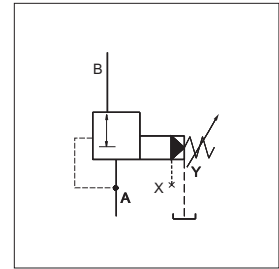


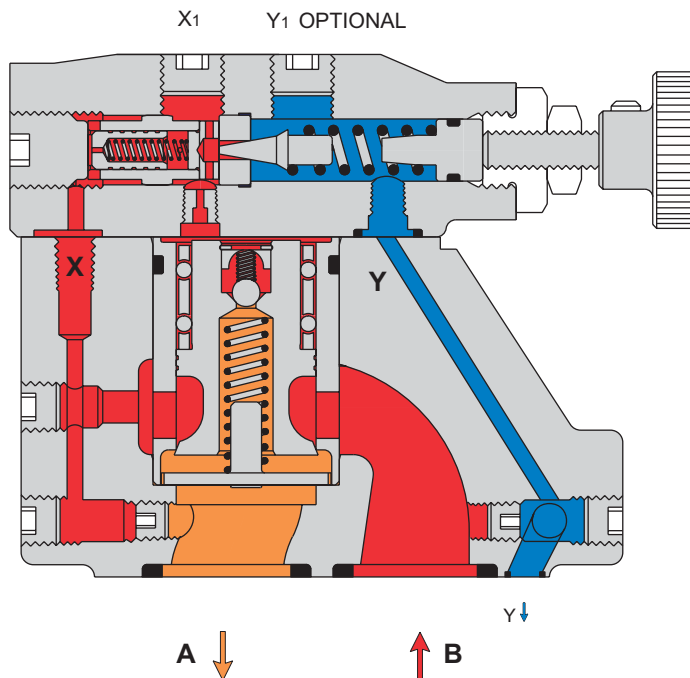
Veljan Pressure Reducer Valve Series VR4R are pilot operated controls used to control pressure in a secondary part of a hydraulic circuit. Pressure is maintained as set by control knob on the pilot or by an external pilot source. In some application, VR4R is used to maintain a lower pressure in the secondary 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 VVO1 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.



PC



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 VELJAN

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 VV01)

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

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 or manifold (Y) At subplate mounting only with body code 3,7,9
- 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

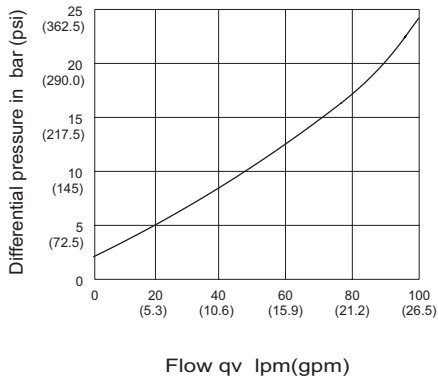


PERFORMANCE CURVES

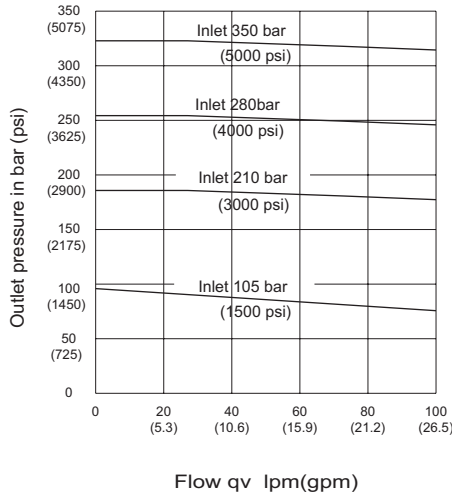
ps min - qv characteristics

VR4R03

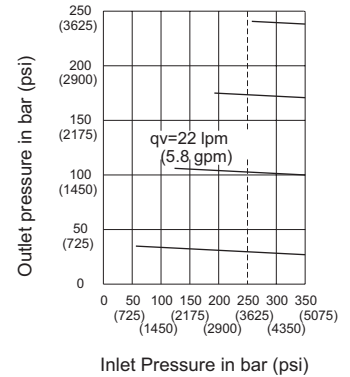
Minimum Differential Pressure between Inlet & Outlet Pressure at Various Flow Rates



