | | | | | | | | | |
| | | | | | | | | ● 0.30 | ● 0.73 | | ● 1.61 | ● 3.70 | ● 8.27 | | | |

## Rotary Gripper

| Series | Rotation angle: 90° | 180° | Sizes: 6 | 7 | 10 | 12 | 15 | 16 | 20 | 25 | 30 | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | External gripping force (at 0.5 MPa) N | | | | | | | | | | | | | | | |
| **MRHQ**  | ● ±10° | ● ±10° | Rotary Gripper | | | | | | | | | | | | | | | |
| | | | | | ● 9 | | | ● 30 | ● 40 | ● 65 | | | | | | | | |

# Simplified Options

LZ



## Electric Cylinders

Looking for a **simple electric cylinder** that can be **operated like an air cylinder** for simple **end to end motion?** Then the LZ electric cylinder available in **two sizes** and driven with a **24VDC motor** should fit the bill. When used in combination with the LC3 directional control driver which is **operated with ON/OFF signals** similar to that used for a solenoid valve, cylinder speeds **up to 200mm/s** and thrust **up to 196N** are possible. Available with **multiple mounting options** and **strokes up to 200mm** this cylinder is the perfect solution for simple applications where there is **no compressed air supply.**

E-MY2

## e-Rodless Actuator

These rodless actuators combine the speed, controllability and performance of an electric actuator with the **easy functionality** of an air cylinder through the use of a simple and quick **three step set-up operation.** With a belt driven construction and strokes between **50 -1000mm** this actuator is capable of velocities up to **1000 mm/sec** and **0.5g** acceleration. Available in two sizes with either a **cam follower guide** or **high precision type** for maximum payloads of 5 or 10kg.

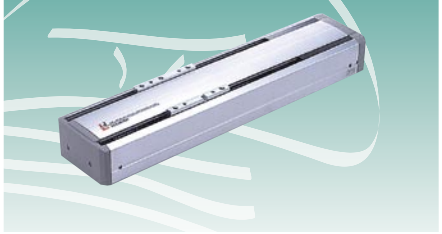
LX

## Short Stroke Electric Actuators

Currently available in **three compact model types**; a low profile slide table (LXF), a guide rod type (LXP) and a slide table version with increased rigidity (LXS). Incorporating either **2 or 5 phases stepper motors,** these **high performance** actuators deliver some really impressive **muscle power** and can move loads of up to 10kg **at speeds up to 200mm/sec.** Additionally, they are also **highly accurate,** with position repeatability of between +/- 0.03 and +/- 0.05 mm dependent on model type.

# More Advanced Options

LJ1



## Single Axis Electric Actuator

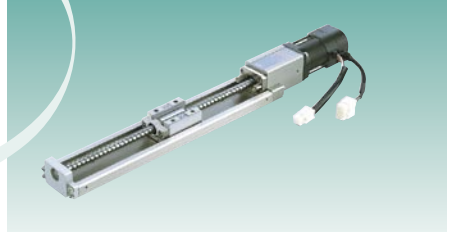
This **comprehensive range** of electric actuators is available with two types of precise linear guides and three types of feed screws and are also designed for use with our LC8 Positioning. With **high positioning accuracy,** dual mounting and multiple cable entry options, these actuator are designed to provide **X-Y axis capability** and are the **perfect solution** for pick and place and palletizing operations.

LG1

## Low Profile Single Axis Electric Actuator

With its **space saving design,** this compact electric actuator, with top or bottom mounting options, offers **high rigidity** and **high linear precision** guide control. Designed for use with our latest Series LC8 Positioning Driver for AC servomotors, these actuators offer **excellent accuracy and high production flexibility.**

LTF



## Electric Actuator with Integrated Guide

This **light weight and compact actuator** is the result of designing an **integrated linear guide** into the support frame to form a **one piece structure.** Additionally the **circulating type ball bearing liner guide** and **martensitic stainless steel frame** creates a table with high rigidity and high sliding accuracy. Available in two sizes with **100 & 200W AC servomotors** for use with the LC8 positioning driver, this actuator is perfect for use in high performance applications wanting a space saving design.

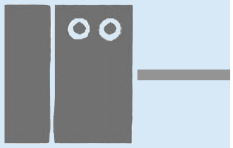
# Compressed Air Purification System Flow

Note 1) When the oil mist concentration (compressor discharge concentration) in the inlet side is approx. 30 mg/m³ (ANR) or less.
Note 2) It means the compressed air quality grade based on ISO8573-1:1991 (JIS B8392-1:2000) (Refer to page 4.), as well as the best quality grade which is achieved by each system.

| System No. | Application example | Impurity in compressed air | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Filtration (95% filtered particle size) | Note1) Oil mist concentration | Cleanliness | Oil smell | Moisture | | Note 2) Quality grade |
| | | | | | | Dew point | Water contents | |
| A | **Water drops removed air**<br>• Air blowing (Simple removal of particles)<br>• General pneumatic tool | 3 µm | — | — | Oil odor | Atmospheric pressure dew point: 6°C<br>0.7 MPa pressure dew point: 40°C | 7 g/m³ (ANR) (At 0.7 MPa 25°C) | 3, –, – |
| B | **Dry air**<br>• It is used for the same usage as "A" and when the temperature drop in the middle of pipe is large. | | | | | Atmospheric pressure dew point: −14 to −23°C<br>0.7 MPa pressure dew point: 15 to 3°C | 1.7 g/m³ (ANR) to 0.8 g/m³ (ANR) | 3, 4, – |
| C | **Dry air**<br>• General pneumatic equipment<br>• General painting | 0.3 µm | Max. 1 mg/m³ (ANR)<br>0.8 ppm | | | | | 2, 4, 3 |
| D | **Dry & Clean air**<br>• High grade painting • Sequence control<br>• Measurement device • Instrumentation<br>• Dry & Cleaning (Precision parts) | 0.01 µm | Max. 0.1 mg/m³ (ANR)<br>0.08 ppm | | | | | 1, 4, 2 |
| E | **Dry & Clean air**<br>• When a refrigerated air dryer is not provided in sub line.<br>• Integrated into the equipment (Machine tools, 3D measurement device, etc) | | Max. 0.01 mg/m³ (ANR)<br>0.008 ppm | 35 particles or less of 0.3 µm diameter or larger /10 ℓ (ANR) (100 particles or less /ft³ or less) | | | | 1, 4, 1 |
| F | **Deodorizated air**<br>• Stirring, transporting, drying and packaging<br>• Food industry (Except for direct blowing to foods) | | Max. 0.004 mg/m³ (ANR)<br>0.0032 ppm | | No oil odor | | | |
| G | **Low dew point clean air**<br>• Drying electric and electronic parts<br>• Drying a filling tank<br>• Transporting powders<br>• Ozone generator<br>• Activation device in a low temperature room | | Max. 0.01 mg/m³ (ANR)<br>0.008 ppm | | Oil odor | Atmospheric pressure dew point: −30 to −60°C<br>0.7 MPa pressure dew point: −6 to −42°C | 0.5 g/m³ (ANR) to 0.02 g/m³ (ANR) | 1, 2, 1 |
| H | **Low dew point clean air (for clean room)**<br>• Blowing semi-conductor parts in a clean room | | Max. 0.004 mg/m³ (ANR)<br>0.0032 ppm | Particle with 0.1 µm diameter or larger 0 pc/6 ℓ | No oil odor | | | |

| Product name |
|---|
| Model |
| Air flow rate ℓ/min (ANR) |
| Max. inlet air temperature |
| Filtration (95% filtered particle size) |
| Note1) Outlet oil mist concentration: Max. |
| Outlet cleanliness |
| Atmospheric pressure dew point [Inlet air pressure at 0.7 MPa] |

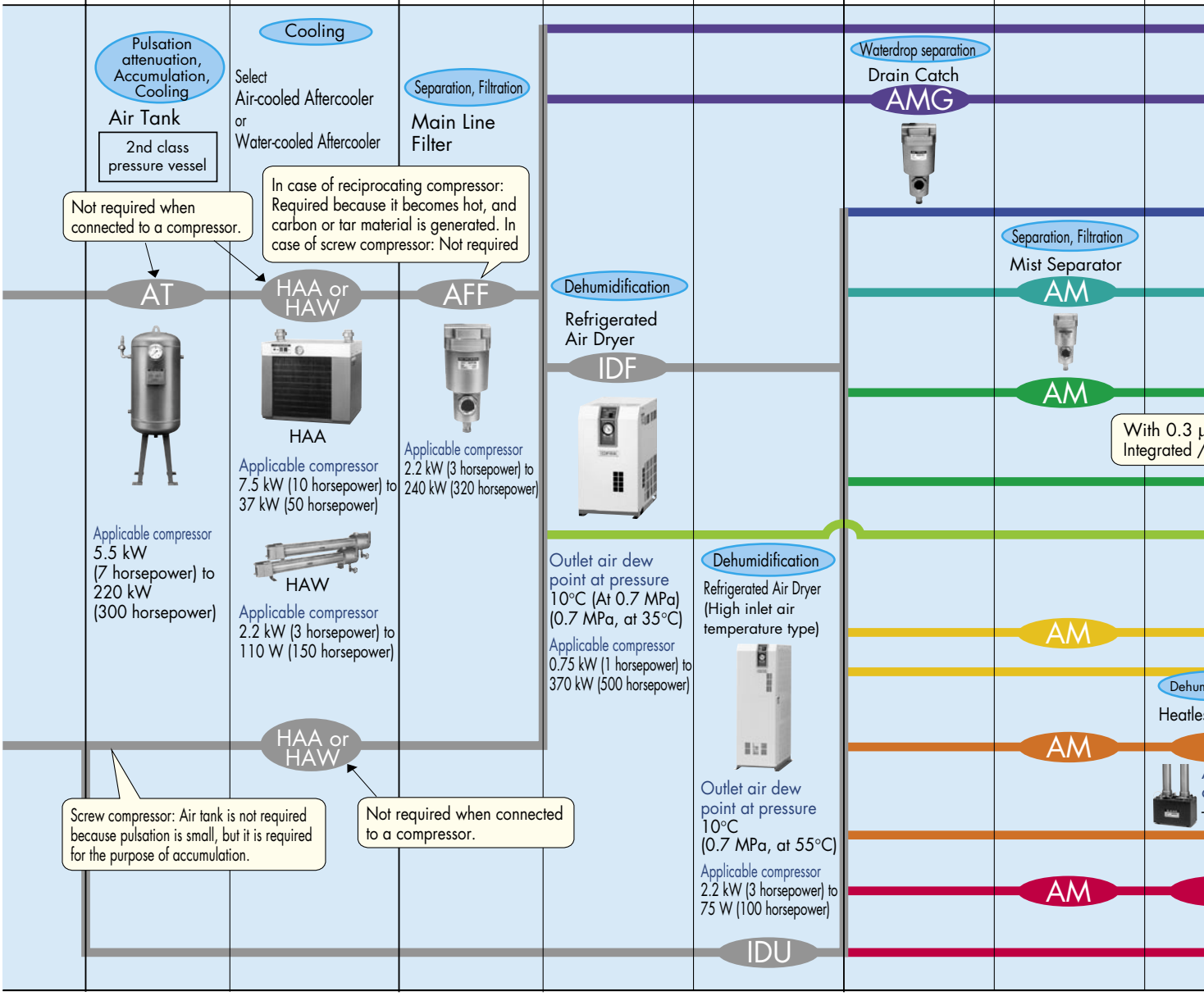
Reciprocating compressor



Screw compressor

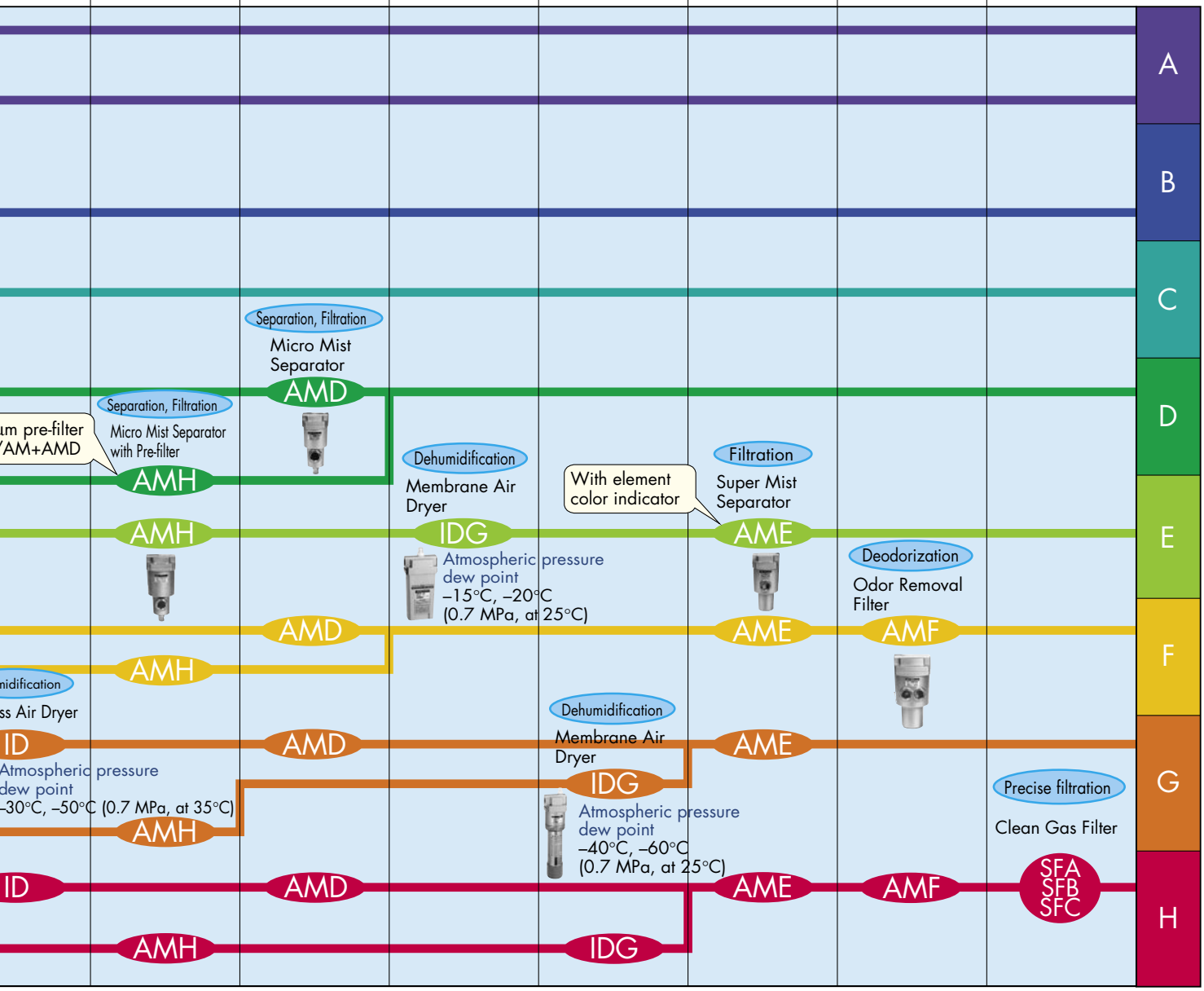
Detailed specifications page
Variant model page

| | Main Line | | Sub Line | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Air Tank | Air-cooled Aftercooler / Water-cooled Aftercooler | Main Line Filter | Refrigerated Air Dryers | | Drain Catch | Mist Separator | He Air |
| | AT | HAA, HAW | AFF | IDF | IDU | AMG | AM | |
| | Volume 100 to 3,000 ℓ | 1,000 to 5,700 / 300 to 18,000 | 300 to 42,000 | 100 to 65,000 | 320 to 12,400 | 300 to 12,000 | | 80 |
| | 100°C | 70°C / 70°C, 180°C (Value is different depending on the model.) | 60°C | 50°C | 60 to 80°C (Value is different depending on the model.) | 60°C | | 5 |
| | | | 3 µm | | | Water droplet removal rate: 99 % | 0.3 µm | |
| | | | | | | | 1 mg/m³ (ANR) [0.8 ppm] | |
| | | | | | | | | |
| | | | | –17°C Inlet temperature 35°C | –17°C Inlet temperature 55°C | | | –30°C Inlet temp |



