# B3 Series, Three Way, Characterized Control Valve
# Stainless Steel Ball and Stem

## 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 or constant flow.

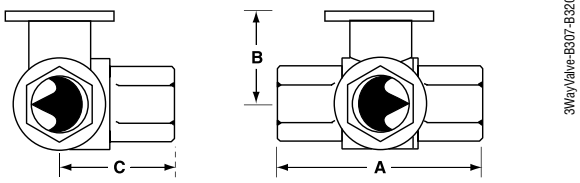
| Technical Data | |
|---|---|
| Service | chilled or hot water, 60% glycol |
| Flow characteristic | A-port equal percentage<br>B-port modified for constant common port flow |
| Action | 90° rotation |
| Sizes | ½", ¾", 1", 1¼", 1½", 2" |
| Type of end fitting | NPT female ends |
| Materials: | |
| Body | forged brass, nickel plated |
| Ball | stainless steel |
| Stem | stainless steel |
| Seats | PTFE |
| Characterizing disc | Tefzel® |
| Packing | 2 EPDM O-rings, lubricated |
| Body pressure rating | |
| 600 psi | ½" - 1" |
| 400 psi | 1¼" - 2" |
| Media temp. range | 0°F to 212°F [-18°C to 100°C] |
| Close off pressure | |
| 200 psi | ½" - 2" |
| Maximum differential pressure (ΔP) | 30 psi for typical applications |
| Leakage | 0% for A to AB<br><2.0% for B to AB |
| External leakage | according to EN 12266-1:2003 |
| $C_v$ rating | A-port: see product chart for values<br>B-port: 70% of A to AB $C_v$ |

Tefzel® is a registered trademark of DuPont

| | Valve Nominal Size | | Type | Suitable Actuators | | | | |
|---|---|---|---|---|---|---|---|---|
| $C_v$ | Inches | DN [mm] | 3-Way NPT | Non-Spring | | | Spring | |
| 0.3 | ½ | 15 | B307 | TR Series | LR Series | NR...N4 Series | TF Series | LF Series |
| 0.46 | ½ | 15 | B308 | | | | | |
| 0.8 | ½ | 15 | B309 | | | | | |
| 1.2 | ½ | 15 | B310 | | | | | |
| 1.9 | ½ | 15 | B311 | | | | | |
| 3 | ½ | 15 | B312 | | | | | |
| 4.7 | ½ | 15 | B313 | | | | | |
| 10 | ½ | 15 | B315* | | | | | |
| 4.7 | ¾ | 20 | B317 | | | | | |
| 7.4 | ¾ | 20 | B318 | | | | | |
| 24 | ¾ | 20 | B320* | | | | | |
| 7.4 | 1 | 25 | B322 | | | | | |
| 10 | 1 | 25 | B323 | | | | | |
| 30 | 1 | 25 | B325* | | | | | |
| 10 | 1¼ | 32 | B329 | | AR Series | AR...N4 Series | | AF Series |
| 19 | 1¼ | 32 | B330 | | | | | |
| 25 | 1¼ | 32 | B331 | | | | | |
| 19 | 1½ | 40 | B338 | | | | | |
| 29 | 1½ | 40 | B339 | | | | | |
| 37 | 1½ | 40 | B340 | | | | | |
| 46 | 1½ | 40 | B341 | | | | | |
| 29 | 2 | 50 | B347 | | | | | |
| 37 | 2 | 50 | B348 | | | | | |
| 46 | 2 | 50 | B349 | | | | | |
| 57 | 2 | 50 | B350 | | | | | |
| 68 | 2 | 50 | B351 | | | | | |
| 83 | 2 | 50 | B352 | | | | | |

*Models without characterizing disc

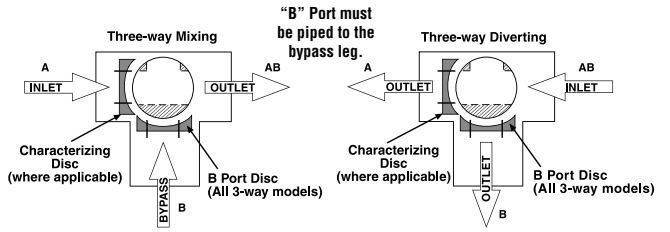
## Dimensions




3WayValve-B307-B320

| | Valve Nominal Size | | Dimensions (Inches [mm]) | | |
|---|---|---|---|---|---|
| Valve Body | Inches | DN [mm] | A | B | C |
| B307-B311 | ½" | 15 | 2.41" [61.1] | 1.39" [35.2] | 1.20" [30.6] |
| B312-B315 | ½" | 15 | 2.38" [60.4] | 1.78" [45.2] | 1.29" [32.8] |
| B317-B320 | ¾" | 20 | 2.73" [69.3] | 1.87" [47.4] | 1.47" [37.3] |
| B322-B325 | 1" | 25 | 3.09" [78.4] | 1.87" [47.4] | 1.59" [40.3] |
| B329-B331 | 1¼" | 32 | 3.96" [100.6] | 2.27" [57.7] | 2.14" [54.3] |
| B338-B341 | 1½" | 40 | 4.39" [111.6] | 2.51" [63.7] | 2.40" [61.1] |
| B347-B352 | 2" | 50 | 4.90" [124.5] | 2.73" [69.5] | 2.74" [69.7] |

