FLOW CONTROL
INDUSTRIES, INC.

Product Catalog

Precision Control DeltaPValves



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DELTA P VALVE



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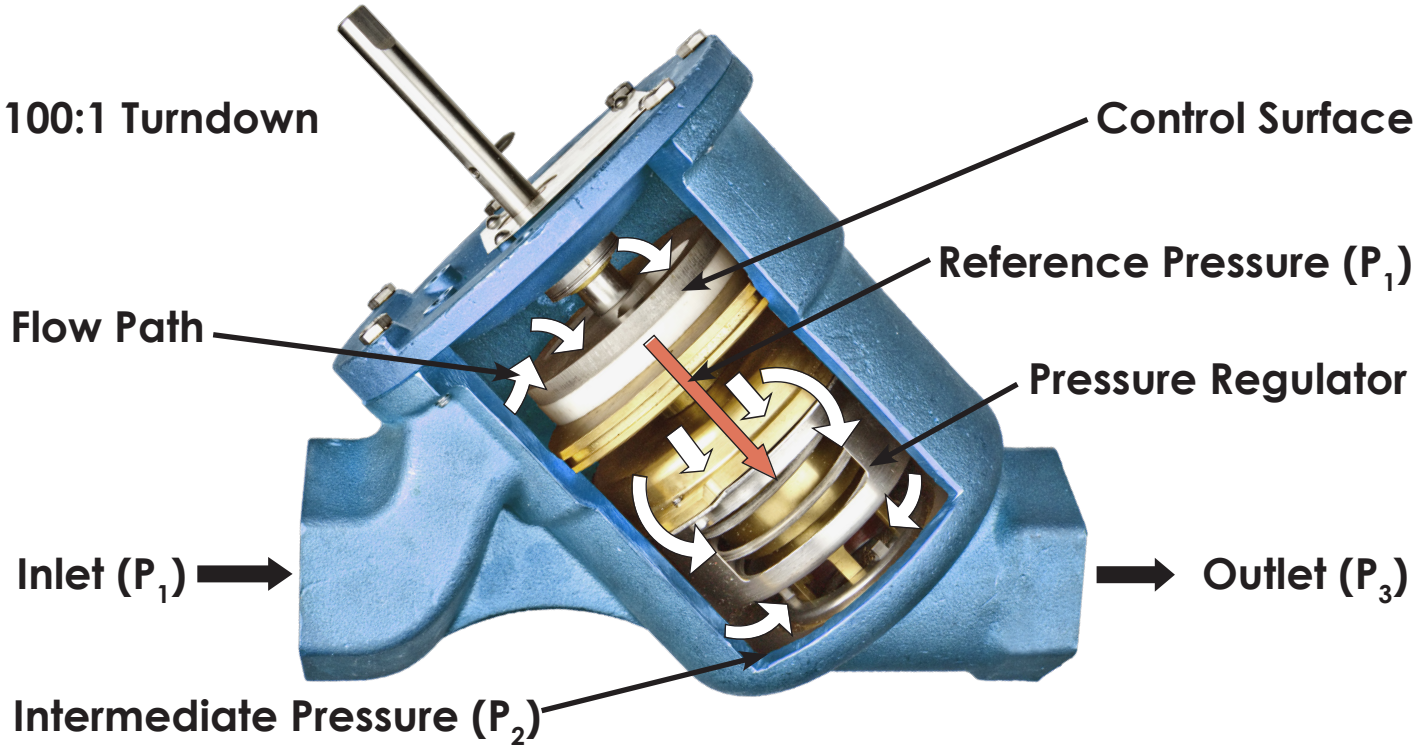


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DELTA P VALVE

Characteristics of a Precision Control Valve



Ability to maintain ± 0.1° LAT

Leaving air temperature from the coil must be maintained within a tight tolerance in order to maintain system stability and achieve design or better ΔT.

Factory commissioned

All DeltaPValves are flow tested with performance verified before shipment. Each valve has a unique serial number, and all testing data tied to that valve is maintained in the FCI database.

Pressure independent control

DeltaPValves instantaneously compensate for system pressure fluctuations to maintain stable flow at all valve positions.

Full system compatibility

Flow ranges of 0.5-5500 GPM allow precision control throughout the entire hydronic system.

Industrial quality design

Debris resistant design due to high spring force, large diaphragm surface area, and large passageways throughout the valve. Stainless steel and brass internal components ensure reliability throughout a 30+ year life.

Field verifiable performance

Inlet, intermediate, and outlet P/T ports are vital to verify pressure independent operation, validate flow rates, confirm valve shutoff, and troubleshoot system issues.

100:1 turndown

The ability to control flow throughout the full range of the control valve. With 90% of valve operation spent below 50% open, it is vital to ensure accurate control at low flow.

Dynamically Balanced

No additional balancing valves or balancing services required.

Benefits of Precision Control

Reduce energy costs

The DeltaPValve® uses far less energy by increasing system stability. In fact, it has proven to reduce energy consumption in heating and cooling systems by 20 - 40%. This translates to saving millions of dollars in operating costs and eliminates needless environmental waste.

Improve comfort

The DeltaPValve® tightens control within heating and cooling systems, enabling precise response and the stabilization of leaving air temperature. This improves comfort for tenants and reduces the number of hot and cold calls received by the facilities team.

Reduce maintenance

The DeltaPValve® is industrial quality and designed to last the life of the facility. Each DeltaPValve® is self-balancing, therefore eliminating the need for repeated system commissioning. This means the cost of maintaining system performance after installation is significantly reduced.

Recover system capacity

By properly managing pressure and ensuring stable control, the DeltaPValve® enables systems to not only operate more efficiently, but actually take advantage of the full, installed system capacity.

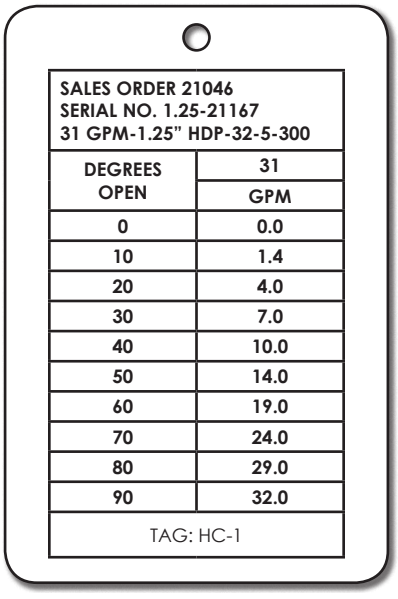
We stand behind our product

Delta T Guarantee

We guarantee that our valves will meet or exceed design ΔT performance, or the valves are free. We are the only valve on the market that guarantees ΔT performance.

10-Year Warranty

All ½" - 8" DeltaPValves are covered by a 10-year warranty. We disagree with short-term solutions, and are confident in the quality and performance of the DeltaPValve®.



DeltaPValves are factory tested and tagged to display the actual flow in operation.

Flow Table & Valve Selection Process

Valve Selection

- **Max Flow:** Determine the maximum flow rate (GPM or LPS) required (usually design from coil schedule).
- **Max ΔP:** Determine the maximum differential pressure that the valve will work against (normally the design head of the pump serving that circuit).
- **Body Pressure:** Determine the maximum static pressure the valve will encounter to establish the required body pressure rating (150 or 300 psi) [10.3 bar or 20.7 bar].
- **Size Valve:** Based on the flow rate, determine the size and model number of the valve.
- **Flow Tag:** Determine coil tag description (i.e. CV-AHU-1, CV-FCU-3) for the valve tag.

