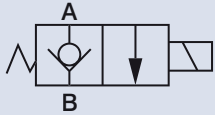


CARTRIDGE SOLENOID OPERATED CHECK VALVE



How to order

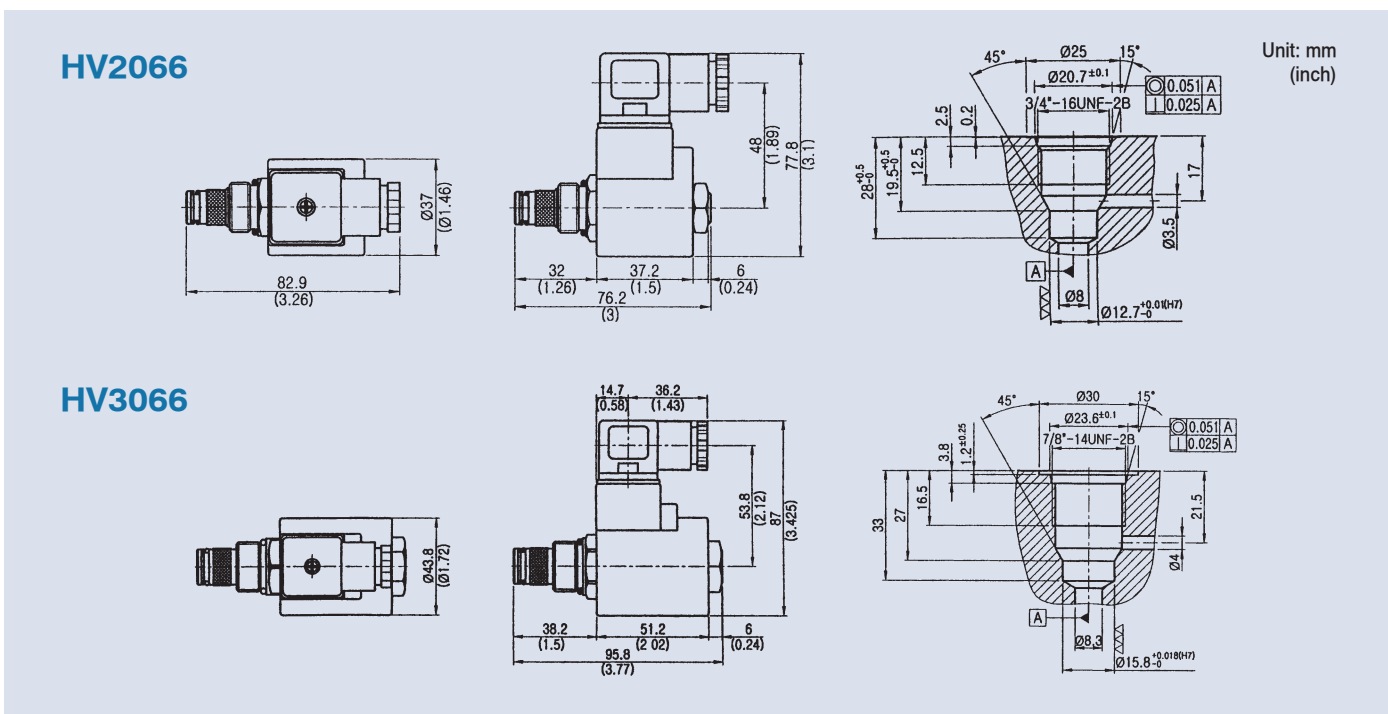
HV2066, HV3066 - NC - ✖ - A22

	1	2	3	4
1	Model HV2066: Size 08 HV3066: Size 10			
2	NC: Normal closed NO: Normal open			
3	None: Standard OM: With manual			
4	Voltage A11: AC110V (50/60HZ) A22: AC220V (50/60HZ) D1: DC12V D2: DC24V			

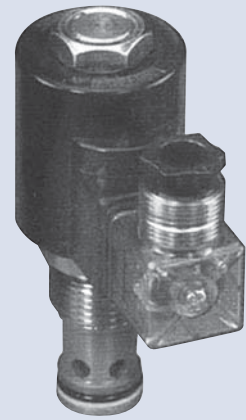
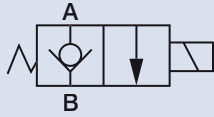
Specifications

Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV2066	250	15	20	0.28
HV3066		30	40	0.53

Dimensions



CARTRIDGE SOLENOID OPERATED CHECK VALVE



How to order

HV6066, HV8066 - NC - ☒ - A22

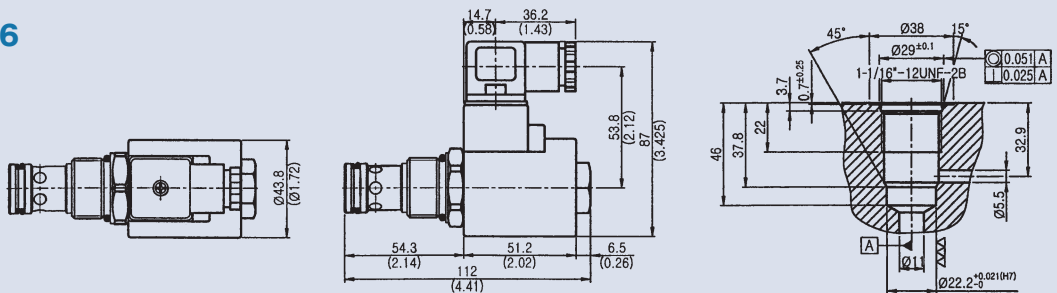
	1	2	3	4
1	Model HV6066: Size 12 HV8066: Size 16			
2	NC: Normal closed NO: Normal open			
3	None: Standard OM: With manual			
4	Voltage A11: AC110V (50/60HZ) A22: AC220V (50/60HZ) D1: DC12V D2: DC24V			

Specifications

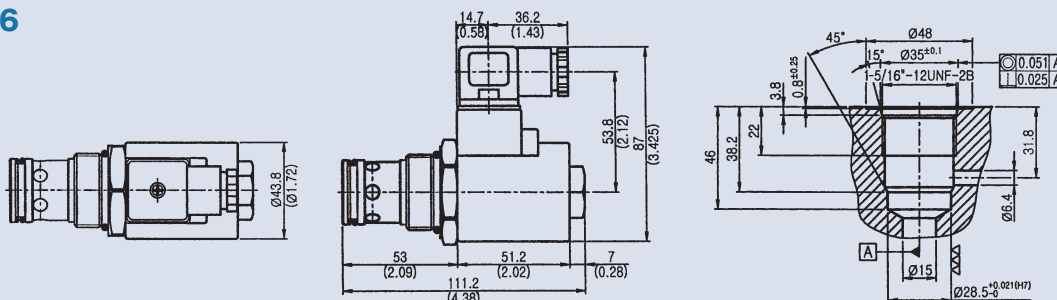
Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV6066	250	80	80	0.58
HV8066		150	150	0.68

Dimensions

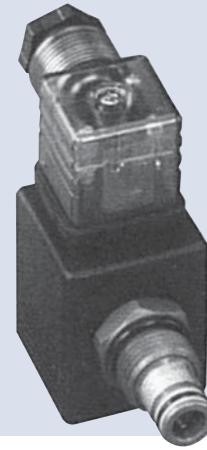
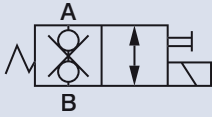
HV6066



HV8066



CARTRIDGE SOLENOID OPERATED DOUBLE CHECK VALVE



How to order

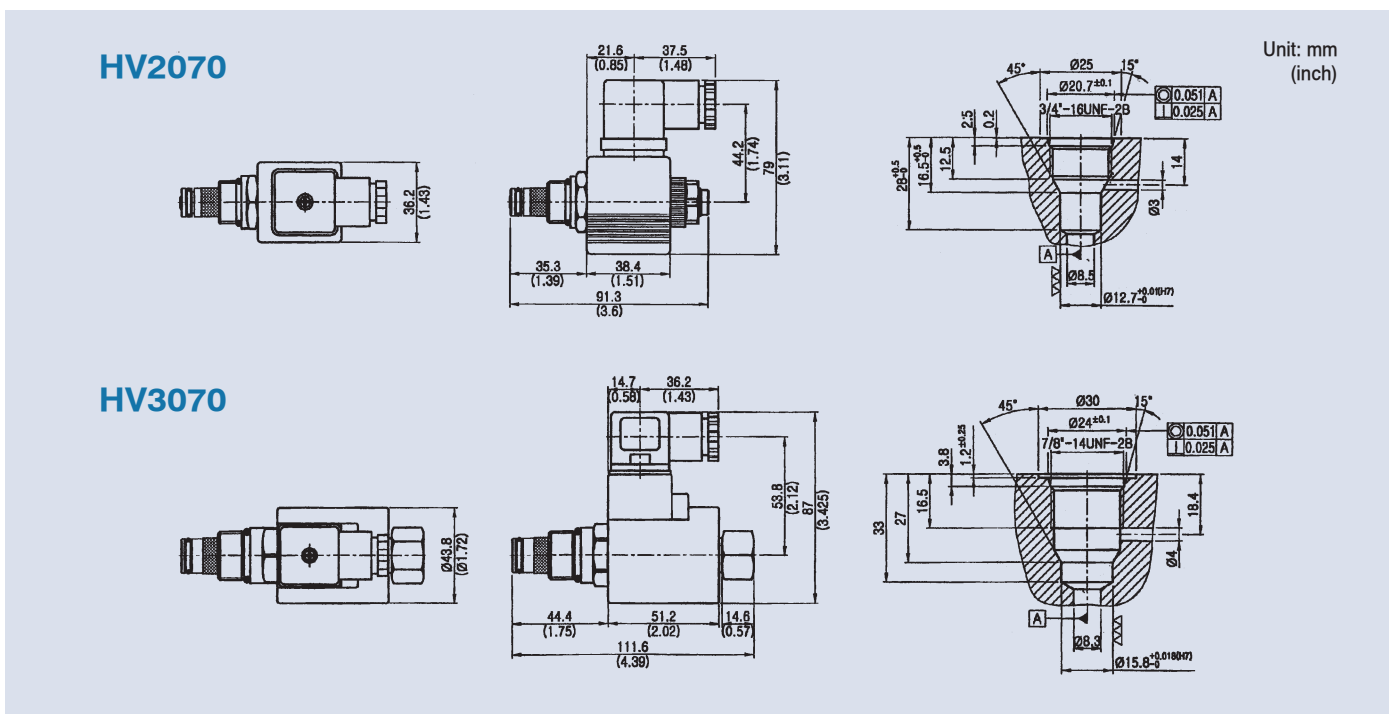
HV2070, HV3070 - NC - ✖ - A22

	1	2	3	4
1	Model			
2	NC: Normal closed NO: Normal open			
3	None: Standard OM: With manual			
4	Voltage A11: AC110V (50/60HZ) A22: AC220V (50/60HZ) D1: DC12V D2: DC24V			

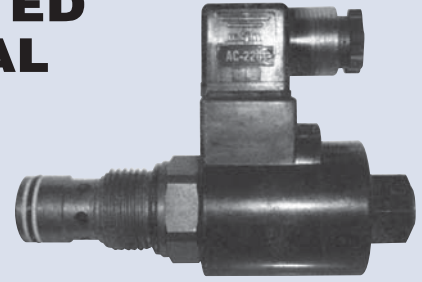
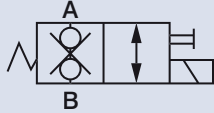
Specifications

Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV2070	250	15	20	0.34
HV3070		20	30	0.5

Dimensions



CARTRIDGE SOLENOID OPERATED DOUBLE CHECK VALVE, MANUAL CHECK VALVE



How to order

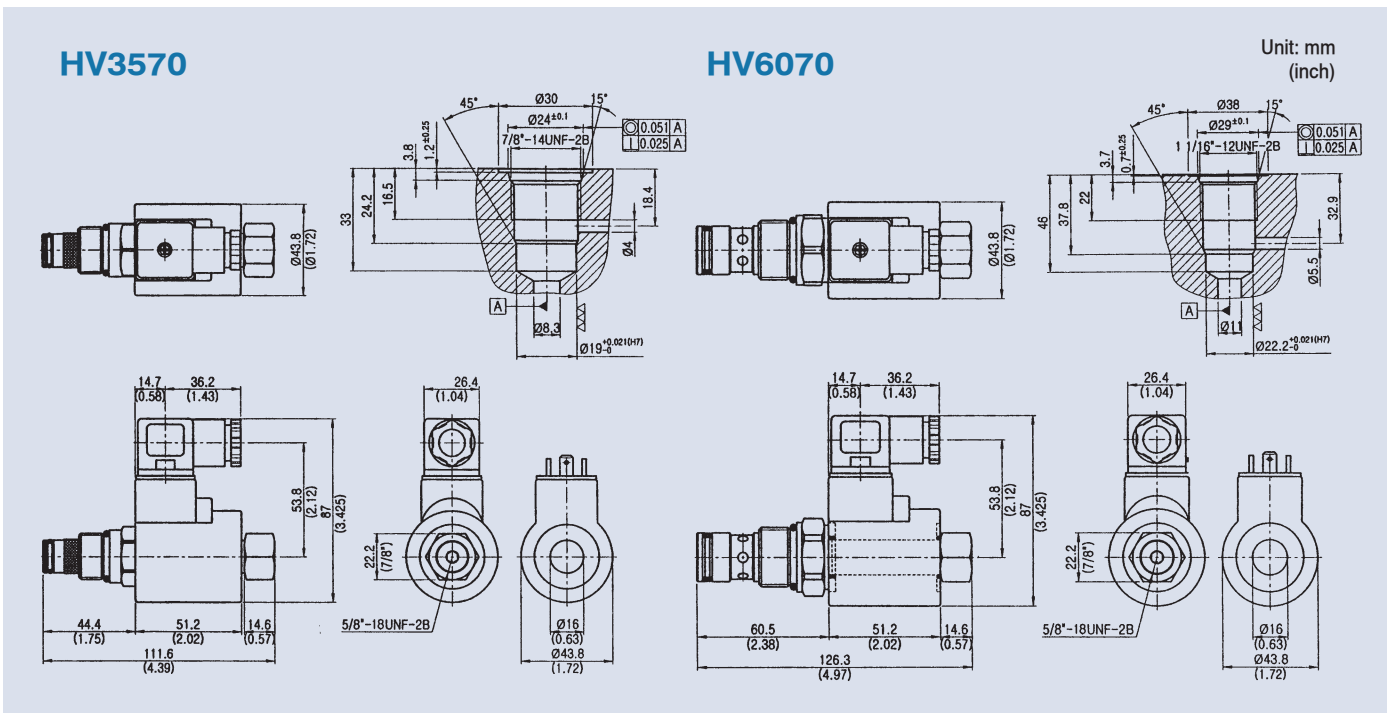
HV3570, HV6070 - NC - ☒ - A22

	1	2	3	4
1	Model			
2	NC: Normal closed NO: Normal open			
3	None: Standard OM: With manual			
4	Voltage A11: AC110V (50/60HZ) A22: AC220V (50/60HZ) D1: DC12V D2: DC24V			

