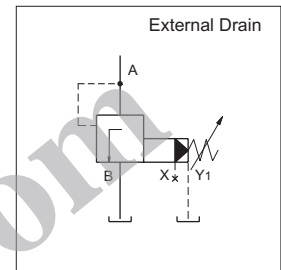
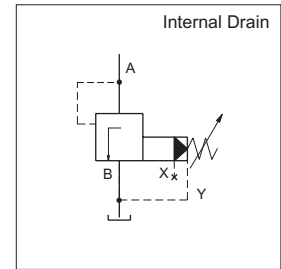


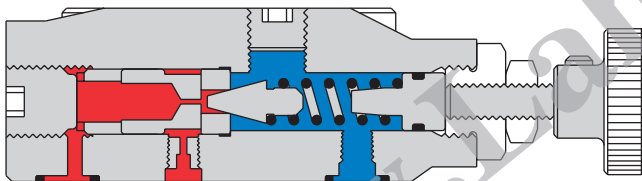
The Veljan Pressure Relief Valve series VR4V are pilot operated and work on the principle of hydraulic balancing. These valves are used to limit the system pressure in a hydraulic system and protect the system against pressure overload. Accurate pressure control even under wide flow variations are achieved by these valves. The valves may also be used to generate a pressure drop in a hydraulic circuit.

VR4V consist 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 knurled knob. For tamper proof setting, an acorn nut with lead seal is available as option. Optional vent valve VV01 sandwiched between pilot section and the main body can be used for venting the VR4V valves.

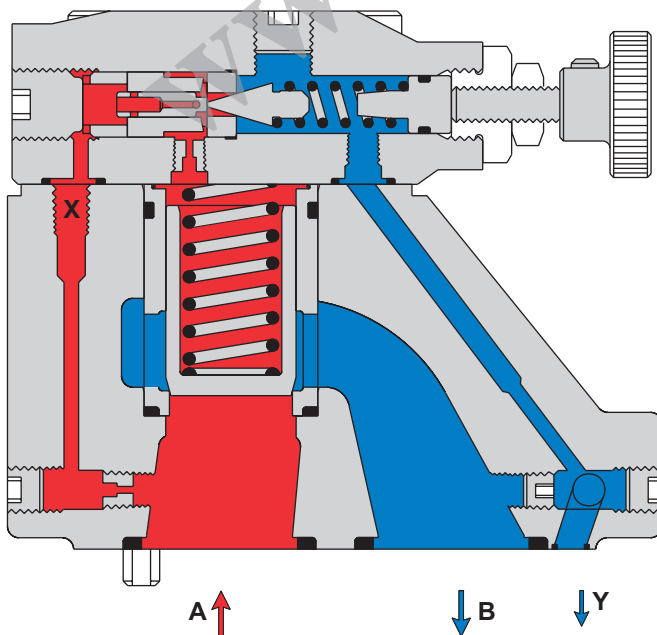
Exceptionally fast response is obtained due to the precise ratio between the main piston area and its mass. High pressure stability is an outstanding feature of VR4V valves.



VR4V03 pilot valve **Y₁ (OPTIONAL)**



VR4V06/10 pilot valve **Y₁ (OPTIONAL)**



Normally port A is connected to pump and port B to tank. At low pressure, flow entering port A is blocked by the main poppet. Pressure at port A passes to the pilot section as well as to the top of the main poppet through orifices. No flow takes place in this portion until the pressure overcomes the spring setting of the pilot cone. This pilot cone is lifted from its seat releasing a small pilot flow to tank and resulting in a pressure drop across the main poppet. The main poppet opens and allows only enough flow from port A to port B maintaining inlet pressure at the set value of the pilot spring. At drop of inlet pressure below the set value, the main poppet closes instantly.

Pilot drain is normally through port B for internal drain valves. External drain from port Y or Y₁ is optional. Port X may be used for venting or remote control of VR4V valves.