Flow Table

DELTA VALVE	Max GPM [liters per second]							
DeltaPValve® Series	5 to 70 PSID [0.34 to 4.83 bar]							
½" MDP [15 mm]	0.5 [0.03]	1.0 [0.06]	1.5 [0.09]	2.0 [0.12]	2.5 [0.15]	3.0 [0.18]	4.0 [0.25]	5.0 [0.31]
¾" LDP [20 mm]	6 [0.37]		8 [0.50]		11 [0.69]			
1 ¼" LDP [32 mm]	18 [1.13]		24 [1.51]		32 [2.01]			
1 ½" LDP [40 mm]	40 [2.52]			50 [3.15]				10 to 90 PSID [0.69 to 6.20 bar]
2" HDP [50 mm]	52 [3.2]		75 [4.7]		90 [5.6]			112 [7.0]
3" HDP [80 mm]	126 [7.9]		150 [9.4]		180 [11.3]			209 [13.1]
4" EDP [100 mm]	248 [15.6]		308 [19.4]		326 [20.5]			430 [27.1]
6" EDP [150 mm]	400 [25.2]		500 [31.5]		590 [37.2]		650 [41.0]	800 [50.4]
8" IDP [200 mm]	700 [44.0]		900 [56.0]		1130 [71.0]		1320 [83.0]	1750 [110.0]
10" NDP [250 mm]	2200 [138.0]							
12" NDP [300 mm]	3000 [189.0]							
14" NDP [350 mm]	4400 [278.0]							
16" NDP [400 mm]	5500 [347.0]							

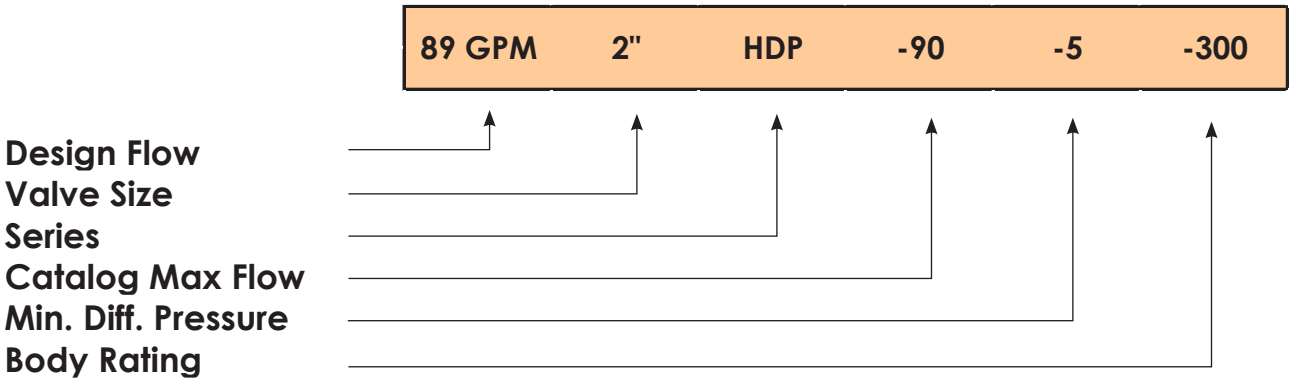
Valve & Actuator Selection Process

Actuator Selection

- **Actuator Type:** Determine what type of actuator you require. Valves ½" thru 8" [200mm] use 0 to 90 degree rotating actuators. Electric actuators are recommended.
  **Pneumatic options available. Consult factory for more information.
- **Fail Action:** Determine if you need fail-open/closed operation. Fail-in-place (last position) is recommended for most chilled water valves. Heating water valves vary by application.
- **Normal Position:** Select Normally Open or Normally Closed for actuator configuration.
- **Control Signal:** Choose the desired actuator control signal. Typically 2-10 VDC, 0-10 VDC, or 4-20 mA for electronic control.
- **Accessories:** Determine if NEMA 4 actuators, P/T plug extensions, or any other special requests are desired.

Fail-In-Place, Fail-Open, or Fail Closed

- **Fail-In-Place:** Actuator remains in last commanded position ("in-place") on loss of power. Recommened for most applications.
- **Fail-Safe:**
  - Fail-Open: Actuator drives the valve open on loss of power. Typically only required for freeze protection and/or critical applications.
  - Fail-Closed: Actuator drives the valve closed on loss of power. Typically only required for specific applications.



Valve Size: ½" - 16" [15mm - 400mm]

Series: MDP, LDP, HDP, EDP, IDP, NDP

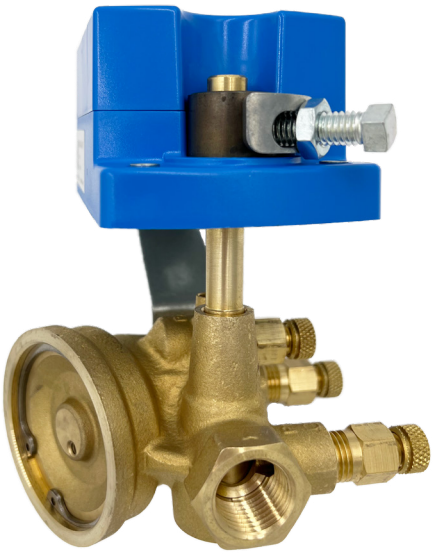
Catalog Flow: Maximum flow for selected valve components

Minimum DP: 5 PSID [0.34 bar]
10 PSID [0.69 bar]

Body Rating: 150 PSIG [10.3 bar]
300 PSIG [20.6 bar]

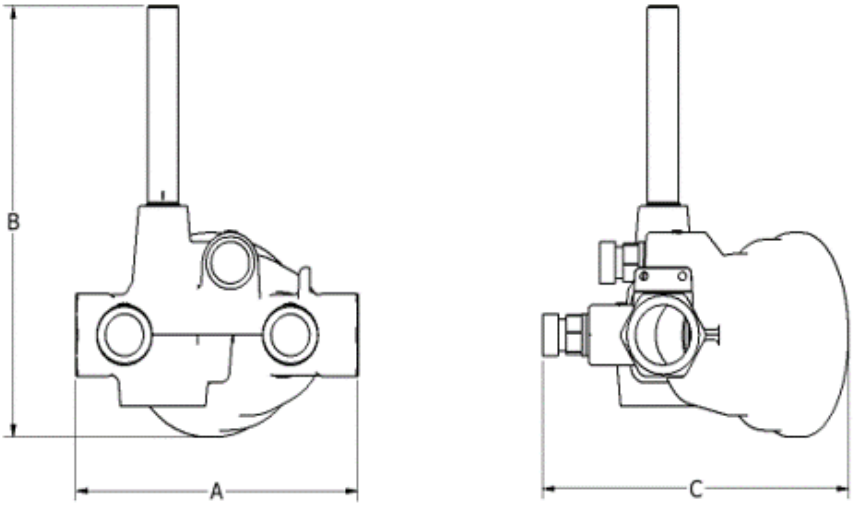
½" MDP DeltaPValve®

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Valve Specifications

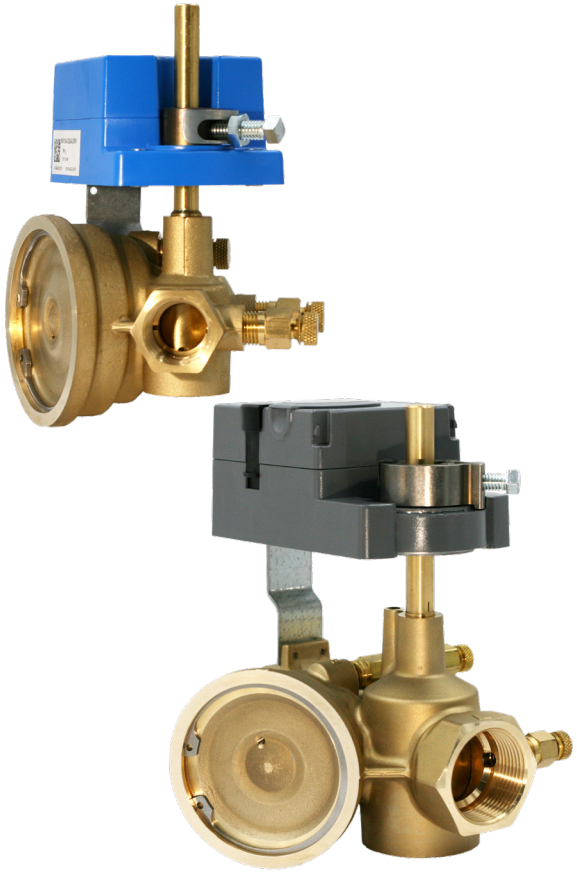
Size	½" [15mm]
Type	Pressure Independent
Service	Heating Water, Chilled Water, Glycol
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar]
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0 GPM [0.03, 0.06, 0.09, 0.12, 0.15, 0.18, 0.25, 0.31 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	N/A
Flow Accuracy	+/- 5%
Pipe Connections	Female NPT
Body Pressure Rating	300 PSIG [20.7 bar]
Close Off Pressure	200 PSID [13.8 bar]
Materials	
Body	Brass
Internals	Brass / 304 SS
Seals	EPDM
Leakage	ANSI / FCI 70-2, Class IV
Rangeability	100:1
Maximum Temperature	250°F [121°C]
P/T Ports	3 (Inlet, Intermediate, Outlet)
Weight (Valve Only)	1.67 lbs [0.76 kg]
Actuation	90° Electric, Fail-In-Place, Fail-Safe; Manual



Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
½" MDP [15mm]	Threaded	3.7 [94]	5.1 [130]	4.0 [102]
For information only and not for fabrication				

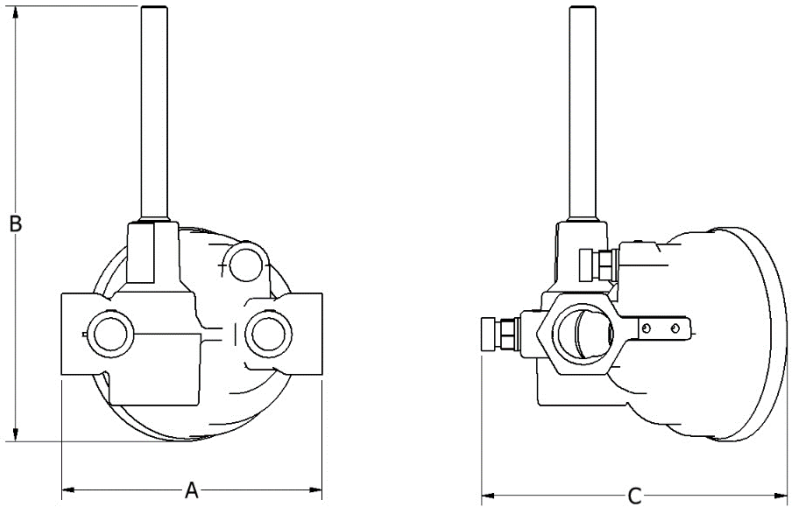
¾" & 1¼" LDP DeltaPValve®

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Valve Specifications

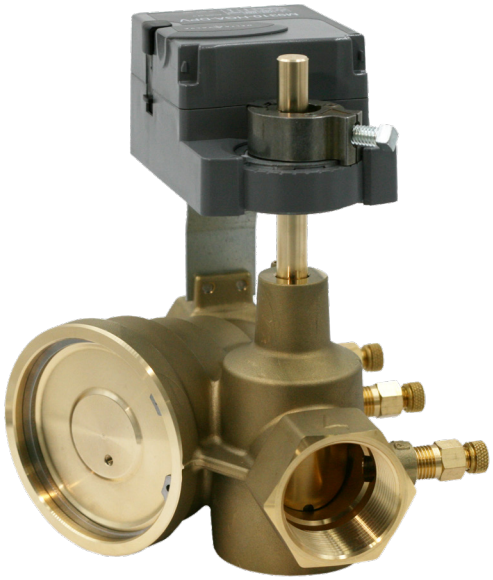
Size	¾" [20mm]	1¼" [32mm]
Type	Pressure Independent	
Service	Heating Water, Chilled Water, Glycol	
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar]	
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	6, 8, 11 GPM [0.37, 0.50, 0.69 LPS]	18, 24, 32 GPM [1.13, 1.51, 2.01 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	N/A	
Flow Accuracy	+/- 5%	
Pipe Connections	Female NPT	
Body Pressure Rating	300 PSIG [20.7 bar]	
Close Off Pressure	200 PSID [13.8]	
Materials		
Body	Brass	
Internals	Brass / 304 SS	
Seals	EPDM	
Leakage	ANSI / FCI 70-2, Class IV	
Rangeability	100:1	
Maximum Temperature	250°F [121°C]	
P/T Ports	3 (Inlet, Intermediate, Outlet)	
Weight (Valve Only)	3.2 lbs [1.45 kg]	5.5 lbs [2.50 kg]
Actuation	90° Electric, Fail-In-Place, Fail-Safe; Manual	



Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
¾" LDP [20mm]	Threaded	4.0 [102]	6.7 [170]	4.6 [117]
1¼" LDP [32mm]	Threaded	6.0 [152]	7.7 [196]	5.6 [142]
For information only and not for fabrication				

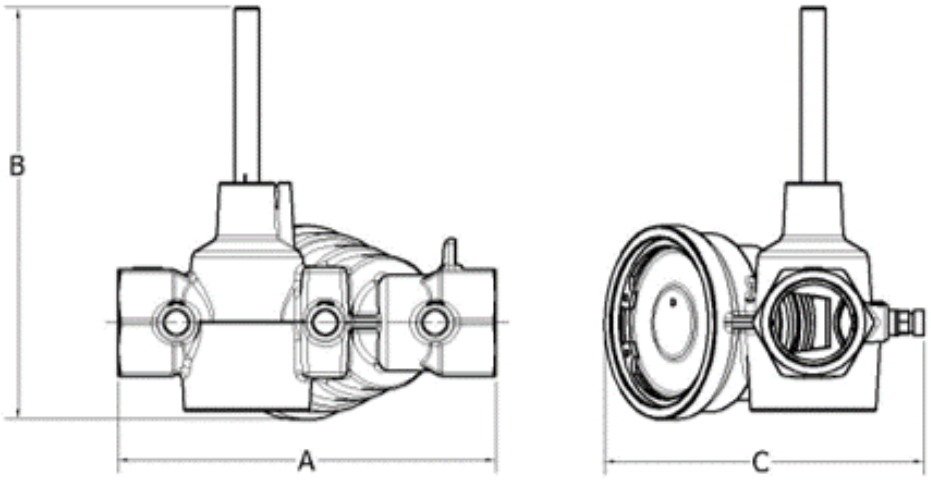
1½" LDP DeltaPValve®

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Valve Specifications

Size	1½" [40mm]
Type	Pressure Independent
Service	Heating Water, Chilled Water, Glycol
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar]
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	40, 50 GPM [2.52, 3.15 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	N/A
Flow Accuracy	+/- 5%
Pipe Connections	Female NPT
Body Pressure Rating	300 PSIG [20.7 bar]
Close Off Pressure	200 PSID [13.8 bar]
Materials	
Body	Brass
Internals	Brass / 304 SS
Seals	EPDM
Leakage	ANSI / FCI 70-2, Class IV
Rangeability	100:1
Maximum Temperature	250°F [121°C]
P/T Ports	3 (Inlet, Intermediate, Outlet)
Weight (Valve Only)	9.6 lbs [4.35 kg]
Actuation	90° Electric, Fail-In-Place, Fail-Safe; Manual



Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
1½" LDP [40mm]	Threaded	7.5 [191]	8.2 [208]	6.3 [160]
For information only and not for fabrication				

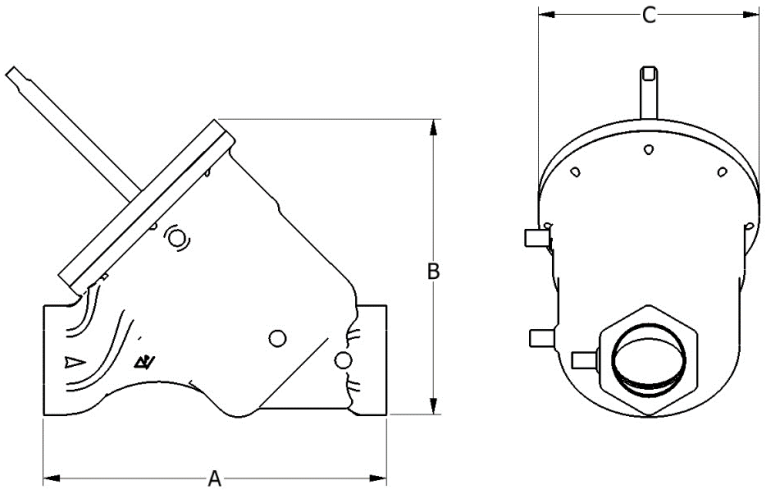
2” HDP DeltaPValve®

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Valve Specifications

Size	2" [50mm]
Type	Pressure Independent
Service	Heating Water, Chilled Water, Glycol
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar] 10-90 PSID [0.69 – 6.20 bar]
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	52, 75, 90 GPM [3.2, 4.7, 5.6 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	112 GPM [7.0 LPS]
Flow Accuracy	+/- 5%
Pipe Connections	Female NPT
Body Pressure Rating	300 PSIG [20.7 bar]
Close Off Pressure	200 PSID [13.8 bar]
Materials	
Body	Ductile Iron
Internals	Brass / 304 SS
Seals	EPDM / PTFE
Leakage	ANSI / FCI 70-2, Class III
Rangeability	100:1
Maximum Temperature	250°F [121°C]
P/T Ports	3 (Inlet, Intermediate, Outlet)
Weight (Valve Only)	28 lbs [12.7 kg]
Actuation	90° Electric, Fail-In-Place, Fail-Safe; Manual



Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
2" HDP [50 mm]	Threaded	10.5 [267]	9.4 [239]	6.8 [173]
For information only and not for fabrication				

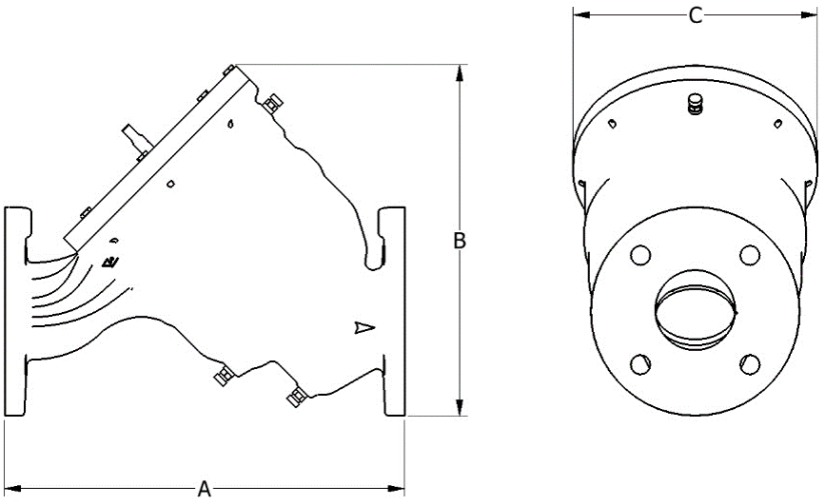
3" HDP DeltaPValve®

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Valve Specifications

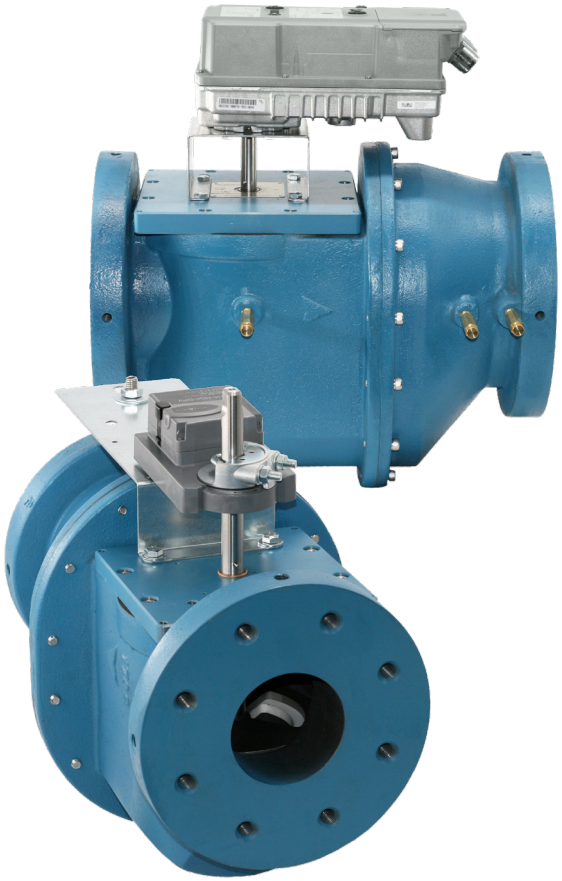
Size	3" [80mm]
Type	Pressure Independent
Service	Heating Water, Chilled Water, Glycol
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar] 10-90 PSID [0.69 – 6.20 bar]
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	126, 150, 180 GPM [7.9, 9.4, 11.3 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	209 GPM [13.1 LPS]
Flow Accuracy	+/- 5%
Pipe Connections	ANSI 125# FF Flanged (150 PSIG) [10.3 bar] ANSI 250# FF Flanged (300 PSIG) [20.7 bar]
Body Pressure Rating	150 PSIG [10.3 bar] 300 PSIG [20.7 bar]
Close Off Pressure	130 PSID [8.9 bar], 150 PSID [10.3 bar]
Materials	
Body	Ductile Iron
Internals	Brass / Teflon / CS / 304 SS
Seals	EPDM
Leakage	ANSI / FCI 70-2, Class III
Rangeability	100:1
Maximum Temperature	250°F [121°C]
P/T Ports	3 (Inlet, Intermediate, Outlet)
Weight (Valve Only)	82 lbs [37.2 kg]
Actuation	90° Electric, Fail-In-Place, Fail-Safe; Manual



Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
3" HDP [80mm]	Flanged	15.5 [394]	13.6 [345]	9.5 [241]
For information only and not for fabrication				

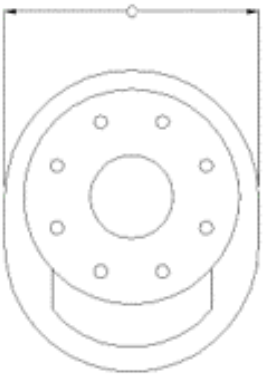
4" & 6" EDP DeltaPValve®

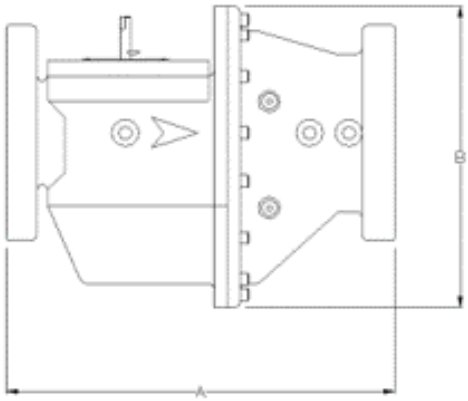
· Guaranteed ΔT ·



Valve Specifications

Size	4" [100mm]	6" [150mm]
Type	Pressure Independent	
Service	Heating Water, Chilled Water, Glycol	
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar 10-90 PSID [0.69 – 6.20 bar]	
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	248, 308, 326 GPM [15.6, 19.4, 20.5 LPS]	400, 500, 590, 650 GPM [25.2, 31.5, 37.2, 41.0 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	430 GPM [27.1 LPS]	800 GPM [50.4 LPS]
Flow Accuracy	+/- 5%	
Pipe Connections	ANSI 125# FF Flanged (150 PSIG) [10.3 bar] ANSI 250# FF Flanged (300 PSIG) [20.7 bar]	
Body Pressure Rating	150 PSIG [10.3 bar] 300 PSIG [20.7 bar]	
Close Off Pressure	70 PSID [4.8 bar], 150 PSID [10.3 bar]	
Materials		
Body	Ductile Iron	
Internals	Brass / Teflon / CS / 304 SS	
Seals	EPDM	
Leakage	ANSI / FCI 70-2, Class III	
Rangeability	100:1	
Maximum Temperature	250°F [121°C]	
P/T Ports	3 (Inlet, Intermediate, Outlet)	
Weight (Valve Only)	172 lbs [78 kg]	240 lbs [109 kg]
Actuation	90° Electric, Fail-In-Place, Fail-Safe; Manual	

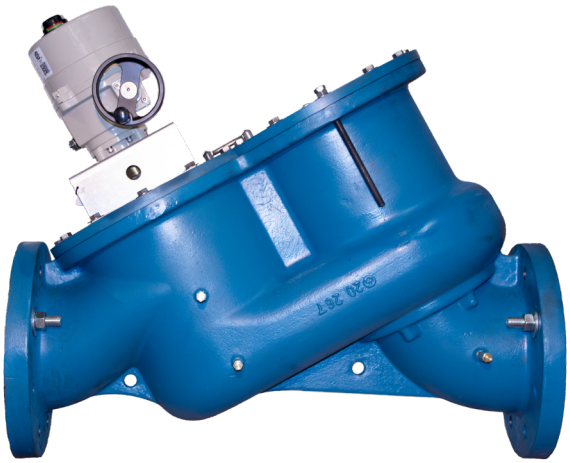




Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
4" EDP [100mm]	Flanged	18.0 [457]	14.0 [356]	11.8 [300]
6" EDP [150mm]	Flanged	20.5 [521]	16.2 [411]	13.4 [340]
For information only and not for fabrication				

