PRODUCT SPECIFICATION

PICV PS A 0208

HIGH CAPACITY

PRESSURE INDEPENDENT CONTROL VALVE

PICV

SIZES:
2 1/2 - 10 INCH

WARREN CONTROLS

Warren Controls Pressure Independent Control Valve with the authority to maximize stability, efficiency and energy savings.

2600 EMRICK BLVD • BETHLEHEM, PA 18020 • USA
800-922-0085 • WWW.WARRENCONTROLS.COM

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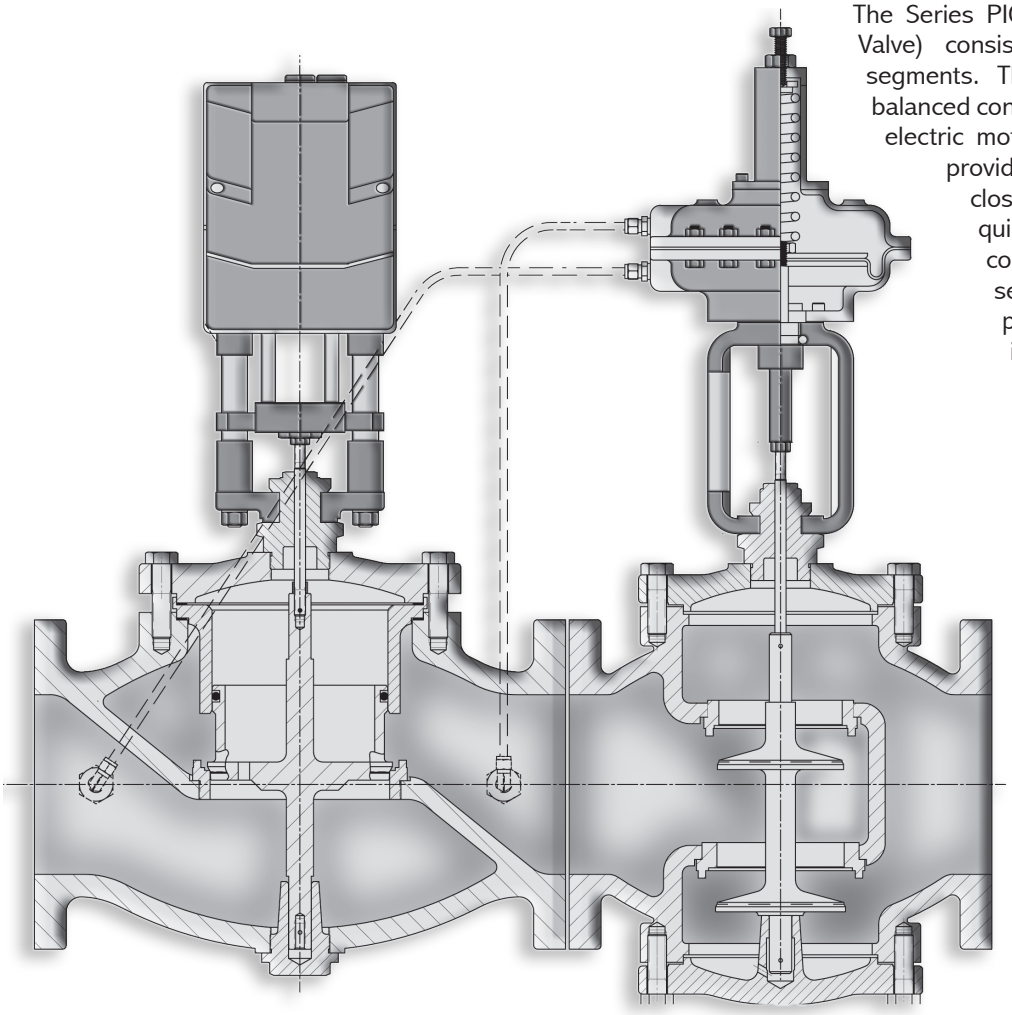
AGENCY APPROVALS

CRN REGISTERED — ALL SERIES 2900 VALVES

ISO 9001 : 2000 REGISTERED FIRM

OPERATION:

One of the primary factors that influence the flow of fluid through a control valve is the amount of pressure, or differential pressure across it. At any point in valve plug travel, flow through a valve will typically increase if differential pressure is raised, and decrease if it is lowered. A change in pumping pressure can therefore produce a change in rate of flow that is not related to the system controller's output signal. With pressure independence, the amount of water flowing through a valve and the controlled load (i.e. heat exchanger coil) is more accurately controlled as a function of the control signal, and is less dependent upon varying pump pressure. Stability in the control system is enhanced when pressure independence is provided, and the control valve's installed flow characteristic more closely resembles its inherent, or constant-pressure characteristic.



The Series PICV (Pressure Independent Control Valve) consists of two functional controlling segments. The first segment is a pressure-balanced control valve, actuated by a high-thrust electric motor actuator. The electric actuator provides precise positioning of the valve closure mechanism, and responds quickly and precisely to the electronic control signals supplied to them. The second segment is a differential pressure control valve that operates independently of the control valve segment. This segment is self-powered (self-operating) and does not burden or interact with the building automation control system. By quickly raising or lowering its own resistance to flow, the differential pressure control segment of the PICV regulates and stabilizes the pressure drop across the control valve segment by absorbing unused head pressure. This compensates for changes in pumping pressure resulting from pump switching or from varying flow demands in it's own, or parallel flow paths and results in pressure independent operation.

