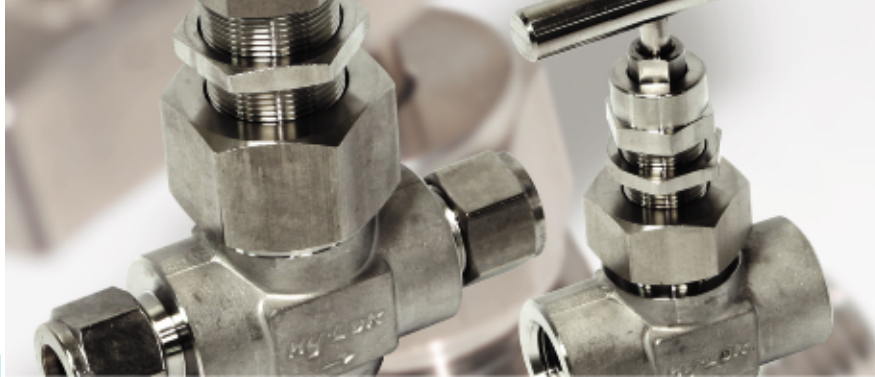




www.hy-lok.com

Catalog No. H-102NV  
Jun. 2023



# Union Bonnet Needle Valves

## GB Series

### Handle

- is available in stainless steel and black phenolic knob.

### Stem Threads

- are rolled maximum service life.

### Panel Mounting Nut

- allows easy mounting.

### Rugged Body

- is available with straight and angle pattern.

### Variety of End Connections

- include Hy-Lok tube fitting, male/female NPT/ISO threads, and socket weld Ends.

### Variety of Orifice Sizes

- include 4.0mm (GB1 series)  
6.4mm (GB2 series)  
11.0mm (GB3 series)

### Locking Nut

- prevents packing bolt from loosening.

### Stem Packing

- available in PTFE(Standard)  
PEEK and Graphite

### Metal Seal Bonnet - to - Body Construction

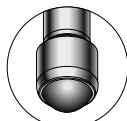
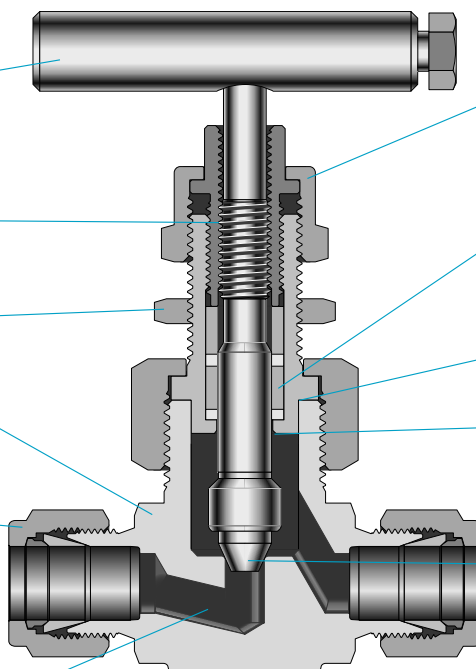
- ensures safety.

### Back Seating

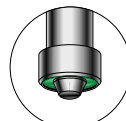
- provides anti - blow out of stem and secondary stem seal.

### Variety of Stem Tips

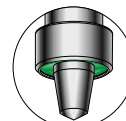
- include non - rotating Vee(Standard)  
non-rotating ball, soft seat, regulating soft seat and non - rotating regulating tip.(Optional)



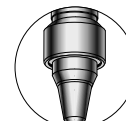
Ball Tip



Soft Seat Tip



Regulating  
Soft Seat Tip



Regulating Tip

## Features

- **Pressure rating** up to 6,000 psig (413bar) @ 100°F (38°C)
- **Temperature rating** from -65°F to 450°F (-54°C to 232°C) with standard PTFE packing and up to 1,000°F (537°C) with optional Graphite packing
- **Body materials** available in 316 stainless steel, carbon steel, and alloy 400
- **100% factory tested.**

