

## DESCRIPTION

### A110 DIFFERENTIAL CONTROL VALVE

The Model A110 controls the pressure difference between two points in a system. It has a wide range of applications: anywhere an increase in the sensed pressure differential causes the valve to open. Typical examples include:

- Maintaining constant pump discharge to suction differential
- Balancing valve in chilled water systems
- LPG metering systems to prevent flashing

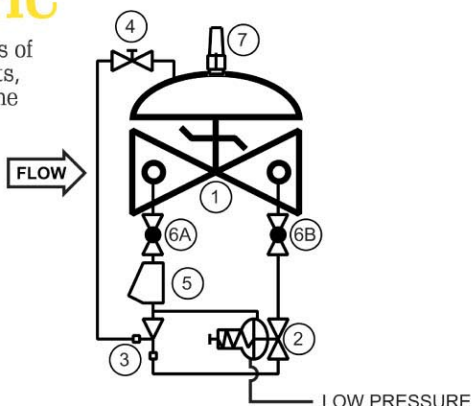
## SERIES FEATURES

- Valve opens on increased pressure differential
- Operates over a wide flow range
- Pressure differential is adjustable with single screw
- Adjustable response speed
- Can be maintained without removal from the line
- Factory tested and can be pre-set to your requirements

## SCHEMATIC

The Model A110 consists of the following components, arranged as shown on the schematic diagram:

- 1.) Basic Control Valve
- 2.) Differential Control Pilot
- 3.) Ejector
- 4.) Needle Valve
- 5.) Y-strainer
- 6.) Isolation Ball Valves
- 7.) Visual Indicator (Optional)

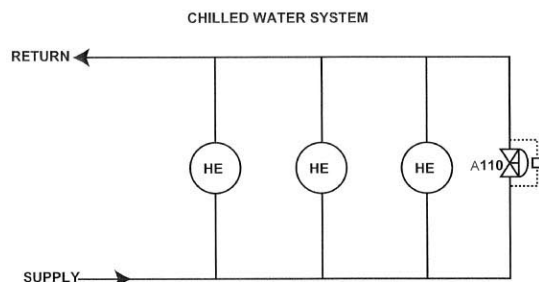


## OPERATION

The normally closed, spring-loaded pilot, sensing two pressure points, responds to changes in the pressure difference and causes the main valve to do the same. The valve opens on increased differential. The net result is a constant modulating action of the pilot and main valve to hold the pressure differential constant. The pilot system is equipped with a needle valve response speed control that fine tunes the valve response to the system variables. The high pressure sensing point is typically at the valve inlet, while the low pressure sensing point can be valve outlet or remotely connected, e.g., pump suction.

## RECOMMENDED INSTALLATION

Model A110 maintains constant differential between Supply and Return lines no matter how many heat exchangers are running. Therefore each heat exchanger can operate at maximum efficiency.



**Sizes:** GLOBE/ANGLE

Threaded Ends:  
1 1/4" - 3"

Grooved Ends:  
1 1/2" - 4"

Flanged Ends:  
1 1/4" - 24"  
(globe);  
1 1/4" - 16"  
(angle)



## MAX. PRESSURE

END CONNECTIONS	DUCTILE IRON	STEEL/STN STL	BRONZE
Threaded	640 psi	640 psi	500 psi
Grooved	300 psi	300 psi	300 psi
150# Flanged	250 psi	285 psi	225 psi
300# Flanged	640 psi	740 psi	500 psi

## TEMPERATURE RANGE

(Valve Elastomers)

Buna-N -40° F - 180°F; Viton 0° F - 400°F; EPDM 0° F - 300°F

## SPRING RANGES

(inlet setting)

5-30 psi, 20-80 psi, 65-180 psi, 100-300 psi

## STANDARD MATERIALS

Consult factory for others.

**Body/Bonnet:** Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, B61 Bronze, Others available (consult factory)

**Seat Ring:** Bronze B61, Stainless Steel

**Stem:** Stainless Steel, Monel

**Spring:** Stainless Steel

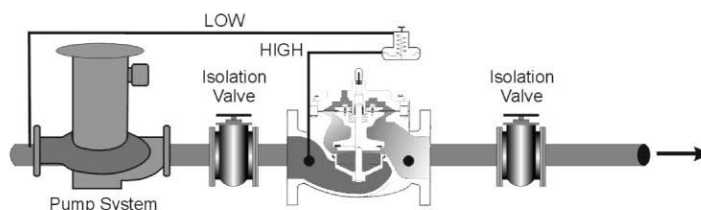
**Diaphragm:** Nylon Reinforced, Buna-N, Viton, EPDM

**Seat Disc:** Buna-N, Viton, EPDM

**Pilot:** Bronze, Stainless Steel

Other pilot system components: Bronze/Brass, All Stainless Steel

**Tubing & Fittings:** Copper/Brass, Stainless Steel



### SPECIFICATIONS

The differential control valve shall function to maintain a constant differential between two pressure points, where an increase in said differential shall cause the valve to open.

#### DESIGN

The valve shall be a single-seated, line pressure operated, diaphragm actuated, pilot controlled globe valve. The valve shall seal by means of a corrosion-resistant seat and a resilient, rectangular seat disc. These, and other parts, shall be replaceable without removing the valve from the line. The stem of the main valve shall be guided top and bottom by integral bushings. Alignment of the body, bonnet and diaphragm assembly shall be by precision dowel pins. The diaphragm shall not be used as a seating surface, nor shall the pistons be used as an operating means. The pilot system shall be furnished complete and installed on the main valve. It shall include a speed control, Y-strainer and isolation ball valves. The differential control valve shall be operationally and hydrostatically tested prior to shipment.