Control Valve Authority:

A mathematical representation for how a control valve will perform in circuit. In general terms, it is a ratio for what the full load pressure drop is on the control valve with respect to the full load pressure drop of the entire circuit including the control valve.

Valve authority should be in the general range of 0.2 - 0.5. If the value gets too low, the control valve looses its rangeability where low demand control performance suffers and nonlinearities throughout the control range are more dramatic. If the value is too high, the valve may be a bit small for the job and generally is not making efficient use of energy.

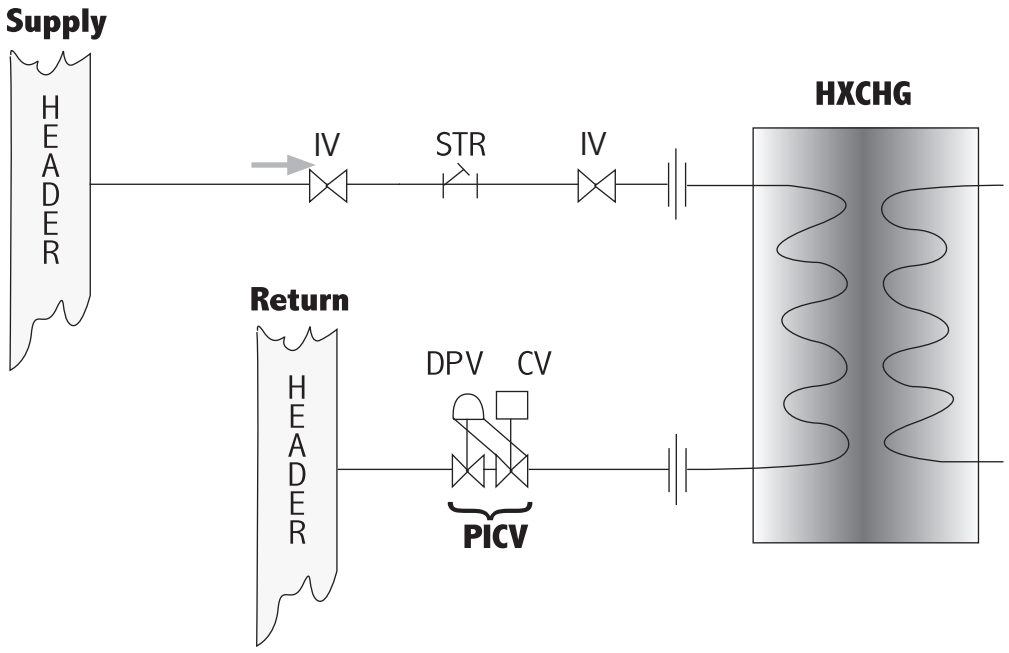
Control Valve Authority Can Be Expressed as:

$$N = \Delta Pcv / (\Delta Pcv + \Delta Prcc)$$

where **N** = Control Valve Authority

ΔPcv = Differential pressure of Control Valve Element when under full open - full load condition

ΔPrcc = Differential pressure of 'Remaining Control Circuit' under same full load condition.



IF YOU HAVE A SYSTEM THAT IS COMPLETELY CLOSED LOOP AND UNTO ITSELF, THEN ΔPRCC TRULY DOES REPRESENT EVERYTHING ELSE IN THE CIRCUIT.

HOWEVER... If the circuit is actually a sub circuit and part of a larger loop, whereby a degree of inherent pressure isolation exists from interaction with the main loop, largely due to the inherent size and capacity of the main loop, as is the case in say for a main on a district cooling loop,

THEN...ΔPrcc **may** only be calculated for elements upstream of the control valve back to the main loop as there will be no interactive influence by the control valve on the elements downstream, as would be realized on a truly closed loop system.

THEREFORE...A sub circuit of a district main can be considered open loop, and Valve Authority **may** be calculated against elements upstream of the control valve up to the supply header.

This is demonstrated in the diagram to the right, where ΔPrcc is defined as elements under the influence of the Control Valve up to the main header, upstream of the Control Valve element.

IT IS CLEAR THAT THE MAXIMUM ALLOWED PRESSURE DROP ACROSS INDIVIDUAL LOOPS WITHIN PLOTS OF LAND IS A FUNCTION OF THE:

- pump size
- distance of the plot from the cooling plants
- loop design within the plot, i.e. number of loops, pipe size, heat exchanger size
- control valves

MOUNTED IN HORIZONTAL PIPE ONLY WITH ACTUATORS VERTICALLY ABOVE VALVE ASSEMBLE

TYPICAL SPECIFICATION

The Pressure independent Control Valve (PICV) shall consist of two functional controlling segments.

The first segment senses and regulates a preset adjustable flowing differential pressure across the control valve segment from 3 to 6 PSID, factory preset to customer's specifications, with a factory default of 5 PSID.

The second is an electrically actuated control valve, capable of responding to a control signal from a controller, not part of the PICV.

