Operating Manual

Model: 110-29
Size: "
Serial #:
Sales Order :

7400 East 42nd Place
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OCV™ Control Valves LLC

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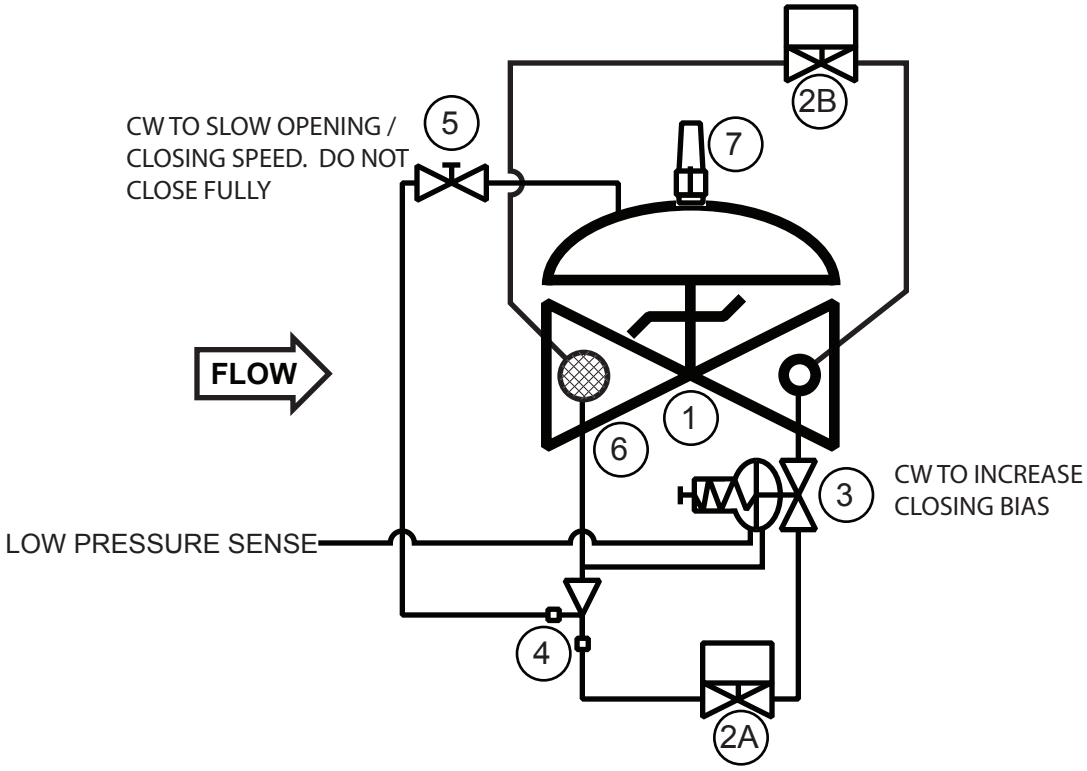
MODEL 110-29

REV A
JRK
10-16-2018

TWO-STAGE SOLENOID VALVE WITH DIFFERENTIAL CONTROL



SOLENOID 2A	SOLENOID 2B	FLOW
DEENERGIZED	DEENERGIZED	OFF
DEENERGIZED	ENERGIZED	LOW FLOW
ENERGIZED	EITHER	HIGH FLOW

ITEM	PART NO.	QTY	DESCRIPTION
1	65	1	BASIC VALVE ASSEMBLY (Fail Closed)
2	451	2	TWO-WAY SOLENOID PILOT, N.C
3	1356	1	DIFFERENTIAL CONTROL PILOT
4	126	1	EJECTOR
5	141-2	1	NEEDLE VALVE
6	123	1	INLINE STRAINER
7	155	1	VISUAL INDICATOR (Optional)

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Installation, Operating, and Maintenance Instructions

Model 65/765

basic control valve

GENERAL DESCRIPTION

The OCV Series 65 is a hydraulically operated, diaphragm-actuated valve, *full port* valve. The globe configuration (Model 65) is available in sizes 1 ¼" thru 16" and 24". The angle configuration (Model 65A) is available in sizes 1 ¼" thru 12" and 16".

The Series 765 is the same as the Series 65, except that it is a *reduced port* valve. It is available only in the globe configuration in sizes 3" thru 24".

The diaphragm is nylon-fabric bonded with synthetic rubber and forms a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. A synthetic rubber seat disc forms a tight seal with the valve seat when pressure is applied above the diaphragm.

FUNCTIONAL DESCRIPTION

Because the Series 65/765 is a hydraulically operated valve, it requires a minimum line pressure of approximately 5 psig in order to function. The valve functions on a simple principle of pressure differential. The line pressure at the inlet of the valve is bypassed through the pilot control piping to the diaphragm chamber of the valve. This pressure, together with the valve spring, works against the pressure under the valve seat. Because the effective area of the diaphragm is greater than that of the seat, the valve is held tightly closed. As the controlling pilot(s) allow the pressure to bleed off the diaphragm chamber, the two opposing pressures begin to balance and the valve will begin to open. The valve can be used to perform a simple on-off function, or with the proper pilot system, a modulating, or regulating function.

In cases where the line fluid is unusually dirty, or is otherwise unsuitable for operating the valve, an independent operating pressure source may be employed. The pressure available from such a source must be equal to, or greater than, line pressure.

INSTALLATION

In order to insure safe, accurate and efficient operation of the OCV control valve, the following list of checkpoints and procedures should be followed when installing the valve.

1. Make a careful visual inspection of the valve to insure that there has been no damage to the external piping, fittings or controls. Check that all fittings are tight.
2. Thoroughly flush all interconnecting piping of chips, scale and foreign matter prior to mounting the valve.

CAUTION: Take appropriate care to protect personnel and equipment when lifting the valve for uncrating and for installation. Use appropriate lifting equipment. Lifting eyes are provided on 8" and larger valves to facilitate this task.

3. Install the valve in the line according to the flow arrow on the inlet flange. The arrow should point downstream.
4. When installing flanged-end valves, use the proper number and size of flange bolts when installing the valve (see Tables 1 & 2). Make sure flange gaskets are of the proper material for the service. To ensure a tight seal, flange bolts should be tightened evenly in a criss-cross pattern. Tables 1 & 2 also shows the proper final torque values for the flange bolts.

