For Pneumatic Control in Process Automation

Air Preparation Equipment
- Air Dryers
- Air Preparation Filters

Detection Conversion Unit
- Pressure Sensors
- Flow Sensors

Industrial Filters
In principle, SMC products cannot be used outdoors.
“Compressed Air” Line

1. **Air Tank**
   - Series AT
   - Tank capacity: 26.4 to 793 gal (100 to 3000 L)
   - Port size: 15A (1/2) to 4B flange

2. **Aftercooler**
   - Air-cooled Series HAA
   - Application compressor: 7 to 37 kW
   - Air flow capacity: 35.3 to 201 scfm (1000 to 5700 L/min) (ANR)
   - Refrigerated Series HAW
   - Application compressor: 2.2 to 110 kW
   - Air flow capacity: 10.5 to 536 scfm (300 to 18000 L/min) (ANR)

3. **Main Line Filter**
   - Series AFF
   - Filtration accuracy: 3 µm (99.9% filtration efficiency)
   - Rated flow: 106 to 1589 scfm (300 to 45000 L/min) (ANR)
   - Port size: 6A (1/8) to 4B flange

4. **Refrigerated Air Dryer**
   - Series IDF 100FS/125FS/150FS
   - Double energy saving function series
   - Application compressor: 100, 125, 150 kW
   - Air flow capacity: 664 to 953 scfm (18.8 to 27.0 m³/min) (ANR)
   - Series IDF 1E to 370D
   - Application compressor: 0.75 to 370 kW
   - Air flow capacity: 0.10 to 65.0 m³/min (ANR)
   - Refrigerant: R134a (HFC) R407C (HFC)

5. **Flow Switch**
   - Series PF2A
   - Measurement flow rate: cfm (L/min)
   - Port size: 6A to 50A (1/8 to 2)

6. **Micro Mist Separator**
   - Series AMD
   - Filtration accuracy: 0.01 µm (99.9% filtration efficiency)
   - Rated flow: 7.06 to 1412 scfm (200 to 40000 L/min) (ANR)
   - Port size: 6A (1/8) to 6B flange

7. **Super Mist Separator**
   - Series AME
   - Filtration accuracy: 0.01 µm (99.9% filtration efficiency)
   - Rated flow: 7.06 to 1412 scfm (200 to 40000 L/min) (ANR)
   - Port size: 6A (1/8) to 6B flange

8. **Odor Removal Filter**
   - Series AMF
   - Filtration accuracy: 0.01 µm (99.9% filtration efficiency)
   - Rated flow: 7.06 to 1412 scfm (200 to 40000 L/min) (ANR)
   - Port size: 6A (1/8) to 6B flange

9. **Water Separator**
   - Series AMG
   - Dehumidification rate: 99%
   - Rated flow: 106 to 424 scfm (300 to 12000 L/min) (ANR)
   - Port size: 6A to 50A (1/8 to 2)

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Pipes and fittings for facilities include:
- Stainless Steel 316 One-touch Fittings
- Fluoropolymer Fittings
- Self-align Fittings
- Insert Fittings
- S Couplers
- TPH, TPS Series
- TUH, TUS Series
- TQ, TS Series
- KF, KQ2 Series
- KKA, KQB2 Series
- LQ Series

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Production facilities require:
- Air, Water, Steam
- Air, Water, Inert gas

Note: For details, please contact SMC.
# SMC Air Preparation System

## Indication
The degree of quality is indicated with 1, 4 and 2 for systems with solid particle “class 1,” moisture “class 4” and oil “class 2.”

