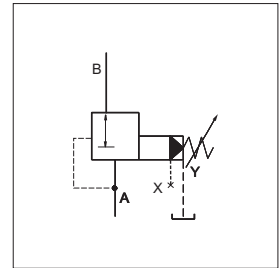


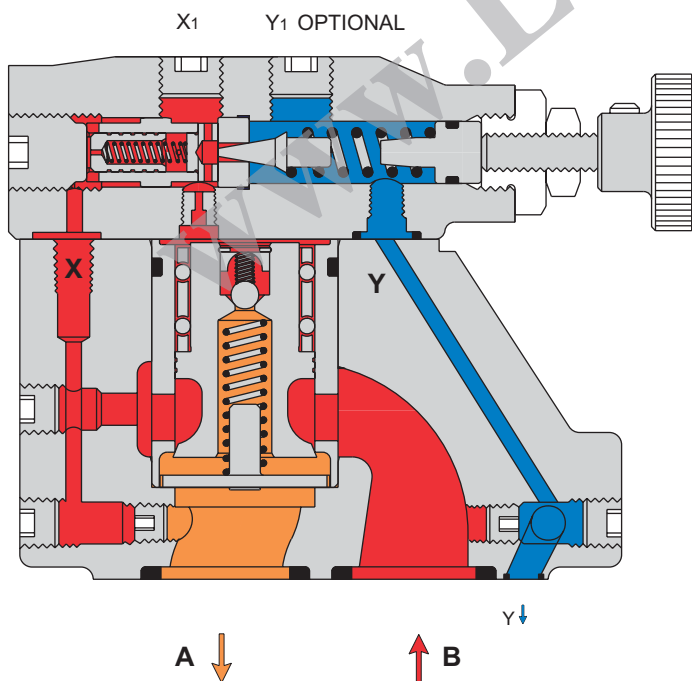
Veljan Pressure Reducer Valve Series VR4R are pilot operated controls used to control pressure in a secondary part of a hydraulic circuit. Pressure is maintained as set by control knob on the pilot or by an external pilot source. In some application, VR4R is used to maintain a lower pressure in the secondary circuit to limit the force available from certain actuators.

VR4R consists of a high flow poppet type seat valve section controlled by the low flow, adjustable pilot section mounted on top. Pressure setting is achieved by means of a knurled knob. For tamper proof setting, a con nut with lead seal is available as an option. Optional vent valve VWO1 sandwiched between pilot section and main body can be used for venting the VR4R valves.

Extremely accurate settings can be obtained due to the precise construction of control components. The design of poppet allows for the minimum of friction and hysteresis giving a sensitive response to conditional changes.



PG



Normally, port A is connected to the secondary part of the hydraulic circuit and port B to the primary part. When the secondary port A is unpressurised, the main poppet opens downwards against a spring by the pressure at primary Port B. Flow passes from primary port B to secondary port A. Pressure at port B passes to the pilot section and to the top of main poppet through an orifice. No flow takes place in this section until the pressure demand exceeds the setting of the pilot head, as determined/set by the control knob. The pilot cone lifts from its seat against the setting spring and allows a maintained pilot flow to pass to external drain. The effect of this is to limit the pressure available on top of the main poppet. In this condition the main poppet moves up and floats allowing enough flow to the secondary circuit (port A) to maintain the set pressure. If the secondary circuit exceeds the pilot head setting, the main poppet moves up further and closes preventing flow to a secondary circuit.

Possibilities of any pressure intensification in the secondary part is eliminated by the small check valve when it opens and allows flow to pilot drain.

