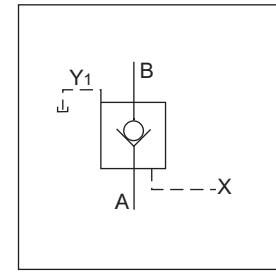


Veljan Pilot Operated Check Valves VC4V are with pilot control for hydraulic unlocking. These are spring-loaded poppet type valves. Mounting configuration of VC4V are according to International Standards such as CETOP, DIN, ISO or NFPA. Standard versions available are subplate mounting L-body and T-body.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

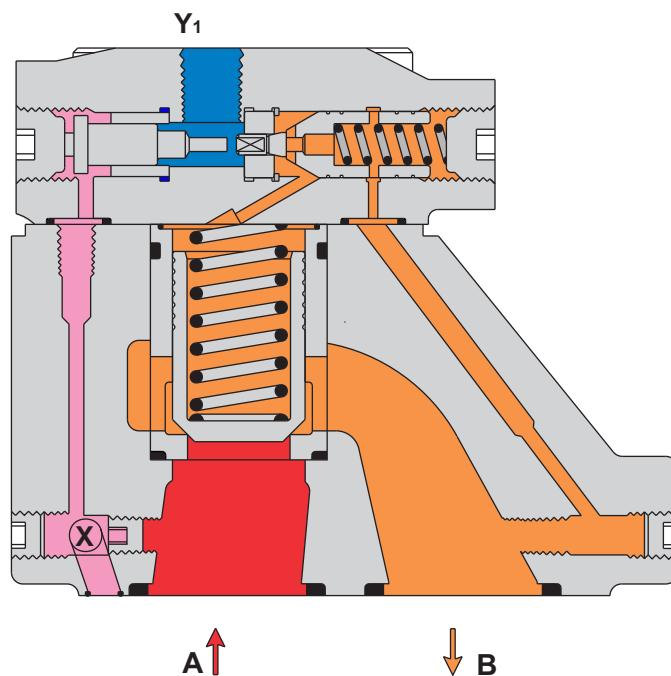
VC4V valves have zero-leak condition for flow from port B to port A and free flow in opposite direction. The blocked flow (zero-leak) direction can be unblocked hydraulically via a control piston. A small control piston and stroke is enough to unblock the flow. Thus the low pilot oil volume of 0.64 ml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

Hydraulics

Operating pressure range	:	Minimum - 50 psi (3.5 bar)
		Maximum - 5000 psi (350 bar)
Cracking pressure	:	See model code
Maximum flow gpm (lpm)	:	VC4V 03 (3/8") VC4V 06 (3/4") VC4V10 (1½")
Nominal flow gpm (lpm)	:	48 (180) 95 (360) 159 (600)
		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

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 lower than at "Y" as a minimum.

$$p_{\text{B, nec.}} = p_{\text{B}} + 2.46 p_{\text{v}} - 1.46 p_{\text{A}} = \dots \text{bar}$$

ORDERING CODE

VC4V **10** - **5** **3** **3** - **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" NPTFG - 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 - C4V03 = 1/2" B.S.P.P. ;
VC4V06 = 1" B.S.P.P.
(2 A - Ports, 1 B - Port) } X,Y₁ ports
= 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) } X,Y₁ ports
= G 1/4"

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 bar	VC4V06/10 bar	VC4V03 bar	VC4V06/10 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

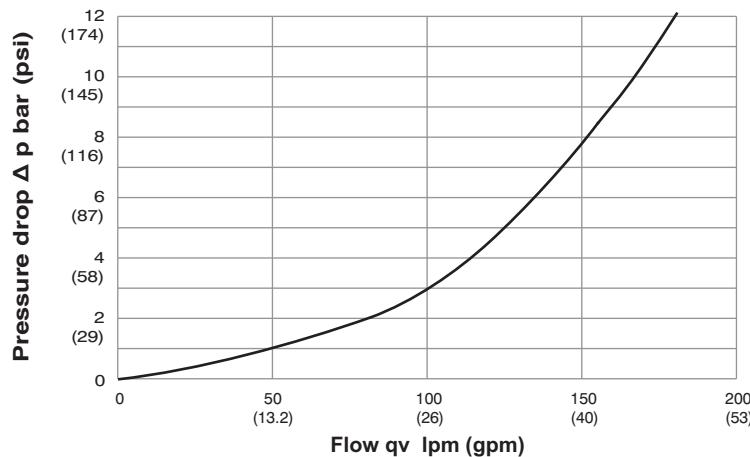
 Δp - qv - Characteristics

(Fluid 60 cSt at 40°C)

