# FPCV-T0 Series Full Port Control Valve

## FPCV-TO Provides Versatile Regulation of Natural Gas Pipelines at an Economical Price


**Figure 1** - Becker Model FPCV-T0 Ball Control Valve

| FPCV-T0 Series Full Port Control Valve | |
|---|---|
| **Classification** | Control Valve |
| **Valve Type** | Rotary trunnion mounted ball |
| **Applications** | Monitoring or mild service when installed above ground<br>Severe service when installed below ground |
| **Noise Attenuation** | None |
| **Maximum Turndown** | 100:1 |
| **Shutoff Class** | VI |
| **Flow Characteristic** | Modified equal percentage (high gain) |
| **Range of Product** | |
| **Size Range** | 2” (50 mm) - 42” (1050 mm) bore |
| **Pressure Ratings** | ANSI Class 150-1500 |
| **End Connections** | RFFE (standard), Weld-End, RTJ |
| **Compatible Actuators** | RPDA Series Actuators<br>RPSR Series Actuators<br>SYDA Series Actuators<br>SYSR Series Actuators |

### Description

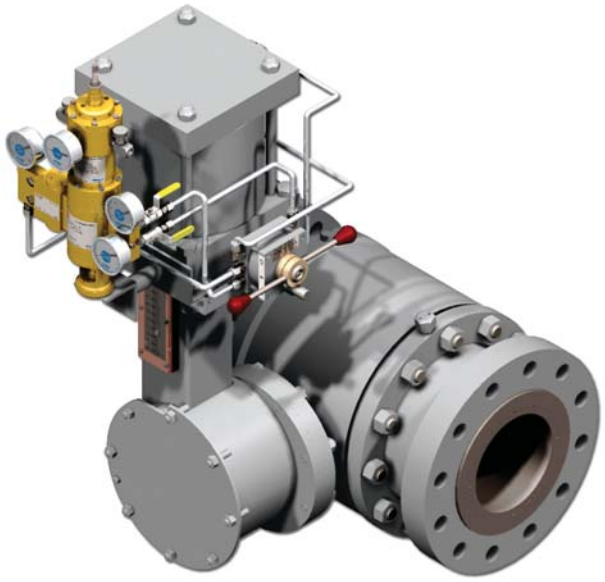
The Becker FPCV-T0 Full Port Control Valve is a trunnion-mounted rotary control valve designed for monitoring or mild-duty service above ground and heavy duty service below ground. The FPCV-T0 features a rugged design that provides maximum capacity with minimal full-open pressure drop. The FPCV-T0 features a side-entry, forged body, and end closures that allows easy maintenance or repair of the control valve. The FPCV-T0 is available in a variety of configurations ranging from 2" (50 mm) to 42" (1050 mm) bore.

### Features

- High turndown capability up 100:1
- High pressure drop shutoff capability to Class VI
- Pig-able design
- Double block & bleed design
- Bi-directional sealing on seat (Piston Effect Principle)
- Upstream and downstream seats
- Bi-directional flow capability
- Self cleaning design, (when installed using left hand mount)
- Emergency sealant system
- Easy maintenance and repair
- Wide array of configurations
- Equalized break torque and running torque
- Rugged design engineered for pipeline applications
- Size Range: 2” (50 mm) - 42” (1050 mm) bore

**Figure 2 -** Model FPCV-T0 Full Port Ball Valve provides guaranteed flow shutoff

The Becker monitor regulator (right) provides over pressure protection with guaranteed Class VI shutoff with double-seated design. The RPSR actuator and VRP-SB-PID provide excellent reliability in high profile installations. Note Becker CVET globe valve regulator installed as the primary regulator (left).



**High Turndown Capability**
The modified equal percentage characteristic of the FPCV-T0 provides high flow capacity combined with low volume control ability. FPCV-T0 can exhibit a turndown ratio up to 100:1. The high turndown capabilities of the FPCV-T0 minimizes the number of regulator runs necessary as compared to globe pattern valves.

**High Pressure Drop Shutoff Capability Class VI**
The rugged design of the FPCV-T0 allows for 100% psig full ANSI rated pressure drop across the control valve at shutoff. The rugged nature of the FPCV-T0 allows implementation in a wide array of demanding natural gas pipeline applications.

**Minimal Pressures Drop**
The full port design of the FPCV-T0 features high flow capacities that provide minimal pressure drop when the control valve is at full-open position.

**Pig-able Design**
The full port, full opening design of the FPCV-T0 allows pipeline pigs to be easily passed.

**Double Block & Bleed**
The FPCV-T0 features a double “block & bleed” feature that allows confirmation of valve seat integrity in one easy procedure. The FPCV-T0 is equipped with a vent plug on the bottom of each control valve body. When the control valve is in a closed position, the vent may be opened to permit venting and subsequent draining of the valve body without blowing down the pipeline.

**Bi-directional sealing on seat (Piston Effect Principle)**
The exclusive design of the FPCV-T0 seats provides increased seat sealing capability. The unique “piston effect principle” causes the control valve seats to seal regardless of relative pressure differential. Hence the FPCV-T0 may seal from either the downstream or upstream side of the control valve. This ensures flow shutoff even if one of seats is damaged. This feature is exclusive to Becker control valve products.

**Bi-Directional Flow Capability**
The versatile and rugged design of the FPCV-T0 allows for bi-directional flow across the control valve. Note that pressure drop capabilities across the valve are not affected by bi-directional flow

**Equalized Break Torque and Running Torque**
The ball element of the FPCV-T0 is specially coated and polished and a special seat spring arrangement is implemented on the FPCV-T0. This ensures smooth operation with equalized break torque and running torque. These characteristics allow for extremely accurate control of the process variable even on the largest bore control valves.

**Easy Maintenance and Repair**
The FPCV-T0 features side-entry, forged body, and end closures that allows easy maintenance or repair of the control valve. Unlike welded-body construction valves, the FPCV-T0 may be easily repaired and returned to service. This is an obvious benefit with respect to efficiency and economy.

**Clean Sweep Feature**
When installed with a control valve stem in horizontal orientation, the FPCV-T0 features a “clean sweep” capability that allows debris to pass through a slight opening of the control valve. The feature prevents debris from scouring the face of the ball element or the control valve seats.

