FINE series PURE
High-temperature Valve series

KIWAMI
The Height of Excellence

Thanks to you-

Fujikin Corp.

80th
Anniversary

2012

FWBR-71-6.35
FWBR-71-9.52

Dedicated heating unit
Patent pending

Safety & Clean Technology

Fujikin, Incorporated
High-temperature Valve Series Lineup

FWBR-71-6.35

FPR-NHD-71-6.35-PA

FPR-UDDF-71-6.35-PA
-Pi

FPR-71-6.35-PA
-Pi

FPR-71-6.35-HT

P3

P5

P5

P6

0.25

0.3
MEGA-M LA
All-metal Pneumatic Valves

High-temperature Valves
MEGA-M LA is an all-metal valve for use in temperatures of up to 350°C. (Exact temperature resistance will depend on operating conditions.) When coupled with a dedicated heater, it significantly helps in preventing deposits from adhering in high-temperature processes and gas exhaust systems.

Standard connection is 1/8” FINELOK

- Maximum temperature: 350°C. (Exact temperature resistance will depend on operating conditions.)
- Durability tested to over 200,000 cycles at 300°C.
- Extra-durable type (1 million cycles) available (Cv value: 0.1).

All-metal actuator withstands temperatures as high as 300°C.

Excellent gas displacement characteristics. (1.38cc total volume for the male UJR version.)

Use of a metal seat provides all-metal wetted surfaces.

All wetted surfaces are UP treated.
Specifications / Materials / Performance

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Nominal Diameter</th>
<th>Maximum Operating Pressure</th>
<th>Fluid Temperature Range</th>
<th>Maximum Cv* (with N2 gas at 20°C)</th>
<th>Actuation Pressure</th>
<th>End Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.35</td>
<td>1 MPa</td>
<td>-10 to +300°C</td>
<td>0.25</td>
<td>0.39 to 0.59 MPa</td>
<td>UJR, UPG®, Wseal</td>
</tr>
<tr>
<td></td>
<td>9.52 &amp; 12.7</td>
<td></td>
<td></td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Theoretical leak rate: External leak: < 5 × 10^-14 Pa·m³/sec
- Tested leak rate: External leak: < 5 × 10^-15 Pa·m³/sec
- Seat leak: < 5 × 10^-14 Pa·m³/sec
- All valves are helium leak tested.
- Durability of over 200,000 cycles at 300°C under test conditions
- * Depends on the configuration of the body.

Materials | Part | Material
---|------|------
| Body | SUS316L double-melt |
| Diaphragm | Nickel-cobalt alloy |
| Stem/bonnet | SUS316 |

Cv - Temperature Curve

Example

Dimensions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Figure</th>
<th>L</th>
<th>h</th>
<th>H</th>
<th>D</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWB(R)-71-6.35</td>
<td>1</td>
<td>57</td>
<td>14.3</td>
<td>69.5</td>
<td>52</td>
<td>18</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>FWB(R)-71-9.52</td>
<td>1</td>
<td>76.2</td>
<td>11.1</td>
<td>94.3</td>
<td>62</td>
<td>20.2</td>
<td>20.2</td>
<td>35</td>
</tr>
<tr>
<td>FWB(R)-71-6.35-2</td>
<td>2</td>
<td>70.6</td>
<td>14.3</td>
<td>69.5</td>
<td>52</td>
<td>18</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>FWB(R)-71-9.52-2</td>
<td>2</td>
<td>83</td>
<td>12.7</td>
<td>94.3</td>
<td>62</td>
<td>20.2</td>
<td>20.2</td>
<td>35</td>
</tr>
<tr>
<td>FWBR-71-6.35-ATS (*)</td>
<td>1</td>
<td>57</td>
<td>14.3</td>
<td>69.5</td>
<td>52</td>
<td>18</td>
<td>18</td>
<td>26</td>
</tr>
</tbody>
</table>

*(Optional or made-to-order; the Cv value is 0.1.)
# High-temperature Valves

## High-temperature Pneumatic Direct Diaphragm Valves

**FPR-NHD-71-★★-PA**

**Durability**

- Durability of over 30 million cycles at 200°C

**Seat Material**

- PFA (PFA resin) and PI (polyimide resin) are also available.

**Specifications**

<table>
<thead>
<tr>
<th>Nominal Diameter</th>
<th>Maximum Operating Pressure</th>
<th>Fluid Temperature Range</th>
<th>Maximum Cv* (with N₂ gas at 20°C)</th>
<th>Actuation Pressure</th>
<th>Supply Air Connection</th>
<th>End Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.35</td>
<td>1 MPa</td>
<td>-10 to +200°C</td>
<td>0.4</td>
<td>0.45 to 0.6 MPa</td>
<td>M6 x 0.8</td>
<td>UJR, UPG, F900, tube stub</td>
</tr>
<tr>
<td>9.52</td>
<td></td>
<td></td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Theoretical leak rate: External leak: < 5 x 10⁻¹¹ Pa·m³/sec
- Tested leak rate: External leak: < 5 x 10⁻¹⁰ Pa·m³/sec

* Depends on the configuration of the body.

