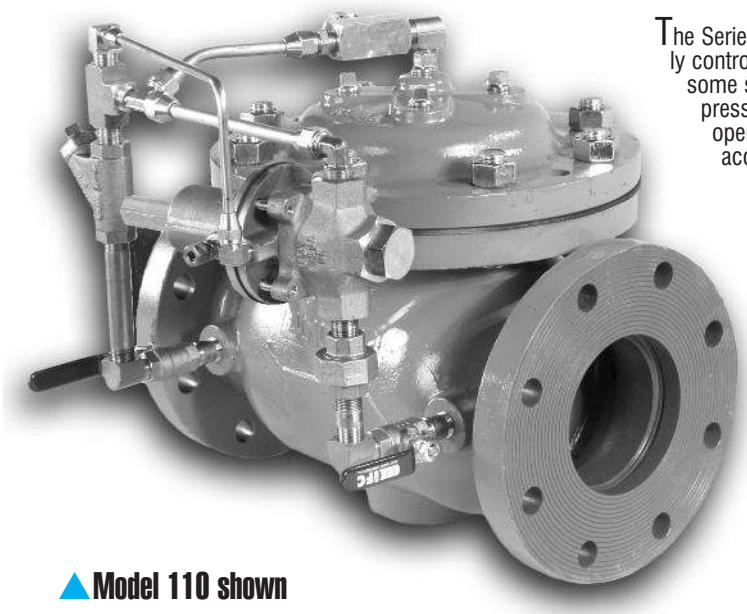


▲Model 110 shown

The Series 110 Differential Control Valve is designed to accurately control the pressure difference between any two points. In some systems this means the valve remains closed until pressure differential commands its opening. It is a pilot-operated, modulating type valve which controls pressure accurately and consistently at the desired setting.

SERIES FEATURES

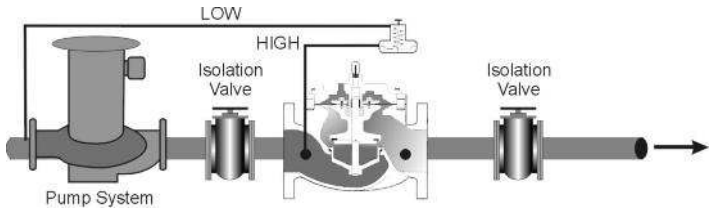
- Opens on increasing differential.
- Dual pilot sense lines can be valve or remote connected.
- Differential is adjustable over complete range of control springs. (see pilot features)

VALVE FEATURES

- Operates automatically off line pressure.
- Heavy-duty, nylon-reinforced diaphragm.
- Rectangular-shaped, soft seat seal provides drip-tight Class VI closure.
- Diaphragm assembly guided top and bottom.
- Throttling seat retainer for flow and pressure stability.
- Easily maintained without removal from the line.
- Replaceable seat ring.
- Alignment pins assure proper reassembly after maintenance.
- Valves are factory tested.
- Valves are serial numbered and registered to facilitate replacement parts and factory support.

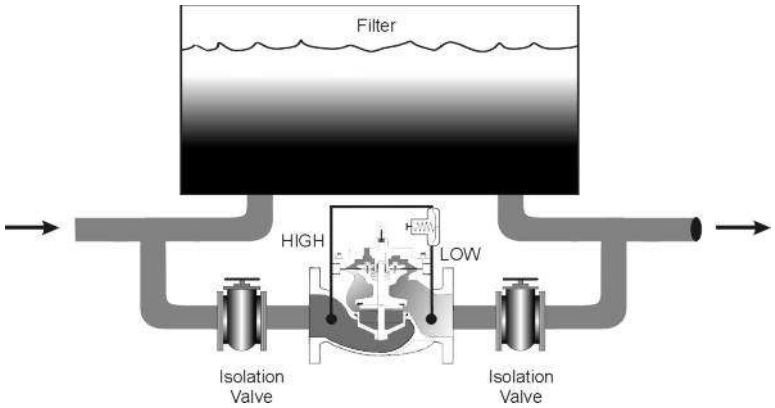
PUMP DIFFERENTIAL CONTROL

Installed on the discharge side of a pump, the valve senses high pressure at pump discharge (valve inlet) and low pressure at the pump suction. Valve modulates to hold differential pressure constant, thus assuring pump is at optimum point on its curve.



