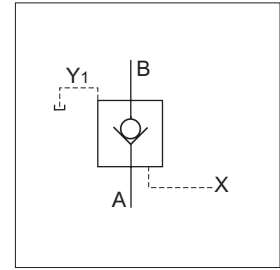
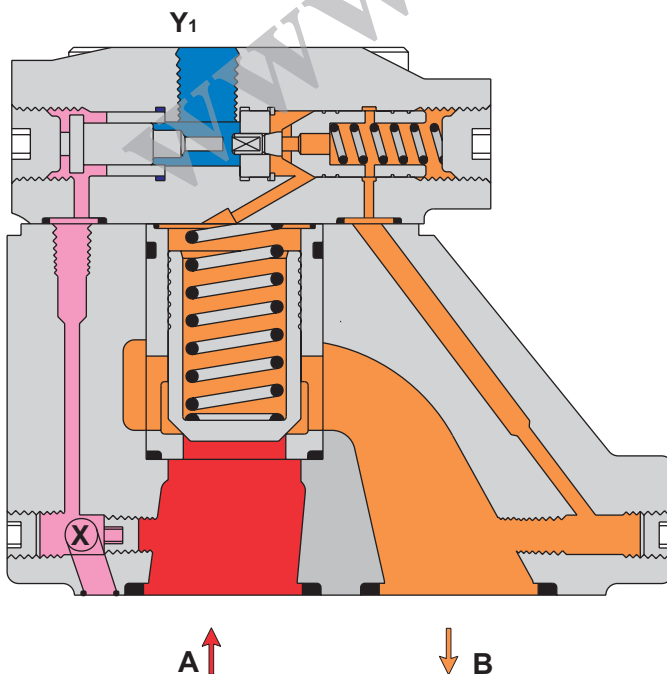


Veljan Pilot Operated Check Valves VC4V are with pilot control for hydraulic unlocking. These are spring-loaded poppet type valves. Mounting configuration of VC4V are according to International Standards such as CETOP, DIN, ISO or NFPA. Standard versions available are subplate mounting L - body and T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

