| Type 807/752 | Standard 1/4", 1/2", 3/4" and 1" RESEARCH CONTROL® Valves | Technical Brief |
|---|---|---|

## DESCRIPTION

The Type 807/752 standard globe control valve is available in ¼", ½", ¾" or 1" sizes. Its compact design and light weight make it especially suited to modulating control of medium to low flow rates at system pressures up to 5000 psig. See page 2 for pressure versus temperature ratings for each size. Many variations of this design are available to serve requirements not covered in this bulletin.

## APPLICATIONS

The Type 807/752 valve is widely used in industrial applications, research, and process pilot plants on liquids, gases or steam to control fractional flows in ¼", ½", ¾" and 1" pipe. Its compact size makes it an ideal choice for additive injection, sampling, or low flow hydraulic systems. It is recommended for use wherever precise control is an important factor or where physical constraints limit valve weight or size.

## MATERIALS OF CONSTRUCTION

**Body – Bonnet:**

**Standard** 316/316L stainless steel, carbon steel (WCB)
**Optional** Monel®, alloy 20, Hastelloy® C or ASTM equivalent, DIN 1.4581/1.4571. Other materials available on request.

**Innervalve:**

**Standard** 316 stainless steel
**Optional** Stellite®, Monel, alloy 20, Halstelloy C or B or ASTM equivalent

**Packing:**

**Standard** TFE chevon rings
**Optional** Graphite, REK

**Actuator:**

**Standard** Die cast aluminum
**Optional** 316L stainless steel on ½", ¾", and 1" models

## ACTUATOR CHOICES

| | |
|---|---|
| **Standard** | Air to open, fail close<br>Air to close, fail open |
| **Optional** | With integral top-mounted positioner |
| **Standard Signals** | 3-15#, 3-27#, 6-30# |
| **Optional Signals** | 3-9#, 9-15#, with positioner |
| **Accessories** | Filter regulator, gauges, I/P converter, limit switches, handwheel, solenoids |

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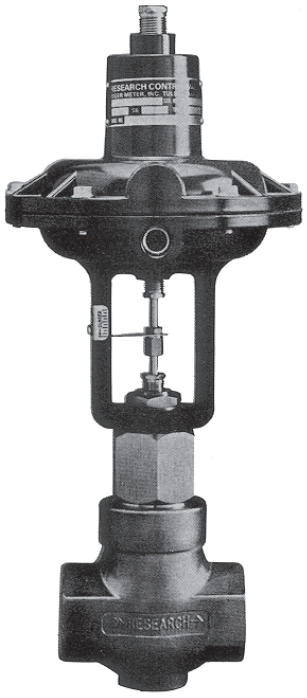


**Shown with Type 754 Actuator**

## STANDARD FEATURES

Wide range of interchangeable trim sets

Threaded bonnet for quick disassembly

Choice of linear or equal percent on "J" trim and larger

TFE chevron packing

ANSI Class IV shutoff (size "O" and larger)

## OPTIONAL FEATURES (on ½", ¾", and 1" models)

Flange sizes up to 1-½", socket weld, butt-weld nipples

Cooling fin bonnet for higher temperatures

Bellows stem seal

Angle pattern body

Graphite or Kalrez® packing

Extended bonnet for cryogenic applications

Barstock bodies in exotic materials

**1/4" Research Control Valve**

Pressure vs. Temperature Rating for Valve Superstructure

Excluding Packing or End Fittings

See Note 1 below

| Temp | 316 S/S | Carbon Steel | Hast B or = | Hast. C or = | Monel | Alloy 20 |
|---|---|---|---|---|---|---|
| 100˚F | 5000 | 4000 | 5000 | 5000 | 4000 | 5000 |
| 200˚F | 5000 | 3700 | 5000 | 5000 | 4000 | 5000 |
| 300˚F | 4750 | 3500 | 5000 | 5000 | 3880 | 4850 |
| 400˚F | 4190 | 3200 | 5000 | 5000 | 3770 | 4700 |
| 500˚F | 4000 | 2900 | 4900 | 4900 | 3740 | 4500 |
| 600˚F | 3820 | 2600 | 4850 | 4850 | 3740 | 4200 |
| 700˚F | 3640 | 2300 | 4800 | 4800 | 3640 | 3900 |
| 800˚F | 3580 | | 4750 | 4750 | 3580 | 3700 |
| 900˚F | 2840 | | | 4500 | 2280 | 3000 |
| 1000˚F | 1160 | | | 4000 | 940 | 1500 |
| 1100˚F | Consult factory for higher temperatures | | | 3500 | | |
| 1200˚F | | | | 3000 | | |
| | | | | | | |
| Rec. Torque ft/lb (+/- 2ft/lb) | 37 | 37 | 39 | 37 | 31 | 35 |

**1/2" Research Control Valve**

Pressure vs. Temperature Rating for Valve Superstructure

Excluding Packing or End Fittings.

