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Compact Cylinder with Linear Guide
Ø12, Ø16, Ø20, Ø25

MXZ Series

Compact Cylinder with Linear Guide

Compact

49.5 mm
MXZ Ø20, 10 mm stroke

30 mm
MXZ Ø20

- Design and assembly time is reduced due to integration of a linear guide to the cylinder.
- Lightweight workpieces such as electronic boards can be stopped, positioned and clamped.

For details, refer to the Web Catalog or the catalog.

CAT.NAS20-236
Compact and Space-saving

<table>
<thead>
<tr>
<th>Height (at 10 mm stroke) [mm]</th>
<th>MXZ</th>
<th>MXH</th>
<th>MGP</th>
<th>CQM</th>
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<tbody>
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*1 Compared with bore size of ø10

<table>
<thead>
<tr>
<th>Width [mm]</th>
<th>MXZ</th>
<th>MXH</th>
<th>MGP</th>
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*1 Compared with bore size of ø10

<table>
<thead>
<tr>
<th>Depth [mm]</th>
<th>MXZ</th>
<th>MXH</th>
<th>MGP</th>
<th>CQM</th>
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<td>49.4</td>
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<td>83</td>
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<td>25</td>
<td>57.4</td>
<td>—</td>
<td>93</td>
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</tr>
</tbody>
</table>

*1 Compared with bore size of ø10

Mounting

- Through-hole mounting
- Tap mounting
Compact Cylinder with Linear Guide  **MXZ** Series

**Port Location Selectable**

Ex.) **MXZ20 R-30-M9BW**

<table>
<thead>
<tr>
<th>Pilot port location</th>
<th>Left</th>
<th>Front</th>
<th>Right</th>
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<tbody>
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<td>Nil</td>
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</table>

Application Examples

Lightweight workpieces such as electronic boards can be stopped, positioned and clamped with high accuracy.

- **Stopper**
- **Positioning**
- **Clamping**

Space is reduced due to the integrated construction of a cylinder and linear guide.

**Auto Switch Mountable on 3 Surfaces**

(For ø20, ø25)

- Solid state auto switch: **D-M9**

**Variations**

<table>
<thead>
<tr>
<th>Series</th>
<th>Bore size [mm]</th>
<th>Standard stroke [mm]</th>
<th>Option</th>
</tr>
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<tbody>
<tr>
<td>MXZ</td>
<td>12</td>
<td>5 10 15 20 25 30 35 40 45 50</td>
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<td>25</td>
<td>5 10 15 20 25 30 35 40 45 50</td>
<td></td>
</tr>
</tbody>
</table>

Port location selectable
Air Slide Table

The centralized adjuster of the functional option is available as standard.
Made to order options have been added.
- Dual stroke specification
- Side adjuster specification
- Combined use of shock absorber + metal stopper, etc.

Reduced in height

10%*1\text{ reduction} \quad 27 \text{ mm*1} \quad \text{(Current model: 30 mm*1)}

Product weight

22%*1\text{ reduction} \quad 298 \text{ g*1} \quad \text{(Current model: 380 g*1)}

Allowable kinetic energy

64%*1\text{ improvement} \quad 0.07 \text{ lbf [0.09 J]*1} \quad \text{(Current model: 0.05 lbf [0.055 J]*1)}

*1 Comparison between the double-ported type and the current MXQ12-30 (without adjuster)

2 combinations of guide and cylinder bore size available

**Double-ported type**
- Increases flexibility of wiring and piping with piping ports and auto switch mounting grooves on both sides

**Bore size**
- ø12

**Bore size**
- ø8

**Low thrust with high rigidity type**
- Combination with a cylinder of one bore size smaller increases rigidity according to thrust. The height can be reduced as well.

**Height interchangeable type**
- Height interchangeable with the current MXQ series

**Single side-ported type**
- Better auto switch visibility. Indicator LED can be checked from one side when used with a short stroke.

**Bore size**
- ø12

**Height interchangeable type**
- Height interchangeable with the current MXQ series

**Bore size**
- ø12

**Bore size**
- ø12

**Bore size**
- ø12

**Bore size**
- ø12
## Variations

<table>
<thead>
<tr>
<th>Bore size</th>
<th>Body option</th>
<th>Functional option</th>
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<tr>
<td></td>
<td>Standard type</td>
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### Double-ported type

**MXQ-A**

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### Low thrust with high rigidity type

**MXQ-B**

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### Single side-ported type

**MXQ-C**

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### Height interchangeable type

**MXQ-D**

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<td>Adjuster option</td>
<td>Auto switch</td>
<td>Made to order</td>
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<tr>
<td>Metal stopper</td>
<td>PTFE grease</td>
<td>Low thrust with high rigidity type MXQ B</td>
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<tr>
<td>Shock absorber</td>
<td>Grease for food processing equipment (X27)</td>
<td>Dual stroke specification (X2212)</td>
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<td>Rubber stopper</td>
<td>Long adjustment bolt (10 mm longer adjustment range) (X111)</td>
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<tr>
<td>Metal stopper</td>
<td>Long adjustment nut and bolt (X12)</td>
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<tr>
<td>Extension stroke end/Retraction stroke end mounting</td>
<td>Without built-in auto switch magnet (X26)</td>
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<tr>
<td>Solid state/Reed</td>
<td>Fluororubber seal (X39)</td>
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<td></td>
<td>Anti-corrosive guide unit (X42)</td>
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<td>EPDM seal (X45)</td>
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<td>Low-speed specification (15 to 50 mm/s) (X60)</td>
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<td></td>
<td>End plate compatible with the current MXQ series (X1100)</td>
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<td>Heat-resistant specification (−10 to 100 °C) (X2128)</td>
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<td>Side adjuster specification (X2192)</td>
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<td>Combined use of shock absorber + metal stopper (X2201)</td>
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<td></td>
<td>Extension stroke end/adjuster fixed from the axial direction (X2202)</td>
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</table>

**Adjuster option**
- Metal stopper with bumper
- Shock absorber
- Rubber stopper
- Metal stopper
- Extension stroke end/Retraction stroke end mounting
- Solid state/Reed

**Auto switch**
- PTFE grease (X27)
- Grease for food processing equipment (X27)
- Long adjustment bolt (10 mm longer adjustment range) (X111)
- Long adjustment nut and bolt (X12)
- Without built-in auto switch magnet (X26)
- Fluororubber seal (X39)
- Anti-corrosive guide unit (X42)
- EPDM seal (X45)
- Low-speed specification (15 to 50 mm/s) (X60)
- End plate compatible with the current MXQ series (X1100)
- Heat-resistant specification (−10 to 100 °C) (X2128)
- Side adjuster specification (X2192)
- Combined use of shock absorber + metal stopper (X2201)
- Extension stroke end/adjuster fixed from the axial direction (X2202)
Shot Pin Cylinder

Size: ø57, ø71

CKZP Series

High Precision

With rod extended:
Deflection of ±0.1 mm or less
(With 71 mm bore, 50 mm stroke)

Non-rotational accuracy ±0.1 mm or less
(71 mm bore, with a 12.72 lbf·ft [17.25 N·m] load applied in the rotating direction.)

