



Products, Instrumentation and Accessories

Becker Rotary Control Valves: T-Ball & V-Max

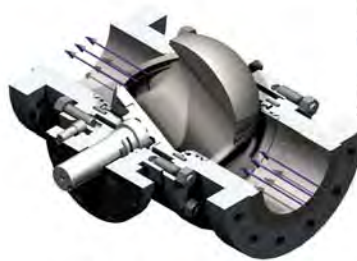


T-Ball Trim Levels



FPCV-T0 Series Full Port Control Valve

- High turndown capability up to 100:1
- High pressure drop shutoff capability to Class VI



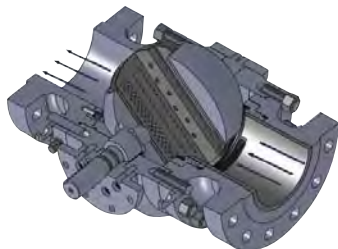
QTCV-T1 Series Quiet Trim Control Valve

- 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

Features (T0)

- Pig-able design
- Double block & bleed design
- Bi-directional sealing on seat (Piston Effect Principle)

Features (T0 & T1)

- Upstream and downstream seats
- Bi-directional flow capability

Features (T0, T1, T2 & T4)

- Self-cleaning design when installed as 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:

T0	2" (50 mm) - 42" (1050 mm) bore
T1, T2	4" (100 mm) - 36" (900 mm) bore
T4	4" (100 mm) - 20" (508 mm) bore
- ANSI Class 150-1500 for all trims

V-Max Control Ball Valve

- Ideal for low pressure applications
- 1" (25 mm) - 12" (300 mm) bore
- 150 & 300 ANSI
- Max turndown capability exceeding 300:1
- High pressure drop shutoff capability to Class VI
- Spring and Diaphragm actuator

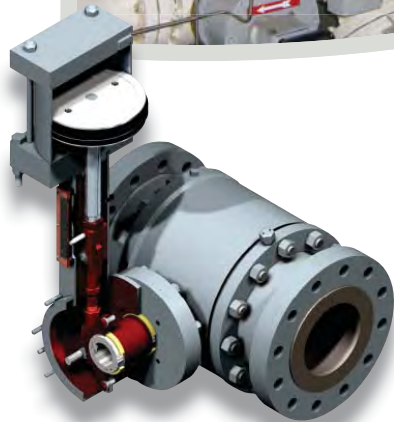


Becker Rotary Series High Pressure Actuators

RPDA Rotary Piston Double Acting Actuator



available with
**below
ground**
option



RPDA Features

- Bleed to Pressure System™ can eliminate bleed gas emissions
- Retrofits to almost any pipeline valve
- High pressure RPDA accepts natural gas up to 500 psig (3,447 kPa)
- Upright actuator design saves space and promotes longer actuator piston seal life
- Designed to be maintenance free
- All RPDA's come equipped with a precision linear scale that indicates valve position in ten degree increments
- Crank-arm design actuators specifically suited for control valve applications
- May be mounted in any orientation

RPSR Rotary Piston Spring Return Actuator



RPSR Features

- Bleed to Pressure System™ can eliminate bleed gas emissions
- Retrofits to almost any pipeline valve
- High pressure RPSR accepts natural gas up to 500 psig (3,447 kPa)
- Upright actuator design saves space and promotes longer actuator piston seal life
- Designed to be maintenance free
- All RPSR's come equipped with a high visibility scale that indicates valve position
- Crank-arm design actuators specifically suited for control valve applications
- May be mounted in any orientation

Becker Linear Series Low and High Pressure Actuators with Globe Valves

LD Linear Diagram



Features

- Utilized when available power gas pressure is less than 50 psig (344 kPa)
- High power output with low power gas supply
- Simple instrumentation design
- ZERO steady state bleed gas when utilizing Model HPP-SB Positioner or Model VRP-SB Pilot

