PIC Pressure Instrumentation Column

The Becker PIC Provides Clean, Dry, Regulated Supply Gas for Natural Gas Control Valves and Instrumentation

Description

The Becker PIC Series Pressure Instrumentation Column provides regulated and conditioned supply pressures for control valves and instrumentation utilized in natural gas pipeline applications. The PIC regulates and reduces full pressure from natural gas transmission and distribution pipelines to the various pressure levels required to operate control valves and related instrumentation. The PIC features a fully-welded assembly that is pressure rated to 600 ANSI (standard) and 900 ANSI (optional) pressure. Each PIC is hydrostatically tested to one and a half times the full ANSI pressure rating. PICs are available with a variety of options and configurations such as catalytic (flameless) heaters, filter-dryers and instrumentation mounting brackets, and a variety of other optional components.

Figure 1 - Becker PIC Series Standard Design

The Becker PIC provides conditioned power supply gas for control valves and instrumentation typically utilized in natural gas distribution and transmission facilities. The PIC provides a single assembly via a single purchase order that minimizes complexity and field work. The PIC is shown with standard configuration and includes a catalytic (flameless) heater.

Features

- The original Pressure Instrumentation Column
- Fully welded design eliminates threaded body for safety and durability
- Rated to full ANSI pressures (600 ANSI and 900 ANSI)
- PICs are hydrostatically tested to one and a half times ANSI pressure rating for four hours
- Single appliance provides complete supply gas system
- Fully tested and engineered packaging minimizes field work
- Standard square flange base mounts and bolts easily to concrete pad or floor
- Non-threaded design
- Fully welded construction, X-Ray to API-1104 available
- Several options and configurations available to meet application needs

Why use PIC?

- Complete supply gas conditions for control valves and instrumentation
- No pipeline heater in cold climate
- High pressure drop from pipeline pressure to supply gas pressure.
- Excessive moisture
- Excessive entrained liquid hydrocarbons (i.e. compressor oil)

Figure 2 - PIC Installed Inside a Natural Gas Regulation Facility

The Becker PIC is used to feed heated, filtered, and regulated supply gas to the working control valve and the monitor valve. The PIC includes the Becker FD-1500 Filter-Dryer to remove water vapor and liquid hydrocarbons from the supply gas. The FACD-1500 Filter-Deodorizer is an additional option. Line pressure gas is fed into the FACD-1500 and then to the FD-1500 before regulation. This system guarantees proper instrument supply gas to the control systems of both valves to provide longer service.

The Becker PIC Pressure Instrumentation Column is a High Performance, High Quality Power Supply Gas System Packaged in a Single System with Guaranteed Performance

Low Pressure Regulator
The Low Pressure Regulator regulates medium pressure to low pressure of approximately 20 - 60 psig (138 - 414 kPa). The Low Pressure Regulator incorporates an integral filter and pressure relief system.

