Equipment for
BEER MANUFACTURING PROCESS
Compressed Air Line

1. Filter Regulator/W
   Filters impurities included in the air and regulates the pressure in the instrumentation equipment line.

2. Booster Relay/IL
   Boosts the air flow rate. Makes the actuator drive speed of the industrial valve faster.

3. Positioner/IP
   Controls the actuator of the industrial valve.

4. Lock-Up Valve/IL
   Detects the air pressure drop and retains the opening position of the control valve until the air source restores its normal status.

5. Air Dryer (For Panel Purging) /IDF
   Pressurizes the inside of the control panel to prevent entry of external foreign objects. Prevents dew condensation caused by cooling the inside of the panel or dry air.

6. Solenoid Valve
   Manifold valve for controlling the pilot air for the air operated sanitary valve, etc.

7. NAMUR Standards Solenoid Valve/VFN(□36)
   Solenoid valve for driving the air operated sanitary valve, etc. Conforming to NAMUR standards

8. Solenoid Valve with Shutoff Valve/VQZ
   Solenoid valve for controlling block and vent and butterfly valves from a cabinet. VQZ 4/2 can replace 3/2 on same manifold
Yeast Collection

Instrumentation Equipment Line

1 Filter Regulator

2 Booster Relay

3 Pneumatic-Pneumatic Positioner

4 Lock-Up Valve

5 Air Dryer (For Panel Purging)

6 Manifolds in brewing control cabinets

7 NAMUR Standards Solenoid Valve

Sanitary Valve Control

Equipment for Beer Manufacturing Process

Filling Machine

Filter Regulator

Yeast Collection

Beer Storage Tank

Filtration Process

Filtering Machine

Filtered Beer Tank

Filling Machine

1 Air Dryer (For Panel Purging)

2 NAMUR Standards Solenoid Valve

3 Manifolds in brewing control cabinets

4 Lock-Up Valve

5 Pneumatic-Pneumatic Positioner

6 Filter Regulator

7 Booster Relay

Sanitary Valve Control

Equipment for Beer Manufacturing Process

Filling Machine

Filter Regulator

Yeast Collection

Beer Storage Tank

Filtration Process

Filtering Machine

Filtered Beer Tank

Filling Machine

1 Air Dryer (For Panel Purging)

2 NAMUR Standards Solenoid Valve

3 Manifolds in brewing control cabinets

4 Lock-Up Valve

5 Pneumatic-Pneumatic Positioner

6 Filter Regulator

7 Booster Relay

Sanitary Valve Control

Equipment for Beer Manufacturing Process

Filling Machine

Filter Regulator

Yeast Collection

Beer Storage Tank

Filtration Process

Filtering Machine

Filtered Beer Tank

Filling Machine

1 Air Dryer (For Panel Purging)

2 NAMUR Standards Solenoid Valve

3 Manifolds in brewing control cabinets

4 Lock-Up Valve

5 Pneumatic-Pneumatic Positioner

6 Filter Regulator

7 Booster Relay

Sanitary Valve Control

Equipment for Beer Manufacturing Process

Filling Machine

Filter Regulator

Yeast Collection

Beer Storage Tank

Filtration Process

Filtering Machine

Filtered Beer Tank

Filling Machine

1 Air Dryer (For Panel Purging)

2 NAMUR Standards Solenoid Valve

3 Manifolds in brewing control cabinets

4 Lock-Up Valve

5 Pneumatic-Pneumatic Positioner

6 Filter Regulator

7 Booster Relay

Sanitary Valve Control

Equipment for Beer Manufacturing Process

Filling Machine

Filter Regulator

Yeast Collection

Beer Storage Tank

Filtration Process

Filtering Machine

Filtered Beer Tank

Filling Machine

1 Air Dryer (For Panel Purging)

2 NAMUR Standards Solenoid Valve

3 Manifolds in brewing control cabinets

4 Lock-Up Valve

5 Pneumatic-Pneumatic Positioner

6 Filter Regulator

7 Booster Relay

Sanitary Valve Control
Equipment System Diagram for Beer Manufacturing Process

Cleaning Fluid Control  P.12

<Fluororesin Equipment>
- Air Operated Valve/ LV
- Fittings/LQ
- Tubing/ TL/TH/TD/TLM
- Process Pump/PAF

Regulation of Pressure in Vessel Tank/Filling
- Electro-Pneumatic Regulator/ ITV
- Precision Regulator/IR

Rotation Part
- Rotary Joint/MQR
  Supplies the air to the rotary and swing shafts.