## SPECIFICATIONS

### General

Type	:	Pilot operated Pressure reducer Valve
Design	:	Poppet type
Mounting	:	Threaded/Subplate/Cartridge
Mounting position	:	Optional
Port sizes (nominal)	:	3/8", 3/4", 1 1/4"
Direction of flow	:	B → A
Ambient temperature	:	-20° C...+60° C (-4° F...+140° F)
Special working conditions	:	Consult <b>VELJAN</b>

### Hydraulics

Pressure control range	:	Minimum - depends on flow Maximum - 5000 psi (350 bar)
Maximum operating pressure	:	
Port B ( primary )	:	5000 psi (350 bar)
Port A ( secondary )	:	5000 psi (350 bar)
Port X (pilot)	:	5000 psi (350 bar)
Port Y, Y1 (Pilot drain )	:	Without pressure to tank
Nominal flow gpm (lpm)	:	VR4R 03 (3/8")    VR4R 06 (3/4")    VR4R 10 (1 1/4") 15.8 (60)    52.9 (200)    119.0 (450)
Maximum flow gpm (lpm)	:	23.8 (90)    79.4 (300)    158.7 (600)
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 Range	:	10 to 650 cSt (60 to 3900 SSU)
Optimum operating viscosity	:	30 cSt (180 SSU)
Seal compatibility	:	Code 1 (Buna N) or Code 5 (Viton) (contact Veljan with specific oil details)
Cleanliness recommended	:	Better than NAS 1638 Class 8 or ISO 17/14

### Adjustment

Manual	:	Handwheel
Rotation	:	3.75 rev.
Operating torque	:	0.72 Nm

### Electricals ( Vent Valve VVV01)

Nominal voltage	:	Solenoid
Permissible voltage fluctuation	:	Refer to Ordering Code
Max. coil temperature	:	+5%...-10%
Type of current	:	+155° C (311° F)
Input power	:	Alternating Current (AC)/Direct Current (DC)
Holding	:	31 W
Inrush	:	78 VA
Relative operating period	:	264 VA
Type of protection	:	100%
	:	I P 65

**ORDERING CODE**

**VR4R 06 - 5 6 5 - 1 0 - 09 - W07 - B 1 \*\*\***

**Series**

**Size**

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

**Max. Pressure of Valve Body**

- 0 - for cartridges only
- 5 - 5000psi (350 bar)

**Body Mounting**

**Cartridge**

- 0 - Cartridge X1 + Y1 port = 1/4" NPTF
- E - Cartridge X1 + Y1 port = SAE - 4 (7/16" - 20 UNF)
- G - Cartridge X1 + Y1 port = G 1/4"

**Threaded body**

- 1 - Threaded body - VR4R03 = 1/2" NPTF ; } X1,Y1 ports = 1/4" NPTF
- A - Threaded body VR4R06 = 3/4" NPTF ; } = 1/4" NPTF
- 6 - Threaded body VR4R03 = 1/2" B.S.P.P. ; } X1,Y1 ports = G 1/4"
- D - Threaded body VR4R06 = 3/4" B.S.P.P. ; } = G 1/4"
- 4 - Threaded body VR4R03 - SAE - 8 } X1,Y1 ports = SAE - 4
- B - Threaded body VR4R06 - SAE - 12, } (7/16" - 20 UNF)

**Subplate mounting**

- 3 - Subplate mounting  
X1+ Y1 port = 1/4" NPTF
- 7 - Subplate mounting  
X1+ Y1 ports = SAE - 4 (7/16" - 20 UNF)
- 9 - Subplate mounting  
X1+ Y1 Ports = G 1/4"

**Pressure setting range**

- 1 - 100 - 1500 psi (7 - 105 bar)
- 3 - 100 - 3000 psi (7 - 210 bar)
- 5 - 100 - 5000 psi (7 - 350 bar)

**Modification**

**Seal Class**

- 1 - Buna N ( Standard)
- 5 - Viton

**Design letter**

**Solenoid Voltage**

(Omit for non vent version)

- W01 - 115V/60 Hz AC GOR - 12V DC
- W02 - 230V/60 Hz AC GOQ - 24V DC
- W06 - 115V/50 Hz AC GOH - 48V DC
- W07 - 230V/50 Hz AC

**Electrical Vent**

(3way VENT VALVE VV01)

Omit for non vent version

- 09 - With manual override (Solenoid de-energized : open to tank. Solenoid energized : vent line blocked)
- 10 - Without manual override (Solenoid de-energized : open to tank. Solenoid energized : vent line blocked)
- 11 - With manual override (Solenoid de-energized : vent line blocked Solenoid energized : open to tank)
- 12 - Without manual override (Solenoid de-energized : vent line blocked Solenoid energized : open to tank)