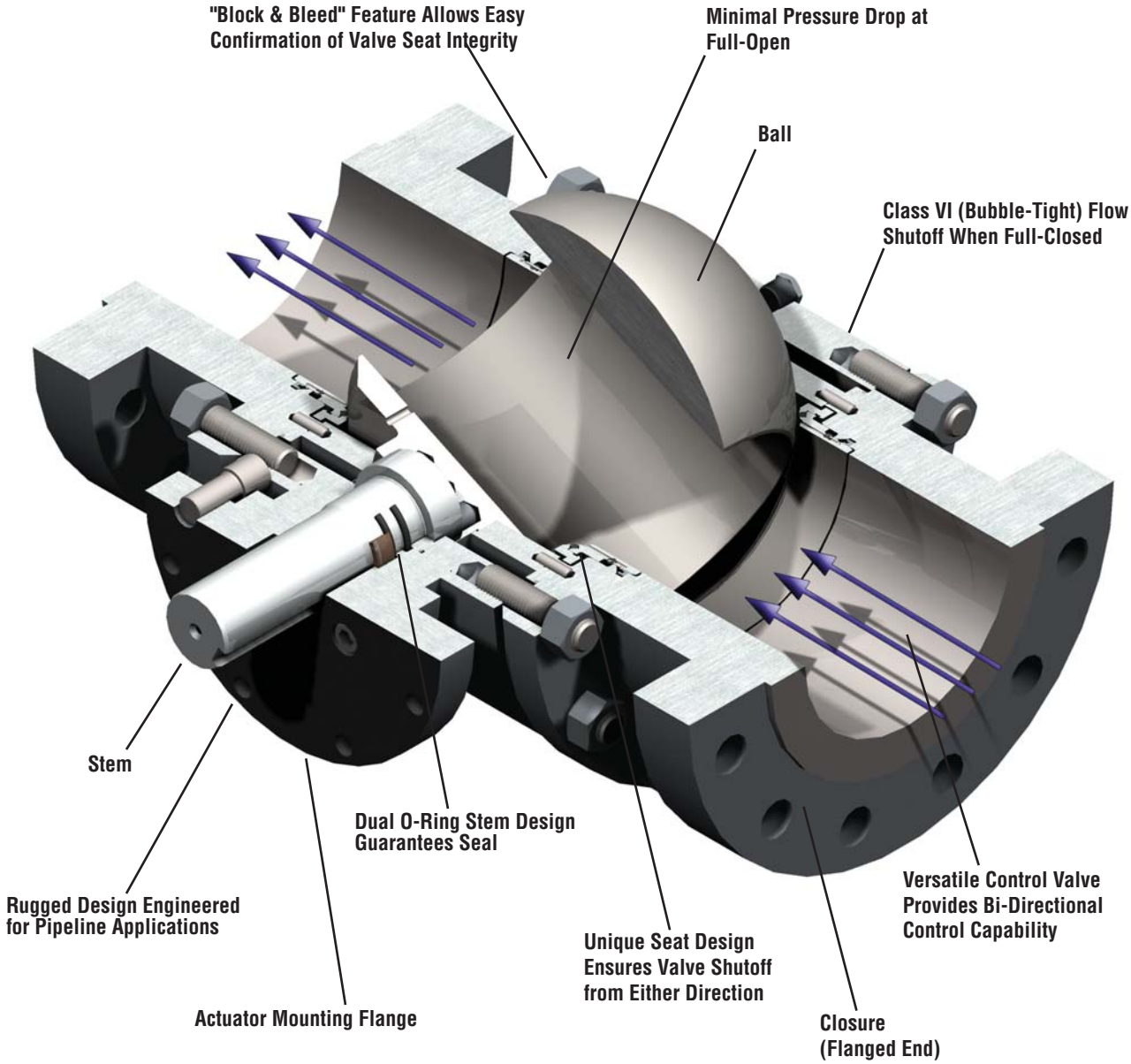
**Wide Array of Configurations**
The FPCV-T0 features one of the widest arrays of rotary control valve configurations in the natural gas industry. FPCV-T0s are available in ANSI ratings from 150-1500. bore sizes from 2 in (50 mm) to 42 in (1050 mm), and a full compliment of end connections and trim materials to suit many applications.

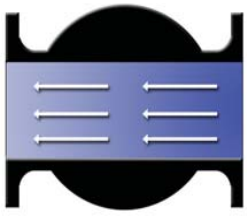
**Stem Construction**
The FPCV-T0 utilizes dual O-ring stem seals that can be serviced while the control valve is under pressure. Additionally, the dual O-ring design can be utilized with confidence in below ground applications, unlike our competitors’ gland type stem seal design.

**Rugged Design Engineered for Pipeline Applications**
Unlike our competitors, the FPCV-T0 is designed for use in rugged pipeline applications. The FPCV-T0 is designed for applications that demand a control valve that will provide continuous service with minimal maintenance for many years.