Positioning Repeatability

Positioning accuracy ±0.05 mm

With a CKZP71, 50 mm stroke

High Output
Retract force 397 lbf [1764 N]
Extending force 531 lbf [2362 N]

Mounting Based on NAAMS Standard (71 mm bore)
Power Clamp Cylinder
Compact Type ø25

CKZT25-X2797 (Base Type)
-X2798 (With Manually Operated Handle)

For material handling and clamping of small workpieces

- Lightweight
- Compact
- High clamping force
- Lock function

**Lightweight**
- **Weight**: 580 g

**Compact**
- **Width**: 34 mm
- **Height**: 192.4 mm
  (Arm opening angle: 90°)

**Clamping force**: 148 lbf [660N]
(Arm length: 50 mm, 73 psi [0.5 MPa pressure])

- Force amplification with a toggle mechanism and lock function
  Can hold a clamped state when supply pressure drops or residual pressure is released

- Spatter-proof construction
  Fully closed structure prevents the intrusion of spatter

- Equipped with a proximity switch that can be used in welding magnetic fields

- A model with a manually operated handle is available.
  For manual workpiece setting processes
NAAMS Standards Compliant Power Clamp Cylinder

CKZ3N-X2742A (Base Type)
CKZ3N-X2568 (With Manually Operated Handle)

- **Weight reduced by up to 38%**
  - Aluminum body with greatly reduced weight
  - Suitable for robot material handling

<table>
<thead>
<tr>
<th>Bore size</th>
<th>CKZ2N</th>
<th>CKZ3N-X2742A</th>
<th>Reduction rate</th>
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</thead>
<tbody>
<tr>
<td>50</td>
<td>5.1 kg</td>
<td>3.2 kg</td>
<td>37% reduction</td>
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<tr>
<td>63</td>
<td>7.2 kg</td>
<td>4.4 kg</td>
<td>38% reduction</td>
</tr>
</tbody>
</table>

- **Simple switch adjustment greatly reduces work hours.**
  - Switch can be adjusted easily when changing the arm opening angle.

- **High clamping force 899 lbf [4000N]**
  - (ø63, Arm length: 100 mm, 73 psi [0.5 MPa])

- **Metal switch cassette cover (Option)**
  - Protects switch cassette from unexpected impact

A model with a manually operated handle is available.
- For manual workpiece setting processes
Wide Type Parallel Style Air Gripper

MHL2 Series

Weight

Max. 10% reduction 585 g → 525 g

ø16, Opening/Closing stroke: 30 mm

Weight reduced by the change of the body shape and internal construction

Dust resistant option now available.
(Made to Order: -X85, -X86□)

Closing width adjusting option now available.
(Made to Order: -X28)

Small auto switches can be directly mounted.
- Mounting brackets are not required. This reduces assembly labor.
- Direct mounting is possible with the changed groove shape.
  · Solid state auto switch: D-M9□

Performance and mounting dimensions are interchangeable with the current model.

3 Types of Stroke Variations [mm]

<table>
<thead>
<tr>
<th>Opening/Closing stroke</th>
<th>Stroke [mm]</th>
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<tr>
<td>Short: MHL2-D□</td>
<td>ø10 ø16 ø20 ø25</td>
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<td>20 30 40 50</td>
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<tr>
<td>Medium: MHL2-D1□</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 60 80 100</td>
</tr>
<tr>
<td>Long: MHL2-D2□</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 80 100 120</td>
</tr>
</tbody>
</table>

For details, refer to the Web Catalog or the catalog.

CAT.NAS20-249
Wide Type Parallel Style Air Gripper  MHL2 Series

**Lightweight**

Lightweight body by changing the body shape

<table>
<thead>
<tr>
<th>Model</th>
<th>MHL2-□Z</th>
<th>MHL2</th>
<th>Reduction rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-10D</td>
<td>280</td>
<td>280</td>
<td>0.0%</td>
</tr>
<tr>
<td>MHL2-16D</td>
<td>525</td>
<td>585</td>
<td>10.3%</td>
</tr>
<tr>
<td>MHL2-20D</td>
<td>940</td>
<td>1025</td>
<td>8.3%</td>
</tr>
<tr>
<td>MHL2-25D</td>
<td>1565</td>
<td>1690</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

**Built-in dust protection mechanism (Standard)**
A scraper with a dust lip is adopted for all rod rotating parts.

**Dust resistant option now available. (Made to order)**

- In micro-powder (10 to 100 μm) environments → With double Lube-retainer (-X85)
  - Prevents particles and foreign matter from entering the gripper.
  - The Lube-retainer ensures a consistent film of grease, improving gripper endurance.
- In dusty environments → With heavy duty scraper + Lube-retainer (-X86)
  - Applicable for environments containing particles or foreign matter.
  - Grease film is formed on the rod due to the Lube-retainers so that the endurance is improved.
  - Seal material can be NBR or fluororubber.

**Series Variations**

<table>
<thead>
<tr>
<th>Series</th>
<th>Action</th>
<th>Bore size [mm]</th>
<th>Made to order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10 16 20 25 32 40</td>
<td></td>
</tr>
<tr>
<td>MHL2-□Z</td>
<td>Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>acting</td>
<td></td>
<td>+1</td>
</tr>
</tbody>
</table>

- X4: Heat resistant (14 to 212°F [−10 to 100°C])
- X5: Fluororubber seal
- X28: With bolt for adjusting the closing width
- X50: Without magnet
- X53: Ethylene propylene rubber seal (EPDM)
- X63: Fluorine grease
- X79: Grease for food processing machines: Fluorine grease
- X79A: Grease for food processing machines: Aluminum complex soap base grease
- X85: Fine-particle proof specification (MHL2-□Z only)
- X86: With heavy duty scraper + Stable lubrication function (Lube-retainer) (NBR seals) (MHL2-□Z only)
- X86A: With heavy duty scraper + Stable lubrication function (Lube-retainer) (Fluororubber seals) (MHL2-□Z only)

*1 For bore size of φ32 and φ40, refer to the Web Catalog for the current model.
Rod End
(Piston Rod End Bracket)
Thread size: M4 to M48

*KJ□D Series*

- Smooth rotation that can adjust the centering automatically.

- Allowable inclination angle: 19°
  (KJ36D, Pin shape: Round bar)

- Can be used as an auxiliary bracket for the oscillating mechanism.

- Reduces the design and assembly labor of the oscillating mechanism.