Both segments include pressure balancing control elements of industrial quality for optimum control performance in the presence of high system pressures and ensuring long life. Stainless steel trim shall be used when flowing differential pressures of the PICV exceed 100 PSID to a maximum of 150 PSID while bronze or stainless steel trim may be used for pressures under 100 PSID.

The electronic control valve segment shall accept all common control signals of 4-20 mA, 0 — 20 mA, 0 — 10 Vdc, 2 — 10 Vdc, not exceed a power consumption of 25 VA, provide a minimum of ANSI Class III leakage in the shut position to a maximum shut off pressure of 150 PSIG. The electric actuator is capable of Fail Open or Fail Closed, field selectable, with a wall mounted back-up control module.

The pressure independent control valve shall be manufactured in accordance with ISO 9001 — 2000. Use Warren Controls #PICV-____-____-__-____

- The VM actuators can be furnished with optional battery backup for "fail safe" operation.
- Differential Pressure compensators (DP) are Type 72 valve body assemblies with differential diaphragm actuators.
- CV and DP segments are bolted together, complete with sensing lines.
- Flange dimensions are in accordance with ANSI B16.1.
- Weights are in pounds, dimensions in inches.

VALVE BODIES

Body Material:	Cast Iron
End Connections:	ANSI 125 Lb. RF Flanges
Trim Designs:	T23 - Single Seat Cylinder Balanced, ANSI Class III Leakage
	T22 and 472 - Double Seat Balanced, ANSI Class III Leakage
Trim Material:	Bronze or 300 Series Stainless Steel
	EPDM Seal (T23 w/Bronze Trim)
	Fluoraz Seal (T23 w/Stainless Steel Trim)
Fluid:	Chilled Water Typical, Water or Water/Glycol from 35 °F- 180°F (2°C - 82°C)
Trim Limits:	Stainless Steel: MAX Flowing Differential Pressure, 150 PSIG (10.3 BARG)
	Bronze: MAX Flowing Differential Pressure, 100 PSIG (6.9 BARG)
Packing:	Long-Life Multi-Stack EPDM Lip Packing - Water / Water-Glycol Service

ELECTRIC ACTUATOR SPECIFICATIONS (VM-1500E AND VM-5000E)

Valve Usage:	VM-1500E (Valve sizes 2-1/2, 3, & 4 inch), VM-5000E (Valve sizes 5, 6, 8, & 10 inch)
Control Signal:	4-20 mAdc (Factory Setting), 0-20 mAdc, 0-10 Vdc or 2-10 Vdc
	and Floating, Self-Adjusting, Field Selectable (Dip Switch)
Power Consumption:	VM-1500E 12VA, VM-5000E 25VA
Timing:	VM-1500E 102 Seconds / Inch, VM-5000E 76 Seconds / Inch
Feedback Signal:	0-10 Vdc or 2-10 Vdc
Failure Mode:	Fail-As-Is (Without VMS-25 Power Pack)
	Fail-Safe (With VMS-25 Power Pack)
Manual Override:	Yes
Construction:	Polycarbonate Motor Housing with Steel Linkage & Yoke.
	Case has one 1/2" NPSM Conduit Adapter
Connections:	Coded Screw Terminals
Locations:	NEMA Type 3 / IP54
Temperature Limits:	Ambient 32°F - 122°F (0°C - 50°C)
Mounting:	Factory Aligned, Vertical Above Centerline of Control Valve
	Consult factory for preconfigured alternate orientations

VMS-25 BCM (BACK-UP CONTROL MODULE) SPECIFICATIONS

Required for Fail Safe Operation	
Failure Direction:	Field Selectable
Power Consumption:	24VAC, 40VA
Construction:	Battery w/Circuit Board & Transformer, in Nema 4 Enclosure
Mounting:	Wall Mount
Approx LxWxD:	8.75 in. x 6.97 in. x 5.19 in.
	See Drawing on Page 9
Weight:	4.3 lbs

DOUBLE ACTING DIAPHRAGM ACTUATOR WITH SPRING ASSIST (SERIES 2)

Control Signal:	Differential Pressure from Control Valve,
	3 - 6 PSIG (0.2 - 0.4 BARG) Nominal, Preset at 5 PSIG
	150 PSIG (10.3 BARG) Max Static
Fluid:	Chilled Water Typical, Water or Water/Glycol from 35 °F- 180°F (2°C - 82°C)
Spring Pack:	Preset to 5 PSIG unless specified, adjustable from 3 to 6 PSIG
Construction:	Ductile Iron, epoxy coated, epoxy coated spring, SS components,
	Woven neoprene diapragm.
Temperature Limits:	Ambient 32°F - 122°F (0°C - 50°C)
Mounting:	Factory Aligned, Vertical Above Centerline of Control Valve
	Consult factory for preconfigured alternate orientations

CONFIGURATIONS

PICV - □□□□□ - 472 - □□ - □□□				
PRODUCT	CONTROL VALVE SEGMENT	DIFFERENTIAL PRESSURE VALVE SEGMENT	TRIM MATERIAL	VALVE SIZES
	T22 Double Seat Balanced Standard Port	**472** Double Seat Balanced	**BR** Bronze	**250** 2.5 inches
	T22R Double Seat Balanced Reduced Port		**SS** 300 Stainless Steel	**300** 3 inches
	T22R2 Double Seat Balanced Reduced Port 2 sizes			**400** 4 inches
	T23X Single Seat Cylinder Balanced Extended Port			**500** 5 inches
	T23 Single Seat Cylinder Balanced Standard Port			**600** 6 inches
	T23R Single Seat Cylinder Balanced Reduced Port			**800** 8 inches
	T23R2 Single Seat Cylinder Balanced Reduced Port 2 sizes			**010** 10 inches

PICV Code Location and Selection:

Use the table to specify PICV configuration (Part Number) or to determine configuration construction. See Max Flow vs. Differential Pressure charts for available configuations and capacities.

