I/P Transducer

I/P Transducer:
The I/P Transducer provides communication between the flow computer and the control valve. The I/P transducer converts the analog electrical signal (4-20 mA typical) to a pneumatic input signal (3-15 psig or 6-30 psig). I/P transducers are compatible with all Becker HPP Family Pneumatic Positioners. Typically a pneumatic positioner and I/P Transducer combination may be required for fast-acting processes. Becker also offers the EFP Series electro-pneumatic positioner that eliminates the need for an I/P transducer. The EFP electro-pneumatic positioner accepts the electronic input signal direct and positions the control valve proportionally. For more information on the EFP, see Becker brochure EFP Series Environmentally Friendly Positioner.

Usage:
- Electronic flow control
- High speed applications that require instantaneous response
- Surge Control
- Power plant control
- Requires RTU or flow computer for implementation
- I/P Transducers fail the output to zero in event of loss of input signal. The Bristol 9110 allows lock in last position but in limited in speed of response.
- To lock the I/P output in last position, an SLV-30 is required (see SLV-30 brochure)

Benefits:
- I/P Transducer and pneumatic positioner combinations are typically utilized in high speed applications such as power plants, surge control, and other short systems
- The combination of the I/P Transducer and pneumatic positioner provide high gain and fast response time
- Minimal bleed
- Simple, easy zero and span adjustment
- Solid state components
- Combatable for natural gas environments

Features:
- Zero and Span adjustment
- Reverse or direct acting switch
- 3-15 psig output or 6-30 psig output
- Split range capability
- Threaded exhaust port to allow exhaust to be routed outside of a building
- Compact space saving design
- FM & CSA Explosion Proof Approval (CENELEC Approval available)
- Class I, Division 1, Groups B, C, and D
- Class II, Division 1, Groups E, F, and G
- Nema 4X Enclosure

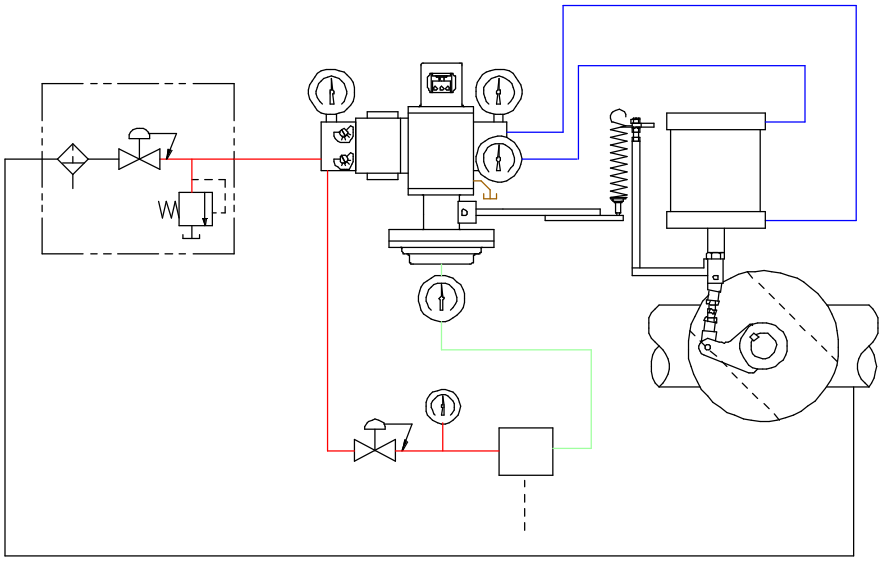
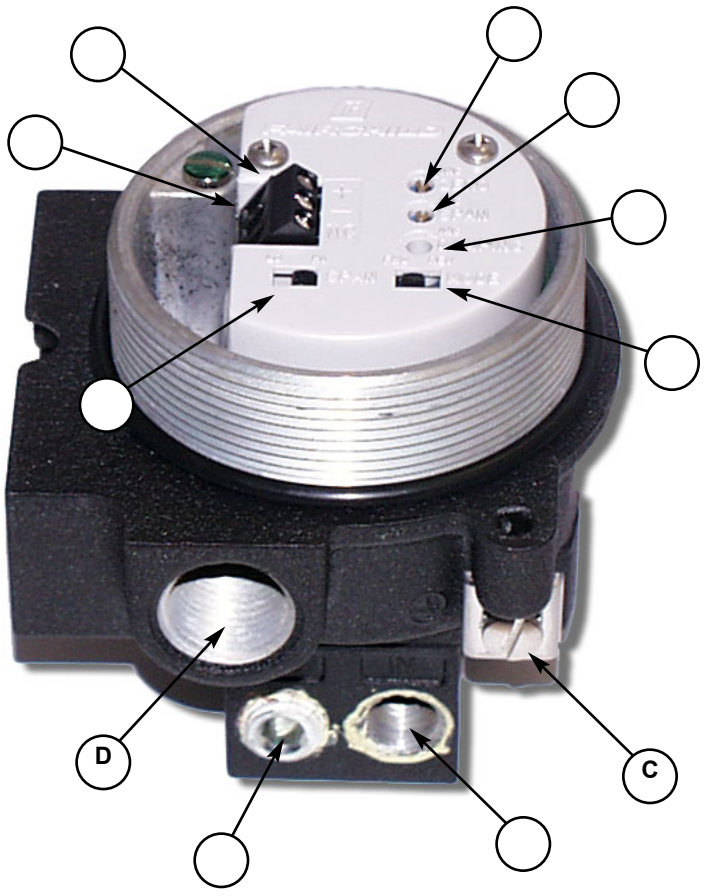