## Flow Patterns



# ARX24-MFT-T N4 NEMA 4X Actuators, Multi-Function Technology

MFT

5 YEAR WARRANTY

CE LISTED 94 D5 TEMP.IND. & REG.EQUIP. c UL us

BRUSHLESS D.C. motor

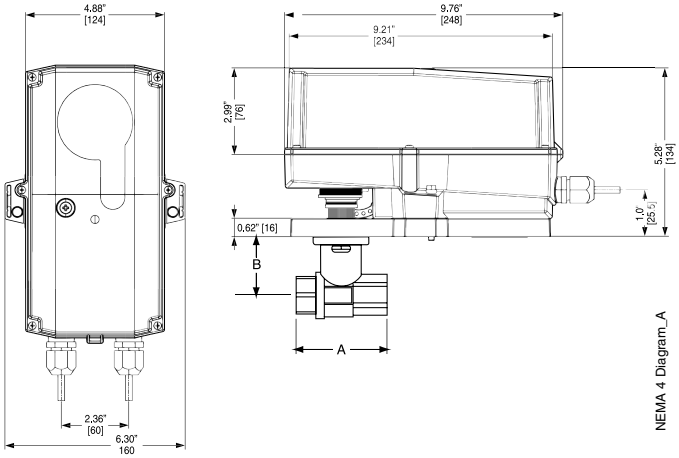
## Models

ARX24-MFT-T N4
ARX24-MFT-T N4H w/built in heater

| Technical Data | |
|---|---|
| Control | 2 to 10 VDC, 4 to 20 mA (default)<br>variable (VDC, PWM, floating point, on/off) |
| Power supply | 24 VAC ± 20% 50/60 Hz<br>24 VDC ± 10% |
| Power consumption running | 3.5 W / heater 24 W |
| holding | 1.25 W |
| Transformer sizing | 6 VA (class 2 power source) / heater 21 VA |
| Electrical connection | screw terminal (for 26 tp 14 GA wire) |
| Overload protection | electronic throughout 0° to 95° rotation |
| Input impedance | 100 kΩ for 2 to 10 VDC (0.1 mA)<br>500 Ω for 4 to 20 mA<br>1500 Ω for PWM, floating point and on/off control |
| Angle of rotation | 95°, adjustable with mechanical stop<br>electronically variable |
| Direction of rotation | reversible with ↷/↶ switch |
| Position indication | visual pointer |
| Manual override | external push button |
| Running time | 150 seconds (default)<br>constant independent of load<br>variable (75 to 350 seconds) |
| Humidity | 100% RH |
| Ambient temperature | -22°F to 122°F [-30°C to 50°C] |
| Storage temperature | -40°F to 176°F [-40°C to 80°C] |
| Housing type | UL Type 4X/NEMA 4X/IP66 & IP67 |
| Housing material | Polypropelene |
| Agency listings† | cULus according to UL 60730-1A/-2-14, CAN/CSA E60730-1, CSA C22.2 No. 24-93, CE according to 89/336/EEC. |
| Quality standard | ISO 9001 |

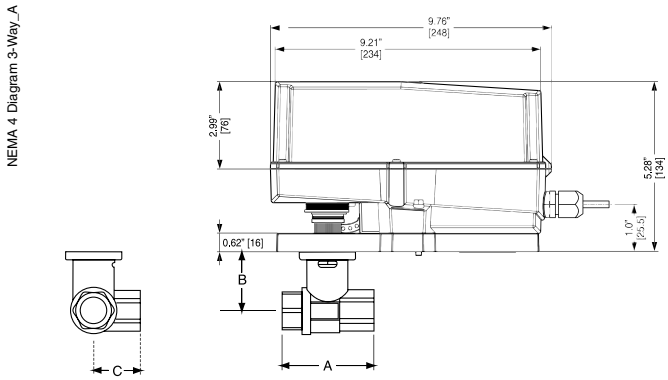
† Rated impulse voltage 4kV, Control pollution degree 3, Type of action 1
*Cannot be used with the CCV-EXT-KIT