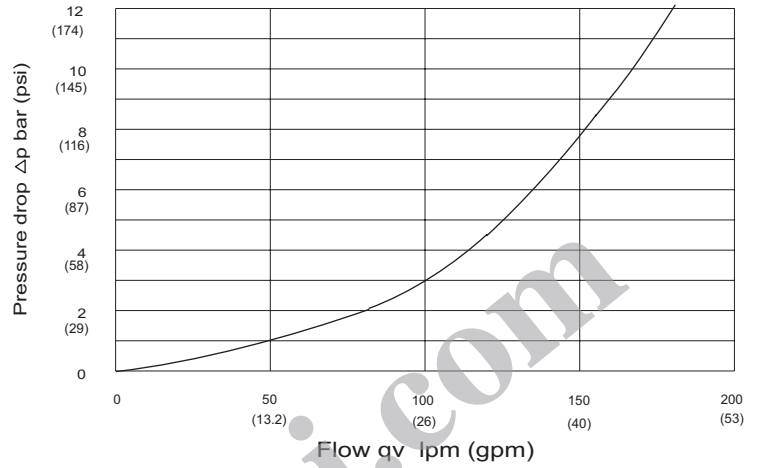
Body Head

- 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

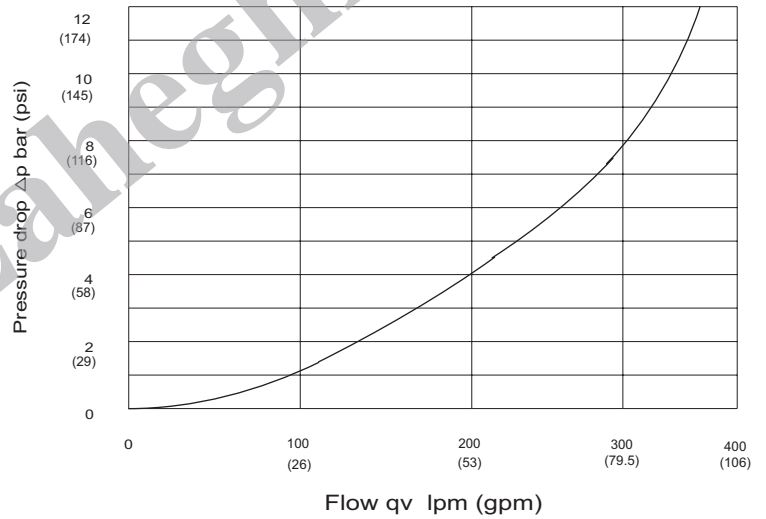
PERFORMANCE CURVES

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

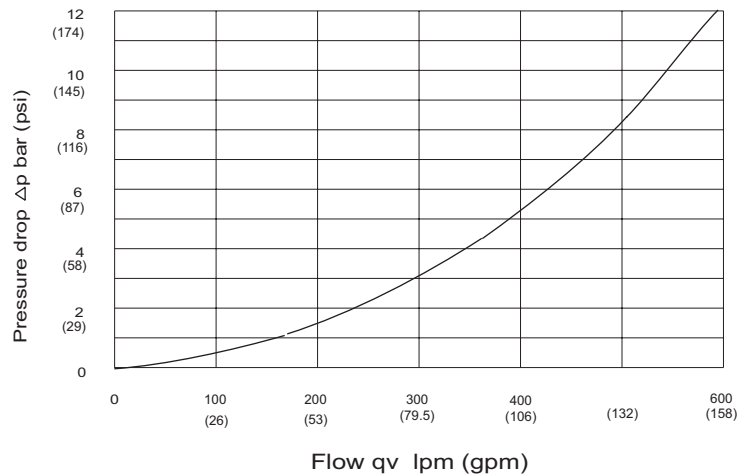
VC4V03



VC4V06

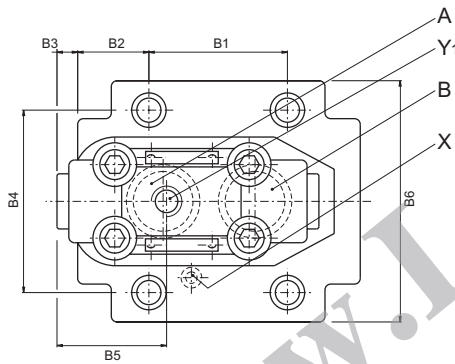
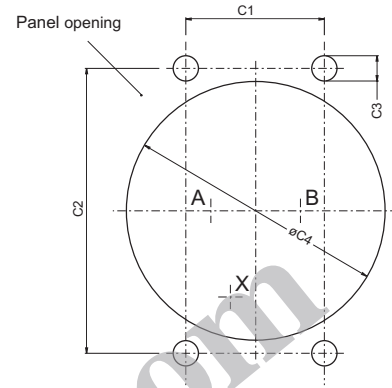
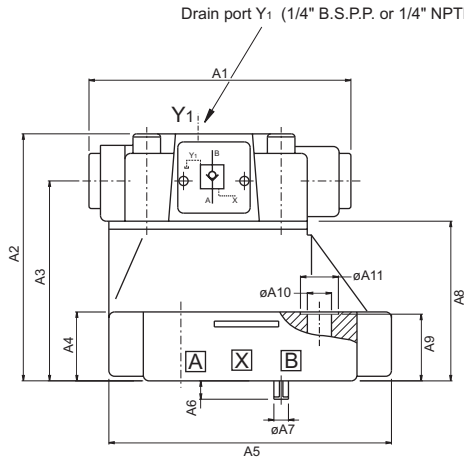


VC4V10



VC4V06 (3/4") SUBPLATE MOUNTING (#3)