Figure 2.0 - I/P used with HPP-5 double-acting positioner for electro-pneumatic control
The I/P transducer may be utilized with any HPP series positioner for electronic flow or pressure control.

DRESSER
Flow Control



IP Adjustments	Item
Zero Adjustment	1
Span Adjustment	2
Mode Selection	3
Lo-Hi Span Selection	4
Sensitivity Adjustment	5

Table 1.0 - Technical Specifications for I/P

Technical Specifications	
Input Range	4-20 mA
Output Range	3-15 psig (20-100 kPa)
6-30 psig (40-200 kPa)	
Supply Pressure	20-120 psig (150-800 kPa) 10 Micron Filtered instrument quality gas
Minimum Span	5 psig (35 kPa) - 3-15 psig signal
Operative Ambient	10 psig (70 kPa) - 6-30 psig signal
Temperature Range	-40°F to 160°F (-40°C to 79°C)
Flow Rate	2.5 scfh with 25 psig supply
Inlet & Outlet Port Sizes	1/4" FNPT
Exhaust Port Size	1/8" FNPT
Conduit Connection	1/2" FNPT
Air Consumption	3.5 scfh at 3 psig
7.0 scfh at 9 psig	
9.5 scfh at 15 psig	
13.5 scfh at 30 psig	
Required Operating Voltage	7.2 V D.C. at 20 mA
Accuracy	±0.25% Full Scale
Hysterisis	? 0.1% Full Scale
Repeatability	? 0.1% Full Scale
Deadband	? 0.02% Full Scale
Approximate Weight	3 pounds (1.36 kg)
Materials of Construction	
Body and Housing	Chromate Treated Aluminum
Orifice	Nickel Plated Brass & Sapphire
Trim	Stainless Steel
Seals	Buna-n
Finish	Epoxy

IP Port Definitions	Port Size	Item
Input (2 universal ports)	¼" FNPT	A
Output (2 universal ports)	¼" FNPT	B
Exhaust	? " FNPT	C
Conduit Connection	½" FNPT	D

How It Works:
The I/P transducer is an electronically controlled pressure sensitive device that proportionally converts a current signal to a pneumatic output. The I/P is made up of two sections, the Primary Converting Section and the Relay Section. The Primary Section contains a piezoelectric ceramic disk that as a flapper and a nozzle. Together the flapper and nozzle work to control the signal pressure in Relay Section. This signal pressure acts on an upper control diaphragm assembly which in turn controls the output pressure. As the electrical signal increases, the flapper (disk) moves towards the nozzle resulting in reduced bleed and an increase in pressure on the diaphragm moving it downward and opening the output valve. As the input signal decreases, the opposite reaction occurs. The disk moves away from the nozzle increasing the bleed and decreasing the pressure on the diaphragm resulting in a decrease in output pressure. The output valve moves proportionally to the input electrical signal causing a proportional change in output pressure.

The output pressure acts on a lower control diaphragm that maintains constant output pressure by equalizing the pressure on the upper control diaphragm. The output pressure is also sensed by an electronic feedback control circuit, which compares the output pressure and input signal (setpoint) to maintain a constant output pressure.