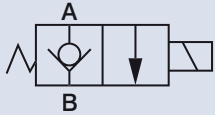
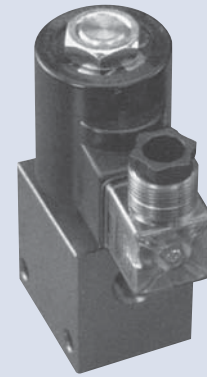
Specifications

Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV3570	250	25	35	0.51
HV6070		50	60	0.62

Dimensions



CARTRIDGE SOLENOID OPERATED CHECK VALVE WITH BODY



How to order

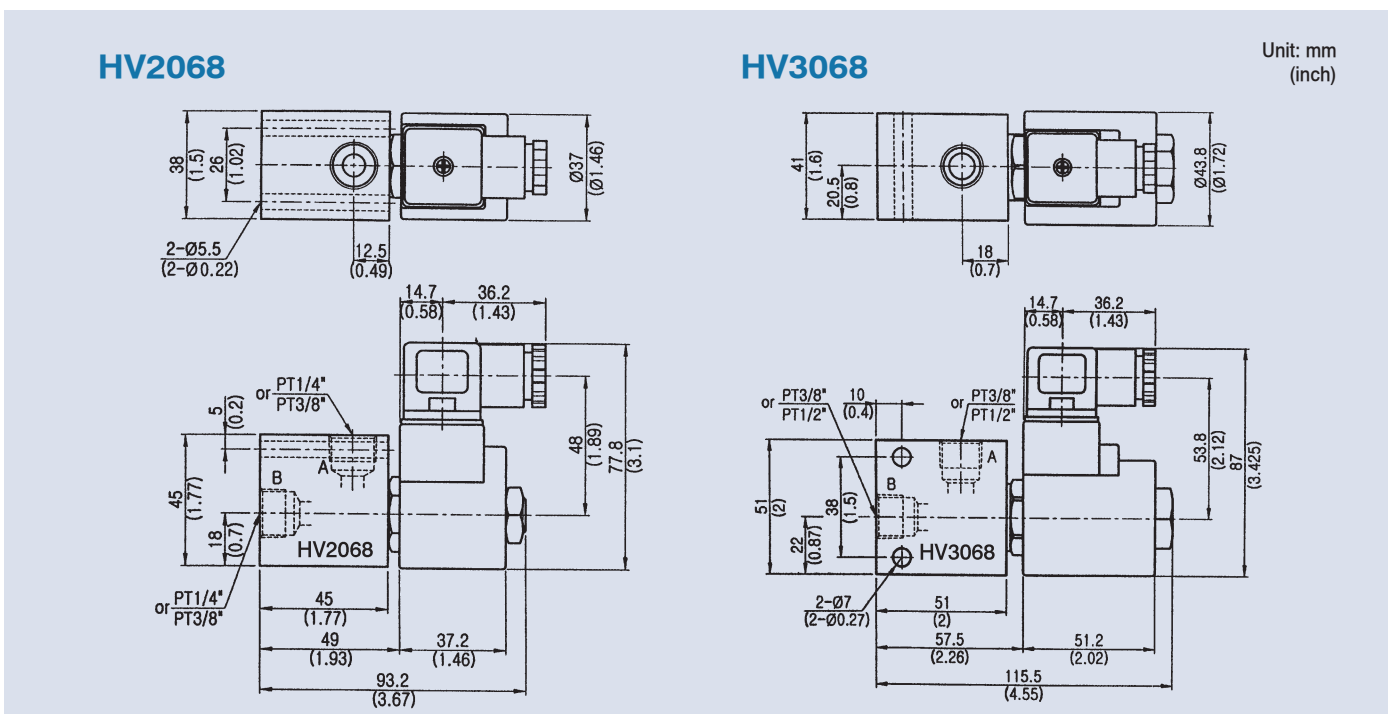
HV 2068-02, HV 3068-03 - NC - * - A22

	1	2	1	2	3	4	5
1	Model	HV2068: HV2066+body	HV3068: HV3066+body				
2	Port size	2068-02: 1/4" (normal)	2068-03: 3/8"	3068-03: 3/8" (normal)	3068-04: 1/2"		
3		NC: Normal closed	NO: Normal open				
4		None: Standard	OM: With manual				
5	Voltage	A11: AC110V (50/60HZ)	A22: AC220V (50/60HZ)	D1: DC12V	D2: DC24V		

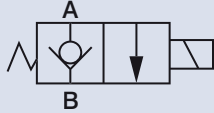
Specifications

Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV2068	250	15	20	0.46
HV3068		30	40	0.74

Dimensions



CARTRIDGE SOLENOID OPERATED CHECK VALVE WITH BODY



E

How to order

HV 6068, HV 8068 - NC - ☒ - A22

	1	2	1	2	3	4	5
1	Model	HV6068: HV6066+body	HV8068: HV8066+body				
2	Port size	6068: PT3/4"	8068: PT1"				
3	NC: Normal closed	NO: Normal open					
4	None: Standard	OM: With manual					
5	Voltage	A11: AC110V (50/60HZ)	A22: AC220V (50/60HZ)	D1: DC12V	D2: DC24V		

Specifications

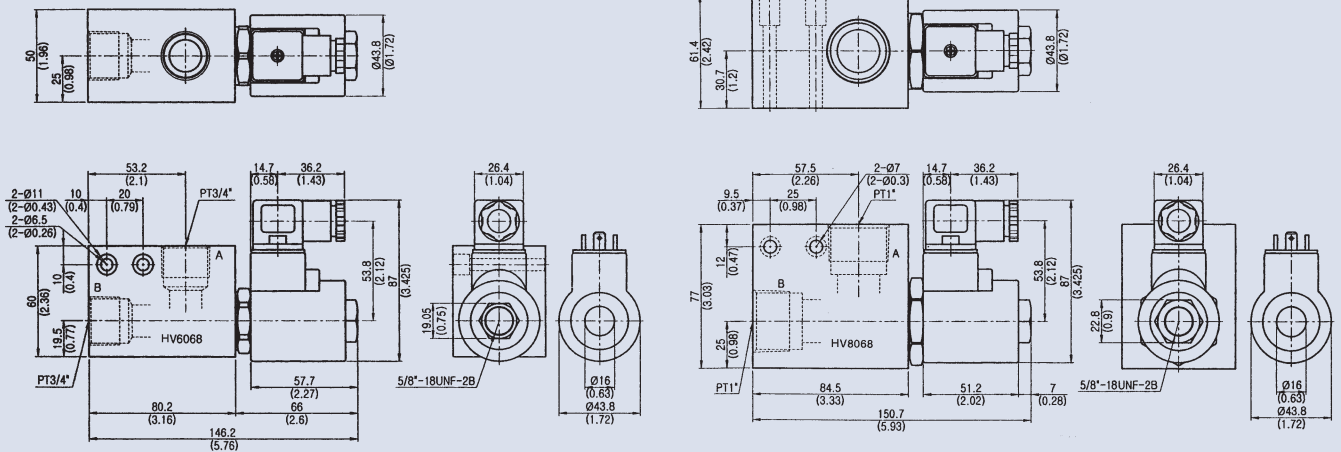
Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV6068	250	80	80	1.08
HV8068		150	150	2.5

Dimensions

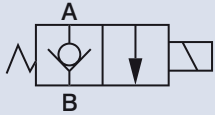
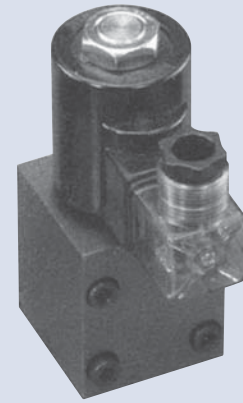
HV6068

HV8068

Unit: mm
(inch)



CARTRIDGE SOLENOID OPERATED CHECK VALVE WITH BODY



How to order

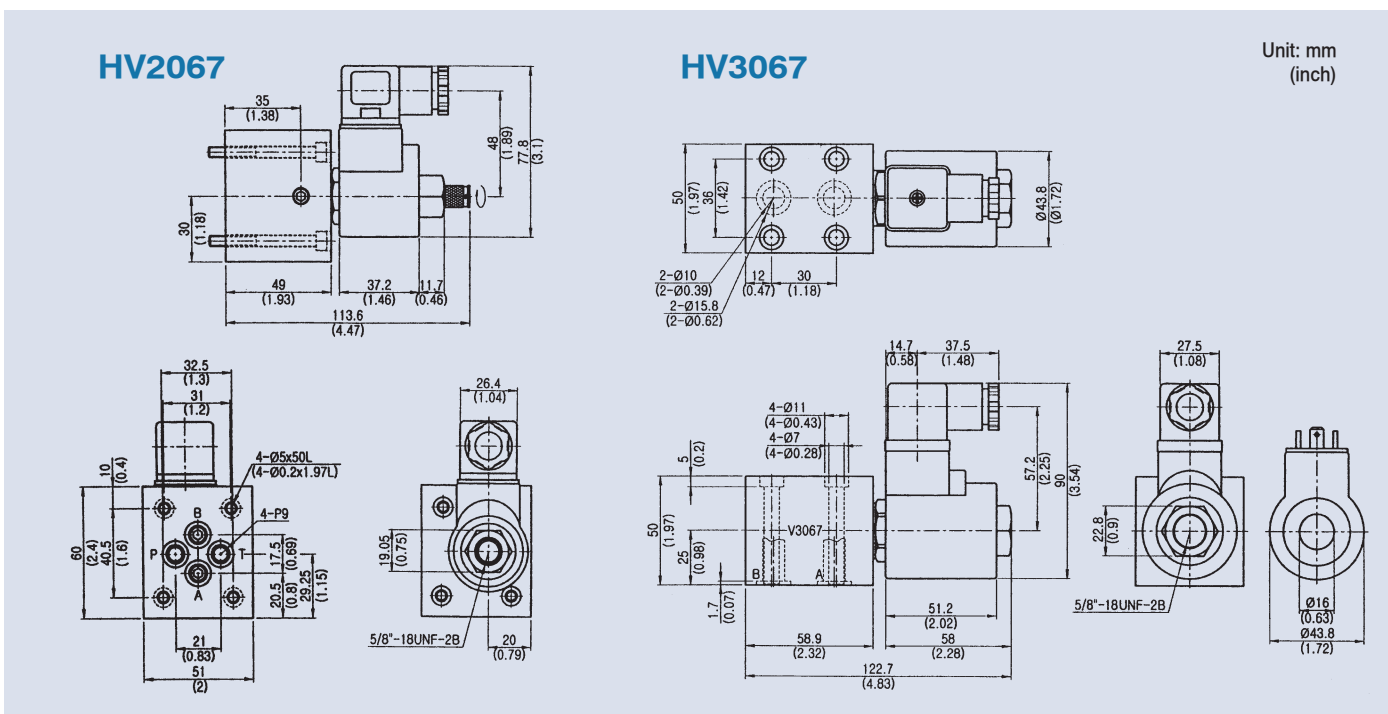
HV2067, HV3067 - G 02 - NC - ✱ - A11

	1	2	3	4	5	6
1	Model	HV2067: HV2066+body HV3067: HV3066+body				
2	Sub-plate mounting type					
3	Normal valve size	02: 1/4" (ISO CETOP 3, NFPA D03, DIN NG 6) for HV2067		03: 3/8" for HV3067		
4	NC: Normal closed NO: Normal open					
5	None: Standard OM: With manual					
6	Voltage	A11: AC110V (50/60HZ) A22: AC220V (50/60HZ) D1: DC12V D2: DC24V				

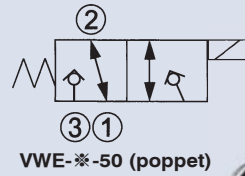
Specifications

Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV2067	250	15	20	0.69
HV3067		30	40	0.87

