

## Three-way Control Valve Type 3244

### Pneumatic Control Valves Type 3244/3271 and 3244/3277

#### Application

Control valves for proportional mixing and diverting of liquids and gases in chemical processes and heating/cooling installations with industrial requirements.

**Nominal sizes** ½" to 6" (15 to 150 mm)

**Pressure ratings** ANSI Class 150 to 300

**Temperatures from** -325 °F to 840 °F (-200 °C to 450 °C)

The control valves consist of a body with stainless steel trim for either mixing or diverting service and a pneumatic actuator with optional control accessories. Alternatively, the valves may be combined with electric, electrohydraulic or hand-operated actuators.

#### Features

- Rugged, heavy-duty construction, one-piece integral 4-flanged body – resistant to high pipeline stresses
- Mixing or diverting asymmetric V-port heavy-duty plugs
- Linear characteristic for proportional mixing/diverting
- Self-locking, exchangeable seats, reduced sizes
- One-piece rigid bonnet and yoke with IEC 534-6 (NAMUR) standard accessory mounting system
- Self-adjusting, live-loaded PTFE V-ring stuffing box
- Compact modular design concept – parts interchangeability with 2-way control valves Series 3240
- Field retro-fittable insulating extensions and metal bellows seals
- Complete selection of actuators, positioners and accessories

#### Standard version

- Body ASTM A 216 WCB or A 351 CF8M
- Nominal sizes ½" to 6" (15 mm to 150 mm)
- Temperature range 15 °F to 430 °F (-10 °C to 220 °C)
- Pressure rating ANSI Class 150 and 300
- End connections ANSI (raised-face) RF flange

#### Options

- **Extension bonnet modules** · For extreme temperatures -325 °F to 800 °F (-200 °C to 427 °C) with optional bellows seal
- **Metal bellows seal module** · For complete seal between process and atmosphere
- **Adjustable packings** · Braided PTFE, HT-graphite or other stuffing box versions for high purity or process compatibility
- **Double stuffing box** · For reduced stem seal emission with leak detection port
- **End connections** · Other flange types available on request
- **Jacket** · For crystallizing or high viscosity process fluids
- **Soft seal plugs** · For Class VI ("bubble-tight") shutoff
- **Trim hardening** · With Stellite facing for wear resistance
- **NACE** · Verification of hardnesses for sour gas applications to meet National Association of Corrosion Engineers recommendations for prevention of sulphide stress-corrosion cracking



Fig. 1 · Type 3244/3271 Pneumatic 3-Way Control Valve with Type 3244 Valve and Type 3271 Pneumatic Actuator

#### Actuator combinations

**Type 3244/3271** (Fig. 1) · With Type 3271 Pneumatic Actuator  
· For operation with or without yoke-mounted positioner

**Type 3244/3277** · With Type 3277 Pneumatic Actuator  
· For integral positioner/accessory mounting according to SAMSON "Valve Management" System

**Type 3244/5802** · With Type 5802 SAM Electric Actuator  
· For details see Technical Data Sheet T 8043 E, T 5870

**Type 3244/3273** · With Type 3273 Hand-operated Actuator  
· For details see Technical Data Sheet T 8312

**Type 3244/3274** · With Type 3274 Electrohydraulic Actuator  
· For details see Technical Data Sheet T 5874

For DIN versions see Technical Data Sheet T 8026 EN

|                               |             |        |
|-------------------------------|-------------|--------|
| Associated Information Sheets | Valves      | T 8000 |
|                               | Actuators   | T 8300 |
|                               | Accessories | T 8350 |

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Technical Data Sheet

T 8026

### Principle of operation (Figs. 2 and 3)

Depending on the plug version, the valves are applied for either mixing or diverting service.

With **mixing valves**, the process medium flows through the valve ports A and B. The combined stream leaves at common port AB (see Fig. 2). The rate of flow from valve port A or B to common port AB depends on the cross-sectional area of flow between the seats and the valve plugs.

With **diverting valves**, the process medium flows through the common port AB and the partial streams leave through ports A and B respectively (see Fig. 3).

The flow coefficient of each port is proportional to its relative opening, dependent on the plug position. The plug stem is connected to the actuator stem and is moved by the force as determined by the actuator spring rate and control signal pressure. The plug stem is sealed by means of a spring-loaded PTFE V-ring packing.

### Fail-safe action

Depending on how the springs are arranged in the actuator (see Technical Data Sheet T 8310 or T 8311 for details), the valve moves in a pre-determined direction with the absence of air supply.

### Actuator stem "extends"

When the forces acting on the actuator diaphragm are reduced or the air supply fails, the spring force moves the actuator stem to the lower extreme position (stem "extends"), causing the valve to fail port "B" closed with mixing valves, or port "A" closed with diverting valves.

### Actuator stem "retracts"

When the forces acting on the actuator diaphragm are reduced or the air supply fails, the spring force moves the actuator stem to the upper extreme position (stem "retracts"), causing the valve to fail port "B" closed with diverting valves, or port "A" closed with mixing valves.