**Drain line**

- 0 - drain to manifold (only for cartridge)
- 1 - External from subplate } At subplate mounting only with body code 3,7,9
- or manifold (Y)
- 2 - External from pilot head (Y1)

**Type of Control**

- 1 - Hand knob (32mm dia)
- 2 - Hand knob (50mm dia) (not for version with vent valve VV01)
- 3 - Acorn nut with lead seal



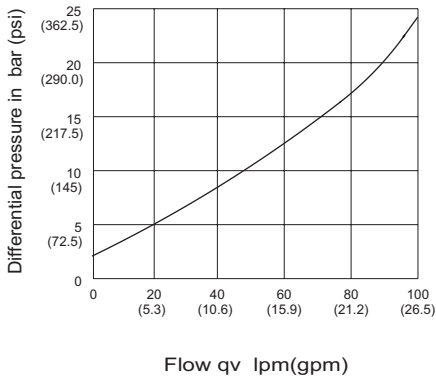
## PERFORMANCE CURVES

ps min - qv characteristics

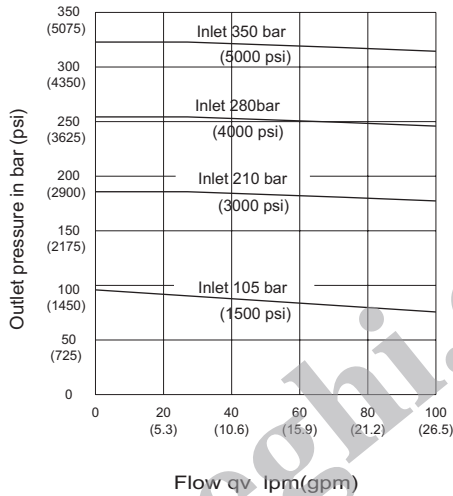


### VR4R03

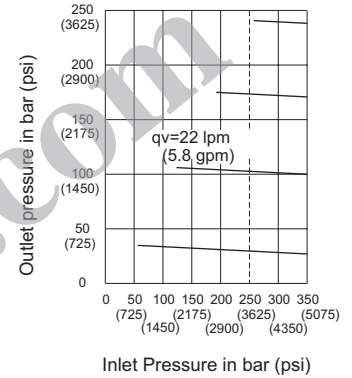
Minimum Differential Pressure between Inlet & Outlet Pressure at Various Flow Rates



Variation in Outlet Pressure for variation in Flow Rate

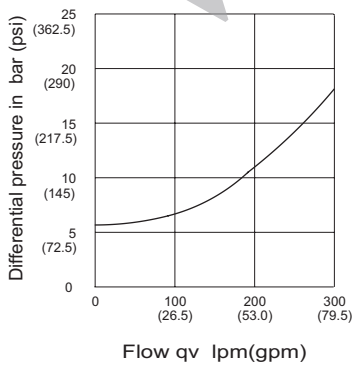


The effect of increase of Inlet Pressure on Outlet Pressure setting

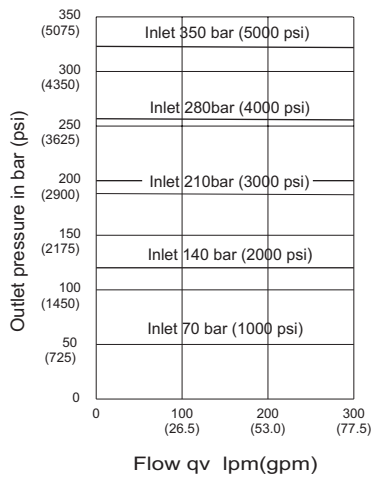


### VR4R06 & VR4R10

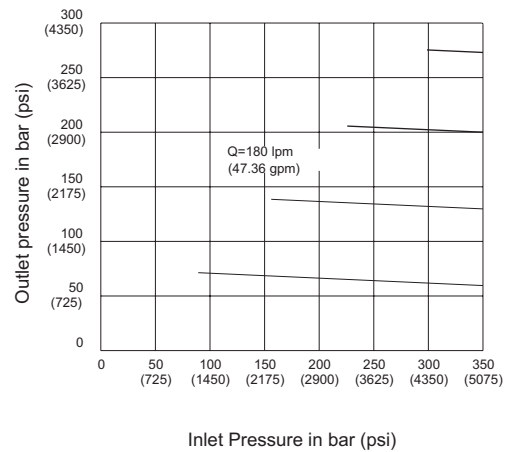
Minimum Differential Pressure between Inlet & Outlet Pressure at Various flow Rates