# HY-LOK CORPORATION

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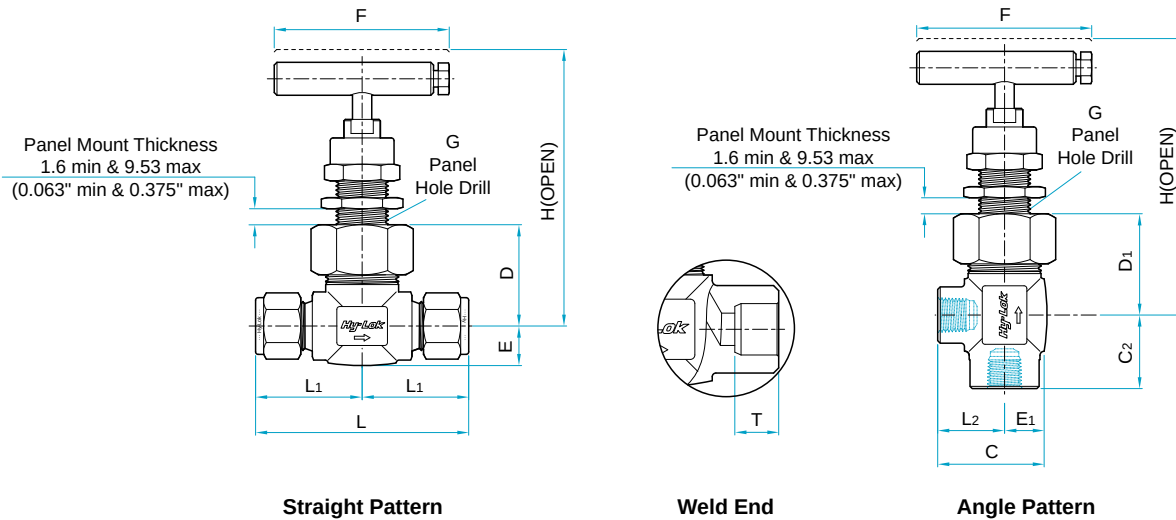