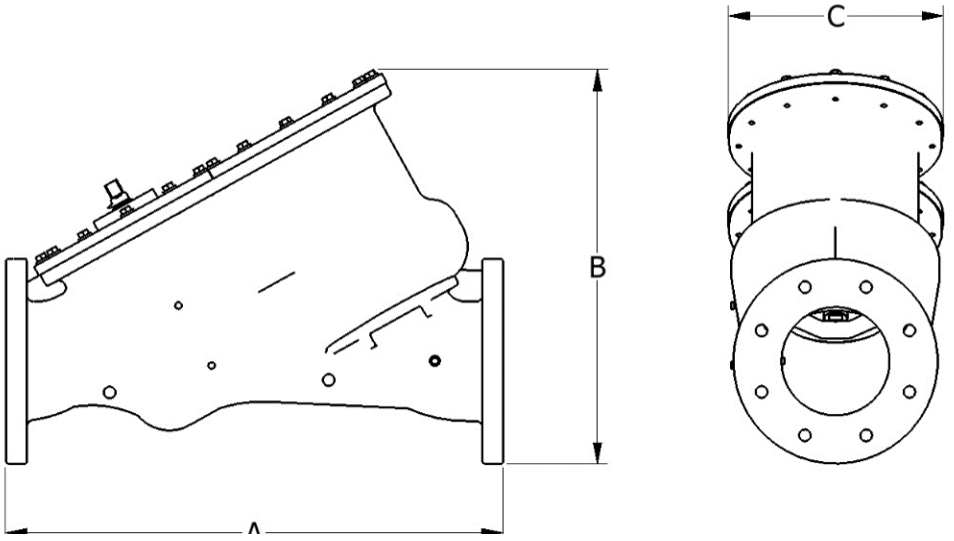
8” IDP DeltaPValve®

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Valve Specifications

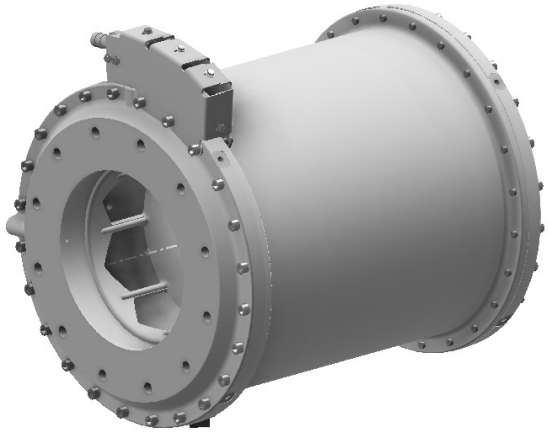
Size	8" [200mm]
Type	Pressure Independent
Service	Heating Water, Chilled Water, Glycol
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar 10-90 PSID [0.69 – 6.20 bar]
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	700, 900, 1130, 1320 GPM [44.0, 56.0, 71.0, 83.0 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	1750 GPM [110.0 LPS]
Flow Accuracy	+/- 5%
Pipe Connections	ANSI 125# FF Flanged (150 PSIG) [10.3 bar] ANSI 250# FF Flanged (300 PSIG) [20.7 bar]
Body Pressure Rating	150 PSIG [10.3 bar] 300 PSIG [20.7 bar]
Close Off Pressure	150 PSID [10.3 bar]
Materials	
Body	Ductile Iron
Internals	Brass / Teflon / CS / 304 SS
Seals	EPDM
Leakage	ANSI / FCI 70-2, Class III
Rangeability	100:1
Maximum Temperature	250°F [121°C]
P/T Ports	3 (Inlet, Intermediate, Outlet)
Weight (Valve Only)	575 lbs [261 kg]
Actuation	90° Electric, Fail-In-Place, Fail-Safe; Manual



Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
8" IDP [200mm]	Flanged	36.5 [927]	28.8 [732]	15.8 [401]
For information only and not for fabrication				

10”, 12”, 14” & 16” NDP DeltaPValve®

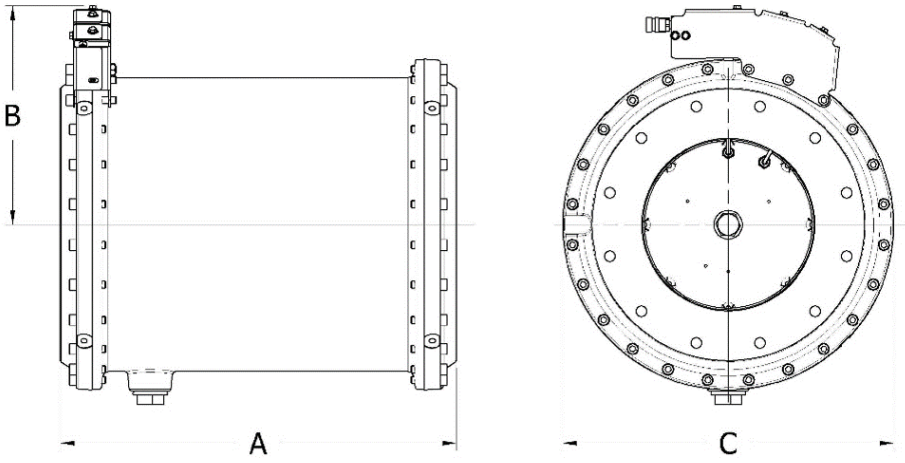
· Guaranteed ΔT ·





Valve Specifications

Size	10”, 12” [250, 300mm]	14”, 16” [350, 400mm]
Type	Pressure Independent	
Service	Chilled Water, Condenser Water, Glycol	
Differential Pressure Operating Range	5-70 PSID [0.34 – 4.83 bar]	
Maximum Flow Setting 5-70 PSID [0.34-4.83 bar]	10”: 2200 GPM [138 LPS] 12”: 3000 GPM [189 LPS]	14”: 4400 GPM [278 LPS] 16”: 5500 GPM [347 LPS]
Maximum Flow Setting 10-90 PSID [0.69-6.20 bar]	N/A	
Flow Accuracy	+/- 5%	
Pipe Connections	ANSI 125# FF Flanged (150 PSIG) [10.3 bar] ANSI 250# FF Flanged (300 PSIG) [20.7 bar]	
Body Pressure Rating	150 PSIG [10.3 bar] 300 PSIG [20.7 bar]	150 PSIG [10.3 bar]
Close Off Pressure	Contact Factory	
Materials		
Body	Carbon Steel, Stainless Steel	
Internals	Brass / Ductile Iron / 304 SS	
Seals	EPDM / Nitrile	
Leakage	ASME FCI 70-2, Class II	
Rangeability	10:1	
Maximum Temperature	145°F [63°C]	
P/T Ports	3 (Inlet, Intermediate, Outlet)	
Weight (Valve Only)	650 lbs [295 kg]	1600 lbs [726 kg]
Actuation	Factory Supplied Hydraulic	



Dimensions in inches [mm]				
Valve Size	**Connection**	**A**	**B**	**C**
10”/12” NDP [250/300mm]	Flanged	27.5 [699]	11.8 [300]	23 [584]
14”/16” NDP [350/400mm]	Flanged	32.5 [826]	18.5 [470]	37.5 [953]
For information only and not for fabrication				

DeltaPValve® Series Sample Spec

A. All modulating control valves shall be pressure independent and provided by the same manufacturer. The basis of design is the DeltaPValve® as manufactured by:

Flow Control Industries, Inc. P: (866) 454-1288
PO Box 848 F: (425) 486-5672
Woodinville, WA 98072 www.flowcontrol.com

B. All modulating control valves shall be industrial quality and must be fully field-rebuildable. Valves shall be designed to last 100,000+ on/off cycles.

C. Each control valve shall be individually factory flow tested and calibrated to deviate by no more than ± 5% through the entire operating differential pressure range without the use of additional electronics. All valves shall be tested on a test stand calibrated and verified with traceability to NIST standards.

D. The control valve operating differential pressure range shall be 5-70 or 10-90 PSID [0.34-4.83 or 0.69-6.2 bar], and shall be equal to or greater than the associated pump's design head pressure.

