Equipment for Machine Tools
SMC offers machine tool solutions to meet your automation and labor-saving needs.

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<td>Small Bore Hydraulic Cylinder/CHN</td>
<td></td>
<td></td>
<td></td>
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<td>Small Bore Hydraulic Cylinder/CHN</td>
<td>P.33</td>
</tr>
<tr>
<td>Compliant with JIS Standards: Hydraulic Cylinder/CH2E/CH2F/CH2G/CH2H</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Compliant with JIS Standards: Hydraulic Cylinder/CH2E/CH2F/CH2G/CH2H</td>
<td>P.32</td>
</tr>
<tr>
<td>Air-Hydro Booster</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Air-Hydro Booster Made to Order</td>
<td>P.33</td>
</tr>
<tr>
<td><strong>Hydraulic Equipment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Line Filter/FH34/44/54/64</td>
<td>P.24</td>
</tr>
<tr>
<td>Magnetic Separator/FHM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Magnetic Separator/FHM</td>
<td>P.24</td>
</tr>
</tbody>
</table>
Air Preparation Equipment
Air Cooled Aftercooler
HAA Series
- Applicable compressor: 7.5 to 37 kW
- Air flow capacity: 1000 to 5700 L/min (ANR)

Water Cooled Aftercooler
HAW Series
- Applicable compressor: 2.2 to 110 kW
- Air flow capacity: 300 to 18000 L/min (ANR)

Air Tank
AT Series
- Tank capacity: 100 to 3000 L
- Port size: 15A (1/2) to 4B flange

Main Line Filter
AFF Series
- Nominal filtration rating: 3 μm (Filtration efficiency: 99%)
- Rated flow: 300 to 45000 L/min (ANR)
- Port size: 6A (1/8) to 4B flange
- Modular connection (1/8 to 1)

Water Separator
AMG Series
- Water removal rate: 99%
- Rated flow: 300 to 12000 L/min (ANR)
- Port size: 6A to 50A (1/8 to 2)
- Modular connection (1/8 to 1)

Refrigerated Air Dryer
IDF100FS/125FS/150FS Series
- Power consumption: Reduced by up to 76%
- Exhaust heat: Reduced by up to 25%
- Applicable compressor: 100, 125, 150 kW
- Air flow capacity: 18.8 to 27.0 m³/min (ANR)
- Refrigerant: R134a (HFC), R407C (HFC)
  Zero ozone depletion potential

Refrigerated Air Dryer
IDF1E to 370D Series
- Applicable compressor: 0.75 to 370 kW
- Air flow capacity: 0.10 to 65.0 m³/min (ANR)
- Refrigerant: R134a (HFC), R407C (HFC)
  Zero ozone depletion potential

Refrigerated Air Dryer
IDU3E to 75E Series
- Applicable compressor: 2.2 to 75 kW
- Air flow capacity: 0.32 to 12.4 m³/min (ANR)
- Refrigerant: R134a (HFC), R407C (HFC)
  Zero ozone depletion potential
Air Preparation Equipment

Thermo-dryer with Air Temperature Adjustment Function

**IDH Series**
- Provides a stable supply of temperature and pressure controlled dry clean air. It is possible to supply compressed air with the same conditions and quality regardless of the season.
- Built-in filter
  - Filter nominal filtration rating: 0.01 μm (99.9% filtration efficiency)
  - Outlet oil mist concentration: Max. 0.01 mg/m³ (ANR)
  - Outlet cleanliness: Particles of 0.3 μm or more: 3.5 particles/L (ANR) or less
- Compatible with power supplies all over the world
  - Single-phase 100 VAC, 200 VAC, 230 VAC (50/60 Hz)

<Application Example>
Supplying compressed air with fixed conditions to air bearings mounted on a tool.

Mist Separator
**AM Series**
- Nominal filtration rating: 0.3 μm (Filtration efficiency: 99.9%)
- Rated flow: 300 to 12000 L/min (ANR)
- Port size: 6A (1/8 to 2)

Micro Mist Separator
**AMD Series**
- Nominal filtration rating: 0.01 μm (Filtration efficiency: 99.9%)
- Rated flow: 200 to 40000 L/min (ANR)
- Port size: 6A (1/8 to 2B flange)

Super Mist Separator
**AME Series**
- Nominal filtration rating: 0.01 μm (Filtration efficiency: 99.9%)
- Rated flow: 200 to 12000 L/min (ANR)
- Port size: 6A to 50A (1/8 to 2)

Odor Removal Filter
**AMF Series**
- Nominal filtration rating: 0.01 μm (Filtration efficiency: 99.9%)
- Rated flow: 200 to 12000 L/min (ANR)
- Port size: 6A to 50A (1/8 to 2)
Air Pressure Supply Equipment
Modular F.R.L. Units
AC Series

- Better visibility & environmental resistance
- Easy element replacement
  Integrated element and bowl.
  Replacement can be done in hand.
- Reduced required maintenance space: Max. 46% reduction
- Pressure gauge is selectable according to application.
  Square embedded type pressure gauge, Round type pressure gauge, Digital pressure switch

Modular Adapter
E210/310/410 Series

Connects easily to current products!
Example) Air filter + 3 port valve

Flexible mounting
- Can be connected to current products such as 3 port valves and F.R.L. Units.
- Can be freely rotated, thus allowing a wide selection of mounting directions.
- Can be connected to current products of different sizes.
  Example: AF30 + ARG20

Reduced space/piping maintenance cost
- Can be connected/disconnected without rotation.
- Fittings, tube, etc. are not required for connection.

Regulator with Built-in Pressure Gauge
ARG Series

Visibility of pressure gauge is improved in various installation places.

Soft Start-up Valve
AV Series

- Start-up valve for low-speed air supply to gradually raise initial pressure in an air system and for quick exhaust by cutting off air supply

Mechanical Valves
Compliant with OSHA Standards: Pressure Relief
3 Port Valve with Locking Holes
VHS Series

- Compliant with OSHA standards (Occupational Safety and Health Administration, Department of Labor).
- Manually operated valve can be used to prevent accidents caused by residual pressure in pneumatic lines.
- It is possible to verify the supply and exhaust status of air flow at a glance.
- When in the exhaust position, the valve may be padlock secured.
  Prevents accidental start-ups while personnel are cleaning or servicing equipment.
- Push the handle and then turn.
  2-step action prevents malfunction.
Air Preparation Equipment

Membrane Air Dryer
IDG/IDG Series

- It is possible to easily supply dry air using the hollow fiber membrane.
- Non-fluorocarbon
- Power supply not required.
- Compatible with low dew points (–60°C)
- No vibration or heat discharge.
- With a dew point indicator

Water Separator
AMG Series

- Eliminates water droplets in the compressed air.
- Water removal rate: 99%
- Easy! Convenient! Eliminates water droplets just by connecting to air line!

<table>
<thead>
<tr>
<th>Series</th>
<th>AMG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air flow capacity [L/min (ANR)]</td>
<td>300 to 12000</td>
</tr>
<tr>
<td>Port size</td>
<td>1/8 to 2</td>
</tr>
</tbody>
</table>

Air Preparation Filters
AFF/AM Series

Main Line Filter AFF Series

- Nominal filtration rating [μm]: 3 (Filtration efficiency: 99%)
- Rated flow [L/min (ANR)]: 300 to 45000
- Port size: 1/8 to 4" flange

Micro Mist Separator AMD Series

- Nominal filtration rating [μm]: 0.01 (Filtration efficiency: 99.9%)
- Rated flow [L/min (ANR)]: 200 to 40000
- Port size: 1/8 to 6" flange

Super Mist Separator AME Series

- Nominal filtration rating [μm]: 0.01 (Filtration efficiency: 99.9%)
- Rated flow [L/min (ANR)]: 200 to 12000
- Port size: 1/8 to 2

ISO Quality Class
Select equipment according to the compressed air quality class in ISO 8573-1:2010 (JIS B 8392-1:2012). For details, refer to the Air Preparation Equipment Selection Guide in the Web Catalog of our website.

<Example of System>
Air of the quality class required by the application can be acquired.

- When using the IDG/L52408A, a refrigerated air dryer should be installed on the primary side.
- This is an example. Please contact SMC for details.
Pneumatic Solenoid Valves

5 Port Solenoid Valve
SY Series

- Power consumption: 0.1 W (With power saving circuit)/0.35 W (Standard)
- Service life: 200 million cycles (Metal seal)/70 million cycles (Rubber seal)

<table>
<thead>
<tr>
<th>Series</th>
<th>Flow rate characteristics</th>
<th>Applicable cylinder size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SY3000</td>
<td>1.6 0.19 ø50</td>
<td></td>
</tr>
<tr>
<td>SY5000</td>
<td>3.6 0.17 ø63</td>
<td></td>
</tr>
<tr>
<td>SY7000</td>
<td>5.9 0.20 ø80</td>
<td></td>
</tr>
</tbody>
</table>

*1 Use as a guide for selection. Please check the actual conditions with SMC Model Selection Software.