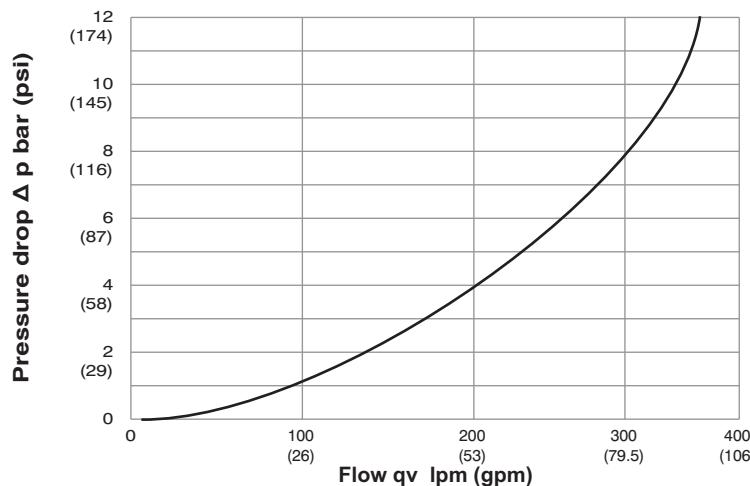
Test temp. 50°C ± 10%

CV

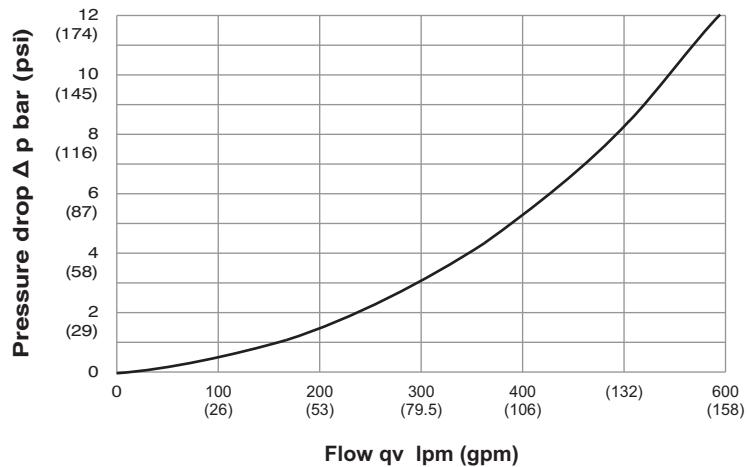
VC4V03



VC4V06

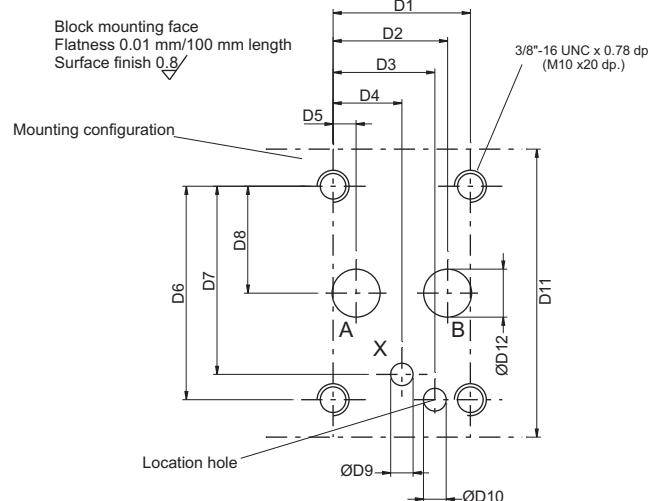
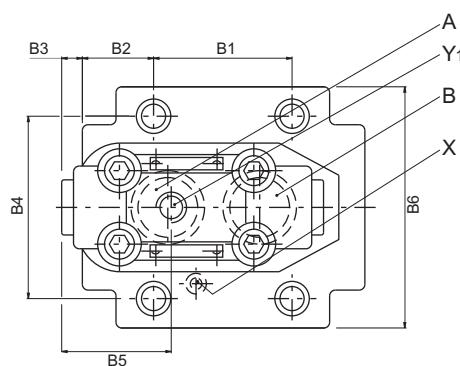
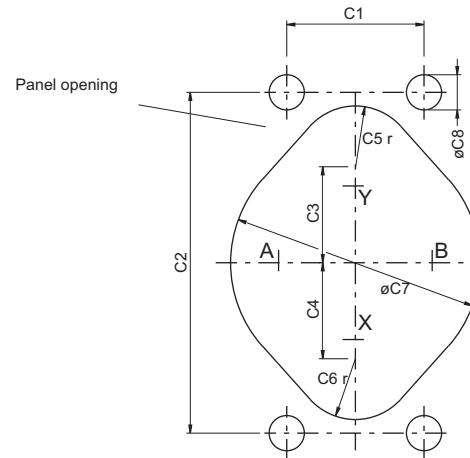
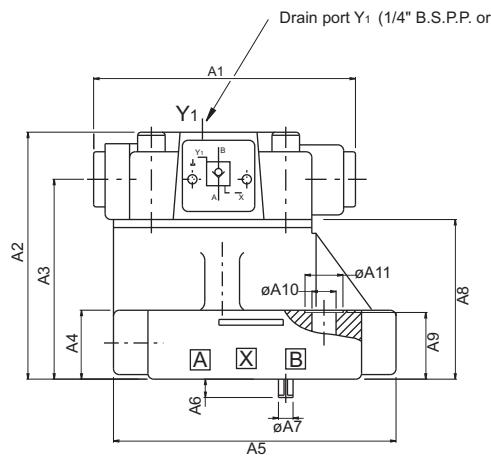


VC4V10



VC4V03 (3/8") SUBPLATE MOUNTING (#3)

Weight : 5.71 lbs (2.6 kg)



Dimensions	
	in mm
A1	4.488 114.0
A2	3.27 83.2
A3	2.46 62.5
A4	0.87 22.0
A5	3.62 92.0
A6	0.315 8.0
A7	ø 0.25 ø 6.35
A8	1.77 45.0
