

CONTROL VALVES

BALL VALVES
B2, B3 SERIES



BELIMO

DESCRIPTION

The Belimo B2 Series 2-way and B3 Series 3-way ball valves are used for two-position, floating or proportional control of HVAC hot or chilled water. The valves come assembled with direct coupled Belimo electric actuators with spring return or non-spring return operation.



FEATURES

- Equal percentage characteristic (2-way)
- Large Cv range from 0.8 to 170
- Assembled, ready for installation
- Spring return or non-spring return actuators
- Floating, two-position, or proportional control



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CONTROL VALVES

SPECIFICATIONS

| | | | |
|----------------------------------|--|--------------------------------|---|
| Size | | Media Compatibility | Hot or chilled water, <60% glycol |
| 2-way | 1/2" - 3" | Media Temperature Range | 0° to 250°F (-18° to 120°C) |
| 3-way | 1/2" - 2" | Compatible Actuators | Non-spring return TR, LRB, NRB, ARB; spring return TF, LF, AF |
| Cv Range | | Pressure Drop | Maximum differential pressure 30 psid (207 kPa), higher could cause noise and/or damage |
| 2-way | 0.8 to 240 | Pressure Rating | |
| 3-way | 0.3 to 83 | Two-way | |
| Body Pattern | Two-way, three-way mixing or diverting | 1/2" to 1-1/4" | 600 psig (4135 kPa) |
| Flow Characteristic | Two-way equal percentage, three-way linear | 1-1/4" (B231) to 3" | 400 psig (2758 kPa) |
| Leakage Rating | 0% for port A to AB; 2% maximum for port B to AB | Three-way | |
| Maximum Closeoff Pressure | | 1/2" to 1" | 600 psig (4135 kPa) |
| 1/2"-2" | 200 psig (1380 kPa)(2" Cv 57 and under) | 1-1/4" to 2" | 400 psig (2758 kPa) |
| 2"-3" | 100 psig (2" Cv 65 and above) | Approvals | CSA, CE |
| Materials of Construction | Forged brass body with nickel plating, chrome plated (or stainless steel) ball, PTFE Teflon® seals, Tefzel® characterized disc, EPDM o-rings | Warranty | 5 years |



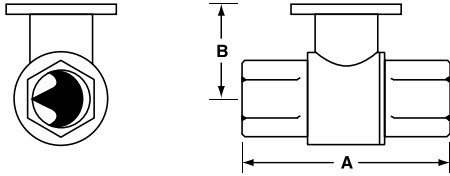
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BALL VALVES B2, B3 SERIES

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CONTROL VALVES

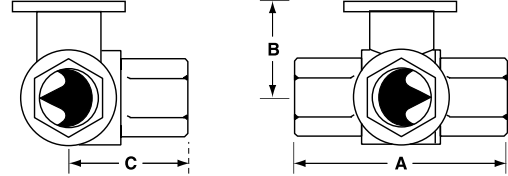
DIMENSIONS



B-2 Series

| Stainless Steel | | Valve Nominal Size | | Dimensions - in (mm) | |
|-----------------|--------|--------------------|--------------|----------------------|--|
| Valve Body | Inches | DN (mm) | A | B | |
| B207-B211 | 0.5 | 15 | 2.41 (61.1) | 1.39 (35.2) | |
| B212-B216 | 0.5 | 15 | 2.38 (60.4) | 1.78 (45.2) | |
| B217-B221 | 0.5 | 20 | 2.73 (69.3) | 1.87 (47.4) | |
| B222-B225 | 1.0 | 25 | 3.09 (78.4) | 1.87 (47.4) | |
| B229-B230 | 1.25 | 32 | 3.72 (94.6) | 1.87 (47.4) | |
| B231-B232 | 1.25 | 32 | 3.72 (94.6) | 2.04 (51.9) | |
| B238-B240 | 1.5 | 40 | 3.88 (98.5) | 2.04 (51.9) | |
| B248-B250 | 2.0 | 50 | 4.21 (107.0) | 2.27 (57.7) | |
| B251-B254 | 2.0 | 50 | 4.93 (125.2) | 2.73 (69.5) | |
| B261-B265 | 2.5 | 65 | 5.55 (140.9) | 2.73 (69.5) | |
| B277-B280 | 3.0 | 80 | 5.82 (147.9) | 2.73 (69.5) | |

| Brass | | Valve Nominal Size | | Dimensions - in (mm) | |
|-------------|--------|--------------------|-------------|----------------------|--|
| Valve Body | Inches | DN (mm) | A | B | |
| B207B-B211B | 0.5 | 15 | 2.38 (60.8) | 1.39 (35.2) | |
| B212B-B216B | 0.5 | 15 | 2.38 (60.8) | 1.78 (45.2) | |
| B217B-B221B | 0.75 | 20 | 2.73 (69.3) | 1.87 (47.4) | |