E. Each control valve shall have a calibrated performance tag listing the measured flow rate in rotation increments of 10 degrees through full stroke. Multi-turn actuators are not acceptable.

F. Control valves shall be factory set not-to-exceed the coil design flow rate.

G. Balancing labor, balancing valves and flow limiting devices are not required.

H. Valve bodies 1½" [40mm] and smaller shall be brass. Valve bodies 2" [50mm] and larger shall be ductile iron. Internal control surfaces and pressure regulator components shall be brass, stainless steel, carbon steel, EPDM or Teflon®.

I. All control valves shall have three (3) factory-installed Pressure/Temperature ports to allow factory and field verification of flow and proper operation. These ports shall be located at the inlet, intermediate, and outlet locations of the valve. The intermediate port must be located between the control surface and pressure regulator.

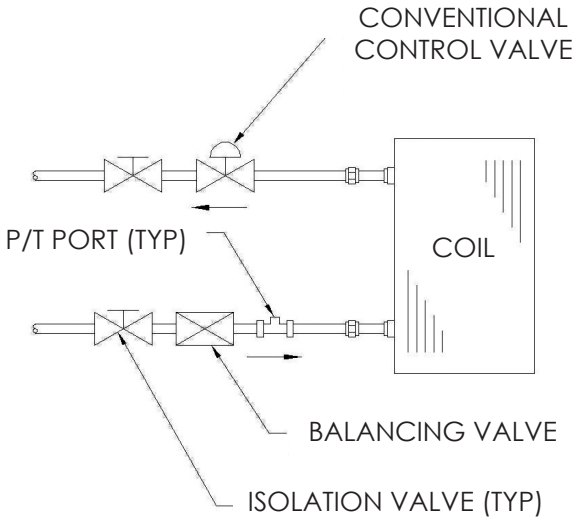
J. Control valve flow characteristics shall be field-modifiable, and may be modified in-line.

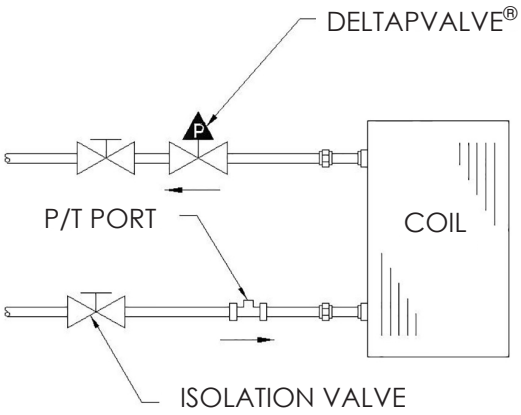
K. Control valves shall be warranted by the manufacturer for a full 10 years from the date of purchase. The warranty provided by the actuator manufacturer shall apply to actuators.

L. The control valve manufacturer guarantees that the heating and cooling coils will meet or exceed design delta T performance at all load conditions as projected by an AHRI certified coil program at time of commissioning, or the valves are free.

Piping Schematics

Simplify Piping and Building Connections





Conventional Control Valve

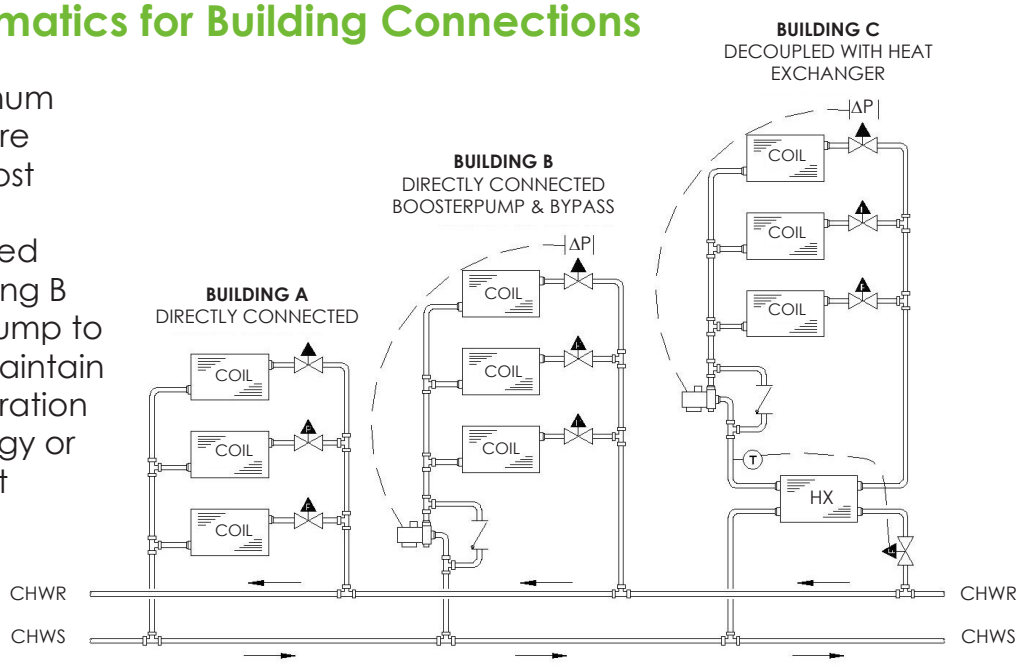
1. Flow will vary through the coil as system pressure changes.
2. Typical valve sizing practice results in poorly sized control valves throughout the system.
3. Balancing valves limit flow and add to the system pressure drop.

DeltaPValve®

1. Flow through the coil remains constant, independent of system pressure changes.
2. DeltaPValves are sized by maximum flow rate only.
3. No balancing valves are required, even as the system changes or expands.

Typical Piping Schematics for Building Connections

Always maintain the minimum required differential pressure across the hydraulically most remote valve. Building A configuration is the preferred piping arrangement. Building B configuration allows the pump to run only as necessary to maintain delta P. Building C configuration is common for district energy or large campus facilities (not recommended for new installation).



Industry Challenges

Delta T (the difference between supply and return water temperatures) is an important measure of total performance in heating and cooling distribution systems. The DeltaPValve® matches water side to air side load to minimize water flow.

$$\Delta T = \frac{24 \times Tons}{GPM} \qquad \Delta T = \frac{BTUH}{500 \times GPM}$$

Low ΔT Syndrome

- Typical hydronic systems aren't able to maintain the precision control required to achieve design or better delta T.
- Variable operating conditions, pressure fluctuations, and improper equipment selection all contribute to increased flow rates and low delta T.
- Flow-limited systems fail to deliver the full installed capacity.

Symptoms of Low ΔT

- Running additional equipment
- Blending return water with supply
- Higher supply fan speeds
- Insufficient system pressure at remote air handlers

Results of Low ΔT

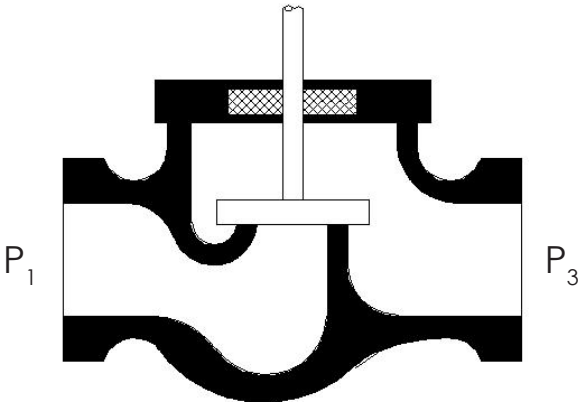
- Wasted energy and money
- Stranded heating and cooling capacity
- Loss of comfort control
- Unnecessary system complexity
- Quick depletion of thermal energy storage
- Simultaneous heating and cooling

A System Solution

Precise flow control at chilled and heating water coils is the only way to achieve the system stability required to maximize installed production and distribution infrastructure while minimizing system energy consumption.