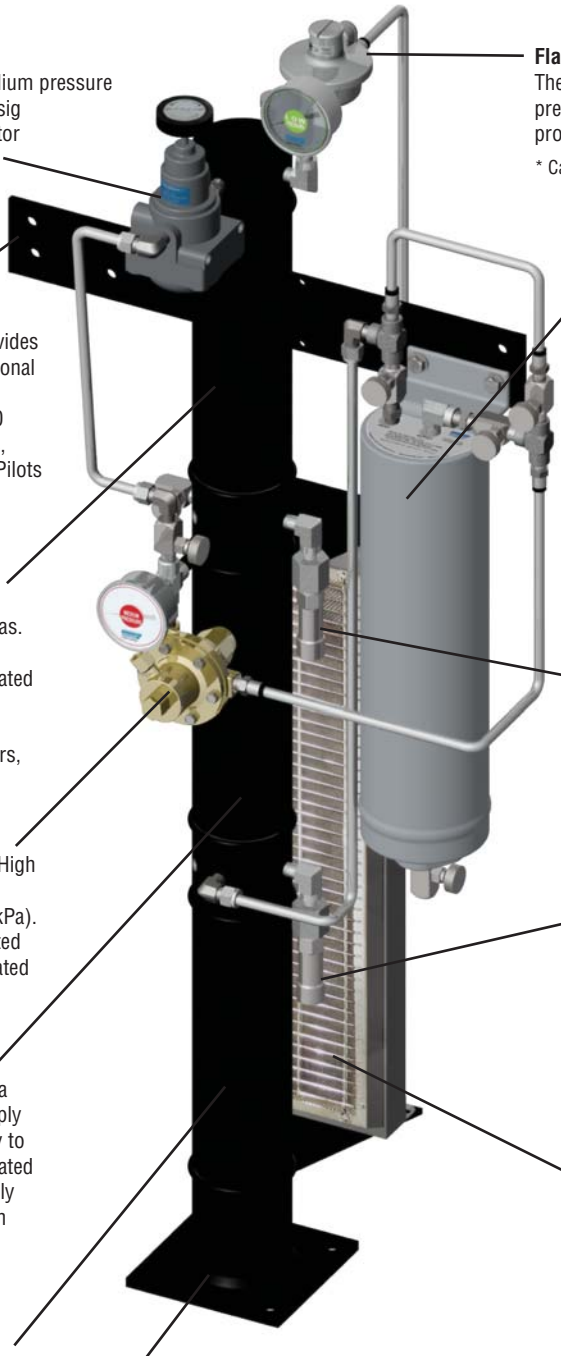
Instrumentation Mounting Bracket
The Instrumentation Mounting Bracket provides a convenient location for installation of optional instrumentation or accessories on the PIC. Commonly mounted items include FD-1500 Filter-Dryers, FACD-1500 Filter-Deodorizers, I/P Transducers, and VRP Valve Regulator Pilots (Pressure Control).

Low Pressure Reservoir
The Low Pressure Reservoir serves as a holding chamber for low pressure supply gas. The chamber enhances the PICs ability to maintain a capacity of heated, filtered regulated gas. Low pressure supply gas is typically utilized for control instrumentation, control instrumentation accessories, I/P Transducers, and low pressure actuators (LD Series).

Medium Pressure Regulator
The Medium Pressure Regulator regulates High Pressure (Pipeline) to Medium Pressure of approximately 100 - 350 psig (689 -2,413 kPa). The Medium Pressure Regulator incorporated is capable of accepting in excess of ANSI rated pressure.

Medium Pressure Reservoir
The Medium Pressure Reservoir serves as a holding chamber for medium pressure supply gas. The chamber enhances the PICs ability to maintain a capacity of heated, filtered regulated gas. Medium pressure supply gas is typically utilized for control instrumentation and high pressure actuators.

High Pressure Reservoir
The High Pressure Reservoir serves as a holding chamber for high pressure supply gas taken directly from the natural gas pipeline. PICs are available to accept pipeline pressure rated to 600 ANSI (standard) and 900 ANSI (optional). The chamber enhances the PICs ability to maintain a capacity of heated, filtered regulated gas.



PIC Mounting Flange
The PIC is available with three different mounting flanges. The most common mounting flange is the Square Base Surface Mount flange. The square base flange allows for easy mounting to solid surfaces such as concrete via a four bolt arrangement. See Page 3 for further information regarding alternate mounting configurations.

Flameless Heater Supply Gas Regulator
The Flameless Heater Supply Gas Regulator regulates pressure to 7.0 inches water column in order to provide fuel gas for the catalytic (flameless) heater.

* Catalytic (flameless) heater is an optional accessory.

Model FD-1500 Filter Dryer
The optional Becker Model FD-1500 Filter-Dryer is available for added security. The FD-1500 provides superior filtration capabilities to 10µ and dehydration capabilities of 3.0 lbs. (1.36 kg) of entrained water. Note that a Model FACD-1500 is also available to remove entrained hydrocarbons (compressor oil) from instrument supply gas.