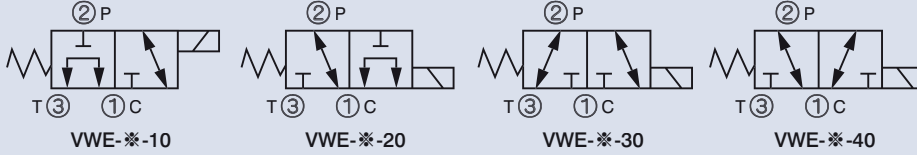
Dimensions



CARTRIDGE SOLENOID OPERATED VALVE SPOOL 3-WAY 2-POSITION



CONTROL PORTS



How to order

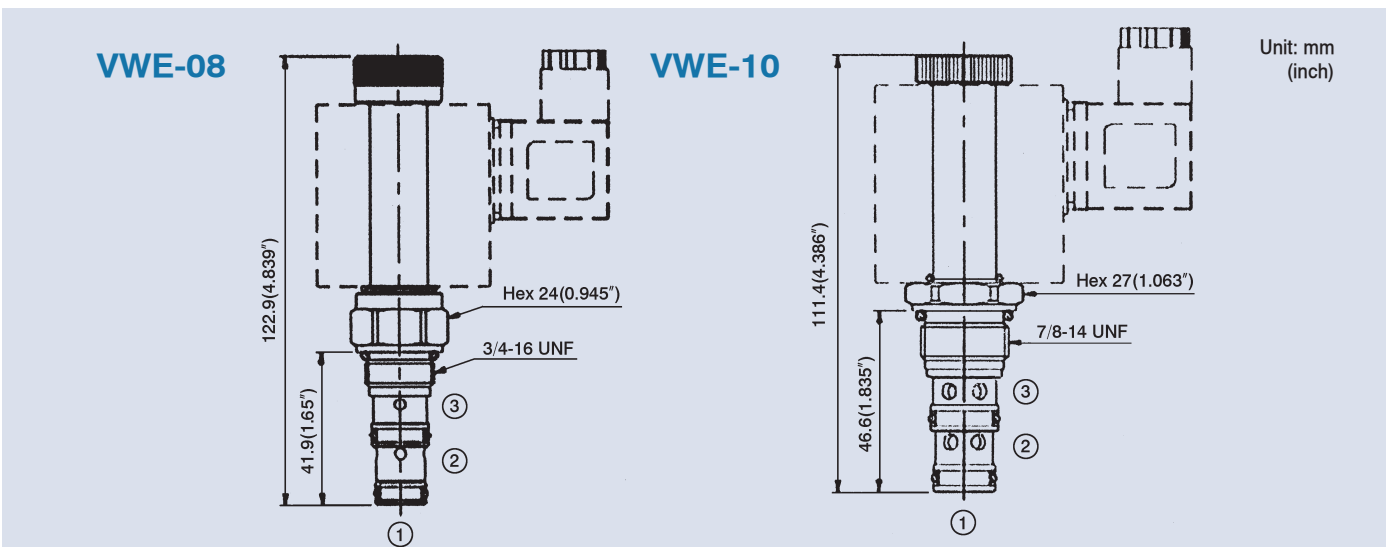
VWE - 08 - 10 - A1 - *

1	2	3	4	5
1	Model			
2	Mounting size 08: 08W-3 Cavity: CS08-3N (see page 163)	10: 10W-3 Cavity: CS10-3N (see page 163)		
3	Control port			
4	Voltage A1: RAC110V (50/60HZ) A2: RAC220V (50/60HZ) D1: DC12V D2: DC24V			
5	Wiring type None: DIN plug X: Double lead			

Specifications

Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VWE-08-10	210	10	0.31
VWE-08-20			
VWE-08-30			
VWE-08-40			
VWE-08-50			
VWE-10-20	20	0.2	
VWE-10-30			
VWE-10-40			

Dimensions



CARTRIDGE SOLENOID OPERATED VALVE SPOOL 4-WAY 2(3)- POSITION

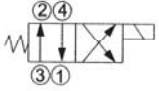
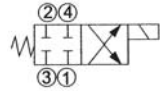
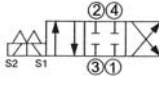
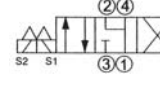
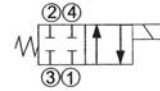


VWE-**-B2, B2B, B2BL

VWE-**-C2, C4

How to order

VWE - 08 - B2 - A1 - *

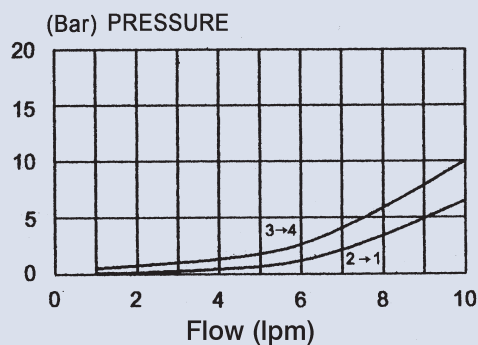
1	2	3	4	5
1	Model			
2	Mounting Size	08:08W-4 Cavity: CS08-4N (see page 164)	10:10W-4 Cavity: CS10-4N (see page 164)	
3	Control port	 VWE-**-B2	 VWE-**-B2B	 VWE-**-C2
		 VWE-**-C4	 VWE-**-B2BL	
4	Voltage	A1: RAC110V (50/60HZ) A2: RAC220V (50/60HZ)	D1: DC12V D2: DC24V	
5	Wiring type	None: DIN plug X: Double lead		

Specifications

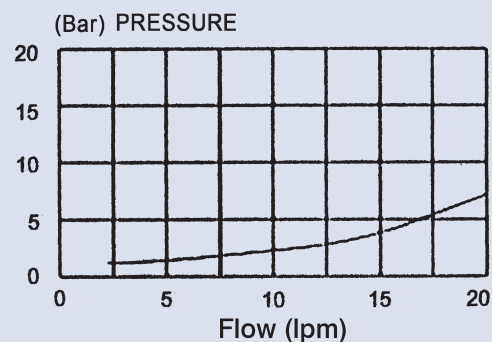
Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VWE-08-B2	210	10	0.45
VWE-08-B2B			
VWE-08-B2BL			
VWE-08-C2			0.75
VWE-08-C4			
VWE-10-B2		20	0.45

Performance

VWE-08



VWE-10



CARTRIDGE SOLENOID OPERATED CHECK VALVE



How to order

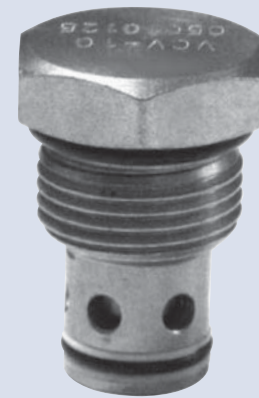
VSE - 10 - * - A2 - X - Y

1	Model	
2	Mounting size	10: Cavity tooling E-017 Size CSE 017-2N (see page 165) 12: Cavity tooling E-021 Size CSE 021-2N (see page 166)
3	Control port	20: 21: 22: 23: 26: 27: 28: 29: 30: 31: 32: 33:
4	Voltage	A1: RAC110V (50/60HZ) A2: RAC220V (50/60HZ) D1: DC12V D2: DC24V
5	Wiring type	None: DIN plug X: Double lead
6	Adjustment option	None: Standard Y: Twist style manual override (for control ports 20, 22, 28, 31, 32, 33) Push style manual override (for control ports 21, 23, 26, 27, 29, 30)

Specifications

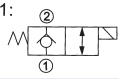
Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VSE-10-*	350	70	0.4
VSE-12-*		150	0.63

CARTRIDGE SOLENOID OPERATED CHECK VALVE



How to order

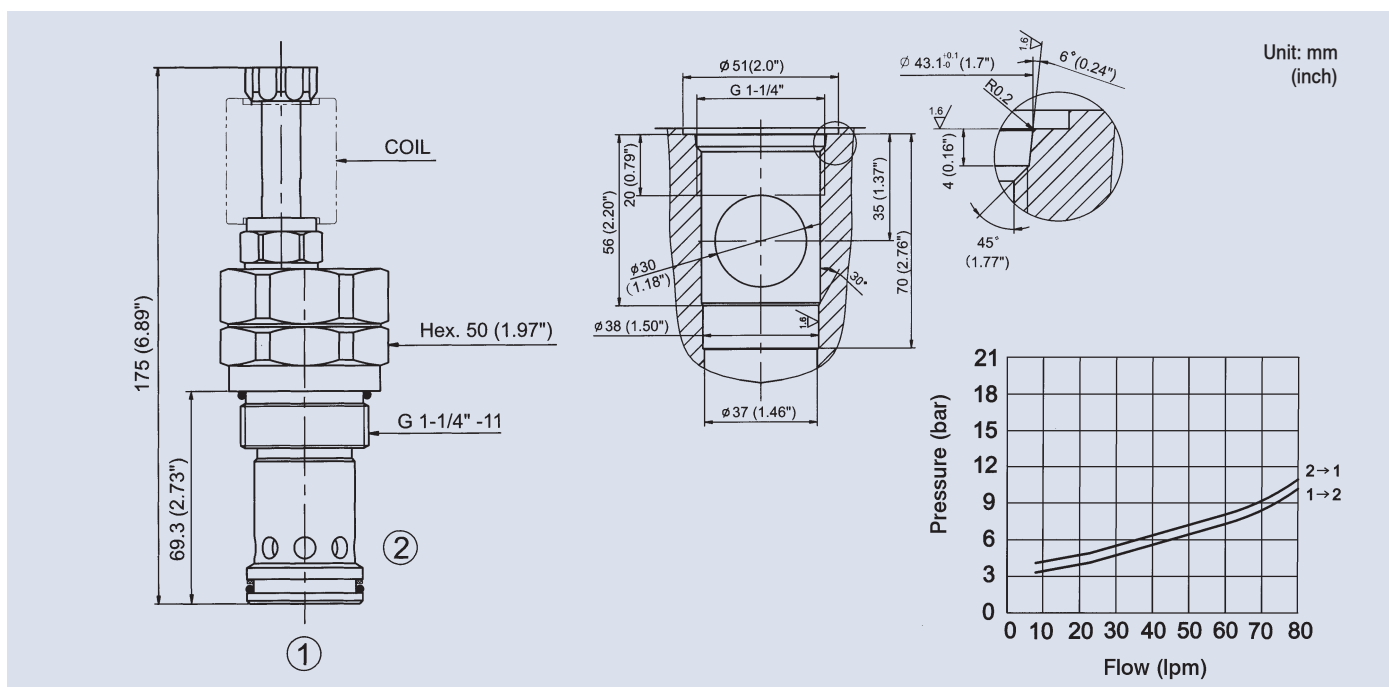
VSE - 20 - 31 - A2 - X - Y

1	2	3	4	5	6
1	Model				
2	Mounting size 20: Size Cavity: E-04				
3	Control port 31: 				
4	Voltage A1: RAC110V (50/60HZ) A2: RAC220V (50/60HZ) D1: DC12V D2: DC24V				
5	Wiring type None: DIN plug X: Double lead				
6	Adjustment option None: Standard Y: Twist style manual override				

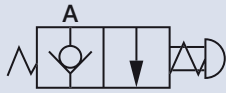
Specifications

Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VSE-20-31	350	260	1.14

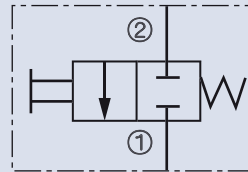
Dimensions/Performance curve



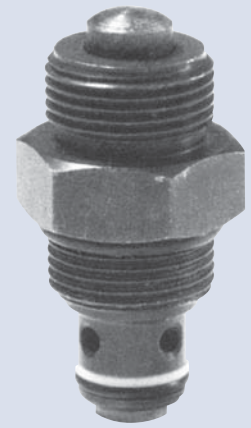
CARTRIDGE MANUAL RELEASE VALVE



HV2069



VMV-08



Specifications

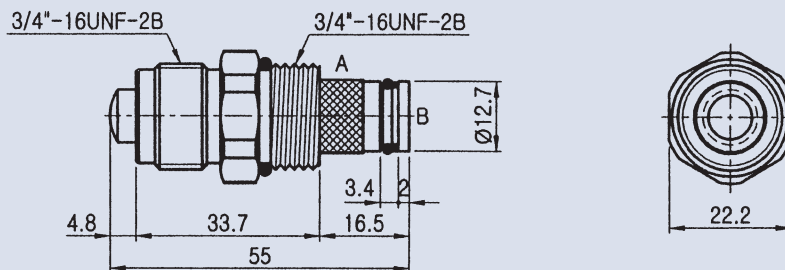
Model	Max. Pressure (bar)	Rated Flow (lpm)	Max. Flow (lpm)	Weight (kg)
HV2069	250	15	20	0.17

Model	Max. Pressure (bar)	Rated Flow (lpm)	Weight (kg)
VMV-08	250	15	0.35

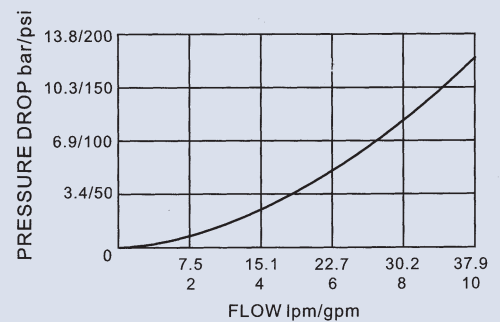
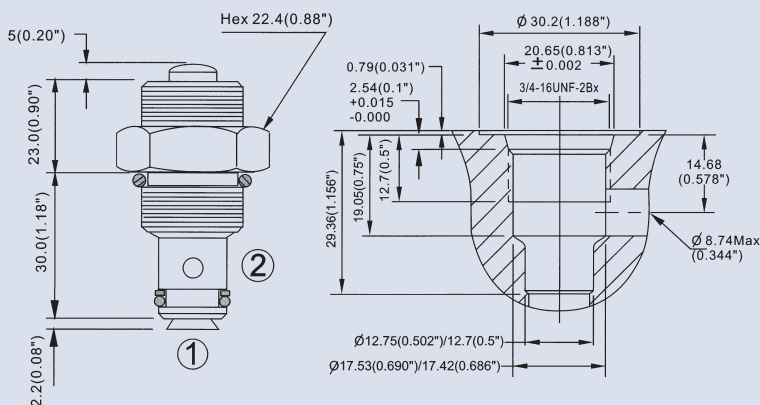
Dimensions / Performance curves

