OCV Model 114-2

Hydrant & Pantograph Control Valves

Aquestia
Directing the Flow

General representation

Fueling

Aviation Fueling

Hydrant Control Valve

Description

The hydrant control valve shall function to reduce a higher upstream pressure to a constant, lower downstream pressure regardless of fluctuations in supply or demand. The valve shall be equipped with a two-way hydraulic valve that will allow the valve to open when pressurized, and is also equipped with a high capacity surge control pilot to close the valve quickly in the event of sudden reduction in flow. It shall also be equipped with a rate of flow control pilot that will automatically limit the maximum flow rate. Sensing of the pilot shall be by means of a calibrated orifice plate integrally installed in the upstream valve flange. The valve will open automatically in the event of pressure reversal. The OCV 114-2 is a control valve specifically designed for aircraft refueling service. Known as either a refueling or a hydrant control valve, it is the typical control valve used on pantograph refueling systems. It performs the following functions:

- Opens and closes electrically via hydraulic deadman control
- While open, modulates to control downstream pressure at a predetermined set point
- Closes rapidly to prevent undue pressure buildup due to a rapid reduction in demand
- Limits flow rate to a predetermined maximum

Certification & Compliance

NSF-ISO Quality System (9001)

FM Approved

Joint Certification Program

United States / Canada Joint Certification Program Certification Number 0073030

UFGS-33 52 43.14 Guide Specifications

CE (Conformité Européenne) Compliance

Features & Benefits

- Hydraulic deadman control
- Pressure reducing pilot senses valve outlet or pressure compensating venturi
- High-capacity surge control minimizes pressure buildup on reduction of flow
- Rate of flow pilot limits maximum flow
- Opening speed control
- Automatically opens for downstream thermal relief or defueling
- Equipped with visual indicator to monitor valve position
- Can be maintained without removal from the line
- Factory tested and can be preset to your requirements

Typical Applications

Commercial Airports

Military Bases

Bulk Fuel Storage Tanks

Truck On/Off Loading

Fuel Farms

Hydrant Systems

Mobile Refueling Equipment (Carts/Trucks/Tankers)

Refineries

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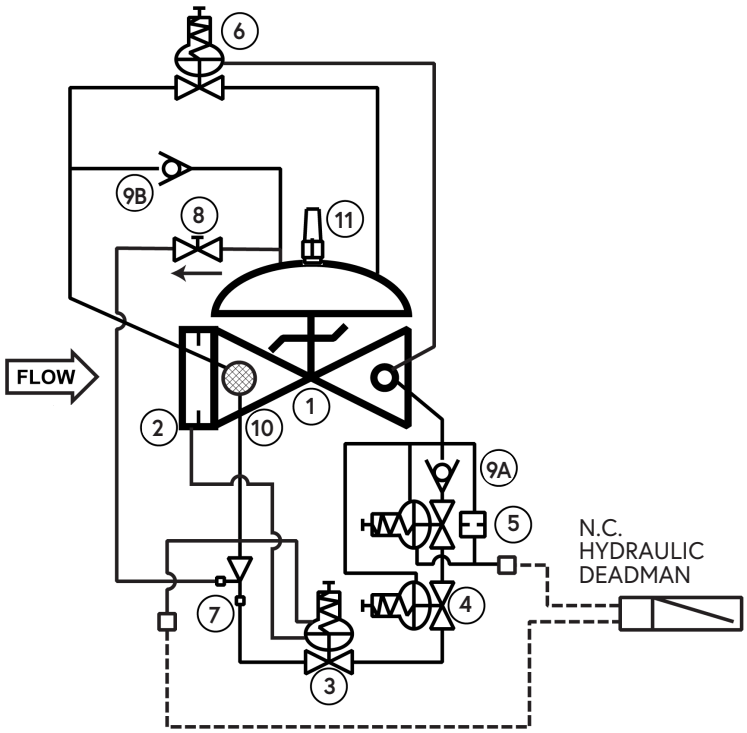
Operation

The two-way, normally closed deadman pilot closes the main valve when actuating hydraulic pressure is removed. Applying hydraulic pressure to the deadman control opens the valve and allows it to come under control of the pressure reducing pilot. The reducing pilot responds to changes in pressure and causes the main valve to do the same. The net result is a constant modulating action of the pilot and main valve to hold the downstream pressure constant. The pilot system is equipped with an opening speed control.