## Model FPCV-TO Full Port Control Valve Provides Versatile Regulation at an Economical Price

**Figure 3 -** Model FPCV-T0 Cutaway view



**FPCV-T0 Full Port Control Valve Features:**

- Maximum noise attenuation 0 dBA above ground
- Maximum turndown ratio 100:1

## Becker FPCV-T0 Full Port Control Valve Components

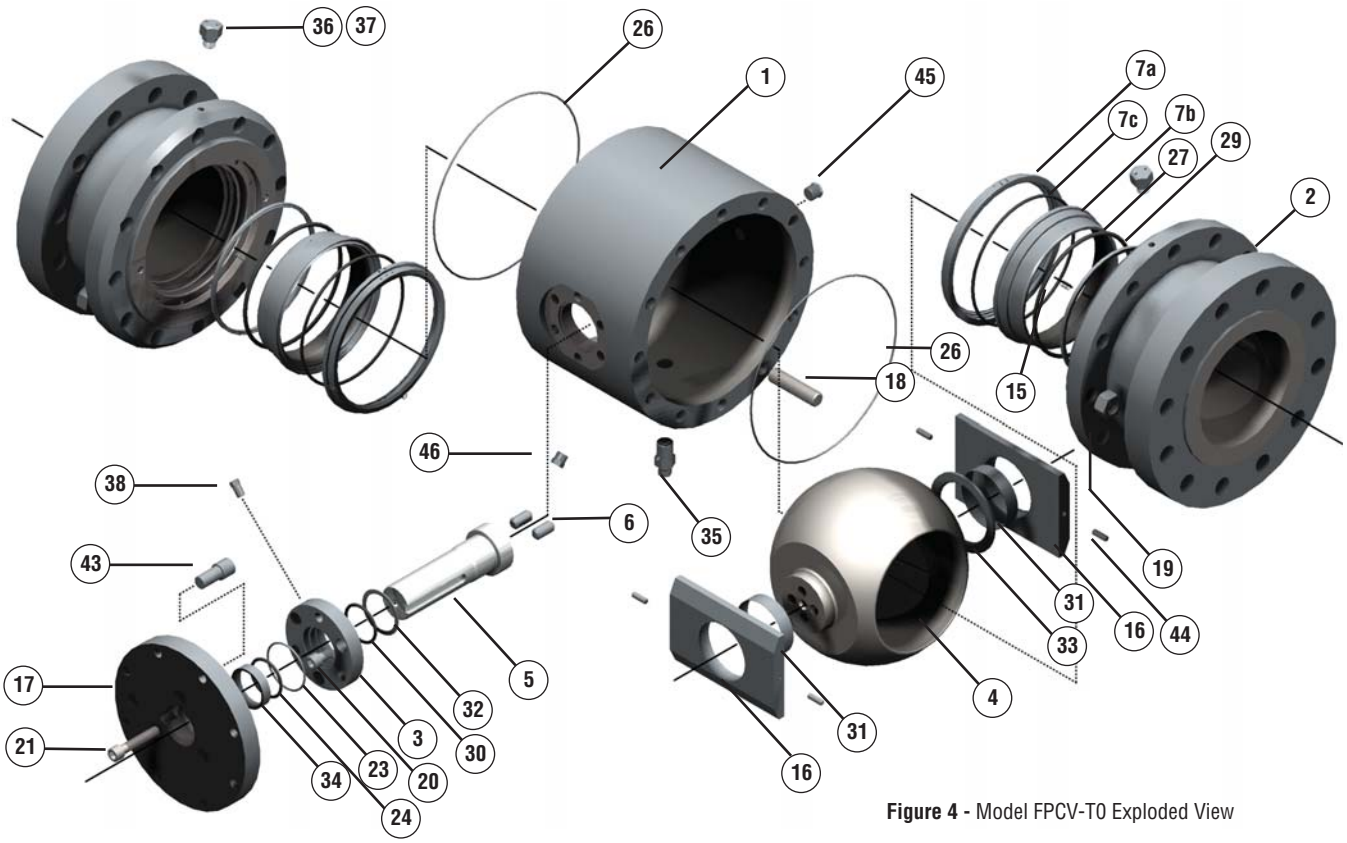



**Figure 4 -** Model FPCV-T0 Exploded View

**Table 1 -** Model FPCV-T0 Materials of Construction

| Item | Description | Material | Item | Description | Material |
|---|---|---|---|---|---|
| 1 | Body | ASTM A350 LF2, A106 | 24 | O-Ring, Gland Plate | Viton |
| 2 | Closure (RFFE) | ASTM A350 LF2, A106 | 26 | O-Ring, Body | Viton |
| 3 | Gland Plate | ASTM A36 | 27 | O-Ring, Gasket, Seat | Viton |
| 4 | Ball[1] | ASTM A395 | 28 | O-Ring, Seat Seal | Viton |
| 5 | Stem | AISI 1018, 4140 | 29 | Seat U-Cup | Viton |
| 6 | Stem Pin | AISI 4140 | 30 | Gland Plate Gasket | Vellumoid |
| 7a | Seat Ring, Inner | ASTM A36 | 31 | Bearing | Teflon/Steel |
| 7b | Seat Ring, Outer | ASTM A36 | 32 | Thrust Washer, Upper | Filled Phenolic |
| 7c | Lock Ring | T-304 SS | 33 | Thrust Washer, Lower | Filled Phenolic |
| 7d | Pin, Seat Lock Ring | SS 300 Series | 34 | Gland Bushing | AISI 1015 |
| 15 | Seat Spring[2] | Alloy X-750 | 35 | Drain Fitting[5] | AISI 1018 |
| 16 | Bearing Retainer | ASTM A36 | 36 | Check Fitting | AISI 1018 |
| 17 | Adapter Plate | ASTM A36 | 37 | Grease Fitting | AISI 1018 |
| 18 | Body Stud | ASTM A193 B7M | 38 | Stem Vent Assembly | AISI 1018 |
| 19 | Body Nut | ASTM A194 2HM | 43 | Anchor Pin | AISI 1018 |
| 20 | Capscrew, Gland Plate | ASTM A574M | 44 | Pin, Bearing Retainer | AISI 4140 |
| 21 | Capscrew, Adapter Plate | ASTM A574M | 45 | Hex Plug | AISI 1018 |
| 23 | O-Ring, Stem[3] | Viton | 46 | Body Relief | AISI 1018 |

**Table 2 -** FPCV-T0 Technical Specifications

| Materials of Construction (Standard Configuration) | | |
|---|---|---|
| **Body Material** | Carbon steel | |
| **Ball Material*** | ENP carbon steel with "moly" coat | |
| **Throttling Trim** | Carbon steel | |
| **Seat Ring Material** | Carbon steel | |
| **Seat Seal Material** | Viton | |
| **Coating** | All valves sandblast per SP-10 and Becker primer and topcoat | |
| *Customer specified coatings applied upon request<br>**Note:** Special configurations and materials are available. Please Consult Factory for your application requirements. | | |
| **General Design Specifications** | | |
| **Maximum Control Cv** | 90% Max Cv | 85° travel (for all systems) |
| **Minimum Control Cv** | 1.0% Max Cv | 9° travel (large downstream systems) |
| | 1.5% Max Cv | 15° travel (power plant type systems) |
| **Pipe Velocity (Gas)** | 100 ft/sec above ground applications<br>200 ft/sec below ground applications | |
| **Pipe Velocity (Liquid)** | 30 ft/sec above ground applications | |
| **Face to Face** | ANSI B16.10 see table | |
| **Testing** | API 6D | |
| **Shut Off Classification** | Class VI (full ANSI rating)* | |
| **Maximum Noise** | 110 dBA | |
| **Maximum Control ΔP** | Full ANSI differential (primary flow)<br>Full ANSI differential (reverse flow) | |
| **Operating Temperature** | -20°F to +350°F (-29°C to +177°C) standard<br>-50°F to +350°F (-46°C to +177°C) optional low temperature trim | |
| *All FPCV-T0 are tested and shipped capable of Class VI shutoff. If the FPCV-T0 is exposed to high pressure drop, repeated cycling, excessive contaminants, or conditions outside reasonable service the control valve leakage class could degrade. | | |

## How it works

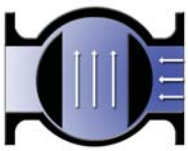


**Figure 5.0 -** Full Closed Position

The FPCV-T0 Full Port Control Valve provides bubble-tight shutoff when the control valve is in the full-closed position. The double-seated design of the FPCV-T0 provides superior flow shutoff. This is particularly important in applications such as monitor regulators. Note that the unique bi-directional sealing seats can provide double the shutoff capability of other manufacturer's control valves.

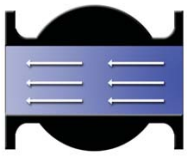


**Figure 5.1 -** Full Open Position

The FPCV-T0 Full Port Control Valve provides minimal pressure differential when the control valve is in the full-open position. The full bore design of the FPCV-T0 provides superior flow capacity. This is particularly important in applications such as monitor regulators.