Table of Dimensions

| Basic Part No. |         | Orifice Hole   | Cv   | End Connection  |                 | Dimensions      |                |                |                |                |                |                |                |                |              |                |                 |                 |                |
|----------------|---------|----------------|------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|----------------|-----------------|-----------------|----------------|
|                |         |                |      | Inlet           | Outlet          | L               | L1             | L2             | C              | C2             | D              | D1             | E              | E1             | F            | G              | H Straight      | H Angle         | T              |
| GB1            | F -2N   | 4.0<br>(0.16)  | 0.35 | 1/8" Female NPT |                 | 50.8<br>(2.00)  | 25.4<br>(1.00) | 23.0<br>(0.91) | 32.6<br>(1.28) | 25.4<br>(1.00) | 27.8<br>(1.09) | 32.6<br>(1.28) | 11.5<br>(0.45) | 11.5<br>(0.45) | 45<br>(1.77) | 15.1<br>(0.59) | 77.8<br>(3.06)  | 82.6<br>(3.25)  | -              |
|                | F -4N   |                |      | 1/4" Female NPT |                 | 52.4<br>(2.06)  | 26.2<br>(1.03) |                |                |                |                |                |                |                |              |                |                 |                 |                |
|                | M -4N   |                |      | 1/4" Male NPT   |                 | 50.8<br>(2.00)  | 25.4<br>(1.00) | 25.4<br>(1.00) | 35.0<br>(1.38) |                |                |                |                |                |              |                |                 |                 |                |
|                | MF -4N  |                |      | 1/4" Male NPT   | 1/4" Female NPT | 52.4<br>(2.06)  | 26.2<br>(1.03) | 23.0<br>(0.91) | 32.6<br>(1.28) |                |                |                |                |                |              |                |                 |                 |                |
|                | H -6M   |                |      | 6mm Hy-Lok      |                 | 61.9<br>(2.44)  | 31.0<br>(1.22) | 29.4<br>(1.16) | 38.9<br>(1.53) | 33.7<br>(1.33) |                |                |                |                |              |                |                 |                 |                |
|                | H -4T   |                |      | 1/4" Hy-Lok     |                 |                 |                |                |                |                |                |                |                |                |              |                |                 |                 |                |
|                | SW -4T  |                |      | 1/4" Tube Weld  |                 | 46.0<br>(1.81)  | 23.0<br>(0.91) | 22.3<br>(0.88) | 31.8<br>(1.03) | 26.2<br>(1.19) |                |                |                |                |              |                |                 |                 | 7.2<br>(0.28)  |
|                | H -8M   |                |      | 8mm Hy-Lok      |                 | 61.9<br>(2.44)  | 31.0<br>(1.22) | 29.4<br>(1.16) | 38.9<br>(1.53) | 33.7<br>(1.33) |                |                |                |                |              |                |                 |                 | -              |
| GB2            | F -4N   | 6.4<br>(0.25)  | 0.86 | 1/4" Female NPT |                 | 57.2<br>(2.25)  | 28.6<br>(1.13) | 25.4<br>(1.00) | 39.6<br>(1.56) | 28.6<br>(1.13) | 34.0<br>(1.34) | 34.0<br>(1.34) | 14.2<br>(0.56) | 14.2<br>(0.56) | 64<br>(2.52) | 19.9<br>(0.78) | 93.7<br>(3.69)  | 96.9<br>(3.81)  | -              |
|                | F -6N   |                |      | 3/8" Female NPT |                 |                 |                |                |                |                |                |                |                |                |              |                |                 |                 |                |
|                | H -10M  |                |      | 10mm Hy-Lok     |                 | 73.0<br>(2.87)  | 36.5<br>(1.44) | 33.7<br>(1.33) | 47.9<br>(1.89) | 37.6<br>(1.48) |                |                |                |                |              |                |                 |                 |                |
|                | H -6T   |                |      | 3/8" Hy-Lok     |                 |                 |                | 33.5<br>(1.32) | 47.7<br>(1.88) | 37.5<br>(1.48) |                |                |                |                |              |                |                 |                 |                |
|                | H -12M  |                |      | 12mm Hy-Lok     |                 | 77.8<br>(3.06)  | 38.9<br>(1.53) | 36.2<br>(1.43) | 50.4<br>(1.98) | 40.2<br>(1.58) |                |                |                |                |              |                |                 |                 |                |
|                | H -8T   |                |      | 1/2" Hy-Lok     |                 |                 |                | 36.0<br>(1.42) | 50.2<br>(1.98) | 40.0<br>(1.57) |                |                |                |                |              |                |                 |                 |                |
|                | SW -4P  |                |      | 1/4" Pipe Weld  |                 |                 |                |                |                | 28.6<br>(1.13) |                |                |                |                |              |                |                 |                 | 10.0<br>(0.39) |
|                | SW -6T  |                |      | 3/8" Tube Weld  |                 | 57.2<br>(2.25)  | 28.6<br>(1.13) | 25.4<br>(1.00) | 39.6<br>(1.56) | 25.4<br>(1.00) |                |                |                |                |              |                |                 |                 | 9.6<br>(0.38)  |
| GB3            | SW -8T  | 11.0<br>(0.43) | 2.2  | 1/2" Tube Weld  |                 |                 |                |                |                |                | 46.0<br>(1.81) | 47.0<br>(1.85) | 15.9<br>(0.63) | 17.5<br>(0.69) | 76<br>(2.99) | 26.2<br>(1.03) | 121.5<br>(4.78) | 122.4<br>(4.82) | -              |
|                | F -8N   |                |      | 1/2" Female NPT |                 | 79.4<br>(3.13)  | 39.7<br>(1.56) | 33.3<br>(1.31) | 50.8<br>(2.00) | 39.7<br>(1.56) |                |                |                |                |              |                |                 |                 |                |
|                | F -12N  |                |      | 3/4" Female NPT |                 | 82.6<br>(3.25)  | 41.3<br>(1.63) | 41.3<br>(1.63) | 61.8<br>(2.43) | 38.0<br>(1.50) |                |                |                |                |              |                |                 |                 |                |
|                | F -16N  |                |      | 1" Female NPT   |                 | 92.1<br>(3.63)  | 46.0<br>(1.81) | -              | -              | 54.0<br>(2.13) |                |                |                |                |              |                |                 |                 |                |
|                | MF -8N  |                |      | 1/2" Male NPT   | 1/2" Female NPT | 79.4<br>(3.13)  | 39.7<br>(1.56) | 33.3<br>(1.31) | 50.8<br>(2.00) | 39.7<br>(1.56) |                |                |                |                |              |                |                 |                 |                |
|                | MF -12N |                |      | 3/4" Male NPT   | 3/4" Female NPT | 82.6<br>(3.25)  | 41.3<br>(1.63) | -              | -              | 48.4<br>(1.91) |                |                |                |                |              |                |                 |                 |                |
|                | MF -16N |                |      | 1" Male NPT     | 1" Female NPT   | 92.1<br>(3.63)  | 46.0<br>(1.81) | -              | -              | 54.0<br>(2.13) |                |                |                |                |              |                |                 |                 |                |
|                | H -12M  |                |      | 12mm Hy-Lok     |                 |                 |                | -              | -              | -              |                |                |                |                |              |                |                 |                 |                |
|                | H -8T   |                |      | 1/2" Hy-Lok     |                 | 100.0<br>(3.94) | 50.0<br>(1.97) | 47.0<br>(1.85) | 61.1<br>(2.41) | 50.0<br>(1.97) |                |                |                |                |              |                |                 |                 |                |
|                | H -12T  |                |      | 3/4" Hy-Lok     |                 |                 |                | -              | -              | -              |                |                |                |                |              |                |                 |                 |                |
|                | H -16T  |                |      | 1" Hy-Lok       |                 |                 |                | -              | -              | -              |                |                |                |                |              |                |                 |                 |                |
|                | SW -8P  |                |      | 1/2" Pipe Weld  |                 |                 |                |                |                | 39.7<br>(1.56) |                |                |                |                |              |                |                 |                 |                |
|                | SW -8T  |                |      | 1/2" Tube Weld  |                 | 79.4<br>(3.13)  | 39.7<br>(1.56) | 33.3<br>(1.31) | 50.8<br>(2.00) | 42.9<br>(1.69) |                |                |                |                |              |                |                 |                 |                |
|                | SW -12T |                |      | 3/4" Tube Weld  |                 |                 |                |                |                | 39.7<br>(1.56) |                |                |                |                |              |                |                 |                 |                |

