

### Features

- Pilot operated, normally open or normally closed
- Snubber slows disc closing speed to protect system against water hammer damage more effectively than other techniques
- Pressure spike due to water hammer is reduced to a point eliminating the need for suppressors or other controls in most water systems
- Fluid Controls Institute Inc. evaluations have classified these valves:

| Pipe Sizes                     | FCI-82-1 Class |
|--------------------------------|----------------|
| 3/8", 1/2", 3/4"               | CC             |
| 1", 1 1/4", 1 1/2", 2", 2 1/2" | BB             |

### Construction

| Valve Parts in Contact with Fluids |                          |
|------------------------------------|--------------------------|
| Body                               | Brass                    |
| Disc                               | NBR                      |
| Seals                              | PTFE & NBR               |
| Core Tube                          | 305 Stainless Steel      |
| Core and Plugnut                   | 430F Stainless Steel     |
| Springs                            | 302 Stainless Steel      |
| Piston                             | Stainless Steel or Brass |
| Shading Coil                       | Copper                   |

### Electrical

| Standard Coil and Class of Insulation | Watt Rating and Power Consumption |       |            |           | Spare Coil Part No. |        |                |        |
|---------------------------------------|-----------------------------------|-------|------------|-----------|---------------------|--------|----------------|--------|
|                                       | DC Watts                          | AC    |            |           | General Purpose     |        | Explosionproof |        |
|                                       |                                   | Watts | VA Holding | VA Inrush | AC                  | DC     | AC             | DC     |
| F                                     | 11.6                              | 6.1   | 16         | 30        | 238210              | 238710 | 238214         | 238714 |
| F                                     | 16.8                              | 16.1  | 35         | 95        | 272610              | 97617  | 272614         | 97617  |
| F                                     | 22.6                              | -     | -          | -         | -                   | 238710 | -              | 238714 |

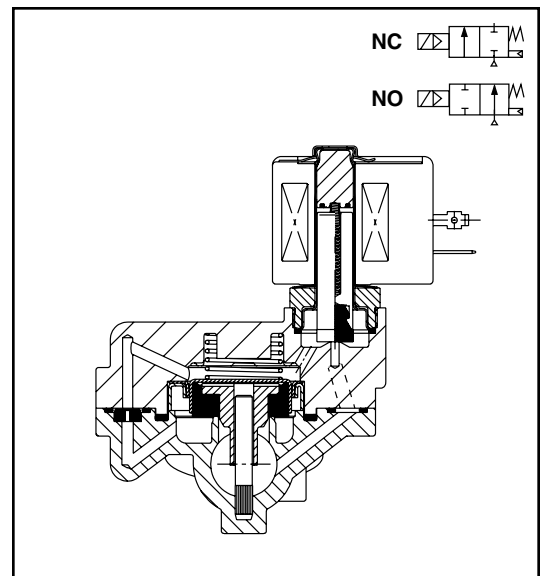
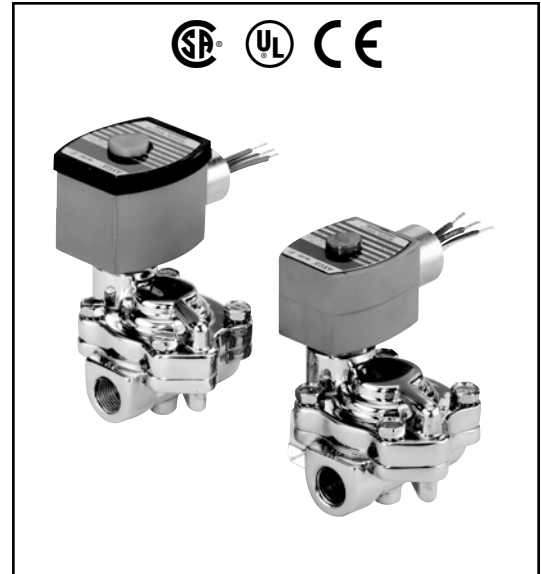
**Standard Voltages:** 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz).  
6, 12, 24, 120, 240 volts DC. Must be specified when ordering.  
Other voltages are available when required.

### Solenoid Enclosures

**Standard:** RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

**Optional:** RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; RedHat - Explosionproof and Raintight, Types 3, 7, and 9. (To order, add prefix "EF" to catalog number.)