PICV Sizing and Selection:

While it may be common in many tempered water loops to simply size valves on pipe size, all factors should be considered. Static pressure, close off pressure, flowing differential pressure, MIN and MAX flows and temperature to name a few. The Warren Controls PICV has a Rangeability of 50:1, meaning that good control performance can be achieved when the minimum flow requirement is as low as 1/50 of the maximum flowing GPM. Simply identify the desired Set Differential Pressure to identify Model and Size by Maximum Flow. Assuming the Minimum Flow is within 1/50 of the Maximum, the proper choice has been made.*

***NOTE:** The maximum differential pressure across the entire PICV is approximately 2 x (Set Differential Pressure) at max flow

MAX FLOW VS. DIFFERENTIAL PRESSURE

PICV-T23-472-BR-250 & PICV-T23-472-SS-250	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
2 1/2" STANDARD PORT	113	130	145	159
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	7.10	8.2	9.17	10.04

PICV-T23R-472-SS-300	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
3" REDUCED PORT	130	150	168	184
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	8.20	9.46	10.58	11.59

PICV-T23-472-BR-300 & PICV-T23-472-SS-300	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
3" STANDARD PORT	156	180	201	220
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	9.83	11.36	12.70	13.91

PICV-T23R2-472-SS-400	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
4" REDUCED PORT (2-Sizes)	203	234	262	287
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	12.78	14.76	16.51	18.08

PICV-T23R-472-SS-400	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
4" REDUCED PORT	249	288	322	353
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	15.70	17.17	20.31	22.25

MAX FLOW VS. DIFFERENTIAL PRESSURE

PICV-T23-472-BR-400 & PICV-T23-472-SS-400	SET DIFFERENTIAL PRESSURE (PSIG)			
4" STANDARD PORT	3	4	5	6
	Maximum Flow (GPM)			
	294	340	380	416
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	18.58	21.45	23.98	26.27

PICV-T23R2-472-BR-500 & PICV-T23R2-472-SS-500	SET DIFFERENTIAL PRESSURE (PSIG)			
5" REDUCED PORT (2-Sizes)	3	4	5	6
	Maximum Flow (GPM)			
	352	406	454	497
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	22.18	25.61	28.64	31.37

PICV-T23R-472-BR-500 & PICV-T23R-472-SS-500	SET DIFFERENTIAL PRESSURE (PSIG)			
5" REDUCED PORT	3	4	5	6
	Maximum Flow (GPM)			
	410	474	530	580
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	25.90	29.90	33.43	36.62

PICV-T23-472-BR-500 & PICV-T23-472-SS-500	SET DIFFERENTIAL PRESSURE (PSIG)			
5" STANDARD PORT	3	4	5	6
	Maximum Flow (GPM)			
	468	540	604	661
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	29.50	34.07	38.09	41.72

PICV-T23R2-472-BR-600 PICV-T23R2-472-SS-600	SET DIFFERENTIAL PRESSURE (PSIG)			
6" REDUCED PORT (2-Sizes)	3	4	5	6
	Maximum Flow (GPM)			
	476	550	615	674
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	30.03	34.70	38.80	42.52

MAX FLOW VS. DIFFERENTIAL PRESSURE

PICV-T23R-472-BR-600 PICV-T23R-472-SS-600	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
6" REDUCED PORT	546	630	704	772
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	34.45	39.75	44.42	48.71

PICV-T23-472-BR-600 PICV-T23-472-SS-600	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
6" STANDARD PORT	624	720	805	882
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	39.37	45.42	50.79	55.65

PICV-T23X-472-BR-600 PICV-T23X-472-SS-600	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
6" SUPER PORT (EXTENDED STROKE)	727	840	939	1029
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	45.87	53.00	59.24	64.92

PICV-T22R2-472-SS-800	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
8" REDUCED PORT (2-Sizes)	901	1040	1163	1274
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	56.84	65.61	73.37	80.38

PICV-T22R-472-SS-800	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
8" REDUCED PORT	1031	1190	1330	1457
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	65.05	75.08	83.91	91.92

MAX FLOW VS. DIFFERENTIAL PRESSURE

PICV-T22-472-BR-800 PICV-T22-472-SS-800	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
8" STANDARD PORT	1178	1360	1521	1666
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	74.32	85.80	95.96	105.11

PICV-T22R2-472-SS-010	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
10" REDUCED PORT (2-Sizes)	1273	1470	1644	1800
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	80.31	92.74	103.72	113.56

PICV-T22R-472-SS-010	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
10" REDUCED PORT	1455	1680	1878	2058
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	91.8	105.99	118.48	129.84