HV2069

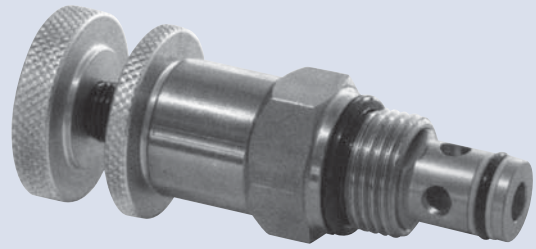
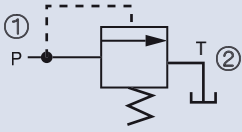
Unit: mm (inch)



VMV-08



CARTRIDGE RELIEF VALVE



How to order

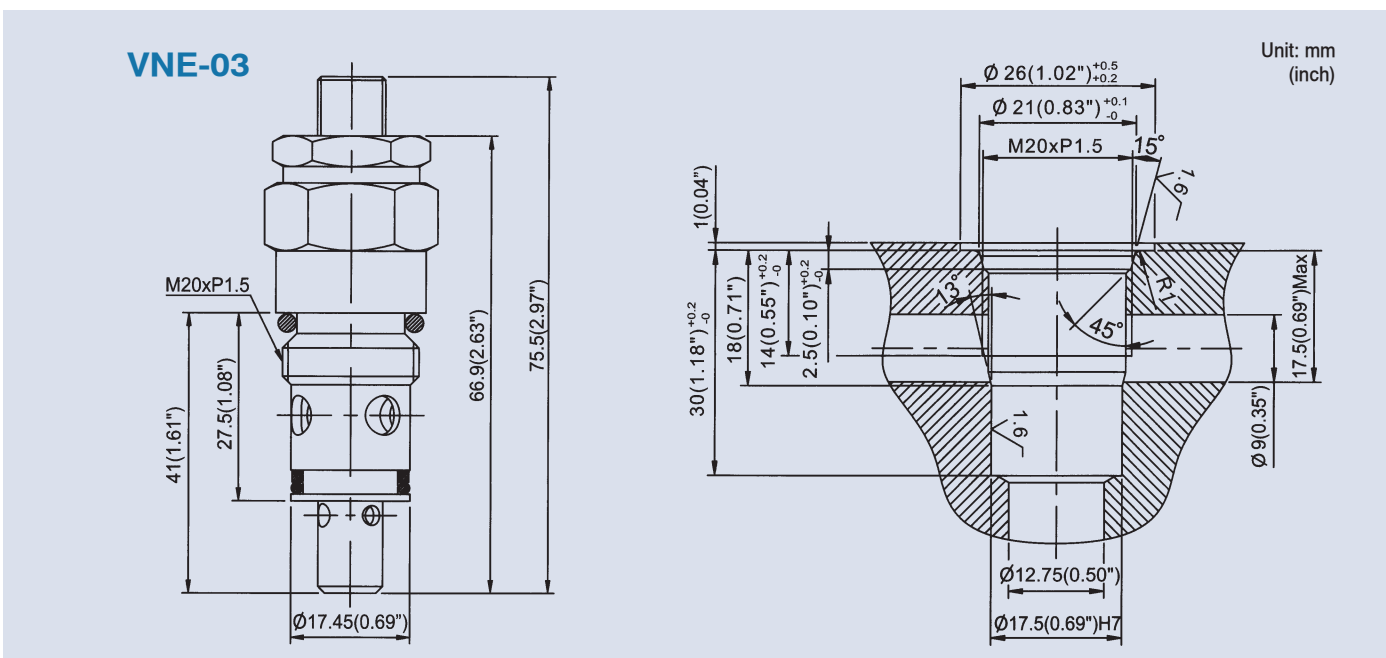
VNE - 04 - 20 - K

	1	2	3	4
1	Model	Direct type		
2	Mounting size	04, 05: Size 08	Cavity CS08-2N (see page 163)	
3	Pressure adjusting range			
4	Adjustment option	None: Tool adjustment	K: Hand-bar adjustment	

Specifications

Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VNE-03	315	28: 30~280 35: 80~350	60	0.18
VNE-04		03: *~30 10: *~100 20: 30~200 30: 40~300	20	0.1
VNE-05	250	10: *~100 20: 30~250 35: 100~350	20	0.2
VNE-07	420	1: *~100 2: *~250 3: *~400	60	1.8
VNE-08	315	1: *~100 2: *~315	120	1.8

Dimensions

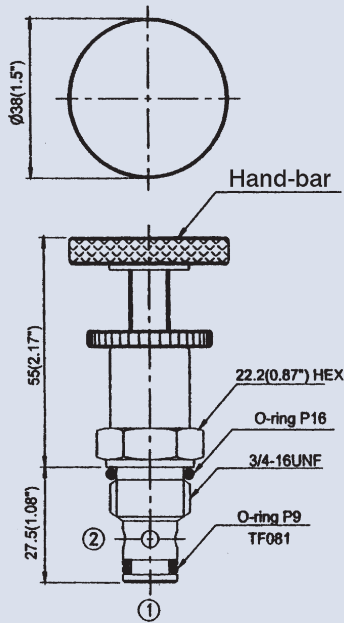


CARTRIDGE RELIEF VALVE

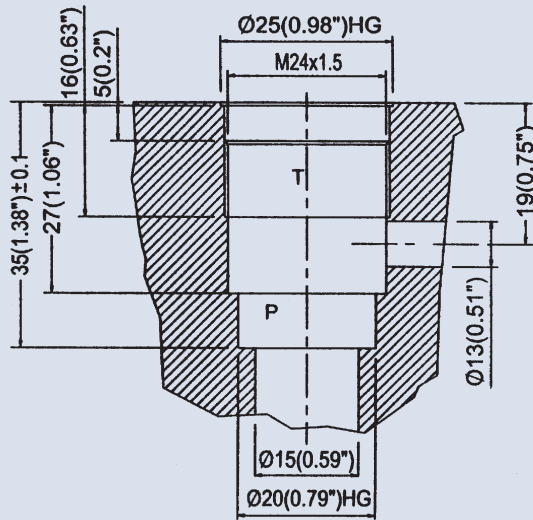
Dimensions



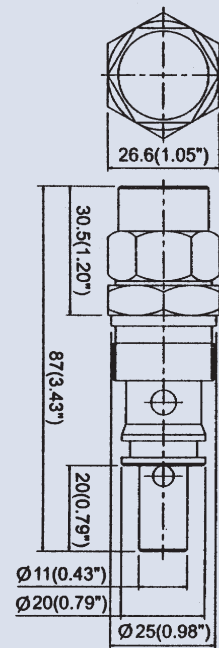
VNE-04



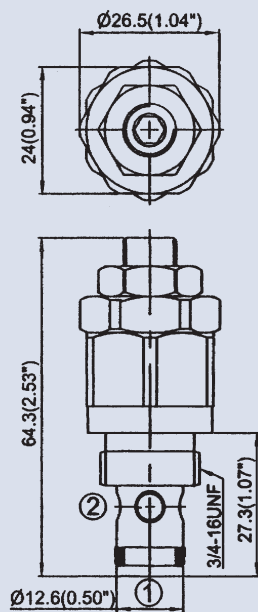
VNE-07



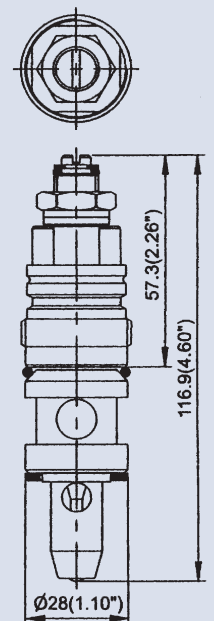
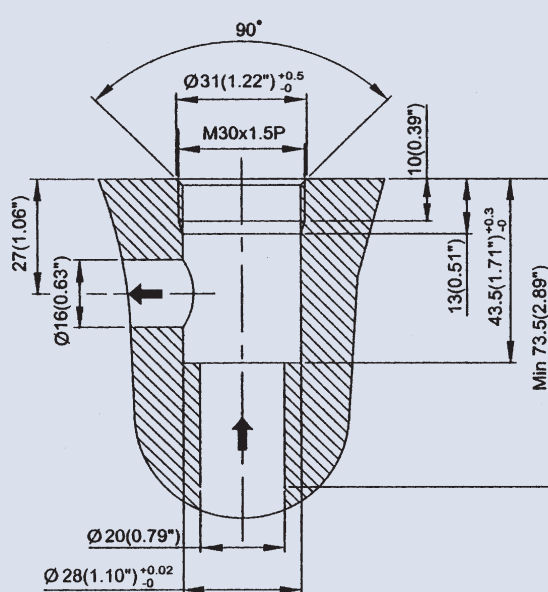
Unit: mm
(inch)



VNE-05

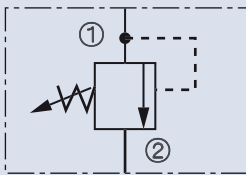


VNE-08

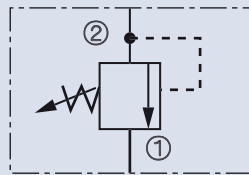


CARTRIDGE RELIEF VALVE

CONTROL PORTS



NO: 20, 26



NO: 22



How to order

VRV - 10 - 24 - * - 20

1 2 3 4 5

1 Model Direct type: VRV-01-*-*-20, VRV-03 (04)-*-*-20, VRV-08-*-*-20 (22), VRV-10-*-*-20 (22)

2	Mounting size	Model	Size	Cavity	See Page	Model	Size	Cavity	See Page
		VRV-01	08	CS08-2N	163	VRV-10	10	CS10-2N	163
VRV-03	E019	CSE019-2N	165	VRV-12	12	CS12-2N	163		
VRV-04	E019	CSE019-2N	165	VRV-16	16	CS16-2N	163		
VRV-08	08	CS08-2N	163						

3 Pressure adjusting range

4 Adjustment option None: Tool adjustment K: Hand-bar adjustment

5 Control port 20, 22, 26

Specifications

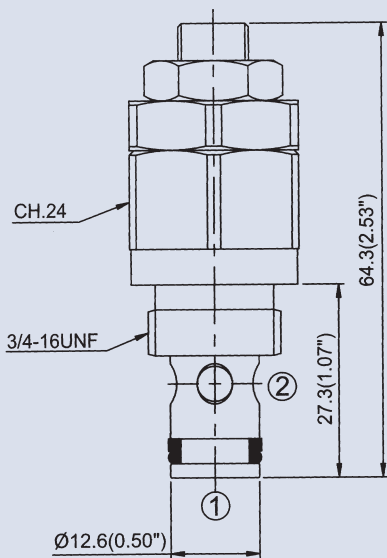
Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VRV-01-*-*-20	250	10: *~100 20: *~250	2	0.15
VRV-03-*-*-20	315	28: 30~280 38: 38~380	60	0.18
VRV-04-*-*-20	420	30: 150~300 40: 300~420	15	0.18
VRV-08-*-*-20	320	06: 4~60 12: 7~120	20	0.23
VRV-08-*-*-22		24: 7~220 31: 27~315	30	0.22
VRV-10-*-*-20	340	08: 10~80 15: 17~150	35	0.23
VRV-10-*-*-22		24: 20~220 34: 34~340	70	0.23
VRV-10-*-*-26		02: *~25 10: 10~100	110	0.25
VRV-12-*-*-26		24: 20~240 34: 20~340	180	0.34
VRV-16-*-*-26			265	0.73

CARTRIDGE RELIEF VALVE

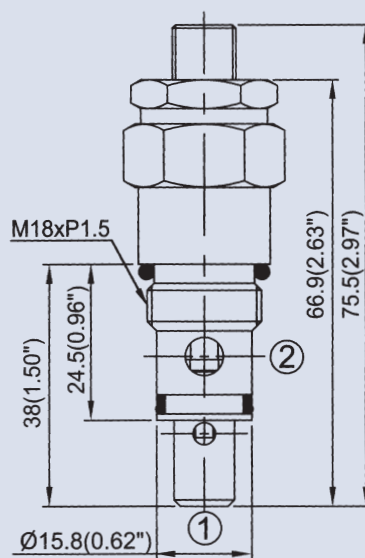
Dimensions

E

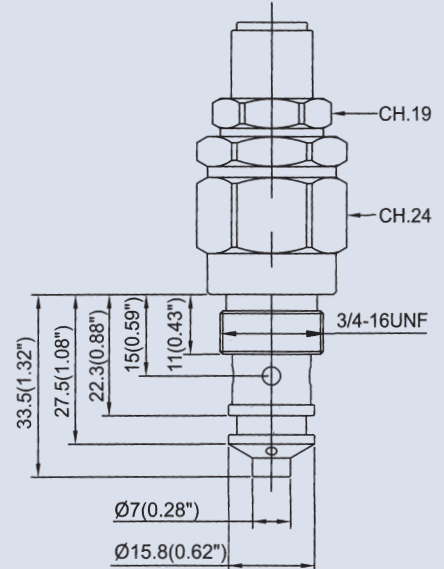
VRV-01



VRV-03

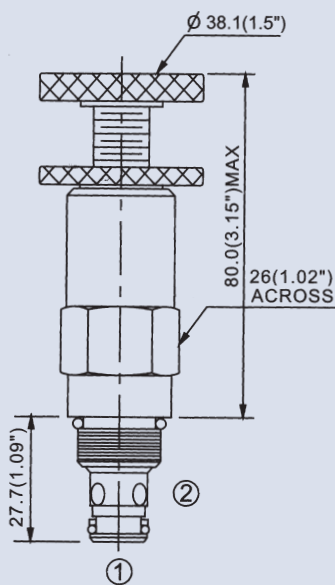


VRV-04

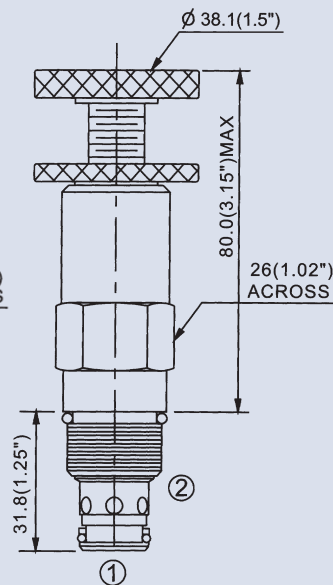


Unit: mm
(inch)