In the event of a sudden decrease in flow, downstream pressure will increase. The normally closed surge control pilot responds to the pressure increase by opening, causing the main valve to move further closed at a much faster rate than would be accomplished through the normal control circuit. As a result, pressure buildup is minimized.

Sensing the differential across the integral orifice plate, the rate of flow pilot will automatically throttle the valve to prevent the flow rate from exceeding a predetermined maximum.

In the event downstream pressure becomes higher than upstream pressure the valve will automatically open to provide thermal pressure relief or defueling flow.



Components

The OCV 114-2 consists of the following components, arranged as shown on the schematic diagram:

1 Model 65 Basic Control Valve (fail closed)
2 Orifice Plate
3 Model 2540 Rate of Flow Control Pilot
4 Model 1340 Pressure Reducing Pilot
5 Model 2430 Deadman Control Pilot
6 Model 1330 or 2470 Surge Control Pilot
7 Model 126 Ejector
8 Model 141-3 Flow Control Valve (opening speed control)
9 Model 141-1 Check Valve (thermal relief)
10 Model 123 Inline Strainer
11 Model 155 Visual Indicator

Pressure Table

End Connections	Ductile Iron	STEEL/SST	STEEL LCB	STEEL WCB	Aluminum
Standard (Maximum Working Pressures at 100°F)					
Screwed	640 psi	640 psi	--	--	285 psi
Grooved	300 psi	300 psi	--	--	200 psi
150# Flanged	250 psi	285 psi	--	--	285 psi
300# Flanged	640 psi	740 psi	--	--	--
Metric (Maximum Working Pressures at 37.78°C)					
Screwed	44.1 bar	44.1 bar	44.1 bar	44.1 bar	19.7 bar
Grooved	20.7 bar	20.7 bar	20.7 bar	20.7 bar	13.8 bar
150# Flanged	17.2 bar	19.0 bar	18.4 bar	19.7 bar	19.7 bar
300# Flanged	44.1 bar	49.6 bar	48.0 bar	51.0 bar	--

Based on ANSI flange ratings.

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Flow Chart

Standard Size Max. Flow (GPM)	1 ¼"	1 ½"	2"	2 ½"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
7.5 FT/SEC (Military)	40	50	80	120	180	300	680	1200	1850	2650	3200	4150	5250	6550	9400
15 FT/SEC (Max. Recommended)	70	100	160	230	350	600	1350	2350	3700	5250	6350	8300	10500	13100	18800
20 FT/SEC (Max. Continuous)	100	130	210	300	470	800	1800	3150	4950	7000	8450	11100	14000	17400	25100
Metric Size Max. Flow (m^3/hr)	DN32	DN40	DN50	DN65	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600
2.29 M/SEC (Military)	9	11	18	27	41	68	154	272	420	602	726	942	1192	1487	2134
4.57 M/SEC (Max. Recommended)	16	23	36	52	79	136	306	533	840	1192	1441	1884	2384	2974	4268
6.10 M/SEC (Max. Continuous)	23	30	48	68	107	182	409	715	1124	1589	1918	2520	3178	3950	5698

The OCV 114-2 is normally sized to match the meter size; however, in no case should the maximum velocity exceed 20 ft/sec (metric: 6.10 meters/sec).

Resetting, maintenance and periodic testing instructions must be followed as described in detail in the applicable OCV IOM (Installation, Operation & Maintenance) Manual.