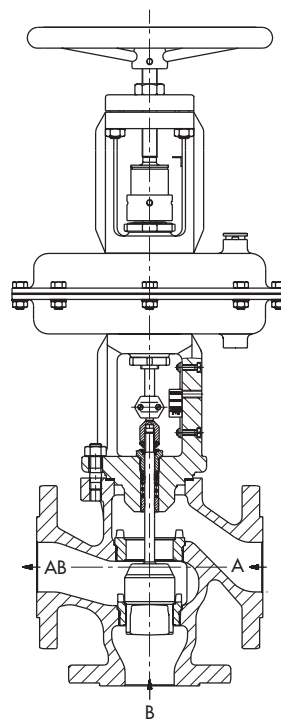


Fig. 2 · Type 3244/3271 Pneumatic Control Valve consisting of Type 3244 Three-way Valve (plug arrangement for mixing service and Type 3271 Pneumatic Actuator (with top mounted hand-wheel)

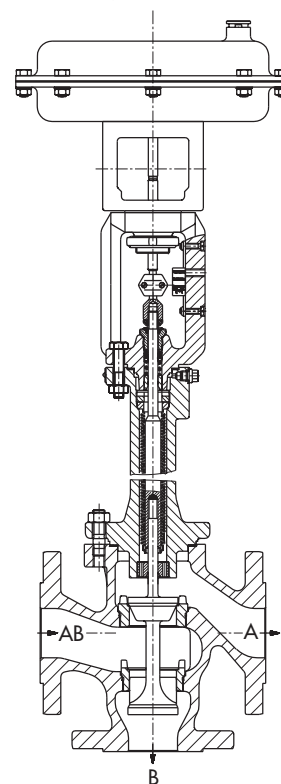


Fig. 3 · Type 3244/3277 Pneumatic Control Valve with: Type 3244 Three-way Valve (plug arrangement for flow-diverting operation), with additional metal bellows seal and Type 3277 Pneumatic actuator

**Table 1 · Technical data**

|   |   |  |                                 |
|---|---|--|---------------------------------|
| <b>Nominal valve size</b>   |   | ½" to 6"   |                                 |
| Pressure-temperature ratings  |   | ANSI Class 150 and 300   |                                 |
| Maximum working pressures   |   | According to ASME/ANSI B16.34-1988 (Standard class)                          |                                 |
| Temperature range   | Valve plug and long extension bonnet            |  | -325 to 800 °F (-198 to 427 °C) |
|   | Standard bonnet                                 | Carbon or stainless steel  | 15 to 430 °F (-10 to 220 °C)    |
|   | Short extension bonnet <sup>1)</sup>            | Carbon steel   | -20 to 800 °F (-29 to 427 °C)   |
|   |   | Stainless steel  | -58 to 800 °F (-50 to 427 °C)   |
|   | Short extension with bellows seal <sup>1)</sup> | Carbon steel   | -20 to 750 °F (-29 to 400 °C)   |
| Stainless steel   |   | -58 to 750 °F (-50 to 400 °C)  |                                 |
| End connections   |   | Integral flange ⅙" Raised Face (RF) per ASME/ANSI B16.5 - 1988 <sup>2)</sup> |                                 |
| Face-to-Face and Face-to-Centerline dimension   |   | According to ISA S75.03-1992 and ISA S75.22-1992                             |                                 |
| Flange face finish (Ra)   |   | Ra = 130 to 250 microinch (3.2 to 6.3 μm) <sup>3)</sup>                      |                                 |
| Packing design  |   | V-ring, spring-loaded, self-adjusting  |                                 |
| Flow direction (normal)   |   | Mixing: A/B → AB      Diverting: AB → A/B                                    |                                 |
| Terms for control valve sizing according to ISA-S75.02 and IEC 534, parts 2-1 and 2-2 |   | F <sub>L</sub> = 0.95, X <sub>T</sub> = 0.75                                 |                                 |
| Seat bore diameter, rated travel, C <sub>v</sub> value                                |   | See Table 3a and 3b  |                                 |
| Seat/plug sealing   |   | Metal-to-metal <sup>4)</sup>   |                                 |
| Leakage rate according to ANSI/FCI 70-2 and IEC 534-6                                 |   | ≤ 0.05% of rated C <sub>v</sub> value <sup>4)</sup>                          |                                 |
| Characteristic of plugs   |   | Linear   |                                 |
| Rangeability  |   | Sizes ½" to 2"; 50 : 1      Sizes 2½" to 6"; 30 : 1                          |                                 |
| Weights and dimensions  |   | See Table 4, 5 and 6   |                                 |

<sup>1)</sup> Long extension bonnet (insulating section) also available

<sup>2)</sup> Other flange versions available on request

<sup>3)</sup> Ra = arithmetic average roughness or centerline average (CLA)

<sup>4)</sup> Special version with PTFE soft seal on request

**Table 2 · Materials**

| <b>Valve body</b>  |               | Cast carbon steel<br>ASTM A 216 WCB  |           | Cast stainless steel<br>ASTM A 351 CF8M |           |
|--|---------------|--|-----------|---|-----------|
| Bonnet with integral yoke  |               | Forged A 105   |           | Forged A 182 F 316                      |           |
| Seat and plug <sup>1)</sup>  | Seat          | AISI 410   | WN 1.4006 | AISI 316 Ti                             | WN 1.4571 |
|  | Plug and stem | AISI 410   | WN 1.4006 | AISI 316 Ti                             | WN 1.4571 |
| Guide bushings (nitrided)  |               | AISI 430F  | WN 1.4104 | AISI 316 Ti                             | WN 1.4571 |
| Stuffing box packing <sup>2)</sup>   | Packing       | PTFE with carbon composite   |           |   |           |
|  | Spring        | AISI 301   |           | WN 1.4310                               |           |
|  | Washer        | AISI 316 Ti  |           | WN 1.4571                               |           |
|  | Retaining nut | AISI 316 Ti with carbon insert   |           | WN 1.4571 with carbon insert            |           |
| Body/bonnet gaskets  |               | Graphite laminate with AISI 316 Ti (WN 1.4571) core                                    |           |   |           |
| Bolting  | Studs         | A 193 B7   |           | A 193 8M Cl. 2                          |           |
|  | Nuts          | A 194 2H   |           | A 194 8M                                |           |
| Exterior hardware, nameplates, travel indicator, couplings                 |               | Stainless steel AISI 304, AISI 316 and AISI 430F<br>WN 1.4301, WN 1.4571 and WN 1.4104 |           |   |           |
| <b>Version with extension bonnet (insulating section or metal bellows)</b> |               |  |           |   |           |
| Extension housing  |               | ASTM A 105   |           | ASTM A 182 F 316                        |           |
| Extended plug stem   |               | AISI 316 Ti  |           | WN 1.4571                               |           |
| Bellows insert, test connection and nitrided guide bushing                 |               | AISI 316 Ti  |           | WN 1.4571                               |           |
| Version with heating or cooling jacket                                     |               | On request   |           |   |           |

<sup>1)</sup> All seats and valve plugs also available with Stellite facing

<sup>2)</sup> Other packing materials on request



**Table 3a · Permissible differential pressures · Pressures in psi**

Values specified in the **shadowed columns** correspond to the nominal spring range **without pre-loading**.