SPECIFICATIONS

General

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

Hydraulics

Pressure control range	:	100 - 5000 psi (7 - 350 bar)
Maximum operating pressure	:	
Port A (inlet)	:	5000 psi (350 bar)
Port B (outlet)	:	425 psi (30 bar)
Port X (pilot)	:	5000 psi (350 bar)
Port Y, Y1 (Pilot drain)	:	425 psi (30 bar)
	:	
	:	VR4V 03 (3/8") VR4V 06 (3/4") VR4V 10 (1 1/4")
Nominal flow gpm (lpm)	:	16.0 (60) 53.0 (200) 119.0 (450)
Maximum flow gpm (lpm)	:	24.0 (90) 80.0 (300) 159.0 (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 Vavle VVV01)

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

ORDERING CODE

VR4V 06 - 5 6 5 - 1 0 - 09 - W07 - A 1 ***

Series _____

Size _____

03 - $\frac{3}{8}$ "
06 - $\frac{3}{4}$ "
10 - $1\frac{1}{4}$ "

Max. Pressure of Valve Body _____

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

Body Mounting _____

Cartridge
0 - Cartridge Y1 port = $\frac{1}{4}$ " NPTF
E - Cartridge Y1 port = SAE - 4 (7/16" - 20 UNF)
G - Cartridge Y1 port = G $\frac{1}{4}$ "

Threaded body

1 - Threaded body - VR4V03 = $\frac{1}{2}$ " NPTF ;
VR4V06 = 1" NPTF
(2 A - Ports, 1B - Port) } X,Y1 ports = $\frac{1}{4}$ " NPTF

A - Threaded body VR4V06 = $\frac{3}{4}$ " NPTF ;
VR4V10 = $1\frac{1}{4}$ " NPTF
(1 A - Port, 1B - Port)

6 - Threaded body VR4V03 = $\frac{1}{2}$ " B.S.P.P ;
VR4V06 = 1" B.S.P.P ;
(2 A - Ports, 1B - Port) } X,Y1 ports = G $\frac{1}{4}$ "

D - Threaded body VR4V06 = $\frac{3}{4}$ " B.S.P.P ;
VR4V10 = $1\frac{1}{4}$ " B.S.P.P
(1 A - Port, 1B - Port)

4 - Threaded body VR4V03 - SAE - 8,
VR4V06 - SAE - 16
(2 A - Ports, 1B - Port) } X,Y1 ports = SAE - 4 (7/16" - 20 UNF)

B - Threaded body VR4V06 - SAE - 12,
VR4V10 - SAE - 20
(1 A - Port, 1B - Port)

Subplate mounting

3 - Subplate mounting - VR4V03/06 /10 ISO
(Y1 port - $\frac{1}{4}$ " NPTF ; with drain line code 2)

7 - Subplate mounting - VR4V03/06 /10 ISO
(Y1 Port - SAE - 4 (7/16" - 20 UNF)

9 - Subplate mounting VR4V03/06 /10 ISO
(Y1 Port - $\frac{1}{4}$ " B.S.P.P ; with drain line code 2)

Flange body

2 - Flange body (X,Y1 port - $\frac{1}{4}$ " NPTF)
(2 A - Ports, 1 B - Port)

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 - Internal
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)
3 - Acorn nut with lead seal

Pressure setting range

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

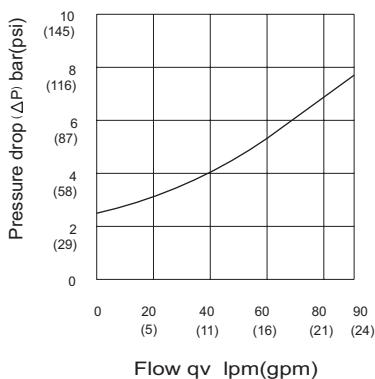
PERFORMANCE CURVES

Δp - q_v - Characteristics

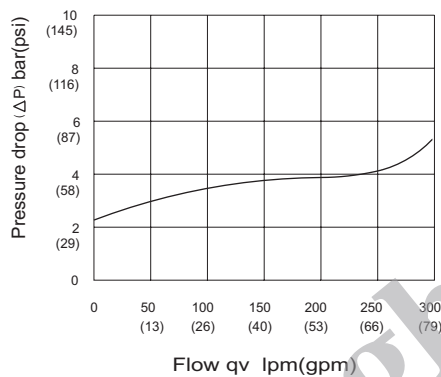
(Fluid 60 cSt at 40° C

Test temp. 50° C \pm 10%)

