

NORRISEAL **CONTROLS**

MANUFACTURED IN CANADA BY ALBERTA OIL TOOL



SERIES 2200 and 2220
CONTROL VALVES

APPLICATION

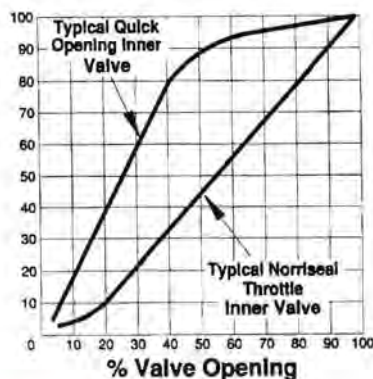
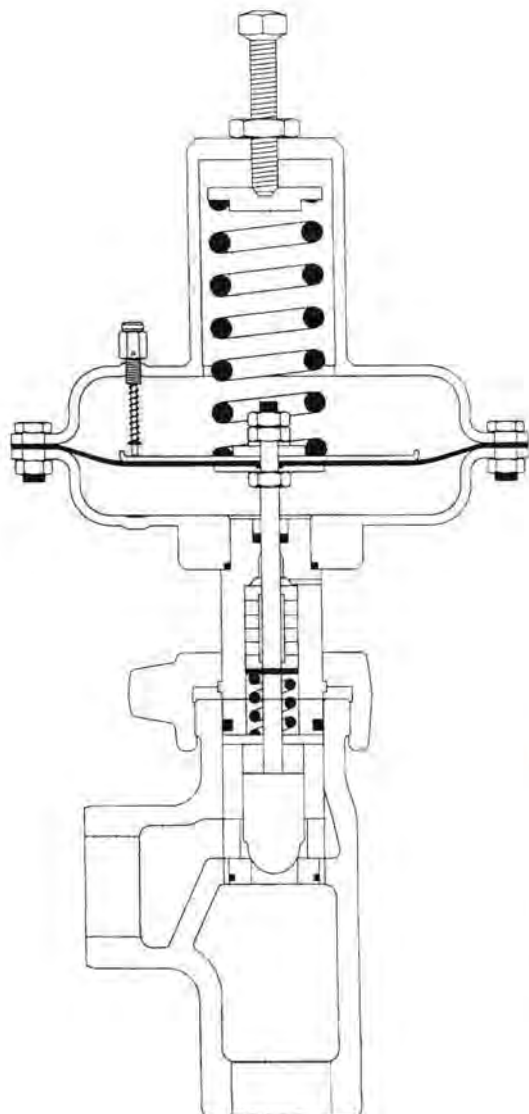
The Norriseal Series 2200 is the latest valve of its kind on the market and combines the operator's needs of a more dependable valve with ease of maintenance. The valve has a wide application for use as a dump as well as a modulating valve on high pressure scrubbers, separators and other process vessels. The valve is available with quick opening trim or throttling trim making it ideally suited for oil and gas lease production service when operated by either a modulating or snap acting pilot. **All valves in the 2200 series can be furnished for NACE service on application.**

Specifically, the Series 2220 is the compact close coupled version of the Series 2200 and has the same performance characteristics. However, the 2220 (no yoke) should be considered where a position indicator would suffice, a temperature range of -20° to 180° F would be satisfactory, or when an enclosed stem is desirable. The Series 2200 is the open yoke version of the 2220. It is the proper selection where a wide temperature range is needed, an accurate travel indication is important, or where an exposed stem is desired for easy mounting of limit switches, etc. A wide range of seals and trim is available for elevated temperature, severe corrosive or abrasive applications. The factory should be consulted for recommendations for such service.