- All valves are helium leak tested.
- Durability of over 30 million cycles under test conditions.

## High-temperature Pneumatic Direct Diaphragm Valves

**FPR-UDDF-71-★★-NL-PA**

**Durability**

- Durability of over 2 million cycles at 150°C

**Seat Material**

- PFA (PFA resin) and PI (polyimide resin) are also available.

**Specifications**

<table>
<thead>
<tr>
<th>Nominal Diameter</th>
<th>Maximum Operating Pressure</th>
<th>Fluid Temperature Range</th>
<th>Maximum Cv* (with N₂ gas at 20°C)</th>
<th>Actuation Pressure</th>
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</tr>
</thead>
<tbody>
<tr>
<td>6.35</td>
<td>1 MPa</td>
<td>-10 to +150°C</td>
<td>0.25</td>
<td>0.34 to 0.49 MPa</td>
<td>Rc1/8</td>
<td>UJR, UPG, F900, tube stub</td>
</tr>
<tr>
<td>9.52</td>
<td></td>
<td></td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Theoretical leak rate: External leak: < 5 x 10⁻¹¹ Pa·m³/sec
- Tested leak rate: External leak: < 5 x 10⁻¹⁰ Pa·m³/sec

* Depends on the configuration of the body.

- All valves are helium leak tested.
- Durability over 2 million cycles at 150°C under test conditions.
### High-temperature Pneumatic Cylinder Actuator Bellows Valves

**FPR-71-** ★★-PA

Product can withstand temperatures up to 150° C

Seat material: PFA (PFA resin) and PI (polyimide resin) are also available.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Nominal Diameter</th>
<th>Maximum Operating Pressure</th>
<th>Fluid Temperature Range</th>
<th>Maximum Cv* (with N₂ gas at 20°C)</th>
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<td>0.3</td>
<td>0.34 to 0.69 MPa</td>
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<td>UJR, F900, tube stub</td>
</tr>
<tr>
<td></td>
<td>9.52</td>
<td></td>
<td></td>
<td>0.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12.7</td>
<td></td>
<td></td>
<td>0.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Theoretical leak rate: External leak: < 5 x 10⁻¹² Pa-m³/sec, Seat leak: < 5 x 10⁻¹³ Pa-m³/sec
- Tested leak rate: External leak: < 5 x 10⁻¹⁹ Pa-m³/sec, Seat leak: < 5 x 10⁻¹⁹ Pa-m³/sec
- * Depends on the configuration of the body.
- All valves are helium leak tested.

### High-temperature Pneumatic Cylinder Actuator Bellows Valves

**FPR-71-** ★★-HT

Product can withstand temperatures up to 150° C

Seat material: PCTFE

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Nominal Diameter</th>
<th>Maximum Operating Pressure</th>
<th>Fluid Temperature Range</th>
<th>Maximum Cv* (with N₂ gas at 20°C)</th>
<th>Actuation Pressure</th>
<th>Supply Air Connection</th>
<th>End Connection</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>6.35</td>
<td>1 MPa</td>
<td>-10 to +150°C</td>
<td>0.3</td>
<td>0.39 MPa</td>
<td>Rc1/8</td>
<td>UJR, F900, tube stub</td>
</tr>
<tr>
<td></td>
<td>9.52</td>
<td></td>
<td></td>
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<td></td>
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- Tested leak rate: External leak: < 5 x 10⁻¹⁹ Pa-m³/sec, Seat leak: < 5 x 10⁻¹⁹ Pa-m³/sec
- * Depends on the configuration of the body.
- All valves are helium leak tested.
Dedicated Heating Unit

1. **Stable temperatures ensured by patented heating mechanism.**
   
   This unit heats the valve body directly. It heats the fittings indirectly by creating a high-temperature convection chamber around the valve. It maintains a constant temperature in and around the wetted parts of the valve.
   
   For a set temperature of 300°C, the temperature uniformity remains within ±3% (under test conditions).

2. **Easily removed for maintenance.**
   
   Disassembling conventional line heaters can be complicated, and involves removing the entire heating assembly and its insulation. This heater is easily assembled and disassembled: the two halves of its case are held together with two thumbscrews.

3. **Solves problems associated with line heating.**
   
   Conventional line heaters have separate heating units for the fittings and the valves. Their multiple-thermostat design renders them susceptible to heating inconsistency and overheating. By heating both the valve body and the fittings, this heating unit eliminates the problems associated with line heating.

4. **Lightweight and highly durable.**
   
   The case design keeps the unit simple and lightweight.
   
