



5-year warranty



Type overview

|      |    |
|------|----|
| Type | DN |
| B278 | 80 |

Technical data

|                           |                          |  |                          |
|---------------------------|--------------------------|--|--------------------------|
| <b>Functional data</b>    | Valve size [mm]          | 3" [80]                                |                          |
|                           | Fluid                    | chilled or hot water, up to 60% glycol |                          |
|                           | Fluid Temp Range (water) | 0...212°F [-18...100°C]                |                          |
|                           | Body Pressure Rating     | 400 psi                                |                          |
|                           | Close-off pressure Δps   | 100 psi                                |                          |
|                           | Flow characteristic      | equal percentage                       |                          |
|                           | Pipe connection type     | Internal thread<br>NPT (female)        |                          |
|                           | Servicing                | maintenance-free                       |                          |
|                           | Flow Pattern             | 2-way                                  |                          |
|                           | Leakage rate             | 0% for A – AB                          |                          |
|                           | Controllable flow range  | 75°                                    |                          |
|                           | Cv                       | 130                                    |                          |
|                           | <b>Materials</b>         | Valve body                             | Nickel-plated brass body |
|                           |                          | Stem                                   | stainless steel          |
| Stem seal                 |                          | EPDM (lubricated)                      |                          |
| Seat                      |                          | PTFE                                   |                          |
| Characterized disc        |                          | TEFZEL®                                |                          |
| O-ring                    |                          | EPDM (lubricated)                      |                          |
| Ball                      |                          | stainless steel                        |                          |
| <b>Suitable actuators</b> | Non-Spring               | ARB(X)                                 |                          |
|                           | Spring                   | AFRB(X)                                |                          |

Safety notes



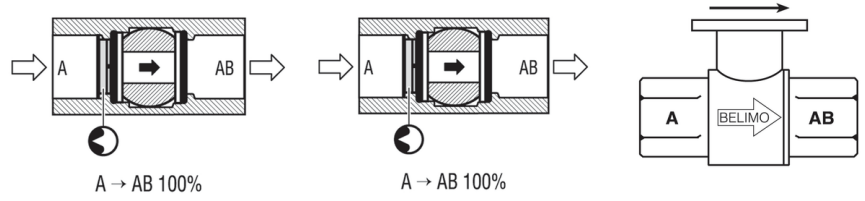
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