See *Optional Features Section* for other available options.



### Nominal Ambient Temp. Ranges:

RedHat II/  
 RedHat AC: 32°F to 125°F (0°C to 52°C)  
 RedHat II DC: 32°F to 104°F (0°C to 40°C)  
 RedHat DC: 32°F to 77°F (0°C to 25°C)  
 (104°F/40°C occasionally)

Refer to *Engineering Section* for details.

### Approvals:

CSA certified (Excludes 8221G015, -035, -G035).  
 UL listed, General Purpose Valves.  
 RedHat II meets applicable CE directives.

Refer to *Engineering Section* for details.

## Specifications (English units)

| Pipe Size (in)                                    | Orifice Size (in) | Cv Flow Factor | Operating Pressure Differential (psi) |         |         | Max. Fluid Temp. °F |     | Brass Body Catalog Number | Const. Ref. | Watt Rating/ Class of Coil Insulation ③ |        |
|---|-------------------|----------------|---------------------------------------|---------|---------|---------------------|-----|---------------------------|-------------|---|--------|
|   |                   |                | Min. ①                                | Max. AC | Max. DC | AC                  | DC  |                           |             | AC                                      | DC     |
|   |                   |                |                                       | Water ② | Water ② |                     |     |                           |             |   |        |
| <b>NORMALLY CLOSED (Closed when de-energized)</b> |                   |                |                                       |         |         |                     |     |                           |             |   |        |
| 3/8   | 9/16              | 3              | 5                                     | 150     | 125     | 180                 | 150 | 8221G001                  | 1           | 6.1/F                                   | 11.6/F |
| 1/2   | 9/16              | 3.5            | 5                                     | 150     | 125     | 180                 | 150 | 8221G003                  | 1           | 6.1/F                                   | 11.6/F |
| 3/4   | 3/4               | 5.5            | 5                                     | 150     | 125     | 180                 | 150 | 8221G005                  | 2           | 6.1/F                                   | 11.6/F |
| 1   | 1                 | 11.5           | 5                                     | 150     | 125     | 180                 | 150 | 8221G007                  | 5           | 6.1/F                                   | 11.6/F |
| 1 1/4   | 1 1/8             | 13             | 5                                     | 150     | 125     | 180                 | 150 | 8221G009                  | 6           | 6.1/F                                   | 11.6/F |
| 1 1/2   | 1 1/4             | 24             | 5                                     | 150     | 125     | 180                 | 150 | 8221G011                  | 7           | 6.1/F                                   | 11.6/F |
| 2   | 1 3/4             | 36             | 5                                     | 150     | 125     | 180                 | 150 | 8221G013                  | 11          | 6.1/F                                   | 22.6/F |
| 2 1/2   | 1 3/4             | 38             | 5                                     | 150     | 125     | 180                 | 150 | 8221G015 ④                | 12          | 6.1/F                                   | 22.6/F |
| <b>NORMALLY OPEN (Open when de-energized)</b>     |                   |                |                                       |         |         |                     |     |                           |             |   |        |
| 3/8   | 9/16              | 3              | 5                                     | -       | 125     | -                   | 150 | 8221 021                  | 15          | -                                       | 16.8/F |
| 3/8   | 9/16              | 3              | 5                                     | 150     | -       | 180                 | -   | 8221G021                  | 3           | 16.1/F                                  | -      |
| 1/2   | 9/16              | 3.5            | 5                                     | -       | 125     | -                   | 150 | 8221 023                  | 15          | -                                       | 16.8/F |
| 1/2   | 9/16              | 3.5            | 5                                     | 150     | -       | 180                 | -   | 8221G023                  | 3           | 16.1/F                                  | -      |
| 3/4   | 3/4               | 5.5            | 5                                     | -       | 125     | -                   | 150 | 8221 025                  | 16          | -                                       | 16.8/F |
| 3/4   | 3/4               | 5.5            | 5                                     | 150     | -       | 180                 | -   | 8221G025                  | 4           | 16.1/F                                  | -      |
| 1   | 1                 | 11.5           | 5                                     | -       | 125     | -                   | 150 | 8221 027                  | 17          | -                                       | 16.8/F |
| 1   | 1                 | 11.5           | 5                                     | 150     | -       | 180                 | -   | 8221G027                  | 8           | 16.1/F                                  | -      |
| 1 1/4   | 1 1/8             | 13             | 5                                     | -       | 125     | -                   | 150 | 8221 029                  | 18          | -                                       | 16.8/F |
| 1 1/4   | 1 1/8             | 13             | 5                                     | 150     | -       | 180                 | -   | 8221G029                  | 9           | 16.1/F                                  | -      |
| 1 1/2   | 1 1/4             | 24             | 5                                     | -       | 125     | -                   | 150 | 8221 031                  | 19          | -                                       | 16.8/F |
| 1 1/2   | 1 1/4             | 24             | 5                                     | 150     | -       | 180                 | -   | 8221G031                  | 10          | 16.1/F                                  | -      |
| 2   | 1 3/4             | 36             | 5                                     | -       | 125     | -                   | 150 | 8221 033                  | 20          | -                                       | 16.8/F |
| 2   | 1 3/4             | 36             | 5                                     | 150     | -       | 180                 | -   | 8221G033                  | 13          | 16.1/F                                  | -      |
| 2 1/2   | 1 3/4             | 38             | 5                                     | -       | 125     | -                   | 150 | 8221 035 ④                | 21          | -                                       | 16.8/F |
| 2 1/2   | 1 3/4             | 38             | 5                                     | 150     | -       | 180                 | -   | 8221G035 ④                | 14          | 16.1/F                                  | -      |