FILTER BYPASS CONTROL

In a filtered liquid application where loss of flow cannot be tolerated, the model 110 allows flow should the filter become clogged.



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Differential Control Valve Series 110

VALVE OPERATION

The OCV MODEL 110

▶Maintains a constant differential pressure between two points in a system.
▶Valve opens on increased differential.

1) Model 65 Basic Control Valve, a hydraulically-operated, diaphragm-actuated globe or angle valve that closes with an elastomer-on-metal seal.

2) Model 1356 Differential Pilot, a two-way, normally closed pilot valve that senses differential pressure across its diaphragm and balances it against an adjustable spring load. An increase in differential above the set point makes the pilot open.

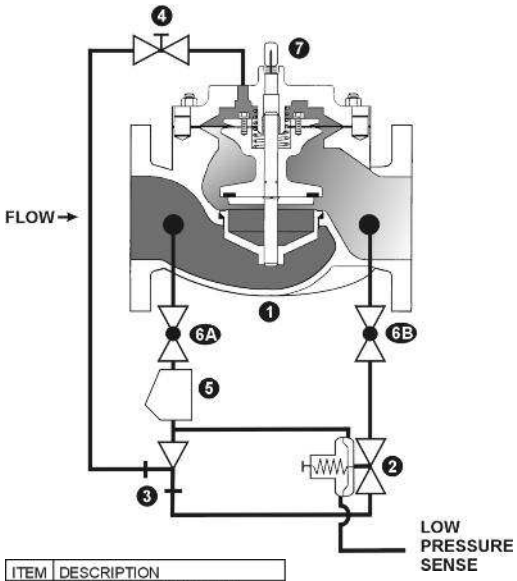
3) Model 126 Ejector, a simple "tee" fitting with a fixed orifice in its upstream port. It provides the proper pressure to the diaphragm chamber of the main valve, depending on the position of the differential pilot.

4) Model 141-2 Needle Valve that controls the opening/closing speed of the main valve.

5) Model 159 Y-Strainer (standard on water service valves), the strainer protects the pilot system from solid contaminants in the line fluid.

6) Model 141-4 Ball Valves (standard on water service valves, optional on fuel service valves), useful for isolating the pilot system for maintenance or troubleshooting.

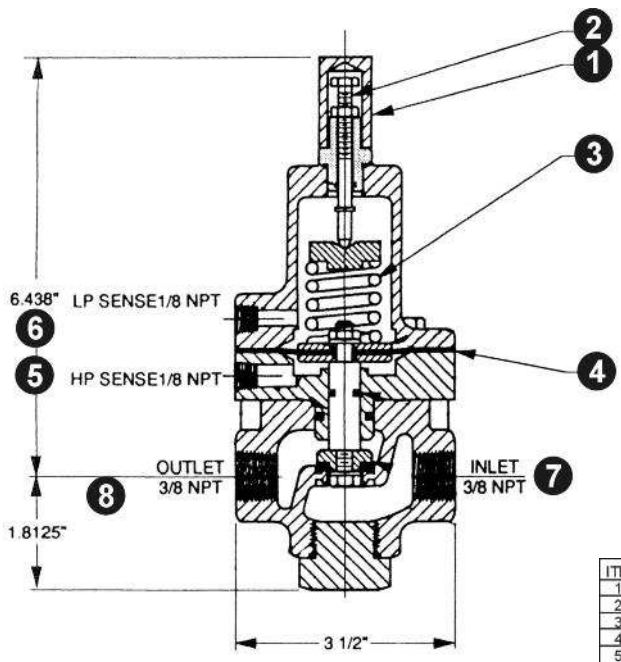
7) Model 155 Visual Indicator (optional)



ITEM	DESCRIPTION
1	BASIC VALVE ASSEMBLY
2	DIFFERENTIAL CONTROL PILOT
3	EJECTOR
4	NEEDLE VALVE
5	Y-STRAINER
6	ISOLATION BALL VALVE
7	VISUAL INDICATOR

PILOT
1356

▶Accurate sensing of high and low pressure.
▶Normally closed, pressure differential to open.
▶Simple, single adjustment of differential set point.
▶All parts replaceable while mounted on the valve.
▶Rubber-to-metal seat provides positive closure until required to open.
▶Large area diaphragm for quick, precise control.
▶Bronze or stainless steel construction.
▶Multiple spring ranges.