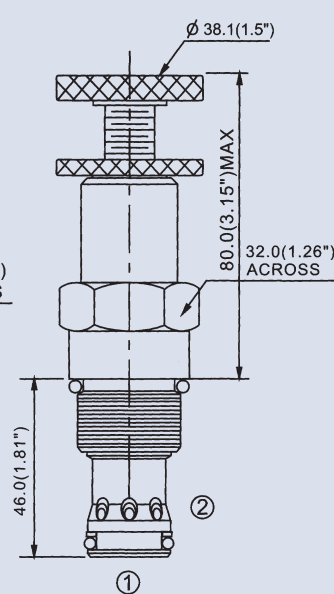
VRV-08



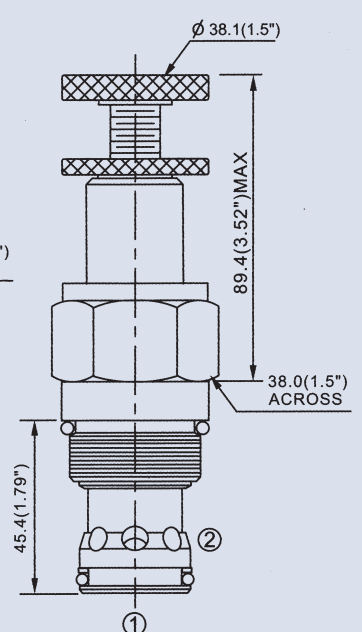
VRV-10



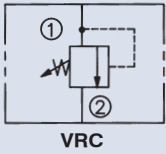
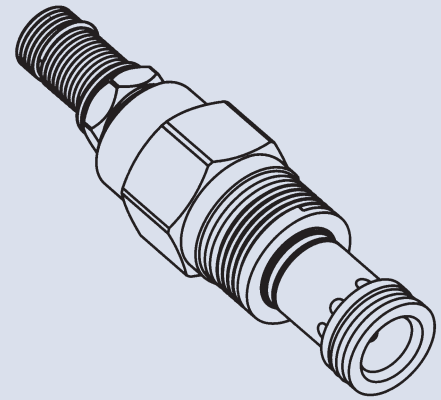
VRV-12



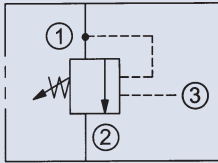
VRV-16



CARTRIDGE RELIEF VALVE



VRC



VRA

How to order

VRC
VRA - 02 - 20 - *

1 2 3 4

1 Model VRA: Remote control included

2	Mounting size	Model	Size	Cavity	See Page	Model	Size	Cavity	See Page
		VRC-02	T-10A	CST-10A	166	VRA-02	T-11A	CST-11A	167
VRC-03	T-3A	CST-3A	166	VRA-03	T-2A	CST-2A	166		
VRC-06	T-16A	CST-16A	167	VRA-06	T-17A	CST-17A	167		
VRC-10	T-18A	CST-18A	167	VRA-10	T-19A	CST-19A	167		

3 Pressure adjusting range

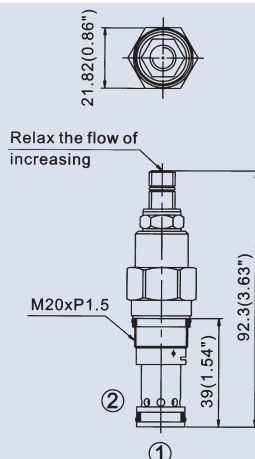
4 Adjustment option None: Tool adjustment K: Hand-bar adjustment

Specifications

Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VRC-02	420	06: * ~60 10: * ~100 20: 8~210 40: 12~420	100	0.15
VRC-03			200	0.27
VRC-06			380	0.55
VRC-10			760	0.9
VRA-02			60	0.18
VRA-03			120	0.3
VRA-06			240	0.7
VRA-10			480	1.1

Dimensions

VRC-02



VRC-03



Unit: mm
(inch)

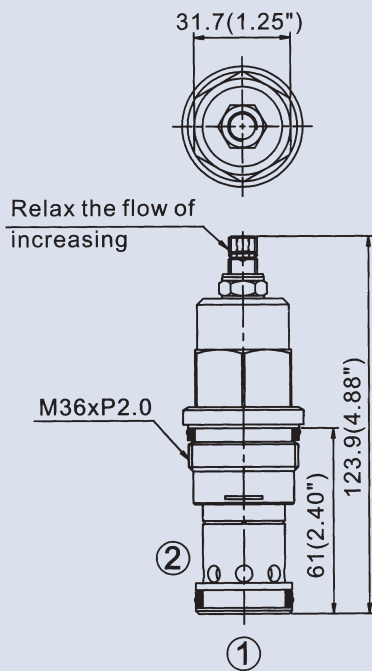
CARTRIDGE RELIEF VALVE

Dimensions

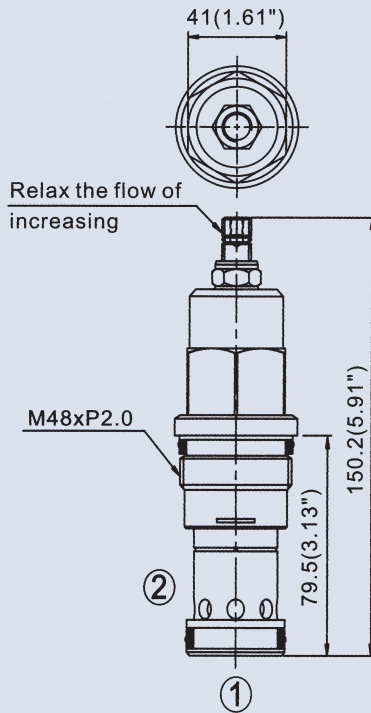


Unit: mm
(inch)

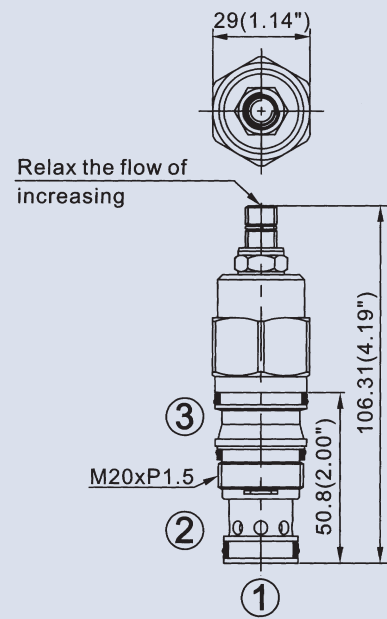
VRC-06



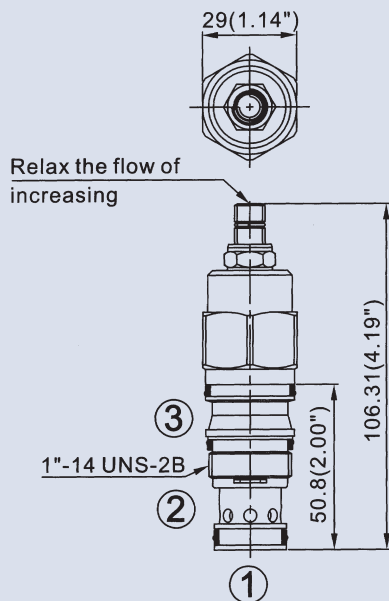
VRC-10



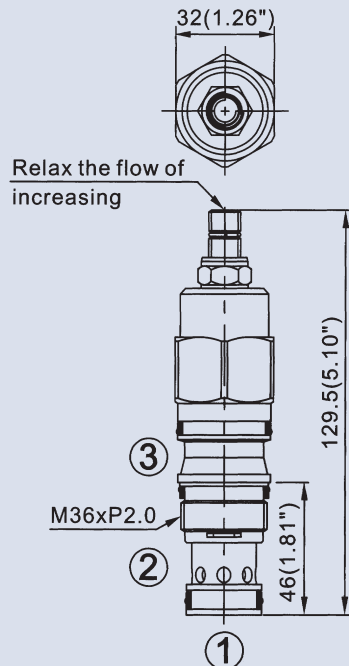
VRA-02



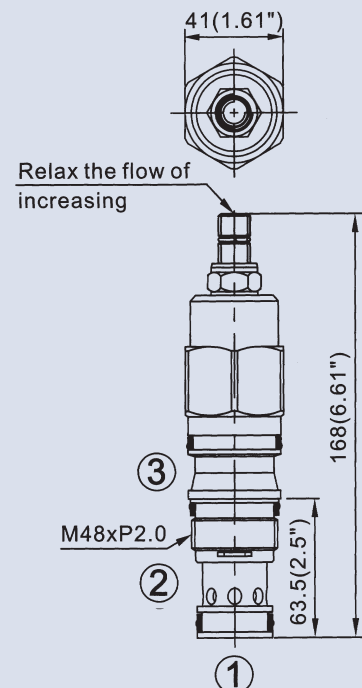
VRA-03



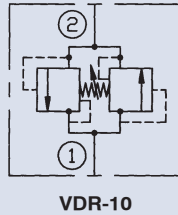
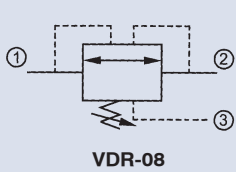
VRA-06



VRA-10



CARTRIDGE BRAKE VALVE



How to order

VRD - 08 - 09 - ✖

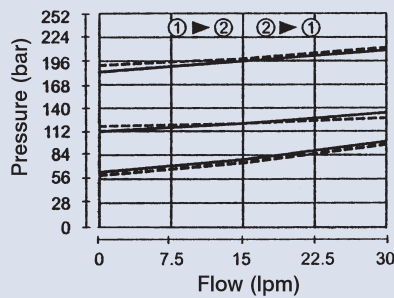
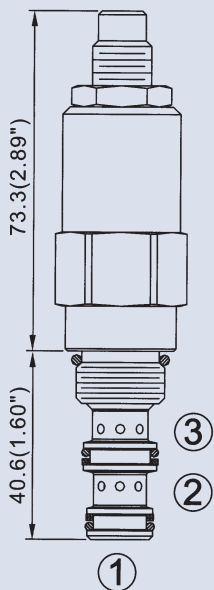
1	2	3	4
1	Model		
2	Mounting size 08: Size 08 Cavity: CS08-3N (see page 163) 10: Size 10 Cavity: CS10-2N (see page 163)		
3	Pressure adjusting range		
4	Adjustment option None: Tool adjustment K: Hand-bar adjustment		

Specifications

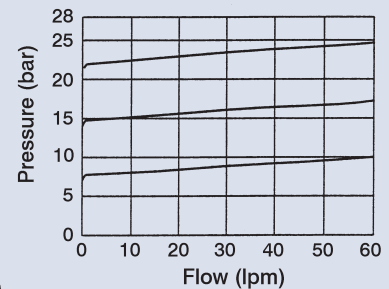
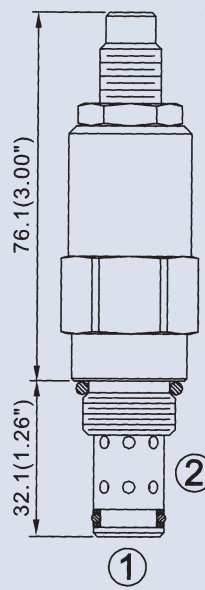
Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VRD-08	240	02: 4~20 04: 7~40 09: 11~89 16: 21~165	18	0.3
VRD-10	340	16: 14~168 20: 160~210	60	0.27

Dimensions/Performance curves

VRD-08



VRD-10

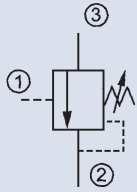


Test Conditions

Oil Temperature: 50 °C (122 °F)
Viscosity: 35 cSt (163 SSU)

Unit: mm (inch)