Press Part
- Standard Cylinder
### Equipment for Beer Manufacturing Process

#### Static Electricity Prevention Measures
- **Ionizer**/IZ
  - **IZN10**
  - **IZS40**
  - **IZF10**

#### Steam Control
- **2 Port Valve for Steam/VXS**

#### OK/NG Judgement
- **2 Port Valve/VX2**

### Static Elimination of PET Bottle
- Fall Prevention During Transportation
- Prevention of Dust Sticking

### Static Elimination of Film
- Prevention of Dust Sticking
- Prevention of Winding Failure Caused by Wrinkle
**Equipment System Diagram for Beer Manufacturing Process**

### Corrugated Fiberboard Packing

- Paper Particle and Particle Dust Prevention Measures
- With Heavy-duty Scraper, Bellows and Dust Cover

- **With Heavy-duty Scraper**
  - Removes foreign objects sticking to the rod.

- **With Bellows and Dust Cover**

### Corrugated Box Transfer/Transportation

- Air Cylinder
- Guide Cylinder

### Polyethylene Resin Packing

- Ionizer/Iz

### Directional Control Valves

- Compact and lightweight design ensures installation of movable part in a narrow space.

- 4 Port Solenoid Valve/SJ
- 5 Port Solenoid Valve/SY
- 5 Port Solenoid Valve/SV
- Compact 5 Port Solenoid Valve/S0700

### Vacuum Ejector

- Vacuum Ejector
- Pad Variations
- Air Suction Filter Variations
- Related Equipment for Vacuum System
- Pressure Sensor/ZSE30A(F)/ISE30A
- Pressure Sensor/PSE
Evaporates a thin carbon film on the inner surface of the PET bottle. PET bottle with excellent oxygen and carbonic acid barrier capability.

<table>
<thead>
<tr>
<th>PET Bottle Manufacture</th>
<th>High Barrier (Deposition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blow Molding</td>
<td></td>
</tr>
</tbody>
</table>

<5.0 MPa Pneumatic Equipment Variation>

Applications include air-blowing, charging fluid into a vessel, or discharging (Blow-molding equipment, etc.)

Made to Order/Manifold Unit

Example of driving a cylinder

Vacuum Deposition

- High Vacuum Valve/XL, XM/XY

- Process Gas Equipment

- Clean Gas Filter/SF

- Pressure Switch/ZSE/ISE
Air Preparation Equipment Line

1. Air Tank
   - Series AT
   - Tank capacity: 3.5 to 106 ft³ (100 to 3000 L)
   - Port size: 15A (1/2) to 4B flange

2. Aftercooler
   - Air-cooled Series HAA
   - Applicable compressor: 7.5 to 37 kW
   - Air flow capacity: 35.3 to 201 scfm (1000 to 5700 L/min (ANR))
   - Water-cooled Series HAW
   - Applicable compressor: 2.2 to 110 kW
   - Air flow capacity: 10.6 to 635.6 scfm 300 to 18000 L/min (ANR)

3. Main Line Filter
   - Series AFF
   - Nominal filtration rating: 3 μm (95% filtered particle size)
   - Rated flow: 10.6 to 1483 scfm (300 to 42000 L/min (ANR))
   - Port size: 6A (1/8) to 4B flange