LPDA Linear Piston Double Acting



Features

- Bleed to Pressure System™ can eliminate bleed gas emissions
- Retrofits to almost any pipeline valve
- Available with a weather seal design to protect piston rod
- High Pressure LPDA Actuator accepts natural gas up to 500 psig (3447 kPa)
- Upright actuator design saves space and promotes longer actuator piston seal life
- Maintenance free design
- All LPDAs come equipped with a precision linear scale that indicates valve position in ten degree increments

LPSR Linear Piston Spring Return



Features

- Bleed to Pressure System™ eliminates bleed gas emissions
- Retrofits to almost any pipeline valve
- High Pressure LPSR Actuator accepts natural gas up to 400 psig (2758 kPa)
- Maintenance free design
- All LPSRs come equipped with a high visibility scale that indicates valve position
- Specifically suited for heavy duty control valve applications.
- “Surge Design” available for high speed stroking up to 750 mSec
- Field reversible

Becker Globe Valve Characteristics

CV

1" - 8" lines

High capacity (larger holes)

Small to medium power plants

Top entry design facilitates maintenance and allows in-line valve service

Interchangeable internal components

Throttling while at maximum pressure drops

41005, 21000

1" - 16" lines

High noise attenuation (smaller holes)

Higher pressure drop capabilities

Reduce actuator size and thrust requirements

Improved stability with larger guide areas

Increase low noise and anti-cavitation trims



Becker VRP-Pilots Double Acting

Becker Model VRP-5C Classic Double-Acting Pilot

The VRP-5C provides pressure control when utilized with a double-acting piston actuated control valve. The VRP-5C measures process sensing pressure and positions the double-acting actuator to maintain the setpoint. The VRP-5C may be utilized for pressure control applications with setpoints ranging from 1.0 - 1300 psig (6.9 - 8964 kPa). The VRP-5C is typically utilized when Bleed to Pressure System (BPS™).

Becker Model VRP-CH Double-Acting Pilot

The VRP-CH Double-Acting Pilot provides pressure control when utilized with a double-acting piston actuated control valve. The VRP-CH measures process sensing pressure and positions the double-acting actuator to maintain the setpoint. The VRP-CH may be utilized for pressure control applications with setpoints ranging from 1.0 - 1300 psig (6.9 - 8964 kPa). The VRP-CH is typically utilized when Bleed to Pressure System (BPS™) may be used to completely eliminate atmospheric bleed emissions. Higher sensitivity provides more accurate control than the VRP-5C.

Becker Model VRP-B-CH Valve Regulator Pilot

The VRP-B-CH provides pressure control when combined with double acting piston actuated control valves. The VRP-B-CH measures the sensing pressure and positions the control valve to maintain pressure setpoint. The VRP-B-CH may be utilized for pressure setpoints ranging from 3.0 - 1300 psig (20.7 - 8964 kPa). The VRP-B-CH features low bleed characteristics and is typically utilized when bleed gas must be directed to atmosphere and used for large downstream systems.



- Bleed to Downstream only
- Any System



- Bleed to Downstream or Atmosphere
- Any System



- Bleed to Atmosphere
- Large System

VRP Double Acting Valve Regulator Pilots Provide Low-Bleed/ZERO-Bleed Pressure Control When Combined with Double-Acting Pneumatic Control Valve Actuators

Becker VRP-Pilots Single-Acting

Becker Model VRP-SB-GAP Single-Acting Gap Controller

The VRP-SB-GAP provides gap control (on-off) when utilized with pneumatically actuated valves. The VRP-SB-GAP measures the process sensing pressure and closes the actuated valve upon pressure rising to the high pressure setpoint. Conversely, VRP-SB-GAP will re-open the actuated valve upon pressure falling to the low pressure setpoint. The action of the VRP-SB-GAP may be reversed to open an actuated valve upon rising pressure while closing on falling pressure. The VRP-SB-GAP may be utilized for gap control applications with setpoints ranging from 100 - 1300 psig (6.89 - 8964 kPa). The VRP-SB-GAP features ZERO steady state bleed, simple adjustment, and may incorporate Becker's unique Bleed to Pressure System (BPS™) capability to eliminate atmospheric emissions. The VRP-SB-GAP is compatible with all Becker control valves as well as most other manufacturers' pneumatic actuators. The VRP-SB-GAP may replace other manufacturers' gap controllers to simplify operations and improve reliability.