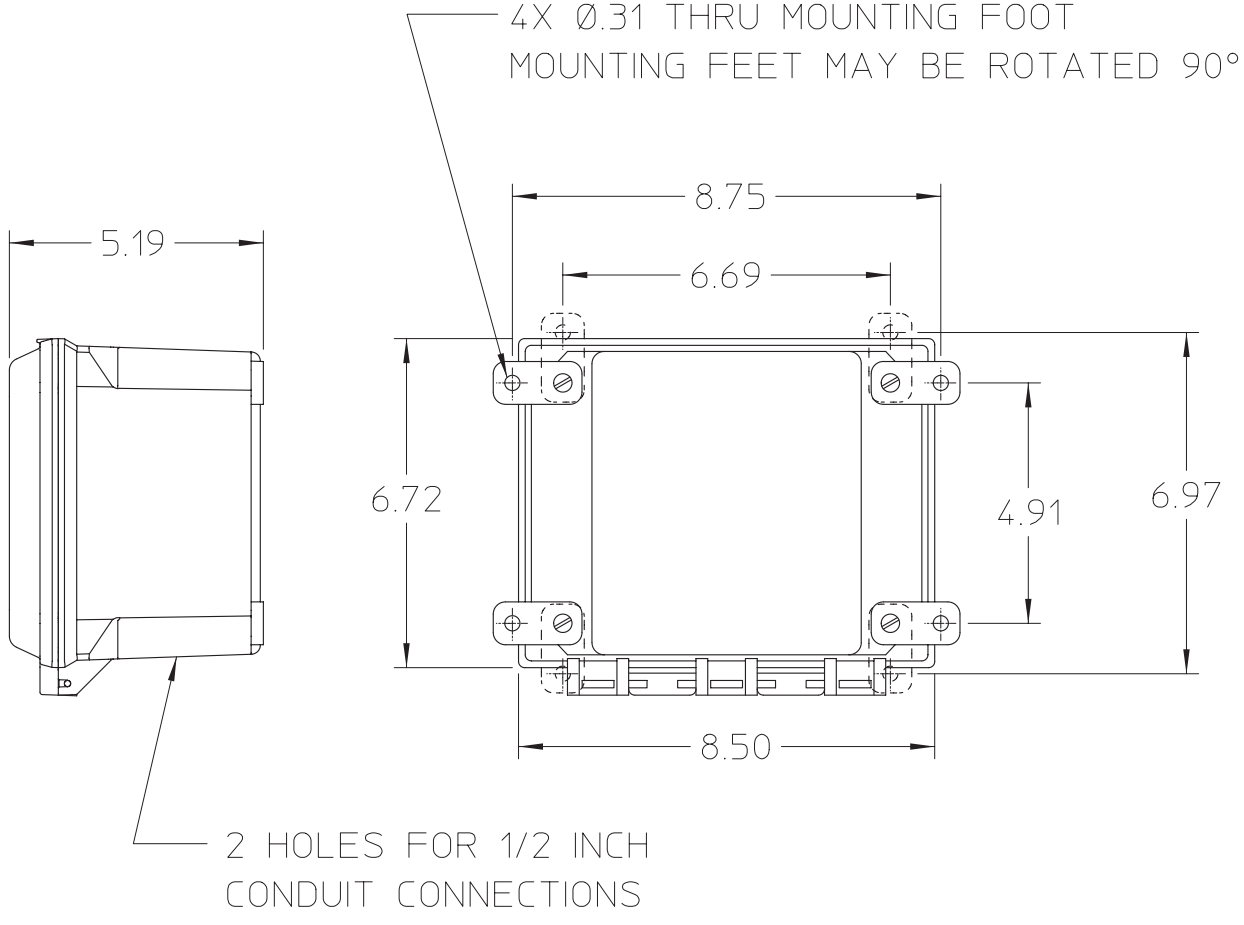
PICV-T22-472-BR-010 PICV-T22-472-SS-010	SET DIFFERENTIAL PRESSURE (PSIG)			
	3	4	5	6
	Maximum Flow (GPM)			
10" STANDARD PORT	1663	1920	2147	2352
	SET DIFFERENTIAL PRESSURE (BARG)			
	0.21	0.28	0.34	0.41
	MAXIMUM FLOW (LPS)			
	104.92	121.13	135.45	148.39