ACTUATOR

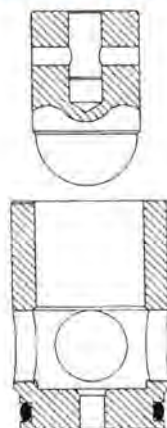
| | |
|-------------------------|--|
| Action | Reverse, direct or pressure balanced |
| Sizes | No. 9 (35 sq. in.), No. 12 (70 sq. in.) See maximum differential pressure table |
| Working Pressure | No. 9, normal 30 psi., maximum 50 psi. No. 12, normal 30 psi., maximum 35 psi. |
| Travel | 5/8" maximum |

Actuators are open yoke mounted or close coupled. Series 2200 has the open yoke with the travel indicator mounted on the yoke. The Series 2220 is the close coupled version with a position indicator located on the diaphragm case. For actuator selection, see the maximum differential pressure table and application section. Actuator springs are adjustable.



The quick opening plug has a 45° taper and fits all orifice sizes, and is ideal for all on-off, snap acting applications. The optional throttling plug is adequate for oilfield modulating service where changes in expected flow rates are moderate. Both trim configurations are available in 17-4PH, 316SS, Tungsten Carbide or Norkote.

INNER VALVES



Assembly of both the quick opening and throttle plugs are the same. The plugs are screwed onto the stem. The hole in the plug body is oriented with the hole through the stem. A stainless steel (316 SS) roll pin prevents the plug from turning on the stem. The threads of the plug and stem bear the thrust load, yet some horizontal plug movement is possible to allow positive alignment with the seat. This insures the most leakproof closure in metal to metal seating surfaces. See orifice sizes table.

Cage and seat are constructed as one piece. It has full opening flow capacity and is made of 17-4PH stainless steel, a metal having excellent hardness, corrosion and galling resistance. The cage **guides** the plug into the orifice, insuring positive alignment. The seal is made between seat-cage and body by an "O" ring. This eliminates threading the seat into the body which requires special tools and sometimes causes galling as well as trouble in thread care.

ORIFICE SIZES (Inches)

| Type Plug & Trim | 1" Body | 2" Body |
|--|-----------------------|-----------------------|
| Quick Opening - 17-4PH, 316SS, Tungsten Carbide, Norkote | 1/4, 3/8, 1/2, 3/4, 1 | 1/4, 3/8, 1/2, 3/4, 1 |
| Throttle Trim - 17-4PH, 316SS | 1/4, 3/8, 1/2, 3/4, 1 | 1/4, 3/8, 1/2, 3/4, 1 |

TEMPERATURE RANGE

Series 2200
Series 2220

Normal -20° to 180° F, on application -20° to 400° F
-20° to 180° F

PACKING

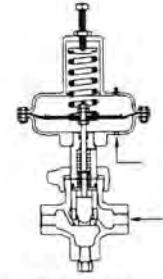
There is nothing for the operator to tighten or lubricate. Standard packing material is non-lubricated Teflon V-ring (Chevron type) packing with 316 stainless steel retainers. The viton stem o-ring take up the wear of the Teflon and also protect it from contacting erosive particles. The Teflon V-ring packing is spring loaded and requires no adjustment.

BODY

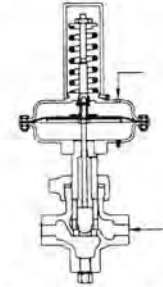
| | | |
|---------------------------|---|--|
| Sizes & Styles | 1" Globe; | |
| | 1" Tee (either globe or angle with pipe plug) | |
| | 2" Globe or Angle | |
| End Connections | 1" Screwed | 3600 psi or 6000 psi @ 100° F |
| | 2" Screwed | 3600 psi @ 100° F |
| | 1" Flanged | ANSI Series 150, 300, 600, 900, 1500 or 2500 |
| | 2" Flanged | ANSI Series 150, 300, 600, 900 or 1500 |