- Overpressure Protection
- Any System
- ZERO Steady State Bleed

Becker Model VRP-SB-PID Pilot

The VRP-SB-PID is a three mode, proportional-integral-derivative, controller providing pressure control when utilized with a single-acting actuated control valve or in tandem with a pneumatic positioner. The VRP-SB-PID measures process sensing pressure adjusting the signal to the positioner or actuator to maintain the pressure setpoint. The VRP-SB-PID is ideal for short pressure control applications such as power plant regulation and double-stage pressure cuts with setpoints ranging from 35-1300 psig (241- 8964 kPa). An output feedback module is added to the VRP-SB-CH design allowing the controller to respond in quickly and avoid cycling of the pressure system. The VRP-SB-PID features ZERO steady state bleed.



- Bleed to Atmosphere
- Any System
- ZERO Steady State Bleed

Becker Model VRP-SB-CH Single-Acting Pilot

The VRP-SB-CH provides pressure control when utilized with a single-acting actuated control valve. The VRP-SB-CH measures process sensing pressure and positions the single-acting actuator to maintain the pressure setpoint. The VRP-SB-CH may be utilized for pressure control applications with setpoints ranging from 1.0 - 1300 psig (6.9 - 8964 kPa). The VRP-SB-CH features zero steady state bleed and may incorporate Becker's unique Bleed to Pressure System (BPS™) capability to completely eliminate atmospheric emissions.



- Bleed to Downstream or Atmosphere
- Large System
- ZERO Steady State Bleed

VRP Single Acting Pilots provide ZERO steady state bleed pressure control when used with single-acting actuators

Becker HPP Pneumatic Positioners

Becker Model HPP-4 Series Pneumatic Valve Positioner

The HPP-4 provides accurate valve positioning when utilized with a double-acting piston actuated control valve. The HPP-4 accepts a pneumatic instrument signal and positions the double-acting actuator proportionally. The HPP-4 may be utilized for most valve positioning applications. HPP-4s are available in both reverse-acting and direct-acting configurations with a variety of different input signal ranges. The HPP-4 is typically utilized when Bleed to Pressure System (BPS™) may be used to completely eliminate atmospheric bleed emissions. Additionally, the HPP-4 is typically utilized for high speed applications and large volume control actuators, requiring VB-250 volume boosters.



- Large Valves 20" +
- Bleed to Downstream and/or Bleed to Atmosphere

Becker Model HPP-5 Double-Acting Positioner

The HPP-5 provides accurate valve positioning when utilized with a double-acting piston actuated control valve. The HPP-5 accepts a pneumatic instrument signal and positions the double-acting actuator proportionally. The HPP-5 may be utilized for most valve positioning applications. HPP-5s are available in both reverse-acting and direct-acting configurations with a variety of different input signal ranges. Due to its low-bleed characteristics, the HPP-5 is typically utilized when bleed gas must be discharged to atmosphere.



- Small Valves 2" - 16"
- Bleed to Downstream or to Atmosphere

Becker Model HPP-SB Single-Acting Positioner

The HPP-SB provides accurate valve positioning when utilized with a single-acting (spring and piston style) actuated control valves. The HPP-SB accepts a pneumatic instrument signal and positions the single-acting actuator proportionally. The HPP-SB may be utilized for most valve positioning applications. HPP-SB's are available in both reverse-acting and direct-acting configurations with a variety of different input signal ranges. The HPP-SB features a ZERO steady state bleed that minimizes emissions when the positioner must bleed to atmosphere.



