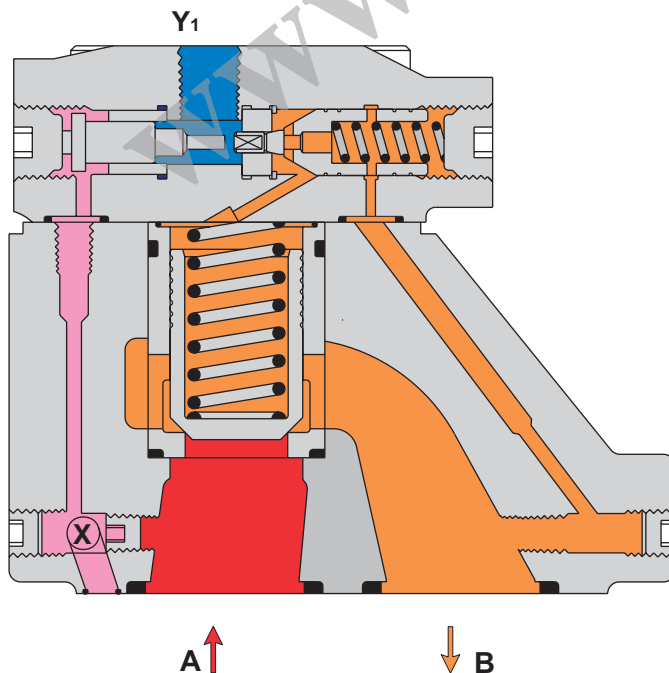
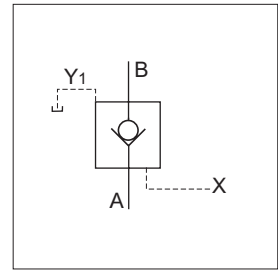


Veljan Pilot Operated Check Valves VC4V are with pilot control for hydraulic unlocking. These are spring-loaded poppet type valves. Mounting configuration of VC4V are according to International Standards such as CETOP, DIN, ISO or NFPA. Standard versions available are subplate mounting L - body and T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



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.



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## 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	:	$\frac{3}{8}$ " , $\frac{3}{4}$ " , $1\frac{1}{2}$ "
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 ( $\frac{3}{8}$ " )      VC4V 06 ( $\frac{3}{4}$ " )      VC4V10 ( $1\frac{1}{2}$ " )
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
  - 5 - for body valve valves only
- } 5000 psi  
(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 )
  - 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 )
  - 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  
= 1/4" NPTF
- } 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