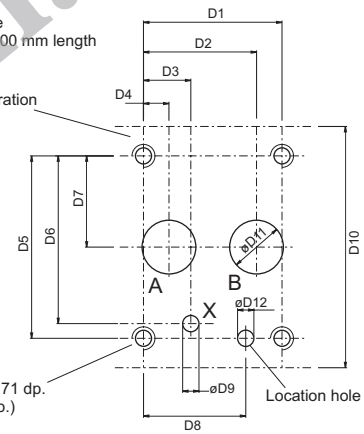
Weight : 9.67 lbs (4.4 kg)



Block mounting face
Flatness 0.01 mm/100 mm length
surface finish 0.8

Mounting configuration

3/8"-16 UNC x 0.71 dp.
(M10 x 18 dp.)



Dimensions	in		mm	
A1	4.488		114.0	
A2	4.24		107.7	
A3	3.425		87.0	
A4	1.18		30.0	
A5	4.843		123.0	
A6	0.315		8.0	
A7	ø0.25		ø6.35	
A8	2.736		69.5	
A9	1.142		29.0	
A10	ø0.41		ø10.5	
A11	ø0.65		ø16.5	

Dimensions	in		mm	
B1	2.374		60.3	
B2	1.22		31.0	
B3	0.35		9.0	
B4	3.126		79.4	
B5	1.88		47.7	
B6	4.134		105.0	

Dimensions	in		mm	
C1	2.374		60.3	
C2	4.882		124.0	
C3	ø0.433		ø11.0	
C4	ø4.646		ø118.0	

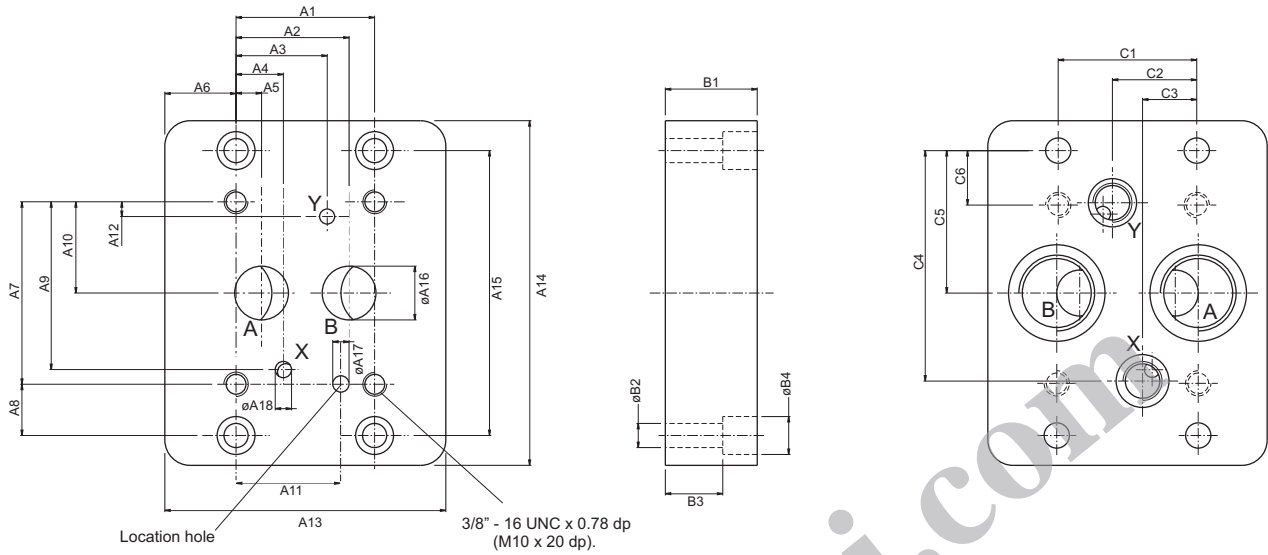
Dimensions	in		mm	
D1	2.374		60.3	
D2	1.937		49.2	
D3	0.81		20.6	
D4	0.437		11.1	
D5	3.126		79.4	
D6	2.874		73.0	
D7	1.563		39.7	
D8	1.752		44.5	
D9	ø0.28		ø7.1	
D10	1.134		105.0	
D11	ø0.92		ø23.4	
D12	ø0.28 x		ø7.1 x	
	0.433 dp.		11.0 dp.	

