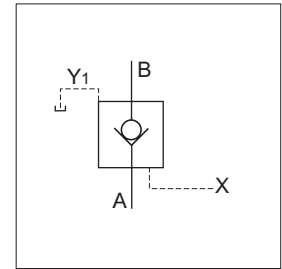


Veljan Pilot Operated Check Valves VC4V are with pilot control for hydraulic unlocking. These are spring-loaded poppet type valves. Mounting configuration of VC4V are according to International Standards such as CETOP, DIN, ISO or NFPA. Standard versions available are subplate mounting L - body and T - body. VC4V valves can be used as body type units or cartridges for manifold application.

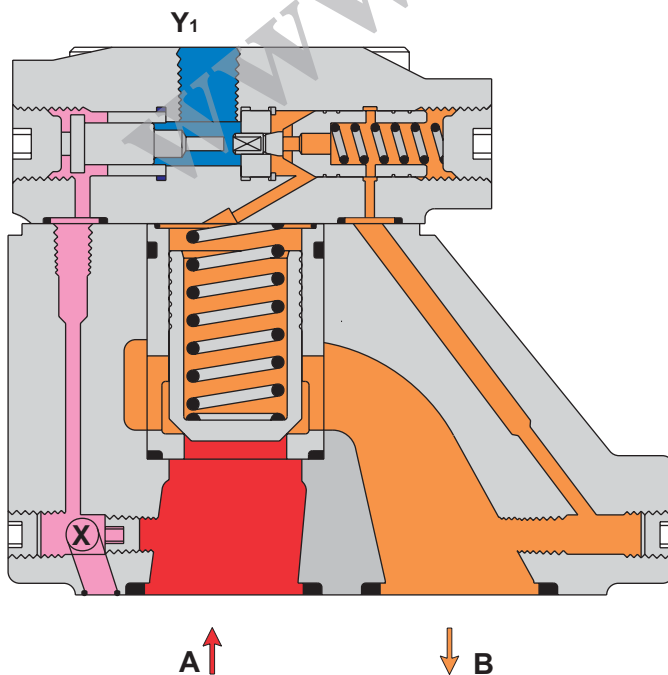


VC4V valves have zero-leak condition for flow from port B to port A and free flow in opposite direction. The blocked flow (zero-leak) direction can be unblocked hydraulically via a control piston. A small control piston and stroke is enough to unblock the flow. Thus the low pilot oil volume of 0.64 ml results in a fast response time.

CV

VC4V Pilot operated check valves works as a normal check valve for flow from port A to port B. Flow from port B to port A is blocked.

To achieve flow from port B to port A, a pilot pressure is necessary at pilot port X which allows the control piston to push the control cone from its seat. The control cone pushes the control spool to block flow from port B to spring chamber connected behind the control cone and spring side of main spool. Simultaneously, the spring chamber gets connected to Y1 port through unseated control cone and, on availability of pressure at port B, the main poppet opens to allow flow from port B to port A. On unloading the pilot line (X), the valve works as a normal check valve.



**SPECIFICATIONS**

**General**

Type	:	Pilot Operated Check Valve
Design	:	Poppet Type
Mounting	:	VC4V03 : Threaded body/Subplate mounting/Cartridge VC4V06 : Threaded body/Subplate mounting/Cartridge/Flange body VC4V10 : Threaded body/Subplate mounting
Mounting Position	:	Optional
Port sizes	:	3/8", 3/4", 1 1/2"
Direction of flow	:	Optional, free flow from A→B Pilot operated flow from B→A
Ambient temperature range	:	-20°C...+60°C (-4°F... 140°F)
Special working conditions	:	Consult <b>VELJAN</b>