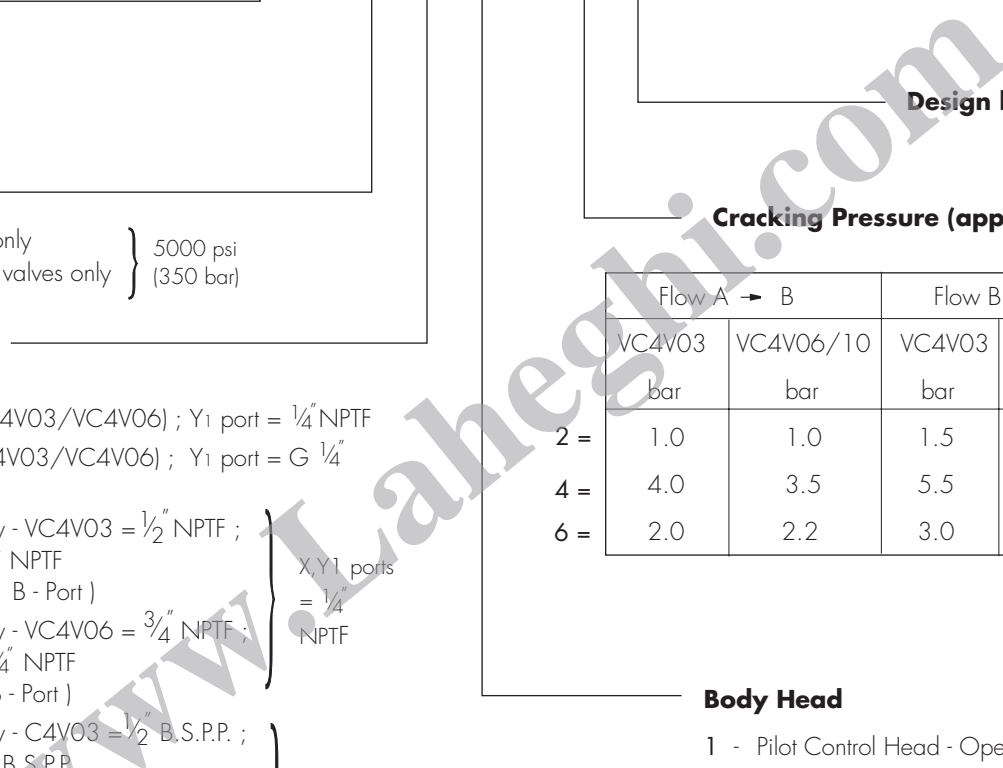
**Design letter**

**Cracking Pressure (approx.)**

	Flow A → B		Flow B → A	
	VC4V03	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**

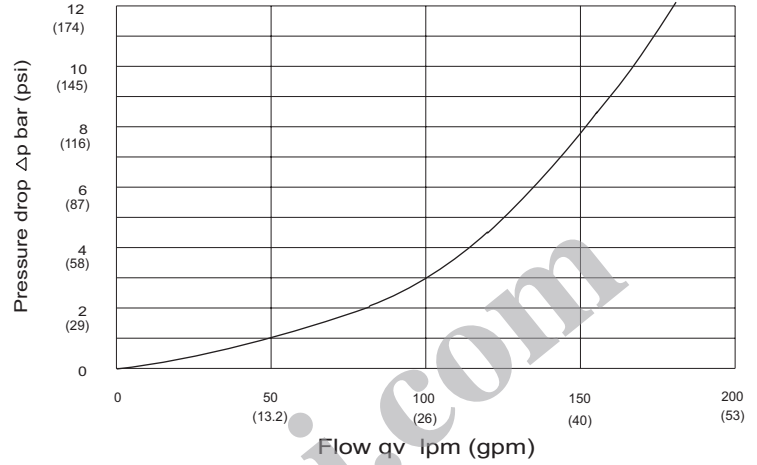
- 1 - Pilot Control Head - Opening ratio 1:1
- 3 - Pilot Control Head - Opening ratio 3:1
- 8 - Pilot Control Head - Opening ratio 8:1
- 9 - Pilot Control Head - Opening ratio 10:1



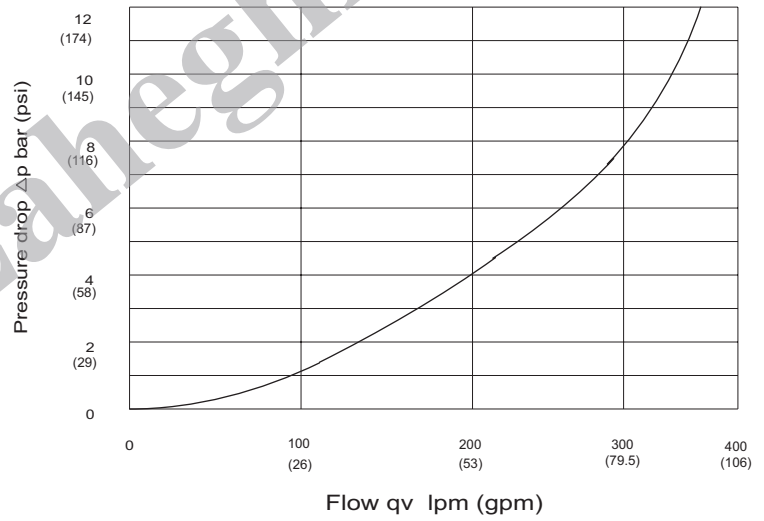
**PERFORMANCE CURVES**

$\Delta p - q_v$  - Characteristics  
 (Fluid 60 cSt at 40°C  
 Test temp. 50°C ± 10%)