## Impurity in Compressed Air

<table>
<thead>
<tr>
<th>System no.</th>
<th>Application</th>
<th>Moisture</th>
<th>Impurity</th>
<th>Cleanliness</th>
<th>Oil odor</th>
<th>Class</th>
<th>Quality grade as system</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Water drop removal air</td>
<td>Atmospheric pressure dew point (not in the middle of piping pipe)</td>
<td>3 µm (Filtering efficiency 99%)</td>
<td>3 µm (Filtering efficiency 99.9%)</td>
<td>Yes</td>
<td>2.4, 3</td>
<td>2.6, 3</td>
</tr>
<tr>
<td>B</td>
<td>Dry air</td>
<td>Atmospheric pressure dew point (not in the middle of piping pipe)</td>
<td>1.7 µg/m³ (ANR) to 1.8 µg/m³ (ANR)</td>
<td>0.8 ppm</td>
<td>Yes</td>
<td>14, 2</td>
<td>15, 2</td>
</tr>
<tr>
<td>C</td>
<td>Dry air</td>
<td>Atmospheric pressure dew point (not in the middle of piping pipe)</td>
<td>0.1 mg/m³ (ANR) to 0.1 mg/m³ (ANR)</td>
<td>0.01 ppm</td>
<td>No</td>
<td>14, 1</td>
<td>15, 1</td>
</tr>
<tr>
<td>D</td>
<td>Dry clean air</td>
<td>Atmospheric pressure dew point (not in the middle of piping pipe)</td>
<td>0.01 µm (Filtering efficiency 99.9%)</td>
<td>0.008 ppm</td>
<td>No</td>
<td>11, 1</td>
<td>12, 1</td>
</tr>
<tr>
<td>E</td>
<td>Deodorant air</td>
<td>Atmospheric pressure dew point (not in the middle of piping pipe)</td>
<td>0.1 µg/m³ (ANR) to 0.1 µg/m³ (ANR)</td>
<td>0.08 ppm</td>
<td>No</td>
<td>11, 1</td>
<td>12, 1</td>
</tr>
<tr>
<td>F</td>
<td>Low dew point air (For clean room)</td>
<td>Atmospheric pressure dew point</td>
<td>0.02 µg/m³ (ANR)</td>
<td>0.01 µm (Filtering efficiency 99.9%)</td>
<td>No</td>
<td>102, 2</td>
<td>106, 2</td>
</tr>
<tr>
<td>G</td>
<td>Low dew point air (For clean room)</td>
<td>Atmospheric pressure dew point</td>
<td>0.02 µg/m³ (ANR)</td>
<td>0.01 µm (Filtering efficiency 99.9%)</td>
<td>No</td>
<td>102, 2</td>
<td>106, 2</td>
</tr>
<tr>
<td>H</td>
<td>Low dew point air (For clean room)</td>
<td>Atmospheric pressure dew point</td>
<td>0.02 µg/m³ (ANR)</td>
<td>0.01 µm (Filtering efficiency 99.9%)</td>
<td>No</td>
<td>102, 2</td>
<td>106, 2</td>
</tr>
</tbody>
</table>

## Description

<table>
<thead>
<tr>
<th>Air Tank</th>
<th>Air Cooled Aftercooler</th>
<th>Water Cooled Aftercooler</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>HAA, HAW</td>
<td>LC</td>
</tr>
</tbody>
</table>

## Flow capacity scfm

<table>
<thead>
<tr>
<th>Main Line Filter</th>
<th>Refrigerated Air Dryer</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.6 to 1,483</td>
<td>6.3 to 224</td>
</tr>
<tr>
<td>3.53 to 2,295</td>
<td>176°F</td>
</tr>
<tr>
<td>11 to 441</td>
<td>176°F</td>
</tr>
</tbody>
</table>

## Coolant

- **Air Tank:** Select either Air Cooled Aftercooler or Water Cooled Aftercooler
- **Cooling:** Dehumidification, Refrigeration, Heating, Condensation, Cooling, Dehumidification

## Air Tank

- **Main Line Filter:** Dehumidification
- **Refrigerated Air Dryer:** Dehumidification, Refrigeration

## Screw Air Compressors

- **Refrigerated Air Dryer:** Dehumidification

## Note

1. When the inlet oil mist density (compressed air density) is approximately 30 mg/m³ (ANR) or less.
2. This describes the grade of compressed air quality based on ISO8573-1:2001 (JIS B8392-1:2003), which is the maximum quality grade for the system. It varies, however, depending on the inlet air conditions.
3. Contact SMC since this can be manufactured as a special order (depending on the operating conditions).
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>AMG</td>
<td>AM</td>
<td>ID</td>
<td>AMH</td>
<td>AMD</td>
<td>IDG</td>
<td>AME</td>
<td>AMF</td>
<td>SFD</td>
<td>SFA/SFB/SFC</td>
</tr>
<tr>
<td>10.6 to 424</td>
<td>3 to 27.5</td>
<td>7.1 to 424</td>
<td>7.1 to 1412</td>
<td>0.35 to 35.3</td>
<td>2.65 to 10.6</td>
<td>1.8 to 5.3</td>
<td>7.1 to 424</td>
<td>7.1 to 1412</td>
<td>3.5 to 17.7</td>
</tr>
</tbody>
</table>