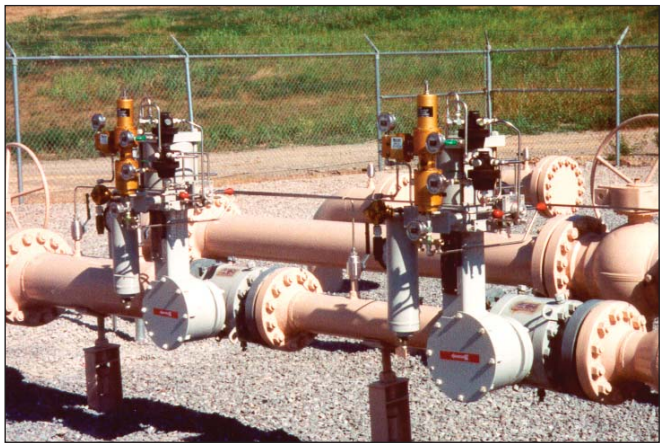


**Figure 5 -** FPCV-T0 installed at Power Plant

The FPCV-T0 is the ideal control valve when pressure differential is low and noise attenuation trim is not necessary. The primary pressure regulator (left) provides up to 100:1 flow turndown. Comparable designs that incorporate globe pattern valves may require multiple parallel piping runs to achieve comparable flow turndown. Additionally, note that the monitor regulator equipped with FPCV-T0 provides complete shutoff (Class VI).

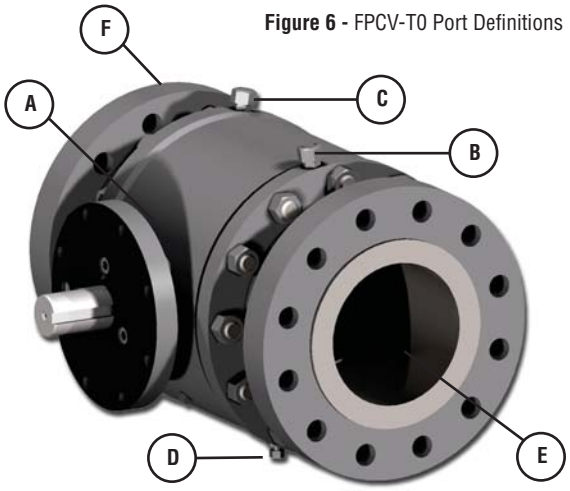



**Figure 6 -** FPCV-T0 Port Definitions

**Table 3 -** FPCV-T0 Technical Specifications

| FPCV-T0 Port Definitions | Port Info | Item |
|---|---|---|
| Stem Lubrication Port | 1/4" NPT | A |
| Upstream Seat Lubrication Port | Buttonhead | B |
| Downstream Seat Lubrication Port | Buttonhead | C |
| Body Blow-down Port / Drain | 1/2" NPT Ball Valve | D |
| Upstream Valve Inlet Port | RFFE, WE, or RTJ | E |
| Downstream Valve Inlet Port | RFFE, WE, or RTJ | F |

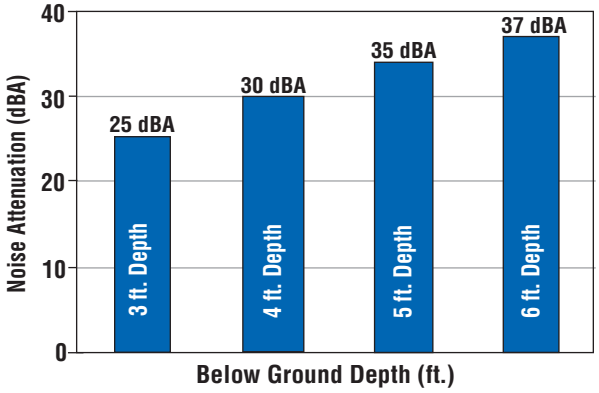
## FPCV-T0 Series Control Valve Accessories/Options

**Realize Optimum Performance of your FPCV-T0 Control Valve with these Popular Accessories and Options!**


**Figure 7 -** Installation of Becker Below Ground Ball Valve Regulator.

A large natural gas transmission company in New York City region installed Becker Below Ground Ball Valve Regulators to achieve maximum noise attenuation, minimal maintenance, and optimum cost effectiveness. The Below Ground Regulator can provide up to 37 dBA noise attenuation with minimal additional costs.

**Below Ground Regulator Option Providing Additional Noise Attenuation**

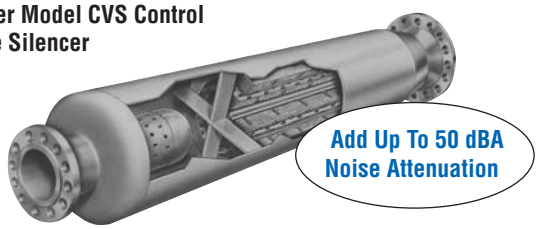



**Noise Attenuation as a Factor of Below Ground Depth**
Typical below ground depths range from 3 feet to 6 feet below ground. The below ground depth is measured from centerline of pipe to ground. Below ground noise attenuation usually provides from 25 dBA to 37 dBA.

**The Becker Below Ground Ball Valve Regulator** option is unique to Becker and provides a multitude of benefits by direct burial of the control valve itself. The valve actuator, lubrication lines, and drain lines are extended above ground while the ball valve remains below ground. The primary advantage of Becker Below Ground Regulators is inexpensive noise attenuation up to 37 dBA.

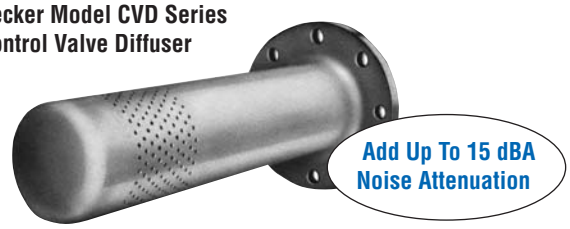
- Up to 37 dBA noise attenuation
- Less ambient heat loss
- May use smaller adjacent piping diameter
- Smaller station footprint
- Economical noise attenuation
- Eliminates need for buildings and enclosures by utilizing the Fiberglass Cabinet
- Below Ground Regulator option may be combined with other noise attenuation solutions

**Becker Model CVS Control Valve Silencer**




**The CVS Control Valve Silencer** is a noise attenuating device that is installed immediately downstream of any control valve regulator to provide noise reduction of up to 50 dBA noise attenuation. The CVS is available in a variety of configurations and designs to accommodate almost any natural gas regulation facility. The CVS may be combined with other Becker noise attenuating products in order to provide additional noise reduction.

**Becker Model CVD Series Control Valve Diffuser**




**The CVD Series Control Valve Diffuser** is a noise attenuating device that is installed immediately downstream of any control valve regulator to provide noise reduction of up to 15 dBA noise attenuation. The CVD is available in a variety of configurations and designs to accommodate any natural gas regulation facility. The CVD may be combined with other Becker noise attenuating products in order to provide additional noise reduction.

## FPCV-T0 Series Control Valve Compatible Actuators

**Becker Control Valve Actuators provide reliability and accuracy for all of your control valve applications**

### RPDA Rotary Piston Double-Acting Actuator

The RPDA Rotary Piston Double-Acting Actuator is designed for heavy duty control applications that require optimum performance. The RPDA is typically utilized when applications require a lock-last failure mode. The RPDA incorporates a crank-arm mechanism specifically designed for the rigors of throttling control valve applications. The RPDA can accept high pressure power supply gas up to 500 psig (3447 kPa) enabling the use of smaller actuators or Becker's exclusive Bleed to Pressure System (BPS™) feature.