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5. Allow sufficient room around the valve for ease of adjustment and maintenance service.
6. After the lines are filled with liquid, bleed all air from the diaphragm chamber. This can be done by carefully loosening a pipe plug in the bonnet until fluid begins to appear around the threads. When only clear liquid (no air) is flowing, retighten the plug.

In addition, it is highly recommended that:

1. Isolation valves (e.g., gate or butterfly) be installed on the inlet and discharge sides of the valve to facilitate isolating the valve for maintenance.
2. Pressure gauges be installed at the inlet and outlet sides of the valve to provide monitoring of the valve during initial start-up and during operation. The body side ports, if unused by the pilot system, provide a convenient connection for the gauges.
3. All valves larger than 6" be installed horizontally, i.e., with the bonnet pointed up, for ease of adjustment and maintenance servicing.

MAINTENANCE

The OCV control valve requires no lubrication and a minimum of maintenance. However, a periodic inspection should be established to determine how the fluid being handled is affecting the efficiency of the valve. In a water system, for example, the fluid velocity as well as the substances occurring in natural waters, such as dissolved minerals and suspended particles, vary in every installation. The effect of these actions or substances must be determined by inspection. It is recommended that an annual inspection, which includes examination of the valve interior, be conducted. Particular attention should be paid to the rubber parts, i.e., the diaphragm and seat disc. Any obviously worn parts should be replaced.

REPAIR PROCEDURES

In the event of malfunction of the OCV control valve, troubleshooting should be conducted according to the procedures outlined for the specific model of valve. Then, if those steps indicate a problem with the main valve, this section will outline the procedures necessary to correct the problem.

Problems with the main valve can be classed in three basic categories:

1. VALVE FAILS TO OPEN

a. Diaphragm damaged* - See Procedure A
b. Stem binding - See Procedure B

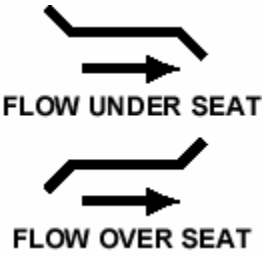
2. VALVE FAILS TO CLOSE

a. Diaphragm damaged* - See Procedure A
b. Stem binding - See Procedure B
c. Object lodged in valve - See Procedure B

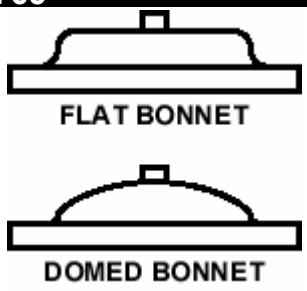
3. VALVE OPENS AND CLOSES BUT LEAKS WHEN CLOSED

a. Seat disc damaged - See Procedure C
b. Seat ring damaged - See Procedure D

**A diaphragm failure can prevent the valve from either opening or closing, depending on the flow direction. Most water service valves flow "under the seat", in which case a diaphragm failure will keep the valve from closing. On the other hand, most fuel service valves flow "over the seat", in which case a diaphragm failure will keep the valve from opening. To determine which you have, examine the bridge mark cast into the side of the valve body, and then compare it with the figures below.*



IMPORTANT: Over the years, OCV has made significant design changes to the 3", 4", 8", 10" and 12" valves. Therefore, before ordering rubber kits or other parts, you will need to determine which style valve you have (old or new). This can be easily determined by looking at the valve *bonnet*. As shown below, old-style valves have flat bonnets; new-style valves (except for the 3" full port and 4" reduced port valves) have domed bonnets.



For 3" valves, simply measure the *diameter* of the bonnet. Old-style bonnets have a 7-11/16" (195 mm) diameter; new style bonnets have an 8-3/4" (222 mm) diameter. That same 8-3/4" diameter flat bonnet is also used on the 4" reduced port valve.

PROCEDURE A: DIAPHRAGM REPLACEMENT

1. Wear appropriate clothing and equipment to protect the skin and eyes from exposure to the line fluid.
2. Isolate the valve from the system by closing upstream and downstream block valves.
3. Bleed all pressure from the valve.

WARNING! IT IS EXTREMELY IMPORTANT THAT ALL PRESSURE BE REMOVED FROM THE VALVE BEFORE DOING EVEN PARTIAL DISASSEMBLY.

4. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
5. To minimize any possible fluid spillage, drain the upstream and downstream sides of the valve as much as possible. Unused side ports in the main valve body can be used for this purpose. They will bring the fluid level down to approximately the centerline of the piping.
6. Remove all tubing connected at the bonnet.
7. Remove the bonnet nuts.
8. Remove the bonnet. If the bonnet sticks in place, it may be loosened by rapping sharply around its edge with a rubber-headed mallet. NOTE: 8" and larger valves are equipped with eye bolts through which a chain can be fastened to aid in lifting the bonnet.
9. Remove the spring.
10. Remove the diaphragm plate capscrews and the diaphragm plate.
11. Remove the old diaphragm.
12. Making sure the dowel pin holes are in the proper location, place the new diaphragm over the studs and press down until it is flat against the body and spool.
13. Replace the diaphragm plate and the diaphragm plate capscrews.
14. Tighten all diaphragm plate capscrews snugly. See Table 4 for proper torque values.
15. Replace the spring.
16. Replace the bonnet and reinstall the bonnet nuts.
17. Tighten the bonnet nuts snugly using a criss-cross tightening pattern. See Table 3 for torque requirements.
18. Reinstall the control tubing.
19. Reopen the upstream and downstream block valves.
20. Before placing the valve back in service, perform the air bleed procedure described in the Installation section of this manual.

PROCEDURE B: CORRECTION OF BINDING STEM

1. Perform Steps 1 thru 9 of Procedure A, above.
2. Remove the spool assembly from the valve. NOTE: On smaller valves, this can be accomplished simply by grasping the stem and pulling upward. Valves 6" and larger have the top of the stem threaded to accept an eyebolt to aid in lifting the spool out of the body. 6" thru 12" valves are threaded 3/8-16. 14" and 16" valves are threaded 5/8-11. The 24" valve is threaded 3/4-10.
3. Carefully examine both ends of the stem for deep scratches, scoring or buildup of mineral deposits. Polish the stem if necessary using a fine grade of emery cloth.
4. Similarly, examine and polish the upper bushing (in the bonnet) and the lower guide (in the seat ring).
5. Reinstall the spool assembly.
6. Reassemble the valve, following Steps 15 thru 20 in Procedure A.

