



▲ Model 22/88 shown

With the development and proliferation of high level SCADA systems comes the need for automatic control valves to interface with such systems. The OCV Series 22 and 88 digital electronic control valves were specifically designed for this task. While retaining the advantages of simplicity and operation from line pressure, these valves offer a level of ease of operation and degree of control not previously achieved.

SERIES FEATURES

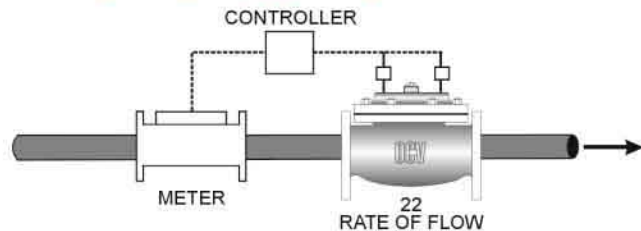
- ▶ Can be used as part of a SCADA system, or as a "stand alone"
- ▶ Extreme stability over a wide range of flows
- ▶ Useful when set points must be changed frequently
- ▶ Remote set point available
- ▶ Can be used to control almost any process variable
- ▶ Hydraulic pilot backup available
- ▶ Can be configured to accept all common process signals (4-20 mA, 0-5 volt, etc.)
- ▶ Can be configured for low head pressure applications.

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.

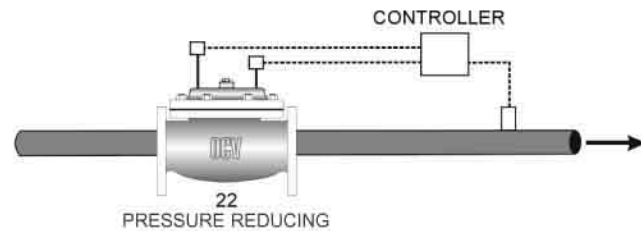
MODEL 22 RATE OF FLOW CONTROL

Controller receives signal from flow meter and actuates valve to maintain flow rate at set point.



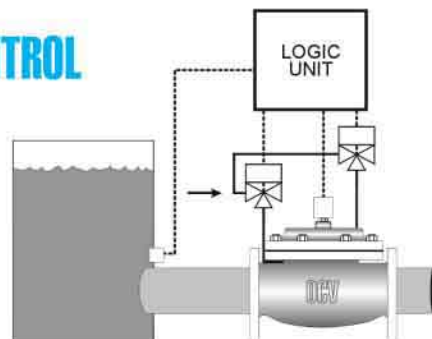
MODEL 22 PRESSURE REDUCING CONTROL

Controller receives signal from downstream pressure transducer and actuates valve to maintain pressure at set point.



MODEL 88 LEVEL CONTROL

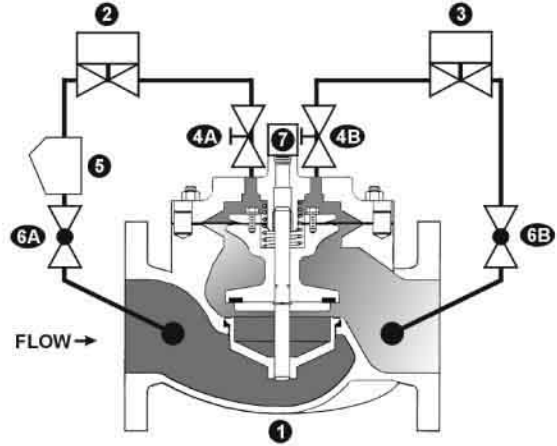
Logic unit receives signal from level transducer and actuates valve to maintain constant level. Diagram shows typical low head application.