## Local Line

| eatless Dryer | Micro Mist Separator with Pre-filter | Micro Mist Separator | Membrane Air Dryer | | Super Mist Separator | Odor Removal Filter | Clean Gas Filters |
|---|---|---|---|---|---|---|---|
| ID | AMH | AMD | IDG | | AME | AMF | SFA, SFB, SFC |
| to 780 | 200 to 12,000 | 200 to 40,000 | 10 to 1,000 | 75 to 300<br>50 to 150 | 200 to 12,000 | 200 to 40,000 | 26 to 300 |
| 50°C | 60°C | | 50°C, 55°C (Value is different depending on the model.) | 50°C | 60°C | | 80°C, 120°C (Value is different depending on the model.) |
| | 0.01 µm (0.3 µm with pre-filter) | 0.01 µm | | | 0.01 µm | | 0.01 µm |
| | 0.1mg/m³(ANR) [0.08 ppm] | | | | 0.01 mg/m³ (ANR) [0.008 ppm] | 0.004 mg/m³ (ANR) [0.0032 ppm] | |
| | | | | | 35 particles or less of 0.3 µm diameter or larger/10 ℓ (ANR) 100 particles or less / ft³ or less | | Particle with 0.1 µm diameter or larger 0 pc/ℓ |
| C –50°C perature 35°C | | | –15°C –20°C Inlet temperature 25°C | –40°C –60°C Inlet temperature 25°C | | | |



# Technical Information

## Impurities Reducible by Air Preparation Equipment

| Product name | Model | Solid foreign matter | | Oil mist | Smell | Moisture | |
|---|---|---|---|---|---|---|---|
| | | Filtration Minimum solid diameter that can be removed more than 95 % (µm) | Outlet cleanliness | Outlet oil mist concentration Max. mg/m³ (ANR) [ppm] | | Droplet Removal rate (%) | Water steam |
| Air Filter | AF | 5 | — | △ | × | △ | × |
| Main Line Filter | AFF | 3 | | | | | |
| Mist Separator | AM | 0.3 | | 1 [0.8] | | | |
| Micro Mist Separator | AMD | 0.01 | | 0.1 [0.08] | | | |
| Super Mist Separator | AME | | 35 particles or less of 0.3 µm diameter or larger/10 ℓ (ANR) (100 particles/ft³ or | 0.01 [0.008] | | × | |
| Odor Removal Filter | AMF | | — | △ | Deodorization of oil smell | | |
| Clean Gas Filter | SFA SFB SFC | | Particle with 0.1 µm diameter or larger 0 pc/6 ℓ | × | × | | |
| Drain Catch | AMG | △ | — | | | 99 | |
| Air-cooled Aftercooler Water-cooled Aftercooler | HAA HAW | × | | | | △ | △ |
| Refrigerated Air Dryer | IDF / IDU | | | | | | –14 to –23 |
| Heatless Air Dryer | ID | | | | | × | –30 to –60 |
| Membrane Air Dryer | IDG | | | | | | –14 to –60 |

Red: Reducible ×: Not reducible △: Reducible as secondary effect.

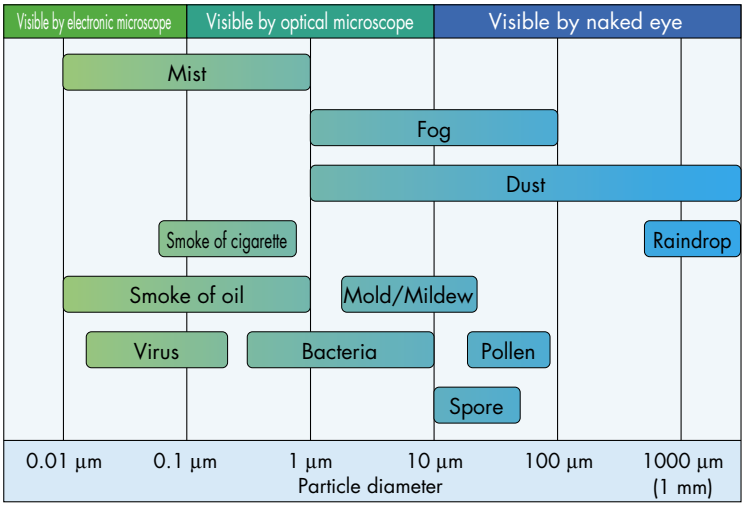
## Dew Point

When air is cooled under the constant pressure and water vapor becomes saturated into dew. The temperature at which the condensed water is formed is defined as the dew point.

Atmospheric pressure dew point: The dew point under atmospheric pressure
<Ex.> Blow the compressed air into atmospheric:
Dew appears when cooled under the atmospheric pressure.

Pressure dew point: The dew point under applied pressure
<Ex.> Compressed air line:
Condensed into dew when cooled lower than the pressure dew point.

## Particle Diameter (Reference)




## ISO Compressed Air Quality Grade

The grade of compressed air purity with solid particles, water, and oil as defined by ISO 8573-1: 1991 (JIS B8392-1: 2000).

| Quality Grade | Max. particle size (µm) | Min. pressure dew point (°C) | Max. oil concentration (mg/m³) |
|---|---|---|---|
| 1 | 0.1 | –70 | 0.01 |
| 2 | 1 | –40 | 0.1 |
| 3 | 5 | –20 | 1.0 |
| 4 | 15 | 3 | 5 |
| 5 | 40 | 7 | 25 |
| 6 | — | 10 | — |

How to use the table:

Ex. In case of following condition
Solid particle size: 0.1 µm
Pressure dew point: 3°C
Oil concentration: 0.1 mg/m³
The quality grade is shown as 1, 4, 2.

# Effects caused by fluids to pneumatic components

| | | Cylinder and accessories CJ5, CG5 | | | Speed controllers and fittings KP | | Tubing TPH/TPS | Cylinder and accessories MGP-XC6, CQ2-XC6 | | | Speed controllers and fittings KG | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Housing Stainless steel 1.4301 | Seal nitrile rubber NBR (-40 bis 70°C) | Seal fluorine rubber FKM (-10 bis 150°C) | Housing Polypropylene PP (-20 bis 80°C) | Seal EPDM ölfrei | Polyethylen PE (-20 bis 80°C) | Housing Aluminium AL | Seal nitrile rubber NBR (-40 bis 70°C) | Seal fluorine rubber FKM | Housing POM (0 bis 60°C) | Seal NBR (-40 bis 70°C) |
| Inorganic acid | hydrochloric acid (10%) | C | B | A | A | A | A | C | B | A | C | B |
| | Chromate (50%) | C | D | A | A | B | A | D | D | A | C | D |
| | Boric acid | A | A | A | A | A | A | C | A | A | A | A |
| | Sulfuric acid | C | C | A | A | A | A | D | C | A | C | C |
| | phosphoric acid | C | B | A | A | A | A | C | B | A | C | B |
| Inorganic alkaline | ammoniumhydroxid | A | B | C | - | A | A | B | B | C | C | B |
| | caustic soda | B | B | B | A | A | A | D | B | B | C | B |
| | kaliumhydroxid, watery (lime water) | B | A | A | A | A | A | C | A | A | A | A |
| | magnesium hydroxide | A | B | A | A | A | A | B | B | A | A | B |
| Organic dissolver | acetylene | A | A | A | A | A | A | A | A | A | A | A |
| | formic acid | B | B | C | A | A | A | C | B | C | C | B |
| | citric acid (10%) | B | A | A | A | A | A | D | A | A | B | A |
| | acetic acid | B | D | D | B | A | B | C | D | D | C | D |
| | lactic acid - watery | B | A | A | A | A | A | D | A | A | B | A |
| Others (oil, gas, etc.) | linseed oil | A | A | A | A | B | A | B | A | A | A | A |
| | potassium chloride - soppy | C | A | A | A | A | A | D | A | A | A | A |
| | calcium chloride - watery | C | A | A | A | A | A | D | A | A | A | A |
| | petroleum | A | A | A | A | D | A | A | A | A | A | A |
| | sodium hypochlorite - soppy | C | B | A | A | B | A | D | B | A | C | B |
| | common salt | A | A | A | A | A | A | - | A | A | A | A |
| | carbon dioxide | A | A | A | - | B | - | A | A | A | - | A |
| | natural gas | A | A | A | A | D | A | A | A | A | A | A |

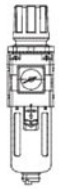
A = Only small attacks or practically none.
B = Moderate attacks.
C = Strong attacks.
D = Attacked till complete disintegration.
- = Not Tested

# Compressed-air conditioning

## Air Pressure for the food and stimulant manufacture
(Air pressure preparation with a refrigerant drier, dew point by +3°C)

General recommendation with air pressure application for the food industry (classification of the air pressure quality in order to meet DIN ISO 8573-1): Oil class 1; Particle class 1; Water class 4.

Packaging machine for food medium and pharmaceutical enviroments



Preliminary filter, 5µm
Solid partical < 0.5µm
Rest oil content < 5mg/m3

Microfilter, 0.1µm - 0.3µm
Solid partical < 0.1µm
Rest oil content < 0.1mg/m3

Supermicrofilter, 0.01µm
Solid partical < 0.01µm
Rest oil content < 0.01mg/m3

In case of direct contact with products additionally odour free

Solid partical, 0.01µm
Rest oel content < 0.01µm
Odor free < 0.004mg/m3

* Note) Pharmaceutical, brewery, dairy industry's include the addition of a sterile filter in the application.

| Filtration degree in order to DIN ISO 8573-1 | | | | | |
|---|---|---|---|---|---|
| Class | Dust rest ratio µm | Dust rest ratio mg/m3 | Oil rest ration mg/m3 | water rest ratio DTP °C | water rest ratio g/m3 |
| 1 | 0.1 | 0.1 | 0.01 | -70 | 0.003 |
| 2 | 1 | 1 | 0.1 | -40 | 0.117 |
| 3 | 5 | 5 | 1 | -20 | 0.88 |
| 4 | 15 | 8 | 5 | +3 | 5.95 |
| 5 | 40 | 10 | 25 | +7 | 7.73 |
| 6 | - | - | - | +10 | 9.96 |
| 7 | - | - | - | not specified | |

## Modular Assemblies

| Series | Combination component | Port size | Set pressure (MPa) | |
|---|---|---|---|---|
| **AC**  | Modular F.R.L. combination: AC | | | |
| | Air filter, Regulator, Lubricator (**AF** + **AR** + **AL**) | M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1 | 0.05 to 0.85 Note) | SEE IN BEST PNEUMATICS CATALOGUE |
| | Filter regulator, Lubricator (**AW** + **AL**) | M5, 1/8, 1/4, 3/8, 1/2, 3/4 | 0.05 to 0.85 Note) | |
| | Air Filter, Regulator (**AF** + **AR**) | 1/8, 1/4, 3/8, 1/2, 3/4, 1 | 0.05 to 0.85 Note) | |
| | Air filter, Mist separator, Regulator (**AF** + **AFM** + **AR**) | 1/8, 1/4, 3/8, 1/2, 3/4 | 0.05 to 0.85 | |
| | Filter regulator, Mist separator (**AW** + **AFM**) | 1/8, 1/4, 3/8, 1/2, 3/4 | 0.05 to 0.85 | |

Note) Set pressure for M5 type is 0.05 to 0.7 MPa.

## Modular Range

| Series | Port size | Set pressure | Bowl capacity | Filtration | |
|---|---|---|---|---|---|
| **AF10 to 60**  | Air filter: AF | | | | |
| | M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1 | – | – | 5 µm | SEE IN BEST PNEUMATICS CATALOGUE |
| **AFM20 to 40**  | Mist separator: AFM | | | | |
| | 1/8, 1/4, 3/8, 1/2, 3/4 | – | – | 0.3 µm | SEE IN BEST PNEUMATICS CATALOGUE |
| **AFD20 to 40**  | Mist separator: AFD | | | | |
| | 1/8, 1/4, 3/8, 1/2, 3/4 | – | – | 0.01 µm | SEE IN BEST PNEUMATICS CATALOGUE |

## Modular Range

| Series | | Port size | Set pressure | Bowl capacity | Filtration | |
|---|---|---|---|---|---|---|
| **AR10 to 60** |  | Regulator: AR | | | | |
| | | M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1 | 0.05 to 0.85 MPa | – | – | |
| **AR20K to 60K** |  | Regulator with back flow mechanism: AR□K | | | | |
| | | 1/8, 1/4, 3/8, 1/2, 3/4, 1 | 0.05 to 0.85 MPa | – | – | |
| **AL10 to 60** |  | Lubricator: AL | | | | |
| | | M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1 | – | 70 to 135 $cm^3$ | – | |
| **AW10 to 60** |  | Filter regulator: AW | | | | |
| | | M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1 | -0.05 to 0.85 MPa | – | 5 µm | |
| **AW20K to 40K** |  | Filter regulator with back flow function: AW□K | | | | |
| | | 1/8, 1/4, 3/8, 1/2, 3/4 | 0.05 to 0.85 MPa | – | 5 µm | |
| **AWM** |  | Mist separator regulator: AWM | | | | |
| | | 1/8, 1/4, 3/8, 1/2 | 0.05 to 0.85 MPa | – | 0.3 µm | |
| **AWD** |  | Micro mist separator regulator: AWD | | | | |
| | | 1/8, 1/4, 3/8, 1/2 | 0.05 to 0.85 MPa | – | 0.01 µm | |

## Modular Accessories

| | Port size | Function | |
|---|---|---|---|
| Piping adapter  | M5, 1/8, 1/4, 3/8, 1/2, 3/4, 1 | Allows installation/removal of the component without removing the piping. | |
| T-interface  | M5, 1/8, 1/4, 3/8, 1/2 | Redirects the air flow. | |
| Pressure switch with piping adapter  | 1/8, 1/4, 3/8, 1/2, 3/4 | Compact switch and piping adapter integrated into one piece. | |
| Check valve  | 1/8, 1/4, 3/8 | Prevents back flow from lubricator. | |
| Pressure switch  | — | Compact switch | |
| Cross interface  | M5, 1/8, 1/4, 3/8, 1/2 | Allows piping in all 4 directions. | |
| Residual pressure relief 3 port valve  | 1/8, 1/4, 3/8, 1/2, 3/4, 1 | Releases residual pressure in lines. | |
| Spacers and brackets  | — | Brackets for modular assemblies | |

## Soft Start-up Valve

| Series | Port size | Set pressure | Notes | |
|---|---|---|---|---|
| **AV**  | Soft start-up valve: AV2000 to 5000 | | | |
| | 1/4, 3/8, 1/2, 3/4, 1 | 0.1 to 1 MPa | A start-up valve that gradually increases downstream pressure after energisation and rapidly exhaust air when de-energised. | |

## Pressure Control Equipment

| Series | Port size | Set pressure | Notes | |
|---|---|---|---|---|
| **ARJ**  | Miniature regulator: ARJ1020F, ARJ210, ARJ310 | | | |
| | M5, 1/8<br>ø4, ø6 | 0.1 to 0.7 MPa | One Touch tube connection.<br>Panel mountable. | SEE IN BEST PNEUMATICS CATALOGUE |
| **AR**  | Pilot operated regulator: AR425 to 925, ar435 to 935 | | | |
| | 1/4, 3/8, 1/2, 3/4,<br>1 1/4, 1 1/2, 2 | 0.02 to 0.83 MPa | | SEE IN BEST PNEUMATICS CATALOGUE |
| **ARM**  | Compact manifold regulator: ARM10/11 | | | |
| | ø4, ø6, ø10,<br>1/4, 3/8 | 0.05 to 0.7 MPa | | SEE IN BEST PNEUMATICS CATALOGUE |
| **ARM**  | Manifold regulator: ARM1000/200/2500/3000 | | | |
| | 1/8, 1/4, 3/8, | 0.05 to 0.85 MPa | | SEE IN BEST PNEUMATICS CATALOGUE |
| **ARP**  | Direct operated precision regulator: ARP3000 | | | |
| | 1/4 | 0.005 to 0.3 MPa | Sensitivity 0.001 MPa.<br>direct-driven, bleed type (with relieving function) | SEE IN BEST PNEUMATICS CATALOGUE |
| **ARX20**  | Regulator for 2 MPa: ARX20 | | | |
| | 1/8, 1/4 | 0.05 to 0.85 MPa | Compliant for inlet supply pressure of 2 MPa.<br>Best suited for adjusting pressure discharged from small compressors. | SEE IN BEST PNEUMATICS CATALOGUE |
| **IR**  | Precision regulator: IR1000/2000/3000 | | | |
| | 1/8, 1/4, 3/8,<br>1/2 | 0.005 to 0.8 MPa | Tension controller<br>Contact pressure control<br>Sensitivity: 0.2% F.S. Max.<br>Repeatability: ±0.5% F.S. Max. | |
| **IRV**  | Vacuum regulator: IRV1000/2000/3000 | | | |
| | 1/8, 1/4,<br>3/8, 1/2 | –100 to –1.3 kPa | Able to adjust the vacuum pressure for vacuum line. | |