Low Pressure Relief Valve
The Low Pressure Relief Valve provides overpressure protection to minimize potential for damage to components supplied at low pressure. The Low Pressure Relief Valve is typically set at 20-60 psig (138-414 kPa) above customer specified Low Pressure Regulator setpoint.

Medium Pressure Relief Valve
The Medium Pressure Relief Valve provides overpressure protection to minimize potential for damage to components supplied at medium pressure. The Medium Pressure Relief Valve is typically set at 100-350 psig (689-2,413 kPa) above customer specified Medium Pressure Regulator setpoint.

Catalytic (Flameless) Heater
The Catalytic (Flameless) Heater provides radiative heat source to minimize Joules-Thompson refrigeration effect inherent to pressure reduction of a gas. Catalytic (Flameless) Heaters provide a self-sustaining heat source (6,000 BTU) via flameless combustion of natural gas at +700°F (+371°C). The Catalytic (Flameless) Heater requires electrical activation at startup and provides self-sustaining source of heat. The Catalytic (Flameless) Heater is rated for use in hazardous areas where natural gas is constantly present.

PIC Pressure Instrumentation Column Overall Dimensions

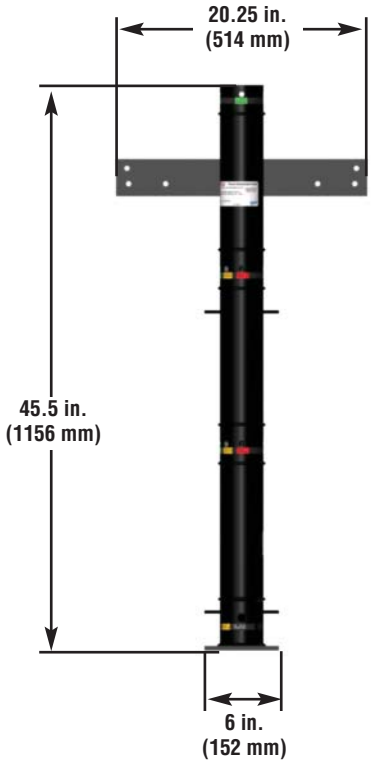


Figure 3.1 - PIC Front View

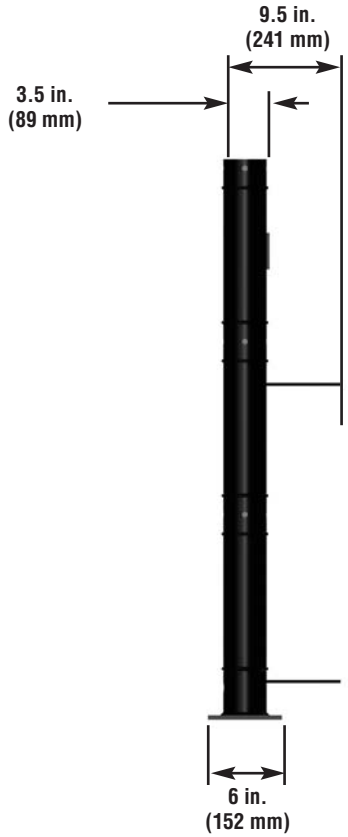


Figure 3.2 - PIC Side View

Notes
*PIC Shown with Catalytic (Flameless) Heater Mounting Brackets
*PIC Shown with Instrumentation Mounting Bracket

PIC Pressure Instrumentation Column Mounting Configurations

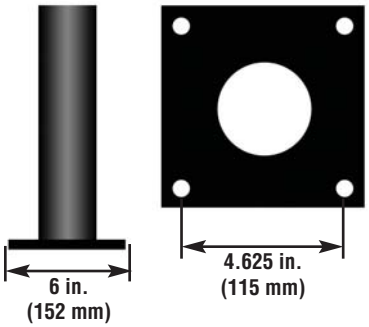


Figure 4.1 - PIC Square Base Mount (Standard)

The Square Base Mount is the standard PIC mounting arrangement. The PIC is mounted to a solid surface, such as concrete, through four bolts. The Square Base Mount allows surface mount of PIC on solid surface (concrete) via four (4) bolts. This is the standard PIC mounting arrangement. The high pressure connection from pipeline is a 1/2" FNPT port at bottom of the PIC. Square Base Mount is available in 600 ANSI (standard) and 900 ANSI (optional) pressure ratings. Mounting dimensions for 600 ANSI and 900 ANSI Square Base Mount are identical.