- Low and/or High Speed Applications
- Bleed to Downstream or Atmosphere
- ZERO Steady State Bleed

HPP pneumatic positioners provide accurate positioning of control valves with reduced bleed emissions

Becker DNGP Digital Natural Gas Positioner

Becker Digital Natural Gas Positioner

The Digital Natural Gas Positioner is used with pneumatically actuated natural gas control valves to provide an accurate valve stem position that is proportional to the electronic command input signal received from an electronic controller. The DNGP is compatible with all Becker actuators and may be retrofitted to other manufacturers' control valve packages. The DNGP eliminates the need for an I/P transducer and features ZERO bleed consumption at steady state. Additionally, the DNGP features easy, menu driven setup along with PC interfaced diagnostic and setup features. The DNGP also features high volume and high pressure capabilities that enables use on large volume pneumatic actuators. Most importantly, the DNGP offers multiple fail safe modes to protect your gas pipeline.



- Any size valve
- Any system except surge control
- ZERO steady state bleed

DNGP Applications

- Pressure control
- Flow control
- Power plant type pressure control
- Power plant type flow control

Compatible Actuators

- RPDA Series
- RPSR Series
- SYDA Series
- SYSR Series
- LPDA Series
- LPSR Series
- LD Series
- V-Max Series
- Other manufacturers' actuators (contact Becker for assistance)

Installation Guidelines

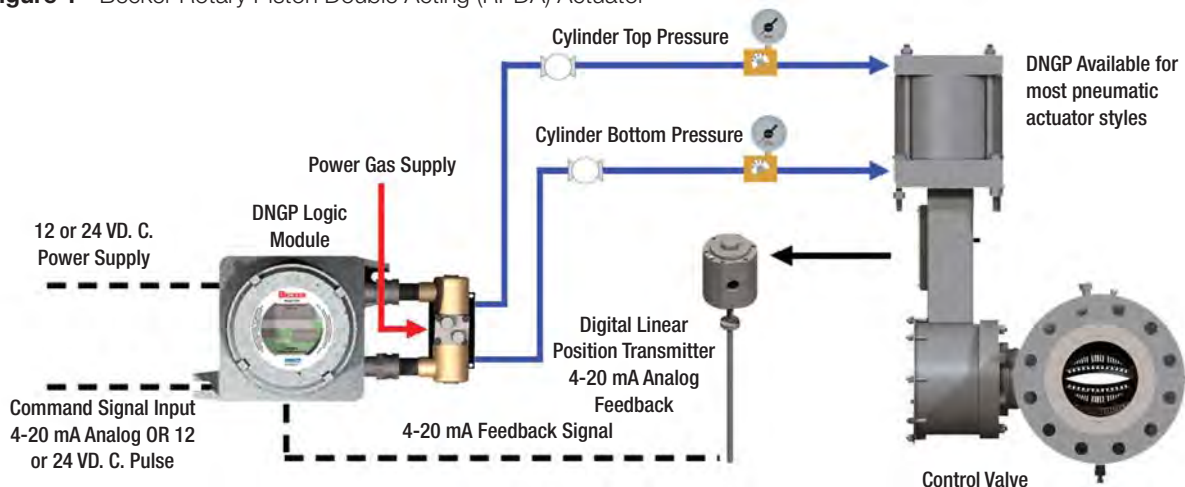
Solenoid Valve Installation

The solenoid valve is the only portion of the DNGP that contains gas pressure. As a result, the solenoid valve must be installed on or near the control valve actuator.

Logic Board Installation

Since the DNGP logic board only incorporates electrical connectivity, it may be remote mounted inside the RTU cabinet with only the wiring going to the solenoid valve. For actuator or hazardous location installations, the logic board is mounted inside an explosion proof box with the factory installed solenoid valve.

Figure 1 - Becker Rotary Piston Double Acting (RPDA) Actuator



DNGP Digital Natural Gas Positioner features ZERO Bleed Technology and Control Logic designed for Natural Gas Control Valves

Below Ground Control Valves Reduce Noise, Minimize Heat Loss & Make Stations Economical



Figure 2 - Installation of Becker Below Ground Ball Valve Regulator.