Ports	Function
A	Free flow
B	Normally closed pilot to open
X	External pilot port
(Y1)	External drain

Note : For details of Subplate & mtg. screws please refer page 31

SUBPLATE FOR VC4V06 (3/4")

Weight : 10.54 lbs (4.8 kg)



	Dimensions	
	in	mm
A1	2.374	60.3
A2	1.937	49.2
A3	1.563	39.7
A4	0.811	20.6
A5	0.437	11.1
A6	1.22	31.0
A7	3.126	79.4
A8	0.88	22.3
A9	2.874	73.0
A10	1.563	39.7
A11	1.75	44.5
A12	0.25	6.4
A13	4.843	123
A14	5.905	150.0
A15	4.882	124.0
A16	ø0.92	ø23.4
A17	ø0.28 x 0.315 dp.	ø7.1 x 8.0 dp.
A18	ø0.28	ø7.1

	Dimensions	
	in	mm
B1	1.575	40.0
B2	ø0.41	ø10.5
B3	0.984	25.0
B4	ø0.65	ø16.5

	Dimensions	
	in	mm
C1	2.374	60.3
C2	1.445	36.7
C3	0.93	23.6
C4	3.949	100.3
C5	2.44	62.0
C6	0.933	23.7

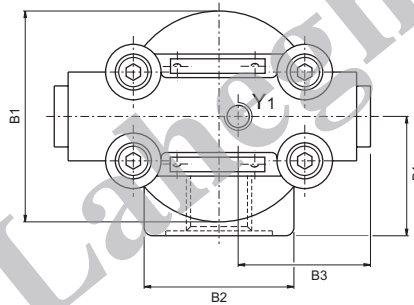
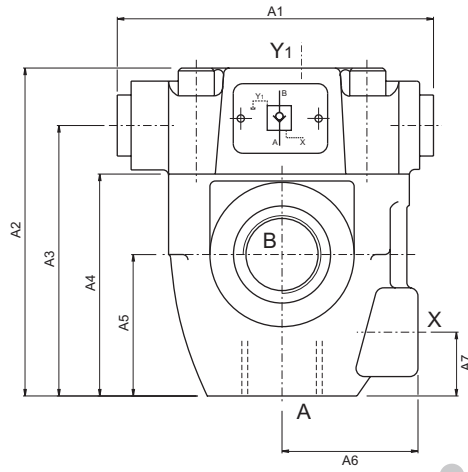
**Note : Port "Y" must not be connected to subplate

Order No.	Port sizes		4 Mounting screws*		
	A+B	X+Y**	Dimension	Order No.	min.tensile strength
VSS - P - 16 - G 114	1" NPTF	1/4" NPTF	3/8"-16UNC 1 3/4" lg	V359 - 16220	at p≤ 210 bar = 100 daN/mm ² (Torque 68 Nm) at p>210 bar = 120 daN/mm ² (Torque 82 Nm)
VSS - B - 12 - G 115	3/4" B.S.P.P.	1/4" B.S.P.P.	M10 x 45mm DIN 912 - 12.9	V700 - 71602	
VSS - B - 16 - G 115	1" B.S.P.P.				