PICV WEIGHTS

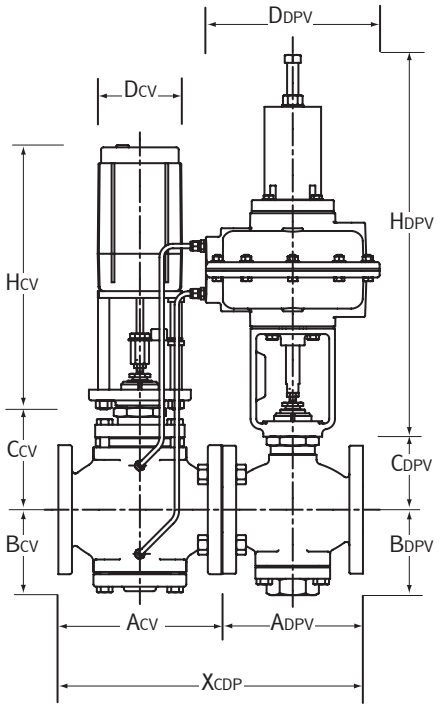
MODEL	WT (LBS)	MODEL	WT (LBS)
PICV-T23-472-BR-250	100	PICV-T23X-472-BR-600	396
PICV-T23-472-SS-250	100	PICV-T23X-472-SS-600	396
		PICV-T23-472-BR-600	396
PICV-T23-472-BR-300	130	PICV-T23-472-SS-600	396
PICV-T23-472-SS-300	130	PICV-T23R-472-BR-600	396
PICV-T23R-472-SS-300	130	PICV-T23R-472-SS-600	396
		PICV-T23R2-472-BR-600	396
PICV-T23-472-BR-400	220	PICV-T23R2-472-SS-600	396
PICV-T23-472-SS-400	220		
PICV-T23R-472-SS-400	220	PICV-T22-472-BR-800	610
PICV-T23R2-472-SS-400	220	PICV-T22-472-SS-800	610
		PICV-T22R-472-SS-800	610
PICV-T23-472-BR-500	303	PICV-T22R2-472-SS-800	610
PICV-T23-472-SS-500	303		
PICV-T23R-472-BR-500	303	PICV-T22-472-BR-010	903
PICV-T23R-472-SS-500	303	PICV-T22-472-SS-010	903
PICV-T23R2-472-BR-500	303	PICV-T22R-472-SS-010	903
PICV-T23R2-472-SS-500	303	PICV-T22R2-472-SS-010	903

Weights do not include VMS-25 BCM (Add 4.3 lbs)
Actual shipping weights may vary

DIMENSIONS
VMS 25 BCM



DIMENSIONS
PICV SIZES: 2.5-4 INCHES

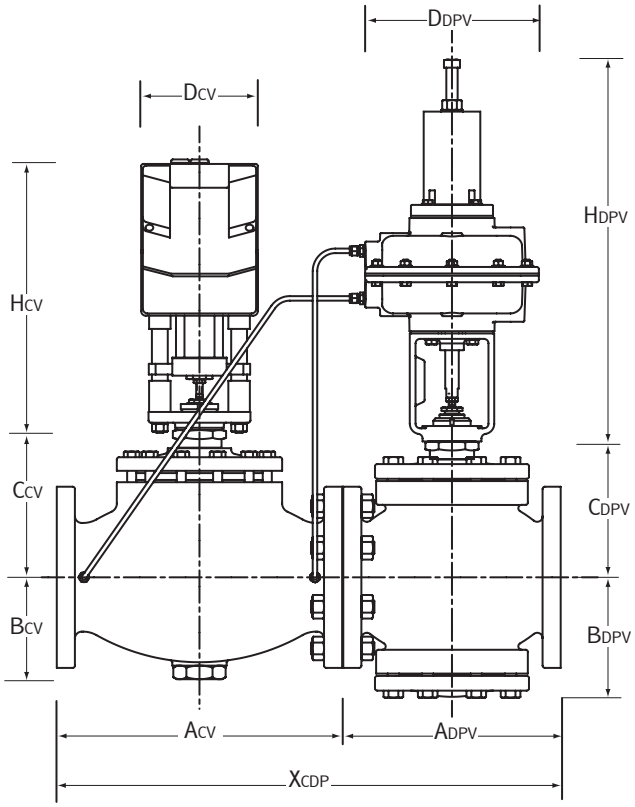


Control Valve (Left)

MODEL LISTING	SIZE	Acv	Bcv	Ccv	Dcv	Hcv
PICV-T23-472-BR-250	2.5”	9”	4.56”	5.75”	4.75”	14.5”
PICV-T23-472-SS-250	2.5”	9”	4.56”	5.75”	4.75”	14.5”
PICV-T23-472-BR-300	3”	10”	5.25”	6.56”	4.75”	14.5”
PICV-T23-472-SS-300	3”	10”	5.25”	6.56”	4.75”	14.5”
PICV-T23R-472-SS-300	3”	10”	5.25”	6.56”	4.75”	14.5”
PICV-T23-472-BR-400	4”	13”	6.19”	7.69”	4.75”	14.5”
PICV-T23-472-SS-400	4”	13”	6.19”	7.69”	4.75”	14.5”
PICV-T23R-472-SS-400	4”	13”	6.19”	7.69”	4.75”	14.5”
PICV-T23R2-472-SS-400	4”	13”	6.19”	7.69”	4.75”	14.5”

Differential Pressure Valve (Right)

MODEL LISTING	SIZE	Adpv	Bdpv	Cdpv	Ddpv	Hdpv	Total combined Xcdp
PICV-T23-472-BR-250	2.5”	7.75”	4.69”	4.13”	9.5”	26.25”	16.75”
PICV-T23-472-SS-250	2.5”	7.75”	4.69”	4.13”	9.5”	26.25”	16.75”
PICV-T23-472-BR-300	3”	9”	4.93”	4.38”	9.5”	26.25”	19”
PICV-T23-472-SS-300	3”	9”	4.93”	4.38”	9.5”	26.25”	19”
PICV-T23R-472-SS-300	3”	9”	4.93”	4.38”	9.5”	26.25”	19”
PICV-T23-472-BR-400	4”	11.38”	6.25”	5.19”	9.5”	26.25”	24.38”
PICV-T23-472-SS-400	4”	11.38”	6.25”	5.19”	9.5”	26.25”	24.38”
PICV-T23R-472-SS-400	4”	11.38”	6.25”	5.19”	9.5”	26.25”	24.38”
PICV-T23R2-472-SS-400	4”	11.38”	6.25”	5.19”	9.5”	26.25”	24.38”



