

4/3- and 3/3-way directional seated valves type VH (R) and VHP

Manually actuated, leakagefree

Size 1
Flow Q_{\max} = 12 lpm
Operating pressure p_{\max} = 700 bar
Size 2
Flow Q_{\max} = 25 lpm
Operating pressure p_{\max} = 500 bar

Individual valve

Type VH 1(2)
for pipe connection (photo)

Type VHP 1
for installation onto customer supplied manifolds



Directional valve bank

Type VHR 1 (2)
for pipe connection

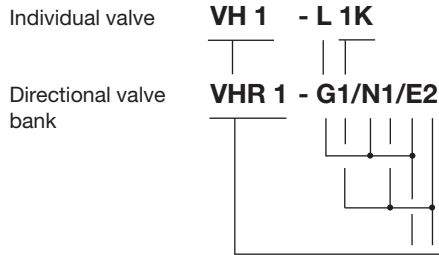


1. General

The 4/3- and 3/3-way directional ball seated valves feature zero leakage and are intended for the movement control of single and double acting consumers. The actuation is via hand lever with spring return into idle position or they will remain in the respecting working position by a detent. The shifting operation is transmitted via an eccentric shaft and pin onto the valve balls. All moving internal parts are lubricated by the hydraulic fluid and therefore maintenance-free. All these parts and the valve seats are hardened and ground. The valve balls are from ball bearings and conform industrial standard DIN 5401 ISO-class G 5 (DIN-class I). These valves are available either as individual valves for pipe connection (type VH) and for manifold mounting (type VHP) or as valve banks (type VHR). The valve banks are internally connected in parallel and held together by a strong tension rod. The individual valve type VH may be arranged later to form a valve bank.

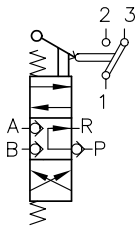
2. Type coding, main data

Order examples:



Symbols acc. to order examples above

Type VH 1 - L1K



Type VHR 1 - G1 / N1 / E2

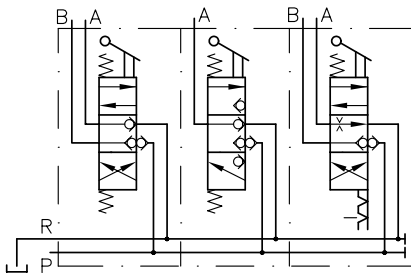


Table 1: Basic type and size

Nomenclature	Coding	Connection	Tapped ports ISO 228/1 (BSPP)	Flow Q_{max} (lpm)	Pressure P_{max} (bar)
Individual valve	VH 1	Pipe connection	G 1/4	12	700
	VH 2		G 3/8	25	500
	VHP 1	Manifold mounting	see dim. drawings sect. 4	12	700
Directional valve bank	VHR 1	Pipe connection	G 1/4	12	700
	VHR 2		G 3/8	25	500

Table 2: Flow pattern symbols

Available for:	Individual valve type VH (P) 1 and VH 2 and valve banks type VHR 1(2)					Individual valve type VH(P)1 and VH 2		
Switching position	G	E	M	N	D	H	L	S

Table 3: Actuation

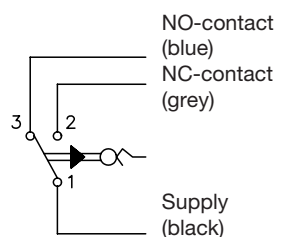
		Spring return ¹⁾	Detent	Flow pattern symbols
Switch ²⁾	without	1	2	1 2 e.g. 1K
	with	1 K	2 K	
The switch is engaged via the hand lever in idle position of the valve and released if the valve is actuated (no matter to which side).				

Electrical data

Co. Burgess No. V 3S
Protection class IP 67 (IEC 60529)

Service life $\approx 10^5$ operations	230V AC	5 A	Note $\cos \varphi = 0.6$ L/R ≈ 3 ms
	15V DC	10 A	
	30V DC	7.5 A	
	110V DC	0.07 A	
	230V DC	0.03 A	

Connection scheme



¹⁾ Automatic selfreturn into idle position up to approx. 50 bar. The lever must be returned manually with higher pressure.