**Hydraulics**

Operating pressure range	:	Minimum - 50 psi (3.5 bar) Maximum - 5000 psi (350 bar)
Cracking pressure	:	See model code
	:	VC4V 03 (3/8")      VC4V 06 (3/4")      VC4V10 (1 1/2")
Maximum flow gpm (lpm)	:	48 (180)              95 (360)              159 (600)
Nominal flow gpm (lpm)	:	40 (150)              72 (270)              120 (450)
Fluid	:	Mineral oil as per DIN 51524/25 or other fluids on request
Fluid temperature range	:	-18°C...+80°C (0°F... 176°F)
Viscosity recommended	:	30 cSt (180 SSU)

**Type of actuator**

Hydraulically	:	● Pilot operated
Pilot pressure range	:	Minimum - 72 psi (5 bar) Maximum - 5000 psi (350 bar)
Pilot oil volume	:	At opening ratio    1 : 8 = 0.64 ml 1 : 10 = 0.64 ml 1 : 3 = 0.26 ml 1 : 1 = 0.08 ml
Minimum holding pressure for pilot piston (independent of pressure at ports A & B)	:	At opening ratio    1 : 8 / 1 : 10 = 72 psi (5 bar) 1 : 3 = 160 psi (11 bar) 1 : 1 = 305 psi (21 bar)

Note : Where ports "A" & "Y" are applied with pressure, this pressure has to be considered as follows.  
With pressure at port "A", the necessary pressure at port "B" will be 1.46 times lower than at "A".  
With pressure at port "Y", the necessary pressure at port "B" will be 2.46 times higher than at "Y" as a minimum.

$$p_{B \text{ nec.}} = p_B + 2.46 p_Y - 1.46 p_A = \dots \text{bar}$$



ORDERING CODE

**VC4V 10 - 5 3 0 - 4 B 1 - \*\*\***

**Series**

VC4V - Check valve (pilot operated)

**Size**

03 - 3/8"  
06 - 3/4"  
10 - 1 1/2"

**Max Pressure**

0 - for cartridges only } 5000 psi  
5 - for body valve valves only } (350 bar)

**Body Mounting**

**Cartridge**

0 - Cartridge (VC4V03/VC4V06) ; Y1 port = 1/4" NPTF  
G - Cartridge (VC4V03/VC4V06) ; Y1 port = G 1/4"

**Threaded body**

1 - Threaded body - VC4V03 = 1/2" NPTF ;  
VC4V06 = 1" NPTF  
( 2 A - Ports, 1 B - Port )  
X,Y1 ports = 1/4" NPTF

A - Threaded body - VC4V06 = 3/4" NPTF ;  
VC4V10 = 1 1/4" NPTF  
( 1 A - Port, 1 B - Port )

6 - Threaded body - VC4V03 = 1/2" B.S.P.P. ;  
VC4V06 = 1" B.S.P.P.  
( 2 A - Ports, 1 B - Port )  
X,Y1 ports = G 1/4"

D - Threaded body - VC4V06 = 3/4" B.S.P.P. ;  
VC4V10 = 1 1/4" B.S.P.P.  
( 1 A - Port, 1 B - Port )

**Subplate mounting**

3 - Subplate mounting VC4V03/06/10  
( Y1 port - 1/4" NPTF )

9 - Subplate mounting VC4V03/06/10  
( Y1 Port = 1/4" B.S.P.P )

**Flange body**

2 - Flange body ( X,Y1 port - 1/4" NPTF )  
( 2 A - Ports, 1 B - Port )

**Modification**

**Seal Class**

1 - Buna N (Standard)  
5 - Viton

**Design letter**

**Cracking Pressure (approx.)**

	Flow A → B		Flow B → A	
	VC4V03	VC4V06/10	VC4V03	VC4V06/10
	bar	bar	bar	bar
2 =	1.0	1.0	1.5	1.7
4 =	4.0	3.5	5.5	6.0
6 =	2.0	2.2	3.0	3.8

**Body Head**

1 - Pilot Control Head - Opening ratio 1:1  
3 - Pilot Control Head - Opening ratio 3:1  
8 - Pilot Control Head - Opening ratio 8:1  
9 - Pilot Control Head - Opening ratio 10:1