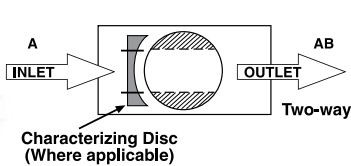


B-3 Series

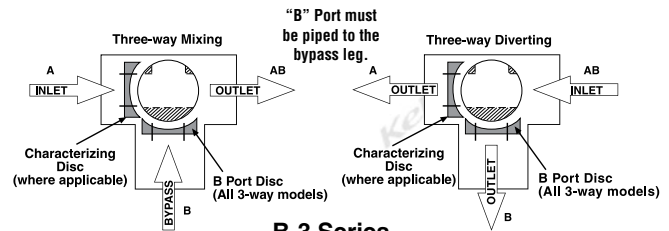
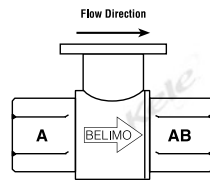
| Stainless Steel | | Valve Nominal Size | | Dimensions - in (mm) | | |
|-----------------|--------|--------------------|--------------|----------------------|-------------|--|
| Valve Body | Inches | DN (mm) | A | B | C | |
| B307-B311 | 0.5 | 15 | 2.41 (61.1) | 1.39 (35.2) | 1.20 (30.6) | |
| B312-B316 | 0.5 | 15 | 2.38 (60.4) | 1.78 (45.2) | 1.29 (32.8) | |
| B317-B321 | 0.75 | 20 | 2.73 (69.3) | 1.87 (47.4) | 1.47 (37.3) | |
| B322-B325 | 1.0 | 25 | 3.09 (78.4) | 1.87 (47.4) | 1.59 (40.3) | |
| B329-B331 | 1.25 | 32 | 3.96 (100.6) | 2.27 (57.7) | 2.14 (54.3) | |
| B338-B341 | 1.5 | 40 | 4.39 (111.6) | 2.51 (63.7) | 2.40 (61.1) | |
| B347-B352 | 2.0 | 50 | 4.90 (124.5) | 2.73 (69.5) | 2.74 (69.7) | |

| Brass | | Valve Nominal Size | | Dimensions - in (mm) | | |
|-------------|--------|--------------------|-------------|----------------------|-------------|--|
| Valve Body | Inches | DN (mm) | A | B | C | |
| B307B-B311B | 0.5 | 15 | 2.41 (61.1) | 1.39 (35.2) | 1.20 (30.6) | |
| B312B-B316B | 0.5 | 15 | 2.38 (60.4) | 1.78 (45.2) | 1.29 (32.8) | |
| B317B-B321B | 0.75 | 20 | 2.73 (69.3) | 1.87 (47.4) | 1.47 (37.3) | |

FLOW PATTERN



B-2 Series



B-3 Series

CAUTION: B port leakage rating on three-way valves is 0.5% to 2% of Cv. Do not pipe B port to the coil.