- **144°F**
  - Water dew point: 1.4°F
  - Water drop removal ratio: 0.01 µm (99.9%)
  - Moisture content: 0.004 mg/m³ (ANR)

- **5°F**
  - Water dew point: 4°F
  - Water drop removal ratio: 0.01 µm (99.9%)
  - Moisture content: 0.0032 ppm (ANR)

- **-40°F**
  - Water dew point: -76°F
  - Water drop removal ratio: 0.01 µm (99.9%)
**Pneumatic Instrumentation Equipment**

1. **Main Line Filter**
   - **Series AFF**
     - Filtration accuracy: 3 µm (95% filtered particle size)
     - Rated flow: 106 to 1483 scfm (300 to 42000 L/min) (ANR)
     - Port size: 6A (1/8) to 4B flange

2. **Pressure Switch**
   - **Series ISG**
     - Set pressure range: 14.5 to 145 psi (0.1 to 1.0 MPa)
     - Port size: 10A (3/8)

3. **Flow Switch**
   - **Series PF2A**
     - Measurement flow rate: cfm (L/min) 0.04 to 0.35 (1 to 10), 0.18 to 1.77 (5 to 50), 0.35 to 3.53 (10 to 100), 0.71 to 7.06 (20 to 200), 1.77 to 17.7 (50 to 500), 3.30 to 106 (150 to 3000) 10.6 to 212 (300 to 6000), 21.2 to 424 (600 to 12000)
     - Port size: 6A to 50A (1/8 to 2)

4. **Filter Regulator**
   - **Series 1301/1W**
     - Filtration accuracy: 5 µm
     - Set pressure range: 2.9 to 73 psi (0.02 to 0.5 MPa)
     - Port size: 8A (1/4)

5. **Positioner**
   - **Series IP**
     - Input current: 4 to 20 mA DC
     - Port size: 8A (1/4)

6. **Positioner**
   - **Series SY/VQC**
     - Reduced wiring
     - Interface: DeviceNet™, CC-Link, PROFINET™, EtherCAT™, EtherCAT®, CompoNetTM, CANopen

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**Manifold with Supply Stop Valve**
- SS5Y3-X460, SS5Y5-X4601
- SS5Y7-X460, SS5Y3-X2104

The supply pressure can be stopped individually. Solenoid valve can be replaced without shutting off the supply pressure in case of emergency.

**NAMUR Standards Solenoid Valve**
- VFN2120N-X23
- VFN2120N-X36

Air operated type Solenoid valve for actuating a sanitary valve, etc. Conforming to NAMUR standards

**Explosion-proof Solenoid Valve**
- 51-SY5000/7000/9000
- 50-VFE3000/5000
- 50-VPE500/700

Double-layered tube with an external layer of vinyl chloride or polyolefin to protect the inner tube. Double-tubed type (Color: black + black/black + white) and 300 m length are available.

- **IN-241-□□□□□□□□□□□**
- T0604 to T1075 (X120, X121, X166)

Double-layered tube for instrumentation device (single-tubed/double-tubed)

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Trademarks:
- DeviceNet™ is a trademark of ODVA. EtherCAT™ is a trademark of ODVA. CompoNetTM is a trademark of ODVA. EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

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<table>
<thead>
<tr>
<th>Port size</th>
<th>10A (3/8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.30 to 106 (150 to 3000) 10.6 to 212 (300 to 6000), 21.2 to 424 (600 to 12000)</td>
<td>Port size: 8A (1/4)</td>
</tr>
</tbody>
</table>
"Industrial Water (Municipal Water)" Line

1. **Industrial Filter**
   - Series FG/FO/FN
     - Nominal filtration accuracy: 0.5 to 120 μm
     - Port size:
       - Thread: 10A to 50A (3/8 to 2)
       - Flange: 25A to 150A (1B to 6B)

2. **Flow Switch**
   - Series PF3W
     - Measurement flow rate cfm (L/min)
     - 0.02 to 0.14 (0.5 to 4), 0.07 to 0.56 (2 to 16), 0.18 to 1.41 (5 to 40) 0.35 to 3.53 (10 to 100), 1.77 to 8.83 (50 to 250)
     - Port size
     - 10A to 40A (3/8 to 1 1/2)

3. **Pressure Switch**
   - Series IFWS
     - Set flow rate range cfm (L/min)
     - 0.04 to 0.35 (1 to 10)
     - 0.35 to 0.71 (10 to 20)
     - 0.71 to 1.77 (20 to 50)
     - Port size
     - 3/8 to 3/4