MATERIALS OF CONSTRUCTION

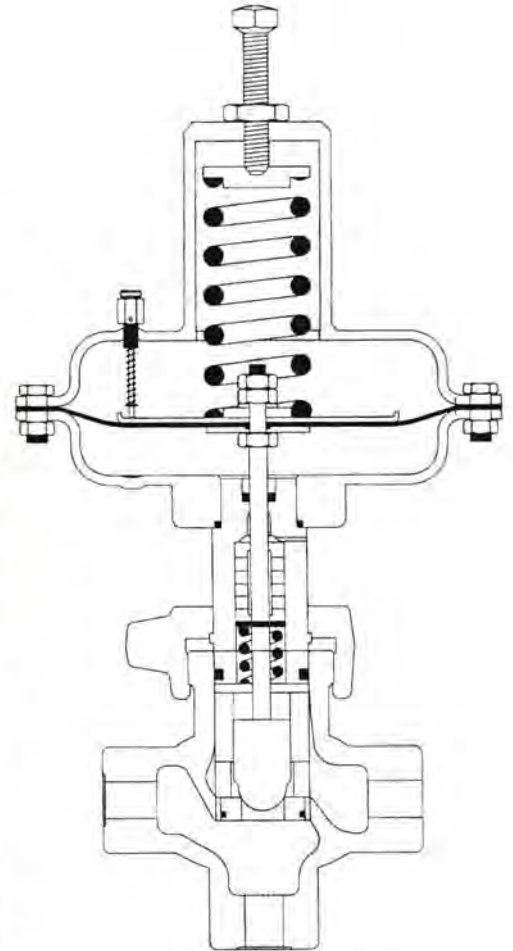
| | |
|--------------------------------|---------------------------------------|
| Body | Cast Steel ASTM A216-WCC |
| Cage | 17-4 PH stainless steel, Rockwell C33 |
| Stem | Stainless Steel |
| Bonnet & Hammer Nut | Steel |
| Diaphragm Case | Pressed Steel |
| Diaphragm | Buna N with Nylon insert |