²⁾ Not available for flow pattern symbol coding N and S

3. Further parameters

3.1 General data

Nomenclature, design	Seated ball valve, versions with 4/3- and 3/3-way functions
Installed position	Any
Pipe connection	Type VH(R): via pipe fittings with tapped journals shape B DIN 3852 page 2 Type VHP 1: via customer furnished manifolds
Ports	P = Inlet port (pump) A, B = Consumer R = Return For pressure resistancy see „Operation pressure“ (hydraulic data)
Port size	VH(R) 1: G 1/4 ISO 228/1 (BSPP) VH(R) 2: G 3/8 ISO 228/1 (BSPP) VHP 1: See dimensional drawings in sect. 4
Flow direction	Only in arrow direction acc. to the resp. symbol
Over lapping	Positive
Surface	Valve housing zn-ni galvanized
Actuation force	VH(R) 1: approx. 30 N at 700 bar approx. 11 N at 0 bar VH(R) 2: approx. 65 N at 500 bar approx. 15 N at 0 bar
Mass (weight) approx.	VH 1: 1.6 kg VH 2: 3.0 kg VHP 1: 1.7 kg For VHR: Number of valves multiplied with factor 1.6 (VHR 1) or 3 (VHR 2)
Max. No. of valve sections	VHR 1: 7 VHR 2: 5

3.2 Hydraulic data

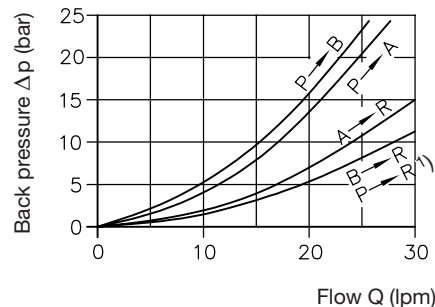
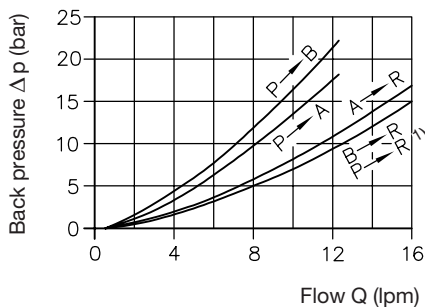
Operation pressure	Ports P, A, B: $p_{max} = 700$ bar R: $p_{perm} = 50$ bar
Stat. over load capacity (nonactuated valve)	Ports P, A, B: $> 1.5 p_{max}$ R: $> 5 p_{perm}$
Flow	Pump delivery Q: VH(R) 1 and VHP 1 = 12 lpm VH(R) 2 = 25 lpm
Pressure fluid	Hydraulic fluid (DIN 51524 table 1 to 3); ISO VG 10 to 68 acc. to (DIN 51519) Viscosity range: min. 4; max. 1500 mm ² /s Optimal operation range: 10...500 mm ² /s Also suitable are biodegradable pressure fluids of the type HEPG (Polyalkylenglycol) and HEES (synth. Ester) at operation temperatures up to +70°C.
Temperatures	Ambient: -40...+80°C Fluid: -25...+80°C, pay attention to the viscosity range! Start temperature down to -40°C are allowable (Pay attention to the viscosity range during start!), as long as the operation temperature during consequent running is at least 20K (Kelvin) higher. Biodegradable pressure fluids: Pay attention to manufacturer's information. With regard to the compatibility with sealing materials do not exceed +70°C.

Δp-Q curves

Type VH(R) 1 and VHP 1

Type VH(R) 2

Fluid viscosity during measurement 60 mm²/s



1) not for symbol H

4. Unit dimensions

4.1 Individual valve

All dimensions in mm, subject to change without notice !