PROCEDURE C: SEAT DISC REPLACEMENT

1. Perform Steps 1 and 2 of Procedure B, above.
2. With the spool assembly removed from the body, remove the seat retainer screws.

3. Slide the seat retainer off the lower end of the stem.
4. Remove the seat disc from its groove in the spool. NOTE: The seat disc may fit quite tightly in the groove. If necessary, it may be pried out using a thin-bladed screwdriver or similar tool.
5. Install the new seat disc in the groove.
6. Reinstall the seat retainer and tighten the seat retainer screws.
7. Reassemble the valve, following Steps 5 and 6 of Procedure B.

PROCEDURE D: SEAT RING REPLACEMENT

NOTE: It is rare for a seat ring to require replacement. Minor nicks and scratches in the seating surface can usually be smoothed out with emery cloth.

1. Perform Steps 1 and 2 of Procedure B, above.
2. If you are working on a 3" or smaller valve, or a 4" old-style valve, follow Steps 4 thru 9, below.
3. If you are working on a new-style 4" valve, or any valve 6" or larger, follow Steps 10 thru 16, below.
4. Seat rings in the smaller valves are threaded into the valve body. To remove, you will need a special seat ring tool. One may be purchased from OCV, or one may be fabricated. (See Table 5 for details.)
5. Using the seat ring tool, unthread the seat ring from the body.
6. Remove the old o-ring from the counterbore in the body.
7. Install the new o-ring in the counterbore.
8. Using the seat ring tool, install the new seat ring.
9. Reassemble the valve, following Steps 5 & 6 of Procedure B.
10. Seat rings on larger valves are bolted into the body with socket head capscrews. In addition you will note that the seat ring is equipped with additional threaded holes that may be used for "jacking" the seat ring out of the body.
11. Remove the socket head capscrews.
12. Remove the old seat ring from the body by temporarily installing two or more of the capscrews in the "jacking" holes.
13. Install a new o-ring in the groove of the new seat ring. Lubricate the o-ring and outer seat ring wall with Vaseline® or similar lubricant.
14. Install the new seat ring in the body, making sure that the capscrew holes line up.
15. Replace and tighten all the capscrews.
16. Reassemble the valve, following Steps 5 and 6 of Procedure B.

TABLE 1
FLANGE BOLTING REQUIREMENTS – CLASS 150 FLANGES

VALVE SIZE (DN)	NO. OF BOLTS	BOLT SIZE	RECOMMENDED TORQUE (FT-LB)	RECOMMENDED TORQUE (N-M)
1 ¼" (32)	4	1/2-13 X 2.50" LONG	75	102
1 ½" (40)	4	1/2-13 X 2.50" LONG	75	102
2" (50)	4	1/2-13 X 2.50" LONG	75	102
2 ½" (65)	4	5/8-11 X 3.00" LONG	150	204
3" (80)	4	5/8-11 X 3.25" LONG	150	204
4" (100)	8	5/8-11 X 3.25" LONG	150	204
6" (150	8	3/4-10 X 3.50" LONG	250	339
8" (200)	8	3/4-10 X 3.75" LONG	250	339
10" (250)	12	7/8-9 X 4.00" LONG	378	513
12"(300)	12	7/8-9 X 4.25" LONG	378	513
14" (350)	12	1-8 X 4.50" LONG	583	791
16" (400)	16	1-8 X 4.75" LONG	583	791
18" (450)	16	1 1/8" X 5.00" LONG	782	1061
20" (500)	20	1 1/8 X 5.50" LONG	782	1061
24" (600)	20	1 1/4"-7 X 6.00" LONG	1097	1488

TABLE 2
FLANGE BOLTING REQUIREMENTS – CLASS 300 FLANGES

VALVE SIZE (DN)	NO. OF BOLTS	BOLT SIZE	RECOMMENDED TORQUE (FT-LB)	RECOMMENDED TORQUE (N-M)
1 ¼" (32)	4	5/8-11 X 2.75" LONG	150	204
1 ½" (40)	4	3/4-10 X 3.00" LONG	250	339
2" (50)*	6 2	5/8-11 X 3.00" LONG 5/8-11 X 2.25" LONG	150 150	204 204
2 ½" (65)	8	3/4-10X 3.25" LONG	250	339
3" (80)	8	3/4-10 X 3.50" LONG	250	339
4" (100)	8	3/4-10 X 3.75" LONG	250	339
6" (150)	12	3/4-10 X 4.25" LONG	250	339
8" (200)	12	7/8-9 X 4.75" LONG	378	513
10" (250)	16	1-8 X 5.50" LONG	583	791
12"(300)	16	1 1/8-7 X 5.75" LONG	782	1061
14" (350)	20	1 1/8-7 X 6.25" LONG	782	1061
16" (400)*	18 2	1 1/4-7 X 6.50" LONG 1 1/4-7 X 5.50" LONG	1097 1097	1488 1488
18" (450)	24	1 1/4-7 X 6.75" LONG	1097	1488
20" (500)	24	1 1/4-7 X 7.25" LONG	1097	1488
24" (600)	24	1 1/2-6 X 8.00" LONG	1750	2375

* TOP TWO HOLES ON VALVE FLANGES ARE DRILLED & TAPPED. USE THE SHORTER BOLTS LISTED IN THESE HOLES.

TABLE 3
BONNET BOLTING TORQUE SPECIFICATIONS
NEW-STYLE FULL PORT VALVES (SERIES 65)

VALVE SIZE (DN)	NO. OF STUDS	STUD SIZE	REC. TORQUE FT-LB (N-M)	VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)
1 ¼" (32)	8	3/8-16	31 (42)	8" (200)	12	7/8-9	378 (513)
1 ½" (40)	8	3/8-16	31 (42)	10" (250)	16	7/8-9	378 (513)
2" (50)	8	3/8-16	31 (42)	12" (300)	20	1 1/8-7	782 (1061)
2 ½" (65)	8	1/2-13	75 (102)	14" (350)	20	1 1/8-7	782 (1061)
3" (80)	8	1/2-13	75 (102)	16" (400)	20	1 1/4-7	1097 (1488)
4" (100)	8	3/4-10	250 (339)	24" (400)	28	1 1/2-6	1750 (2375)
6" (150)	12	3/4-10	250 (339)				

NEW-STYLE REDUCED PORT VALVES (SERIES 765)