Variation in Outlet Pressure for variation in Flow Rate



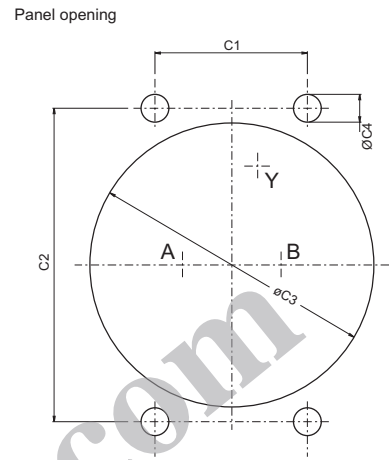
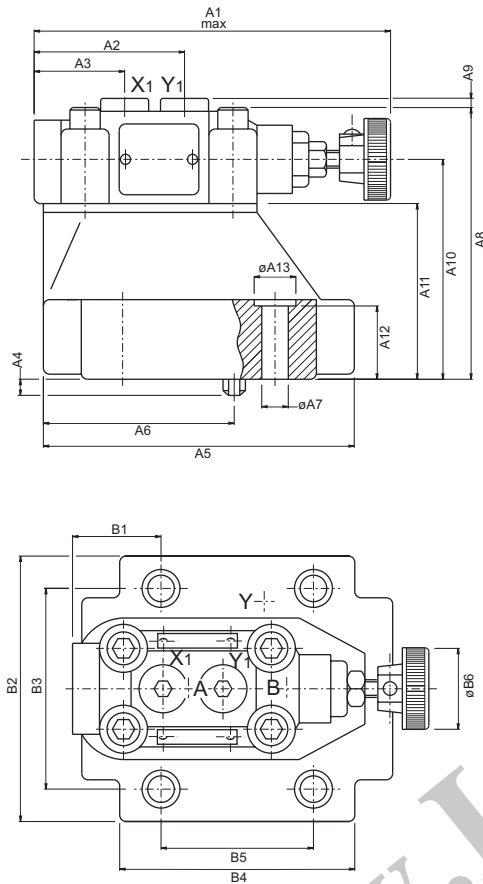
The effect of increase of Inlet Pressure on Outlet Pressure setting



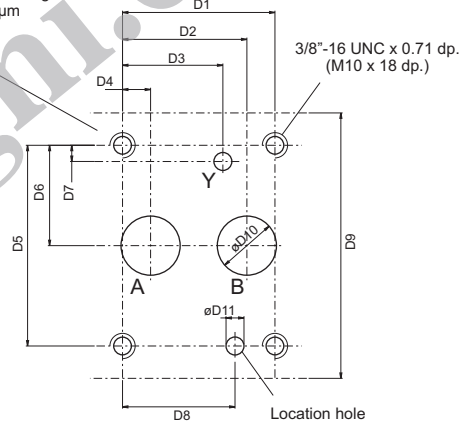
Note : All Performance Data given is typical and can be influenced by application.  
Oil Temperature = 45°C (113°F) ; Oil Viscosity = 40cSt (240SSU).