- Can be used in various applications, not limited to connecting to a cylinder.

**Applicable cylinders**
- CJ2 series: ø10, ø16
- CM2 series: ø20 to ø40
- CG1 series: ø20 to ø100
- CA2 series: ø40 to ø100
- MB series: ø32 to ø125
- MB1 series: ø32 to ø125
- CQ2 series: ø12 to ø100
- C85 series: ø8 to ø25
- C75 series: ø32, ø40
- C76 series: ø32, ø40
- C95 series: ø160 to ø250
- C96 series: ø32 to ø125
- CP96 series: ø32 to ø125

For details, refer to the Web Catalog.
Alignment and positioning of transferred workpieces

Contributes to space saving on conveyor lines

Heavy workpieces can now be aligned and positioned with small cylinders, resulting in compact conveyor lines.

Table

Max. allowable load weight: **2205 lbs [1000 kg]**

<table>
<thead>
<tr>
<th>Workpieces can be moved in any direction: forward/backward, right/left, at an angle, and even rotated (360°). Ball bearings allow for smooth operation.</th>
</tr>
</thead>
</table>

Table centering accuracy

±1 mm or less (Workpiece not loaded)

3 types of table material can be selected.

- Stainless steel
- Ultra high molecular weight polyethylene
- Cast nylon

For lock/unlock confirmation

External photo sensor mountable

Select from lock port side or opposite side of port installation.

Built-in air locking mechanism

Table can be held in any position.

External photo sensor

Locking port

Unlocking port
<Application Examples>

## Conveyor Line

### 1 Transferred workpieces are stopped

Workpieces transferred at an angle are stopped at an alignment point (stops where the centering unit is installed).

### 2 Centering unit rises

Cylinder rises to lift the workpiece (separates roller conveyor from workpiece).

### 3 Workpiece alignment/table lock

Alignment cylinder corrects skewed workpieces and realigns them. After alignment, the table of the centering unit is locked to maintain the corrected position even after the adjustment cylinders are released.

### 4 Centering unit descends/workpiece is transferred to next step

Cylinder descends, places workpiece back on the roller conveyor, and transfers it to the next step.
Liquid Crystal Cassette Transfer

1. Stops in front of rack
Is transferred to and stopped in front of the rack where skewed liquid crystal cassettes are to be stored.

2. Is stored in rack

3. Alignment of cassette/table lock
The alignment cylinder corrects skewed workpieces and aligns the liquid crystal cassettes. After alignment, the table of the centering unit is locked to maintain the corrected position even after the alignment cylinders are released.
Fieldbus System 
**EX245 Series**

- **AIDA*1 specifications compliant**
- **Push Pull connectors**
  - One-touch installation and removal
  - Reduced wiring time

- **Compatible protocol**
  - Fiber-optic cable (SCRJ connector)

- **Modules can be combined flexibly.**
  - Number of valves, digital inputs/outputs
    - Solenoid valve: Max. 32 valves
    - Digital input: Max. 128 inputs
    - Digital output: Max. 64 outputs
  - I/O modules can be connected and removed one by one.
  - Up to 8 modules can be connected in any order.

### Manifold Solenoid Valves

- SY3000/5000/7000
- VQC4000/5000
- SV1000/2000/3000
In-line Type Vacuum Ejector

**ZU-A Series**

**Compact and Lightweight**

**O.D.**

$\varnothing 10.4$ mm  /
(Current model $\varnothing 12.8$)

**Weight**

$3.9$ g / (Current model 6.5 g)

**Overall length**

$52$ mm / (Current model 59 mm)

Variations

<table>
<thead>
<tr>
<th>Model</th>
<th>Nozzle size [mm]</th>
<th>Vacuum pressure reached</th>
<th>Max. suction flow rate scfm [L/min (ANR)]</th>
<th>Air consumption scfm [L/min (ANR)]</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type S Type L</td>
<td></td>
<td>Type S Type L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZU05-A</td>
<td>0.5</td>
<td>$-13$ psi</td>
<td>$0.25$ [7]</td>
<td>$0.49$ [14]</td>
<td>$\varnothing 6$ One-touch fitting</td>
</tr>
<tr>
<td>ZU07-A</td>
<td>0.7</td>
<td>$-90$ kPa</td>
<td>$0.38$ [11]</td>
<td>$0.56$ [16]</td>
<td>Rc1/8</td>
</tr>
</tbody>
</table>

$^1$ Supply pressure: 65 psi [0.45 MPa]
Step Motor Controller
JXCE1/91/P1/D1 Series

Two types of operation command

- **Step no. defined operation**: Operate using the preset step data in the controller.
- **Numerical data defined operation**: The actuator operates using values such as position and speed from the PLC.

Numerical monitoring available

Numerical information, such as the current speed, current position, and alarm codes, can be monitored on the PLC.

Application Examples

Both air and electric systems can be established under the same protocol.

Electric Actuators

- PLC
- Communication protocol
- EtherCAT™ Type
- PROFINET® Type
- DeviceNet™ Type
- EtherNET/IPv Type

Electric slide table
LES/LESH Series

Electric actuator/
Slider type
LEF Series

Electric actuator/
Low profile slider type
LEM Series

Electric actuator/
Guide rod slider
LEL Series

Electric actuator/
Rod type
LEY/LEYG Series

Electric gripper
LEH Series

Electric actuator/
Rotary table
LER Series

Air Cylinders

EX260

<Applicable electric actuators>

Trademark
EtherCAT™ is a trademark of ODVA. DeviceNet™ is a trademark of ODVA.
Air Tank for Booster Regulator
Compliant with ASME Standards
VBAT-X105

Compliant with ASME standards
ASME Section VIII-Division 1
Miniature pressure vessels: UM stamp

Series Variations

<table>
<thead>
<tr>
<th>Material</th>
<th>Tank capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 L</td>
</tr>
<tr>
<td>Carbon steel</td>
<td>●</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>●</td>
</tr>
</tbody>
</table>

ASME standards compliant safety valve included (UV stamp)

Manufacturer’s certificate of compliance included (FORM U-3A)

There are many overseas countries, including but not limited to the U.S., which have adopted the ASME standards as their design safety standards. These products can be used in the following countries by submitting a notification of use (application) in each country.