Reverse Actuator Spring Closing



Direct Actuator Spring Opening



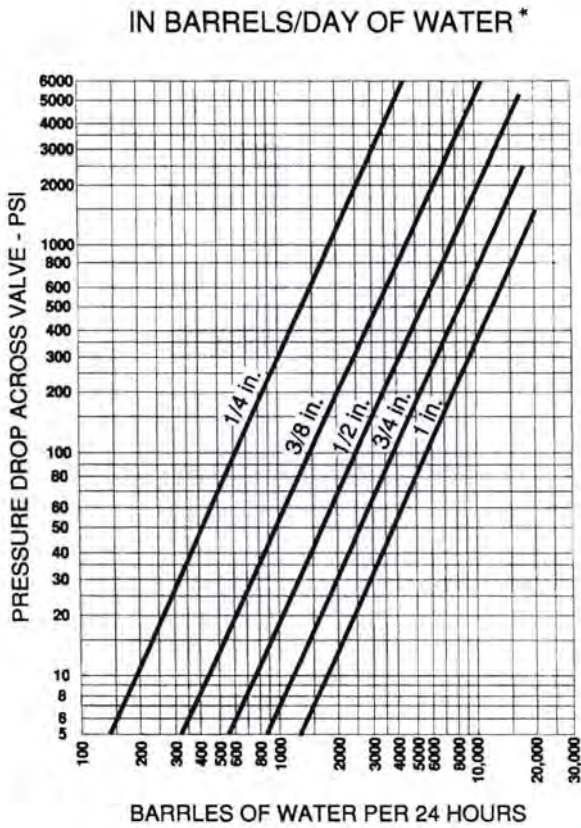
1" Series 2220 with Tee Body

| MAXIMUM DIFFERENTIAL PRESSURES * | | | | | | |
|---|---------------|----------------------------|----------------|---------------|-----------------|---------|
| Orifice Size | Actuator Size | Gas Supply Pressure (PSIG) | Flow Over Seat | | Flow Under Seat | |
| | | | Direct (ATC) | Reverse (ATO) | Direct | Reverse |
| 1/4" | 9 | 20 | 6000 | 6000 | 6000 | 6000 |
| | | 30 | 6000 | 6000 | 6000 | 6000 |
| | 12 | 20 | 6000 | 6000 | 6000 | 6000 |
| | | 30 | 6000 | 6000 | 6000 | 6000 |
| 3/8" | 9 | 20 | 6000 | 6000 | 2700 | 2700 |
| | | 30 | 6000 | 6000 | 5400 | 3280 |
| | 12 | 20 | 6000 | 6000 | 5130 | 5130 |
| | | 30 | 6000 | 6000 | 6000 | 6000 |
| 1/2" | 9 | 20 | 6000 | 6000 | 1370 | 1370 |
| | | 30 | 6000 | 6000 | 2880 | 1680 |
| | 12 | 20 | 6000 | 6000 | 2540 | 2560 |
| | | 30 | 6000 | 6000 | 5490 | 5490 |
| 3/4" | 9 | 20 | 1750 | 1580 | 410 | 410 |
| | | 30 | 1940 | 2530 | 1080 | 560 |
| | 12 | 20 | 3780 | 3200 | 730 | 730 |
| | | 30 | 5700 | 5000 | 2020 | 2020 |
| 1" | 9 | 20 | 860 | 770 | 140 | 140 |
| | | 30 | 940 | 1240 | 520 | 220 |
| | 12 | 20 | 1840 | 1570 | 230 | 230 |
| | | 30 | 2790 | 2510 | 960 | 960 |

* If body rating is less than maximum ΔP , then body rating is the maximum.

For any supply pressure between 20 and 30 PSIG the maximum shut-off pressure can be interpolated from the above chart.

FLUID CAPACITY



| FLOW COEFFICIENTS | | | |
|--------------------------|------------------|-------------------|---------------------------------|
| Size Trim | Body Size | Body Style | Orifice C_v |
| 1/4" | 1" | Angle | 2.1 |
| | | Globe | 1.8 |
| 1/4" | 2" | Angle | 1.9 |
| | | Globe | 1.7 |
| 3/8" | 1" | Angle | 4.7 |
| | | Globe | 4.0 |
| | 2" | Angle | 4.3 |
| | | Globe | 3.8 |
| 1/2" | 1" | Angle | 8.3 |
| | | Globe | 7.0 |
| | 2" | Angle | 7.2 |
| | | Globe | 6.8 |
| 3/4" | 1" | Angle | 16.2 |
| | | Globe | 12.0 |
| | 2" | Angle | 16.1 |
| | | Globe | 13.7 |
| 1" | 1" | Angle | 20.0 |
| | | Globe | 15.4 |
| | 2" | Angle | 20.3 |
| | | Globe | 18.2 |

DIMENSIONS

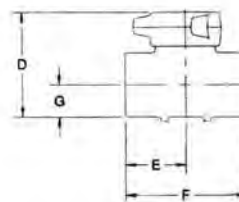
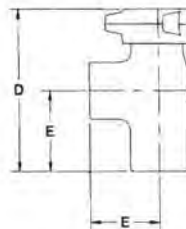
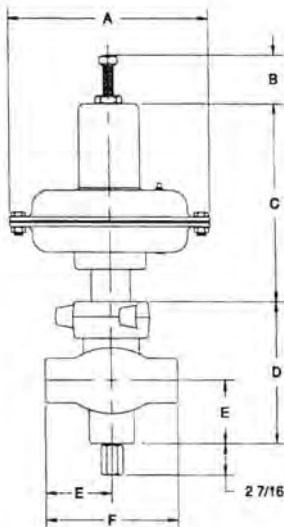
Actuator Dimension (Inches)

| Valve Travel | Orifice Size | Size | ACTUATOR | | | | | |
|--------------|--------------|------|----------|------------------|---------|---------|---------|----------|
| | | | A | B | C | | | |
| | | | | | Reverse | | Direct | |
| | | | | Reverse Top Only | 2200 | 2220 | 2200 | 2220 |
| 5/8" | 1/4 - 1 | 9 | 9 1/2 | 2 | 14 1/2 | 8 7/8 | 16 7/16 | 10 13/16 |
| | | 12 | 12 1/2 | 2 3/8 | 15 9/16 | 9 13/16 | 18 1/5 | 12 1/2 |

