



## SOLENOID VALVES

## 1/8"-3" NPT TYPE Q & QR Series

2-WAY – CAST BRONZE BODIES - PACKLESS  
VELVETROL® INTERNAL PISTON PILOT OPERATED  
GENERAL PURPOSE SOLENOID VALVES - FULL PORT  
NORMALLY CLOSED OR NORMALLY OPEN



- ★ FOR: GENERAL SERVICE-AIR-INERT GASES-WATER-OIL-STEAM
- ★ PRESSURES: 5 PSI DIFFERENTIAL MINIMUM TO 400 PSI MAXIMUM
- ★ TEMPERATURE: -40°F TO 450°F. CLASS F OR H COILS
- ★ MOUNTING: INSTALL IN HORIZONTAL LINE WITH COIL UPRIGHT AND ON TOP

| <b>SIZES 1/8" - 3" NPT FULL PORT</b>  |  |   |
|---|--|---|
| ★ <b>SERVICE RATINGS</b>  | Complete Pricing, Service & Electrical Ratings shown in Price Schedule. Valves will be furnished for 5-150 PSI Air-Water and 120 VAC Unless Otherwise Specified.   |   |
| NORMALLY CLOSED--   |  | --NORMALLY OPEN                             |
| <b>Q-3B, Q-3EP, Q-3V</b><br> <b>Q-3T</b> | GENERAL PURPOSE – AIR – WATER<br>5-150, 10-400 PSI (Normally Open to 300 PSI)<br>220°F. Max. Fluid Temp. Class F<br>Coils: 120, 240, 480 VAC 60 Hz, 14Watts Max.   | <b>QR-3B, QR-3EP</b><br><b>QR-3V, QR-3T</b> |
| <b>Q4-3B, Q4-3EP</b><br><b>Q4-3V, Q4-3T</b>   | GENERAL PURPOSE:<br>AIR – WATER - INERT GASES – WATER – OIL<br>5-150, 10-400 PSI (Normally Open to 300 PSI)<br>300°F. Max. Fluid Temp. Class F. Non-Standard Coils Available<br>With Voltage, Wattage, and Lead Wire Length To Your Specs. | <b>QR-3B, QR-3EP</b><br><b>QR-3V, QR-3T</b> |
| <b>Q-1-3T, Q-1-3EP</b><br>             | STEAM<br>5-150 PSI; 365°F Max. Fluid Temp., (-3EP: 5-50, 300°F); Class H<br>120, 240, 480 VAC 60 Hz, 20 Watts Max.   | <b>QR-1-3T</b><br><b>QR-1-3EP</b>           |
| <b>Q4-1-3T, Q4-1-3EP</b>  | STEAM (to 200 PSI) – HOT FLUIDS (to 450°F)<br>SIMILAR TO Q4 Series EXCEPT High Temp.   | <b>QR-1-3T, QR-1-3EP</b>                    |
| <b>ADD -1</b>   | HIGH TEMP. (CLASS H) COILS - FLUID TEMP. TO 450°F.<br>STEAM to 200 PSI.  | <b>ADD -1</b>                               |
| <b>ADD -2</b>   | EXPLOSION PROOF COIL HOUSING – UL CLASS I GROUP D,<br>CLASS II GROUP E, F, G. NEMA 7   | <b>ADD -2</b>                               |
| <b>ADD -3B, -3EP</b><br><b>-3T, -3V</b>   | LEAKPROOF PILOT SEAT:<br><b>-3B</b> (BUNA), <b>-3EP</b> ETHYLENE- PROPYLENE,<br><b>-3T</b> (TEFLON®) PTFE, <b>-3V</b> (VITON®) FLUOROCARBON  | <b>ADD -3B, -3EP</b><br><b>-3T, -3V</b>     |
| <b>ADD -24</b>  | WATER TIGHT COIL HOUSING - NEMA 4  | <b>ADD -24</b>                              |
| <b>ADD -25</b>  | DUST TIGHT COIL HOUSING - NEMA 5   | <b>ADD -25</b>                              |
| <b>ADD -57</b>  | MANUAL RESET – SAFETY SHUT-OFF, NO VOLTAGE<br>RELEASE. SEE BULLETIN 210-Q57  | <b>ADD -57</b>                              |
| <b>ADD -81, -84</b>   | -81 SLOW CLOSE (REDUCES WATER HAMMER)<br>-84 QUICK CLOSE (BOTH FACTORY SETUPS)   | <b>ADD -81, 84</b>                          |
| <b>ADD -230</b>   | SPECIAL CONSTRUCTION FOR GASOLINE AND DIESEL<br>FUEL. SEE BULLETIN 230-Q   | <b>ADD -230</b>                             |