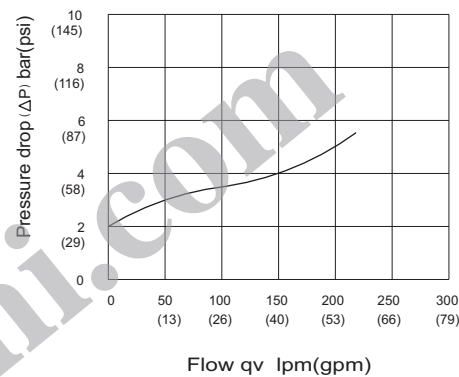
VR4V03



VR4V06

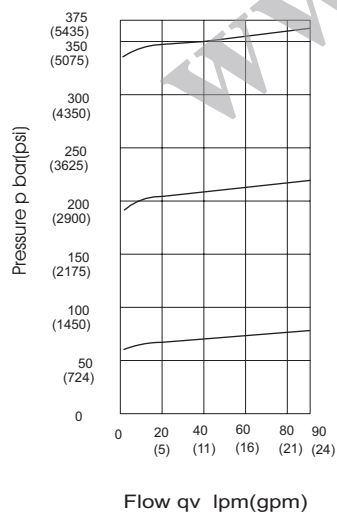


VR4V10

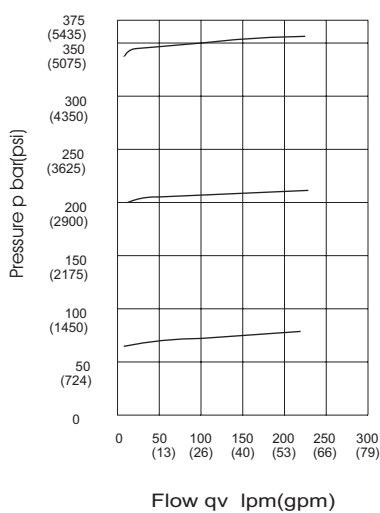


P- q_v - Characteristics

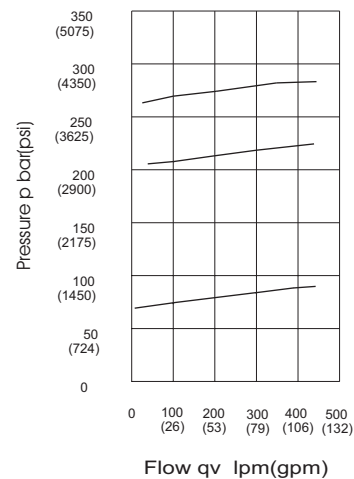
VR4V03



VR4V06

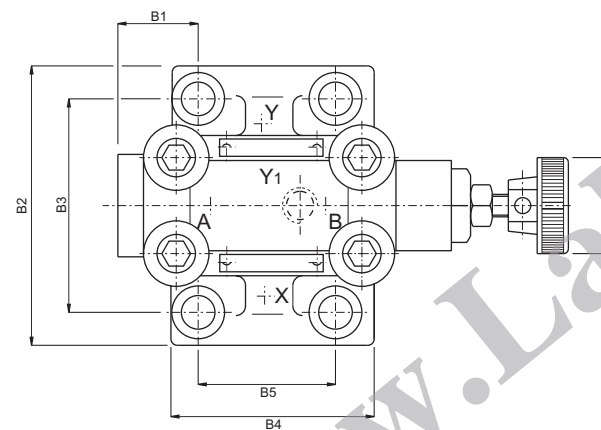
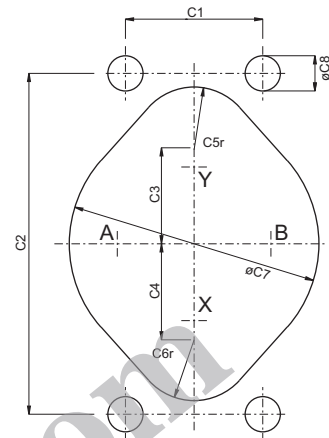
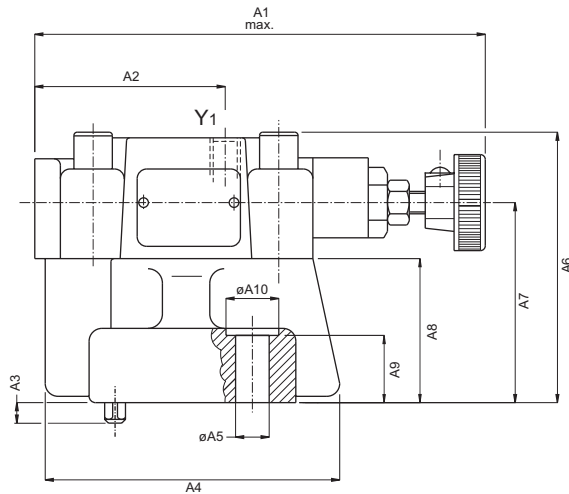