Variation in Outlet Pressure for variation in Flow Rate

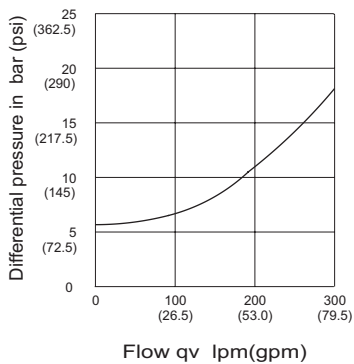


The effect of increase of Inlet Pressure on Outlet Pressure setting

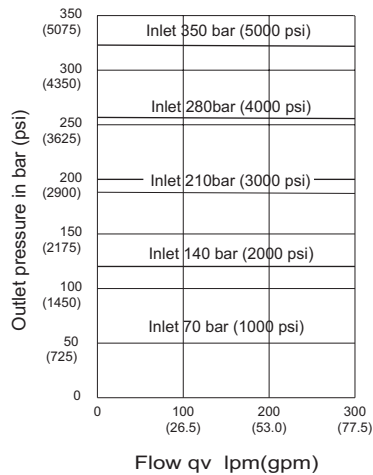


VR4R06 & VR4R10

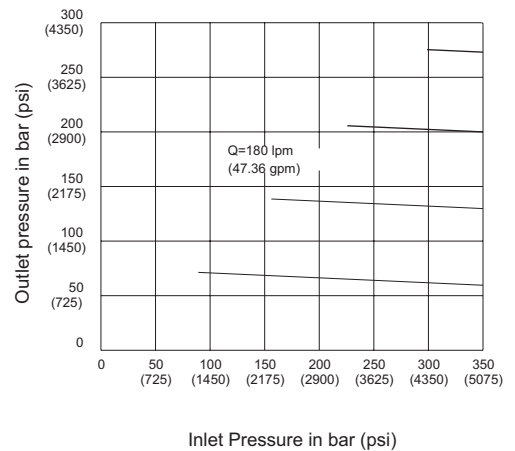
Minimum Differential Pressure between Inlet & Outlet Pressure at Various flow Rates



Variation in Outlet Pressure for variation in Flow Rate



The effect of increase of Inlet Pressure on Outlet Pressure setting

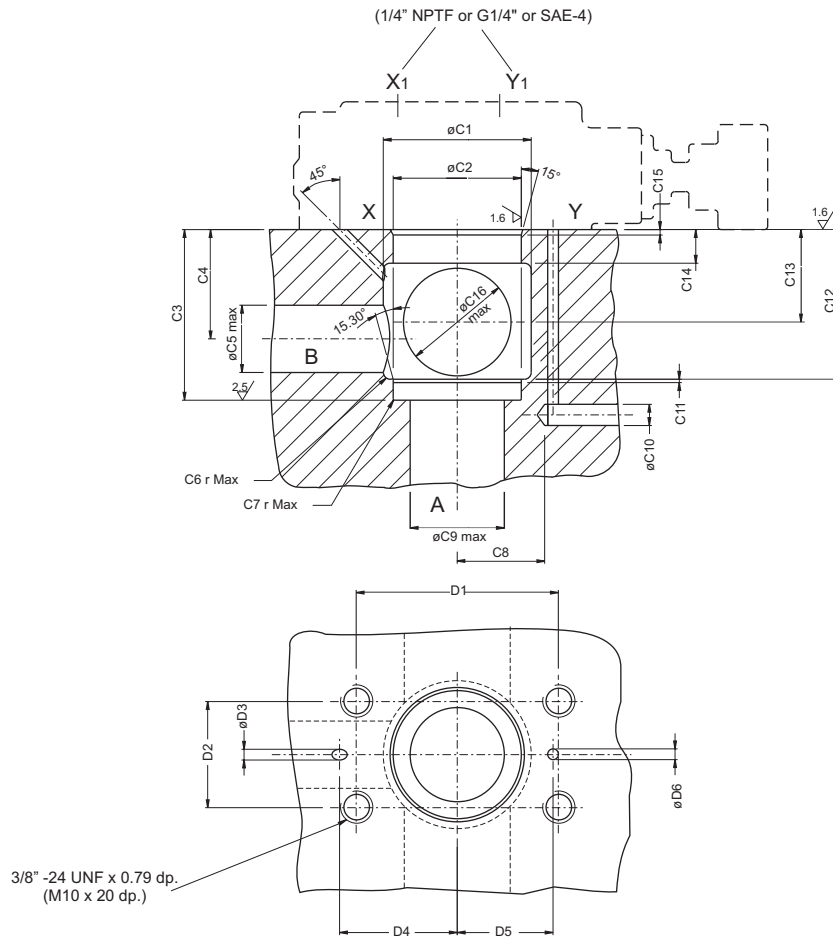


Note : All Performance Data given is typical and can be influenced by application.
Oil Temperature = 45°C (113°F) ; Oil Viscosity = 40cSt (240SSU).