Product features

**Application** This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

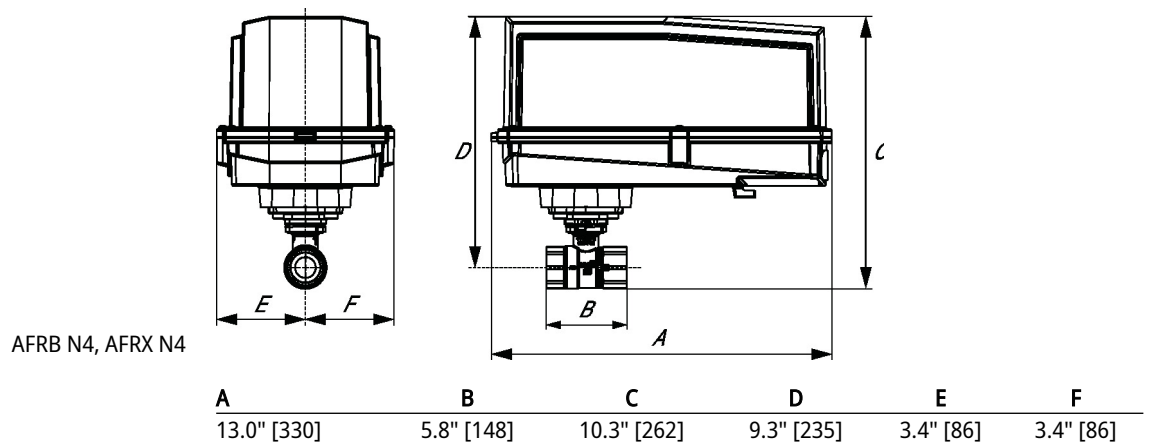
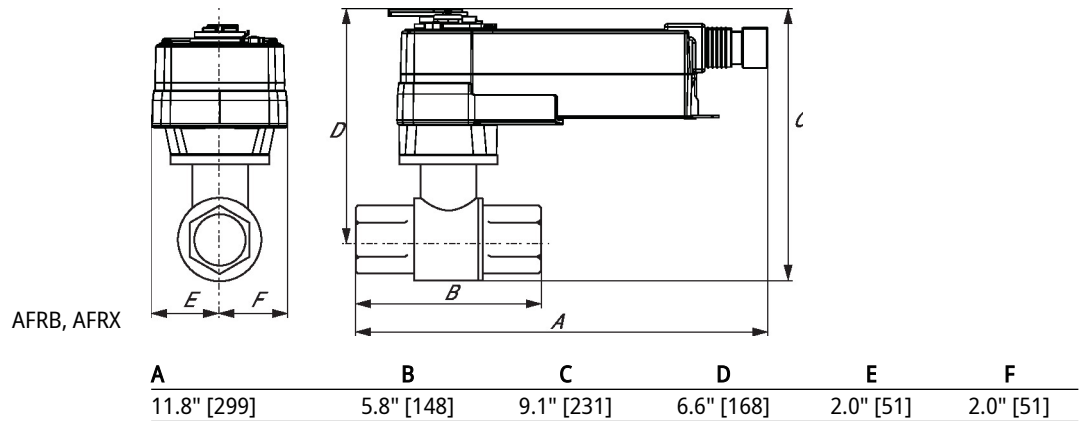
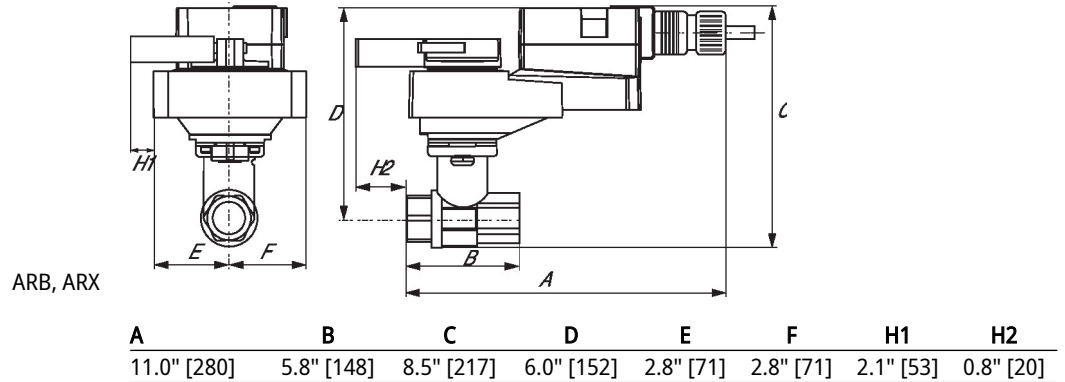
## Flow/Mounting details

Two-way valves should be installed with the disc upstream.

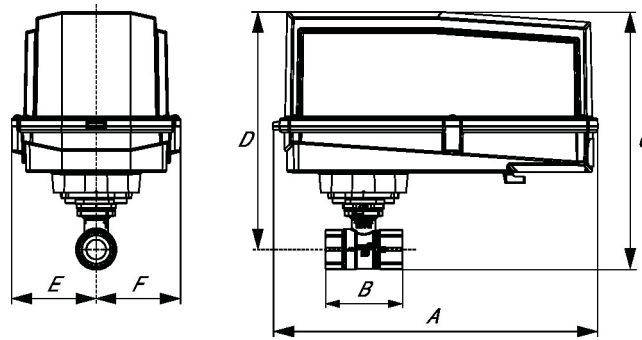


## Dimensions

| Type | DN | Weight          |
|------|----|-----------------|
| B278 | 80 | 9.0 lb [4.1 kg] |

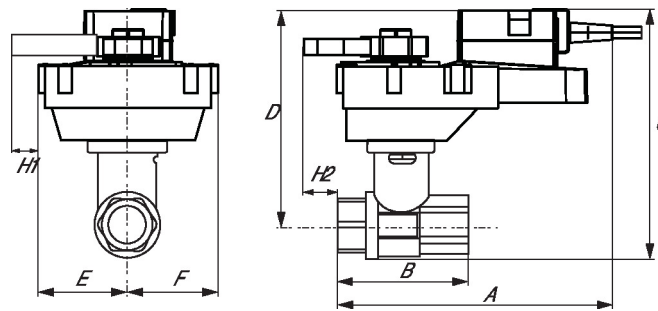


ARB N4, ARX N4, NRB N4, NRX N4



| A           | B          | D          | E         | F         |
|-------------|------------|------------|-----------|-----------|
| 11.4" [289] | 5.8" [148] | 8.0" [203] | 3.1" [80] | 3.1" [80] |

ARQB, ARQX



| A          | B          | C          | D          | E         | F         | H1        | H2        |
|------------|------------|------------|------------|-----------|-----------|-----------|-----------|
| 9.9" [251] | 4.2" [107] | 8.6" [219] | 6.1" [155] | 2.3" [58] | 2.3" [58] | 0.8" [20] | 0.6" [15] |