4. **2 Port Valve**
   - Series VX
     - Orifice diameter: ø3 to ø50
     - Port size:
       - Thread: 6A to 50A (1/8 to 2)
       - Flange: 32A to 50A

5. **Flow Switch (for Steam)**
   - Series VND
     - Orifice diameter: ø7 to ø50
     - Port size:
       - Thread: 6A to 50A (1/8 to 2)
       - Flange: 32F to 50F

6. **Circulating Fluid Temperature Controller**
   - Thermo-cooler
     - This equipment supplies temperature-controlled water to the heat source in a circular manner.
     - Series HRSH
       - Set temperature: 41 to 95°F (5 to 35°C)
       - Port size: Rc1
       - Cooling capacity (60Hz): 10 to 25 kW
         - (air-cooled, water-cooled)

7. **Check Valve**
   - INA-14-290 (Brass, Rc: 1/8)
   - XTO-674-□ (Brass, Rc: 1/4 to 1/2)
   - INA-14-□ (All stainless steel, Rc: 1/4 to 1/2)
**Inert Gas” “Clean Dry Air” Line**

1. **Regulator**  
   - **Series SRH**  
     - Set pressure range: 7.3 to 102 psi (0.05 to 0.7 MPa)  
     - Port size: 6A to 15A (1/8 to 1/2)  
     - **Series AP/AZ/AK**

2. **2 Port Valve**  
   - **Series VX**  
     - Orifice diameter: ø3 to ø50  
     - Port size: Thread: 6A to 50A (1/8 to 2)  
     - Flange: 32A to 50A

3. **Flow Switch**  
   - **Series PF2A**  
     - Measurement flow rate: cfm (L/min)  
       - 0.04 to 0.35 (1 to 10), 0.18 to 1.77 (5 to 50), 0.35 to 3.53 (10 to 100), 0.71 to 7.06 (20 to 200), 1.77 to 17.7 (50 to 500), 5.30 to 106 (150 to 3000)  
     - Port size: 6A to 50A (1/8 to 2)

4. **Pressure Switch**  
   - **Series ISE**  
     - Rated pressure range: –14.5 to 145 psi (–0.100 to 1.000 MPa)  
     - Port size: M5, 6A (1/8), 8A (1/4)

5. **Clean Air Module**  
   - **Series LLB**  
     - Filtration accuracy: 0.01 µm  
     - Port size: 8A to 10A (1/4 to 3/8)

**Piping Equipment**  
- Stainless Steel 316 Fittings: Series KQG2/KFG2  
- Clean One-touch Fittings: Series KP  
- Fluoropolymer Tubing: Series TH/TL/TD/TLM/TQ  
- Clean Tubing: Series TPH/TPS
“Deionized Water/Chemical Liquids” Line

1. **Pump**
   - Process Pump: Series PAF
   - Discharge flow rate: 0.04 to 1.59 cfm (1 to 45 L/min)
   - Port size
   - Thread: (3/8, 3/4)/10A, 20A
   - Tube extension: 1/2", 3/4"
   - With nut: Connection
   - Port size: 4 or 5 (LQ1, LQ3)

2. **Regulator**
   - Series SRF
   - Port size
   - Integral fitting: Applicable tubing O.D. ø4 to ø19
   - Tube extension: 1/4" to 3/4"
   - Set pressure range: 2.9 to 58 psi (0.02 to 0.4 MPa)

3. **Flow Switch**
   - Series PF2D
   - Measurement flow rate: 0.01 to 1.14 cfm (0.4 to 40 L/min)
   - Port size
   - Tube extension: 3/8" to 3/4"

4. **2 Port Valve**
   - Series LV
   - Port size
   - Thread: (1/8 to 1)/6A to 25A
   - Integral fitting: Applicable tubing O.D. ø3 to ø25
   - Tube extension: ø3 to ø25
   - Orifice diameter ø2 to ø22

5. **Restrictor**
   - Needle Valve: Series LVN
   - Port size
   - Integral fitting: Applicable tubing O.D. ø4 to ø12
   - Orifice diameter ø4.4 to ø10

**Piping Equipment**

- Fluoropolymer Fittings: Series LQ
- Fluoropolymer Tubing: Series TH/TL/TD/TLM/TQ

- Quick Drain Valve: Series LVW
  - Applicable tubing O.D. ø32 to ø89 (25A to 80A)
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