4. Air Dryer
   - Series IDF
   - Applicable compressor: 0.75 to 370 kW
   - Air flow capacity: 3.53 to 2295 scfm (0.10 to 65.0 m³/min (ANR))
   - Series IDU
   - Applicable compressor: 2.2 to 37 kW
   - Air flow capacity: 11.3 to 438 scfm (0.32 to 12.4 m³/min (ANR))

5. Mist Separator
   - Series AM
   - Nominal filtration rating: 0.3 μm (95% filtered particle size)
   - Rated flow: 10.6 to 1483 scfm (300 to 42000 L/min (ANR))
   - Port size: 6A to 50A (1/8 to 1/2)

6. Odor Removal Filter
   - Series AMF
   - Nominal filtration rating: 0.01 μm (95% filtered particle size)
   - Rated flow: 7.06 to 1412 scfm (200 to 40000 L/min (ANR))
   - Port size: 6A (1/8) to 6B flange
Equipment for Beer Manufacturing Process

Inert Gas Line (N₂, CO₂, etc.)

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 AK
   - Material: SUS316
   - Port size: 1/4 to 1/2

2 2 Port Valve
   Series VX
   - Orifice diameter: Ø2 to Ø10
   - Port size: 1/8 to 1/2

3 Flow Switch
   Series PF2A
   - Measurement flow rate: 0.04 to 424 scfm (1 to 12000 L/min)
   - Port size: 6A to 50A (1/8 to 2)

4 Pressure Switch
   Series ISE
   - Rated pressure range: –15 to 145 psi (~0.100 to 1.000 MPa)
   - Port size: M5, 6A (1/8), 8A (1/4)

5 Clean Gas Filter
   Series SF
   - Nominal filtration rating: 0.01 μm
   - Port size: 8A to 15A (1/4 to 1/2)

6 Clean Air Module
   Series LLB
   - A flow switch, regulator, 2 port valve, restrictor, and filter have been combined into a single unit.
   - Easily obtains clean air.

Piping Equipment
   Stainless Steel Fittings: Series KQG2/KFG2
   Clean One-touch Fittings: Series KP
   Fluororesin Tubing: Series TH/LT/TD/TPH/TPS

Air Piping Line
   - Inert Gas (N₂, CO₂, etc.)
### Air Preparation Equipment Selection Guide

145 psi = 1 MPa, 32°F = 0°C, 1 gal = 3.8 L, 1 scfm = 28.32 L/min

<table>
<thead>
<tr>
<th>Solid particle</th>
<th>Max. number of particles/1 m³</th>
<th>Particle size d μm</th>
<th>Concentration mg/m³</th>
<th>Oil #N</th>
<th>Oil atomized mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 0.10</td>
<td>≤ 0.10</td>
<td>≤ 0.10</td>
<td>≤ 0.10</td>
<td>≤ 0.10</td>
<td>≤ 0.10</td>
</tr>
<tr>
<td>1 Not specified</td>
<td>100</td>
<td>100</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>2 Not specified</td>
<td>10000</td>
<td>1000</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>3 Not specified</td>
<td>10000</td>
<td>1000</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>4 Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>5 Not specified</td>
<td>Not specified</td>
<td>10000</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6 NA</td>
<td>≤ 5</td>
<td>≤ 5</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>7 NA</td>
<td>≤ 40</td>
<td>≤ 40</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