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

VC4V06 (3/4") - THREADED BODY (#A & #D)

Weight : 7.03 lbs (3.2 kg)



Dimensions		
	in	mm
A1	4.488	114.0
A2	4.854	118.2
A3	3.839	97.5
A4	3.15	80.0
A5	2.01	51.0
A6	1.93	49.0
A7	0.906	23.0

Dimensions		
	in	mm
B1	2.993	76.0
B2	2.126	54.0
B3	1.878	47.7
B4	1.693	43.0

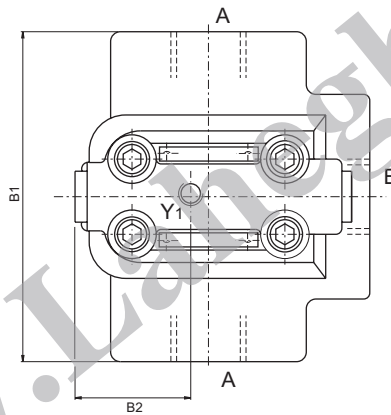
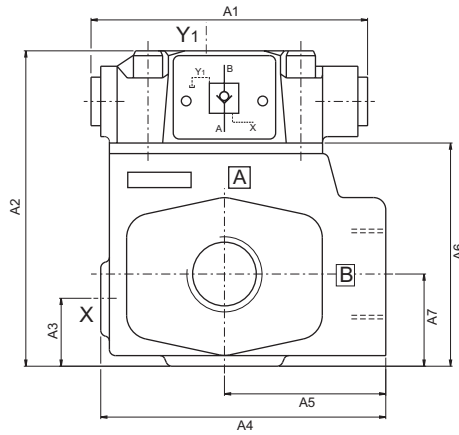
Ports	Function	Port sizes
A	Free flow	3/4" B.S.P.P or 3/4" NPTF
B	Normally closed pilot to open	
X	External pilot port	1/4" B.S.P.P. or 1/4" NPTF
Y1	External drain	



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VC4V06 (3/4") - THREADED BODY (#1 & #6)

Weight : 14.28 lbs (6.5 kg)



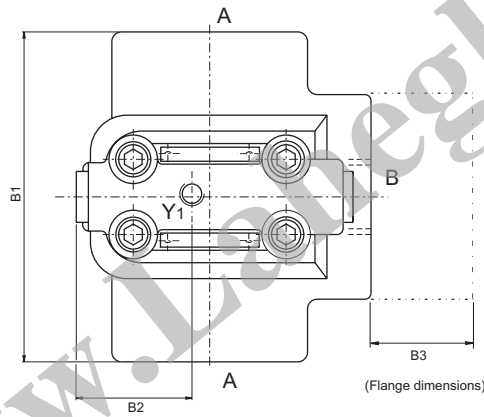
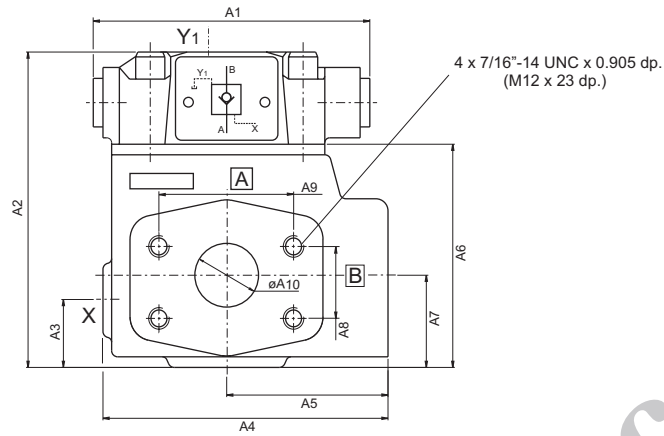
	Dimensions	
	in	mm
A1	4.488	114.0
A2	5.12	130.0
A3	1.1	28.0
A4	4.626	117.5
A5	2.62	66.5
A6	3.622	92.0
A7	1.496	38.0

	Dimensions	
	in	mm
B1	5.354	136.0
B2	1.878	47.7

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

VC4V06 (3/4") - FLANGE BODY (#2)

Weight : 14.28 lbs (6.5 kg)



	Dimensions	
	in	mm
A1	4.488	114.0
A2	5.12	130.0
A3	1.1	28.0
A4	4.51	114.5
A5	2.5	63.5
A6	3.622	92.0
A7	1.496	38.0
A8	1.188	30.2
A9	2.31	58.7
A10	ø1.18	ø30.0