Type VH 1 and VH 2

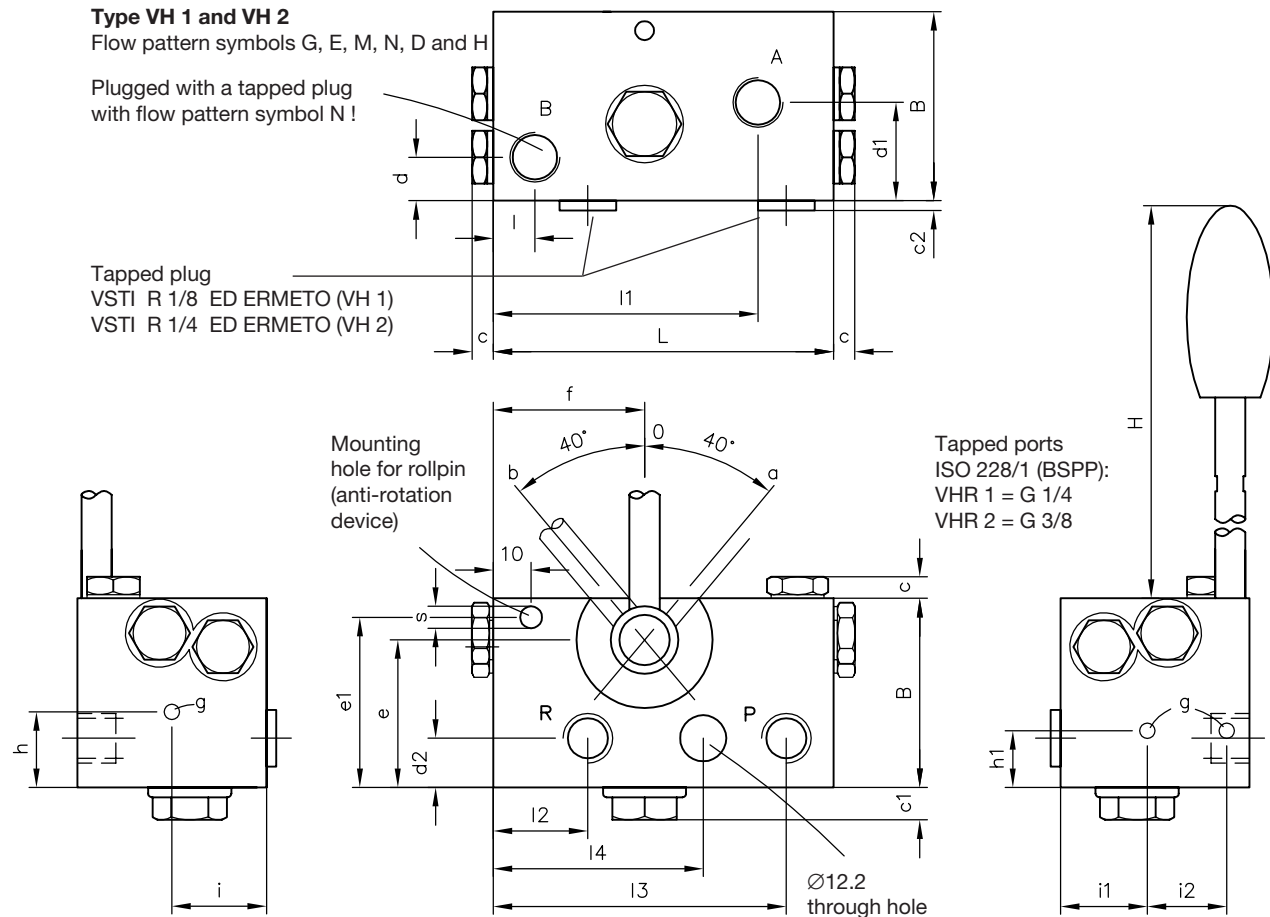
Flow pattern symbols G, E, M, N, D and H

Plugged with a tapped plug with flow pattern symbol N !