[Central and South America] Argentina, Bolivia, Chile, Venezuela, Brazil, Mexico
[Asia/Oceania] Pakistan, Taiwan, Hong Kong, India, Philippines, New Zealand

Overseas Standards Compliant Product Variations

<table>
<thead>
<tr>
<th>Main country/region</th>
<th>Law</th>
<th>Part no.</th>
<th>Material</th>
<th>Tank capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>CE Marking/Simple Pressure Vessels Directive</td>
<td>VBAT-Q</td>
<td>Carbon steel</td>
<td>5 L/10 L/20 L/38 L</td>
</tr>
<tr>
<td>China</td>
<td>Regulations on Safety Supervision of Special Equipment/Simple Pressure Vessels Safety and Technical Regulations</td>
<td>VBAT-X104</td>
<td>Carbon steel/Stainless steel</td>
<td>5 L/10 L/20 L/38 L</td>
</tr>
<tr>
<td>South Korea</td>
<td>Occupational Safety and Health Act/KC Certification*2</td>
<td>VBAT-X101</td>
<td>Carbon steel/Stainless steel</td>
<td>5 L/10 L/20 L/38 L</td>
</tr>
</tbody>
</table>

* Refer to the Web Catalog for details about models, specifications, etc.
*1 The capacity of the VBAT-Q-X104 carbon steel tank is 22 L.
*2 The VBAT-X101 is not within the coverage of the High Pressure Gas Safety Control Act in South Korea as the maximum operating pressure is 140 PSI [0.97 MPa].
Main Line Filter
Compressed Air Preparation Filter
**AFF Series**

### Flow Capacity

**512 scfm**

**14.5 m³/min (ANR)**

### Weight

5.0 kg

### Depth

160 mm

### Pressure Drop

0.73 psi [5kPa]

or less

170 mm

**Nominal filtration rating 1 μm**

**Water droplet removal**

For details, refer to the Web Catalog or the catalog.

CAT.NAS30-17

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**Main Line Filter**

**Compressed Air Preparation Filter**

**AFF Series**

**Nominal filtration rating 1 μm**

**Water droplet removal**

For details, refer to the Web Catalog or the catalog.

CAT.NAS30-17
Space-saving design, Labor-saving in piping!

Water droplets and solid particles can be removed with just one AFF. A separate filter for removing water droplets (water separator, AMG series) is not necessary any more. Space and piping work are reduced.

Lightweight

Light body weight to thinner stainless steel bowl. Easier installation.

<table>
<thead>
<tr>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFF70D</td>
<td>3.4 kg (Current model: 4.2 kg)</td>
</tr>
<tr>
<td>AFF80D</td>
<td>4.7 kg</td>
</tr>
<tr>
<td>AFF90D</td>
<td>5.0 kg (Current model: 10.5 kg)</td>
</tr>
</tbody>
</table>
Increase in an air flow capacity due to lower pressure drop contributing to energy saving

Flow capacity:
512 scfm [14.5 m³/min (ANR)]
Pressure drop:
0.73 psi [5 kPa] or less

3 sizes are available.

Model with 388 scfm [11.0 m³/min] flow capacity added. More choices available depending on the flow rate of customer.

<table>
<thead>
<tr>
<th>Size</th>
<th>Nominal filtration rating</th>
<th>Port size</th>
<th>Flow capacity scfm [m³/min (ANR)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFF70D</td>
<td>1 μm¹</td>
<td>1, 1-1/2</td>
<td>247 [7.0] AFF75B (Current model)</td>
</tr>
<tr>
<td>AFF80D</td>
<td>1 μm¹</td>
<td>1-1/2</td>
<td>212 [6.0] AFF73B (Current model)</td>
</tr>
<tr>
<td>AFF90D</td>
<td>1 μm¹</td>
<td>1-1/2, 2</td>
<td>388 [11.0]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>512 [14.5] AFF75B (Current model)</td>
</tr>
</tbody>
</table>

*1 ISO 8573-4: 2010 compliant
Easier replacement of the element

Stopper function prevents the bowl from falling.

The bowl does not fall even if the bolts are removed. It is not necessary to hold the bowl for removing the bolts. Safe and secure mounting and removing of the bowl with both hands is possible. The lightweight stainless bowl with reduced thickness means easier element replacement.

1. Remove the 4 securing bolts.
An end cap with slits is used for the element.

The end cap with slits eliminates the accumulation of drain water. Even high velocity fluid is not spattered. Results in compact bowl design.

**Nominal filtration rating:** 1 μm

ISO 8573-4: 2010 compliant
Auto Drain Valve
AD402-A Series

Longer life & Higher resistance to foreign matter

Improved foreign matter resistance

Increase in condensate discharge

Reduction of operation frequency due to increased condensate discharge
- Condensate discharge: Max. 3.38 oz/cycle [100 cm³/cycle]
  (3 times compared with the current model)

Double layer design
- Better visibility & environmental resistance
- The bowl is covered with a transparent bowl guard.

With manual discharge mechanism
N.O.: Black
N.C.: Gray

For details, refer to the Web Catalog or the catalog.
CAT.NAS40-65
Lightweight

- Resin bowl guard has reduced the weight by 22%

Weight
16.2 oz [460 g]

Weight
20.8 oz [590 g]

Reduced required maintenance space

- Only 30 mm of space is required underneath for maintenance, allowing more compact installation.

Transparent bowl guard

- Better environmental resistance: Transparent bowl guard can protect the inner bowl!
  Windows on the bowl guard have been removed and the inner bowl is instead covered with a polycarbonate transparent bowl guard. Now, even if the environment changes and the bowl is exposed to corrosive chemical or oil splash, the foreign matter will not stick directly to the pressurized bowl. This can reduce risk of bowl breakage.

Bowl material can be selected according to the operating environments.
- Polycarbonate (Standard)
- Nylon (Option)
- Metal (Option)

Options

- One-touch mounting and removal of the bowl is possible without using a tool.
  Release the lock by sliding the lock button down while holding the body. Then, rotate the bowl guard and pull down for removal.

- Bleed valve equipped type can be selected.

When condensate is not dropping down into the drain bowl, open the bleed valve.

Better visibility: 360°

Use of transparent bowl guard makes it possible to check the condensate inside the bowl from the entire periphery.

Compressor
Aftercooler
Air tank
Air dryer
Mounting example

Double layer design

Bleed valve

Compressor
Aftercooler
Air tank
Air dryer

Current model

Weight
30 mm

AD402-A

Current model

Condensate
Amount of condensate can be monitored from any direction.