Values specified in the **white columns** apply to maximum bench settings **with pre-loading**.

Differential pressures enclosed in parentheses in the table refer to the values enclosed in parentheses in the row "bench range."

The table applies for both fail-safe actions.

| Valve size  |               | C <sub>v</sub>                | K <sub>vs</sub>               | Seat Ø                |                       | Travel |     | Actuator                                    |                 | Δp with p <sub>2</sub> = 0 psi |           |       |           |         |           |           |         |     |
|---|---------------|-------------------------------|-------------------------------|-----------------------|-----------------------|--------|-----|---|-----------------|--------------------------------|-----------|-------|-----------|---------|-----------|-----------|---------|-----|
| in  | mm            |                               |                               | in.                   | mm.                   | in.    | mm  | in <sup>2</sup>                             | cm <sup>2</sup> |                                |           |       |           |         |           |           |         |     |
| Bench range, psi<br>for actuator with effective area: |               |                               |                               |                       |                       |        |     |   |                 |                                |           |       |           |         |           |           |         |     |
|   |               |                               |                               |                       |                       |        |     | 18.5 in <sup>2</sup> (120 cm <sup>2</sup> ) | -               | -                              |           |       |           |         |           | 20...34   | 30...48 |     |
|   |               |                               |                               |                       |                       |        |     | 37 in <sup>2</sup> (240 cm <sup>2</sup> )   |                 | -                              | 6...30    |       |           |         |           |           |         |     |
|   |               |                               |                               |                       |                       |        |     | 54 in <sup>2</sup> (350 cm <sup>2</sup> )   | 3...15          |                                | (18...30) |       | 9...44    |         |           | 20...34   | 30...48 |     |
|   |               |                               |                               |                       |                       |        |     | 108 in <sup>2</sup> (700 cm <sup>2</sup> )  |                 | 6...18                         |           |       | (26...44) | 18...52 | (26...34) | (39...48) |         |     |
| Stem "extends"  |               |                               |                               |                       |                       |        |     |   | •               | •                              | •         | •     | •         | •       | •         | •         | •       |     |
| Stem "retracts" 1)                                    |               |                               |                               |                       |                       |        |     |   | •               | -                              | •         | -     | •         | -       | •         | •         | •       |     |
| Required supply pressure, psi                         |               |                               |                               |                       |                       |        |     |   | 18              | 23                             | 35 (47)   | 47    | 52 (70)   | 70      | 54 (61)   | 78 (87)   |         |     |
| Valve size  |               | C <sub>v</sub>                | K <sub>vs</sub>               | Seat Ø                |                       | Travel |     | Actuator                                    |                 | Δp with p <sub>2</sub> = 0 psi |           |       |           |         |           |           |         |     |
| in  | mm            |                               |                               | in.                   | mm.                   | in.    | mm  | in <sup>2</sup>                             | cm <sup>2</sup> |                                |           |       |           |         |           |           |         |     |
| 1/2"  | 15            | 2.3; 5                        | 2; 4                          | 0.9                   | 24                    | 0.6    | 15  | 18.5  | 120             | -                              | -         | 75    | -         | -       | -         | 425       | 580     |     |
| 3/4"  | 20            | 2.3; 5; 7.5                   | 2; 4; 6.3                     |                       |                       |        |     | 37  | 240             | 75                             | -         | 215   | -         | 355     | -         | -         | -       | -   |
| 1"  | 25            | 2.3; 5;<br>7.5; 12            | 2; 4;<br>6.3; 10              | 54                    | 350                   |        |     | 139   | 344             | 344                            | 580       | 548   | 580       | 580     | 580       | 580       | 580     | 580 |
|   |               |                               |                               | 108                   | 700                   |        |     | 344   | -               | -                              | -         | -     | -         | -       | -         | -         | -       | -   |
| 1 1/2"<br>&<br>2"                                     | 40<br>&<br>50 | 7.5; 12;<br>20                | 6.3, 10;<br>16                | 1.2                   | 31                    |        |     | 18.5  | 120             | -                              | -         | -     | -         | -       | -         | -         | 247     | 393 |
|   |               |                               |                               |                       |                       |        |     | 54  | 350             | 75                             | 197       | 197   | 442       | 319     | 580       | 580       | 580     | 580 |
| 1 1/2"<br>&<br>2"                                     | 40<br>&<br>50 | 30                            | 25                            | 1.5                   | 38                    |        |     | 108   | 700             | 197                            | -         | -     | -         | -       | -         | -         | -       | -   |
|   |               |                               |                               |                       |                       |        |     | 18.5  | 120             | -                              | -         | -     | -         | -       | -         | -         | -       | 158 |
| 2"  | 50            | 47                            | 40                            | 1.9                   | 48                    |        |     | 54  | 350             | 45                             | 126       | 126   | 289       | 207     | 451       | 532       | 580     | 580 |
|   |               |                               |                               |                       |                       |        |     | 108   | 700             | 126                            | -         | -     | -         | -       | -         | -         | -       | -   |
| 2 1/2"<br>& 3"  | 65<br>& 80    | 30                            | 25                            | 1.9                   | 48                    |        |     | 18.5  | 120             | -                              | -         | -     | -         | -       | -         | -         | 94      | 155 |
|   |               |                               |                               |                       |                       |        |     | 54  | 350             | 23                             | 74        | 74    | 175       | 125     | 278       | 329       | 508     |     |
| 2 1/2"  | 65            | 70/47 Div<br>70 Mix           | 60/40 Div<br>60 Mix           | 2 5/19<br>2.5         | 63/48<br>63           | 108    | 700 | 74  | -               | (580)                          | -         | (580) | -         | -       | -         | -         |         |     |
|   |               |                               |                               |                       |                       | 54     | 350 | 23  | 74              | 74                             | 175       | 125   | 278       | 329     | 508       |           |         |     |
| 2 1/2"  | 65            | 70/47 Div<br>70 Mix           | 60/40 Div<br>60 Mix           | 2 5/19<br>2.5         | 63/48<br>63           | 108    | 700 | 39  | -               | (335)                          | -         | (512) | -         | (526)   | (580)     |           |         |     |
|   |               |                               |                               |                       |                       | 54     | 350 | 39  | -               | (335)                          | -         | (512) | -         | (526)   | (580)     |           |         |     |
| 3"  | 80            | 70                            | 60                            | 2.5                   | 63                    | 108    | 700 | 39  | -               | (335)                          | -         | (512) | -         | (526)   | (580)     |           |         |     |
|   |               |                               |                               |                       |                       | 54     | 350 | 39  | -               | (335)                          | -         | (512) | -         | (526)   | (580)     |           |         |     |
| 3"  | 80            | 95/70 Div<br>70 Mix           | 80/60 Div<br>80 Mix           | 2 9/25<br>2.9         | 75/63<br>75           | 108    | 700 | 25  | -               | (233)                          | -         | (358) | -         | (370)   | 547       |           |         |     |
|   |               |                               |                               |                       |                       | 54     | 350 | 25  | -               | (233)                          | -         | (358) | -         | (370)   | 547       |           |         |     |
| 4"  | 100           | 120<br>190/120 Div<br>190 Mix | 100<br>160/100 Div<br>160 Mix | 3.1<br>3 9/31<br>3.9  | 80<br>100/80<br>100   | 1.2    | 30  | 108   | 700             | 20                             | 57        | 57    | 131       | 93      | 203       | 241       | 368     |     |
|   |               |                               |                               |                       |                       |        |     |   |                 | -                              | 33        | 33    | 381       | 58      | 128       | 151       | 233     |     |
| 6"  | 150           | 230<br>350/230 Div<br>350 Mix | 200<br>300/200 Div<br>300 Mix | 4.3<br>5 1/4.3<br>5.1 | 110<br>130/110<br>130 | 1.2    | 30  | 108   | 700             | -                              | 28        | 28    | 65        | 46      | 104       | 125       | 193     |     |
|   |               |                               |                               |                       |                       |        |     |   |                 | -                              | 17        | 17    | 46        | 32      | 74        | 87        | 136     |     |