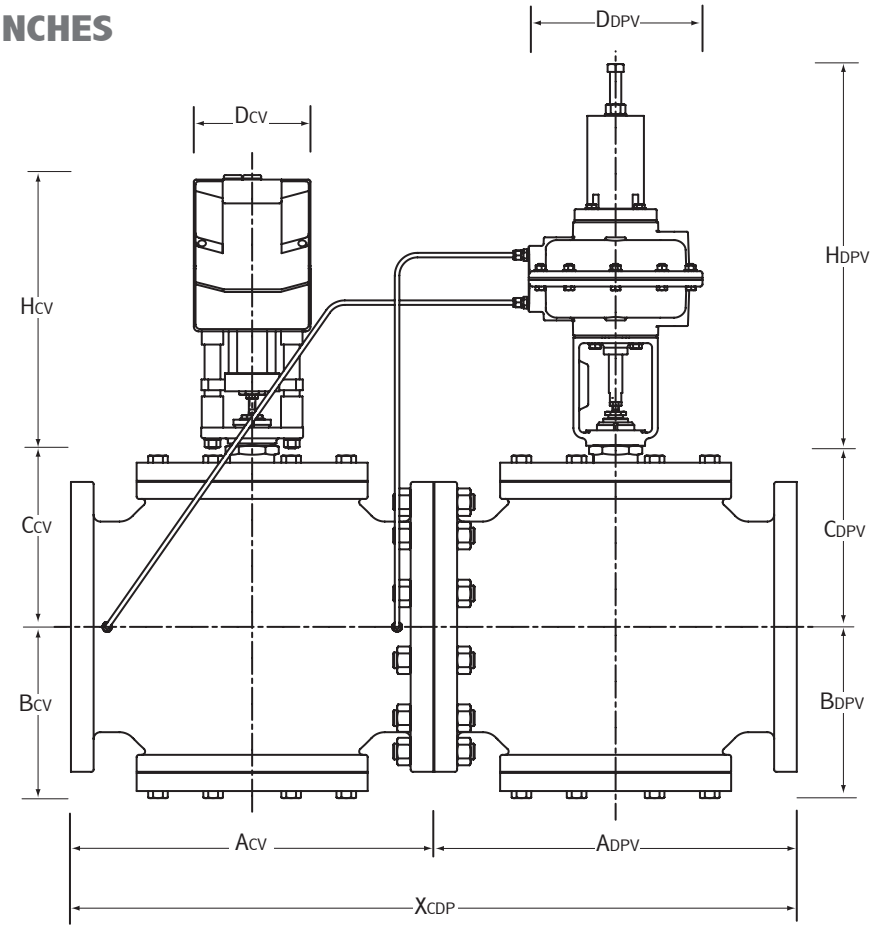
Control Valve (Left)

MODEL LISTING	SIZE	Acv	Bcv	Ccv	Dcv	Hcv
PICV-T23-472-BR-500	5”	15.75”	5.63”	8.13”	6.5”	14.88”
PICV-T23-472-SS-500	5”	15.75”	5.63”	8.13”	6.5”	14.88”
PICV-T23R-472-BR-500	5”	15.75”	5.63”	8.13”	6.5”	14.88”
PICV-T23R-472-SS-500	5”	15.75”	5.63”	8.13”	6.5”	14.88”
PICV-T23R2-472-BR-500	5”	15.75”	5.63”	8.13”	6.5”	14.88”
PICV-T23R2-472-SS-500	5”	15.75”	5.63”	8.13”	6.5”	14.88”
PICV-T23X-472-BR-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”
PICV-T23X-472-SS-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”
PICV-T23-472-BR-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”
PICV-T23-472-SS-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”
PICV-T23R-472-BR-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”
PICV-T23R-472-SS-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”
PICV-T23R2-472-BR-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”
PICV-T23R2-472-SS-600	6”	17.75”	6.37”	8.88”	6.5”	14.88”

Differential Pressure Valve (Right)

MODEL LISTING	SIZE	Adpv	Bdpv	Cdpv	Ddpv	Hdpv	Total combined Xcdp
PICV-T23-472-BR-500	5”	12”	6.69”	7.5”	9.63”	22.5”	27.75”
PICV-T23-472-SS-500	5”	12”	6.69”	7.5”	9.63”	22.5”	27.75”
PICV-T23R-472-BR-500	5”	12”	6.69”	7.5”	9.63”	22.5”	27.75”
PICV-T23R-472-SS-500	5”	12”	6.69”	7.5”	9.63”	22.5”	27.75”
PICV-T23R2-472-BR-500	5”	12”	6.69”	7.5”	9.63”	22.5”	27.75”
PICV-T23R2-472-SS-500	5”	12”	6.69”	7.5”	9.63”	22.5”	27.75”
PICV-T23X-472-BR-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”
PICV-T23X-472-SS-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”
PICV-T23-472-BR-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”
PICV-T23-472-SS-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”
PICV-T23R-472-BR-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”
PICV-T23R-472-SS-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”
PICV-T23R2-472-BR-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”
PICV-T23R2-472-SS-600	6”	14.13”	8.31”	7.63”	9.5”	26.25”	31.88”