5 Port Solenoid Valve
SY Series

- Power consumption: 0.1 W (With power saving circuit)/0.35 W (Standard)
- Combined mounting of 3 port valve and 5 port valve is possible.
- A wide variety of manifold options, such as aluminum body manifold, DIN rail, and stacking type manifold, are available.
- UL Standards compliant product is available. (30-SY)

<table>
<thead>
<tr>
<th>Series</th>
<th>Flow rate characteristics</th>
<th>Applicable cylinder size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SY3000</td>
<td>1.1 0.30 ø40</td>
<td></td>
</tr>
<tr>
<td>SY5000</td>
<td>2.8 0.29 ø63</td>
<td></td>
</tr>
<tr>
<td>SY7000</td>
<td>4.5 0.27 ø80</td>
<td></td>
</tr>
<tr>
<td>SY9000</td>
<td>10 0.29 ø100</td>
<td></td>
</tr>
</tbody>
</table>

*1 Use as a guide for selection. Please check the actual conditions with SMC Model Selection Software.

Compliant with ISO13849-1 Categories: 3 Port Solenoid Valve/Residual Pressure Release Valve with Detection of Main Valve Position
VP/VG Series

With Detection of Main Valve Position

The detecting function of the main valve position detects inconsistencies between the input signal and valve operation.

<table>
<thead>
<tr>
<th>Residual pressure release valve</th>
<th>Safety limit switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP542-X536</td>
<td></td>
</tr>
</tbody>
</table>

Redundant system can be constructed easily.

When the dual residual pressure release valve is used, if one of the valves fails to operate, the other one releases residual pressure.

Dual Residual Pressure Release Valve
VP544-X555

A function to gradually increase the initial pressure of the pneumatic system has been added to the dual residual pressure release valve.

Dual Residual Pressure Release Valve
VG342-X87

Can be connected to modular type F.H.L. units.

Products do not come assembled. They should be ordered separately and assembled by the customer.
Modular Connection Type Residual Pressure Relief 3 Port Solenoid Valve
VP500/700 Series

- Allows for space saving and reduced piping labor.
- Power consumption: 0.35 W (Without light)
- Can be connected to F.R.L. units.

<table>
<thead>
<tr>
<th>Series</th>
<th>Applicable combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP500</td>
<td>AC25-A, AC30-A, AC40-A</td>
</tr>
<tr>
<td>VP700</td>
<td></td>
</tr>
</tbody>
</table>

AC30C-A + VP500

Residual pressure relief 3 port solenoid valve (VP500)

Regulator** (AR30-A)

Air filter** (AF30-A)

Mist separator** (AFM30-A)

Air combination (AC30C-A)

Products do not come assembled. They should be ordered separately and assembled by the customer.

2-Color Display High-Precision Digital Pressure Switch
ISE40A Series

- Enclosure: IP65
- Can copy up to 10 switches simultaneously.
- 3-step setting
- With One-touch fitting

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISE40A</td>
<td>Positive</td>
<td>-0.100 to 1.000 MPa</td>
</tr>
</tbody>
</table>

Fittings

S Couplers
KK130 Series

- Pressure loss reduction leads to energy saving.
- Cv factor: Increased by 34%*1
- Plug insertion force: Reduced by 22% (20 N)*1
- Lightweight: Reduced by 14% (12 g)*1
  *1 Compared to the current KK13 series.

Pressure Switches

3-Screen Display High-Precision Digital Pressure Switch
ISE20 Series

- Visualization of setting items
- Simple 3-step setting
- Easy screen switching:
  Setting is possible while checking the measured value.
- Delay time: Fastest 1.5 ms or less
- Current consumption: 25 mA or less
- Enclosure: IP40

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISE20</td>
<td>Positive</td>
<td>-0.100 to 1.000 MPa</td>
</tr>
</tbody>
</table>
Sensing Equipment
Pressure Switches

3-Screen Display High-Precision Digital Pressure Switch
ZSE20(F)/ISE20 Series

- Visualization of setting items
- Simple 3-step setting
- Easy screen switching: Setting is possible while checking the measured value.
- Delay time: Fastest 1.5 ms or less
- Current consumption: 25 mA or less
- Enclosure: IP60

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE20F</td>
<td>Compound pressure</td>
<td>~100.0 to 100.0 kPa</td>
</tr>
<tr>
<td>ZSE20</td>
<td>Vacuum pressure</td>
<td>0.0 to ~101.0 kPa</td>
</tr>
<tr>
<td>ISE20</td>
<td>Positive pressure</td>
<td>~0.100 to 1.000 MPa</td>
</tr>
</tbody>
</table>

2-Screen Display High-Precision Digital Pressure Switch
ZSE40A(F)/ISE40A Series

- Enclosure: IP65
- Can copy up to 10 switches simultaneously.
- 3-step setting
- With One-touch fitting

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE40AF</td>
<td>Compound pressure</td>
<td>~100.0 to 100.0 kPa</td>
</tr>
<tr>
<td>ZSE40A</td>
<td>Vacuum pressure</td>
<td>0.0 to ~101.3 kPa</td>
</tr>
<tr>
<td>ISE40A</td>
<td>Positive pressure</td>
<td>~0.100 to 1.000 MPa</td>
</tr>
</tbody>
</table>

2-Color Display Digital Pressure Switch
ISE70/75(H) Series

- Metal body type (Die-cast aluminum)
- Enclosure: IP67
- With M12 connector

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISE70</td>
<td>Positive pressure (for air)</td>
<td>0 to 1 MPa</td>
</tr>
<tr>
<td>ISE75</td>
<td>Positive pressure (for general fluids)</td>
<td>0 to 10 MPa</td>
</tr>
<tr>
<td>ISE75H</td>
<td>Positive pressure (for general fluids)</td>
<td>0 to 15 MPa</td>
</tr>
</tbody>
</table>

2-Color Display Digital Pressure Switch
ZSE80(F)/ISE80(H) Series

- The stainless diaphragm makes it suitable for a wide variety of fluids.
- VCR® and Swagelok® fittings are available.
- Enclosure: IP65

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE80F</td>
<td>Compound pressure</td>
<td>~100.0 to 100.0 kPa</td>
</tr>
<tr>
<td>ZSE80</td>
<td>Vacuum pressure</td>
<td>0.0 to ~101.0 kPa</td>
</tr>
<tr>
<td>ISE80</td>
<td>Positive pressure</td>
<td>~0.100 to 1.000 MPa</td>
</tr>
<tr>
<td>ISE80H</td>
<td>Positive pressure</td>
<td>~0.100 to 2.000 MPa</td>
</tr>
</tbody>
</table>

Installation Example
### Pressure Switches

**3-Color Display Digital Gap Checker**

**ISA3 Series**
- Check at a glance if a workpiece is placed or not.
- The clearance distance between the detection surface and the workpiece can be found intuitively.
- Simple setting: Change the settings while checking the displayed value.
- Energy saving: Air consumption reduced by 60%
- Improved drainage resistance: 10 times or more
- Enclosure: IP67 equivalent

**Application Examples**

- Confirmation of close contact with the reference plane
- Confirmation of close contact with the workpiece

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated distance range</th>
<th>Supply side piping specifications</th>
<th>Detection side piping specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISA3-F</td>
<td>0.01 to 0.03 mm</td>
<td>Rc, G 1/8</td>
<td>ø4, ø6 One-touch fitting, G 1/8</td>
</tr>
<tr>
<td>ISA3-G</td>
<td>0.02 to 0.15 mm</td>
<td>Rc, G 1/8</td>
<td>ø4, ø6 One-touch fitting, G 1/8</td>
</tr>
<tr>
<td>ISA3-H</td>
<td>0.05 to 0.30 mm</td>
<td>Rc, G 1/8</td>
<td>ø4, ø6 One-touch fitting, G 1/8</td>
</tr>
</tbody>
</table>

**Compact Pneumatic Pressure Sensor**

**PSE54 Series**
- Analog output (voltage)
- Enclosure: IP40

**Series**

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE541</td>
<td>Vacuum pressure</td>
<td>0 to –101 kPa</td>
</tr>
<tr>
<td>PSE543</td>
<td>Compound pressure</td>
<td>–100 to 100 kPa</td>
</tr>
<tr>
<td>PSE540</td>
<td>Positive pressure</td>
<td>0 to 1 MPa</td>
</tr>
</tbody>
</table>

**Low Differential Pressure Sensor**

**PSE550 Series**
- Suitable for applications such as air current volume maintenance, filter blockage, and liquid surface detection.
- Analog output (voltage/current)
- Enclosure: IP40

**Application Example**

Monitoring filter clogging

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE550</td>
<td>Vacuum pressure</td>
<td>0 to 2 kPa</td>
</tr>
</tbody>
</table>

**Pressure Sensor for General Fluids**

**PSE57 Series**
- Materials of parts in contact with fluid
- Enclosure: IP65

**Application Example**

Liquid coolant pressure control

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE570</td>
<td>Positive pressure</td>
<td>0 to 1 MPa</td>
</tr>
<tr>
<td>PSE573</td>
<td>Compound pressure</td>
<td>0 to 100 kPa</td>
</tr>
<tr>
<td>PSE574</td>
<td>Positive pressure</td>
<td>0 to 500 kPa</td>
</tr>
<tr>
<td>PSE575</td>
<td>Positive pressure</td>
<td>0 to 2 MPa</td>
</tr>
<tr>
<td>PSE576</td>
<td>Positive pressure</td>
<td>0 to 5 MPa</td>
</tr>
<tr>
<td>PSE577</td>
<td>Positive pressure</td>
<td>0 to 10 MPa</td>
</tr>
</tbody>
</table>
Multi-Channel Digital Pressure Sensor Controller