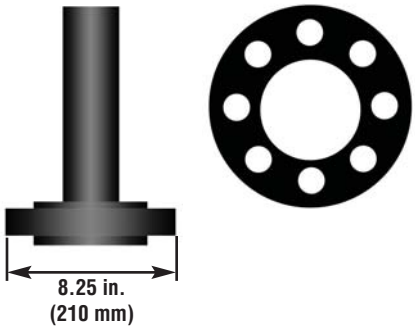


Figure 4.2 - PIC 600 ANSI Weld Neck Flange Mount (Optional)

The Weld Neck Flange incorporates a high capacity 3.0 in. (75 mm) Weld Neck Flange connection. The Weld Neck Flange option provides flange-to-flange connection and allows finite rotational position of the PIC in 45° increments. PIC Weld Neck Flange Mount is available in 600 ANSI (standard) and 900 ANSI (optional) pressure ratings. 600 ANSI Weld Neck Flange is shown above.

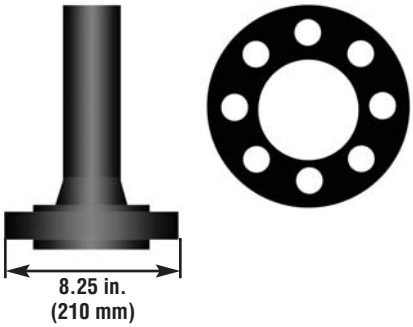


Figure 4.3 - PIC 600 ANSI Lap Joint Flange Mount (Optional)

The Lap Joint Flange incorporates a high capacity 3.0 in. (75 mm) Lap Joint Flange connection. The Lap Joint Flange option provides flange-to-flange connection and allows infinite rotational position. PIC Lap Joint Flange Mount is available in 600 ANSI (standard) and 900 ANSI (optional) pressure ratings. 600 ANSI Lap Joint Flange is shown above.

Figure 5 - PIC Port Identification Square Base Mount (standard)
*Top view cross sections are shown for each block to facilitate explanation of PIC port configuration.