VR4V10



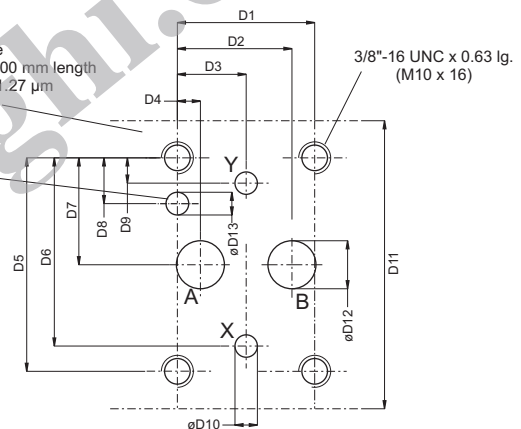
VR4V03 (3/8") SUBPLATE MOUNTING BODY (#3, #7 & #9)

Weight : 5.93 lbs (2.7 kg)



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

Location hole



	Dimensions	
	in	mm
A1	5.55	141.0
A2	2.34	59.5
A3	0.25	6.4
A4	3.622	92.0
A5	ø0.41	ø10.5
A6	3.33	84.5
A7	2.46	62.5
A8	1.77	45.0
A9	0.83	21.0
A10	ø0.65	ø16.5

	Dimensions	
	in	mm
B1	1.14	29.0
B2	3.437	87.3
B3	2.626	66.7
B4	2.5	63.5
B5	1.69	42.9
B6	ø1.26	ø32.0

	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	0.846	21.5
D4	0.283	7.2
D5	2.626	66.7
D6	2.315	58.8
D7	1.315	33.4
D8	0.563	14.3
D9	0.311	7.9
D10	ø0.275	ø7.0
D11	3.543	90.0
D12	ø0.59	ø15.0
D13	ø0.28 x 0.315 dp.	ø7.1 x 8.0 dp.

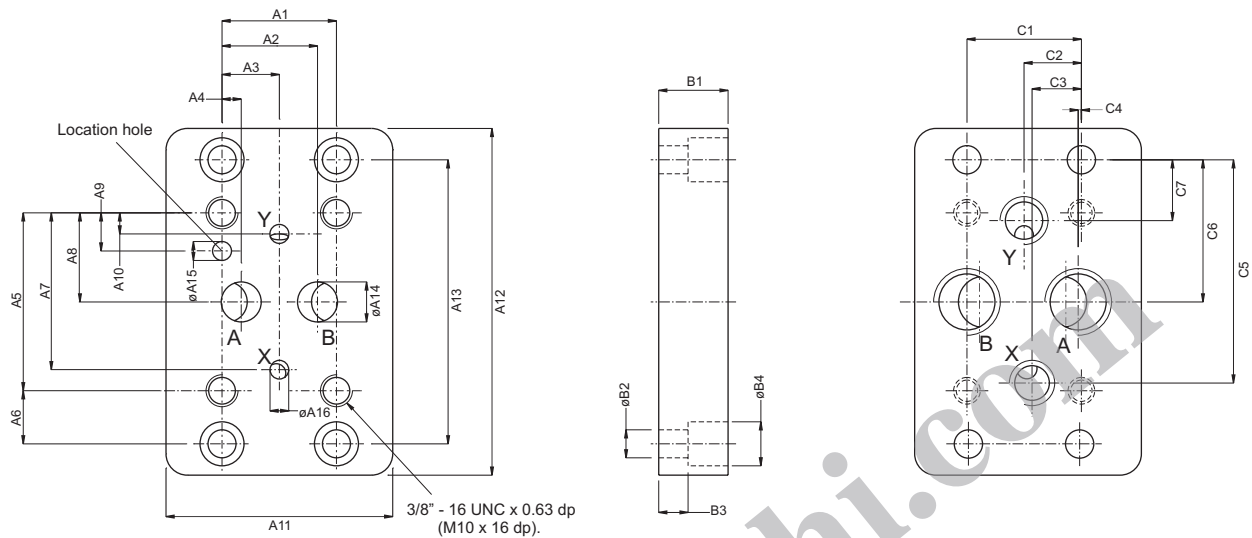
Ports	Function
A	Pressure (inlet)
B	Tank (outlet)
X	Remote control or vent connection
Y(Y ₁)	External drain ¹⁾