**PSE200 Series**

- 4 inputs, 5 outputs
- Applicable sensor: PSE53/L52408, 54/L52408, 56/L52408, 570/573
- Enclosure: IP65 (Front face), IP40 (Others)

<table>
<thead>
<tr>
<th>Series</th>
<th>Set pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE200</td>
<td>−101 to 101 kPa</td>
</tr>
<tr>
<td></td>
<td>10 to −101 kPa</td>
</tr>
<tr>
<td></td>
<td>−10 to 101 kPa</td>
</tr>
<tr>
<td></td>
<td>−0.1 to 1 MPa</td>
</tr>
</tbody>
</table>

2-Color Display Digital Pressure Sensor Controller

**PSE300 Series**

- 1 input, 2 outputs
- Applicable sensor: PSE53/L52408, 54/L52408, 55/L52408, 56/L52408, 570/573/574
- Enclosure: IP40

<table>
<thead>
<tr>
<th>Series</th>
<th>Set pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE300</td>
<td>−101 to 101 kPa</td>
</tr>
<tr>
<td></td>
<td>10 to −101 kPa</td>
</tr>
<tr>
<td></td>
<td>−10 to 100 kPa</td>
</tr>
<tr>
<td></td>
<td>−0.1 to 1 MPa</td>
</tr>
<tr>
<td></td>
<td>−50 to 500 kPa</td>
</tr>
<tr>
<td></td>
<td>−0.2 to 2 kPa</td>
</tr>
</tbody>
</table>

Pneumatic Pressure Switch

**IS3000 Series**

- Micro switch type
- Can be used for micro loads around 10 mA.
- With neon light

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Set pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS3000</td>
<td>Positive pressure</td>
<td>0.1 to 0.7 MPa</td>
</tr>
</tbody>
</table>

General Purpose Pressure Switch: Snap Switch Type

**ISG Series**

- For general fluids
- Equivalent to IP44 (Drip proof)
- With neon light

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Set pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISG11</td>
<td>21/L52408</td>
<td>Positive pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.02 to 0.3 MPa</td>
</tr>
<tr>
<td>ISG12</td>
<td>22/L52408</td>
<td>Positive pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.05 to 0.7 MPa</td>
</tr>
<tr>
<td>ISG13</td>
<td>23/L52408</td>
<td>Positive pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1 to 1.0 MPa</td>
</tr>
<tr>
<td>ISG19</td>
<td>29/L52408</td>
<td>Vacuum pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>−10 to −100 kPa</td>
</tr>
</tbody>
</table>

Flow Switches

2-Color Display

**Digital Flow Switch PFMB Series**

- Dry air, N2
- Grease-free
- Integrated flow adjustment valve
- Compact, Space saving
- Enclosure: IP40

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PFMB</td>
</tr>
<tr>
<td></td>
<td>2 to 200</td>
</tr>
<tr>
<td></td>
<td>5 to 500</td>
</tr>
<tr>
<td></td>
<td>10 to 1000</td>
</tr>
<tr>
<td></td>
<td>20 to 2000</td>
</tr>
</tbody>
</table>
Flow Switches

3-Color Display Digital Flow Switch
PF3W Series

- Flow sensor with 3-color/2-screen display
- Integrated temperature sensor
- 40% smaller (compared with PF2W)
- Grease-free
- Fluid temperature: 0 to 90°C
- PVC piping type: Applicable to deionized water and chemical liquids
- Enclosure: IP65

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF3W</td>
<td>0.5 to 4</td>
</tr>
<tr>
<td></td>
<td>2 to 16</td>
</tr>
<tr>
<td></td>
<td>5 to 40</td>
</tr>
<tr>
<td></td>
<td>10 to 100</td>
</tr>
<tr>
<td></td>
<td>50 to 250</td>
</tr>
</tbody>
</table>

Digital Flow Switch for Air
PF2A Series

- Integrated type and separate monitor type are available.
- Switch output, accumulated pulse output, analog output
- Capable of switching back and forth between cumulative and instantaneous flow
- Port size: 6A to 50A (1/8 to 2)
- Enclosure: IP65

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF2A</td>
<td>1 to 10</td>
</tr>
<tr>
<td></td>
<td>5 to 50</td>
</tr>
<tr>
<td></td>
<td>10 to 100</td>
</tr>
<tr>
<td></td>
<td>20 to 200</td>
</tr>
<tr>
<td></td>
<td>50 to 500</td>
</tr>
<tr>
<td></td>
<td>150 to 3000</td>
</tr>
<tr>
<td></td>
<td>300 to 6000</td>
</tr>
<tr>
<td></td>
<td>600 to 12000</td>
</tr>
</tbody>
</table>

Application Example

Flow control for water-soluble coolant

3-Color Display Electromagnetic Type Digital Flow Switch
LFE Series

- Pressure loss: 0.02 MPa or less
- Reverse flow can be detected.
- Operating fluid temperature: 0 to 85°C
- Applicable fluid: Water, Water-soluble coolant
- Enclosure: IP65

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFE</td>
<td>0.5 to 20</td>
</tr>
<tr>
<td></td>
<td>2.5 to 100</td>
</tr>
<tr>
<td></td>
<td>5 to 200</td>
</tr>
</tbody>
</table>

Installation Example
**Stroke Reading Cylinders**

**High Precision Stroke Reading Cylinder**

**CEP1 Series**
- Can be used in an environment where the product is exposed to fluids (water, oil, coolant, etc.).
- Resolution: 0.01 mm (Accuracy ±0.02 mm)
- Standardly comes with special scraper.

**Stroke Reading Cylinder**

**CE1 Series**
- Can be used in an environment where the product is exposed to fluids (water, oil, coolant, etc.). (Special order∗2)
- Resolution: 0.1 mm (Accuracy ±0.2 mm)

∗2 The CE1 series does not standardly come with a scraper. Please contact SMC to special order a cylinder with a scraper. (Exceptions: ø12, ø20)

**Multi-counter**

**CEU5 Series**
- Counter for connecting the CE1 series or CEP1 series

---

**Application Examples**

**Parts inspection**
Measures the dimensions of parts, discriminates between good and defective articles, prevents the mixing of different parts, etc.

**Length/width discrimination**
Distinguishes between lengthwise or crosswise while correcting the position of a workpiece.

**Inspection of machined holes**
Can detect machined hole depth, burrs, foreign matter, etc.

**Measurement of dimensions**
Can measure dimensions of parts.

**Measurement of machining dimensions**
Performs adjustment of machining depth, etc. by measuring the part dimensions before machining.
Coolant Equipment
## 2/3 Port Valves for Fluid Control

### Coolant Valve
*SGC Series*
- Low power consumption: 0.35 W (for 24 VDC/Y type)
- Max. operating pressure: 0.5 MPa, 1 MPa, 1.6 MPa
- Service life: 5 million cycles or more
  (Based on SMC’s test conditions)

![Coolant Valve Image](image1)

### High Pressure Coolant Valve
*SGH Series*
- Max. operating pressure: 3 MPa, 7 MPa
- Compatible with high-speed grinding and long drilling processes
- Coolant valve for high-pressure coolant liquid that is ideal for lubrication, dust blowing, and cooling
- Low power consumption: 0.35 W (for 24 VDC)
- Service life: 3 million cycles or more
  (Based on SMC’s test conditions)

## 4 Port Coolant Valve  Made to Order
- Can be used as a pressure relief valve when through coolant is used.
- Prevents malfunctions caused by residual pressure and improves cycle time.