① Valves require a 5 psi Minimum Pressure Differential to open. Once open, they remain open with 3 psi differential pressure.  
 ② Refer to Steam/Hot Water Valve Series for Hot Water constructions.  
 ③ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts.  
 ④ Not CSA certified.

### Specifications (Metric units)

| Pipe Size (in)                                    | Orifice Size (mm) | Kv Flow Factor (m3/h) | Operating Pressure Differential (bar) |         |         | Max. Fluid Temp. °C |    | Brass Body | Const. Ref. | Watt Rating/ Class of Coil Insulation ③ |        |
|---|-------------------|-----------------------|---------------------------------------|---------|---------|---------------------|----|------------|-------------|---|--------|
|   |                   |                       | Min. ①                                | Max. AC | Max. DC | AC                  | DC |            |             | Catalog Number                          | AC     |
|   |                   |                       |                                       | Water ② | Water ② |                     |    |            |             |   |        |
| <b>NORMALLY CLOSED (Closed when de-energized)</b> |                   |                       |                                       |         |         |                     |    |            |             |   |        |
| 3/8   | 14                | 2.6                   | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G001   | 1           | 6.1/F                                   | 11.6/F |
| 1/2   | 14                | 3.0                   | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G003   | 1           | 6.1/F                                   | 11.6/F |
| 3/4   | 19                | 4.7                   | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G005   | 2           | 6.1/F                                   | 11.6/F |
| 1   | 25                | 9.9                   | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G007   | 5           | 6.1/F                                   | 11.6/F |
| 1 1/4   | 29                | 11                    | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G009   | 6           | 6.1/F                                   | 11.6/F |
| 1 1/2   | 32                | 21                    | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G011   | 7           | 6.1/F                                   | 11.6/F |
| 2   | 44                | 31                    | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G013   | 11          | 6.1/F                                   | 22.6/F |
| 2 1/2   | 44                | 33                    | 0.3                                   | 10      | 9       | 82                  | 65 | 8221G015 ④ | 12          | 6.1/F                                   | 22.6/F |
| <b>NORMALLY OPEN (Open when de-energized)</b>     |                   |                       |                                       |         |         |                     |    |            |             |   |        |
| 3/8   | 14                | 2.6                   | 0.3                                   | -       | 9       | -                   | 65 | 8221 021   | 15          | -                                       | 16.8/F |
| 3/8   | 14                | 2.6                   | 0.3                                   | 10      | -       | 82                  | -  | 8221G021   | 3           | 16.1/F                                  | -      |
| 1/2   | 14                | 3.0                   | 0.3                                   | -       | 9       | -                   | 65 | 8221 023   | 15          | -                                       | 16.8/F |
| 1/2   | 14                | 3.0                   | 0.3                                   | 10      | -       | 82                  | -  | 8221G023   | 3           | 16.1/F                                  | -      |
| 3/4   | 19                | 4.7                   | 0.3                                   | -       | 9       | -                   | 65 | 8221 025   | 16          | -                                       | 16.8/F |
| 3/4   | 19                | 4.7                   | 0.3                                   | 10      | -       | 82                  | -  | 8221G025   | 4           | 16.1/F                                  | -      |
| 1   | 25                | 9.9                   | 0.3                                   | -       | 9       | -                   | 65 | 8221 027   | 17          | -                                       | 16.8/F |
| 1   | 25                | 9.9                   | 0.3                                   | 10      | -       | 82                  | -  | 8221G027   | 8           | 16.1/F                                  | -      |
| 1 1/4   | 29                | 11                    | 0.3                                   | -       | 9       | -                   | 65 | 8221 029   | 18          | -                                       | 16.8/F |
| 1 1/4   | 29                | 11                    | 0.3                                   | 10      | -       | 82                  | -  | 8221G029   | 9           | 16.1/F                                  | -      |
| 1 1/2   | 32                | 21                    | 0.3                                   | -       | 9       | -                   | 65 | 8221 031   | 19          | -                                       | 16.8/F |
| 1 1/2   | 32                | 21                    | 0.3                                   | 10      | -       | 82                  | -  | 8221G031   | 10          | 16.1/F                                  | -      |
| 2   | 44                | 31                    | 0.3                                   | -       | 9       | -                   | 65 | 8221 033   | 20          | -                                       | 16.8/F |
| 2   | 44                | 31                    | 0.3                                   | 10      | -       | 82                  | -  | 8221G033   | 13          | 16.1/F                                  | -      |
| 2 1/2   | 44                | 33                    | 0.3                                   | -       | 9       | -                   | 65 | 8221 035 ④ | 21          | -                                       | 16.8/F |
| 2 1/2   | 44                | 33                    | 0.3                                   | 10      | -       | 82                  | -  | 8221G035 ④ | 14          | 16.1/F                                  | -      |