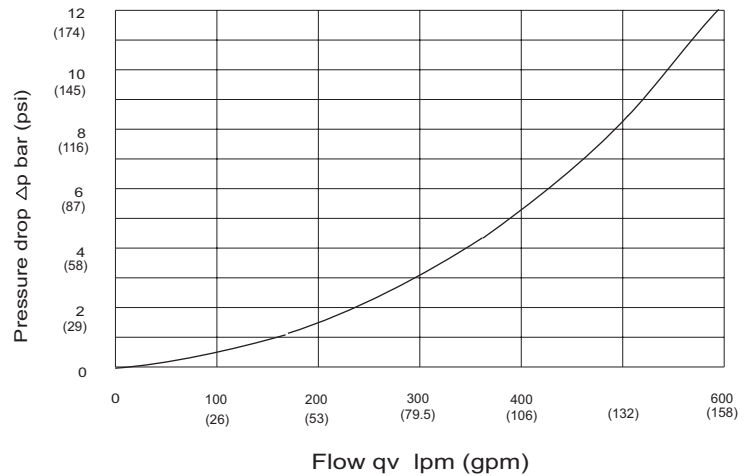
**VC4V03**



**VC4V06**



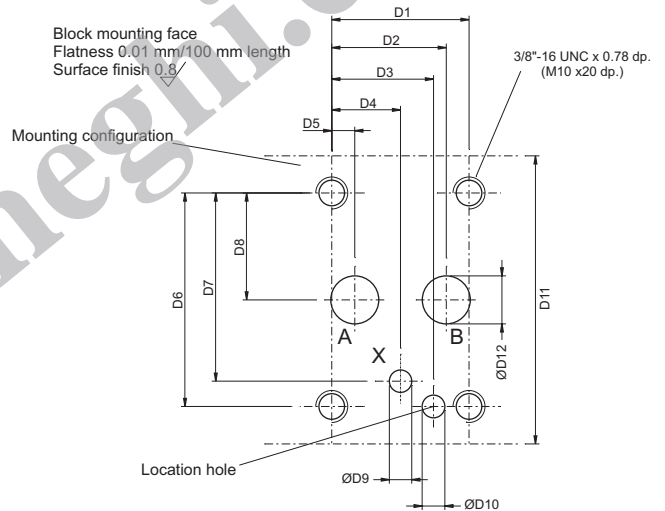
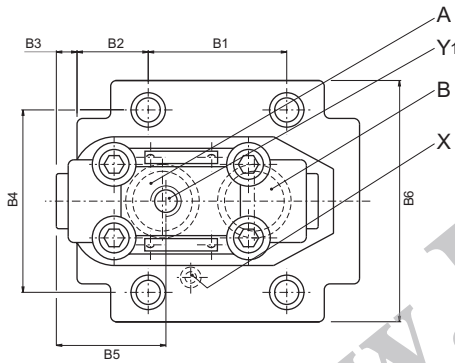
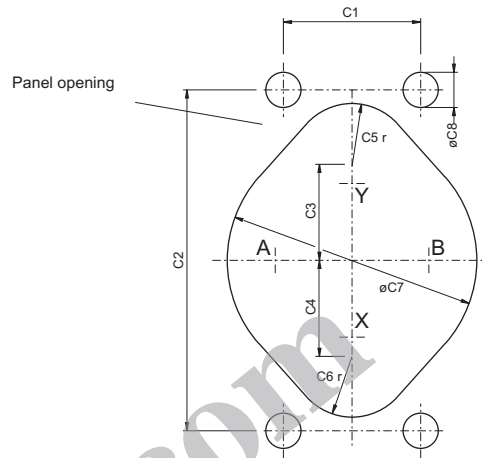
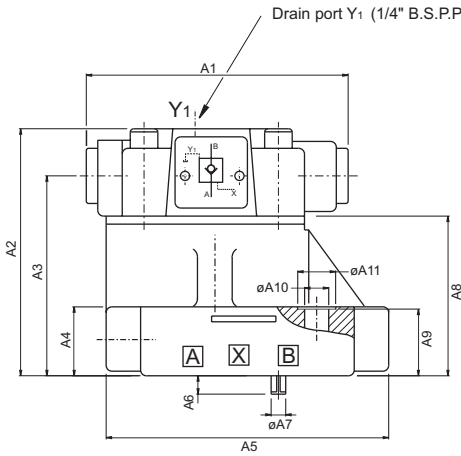
**VC4V10**



CV

**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	ø0.25	ø6.35
A8	1.77	45.0
A9	0.83	21.0
A10	ø0.41	ø10.5
A11	ø0.65	ø16.5