![Coolant Valve Image](image2)

### Installation Example

### Application Example

### Water Resistant Cylinder
- Compatible with an operating environment using coolants
- Anti-coolant performance has been improved compared to the standard cylinders.
- With water resistant 2-color indicator auto switch

![Cylinders Image](image3)
**Industrial Filters**

**Bag Filter**  
**FGF Series**  
- Ideal for high flow filtration. (Max. 2000 L/min)  
- Port size: Rc2,100 (4") JIS10°FF, 150 (6") JIS10°FF

**Industrial Filter/Vessel Series**  
**FGD Series**  
- Ideal for low flow filtration. (Max. 60 L/min)  
- Port size: Rc3/8, 1/2, 3/4

**Filter for Cleaning Fluid/Quick Change Filter**  
**FQ1 Series**  
- No tools required, easy element replacement  
- Ideal for low flow filtration. (Max. 30 L/min)  
- Port size: Rc1/2, 3/4, 1

**Pressure Switches**

**2-Color Display Digital Pressure Switch For General Fluids**  
**ISE75/75H Series**  
- Rated pressure: 10 MPa/15 MPa  
- Metal body type (Die-cast aluminum)  
- Enclosure: IP67  
- With M12 connector

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISE75</td>
<td>Positive pressure</td>
<td>0 to 10 MPa</td>
</tr>
<tr>
<td>ISE75H</td>
<td>Positive pressure</td>
<td>0 to 15 MPa</td>
</tr>
</tbody>
</table>

**2-Color Display Digital Pressure Switch**  
**ISE80H Series**  
- The stainless diaphragm makes it suitable for a wide variety of fluids.  
- Enclosure: IP65  
- Withstand pressure: 4 MPa  
- VCR® and Swagelok® fittings are available.  
- Applicable fluid: Water, Argon, Hydraulic fluid (JIS-K2213), Carbon dioxide, Silicone oil (JIS-K2213), Air-containing drainage, Lubricant (JIS-K6301), Nitrogen, Fluorocarbon

**Application Examples**  
- Confirmation of supply pressure of cleaning lines  
- Confirmation of working pressure of hydraulic cylinder

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISE80H</td>
<td>Positive</td>
<td>−0.100 to 2.000 MPa</td>
</tr>
</tbody>
</table>

* VCR® and Swagelok® are registered trademarks of Swagelok Company.
Pressure Sensor for General Fluids

**PSE57 Series**
- Materials of parts in contact with fluid:
  - Piping port: C3604 + Nickel plating
  - Pressure sensor: Al2O3 (Alumina 96%)
- Enclosure: IP65

### Application Example
Liquid coolant pressure control

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
<th>Proof pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE570</td>
<td>Positive pressure</td>
<td>0 to 1 MPa</td>
<td>3.0 MPa</td>
</tr>
<tr>
<td>PSE573</td>
<td>Compound pressure</td>
<td>−100 to 100 kPa</td>
<td>600 kPa</td>
</tr>
<tr>
<td>PSE574</td>
<td>Positive pressure</td>
<td>0 to 500 kPa</td>
<td>1.5 MPa</td>
</tr>
<tr>
<td>PSE575</td>
<td>Positive pressure</td>
<td>0 to 2 MPa</td>
<td>5.0 MPa</td>
</tr>
<tr>
<td>PSE576</td>
<td>Positive pressure</td>
<td>0 to 5 MPa</td>
<td>12.5 MPa</td>
</tr>
<tr>
<td>PSE577</td>
<td>Positive pressure</td>
<td>0 to 10 MPa</td>
<td>30 MPa</td>
</tr>
</tbody>
</table>

Multi-Channel Digital Pressure Sensor Controller

**PSE200 Series**
- Four sensors can be connected.
- Applicable sensor: PSE53/L52408, 54/L52408, 56/L52408, 570/573
- A single controller can monitor various applications.
- 4 inputs, 5 outputs
- Enclosure: IP65 (Front face), IP40 (Others)

<table>
<thead>
<tr>
<th>Series</th>
<th>Set pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE200</td>
<td>−101 to 101 kPa</td>
</tr>
<tr>
<td></td>
<td>10 to −101 kPa</td>
</tr>
<tr>
<td></td>
<td>−10 to 101 kPa</td>
</tr>
<tr>
<td></td>
<td>−0.1 to 1 MPa</td>
</tr>
</tbody>
</table>

2-Color Display Digital Pressure Sensor Controller

**PSE300 Series**
- Applicable sensor: PSE53/L54/L55/L56/L570/L573/L574
- Compatible with voltage input and current input
- Response time: 1 ms
- Space saving, capable of vertical and horizontal contact mounting
- Panel mounting, Bracket mounting, DIN rail mounting
- Enclosure: IP40

<table>
<thead>
<tr>
<th>Series</th>
<th>Set pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE300</td>
<td>−101 to 101 kPa</td>
</tr>
<tr>
<td></td>
<td>10 to −101 kPa</td>
</tr>
<tr>
<td></td>
<td>−10 to 100 kPa</td>
</tr>
<tr>
<td></td>
<td>−0.1 to 1 MPa</td>
</tr>
<tr>
<td></td>
<td>−50 to 500 kPa</td>
</tr>
<tr>
<td></td>
<td>−0.2 to 2 kPa</td>
</tr>
</tbody>
</table>

Flow Switches

**3-Color Display Electromagnetic Type Digital Flow Switch**

**LFE Series**
- Applicable fluid: Water, Water-soluble coolant
- Pressure loss: 0.02 MPa or less
- Reverse flow can be detected.
- Enclosure: IP65

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFE</td>
<td>0.5 to 20</td>
</tr>
<tr>
<td></td>
<td>2.5 to 100</td>
</tr>
<tr>
<td></td>
<td>5 to 200</td>
</tr>
</tbody>
</table>

Hydraulic Equipment

**Line Filter**

**FH34/44/54/64 Series**
- Operating pressure: 3.5, 7.0, 14.0, 21.0 MPa
- O-ring: Choice of NBR (Petroleum, Water-glycol, Emulsion) or FKM (Phosphoric ester)
- Paper element and micromesh element are selectable.
- Option: Differential pressure indicator, Differential pressure indication switch

**Magnetic Separator**

**FHM Series**
- Adsorbs and eliminates contaminants in the fluid by means of magnetism.
- There are no consumable parts and the running cost is basically zero.
- Fluid: Petroleum, Water-glycol, Cutting oil, Emulsion, Phosphoric ester
Air Cylinders

Water Resistant Cylinder

Compatible with an operating environment using coolants
- Anti-coolant performance has been improved compared to the standard cylinders.
- With water resistant 2-color indicator auto switch

<Applicable Cylinders>

<table>
<thead>
<tr>
<th>Air Cylinders</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CM2 Series ø20 to ø40 / CG1 Series ø32 to ø100 / Air Cylinder MB Series ø32 to ø100 / Square Tube Type Air Cylinder MB1 Series ø32 to ø100 / Compact Cylinder CQ2 Series ø20 to ø100 / CA2 Series ø40 to ø100 / Compact Guide Cylinder MGP Series ø20 to ø100 / Guide Cylinder MGG Series ø32 to ø100</td>
<td></td>
</tr>
</tbody>
</table>

Compact Guide Cylinder

MGP Series

- Weight reduced by up to 24% with a shorter guide rod and thinner plate.
- Space required between the bottom of the cylinder body and your equipment is reduced by max. 22 mm because of shortened guide rod.
- Round type and magnetic field resistant auto switches can be mounted directly without spacer.

Cylinder with Lock

CNA2 Series

- Locking cylinders are ideal for intermediate stops, emergency stops, and drop prevention. (Bi-directional lock)
- Bore size: 40, 50, 63, 80, 100

CNS Series

- Bore size: 125, 140, 160

CLS Series

- Bore size: 125, 140, 160, 180, 200, 250

Compact Cylinder with Lock

CLQ Series

- Bore size: 20, 25, 32, 40, 50, 63, 80, 100

Compact Guide Cylinder with Lock

MLGP Series

- Bore size: 20, 25, 32, 40, 50, 63, 80, 100

Hydraulic Cylinders

Compact Hydraulic Cylinder Compliant with JIS Standards (10 MPa)

CHKDB Series ø20 to ø100 / Hydraulic Cylinder Compliant with JIS Standards (7 MPa)

CH2F Series ø32 to ø100

Compatible with an operating environment using coolants /L50766

Air Cylinders /L50766

Hydraulic Cylinders /L50766

<Applicable Cylinders>

Automatic Doors/Transfer Equipment
Air Cylinders

High Power Cylinder
RHC Series
- For high-speed opening/closing of ATC doors
- Has the capacity to absorb 10 to 20 times more energy than general purpose cylinders (CG1 series)
- Smooth cushioning for high-speed operation (3000 mm/s) with light loads and low/medium-speed operation with heavy loads
- XC93: With improved water resistance + stable lubrication function
  Equipped with an improved water resistant scraper (Fluororubber). The Lube-retainer creates a grease coating around the piston rod, which improves lubrication. Stainless steel can be selected for the piston rod and rod end nut.

Application Example
High-speed door opening/closing

Specialty Cylinders

High Power Cylinder
RHC Series
- For high-speed opening/closing of ATC doors
- Has the capacity to absorb 10 to 20 times more energy than general purpose cylinders (CG1 series)
- Smooth cushioning for high-speed operation (3000 mm/s) with light loads and low/medium-speed operation with heavy loads
- XC93: With improved water resistance + stable lubrication function
  Equipped with an improved water resistant scraper (Fluororubber). The Lube-retainer creates a grease coating around the piston rod, which improves lubrication. Stainless steel can be selected for the piston rod and rod end nut.

Rotary Clamp Cylinder
MK Series
- Allowable moment of inertia 3 times higher (ø20 to ø63)
  (The same as the former heavy-duty MK2 series)
- It is possible to mount small auto switches on 4 surfaces.

Compact Cylinder
JCQ Series
- Compact: Reduced overall length 6.5 mm, width 6 mm, height 4 mm
- Weight reduced by up to 45% (150 g → 82 g)
- Volume reduced by up to 40% (Compared with the CDQS series)

Rodless Cylinders

Mechanically Jointed Rodless Cylinder with Protective Cover
MY1□W Series
- Protective cover with improved water resistance and dust-proof construction. The side seal prevents water and dust from entering from the sides.
Air Grippers

Linear Guide Parallel Type Air Gripper
MHZgü2 Series
- Linear guide improves rigidity and accuracy.
- Dust-proof and drip-proof construction
- Dust cover material is selectable.