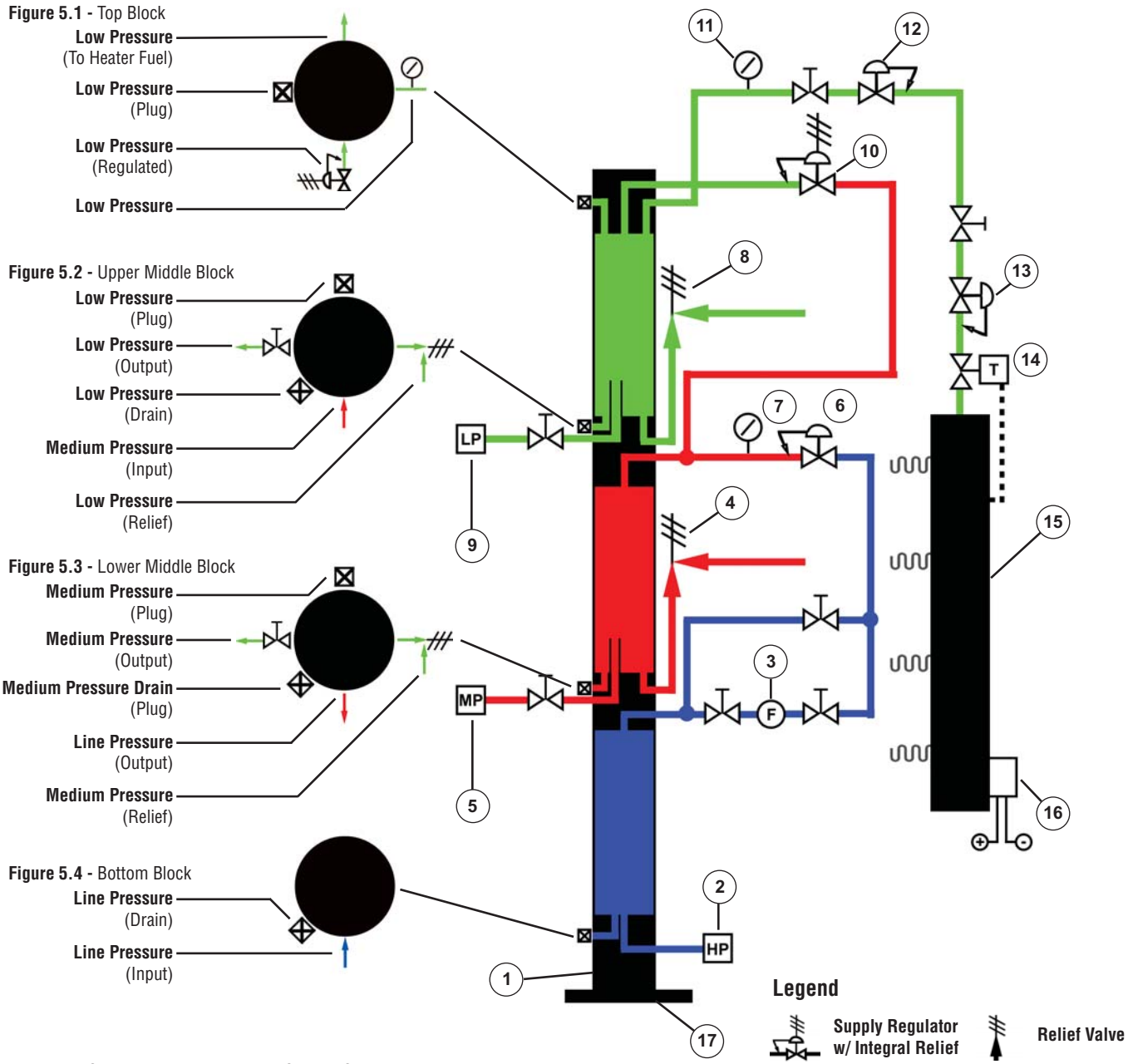
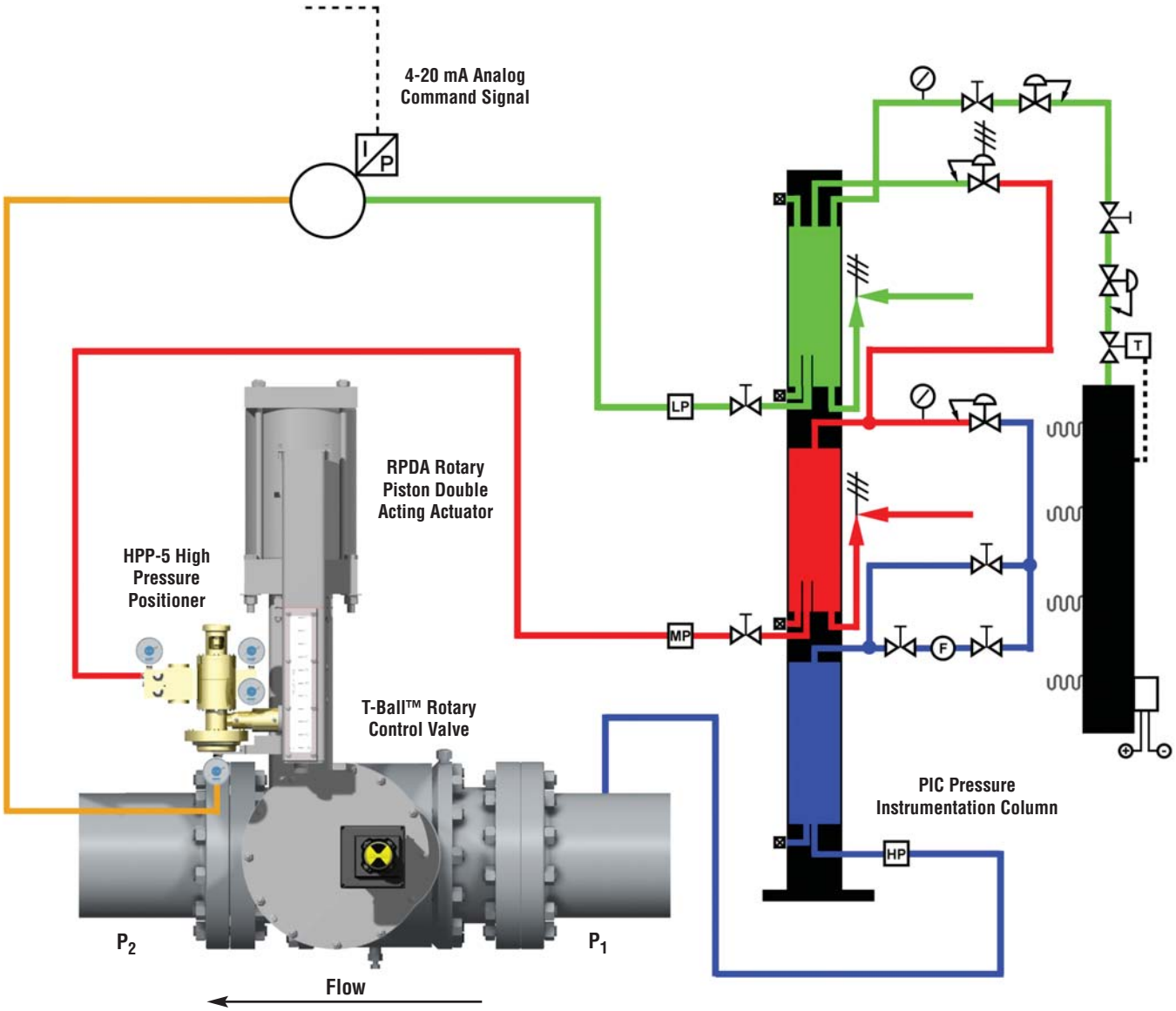