**VR4R06 (3/4") SUBPLATE MOUNTING BODY ( #3, #7 & #9 )**

Weight : 9.89 lbs (4.5 kg)



Block mounting face  
Flatness 0.01 mm/100 mm length  
Surface finish CLA 1.27 µm



Dimensions	in		mm	
A1	5.55		141.0	
A2	2.34		59.5	
A3	1.41		35.8	
A4	0.25		6.4	
A5	4.842		123.0	
A6	2.97		75.5	
A7	ø0.41		ø10.5	
A8	4.232		107.5	
A9	3.425		3.6	
A10	2.736		87.0	
A11	1.142		69.5	
A12	1.142		29.0	
A13	ø0.65		ø16.5	

Dimensions	in		mm	
B1	1.38		35.0	
B2	4.134		105.0	
B3	3.126		79.4	
B4	3.66		93.0	
B5	2.374		60.3	
B6	ø1.26		ø32.0	

Dimensions	in		mm	
C1	2.374		60.3	
C2	4.88		124.0	
C3	ø4.645		ø118.0	
C4	ø0.433		ø11.0	

Dimensions	in		mm	
D1	2.374		60.3	
D2	1.937		49.2	
D3	1.563		39.7	
D4	0.437		11.1	
D5	3.126		79.4	
D6	1.563		39.7	
D7	0.25		6.4	
D8	1.75		44.5	
D9	4.134		105.0	
D10	ø0.92		ø23.4	
D11	ø0.28 x 0.315 dp.		ø7.1 x 8.0 dp.	

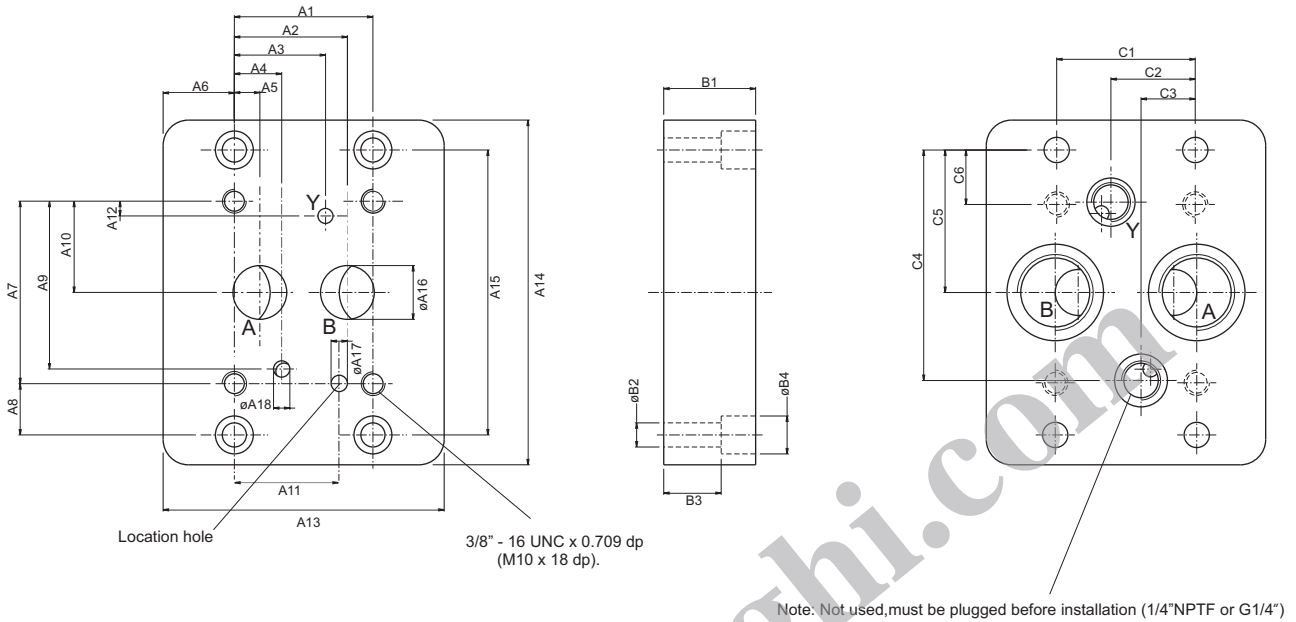
Ports	Function
B	Primary (inlet)
A	Secondary (outlet)
X1	Remote control or vent connection
Y, Y1	External drain

Note : For details of Subplate & mtg. screws please refer page 70

**SUBPLATE FOR VR4R06 (3/4")**

Weight : 10.54 lbs (4.8 kg)