CARTRIDGE UNLOADING VALVE



How to order

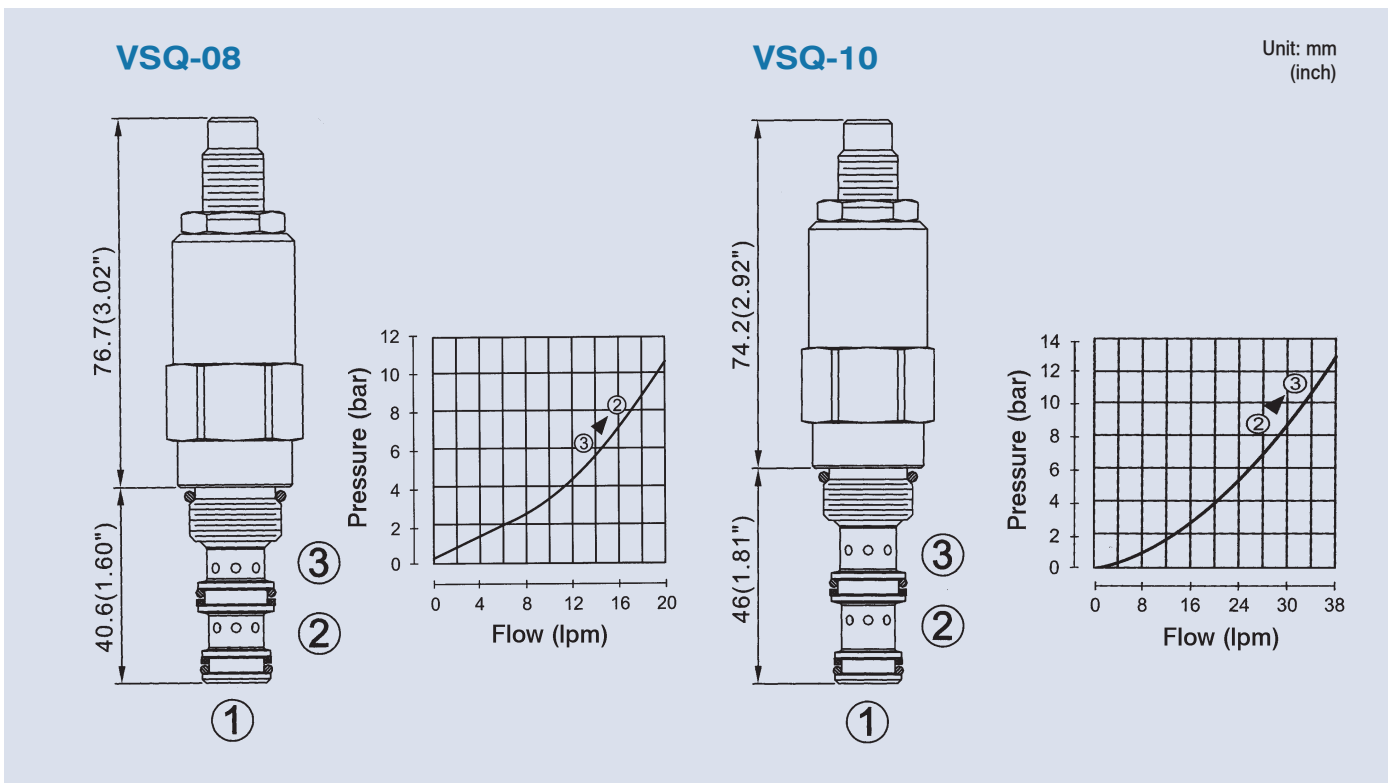
VSQ - 08 - 16 - ✖

1	2	3	4
1	Model		
2	Mounting size 08: Size 08 Cavity: CS08-3N (see page 163) 10: Size 10 Cavity: CS10-3N (see page 163)		
3	Pressure adjusting range		
4	Adjustment option None: Tool adjustment K: Hand-Bar adjustment		

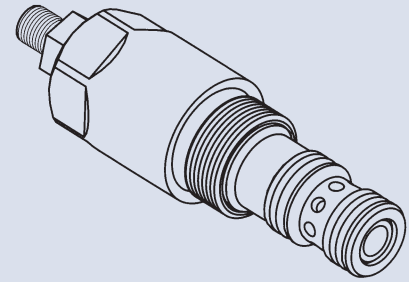
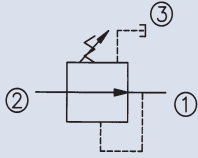
Specifications

Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VSQ-08	350	02: 4~20 04: 7~40 09: 11~89 16: 21~165	18	0.3
VSQ-10		02: 6~27 04: 14~55 10: 21~103 14: 28~145	38	0.3

Dimensions / Performance curves



CARTRIDGE PRESSURE REDUCING VALVE



How to order

VBP
VBR - 10 - ✖ - ✖

1 2 3 4

1 Model

2 Mounting size

Model	Size	Cavity	See Page
VBP-10	10	CS10-3N	163
VBP-12	12	CS12-3N	164

Model	Size	Cavity	See Page
VBR-02	T-11A	CST-11A	167
VBR-03	T-2A	CST-2A	166
VBR-06	T-17A	CST-17A	167
VBR-10	T-19A	CST-19A	167

3 Pressure adjusting range

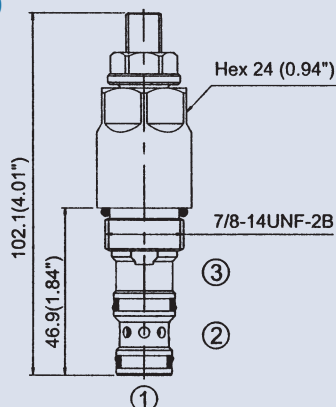
4 Adjustment option None: Tool adjustment K: Hand-bar adjustment

Specifications

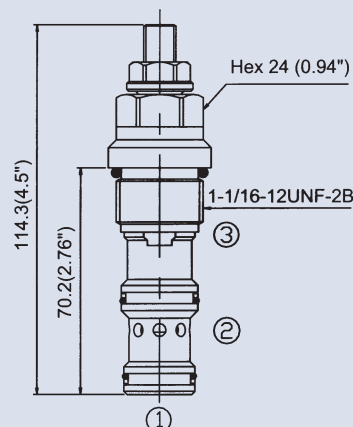
Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VBP-10	350	07: 6~70 14: 10~140	60	0.22
VBP-12		28: 70~280 35: 140~350	120	0.29
VBR-02		02: 4~20 04: 4~60 09: 4~100 20: 7~210	40	0.2
VBR-03			80	0.33
VBR-06			160	0.6
VBR-10			320	1.3

Dimensions

VBP-10



VBP-12

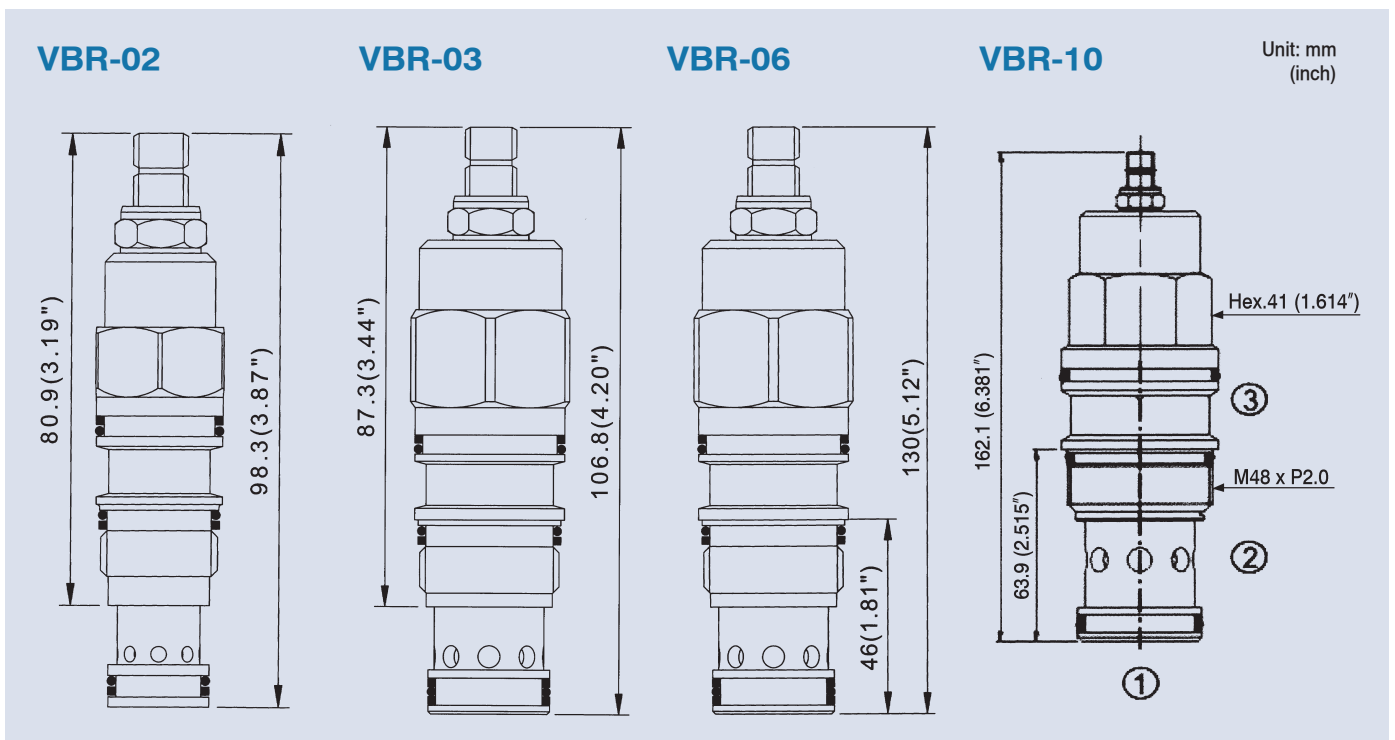


Unit: mm
(inch)