   The heater itself can withstand temperatures approaching 350°C.

5. **Cost efficient.**
   
   Conventional tape or sheathed heaters can be complex and time-consuming to install. Installing this heating unit is safe and easy. As a result, the cost of ownership is lower.
Performance

Stable temperature between 299°C and 305°C in the valve’s wetted parts under test conditions.

UHT-WB-6.35 Temperature Stability (no gas purge)

Temperature stays within ±3% of the set temperature under test conditions.

1: Control point
2: Diaphragm, inlet side 300°C
3: Fitting nut surface 307°C
4: Diaphragm, outlet side 299°C
5: Heater case surface 300°C
6: Actuator
7: Inside the valve 305°C
8: Control point

(Time)
### Basic Specifications

<table>
<thead>
<tr>
<th></th>
<th>6.35 Heater UHT-WB-6.35</th>
<th>9.52 Heater UHT-WB-9.52</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Model</td>
<td>FWBR-71-6.35(ATS)</td>
<td>FWBR-71-9.52</td>
</tr>
<tr>
<td>Maximum Operating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>350°C (heater only)</td>
<td>350°C (heater only)</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>100 V AC, 150 W</td>
<td>100 V AC, 190 W</td>
</tr>
<tr>
<td></td>
<td>Power Consumption: 140</td>
<td>Power Consumption: 170</td>
</tr>
<tr>
<td></td>
<td>W (at 300°C)</td>
<td>W (at 300°C)</td>
</tr>
<tr>
<td>Rated Resistance</td>
<td>66.7Ω (±10%)</td>
<td>52.6Ω (±10%)</td>
</tr>
<tr>
<td>Heater Wire</td>
<td>Kanthal</td>
<td>Kanthal</td>
</tr>
<tr>
<td>Electrical Lead Wire</td>
<td>Teflon-coated, exposed</td>
<td>Teflon-coated, exposed</td>
</tr>
<tr>
<td>(Load length: 0.5 m)</td>
<td>ends (UL-compliant)</td>
<td>ends (UL-compliant)</td>
</tr>
<tr>
<td>Relay Lead Wire</td>
<td>Polymide-coated STM500</td>
<td>Polymide-coated STM500</td>
</tr>
<tr>
<td>(Load length: 0.5 m)</td>
<td>(UL-compliant)</td>
<td>(UL-compliant)</td>
</tr>
<tr>
<td>Ceramic Heater</td>
<td>WAGO connector (UL-compliant)</td>
<td>WAGO connector (UL-compliant)</td>
</tr>
<tr>
<td>Casing Material</td>
<td>SUS304</td>
<td>SUS304</td>
</tr>
<tr>
<td>Thermocouple Securing</td>
<td>Standard feature (for Ø1.6 mm only)</td>
<td>Standard feature (for Ø1.6 mm only)</td>
</tr>
<tr>
<td>Plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermocouple *1</td>
<td>Optional (for heating control and safety)</td>
<td>Optional (for heating control and safety)</td>
</tr>
<tr>
<td>Fittings *2</td>
<td>UJR-6.35MS-L.33-AW-S (for valves with female end connections)</td>
<td>UJR-9.52MS-L.37-AW-S (for valves with female end connections)</td>
</tr>
</tbody>
</table>

*1: Use a thermocouple of 1.6 mm in diameter and longer than 150 mm.  
*2: These part numbers are for the standard configuration only. All other specifications are for optional configurations (non-Fujikin products included).

### Related Products

- 200 V model
- Block valve heaters are also available.
- Consult with Fujikin for other specifications.
**Thermocouple**

Thermocouple Type K sheath (standard material: SUS304)

Sheath Outer Diameter Ø1.6
Sheath Length: 200 mm
Electrical Lead
Teflon-coated electrical lead (standard) (Heat-resistant up to 180°C)

**Thermocouple Part Number Designation**

<table>
<thead>
<tr>
<th>TCS</th>
<th>K</th>
<th>B</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type K</td>
<td>Sheath Diameter</td>
<td>Electrical Lead Length</td>
<td>Sheath Length</td>
</tr>
<tr>
<td>B: Ø1.6</td>
<td>1: 1m, 3: 3m</td>
<td>1: 200mm</td>
<td></td>
</tr>
</tbody>
</table>

Note:
- We recommend the standard configuration (part numbers shown in red).
- Other manufacturers' products may be used if their dimensions are the same as those of the standard options (sheath diameter: Ø1.6 mm, sheath length: 200mm).
- Please specify lengths for the electrical leads.
- Please contact Fujikin for other specifications.

**Thermocouple Installation**

- Ø1.6mm thermocouple (optional)
- Heater case
- Secure the stud to the plate.
- Wrap the thermocouple around the threads of the included stud or an M5 screw.
- Thermocouple securing plate (standard)