5-year warranty


**Technical data**

|                        |                                     |   |
|------------------------|-------------------------------------|---|
| <b>Electrical data</b> | Nominal voltage                     | AC/DC 24 V  |
|                        | Nominal voltage frequency           | 50/60 Hz  |
|                        | Nominal voltage range               | AC 19.2...28.8 V / DC 21.6...28.8 V   |
|                        | Power consumption in operation      | 7.5 W   |
|                        | Power consumption in rest position  | 3 W   |
|                        | Transformer sizing                  | 10 VA   |
|                        | Auxiliary switch                    | 2x SPDT, 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V, one set at 10°, one adjustable 10...90° |
|                        | Switching capacity auxiliary switch | 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V   |
|                        | Electrical Connection               | (2) 18 GA appliance cables, 1 m, with 1/2" NPT conduit connectors                                 |
|                        | Overload Protection                 | electronic throughout 0...95° rotation  |
| <b>Functional data</b> | Operating range Y                   | 2...10 V  |
|                        | Operating range Y note              | 4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)   |
|                        | Input impedance                     | 100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point      |
|                        | Operating range Y variable          | Start point 0.5...30 V<br>End point 2.5...32 V  |
|                        | Operating modes optional            | variable (VDC, PWM, on/off, floating point)   |
|                        | Position feedback U                 | 2...10 V  |
|                        | Position feedback U note            | Max. 0.5 mA   |
|                        | Position feedback U variable        | VDC variable  |
|                        | Direction of motion motor           | selectable with switch  |
|                        | Direction of motion fail-safe       | reversible with cw/ccw mounting   |
|                        | Manual override                     | 5 mm hex crank (3/16" Allen), supplied  |
|                        | Angle of rotation                   | 90°   |
|                        | Running Time (Motor)                | 150 s / 90°   |
|                        | Running time motor variable         | 70...220 s  |
|                        | Running time fail-safe              | <20 s @ 20°C  |
|                        | Adaptation Setting Range            | off (default)   |
|                        | Override control                    | MIN (minimum position) = 0%<br>MID (intermediate position) = 50%<br>MAX (maximum position) = 100% |
|                        | Noise level, motor                  | 45 dB(A)  |
|                        | Noise level, fail-safe              | 62 dB(A)  |
|                        | Position indication                 | Mechanical  |
| <b>Safety data</b>     | Power source UL                     | Class 2 Supply  |
|                        | Degree of protection IEC/EN         | IP54  |
|                        | Degree of protection NEMA/UL        | NEMA 2  |
|                        | Enclosure                           | UL Enclosure Type 2   |


|                    |  |   |
|--------------------|--|---|
| <b>Safety data</b> | Agency Listing   | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02<br>CE acc. to 2014/30/EU and 2014/35/EU |
|                    | Quality Standard   | ISO 9001  |
|                    | UL 2043 Compliant  | Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC |
|                    | Ambient humidity   | Max. 95% RH, non-condensing   |
|                    | Ambient temperature  | -22...122°F [-30...50°C]  |
|                    | Storage temperature  | -40...176°F [-40...80°C]  |
|                    | Servicing  | maintenance-free  |
| <b>Weight</b>      | Weight   | 5.4 lb [2.4 kg]   |
| <b>Materials</b>   | Housing material   | Galvanized steel and plastic housing  |
| <b>Footnotes</b>   | †Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3 |   |

**Accessories**

| <b>Gateways</b>               | <b>Description</b>  | <b>Type</b> |
|-------------------------------|---|-------------|
|                               | Gateway MP to BACnet MS/TP  | UK24BAC     |
|                               | Gateway MP to Modbus RTU  | UK24MOD     |
|                               | Gateway MP to LonWorks  | UK24LON     |
| <b>Electrical accessories</b> | <b>Description</b>  | <b>Type</b> |
|                               | Service tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US      |
| <b>Tools</b>                  | <b>Description</b>  | <b>Type</b> |
|                               | Connecting cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection   | ZK4-GEN     |
|                               | Service tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US      |