Tapped plug

VSTI R 1/8 ED ERMETO (VH 1)

VSTI R 1/4 ED ERMETO (VH 2)



Type	L	B	H	c	c1	c2	d	d1	d2	e	e1	f	g	h	h1	i	i1	i2	l	l1	l2	l3	l4	s
VH 1-..	90	50	app. 172	6	9	2.6	11.5	26.5	13	39	45	40	M6, 8 deep	20	15	25	23	21	11	70	25	77.5	55.5	Ø4.2, 4 deep
VH 2-..	120	60	app. 162	7	12	5	12	39	13.5	46	55	54	M6, 10 deep	27	16	30	30	23	12	91.5	29	107.5	74	Ø5.2, 5.3 deep

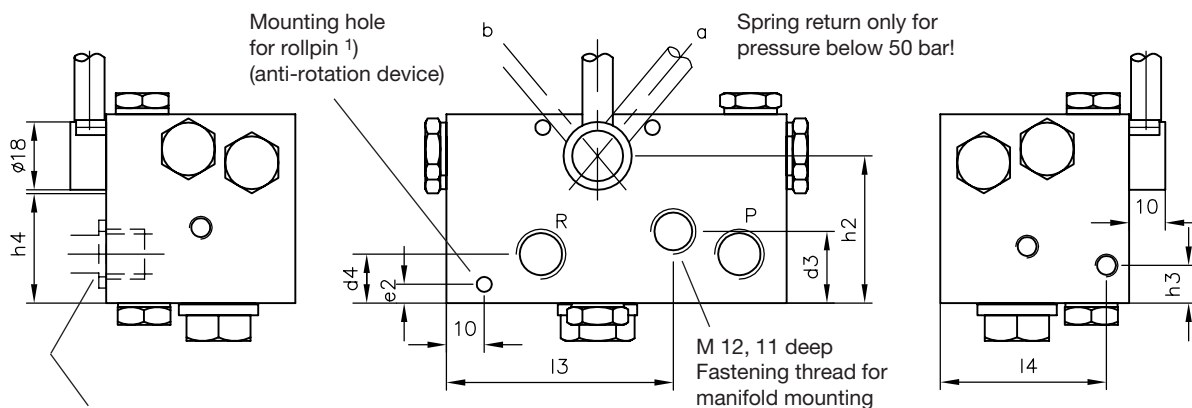
Type VH 1 and VH 2

Flow pattern symbols of L and S

Plugged with a tapped plug with type VH 1(2)-S

Type	d3	d4	e2	h2	h3	h4	l3	l4
VH 1 - L, S	19	13	5	39	10	29	60	44
VH 2 - L, S	15.5	15.5	55	46	16	33	79	53

For missing dimensions see VH 1(2) - G...H !