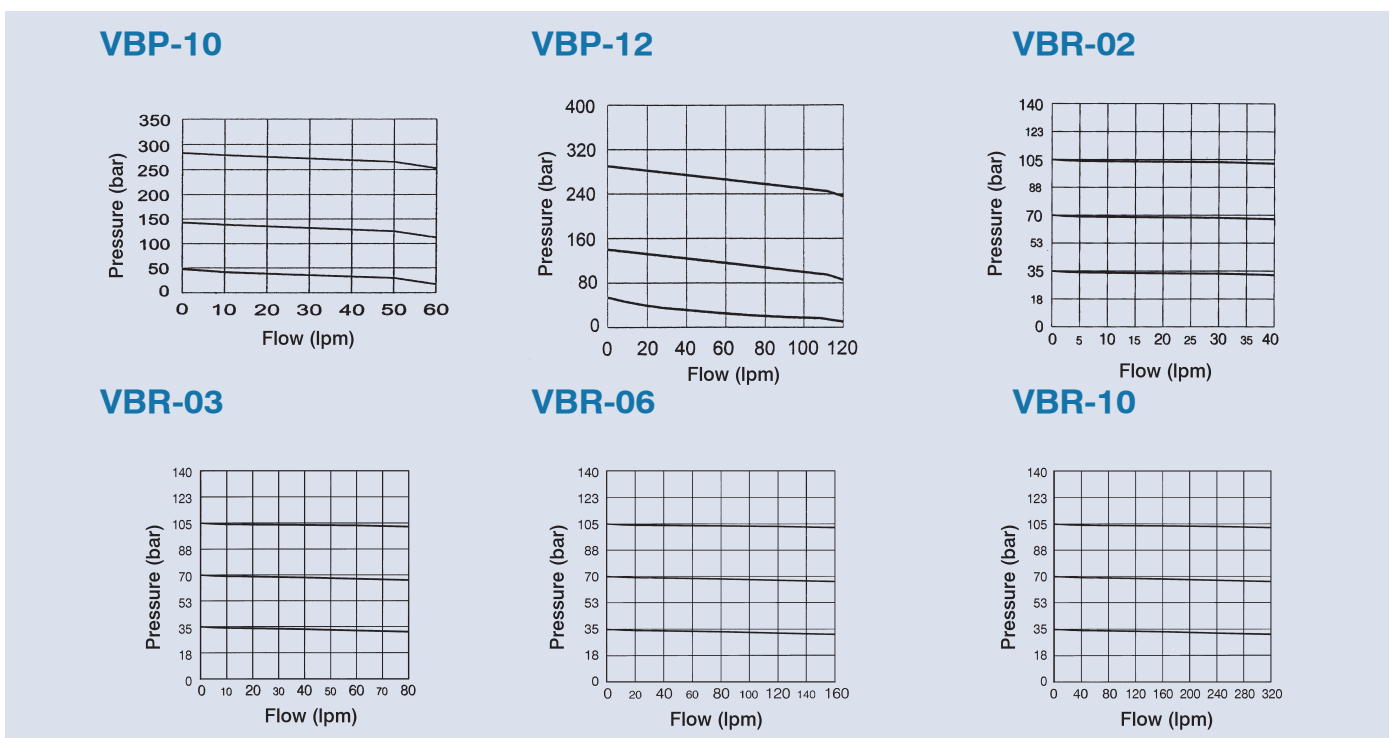
CARTRIDGE PRESSURE REDUCING VALVE

Dimensions

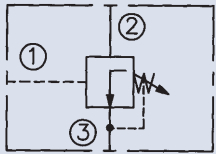
E



Performance curves



CARTRIDGE SEQUENCE VALVE



How to order

VS - 08 - 16 - ✖

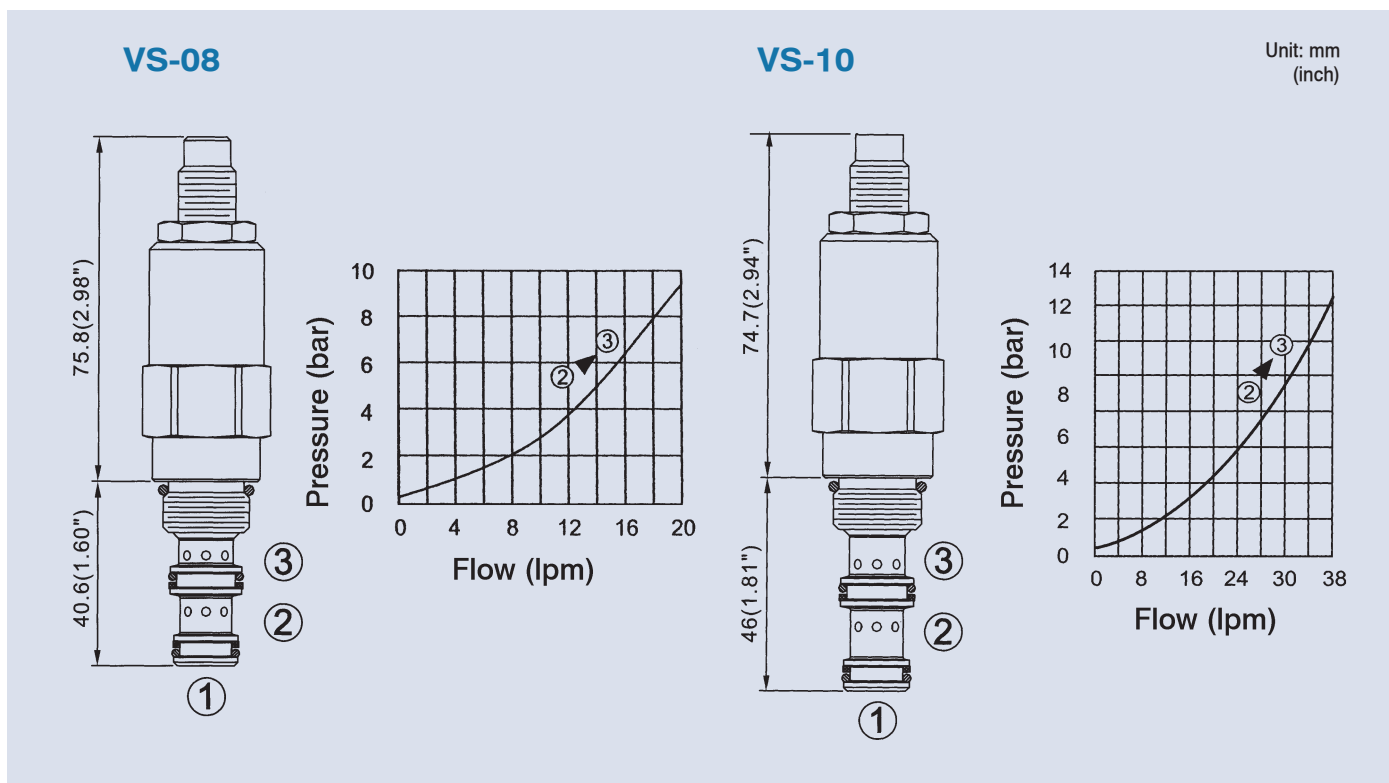
1 2 3 4

- 1 Model
- 2 Mounting size 08: Size 08 Cavity: CS08-3N (see page 163) 10: Size 10 Cavity: CS10-3N (see page 163)
- 3 Pressure adjusting range
- 4 Adjustment option None: Tool adjustment K: Hand-bar adjustment

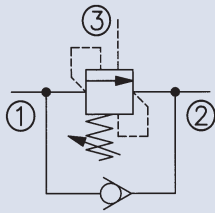
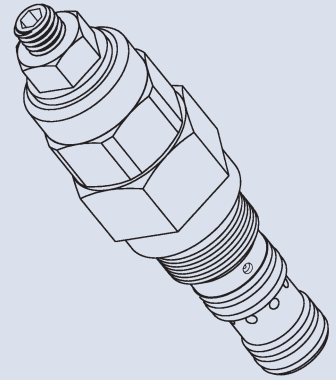
Specifications

Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VS-08	240	02: 4~20 04: 7~40	18	0.3
VS-10		09: 11~89 16: 21~165	37	0.35

Dimensions/Performance curves



CARTRIDGE COUNTERBALANCE VALVE



How to order

VCQ - 08 - 20 - ✖ - 4A

1 2 3 4 5

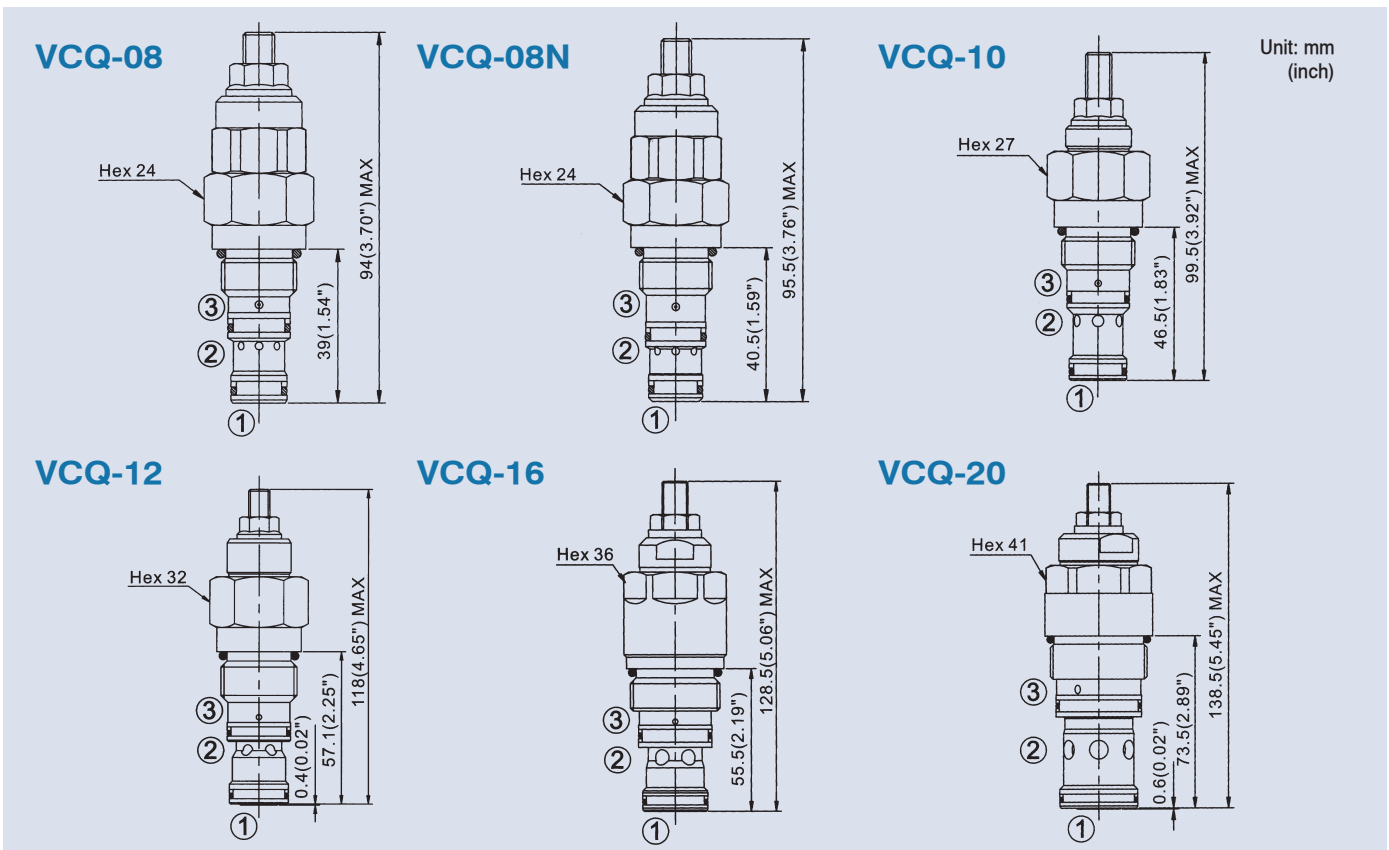
1	Model								
2	Mounting size	Model	Size	Cavity	See Page	Model	Size	Cavity	See Page
		VCQ-08	08	CS08-3S	164	VCQ-12	12	CS12-3S	165
		VCQ-08N	08	CS08-3N	163	VCQ-16	16	CS16-3S	165
		VCQ-10	10	CS10-3S	165	VCQ-20	20	CS20-3S	165
3	Pressure adjusting range	Model	Pilot Ratio	Code	Pressure Adjusting Range (bar)	Model	Pilot Ratio	Code	Pressure Adjusting Range (bar)
		VCQ-08	4: 1	20	100~210	VCQ-12	4: 1 8: 1	20	70~210
		VCQ-08N		35	200~350			35	140~350
		VCQ-10	3: 1 8: 1	20	70~210	VCQ-16	4: 1 8: 1	20	70~210
				35	140~350			35	140~350
						VCQ-20	8: 1	40	140~420
4	Adjustment option	None: Tool adjustment K: Hand-bar adjustment							
5	Pilot ratio	3A: 3:1 4A: 4:1 8A: 8:1							

Specifications

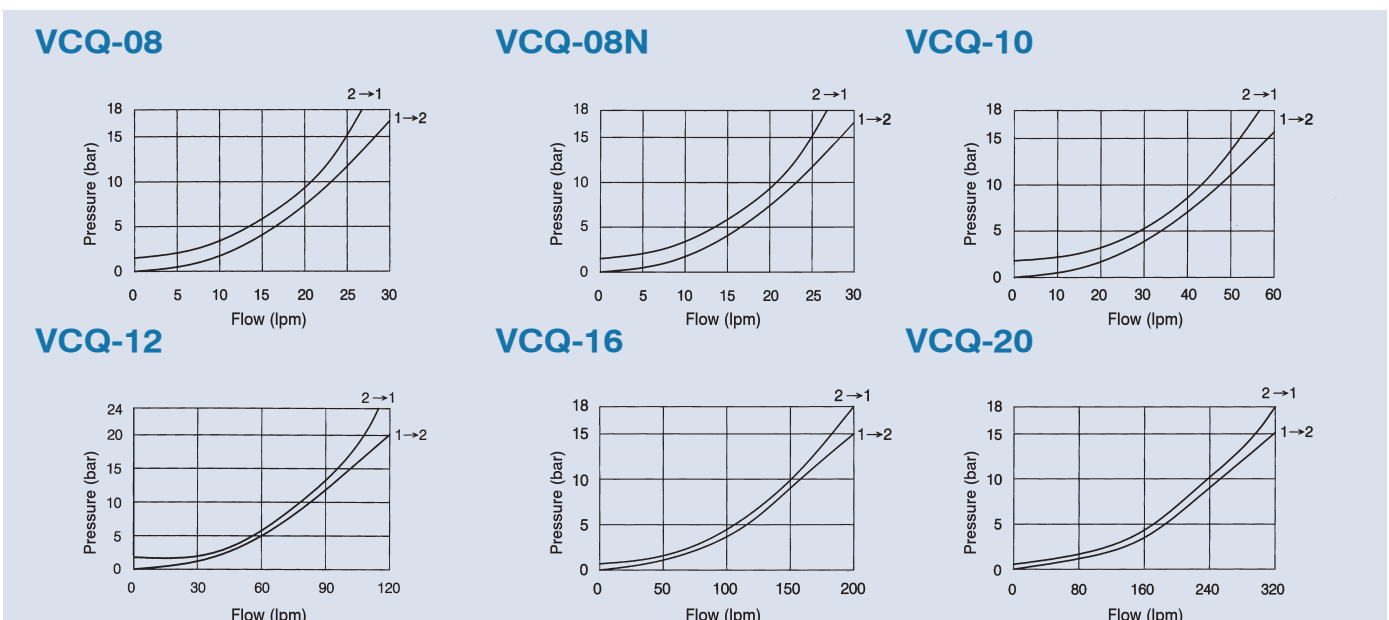
Model	Max. Pressure (bar)	Pressure Adj. Range (bar)	Pilot Ratio	Max. Flow (lpm)	Weight (kg)
VCQ-08	350	20: 100~210 35: 200~350	4: 1	30	0.19
VCQ-08N					
VCQ-10		420	20: 70~210 35: 140~350	3: 1 8: 1	60
VCQ-12	4: 1 8: 1			120	0.38
VCQ-16	420		20: 70~210 35: 140~350 40: 140~420	4: 1 8: 1	200
VCQ-20		320			0.87

CARTRIDGE COUNTERBALANCE VALVE

Dimensions

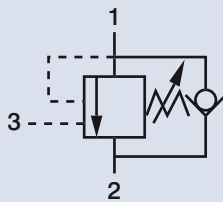


Performance curves



CARTRIDGE COUNTERBALANCE VALVE

CONTROL PORT



How to order

VCB - 02 - 28 - 3A

1 2 3 4

1 Model VCB: Overcentre valve pilot assisted relief with check

2	Mounting size	Model	Size	Cavity	See Page
		VCB-02	T-11A	CST-11A	167
		VCB-03	T-2A	CST-2A	166
		VCB-06	T-17A	CST-17A	167
		VCB-10	T-19A	CST-19A	167

3 Pressure adjusting range

Check Spring Pressure 1.8 bar		
Pilot Ratio	Code	Pressure Adjusting Range (bar)
3: 1	10	30~105
	28	70~280
4.5: 1	17	70~175
10: 1	35	140~350

Check Spring Pressure 0.3 bar		
Pilot Ratio	Code	Pressure Adjusting Range (bar)
3: 1	25	25~105
	70	70~280
4.5: 1	80	70~175
10: 1	14	140~350

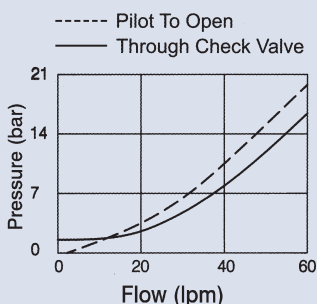
4 Pilot ratio 3A: 3:1 4A: 4.5:1 10A: 10:1

Specifications

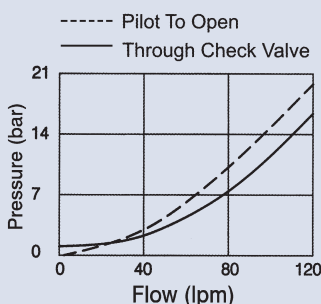
Model	Max. Pressure (bar)	Pressure Adj. Range (bar)	Pilot Ratio	Max. Flow (lpm)	Weight (kg)
VCB-02	350	10: 30~105 14: 140~350	3: 1	60	0.2
VCB-03		17: 70~175 25: 25~105		120	0.3
VCB-06		28: 70~280 35: 140~350	4.5: 1	240	0.61
VCB-10		70: 70~280 80: 70~175	10: 1	480	1.6