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>Moisture</th>
<th>Filtration</th>
<th>Oil mist concentration</th>
<th>Cleanliness</th>
<th>Oil content</th>
<th>Cleaning grade as a system</th>
<th>Atmospheric pressure dew point (0.7 MPa)</th>
<th>Pulse attenuation, Accumulation (ANR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water drop removed air</td>
<td>7 g/m³ (ANR)</td>
<td>0.1 mg/m³</td>
<td>0.01</td>
<td>3 μm</td>
<td>99%</td>
<td>0.7 MPa, 25°C</td>
<td>3.5</td>
</tr>
<tr>
<td>Dry air</td>
<td>0.3 μm (ANR)</td>
<td>0.01 mg/m³</td>
<td>0.01</td>
<td>3 μm</td>
<td>99%</td>
<td>0.7 MPa, 25°C</td>
<td>3.5</td>
</tr>
<tr>
<td>Dry clean air</td>
<td>1.7 g/m³ (ANR)</td>
<td>0.01 mg/m³</td>
<td>0.01</td>
<td>3 μm</td>
<td>99%</td>
<td>0.7 MPa, 25°C</td>
<td>3.5</td>
</tr>
<tr>
<td>Dry clean air</td>
<td>0.01 mg/m³</td>
<td>0.01 mg/m³</td>
<td>0.01</td>
<td>3 μm</td>
<td>99%</td>
<td>0.7 MPa, 25°C</td>
<td>3.5</td>
</tr>
<tr>
<td>Deodorant air</td>
<td>0.01 mg/m³</td>
<td>0.01 mg/m³</td>
<td>0.01</td>
<td>3 μm</td>
<td>99%</td>
<td>0.7 MPa, 25°C</td>
<td>3.5</td>
</tr>
<tr>
<td>Low dew point clean air</td>
<td>0.5 g/m³ (ANR)</td>
<td>0.01 mg/m³</td>
<td>0.01</td>
<td>3 μm</td>
<td>99%</td>
<td>0.7 MPa, 25°C</td>
<td>3.5</td>
</tr>
<tr>
<td>Low dew point clean air (For clean room)</td>
<td>0.01 mg/m³</td>
<td>0.01 mg/m³</td>
<td>0.01</td>
<td>3 μm</td>
<td>99%</td>
<td>0.7 MPa, 25°C</td>
<td>3.5</td>
</tr>
</tbody>
</table>

### Main Line

- **Air Tank**
  - Pressure: 1,000 to 3,000 L
  - Temperature: 70°C
  - Maximum inlet air temperature: 70°C

- **Air Cooled Aftercooler**
  - Pressure: 1,000 to 3,000 L
  - Temperature: 70°C

- **Water Cooled Aftercooler**
  - Pressure: 1,000 to 3,000 L
  - Temperature: 70°C

- **Main Line Filter**
  - Pressure: 1,000 to 3,000 L
  - Temperature: 70°C

### Refrigerated Air Dryer

- **Model**
  - AT
  - HAA, HAW
  - AFF
  - IDF
  - IDU
  - Pressure: 1,000 to 3,000 L
  - Temperature: 70°C

- **Flow capacity (L/min (ANR))**
  - 1,000 to 7,500
  - 300 to 18,000

- **Max. inlet air temperature**
  - 70°C

- **Filteration (Filtering efficiency)**
  - 3 μm (99%) for HAA, HAW

- **Outlet oil mist concentration (Max.)**
  - 0.01 mg/m³

- **Pressures (L/min (ANR))**
  - IDF: 300 to 42,000
  - IDU: 100 to 65,000
  - IDU: 320 to 12,500

### System no.

- **Application**
  - Air blowing (Simple removal of particles)
  - General pneumatic tools

- **Impurity in compressed air**
  - Moisture: Ambient
  - Filtration: 3 μm
  - Oil mist concentration: 0.01 mg/m³
  - Cleanliness: 3 μm
  - Oil content: 0.01 mg/m³

### Notations

- **Note 1:** When the inlet oil mist concentration (compressor discharge concentration) is approx. 30 mg/m³ (ANR) or less.
- **Note 2:** This describes the grade of compressed air quality based on ISO6573-1:2001 (JIS B8392-1:2003), which is the maximum quality grade for the system. It varies, however, depending on the inlet air conditions.
- **Note 3:** Please contact SMC since this can be manufactured as a special order (depending on the operating conditions).
### Industrial Water (Municipal Water) Line

#### Water Piping Line
- Industrial water (Municipal water)
- Steam

#### Diagram
- Cooling Tower (Cooling building)
- Pump
- Compressor room
- Tank
- Dryer
- Flow Switch
- Flow Switch
- Flow Switch
- Filter
- Filter
- Filter
- Flow Switch
- Flow Switch
- Filter
- Filter
- Filter