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

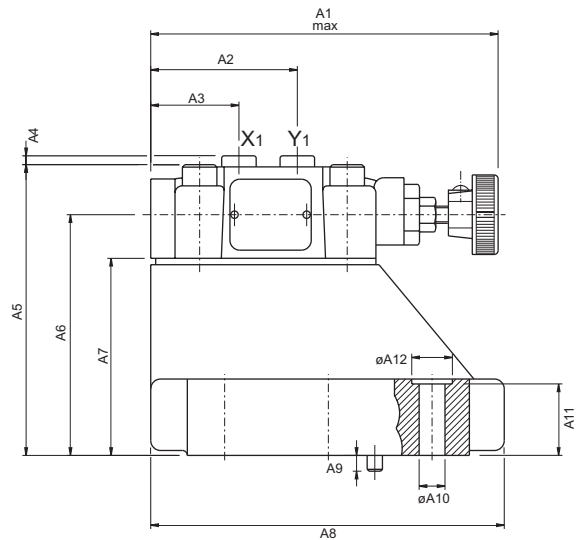
Ports	Function
B	Primary (Inlet)
A	Secondary (Outlet)
X	Internal pilot pressure
X ₁	Remote control or vent connection
Y, Y ₁	External drain

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

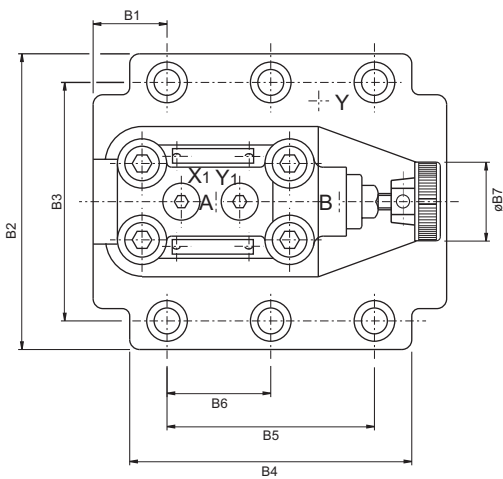
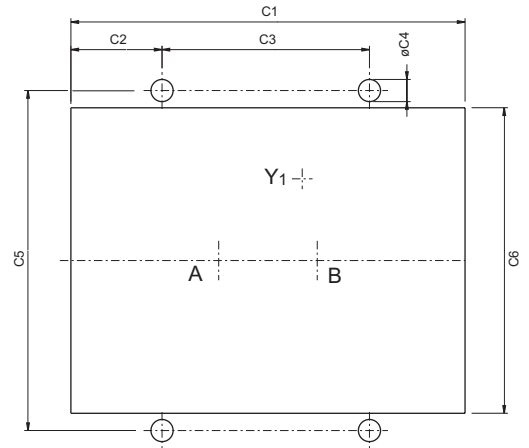
* Mounting screws must be ordered separately

VR4R10 (1 1/4") SUBPLATE MOUNTING BODY (#3, #7 & #9)

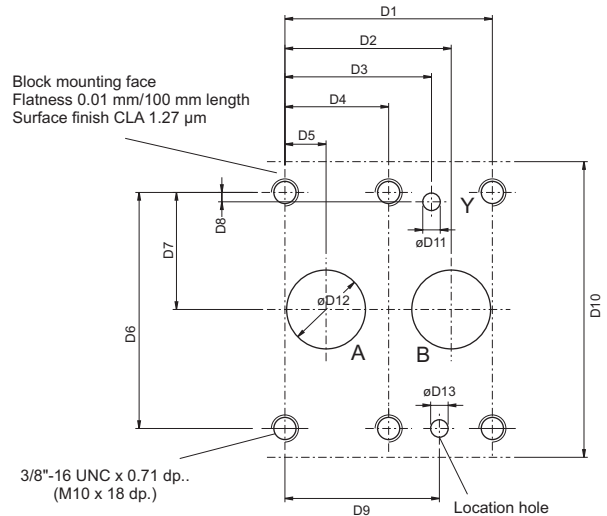
Weight : 13.18 lbs (6.0 kg)