VALVE OPERATION

Principles of Digital Control Systems

The 115-3 valve is the basis for both the Model 22 and Model 88 systems. It is modulated, or positioned, by its two solenoid pilots (2) and (3). With pilot (2) closed and pilot (3) open, the diaphragm chamber of the main valve (1) is vented to downstream, and the valve moves further open. Conversely, with pilot (2) open and pilot (3) closed, inlet pressure is applied to the main valve diaphragm chamber, moving the valve further closed. Finally, with both pilots closed, the diaphragm chamber is "hydraulically locked" (no flow on or off the chamber), and the valve holds its position. This locking action gives the valve extreme stability, even at highly-throttled positions.



Series 22

In the Model 22 system, the analog process signal (PV) is received by the controller from the transducer and compared to the programmed set point. If the PV is outside the small dead band around the set point, the controller begins pulsing the appropriate solenoid pilot open and closed on a time proportional basis, with the amount of open time proportional to the deviation from the set point. Hydraulic locking occurs when the process variable is within the dead band around the set point. The pulsing action enables the set point to be maintained within close limits, with a minimum of overshoot or "hunting" when process conditions change.

Series 88

In the Model 88, the analog "command" signal is input to the Logic Unit, which converts the signal to a digital one. It then compares this digital signal to the digital signal from the valve position transmitter* which is reporting actual valve position (% open). If the two signals are different, the logic unit opens the appropriate solenoid pilot to either open or close the valve. When the signals match, the logic unit closes both solenoid pilots, resulting in hydraulic lock. The valve will stably hold its position until the command signal again changes.

*The OCV Digital Valve Position Transmitter is a non-contact type, impervious to the effects of wear, electrical noise and drift. Installed and "zeroed" in the closed position, no further adjustment is required.

ITEM	DESCRIPTION
1	BASIC VALVE ASSEMBLY
2	TWO-WAY SOLENOID PILOT
3	TWO-WAY SOLENOID PILOT
4	NEEDLE VALVE
5	Y-STRAINER
6	ISOLATION BALL VALVE
7	POSITION TRANSMITTER ASSEMBLY (REQ'D ON 88 ONLY)

Application Chart

APPLICATION	MODEL 22	MODEL 88	INPUT DEVICE REQUIRED
Pressure Reducing	X		Downstream Pressure Transducer
Pressure Sustaining	X		Upstream Pressure Transducer
Differential Control	X		Differential Pressure Transducer
Rate of Flow Control	X		Flow Meter
Blending Valve*	X		Two Flow Meters
Temperature Control	X		Thermocouple or RTD
Straight Positioning		X	Computer or PLC
Modulating Level Control		X	Scaleable Level Transducer

*Blending Valve - Requires flow meters in both controlled and uncontrolled lines and controller with Remote Set Point option.

Controllers & Valve Position Transmitter

Each series is supplied with an OCV control module. These are supplied in a NEMA 4X enclosure.

Enclosure overall dimensions:
16" High x 12 1/2" Wide x 8 1/2" Deep
Valve Position Transmitter:
Enclosure: NEMA 4



Power/Signal Failure Modes

Both the model 22 and 88 valves can be configured to either close, open or hold last position in the event of electrical power or signal failure.

Hydraulic Pilot Backup System

The valve can be configured with a full pilot system to provide control backup in the event of power failure. They can also provide additional limiting controls in conjunction with the electronic positioned function. See Valve Selection Guide for specific model combinations.

Low Pressure Applications

Both the 22 and 88 are line-pressure-operated valves. In those cases where line pressure is too low or otherwise unsuitable for valve operation, the desired function can still be provided through the use of a power-actuated main valve (model 66) and independent pressure source. See Valve Selection Guide for specific model combinations.

SIZING CONSIDERATIONS

Sizing Electronic Control Valves

For the most comprehensive procedure in sizing Electronic Control Valves, it is best to use our ValveMaster software. In its absence, the following procedure will generally suffice.

1. Decide whether a globe or angle valve will best fit your installation. Keep in mind that it is always best to install any control valve "bonnet up," particularly in sizes 8" and larger.