#### Equipment List

1. **Industrial Filter**
   - **Series FG/FQ/FN**
   - Nominal filtration rating: 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: 0.13 to 66.0 gpm (0.5 to 250 L/min)
   - Port size
     - 10A to 40A (3/8 to 1 1/4)

3. **Pressure Switch**
   - **Series ISE**
   - Rated pressure range: −15 to 290 psi
   - Orifice diameter: ø10 to ø50
   - Port size
     - Thread: 1/2", 3/4"

4. **2 Port Valve**
   - **Series VXP**
   - Orifice diameter: ø10 to ø50
   - Port size
     - Thread: 8A to 50A (1/4 to 2)
     - Flange: 32A to 50A

5. **2 Port Valve (for Steam)**
   - **Series VND**
   - Orifice diameter: ø7 to ø50
   - Rated flow
     - 7.06 to 1412 scfm
     - 200 to 40000 L/min (ANR)
   - Port size
     - Thread: 6A to 50A (1/8 to 2)
     - Flange: 32A to 50A

6. **Circulating Fluid Temperature Controller**
   - **Thermo-chiller**
   - Series HR
   - This equipment supplies temperature-controlled water to the heat source in a circular manner.

---

Installing extra cooling towers can be troublesome. The HRG (air-cooled refrigerated type) can be moved easily to wherever you need it, when you need it. Cooling water is supplied from the attached hose.
Cleaning Fluid Line

1 Pump
Process Pump: Series PA
- Discharge flow rate: 0.26 to 11.9 gpm (1 to 45 L/min)
- Port size
  - Thread: (3/8, 3/4)/10A, 20A
  - Tube extension: 1/2", 3/4"

2 Regulator
Series SRF
- Port size
  - Integral fitting: Applicable tube 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: 1.06 to 10.6 gpm (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 tube 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 tube O.D. ø4 to ø12
  - Orifice diameter ø4.4 to ø10

Piping Equipment
Fluororesin Fittings: Series LQ
Fluororesin Tubing: Series TH/TL/TD/TLM
**Equipment for Beer Manufacturing Process**

### Piping Equipment (Fittings and Tubing)

#### S Couplers

**Series KK**
- **Fluid**: Air, Water
- **Applicable tube O.D.**: ø3.2 to ø16
- **Applicable hose I.D./O.D.**: 5/8 to 11/16
- **Port size**: M5 to 25A (3/4)