Screwed Body Dimension (Inches)

| Orifice Size | Body Size | Body Style | D | E | F | G |
|--------------|-----------|------------|---------|-------|-------|---------|
| 1/4" - 1" | 1" | Globe | 5 1/4 | - | 6 1/4 | 1 9/16 |
| | | Tee | 6 13/16 | 3 1/8 | 6 1/4 | - |
| | 2" | Angle | 7 13/16 | 3 3/4 | - | - |
| | | Globe | 5 3/4 | 3 3/4 | 7 1/2 | 1 11/16 |

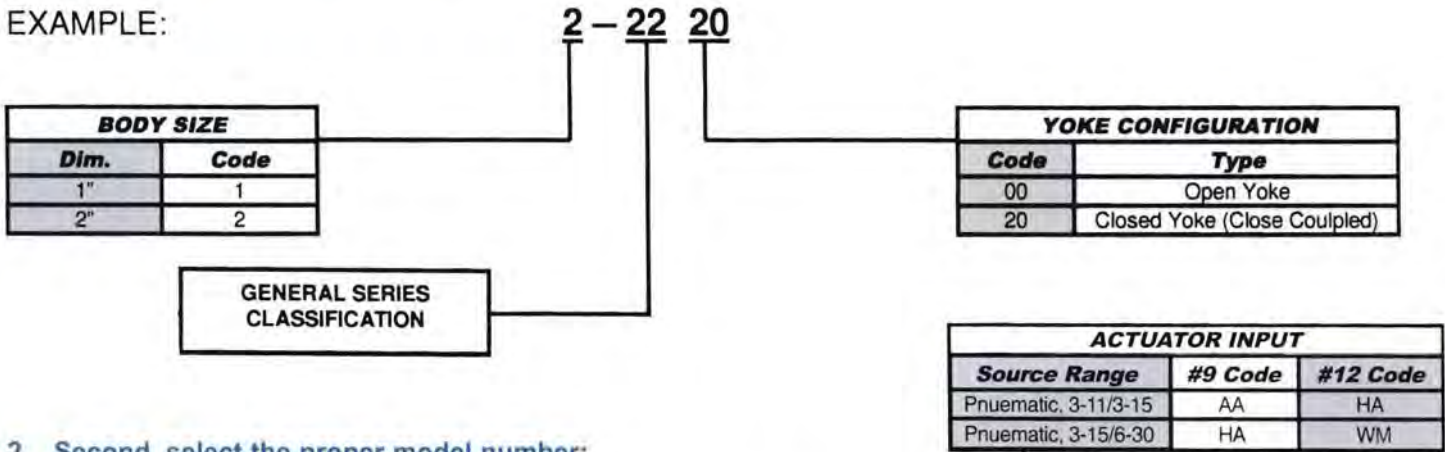
NOTE: Flanged bodies conform to ISA standard face-to-face dimensions.