**Specifications**

| | |
|---|---|
| **Actuator Type:** | Quarter turn (90° rotation) |
| **Mechanism:** | Crank-arm |
| **Usage:** | Heavy-duty |
| **Action:** | Double-acting |
| **Applications:** | Throttling, On-Off |
| **Maximum Supply Gas:** | 500 psig (3447 kPa) |
| **Bleed to Pressure System:** | Yes |
| **Below Ground Design:** | Yes |
| **Maximum Valve Size:** | 42" bore |
| **Minimum Valve Size:** | 2" bore |
| **Stop Adjustment:** | Internal |

### RPSR Rotary Piston Spring Return Actuator

The RPSR Rotary Piston Spring Return Actuator is designed for heavy duty control applications that require optimum performance. The RPSR is typically utilized when applications require the control valve to fail-open or fail closed upon loss of power supply gas. The RPSR incorporates a "crank-arm" mechanism specifically designed for the rigors of throttling control valve applications. The RPSR can accept high pressure power supply gas up to 500 psig (3447 kPa) enabling the use of smaller actuators or Becker's exclusive Bleed to Pressure System (BPS) feature.

**Specifications**

| | |
|---|---|
| **Actuator Type:** | Quarter Turn (90° rotation) |
| **Mechanism:** | Crank-arm |
| **Usage:** | Heavy-duty |
| **Action:** | Single-acting (fail-open or fail-closed) |
| **Applications:** | Throttling, On-Off, Surge Control |
| **Maximum Supply Gas:** | 500 psig (3447 kPa) |
| **Bleed to Pressure System:** | Yes |
| **Below Ground Design:** | Yes |
| **Maximum Valve Size:** | 16" bore |
| **Minimum Valve Size:** | 2" bore |
| **Stop Adjustment:** | Internal |


### SYDA Scotch Yoke Double-Acting Actuator

The SYDA Scotch Yoke Double-Acting Actuator is designed as an economical actuator for moderate duty control applications. The SYDA is typically utilized when applications require lock-last failure mode. The SYDA incorporates a scotch yoke mechanism. The SYDA can accept power supply gas up to 130 psig (896 kPa). The SYDA features a compact design that is convenient when installation space is a premium.

**Specifications**

| | |
|---|---|
| **Actuator Type:** | Quarter Turn (90° rotation) |
| **Mechanism:** | Scotch Yoke |
| **Usage:** | Moderate duty |
| **Action:** | Double-acting |
| **Applications:** | Throttling, On-Off |
| **Maximum Supply Gas:** | 130 psig (896 kPa) |
| **Bleed to Pressure System:** | Limited |
| **Below Ground Design:** | Not recommended |
| **Maximum Valve Size:** | 42" bore |
| **Minimum Valve Size:** | 2" bore |
| **Stop Adjustment:** | External |


### SYSR Scotch Yoke Spring Return Actuator

The SYSR Scotch Yoke Spring Return Actuator is designed as an economical actuator for moderate duty control applications. The SYSR is typically utilized when applications require the control valve to fail-open or fail-closed mode. The SYSR incorporates a scotch yoke mechanism. The SYSR can accept power supply gas up to 130 psig (896 kPa). The SYSR may be easily field configured to reverse failure mode. The SYSR features a compact design that is convenient when installation space is a premium.

**Specifications**

| | |
|---|---|
| **Actuator Type:** | Quarter Turn (90° rotation) |
| **Mechanism:** | Scotch Yoke |
| **Usage:** | Moderate-duty |
| **Action:** | Single-acting (fail-open or fail-closed) |
| **Applications:** | Throttling, On-Off |
| **Maximum Supply Gas:** | 130 psig (896 kPa) |
| **Bleed to Pressure System:** | Limited |
| **Below Ground Design:** | Not recommended |
| **Maximum Valve Size:** | 36" bore |
| **Minimum Valve Size:** | 2" bore |
| **Stop Adjustment:** | External |

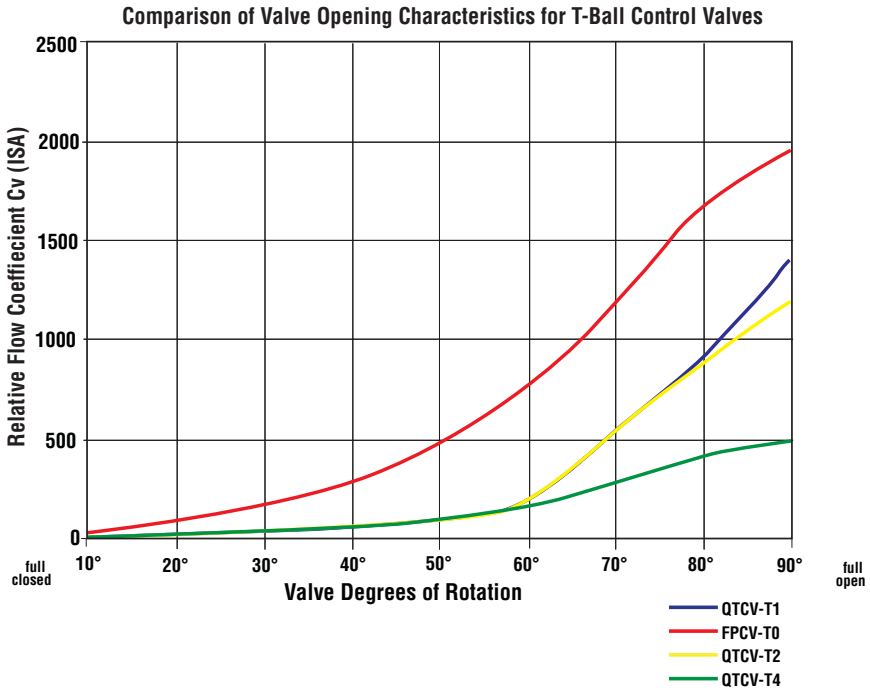
**Table 4 -** Model FPCV-T0 Flow Coefficients (Cv) Based Upon ISA Sizing Equation Criteria