1) Optional from pilot head or subplate.
Port Y₁ is only available at drain line (code 2)
external from the pilot head.

Note : For details of Subplate & mtg. screws please refer page 12

VR4V03 (3/8") SUBPLATE

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

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

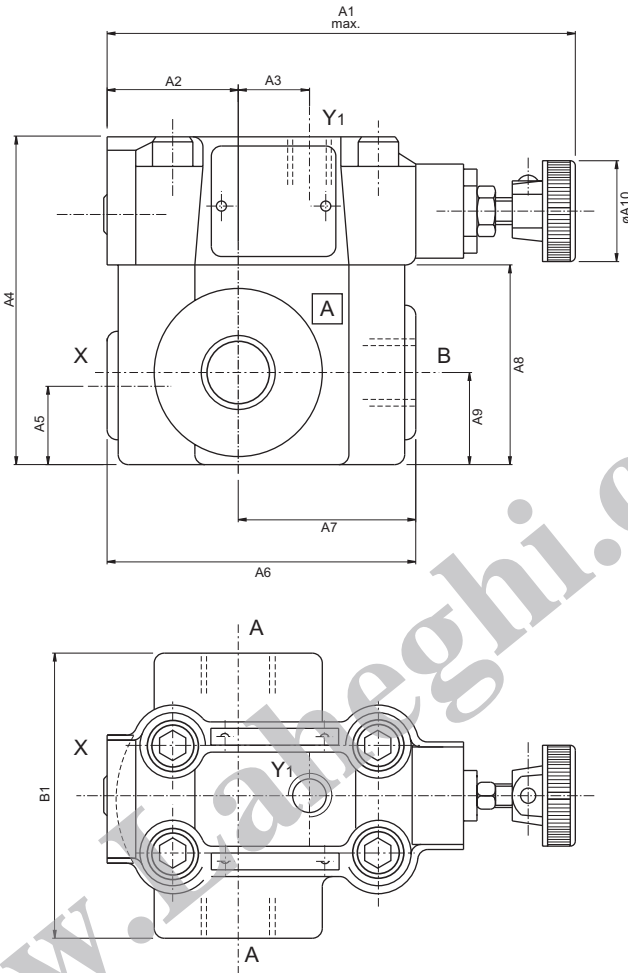
	Dimensions	
	in	mm
C1	1.69	42.9
C2	0.846	21.5
C3	0.73	18.5
C4	0.047	1.2
C5	3.295	83.7
C6	2.1	53.3
C7	0.9	22.8

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.	V358 - 16180	at p ≤ 210 bar = 100 daN/mm ² (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 ² (Torque 82 Nm)

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

VR4V03 (3/8") - THREADED BODY (#1, #4 & #6)

Weight : 7.03 lbs (3.2 kg)



	Dimensions	
	in	mm
A1	5.55	141.0
A2	1.535	39.0
A3	0.807	20.5
A4	3.84	97.5
A5	0.92	23.3
A6	3.62	91.9
A7	2.08	52.8
A8	2.34	59.4
A9	1.08	27.4
A10	ø1.26	ø32.0