#### One-touch Fittings

**Series KQ2**
- **Fluid**: Air
- **Applicable tube O.D.**: ø4 to ø16

#### Insert Fittings

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

#### Stainless Steel 316 One-touch Fittings

**Series KQG2**
- **Fluid**: Air, Water, Steam
- **Applicable tube O.D.**: ø4 to ø12

#### Fluoropolymer Fittings

**Series LQ**
- **Fluid**: Deionized water, Chemicals, etc.
- **Applicable tube O.D.**: ø3 to ø25

#### S Couplers/Stainless Steel 304

**Series KKA**
- **Fluid**: Air, Water
- **Port size**: 6A to 50A (1/8 to 11/2)

#### Brass One-touch Fittings

**Series KQB2**
- **Fluid**: Air, Water
- **Applicable tube O.D.**: ø4 to ø12

#### Self-align Fittings

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

#### Stainless Steel 316 Insert Fittings

**Series KFG2**
- **Fluid**: Air, Water, Steam
- **Applicable tube O.D.**: ø4 to ø12

#### Clean One-touch Fittings

**Series KP**
- **Fluid**: Air, N₂, Water (Deionized water)
- **Applicable tube O.D.**: ø4 to ø12

### Tubing

<table>
<thead>
<tr>
<th>Series</th>
<th>Material</th>
<th>Fluid</th>
<th>O.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Nylon</td>
<td>Air, Water</td>
<td>ø4 to ø16</td>
</tr>
<tr>
<td>TS</td>
<td>Soft Nylon</td>
<td>Air</td>
<td>ø4 to ø16</td>
</tr>
<tr>
<td>TU</td>
<td>Polyurethane</td>
<td>Air, Water</td>
<td>ø4 to ø16</td>
</tr>
<tr>
<td>TUS</td>
<td>Soft Polyurethane</td>
<td>Air</td>
<td>ø4 to ø12</td>
</tr>
<tr>
<td>TUH</td>
<td>Hard Polyurethane</td>
<td>Air</td>
<td>ø4 to ø12</td>
</tr>
<tr>
<td>TPH, TPS</td>
<td>Polyolefin-based resin</td>
<td>Air, N₂, Water (Deionized water)</td>
<td>ø4 to ø12</td>
</tr>
<tr>
<td>TH</td>
<td>FEP (Fluoropolymer)</td>
<td>Air, Water, Inert gas</td>
<td>ø4 to ø12</td>
</tr>
<tr>
<td>TD</td>
<td>Modified PTFE (Soft Fluoropolymer)</td>
<td>Air, Water, Inert gas</td>
<td>ø4 to ø12</td>
</tr>
<tr>
<td>TL</td>
<td>Super PFA (Note) Deionized water, Chemicals, etc.</td>
<td>ø4 to ø19</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Please contact SMC for details.*

Length: Up to 500-meter rolls can be used, but the maximum roll length depends on tube materials and external diameter. Please consult SMC for details. (Made To Order)
Positioning Cylinder

Series MPC Multi-Position Cylinder

A pneumatic cylinder with integral position control needing only 0-10VDC or 4-20mA input signal. Position control is a continuous servo-loop, taking a feedback signal from the linear sensor. It will keep the target position by controlling pressure on the cylinder by way of opening and closing the solenoid valves. Unlike analog control for a servo valve, the solenoid valves mounted internally are a simple ON-OFF control.

“Case Conveyor Rail Adjustment Application”

“Conveyors feed palletizers at a high rate of speed. The conveyor width is adjusted according to the case or carton size coming down the line. This process has been done manually by operators in the past which can lead to mistakes and/or shut downs while the task is performed. One operator handles several machines so it can take time to move from one machine to the next. The MPC has allowed this process to be fully automated. The operator can program via touch screen any changes to the conveyor line without leaving his position. The MPC can perform this function without all of the added devices required by using a servo motor. A closed loop is achieved with two connections.”

— Project Engineer “Brewery Production Plant”
Conforming to NAMUR standards

Interface Valve

VFN2120N-X23 / VFN2120N-X36

**Features:**

**Hygienic design**
Resin body with less concaves
Direct cleaning of valve is possible (IP67).

**3 port / 5 port available**
Function plate realized 3 / 5 port selectable

**Low power consumption**
Power consumption: 0.5 W
(Conventional model: 1.8 W) * DC specifications

**Conforming to CE standards**
Port threads: NPT1/4, G1/4 available

---

**Specifications:**

**Valve Specifications**

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient and fluid temperature</td>
<td>22 to 131 psi (0.15 to 0.9 MPa)</td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>14 to 140°F (–10 to + 60°C)</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td>Manual override</td>
<td>Push type / Locking type (tool required) / Locking type (manual type)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Equivalent to IP67</td>
</tr>
<tr>
<td>Thread port size</td>
<td>1/4”</td>
</tr>
<tr>
<td>Flow characteristics (Cv / Effective area)</td>
<td>0.8 / 11 mm²</td>
</tr>
</tbody>
</table>

**Electrical Specifications**

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowable voltage fluctuation</td>
<td>–15 to + 10% of</td>
</tr>
<tr>
<td>Type of coil insulation</td>
<td>Class B</td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.5 W</td>
</tr>
</tbody>
</table>

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**For air, gas, steam, water, oil**

Pilot Operated 2 Port Solenoid Valve

Series VXP21/22/23

**Features:**

Wide variations of combination.

Able to control a wide variety of fluids.