All dimensions in millimeters (inch.) Dimensions shown with Hy-Lok nuts in finger - tight position, where applicable.

## Technical Data

### Materials of Construction

| Description       |            | Grade / ASTM Specification |                              |                         |
|-------------------|------------|----------------------------|------------------------------|-------------------------|
|                   |            | Valve Body Materials       |                              |                         |
|                   |            | SS316                      | Carbon Steel                 | Alloy 400               |
| Handle            |            | Stainless Steel            | Aluminum                     | Stainless Steel         |
| Lock Nut          |            | SS316 / A479<br>or A276    | 1020 / A108<br>JIS 4051 S20C | SS316 / A479<br>or A276 |
| Packing Bolt      |            | SS630 / A564               |                              |                         |
| Packing Gland     |            | SS316 / A479 or A276       |                              | SS316 / A479 or A276    |
| Packing Support * |            | Reinforced PTFE            |                              |                         |
| Stem Packing *    |            | PTFE                       |                              |                         |
| Bonnet *          |            | SS316 / A479               | 1020 / A108<br>JIS 4051 S20C | Alloy 400 / B164        |
| Stem *            |            | SS316 / A479 or A276       |                              | Alloy 400 / B164        |
| Stem Tip *        | Vee Tip    | SS630 / A564               |                              | Alloy 400 / B164        |
|                   | Ball Tip   |                            |                              |                         |
|                   | Regulating |                            |                              |                         |
|                   | Soft Tip   | PCTFE                      |                              |                         |
| Body *            |            | SS316 / A479<br>or A182    | 1020 / A108<br>JIS 4051 S20C | Alloy 400 / B164        |

Note : " \* " marked are wetted parts.

Nickel anti-seize lubricant for PTFE packed valves and fluorinated grease for PEEK and Graphite packed valves.

### Temperature vs Working Pressure

| Temperature     | Pressure (psig) @ Temperature Rating |       |               |           |
|-----------------|--------------------------------------|-------|---------------|-----------|
|                 | ASME Group                           | 2.2   | NA            | 3.4       |
|                 | Materials                            | SS316 | Carbon Steel† | Alloy 400 |
| -65 °F (-54 °C) | 100 °F ( 38 °C)                      | 6000  | 6000          | 5000      |
|                 | 200 °F ( 93 °C)                      | 5160  | 5420          | 4400      |
|                 | 300 °F (148 °C)                      | 4660  | 5320          | 4120      |
|                 | 350 °F (176 °C)                      | 4470  | 5230          | 4050      |
|                 | 400 °F (204 °C)                      | 4280  | -             | 3980      |
|                 | 450 °F (232 °C)                      | 4130  | -             | 3970      |

† Rated at a low temperature of -20 °F (-29 °C)

- To determine kPa, multiply psig by 6.89 and bar by 0.0689.
- When valves with Hy-Lok fitting end connections are connected to tubing, the working pressure of tubing must be considered in the calculation of total system working pressure.