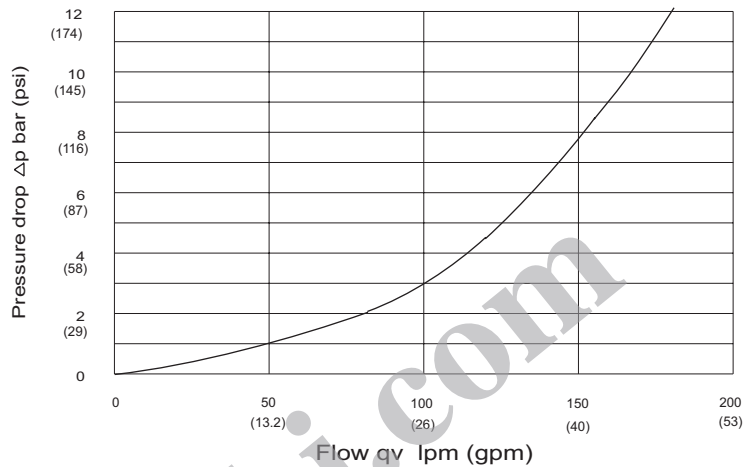
PERFORMANCE CURVES

$\Delta p - q_v$  - Characteristics

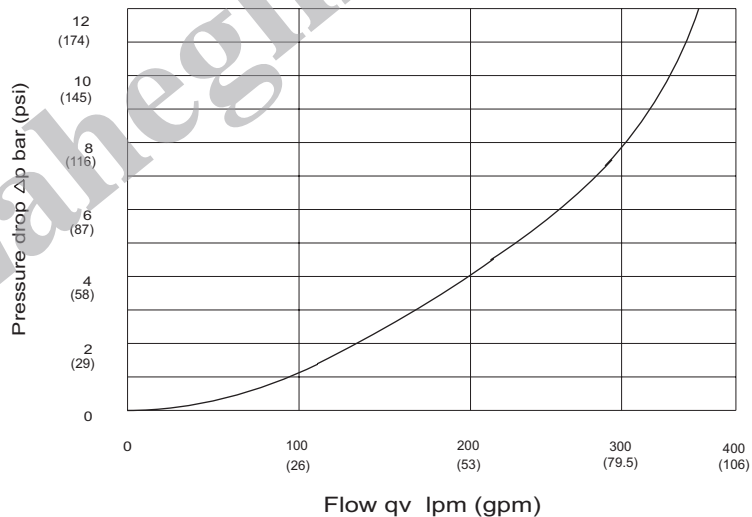
(Fluid 60 cSt at 40°C)