PC



	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

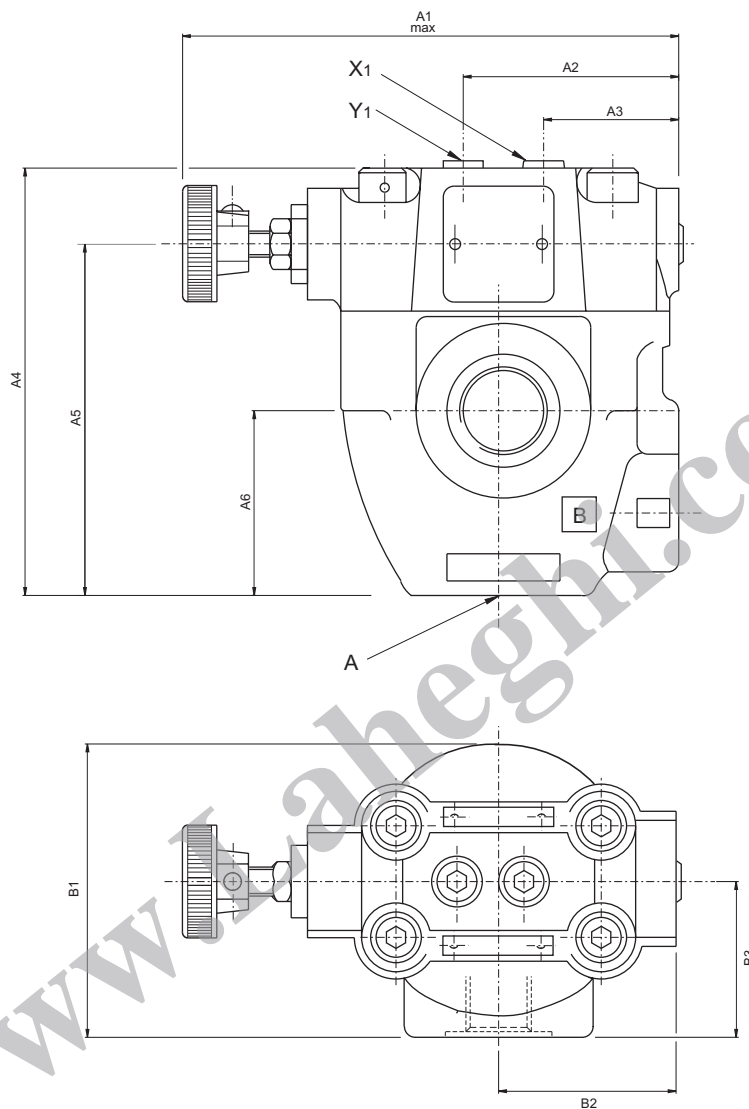
	Dimensions	
	in	mm
C1	2.374	60.3
C2	1.445	36.7
C3	0.93	23.6
C4	3.949	100.3
C5	2.44	62.0
C6	0.933	23.7

Order No.	Port sizes		4 Mounting screws*		
	A+B	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 <sup>2</sup> (Torque 68 Nm) at p > 210 bar = 120 daN/mm <sup>2</sup> (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.

**VR4R06 (3/4") - THREADED BODY ( #A, #B & #D )**

Weight : 7.4 lbs (3.3 kg)



	Dimensions	
	in	mm
A1	5.55	141.0
A2	2.34	59.5
A3	1.47	37.3
A4	4.645	118.0
A5	3.82	97.0
A6	2.01	51.0