1) Actuators employing "stem retracts" action cannot be pre-loaded (white columns do not apply)

NOTE: With some diverting valve versions, due to geometry assembly reasons, the upper seat diameter is larger than the lower. This is indicated by two C<sub>v</sub> (K<sub>vs</sub>) values and two seat bore diameters in the table. The upper value refers to the upper port and likewise the lower value refers to the lower port.

**Table 3b · Permissible differential pressures · Pressures in bar**

Values specified in the **shadowed columns** correspond to the nominal spring range **without pre-loading**.

Values specified in the **white columns** apply to maximum bench settings **with pre-loading**.

Differential pressures enclosed in parentheses in the table refer to the values enclosed in parentheses in the row "bench range."

The table applies for both fail-safe actions.

| Valve size  |               | C <sub>v</sub>    | K <sub>vs</sub> | Seat Ø                                      |         | Travel    |     | Actuator        |                 | Δp with p <sub>2</sub> = 0 bar |      |                          |      |           |        |           |      |                           |   |                          |  |           |  |           |  |
|---|---------------|-------------------|-----------------|---|---------|-----------|-----|-----------------|-----------------|--------------------------------|------|--------------------------|------|-----------|--------|-----------|------|---------------------------|---|--------------------------|--|-----------|--|-----------|--|
|   |               |                   |                 | in.   | mm.     | in.       | mm  | in <sup>2</sup> | cm <sup>2</sup> |                                |      |                          |      |           |        |           |      |                           |   |                          |  |           |  |           |  |
| Bench range, bar<br>for actuator with effective area: |               |                   |                 | 18.5 in <sup>2</sup> (120 cm <sup>2</sup> ) |         | -         |     | -               |                 | -                              |      | -                        |      | -         |        | 1.4...2.3 |      | 2.1...3.3                 |   |                          |  |           |  |           |  |
|   |               |                   |                 | 37 in <sup>2</sup> (240 cm <sup>2</sup> )   |         | -         |     | -               |                 | 0.4...2.0<br>(1.2...2.0)       |      | -                        |      | -         |        | -         |      | -                         |   |                          |  |           |  |           |  |
|   |               |                   |                 | 54 in <sup>2</sup> (350 cm <sup>2</sup> )   |         | 0.2...1.0 |     | 0.4...1.2       |                 | -                              |      | 0.6...3.0<br>(1.8...3.0) |      | -         |        | -         |      | 1.4...2.3<br>(1.85...2.3) |   | 2.1...3.3<br>(2.7...3.3) |  |           |  |           |  |
|   |               |                   |                 | 108 in <sup>2</sup> (700 cm <sup>2</sup> )  |         | -         |     | -               |                 | 0.8...2.4                      |      | -                        |      | 1.2...3.6 |        | -         |      | -                         |   | -                        |  |           |  |           |  |
| Stem "extends"  |               |                   |                 |   |         |           |     |                 |                 | •                              |      | •                        |      | •         |        | •         |      | •                         |   | •                        |  |           |  |           |  |
| Stem "retracts" <sup>1)</sup>                         |               |                   |                 |   |         |           |     |                 |                 | •                              |      | -                        |      | •         |        | -         |      | •                         |   | •                        |  |           |  |           |  |
| Required supply pressure, bar                         |               |                   |                 |   |         |           |     |                 |                 | 1.2                            |      | 1.6                      |      | 2.4 (3.2) |        | 3.2       |      | 3.6 (4.8)                 |   | 4.8                      |  | 3.7 (4.2) |  | 5.4 (6.0) |  |
| Valve size  |               | C <sub>v</sub>    | K <sub>vs</sub> | Seat Ø                                      |         | Travel    |     | Actuator        |                 | Δp with p <sub>2</sub> = 0 bar |      |                          |      |           |        |           |      |                           |   |                          |  |           |  |           |  |
| in  | mm            |                   |                 | in.   | mm.     | in.       | mm  | in <sup>2</sup> | cm <sup>2</sup> |                                |      |                          |      |           |        |           |      |                           |   |                          |  |           |  |           |  |
| 1/2"  | 15            | 2.3; 5            | 2; 4            | 0.9   | 24      | 0.6       | 15  | 18.5            | 120             | -                              | -    | 5.2                      | -    | -         | -      | 29.3      | 40   |                           |   |                          |  |           |  |           |  |
| 3/4"  | 20            | 2.3; 5<br>7.5     | 2; 4<br>6.3     |   |         |           |     | 37              | 240             | 5.2                            | -    | 14.8                     | -    | 24.5      | -      | -         | -    | -                         | - |                          |  |           |  |           |  |
| 1"  | 25            | 2.3; 5<br>7.5; 12 | 2; 4<br>6.3; 10 |   |         |           |     | 54              | 350             | 9.6                            | 23.7 | 23.7                     | 40   | 37.8      | 40     | 40        | 40   | 40                        |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         |           |     | 108             | 700             | 23.7                           | -    | -                        | -    | -         | -      | -         | -    | -                         |   |                          |  |           |  |           |  |
| 1 1/2"<br>&<br>2"                                     | 40<br>&<br>50 | 7.5; 12<br>20     | 6.3; 10<br>16   | 1.2   | 31      |           |     | 18.5            | 120             | -                              | -    | -                        | -    | -         | -      | -         | 17   | 27.1                      |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         |           |     | 54              | 350             | 5.2                            | 13.6 | 13.6                     | 30.5 | 22.0      | 40     | 40        | 40   |                           |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         |           |     | 108             | 700             | 13.6                           | -    | -                        | -    | -         | -      | -         | -    | -                         |   |                          |  |           |  |           |  |