★ **CONSTRUCTION:**

CLASS F & H COILS are Waterproof, Fungusproof, Molded of Filled Polyester with 18" Leads.  
 BODIES are Sand Cast in Bronze rated 400 psi WOG. PISTON SPRINGS are 316 or 302 SS.  
 BONNET ASSEMBLIES are 304 SS TUBES silver soldered to Brass BONNET and TUBE PLUG.  
 PISTON ASSEMBLIES are Brass with Filled Teflon® PISTON RINGS, Stainless Steel EXPANDERS, and Buna, EP, Fluorocarbon, or Virgin Teflon® SEAT DISCS.  
 PILOT ASSEMBLIES are 416 SS ARMATURE with a 316 SS PILOT POINT and 316 SS PINS.

★ **SPECIALS:**

Teflon® Leak Proof Seat Screws, Teflon® Discs (Standard on all Steam Valves), Teflon® Coated Pistons & other Special Assemblies Available. Non-Standard Coils are Available with Voltage, Wattage, and Lead Wire Length to your specifications. Consult Factory.

See Price Schedule for "Terms and Conditions of Sale."

## PERFORMANCE, ORDERING AND INSTALLATION GUIDE

**ORDERING DATA**--SPECIFY PIPE SIZE, TYPE, FLUID, OPERATING PRESSURE, TEMPERATURE RANGE, ELECTRICAL SPECIFICATIONS, BACK PRESSURE (IF ANY).

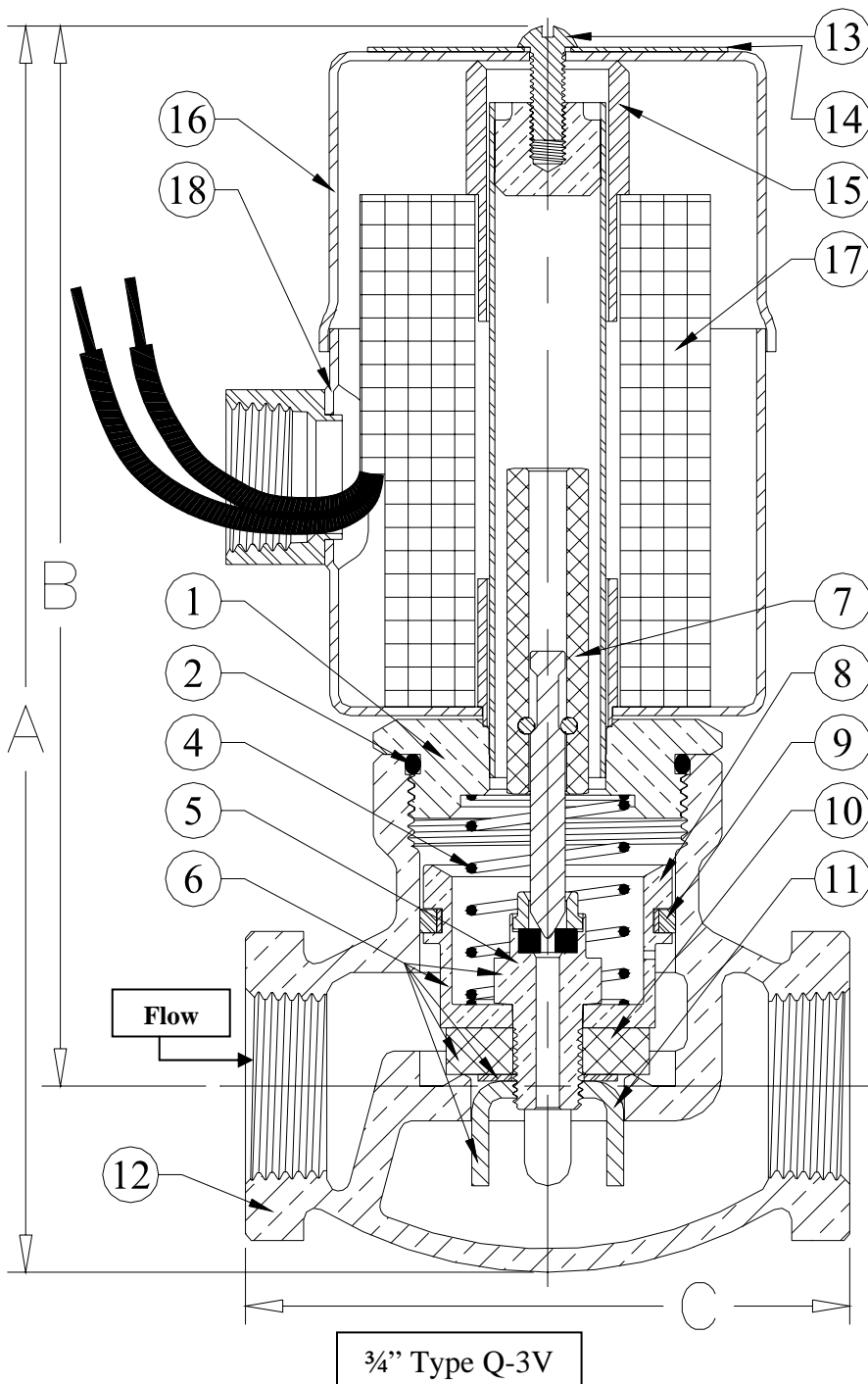
**FLOW CHARACTERISTICS**--SEE FLOW CURVES IN BULLETIN 5-FL, OR Cv FACTORS LISTED BELOW AND IN BULLETIN CP-1.