Installation of 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.

There has been growing concern within the natural gas industry regarding the effect natural gas regulating stations have on their surrounding environments. In an effort to cut down on excessive noise and pollution, many gas distribution and transmission companies have begun utilizing equipment, which reduces the impact on the surrounding environment. The Below Ground ball valve regulator is a prime example of this environment friendly equipment. Because of its high capacity, control capabilities, rangeability, and dependability,

“...the Below Ground ball valve regulator has become the preferred method for controlling gas flow through natural gas regulating stations...”

Mike Hagar, Chief Engineer
Major Midwestern Gas Utility

It remains the optimum choice for high volume regulation throughout the gas industry. Its long term reliability warrants further consideration for the direct burial of the ball valve regulator as a method of, not only maintaining superior flow characteristics, but also of greatly reducing any noise created in the station facilities.

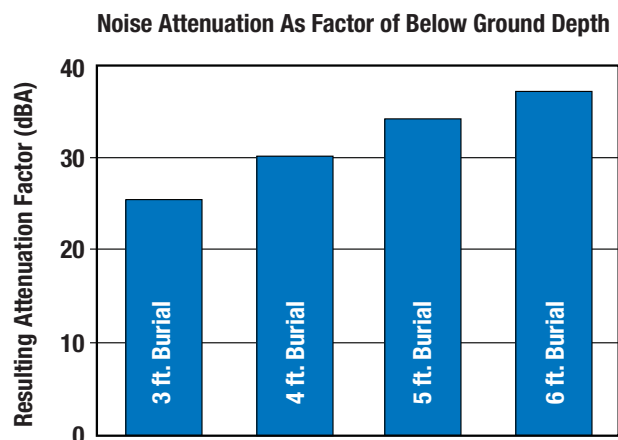


Figure 3 - Noise Attenuation as a Factor of Below Ground Depth.

Typical below ground depths range from 3 feet burial to 6 feet burial 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 noise attenuation for these buried depths.

Application #2

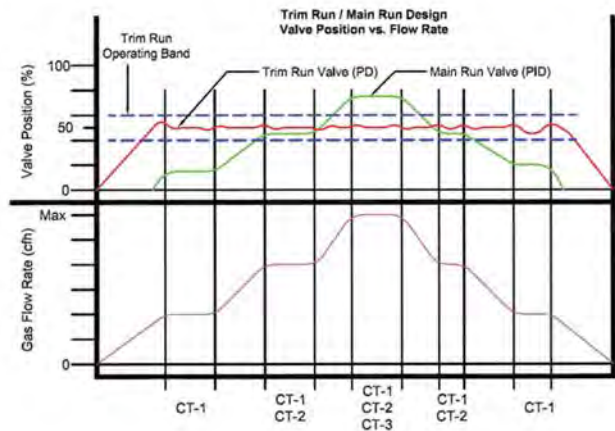
Combustion Turbine Power Plants Regulator/Trim Run Solution



This application provides the challenge of essentially requiring infinite turndown (to meet the small gas flow rate demands of ancillary equipment), allowing for smooth start-up of the combustion turbine, and providing enough capacity for multiple turbines at 100% loads. Additionally, the control valve system must have exceptional speed of response because of the proximity to the combustion turbines. This speed of response cannot come at the expense of maintaining stable steady-state control. This is especially critical to the commissioning of new CT power plants as fluctuating inlet pressure to the CTs will not allow the units to pass emission requirements and could cause a unit or multiple units to trip off line.

Figure 4

The Main Run provides all the gross gas load requirements at set-point pressure, and the quicker Trim Run maintains the fine control no matter how many CTs come on line. The Trim Run will operate between 40-60% open under normal operation with 50% as its target position for the station set-point. This identical process will take place in the opposite direction if there is a large decrease in gas flow rate demand. It is this ability to satisfy both large and small gas load requirements at the same time and maintain control that makes this design the right choice for CT power plants. By having both runs in control and having the Trim Run as the “leading” function, the station will have a fast speed of response coupled with tight control capability and a stable delivery pressure, under all operational conditions.