## Pressure Control Equipment

| Series | Port size | Set pressure | Notes | |
|---|---|---|---|---|
| **ITV0000**  | Compact electro-pneumatic regulator: ITV0000 | | | |
| | ø4 | 0.001 to 0.1 MPa<br>0.001 to 0.5 MPa<br>0.001 to 0.9 MPa<br>–1 to –100 kPa | Stepless control of air pressure proportional to an electrical signal. | SEE IN BEST PNEUMATICS CATALOGUE |
| **ITV1/2/3000**  | Electro-pneumatic regulator: ITV1000/2000/3000 | | | |
| | 1/8, 1/4, 3/8, 1/2 | 0.001 to 0.1 MPa<br>0.001 to 0.5 MPa<br>0.001 to 0.9 MPa | Stepless control of air pressure proportional to an electrical signal. | |
| **ITV2090/2091**  | Electronic vacuum regulator: ITV2090/2091 | | | |
| | 1/4 | –1.3 to –80 MPa | Pressure controlled by electrical signals. | |
| **VBA + tank**  | Booster regulator: VBA + reservoir tank UKT138 | | | |
| | 1/8, 1/4, 3/8, 1/2 | 0.05 to 0.85 MPa | | SEE IN BEST PNEUMATICS CATALOGUE |

## Lubrication Equipment

| Series | Port size | Bowl capacity | Notes | |
|---|---|---|---|---|
| **AL**  | Large flow lubricator: AL800/900 | | | |
| | 1 1/4, 1 1/2, 2 | 440, 1000 $cm^3$ | Individual lubrication. | SEE IN BEST PNEUMATICS CATALOGUE |
| **ALD/ALDU**  | Jet lube: ALD600/900, ALDU600/900 | | | |
| | 3/4, 1, 1 1/4, 1 1/2, 2 | 2000, 5000 $cm^3$ | Centralized multipoint lubrication. | SEE IN BEST PNEUMATICS CATALOGUE |
| **ALB**  | Booster lube: ALB900 | | | |
| | 1, 2, 3 inch flange | 5000 $cm^3$ | Centralized multipoint lubrication unit with non-differential pressure type. | SEE IN BEST PNEUMATICS CATALOGUE |

## Air Dryers

| Series | Specifications | Notes | |
|---|---|---|---|
| **IDFA**  | Refrigerated Air Dryer: IDFA | | |
| | Inlet air pressure: 1.5 to 16 bar<br>Inlet air temperature: 5 to 50°C | High efficiency heat exchanger.<br>Ozone friendly refrigerants.<br>Conforms to stringent ISO8573-1 standards. | SEE IN BEST PNEUMATICS CATALOGUE |
| **IDG**  | Membrane Air Dryer: IDG | | |
| | Outlet air flow rate (l/min (ANR)): 25 to 1000<br>Inlet air flow rate (l/min (ANR)): 62 to 1400 | Macro molecular membrane dryers that act like filters. | |

## Large Flow Air filter

| Series | Port size | Filtration | Notes | |
|---|---|---|---|---|
| **AF800/900**  | Large flow air filter: AF800/900 | | | |
| | 1 1/4, 1 1/2, 2 | Standard 5 µm filter element | Auto or manual drain | SEE IN BEST PNEUMATICS CATALOGUE |

## Oil Mist Separators

| Series | Filtration | Rated flow (l/min (ANR) | Port size | |
|---|---|---|---|---|
| **AFF**  | Main Line Filter: AFF | | | |
| | 3 µm (95% particle size collection) | 300 to 42000 | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 | SEE IN BEST PNEUMATICS CATALOGUE |
| **AM**  | Mist Separator: AM | | | |
| | 0.3 µm (95% particle size collection) | 300 to 12000 | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 | SEE IN BEST PNEUMATICS CATALOGUE |
| **AMD**  | Micro mist separator: AMD | | | |
| | 0.01 µm (95% particle size collection) | 200 to 12000 | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 | SEE IN BEST PNEUMATICS CATALOGUE |
| **AMH**  | Micro mist separator with prefilter: AMH | | | |
| | 0.01 µm (95% particle size collection) | 200 to 12000 | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 | |
| **AME**  | Super mist separator: AME | | | |
| | 0.01 µm (95% particle size collection) | 200 to 12000 | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 | SEE IN BEST PNEUMATICS CATALOGUE |

## Water Separator

| Series | | Port size | Max. flow capacity (l/min (ANR) | Notes | |
|---|---|---|---|---|---|
| **AMG** |  | Water separator: AMG | | | |
| | | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 | 300 to 12000 | It eliminates the waterdroplets in the compressed air. | |

## Odour Removal Filter

| Series | | Filtration | Rated flow (l/min (ANR) | Port size | |
|---|---|---|---|---|---|
| **AMF** |  | Odour removal filter: AMF | | | |
| | | 0.01 µm (95% particle size collection) | 200 to 12000 | 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/2, 2 | |

## Related Products

| Series | | Port size | Notes | |
|---|---|---|---|---|
| **AD** |  | Auto drain valve: AD402/600 | | |
| | | 1/4, 3/8, 1/2, 3/4, 1 | Drainage is automatically discharged in a reliable manner, without requiring human operators. Highly resistant to dust and corrosion. | |
| **AMJ** |  | Drain separator for vacuum: AMJ | | |
| | | 1/4, 3/8, 1/2, 3/4, 1 | Remove water droplets from air by simply installing in vacuum equipment connection line. Effective for removing water droplets from the air sucked into vacuum pumps and ejectors, etc. | |
| **ADH** |  | Heavy duty auto drain: ADH4000 | | |
| | | 1/2 | Easy maintenance. Float style drain allows automatic drain discharge without electric power. | |
| **GD40** |  | Pressure differential gauge: GD40-2-01 | | |
| | | 1/8 | The pressure differential at the inlet and the outlet of compressed air equipment can be viewed at a glance on the pressure differential gauge. It is ideal for the maintenance control of filters. | |

General Purpose Fittings Series

## Variations

One-touch connection and release
Possible to use in vacuum to –100 kPa

One-touch Mini
**Series KJ**

Applicable tubing—Metric size

One-touch connection and release
Possible to use in vacuum to –100 kPa

One-touch Fittings
**Series KQ2**

Applicable tubing—Metric size

Low-torque rotation for fast swivel and oscillating applications

Rotary One-touch Fittings
**Series KS** (Standard)
**Series KX** (High speed)

Applicable tubing—Metric size

One-touch connection and release
One-touch In/Out connection for compact and concentrated tubing applications

One-touch Fittings/Manifold
**Series KM**

Applicable tubing—Metric size

Possible to use in vacuum to –1.0 MPa

Insert Fittings
**Series KF**

Applicable tubing—Metric size

Tubing connection/disconnection without use of tools

Miniature Fittings
**Series M**

Applicable tubing—Metric size

Accepts soft copper tube

Self-align Fittings
**Series H/DL/L/LL**

Applicable tubing—Metric size

| Applicable tubing material | Applicable tubing O.D. (mm) | With seal | Electroless nickel plated |
|---|---|---|---|
| | 2 ø3.2 ø4 ø6 ø8 ø10 ø12 ø16 | | |
| Nylon, Soft nylon, Polyurethane | M3, M5, 1/8, Unions | ● | ● |
| Nylon, Soft nylon, Polyurethane | M5, M6, 1/8, 1/4, 3/8, 1/2, Unions | ● | |
| Nylon, Soft nylon, Polyurethane | M5, M6, 1/8, 1/4, 3/8, 1/2 | ● | ● |
| Nylon, Soft nylon, Polyurethane | 1/4, 3/8, ø8, ø10, ø12 | | |
| Nylon, Soft nylon, Polyurethane | 1/8, 1/4, 3/8, 1/2, Unions | ● | |
| Nylon, Soft nylon, Polyurethane | M3, M5, 1/8 | ● | ● |
| Nylon, Soft nylon, Soft copper (C1220T-0) | 1/8, 1/4, 3/8, 1/2, Unions | ● | ● |

## Variations

One-touch connection and release
Built-in self-seal mechanism

Tube Coupler
**Series KC**

Applicable tubing—Metric size

General purpose type

S Couplers
**Series KK**

* Table on the right shows the One-touch fittings type.

With shock absorption cover

S Couplers
**Series KKH**

Body material: SUS304

S Couplers Stainless Steel
**Series KKA**

Manufactured by Rectus

S Couplers
**Series KK13**

Multi-connector
with One-touch Fittings
**Series DMK**

Applicable tubing—Metric size

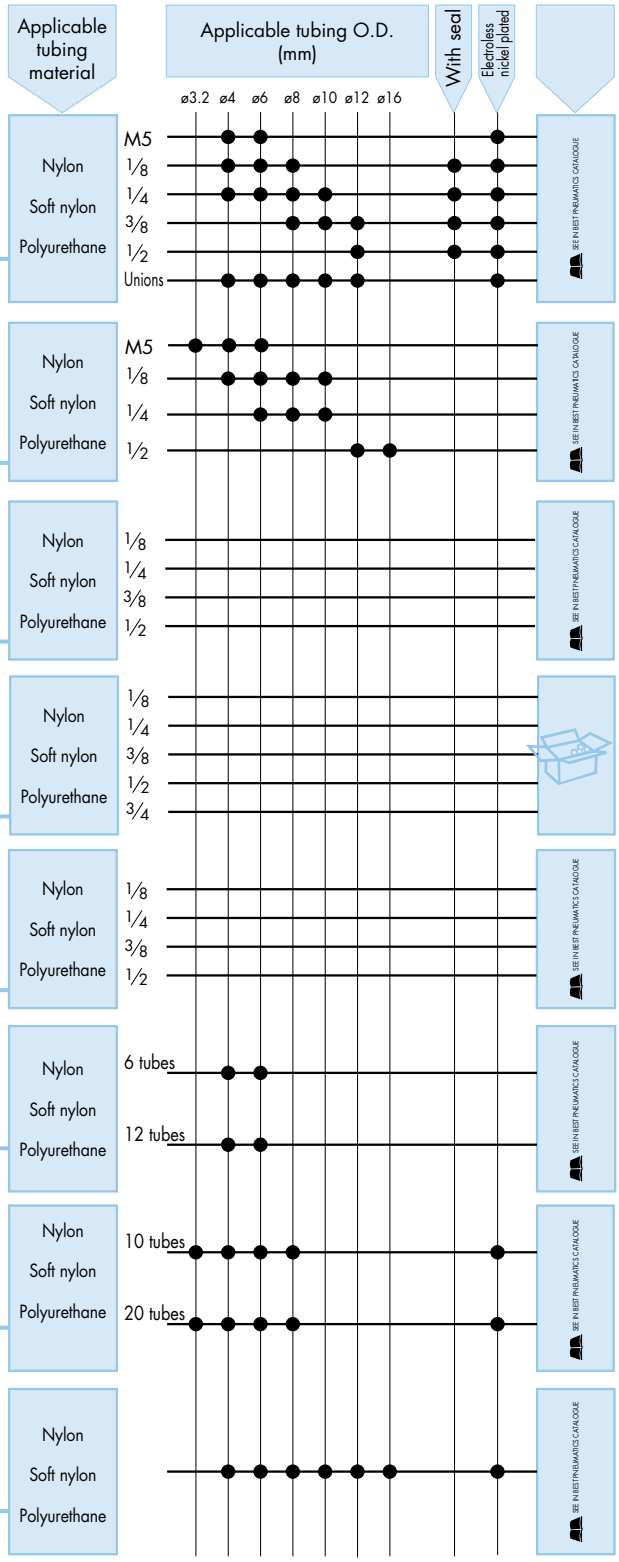
Rectangular Multi-connector
**Series KDM**

Applicable tubing—Metric size

Centralized distribution of supply air

Piping Module
**Series KB**

Applicable tubing—Metric size



Fitting Series for Special Environments

## Variations

For use where weld spatter is generated
Flame resistant material UL-94, V0

### FR One-touch Fittings **Series KR**

Applicable tubing—Metric size

For use where weld spatter is generated
Flame resistant material UL-94, V-0

### FR One-touch Fittings Manifold **Series KRM**

Applicable tubing—Metric size

For use in corrosive environments
Stainless series

### One-touch Fittings **Series KG**

Applicable tubing—Metric size

For use in corrosive environments
Stainless series 316

### One-touch Fittings **Series KQG**

Applicable tubing—Metric size

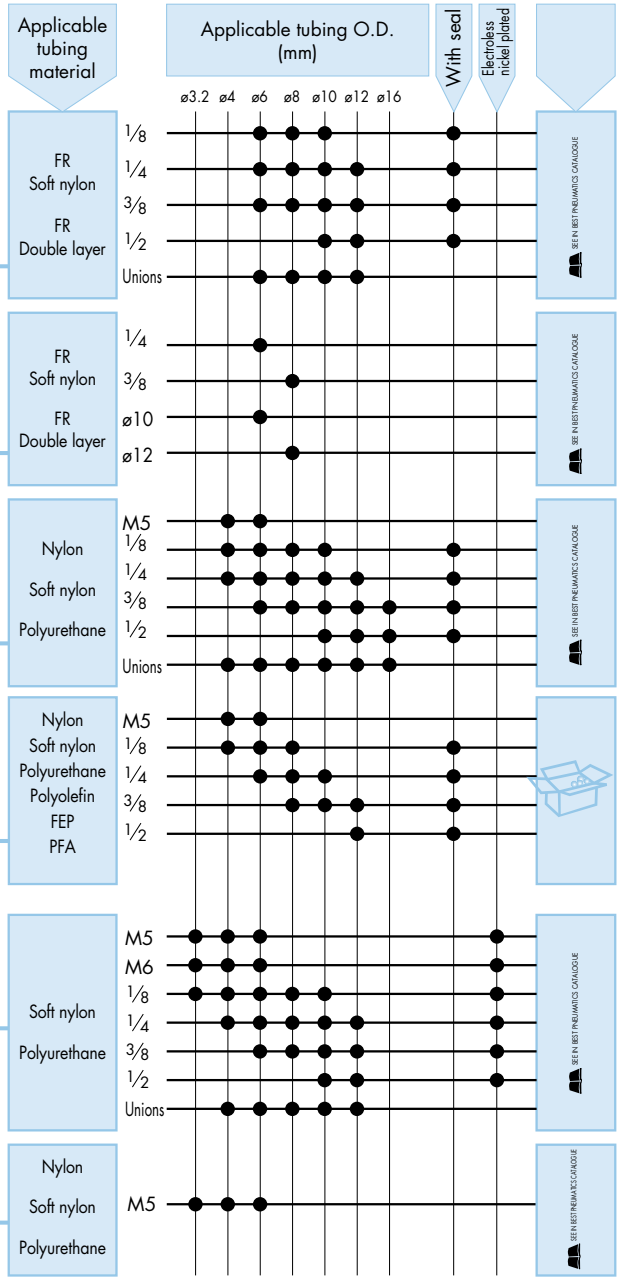
For preventing static electricity

### Antistatic One-touch Fittings **Series KA**

For use in corrosive environments
Stainless steel (SUS316)