DIMENSIONS
PICV SIZES: 8-10 INCHES



Control Valve (Left)

MODEL LISTING	SIZE	ACV	BCV	CCV	DCV	HCV
PICV-T22-472-BR-800	8”	16.25”	8.67”	9.63”	6.5”	14.88”
PICV-T22-472-SS-800	8”	16.25”	8.67”	9.63”	6.5”	14.88”
PICV-T22R-472-SS-800	8”	16.25”	8.67”	9.63”	6.5”	14.88”
PICV-T22R2-472-SS-800	8”	16.25”	8.67”	9.63”	6.5”	14.88”
PICV-T22-472-BR-010	10”	20”	9.5”	10”	6.5”	14.88”
PICV-T22-472-SS-010	10”	20”	9.5”	10”	6.5”	14.88”
PICV-T22R-472-SS-010	10”	20”	9.5”	10”	6.5”	14.88”

Differential Pressure Valve (Right)

MODEL LISTING	SIZE	ADPV	BDPV	CDPV	DDPV	HDPV	Total combined XCDP
PICV-T22-472-BR-800	8”	16.25”	8.69”	9.63”	9.5”	26.25”	32.5”
PICV-T22-472-SS-800	8”	16.25”	8.69”	9.63”	9.5”	26.25”	32.5”
PICV-T22R-472-SS-800	8”	16.25”	8.69”	9.63”	9.5”	26.25”	32.5”
PICV-T22R2-472-SS-800	8”	16.25”	8.69”	9.63”	9.5”	26.25”	32.5”
PICV-T22-472-BR-010	10”	20”	9.5”	10”	9.5”	26.25”	40”
PICV-T22-472-SS-010	10”	20”	9.5”	10”	9.5”	26.25”	40”
PICV-T22R-472-SS-010	10”	20”	9.5”	10”	9.5”	26.25”	40”

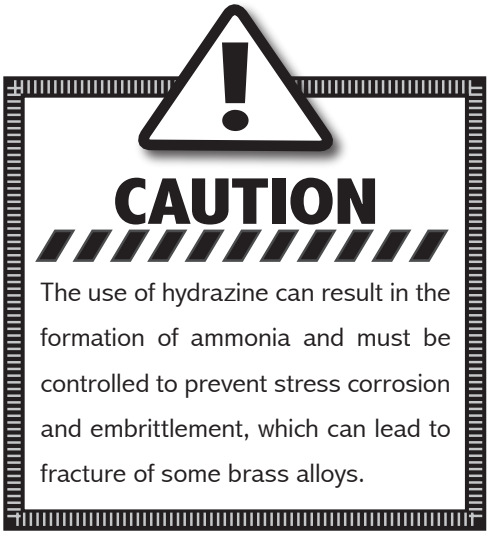
CONTROL VALVES IN HVAC WATER SYSTEMS

FLUID QUALITY AND SERVICE LIFE GUIDE LINES: The purpose of these guidelines is to avoid valve and water systems problems caused by poor water quality in HVAC systems. While all cooling and heating systems are susceptible to problems, closed chilled water systems, including those containing brine or glycol, are especially prone to system and valve problems. To achieve the satisfactory operation and maximum life of your Warren Controls valve, it is important that the following recommendations are adhered to and that a water treatment, filtration and control specialists be consulted before the system start-up.

WATER QUALITY RECOMMENDED PARAMETERS

Chilled Water, Closed Loops, and Hot Water Systems up to 212°F (100° C).

	8.0	<	**pH**	<	10.3
			Conductivity	<	3000 MMHS
			Iron	<	0.5 ppm
			Copper	<	0.5 ppm
Chilled Systems →	100 ppm	<	**Molybdenum** *(Mild Steel Corrosion Inhibitor)*	<	150 ppm
Hot Systems →	200 ppm	<	**Molybdenum** *(Mild Steel Corrosion Inhibitor)*	<	250 ppm
	400 ppm	<	**Nitrite** *(Mild Steel Corrosion Inhibitor)*	<	1000 ppm
			Azole *(Yellow Metal Inhibitor)*	>	5 ppm free and available
			Bacteria	<	1000 cells/ml *(when system is cool)*



Water hardness should be less than 100 ppm of hard water ions (Ca++, Mg++), where 17.1 ppm = 1 Grain Hardness. Additionally, levels of chloride and sulfate should remain less than 25 ppm. When water hardness is at unacceptable levels, a water softener expert should be consulted.

ANTIFREEZE SOLUTIONS-GLYCOLS

The commonly used heat transfer glycol fluids are, either ethylene glycol or propylene glycol. Glycol concentrations of <25% often do not provide sufficient corrosion inhibiting properties and at levels <20% can actually provide a food source for bacteria. As bacteria consume the food and die off, a highly acidic condition can result. The recommended concentration for popular glycol based solutions is 25% to 60%.

PRODUCT SPECIFICATION

PICV PS A 0208

WARREN CONTROLS

WARREN CONTROLS INC.
A VETERAN OWNED, PRIVATELY HELD, SMALL BUSINESS
WARREN CONTROLS INC.