<table>
<thead>
<tr>
<th>Type</th>
<th>Series</th>
<th>Cylinder bore size [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact</td>
<td>MHZA2-6</td>
<td>6</td>
</tr>
<tr>
<td>Compact, with dust</td>
<td>MHZAJ2-6</td>
<td>6</td>
</tr>
<tr>
<td>Standard</td>
<td>MHZ2</td>
<td>6, 10, 16, 20, 25, 32, 40</td>
</tr>
<tr>
<td>Long stroke</td>
<td>MHZL2</td>
<td>10, 16, 20, 25</td>
</tr>
<tr>
<td>With dust cover</td>
<td>MHZJ2</td>
<td>6, 10, 16, 20, 25</td>
</tr>
</tbody>
</table>

Slide Guide Round Body Air Gripper: 2-Finger, 3-Finger, 4-Finger Type
MH Series
- Vertically compact, lightweight due to the wedge-shaped cam construction
- Repeatability: ±0.01 mm
- Long stroke type: Strokes two times longer than the standard type
- Reliable workpiece removal with through-holes and a center pusher

Air Gripper Reverse Unit: Made to Order
- For workpiece transfer with gantry loaders
- For loading/unloading workpieces from equipment

Electric Actuators

Electric Actuator: Slider Type
Ball Screw Drive
LEFS Series
- Step Motor (Servo/24 VDC), Servo Motor (24 VDC)
  - Max. work load: 65 kg
  - Positioning repeatability: ±0.02 mm
- AC Servo Motor
  - High-output motor (100/200/400 W)
  - Improved high-speed transfer ability
  - Max. speed: 1,500 mm/s
  - High acceleration/deceleration (20.000 mm/s²)
  - Positioning repeatability: ±0.01 mm

Electric Actuator: Slider Type
Belt Drive
LEFB Series
- Step Motor (Servo/24 VDC), Servo Motor (24 VDC)
  - Max. stroke: 2000 mm
  - Max. speed: 2000 mm/s
- AC Servo Motor
  - Max. stroke: 3000 mm
  - Max. speed: 2000 mm/s
  - Max. acceleration/deceleration: 20000 mm/s²

Electric Actuator: High Rigidity Slider Type, Ball Screw Drive
LEJS Series
- Low profile/Low center of gravity: Height dimension reduced by approx. 36% (Reduced by 32 mm)
- Max. work load: 85 kg
- Positioning repeatability: ±0.01 mm
- Max. acceleration/deceleration: 20000 mm/s²
### Electric Actuators

#### Electric Actuator: High Rigidity Slider Type, Belt Drive
**LEJB Series**
- Max. stroke: 3000 mm
- Max. speed: 3000 mm/s
- Max. acceleration/deceleration: 20000 mm/s²

#### Electric Actuator: Low Profile Slider Type
**LEM Series**
- Compact, Low profile
- Table height: 28 mm
  (For LEMC/H-HT, size 25)
- Can be connected to various types of guides.

#### Electric Actuator: Guide Rod Slider, Belt Drive
**LEL Series**
- Low profile/Flat: Height 48 mm
- Profile reduced by side mounting of motor.
  No interference with motor, even with large workpieces.
- Max. stroke: 1000 mm
- Transfer speed: 1000 mm/s

#### Electric Actuator: Rod Type
**LEY Series**
- Step Motor (Servo/24 VDC), Servo Motor (24 VDC)
  - Long stroke: Max. 500 mm
  - Direct mounting: 3 directions
  - Bracket mounting: 3 types
  - Auto switch mountable
  - Speed control/Positioning: Max. 64 points
- AC Servo Motor
  - High-output motor (100/200/400 W)
  - Improved high-speed transfer ability
  - High-acceleration compatible (5,000 mm/s²)

#### Electric Actuator: Guide Rod Type
**LEYG Series**
- Compact integrated guide rods, lateral load resistance, high non-rotating accuracy
- Lateral end load: 5 times more (Compared with rod type, size 25 and 100 mm stroke)
- Compatible with sliding bearing and ball bushing bearing
  Compatible with moment load and stopper (sliding bearing)
- AC Servo Motor
  - High-output motor (100/200 W)
  - Improved high-speed transfer ability
  - High-acceleration/deceleration compatible (5,000 mm/s²)

---

*1 Except the AC servo motor.
Electric Slide Table
**LES/LESH Series**

- Max. pushing force: 180 N
- Positioning repeatability: ±0.05 mm
- Cycle time can be reduced
  - Max. acceleration/deceleration: 5,000 mm/s²
  - Max. speed: 400 mm/s

**<Compact Type>**
- Compact. Workpiece mounting height reduced by up to 12% compared with the LESH
- Lightweight: Reduced by up to 29% (Compared with the LESH16D-100)

**<High Rigidity Type>**
- Deflection: 0.016 mm (LESH16-50 Load: 25 N)
- Integrated guide rail and table. Uses a recirculating linear guide for high rigidity and high precision.

**Electric Actuator: Miniature Type**
**LEP/L Series**

- Max. pushing force: 50 N
- Positioning repeatability: ±0.05 mm

**<Rod Type>**
- Compact and lightweight
  - W20.5 mm x H30 mm x L125.6 mm, Weight 240 g

**<Slide Table Type>**
- Compact and lightweight
  - W21 mm x H41 mm x L138.6 mm, Weight 290 g

---

Electric Rotary Table
**LER Series**

- Rotation angle: 360°, 320° (310°), 180°, 90°
  - The value indicated in brackets shows the value for the LER10.
- Low profile: Height dimension 42 mm (LER10)
- Space saving: Built-in step motor
- Shock-less/High-speed actuation
  - Max. speed: 420°/sec (7.33 rad/sec)
  - Max. acceleration/deceleration: 3000°/sec² (52.36 rad/sec²)

**Electric Gripper**
**LEH Series**

- With drop prevention function (Self-lock mechanism is provided for all series.)
- Power consumption is reduced by self-lock mechanism.
- With gripping check function
- Position, speed, and force can be set. (64 points)

**LEHZ Series**
Compact and lightweight
Various gripping forces

**LEHZJ Series**
With dust cover (Equivalent to IP50)
3 types of cover material (Finger portion only)

**LEHS Series**
Can hold round workpieces.

---

Automatic Doors/Transfer Equipment
Electric Actuators

Controller/Driver

Step Motor (Servo/24 VDC)

Step Data Input Type
- LECP6 Series
- LEC6 Series
- 64 points positioning
- Input using controller setting kit or teaching box

Programless Type
- LECP1 Series
- 14 points positioning
- Control panel setting (PC is not required.)

Pulse Input Type
- LECP2 Series
- End to end operation similar to an air cylinder
- 2 stroke end points + 12 intermediate points positioning

Programless Type (With Stroke Study)
- LECP1 Series
- 14 points positioning
- Control panel setting (PC is not required.)

Step Motor (Servo/24 VDC)

4 Axis Type
- EtherNet/IP™ Type
- JXC93 Series
- Parallel I/O Type
- JXC73/83 Series

Specialized for the LEM series

Fieldbus-compatible Network Controller/Gateway Unit

CC-Link Direct Input Type
-LECPMU Series

EtherNet/IP™ Direct Input Type
- JXC91 Series

DeviceNet™ Direct Input Type
- JXCD1 Series

PROFINET™ Direct Input Type
- JXCP1 Series

AC Servo Motor

Pulse Input Type
- LECSA Series
- LECSB Series
- Absolute encoder (LECSB)
- Absolute positioning function (LECSA)

CC-Link Direct Input Type
- LECSB Series

SSCNET III Type
- LECSS Series

MECHATROLINK II Type
- LECYII Series

MECHATROLINK III Type
- LECYIII Series

Trademark
EtherNet/IP™ is a trademark of ODVA. DeviceNet™ is a trademark of ODVA.