Your Control Decision

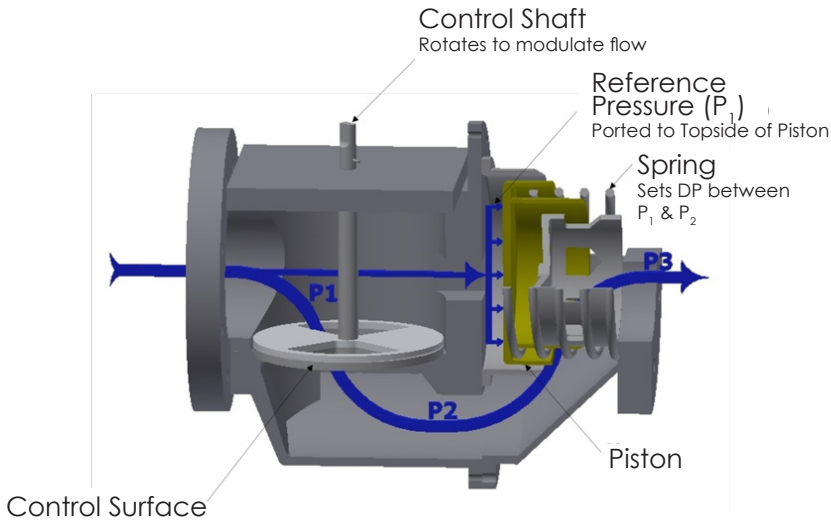
Conventional Control Valve



$Q = Cv \times \sqrt{\Delta P}$
(ΔP Varies)

The ΔP (P_1-P_2) across a conventional valve changes with system pressure fluctuations. Coil flow will vary regardless of changes in load.

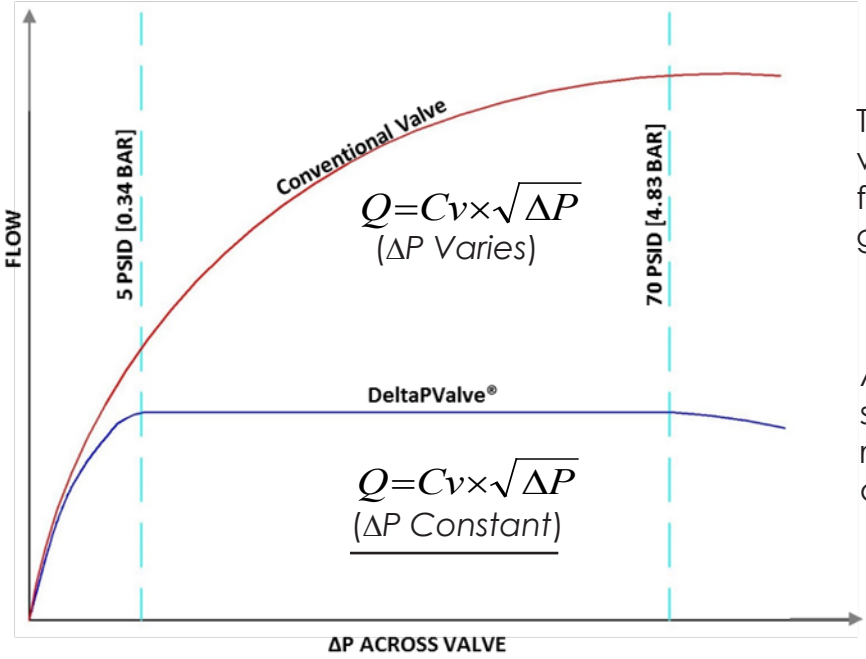
A Better Way to Control Flow: DeltaPValve®



$Q = Cv \times \sqrt{\Delta P}$
(ΔP Constant)

The ΔP across the control surface (P_1-P_2) in a pressure independent DeltaPValve® remains constant despite system pressure fluctuations. Coil flow only varies when the actuator rotates the control shaft to accommodate changes in load.

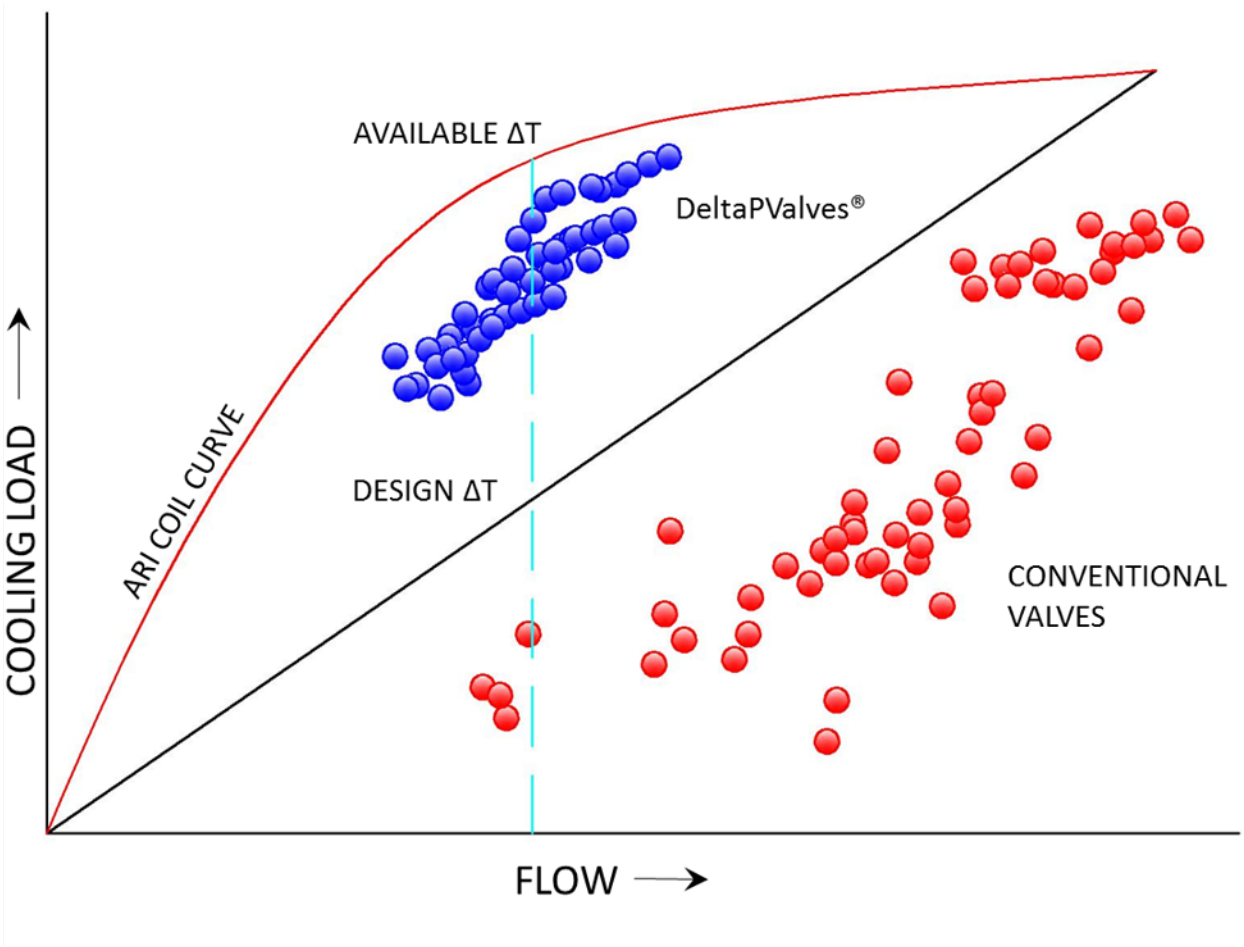
Flow Performance



The ΔP (P_1-P_3) across a conventional valve changes with system pressure fluctuations. Coil flow will vary regardless of changes in load.

As the minimum ΔP across a pressure independent DeltaPValve® is reached, flow remains constant at any setting.

Coil Performance

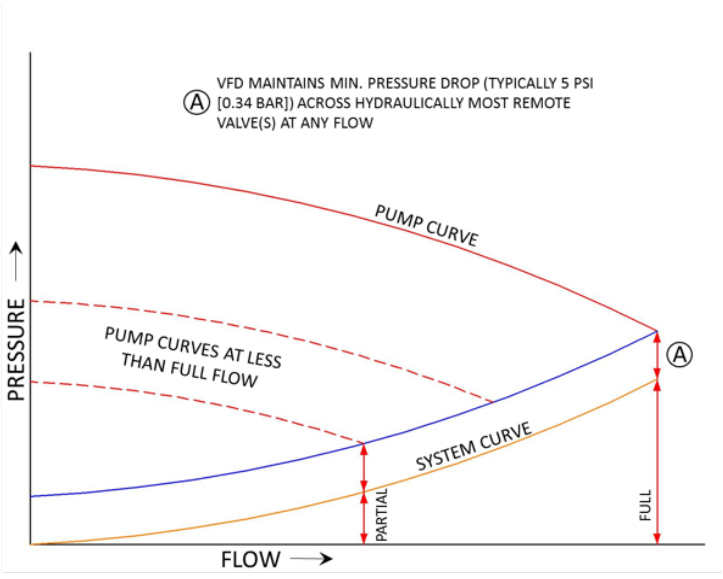


Variable Speed Pumping System

DeltaPValves®, combined with variable speed pumping, will optimize system performance and minimize energy consumption.