### Miniature Fittings **Series MS**

Applicable tubing—Metric size




Clean Series Fittings

## Variations

For air Blow applications

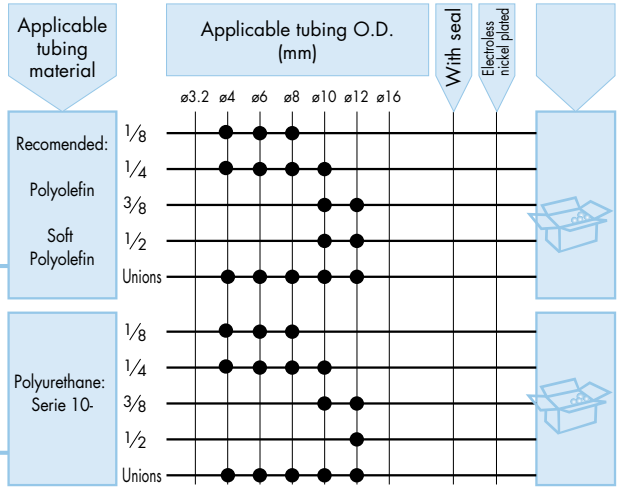
### Clean One-touch Fittings **Series KP**

Applicable tubing—Metric size

For driving System Air Piping

### Clean One-touch Fittings **Series KPQ/KPG**

Applicable tubing—Metric size






SMC

Recommended for Food and Packaging Industry

## Variations

General tubing 1.5 MPa max. at 20°C

Nylon Tubing
**Series T/TIA**

Slightly flexible 1.0 MPa max. at 20°C

Soft Nylon Tubing
**Series TS/TISA**

Flexible 0.8 MPa max. at 20°C

Polyurethane Tubing
**Series TU/TIUB**

Extremely flexible 0.6 MPa max. at 20°C

Soft Polyurethane Tubing
**Series TUS**

0.8 MPa standard type, 10 MPa for high pressure type

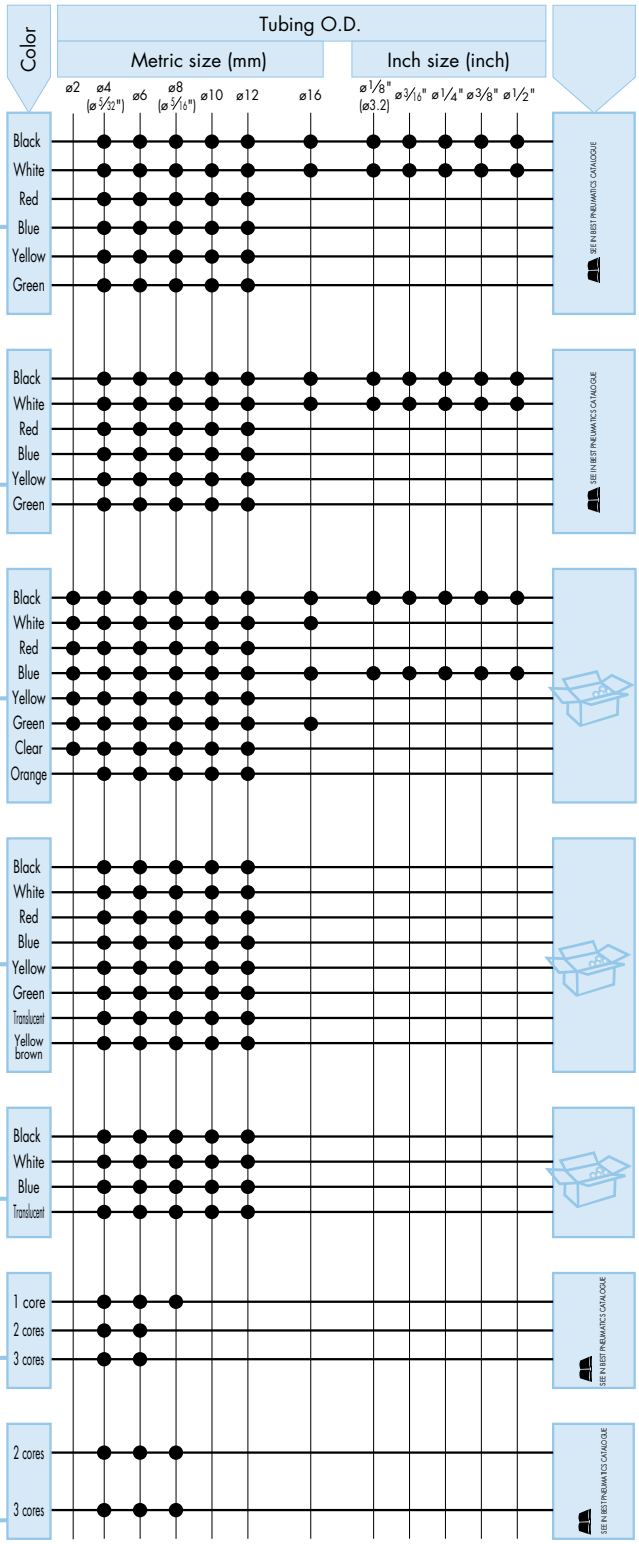
Hard Polyurethane Tubing
**Series TH/TUH**

For flexible and moving applications

Polyurethane Coil Tubing
**Series TCU**

For flexible multi-tube applications

Polyurethane Flat Tubing
**Series TFU**



Tubing

## Variations

Use in spatter generating atmosphere/ Flame resistant material

FR Soft Nylon Tubing
**Series TRS**

Flame resistance (Equivalent to UL-94 standard, V-0)

FR Double Layer Tubing
**Series TRB**

Flame resistance (Equivalent to UL-94 standard, V-0)

FR Double Layer Polyurethane Tubing
**Series TRBU**

Flame resistance (Equivalent to UL-94 standard, V-0)

The outer layer for double layer tubing, Series TRB, TRBU is peeled off easily.

Double Layer Tube Stripper
**Series TKS**

For preventing static electricity

Antistatic Polyurethane Tubing
**Series TAU**

For preventing static electricity

Antistatic Soft Polyurethane Tubing
**Series TAS**

Outstanding corrosion resistance.

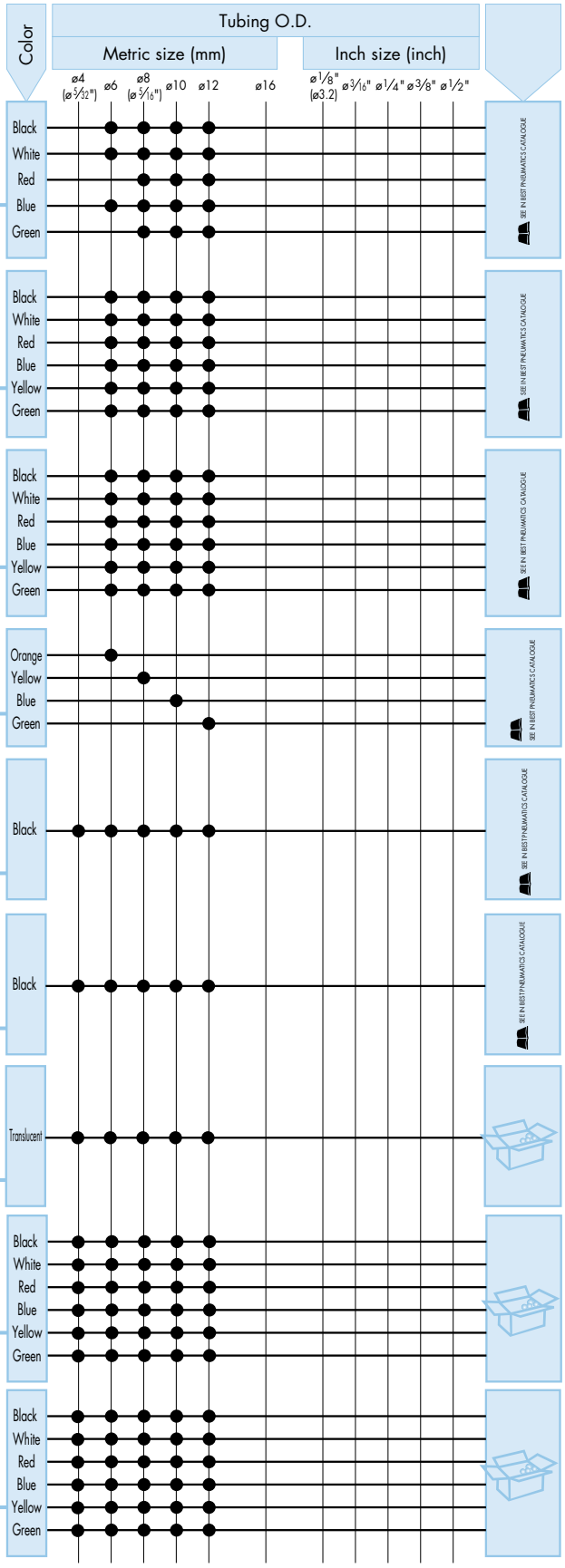
High Purity Fluoropolymer Tubing
**Series TL**

Clean tubing

Polyolefin Tubing
**Series TPH**

Clean tubing

Soft Polyolefin Tubing
**Series TPS**






SMC

Recommended for Food and Packaging Industry

Related Products

## Related Products:

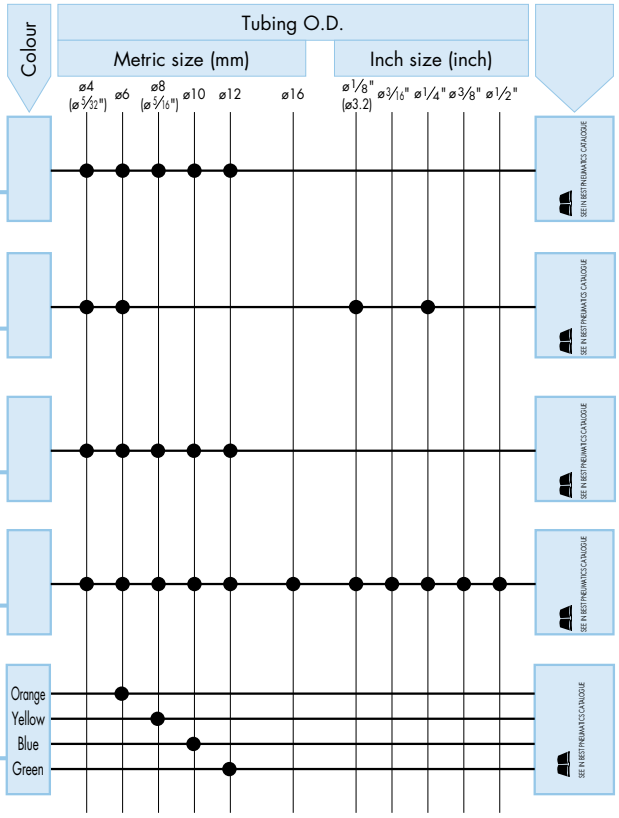
Multi-tube Holder
**Series TM**

Tube Releasing Tool
**Series TG**

Tube Stand & Tube Reel
**Series TB/TBR**

Tube Cutter
**Series TK**

Double Layer Tube Stripper
**Series TKS**




Rotary Joint

Low Torque Metal Seal Type Rotary Joint
**Series MQR**

Number of circuits (number of ports): 1, 2, 4, 8, 12, 16

Blow Gun

Blow Gun
**Series VMG**

Pressure loss is less than 1%.

Nozzles

Nozzles for Blowing
**Series KN**

Nozzle system for air blowing and back pressure sensing.

## Speed Controller with One-touch Fittings

Applicable tubing O.D.

| | Model | Port size in the cylinder side | Metric size (mm) 2 | 3.2 | 4 | 6 | 8 | 10 | 12 | Inch size (inch) 1/8 | 5/32 | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 | Applicable cylinder bore size (mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elbow type | AS12□1F | M3 | ● | ● | ● | ● | ● | ● | ● | | | | | | | | ø2.5 to ø6 | |
| | AS12□1F | M5 | | ● | ● | ● | ● | ● | ● | | | | | | | | ø6 to ø20 | |
| | AS22□1F | 1/8, 1/4 | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | AS32□1F | 1/4, 3/8 | | | | | | ● | ● | | | | ● | ● | ● | ● | ø40 to ø63 | |
| | AS42□1F | 1/2 | | | | | | | ● | | | | | | | ● | ø63 to ø100 | SEE IN BEST PNEUMATICS CATALOGUE |
| Universal type | AS13□1F | M3 | ● | ● | ● | ● | ● | ● | ● | | | | | | | | ø2.5 to ø6 | |
| | AS13□1F | M5 | | ● | ● | ● | ● | ● | ● | | | | | | | | ø6 to ø20 | |
| | AS23□1F | 1/8, 1/4 | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | AS33□1F | 1/4, 3/8 | | | | | | ● | ● | | | | ● | ● | ● | ● | ø40 to ø63 | |
| | AS43□1F | 1/2 | | | | | | | ● | | | | | | | ● | ø63 to ø100 | SEE IN BEST PNEUMATICS CATALOGUE |
| Elbow type (Metal body) | AS12□1 | M5 | | ● | ● | ● | ● | ● | ● | | | | | | | | ø6 to ø20 | |
| | AS22□1 | 1/8 | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø32 | |
| | AS22□1 | 1/4 | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | AS32□1 | 3/8 | | | | | | ● | ● | | | | ● | ● | ● | ● | ø40 to ø63 | |
| | AS42□1 | 1/2 | | | | | | | ● | | | | | | | ● | ø63 to ø100 | SEE IN BEST PNEUMATICS CATALOGUE |
| In-line type | AS1001F | | | ● | ● | ● | ● | ● | ● | | | | | | | | ø2.5 to ø20 | |
| | AS2001F | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø32 | |
| | AS2051F | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | AS3001F | | | | | | | ● | ● | | | | ● | ● | ● | ● | ø40 to ø63 | |
| | AS4001F | | | | | | | | ● | | | | | | | ● | ø63 to ø100 | SEE IN BEST PNEUMATICS CATALOGUE |
| Dual speed controller | ASD230F | M5 | | ● | ● | ● | ● | ● | ● | | | | | | | | ø6 to ø20 | |
| | ASD330F | 1/8 | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø32 | |
| | ASD430F | 1/4 | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | ASD530F | 1/4 | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | ASD530F | 3/8 | | | | | | ● | ● | | | | ● | ● | ● | ● | ø40 to ø63 | |
| | ASD630F | 1/2 | | | | | | | ● | | | | | | | ● | ø63 to ø100 | SEE IN BEST PNEUMATICS CATALOGUE |

## Speed Controller with Residual Pressure Release Valve

Applicable tubing O.D.

| | Model | Port size in the cylinder side | Metric size (mm) 3.2 | 4 | 6 | 8 | 10 | 12 | Inch size (inch) 1/8 | 5/32 | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 | Applicable cylinder bore size (mm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| With One-touch fitting/Elbow | AS22□1FE | 1/8 | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø32 | |
| | AS22□1FE | 1/4 | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | AS32□1FE | 3/8 | | | | | ● | ● | | | | ● | ● | ● | ● | ø40 to ø63 | |
| | AS42□1FE | 1/2 | | | | | | ● | | | | | | | ● | ø63 to ø100 | SEE IN BEST PNEUMATICS CATALOGUE |
| With One-touch fitting/Universal | AS23□1FE | 1/8 | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø32 | |
| | AS23□1FE | 1/4 | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ø20 to ø40 | |
| | AS33□1FE | 3/8 | | | | | ● | ● | | | | ● | ● | ● | ● | ø40 to ø63 | |
| | AS43□1FE | 1/2 | | | | | | ● | | | | | | | ● | ø63 to ø100 | SEE IN BEST PNEUMATICS CATALOGUE |