Test temp. 50°C ± 10%

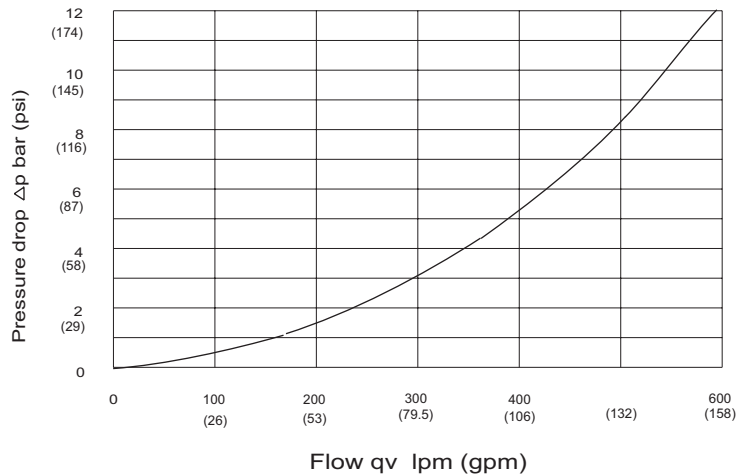
VC4V03



VC4V06

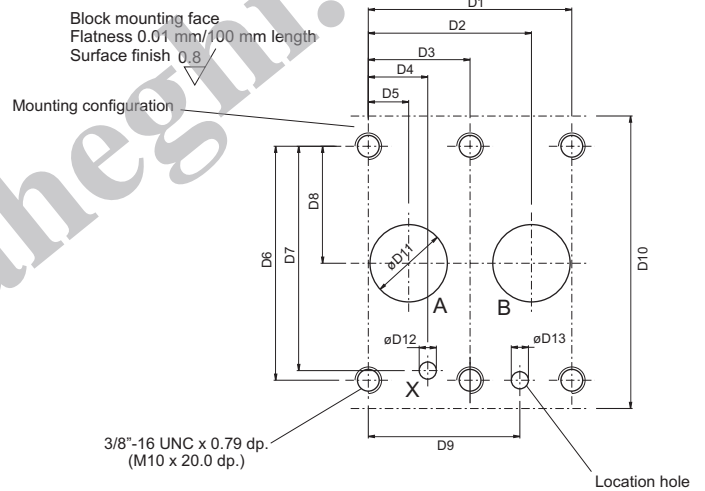
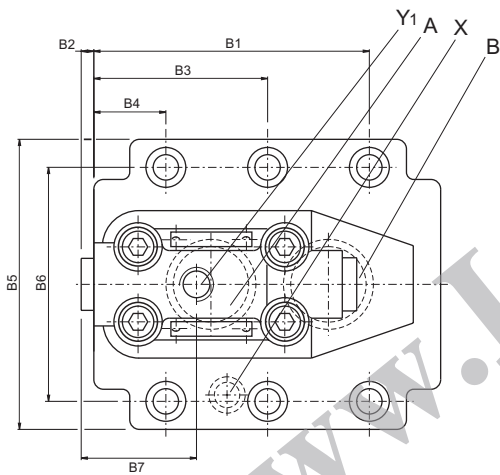
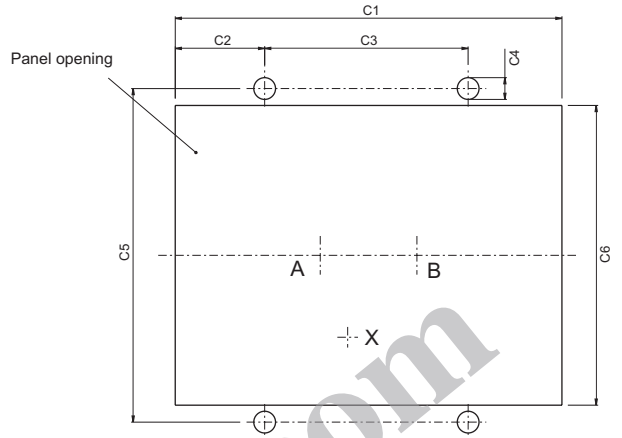
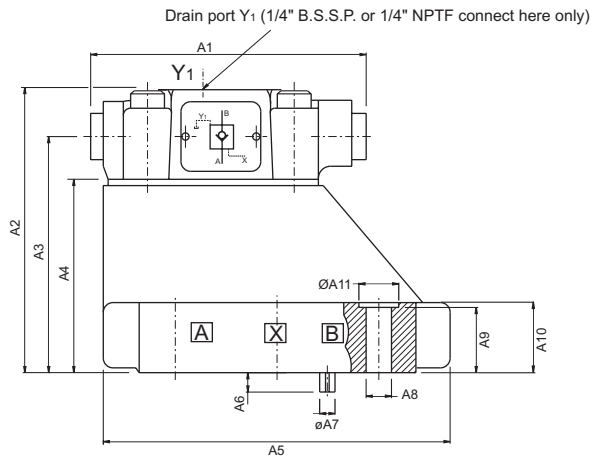


VC4V10



VC4V10 (1 1/2") SUBPLATE MOUNTING (#3)

Weight : 12.96 lbs (5.9 kg)