VALVE SIZE (DN)	NO. OF STUDS	STUD SIZE	REC. TORQUE FT-LB (N-M)	VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)
3" (80)	8	3/8-16	31 (42)	12" (300)	16	7/8-9	378 (513)
4" (100)	8	1/2-13	75 (102)	16" (250)	20	1 1/8-7	782 (1061)
6" (150)	8	3/4-10	250 (339)	18" (300)	20	1 1/4-7	1097 (1488)
8" (200)	12	3/4-10	250 (339)	20" (350)	20	1 1/4-7	1097 (1488)
10" (250)	12	7/8-9	378 (513)	24" (400)	20	1 1/4-7	1097 (1488)

OLD-STYLE FULL PORT VALVES (SERIES 65)

VALVE SIZE (DN)	NO. OF SCREWS	STUD SIZE	REC. TORQUE FT-LB (N-M)	VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)
3" (80)	8	3/8-16	31 (42)	10" (250)	16	3/4-10	250 (339)
4" (100)	8	7/16-20	50 (68)	12" (300)	20	1 1/8-7	782 (1061)
8" (200)	12	3/4-10	250 (339)				

TABLE 4
DIAPHRAGM PLATE CAPSCREW TORQUE SPECIFICATIONS
NEW-STYLE FULL PORT VALVES (SERIES 65)

VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)	VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)
1 ¼" (32)	1	3/8-24 N	21.5 (29)	8" (200)	8	1/2-13 H	43 (58)
1 ½" (40)	1	3/8-24 N	21.5 (29)	10" (250)	12	1/2-13 H	43 (58)
2" (50)	4	1/4-20 A	6.3 (8.6)	12" (300)	12	1/2-13 H	43 (58)
2 ½" (65)	6	10-32 A	2.7 (3.7)	14" (350)	16	3/8-16 H	19.7 (27)
3" (80)	6	1/4-20 A	6.3 (8.6)	16" (400)	16	1/2-13 H	43 (58)
4" (100)	6	3/8-16 H	19.7 (27)	24" (400)	16	1-8 H	286 (383)
6" (150)	8	3/8-16 H	19.7 (27)				

NEW-STYLE REDUCED PORT VALVES (SERIES 765)

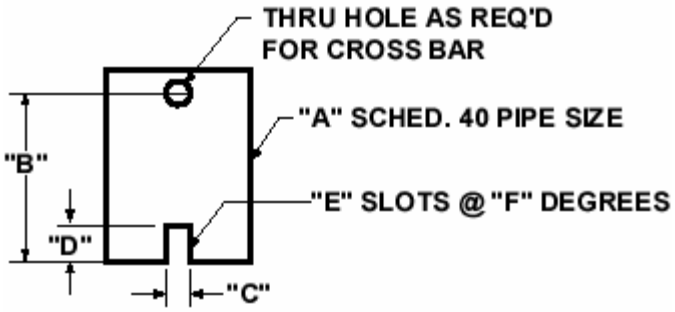
VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)	VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)
3" (80)	4	1/4-20 A	6.3 (8.6)	12" (300)	12	1/2-13 H	43 (58)
4" (100)	6	1/4-20 A	6.3 (8.6)	16" (250)	12	1/2-13 H	43 (58)
6" (150)	6	3/8-16 H	19.7 (27)	18" (300)	12	1/2-13 H	43 (58)
8" (200)	8	3/8-16 H	19.7 (27)	20" (350)	12	1/2-13 H	43 (58)
10" (250)	8	1/2-13 H	43 (58)	24" (400)	12	1/2-13 H	43 (58)

OLD-STYLE FULL PORT VALVES (SERIES 65)

VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)	VALVE SIZE (DN)	NO. OF SCREWS	SCREW SIZE	REC. TORQUE FT-LB (N-M)
3" (80)	4	1/4-20 H	6.3 (8.6)	10" (250)	12	3/8-16 H	19.7 (27)
4" (100)	6	1/4-20 H	6.3 (8.6)	12" (300)	12	1/2-13 H	43 (58)
8" (200)	8	3/8-16 H	19.7 (27)				

N = SINGLE HEX NUT ON VALVE STEM
A = ALLEN-HEAD CAPSCREWS
H = HEX-HEAD CAPSCREWS

TABLE 5
SEAT RING TOOL DETAILS

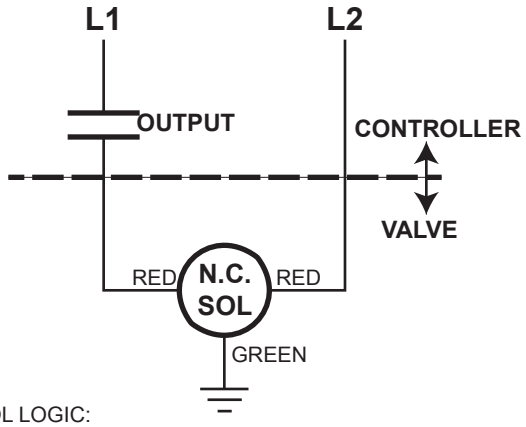


VALVE SIZE FULL PORT	VALVE SIZE RED. PORT	"A" PIPE SIZE	"B" MIN. LENGTH	"C" SLOT WIDTH	"D" SLOT DEPTH	"E" # SLOTS	"F" SPACING
1 1/4"	--	3/4	6"	3/8"	3/8"	2	180°
1 1/2"	--	3/4	6"	3/8"	3/8"	2	180°
2"	3"	1 1/2	7"	3/8"	3/8"	2	180°
2 1/2"	--	2	8"	1/2"	1/2"	3	120°
3" NEW	4"	2 1/2	9"	1/4"	3/8"	3	120°
3" OLD	--	2 1/2	9"	5/8"	5/8"	2	180°
4" OLD	--	3	10"	5/8"	5/8"	2	180°

STANDARD WIRING DIAGRAMS

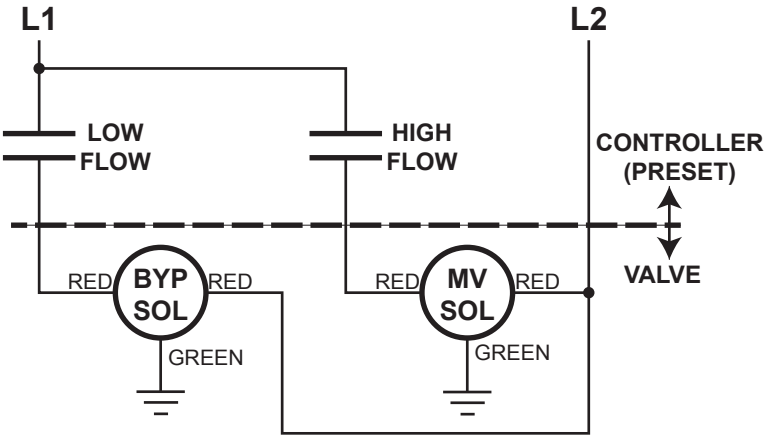
SDJ 12-11-18

SINGLE STAGE VALVES
(115-2, 120-1, 127-80, 110-2, ETC.)