| | | Valve Degree of Rotation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Size Inch (mm) | Minimum Controllable Cv. | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
| 2" (50) | 2.0 | 4.2 | 12.4 | 23.1 | 38.7 | 64.3 | 104 | 156 | 224 | 260 |
| 3" (80) | 4.1 | 3.3 | 26.2 | 49.0 | 81.9 | 136 | 220 | 330 | 474 | 550 |
| 4" (100) | 7.3 | 15.9 | 46.5 | 86.8 | 145 | 241 | 390 | 584 | 840 | 975 |
| 6" (150) | 20.0 | 42.5 | 124 | 231 | 387 | 643 | 1,039 | 1,559 | 2,240 | 2,600 |
| 8" (200) | 39.0 | 85.7 | 250 | 467 | 782 | 1,298 | 2,098 | 3,148 | 4,523 | 5,250 |
| 10" (250) | 64.0 | 139 | 405 | 757 | 1,226 | 2,101 | 3,396 | 5,096 | 7,323 | 8,500 |
| 12" (300) | 104.0 | 227 | 663 | 1,237 | 2,071 | 3,436 | 5,554 | 8,333 | 11,976 | 13,900 |
| 16" (400) | 169.0 | 367 | 1,073 | 2,003 | 3,352 | 5,562 | 8,989 | 13,489 | 19,385 | 22,500 |
| 20" (500) | 291.0 | 634 | 1,850 | 3,454 | 5,781 | 9,592 | 15,502 | 23,261 | 33,429 | 38,800 |
| 24" (600) | 435.0 | 947 | 2,765 | 5,163 | 8,641 | 14,338 | 23,173 | 34,772 | 49,971 | 58,000 |
| 30" (750) | 735.0 | 1,600 | 4,673 | 8,723 | 14,601 | 24,227 | 39,154 | 58,753 | 84,434 | 98,000 |
| 36" (915) | 1,155.0 | 2,515 | 7,343 | 13,708 | 22,904 | 38,070 | 61,528 | 93,326 | 132,682 | 154,000 |
| 42" (1,050) | 1,868.0 | 4,066 | 11,872 | 22,164 | 37,098 | 61,555 | 99,483 | 149,280 | 214,531 | 249,000 |
| $X_t$ | | 0.82 | 0.82 | 0.82 | 0.79 | 0.71 | 0.55 | 0.36 | 0.19 | 0.10 |
| $F_1$ | | 0.91 | 0.91 | 0.91 | 0.90 | 0.86 | 0.80 | 0.72 | 0.61 | 0.50 |

(1) Flow Coefficients (Cv) are based upon ISA sizing equation criteria.
(2) Consult Becker Precision Equipment for additional information.
(3) Minimum controllable Cv based upon natural gas pipeline systems that do not feed power plants or similar small downstream systems.
(4) For Flow Coefficients (Cv) based upon Universal Sizing criteria see bulletin "FPCV-T0 Series Full Port Control Valve Universal Cv 0102".
(5) For sizing and station design software using Universal Sizing criteria, utilize Becker bpeSize program.

**Figure 8 -** Comparison of Valve Opening Characteristics for T-Ball Control Valves

Graph provides relative comparison for Models FPCV-T0, QTCV-T1, QTCV-T2, and QTCV-T4 control valves. Note difference in rate of opening and full-open capacity between each control valve. Data based upon 6" (150 mm) model FPCV-T0, QTCV-T1, QTCV-T2, and QTCV-T4 control valves, utilizing ISA Cv data.




**www.dresser.com/becker**

Control Valve sizing and station design software is available for free download from our website at www.dresser.com/becker. Contact Becker Precision Equipment for assistance!

**Table 5 -** Model FPCV-T0 Face to Face Dimensions (RFFE)

| Size | ANSI 150 | | ANSI 300 | | ANSI 600 | | ANSI 900 | | ANSI 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) |
| 2” (50) | 7.000 | (178) | 8.500 | (216) | 11.500 | (292) | 14.500 | (368) | 14.500 | (368) |
| 3” (80) | 8.000 | (203) | 11.125 | (283) | 14.000 | (356) | 15.000 | (381) | 18.500 | (470) |
| 4” (100) | 9.000 | (229) | 12.000 | (305) | 17.000 | (432) | 18.000 | (457) | 21.500 | (546) |
| 6” (150) | 15.500 | (394) | 15.875 | (403) | 22.000 | (559) | 24.000 | (610) | 28.000 | (711) |
| 8” (200) | 18.000 | (457) | 19.750 | (502) | 26.000 | (660) | 29.000 | (737) | 32.750 | (832) |
| 10” (250) | 21.000 | (533) | 22.375 | (568) | 31.000 | (787) | 33.000 | (838) | 39.000 | (991) |
| 12” (300) | 24.000 | (610) | 25.500 | (648) | 33.000 | (838) | 38.000 | (965) | 44.500 | (1,130) |
| 16” (400) | 30.000 | (762) | 33.000 | (838) | 39.000 | (991) | 44.500 | (1,130) | 54.500 | (1,384) |
| 20” (500) | 36.000 | (914) | 39.000 | (991) | 47.000 | (1,194) | 52.000 | (1,321) | 65.500 | (1,664) |
| 24” (600) | 42.000 | (1,067) | 45.000 | (1,143) | 55.000 | (1,397) | 61.000 | (1,549) | 80.500 | (2,045) |
| 30” (750) | 51.000 | (1,295) | 55.000 | (1,397) | 65.000 | (1,651) | 74.000 | (1,880) | N/A | (N/A) |
| 36” (900) | 60.000 | (1,524) | 68.000 | (1,727) | 82.000 | (2,083) | 90.000 | (2,286) | N/A | (N/A) |
| 42” (1,050) | 73.000 | (1854) | 82.000 | (2082) | 96.000 | (2438) | N/A | (N/A) | N/A | (N/A) |

(1) Consult Becker Precision Equipment for additional information.

**Table 6 -** Model FPCV-T0 Standard Weights (RFFE)

| | ANSI 150 | | ANSI 300 | | ANSI 600 | | ANSI 900 | | ANSI 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Size inches (mm) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) |
| 2” (50) | 61 | (28) | 68 | (31) | 79 | (36) | 112 | (51) | 130 | (59) |
| 3” (80) | 130 | (59) | 150 | (68) | 160 | (72) | 195 | (88) | 255 | (116) |
| 4” (100) | 210 | (95) | 240 | (109) | 295 | (134) | 355 | (161) | 430 | (195) |
| 6” (150) | 330 | (200) | 485 | (220) | 550 | (250) | 850 | (390) | 1,270 | (575) |
| 8” (200) | 610 | (350) | 825 | (375) | 975 | (440) | 1,225 | (560) | 1,650 | (750) |
| 10” (250) | 975 | (500) | 1,175 | (535) | 1,550 | (700) | 1,800 | (820) | 2,620 | (1,190) |
| 12” (300) | 1,435 | (705) | 1,675 | (760) | 2,025 | (920) | 2,700 | (1,230) | 3,640 | (1,650) |
| 16” (400) | 2,250 | (1020) | 2,850 | (1,295) | 3,375 | (1,530) | 4,420 | (2,000) | 8,800 | (4,000) |
| 20” (500) | 4,225 | (1,920) | 4,575 | (2,075) | 5,800 | (2,630) | 7,610 | (3,450) | N/A | (N/A) |
| 24” (600) | 6,175 | (2,800) | 6,775 | (3,075) | 8,700 | (3,950) | 12,100 | (5,490) | N/A | (N/A) |
| 30” (750) | 10,600 | (4,800) | 12,275 | (5,575) | 14,725 | (6,690) | 21,000 | (9,530) | N/A | (N/A) |
| 36” (900) | 16,750 | (7,600) | 18,525 | (8,400) | 23,400 | (10,620) | 29,900 | (12,200) | N/A | (N/A) |
| 42” (1,050) | 26,650 | (12,100) | 28,500 | (12,950) | 35,900 | (16,300) | N/A | (N/A) | N/A | (N/A) |

(1) Weights are for bare-stem valve and do not include actuator, instrumentation, accessories, or packaging materials.