A9	0.83 21.0
A10	ø 0.41 ø 10.5
A11	ø 0.65 ø 16.5

Dimensions	
	in mm
B1	1.69 42.9
B2	0.98 25.0
B3	0.33 8.5
B4	2.62 66.7
B5	1.88 47.7
B6	3.44 87.3

Dimensions	
	in mm
C1	1.69 42.9
C2	4.19 106.5
C3	1.18 30.0
C4	1.18 30.0
C5	0.75 r 19.0 r
C6	0.75 r 19.0 r
C7	ø 3.07 ø 78.0
C8	ø 0.43 ø 11.0

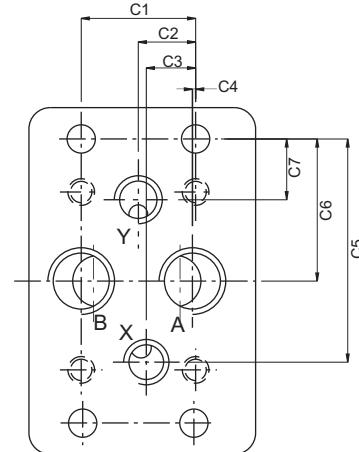
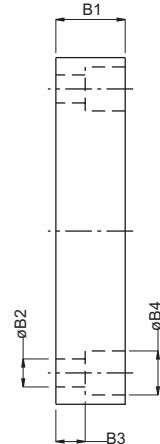
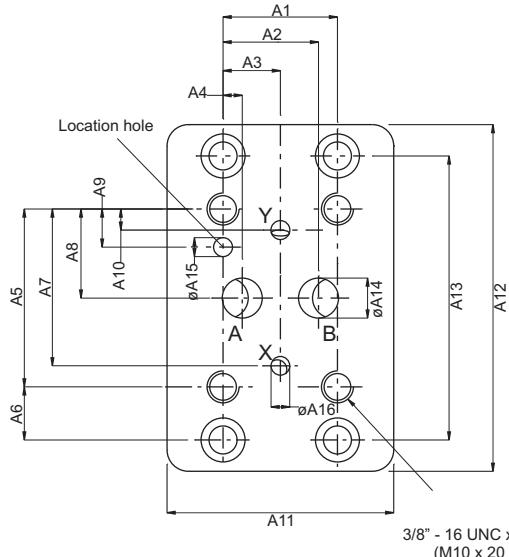
Ports	Function
A	Inlet or outlet
B	Outlet or inlet
X	External pilot port
Y(Y ₁)	External drain