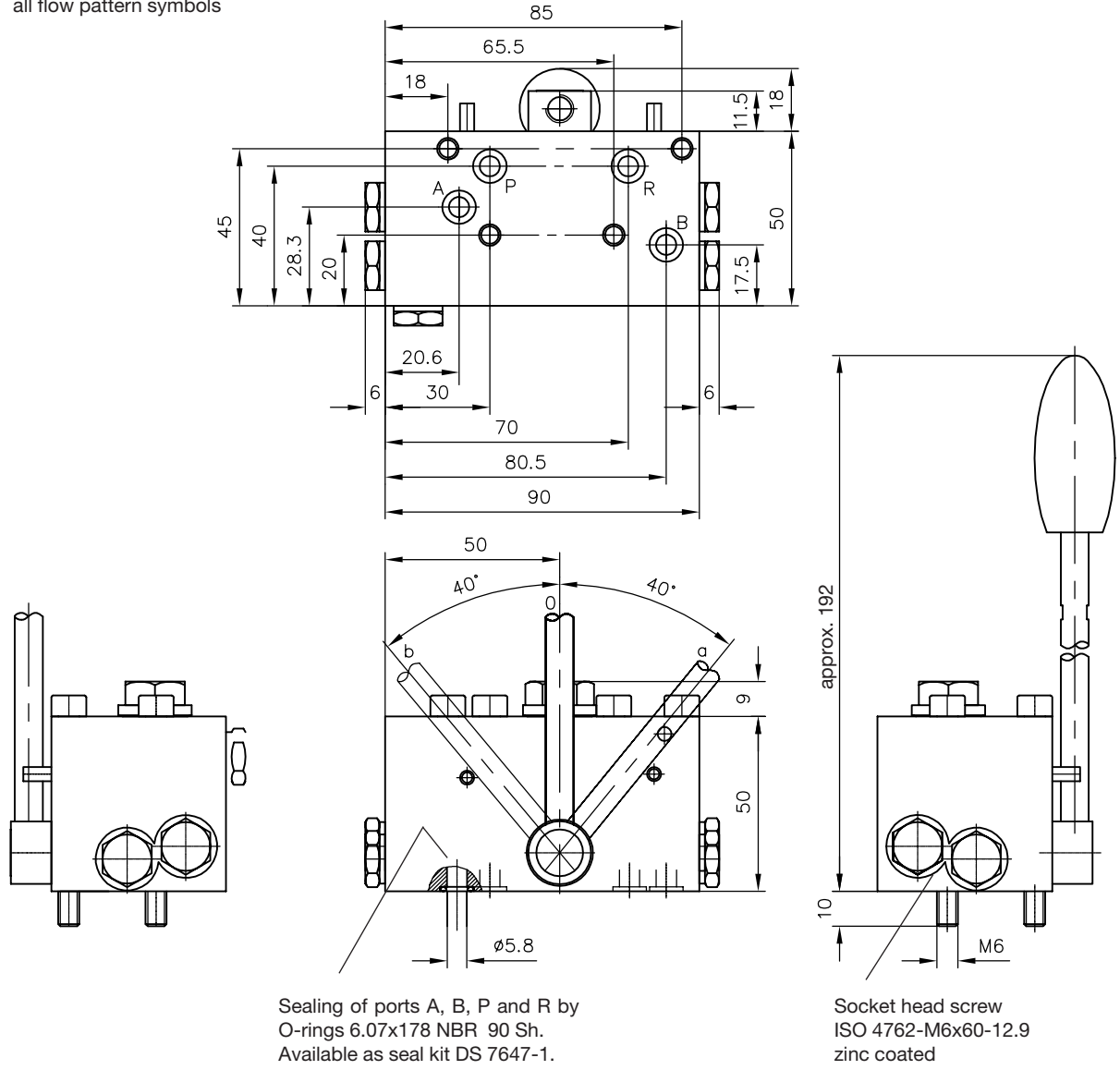


When mounting onto a connection plate:

Sealing of ports P and R by O-rings 14x1.78 (VH 1..) or 17.17x1.78 (VH 2..) NBR 90 Sh

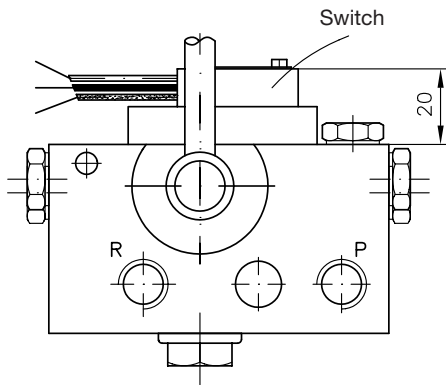
1) When a customer furnished connection plate utilized rollpins ISO 8750-4x8-St (VH 1..) or ...5x10 St (VH 2) must be provided