See Note 1 below

| Temp | 316 S/S | Carbon Steel | Hast B or = | Hast. C or = | Monel | Alloy 20 |
|---|---|---|---|---|---|---|
| 100˚F | 5000 | 4000 | 5000 | 5000 | 4000 | 5000 |
| 200˚F | 4750 | 3800 | 5000 | 5000 | 3780 | 5000 |
| 300˚F | 4310 | 3600 | 5000 | 5000 | 3520 | 4950 |
| 400˚F | 3860 | 3300 | 5000 | 5000 | 3420 | 4850 |
| 500˚F | 3640 | 3100 | 4900 | 4900 | 3390 | 4600 |
| 600˚F | 3470 | 2900 | 4870 | 4870 | 3390 | 4300 |
| 700˚F | 3310 | 2700 | 4610 | 4610 | 3310 | 4200 |
| 800˚F | 3255 | | 4430 | 4430 | 2090 | 4000 |
| 900˚F | 3190 | | | 4200 | 2070 | 3000 |
| 1000˚F | 1860 | | | 4000 | 850 | 1500 |
| 1100˚F | Consult factory for higher temperatures | | | 3400 | | |
| 1200˚F | | | | 3000 | | |
| | | | | | | |
| Rec. Torque ft/lb (+/- 2ft/lb) | 122 | 122 | 131 | 124 | 102 | 117 |

**3/4" and 1" Research Control Valve**

Pressure vs.Temperature Rating for Valve Superstructure

Excluding Packing or End Fittings

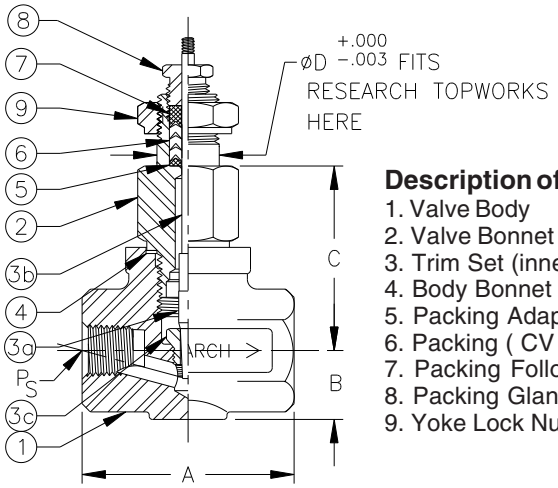
See Note 1 below

| Temp | 316 S/S | | Carbon Steel | |
|---|---|---|---|---|
| | 3/4" | 1" | 3/4" | 1" |
| 100°F | 1500 | 1500 | 1500 | 1500 |
| 200°F | 1450 | 1450 | 1350 | 1350 |
| 300°F | 1325 | 1325 | 1325 | 1325 |
| 400°F | 1175 | 1175 | 1275 | 1275 |
| 500°F | 1100 | 1100 | 1200 | 1200 |
| 600°F | 1050 | 675 | 1100 | 1100 |
| 700°F | 840 | 250 | 1075 | 1075 |
| 800°F | 575 | | | |
| | | | | |
| 3/4" and 1" Rec. Torque = 290 ft/lbs. | | | | |

**Note 1.** The pressure/temperature ratings listed above are based on material cross sections at the joint between the body and bonnet where a gasketed screwed type bonnet is utilized. When the proper torque levels are used, the valve should not experience rupture of the joint or the material. The above listed torque levels were used in hydrostatic tests at the factory at 70 degrees F. at maximum body rating and were found to provide acceptable seating. Other factors such as high or cyclic temperatures, light process gases, or poor gasket surfaces can dictate the ability of a seal to be made. Under such conditions, the only way to be assured of tight sealing is to perform a test under the actual process conditions.