	Dimensions	
	in	mm
A1	4.489	114.0
A2	4.646	118.0
A3	3.846	97.7
A4	3.15	80.0
A5	5.65	143.5
A6	0.315	8.0
A7	ø0.25	ø6.35
A8	ø0.41	ø10.5
A9	1.142	29.0
A10	1.18	30.0
A11	ø0.65	ø16.5

	Dimensions	
	in	mm
B1	4.489	114.0
B2	0.35	9.0
B3	2.831	71.9
B4	1.174	29.8
B5	4.725	120.0
B6	3.811	96.8
B5	1.878	47.7

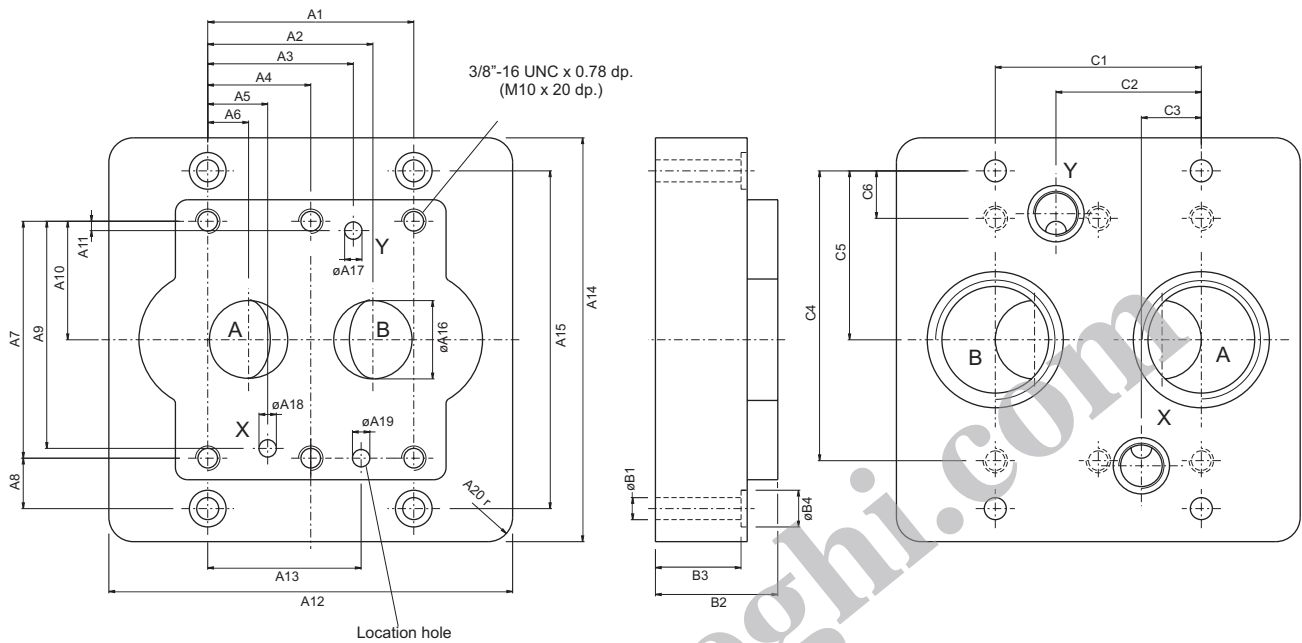
	Dimensions	
	in	mm
C1	6.3	160.0
C2	1.456	37.0
C3	3.315	84.2
C4	ø0.35	ø9.0
C2	5.433	138.0
C3	4.88	124.0

	Dimensions	
	in	mm
D1	3.345	84.2
D2	2.657	67.5
D3	1.657	42.1
D4	0.97	24.6
D5	0.657	16.7
D6	3.811	96.8
D7	3.653	92.8
D8	1.906	48.4
D9	2.47	62.7
D10	4.724	120.0
D11	ø1.26	ø32.0
D12	ø0.28 x 0.433 dp.	ø7.1 x 11.0 dp.