CONTROL LOGIC:
CLOSED OUTPUT OPENS VALVE
OPEN OUTPUT CLOSES VALVE
(REVERSED OF SOLENOID IS N.O. TYPE)

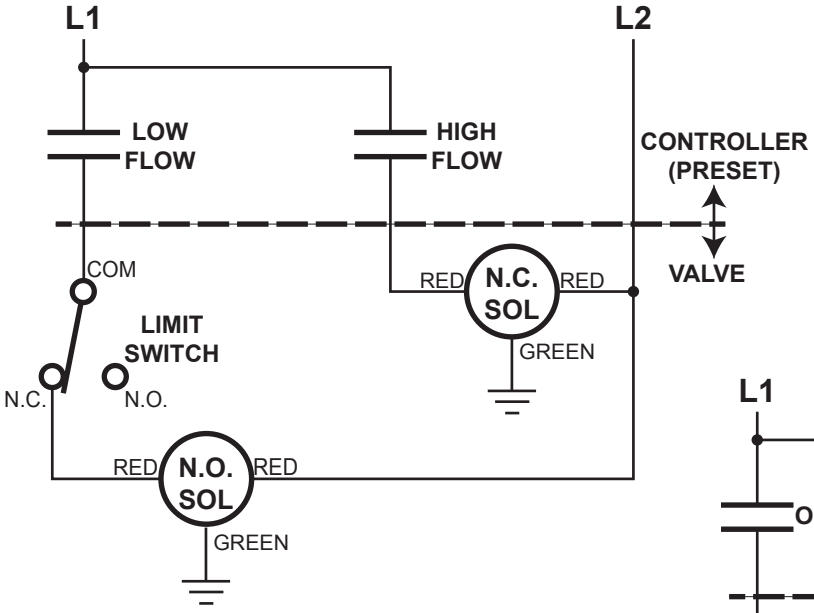
TWO-STAGE VALVES
WITH BYPASS SOLENOID
(115-25, 120-17, 127-89, 110-29, ETC.)



CONTROL LOGIC

LOW FLOW	HIGH FLOW	MAIN VALVE
EITHER	ON	HIGH FLOW
ON	OFF	LOW FLOW
OFF	OFF	CLOSES

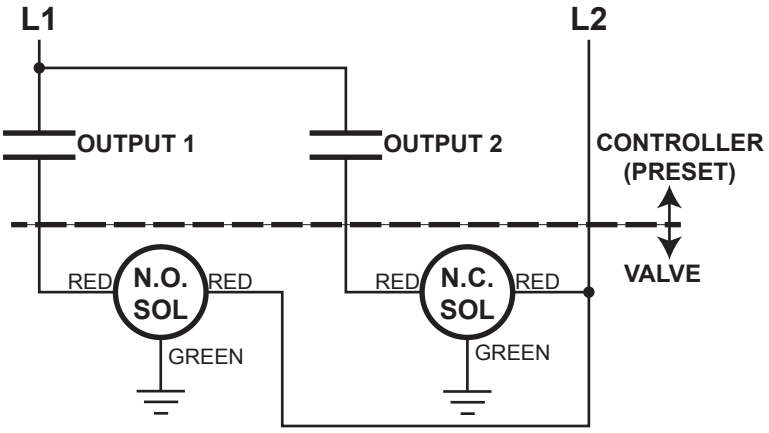
TWO-STAGE VALVES
S-SERIES
(115-5S, 120-7S, 127-9S, 110-9S, ETC.)



CONTROL LOGIC

LOW FLOW	HIGH FLOW	MAIN VALVE
EITHER	ON	HIGH FLOW
ON	OFF	LOW FLOW
OFF	OFF	CLOSES

DIGITAL CONTROL VALVES
(115-3 SERIES)



CONTROL LOGIC

OUTPUT 1	OUTPUT 2	MAIN VALVE
ON	ON	OPENS
ON	OFF	HOLDS
OFF	OFF	CLOSES

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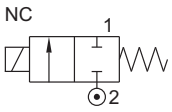
2/2 DIRECT ACTING, HIGH ORIFICE NORMALLY CLOSED SOLENOID VALVE

TYPE	PRESSURE

TYPE	PRESSURE

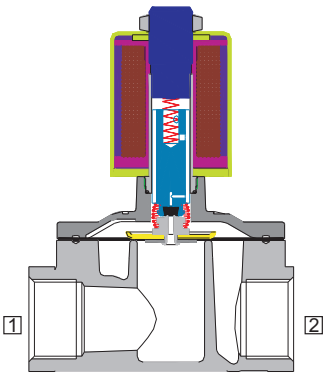
TYPE	PRESSURE
20172	0 - 10 bar



FEATURES

- Bubble tight shut off
- Vibration resistance up to 9g
- Suitable for high speed cycling
- Speed up to 100 cycles/ min.
- Life >2 million cycles
- Mounting Solenoid Vertical only.