Panel opening



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



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

Dimensions	in	mm
	A1	5.55
A2	2.34	59.5
A3	1.41	35.8
A4	0.14	3.6
A5	4.645	118.0
A6	3.846	97.7
A7	3.15	80.0
A8	5.645	143.5
A9	0.25	6.4
A10	ø0.41	ø10.5
A11	1.14	29.0
A12	ø0.65	ø16.5

Dimensions	in	mm
	B1	1.181
B2	4.72	120.0
B3	3.8	96.52
B4	4.51	114.5
B5	3.315	84.2
B6	1.657	42.1
B7	ø1.26	ø32.0

Dimensions	in	mm
	C1	6.3
C2	1.456	37.0
C3	3.315	84.2
C4	ø0.35	ø9.0
C5	5.433	138.0
C6	4.88	124.0

Dimensions	in	mm
	D1	3.315
D2	2.657	67.5
D3	2.342	59.5
D4	1.657	42.1
D5	0.657	16.7
D6	3.81	96.8
D7	1.906	48.4
D8	0.15	3.8
D9	2.468	62.7
D10	4.724	120.0
D11	ø0.28	ø7.1
D12	ø1.26	ø32.0
D13	ø0.28 x 0.315 dp.	ø7.1 x 8.0 dp.

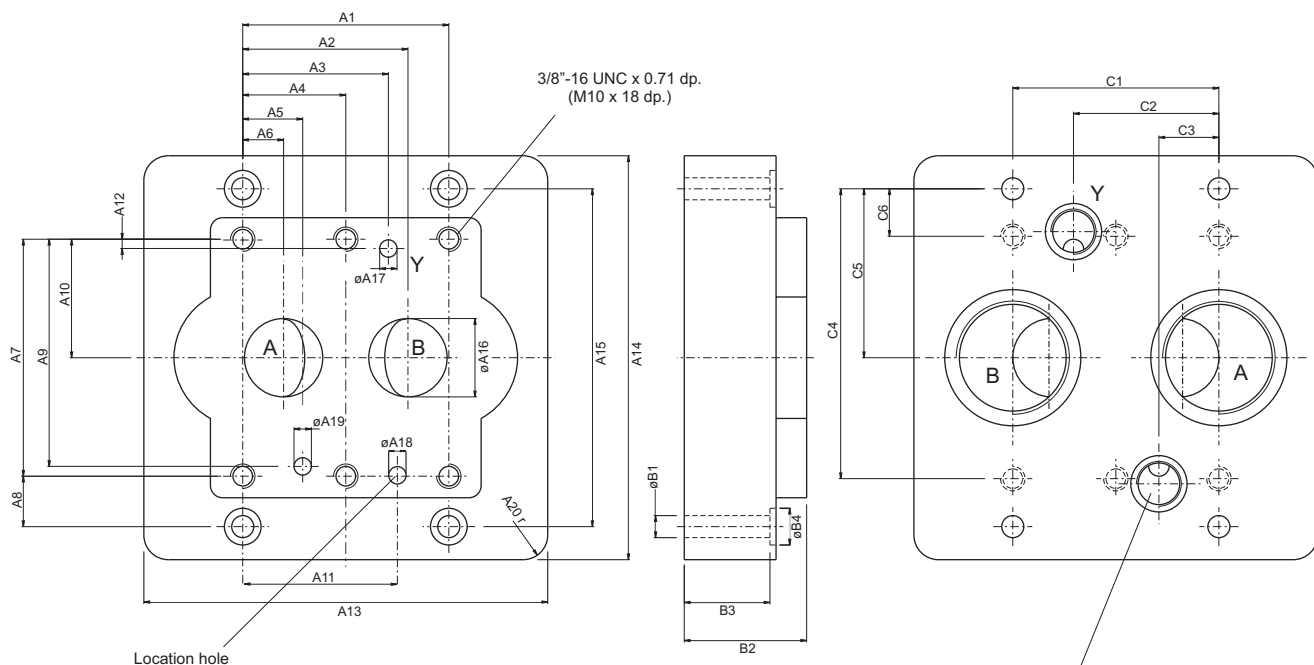
Ports	Function
B	Primary (inlet)
A	Secondary (Outlet)
X1	Remote control or vent connection
Y,(Y1)	External drain

Note : For details of Subplate & mtg.screws please refer page 74

Subplate for VR4R10

Weight : 19.1 lbs (8.5 kg)

PC



Note: Not used, must be plugged before installation (1/4"NPTF or G1/4")