**OPERATION**--PISTON PILOT OPERATED. MINIMUM PRESSURE DROP OF 5 PSI ( $\Delta P$ ) IS REQUIRED ACROSS VALVE FOR OPERATION.

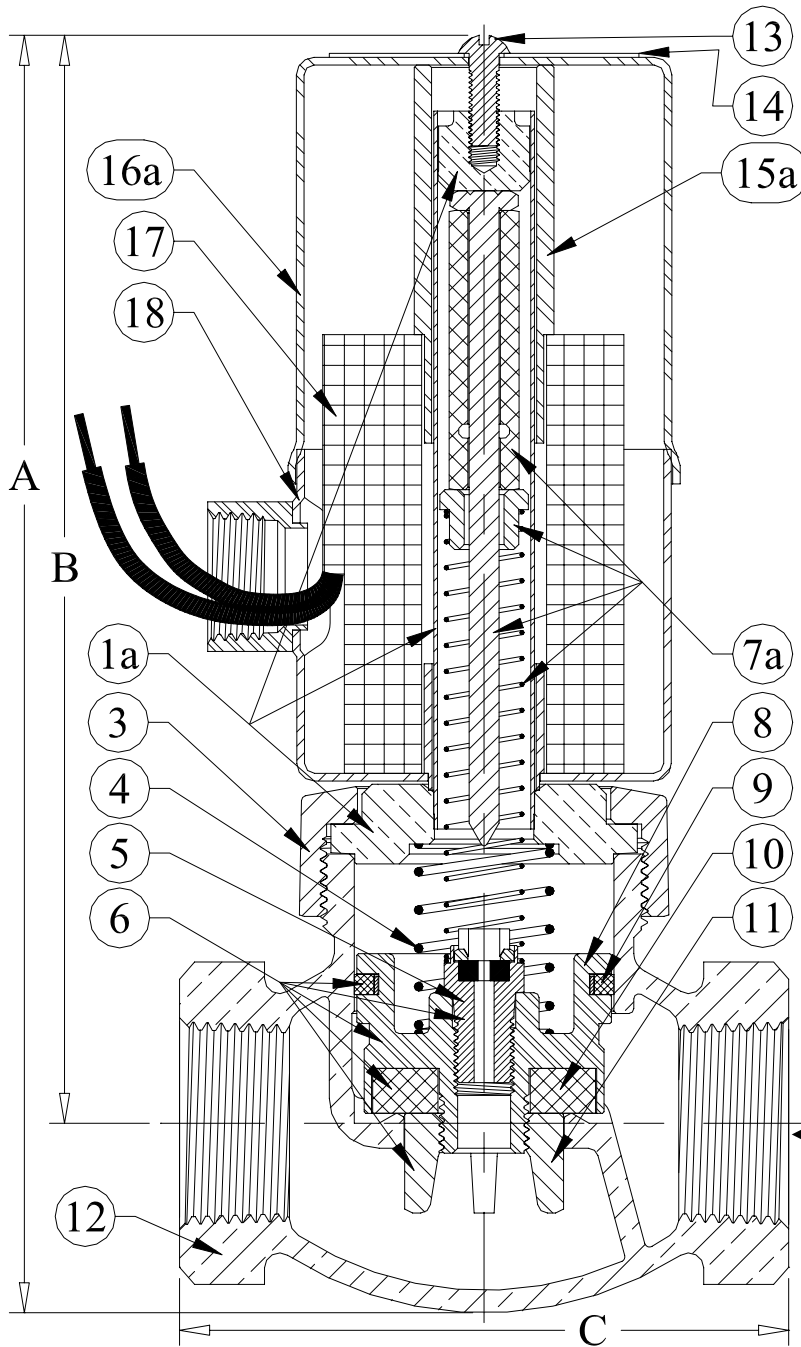
**MOUNTING**--MOUNT IN HORIZONTAL LINE WITH COIL VERTICAL AND ON TOP. INSTALL 40 MESH STRAINER (NO LARGER) AHEAD OF VALVE. CHECK FOR PROPER COIL VOLTAGE. MAKE SURE THAT THE FLOW ARROW ON VALVE BODY IS POINTING IN THE DIRECTION OF FLOW. PTFE TAPE STRONGLY RECOMMENDED FOR ALL JOINTS.