AML



WETTED PARTS

Code	※	B2	B12
Body	Powder Coated Die Cast Aluminium	Brass	CF8M
Diaphragm	Viton, NBR, EPDM		
Guide Assembly	SS 304		
Shadow-Ring	Copper		
Plunger, Insert	SS 430		
Spring	SS 302		
Seat, Seals	NBR, Viton, EPDM		
Fasteners	SS 304		

AMBIENT AND FLUID TEMPERATURE

-20 °C to 80 °C

SPECIAL VERSION AND SUFFIX

Suffix : (Valve) OX, AM, WO
Special version : (Solenoid) CO, FR, SS, LC

MEDIA

Air, Inert gases, Water, Free flowing liquid, Oil, Diesel, Kerosene, LPG, CNG

APPLICATION

Drain shut off

PORT CONNECTION

ACTION	INLET	OUTLET
NC	2	1

SPARES

(Refer page 25 for ordering code)

SPARE KIT	CODE
Diaphragm Kit : Diaphragm Set	100
Seal Kit : Oring Set Diaphragm, Plunger Assembly	98
Repair Kit : Oring Set, Diaphragm, Plunger Assembly, Fastener, Springs	99
Solenoid Kit : Solenoid, Gasket and Nut	34

APPROVAL

(* applied for)

Approval	Nema 4X	IP67	Ex d IIC T4 or T5 or T6 IP66	Ex ia IIC T6 IP67	DGMS	CCOE
ISI		✓	✓	✓	✓	✓
CE		✓	✓	✓		
UL	✓		*			
CCPEL			✓	✓		
PESO			✓	✓		
IECEx			*	*		

Contact Rotex for any other ambient, fluid temperature, media and application

CONTACT ROTEX BEFORE SELECTING THIS ITEM

ROTEX
Engineering For The Future

2/2 DIRECT ACTING, HIGH ORIFICE NORMALLY CLOSED SOLENOID VALVE

SPECIFICATION

PORT CONNECTION			PRE-SSURE bar					PILOT PRESSURE	BODY MATERIAL AND INTERNALS				SEALS					MANUAL OVERRIDE			SOLENOID ENCLOSURE						SUFFIX		POWER VA			CONSTRUCTION REFERENCE NUMBER
																					WEATHER PROOF			EXPLOSION PROOF							
SIZE	BSP(F)	NPT(F)	MINIMUM	MAXIMUM	ORIFICE (mm)	FLOW FACTOR kv (LPM OF WATER @ 1 bar ΔP)	VALVE TYPE		ALUMINIUM	ALUMINIUM + SS	BRASS	SS 316/ CF8M	NBR	Viton	EPDM	HYTREL	PTFE	NIL	STAYPUT CUM MOMENTARY	MOMENTARY	FLYING LEAD	PLUG IN, IP67	SQ. PLUG IN, IP67	TERMINAL BOX IP67	FPJB Ex d IIC, T4 OR T6, IP67	LARGE ENCLOSURE	SOLENOID SIZE	OXYGEN	AMONIA	AC INRUSH	AC HOLDING	DC	
2/2 NORMALLY CLOSED																															
1/2"	4G	4R	0	10	12	50	20172					※	※	S2					※				25	T	E		18	✓	✓	30	30	30	15
3/4"	6G	6R	0	10	20	95	20172					※	※	S2					※				25	T	E		18	✓	✓	30	30	30	20
1"	8G	8R	0	10	25	160	20172					※	※	S2					※				25	T	E		18	✓	✓	30	30	30	20
~~1 1/4"~~	~~10G~~	~~10R~~	~~0~~	~~8~~	~~40~~	~~320~~	20172					※	※	S2					※				~~25~~	~~T~~			~~18~~	✓	✓	~~30~~	~~30~~	~~30~~	~~30~~
11/2"	12G	12R	0	8	40	350	20172					※	※	S2					※				25	T			18	✓	✓	30	30	30	30
2"	16G	16R	0	8	50	560	20172					※	※	S2					※				25	T			18	✓	✓	30	30	30	30

Cable Entry	T	E
M20 x 1.5	19	39
1/2" NPT	16	37

※ = Do not specify when opted for
✓= Options available

ORDERING CODE AND EXAMPLE

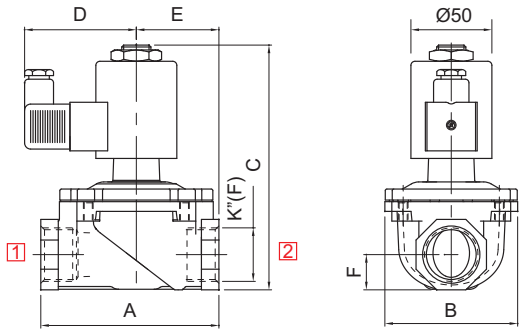
VALVE + SOLENOID

TYPE – SUFFIX – ORIFICE – PORT CONNECTION – BODY AND INTERNALS – SEAL +
SIZE – VOLTAGE – CURRENT – SOLENOID ENCLOSURE – APPROVAL – INSULATION – SPECIAL VERSION

e.g. 20172-25-8G+220V 50Hz-25; 20172-12-4G-S2+24V DC-19

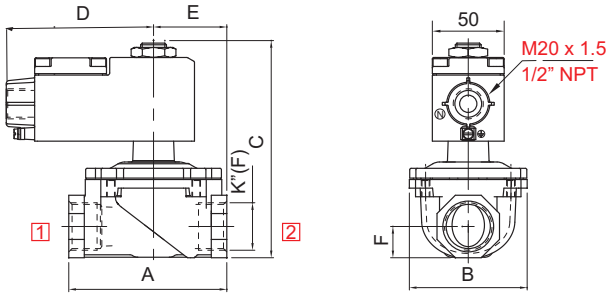
DIMENSIONS

All Dimensions are in mm



SQUARE PLUG IN SOLENOID TYPE 25

NW	K (PORT SIZE)	A	B	C	D	E	F	CONST. REF.
VALVE TYPE : 24101, 24102, 24103								
12	1/2", 3/8", 1/4"	65	50	124	66	29	15	29
20	3/4"	84	64	134	66	42	17	30
25	1"	110	93	148	66	51	25	31
~~32~~	~~1 1/4"~~	~~135~~	~~94~~	~~168~~	~~68~~	~~65~~	~~30~~	~~32A~~
40	11/2"	135	94	168	68	68	30	32A
50	2"	165	140	186	66	75	38	32



TERMINAL BOX/ Ex d LARGE ENCLOSURE, TYPE 16, 19, 37, 39, LC

NW	K (PORT SIZE)	A	B	C	D	E	F	CONST. REF.
VALVE TYPE : 24101, 24102, 24103								
12	1/2", 3/8", 1/4"	65	50	124	103	29	15	29
20	3/4"	84	64	134	103	42	17	30
25	1"	110	82	152	103	51	22	31
~~32~~	~~1 1/4"~~	~~135~~	~~94~~	~~168~~	~~103~~	~~65~~	~~30~~	
40	11/2"	135	94	168	103	65	30	
50	2"	165	140	188	103	75	38	32

CONTACT ROTEX BEFORE SELECTING THIS ITEM

Plug In Coil type 25 can be supplied only for 'DC' Voltages.