Amount of condensate can be monitored from the slits.
Soft Start-up Valve
AV2000-A/3000-A/4000-A/5000-A 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

**Power consumption: 0.35 W**
- At 12/24 VDC

Current model: 1.8 W (80% reduction)

**Improved flow rate characteristics:**
Up to 2.3 times

*Cv = 2.4 (C[dm³/(s·bar)]: 9.2)*
- For AV2000-A

**Energy saving**
No air flow when the main valve is switched.
Improved flow rate characteristics*: Up to 2.3 times
\[ C_v = 2.4 \text{ [C} \text{dm}^3/(\text{s} \cdot \text{bar})]: 9.2 \]
Fill time: Up to 50% shorter

*1 For high speed air supply

Improved adjustability at low speed air supply

Smaller profile and less work hours due to integrated silencer

Energy saving
When switching the main valve (exhaust → low speed air supply), the flow passage to port 3 (R) is closed with the main valve. Therefore, air does not blow out to the outside.
Soft Start-up Valve AV2000-A/3000-A/4000-A/5000-A Series

Variations

<table>
<thead>
<tr>
<th>Series</th>
<th>Cv (C [dm³/(s·bar)])</th>
<th>Port size</th>
<th>Voltage</th>
<th>Electrical entry</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV2000-A</td>
<td>2.4 (9.2)</td>
<td>1/4</td>
<td>100 VAC</td>
<td>· Grommet</td>
<td>· Bracket</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>200 VAC</td>
<td>· DIN terminal</td>
<td>· Pressure gauge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>110 VAC</td>
<td></td>
<td>· Silencer (Built-in)</td>
</tr>
<tr>
<td>AV3000-A</td>
<td>3.1 (13.1)</td>
<td>3/8</td>
<td>220 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AV4000-A</td>
<td>5.1 (19.2)</td>
<td>1/2</td>
<td>24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AV5000-A</td>
<td>12.6 (34.8)</td>
<td>3/4</td>
<td>12 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13.7 (41.3)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Options

- Grommet
- DIN terminal
- Bracket
- Pressure gauge
- Silencer (Built-in)

Pilot Valve Variations

- DIN terminal with connector
  - Type D
  - Type Y
- DIN terminal without connector
  - Type D
  - Type Y
- Grommet

Manual Override Variations

- Push-turn locking slotted type
- Push-turn locking lever type

Combination with F.R.L. Units

<table>
<thead>
<tr>
<th>Series</th>
<th>Port size</th>
<th>F.R.L. units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AC20</td>
</tr>
<tr>
<td>AV2000-A</td>
<td>1/4</td>
<td></td>
</tr>
<tr>
<td>AV3000-A</td>
<td>3/8</td>
<td></td>
</tr>
<tr>
<td>AV4000-A</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>AV5000-A</td>
<td>3/4</td>
<td></td>
</tr>
</tbody>
</table>

Connection Example

- Soft Start-up Valve AV3000-A
- F.R.L. Units AC30-□-A (Sold separately)

Application Example

For slow air supply when starting-up and for rapid air exhaust after stopping the equipment.

Simple Specials System

Units with an F.R.L are available through the simple special ordering system. The lead time is almost the same as the standard product. Please contact your local sales representative for more details.
Air Saving Speed Controller
AS-R/AS-Q Series

Reduce air consumption just by mounting to air cylinder

Air consumption reduced by 25%!!
(33% reduction: Supply pressure at 73 psi [0.5 MPa], Air supply pressure at 15 psi [0.1 MPa])

Acquire two-pressure control just by mounting the product. Reduces the air supply pressure of the stroke on the non-working side to 29 psi [0.2 MPa].

Mounting and operation are the same as a speed controller!!

Equal response time!
No delay of the response time with two-pressure control

Air supply pressure of 15 psi [0.1 MPa] is also available.
Air Saving Speed Controller *AS-R/AS-Q Series*

**Air Saving 25% reduction**

By reducing the pressure on the return stroke to 29 psi [0.2 MPa], the air consumption can be reduced.

- Air consumption reduced by 25%
- Working stroke: 73 psi [0.5 MPa]
- Return stroke: 29 psi [0.2 MPa]

**Compact 85% reduction**

*(Occupied volume: 230 cm³ → 34 cm³)*

The functions of the regulator and speed controller are combined.

- Speed controller with One-touch fitting
- Built-in Regulator with backflow function

**Easy Adjustment**

- Push-lock type
- Only speed is adjustable.

- Knob adjustment range: 1 rotation (270°)
- Marker for fully closed position
- Marker for fully open position

**Compact Air Saving Speed Controller**

- 29 psi [0.2 MPa] (Air supply pressure)
- 73 psi [0.5 MPa] (Supply pressure)

**With pressure reduction function**

- Working stroke: 73 psi [0.5 MPa]
- Return stroke: 29 psi [0.2 MPa]

---

*1 The air consumption reduction rate indicates the rate for one cycle of the cylinder.
*2 Cylinder pressure of return stroke side

---

**Model (Body size) - Port size - Applicable tubing O.D. - Applicable tubing material**

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Applicable tubing O.D.</th>
<th>Applicable tubing material</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS22R-01</td>
<td>1/8</td>
<td>1/8</td>
<td>nylon (T, TIA series)</td>
</tr>
<tr>
<td>AS22R-02</td>
<td>1/4</td>
<td>1/4</td>
<td>soft nylon (TS, TISA series)</td>
</tr>
<tr>
<td>AS32R-02</td>
<td>3/8</td>
<td>3/8</td>
<td>polyurethane (TU, TIUB series)</td>
</tr>
<tr>
<td>AS42R-03</td>
<td>1/2</td>
<td>1/2</td>
<td>fluororesin (TLM, TILM series)</td>
</tr>
</tbody>
</table>

---

**Variations**

- Inch (Orange) Metric (Light gray)

---

**Knob adjustment range**

- 0° (Fully closed)
- 135° (Fully open)
- 270° (Fully open)

---

**Air Saving 25% reduction**

- Air consumption reduced by 25%

---

**Current model (AS-F)**

- Air supply pressure 2 psi [MPa]

---

**Comparison of AR20K-02-B + AS22F-02-08 and AS22R-02-08**

---

**Marker for fully closed position**

- Adjustment can be made every 45 degrees.
Equal Response Time

- Improved output response at the stroke end due to rapid air-charge.
- Improved response time of return stroke due to rapid air exhaust.

Lurch Prevention

As this product is operated by the return stroke at a reduced pressure by the meter-in circuit, a sudden extension of the working stroke is prevented.

Variations

<table>
<thead>
<tr>
<th>With pressure reduction function</th>
<th>With rapid supply and exhaust function</th>
<th>Model (Body size)</th>
<th>Port size</th>
<th>Applicable tubing O.D.</th>
<th>Applicable tubing material</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS22R- 01- 〇 〇</td>
<td>AS22R- 02- 〇 〇 AS22Q- 02- 〇 〇</td>
<td>2</td>
<td>1/8</td>
<td>0.2</td>
<td>Nylon (T, TIA series)</td>
</tr>
<tr>
<td>AS22R- 02- 〇 〇 AS22Q- 02- 〇 〇</td>
<td>AS22R- 03- 〇 〇 AS22Q- 03- 〇 〇</td>
<td>3</td>
<td>1/4</td>
<td>0.2</td>
<td>Soft nylon (TS, TISA series)</td>
</tr>
<tr>
<td>AS32R- 02- 〇 〇 AS32Q- 02- 〇 〇</td>
<td>AS32R- 03- 〇 〇 AS32Q- 03- 〇 〇</td>
<td>3</td>
<td>1/4</td>
<td>0.2</td>
<td>Polyurethane (TU, TIUB series)</td>
</tr>
<tr>
<td>AS42R- 03- 〇 〇 AS42Q- 03- 〇 〇</td>
<td>AS42R- 04- 〇 〇 AS42Q- 04- 〇 〇</td>
<td>4</td>
<td>1/2</td>
<td>0.2</td>
<td>Fluororesin (TLM, TILM series) (TH, TIH series)</td>
</tr>
</tbody>
</table>
Application Proposal for Air Saving Speed Controller

Air consumption reduction ratio: **50%**

**Pusher**

- Applications which transfer a workpiece, \( W \) (kg), during the working stroke, and with no workpiece (or loading) during the return stroke.
- The cylinder is returned right after reaching the end of the working stroke so that air consumption can be reduced without unnecessary charging.