ACTUATOR SELECTION INFORMATION

| SPRING RETURN | | | | | | |
|---------------|------------------------|-------------------|----------------|------------|---------------------------|-----------------------------------|
| MODEL | SUITABLE VALVE | TORQUE | SUPPLY VOLTAGE | ELECTRICAL | CONTROL TYPE | MOTOR RUN TIME/SPRING RETURN TIME |
| TFRB24 | 1/2" and 3/4" only | 18 in-lb (2 Nm) | 24 VAC | 3 ft cable | on/off | <75 seconds/<75 seconds |
| TFRB24-3 | 1/2" and 3/4" only | 35 in-lb (4 Nm) | 24 VAC | 3 ft cable | floating point | 90 seconds/<25 seconds |
| TFRB24-SR | 1/2" and 3/4" only | 35 in-lb (4 Nm) | 24 VAC | 3 ft cable | proportional | 95 seconds/<25 seconds |
| LF24 | 1/2" thru 1-1/4" | 35 in-lb (4 Nm) | 24 VAC | 3 ft cable | on/off | 75 seconds/<25 seconds |
| LF24-3 | 1/2" thru 1-1/4" | 35 in-lb (4 Nm) | 24 VAC | 3 ft cable | floating point | 150 seconds/<25 seconds |
| LF24-SR | 1/2" thru 1-1/4" | 35 in-lb (4 Nm) | 24 VAC | 3 ft cable | proportional | 150 seconds/<25 seconds |
| LF24-MFT | 1/2" thru 1-1/4" | 35 in-lb (4 Nm) | 24 VAC | 3 ft cable | multi-function technology | 150 seconds/ <25 seconds**** |
| AFRB24 | 1-1/4" thru 3" SS only | 180 in-lb (20 Nm) | 24 VAC | 3 ft cable | on/off | 75 seconds/ <20 seconds |
| AFRB24-MFT | 1-1/4" thru 3" SS only | 180 in-lb (20 Nm) | 24 VAC | 3 ft cable | multi-function technology | 150 seconds/ <20 seconds***** |

All MFT models have variable options. Please specify the control signal configuration or the Belimo P-code for a preset MFT configuration. Default signal configuration is 2-10 VDC.

NOTE: Not all valve body and actuator combinations are compatible. Follow charts and if not available contact your sales representative at Kele.

****Variable from 75 to 300 seconds

*****Variable from 70 to 220 seconds

| NON-SPRING ACTUATOR SELECTION INFORMATION | | | | | | |
|---|--------------------------|-------------------|----------------|----------------|------------------------|----------------|
| MODEL | SUITABLE VALVE | TORQUE | SUPPLY VOLTAGE | ELECTRICAL | CONTROL TYPE | MOTOR RUN TIME |
| TR24-3-T | 1/2" and 3/4" only | 18 in-lb (2 Nm) | 24 VAC | Screw terminal | on/off, floating point | 90 seconds |
| TR24-SR-T | 1/2" and 3/4" only | 18 in-lb (2 Nm) | 24 VAC | Screw terminal | proportional | 90 seconds |
| LRB24-3 | 1/2" thru 1-1/4" | 45 in-lb (5 Nm) | 24 VAC | 3 ft cable | on/off, floating point | 90 seconds |
| LRB24-SR | 1/2" thru 1-1/4" | 45 in-lb (5 Nm) | 24 VAC | 3 ft cable | proportional | 90 seconds |
| NRB24-3-T N4 | 1/2" thru 1-1/4" SS only | 70 in-lb (8 Nm) | 24 VAC | Screw terminal | on/off, floating point | 90 seconds |
| NRB24-SR-T N4 | 1/2" thru 1-1/4" SS only | 70 in-lb (8 Nm) | 24 VAC | Screw terminal | proportional | 90 seconds |
| ARB24-3 | 1-1/4" thru 3" SS only | 180 in-lb (20 Nm) | 24 VAC | 3 ft cable | on/off, floating point | 90 seconds |
| ARB24-3-T N4 | 1-1/4" thru 3" SS only | 180 in-lb (20 Nm) | 24 VAC | Screw terminal | on/off, floating point | 90 seconds |
| ARB24-SR | 1-1/4" thru 3" SS only | 180 in-lb (20 Nm) | 24 VAC | 3 ft cable | proportional | 90 seconds |
| ARB24-SR-T N4 | 1-1/4" thru 3" SS only | 180 in-lb (20 Nm) | 24 VAC | Screw terminal | proportional | 90 seconds |

N4 = UL Type 4X/NEMA 4X/IP66 & IP67

| MFT Function Codes | | |
|--------------------|-------------------|----------|
| P-Code | Signal | Feedback |
| A01 | 2-10 VDC | 2-10 VDC |
| A02 | 0-10 VDC | 0-10 VDC |
| A07 | 0-5 VDC | 2-10 VDC |
| A09 | 5-10 VDC | 2-10 VDC |
| A16 | 2-6 VDC | 2-10 VDC |
| A17 | 6-10 VDC | 2-10 VDC |
| W01 | PWM 0.59-2.95 sec | 2-10 VDC |
| W02 | PWM 0.02-5.00 sec | 2-10 VDC |
| F01 | Floating | 2-10 VDC |
| J2 | Two-position | 2-10 VDC |