Motorless Type

LE Series

Your motor and driver can be used together!
- Manufacturers of compatible motors: 15 companies
- Mitsubishi Electric Corporation, YASKAWA Electric Corporation,
- SANYO DENKI CO., LTD., OMRON Corporation, Panasonic Corporation,
- FANUC CORPORATION, NIDEK SANKYO CORPORATION, KEYENCE CORPORATION,
- FUJI ELECTRIC CO., LTD., ORIENTAL MOTOR Co., Ltd., FASTECH Co., Ltd.,
- Rockwell Automation, Inc. (Allen-Bradley),
- Beckhoff Automation GmbH, Siemens AG,
- Delta Electronics, Inc.
**Vacuum Equipment**

**Vacuum Unit**  
ZK2 Series  
- Digital pressure switch for vacuum with energy saving function cuts supply air when the pressure reaches the desired vacuum. Air consumption: 90% reduction  
- Improved ejector efficiency: Suction flow increased by 50%  
- Air consumption reduced by 30%  
- (Compared to other SMC single stage ejectors)  
- Compact/Lightweight: Volume 88 cm³ (28% reduction)  
- Weight 81 g (59% reduction)  
- Nozzle size: ø0.7, ø1.0, ø1.2, ø1.5

**Body Ported Type Vacuum Ejector**  
ZH Series  
- Compact and lightweight  
  - Overall length: Max. 11% reduction (6.7 mm shorter)  
  - Port height: Max. 25% reduction (9.1 mm shorter)  
  - Weight: Max. 74% reduction (65.1 g lighter)  
- 4 mounting types: Direct mounting, Standard bracket mounting, L-bracket mounting, DIN rail mounting

**Vacuum Pad**  
ZP3 Series  
- Compact, Space saving  
- Overall shortened length  
- One-touch fitting and barb fitting for ø2 are available  
- Pad diameter: ø1.5 to ø16

**Vacuum Pad**  
ZP3E Series  
- Stability of suction position, improved ease of removal  
- Dents and bumps on the adsorption surface expand the area which is in contact with the workpiece. Ribs reduce the inclinations during transport of workpiece  
- Reduced number of mounting screws (4 pcs. → 1 pc.)  
- Pad and metal parts can be disposed of separately  
- Pad diameter: ø32 to ø125

**Compact, Short, Nozzle Pad**  
ZP2 Series  
- Compact, Space saving  
- Pad diameter: ø0.8 to ø15

**Hydraulic Cylinders**

**JIS Standard Hydraulic Cylinder**  
CH2/CHD2 Series  
- Uses the cushion seal type cushion mechanism, reduces impact at the stroke end, improves durability  
- Rod cover with block construction makes for easy disassembly and assembly
Hydraulic Cylinders

Small Bore Hydraulic Cylinder  
**CHN Series**
- Lightweight with a stainless steel tube and aluminum cover
- Uses the cushion seal system mechanism, reduces impact at the stroke end, improves durability
- Smaller cover section compared to tie-rod cylinders

Compact Hydraulic Cylinder  
**CHQ/CHDQ Series**
- Lightweight, compact aluminum body
- It is possible to mount auto switches.
- Same longitudinal dimensions for cylinders with/without auto switches

Air-Hydro Booster  
**Made to Order**
Converts air pressure to hydraulic pressure for high-pressure hydraulic cylinder actuation.
- Generates 3.5 to 14 MPa of hydraulic pressure with 0.5 MPa of air pressure.
- No hydraulic pump is required. High hydraulic pressure can easily be obtained.
- Hydraulic pressure can be steplessly controlled by only adjusting the air pressure using the regulator.
- No problems will occur due to temperature rise even under the condition of continuous pressurization.
- You can select from two types of pressurization methods (direct type and pre-load type) according to the application.
- No hydraulic unit is required.
Various Blow Equipment
2/3 Port Valves for Fluid Control

Direct Operated 2 Port Solenoid Valve

**VX2 Series**
- For air, medium vacuum, water, oil, steam (Can be used with heated water.)
- Flow rate: 20% more flow*1
- Height: 10% smaller*1
- Weight: 30% lighter*1
- Body material: Aluminum, Resin, C37, Stainless steel
- With One-touch fittings (resin body) type is available.
- Port size: 1/8 to 1/2, ø6 to ø12
  - *1 Compared with SMC current model

Pilot Operated 2 Port Solenoid Valve for Dry Air

**VQ20/30 Series**
- High-frequency operation possible: High-speed response 7 ms or less (VQ20), 20 ms or less (VQ30)
- Easy piping with One-touch fittings
- Dust-tight, water-jet-proof enclosure (IP65) compatible with DIN terminal type.
- Application: Air-blow, Blow-off of workpiece, etc.

Pilot Operated 2 Port Solenoid Valve

**VXD Series**
- For air, water, heated water, oil, high-temperature oil
- Body material: Aluminum, Resin, C37, Stainless steel, CAC408
- With One-touch fittings (resin body) type is available.
- Enclosure: IP65
  - *1 Electrical entry flat terminal type terminal is IP40.

Zero Differential Pressure Type
Pilot Operated 2 Port Solenoid Valve

**VXZ Series**
- For air, water, heated water, oil, high-temperature oil
- Body material: Aluminum, Resin, C37, Stainless steel
- With One-touch fittings (resin body) type is available.
- Enclosure: IP65
  - Electrical entry flat terminal type terminal is IP40.

Blow Guns

**VMG Series**
- Reduction of 2000 m³ per annum is possible. (Energy saving)
- Pressure loss: 1% or less (Nozzle size: ø2.5)
- Available nozzle:
  - Male thread nozzle, High efficiency nozzle with male thread, Low noise nozzle with male thread, Copper extension nozzle

20% reduction in power consumption with the SMC “blow gun” + “S coupler” + “coil tube”
- Blow gun facilitates effective pressure use.
- Pressure loss of 1% or less (Nozzle size: ø2.5)

Energy-saving Circuit

- Impact pressure: 0.011 MPa (Distance: 100 mm)
- Blow time: 10 seconds (Frequency: 12 times/hour)
- Working hours: 10 hours/day (250 days/year)
- Total working hours: 8300 hours
- Compressor pressure: 0.5 MPa
- Air consumption: 257 L/min (ANR)

Current Circuit

- Impact pressure: 0.011 MPa (Distance: 100 mm)
- Blow time: 10 seconds (Frequency: 12 times/hour)
- Working hours: 10 hours/day (250 days/year)
- Total working hours: 8300 hours
- Compressor pressure: 0.6 MPa
- Air consumption: 287 L/min (ANR)

Power consumption by compressor

- 1.25 kW (155,655 J/year)
- 20% reduction
- 1.0 kW (124,520 J/year)

Corresponding value: Electricity unit 15 JPY/kWh

For details, refer to the energy saving program and the Web Catalog.
Nozzles for Blowing

KN Series

<table>
<thead>
<tr>
<th>Type</th>
<th>Nozzle size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle with male thread</td>
<td>ø1 to ø8</td>
</tr>
<tr>
<td>High efficiency nozzle</td>
<td>ø1 to ø2</td>
</tr>
<tr>
<td>Low noise nozzle with male thread</td>
<td>ø0.75 x 4 to ø1.1 x 8</td>
</tr>
<tr>
<td>Copper extension nozzle</td>
<td>ø1.5 to ø3</td>
</tr>
<tr>
<td>Pivoting nozzle</td>
<td>ø4, ø6</td>
</tr>
<tr>
<td>Nozzle with self-align fitting</td>
<td>ø1 to ø6</td>
</tr>
<tr>
<td>Nozzle for One-touch fitting</td>
<td>ø1 to ø3</td>
</tr>
</tbody>
</table>

Energy-saving model

---

Polyurethane Coil Tubing

TCU Series

- Flexible
- Max. operating pressure: 0.8 MPa (at 20°C)
- For moving applications

Flow Switches

2-Color Display Digital Flow Switch

PFMB Series

- Dry air, N₂
- Grease-free
- Integrated flow adjustment valve
- Compact, Space saving
- Enclosure: IP40

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFMB</td>
<td>2 to 200</td>
</tr>
<tr>
<td></td>
<td>5 to 500</td>
</tr>
<tr>
<td></td>
<td>10 to 1000</td>
</tr>
<tr>
<td></td>
<td>20 to 2000</td>
</tr>
</tbody>
</table>

3-Color Display Digital Flow Switch

PFMC Series

- Dry air, N₂
- 3-color/2-screen display
- Expanded flow range. Wide range of flow measurement is possible with one product.
- Compact, Space saving
- Enclosure: IP65

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated flow range [L/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFMC</td>
<td>5 to 500</td>
</tr>
<tr>
<td></td>
<td>10 to 1000</td>
</tr>
<tr>
<td></td>
<td>20 to 2000</td>
</tr>
</tbody>
</table>
Other Equipment (Special)
Air Grippers

Air Gripper Reverse Unit Made to Order

- For workpiece transfer with gantry loaders
- For loading/unloading workpieces from equipment

Pressure Control Equipment

Precision Regulator
IR1000-A/IR2000-A/IR3000-A Series

- Air consumption: Reduced by up to approx. 90% (Compared with the current model)
- High flow rate: Up to approx. twice (Compared with the current model)
- Lightweight: Reduced by up to approx. 27% (Compared with the current model)
- Sensitivity: 0.2% (Full span)
- Repeatability: ±0.5% (Full span)

Application Example

Accurate pressure setting
Sensitivity within 0.2% F.S. (Full Span)
Tension control*1

Balance and drive
Accurate balance pressure setting*1

Boosters Regulator
VBA Series

- Can increase factory air by a maximum of 200%. Power supply not required.
- It is possible to get a maximum of double pressure by connecting air with a factory line. (VBA11 A: maximum 4 times)

- Space-saving type that directly connects air tanks and booster regulators

Air Tank
VBAT Series

- Compact air tank that can be directly connected with a regulator
- Can be used as an independent tank.
- With a safety valve port (Option)

*1 The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.
Lubrication Equipment

Liquid Collector: Exhaust Pressure Type
AEP100 Series
- Collect and reuse the leaked lubricating oil or hydraulic fluid using exhaust pressure.
- Liquids are collected using only the exhausted air released from the switching valve. This leads to energy saving.
- Increase efficiency by eliminating the need to collect and wipe by hand.