	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	2.468	62.7
A12	0.15	3.8
A13	6.535	166.0
A14	6.5	165.0
A15	5.43	138.0
A16	1.26	32.0
A17	ø0.28	ø7.1
A18	ø0.28 x 0.315 dp.	ø7.1 x 8.0 dp.
A19	ø0.28	ø7.1
A20	0.4 r	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

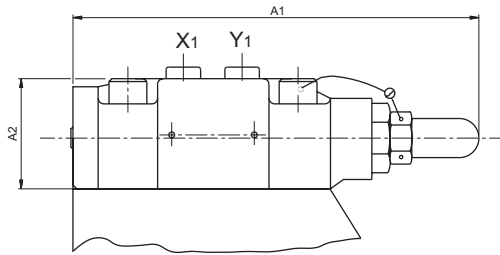
	Dimensions	
	in	mm
C1	3.315	84.2
C2	2.342	59.5
C3	0.97	24.6
C4	4.66	118.4
C5	2.716	69.0
C6	0.764	19.4

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 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.

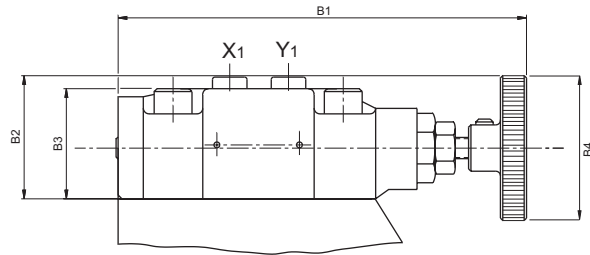
OPTIONAL CONTROL

Type of control - Code 3
Acron nut with lead seal



	Dimensions	
	in	mm
A1	5.51	140.0
A2	1.49	38.0

Type of control - Code 2
Hand knob 50mm dia
(not for version with vent valve VVV01)

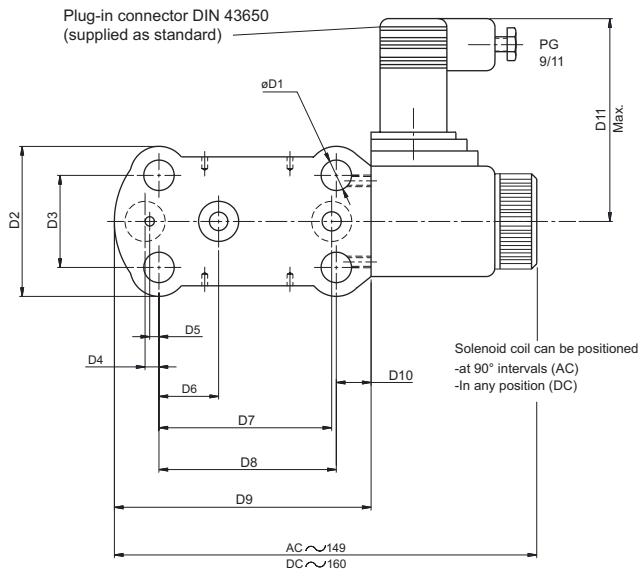
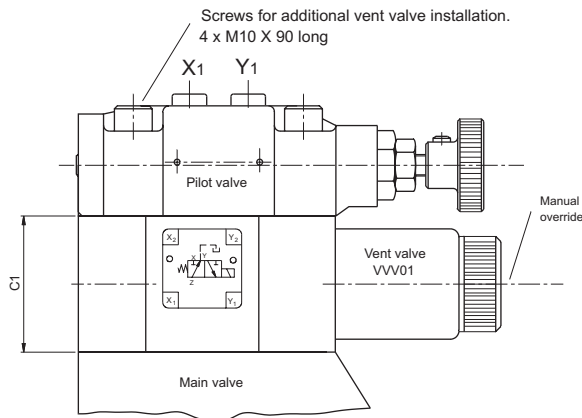


	Dimensions	
	in	mm
B1	5.55	141.0
B2	1.67	42.5
B3	1.49	38.0
B4	ø1.96	ø50.0



Version with Vent Valve VVV01

Weight (VVV01) : 3.73 lbs (1.7 kg)



	Dimensions	
	in	mm
C1	1.85	47.0

	Dimensions	
	in	mm
D1	ø0.41	ø10.5
D2	2.03	51.8
D3	1.25	31.8
D4	0.18	4.8
D5	0.12	3.2
D6	0.81	20.6
D7	2.31	58.7
D8	2.37	60.3
D9	3.49	88.7
D10	0.51	13.0
D11	2.75	70.0

Code	External Drain
11 or 12	
09 or 10	