Dimensions	
	in mm
D1	1.69 42.9
D2	1.41 35.8
D3	1.253 31.8
D4	0.846 21.5
D5	0.283 7.2
D6	2.626 66.7
D7	2.315 58.8
D8	1.315 33.4
D9	ø 0.275 ø 7.0
D10	ø 0.28 x 0.315 dp. ø 7.1 x 11.0 dp.
D11	3.43 87.3
D12	ø 0.59 ø 15.0

Note : For details of Subplate & mtg. screws please refer page 27

SUBPLATE FOR VC4V03 (3/8")

Weight : 4.4 lbs (2.0 kg)



Dimensions	
	in mm
A1	1.69 42.9
A2	1.41 35.8
A3	0.846 21.5
A4	0.283 7.2
A5	2.626 66.7
A6	0.783 19.9
A7	2.315 58.8
A8	1.315 33.4
A9	0.563 14.3
A10	0.311 7.9
A11	3.346 85.0
A12	5.12 130.0
A13	4.19 106.5
A14	ø0.59 ø 15.0
A15	ø 0.28 x ø 7.1 x 0.315 dp. 8.0 dp.
A16	ø 0.275 ø 7.0

Dimensions	
	in mm
B1	1.024 26.0
B2	ø 0.41 ø 10.5
B3	0.433 11.0
B4	ø 0.65 ø 16.5

Dimensions	
	in mm
C1	1.69 42.9
C2	0.846 21.5
C3	0.73 18.5
C4	0.047 1.2
C5	3.295 83.7
C6	2.1 53.3
C7	0.9 22.8

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

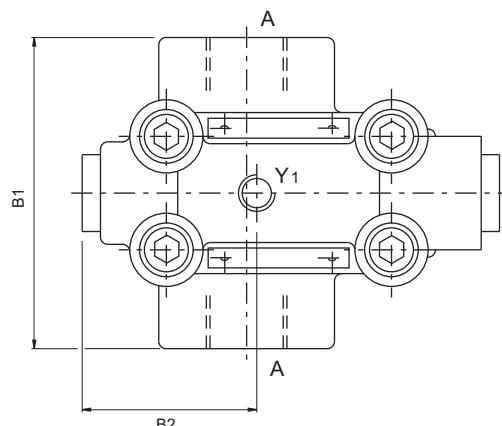
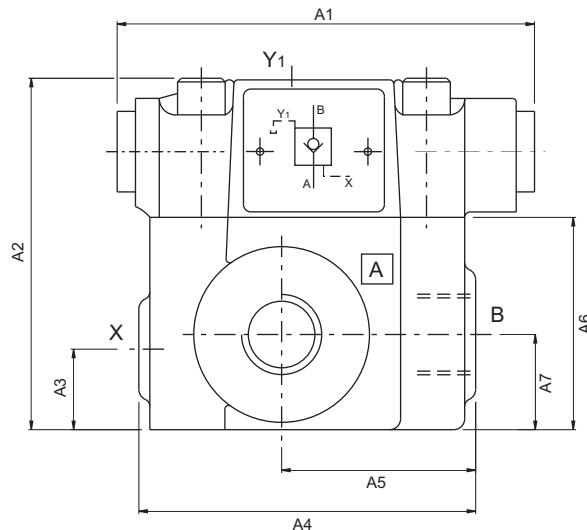
Order No.	Port sizes		4 Mounting screws*		
	A+B	X+Y**	Dimensions	Order No.	min.tensile strength
VSS - P - 08 - G 112	1/2" NPTF	1/4" NPTF	3/8"-16UNC 1 1/4" lg. M10 x 35 DIN 912 - 12.9	V358 - 16180	at p ≤ 210 bar = 100 daN/mm ² (Torque 68 Nm) at p > 210 bar = 120 daN/mm ² (Torque 82 Nm)
VSS - B - 08 - G 113	1/2" B.S.P.P	1/4" B.S.P.P		V700 - 70039	

*Mounting screws are included in subplate order.