Ports	Function
A	Free flow
B	Normally closed pilot to open
X	External pilot port
Y <sub>1</sub>	External drain

**VC4V10 (1 1/2") SUBPLATE**

Weight : 18.68 lbs (8.5 kg)



	Dimensions	
	in	mm
A1	3.315	84.2
A2	2.657	67.5
A3	2.342	59.5
A4	1.657	42.1
A5	0.968	24.6
A6	0.657	16.7
A7	3.811	96.8
A8	0.811	20.6
A9	3.653	92.8
A10	1.905	48.4
A11	0.15	3.8
A12	6.53	166.0
A13	2.47	62.7
A14	6.5	165.0
A15	5.43	138.0
A16	ø1.26	ø32.0
A17	ø0.28	ø7.1
A18	ø0.28	ø7.1
A19	ø0.28 x 0.433 dp.	ø7.1 x 11.0 dp.
A20	0.4r	10.0 r

	Dimensions	
	in	mm
B1	ø0.351	ø9.0
B2	1.97	50.0
B3	1.38	35.0
B4	ø0.59	ø15.0

	Dimensions	
	in	mm
C1	3.315	84.2
C2	2.342	59.5
C3	0.97	24.5
C4	4.66	118.4
C5	2.716	69.0
C6	0.764	19.4

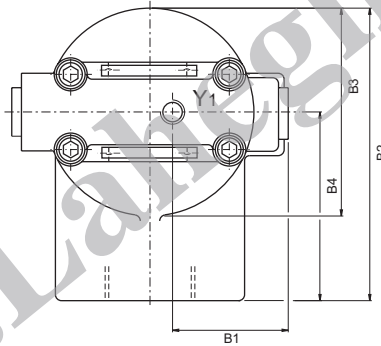
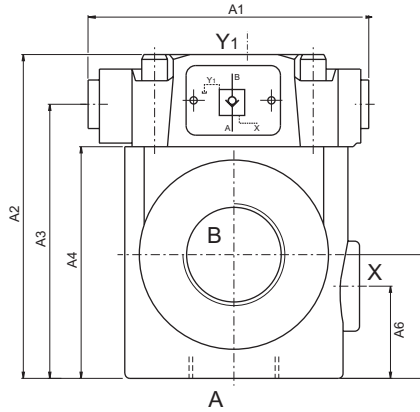
\*\*Note : Port "Y" must not be connected to subplate

Order No.	Port sizes		Dimension	6 Mounting screws*	
	A+B	X+Y**		Order No.	min.tensile strength
VSS - P - 24 - G 116	1 1/2" NPTF	1/4" NPTF	3/8"- 16UNC1 3/4" lg.	V358 - 16220	at p< 210 bar ≅ 100 daN/mm <sup>2</sup> (Torque 68 Nm)
VSS - B - 24 - G 117	1 1/2" B.S.P.P	1/4" B.S.P.P.	M 10 x 45 DIN 912 -12.9	V700 - 71602	at p>210 bar = 120 daN/mm <sup>2</sup> (Torque 82 Nm)

\* Mounting screws are included in subplate order.  
For valves ordered without subplate mounting screws must be ordered separately.

VC4V10 (1 1/2") - THREADED BODY ( # A & D )

Weight : 12.08 lbs (5.5 kg)



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	Dimensions	
	in	mm
A1	4.488	114.0
A2	5.256	133.5
A3	4.449	113.0
A4	3.76	95.5
A5	2.01	51.0
A6	1.496	38.0

	Dimensions	
	in	mm
B1	1.878	47.7
B2	4.748	120.6
B3	3.374	85.7
B4	3.063	77.8

Ports	Function	Port sizes
A (2x)	Free flow	1 1/4" B.S.P.P or 1 1/4" NPTF
B	Normally closed pilot to open	
X	External pilot port	1/4" B.S.P.P. or 1/4" NPTF
Y1	External drain	