Conventional piping systems experience wide pressure fluctuations, even with variable speed pumps and complex controls. This results in imprecise control and low delta T, and limits the benefits of the drives.

DeltaPValves® stabilize system flow and high delta T results at each heating and cooling coil.



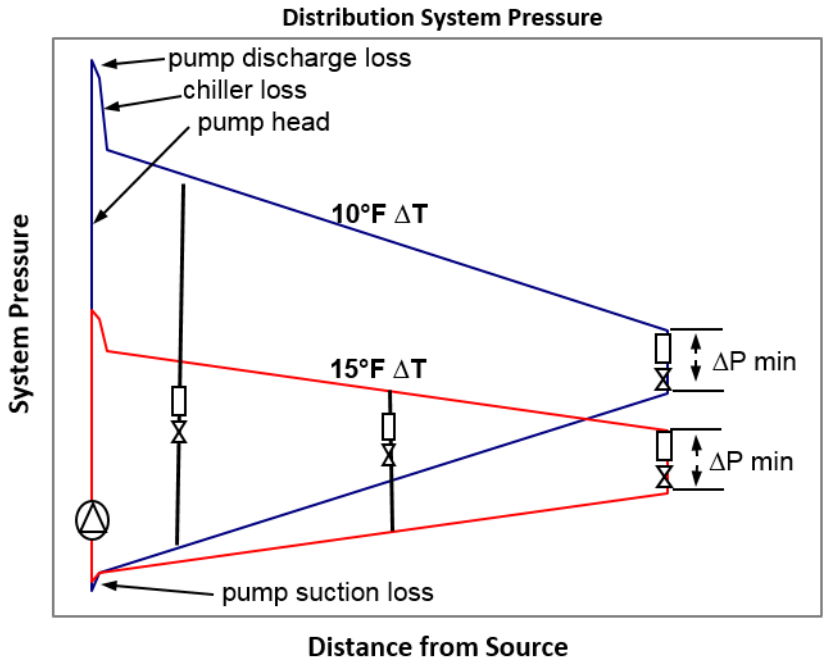
The DeltaPValve® Application

Achieve High ΔT to Minimize Energy

1/2 Flow = 1/4 Head = 1/8 Power

The key to reducing pump energy consumption is achieving high delta T and minimizing flow while still serving the heating or cooling load.

Reducing the flow required at building coils significantly reduces the necessary pump head and brake horsepower.



More Capacity. Less Capital.

Achieving high delta T allows existing production and distribution systems to serve larger loads. This reduces pumping and piping constraints, extends thermal storage hours and helps realize full plant capacity.

Capacity Limit	Delta T °F [°C]	Available Capacity	Comment
Chiller plant 12°F ΔT design [6.7°C ΔT design]	10 [5.6]	83%	Chiller plant becomes flow limited at peak loads with low delta T
	12 [6.7]	100%	
	15 [8.3]	100%	
Thermal Storage 480K gal., 12°F ΔT design [1,817 m^3, 6.7°C ΔT design]	10 [5.6]	83%	TES capacity can be proportionally increased with higher delta T
	12 [6.7]	100%	
	15 [8.3]	125%	
Distribution Pipe 10", 2,000 GPM, 8 fps [250 mm, 126 L/S, 2.4 mps]	10 [5.6]	80%	Pipe capacity can be proportionally increased with higher delta T
	12 [6.7]	100%	
	15 [8.3]	125%	

Frequently Asked Questions

What is "delta T" (ΔT)?
Delta T is the difference between entering and leaving water temperatures at a heating or cooling coil.

Why is delta T important?
Systems that operate with a high delta T are more efficient. Systems operating with a low delta T require more flow, more running equipment and consume more energy.

How many existing systems achieve delta T of design or greater at any load conditions?
With over 30 years of experience in system design and modification, Flow Control Industries estimates less than 1% of conventional operating systems achieve design delta T.

Why do I need DeltaPValves to achieve a high delta T?
DeltaPValves deliver precision control over a wide operating range with turndown exceeding 100:1. DeltaPValves precisely match flow to the heating or cooling load, resulting in a high delta T.

Will the required 5 PSID differential across the DeltaPValve® increase my pump energy consumption?
No. The amount of pump energy consumed is a function of both head pressure and flow rate. Because DeltaPValves improve coil heat transfer and reduce the flow required to serve the load, pump energy consumption is minimized.

What is the expected life for DeltaP-Valves?
DeltaPValves can be expected to last 20 - 30 years in typical systems. Internal components are high quality and should never need replacement.

Why should I use the DeltaPValve® over other pressure independent control valves?
No other manufacturer approaches hydronic system optimization with the breadth of experience and system expertise of Flow Control Industries. DeltaPValve® systems have consistently increased system capacity and improved energy efficiency while simplifying installation and operation of hydronic systems.

Are DeltaPValves selected the same way as pressure dependent valves?
No. Pressure dependent valves are selected using a Cv and pressure drop, often resulting in oversized, underperforming valves. DeltaPValves are sized only with the coil design flow rate, for simple selection in new designs and easy integration into existing systems.

Can I use my DeltaPValve® to indicate flow?
Yes, it is possible to field verify flow on each DeltaPValve® using the three pressure/temperature posts (standard) and valve position. Every DeltaPValve® is factory tested and tagged with the actual flow rate in 10 degree increments of rotation. If you know the valve position and verify minimum pressure, you know the flow rate.

Flow Table & Commissioning Checklist

DeltaPValve® Series	Max GPM [liters per second]							
	5 to 70 PSID [0.34 to 4.83 bar]							
½" MDP [15 mm]	0.5 [0.03]	1.0 [0.06]	1.5 [0.09]	2.0 [0.12]	2.5 [0.15]	3.0 [0.18]	4.0 [0.25]	5.0 [0.31]
¾" LDP [20 mm]	6 [0.37]		8 [0.50]		11 [0.69]			
1 ¼" LDP [32 mm]	18 [1.13]		24 [1.51]		32 [2.01]			
1 ½" LDP [40 mm]	40 [2.52]			50 [3.15]			**10 to 90 PSID [0.69 to 6.20 bar]**	
2" HDP [50 mm]	52 [3.2]		75 [4.7]		90 [5.6]		112 [7.0]	
3" HDP [80 mm]	126 [7.9]		150 [9.4]		180 [11.3]		209 [13.1]	
4" EDP [100 mm]	248 [15.6]		308 [19.4]		326 [20.5]		430 [27.1]	
6" EDP [150 mm]	400 [25.2]		500 [31.5]		590 [37.2]	650 [41.0]	800 [50.4]	
8" IDP [200 mm]	700 [44.0]		900 [56.0]		1130 [71.0]	1320 [83.0]	1750 [110.0]	
10" NDP [250 mm]	2200 [138.0]							
12" NDP [300 mm]	3000 [189.0]							
14" NDP [350 mm]	4400 [278.0]							
16" NDP [400 mm]	5500 [347.0]							

DeltaPValve Commissioning Checklist

DeltaPValves do not need to be balanced; however, it is recommended after installation to commission the valves to ensure proper operation. This checklist does not apply to DeltaP-Valves installed in the central plant to control flow.

_____ Note the date (mm/dd/year)
_____ Note the DeltaPValve® serial number (on flow tag)
_____ Verify valve is installed in the proper location (match flow tag to unit)
_____ Verify valve is installed in the proper direction of flow (see arrow on casting)
_____ Verify that balancing valves are not installed (preferred)
_____ Verify isolation valves to the circuit are open
_____ When the valve is flowing, verify that minimum differential pressure is available measured across ports P1 and P3 (built into the valve)
_____ Apply compatible control signal to the actuator and verify that the actuator strokes through the full range of flow

DELTA P VALVE

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