1. **Start the stroke operation by turning the solenoid valve ON.**

2. **The solenoid valve is turned off at the end of the working stroke.**
   - The air consumption can be reduced by shutting off the air supply before the internal pressure of the cylinder reaches the supply pressure.

3. **The air consumption for the return stroke can be reduced by supplying the pressure which has been reduced by the AS-R.**

<Load and applicable speed controller>

1. Start the stroke operation by turning the solenoid valve ON.

2. The solenoid valve is turned off at the end of the working stroke.
   - The air consumption can be reduced by shutting off the air supply before the internal pressure of the cylinder reaches the supply pressure.

3. The air consumption for the return stroke can be reduced by supplying the pressure which has been reduced by the AS-R.

Air consumption reduction ratio: **46%**

**Combination with the Optimum Size of Cylinder Size**

For example, when an \( \phi 80 \) mm bore cylinder is used in place a \( \phi 63 \) mm bore cylinder that does not have enough force, the customer can choose an optimally sized \( \phi 67 \) mm bore JMB series cylinder. In addition, an AS-R/AS-Q series combined with this cylinder can reduce air consumption by up to 46%.

### Air Consumption (for one cycle)

<table>
<thead>
<tr>
<th>Speed controller</th>
<th>Air Saving Speed Controller AS-R/AS-Q Series</th>
<th>Elbow type AS Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder bore size [mm]</td>
<td>( \phi 67 ) (intermediary bore size)</td>
<td>( \phi 80 )</td>
</tr>
<tr>
<td>Air consumption [L]</td>
<td>3.1</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Conditions:
- Working stroke pressure: 73 psi [0.5 MPa]
- Return stroke pressure: 29 psi [0.2 MPa]
- Stroke: 100 mm
- Utilizing the SMC sizing program.

**46% reduction**
Pilot Check Valve: Metal Body Type
AS-X785

The use of a metal body improves strength and environmental resistance.

Three types capable of connecting to female threads and One-touch fittings are available.

Temporary intermediate stops are possible. *1

*1 Precise intermediate stops are not guaranteed.

Example of a drop prevention circuit

<table>
<thead>
<tr>
<th>Pilot port: Female thread</th>
<th>Valve side: Female thread</th>
<th>Cylinder side: Male thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size on the cylinder side</td>
<td>Pilot port</td>
<td>Port size on the valve side</td>
</tr>
<tr>
<td>R, G</td>
<td>1/8</td>
<td>M5</td>
</tr>
<tr>
<td>1/4</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>3/8</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1/2</td>
<td>1/4</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pilot port: Female thread</th>
<th>Valve side: One-touch fitting</th>
<th>Cylinder side: Male thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size on the cylinder side</td>
<td>Pilot port</td>
<td>Port size on the valve side</td>
</tr>
<tr>
<td>R, G</td>
<td>1/2</td>
<td>Rc, G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pilot port: One-touch fitting</th>
<th>Valve side: One-touch fitting</th>
<th>Cylinder side: Male thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size on the cylinder side</td>
<td>Pilot port</td>
<td>Port size on the valve side</td>
</tr>
<tr>
<td>R, G</td>
<td>1/8</td>
<td>α6</td>
</tr>
<tr>
<td>1/4</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>3/8</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Flame-resistant resin
(Equivalent to UL-94 Standard V-0)

Temporary intermediate stops are possible.

Rotates 360°

For details, refer to the Web Catalog or the catalog.

16-E672
2-Color Display High-Precision Digital Pressure Switch (for Low Pressure)

ZSE30AF-X576 to X580

Able to detect and display pressures of 1.45 psi [10 kPa] or less

**Rated pressure range**

<table>
<thead>
<tr>
<th>Model</th>
<th>Effective range</th>
</tr>
</thead>
<tbody>
<tr>
<td>-X576</td>
<td>−0.000435 to 0.000435 psi [−3 to 3 Pa]</td>
</tr>
<tr>
<td>-X577</td>
<td>−0.000725 to 0.000725 psi [−0.005 to 0.005 kPa]</td>
</tr>
<tr>
<td>-X578</td>
<td>−0.00145 to 0.00145 psi [−0.01 to 0.01 kPa]</td>
</tr>
<tr>
<td>-X579</td>
<td>−0.00435 to 0.00435 psi [−0.03 to 0.03 kPa]</td>
</tr>
<tr>
<td>-X580</td>
<td>−0.00725 to 0.00725 psi [−0.05 to 0.05 kPa]</td>
</tr>
</tbody>
</table>

**Can copy to up to 10 switches simultaneously**

The settings of the master sensor can be copied to the slave sensors.

- Reduced setting time
- Minimized risk of setting mistakes

The sensors can be connected by a dedicated lead wire (ZS-38-5L (for master and one slave) or ZS-38-U (for master and up to 10 slaves)).

**With display low-cut function (zero-cut function)**

“0” is displayed within the effective range.