Please note that the above chart is not intended as an indication of functionability or suitability for control service. Other charts are available to assist in the choosing of valve type, bonnet type, trim type and actuator.

When flanges, fittings or other pressure containing elements are added to the valve, the pressure rating of the total valve assumes the rating of the weakest component.




## Description of Items

1. Valve Body
2. Valve Bonnet
3. Trim Set (innervalve)
4. Body Bonnet Gasket
5. Packing Adaptor
6. Packing ( CV ring)
7. Packing Follower
8. Packing Gland
9. Yoke Lock Nut

**DIMENSIONS (Inches)**

| PS | A | B | C | D | STROKE |
|---|---|---|---|---|---|
| 1/4 inch | 2.12 | 0.68 | 1.87 | 0.625 | 0.437 |
| 1/2 inch | 2.75 | 1.00 | 2.85 | 0.875 | 0.562 |
| 3/4 inch | 3.37 | 1.18 | 3.84 | 0.875 | 0.562 |
| 1 inch | 4.00 | 1.50 | 3.95 | 0.875 | 0.562 |

## INNERVALVE CHART

| Valve Size | Trim Designation | Max Cv | Orifice Dia. (in) | Orifice Area(sq in) | Nominal Rangeability Linear | Nominal Rangeability Equal % |
|---|---|---|---|---|---|---|
| 1" | 6.0 | 6.0 | 0.6250 | 0.3068 | 50:1 | 60:1 |
| 1" | 5.0 | 5.0 | 0.6250 | 0.3068 | 50:1 | 60:1 |
| 1" | 4.5 | 4.5 | 0.5000 | 0.1963 | 50:1 | 60:1 |
| 3/4"-1" | 4.0 | 4.0 | 0.5000 | 0.1963 | 50:1 | 60:1 |
| 3/4"-1" | 3.5 | 3.5 | 0.5000 | 0.1963 | 50:1 | 60:1 |
| 1/2"-1" | A | 2.5 | 0.3750 | 0.1104 | 40:1 | 50:1 |
| 1/2"-1" | B | 2.0 | 0.3750 | 0.1104 | 40:1 | 50:1 |
| 1/2"-1" | C | 1.25 | 0.2810 | 0.0620 | 40:1 | 50:1 |
| 1/2"-1" | D | 0.8 | 0.2500 | 0.0491 | 40:1 | 50:1 |
| 1/2"-1" | E | 0.5 | 0.2500 | 0.0491 | 40:1 | 50:1 |
| 1/4"-1" | F | 0.32 | 0.1560 | 0.0191 | 30:1 | 40:1 |
| 1/4"-1" | G | 0.2 | 0.1560 | 0.0191 | 30:1 | 40:1 |
| 1/4"-1" | H | 0.13 | 0.1560 | 0.0191 | 30:1 | 40:1 |
| 1/4"-1" | I | 0.08 | 0.1560 | 0.0191 | 30:1 | 40:1 |
| 1/4"-1" | J | 0.05 | 0.1560 | 0.0191 | 30:1 | 40:1 |
| 1/4"-1" | K | 0.03 | 0.0860 | 0.0058 | 25:1 | NA |
| 1/4"-1" | L | 0.02 | 0.0860 | 0.0058 | 25:1 | NA |
| 1/4"-1" | M | 0.01 | 0.0860 | 0.0058 | 25:1 | NA |
| 1/4"-1" | N | 0.006 | 0.0860 | 0.0058 | 25:1 | NA |
| 1/4"-1" | O | 0.003 | 0.0860 | 0.0058 | 25:1 | NA |
| 1/4"-1/2" | P1 | 0.002 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P2 | 0.0013 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P3 | 0.001 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P4 | 0.0006 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P5 | 0.0004 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P6 | 0.00027 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P7 | 0.00018 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P8 | 0.00012 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4"-1/2" | P9 | 0.00008 | 0.0625 | 0.0031 | 15:1 | NA |
| 1/4" | P10 | 0.00005 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P11 | 0.000036 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P12 | 0.000024 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P13 | 0.000016 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P14 | 0.00001 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P15 | 0.000006 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P16 | 0.000004 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P17 | 0.0000027 | 0.0420 | 0.0014 | 15:1 | NA |
| 1/4" | P18 | 0.0000018 | 0.0420 | 0.0014 | 15:1 | NA |

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