| 1 1/2"<br>&<br>2"                                     | 40<br>&<br>50 | 30                | 25              | 1.5   | 38      |           |     | 18.5            | 120             | -                              | -    | -                        | -    | -         | -      | -         | 10.9 | 17.7                      |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         |           |     | 54              | 350             | 3.1                            | 8.7  | 8.7                      | 19.9 | 14.3      | 31.1   | 36.7      | 40   |                           |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         |           |     | 108             | 700             | 8.7                            | -    | -                        | -    | -         | -      | -         | -    |                           |   |                          |  |           |  |           |  |
| 2"  | 50            | 47                | 40              | 1.9   | 48      |           |     | 18.5            | 120             | -                              | -    | -                        | -    | -         | -      | -         | 6.5  | 10.7                      |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         |           |     | 54              | 350             | 1.6                            | 5.1  | 5.1                      | 12.1 | 8.6       | 19.2   | 22.7      | 35   |                           |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         | 108       | 700 | 5.1             | -               | (40)                           | -    | (40)                     | -    | -         | -      |           |      |                           |   |                          |  |           |  |           |  |
| 2 1/2"<br>&<br>3"                                     | 65<br>&<br>80 | 30                | 25              | 1.9   | 48      | 54        | 350 | 1.6             | 5.1             | 5.1                            | 12.1 | 8.6                      | 19.2 | 22.7      | 35     |           |      |                           |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         | 108       | 700 | 5.1             | -               | (40)                           | -    | (40)                     | -    | -         | -      |           |      |                           |   |                          |  |           |  |           |  |
|   |               |                   |                 |   |         | 54        | 350 | -               | 2.7             | 2.7                            | 6.7  | 4.7                      | 10.8 | 12.9      | 20     |           |      |                           |   |                          |  |           |  |           |  |
| 2 1/2"  | 65            | 70/47 Div         | 60/40 Div       | 2.5/1.9                                     | 63/48   | 108       | 700 | 2.7             | -               | (23.1)                         | -    | (35.3)                   | -    | (36.3)    | (40)   |           |      |                           |   |                          |  |           |  |           |  |
|   |               | 70 Mix            | 60 Mix          | 2.5   | 63      | 54        | 350 | -               | 2.7             | 2.7                            | 6.7  | 4.7                      | 10.8 | 12.9      | 20     |           |      |                           |   |                          |  |           |  |           |  |
|   |               | 3"                | 80              | 70  | 60      | 2.5       | 63  | 108             | 700             | 2.7                            | -    | (23.1)                   | -    | (35.3)    | -      | (36.3)    | (40) |                           |   |                          |  |           |  |           |  |
| 3"  | 80            | 95/70 Div         | 80/60 Div       | 2.9/2.5                                     | 75/63   | 54        | 350 | -               | 1.7             | 1.7                            | 4.6  | 3.1                      | 7.5  | 8.9       | 13.9   |           |      |                           |   |                          |  |           |  |           |  |
|   |               | 95 Mix            | 80 Mix          | 2.9   | 75      | 108       | 700 | 1.7             | -               | (16.1)                         | -    | (24.7)                   | -    | (25.5)    | (37.7) |           |      |                           |   |                          |  |           |  |           |  |
|   |               | 4"                | 100             | 120   | 100     | 3.1       | 80  | 1.4             | 3.9             | 3.9                            | 9.0  | 6.4                      | 14   | 16.6      | 25.4   |           |      |                           |   |                          |  |           |  |           |  |
| 4"  | 100           | 190/120 Div       | 160/100 Div     | 3.9/3.1                                     | 100/80  | -         | 2.3 | 2.3             | 5.6             | 4.0                            | 8.8  | 10.4                     | 16.1 |           |        |           |      |                           |   |                          |  |           |  |           |  |
|   |               | 190 Mix           | 160 Mix         | 3.9   | 100     | -         | 1.9 | 1.9             | 4.5             | 3.2                            | 7.2  | 8.6                      | 13.3 |           |        |           |      |                           |   |                          |  |           |  |           |  |
|   |               | 230               | 200             | 4.3   | 110     | -         | 1.2 | 1.2             | 3.2             | 2.2                            | 5.1  | 6.0                      | 9.4  |           |        |           |      |                           |   |                          |  |           |  |           |  |
| 6"  | 150           | 350/230 Div       | 300/200 Div     | 5.1/4.3                                     | 130/110 | -         | 1.2 | 1.2             | 3.2             | 2.2                            | 5.1  | 6.0                      | 9.4  |           |        |           |      |                           |   |                          |  |           |  |           |  |
|   |               | 350 Mix           | 300 Mix         | 5.1   | 130     | -         | 1.2 | 1.2             | 3.2             | 2.2                            | 5.1  | 6.0                      | 9.4  |           |        |           |      |                           |   |                          |  |           |  |           |  |