2. Begin with a line sized valve.

Calculate the pressure drop from the formula,

$$DP = sg \left(\frac{Q}{C_v} \right)^2$$

where: DP = pressure drop, psi
 sg = specific gravity of line fluid (water = 1.0)
 Q = Maximum anticipated flow, gpm
 Cv = Valve coefficient from Table 2.

3. The pressure drop calculated is for a wide-open valve; however, these valves are modulating and actual pressure drop seen could be higher, dependent upon the valve function (i.e. pressure reducing). Because the calculated pressure drop is calculated at maximum anticipated flow, it is useful to ensure that system capacity is not exceeded.

4. Check to see that the flow velocity does not exceed 20 ft/sec. If it does, or if the pressure drop is excessive, consider using the next size larger valve.

FLOW CHARACTERISTICS

SIZE	CV (GLOBE)	CV (ANGLE) (GPM)	FLOW @ 20 FT/SEC
1 ¼	23	30	85
1 ½	27	35	120
2	47	65	210
2 ½	68	87	300
3	120	160	460
4	200	270	800
6	450	550	1800
8	760	1000	3100
10	1250	1600	4900
12	1940	2400	7000
14	2200	--	8450
16	2850	4000	11,000
24	6900	--	25,000

VALVE SELECTION GUIDE

Feature	22	88	22-2	88-2	22PR	22BP	88PR	88BP	Description
Control: Pressure/flow/Temp.	X		X		X	X			See application chart I
Control: Valve Position /Liquid level		X		X			X	X	See application chart for details.
Power Actuated w/ Independent pressure source			X	X					For gravity flow and other low differential applications.
Hydraulic Reducing Override					X		X		Prevents downstream pressure from exceeding preset value.
Hydraulic Sustaining Override						X		X	Prevents upstream pressure from falling below preset value.

ABOUT YOUR VALVE

OCV Control Valves was founded more than 50 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:



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.

TOLL FREE 1.888.628.8258 • phone: (918)627.1942 • fax: (918)622.8916 • 7400 East 42nd Place, Tulsa, OK 74145
 email: sales@controlvalves.com • website: www.controlvalves.com

Global performance. Personal touch.

SPECIFICATIONS

VALVE BODY & BONNET	DUCTILE IRON		CAST STEEL		CAST BRONZE		STAINLESS STEEL	
Material Specifications	ASTM A536 (epoxy coated)		ASTM A216/WCB (epoxy coated)		ASTM B61		ASTM A743/CF8M	
END CONNECTIONS								
Flange Standard (also available in metric)	ANSI B16.42		ANSI B16.5		ANSI B16.24		ANSI B16.5	
Flange Class	150#	300#	150#	300#	150#	300#	150#	300#
Flange Face	Flat	Raised	Raised	Raised	Flat	Flat	Raised	Raised
Maximum Working Pressure	250 psi	640 psi	285 psi	740 psi	225 psi	500 psi	285 psi	740 psi
Screwed Working Pressure:	ANSI B1.20.1 (B2.1) 640 psi (Bronze 500 psi)		Grooved End Working Pressure:		300 psi			
INTERNALS								
Stem	STAINLESS STEEL AISI 303				OPTIONAL MONEL			
Spring	STAINLESS STEEL AISI 302							
Spool	DUCTILE IRON ASTM A536 (epoxy coated)				B-61		STN. STL. ASTM A 743/CF8M	
Seat Disc Retainer	DUCTILE IRON ASTM A536 (epoxy coated) 4" & SMALLER VALVES - STAINLESS STEEL				B-61		STAINLESS STEEL	
Diaphragm Plate	DUCTILE IRON ASTM A536 (epoxy coated)				B-61		STAINLESS STEEL	
Seat Ring (Trim)	BRONZE B61 OPTIONAL STAINLESS STEEL ASTM A743/CF8M						STN. STL. ASTM A 743/CF8M	
Upper Stem Bushing	STANDARD BRONZE ASTM B438		VALVE W/ STAINLESS STEEL SEAT RING-TEFLON				TEFLON	
Lower Stem Bushing	SEAT MATERIAL VALVES W/ STAINLESS STEEL SEAT RING-TEFLON						TEFLON	
ELASTOMER PARTS (Rubber)								
Diaphragm/Seat Disc/O-Rings	STANDARD - BUNA-N NYLON REINFORCED				OPTIONAL - VITON®		OPTIONAL - EPDM	
Operating Temperature	-40°F to 180°F				32°F to 400°F		0°F to 300°F	
COATINGS WIDE RANGE OF COATING PER YOUR FLUID APPLICATION. COATINGS HANDLE MUNICIPAL POTABLE WATER, SEAWATER, PETROLEUM AND REFINED PRODUCTS.								
ELECTRICAL SOLENOIDS								
Bodies	STANDARD BRASS				STAINLESS STEEL (OPTIONAL)			
Elastomers	STANDARD - BUNA-N NYLON REINFORCED				OPTIONAL - VITON®			
Enclosures	WATER TIGHT, NEMA 1, 3, 4, & 4X - EXPLOSION PROOF - OPTIONAL (NEMA 7 & 9)							
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	BRONZE B61	STAINLESS STEEL ASTM A743/CF8M
Internal		AISI 303
CONTROL CIRCUITS		
Tubing		COPPER OR STAINLESS STEEL
Fittings		BRASS OR STAINLESS STEEL