- Low-cut function “ON”: 0 → 0 → 4 → ⋯ → 0.0725 psi [500 Pa]
- Low-cut function “OFF”: 0 → 1 → 2 → 3 → 4 → ⋯ → 0.0725 psi [500 Pa]

**Application Examples**

- Flow control: Can control air flow by monitoring the flow rate inside the duct
- Liquid level detection: Can detect the liquid level through changes in the purge pressure

**Liquid Level Detection Range (for water)**

<table>
<thead>
<tr>
<th>Pressure range</th>
<th>Liquid level detection range</th>
<th>Minimum set value</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.0725 psi [±500 Pa]</td>
<td>50 mm</td>
<td>0.1 mm</td>
</tr>
<tr>
<td>±0.145 psi [±1 kPa]</td>
<td>100 mm</td>
<td>0.1 mm</td>
</tr>
<tr>
<td>±0.29 psi [±2 kPa]</td>
<td>200 mm</td>
<td>1 mm</td>
</tr>
<tr>
<td>±0.725 psi [±5 kPa]</td>
<td>500 mm</td>
<td>1 mm</td>
</tr>
<tr>
<td>±1.45 psi [±10 kPa]</td>
<td>1000 mm</td>
<td>1 mm</td>
</tr>
</tbody>
</table>
Remote Type
Pressure Sensor/
3-Screen Display Sensor Monitor
PSE57□/PSE300AC Series

Pressure Sensor for General Fluids  PSE57□ Series

- **Rated pressure range**
  - psi [MPa]
    - 0 to 145 [0 to 1]
    - -14.5 to 14.5 [-100 to 100 kPa]
    - 0 to 73 [0 to 500kPa]
  - 0 to 290 [0 to 2]
  - 0 to 725 [0 to 5]
  - 0 to 1450 [0 to 10]

- **Withstand voltage**
  - 500 VAC

- **Materials of Parts in Contact with Fluid**
  - Piping port: C3604 + Nickel plating
  - Pressure sensor: Al2O3 (Alumina 96%)
  - Square ring: FKM

New 3-Screen Display Sensor Monitor  PSE300AC Series

It is possible to change the settings while checking the measured value.

- **Main screen**
  - Measured value (Current pressure value)

- **Sub screen**
  - Label (Display item), Set value (Threshold value)

Visualization of Settings
- Set value (Threshold value)
- Hysteresis value
- Delay time
- Peak value
- Bottom value

For details, refer to the Web Catalog or the catalog.
Pressure Sensor for General Fluids  **PSE57□ Series**

- **PSE570/573/574**  
  (145/14.5/73 psi  
  [1 MPa/100 kPa/500 kPa])

  - Materials of parts in contact with fluid
  - Port size: R1/8, 1/4  
    (with M5 female thread)

- **PSE575/576/577**  
  (290/725/1450 psi  
  [2 /5/10 MPa])

  - Materials of parts in contact with fluid

**Series Variations**

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated pressure range</th>
<th>Proof pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−14.5 psi [-100 kPa]</td>
<td>0 (−100 kPa)</td>
</tr>
<tr>
<td>PSE570</td>
<td>14.5 psi [100 kPa]</td>
<td>145 psi [1 MPa]</td>
</tr>
<tr>
<td>PSE573</td>
<td>73 psi [500 kPa]</td>
<td>290 psi [2 MPa]</td>
</tr>
<tr>
<td>PSE574</td>
<td>145 psi [1 MPa]</td>
<td>725 psi [5 MPa]</td>
</tr>
<tr>
<td></td>
<td>73 psi [500 kPa]</td>
<td>290 psi [2 MPa]</td>
</tr>
<tr>
<td></td>
<td>145 psi [1 MPa]</td>
<td>725 psi [5 MPa]</td>
</tr>
<tr>
<td></td>
<td>145 psi [1 MPa]</td>
<td>725 psi [5 MPa]</td>
</tr>
</tbody>
</table>

**Reduced Work-hours & Required Installation Space for Piping**

- **Remote type**
  
<table>
<thead>
<tr>
<th>Steel tube piping</th>
<th>Hydraulic cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic manifold</td>
<td></td>
</tr>
<tr>
<td>PSE57□</td>
<td></td>
</tr>
<tr>
<td>180 mm</td>
<td></td>
</tr>
<tr>
<td>PSE300AC</td>
<td></td>
</tr>
</tbody>
</table>

- **Integrated type**
  
<table>
<thead>
<tr>
<th>Steel tube piping</th>
<th>Hydraulic cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic manifold</td>
<td></td>
</tr>
<tr>
<td>360 mm</td>
<td></td>
</tr>
</tbody>
</table>

**Applicable Pressure Sensors**

- Compact Pneumatic Pressure Sensor  
  PSE53□  
  PSE54□

- Low Differential Pressure Sensor  
  PSE55□  
  PSE56□

- Pressure Sensor for General Fluids  
  PSE57□

**Variations**

For details, refer to the Web Catalog.

For General Fluids

- PSE56□ Series
  - Wetted parts: Stainless steel 316L
  - IP65
  - Oil-free  
    (Single diaphragm construction)

- Suction verification of workpieces containing moisture

- When vacuum is released, take precautions to avoid water hammer.  
  (An adapter with restrictor (ZS-31-X175) is available to prevent water hammer.) (Refer to “NOTE” in the Operation Manual on the SMC website for details.)

- Liquid coolant pressure control

- Discharge pressure control for compressors

- PET bottle molding machines

- Liquid pressure control of gun drills

- ISE75 (with bracket)
Visualizations of Settings

The sub screen (label) shows the item to be set.

**NPN/PNP Switch Function**

The number of stock items can be reduced.

**Easy Screen Switching**

It is possible to change the settings while checking the measured value.

**Input Range Selection (for Pressure/Flow rate)**

The sensor input range can be set to the required value and displayed.
(Voltage input: 1 to 5 V/Current input: 4 to 20 mA)

Pressure switch/Flow switch can be displayed.

- **A** is displayed for 1 V (or 4 mA).
- **B** is displayed for 5 V (or 20 mA).
- The range can be set as required.

For Digital Flow Switch for Water/PF3W511

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF3W504</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>PF3W520</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>PF3W540</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>PF3W511</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Set A and B to the values shown in the table above.

**Simple 3-Step Setting**

When the S button is pressed and the set value (P_1) is being displayed, the set value (threshold value) can be set.
When the S button is pressed and the hysteresis (H_1) is being displayed, the hysteresis value can be set.

With a snapshot function for set value reading

Pressing the **and** buttons for a minimum of 1 second will make the set value (threshold value) the same as the current pressure value.

Release the buttons after “---” is displayed on the right side sub screen.

Setting complete
Angle Seat Valve / Air Operated Type
VXB Series

With indicator

Low pressure loss due to angle seat structure!

Long service life

3 million cycles \(^*1\) (Steam)
5 million cycles \(^*1\) (Air)

\(^*1\) Based on SMC's test conditions

Low leakage

0.6 in\(^3\)/min
10 cm\(^3\)/min \(^*2\) or less

\(^*2\) With air

Space saving

Height 100 mm \(^*3\)

\(^*3\) Port size: 3/8

Body material
Stainless steel 316L equivalent

Body material
Bronze (CAC)

Steam

\(^\ast\) Can be used with air or water

For details, refer to the Web Catalog or the catalog.

RoHS

New With indicator

For details, refer to the Web Catalog or the catalog.

CAT.NAS70-54
High Vacuum Angle Valve

**XL Series**

A model with a solenoid valve has been added. A heat-resistant 2-color indicator solid state auto switch has been added to the high-temperature type.