## Speed Controller Stainless Series

| | Model | Port size in the cylinder side | Applicable tubing O.D. | Applicable cylinder bore size (mm) |
|---|---|---|---|---|
| Elbow type  | AS12□1FG | M5 | 3.2 4 6 8 10 12 1/8 5/32 3/16 1/4 5/16 3/8 1/2 | ø6 to ø20 |
| | AS22□1FG | 1/8 | | ø20 to ø32 |
| | AS22□1FG | 1/4 | | ø20 to ø40 |
| | AS32□1FG | 1/4 | | ø40 to ø63 |
| | AS32□1FG | 3/8 | | ø40 to ø63 |
| | AS42□1FG | 1/2 | | ø63 to ø100 |
| Universal type  | AS13□1FG | M5 | | ø6 to ø20 |
| | AS23□1FG | 1/8 | | ø20 to ø32 |
| | AS23□1FG | 1/4 | | ø20 to ø40 |
| | AS33□1FG | 1/4 | | ø40 to ø63 |
| | AS33□1FG | 3/8 | | ø40 to ø63 |
| | AS43□1FG | 1/2 | | ø63 to ø100 |
| In-line type  | AS1001FG | | | ø6 to ø20 |
| | AS2001FG | | | ø20 to ø32 |
| | AS2051FG | | | ø20 to ø40 |
| | AS3001FG | | | ø40 to ø63 |
| | AS4001FG | | | ø63 to ø100 |
| Dual speed controller  | ASD230FG | M5 | | ø 6 bis ø 20 |
| | ASD330FG | 1/8 | | ø 20 bis ø 32 |
| | ASD430FG | 1/4 | | ø 20 bis ø 40 |
| | ASD530FG | 1/4 | | ø 20 bis ø 40 |
| | ASD530FG | 3/8 | | ø 40 bis ø 63 |
| | ASD630FG | 1/2 | | ø 63 bis ø 100 |
| Elbow Type  | ASG22□F-M5 | M5 | | ø 6 bis ø 20 |
| | ASG32□F-01 | 1/8 | | ø 20 bis ø 32 |
| | ASG42□F-02 | 1/4 | | ø 20 bis ø 40 |
| | ASG52□F-03 | 3/8 | | ø 40 bis ø 63 |
| | ASG62□F-04 | 1/2 | | ø 63 bis ø 100 |

## Speed Controller for Low Speed Operation

| | Model | Port size in the cylinder side | Applicable tubing O.D. | Applicable cylinder bore size (mm) |
|---|---|---|---|---|
| Elbow type  | AS12□1FM | M5 | 3.2 4 6 8 10 12 1/8 5/32 3/16 1/4 5/16 3/8 1/2 | ø6 to ø20 |
| | AS22□1FM | 1/8 | | ø20 to ø32 |
| | AS22□1FM | 1/4 | | ø20 to ø40 |
| Universal type  | AS13□1FM | M5 | | ø6 to ø20 |
| | AS23□1FM | 1/8 | | ø20 to ø32 |
| | AS23□1FM | 1/4 | | ø20 to ø40 |
| In-line type  | AS1001FM | | | ø6 to ø20 |
| | AS2001FM | | | ø20 to ø32 |
| | AS2051FM | | | ø20 to ø40 |
| Dual speed controller  | ASD230FM | M5 | | ø6 to ø20 |
| | ASD330FM | 1/8 | | ø20 to ø32 |
| | ASD430FM | 1/4 | | ø20 to ø40 |

## Tamper Proof Speed Controller

Elbow type

Universal type

In-line type

Dual speed controller

| Model | Port size in the cylinder side | Applicable tubing O.D. Metric size (mm) | Applicable tubing O.D. Inch size (inch) | Applicable cylinder bore size (mm) |
|---|---|---|---|---|
| AS12□1F | M5 | 3.2 4 6 8 10 12 | 1/8 5/32 3/16 1/4 5/16 3/8 1/2 | ø6 to ø20 |
| AS22□1F | 1/8, 1/4 | | | ø20 to ø40 |
| AS32□1F | 1/4, 3/8 | | | ø40 to ø63 |
| AS42□1F | 1/2 | | | ø63 to ø100 |
| AS13□1F | M5 | | | ø6 to ø20 |
| AS23□1F | 1/8, 1/4 | | | ø20 to ø40 |
| AS33□1F | 1/4, 3/8 | | | ø40 to ø63 |
| AS43□1F | 1/2 | | | ø63 to ø100 |
| AS1001F | | | | ø6 to ø20 |
| AS2001F | | | | ø20 to ø32 |
| AS2051F | | | | ø20 to ø40 |
| AS3001F | | | | ø40 to ø63 |
| AS4001F | | | | ø63 to ø100 |
| ASD230F | M5 | | | ø6 to ø20 |
| ASD330F | 1/8 | | | ø20 to ø32 |
| ASD430F | 1/4 | | | ø20 to ø40 |
| ASD530F | 1/4 | | | ø20 to ø40 |
| ASD530F | 3/8 | | | ø40 to ø63 |
| ASD630F | 1/2 | | | ø63 to ø100 |

## Speed Controller with Pilot Check Valve

| Model | Port size in the cylinder side | Applicable tubing O.D. Metric size (mm) | Applicable tubing O.D. Inch size (inch) | Applicable cylinder bore size (mm) |
|---|---|---|---|---|
| ASP330F-01 | 1/8 | 3.2 4 6 8 10 12 | 1/8 5/32 3/16 1/4 5/16 3/8 1/2 | ø20 to ø32 |
| ASP430F-02 | 1/4 | | | ø20 to ø40 |
| ASP530F-03 | 3/8 | | | ø40 to ø63 |
| ASP630F-04 | 1/2 | | | ø63 to ø100 |

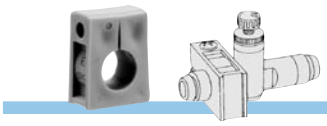
## Speed Controller for Clean Room

| Model | Port size in the cylinder side | Applicable tubing O.D. Metric size (mm) | Applicable tubing O.D. Inch size (inch) | Applicable cylinder bore size (mm) |
|---|---|---|---|---|
| AS1201FP□ | M5 | 3.2 4 6 8 10 12 | 1/8 5/32 3/16 1/4 5/16 3/8 1/2 | ø6 to ø20 |
| AS2201FP□ | 1/8 | | | ø20 to ø32 |
| AS2201FP□ | 1/4 | | | ø20 to ø40 |
| AS3201FP□ | 3/8 | | | ø40 to ø63 |
| AS4202FP□ | 1/2 | | | ø63 to ø100 |

Residual Pressure Exhaust Valve with One Touch Fitting
**Series KE**

| Model | Tubing O.D. |
|---|---|
| KE□06 | 6 |
| KE□08 | 8 |
| KE□10 | 10 |
| KE□12 | 12 |

Speed Controller Holder
**Series TMH**



| Model | Tubing O.D. |
|---|---|
| TMH-23J | 3.2 |
| TMH-04J | 4 |
| TMH-06□ | 6 |
| TMH-08 | 8 |
| TMH-10 | 10 |
| TMH-12 | 12 |

Multiple Fitting Holder
**Series TMA**

| Model | Tubing O.D. |
|---|---|
| TMA-06 | 6 |
| TMA-08 | 8 |
| TMA-10 | 10 |
| TMA-12 | 12 |

Metering valve with silencer
**Series ASN2**

| Model | Port size |
|---|---|
| ASN2-M5 | M5 |
| ASN2-01 | 1/8 |
| ASN2-02 | 1/4 |
| ASN2-03 | 3/8 |
| ASN2-04 | 1/2 |

Quick exhaust valve
**Series AQ**

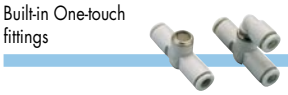
Lip

| Model | Port size |
|---|---|
| AQ1500 | M5 |
| AQ1510 | 1/8 |

Diaphragm

| Model | Port size |
|---|---|
| AQ2000 | 1/8, 1/4 |
| AQ3000 | 1/4, 3/8 |
| AQ5000 | 1/2, 3/4 |

Built-in One-touch fittings

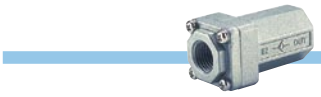


| Model | Applicable tubing |
|---|---|
| AQ240F-04 | 04 |
| AQ240F-06 | 06 |
| AQ340F-06 | 06 |

Speed exhaust controller
**Series ASV**

| Model | Port size |
|---|---|
| ASV120F-M3 | M3 |
| ASV220F-M5 | M5 |
| ASV310F | 1/8, 1/4 |
| ASV410F | 1/8, 1/4, 3/8 |
| ASV510F | 1/4, 3/8, 1/2 |

Check valve
**Series AK**



| Model | Port size |
|---|---|
| AK2000 | 1/8, 1/4 |
| AK4000 | 1/4, 3/8, 1/2 |
| AK6000 | 3/4, 1 |

Check valve with One-touch fittings, Straight type, Half union type
**Series AKH**

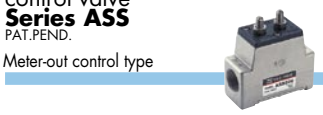
| Model | Port size |
|---|---|
| AKH04 | M5, 1/8 |
| AKH06 | M5, 1/8, 1/4 |
| AKH08 | 1/8, 1/4, 3/8 |
| AKH10 | 1/4, 3/8, 1/2 |
| AKH12 | 3/8, 1/2 |

Bushing type
**Series AKB**

| Model | Port size |
|---|---|
| AKB01 | 1/8 |
| AKB02 | 1/4 |
| AKB03 | 3/8 |
| AKB04 | 1/2 |

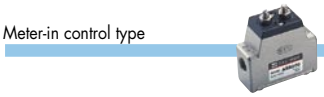
Safety speed control valve
**Series ASS**
PAT.PEND.

Meter-out control type



| Model | Port size |
|---|---|
| ASS100 | 1/8 |
| ASS300 | 1/4, 3/8 |
| ASS500 | 1/2, 3/4 |
| ASS600 | 3/4, 1 |

Meter-in control type



| Model | Port size |
|---|---|
| ASS110 | 1/8 |
| ASS310 | 1/4, 3/8 |

New air-saving PFC valve, QFC valve:
**Series ASR/ASQ**

PFC valve

| Model | Port size |
|---|---|
| ASR430F-02 | 1/4 |
| ASR530F-02 | 1/4 |
| ASR530F-03 | 3/8 |
| ASR630F-03 | 3/8 |
| ASR630F-04 | 1/2 |

QFC valve

| Model | Port size |
|---|---|
| ASQ430F-02 | 1/4 |
| ASQ530F-02 | 1/4 |
| ASQ530F-03 | 3/8 |
| ASQ630F-03 | 3/8 |
| ASQ630F-04 | 1/2 |

## Piping Equipment

# Made to Order Products

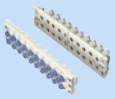
## One-touch Fittings

| Made to order specifications |  White body |  Black body |  Miniature one-touch |  Rotary (Standard speed) |  Rotary (High speed) |  Tubing coupler |  Manifold |  Piping module | |
|---|---|---|---|---|---|---|---|---|---|
| | KQ2 | KQ | KJ | KS | KX | KC | KM | KB | |
| Brass metal parts: Electroless nickel plated | X2 | X2 | | | | | X2 | | |
| Brass metal parts: Electroless nickel plated, Packing O-ring: Fluoro rubber Note 3) | X47 | X47 | | | | | | | |
| Lubricant: Vaseline | X12 | X12 | X12 | | | | X12 | | |
| No lubrication | X57 | X57 | X57 | | | | X57 | | |
| Packing: Fluororesin coating Note 4) | X17 | X17 | X17 | | | | X17 | | |
| Lubricant: Vaseline<br>Brass metal parts: Electroless nickel plated | X16 | X16 | | | | | | | |
| Lubricant :Vaseline<br>Brass metal parts: Electroless nickel plated<br>Packing: Fluororesin coating | X29 | X29 | | | | | | | |
| Clean series Note 4) | | Note 5) 10- | 10- | | | | | | |

# Piping Equipment Made to Order Products



Standardized  Made to order specification available.

| |  Rectangular multi-connector |  Multi connector |  Stainless steel |  Clean |  Clean |  Antistatic |  Flame resistant |  Flame resistant manifold |  Insert |  Self-align |  Miniature |  Miniature (SUS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | KDM | DM | KG | KP | KPQ KPG | KA | KR | KRM | KF | H,DL L,LL | M | MS |
| | X2 | X2 | | | Note 6) | | X2 | X2 | X2 | X2 | Note 1) | |
| | | | | | | | | | | | | |
| | | | X12 | | | | | | | | | |
| | | | X57 | | | | | | | | Note 2) | |
| | | | X17 | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | 10- | | 10- | | | | | | 10- | | 10- | 10- |

Note 1) Only M-5E, M-5ER and M-5M are available for X2.
Note 2) Not including M-5UN and MS-5UN.
Note 3) Only available for a part of models.
Note 4) Not including inch sizes.
Note 5) 10-KQ has a white body.
Note 6) SUS304 with KPG.

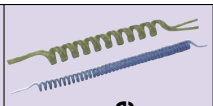
## Piping Equipment

# Made to Order Products

## Speed Controller with Fittings

| Made to order specifications |  General |  Dual |  Low speed control |  Low speed control dual |  Stainless steel |  Stainless dual | |
|---|---|---|---|---|---|---|---|
| | AS•F | ASD•F | AS•FM | ASD•FM | AS•FG | ASD•FG | |
| Lubricant: Vaseline | X12 | X12 | X12 | X12 | X12 | X12 | |
| Throttle valve (Without check valve) | X214 | | X214 | | X214 | | |
| Throttle valve (Without check valve) Oil free (Sealant material: PTFE coating) | X21 | | X21 | | X21 | | |
| Clean series | 10- | 10- | 10- | 10- | 10- | 10- | |

## Tube

| Made to order specifications |  Polyurethane |  Nylon |  Soft nylon |  Coil polyurethane |  Polyurethane flat | |
|---|---|---|---|---|---|---|
| | TU | T | TS | TCU | TFU | |
| Reel | X3 | X3 | X3 | | X3 | |
| Change in the number of coil windings and color | | | | X6 | | |
| Change in the number of tubes and color | | | | | X4 | |
| Clean series | 10- | | | 10- | 10- | |

## Piping Equipment Made to Order Products



| |  Clean |  Flame resistant (Metal elbow) |  With residual pressure exhaust |  Speed exhaust controller |  Pilot with built-in check valve |  Tamper proof |  Tamper proof dual |  Flat head screw adjustment |  Flat head screw adjustment dual |
|---|---|---|---|---|---|---|---|---|---|
| | AS•FPQ AS•FPG | AS-F | AS•FE | ASV•F | ASP•F | AS•F-T | ASD•F-T | AS•F-D | ASD•F-D |
| | | X12 | X12 | X12 | X12 | X12 | X12 | X12 | X12 |
| | | X214 | X214 | | | X214 | | X214 | |
| | | X21 | X21 | | | X21 | | X21 | |
| | Standardized | 10- | | | | 10- | 10- | 10- | 10- |

| |  Clean polyolefin |
|---|---|
| | TPH TPS |
| | |
| | |
| | |
| | Standardized |

## Vacuum Selection

| | |
|---|---|
| Selecting of vacuum system, vacuum eyector, pad type and typical circuit. | |

## Vacuum Ejector

| Series | | |
|---|---|---|
| **ZU** |  | In-line vacuum ejector<br>• Nozzle diameter: ø0.5, ø0.7<br>• Vacuum port and supply port are located in-line to facilitate piping<br>• Built-in One-touch fitting (Copper free) |
| **ZH** |  | Vacuum ejector<br>• Nozzle diameter: ø0.5, ø0.7, ø1.0, ø1.3, ø1.5, ø1.8, ø2.0<br>• Composite resin nozzle and body<br>• Available in 2 types: box type and direct piping type |
| **EZM** |  | Vacuum ejector<br>• Valve and switch are unitized<br>• Adaptable for manifold applications<br>• Maximum suction flow rate increased 40%<br>• Max. vacuum pressure –84 kPa {–630 mmHg} |
| **ZMA** |  | Vacuum ejector with solid state timer<br>• Incorporates solid state timer function for release valve control (timer setting with PLC is unnecessary)<br>• Allows sharing of switch/valve power supply, and single line for suction signal (valve wiring is unnecessary)<br>• Timer can be easily adjusted without programming |
| **ZL** |  | Multistage ejector<br>• Suction flow rate increased by a 3 stage diffuser construction<br>• Functions such as a digital vacuum switch or a vacuum pressure gauge can be selected |
| **ZYY/ZYX** |  | Ejector valve unit<br>• Ejector valve unit suitable for vacuum adsorption systems<br>• A combination of solenoid valve for cylinder drive, etc + vacuum ejector |