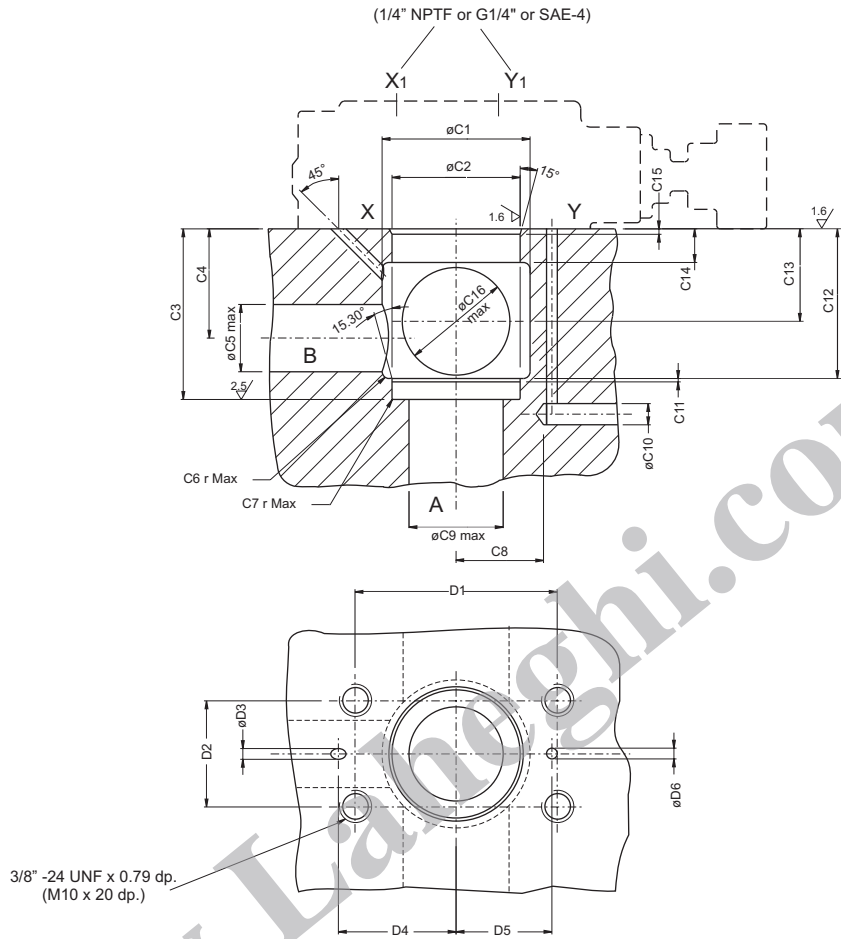
	Dimensions	
	in	mm
B1	3.2	81.0
B2	1.93	49.0
B3	1.7	43.0

Ports	Function	Ports sizes
B	Primary (inlet)	3/4" NPTF or G 3/4" or SAE - 12 (1 1/16" - 12 UNF)
A	Secondary (outlet)	3/4" NPTF or G 3/4" or SAE - 12 (1 1/16" - 12 UNF)
X1	Remote control or vent connection	1/4" NPTF or G 1/4" or SAE - 4 (7/16" - 20 UNF)
Y1	External drain	1/4" NPTF or G 1/4" or SAE - 4 (7/16" - 20 UNF)

CARTRIDGES WITH PILOT VALVES VR4R06/VR4R10 ( #0, #E & #G )

Weight : 2.64 lbs (1.2 kg)

PC



	Dimensions	
	in	mm
C1	ø1.73/1.77	ø44.0/45.0
C2	ø1.500 ø1.502	ø38.100 ø38.139
C3	1.99/2.00	50.73/50.80
C4	1.28	32.5
C5	0.8	20.0
C6	0.08 r	2.0 r
C7	0.016 r	0.4 r
C8	1.02	26.0
C9	ø1.1	ø28.0
C10	ø0.25	ø6.3
C11	0.4	1.0
C12	1.75	44.5
C13	1.08/1.10	27.5/28.0
C14	0.4	11.0
C15	0.06	1.6
C16	ø1.26	ø32.0

	Dimensions	
	in	mm
D1	2.367/2.383	60.12/60.52
D2	1.24/1.26	31.55/31.95
D3	ø0.126	ø3.2
D4	1.38	35.0
D5	1.12	28.5
D6	ø0.126 ø0.236	ø3.2 ø6.0

Ports	Function
B	Primary (Inlet)
A	Secondary (Outlet)
X	Internal pilot pressure
X <sub>1</sub>	Remote control or vent connection
Y, Y <sub>1</sub>	External drain

4 Mounting screws*	
Dimensions	Order - No.
3/8" - 24 UNF x 1 3/4" lg. or M10 x 45mm, DIN 912 - 12.9	V359 - 15220 or V700 - 71602

\* Mounting screws must be ordered separately