Pilot Materials
Bronze ASTM B584-C89836
Stainless Steel
Spring Ranges
5-30, 20-80, 65-180 psi

ITEM	QTY	DESCRIPTION
1	1	CAP
2	1	ADJUSTING SCREW
3	1	SPRING
4	1	DIAPHRAGM
5	1	HIGH PRESSURE SENSE
6	1	LOW PRESSURE SENSE
7	1	INLET
8	1	OUTLET

The Model 1356 Differential Pressure Pilot controls the amount of pressure in the upper chamber of the main valve (hence, the degree of opening or closing of the main valve). The pilot senses high pressure under its diaphragm and low pressure above its diaphragm. As the differential increases above the setting of the spring (adjustable), the pilot opens, decreasing the pressure in the main valve diaphragm chamber, allowing the main valve to open a proportionate amount.

Sense line locations.
High pressure sensing is typically at the main valve inlet. Low pressure can be sensed at the valve outlet or at a field installed remote location.

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SIZING CONSIDERATIONS

SIZING DIFFERENTIAL CONTROL VALVES

Because the Model 110 typically controls the differential pressure, that particular parameter of the sizing equation is already defined. All that remains is to ensure the valve is large enough to handle the required flow within proper velocity limits.

$$C_V = \frac{Q_{max}}{\sqrt{DP/sg}}$$

where: Cv = valve coefficient
Q = Maximum flow rate, gpm
sg = Liquid specific gravity (water = 1.0)
dp = Differential pressure, psig

From the chart below, pick the smallest valve that has a Cv at least equal to the value calculated and where the velocity does not exceed 25 ft/sec.

SIZE	CV (GLOBE)	CV (ANGLE)	FLOW @ 25 FT/SEC (GPM)
1 ¼	23	30	115
1 ½	27	35	150
2	47	65	260
2 ½	68	87	370
3	120	160	570
4	200	270	1000
6	450	550	2250
8	760	1000	3900
10	1250	1600	6150
12	1940	2400	8700
14	2200	--	10,500
16	2850	4000	13,800
24	6900	--	31,300

VALVE SELECTION GUIDE

By combining various control pilots, multiple valve functions can be performed on a single Series 110 Differential Control Valve. To find the combination function valve, select the desired features and then the model number.

This chart shows only a sample of those most often specified valves.
Consult the factory for specific data on the model you selected.

Feature	110	110-1	110-2	110-12	Definition
Differential Control	X	X	X	X	Valve opens on increased pressure differential.
Check Valve		X		X	Closes valve on pressure reversal
Solenoid Shutoff			X	X	Opens or closes valve electrically.

ABOUT YOUR VALVE

OCV Control Valves was founded more than 60 years ago with a vision and commitment to quality and reliability. From modest beginnings, the company has grown to be a global leader just a half century later. In fact, OCV Valves can be found in some capacity in nearly every country around the world from fire protection systems in Malaysia to aircraft fueling systems in Africa and from oil refineries in Russia to water supply systems in the USA and Canada. You will also find our valves in irrigation systems in Europe, South America and the Middle East.

The original foundation on which the company was built allows our team of professionals to not only provide the service required to be a worldwide supplier, but more importantly the opportunity to afford the personal touch necessary to be each of our customers' best partner. Simply stated, we take pride in all that we do.

Committed to the work they do, our employees average over 15 years of service. This wealth of knowledge allows us to provide quality engineering, expert support, exacting control and the know-how to create valves known for their long life.

Being ISO 9001 certified means we are committed to a quality assurance program. Our policy is to supply each customer with consistent quality products and ensure that the process is right every time. Our valves meet and exceed industry standards around the world, including approvals by:

QUALITY SYSTEM REGISTERED TO ISO 9001 · UL · FM APPROVED · CE · NSF Certified to NSF/ANSI 61-G & 372 · ABS TYPE APPROVED PRODUCT

Check individual models for availability.

All valves are not created equal. OCV Control Valves proves that day in and day out.
We stand behind our valves and are ready to serve your needs.