Surge Control Valves - Increased Protection for Centrifugal Compressors

Surge Control Valve is the Complete Solution

The surge control valve is the most important valve in the centrifugal compressor system. The surge control valve must provide accurate control, wide flow rangeability, and fast action. Most importantly, the valve must be rugged and reliable. Since the surge control valve is so essential to the protection of the centrifugal compressor, Becker strives to engineer and manufacture the highest quality surge control valves.

The Becker Surge Control Valve Features

- High flow capacity with minimum pressure differential
- Low flow controllability
- Wide flow rangeability
- Quick stroking times of 750mSec or less
- Heavy duty pneumatic cylinder
- All-welded spring cartridge
- Unique, no-bleed, high pressure positioners
- Ball control valve available with quiet trim
- Up to Class VI shutoff

New positioner reduces cost.

This Becker single-acting positioner eliminates gas emissions in full open, full closed, as well as steady state positions, in addition to ZERO bleed, complete system reliability and quicker stroke times.



Becker Accessories

MCV



The MCV Series Manual Control Valve provides manual operation of pneumatic valve actuators. The MCV is the ideal device for maintenance and manual operation of control valves. The MCV allows the user to override the primary control instrumentation and position the control valve actuator. The unique safety button feature of the MCV prevents unintentional operation. An optional locking feature is available for additional security.

Max. Allowable Operation Pressure

Model MCV-3: Up to 150 psig (1034 kPa)

Model MCV-3M: 150 - 250 psig (1034 - 1724 kPa)

Model MCV-3H: 250 - 500 psig (1723 kPa - 3447 kPa)

All Ports: 1/4" FNPT

Weight: 10 lbs (4.5 Kg)



Gear Operator Override

The manual handwheel is utilized for manual operation of small and medium sized control valves when pneumatic power is not available. The handwheel utilizes a system of gear multipliers to develop necessary torque to open and close the control valve.

No-Bleed Valve NBV Series



The No-Bleed Valve NBV Series eliminates bleed gas from Becker double-acting control instrumentation when corresponding control valve is at full-open and full-closed positions. This is ideal for monitor regulators and standby regulators that typically remain in the full-open or full-closed positions for extended periods of time. The NBV features bleed shutoff at both ends of valve travel without adjustment. The NBV is the primary choice for Non-Bleed technology on Becker double-acting control instrumentation. The NBV is compatible with all Becker double acting Valve Regulator Pilots (VRPs) and double acting High Pressure Positioners (HPPs).



PS-2 Series Non-Bleed Sensor

The PS-2 Series Non-Bleed Sensor eliminates bleed gas from Becker seat and nozzle type double-acting control instrumentation when corresponding control valve is at full-open or full-closed positions. This is ideal for monitor regulators and standby regulators that typically remain in the full-open or full-closed positions for extended periods of time. The PS-2 features bleed shutoff at one end of valve travel. If bleed shutoff is required at both ends of valve travel, two PS-2 Non-Bleed Sensors are required. The PS-2 is typically utilized for high pressure power supply gas greater than 150 psig (1034 kPa) or when Bleed to Pressure System (BPS™) discharge pressures exceed 60 psig. The PS-2 is compatible with the following Valve Regulator Pilots (VRPs) and High Pressure Positioners: Models VRP, VRP-CH, HPP-4.



PIC & GSP Series Pressure Instrumentation Columns

The Becker PIC and GSP Series Pressure Instrumentation Columns provide (413 kPa) regulated and conditioned supply pressures for control valves and instrumentation utilized in natural gas pipeline applications. PICs are available with a variety of options and configurations, such as catalytic (flameless) heaters, filter-dryers, instrumentation mounting brackets. The Becker PIC is the original column designed for use in natural gas distribution and transmission pipelines.

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