Application Example

Liquid Collector: Ejector Type
HEP500 Series
- Collects the leakage of expensive cutting and grinding oil.
- No need to collect the leaked liquid by hand.
- As it is possible to use the equipped pump, special driving force is not required.

Application Example

Large Flow Lubricator
AL Series
- Individual lubrication
- Large flow type

<table>
<thead>
<tr>
<th>Series</th>
<th>Port size</th>
<th>Bowl capacity [cm³]</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL800/900</td>
<td>1 1/4, 1 1/2, 2</td>
<td>440, 1000</td>
</tr>
</tbody>
</table>

Mist Spray Unit
LMU Series
- Intermittent spray to cutting and press gear chains, etc.

Application Examples

Liquid Collector: Exhaust Pressure Type
AEP100 Series

Mist Spray Unit
LMU Series

Liquid Collector: Ejector Type
HEP500 Series

Application Example

<Related Products>
Mixing Valve/LMV Series
Magnet Holder/LMH Series
Branch Pipe/LMD Series
Impulse Lubricator
ALIP Series

• Supplies a set volume of oil just before the lubrication point. It is possible to lubricate a constant volume of oil to circuits that are difficult for oil to reach, or places with little air consumption.

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Port size</th>
<th>Feeding volume/cycle [cm³]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIP</td>
<td>Pressure type</td>
<td>1/8</td>
<td>0 to 0.04</td>
</tr>
<tr>
<td>ALT10</td>
<td>Oil tank</td>
<td>Air: 1/8</td>
<td>Tank capacity: 160 cm³</td>
</tr>
<tr>
<td>ALT20</td>
<td>Oil tank</td>
<td>Oil: 1/4</td>
<td>Tank capacity: 1000 cm³</td>
</tr>
</tbody>
</table>

Process Pump/Double Acting Pump
PA Series

<table>
<thead>
<tr>
<th>Series</th>
<th>Actuation</th>
<th>Discharge [L/min]</th>
<th>Wetted part material</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA3130</td>
<td>Automatically operated</td>
<td>1 to 20</td>
<td>ADC12 (Aluminum) SCS14 (Stainless steel)</td>
</tr>
<tr>
<td>PA313</td>
<td>Air operated</td>
<td>0.1 to 12</td>
<td>ADC12 (Aluminum) SCS14 (Stainless steel)</td>
</tr>
<tr>
<td>PA5130</td>
<td>Automatically operated</td>
<td>5 to 45</td>
<td>ADC12 (Aluminum) SCS14 (Stainless steel)</td>
</tr>
<tr>
<td>PA513</td>
<td>Air operated</td>
<td>1 to 24</td>
<td>ADC12 (Aluminum) SCS14 (Stainless steel)</td>
</tr>
</tbody>
</table>

Process Pump/Single Acting Pump
PB Series

<table>
<thead>
<tr>
<th>Series</th>
<th>Actuation</th>
<th>Discharge [mL/min]</th>
<th>Wetted part material</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB1011A</td>
<td>Built-in solenoid</td>
<td>8 to 2000</td>
<td>Polypropylene Stainless steel 316</td>
</tr>
<tr>
<td>PB1013A</td>
<td>Air operated</td>
<td>8 to 1000</td>
<td>Polypropylene Stainless steel 316</td>
</tr>
<tr>
<td>PB1313A</td>
<td>Air operated</td>
<td>8 to 1000</td>
<td>New PFA (Fluororesin)</td>
</tr>
</tbody>
</table>
S Couplers

**KK Series**
- Fluid: Air, Water
- Applicable tubing O.D.: ø3.2 to ø16
- Applicable hose I.D./O.D.: 5/8 to 11/16
- Port size: M5, R1/8 to 3/4, Rc1/8 to 1/2

**KK130 Series**
- C factor: Increased by 34% (Thread R1/4 type, compared to the current model\(^*)
- Plug insertion force: Reduced by 22% (20 N) (Compared to the current model\(^*) at 0.5 MPa)
- Lightweight: Reduced by 14% (12 g) (Compared to the current model\(^*)
- Fluid: Air
- Applicable tubing O.D.: ø6 to ø12, ø1/4” to ø1/2”
- Applicable hose I.D./O.D.: 5/8 to 11/16
- Hose nominal: 6 (1/4”) to 12 (1/2”)
- Port size: (R, Rc, NPT) 1/8 to 1/2
\(^*1\) Current model: KK13 series

S Couplers: Stainless steel 304

**KKA Series**
- Fluid: Air, Water
- Port size: (R, Rc)1/8 to 11/2

One-touch Fittings

**KQ2 Series**
- Fluid: Air, Water
- Applicable tubing O.D.: ø2 to ø16, ø1/8” to ø1/2”

Metal One-touch Fittings

**KQB2 Series**
- Fluid: Air, Water
- Applicable tubing O.D.: ø3.2 to ø16, ø1/8” to ø1/2”

Insert Fittings

**KF Series**
- Fluid: Air, Steam (Brass sleeve)
- Fluid: Air, Water (Resin sleeve)
- Applicable tubing O.D.: ø4 to ø12

Self-align Fittings

**H/D/L/LL Series**
- Fluid: Air
- Applicable tubing O.D.: ø4 to ø12

Stainless Steel 316 One-touch Fittings

**KQG2 Series**
- Fluid: Air, Water, Steam
- Applicable tubing O.D.: ø3.2 to ø16, ø1/8” to ø1/2”

Stainless Steel 316 Insert Fittings

**KFG2 Series**
- Fluid: Air, Water, Steam
- Applicable tubing O.D.: ø4 to ø16, ø1/8” to ø1/2”
Polyurethane Tubing
TU/TIUB Series

- Fluid: Air, Water
- Tubing O.D.: ø2 to ø16, ø1/8" to ø1/2"

Color Variations*: 29 colors

- Black
- White
- Red
- Blue
- Yellow
- Green
- Clear
- Orange
- Solid blue
- Clear blue
- Medium blue
- Brown
- Solid green
- Clear green
- Neon green
- Dark green
- Gray
- Light gray
- Neon pink
- Solid purple
- Clear purple
- Solid red
- Clear red
- Silver
- Solid yellow
- Clear yellow
- Neon yellow
- Clear orange
- Neon orange

*1 Please contact SMC for the TIUB.

Wear Resistant Tubing
TUZ

- Fluid: Air, Water
- Tubing O.D.: ø2 to ø16
- Abrasion: Approx. 1/3 (Compared with SMC polyurethane tubing TU series)

Color Variations

- Black
- White
- Red
- Blue
- Yellow
- Green

Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Soft Nylon Tubing
TRS Series

- Fluid: Air, Water
- Tubing O.D.: ø6 to ø12

Color Variations

- Black
- White
- Red
- Blue
- Green

Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Double Layer Tubing
TRB Series

- Fluid: Air, Water
- Tubing O.D.: ø6 to ø12

Color Variations

- Black
- White
- Red
- Blue
- Green

Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Double Layer Polyurethane Tubing
TRBU Series

- Fluid: Air, Water
- Tubing O.D.: ø6 to ø12

Color Variations

- Black
- White
- Red
- Blue
- Yellow
- Green

* Note that the tube colors are samples.
Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Three-layer Polyurethane Tubing
TRTU Series
- Fluid: Air, Water
- Tubing O.D.: ø4 to ø12

Outer layer: Flame resistant polyolefin
Middle layer: Aluminum laminated film
Inner tube: Polyurethane

Color Variations
Black White Red Blue Yellow Green

Fluoropolymer Tubing (Super PFA)
TL/TIL Series
- Applicable tubing O.D.
  Metric size: ø4, ø6, ø8, ø10, ø12, ø19
- Max. operating pressure: 1.0 MPa (at 20°C)\(^\ast\)
- Max. operating temperature: 260°C (This may vary according to operating pressure.)
  \(^\ast\) This may vary according to size.

\(\ast\) Note that the tube colors are samples.

Flow Control Equipment
Speed Controller with One-touch Fittings
Push-lock Type AS Series
- Easy to lock push-lock type
- Larger knob
- Improved tube insertion/removal
  Insertion force: Max. 30% (8 N) reduction
  Removal force: Max. 20% (5 N) reduction\(^\ast\)
  \(^\ast\) Tube pull-out strength is ensured to be equivalent to current model.

Elbow type/Universal type In-line type

Speed Controller with Indicator
AS-FS Series
- Applicable tubing O.D.: ø2 to ø16 (Metric), ø1/8" to ø1/2" (Inch)
- Numerical indication of knob rotation for flow rate reduces flow setting time and setting errors! The value can be controlled via the indicator window.

Elbow type/Universal type In-line type

Dual Speed Controller
ASD Series
- Applicable tubing O.D.: ø4 to ø12 (Metric), ø1/8" to ø3/8" (Inch)
- Enables bi-directional flow control with a speed controller (Meter-in and meter-out)
- Prevents cylinders from lurching

Safety
Measures

Speed Controller with Pilot Check Valve
ASP Series
- Applicable tubing O.D.: ø6 to ø12 (Metric), ø1/4" to ø1/2" (Inch)
- Integrated pilot check valve and speed controller.
- Realizes momentary intermediate stoppage of a cylinder and is able to adjust the speed control of it.