SALTWATER SERVICE VALVE MATERIALS

Cast Steel Special Coatings --Ni Aluminum Bronze ASTM B148 --Super Duplex Stainless Steel



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



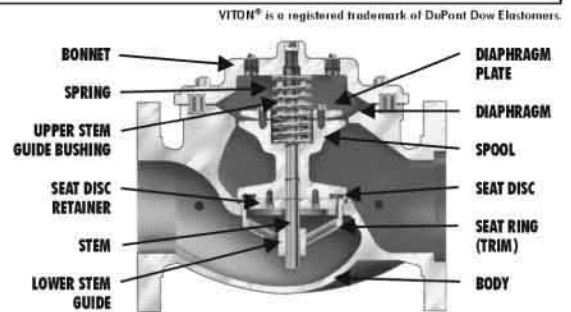
Globe/Angle Screwed Sizes

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



Globe/Angle Grooved Sizes

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



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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
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	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
B	SCREWED	1 7/16	1 11/16	1 7/8	2 1/4	--	--	--	--	--	--	--	--
	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
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	--	--	--	--	--	--	--
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	--
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
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

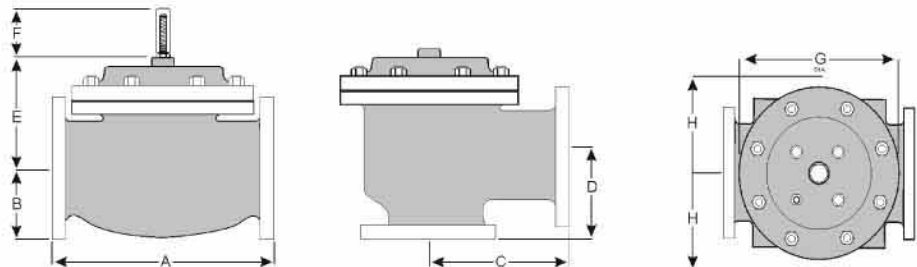
*GROOVED END NOT AVAILABLE IN 1 1/4"

METRIC DIMENSIONS - M.M.

DIM	END CONN.	DN32-DN40	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN600
A	SCREWED	222	251	267	330	--	--	--	--	--	--	--	--
	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
B	SCREWED	37	43	48	57	--	--	--	--	--	--	--	--
	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
C	SCREWED	111	121	152	165	--	--	--	--	--	--	--	--
	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	--
D	SCREWED	79	98	102	114	--	--	--	--	--	--	--	--
	GROOVED	79*	98	102	114	143	--	--	--	--	--	--	--
	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.

Represented by:

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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