Table 1 - PIC Pressure Instrumentation Column Components

Item	Description	Item	Description
1	Pressure Instrument Column (Body)	10	Low Pressure Supply Regulator w/Integral Relief
2	High Pressure Connection (In)		
3	FD-1500 Filter Dryer (Optional)	11	Low Pressure Supply Gage
4	Medium Pressure Relief Valve	12	Heater (1st Stage) Supply Regulator
5	Medium Pressure Connection (Out)	13	Heater (2nd Stage) Supply Regulator
6	Medium Pressure Supply Regulator	14	Heater Fuel Supply Thermocouple
7	Medium Pressure Supply Gage	15	Catalytic (Flameless) Heater
8	Low Pressure Relief Valve	16	Starting Voltage Connection (In)
9	Low Pressure Connection (Out)	17	Mounting Flange

Figure 6 - Typical Installation Schematic for PIC Pressure Instrumentation Column

The PIC is shown in a typical installation with a Becker Control Valve and relevant instrumentation components. The PIC provides all necessary pressure levels of instrument supply gas necessary to operate all components.



Schematic Legend

- Low Pressure Power Gas
- Medium Pressure Power Gas
- Line Pressure
- Signal Pressure

Legend

- Supply Regulator w/ Integral Relief
- Gage
- Needle Valve
- Plug
- Thermo Couple
- Relief Valve
- Supply Regulator
- Customer Connection
- Filter-Dryer

Figure 7 - Dual PICs Installed in Becker CAB Series Fiberglass Enclosure

Two Becker PIC are installed inside a Becker CAB Fiberglass Cabinet. Each PIC provides conditioned and regulated supply gas to a Becker control valve, one PIC for the working control valve and one PIC for the monitor control valve. Each PIC also includes the Becker FD-1500 Filter-Dryer to remove moisture from the supply gas. The fiberglass enclosure is required to prevent the catalytic heaters from extinguishing during inclement weather. Each catalytic face heater is hard wired with 120 V A.C. starting voltage and each disconnect is also located inside the fiberglass enclosure.