**OPERATING PRESSURE:** THE SOLENOID VALVE SHOULD BE ORDERED WITH **THE MAXIMUM RATED PRESSURE CLOSEST TO THE ACTUAL PRESSURE THE VALVE WILL OPERATE IN.** FOR EXAMPLE: IF YOUR APPLICATION IS FOR 40 PSI, ORDER A VALVE RATED 5-150 PSI **NOT** 10- 400 PSI.

**SERVICING**--SOLENOID VALVES SHOULD BE FREQUENTLY CHECKED FOR OPERATION, CLEANLINESS, & INTERNAL WEAR - REPAIR KITS ARE FACTORY AVAILABLE --GIVE SIZE, TYPE, SERIAL NUMBER OR OPERATING DATA (VOLTAGE, PRESSURE, ETC.)



| Valve Size | 1<br>N.C. Bonnet Assembly | 1a<br>N.O. Bonnet Assembly | 2<br>Bonnet Seal | 3<br>Bonnet Ring | 4<br>Piston Spring | 5<br>SeatScrew | 6<br>Piston Assembly | 7<br>N.C. Pilot Assembly | 7a<br>N.O. Pilot Assembly | 8<br>Piston Only | 9<br>Piston Ring & Expander | 10<br>Seat Disc | 11<br>Guide Nut | 12<br>Body | 13<br>Coil Screw | 14<br>Nameplate |
|------------|---------------------------|----------------------------|------------------|------------------|--------------------|----------------|----------------------|--------------------------|---------------------------|------------------|-----------------------------|-----------------|-----------------|------------|------------------|-----------------|
|            | Q-3V*                     | QR-3V*                     | BOTH             | BOTH             | BOTH               | BOTH           | BOTH                 | Q-3V*                    | QR-3V*                    | BOTH             | BOTH                        | BOTH            | BOTH            | BOTH       | BOTH             | BOTH            |
| 1/8        | 403-2                     | 403-2R                     | 2-121x           | N/A              | 37-14              | 415-3x         | 407-3x               | 25-1                     | 32R1                      | 402              | 57                          | 36-12x          | 406             | 400-8      | 9                | 44-1-1          |
| 1/4        | 403-2                     | 403-2R                     | 2-121x           | N/A              | 37-14              | 415-3x         | 407-3x               | 25-1                     | 32R1                      | 402              | 57                          | 36-12x          | 406             | 400-4      | 9                | 44-1-1          |
| 3/8        | 403-2                     | 403-2R                     | 2-121x           | N/A              | 37-14              | 415-3x         | 407-3x               | 25-1                     | 32R1                      | 402              | 57                          | 36-12x          | 406             | 400-1      | 9                | 44-1-1          |
| 1/2        | 403-2                     | 403-2R                     | 2-121x           | N/A              | 37-14              | 415-3x         | 407-3x               | 25-1                     | 32R1                      | 402              | 57                          | 36-12x          | 406             | 400-2      | 9                | 44-1-1          |
| 3/4        | 413-2                     | 413-2R                     | 2-125x           | N/A              | 37-3               | 415-3x         | 417-3x               | 25-1                     | 32R1                      | 412              | 159                         | 36-34x          | 416             | 410        | 9                | 44-1-1          |
| 1          | 423-2                     | 423-2R                     | N/A              | 428              | 37-3               | 415-3x         | 427-3x               | 25-1                     | 32R1                      | 422              | 58                          | 36-1x           | 429             | 420        | 9                | 44-1-1          |
| 1-1/4      | 433-2                     | 433-2R                     | N/A              | 438              | 37-2               | 415-3x         | 437-3x               | 25-1                     | 32R1                      | 432              | 434                         | 36-114x         | 439             | 430        | 9                | 44-1-1          |
| 1-1/2      | 443-2                     | 443-2R                     | N/A              | 448              | 37-2               | 415-3x         | 447-3x               | 25-1                     | 32R1                      | 442              | 93                          | 36-112x         | 449             | 440        | 9                | 44-1-1          |
| 2          | 453-2                     | 453-2R                     | 2-40x            | 458              | 37-2               | 415-3x         | 457-3x               | 25-1                     | 32R1                      | 452              | 176                         | 36-2x           | 459             | 450        | 9                | 44-1-1          |
| 2-1/2      | 463-2                     | 463-2R                     | 2-42x            | 468              | 37-2               | 415-3x         | 467-3x               | 22-1                     | 32R6                      | 462              | 102                         | 36-212x         | 469             | 460        | 9                | 44-1-1          |
| 3          | 473-2                     | 473-2R                     | 2-46x            | 478              | 37-2               | 415-3x         | 477-3x               | 22-1                     | 32R6                      | 472              | 474                         | 36-3x           | 479             | 470        | 9                | 44-1-1          |