### Dimensions with 2-Way Valve




| | Valve Nominal Size | | Dimensions (Inches [mm]) | |
|---|---|---|---|---|
| Valve Body | Inches | DN [mm] | A | B |
| B231-B232 | 1¼" | 32 | 3.72" [94.6] | 2.04" [51.9] |
| B238-B240 | 1½" | 40 | 3.88" [98.5] | 2.04" [51.9] |
| B248-B250 | 2" | 50 | 4.21" [107.0] | 2.27" [57.7] |
| B251-B254 | 2" | 50 | 4.93" [125.2] | 2.73" [69.5] |
| B261-B265 | 2½" | 65 | 5.55" [140.9] | 2.73" [69.5] |
| B277-B280 | 3" | 80 | 5.82" [147.9] | 2.73" [69.5] |

### Dimensions with 3-Way Valve




| | Valve Nominal Size | | Dimensions (Inches [mm]) | | |
|---|---|---|---|---|---|
| Valve Body | Inches | DN [mm] | A | B | C |
| B329-B331 | 1¼" | 32 | 3.96" [100.6] | 2.27" [57.7] | 2.14" [54.3] |
| B338-B341 | 1½" | 40 | 4.39" [111.6] | 2.51" [63.7] | 2.40" [61.1] |
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## Wiring Diagrams

### INSTALLATION NOTES

△2 ***CAUTION** Equipment damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

△3 Actuators may also be powered by 24 VDC.

△4 Position feedback cannot be used with Triac sink controller.
The actuator internal common reference is not compatible.

△6 Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.

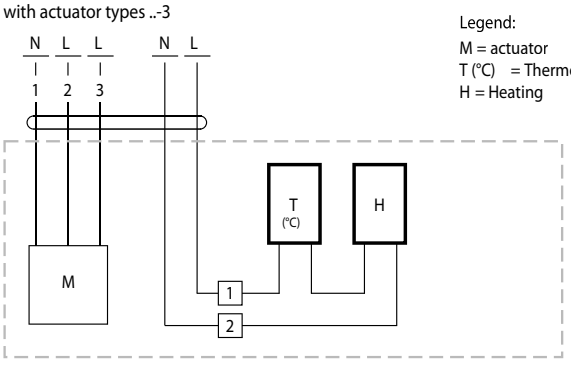
△8 Contact closures A & B also can be triacs.
A& B should both be closed for triac source and open for triac sink.

△9 For triac sink the common connection from the actuator must be connected to the hot connection.

### APPLICATION NOTES

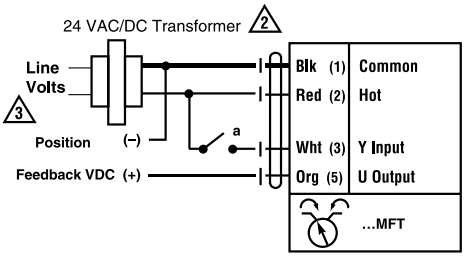
◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

⚠ ***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.

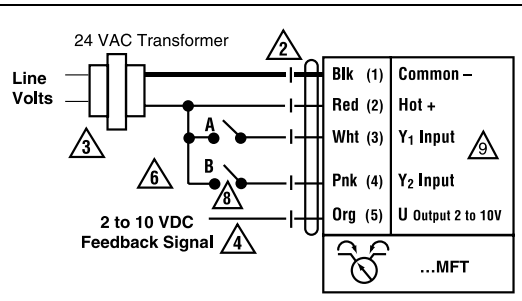



Note
The following points must be taken into account with independent, external wiring:
- All contact between the cables or wires that are introduced and the heating element is to be avoided.
- Where necessary, use cables with sufficient numbers of wires, e.g. so that the heating and the actuator can be supplied separately with voltage.

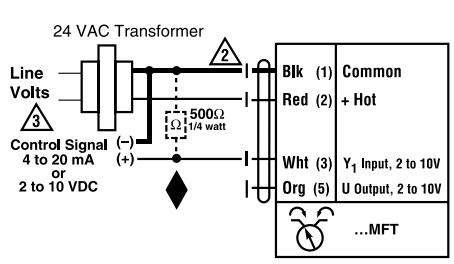
**Heater wiring**



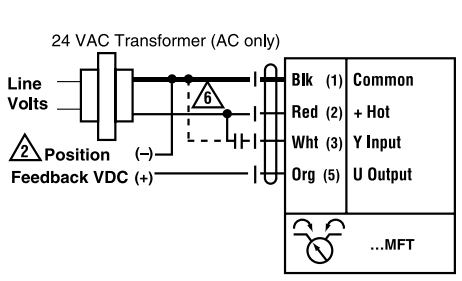

**On/Off control**




**Floating Point**




**VDC/4-20 mA**




**PWM**