Figure 8 - Single PIC Installed in Becker CAB Series Fiberglass Enclosure

A Becker PIC is installed inside a Becker CAB Fiberglass Cabinet. The PIC provides conditioned and regulated supply gas to four tube switching valves. The outputs to the tube switching valves are located in the upper left corner of the cabinet. The PIC includes dual FD-1500 Filter-Dryers complete with independent regulation systems to meet higher capacity requirements. Each FD-1500 and regulator set feeds a pair of the tube switching valves. The PIC system also includes the option of stainless steel components to comply with no brass application specifications. The catalytic face heater is hard wired with 120 V A.C. starting voltage complete with the disconnect located inside the fiberglass enclosure.

PIC Pressure Instrumentation Column Accessories

Realize Optimum Performance of your PIC Pressure Instrumentation Column with these popular accessories!

Becker Model FD-1500 Filter-Dryer

The Becker Model FD-1500 Filter-Dryer filters and dehydrates supply gas for all Becker Control Instrumentation. The FD-1500 Filter-Dryer provides superior filtration and dehydration with 110 inch^2 of 10 µ filtering media and 2.0 lbs. of silica gel. The FD-1500 incorporates an easy-to-replace "spin on" cartridge made up of a high quality, high capacity nylon and fiberglass filter element reinforced with stainless steel mesh. All FD-1500's are fully hydrotested to one and a half times the working pressure to ensure the integrity of the pressure vessel.

Becker Model FACD-1500 Filter-Deordorizer

The Becker Model FACD-1500 Filter-Deodorizer filters and removes hydrocarbons odor from supply gas for all Becker Control Instrumentation. The FACD-1500 Filter-Deodorizerer provides superior filtration with 110 inch^2 of 10 µ filtering media and 2.0 lbs. of activated charcoal. The FACD-1500 incorporates an easy-to-replace-spin-on-cartridge made up of a high quality, high capacity nylon and fiberglass filter element reinforced with stainless steel mesh. All FACD-1500s are fully hydrotested to one and a half times the working pressure to ensure the integrity of the pressure vessel.

Becker Fiberglass Cabinet (CAB)

The Becker Fiberglass Cabinet is ideal for the safe enclosure of Becker Below Ground Regulators, PICs, and other regulating station equipment. The cabinet is particularly useful in areas of extreme weather or fluctuating elemental conditions. When regulating components must be heated, the cabinet minimizes ambient heat loss. The flip top cover protects operating personnel during routine maintenance.

Becker Thermal Check Valve (TCV)

The Becker Thermal Check Valve (TCV) is designed for use with regulated natural gas supply systems. The Thermal Check Valve offers simple and inexpensive insurance against fire in natural gas regulating stations, compressor stations, or other areas where regulated natural gas supply systems are present. The TCV stops the flow of combustible natural gas into potentially hazardous areas in the event of fire or excessive heat.

Catalytic (Flameless) Heater

For PIC applications where freezing may be problematic, the Catalytic (Flameless) Heater is an ideal accessory. The Catalytic (Flameless) Heater provides continuous, flameless heat to PIC and related instrumentation without external power sources, after heater startup. The catalytic technology operates at a temperatures of 600F°- 800°F, ensuring a safe, reliable source of heat. Catalytic (Flameless) Heater startup voltages are available in both ±12 V D.C. and 120 V A.C. and are available with both CGA and FM approval ratings. Unit includes all necessary regulation and components for easy operation.