#### MATERIALS OF CONSTRUCTION

The main valve body and bonnet shall be ductile iron per ASTM A536, Grade 65-45-12. All ferrous surfaces shall be coated with 4 mils of epoxy. The main valve seat ring shall be bronze per ASTM B61. Elastomers (diaphragms, resilient seats and O-rings) shall be Buna-N. Control pilots shall be ASTM B61 bronze. The speed control and isolation ball valves shall be brass, and control line tubing shall be copper.

#### OPERATING CONDITIONS

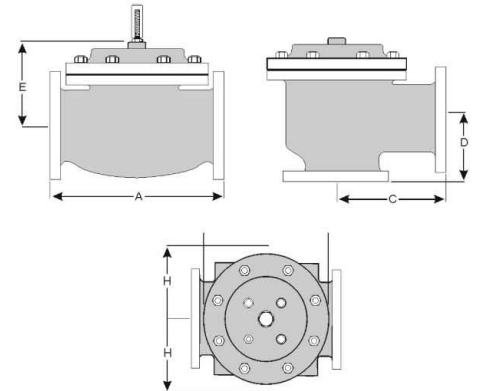
The differential control valve shall be suitable for controlling the pressure differential at <X> psid at flow rates ranging from <X to X> gpm.

#### ACCEPTABLE PRODUCTS

The differential control valve shall be a <size> Model A110, <globe pattern, angle pattern>, with <150# flanged, 300# flanged, threaded, grooved> end connections, as manufactured by Conbraco Industries, Matthews, NC.

U.S. DIMENSIONS - INCHES													
DIM	END CONN.	1 1/4-1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	24
A	SCREWED	8 3/4	9 7/8	10 1/2	13	--	--	--	--	--	--	--	--
	GROOVED	8 3/4	9 7/8	10 1/2	13	15 1/4	--	--	--	--	--	--	--
	150# FLGD	8 1/2	9 3/8	10 1/2	12	15	17 3/4	25 3/8	29 3/4	34	39	40 3/8	62
	300# FLGD	8 3/4	9 7/8	11 1/8	12 3/4	15 5/8	18 5/8	26 3/8	31 1/8	35 1/2	40 1/2	42	63 3/4
C	SCREWED	4 3/8	4 3/4	6	6 1/2	--	--	--	--	--	--	--	--
	GROOVED	4 3/8*	4 3/4	6	6 1/2	7 5/8	--	--	--	--	--	--	--
	150# FLGD	4 1/4	4 3/4	6	6	7 1/2	10	12 11/16	14 7/8	17	--	20 13/16	--
	300# FLGD	4 3/8	5	6 3/8	6 3/8	7 13/16	10 1/2	13 3/16	15 9/16	17 3/4	--	21 5/8	--
D	SCREWED	3 1/8	3 7/8	4	4 1/2	--	--	--	--	--	--	--	--
	GROOVED	3 1/8*	3 7/8	4	4 1/2	5 5/8	--	--	--	--	--	--	--
	150# FLGD	3	3 7/8	4	4	5 1/2	6	8	11 3/8	11	--	15 11/16	--
	300# FLGD	3 1/8	4 1/8	4 3/8	4 3/8	5 13/16	6 1/2	8 1/2	12 1/16	11 3/4	--	16 1/2	--
E	ALL	6	6	7	6 1/2	8	10	11 7/8	15 3/8	17	18	19	27
H	ALL	10	11	11	11	12	13	14	17	18	20	20	28 1/2

\*GROOVED END NOT AVAILABLE IN 1 1/4"



For maximum efficiency, the Apollo control valve should be mounted in a piping system so that the valve bonnet (cover) is in the top position. Other positions are acceptable but may not allow the valve to function to its fullest and safest potential. In particular, please consult the factory before installing 8" and larger valves, or any valves with a limit switch, in positions other than described. Space should be taken into consideration when mounting valves and their pilot systems.

#### Special Functions

00A = Pressure Relief (0-30 PSI)  
 00B = Pressure Relief (20-80 PSI)  
 00C = Pressure Relief (65-180 PSI)  
 00D = Pressure Relief (100-300 PSI)

#### \*Other Options Available Upon Request

#### Model Number

#### Valve Type / Connection

A = Angle / Flanged ANSI 150 Class  
 B = Angle / Flanged ANSI 300 Class  
 C = Angle / Threaded (1-1/4 - 3")  
 E = Angle / Grooved Ends (1-1/2 - 4")  
 F = Angle / Flanged 300clsX150cls  
 G = Globe / Flanged ANSI 150cls  
 H = Globe / Flanged ANSI 300cls  
 J = Globe / Threaded Ends (1-1/4 - 3")  
 V = Globe / Grooved Ends (1-1/2 - 4")

#### Valve Size

012 = 1 - 1/4"  
 015 = 1 - 1/2"  
 020 = 2"  
 025 = 2 1/2"  
 030 = 3"  
 040 = 4"  
 060 = 6"  
 080 = 8"  
 100 = 10"  
 120 = 12"  
 140 = 14"  
 160 = 16"  
 240 = 24"

#### Seat Ring Material

1 = Bronze, B61  
 2 = Stainless Steel

#### Body & Bonnet Material

1 = Ductile Iron  
 2 = Cast Steel  
 4 = Bronze  
 7 = Stainless Steel

#### Elastomers

1 = Buna-N 2 = Viton 3 = EPDM

#### Pilot, Fittings, Tube MATERIAL

CODE	PILOT	FTGS	TUBE
1	BZ	BRS	CU
4	SS	BRS	CU
8	SS	SS	SS
9	BZ	SS	SS

"Apollo" Valves  
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