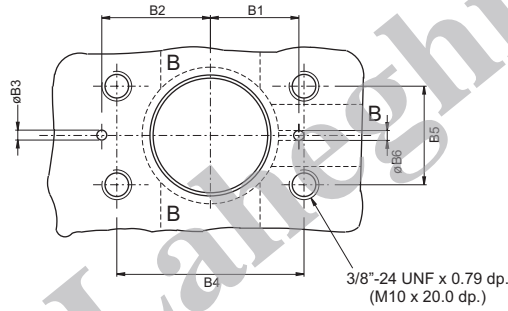
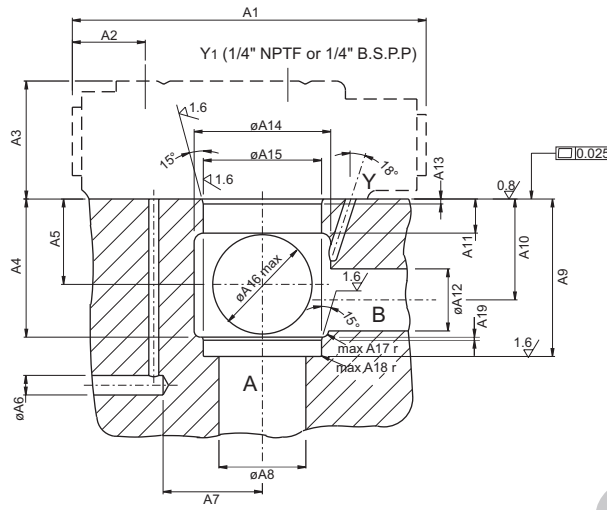
	Dimensions	
	in	mm
B1	5.354	136.0
B2	1.878	47.7
B3	1.574	40.0

Ports	Function	Flange model no	Flange order no*	Port Sizes
A (2x)	Free flow	VFS4 - B - 20 - 26	VS14 - 66935	1 1/4" B.S.P.P
B	Normally closed pilot to open	VFS4 - P - 20 - 26	VS14 - 66927	1 1/4" NPTF
X	External pilot port	-	-	1/4" B.S.P.P
Y1	External drain	-	-	1/4" NPTF

Flanges must be ordered separately.
Mounting screws are included in flange order.

CARTRIDGE WITH PILOT VALVE VC4V06 (#0)

Weight : 2.2 lbs (1.0 kg)



Dimensions	in	mm
	A1	4.49
A2	0.92	23.5
A3	1.496	38.0
A4	1.752	44.5
A5	1.083 ^{+0.02}	27.5 ^{+0.5}
A6	ø0.25	ø6.3
A7	1.26	32.0
A8	ø1.1	ø28.0
A9	1.997 ^{+0.003}	50.73 ^{+0.07}
A10	1.28	32.5
A11	0.433	11.0
A12	ø0.79	ø20.0
A13	0.06	1.6
A14	ø1.732 ^{+0.04}	ø44.0 ⁺¹
A15	ø1.5 ^{H8}	ø38.1 ^{H8}
A16	ø1.26	ø32.0
A17	0.08 r	2.0 r
A18	0.016 r	0.4 r
A19	0.04	1.0

Dimensions	in	mm
	B1	1.122
B2	1.378	35.0
B3	ø0.126	ø3.2
B4	2.375 ^{+0.008}	60.32 ^{+0.2}
B5	1.256 ^{+0.008}	31.75 ^{+0.2}
B6	ø0.126	ø3.2

Ports	Function
A	Free flow
B*	Normally closed pilot to open
X	External pilot port
Y1	External drain

* arrangement optional

4 Mounting screws (to be ordered separately)	
Dimensions	Order No.
M10 x 45mm, DIN 912 - 10.9	V700 - 71602
3/8" - 24 UNF X 3/4" lg.	V359 - 15220

(Mounting screws must be ordered separately)
Torque 68 Nm