## Vacuum Module

| Series | | |
|---|---|---|
| **ZX** |  | Vacuum module<br>• Optimal for electronic parts or small precision parts weighing up to 100 g<br>• Supports the ejector system and the vacuum pump system<br>• Modular design<br>• Adaptable for manifold applications |
| **ZR** |  | Large size vacuum module<br>• Necessary functions can be combined through modular design<br>• Adaptable for manifold applications<br>• Functions such as a digital vacuum switch or a solenoid valve can be selected<br>• Supports the ejector system and the vacuum pump system<br>• Double solenoids provide a self-holding function |

## Air Suction Filter

| Series | | |
|---|---|---|
| **ZFA** |  | Air suction filter<br>• Prevents problems related to vacuum circuits or airborne contaminants<br>• Provides a large filter element surface |
| **ZFB** |  | Air suction filter with one-touch fittings<br>• Prevents problems related to vacuum circuits or airborne contaminants<br>• Piping tube can be connected and disconnected with one touch |
| **ZFC** |  | Air suction filter in-line type with one-touch fittings<br>• IN/OUT straight piping<br>• One-touch fittings for easy installation and removal<br>• Lightweight molded resin parts<br>Cartridge type element replacement |

## Vacuum Pad

| Series | | |
|---|---|---|
| **ZP** |  | Vacuum pad<br>• A variety of models accommodate a wide range of applications<br>• Pad type: Flat, Flat with ribs, Deep, Bellows<br>• Pad diameter: ø2 to ø125, Made to Order = ø150 to ø250 |
| **ZPT/ZPX** |  | Vacuum pad: Large/Heavy duty type<br>• Ideal for heavy weight material or objects with a large surface area<br>Example: CRT, Car body<br>• Pad diameter: ø40, ø50, ø63, ø80, ø100, ø125 |
| **ZPT/ZPX** |  | Vacuum pad: Large size bellows type<br>• Ideal for loads with a curved surface, heavy weight loads and loads with large surface area<br>• Pad diameter: ø40, ø50, ø63, ø80, ø100, ø125 |
| **ZPT/ZPR** |  | Vacuum pad: Ball joint type<br>• Ball joint type ideal for use on slanted work surface<br>• Pad diameter: ø10, ø13, ø16, ø20, ø25, ø32, ø40, ø50 |

## Free Mount Cylinder for Vacuum

| Series | | |
|---|---|---|
| **ZCUK** |  | Vacuum Compact Cylinder<br>• In the rectangular, compact cylinder Series CU with a high level of mounting precision, a vacuum passage is provided to facilitate the mounting of a vacuum pad and to save space.<br>• Standard vacuum pads (ø2 to ø50) can be mounted |

## Drain Separator for vacuum

| Series | | | |
|---|---|---|---|
| **AMJ** |  | Drain separator for vacuum<br>• Remove water droplets from air by simply installing in vacuum equipment connection line. Effective for removing water droplets from the air sucked into vacuum pumps and ejectors, etc. | SEE IN BEST PNEUMATICS CATALOGUE |

## Vacuum System Peripherals and Related Products

| Series | | | |
|---|---|---|---|
| **IRV** |  | Vacuum Regulator<br>• Direct operated vacuum pressure adjustment valve that regulates the vacuum pressure. | |
| **ITV2090** |  | Electro-pneumatic Regulator<br>• Controls the vacuum pressure in accordance with external electric signals. | SEE IN BEST PNEUMATICS CATALOGUE |

## Digital Pressure Switches (Self-Contained Type)

| Series | Fluid | Set pressure range | Output | Note | |
|---|---|---|---|---|---|
| **ZSE/ISE30**  | High precision, 2-colour display digital pressure switch | | | | |
| | General pneumatic | –101 to 101 kPa<br>–0.1 to 1 MPa | NPN/PNP open collector<br>1-5 V, 4-20 mA Analogue output | • Port size: 1/8, ø4, ø6<br>• Enclosure: IP40 | SEE IN BEST PNEUMATICS CATALOGUE |
| **ZSE/ISE40**  | High precision digital pressure switch | | | | |
| | General pneumatic | –100 to 100 kPa<br>10 to –101.3 kPa<br>–0.1 to 1 MPa | NPN/PNP open collector<br>Analogue output | • Port size: M5, 1/8, ø4, ø6<br>• Enclosure: IP65 | |
| **ZSE50F**<br>**ISE50**  | High precision digital pressure switch for general fluids | | | | |
| | General fluids | –100 to 100 kPa<br>–0.1 to 1 MPa | NPN/PNP open collector<br>Analogue output | • Port size: M5, 1/4<br>• Enclosure: IP65 | SEE IN BEST PNEUMATICS CATALOGUE |
| **ZSE60F**<br>**ISE60**  | High precision digital pressure switch for general fluids | | | | |
| | General fluids | –100 to 100 kPa<br>–0.1 to 1 MPa | NPN/PNP open collector<br>Analogue output | • Port size: URJ 1/4, TSJ 1/4<br>• Enclosure: IP65 | SEE IN BEST PNEUMATICS CATALOGUE |
| **ISE70**  | 2-colour display digital pressure switch | | | | |
| | General pneumatic | 0 to 1 MPa | 1 setup NPN/PNP open collector<br>PNP open collector | • Port size: 1/4<br>• Enclosure: IP67 | SEE IN BEST PNEUMATICS CATALOGUE |
| **ISE75/75H**  | 2-colour display digital pressure switch for general fluids | | | | |
| | General fluids | 0.4 to 10 MPa<br>0.5 to 15 MPa | 1 setup NPN/PNP open collector<br>PNP open collector | • Port size: 1/4<br>• Enclosure: IP67 | SEE IN BEST PNEUMATICS CATALOGUE |

## Digital Pressure Switches (Separate Type)

| Series | Fluid | Set pressure range | Output | Note | |
|---|---|---|---|---|---|
| **PSE530**  | Pressure sensor | | | | |
| | General pneumatic | 0 to 1 MPa<br>0 to –101 kPa<br>0 to 101 kPa<br>–101 to 101 kPa | | • Port size: M5<br>• Enclosure: IP40 | SEE IN BEST PNEUMATICS CATALOGUE |
| **PSE540**  | Compact pressure sensor | | | | |
| | General pneumatic | 0 to 1 MPa<br>0 to –101 kPa<br>–100 to 100 kPa | | • Port size: M3, M5, 1/8, ø4, ø6<br>• Enclosure: IP40 | SEE IN BEST PNEUMATICS CATALOGUE |
| **PSE560**  | Pressure sensor for general fluids | | | | |
| | General fluids | 0 to 1 MPa<br>0 to –101 kPa<br>–100 to 100 kPa<br>0 to 500 kPa | | • Port size: M5, 18, 1/4<br>• Enclosure: IP65 | SEE IN BEST PNEUMATICS CATALOGUE |
| **PSE550**  | Low differential pressure sensor | | | | |
| | General pneumatic | –50 to 50 kPa<br>(can detect differential pressure from 0 to 2 kPa) | | • Port size: ø4<br>• Enclosure: IP40 | SEE IN BEST PNEUMATICS CATALOGUE |

## Controllers

| Series | Sensor input amount | Set pressure range | Output | Note | |
|---|---|---|---|---|---|
| **PSE300**  | 2-colour display controller | | | | |
| | 1 input | –0.1 to 1 MPa<br>10 to –101 kPa<br>–100 to 100 kPa<br>–10 to 100 kPa<br>–50 to 500 kPa<br>–0.2 to 2 kPa | NPN/PNP<br>open collector<br>2 outputs<br>Analog output | • Red/Green dual colour LCD display<br>• Enclosure: Font only IP65, the rest IP40 | SEE IN BEST PNEUMATICS CATALOGUE |
| **PSE200**  | Multi-channel controller | | | | |
| | 4 inputs | –0.1 to 1 MPa<br>10 to –101 kPa<br>–101 to 101 kPa<br>–10 to 100 kPa | NPN/PNP<br>open collector<br>1 CH: 2 outputs<br>2 to 4 CH: 1 output | • Monitor up to 4 individual sensors<br>• Enclosure: IP40 | SEE IN BEST PNEUMATICS CATALOGUE |

## Electronic Pressure Switches (Trimmer calibration)

| Series | Fluid | Set pressure range | Output | Note | |
|---|---|---|---|---|---|
| **PS1000**<br>**PS1100**  | Simple electronic pressure switch | | | | |
| | General pneumatic | –0.1 to 0.45 MPa<br>–0.1 to 0.4 MPa | 2-wire type | • Port size: ø6<br>• Enclosure: IP40 | SEE IN BEST PNEUMATICS CATALOGUE |
| **ISA2**  | Air catch sensor | | | | |
| | General pneumatic | 30 to 200 kPa<br>(Detection distance<br>0.01 to 0.25 mm)<br>50 to 200 kPa<br>(Detection distance<br>0.03 to 0.50 mm) | NPN/PNP<br>open<br>collector | • Port size: 1/8<br>• Enclosure: IP66 | SEE IN BEST PNEUMATICS CATALOGUE |

## Mechanical Pressure Switches

| Series | Fluid | Set pressure range | Contacts (Voltage) | Note | |
|---|---|---|---|---|---|
| **IS1000**  | Mechanical style pressure switch | | | | |
| | General pneumatic | 0.1 to 0.6 MPa | 1a<br>(to 100 VDC<br>to 100 VAC) | • Port size: 1/8 | SEE IN BEST PNEUMATICS CATALOGUE |
| **IS3000**  | Pneumatic pressure switch | | | | |
| | General pneumatic | 0.1 to 0.7 MPa | 1ab<br>(24 to 125 VDC<br>100 to 250 VAC) | • Port size: 1/4 | SEE IN BEST PNEUMATICS CATALOGUE |

## Digital Flow Switches

| Series | Fluid | Flow rate range | Output | Note | |
|---|---|---|---|---|---|
| **PF2A**  | Digital flow switch for air | | | | |
| | General pneumatic | 1 to 12000 l/min | NPN/PNP<br>open<br>collector<br>3 outputs | • Port size: 1/8, 1/4, 3/8, 1/2, 1, 1 1/2, 2<br>• Enclosure: IP65 | |
| **PF2W**  | Digital flow switch for water | | | | |
| | Water | 0.5 to 100 l/min | NPN/PNP<br>open<br>collector<br>3 outputs | • Port size: 3/8, 1/2, 3/4,1<br>• High temperature fluid (water 90°C)<br>• Enclosure: IP65 | |
| **PF2D**  | Digital flow switch for deionized water and chemicals | | | | |
| | Deionized water and chemicals | 0.4 to 40 l/min | NPN/PNP<br>open<br>collector<br>4 outputs | • Body and sensor: New PFA<br>Tube: Super PFA.<br>• Port size: 3/8, 1/2, 3/4 inch tube.<br>• Enclosure: IP65 | SEE IN BEST PNEUMATICS CATALOGUE |

**IP8000/8100**

■ Electro-Pneumatic Positioner

- Electro-pneumatic positioner for process valves or other equipment.
- Lever arm and rotary shaft versions.

# SMC - provide products

## Outline of ATEX directive

Since 1st July 2003, equipment used in potentially explosive atmospheres within the EU is required to comply with the ATEX directive.

**ATEX directive**

Directive 94/9/EC
Equipment and Protective Systems intended for use in potentially Explosive Atmospheres

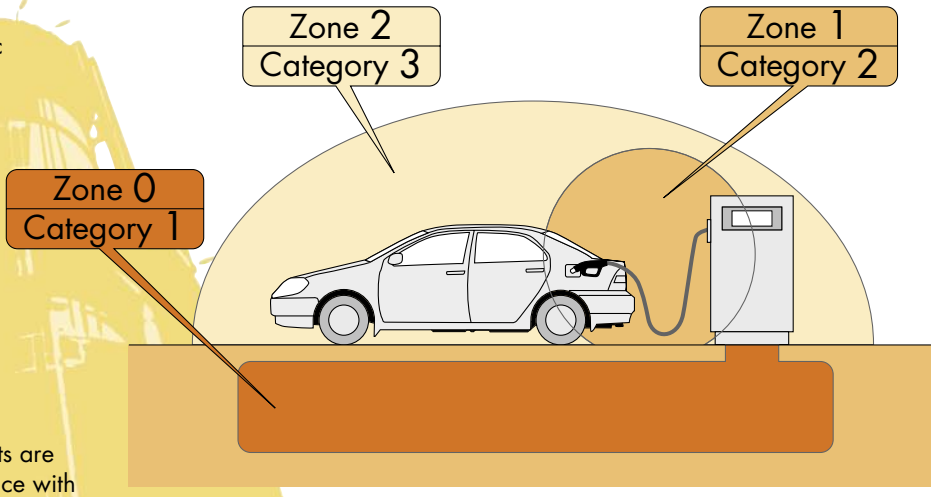
### ATEX, New Approach directives and CE marking

Directive 94/9/EC, known as ATEX directive, is one of the directives based on the New Approach towards technical harmonization and standardisation.
The New Approach is a new regulatory technique and strategy laid down by the European Council Resolution of 1985, in order to allow free movement of goods within the EU market and to prevent barriers to trade.
Products in compliance with all provisions of applicable directives (such as Directive 94/9/EC for ATEX) must bear the CE marking. This is an indication that the products comply with the requirements of applicable directives and have been subjected to the conformity assessment procedure provided for in these directives.

### ATEX definitions

Potentially explosive atmospheres are atmospheres likely to become explosive due to local and operational conditions.
The ATEX directive regards explosive atmospheres which are defined as mixtures with air, under atmospheric conditions, of flammable substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture. (Quotation from Directive 94/9/EC)
The following applications are explicitly excluded by the ATEX directive and must comply with other specific standards: medical devices, equipment or safety devices to be used with explosive or chemically unstable substances, equipment for domestic and non-commercial environments with explosive atmosphere generated by leakage of fuel gas, personal protective equipment, offshore vessels, mobile units and means of transport.
Certified equipment is designed to prevent the generation of ignition sources as defined by the standard EN1127-1:

- hot surfaces
- flames and hot gases
- mechanically generated sparks
- electrical sparks
- stray electric currents, cathodic corrosion protection
- static electricity
- lightning
- electromagnetic fields
- electromagnetic radiations
- ionising radiations
- ultrasonics
- adiabatic compression shock waves, gas flows
- chemical reactions




### Classification

Potentially explosive environments are classified into zones in accordance with Directive 1999/92/EC. These are:

- 0, 1, 2 for gas explosive atmospheres
- 20, 21, 22 for dust explosive atmospheres

The ATEX directive defines categories of equipment and protective systems, which can be used in the corresponding zones as per the following table.

| Zone | | Equipment category | Presence of the explosive atmosphere |
|---|---|---|---|
| Gas | Dust | | |
| 0 | 20 | 1 | Continuously or for long periods >1000 hours/year |
| 1 | 21 | 2 | Occasionally 10~1000 hours/year |
| 2 | 22 | 3 | Rarely or for short periods <10 hours/year |