<sup>1)</sup> Actuators employing "stem retracts" action cannot be pre-loaded (white columns do not apply)

NOTE: With some diverting valve versions, due to geometry assembly reasons, the upper seat diameter is larger than the lower. This is indicated by two C<sub>v</sub> (K<sub>vs</sub>) values and two seat bore diameters in the table. The upper value refers to the upper port and likewise the lower value refers to the lower port.

**Table 4 · Dimensions in inches (see Fig. 4)****Table 4a · Type 3244 Three-way valve**

| Nominal size | in        | 1/2" | 3/4" | 1"   | 1 1/2" | 2"    | 2 1/2" | 3"    | 4"    | 6"    |  |
|--------------|-----------|------|------|------|--------|-------|--------|-------|-------|-------|--|
| Length L     | Class 150 | 7.25 | 7.25 | 7.25 | 8.75   | 10.00 | 10.87  | 11.75 | 13.87 | 17.75 |  |
|              | Class 300 | 7.50 | 7.62 | 7.75 | 9.25   | 10.50 | 11.50  | 12.50 | 14.50 | 18.62 |  |
| H1           | in        | 9.25 |      |      |        |       | 10.63  |       | 14.17 | 14.76 |  |
| H2           | Class 150 | 3.62 | 3.62 | 3.62 | 4.37   | 5     | 5.43   | 5.87  | 6.93  | 8.88  |  |
|              | Class 300 | 3.76 | 3.82 | 3.88 | 4.63   | 5.26  | 5.75   | 6.26  | 7.24  | 9.31  |  |

**Table 4b · Version with short or long extension bonnet (insulating section) or bellows seal**

| Nominal size | in                                     | 1/2" | 3/4"  | 1" | 1 1/2" | 2"    | 2 1/2" | 3"    | 4" | 6"    |       |
|--------------|--|------|-------|----|--------|-------|--------|-------|----|-------|-------|
| H4 with      | Short extension bonnet or bellows seal | in   | 16.54 |    |        | 16.14 |        | 17.52 |    | 25.39 | 25.19 |
|              | Long extension bonnet or bellows seal  | in   | 28.54 |    |        | 28.15 |        | 29.53 |    | 34.84 | 34.64 |

**Table 4c · Type 3271 and Type 3277 Pneumatic Actuators**

|   |                 |                  |  |      |          |      |  |          |  |  |
|---|-----------------|------------------|--|------|----------|------|--|----------|--|--|
| Effective diaphragm area                  | in <sup>2</sup> | 18.5             |  | 37   |          | 54   |  | 108      |  |  |
| Diaphragm Ø D                             | in              | 6.6              |  | 9.4  |          | 11.0 |  | 15.4     |  |  |
| H   | in              | 2.75             |  | 2.45 |          | 3.35 |  | 5.43     |  |  |
| H3 (for Type 3271 Actuator) <sup>1)</sup> | in              | 6.9              |  | 6.7  |          | 7.48 |  | 12.4     |  |  |
| Thread                                    |                 | M 30 mm x 1.5 mm |  |      |          |      |  |          |  |  |
| α (for Type 2371 Actuator)                |                 | NPT 1/2"         |  |      | NPT 1/4" |      |  | NPT 3/8" |  |  |
| α2 (for Type 3277 Actuator)               |                 | -                |  |      | NPT 3/8" |      |  |          |  |  |

<sup>1)</sup> Minimum clearance for actuator disassembly; with the Type 3277 Actuator, H3 = H3 + 4"