Other Available Options

The Becker PIC Pressure Instrumentation Column is available with a variety of options and accessories to suit your applications needs. For more information on these options and accessories, contact Becker.

- High Pressure Design (900 ANSI)
- High Volume Capacity Design
- Multiple Mounting Arrangements
  - PIC Square Base Mount (standard)
  - PIC Weld Neck Flange Mount (optional)
  - PIC Lap Joint Flange Mount (optional)
- Stainless Steel Component Construction
- Radiographic (X-Ray) Testing of Pressure Vessel
- Square Base Extension Pedestal (Elevate PIC)
- Custom Instrumentation Mounting Brackets
- Catalytic (Flameless) Heater Shroud
- Custom Paint/Coating

Specifications	
Item	PIC Series Pressure Instrumentation Column
Classification	Supply Gas System
MAOP	600 ANSI 1480 psig (10,204 kPa) 900 ANSI 2175 psig (14,996 kPa)
Flow Capacity	50 SCFM (1.4 std. m^3 / min) - Standard PIC Design
Inlet (Line Pressure) Port	1/4" FNPT (Standard Square Base Flange Mount) 3" Port (Lap Joint Flange Mount) 3" Port (Weld Neck Flange Mount)
All Other Ports:	1/4" FNPT
Weight:	20 lbs. (9.0 kg) Standard Square Base, Flange Mount PIC - 600 ANSI
Supply Gas Regulator Typical Pressure Ranges	Medium Pressure Regulator: 100-350 psig (689-2,413 kPa) Low Pressure Regulator: 20-60 psig (138-414 kPa)
Heater Supply Regulator (Optional)	7.0 in water column
Temperature Range:	-20°F to +160°F (-29°C to +71°C)
Materials of Construction	
PIC Body	Carbon steel
Isolation Valves	Plated steel needle valves (standard)
Gauges	2.5 in. diameter liquid-filled gauges (standard)
Fittings	Plated steel (standard)
Tubing Fittings	Dual ferrule 316 SS
Tubing	316 SS seamless
Relief Valves	Plated steel
Med. Pressure Regulator	Painted Cast Aluminum (standard)
Low Pressure Regulator	Brass (standard)
Catalytic Heater Fuel Supply Regulator	Cast aluminum (standard)
Available Mounting Arrangements	600 ANSI Square Base Flange Mount (standard) 900 ANSI Square Base Flange Mount (alternate) 600 ANSI Weld Neck Flange Mount (alternate) 900 ANSI Weld Neck Flange Mount (alternate) 600 ANSI Lap Joint Flange Mount (alternate) 900 ANSI Lap Joint Flange Mount (alternate)
Hydrostatic Testing	600 ANSI Design - 2220 psig (15,306 kPa) for duration of 4.0 hours 900 ANSI Design - 3263 psig (22,494 kPa) for duration of 4.0 hours
Catalytic Heater	
Heater Type	Self-sustaining catalytic (no outside power source required after initial ignition)
Fuel Type	Natural Gas
Fuel Supply Pressure	7.0 in water column
Heat Output	6,000 BTU
Available Ignition Voltages	12 V D.C. or 120 V A.C.
Electrical Classification Options	FM Approved - Class 1-Division 2-Group D locations by CGA Approved - Class 1-Division 1- Division 2-Group D locations
Safety Shutoff	All catalytic heaters are equipped with thermocouple safety shutoff valves

Figure 9 - PIC Installed Inside Pressure Limiting Station Building

A Becker PIC is located inside a pressure limiting station building to provide complete supply gas conditioning to an adjacent Becker monitor control valve. This PIC includes the optional Becker FD-1500 Filter-Dryer and with the option of a Becker FACD-1500 Filter-Deodorizer connected in series to remove any water vapor and liquid hydrocarbons from the supply gas before entering the regulation stages. The catalytic face heater requires 12 V D.C. or 120 V A.C. starting voltage. Note the extension cord receptacle located at the rear of heater. This complete PIC system eliminates common problems associated with instrument supply gas such as freezing, liquids, and particulate.

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