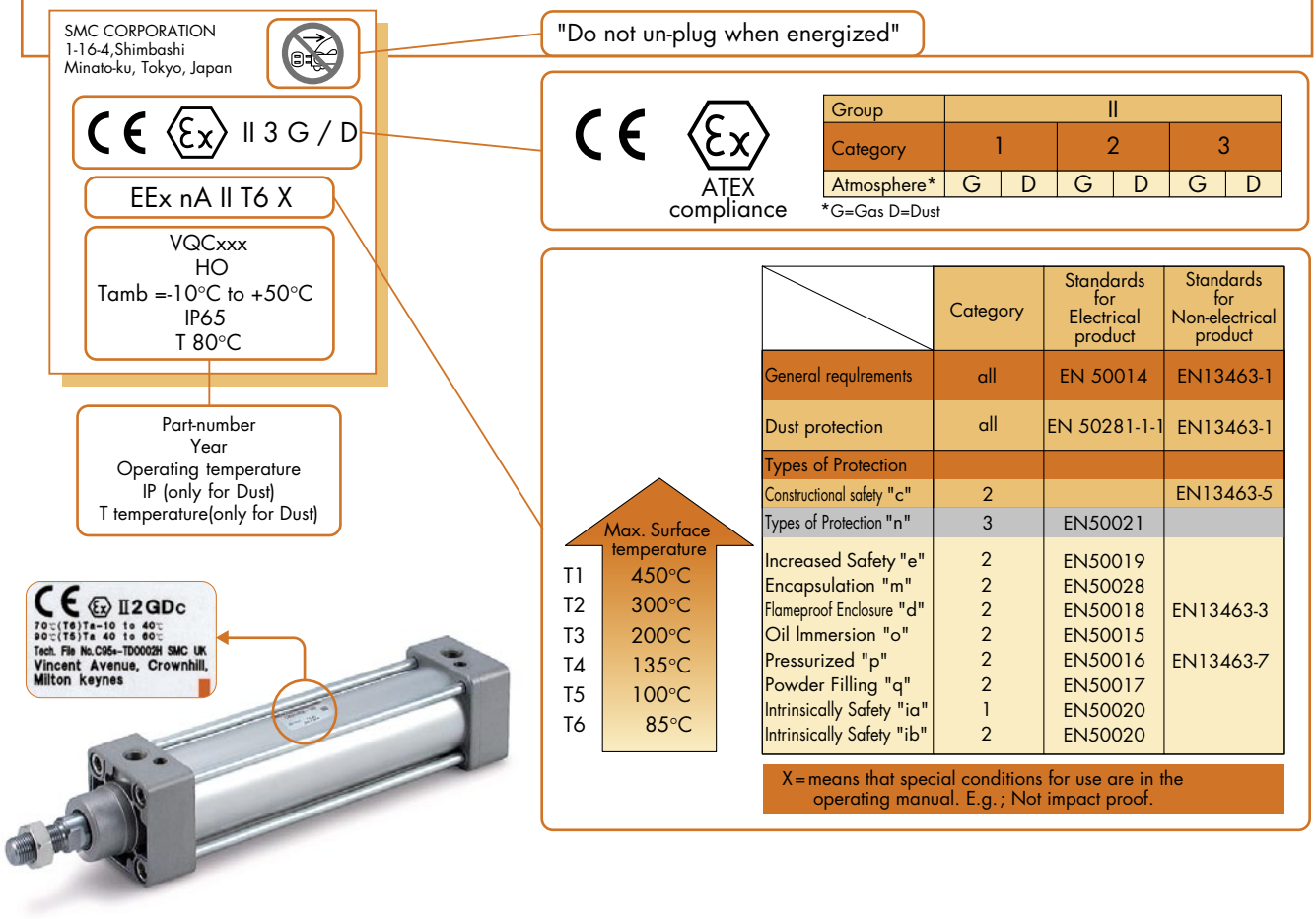
# compliant to ATEX Directive



## New elements at a glance

Previous legislation covered the most obvious sources of ignition generated by electrical devices.
The ATEX directive and the corresponding harmonised standards have extended the applicability of legislation to all the equipment that is intended for generation, transfer, storage, measurement, control and conversion of energy.
Pneumatic equipment used in potentially explosive atmospheres must, therefore, comply with the new legislation.
Products, which do not contain any potential ignition sources, are out of the scope of the directive.

## ATEX label example and explanation




| | Category | Standards for Electrical product | Standards for Non-electrical product |
|---|---|---|---|
| General requirements | all | EN 50014 | EN13463-1 |
| Dust protection | all | EN 50281-1-1 | EN13463-1 |
| Types of Protection | | | |
| Constructional safety "c" | 2 | | EN13463-5 |
| Types of Protection "n" | 3 | EN50021 | |
| Increased Safety "e" | 2 | EN50019 | |
| Encapsulation "m" | 2 | EN50028 | |
| Flameproof Enclosure "d" | 2 | EN50018 | EN13463-3 |
| Oil Immersion "o" | 2 | EN50015 | |
| Pressurized "p" | 2 | EN50016 | EN13463-7 |
| Powder Filling "q" | 2 | EN50017 | |
| Intrinsically Safety "ia" | 1 | EN50020 | |
| Intrinsically Safety "ib" | 2 | EN50020 | |

X = means that special conditions for use are in the operating manual. E.g.; Not impact proof.

# ■SMC product information

| Product | | Series | Category |
|---|---|---|---|
| Others | Hand valve | VH200/201/400/401 | Out of scope [1] |
| | Regulator | AR10/20/25/30/40/50/60 | |
| | Manifold regulator | ARM2500/3000 | |
| | Air filter | AF10/20/30/40/50/60 | |
| | Mist separator | AFM20/30/40 | |
| | Micro mist separator | AFD20/30/40 | |
| | Filter regulator | AW10/20/30/40 | |
| | Lubricator | AL10/20/30/40/50/60 | |
| | Finger valve | VHK2/3 | |
| | 3 port residual pressure realase valve | VHS20/30/40/50 | |
| | Cross interface | Y24~54 | |
| | Speed controller | AS | |
| | Check valve | AK,AKH | |
| | Shuttle valve | VR12 | |
| | Quick exhaust valve | AQ | |
| | Fitting | KQ | |
| | One-touch fittings | KA, KAB, KC, KEC, KG, KJ, KM, KP*, KQ*, KR*, KS, KW, KX | |
| | Multi-connector | DM*, KDM | |
| | Insert fittings | KF* | |
| | Self-align fittings | H, DL, L, LL | |
| | Miniature fittings | M, MS | |
| | S Couplers | KK* | |
| | Tube | T, TS, TU | |
| | Booster relay | IL100 | |
| | Lock up valve | IL201/211/220 | |
| | Precision regulator | IR1000~3000 | |
| | Vacuum Regulator | IRV1000~3000 | |
| | Filter Regulator | IW212~217 | |
| | Air-hydro Converter | CCT | |
| | Heavy duty Auto Drain | ADH4000 | |
| | Main line Filter | AFF2B~AFF75B | |
| | Mist Separator | AM150~850 | |
| | Micro mist Separator | AMD150~850, AMD800~1000 | |
| | Super mist Separator | AME150~850 | |
| | Odour Removal Filter | AMF150~1000 | |
| | Water Separator | AMG150~850 | |
| | Micro mist Separator with Prefilter | AMH150~850 | |
| | MR unit | AMR3000~6000 | |
| | Silencer | AN200-900, AN103 | |

Note 1) An "Out of scope" product is one that can be used without certification in Zone 1, 2 (gas) or Zone 21, 22 (dust).

Consult SMC for individual part numbers and details of compliant models.

## Actuator



## Rotary Actuator



## Instruments



## Others



## Directional Valves



## Safety Precautions

# Are your energy costs spiralling out of control?

## Using compressed air can be more expensive than you think!

**Would you like to reduce your energy costs and help the enviroment at the same time?**

**As world leaders in Automation Control, we can offer you the best Energy Saving Solutions around.**

## CALL SMC FOR A FREE – no obligation – CONSULTATION and see the huge savings that can be made!

SMC ENERGY SAVING

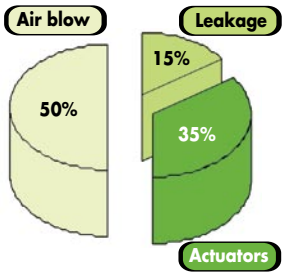
- Help reduce global warming
- Reduce CO2 emissions
- Help meet your ISO 14001 needs
- Cut your electricity bills
- Benefit from government assistance schemes
- Reduce your energy taxes and levies


As world leaders in **Pneumatics**, we have developed an energy saving programme which recognises the key areas in many factories where energy loss can be saved.

For example, around 90% of the electricity consumed by a modern compressor is lost in waste heat and not in the production of compressed air. This makes compressed air 10 times more expensive than the cost of the electricity cosumed in its production!

By focussing on the installation of an energy efficient compressed air system in your facilities, we can guarantee savings which could make the difference between making a profit or a loss!

**Compressed Air Consumption by Application**




**In terms of energy savings for compressed air, there are three big areas:**

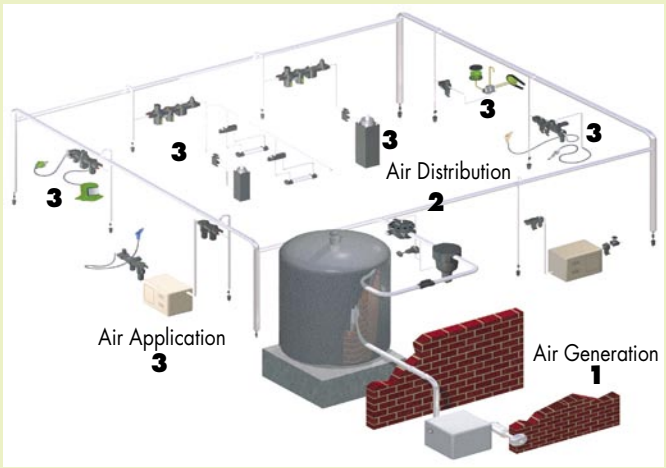
**1. Air Generation.** Compressors and other air supply side equipment.

**2. Air Distribution.** Piping, fittings, valves, FRL units,...

SMC ENERGY SAVING

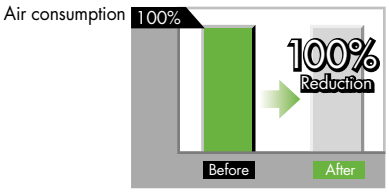
**3. Air Applications.** Actuators, Air blow, Suction units... Within these areas substantial energy and monetary savings can be made!

SMC ENERGY SAVING



# Leakage

## Reduce the "hiss"



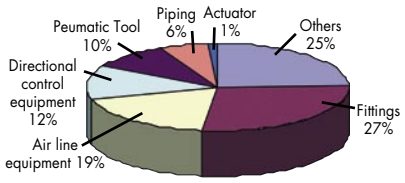

How many times have you walked around a factory accompanied by the ever present background noise of air leakage?

The hissing sound is actually the noise made by escaping air, which not only wastes energy, with potentially harmful long term effects on the environment, but costs organisations substantial amounts of money!

| Hole Diameter | Air Leakage ($dm^3$/min (ANR)) | Annual Loss ( €/year) |
|---|---|---|
| 0.5 | 13 | 44.5 |
| 2 | 204 | 682 |
| 5 | 1275 | 4256 |

Line pressure: 5 Bar Working hours: 2500 Hrs/year
Compressed Air unit Cost: 0.022 €/$m^3$

Whilst compressed air systems will always have some leakage, many factories today have leakage which can account for as much as **25-30%** of the compressor's output. If this was reduced to a more acceptable and recognised levels of **5-10%**, the savings made could be the difference between profitability or loss!
So where do you search for leaks? "Just about everywhere!"
However, it is often more common to find them around fittings and piping.....




## Wastage related to air leakage

- Compressor overload – resulting in higher operational costs.
- Pressure fluctuation – reduced air tool efficiency and durability.
- Secondary procurement – the need to purchase additional compressors to maintain performance levels.
- Higher maintenance costs.
- Probable increases in machine downtime.

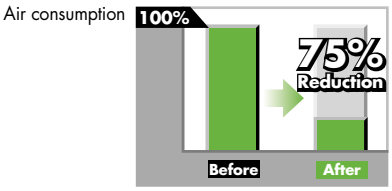
## Leak Prevention

- Maintain good air quality in the system - contaminants or moisture in the air system will cause increased leakage and equipment malfunction.
- Special care should be taken during the assembly of all fittings and tubing etc - use a special tube cutter, including leakage resistant equipment and allow sufficient time for accurate installation.

- Stop air consumption during non operational times – install a 3/2 or 2/2 port solenoid valve to cut off the compressed air supply when it is not needed.

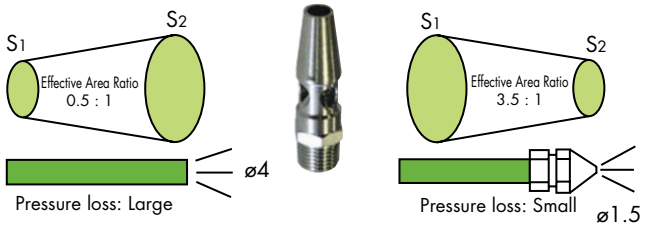
- Accurately estimate the correct air pressure for the system – over pressurisation will result in more compressed air leakeage and higher energy costs.

# Air blow




Many industries use air blow as part of their manufacturing processes. Often this can acccount for up to 50% of the total compressed air consumed, but this is often overlooked when energy costs are under scrutiny.

An "open blow" system where the air is blown through the air outlet without the use of end fittings (nozzles) is now recognised as one of the biggest consumers of compressed air.

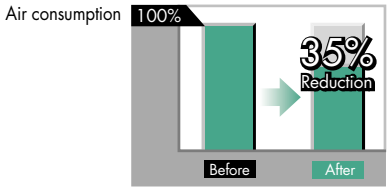



| | Nozzle Diameter (mm) | Pressure Before Nozzle (MPa) | Impact Pressure (MPa) | Work-Piece distance (mm) | Flow Rate ($dm^3$/min (ANR)) |
|---|---|---|---|---|---|
| Current | 4 | 0.02 | 0.014 | 100 | 121 |
| Improvement 1 | 1.7 | 0.10 | 0.014 | 100 | 49 |
| Improvement 2 | 1 | 0.28 | 0.014 | 100 | 33 |

## PREVENTION OF WASTAGE IN AIR BLOW:

- Use a regulator, to insure the right pressure at the nozzle.
- Reduce pressure loss in upstream piping.
- Check the distance to the work piece and select the correct diameter of nozzle.
- Install a solenoid valve to reduce the blow time operation – from constant to intermittent operation.

# Actuators




In a single machine the number of air operated cylinders can vary from one to a complex multi-cylinder machine application and today´s manufacturers can often use hundreds of pneumatics cylinders in their production facilities.

## ACTUATOR RELATED WASTAGE & PREVENTION

- In many cases, the air pressure required to extend the cylinder is greater than the air pressure required to retract the piston rod and yet the same pressure is used – therefore install a pressure regulator.
- Select the stroke and bore size to your speed and load requirements – do not oversize the pneumatic cylinder.
- A solenoid valve´s flow characteristics affects a cylinders response time – the valve should be sized to meet the required operating conditions.
- As the piping length increases, please note that the total stroke time increase as well.

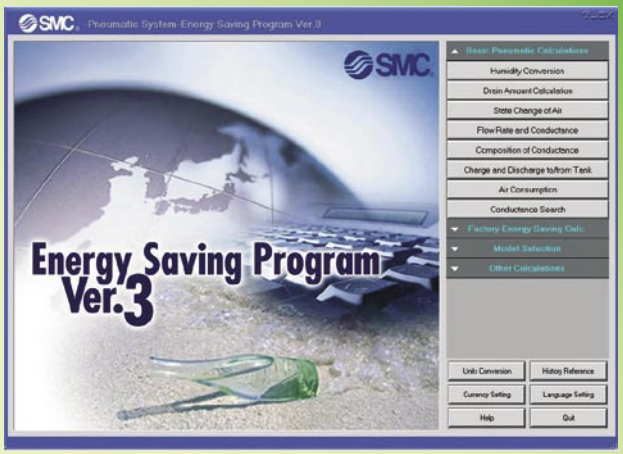
## ENERGY SAVING QUICK & EASY

- **Switch off** your **compressors** during idle time – an inoperative compressor draws between 40 and 60% of full load power.
- **Place the valve as close as possible to the cylinder.** this will save the unnecessary energy to pressurize and depressurize the driving piping length,
- Energy saving starts and ends with **measurement**. **Flow & Pressure Switches** can identify the amount of air used before and after any improvements. With them you will find the problem areas and solve the pressure / flow fluctuations.
- **Do not abuse air.** When you are not using air tools, switch them off.
- **Introduce a leak prevention programme –** by regularly reviewing your system for leaks, compressed air wastage can be kept to an absolute minimum.
- **Use a well designed pneumatic system -** by accurately estimating your needs when initially designing your system, the selection of energy efficient products can be made ensuring minimal pressure falls and compressed air wastage.

## ENERGY SAVING PROGRAME V.3

**We have developed one of the most advanced "user friendly" cd based Energy Saving Programmes available. Within minutes this software can help you specify the best products for your new pneumatic systems and additionally, it can also help you analyse your existing system. With simple simulation the most cost efficient improvements can be seen immediately.**

Used in conjunction with our V.2 Model Selection Software, it´s the most cost effective way when designing a pneumatic system!




## GREEN PROCUREMENT

SMC are firmly committed to producing products that are environmentally cleaner and continuously assess all the materials used. Gradually we are eliminating those materials which are known to be environmentally harmful (RoSH European Directive), such as mercury, lead, cadmium, hexavalent chromiun and PBB/PBDE flame retardants.