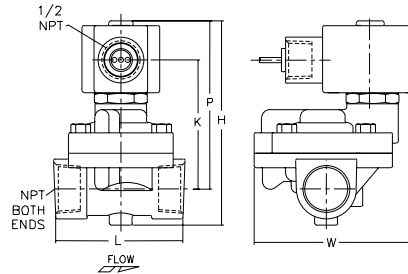
① Valves require a 0.3 bar Minimum Pressure Differential to open. Once open, they remain open with 0.2 bar differential pressure.  
 ② Refer to Steam/Hot Water Valve Series for Hot Water constructions.  
 ③ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts.  
 ④ Not CSA certified.

## Dimensions: inches (mm)

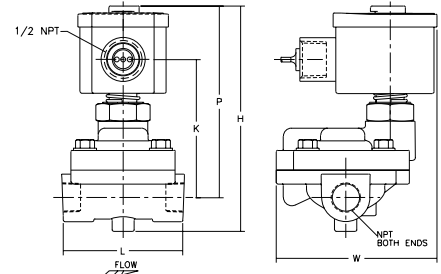
| Const. Ref. |    | H    | K    | L    | P    | W    |
|-------------|----|------|------|------|------|------|
| 1           | in | 4.34 | 2.69 | 2.72 | 3.59 | 3.41 |
|             | mm | 110  | 68   | 69   | 91   | 87   |
| 2           | in | 4.53 | 2.85 | 2.78 | 3.75 | 3.41 |
|             | mm | 115  | 72   | 71   | 95   | 87   |
| 3           | in | 5.22 | 3.14 | 2.72 | 4.47 | 3.69 |
|             | mm | 133  | 80   | 69   | 114  | 94   |
| 4           | in | 5.41 | 3.30 | 2.78 | 4.62 | 3.69 |
|             | mm | 137  | 84   | 71   | 117  | 94   |
| 5           | in | 5.62 | 3.15 | 3.75 | 4.03 | 3.16 |
|             | mm | 143  | 80   | 95   | 102  | 80   |
| 6           | in | 5.56 | 3.15 | 3.66 | 4.03 | 3.56 |
|             | mm | 141  | 80   | 93   | 102  | 90   |
| 7           | in | 6.12 | 3.30 | 4.38 | 4.19 | 4.12 |
|             | mm | 156  | 84   | 111  | 106  | 105  |
| 8           | in | 6.53 | 3.59 | 3.75 | 4.91 | 3.16 |
|             | mm | 166  | 91   | 95   | 125  | 80   |
| 9           | in | 6.47 | 3.59 | 3.56 | 4.91 | 3.56 |
|             | mm | 164  | 91   | 93   | 125  | 90   |
| 10          | in | 7.03 | 3.74 | 4.38 | 5.06 | 4.12 |
|             | mm | 179  | 95   | 111  | 129  | 105  |