| Valve Size | 15<br>N.C. Nip | 15a<br>N.O. Nip | 16<br>N.C. Coil Cover | 16a<br>N.O. Coil Cover | 17<br>Coil   | 18<br>Coil Can |
|------------|----------------|-----------------|-----------------------|------------------------|--|----------------|
|            | Q-3V*          | QR-3V*          | Q-3V*                 | QR-3V*                 | BOTH   | BOTH           |
| 1/8        | 115-2          | 115-3           | 89                    | 89NO                   | Consult<br>Factory<br>or<br>List Price<br>Schedule | 87             |
| 1/4        | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 3/8        | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 1/2        | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 3/4        | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 1          | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 1-1/4      | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 1-1/2      | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 2          | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 2-1/2      | 115-2          | 115-3           | 89                    | 89NO                   |  | 87             |
| 3          | 115-2          | 115-3           | 89                    | 89NO                   | 87   |                |

| Valve Size | CV Factor | Valve Dimensions |      |      |        |       |      |      |        |
|------------|-----------|------------------|------|------|--------|-------|------|------|--------|
|            |           | N. C.            |      |      |        | N. O. |      |      |        |
|            |           | A                | B    | C    | wt lbs | A     | B    | C    | wt lbs |
| 1/8        | 1.3       | 6.31             | 5.5  | 2.75 | 3      | 7.31  | 6.5  | 2.75 | 4      |
| 1/4        | 2.1       | 6.31             | 5.5  | 2.75 | 3      | 7.31  | 6.5  | 2.75 | 4      |
| 3/8        | 2.3       | 6.31             | 5.5  | 2.75 | 3      | 7.31  | 6.5  | 2.75 | 4      |
| 1/2        | 3.9       | 6.31             | 5.5  | 2.75 | 3      | 7.31  | 6.5  | 2.75 | 4      |
| 3/4        | 5.1       | 6.69             | 5.7  | 3.25 | 4      | 7.69  | 6.7  | 3.25 | 4      |
| 1          | 11.6      | 7.0              | 5.83 | 3.81 | 5      | 8.0   | 6.83 | 3.81 | 5      |
| 1-1/4      | 12.1      | 7.7              | 6.3  | 4.25 | 6      | 8.7   | 7.3  | 4.25 | 7      |
| 1-1/2      | 26        | 8.27             | 6.64 | 4.88 | 8      | 9.27  | 7.64 | 4.88 | 9      |
| 2          | 48        | 8.88             | 6.94 | 5.88 | 13     | 9.88  | 7.94 | 5.88 | 14     |
| 2-1/2      | 75        | 9.63             | 7.3  | 7.00 | 18     | 10.63 | 8.3  | 7.00 | 18     |
| 3          | 100       | 10.6             | 7.8  | 8.25 | 27     | 11.6  | 8.8  | 8.25 | 27     |