(2) Non-standard sizes and reduced port designs available.

(3) Consult Becker Precision Equipment for additional information.

**Table 7 -** Model FPCV-T0 Face to Face Dimensions (RTJ)

| Size | ANSI 150 | | ANSI 300 | | ANSI 600 | | ANSI 900 | | ANSI 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) |
| 2” (50) | N/A | (N/A) | N/A | (N/A) | 11.625 | (295) | 14.625 | (371) | 14.625 | (371) |
| 3” (80) | N/A | (N/A) | N/A | (N/A) | 14.125 | (359) | 15.125 | (384) | 18.625 | (473) |
| 4” (100) | N/A | (N/A) | N/A | (N/A) | 17.125 | (435) | 18.125 | (460) | 21.625 | (549) |
| 6” (150) | N/A | (N/A) | N/A | (N/A) | 22.125 | (562) | 24.125 | (613) | 28.000 | (711) |
| 8” (200) | N/A | (N/A) | N/A | (N/A) | 26.125 | (664) | 29.125 | (740) | 33.125 | (841) |
| 10” (250) | N/A | (N/A) | N/A | (N/A) | 31.125 | (791) | 33.125 | (841) | 39.374 | (1000) |
| 12” (300) | N/A | (N/A) | N/A | (N/A) | 33.125 | (841) | 38.125 | (968) | 45.125 | (1146) |
| 16” (400) | N/A | (N/A) | N/A | (N/A) | 39.125 | (994) | 44.875 | (1,410) | 55.375 | (1407) |
| 20” (500) | N/A | (N/A) | N/A | (N/A) | 47.250 | (1,200) | 52.500 | (1,335) | N/A | (N/A) |
| 24” (600) | N/A | (N/A) | N/A | (N/A) | 55.375 | (1,407) | 61.750 | (1,568) | N/A | (N/A) |
| 30” (750) | N/A | (N/A) | N/A | (N/A) | 65.500 | (1,664) | 74.875 | (1,902) | N/A | (N/A) |
| 36” (900) | N/A | (N/A) | N/A | (N/A) | 82.625 | (2,099) | 91.125 | (2,315) | N/A | (N/A) |
| 42” (1,050) | N/A | (N/A) | N/A | (N/A) | NA | (N/A) | N/A | (N/A) | N/A | (N/A) |

(1) Consult Becker Precision Equipment for additional information.

**Table 8 -** Model FPCV-T0 Standard Weights (RTJ)

| Size | ANSI 150 | | ANSI 300 | | ANSI 600 | | ANSI 900 | | ANSI 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches (mm) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) |
| 2” (50) | N/A | (N/A) | N/A | (N/A) | 79 | (36) | 112 | (51) | 130 | (59) |
| 3” (75) | N/A | (N/A) | N/A | (N/A) | 160 | (73) | 195 | (88) | 255 | (116) |
| 4” (100) | N/A | (N/A) | N/A | (N/A) | 295 | (134) | 355 | (161) | 430 | (195) |
| 6” (150) | N/A | (N/A) | N/A | (N/A) | 550 | (249) | 850 | (386) | 1,270 | (576) |
| 8” (200) | N/A | (N/A) | N/A | (N/A) | 975 | (442) | 1,225 | (556) | 1,650 | (748) |
| 10” (250) | N/A | (N/A) | N/A | (N/A) | 1,550 | (703) | 1,800 | (816) | 2,620 | (1,118) |
| 12” (300) | N/A | (N/A) | N/A | (N/A) | 2,025 | (919) | 2,700 | (1,225) | 3,640 | (1,651) |
| 16” (400) | N/A | (N/A) | N/A | (N/A) | 3,375 | (1,531) | 4,420 | (2,005) | 8,800 | (3,992) |
| 20” (500) | N/A | (N/A) | N/A | (N/A) | 5,800 | (2,631) | 7,610 | (3,452) | N/A | (N/A) |
| 24” (600) | N/A | (N/A) | N/A | (N/A) | 8,700 | (3,946) | 12,100 | (5,488) | N/A | (N/A) |
| 30” (750) | N/A | (N/A) | N/A | (N/A) | 14,725 | (6,679) | 21,000 | (9,525) | N/A | (N/A) |
| 36” (900) | N/A | (N/A) | N/A | (N/A) | 23,400 | (10,614) | 29,900 | (13,562) | N/A | (N/A) |
| 42” (1,050) | N/A | (N/A) | N/A | (N/A) | NA | (N/A) | N/A | (N/A) | N/A | (N/A) |

(1) Weights are for bare-stem valve and do not include actuator, instrumentation, accessories, or packaging materials.
(2) Non-standard sizes and reduced port designs available.
(3) Consult Becker Precision Equipment for additional information.

**Table 9 -** Model FPCV-T0 Face to Face Dimensions (Weld End)

| Size | ANSI 150 | | ANSI 300 | | ANSI 600 | | ANSI 900 | | ANSI 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) | Inches | (mm) |
| 2” (50) | 8.500 | (215) | 8.500 | (215) | 11.500 | (292) | 14.5 | (368) | 14.5 | (368) |
| 3” (75) | 11.125 | (282) | 11.125 | (282) | 14.000 | (355) | 15.0 | (381) | 18.5 | (470) |
| 4” (100) | 12.000 | (305) | 12.000 | (304) | 17.000 | (431) | 18.0 | (457) | 21.5 | (546) |
| 6” (150) | 18.000 | (457) | 18.000 | (457) | 22.000 | (558) | 24.0 | (610) | 27.75 | (705) |
| 8” (200) | 20.500 | (521) | 20.500 | (520) | 26.000 | (660) | 29.0 | (737) | 32.75 | (832) |
| 10” (250) | 22.000 | (559) | 22.000 | (558) | 31.000 | (787) | 33.0 | (838) | 39.0 | (990) |
| 12” (300) | 25.000 | (635) | 25.000 | (635) | 33.000 | (838) | 38.0 | (965) | 44.5 | (1,130) |
| 16” (400) | 33.000 | (838) | 33.000 | (838) | 39.000 | (990) | 44.5 | (1,130) | 54.5 | (1,384) |
| 20” (500) | 39.000 | (991) | 39.000 | (990) | 47.000 | (1,193) | 52.0 | (1,320) | N/A | (N/A) |
| 24” (600) | 45.000 | (1,143) | 45.000 | (1,143) | 55.000 | (1,397) | 61.0 | (1,549) | N/A | (N/A) |
| 30” (750) | 55.000 | (1,397) | 55.000 | (1,397) | 65.000 | (1,651) | 74.0 | (1,879) | N/A | (N/A) |
| 36” (900) | 68.000 | (1,727) | 68.000 | (1,727) | 82.000 | (2,082) | 90.0 | (2,286) | N/A | (N/A) |
| 42” (1,050) | 82.000 | (2,082) | 82.000 | (2,082) | 96.000 | (2,438) | N/A | (N/A) | N/A | (N/A) |

(1) Consult Becker Precision Equipment for additional information.