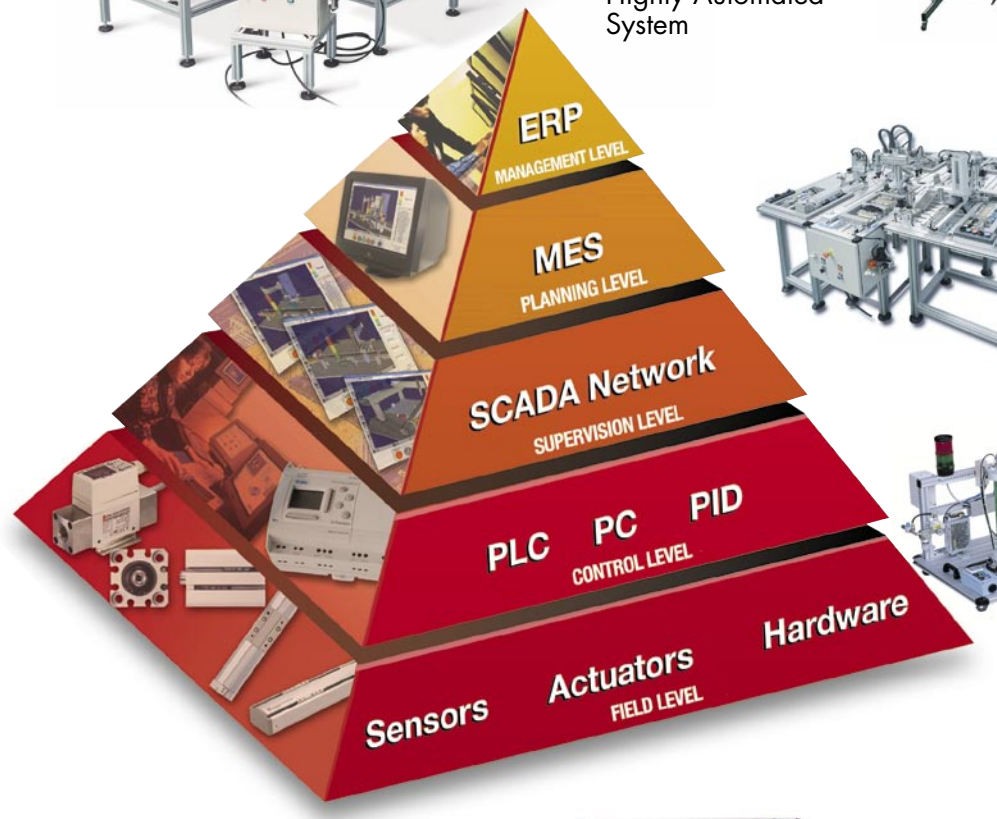
If you would like to receive more information on SMC´s Green Procurement Policy please contact your local SMC office and ask for an electronic copy (pdf) of our latest Green Product leaflet.

# International Training

Integral SOLUTIONS for the development of the professional skills requiered by Industry.

HAS-200
Highly Automated System

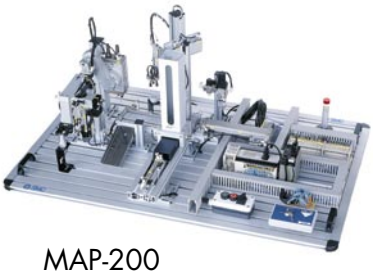
FMS-200
Flexible Manufacturing System






MAS-200
Modular Assembling System

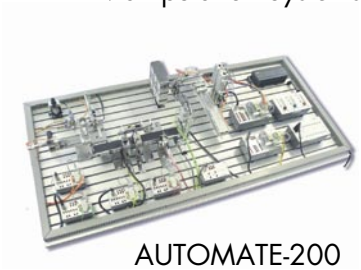
IPC-200
Industrial Process Control



MAP-200
Manipulation Systems

PNEUMATE-200
Your mate in Pneumatics!

PNEUTRAINER-200
Pneumatics/ Electro-pneumatics



AUTOMATE-200
Your mate in automation!

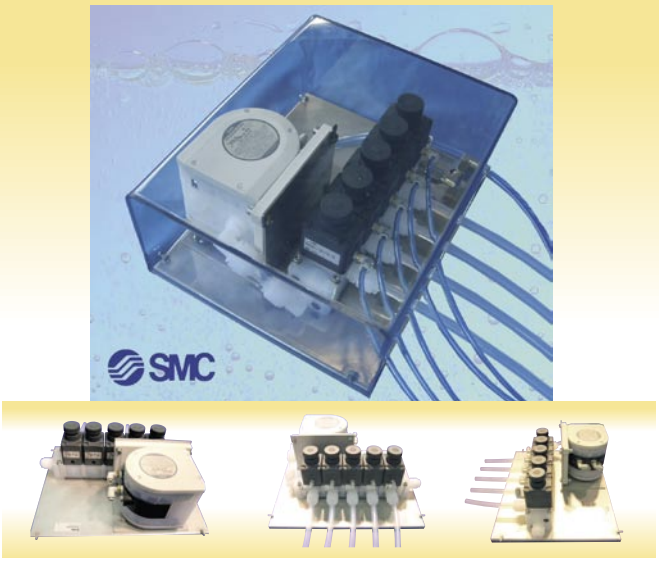
SMC International Training emerges from the heart of SMC as a clear commitment to offer Training adapted to the needs of industry; training focused on the development of the professional skills required for the most diverse sectors (Automotive, Pharmaceutical, Semiconductors, Food processing, etc.).

A knowledgeable team with wide experience in both the industrial and educational sectors, continously investigates the training demands of the industry in order to offer a customized SOLUTION to every customer.

www.smctraining.com

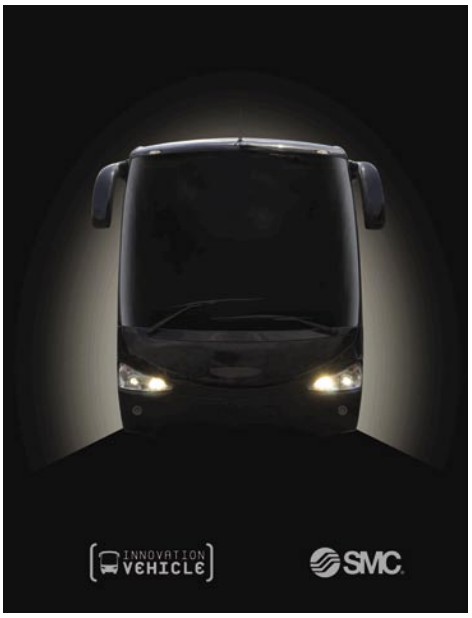
# Customised or Special Solutions

- With over 1.000 specialist development engineers based in our technical centres in Japan, USA and Europe we can respond quickly and efficiently to our customers needs.
- SMC products are not just confined to the limits of conventional pneumatics control components but include new peripheral markets as well.
- From small alterations to products in our standard range – "simple specials"- to full blown customised – "one off" – solutions, we have the ability, skills and people to meet even the most challenging of applications.
- We are therefore firmly committed to developing new products to satisfy our both our European and Global customers.




# Innovation Vehicle

- Recognising that innovation and the latest developments in component technology are the life blood to busy engineers who cannot always visit exhibitions, we are please to announce the launch of our own innovative solution.
- Now our customers need only leave their offices for a few minutes to see real life applications, using our latest new products, by visiting our impressive, custom made, Innovation Vehicle as it extensively tours throughout Europe.
- The vehicle which is 15 metres long and 4 metres high features 10 dynamic product display panels which combine our latest key European products.
- If you would like more information on the Innovation Vehicle´s circular European route, please contact your local subsidiary for further details.




# Demostration Cases and Minipanels

- If you would like to see some real examples of our specialist Food and Packaging components, all our European sales engineers have access to a comprehensive selection of demonstration cases and Japanese produced mini panels. These product demonstration tools can literally transform a small meeting room into a customised mini exhibition for you and your colleagues within a few minutes.
- If you interested in seeing more of our industry specific products, simply contact your local subsidiary to arrange your exclusive product presentation.

## EUROPEAN SUBSIDIARIES:


**Austria**
SMC Pneumatik GmbH (Austria).
Girakstrasse 8, A-2100 Korneuburg
Phone: +43 2262-62280, Fax: +43 2262-62285
E-mail: office@smc.at
http://www.smc.at

**Belgium**
SMC Pneumatics N.V./S.A.
Nijverheidsstraat 20, B-2160 Wommelgem
Phone: +32 (0)3-355-1464, Fax: +32 (0)3-355-1466
E-mail: post@smcpneumatics.be
http://www.smcpneumatics.be

**Bulgaria**
SMC Industrial Automation Bulgaria EOOD
16 kliment Ohridski Blvd., fl.13 BG-1756 Sofia
Phone:+359 2 9744492, Fax:+359 2 9744519
E-mail: office@smc.bg
http://www.smc.bg

**Croatia**
SMC Industrijska automatika d.o.o.
Crnomerec 12, 10000 ZAGREB
Phone: +385 1 377 66 74, Fax: +385 1 377 66 74
E-mail: office@smc.hr
http://www.smc.hr

**Czech Republic**
SMC Industrial Automation CZ s.r.o.
Hudcova 78a, CZ-61200 Brno
Phone: +420 5 414 24611, Fax: +420 5 412 18034
E-mail: office@smc.cz
http://www.smc.cz

**Denmark**
SMC Pneumatik A/S
Knudsminde 4B, DK-8300 Odder
Phone: +45 70252900, Fax: +45 70252901
E-mail: smc@smc-pneumatik.dk
http://www.smcdk.com

**Estonia**
SMC Pneumatics Estonia OÜ
Laki 12, 106 21 Tallinn
Phone: +372 6510370, Fax: +372 65110371
E-mail: smc@smcpneumatics.ee
http://www.smcpneumatics.ee

**Finland**
SMC Pneumatics Finland Oy
PL72, Tiistinniityntie 4, SF-02231 ESPOO
Phone: +358 207 513513, Fax: +358 207 513595
E-mail: smcfi@smc.fi
http://www.smc.fi

**France**
SMC Pneumatique, S.A.
1, Boulevard de Strasbourg, Parc Gustave Eiffel
Bussy Saint Georges F-77607 Marne La Vallee Cedex 3
Phone: +33 (0)1-6476 1000, Fax: +33 (0)1-6476 1010
E-mail: contact@smc-france.fr
http://www.smc-france.fr

**Germany**
SMC Pneumatik GmbH
Boschring 13-15, D-63329 Egelsbach
Phone: +49 (0)6103-4020, Fax: +49 (0)6103-402139
E-mail: info@smc-pneumatik.de
http://www.smc-pneumatik.de

**Greece**
SMC Hellas EPE
Anagenniseos 7-9 - P.C. 14342. N. Philadelphia, Athens
Phone: +30-210-2717265, Fax: +30-210-2717766
E-mail: sales@smchellas.gr
http://www.smchellas.gr

**Hungary**
SMC Hungary Ipari Automatizálási Kft.
Budafoki ut 107-113, H-1117 Budapest
Phone: +36 1 371 1343, Fax: +36 1 371 1344
E-mail: office@smc.hu
http://www.smc.hu

**Ireland**
SMC Pneumatics (Ireland) Ltd.
2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin
Phone: +353 (0)1-403 9000, Fax: +353 (0)1-464-0500
E-mail: sales@smcpneumatics.ie
http://www.smcpneumatics.ie

**Italy**
SMC Italia S.p.A
Via Garibaldi 62, I-20061Carugate, (Milano)
Phone: +39 (0)2-92711, Fax: +39 (0)2-9271365
E-mail: mailbox@smcitalia.it
http://www.smcitalia.it

**Latvia**
SMC Pneumatics Latvia SIA
Smerla 1-705, Riga LV-1006
Phone: +371 781-77-00, Fax: +371 781-77-01
E-mail: info@smclv.lv
http://www.smclv.lv

**Lithuania**
SMC Pneumatics Lietuva, UAB
Oslo g.1, LT-04123 Vilnius
Phone: +370 5 264 81 26, Fax: +370 5 264 81 26

**Netherlands**
SMC Pneumatics BV
De Ruyterkade 120, NL-1011 AB Amsterdam
Phone: +31 (0)20-5318888, Fax: +31 (0)20-5318880
E-mail: info@smcpneumatics.nl
http://www.smcpneumatics.nl

**Norway**
SMC Pneumatics Norway A/S
Vollsveien 13 C, Granfos Næringspark N-1366 Lysaker
Tel: +47 67 12 90 20, Fax: +47 67 12 90 21
E-mail: post@smc-norge.no
http://www.smc-norge.no

**Poland**
SMC Industrial Automation Polska Sp.z.o.o.
ul. Poloneza 89, PL-02-826 Warszawa,
Phone: +48 22 211 9600, Fax: +48 22 211 9617
E-mail: office@smc.pl
http://www.smc.pl

**Portugal**
SMC Sucursal Portugal, S.A.
Rua de Engº Ferreira Dias 452, 4100-246 Porto
Phone: +351 22-610-89-22, Fax: +351 22-610-89-36
E-mail: postpt@smc.smces.es
http://www.smces.es

**Romania**
SMC Romania srl
Str Frunzei 29, Sector 2, Bucharest
Phone: +40 213205111, Fax: +40 213261489
E-mail: smcromania@smcromania.ro
http://www.smcromania.ro

**Russia**
SMC Pneumatik LLC.
4B Sverdlovskaja nab, St. Petersburg 195009
Phone.:+7 812 718 5445, Fax:+7 812 718 5449
E-mail: info@smc-pneumatik.ru
http://www.smc-pneumatik.ru

**Slovakia**
SMC Priemyselná Automatizáciá, s.r.o.
Námestie Matina Benku 10, SK-81107 Bratislava
Phone: +421 2 444 56725, Fax: +421 2 444 56028
E-mail: office@smc.sk
http://www.smc.sk

**Slovenia**
SMC industrijska Avtomatika d.o.o.
Mirnska cesta 7, SLO-8210 Trebnje
Phone: +386 7 3885412 Fax: +386 7 3885435
E-mail: office@smc.si
http://www.smc.si

**Spain**
SMC España, S.A.
Zuazobidea 14, 01015 Vitoria
Phone: +34 945-184 100, Fax: +34 945-184 124
E-mail: post@smc.smces.es
http://www.smces.es

**Sweden**
SMC Pneumatics Sweden AB
Ekhagsvägen 29-31, S-141 71 Huddinge
Phone: +46 (0)8-603 12 00, Fax: +46 (0)8-603 12 90
E-mail: post@smcpneumatics.se
http://www.smc.nu

**Switzerland**
SMC Pneumatik AG
Dorfstrasse 7, CH-8484 Weisslingen
Phone: +41 (0)52-396-3131, Fax: +41 (0)52-396-3191
E-mail: info@smc.ch
http://www.smc.ch

**Turkey**
Entek Pnömatik San. ve Tic. A*.
Perpa Ticaret Merkezi B Blok Kat:11 No: 1625, TR-34386, Okmeydani, Istanbul
Phone: +90 (0)212-444-0762, Fax: +90 (0)212-221-1519
E-mail: smc@entek.com.tr
http://www.entek.com.tr

**UK**
SMC Pneumatics (UK) Ltd
Vincent Avenue, Crownhill, Milton Keynes, MK8 0AN
Phone: +44 (0)800 1382930 Fax: +44 (0)1908-555064
E-mail: sales@smcpneumatics.co.uk
http://www.smcpneumatics.co.uk


## OTHER SUBSIDIARIES WORLDWIDE:

ARGENTINA, AUSTRALIA, BOLIVIA, BRASIL, CANADA, CHILE, CHINA, HONG KONG, INDIA, INDONESIA, MALAYSIA, MEXICO, NEW ZEALAND, PHILIPPINES, SINGAPORE, SOUTH KOREA, TAIWAN, THAILAND, USA, VENEZUELA

**http://www.smc.eu**
**http://www.smcworld.com**


European Marketing Centre - Zuazobidea 14, 01015 Vitoria-Gasteiz, Spain - Phone: +34 945 184100 Fax: +34 945 945124



1st printing MO printing MO 30 Printed in Spain