Typical Materials

Part	Standard Material
Body/Bonnet	Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, Aluminum
Seat Ring	Stainless Steel, Bronze
Stem	Stainless Steel, Monel
Spring	Stainless Steel
Diaphragm	Buna-N, Viton (Nylon reinforced)
Seat Disc	Buna-N, Viton
Pilot	Stainless Steel, Bronze
Other Pilot System Components	Stainless Steel, Bronze/Brass
Tubing & Fittings	Stainless Steel, Copper/Brass

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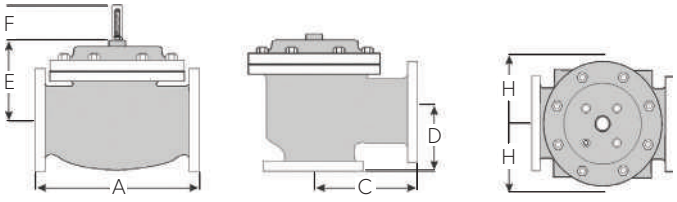
General Arrangement & Dimensions

Standard Sizes													
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
C ANGLE	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	---	---	---	---	---	---	---
	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 ANGLE	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 (OPT)	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
H	ALL	10	11	11	11	12	13	14	17	18	20	20	28 1/2

Metric Sizes													
DIM	END CONN.	DN32-40	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	863	991	1026	1575
	300# FLGD	222	251	283	324	397	473	670	791	902	1029	1067	1619
C ANGLE	SCREWED	111	121	152	165	---	---	---	---	---	---	---	---
	GROOVED	111*	121	152	165	194	---	---	---	---	---	---	---
	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 ANGLE	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 (OPT)	ALL	98	98	98	98	98	98	162	162	162	162	162	203
H	ALL	254	279	279	279	305	330	356	432	457	508	508	724

*Grooved End not available in 1 1/4" (DN32).



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Technical Data

Temperature (Elastomers)	
Buna-N	-40°F to 180°F
Viton	20°F to 230°F
Fluorosilicone	-40°F to 150°F
EPDM	0°F to 230°F
Sizes	
Screwed Ends	1-1/4" - 3"
Grooved Ends	1-1/2" - 6" (globe & angle)
Flanged Ends	1-1/4" - 24" (globe); 1-1/4" - 16" (angle)
Pressure Rating (ANSI at 100°F)	
250psi for Class 150# ANSI Flanged Ductile Iron	
285psi for Steel/Stainless Steel & Aluminum	
300# ANSI Flanges are available	
Solenoid Voltage	
Enclosure	Explosion Proof NEMA 4X, 6P, 7, 9
Body	Brass, Stainless Steel
Voltages	24, 120, 240, 480 VAC; 12, 24 VDC

Body & Cover Material
Ductile Iron
Carbon Steel
Stainless Steel
Aluminum
Trim Material
Bronze/Brass
Stainless Steel
Copper
Optional Components
Two-Stage Opening
Visual Indicator
Pre-Wired Junction Box
Items to Specify
Fluid Type
Model Number
Size
Body & Trim Material
Solenoid Voltage
Globe or Angle
Special Installation Requirements

Engineering Specifications

The hydrant control valve shall be a single-seated, line pressure operated, diaphragm actuated, pilot controlled valve. The valve shall seal by means of a corrosion-resistant seat and a resilient, rectangular seat disc. These, and other parts, shall be replaceable without removing the valve from the line. The stem of the main valve shall be guided top and bottom by integral bushings. Alignment of the body, bonnet and diaphragm assembly shall be by precision dowel pins. The diaphragm shall not be used as a seating surface, nor shall the pistons be used as an operating means. The pilot system shall be furnished complete and installed on the main valve. It shall include an opening speed control, an inline strainer, pilot check valves, a valve position indicator, and a hydraulic deadman valve.

The hydrant control valve shall be operationally and hydrostatically tested prior to shipment. The main valve body and bonnet shall be ductile iron. All ferrous surfaces shall be coated with 4 mils of epoxy. The main valve seat ring shall be stainless steel. Elastomers (diaphragms, resilient seats and o-rings) shall be Buna-N. The control pilots, deadman valve control, opening speed control, check valves, control line tubing, and fittings shall be stainless steel. The hydrant control valve shall be suitable on <voltage> (see Technical Data section). The hydrant control valve shall be suitable for pressures of <X to X> psi (see Pressure Table) at flow rates up to <X> gpm (see Flow Chart). The hydrant control valve shall be an OCV 114-2, as manufactured by OCV, Tulsa, OK, USA.

Aquestia USA

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