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SPECIFICATIONS

NOTE: ALL waterworks valves meet the Low-Lead laws of the United States, including individual state laws, as of March 2014.
**Valves 1-1/4" through 24" are certified to NSF/ANSI 372. Valves 4" through 24" are also certified to NSF/ANSI 61-G.*

NSF Certified to NSF/ANSI 61-G & 372

VALVE BODY & BONNET	DUCTILE IRON		CAST STEEL		STAINLESS STEEL	
Material Specification	ASTM A536/65-45-12 (epoxy coated)		ASTM A216/WCB (epoxy coated)		ALL GRADES	
END CONNECTIONS						
Flange Standard (also available in metric)	ANSI B16.42		ANSI B16.5		ANSI B16.5	
Flange Class	150#	300#	150#	300#	150#	300#
Flange Face	Flat	Raised	Raised	Raised	Raised	Raised
Maximum Working Pressure	250 psi	640 psi	285 psi	740 psi	285 psi	740 psi
Screwed Working Pressure: ANSI B1.20.1 640 psi			Grooved End Working Pressure: 300 psi			
INTERNALS						
Stem	STAINLESS STEEL					
Spring	STAINLESS STEEL					
Spool	DUCTILE IRON (epoxy coated) / OPTIONAL - STN. STL.				STAINLESS STEEL	
Seat Disc Retainer	DUCTILE IRON (epoxy coated) (10" & LARGER) STN. STL. (8" & SMALLER / OPTIONAL - ALL SIZES)				STAINLESS STEEL	
Diaphragm Plate	DUCTILE IRON (epoxy coated) / OPTIONAL - STN. STL.				STAINLESS STEEL	
Seat Ring (Trim)	LOW-LEAD BRONZE OR STN. STL.				STN. STL.	
Upper Stem Bushing	BRONZE OR TEFLON®				TEFLON®	
Lower Stem Bushing	NOT APPLICABLE FOR LOW-LEAD BROZE SEAT RINGS / TEFLON FOR FOR STN. STL. SEAT RINGS					
ELASTOMER PARTS (Rubber)						
Diaphragm/Seat Disc/O-Rings	EPDM					
Operating Temperature* *Consult factory when temperatures approach low or high temperature allowance.	32°F to 230°F					
COATINGS	NSF-61 EPOXY COATING					
ELECTRICAL SOLENOIDS						
Bodies	BRASS / OPTIONAL - STAINLESS STEEL					
Enclosures	WATER TIGHT, NEMA 1, 3, 4, & 4X					
Power	AC, 60HZ - 24, 120, 240, 480 VOLTS		AC, 50HZ - In 110 VOLT MULTIPLES		DC, 6 12, 24, 240 VOLTS	
Operation	ENERGIZE TO OPEN (NORMALLY CLOSED)		DE-ENERGIZE TO OPEN (NORMALLY OPEN)			

CONTROL PILOTS		
Bodies	LOW-LEAD BRONZE	STN. STL.
Internal	STAINLESS STEEL	STAINLESS STEEL
Tubing	COPPER	STAINLESS STEEL
Fittings	LOW-LEAD BRASS	STAINLESS STEEL

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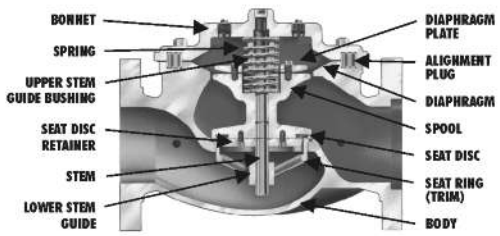

Globe Flanged Sizes

1.25"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"*	20"*	24"
32mm	40mm	50mm	65mm	80mm	100mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm*	500mm*	600mm

*CONSULT FACTORY

Angle Flanged Sizes

1.25"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	16"
32mm	40mm	50mm	65mm	80mm	100mm	150mm	200mm	250mm	300mm	400mm