For valves ordered without subplate, mounting screws must be ordered separately.

VC4V03 (3/8") - THREADED BODY (#1& #6)

Weight : 6.81 lbs (3.1 kg)



Dimensions		
	in	mm
A1	4.488	114.0
A2	3.78	96.0
A3	0.867	22.0
A4	3.623	92.0
A5	2.087	53.0
A6	2.284	58.0
A7	1.024	26.0

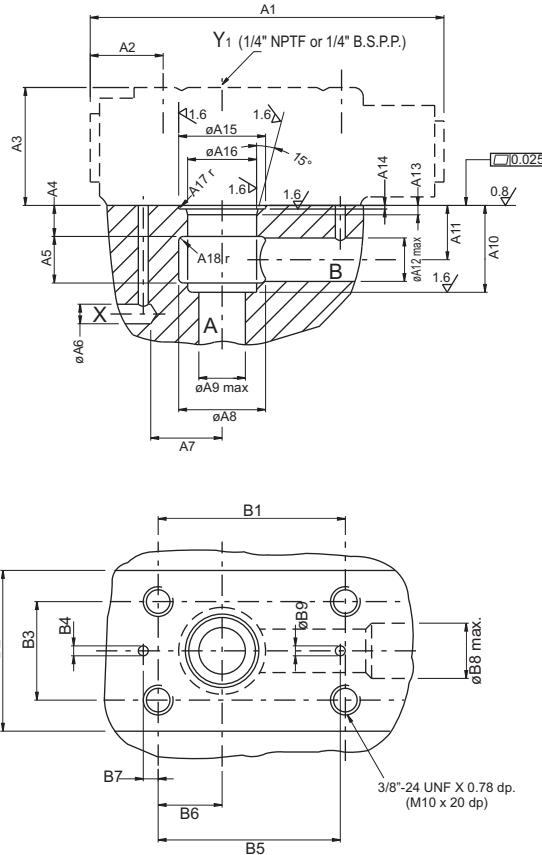
Dimensions		
	in	mm
B1	3.347	85.0
B2	1.878	47.7

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

CARTRIDGE WITH PILOT VALVE VC4V03 (#0)

Weight : 1.97 lbs (0.9 kg)

CV



Dimensions		
	in	mm
A1	4.49	114.0
A2	0.92	23.5
A3	1.496	38.0
A4	0.4	10.0
A5	0.59	15.0
A6	Ø 0.25	Ø 6.3
A7	0.91	23.0
A8	Ø 1.1	Ø 28.0
A9	Ø 0.59	Ø 15.0
A10	1.1 ^{+0.02}	28.0 ^{+0.05}
A11	0.69	17.5
A12	Ø 0.55	Ø 14.0
A13	0.12	3.0
A14	0.045 ^{+0.006}	1.15 ^{+0.15}
A15	Ø 1.1 ^{+0.004}	Ø 28.0 ^{+0.1}
A16	Ø 0.875 ^{+0.0008}	Ø 22.225 ^{+0.02}
A17	0.016 r	0.4 r
A18	0.06 r	1.5 r

Dimensions		
	in	mm
B1	2.374 ^{+0.008}	60.32 ^{+0.2}
B2	2.03	51.8
B3	1.25 ^{+0.008}	31.75 ^{+0.2}
B4	Ø 0.126	Ø 3.2
B5	2.31	58.7
B6	0.81	20.6
B7	0.189	4.8
B8	Ø 0.69	Ø 17.8
B9	Ø 0.126	Ø 3.2

Ports	Function
A	Free flow
B	Normally closed, pilot to open
X	External pilot port
Y ₁	External drain

4 Mounting screws	
Dimensions	Order No.
M10 x 45mm, DIN 912 - 10.9	V700 - 71602

(Mounting screws must be ordered separately)
Torque 68 Nm