Safety
Measures
Temperature Control Equipment
Temperature Control Equipment

Thermo-chiller: Standard Type  
HRS Series

- With this chiller, cooling water can be obtained anywhere it is necessary because of easy installation and easy operation.
- For a wide range of applications such as laser machine tools, etc.
- Compact: W377 x H615 x D500 mm, 40 kg (HRS012/018/024)
- Timer function, Low liquid level protection, Power failure auto-restart, Anti-freezing function, etc.
- Self diagnosis function
- Ideal for overseas models (Single-phase 200 to 230 VAC, Single-phase 100, 115 VAC)

Thermo-chiller: Standard Type  
HRS090 Series

- Compact and lightweight: 136 kg (Air-cooled type)
- Cooling capacity: 9 kW
- Temperature stability: ±0.5°C
- Set temperature range: 5 to 35°C
- Max. ambient temperature: 45°C
- Power supply: 3-phase 200 to 230 VAC, 380 to 415 VAC

Thermo-chiller: Standard Type  
HRS100/150 Series

- No heater required, as circulating fluid is heated using heat exhausted by refrigerating circuit.
- Compatible with power supplies in Europe, Asia, Oceania, North, Central, and South America
- Low-noise design: 70 dB(A)
- Outdoor installation: IPX4
- Compact, Space saving

Application Examples

Cooling of built-in motors
The use of water with a high efficiency ratio increases the cooling effect.

Cooling of ball screws
The cooling efficiency of hollow ball screws can be increased.

Thermo-chiller: Inverter Type  
HRSH090 Series

- Power consumption reduced by 53%
  Complete with energy-saving triple inverter!
- Cooling capacity: 9.5 kW (Air-cooled), 11.0 kW (Water-cooled)
- Temperature stability: ±0.1°C
- Set temperature range: 5°C to 40°C

Thermo-chiller: Inverter Type  
HRSH Series

- Complete with energy-saving triple inverter!
- Outdoor installation, Splashproof type (IPX4)
- Temperature stability: ±0.1°C (when a load is stable)
- Space saving and lightweight: 280 kg (25 kW type)

Thermo-chiller: Basic Type  
HRSE Series

- Complete with energy-saving triple control!
  Reduces power consumption by 33%
- Compact and lightweight: 32 kg (100 VAC)
- Maintenance free: Magnet pump
- Low-noise design: 55 dB(A)
Laser Beam Machine Equipment
2/3 Port Valves for Fluid Control

Direct Operated 2 Port Solenoid Valve

VX2 Series

- For air, medium vacuum, water, oil, steam (Can be used with heated water.)
- Flow rate: 20% more flow*1
- Height: 10% smaller*1
- Weight: 30% lighter*1
- Body material: Aluminum, Resin, C37, Stainless steel
- With One-touch fittings (resin body) type is available.
- Port size: 1/8 to 1/2, ø6 to ø12
  *1 Compared with SMC current model

Please contact SMC in regards to the use of special fluids (O₂, N₂) in laser beam machines, etc.

5.0 MPa Pilot Operated 2/3 Port Solenoid Valve & Check Valve

VCH/VCHC Series

- Service life: 10 million cycles
- Uses a polyurethane elastomer poppet in the valve seat
- Improved durability under high-pressure environments

Direct Operated Regulator for 6.0 MPa (Relieving Type)

VCHR Series

- Service life: 10 million times
- Improved durability in high-pressure environments using a polyurethane elastomer poppet
- Improved durability using a metal seal type relief valve
- Uses special fluororesin seals for sliding parts
- Stable unattached response, not easily affected by pressure

<table>
<thead>
<tr>
<th>Series</th>
<th>VCHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>VCHR30/40</td>
</tr>
<tr>
<td>Type</td>
<td>Direct operated regulator (Relieving type)</td>
</tr>
<tr>
<td>Port size</td>
<td>G3/4, 1, 1 1/2</td>
</tr>
<tr>
<td>Max. operating pressure [MPa]</td>
<td>6.0</td>
</tr>
<tr>
<td>Set pressure range [MPa]</td>
<td>0.5 to 5.0</td>
</tr>
</tbody>
</table>

Pressure Control Equipment

5.0 MPa Maximum Supply Pressure High Pressure Electro-Pneumatic Regulator

ITVX Series

- Stepless control of air pressure proportional to an electrical signal
- Max. supply pressure: 5.0 MPa
- Set pressure range: 0.01 to 3.0 MPa
- Max. flow rate: 3000 L/min (ANR)
- Fluid: Air, N₂, O₂, Ar
- Wetted parts: Fluorine grease

Application Example
Flow Control Equipment/Related Equipment

Check Valve
AK Series

- Oil-free compatible (Please contact SMC separately.)

<table>
<thead>
<tr>
<th>Type</th>
<th>Series</th>
<th>Port size</th>
<th>Applicable tubing O.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-line type</td>
<td>AK2000/AK4000</td>
<td>1/8 to 1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>AK6000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Straight type</td>
<td>AKH</td>
<td>-</td>
<td>ø4 to ø12</td>
</tr>
<tr>
<td>Male connector type</td>
<td>AKH</td>
<td>M5 to 1/2</td>
<td>ø4 to ø12, ø5/32&quot; to ø1/2&quot;</td>
</tr>
<tr>
<td>Bushing type</td>
<td>AKB</td>
<td>1/8 to 1/2</td>
<td>-</td>
</tr>
</tbody>
</table>

Made to order for air/water

- Body material: Brass IN-A-14-290/XT0-674-[ ]
- Body material: Stainless steel IN-A-14-[ ]
- Rubber material: NBR/FKM/CR high temperature, low cracking

Also compatible with O2 (Available as special order). Please contact SMC separately.

Fittings & Tubing

Fluoropolymer Tubing (Super PFA)
TL/TIL Series

- Applicable tubing O.D.
  Metric size: ø4, ø6, ø8, ø10, ø12, ø19
- Max. operating pressure: 1.0 MPa (at 20°C)*1
- Max. operating temperature: 260°C (This may vary according to operating pressure.)
  *1 This may vary according to size.

Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Soft Nylon Tubing
TRS Series

- Fluid: Air, Water
- Tubing O.D.: ø6 to ø12

Color Variations

![Color Variations](image)

Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Double Layer Tubing
TRB Series

- Fluid: Air, Water
- Tubing O.D.: ø6 to ø12

Color Variations

![Color Variations](image)

Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Double Layer Polyurethane Tubing
TRBU Series

- Fluid: Air, Water
- Tubing O.D.: ø6 to ø12

Color Variations

![Color Variations](image)

Flame Resistant (Equivalent to UL-94 Standard V-0)
FR Three-layer Polyurethane Tubing
TRTU Series

- Fluid: Air, Water
- Tubing O.D.: ø6 to ø12

Color Variations

![Color Variations](image)

* Note that the tube colors are samples.
**Temperature Control Equipment**

**Thermo-chiller: Standard Type**

**HRS Series**

- With this chiller, cooling water can be obtained anywhere it is necessary because of easy installation and easy operation.
- For a wide range of applications such as laser machine tools, etc.
- Compact: W377 x H615 x D500, 40 kg
- Timer function, Low liquid level protection, Power failure auto-restart, Anti-freezing function, etc.
- Self diagnosis function
- Ideal for overseas models (Single-phase 200 to 230 VAC, Single-phase 100, 115 VAC)

<table>
<thead>
<tr>
<th>Series</th>
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<tbody>
<tr>
<td>Set temperature range</td>
<td>5 to 40°C</td>
</tr>
<tr>
<td>Max. cooling capacity</td>
<td>5.9 kW</td>
</tr>
<tr>
<td>Temperature stability</td>
<td>±0.1°C</td>
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**Thermo-chiller: Inverter Type**

**HRSH Series**

- Complete with energy-saving triple inverter!
- Outdoor installation, Splashproof type (IPX4)
- Max. ambient temperature: 45°C
- Temperature stability: ±0.1°C (when a load is stable)
- Space saving and lightweight: 280 kg (25 kW type)

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**Air Preparation Equipment**

**Membrane Air Dryer**

**IDG A/IDG Series**

- It is possible to easily supply dry air using the hollow fiber membrane.
- Non-fluorocarbon
- Power supply not required.
- Compatible with low dew points (−60°C)
- No vibration or heat discharge.
- With a dew point indicator

**<Example of System>**

Air purge applied continuously where laser beam passes through (light path)

**Thermo-chiller: Standard Type**

**HRS Series**

- With this chiller, cooling water can be obtained anywhere it is necessary because of easy installation and easy operation.
- For a wide range of applications such as laser machine tools, etc.
- Compact: W377 x H615 x D500, 40 kg
- Timer function, Low liquid level protection, Power failure auto-restart, Anti-freezing function, etc.
- Self diagnosis function
- Ideal for overseas models (Single-phase 200 to 230 VAC, Single-phase 100, 115 VAC)

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**Openor**

**IDG Series**

**L52408 A/IDG  Series**

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- Non-fluorocarbon
- Power supply not required.
- Compatible with low dew points (−60°C)
- No vibration or heat discharge.
- With a dew point indicator

**<Example of System>**

Air purge applied continuously where laser beam passes through (light path)