Globe/Angle Screwed Sizes

1.25"	1.5"	2"	2.5"	3"
32mm	40mm	50mm	65mm	80mm

Globe/Angle Grooved Sizes

1.5"	2"	2.5"	3"	4"	6"*
32mm	50mm	65mm	80mm	100mm	150mm*

*GLOBE ONLY

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DIMENSIONS

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
	SCREWED	8 3/4	9 7/8	10 1/2	13	--	--	--	--	--	--	--	--
A	GROOVED	8 3/4	9 7/8	10 1/2	13	15 1/4	20	--	--	--	--	--	--
	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
	SCREWED	1 7/16	1 11/16	1 7/8	2 1/4	--	--	--	--	--	--	--	--
B	GROOVED	1*	1 3/16	1 7/16	1 3/4	2 1/4	3 5/16	--	--	--	--	--	--
	150# FLGD	2 5/16-2 1/2	3	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4	8	9 1/2	10 5/8	11 3/4	16
	300# FLGD	2 5/8-3 1/16	3 1/4	3 3/4	4 1/8	5	6 1/4	7 1/2	8 3/4	10 1/4	11 1/2	12 3/4	18
	SCREWED	4 3/8	4 3/4	6	6 1/2	--	--	--	--	--	--	--	--
C	GROOVED	4 3/8*	4 3/4	6	6 1/2	7 5/8	--	--	--	--	--	--	--
ANGLE	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	--
	SCREWED	3 1/8	3 7/8	4	4 1/2	--	--	--	--	--	--	--	--
D	GROOVED	3 1/8*	3 7/8	4	4 1/2	5 5/8	--	--	--	--	--	--	--
ANGLE	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
F	ALL	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	6 3/8	6 3/8	6 3/8	6 3/8	6 3/8	8
G	ALL	6	6 3/4	7 11/16	8 3/4	11 3/4	14	21	24 1/2	28	31 1/4	34 1/2	52
H	ALL	10	11	11	11	12	13	14	17	18	20	20	28 1/2

*GROOVED END NOT AVAILABLE IN 1 1/4"

METRIC DIMENSIONS - M.M.

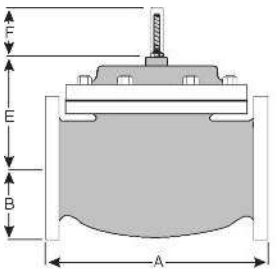
DIM	END CONN.	DN32-DN40	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN600
	SCREWED	222	251	267	330	--	--	--	--	--	--	--	--
A	GROOVED	222	251	267	330	387	508	--	--	--	--	--	--
	150# FLGD	216	238	267	305	381	451	645	756	864	991	1026	1575
	300# FLGD	222	251	283	324	397	473	670	791	902	1029	1067	1619
	SCREWED	37	43	48	57	--	--	--	--	--	--	--	--
B	GROOVED	25*	30	37	44	57	84	--	--	--	--	--	--
	150# FLGD	59-64	76	89	95	114	140	171	203	241	270	298	406
	300# FLGD	67-78	83	95	105	127	159	191	222	260	292	324	457
	SCREWED	111	121	152	165	--	--	--	--	--	--	--	--
C	GROOVED	111*	121	152	165	194	--	--	--	--	--	--	--
ANGLE	150# FLGD	108	121	152	152	191	254	322	378	432	--	529	--
	300# FLGD	111	127	162	162	198	267	335	395	451	--	549	--
	SCREWED	79	98	102	114	--	--	--	--	--	--	--	--
D	GROOVED	79*	98	102	114	143	--	--	--	--	--	--	--
ANGLE	150# FLGD	76	98	102	102	140	152	203	289	279	--	398	--
	300# FLGD	79	105	111	111	148	165	216	306	298	--	419	--
E	ALL	152	152	178	165	203	254	302	391	432	457	483	686
F	ALL	98	98	98	98	98	98	162	162	162	162	162	203
G	ALL	152	171	195	222	298	356	533	622	711	794	876	1321
H	ALL	254	279	279	279	305	330	356	432	457	508	508	724

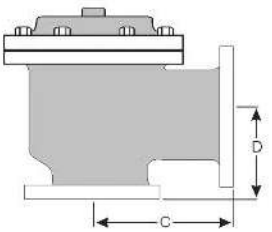
*GROOVED END NOT AVAILABLE IN DN32

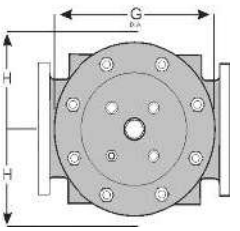
For maximum efficiency, the OCV control valve should be mounted in a piping system so that the valve bonnet (cover) is in the top position. Other positions are acceptable but may not allow the valve to function to its fullest and safest potential. In particular, please consult the factory before installing 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.

A routine inspection & maintenance program should be established and conducted yearly by a qualified technician. Consult our factory @ **1-888-628-8258** for parts and service.

How to order your valve
When Ordering please provide:
Series Number - Valve size - Globe or Angle - Pressure Class - Screwed, Flanged, Grooved - Trim Material - Adjustment Range - Pilot Options - Special needs / or installation requirements.







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