DIFFERENTIAL PRESSURE PILOT 1356

DESCRIPTION

MODEL 1356 DIFFERENTIAL PRESSURE

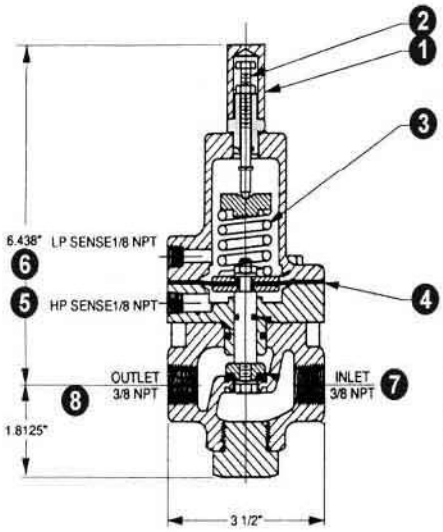
- Normally closed, increasing differential pressure opens
- Multiple spring ranges for accurate control
- Can be local or remote sensed
- Simple adjustment
- All parts replaceable while mounted on valve
- Rubber to metal seat for positive shut-off
- Bronze or stainless steel construction

The Model 1356 is a two-way, normally closed pilot, that senses high pressure under its diaphragm, low pressure above the diaphragm, and balances the differential pressure against an adjustable spring load. An increase in differential above the spring set point tends to make the pilot open.

The Model 1356 is the standard pilot for OCV Series 110 Differential Control Valve. Sensing high and low pressures and opening at the differential set point, the pilot modulates the main valve to maintain the required differential pressure.

MODEL 1356 MATRIX

MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	USED ON VALVE SIZE
Bronze, Buna-N	230113	3/8	1 ¼"-6"
Bronze, Buna-N	230165	1/2	8"-16"
Stn. Steel, Buna-N	230713	3/8	1 ¼"-6"
Stn. Steel, Buna-N	230723	1/2	8"-16"



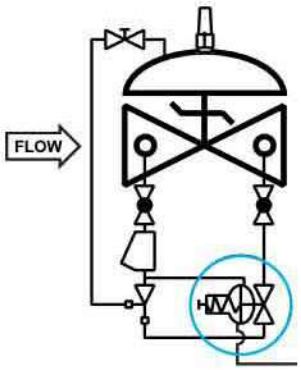
Model 1356 Differential Pressure Pilot:
1. Adjusting Screw Cover
2. Adjusting Screw
3. Spring
4. Diaphragm
5. High Pressure Sense
6. Low Pressure Sense
7. Pilot Inlet
8. Pilot Outlet

SPRING RANGES

PART NUMBER	COLOR	RANGE PSI	RANGE kPa
651701	Green	5 - 30	35 - 210
651703	Red	20 - 80	140 - 560
651704	Yellow	65 - 180	450 - 1240
651702	Blue	100 - 300	700 - 2100

SCHEMATIC SYMBOL

The Model 1356 is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 110 Differential Pressure Valve

MATERIALS

Bronze B61
Stainless Steel ASTM A743/CF8-M
Elastomers (diaphragm, seat disc, o-rings)
- Buna-N (Std.)
- Viton® (Opt.) Viton is a registered trademark of DuPont Dow Elastomers
- EPDM (Opt.)

MAINTENANCE

Rubber components are typically the only parts that may require periodic replacement.
These are available in kits consisting of the diaphragm, the seat disc and all O-rings.
Buna-N Kit-Part # 930010
Viton® Kit-Part # 930110
EPDM Kit-Part # 930410

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Differential Pressure Pilot 1356

DESCRIPTION

MODEL 126 EJECTOR
The Model 126 ejector is a simple tee fitting with a fixed orifice in its inlet port. It provides the proper supply pressure to the main valve diaphragm chamber, allowing various two-way control pilots to control the valve position.

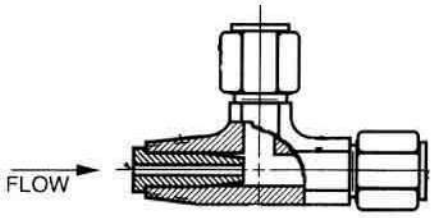
MODEL 126 EJECTOR DIAGRAM

Brass Construction / Stainless Steel Construction

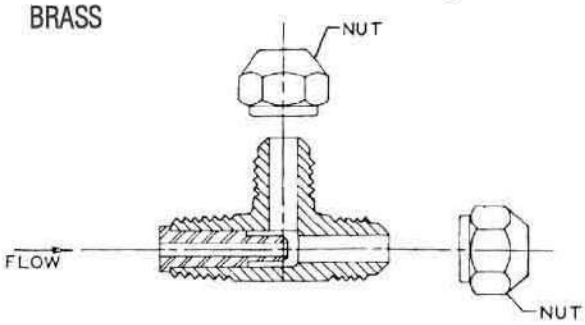
MATERIAL	PART NUMBER	P (NPT)	T-TUBE O.D.	STD. ORIFICE	USED ON VALVE SIZES
Brass	213100	3/8"	3/8"	.125"	1 ¼"-6"
Brass	214100	1/2"	1/2"	.188"	8"-10"
Brass	215100	3/4"	3/4"	.188"	12"-16"
316 Stn. Steel	213700	1/4"	3/8"	.090"	1 ¼"-6"
316 Stn. Steel	214700	3/8"	1/2"	.125"	8"-10"
316 Stn. Steel	215700	1/2"	3/4"	.188"	12"-16"

Orifice bushings are stainless steel.