### Testing

- Each valve is tested with nitrogen @ 1000psig (69bar) to a max leak rate of 0.1 SCCM.
- Hydrostatic shell test is performed at 1.5 times the working pressure.
- Optional tests are available upon request.

### Temperature and Pressure Rating

| Body Material       | Stem Tip                    | Temperature Rating                | Pressure Rating @ -65°F ~ 100°F (-54°C ~ 38°C) |
|---------------------|-----------------------------|-----------------------------------|------------------------------------------------|
| 316 Stainless Steel | NR Vee, NR Ball, Regulating | -65 °F ~ 450 °F (-54 °C ~ 232 °C) | 6000 psig                                      |
|                     | NR Soft Seat (PCTFE)        | -65 °F ~ 200 °F (-54 °C ~ 93 °C)  |                                                |
| Carbon Steel        | NR Vee, NR Ball, Regulating | -20 °F ~ 350 °F (-29 °C ~ 176 °C) | 6000 psig                                      |
|                     | NR Soft Seat (PCTFE)        | -65 °F ~ 200 °F (-54 °C ~ 93 °C)  |                                                |
| Alloy 400 (monel)   | NR Vee, NR Ball, Regulating | -65 °F ~ 450 °F (-54 °C ~ 232 °C) | 5000 psig                                      |
|                     | NR Soft Seat (PCTFE)        | -65 °F ~ 200 °F (-54 °C ~ 93 °C)  |                                                |

- NR stands for non-rotating.
- The above ratings are for a standard valve with PTFE packing. For optional packing materials, refer to the table shown below.
- Extreme temperature fluctuations may require packing adjustment.

### Packing and Body Materials vs Temperature and Pressure Rating

| Packing Material | Body Material       | Temperature                        | Pressure @ Temp Rating |
|------------------|---------------------|------------------------------------|------------------------|
| PTFE (Standard)  | 316 Stainless Steel | -65 °F ~ 450 °F (-54 °C ~ 232 °C)  | 4130 psig              |
|                  | Alloy 400 *         |                                    | 3970 psig              |
| PEEK†            | 316 Stainless Steel | -65 °F ~ 600 °F (-54 °C ~ 315 °C)  | 3760 psig              |
|                  | Alloy 400 *         | -65 °F ~ 500 °F (-54 °C ~ 260 °C)  | 3960 psig              |
| Graphite         | 316 Stainless Steel | -65 °F ~ 1000 °F (-54 °C ~ 537 °C) | 3030 psig              |
|                  | Carbon Steel        | -20 °F ~ 350 °F (-29 °C ~ 176 °C)  | 5230 psig              |
|                  | Alloy 400 *         | -65 °F ~ 500 °F (-54 °C ~ 260 °C)  | 3960 psig              |

\* Not applicable over 500 °F (260 °C).

† PEEK is not recommended for service with aromatic heat transfer fluids or concentrated sulfuric and nitric acids. Other limitations may apply.

### Sour Gas Service

- is provided to meet NACE Standard MR-01-75.

### Steam and Severe Service

- To order, add-SB (Stellite Ball) to the valve ordering number.

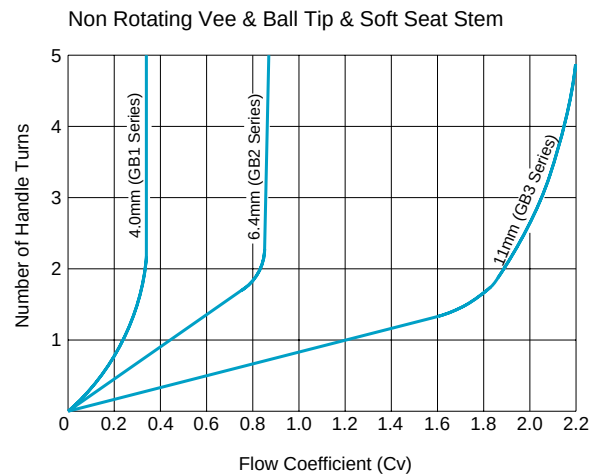
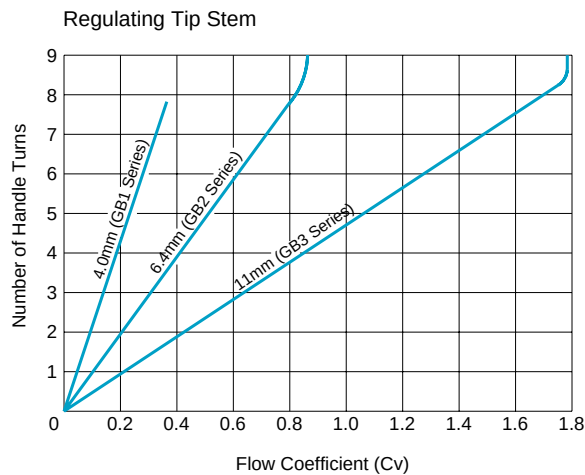
### Hydrogen Service

- To order, add-KT (Krytox lubricant) to the valve ordering number.