| 11          | in | 7.38 | 3.71 | 5.06 | 4.59 | 4.72 |
|             | mm | 188  | 94   | 129  | 117  | 120  |
| 12          | in | 7.38 | 3.71 | 5.50 | 4.59 | 5.19 |
|             | mm | 188  | 94   | 140  | 117  | 132  |
| 13          | in | 8.22 | 4.15 | 5.06 | 5.47 | 4.72 |
|             | mm | 209  | 105  | 129  | 139  | 120  |
| 14          | in | 8.22 | 4.15 | 5.50 | 5.47 | 5.19 |
|             | mm | 209  | 105  | 140  | 139  | 132  |
| 15          | in | 5.22 | -    | 2.72 | 4.47 | 3.69 |
|             | mm | 133  | -    | 69   | 114  | 94   |
| 16          | in | 5.41 | -    | 2.78 | 4.62 | 3.69 |
|             | mm | 137  | -    | 71   | 117  | 94   |
| 17          | in | 6.53 | -    | 3.75 | 4.91 | 3.16 |
|             | mm | 166  | -    | 95   | 125  | 80   |
| 18          | in | 6.47 | -    | 3.66 | 4.91 | 3.56 |
|             | mm | 164  | -    | 93   | 125  | 90   |
| 19          | in | 7.03 | -    | 4.38 | 5.06 | 4.12 |
|             | mm | 179  | -    | 111  | 129  | 105  |
| 20          | in | 8.22 | -    | 5.06 | 5.47 | 4.72 |
|             | mm | 209  | -    | 129  | 139  | 120  |
| 21          | in | 8.22 | -    | 5.50 | 5.47 | 5.19 |
|             | mm | 209  | -    | 140  | 139  | 132  |

**IMPORTANT:** Valves may be mounted in any position.

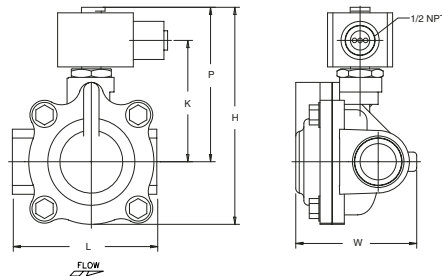
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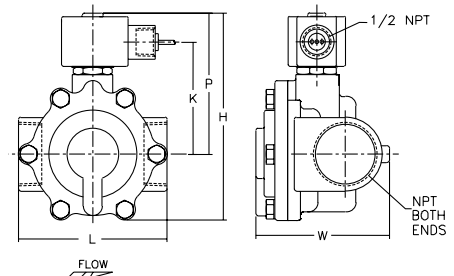
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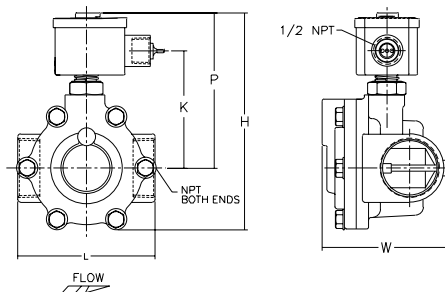
Const. Ref. 5, 6



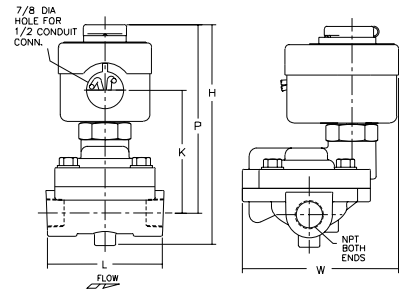
Const. Re. 7, 11, 12



Const. Ref. 8, 9, 10, 13, 14



Const. Ref. 15, 16



Const. Ref. 17 - 21