### Aluminum bodied
- Uniform baking temperature
- Lightweight, Compact
- Minimal outgassing
- Minimal contamination from heavy metals
- High corrosion resistance to fluorine gas

### Bellows are replaceable
(Bellows seal type)

The bellows assembly can be replaced, which reduces maintenance costs and waste materials.

### New
A model with a solenoid valve has been added.

### New
A heat-resistant 2-color indicator solid state auto switch has been added to the high-temperature type.
Normal Close High Vacuum Solenoid Valve

XSA Series

Female thread type (Rc, NPT) added

Minimum operating pressure

\[ 1 \times 10^{-6} \text{ Pa (abs)} \]

\(^{+1}\) OUT side

Leakage

Internal

\[ 1.3 \times 10^{-9} \text{ Pa} \cdot \text{m}^3/\text{s} \]

External

\[ 1.3 \times 10^{-11} \text{ Pa} \cdot \text{m}^3/\text{s} \]

Power consumption

Max. \(25\%\) reduction

Weight

Max. \(18\%\) \(^{+1}\) lighter

\[0.5 \text{ kg} \rightarrow 0.41 \text{ kg}\]

Applications

- Photovoltaic cell manufacturing
- Semiconductor manufacturing
- LCD manufacturing
- Medical
- Food

Fluid temperature

41 to 140°F [50 to 60°C]

Reverse pressure potential

\[73 \text{ psi } [0.5 \text{ MPa (G)}]\]

\(^{+1}\) XSA1-12 (Refer to the Specifications in the Web Catalog.)

Rated voltage

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>100 V, 200 V, 110 V, 220 V, 240 V, 48 V, 24 V, 230 V</td>
</tr>
<tr>
<td>DC</td>
<td>24 V, 12 V</td>
</tr>
</tbody>
</table>

For details, refer to the Web Catalog or the catalog.

CAT.NAS140-7

* Excluding grommet/AC

\(^{+1}\)
Guide to Using the SMC Web Catalog

Easy-to-Use Web Catalog

1. 3 different search methods are available.

   - **Product Series Search**
   - **Keyword Search**
   - **Series Code Search**

   **Find the catalog you’re looking for with ease!**

New product information updated regularly!
2 Create your own personal catalog with the My List function.

1 Add products to your My List.

2 Organize your list with folders.

3 Download CAD Data, Operation Manuals, and other product information data.

5 Port Solenoid Valve SY3000/5000/7000/9000

- The combined model
- Power consumption
- A wide variety of manifold, DIN rail
- Manifold type no.:

Data concerning design, maintenance, etc., is conveniently gathered in one place!
CAD Data Information

Quick access to necessary data!

5 search methods

1. Search from product photos

2. Search by keywords (Series/Model)

3. Full part number search

4. Keyword search (Product name, series)

5. Search from the product list

SMC World Top Page
http://www.smcworld.com/en/
Reduces design labor!

4 convenient functions

1. Check the shape before downloading

   - Edges
   - Default view
   - Front view
   - Rear view
   - Right view
   - Top view
   - Isometric view

   ∗ The displayed command functions may differ according to the browser that you use.

2. Change the rod position of an actuator

   The position of the rod can be set to any stroke distance before outputting the data. Correction of the data in the CAD software is not required.

3. Select thread on/off

   Setting the threads to off prevents interference errors between male threads and female threads when mounting fittings, etc., to the piping ports.

4. Display related parts and brackets

   The time required to select mounting brackets, included attachments, etc., can be reduced. With this function, overlooking or forgetting to download the data of related parts is less likely to occur.

   Even when the parts are selected, the related product series will be displayed in a list.
### Various Formats Available

#### 3D CAD Data Available Format List

<table>
<thead>
<tr>
<th>3D</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP AP203</td>
</tr>
<tr>
<td>STEP AP214a</td>
</tr>
<tr>
<td>Parasolid Binary V15</td>
</tr>
<tr>
<td>Parasolid Text V15</td>
</tr>
<tr>
<td>IGES</td>
</tr>
<tr>
<td>SAT 7.0</td>
</tr>
<tr>
<td>SolidWorks &gt;= 2001+</td>
</tr>
<tr>
<td>INVENTOR 2011</td>
</tr>
<tr>
<td>Pro/ENGINEER Wildfire 4.0</td>
</tr>
<tr>
<td>Catia &gt;= V5 R8</td>
</tr>
<tr>
<td>Solid Edge ST2</td>
</tr>
<tr>
<td>NX 7</td>
</tr>
<tr>
<td>One Space Modeling &gt;= 2007</td>
</tr>
<tr>
<td>Mechanical Desktop &gt;= V5</td>
</tr>
<tr>
<td>AutoCAD &gt;= V14</td>
</tr>
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<td>Autodesk Revit &gt;= 2012</td>
</tr>
<tr>
<td>CoCreate Modeling &gt;= 2007</td>
</tr>
<tr>
<td>Creo Elements/Direct Modeling &gt;= 17.0</td>
</tr>
<tr>
<td>Creo Elements/Pro 5.0</td>
</tr>
<tr>
<td>Creo Parametric 1.0</td>
</tr>
<tr>
<td>Creo Parametric 2.0</td>
</tr>
<tr>
<td>DWG AUTOCAD VERSION 2004 - 2006</td>
</tr>
<tr>
<td>DXF AUTOCAD VERSION 2004 - 2006</td>
</tr>
<tr>
<td>INVENTOR 2012</td>
</tr>
<tr>
<td>INVENTOR 2013</td>
</tr>
<tr>
<td>INVENTOR 2014</td>
</tr>
<tr>
<td>JT</td>
</tr>
<tr>
<td>NX 7.5</td>
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<tr>
<td>NX 8</td>
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<tr>
<td>NX 8.5</td>
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<td>PDF 3D 7.01</td>
</tr>
<tr>
<td>Pro/ENGINEER Wildfire 5.0</td>
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<tr>
<td>Solid Edge ST3</td>
</tr>
<tr>
<td>Solid Edge ST4</td>
</tr>
<tr>
<td>Solid Edge ST5</td>
</tr>
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<td>STL</td>
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</tbody>
</table>

#### 2D CAD Data Available Format List

<table>
<thead>
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<th>2D</th>
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</thead>
<tbody>
<tr>
<td>BMP (2D View)</td>
</tr>
<tr>
<td>DWG AUTOCAD VERSION 2004 - 2006</td>
</tr>
<tr>
<td>DXF AUTOCAD VERSION 2004 - 2006</td>
</tr>
<tr>
<td>DXF AUTOCAD VERSION 2004 - 2006 (6 sided view first angle projection)</td>
</tr>
<tr>
<td>DXF AUTOCAD VERSION 2004 - 2006 (6 sided view third angle projection)</td>
</tr>
<tr>
<td>JPEG (2D View)</td>
</tr>
<tr>
<td>MI &gt;= V8</td>
</tr>
</tbody>
</table>

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