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

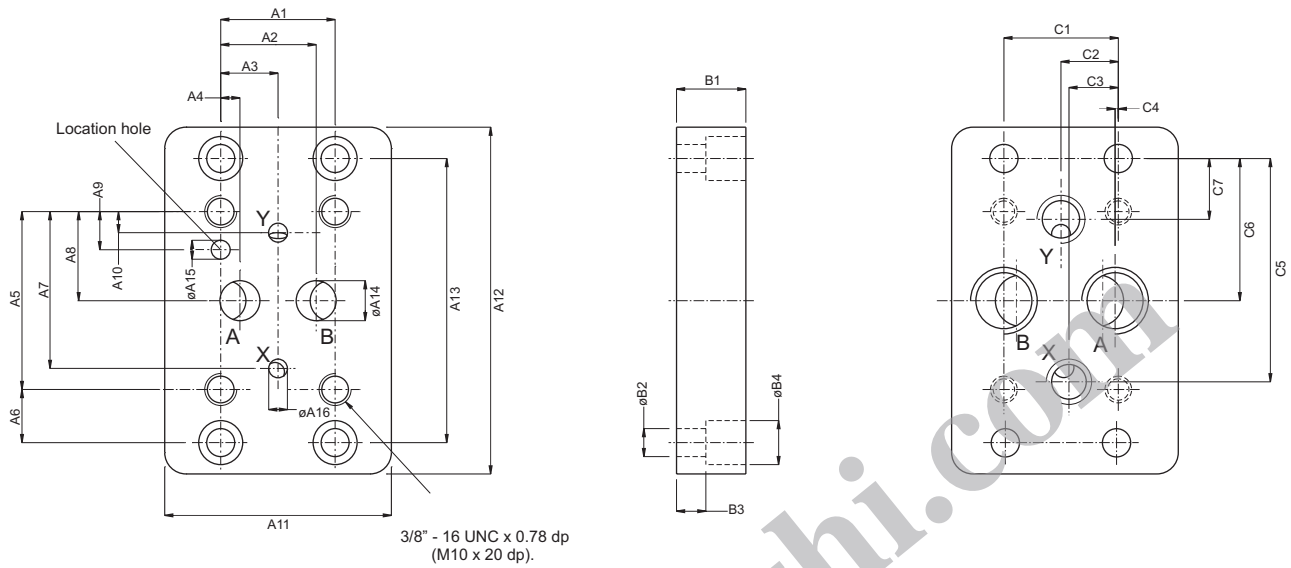
Dimensions		
	in	mm
C1	1.69	42.9
C2	4.19	106.5
C3	1.18	30.0
C4	1.18	30.0
C5	0.75 r	19.0 r
C6	0.75 r	19.0 r
C7	ø3.07	ø78.0
C8	ø0.43	ø11.0

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	ø0.275	ø7.0
D10	ø0.28 x 0.315 dp	ø7.1 x 11.0 dp.
D11	3.43	87.3
D12	ø0.59	ø15.0

Ports	Function
A	Inlet or outlet
B	Outlet or inlet
X	External pilot port
(Y1)	External drain

**SUBPLATE FOR VC4V03 (3/8")**

Weight : 4.4 lbs (2.0 kg)



Dimensions	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	ø15.0
A15	ø0.28 x 0.315 dp.	ø7.1 x 8.0 dp.
A16	ø0.275	ø7.0

Dimensions	Dimensions	
	in	mm
B1	1.024	26.0
B2	ø0.41	ø10.5
B3	0.433	11.0
B4	ø0.65	ø16.5