**Table 4d, 4e and 4f · Dimensions in mm (see Fig. 4)****Table 4d · Type 3244 Three-way valve**

| Nominal size | mm        | 15   | 20  | 25   | 40    | 50    | 65  | 80  | 100 | 150   |  |
|--------------|-----------|------|-----|------|-------|-------|-----|-----|-----|-------|--|
| Length L     | Class 150 | 184  | 184 | 184  | 222   | 254   | 276 | 298 | 352 | 451   |  |
|              | Class 300 | 191  | 194 | 197  | 235   | 267   | 292 | 318 | 368 | 473   |  |
| H1           | mm        | 235  |     |      |       |       | 270 |     | 360 | 375   |  |
| H2           | Class 150 | 92   | 92  | 92   | 111   | 127   | 138 | 149 | 176 | 225.5 |  |
|              | Class 300 | 95.5 | 97  | 98.5 | 117.5 | 133.5 | 146 | 159 | 184 | 236.5 |  |

**Table 4e · Version with short or long extension bonnet (insulating section) or bellows seal**

| Nominal size | mm                                     | 15 | 20  | 25 | 40 | 50  | 65 | 80  | 100 | 150 |     |
|--------------|--|----|-----|----|----|-----|----|-----|-----|-----|-----|
| H4 with      | Short extension bonnet or bellows seal | mm | 420 |    |    | 410 |    | 445 |     | 645 | 640 |
|              | Long extension bonnet or bellows seal  | mm | 725 |    |    | 715 |    | 750 |     | 885 | 880 |

**Table 4f · Type 3271 and Type 3277 Pneumatic Actuators**

|   |                 |            |  |     |          |     |  |          |  |  |
|---|-----------------|------------|--|-----|----------|-----|--|----------|--|--|
| Effective diaphragm area                  | cm <sup>2</sup> | 120        |  | 240 |          | 350 |  | 700      |  |  |
| Diaphragm Ø D                             | mm              | 168        |  | 240 |          | 280 |  | 390      |  |  |
| H   | mm              | 70         |  | 62  |          | 85  |  | 138      |  |  |
| H3 (for Type 3271 Actuator) <sup>1)</sup> | mm              | 175        |  | 170 |          | 190 |  | 315      |  |  |
| Thread                                    |                 | M 30 x 1.5 |  |     |          |     |  |          |  |  |
| α (for Type 3271 Actuator)                |                 | NPT 1/2"   |  |     | NPT 1/4" |     |  | NPT 3/8" |  |  |
| α2 (for Type 3277 Actuator)               |                 | -          |  |     | NPT 3/8" |     |  |          |  |  |

<sup>1)</sup> Minimum clearance for actuator disassembly; with the Type 3277 Actuator, H3 = H3 + 100 mm

**Table 5 · Weights in lbs**

**Table 5a · Type 3244 Control Valve**

| Nominal size   |       | in  | ½"   | ¾"   | 1"   | 1½"  | 2"   | 2½" | 3"  | 4"  | 6"  |
|--|-------|-----|------|------|------|------|------|-----|-----|-----|-----|
| Approximate weight of valve without actuator             | lbs   |     | 13   | 15.5 | 17.5 | 33   | 37.5 | 68  | 82  | 108 | 298 |
| Approximate weight with extension bonnet or bellows seal | Short | lbs | 20   | 22   | 24   | 46.3 | 50.7 | 88  | 99  | 150 | 364 |
|  | Long  | lbs | 28.7 | 30.9 | 33   | 55   | 59.5 | 97  | 108 | 168 | 382 |

**Table 5b · Type 3271 and Type 3277 Pneumatic Actuators**

| Pneumatic actuator  |         | in <sup>2</sup> | 18.6 in <sup>2</sup> | 37.2 in <sup>2</sup> | 54.2 in <sup>2</sup> | 108.5 in <sup>2</sup> |
|---|---------|-----------------|----------------------|----------------------|----------------------|-----------------------|
| Weight of Type 3271 Pneumatic Actuator without/with handwheel | Without | lbs             | 4.4                  | 11                   | 18                   | 48.5                  |
|   | With    | lbs             | –                    | 20                   | 29                   | 59.5                  |
| Weight of Type 3277 Pneumatic Actuator without/with handwheel | Without | lbs             | 7.05                 | 20                   | 26.5                 | 57.5                  |
|   | With    | lbs             | –                    | 29                   | 37.5                 | 68                    |