**Table 10 -** Model FPCV-T0 Standard Weights (Weld End)

| Size | ANSI 150 | | ANSI 300 | | ANSI 600 | | ANSI 900 | | ANSI 1500 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches (mm) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) | Lbs. | (Kg.) |
| 2” (50) | 57 | (26) | 57 | (26) | 61 | (28) | 72 | (33) | 82 | (37) |
| 3” (80) | 125 | (57) | 125 | (57) | 140 | (63) | 150 | (68) | 185 | (84) |
| 4” (100) | 200 | (91) | 200 | (91) | 235 | (107) | 255 | (116) | 290 | (132) |
| 6” (150) | 425 | (193) | 425 | (193) | 450 | (204) | 650 | (295) | 970 | (440) |
| 8” (200) | 725 | (330) | 725 | (330) | 840 | (380) | 950 | (430) | 1,190 | (540) |
| 10” (250) | 1,050 | (476) | 1,025 | (465) | 1,250 | (570) | 1,400 | (640) | 1,840 | (835) |
| 12” (300) | 1,450 | (658) | 1,450 | (660) | 1,700 | (770) | 2,200 | (1,000) | 2,660 | (1,210) |
| 16” (400) | 2,150 | (975) | 2,350 | (1,065) | 2,825 | (1,280) | 4,420 | (1,590) | 6,750 | (3,070) |
| 20” (500) | 4,050 | (1,387) | 4,050 | (1,840) | 5,100 | (2,310) | 7,610 | (2,730) | N/A | (N/A) |
| 24” (600) | 6,000 | (2,722) | 6,000 | (2,725) | 8,025 | (3,640) | 12,100 | (4,150) | N/A | (N/A) |
| 30” (750) | 10,400 | (4,717) | 10,925 | (4,960) | 13,450 | (6,110) | 21,000 | (7,490) | N/A | (N/A) |
| 36” (900) | 16,650 | (7,552) | 16,650 | (7,560) | 20,860 | (9,380) | 29,900 | (9,730) | N/A | (N/A) |
| 42” (1,050) | 25,330 | (11,500) | 25,330 | (11,500) | 31,300 | (14,210) | N/A | (N/A) | N/A | (N/A) |

(1) Weights are for bare-stem valve and do not include actuator, instrumentation, accessories, or packaging materials.
(2) Non-standard sizes and reduced port designs available.
(3) Consult Becker Precision Equipment for additional information.

## Choose the Perfect Rotary Control Valve for Your Application

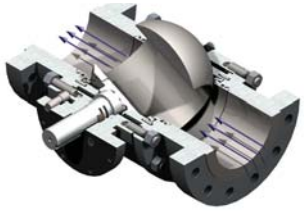
Becker Precision Equipment has a wide variety of rotary control valves with a variety of features that ensure the optimum solution for application needs.

**Table 11** Becker Precision Equiptment Control Valve Selection Criteria

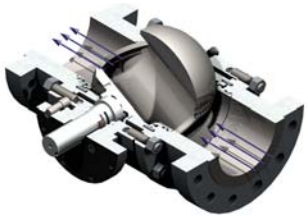
| | FPCV-T0 | QTCV-T1 | QTCV-T2 | QTCV-T4 | CVEZ | CVET |
|---|---|---|---|---|---|---|
| **Performance Specifications** | | | | | | |
| **Max. Noise Attenuation** | NA | 7 dBA | 17 dBA | 25 dBA | NA | 25 dBA |
| **Max. Turndown Ratio** | 100:1 | 200:1 | 300:1 | 200:1 | 30:1 | 30:1 |
| **Max. Shutoff Class** | VI | V | IV | IV | VI | VI |
| **Control Valve Accessories/Options** | | | | | | |
| **Low Temperature Trim** | • | • | • | • | • | • |
| **Surge Control Specs** | • | • | • | • | • | • |
| **Alternate Trim Materials** | • | • | • | • | • | • |
| **Below Ground Design** | • | • | • | • | | |
| **CVS Control Valve Silencer** | • | • | • | • | • | • |
| **CVD Control Valve Diffuser** | • | • | • | • | • | • |
| **Quick Change "Characterize-able" Trims** | | | | | • | • |
| **Removable Noise Trim** | | | | | • | • |
| **Compatible Actuators** | | | | | | |
| **RPDA Series** | • | • | • | • | | |
| **RPSR Series** | • | • | • | • | | |
| **SYDA Series** | • | • | • | • | | |
| **SYSR Series** | • | • | • | • | | |
| **LPDA Series** | | | | | • | • |
| **LPSR Series** | | | | | • | • |
| **LD Series** | | | | | • | • |

*CAUTION: This information is intended as a guideline for application of Becker Precision Equipment products. Becker strongly recommends consulting Becker Engineering prior to application of any product.

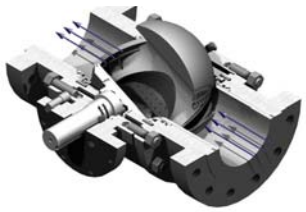
Additional Resources are available on our website. Sales literature, sizing software, and technical manuals are available for download at www.dresser.com/becker



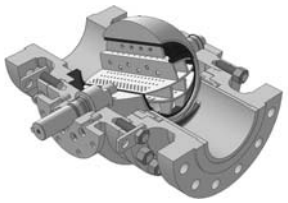
**FPCV-T0 Series Quiet Trim Control Valve:**
- High turndown capability up 100:1
- High pressure drop shutoff capability to Class VI



**QTCV-T1 Series Quiet Trim Control Valve:**
- Noise attenuation up to 7 dBA
- High turndown capability up to 200:1
- High pressure drop shutoff capability to Class V



**QTCV-T2 Series Quiet Trim Control Valve:**
- Noise attenuation up to 17 dBA
- High turndown capability up to 300:1
- High pressure drop shutoff capability to Class IV



**QTCV-T4 Series Quiet Trim Control Valve:**
- Noise attenuation up to 25 dBA
- High turndown capability up to 200:1
- High pressure drop shutoff capability to Class IV

**Becker Precision Equipment**
**Dresser, Inc.**
1550 Greenleaf Avenue
Elk Grove Village, Illinois 60007 USA
Ph: 847.437.5940 Fax: 847.437.2549
Toll Free Phone: 800.323.8844 Email: becker@dresser.com

**www.dresser.com**