Valve can be matched to particular application through selection of body materials (Brass/BC6 or Stainless steel), seal material (NBR, PTFE, EPDM or FKM) and solenoid coil (Class B or H).

Easy to disassemble and reassemble in a short time.

Flange for threaded ports available.

(32A to 50A)
Digital Flow Switch for Air

Series PF2A

Features:

- 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
- IP65

<table>
<thead>
<tr>
<th>Series</th>
<th>Set flow range scfm (L/min)</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF2A</td>
<td>0.04 to 0.35 (1 to 10)</td>
<td>1/8, 1/4</td>
</tr>
<tr>
<td></td>
<td>0.18 to 1.77 (5 to 50)</td>
<td>1/8, 1/4</td>
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<tr>
<td></td>
<td>0.35 to 3.5 (10 to 100)</td>
<td>3/8</td>
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<tr>
<td></td>
<td>0.71 to 7.1 (20 to 200)</td>
<td>3/8</td>
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<td>1.77 to 17.7 (50 to 500)</td>
<td>1/2</td>
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<td>5.30 to 106 (150 to 3000)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10.6 to 212 (300 to 6000)</td>
<td>11/2</td>
</tr>
<tr>
<td></td>
<td>21.2 to 424 (600 to 12000)</td>
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</table>

Digital Flow Switch for Energy Saving Management!

The air flow control in each application is absolutely required to promote the energy saving.

The energy saving activity starts with numerical management of the air flow consumptions of various equipments and lines, and clarification of the improvement targets and effects.

The accumulated pulse output function enables remote monitoring of accumulated flow.
Subject:
Automatic Leak Detection in a Compressed Air System (CAS)

Background:
Recent Energy Saving Audits completed by our Energy Saving Experts have revealed that poor system design and inadequate maintenance is having a significant impact on the cost of production with up to 20% of all compressed air simply just leaking away and wasting over 2.3 billion Euros for European compressed air users each year.

Objective:
To find a simple, low cost, solution to help detect air leakage in a compressed air circuit, by value in Nl/min, by integrating an automated leak detection system as a part of the machine that can even monitor leakage when the machine is in operation.

Considerations:
In today’s economic climate the time and effort required to detect or monitor for compressed air leakages often means that it’s a low priority. Most machines function 24/5 and in some cases 24/7 so it’s just not economically viable to cease operation to check individual valves, tubes, fittings etc. Also the use of a ultra-sonic leak detector is time consuming and relatively expensive to undertake.

Solution:
SMC’s A.L.D.S – a low cost, automated leak detection system.
Benefits:
By adding an A.L.D.S. to a machine it can:

- detect air leakages as and when they occur - even on a daily basis
- confirm the exact value of the leak in l/m
- provide maintenance personnel with a detailed report on where the leakages are located without the need to detect individual components
- operate and detect leakages even when the machine is in operation
- be integrated in the machine’s software without the need for any external supervision system – scad etc.

Basic Operating Concept:
The A.L.D.S. is based on a manifold block consisting of a standard SMC Series PFM flow meter plus the introduction of a diverting valve which is installed in the machines main air supply. The valve is operated using sequence instruction which are integrated in the machines operating software.

Key A.L.D.S Product:
Series PFM – a Digital Flow Switch with a dual colour display

A key component in SMC’s portfolio of Energy Saving products, the PFM Digital Flow Switch utilises a micro-electromechanical system (MEMs) in its construction and this latest microchip technology delivers outstanding accuracy and fast response speeds, especially when working with low flow applications.

Suitable for use with Dry air, N₂, Ar, and CO₂, the PFM range is extremely compact and lightweight and it’s easy-to-see digital sensor provides excellent visual performance - at-a-glance. And, as the flow adjustment valve is integrated into the switch, piping installation could never be any easier and mounting flexibility is ensured.

Next Steps:
For more information on the innovative A.L.D.S (automated leak detection system), including the high performance Series PFM flow meter range – simply contact your nearest SMC office using the contact details provided.
Equipment for BEER MANUFACTURING PROCESS

NP-E12-19A

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