CONTROL VALVES

BALL VALVES B2, B3 SERIES

ORDERING INFORMATION

| VALVE SPECIFICATION | | | | NON-SPRING RETURN | | | | SPRING RETURN (N.O. / CCW) | | |
|---------------------|---------|-------|--------|-------------------|--------------|--------------|---------------|----------------------------|------------|--------------|
| Port | Valve # | Cv | Size | Two-pos/Tri-state | | Proportional | | Two-pos | Tri-state | Proportional |
| | | | | Standard | NEMA 4 | Standard | NEMA 4 | | | |
| Two-way | B207B | 0.8 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B209B | 0.8 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B211B | 1.9 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B212B | 3.0 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B213B | 4.7 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B214B | 7.4 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B216B | 7.4 | 3/4" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B219B | 10.0 | 3/4" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Two-way | B221B* | 24.0 | 3/4" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Two-way | B223 | 10.0 | 1" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Two-way | B224 | 19.0 | 1" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Two-way | B225* | 30.0 | 1" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Two-way | B230* | 19.0 | 1-1/4" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Two-way | B231 | 25.0 | 1-1/4" | ARB24-3 | NRB24-3-T-N4 | ARB24-SR | NRB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B232* | 37.0 | 1-1/4" | ARB24-3 | NRB24-3-T-N4 | ARB24-SR | NRB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B238 | 19.0 | 1-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B239 | 29.0 | 1-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B240* | 37.0 | 1-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B249 | 46.0 | 2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B250* | 57.0 | 2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B254* | 240.0 | 2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B261 | 60.0 | 2-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B263 | 110.0 | 2-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B265* | 210.0 | 2-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B277 | 70.0 | 3" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B278 | 130.0 | 3" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Two-way | B280* | 170.0 | 3" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B307B | 0.3 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Three-way | B309B | 0.8 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Three-way | B311B | 1.9 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Three-way | B312B | 3.0 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Three-way | B313B | 4.7 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Three-way | B316B* | 16.0 | 1/2" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Three-way | B318B | 7.4 | 3/4" | TR24-3-T | NRB24-3-T-N4 | TR24-SR-T | NRB24-SR-T-N4 | TFRB24 | TFRB24-3 | TFRB24-SR |
| Three-way | B322 | 7.4 | 1" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Three-way | B323 | 10.0 | 1" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Three-way | B325* | 30.0 | 1" | LRB24-3 | NRB24-3-T-N4 | LRB24-SR | NRB24-SR-T-N4 | LF24 | LF24-3 | LF24-SR |
| Three-way | B329 | 10.0 | 1-1/4" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B330 | 19.0 | 1-1/4" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B331 | 25.0 | 1-1/4" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B338 | 19.0 | 1-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B340 | 37.0 | 1-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B341 | 46.0 | 1-1/2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B347 | 29.0 | 2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B349 | 46.0 | 2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B350 | 57.0 | 2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |
| Three-way | B352 | 83.0 | 2" | ARB24-3 | ARB24-3-T-N4 | ARB24-SR | ARB24-SR-T-N4 | AFRB24 | AFRB24-MFT | AFRB24-MFT |

*No characterized disc; requires Cv adjustment for installation in pipe sizes larger than the valve.

| MODEL | DESCRIPTION |
|----------|---|
| B_ _ _ / | Ball valve with brackets and mounting (select from above) |
| - - - - | Compatible actuator (select from above) (other options for the actuator family are also available) |

All valves are factory assembled. No field assembly required.

Example: B209B / TR24-SR-T 1/2" ball valve, Cv=0.8, with proportional non-spring return actuator

Note: Other valves and actuators available. Call your Kele sales representative for more information.

Note: Standard ball valve construction is chrome-plated brass ball for 1/2" and 3/4" sizes (B suffix); stainless steel ball available as an option. On 1" sizes and larger, stainless ball is standard.

Note: Multi-function Technology® (MFT) model actuators are also available. Add -MFT to the base model number and specify the control signal configuration or the Belimo P-code for a pre-set MFT configuration (not required if to be field configured, or if the default configuration of 2-10 VDC is required).

RELATED PRODUCTS

ZS-CCV-90
SSTAG
ZS-CCV-110
ZS-CCV-100

NEMA 4 weather shield for LF
Stainless steel tag on bead chain, 1" x 2" dogtag, custom engraved per order
NEMA 4 weather shield for AFB/AFR
Nema 4 weather shield for LR/AR