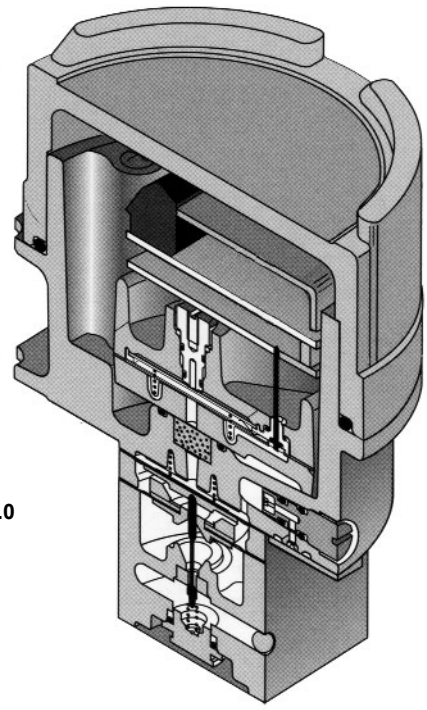


Figure 3.0

Table 2.0 - Application Guidelines for I/P Transducer	VRP-CH Series Pilot	VRP-B-CH Series Pilot	VRP-SB-CH Series Pilot	VRP-SB-PID Series Controller	HPP-4 Series Positioner	HPP-5 Series Positioner	HPP-SB Series Positioner	EFP Positioner	Notes
Instrumentation Options									
Bleed to Pressure System BPS™	•	•	•		•	•	•	•	1
AB Series Atmospheric Bleed Control	•	•	•	•	•	•	•	•	
NBV Series No-Bleed Valve	•	•			•	•			2
DPS-2 Series Non-Bleed Sensor		•				•			3
PS-2 Series Non-Bleed Sensor	•				•				3
SP Series Setpoint Pump	•	•	•	•					
RSM Series Remote Setpoint Module	•	•	•	•					
Panel Mounting	•	•	•	•				•	
Stainless Steel Option	•	•	•	•	•	•	•		
VB Series Volume Booster	•			•	•				4
QEV Series Quick Exhaust Valve	•		•	•	•		•		
I/P Transducer					•	•	•		
SLV Series Signal Lock Valve					•	•	•		

1. BPSä is limited to pressure systems below 400 psig. Consult Becker for application assistance. NBV No-Bleed Valves may only be utilized when PDischarge[60 psig (414 kPa) and/or PSupply[150 psig (1034 kPa).
2. PS-2 & DPS-2 Non-Bleed Sensors must be utilized when PDischarge>60 psig (414 kPa) and/or PSupply>150 psig (1034 kPa).
3. VB Series Volume Boosters are necessary for Power Plant Regulation, Surge Control Applications, or when Large Model RPDA & LPDA Series Actuators are utilized.

*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.

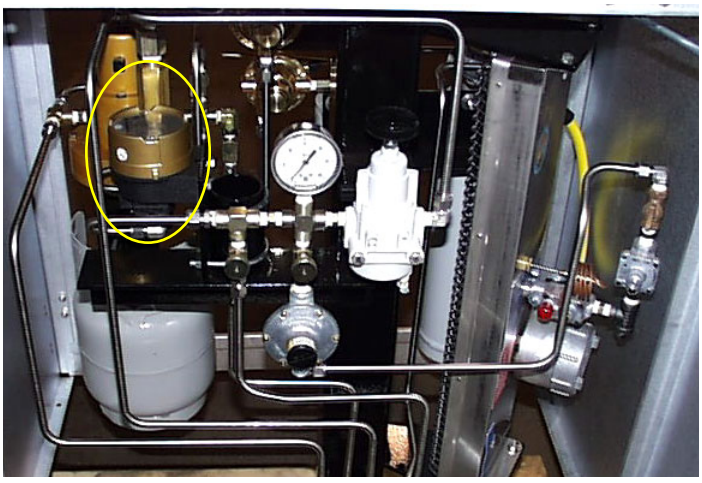


Figure 4.0 - I/P Transducer (circled) panel mounted with enclosure, catalytic heater, SLV-30 Signal Lock Valve (behind panel), and regulation. The I/P receives a 4-20 mA analog signal and converts the electrical signal to a proportional 3-15 psig pneumatic signal which is then sent to a HPP Series positioner mounted directly on a Becker actuator.

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