\* Also for -3B, -3EP, & -3T Valves

FLOW

1 inch Type QR-3V

| Valve Size | 1b<br>N.C. XP<br>Bonnet<br>Assembly | 1c<br>N.O. XP<br>Bonnet<br>Assembly | 7b<br>N.C. XP<br>Pilot<br>Assembly | 7c<br>N.O. XP<br>Pilot<br>Assembly | 20<br>Coil<br>Endplates | 21<br>Coil<br>Spring | 22<br>N.C. XP<br>Cover | N.O. XP<br>Cover | 23<br>XP Bolts      | XP<br>Washers       | 24<br>XP Base       |
|------------|-------------------------------------|-------------------------------------|------------------------------------|------------------------------------|-------------------------|----------------------|------------------------|------------------|---------------------|---------------------|---------------------|
|            | Q-3V-2*                             | QR-3V-2*                            | Q-3V-2*                            | QR-3V-2*                           | Q-3V-2*<br>QR-3V-2*     | Q-3V-2*<br>QR-3V-2*  | Q-3V-2*                | QR-3V-2*         | Q-3V-2*<br>QR-3V-2* | Q-3V-2*<br>QR-3V-2* | Q-3V-2*<br>QR-3V-2* |
| 1/8        | 403-2XP                             | 403-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 1/4        | 403-2XP                             | 403-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 3/8        | 403-2XP                             | 403-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 1/2        | 403-2XP                             | 403-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 3/4        | 413-2XP                             | 413-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 1          | 423-2XP                             | 423-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 1-1/4      | 433-2XP                             | 433-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 1-1/2      | 443-2XP                             | 443-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 2          | 453-2XP                             | 453-2RXP                            | 22-1                               | 32R-6                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 2-1/2      | 463-2XP                             | 463-2RXP                            | 24-1                               | 32R-7                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |
| 3          | 473-2XP                             | 473-2RXP                            | 24-1                               | 32R-7                              | 113                     | 37-2                 | 42NC                   | 42NO             | 9-4                 | 46-3                | 41A                 |

| size  | A     | B    | C    | wt |
|-------|-------|------|------|----|
| 1/8   | 7     | 6.19 | 2.75 | 7  |
| 1/4   | 7     | 6.19 | 2.75 | 7  |
| 3/8   | 7     | 6.19 | 2.75 | 7  |
| 1/2   | 7     | 6.19 | 2.75 | 7  |
| 3/4   | 7.38  | 6.38 | 3.25 | 8  |
| 1     | 7.63  | 6.44 | 3.81 | 9  |
| 1-1/4 | 8.38  | 6.88 | 4.25 | 10 |
| 1-1/2 | 8.88  | 7.25 | 4.88 | 12 |
| 2     | 9.81  | 7.69 | 5.88 | 17 |
| 2-1/2 | 10.13 | 8.25 | 7    | 22 |
| 3     | 11.19 | 8.38 | 8.25 | 31 |

Physical Dimensions of Normally Closed Valves

The Explosionproof housing is constructed of two (2) machined, enamel painted sand-cast gray iron parts bolted together, threaded onto the bonnet assembly and rigidly cemented in place. Once assembled the housing will *not* rotate. NEMA 4, NEMA 5, or NEMA 7 ratings are available with this housing.

| size  | A     | B    | C    | wt |
|-------|-------|------|------|----|
| 1/8   | 8.13  | 7.31 | 2.75 | 8  |
| 1/4   | 8.13  | 7.31 | 2.75 | 8  |
| 3/8   | 8.13  | 7.31 | 2.75 | 8  |
| 1/2   | 8.13  | 7.31 | 2.75 | 8  |
| 3/4   | 8.50  | 7.50 | 3.25 | 9  |
| 1     | 8.75  | 7.56 | 3.81 | 10 |
| 1-1/4 | 9.50  | 8.00 | 4.25 | 11 |
| 1-1/2 | 10.00 | 8.38 | 4.88 | 13 |
| 2     | 10.94 | 8.81 | 5.88 | 18 |
| 2-1/2 | 11.25 | 9.38 | 7    | 22 |
| 3     | 12.31 | 9.50 | 8.25 | 31 |

Physical Dimensions of Normally Open Valves

\* Also for -3B, -3EP, & -3T Valves