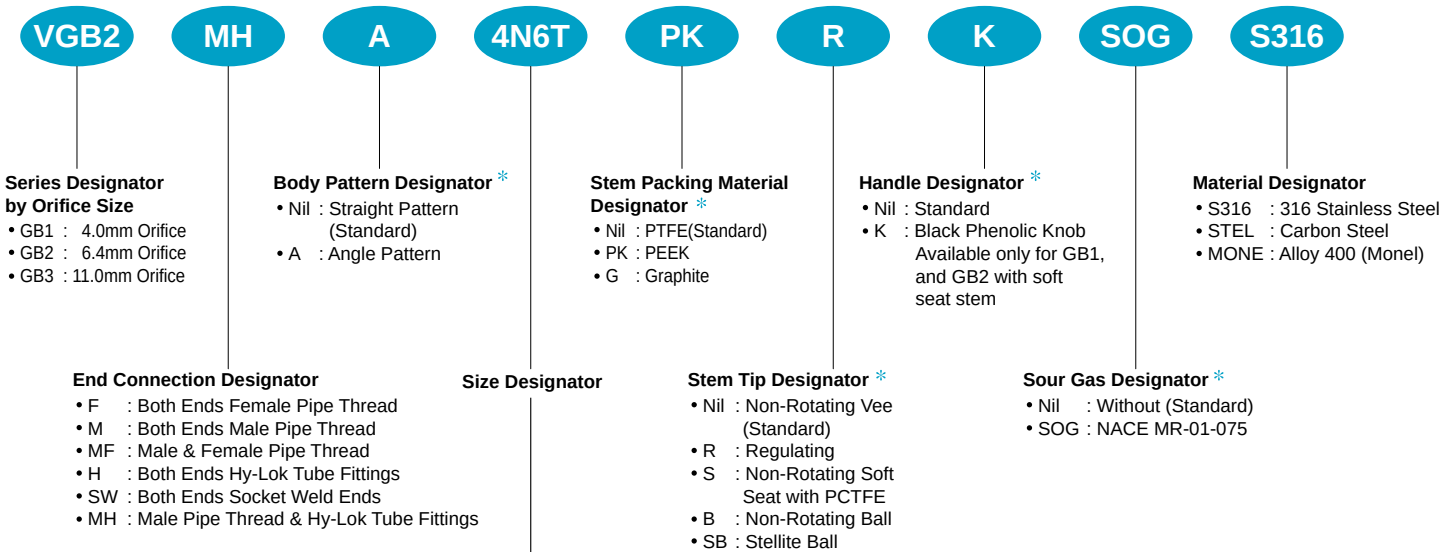
### Handles

- Standards are black aluminum bar for carbon steel body and stainless steel bar for SS316 and Alloy 400 body.

## Flow Coefficient (Cv) vs Number of Handle Turns



## Ordering Information



• NPT (ISO/BSP)

| Thread (in.) | 1/8   | 1/4   | 3/8   | 1/2   | 3/4    | 1      |
|--------------|-------|-------|-------|-------|--------|--------|
| Designator   | 2N(R) | 4N(R) | 6N(R) | 8N(R) | 12N(R) | 16N(R) |

• Tube

| Fractional Tube | O.D. (in.) | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1   |
|-----------------|------------|-----|-----|-----|-----|-----|-----|
|                 | Designator | 2T  | 4T  | 6T  | 8T  | 12T | 16T |
| Metric Tube     | O.D. (mm)  | 3   | 6   | 10  | 12  | 20  | 25  |
|                 | Designator | 3M  | 6M  | 10M | 12M | 20M | 25M |

**Note \*** : No designator is required for standard, e.g. GB2MH-4N6T-S316.

## SAFETY in VALVE SELECTION

Proper installation, materials compatibility, operation and maintenance of these valves are the responsibility of the user. The total system design must be taken into consideration to ensure optimal performance and safety