Dimensions	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

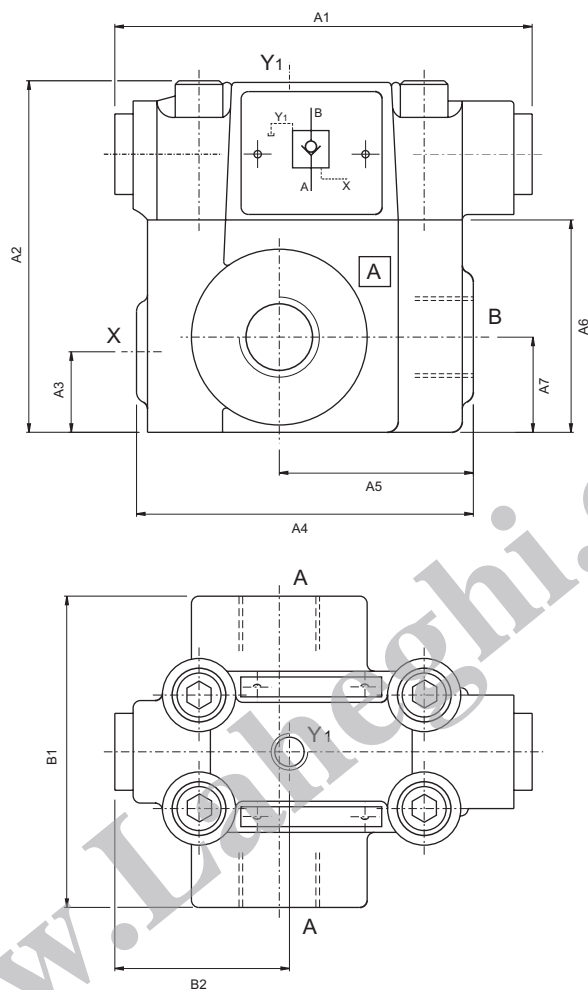
\*\*Note : Port "Y" must not be connected to subplate

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

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

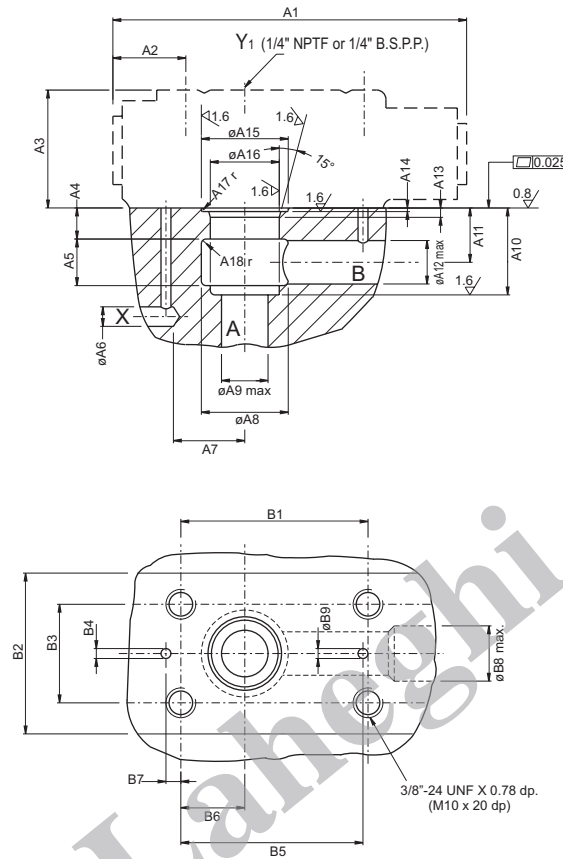
Ports	Function	Port sizes
A (2x)	Free flow	1/2" B.S.P.P or 1/2" NPTF
B	Normally closed pilot to open	
X	External pilot port	1/4" B.S.P.P. or 1/4" NPTF
Y1	External drain	



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**CARTRIDGE WITH PILOT VALVE VC4V03 (#0)**

Weight : 1.97 lbs (0.9 kg)



Dimensions	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	ø0.25	ø6.3
A7	0.91	23.0
A8	ø1.1	ø28.0
A9	ø0.59	ø15.0
A10	1.1 <sup>+0.02</sup>	28.0 <sup>+0.05</sup>
A11	0.69	17.5
A12	ø0.55	ø14.0
A13	0.12	3.0
A14	0.045 <sup>+0.006</sup>	1.15 <sup>+0.15</sup>
A15	ø1.1 <sup>+0.004</sup>	ø28.0 <sup>+0.1</sup>
A16	ø0.875 <sup>+0.0008</sup>	ø22.225 <sup>+0.02</sup>
A17	0.016 r	0.4 r
A18	0.06 r	1.5 r

Dimensions	Dimensions	
	in	mm
B1	2.374 <sup>±0.008</sup>	60.32 <sup>±0.2</sup>
B2	2.03	51.8
B3	1.25 <sup>±0.008</sup>	31.75 <sup>±0.2</sup>
B4	ø0.126	ø3.2
B5	2.31	58.7
B6	0.81	20.6
B7	0.189	4.8
B8	ø0.69	ø17.8
B9	ø0.126	ø3.2

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