STAINLESS

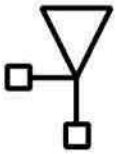


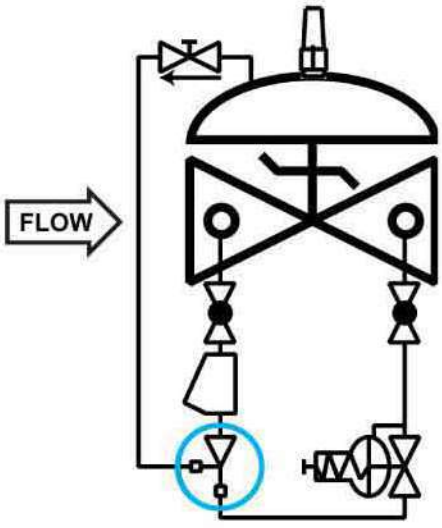
BRASS



SCHEMATIC SYMBOL

The Model 126 Ejector is shown on OCV Valve Schematics as:





EXAMPLE: Shown here on a MODEL 127-3 Pressure Reducing Valve

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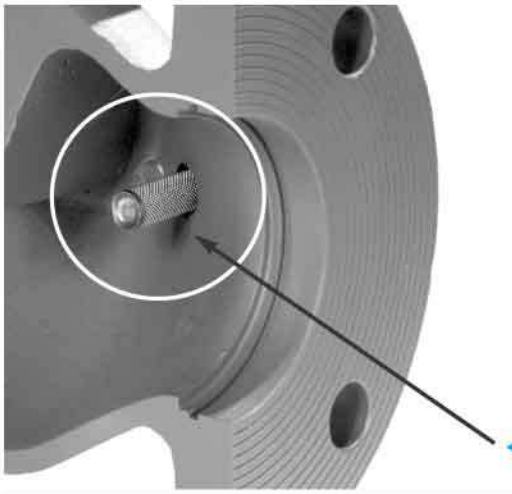


DESCRIPTION

The 123 Inline Strainer installs in the inlet side port of the main valve, and protects the pilot system from solid contaminates in the line fluid. The screen prevents the entrance of particles into the pilot system piping while flow through the main valve washes the screen clean. Recommended use on petroleum valve applications where flushing or removal of the screen for cleaning is not practical or may be considered hazardous.

DIMENSIONS

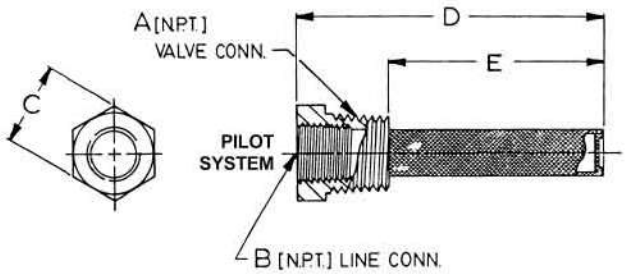
PART NUMBER	A	B	C	D	E	USED ON VALVE SIZE
660704	3/8	1/4	11/16	2 3/16	1 1/2	1 1/4"-6"
660705	1/2	3/8	7/8	2 1/4	1 1/2	8"-10"
660706	3/4	1/2	1 1/8	2 3/8	1 1/2	12"-16"

MATERIALS

Inline strainers are all-stainless steel construction.

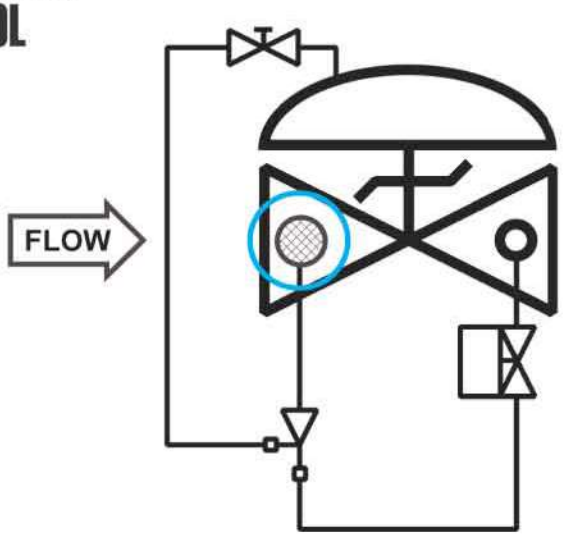
SCREEN SIZE

Standard screen is 40 mesh. Other mesh sizes are available.



SCHEMATIC SYMBOL

The Model 123 Inline Strainer is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 115-2 Solenoid Valve.

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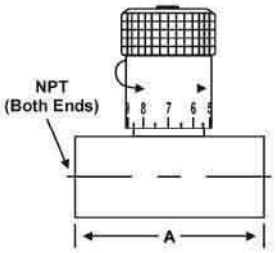
Inline Strainer 123

DESCRIPTION

The Model 141-2 Needle Valve is an adjustable restriction device installed in the control circuit tubing. The setting of the needle valve meters the flow into and out of the main valve diaphragm chamber, thus controlling the response speed of the main valve. Depending on the application, the needle valve may be used as a closing speed control, opening speed control, or both simultaneously.

◀**Needle Valves shown**
Sizes: 3/4" & 1/4"

MODEL 141-2 MATRIX

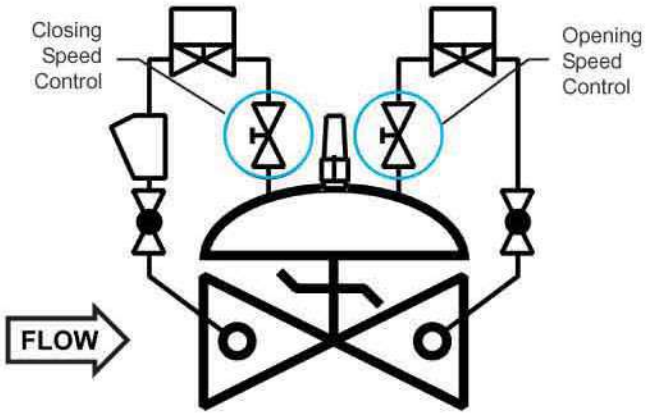


MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	A	USED ON VALVE SIZE*
Brass	683100	1/4	2	1 ¼"-2"
Brass	683101	3/8	2 1/4	2 ½"-6"
Brass	683102	1/2	2 5/8	8"-10"
Brass	683103	3/4	3 1/4	12"-16"
Stn. Steel	683700	1/4	2	1 ¼"-2"
Stn. Steel	683702	3/8	2 1/4	2 ½"-6"
Stn. Steel	682704	1/2	2 5/8	8"-10"
Stn. Steel	683703	3/4	3 5/8	12"-16"

Note: Needle valve size may vary on valve application. Consult factory.

SCHEMATIC SYMBOL

The Model 141-2 Needle Valve is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 115-3 DIGITAL VALVE as separate opening and closing speed controls.

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Needle Valve 141-2

Global performance. **Personal** touch.