HOW TO ORDER

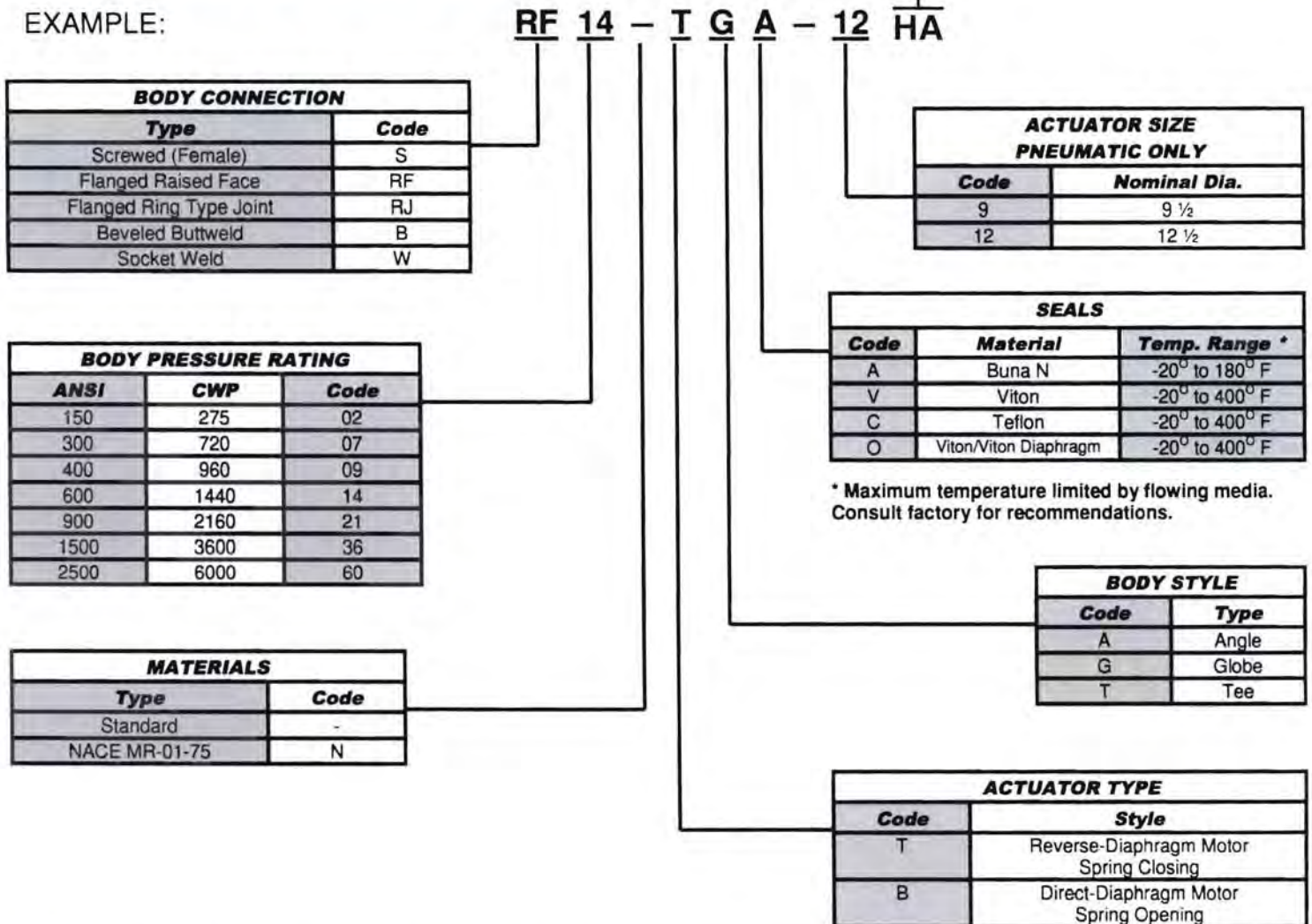
1. First, select the valve by series number:

EXAMPLE:



2. Second, select the proper model number:

EXAMPLE:

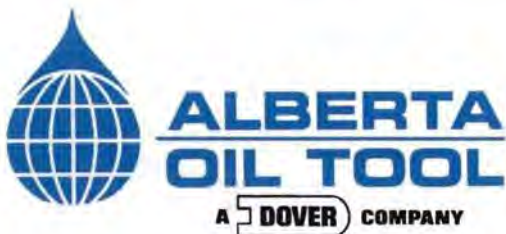


3. Third, select the trim size and material of trim from orifice selection on page two.

EXAMPLE: 3/8" Throttle Trim 17-4PH

By ordering with both the series and model numbers and choosing the proper trim the valve can be fully identified.

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