Type VHP 1
all flow pattern symbols

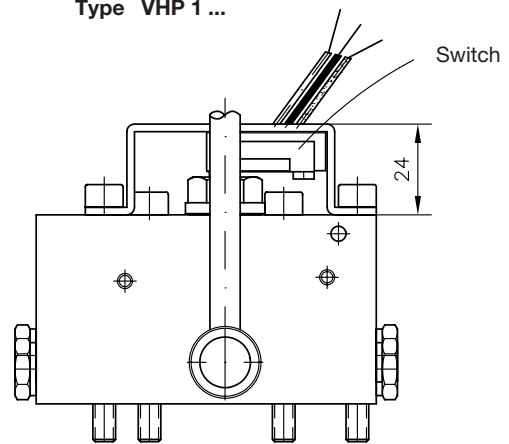


4.2 Switch assembly

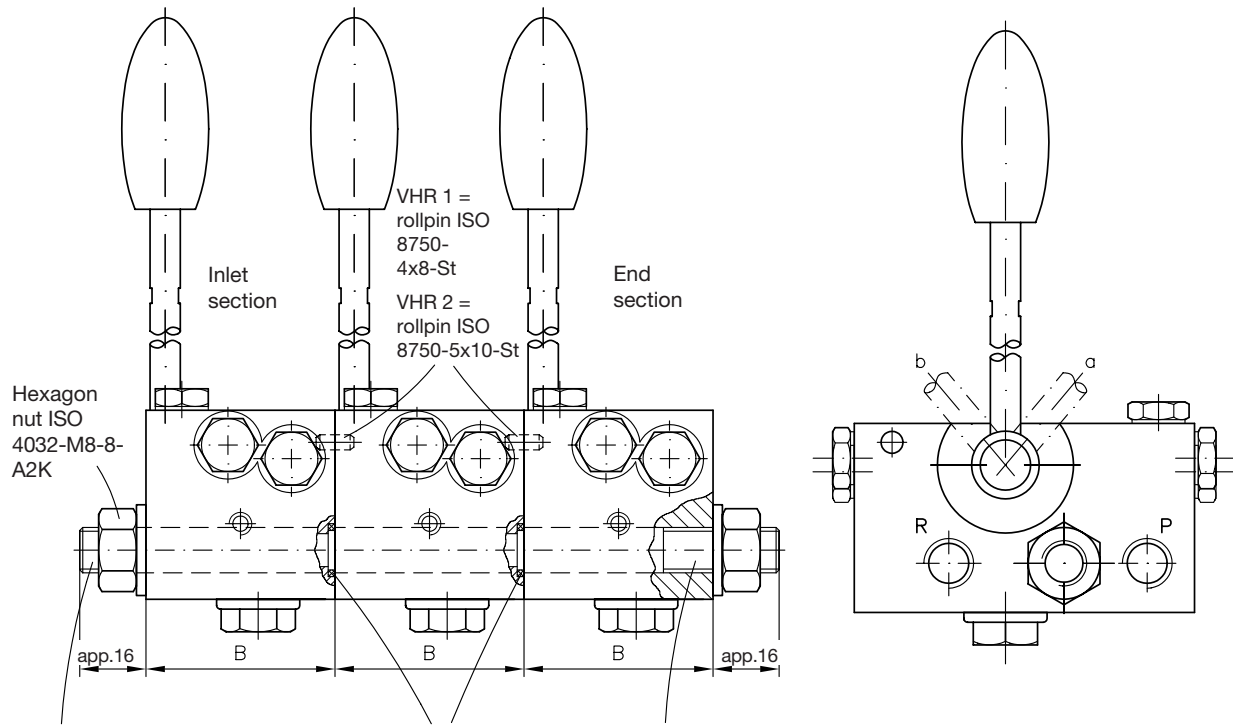
Type VH 1(2) ... and VHR 1(2) ...



Type VHP 1 ...



4.3 Directional valve bank



Tension rod DIN 940-
M12 Fo x (N x B)-8.8-A2K

Sealing of ports P
and R by O-rings

Ports P and R plugged
with tapped plugs.

Type	N Number of valves	B	O-ring NBR 90 Shore	Tapped plug (end section P, and R)
VHR 1	max. 7	50	14x1.78	VSTI R 1/8 ED ERMETO
VHR 2	max. 5	60	17.17x1.78	VSTI R 1/4 ED ERMETO

For missing dimensions
see section 4.1!