**Electrical installation**
**INSTALLATION NOTES**

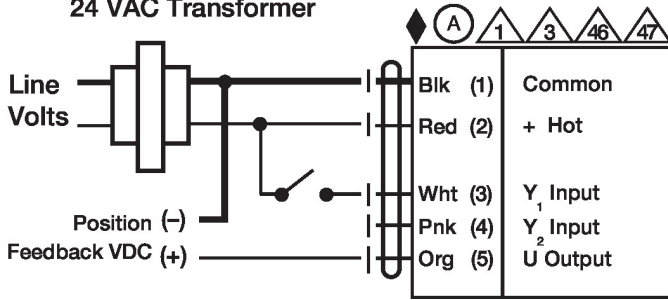
- Actuators with appliance cables are numbered.
- Provide overload protection and disconnect as required.
- Actuators may also be powered by DC 24 V.
- Two built-in auxiliary switches (2x SPDT), for end position indication, interlock control, fan startup, etc.
- Only connect common to negative (-) leg of control circuits.
- A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V line.
- For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.
- Actuators may be controlled in parallel. Current draw and input impedance must be observed.
- Master-Slave wiring required for piggy-back applications. Feedback from Master to control input(s) of Slave(s).
- Meets cULus requirements without the need of an electrical ground connection.
- Warning! Live electrical components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

 Apply only AC line voltage or only UL-Class 2 voltage to the terminals of auxiliary switches. Mixed or combined operation of line voltage/safety extra low voltage is not allowed.

**Wiring diagrams**

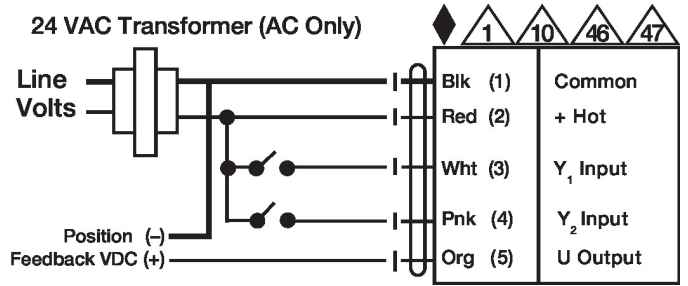
On/Off

24 VAC Transformer



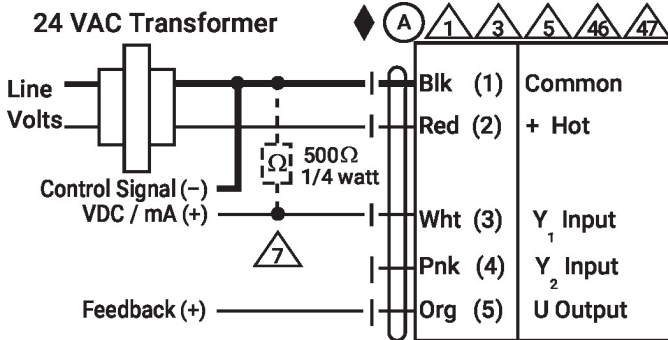
Floating Point

24 VAC Transformer (AC Only)



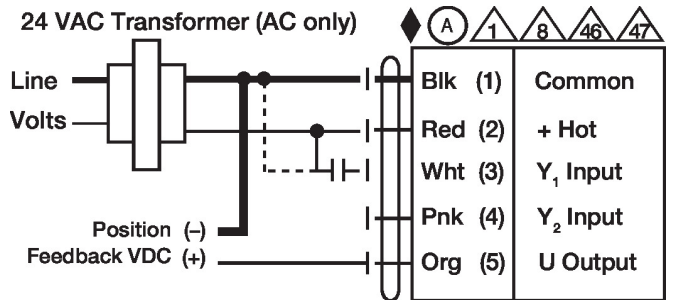
VDC/mA Control

24 VAC Transformer



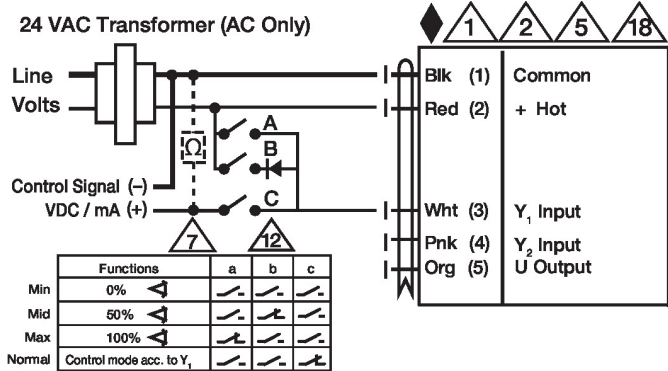
PWM Control

24 VAC Transformer (AC only)

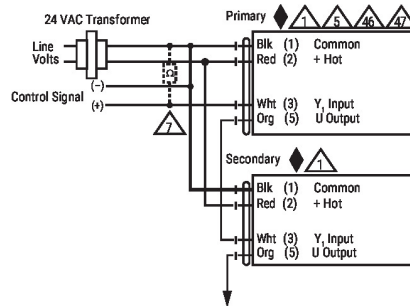


Override Control

24 VAC Transformer (AC Only)



Primary - Secondary



Auxiliary Switches