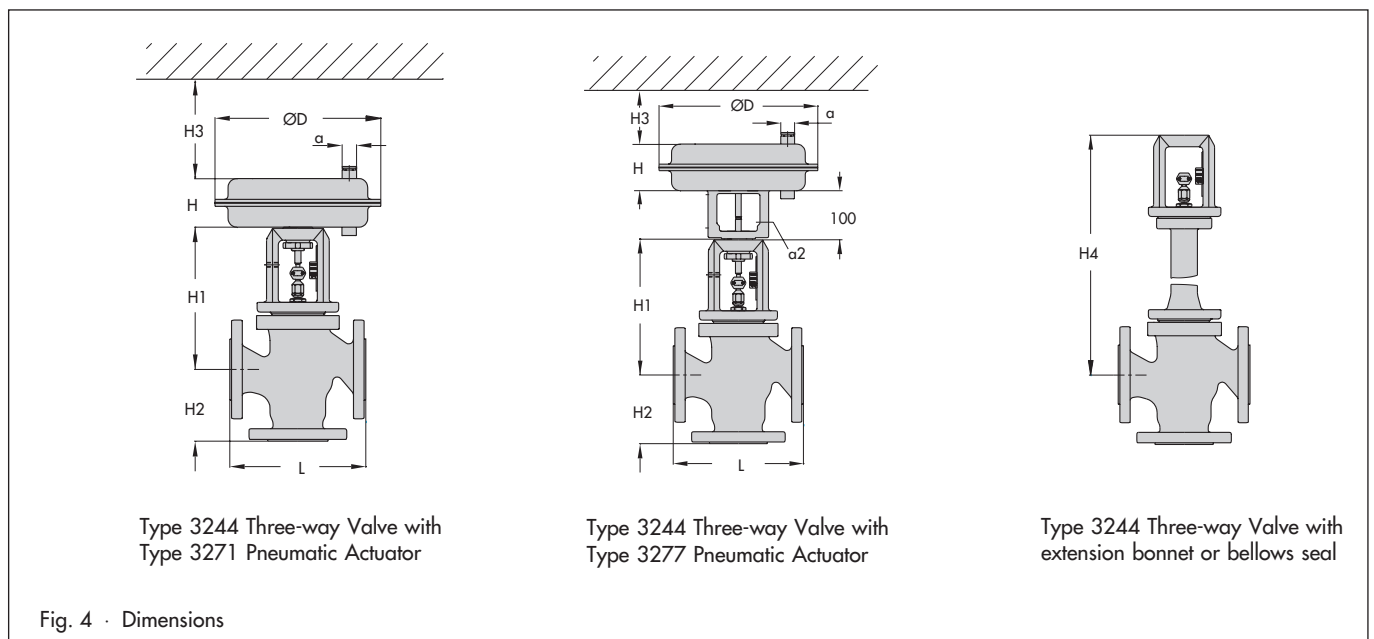
**Table 5c and 5d · Weights in kg**

**Table 5c · Type 3244 Control Valve**

| Nominal size   |       | mm | 15 | 20 | 25 | 40 | 50 | 65 | 80 | 100 | 150 |
|--|-------|----|----|----|----|----|----|----|----|-----|-----|
| Approximate weight of valve without actuator             | kg    |    | 6  | 7  | 8  | 15 | 17 | 31 | 37 | 49  | 135 |
| Approximate weight with extension bonnet or bellows seal | Short | kg | 9  | 10 | 11 | 21 | 23 | 40 | 45 | 68  | 165 |
|  | Long  | kg | 13 | 14 | 15 | 25 | 27 | 44 | 49 | 76  | 173 |

**Table 5d · Type 3271 and Type 3277 Pneumatic Actuators**

| Pneumatic actuator  |         | cm <sup>2</sup> | 120 cm <sup>2</sup> | 240 cm <sup>2</sup> | 350 cm <sup>2</sup> | 700 cm <sup>2</sup> |
|---|---------|-----------------|---------------------|---------------------|---------------------|---------------------|
| Weight of Type 3271 Pneumatic Actuator without/with handwheel | Without | kg              | 2                   | 5                   | 8                   | 22                  |
|   | With    | kg              | –                   | 9                   | 13                  | 27                  |
| Weight of Type 3277 Pneumatic Actuator without/with handwheel | Without | kg              | 3.2                 | 9                   | 12                  | 26                  |
|   | With    | kg              | –                   | 13                  | 17                  | 31                  |



## Ordering information

### 3-Way Globe Control Valve Type 3244:

|   |   |
|---|---|
| Nominal size <sup>1)</sup> ...                                    | Body material ...   |
| ANSI Class ...  | End connection ...  |
| Seat/plug material ...  | Plug for mixing/diverting ...                                     |
| C <sub>v</sub> -/K <sub>vs</sub> -value (upper) <sup>1)</sup> ... | C <sub>v</sub> -/K <sub>vs</sub> -value (lower) <sup>1)</sup> ... |
| Options ...   | Special version ...   |
| Special testing ...   | Special preparation ...   |

#### Actuator:

|   |                     |
|---|---------------------|
| Type ...  | Specification ...   |
| (with pneumatic actuator, specify)                                |                     |
| Size ...  | Spring range ...    |
| Spring action: Actuator ... [extends, retracts] stem (or specify) |                     |
| Fail-safe position: Port ... ["A", "B"] closed on loss of supply  |                     |
| Air/Power supply available ...                                    |                     |
| Options ...   | Special version ... |

#### Operating conditions:

|  |                                       |
|--|---------------------------------------|
| Process fluid <sup>3)</sup> ...                        | Flow rate <sup>4)</sup> A/B ...       |
| Inlet pressure A/B ...                                 | Outlet pressure A/B <sup>4)</sup> ... |
| Temperature A/B ...                                    |                                       |
| Maximum shutoff $\Delta p$ for actuator sizing ...     |                                       |
| Air/power supply available for actuator, max./min. ... |                                       |

#### Accessories:

Positioner, Switches, Transmitter, Solenoid valve, Filter/regulator, Bypass, Volume/pressure amplifier, Lockup relay ...

|          |                   |
|----------|-------------------|
| Type ... | Specification ... |
|----------|-------------------|

Tubing and fittings type/material ...

#### Other instrumentation:

Controllers, Sensors, Transmitters, Transducers, Converters ...

|          |                   |
|----------|-------------------|
| Type ... | Specification ... |
|----------|-------------------|

#### Notes:

- <sup>1)</sup> If Nominal size or C<sub>v</sub>-/K<sub>vs</sub>-value unknown, specify operating conditions
- <sup>2)</sup> Specify system of units, pressures: specify in terms of gauge or absolute  
Provide minimum, normal, and maximum values, where applicable  
Gases, vapors: specify flow rate under standard or operating conditions
- <sup>3)</sup> Nonstandard process fluids, specify additionally:  
Density, Specific gravity, or Molecular weight ...  
Liquids: Vapor pressure, Critical pressure, Viscosity ...  
Gases, Vapors: Ratio of specific heats, Compressibility factor
- <sup>4)</sup> Or, specify required valve flow coefficient C<sub>v</sub>, K<sub>vs</sub> ...

Specifications subject to change without notice.



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