B1	Dimensions	
	in	mm
B1	3.34	84.8

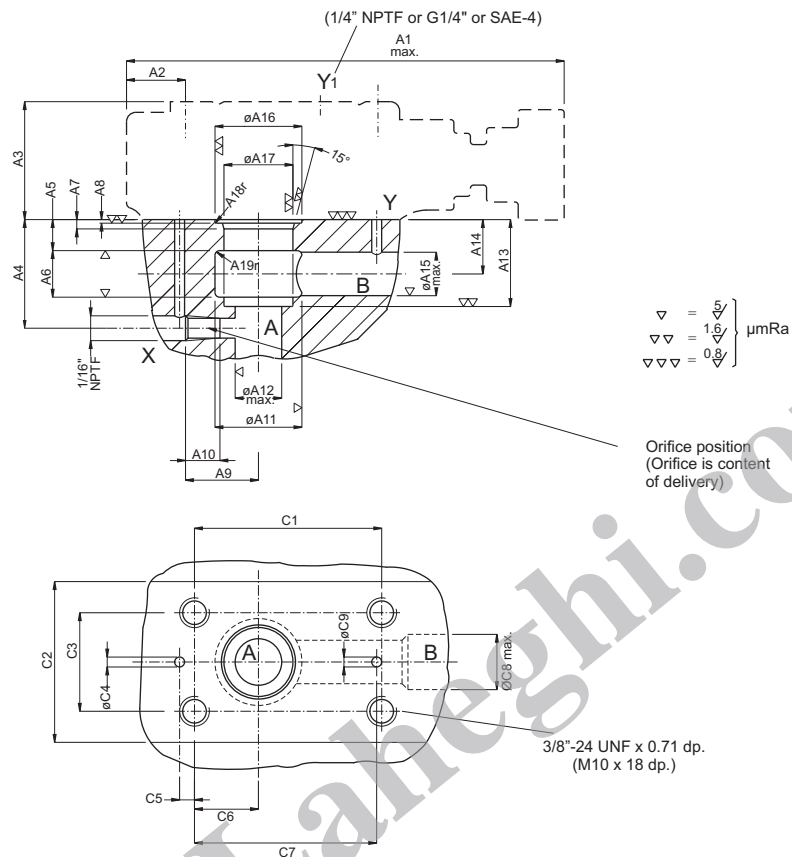
Ports	Function	Port Sizes
A (2)	Pressure (inlet)	1/2" NPTF or G 1/2" or SAE - 8 (3/4" - 16 UNF)
B	Tank (outlet)	1/2" NPTF or G 1/2" or SAE - 8 (3/4" - 16 UNF)
X 1)	Ext.remote control or vent connection	1/4" NPTF or G 1/4" or SAE - 4 (7/16" - 20 UNF)
Y1 ²⁾	External drain	1/4" NPTF or G 1/4" or SAE - 4 (7/16" - 20 UNF)

1) Closed when supplied

2) Port Y1 is only available at drain line (code 2) external from the pilot head

CARTRIDGE WITH PILOT VALVE VR4V03 (#0, #E & #G)

Weight : 1.32 lbs (0.6 kg)



	Dimensions	
	in	mm
A1	5.55	141.0
A2	0.75	19.0
A3	1.49	38.0
A4	1.38	35.0
A5	0.39	10.0
A6	0.59	15.0
A7	0.12	3.0
A8	0.045 ^{+0.006}	1.15 ^{+0.15}
A9	0.925	23.5
A10	0.437	11.1
A11	ø1.1	ø28.0
A12	ø0.6	ø15.0
A13	1.1	28.0
A14	0.69	17.5
A15	ø0.55	ø14.0
A16	ø1.1 ^{+0.004}	ø28.0 ^{+0.1}
A17	ø0.875 ^{+0.0008}	ø22.225 ^{+0.02}
A18	0.016	0.4
A19	0.6	15.0

	Dimensions	
	in	mm
C1	2.375 ^{± 0.008}	60.32 ^{± 0.2}
C2	2.04	51.8
C3	1.25 ^{± 0.008}	31.75 ^{± 0.2}
C4	ø0.126	ø3.2
C5	0.19	4.8
C6	0.81	20.6
C7	2.31	58.7
C8	ø0.7	ø17.8
C9	ø0.126	ø3.2

Ports	Function
A	Pressure (Inlet)
B	Tank (Outlet)
X	External control connection
Y, Y1 ¹⁾	Drain

1) Port Y1 is only available at drain line (code 2) external from the pilot head.

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