Performance curves

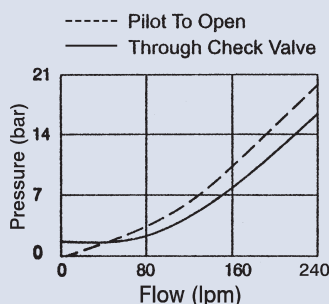
VCB-02



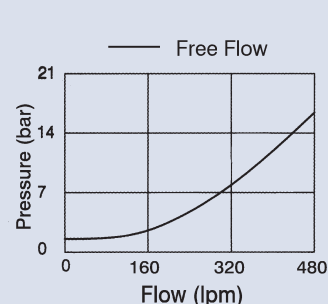
VCB-03



VCB-06



VCB-10

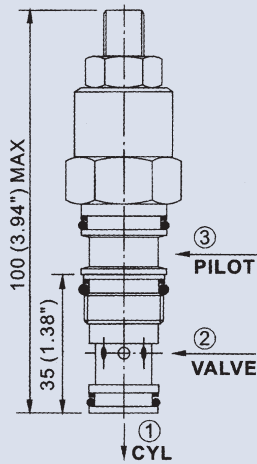


CARTRIDGE COUNTERBALANCE VALVE

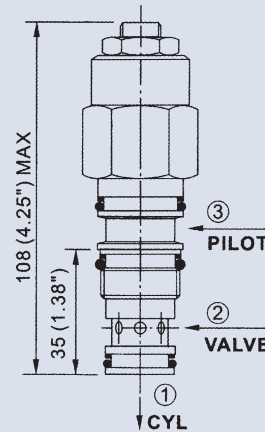
Dimensions

Unit: mm
(inch)

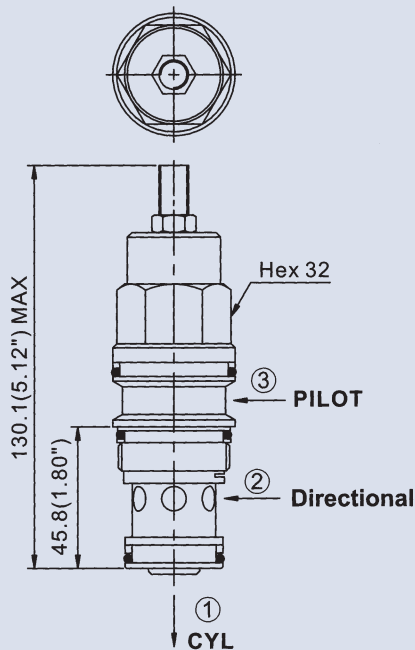
VCB-02



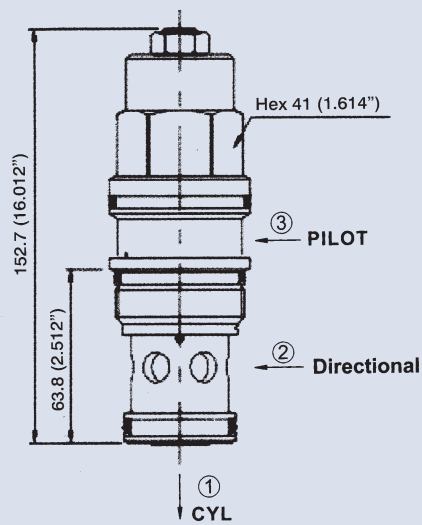
VCB-03



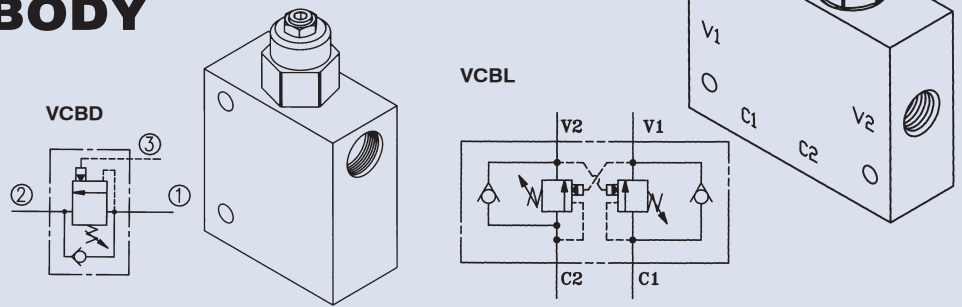
VCB-06



VCB-10



CARTRIDGE COUNTERBALANCE VALVE WITH BODY



How to order

VCBD VCBL - 02 - 28 - A - 1P - 3A - AL

1	2	3	4	5	6	7	
1	Model	VCBD: Single valve	VCBL: Double valve				
2	Valve size	(see model VCB)					
3	Pressure adjusting range	Check Spring Pressure 1.8 bar		Check Spring Pressure 0.3 bar			
		Pilot Ratio	Code	Pressure Adjusting Range (bar)	Pilot Ratio	Code	
		3: 1	10	30~105	3: 1	25	
			28	70~280		70	
		4.5: 1	17	70~175	4.5: 1	80	
		10: 1	35	140~350	10: 1	14	
4	Port size	VCBD-02 A: 1/4, B: 3/8	VCBD-03 A: 3/8, B: 1/2	VCBD-06 A: 3/4, B: 1	VCBL-02 A: 3/8, B: 1/2	VCBL-03 A: 3/4, B: 1/2	VCBL-06 A: 1, B: 3/4
5	Port thread	1P: PT	2N: NPT	3G: PF (G)	4A: SAE		
6	Pilot ratio	3A: 3:1	4A: 4.5:1	10A: 10:1			
7	Body material	AL: Aluminum (normal) S: Steel					

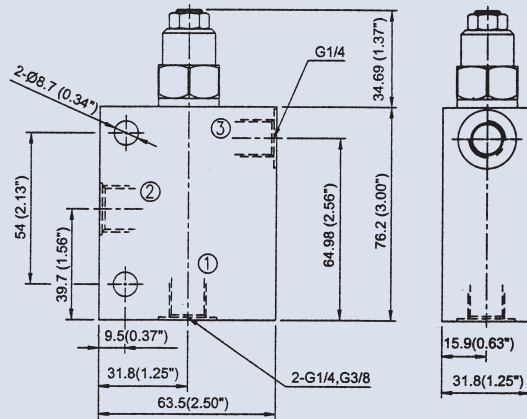
Specifications

Model	Max. Pressure (bar)		Adjusting Pressure Range (bar)	Pilot Ratio	Max. Flow (lpm)	Weight (kg)								
	Aluminum Body	Steel Body				Aluminum Body	Steel Body							
VCBD-02-**-AL (S)	240	350	10: 30~105 14: 140~350	3: 1	60	0.63	1.35							
VCBD-03-**-AL (S)														
VCBD-06-**-AL (S)														
VCBL-02-**-AL (S)								10: 1	60	1.09	2.2			
VCBL-03-**-AL (S)												120	1.61	3
VCBL-06-**-AL (S)														

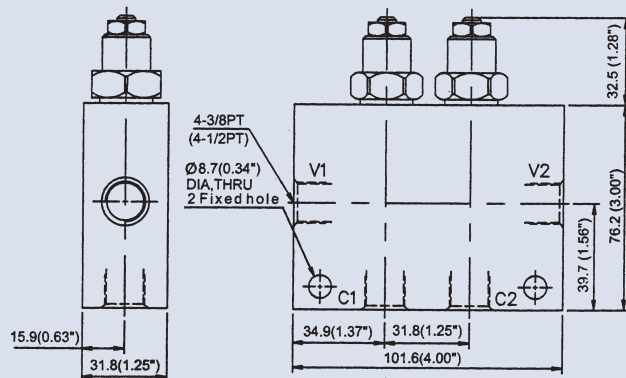
CARTRIDGE COUNTERBALANCE VALVE WITH BODY

Dimensions

VCBD-02

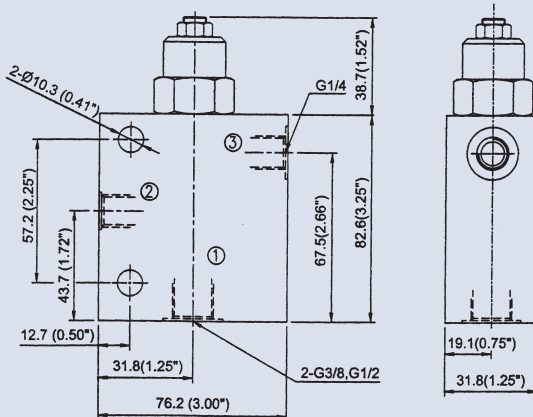


VCBL-02

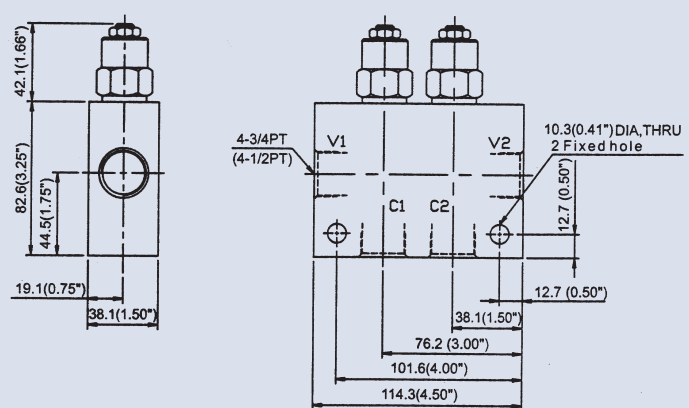


Unit: mm
(inch)

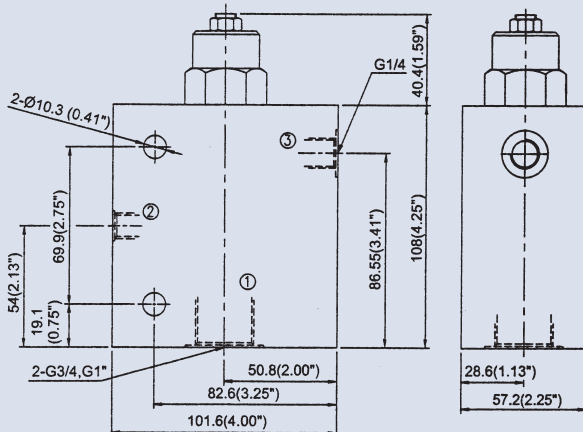
VCBD-03



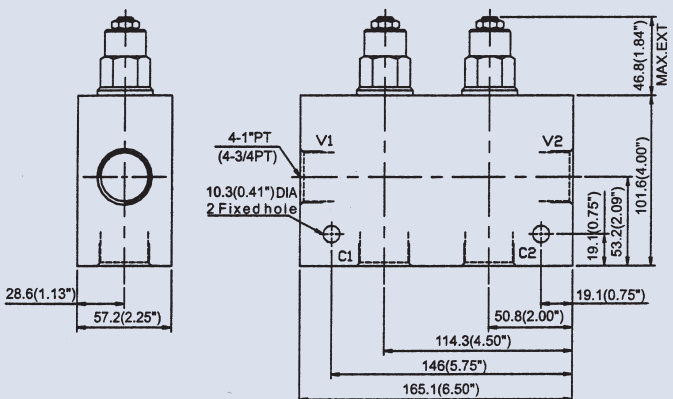
VCBL-03



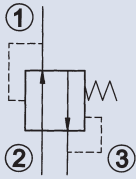
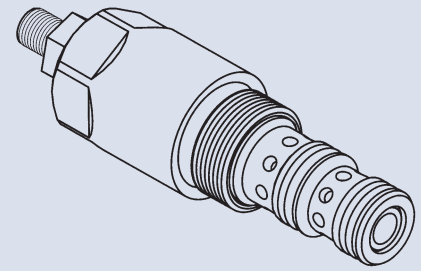
VCBD-06



VCBL-06



CARTRIDGE BALANCE VALVE



How to order

VGR - 10 - 28 - ✱

1	Model
2	Mounting size 10: Size 10 Cavity: CS10-3N (see page 163) 12: Size 12 Cavity: CS12-3N (see page 164)
3	Pressure adjusting range
4	Adjustment option None: Tool adjustment K: Hand-bar adjustment

Specifications

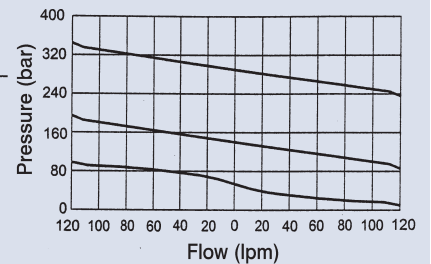
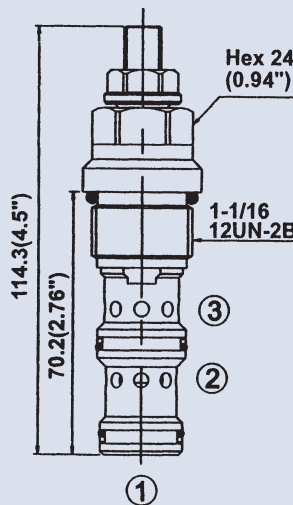
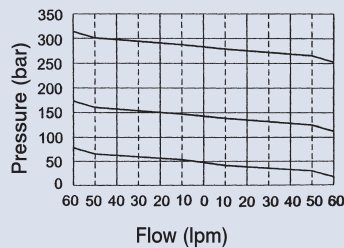
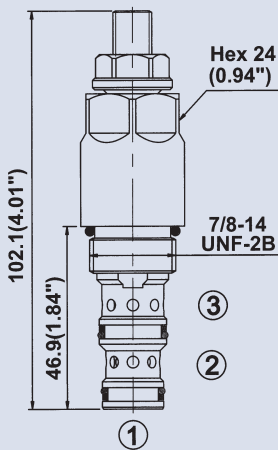
Model	Max. Pressure (bar)	Pressure Adjusting Range (bar)	Max. Flow (lpm)	Weight (kg)
VGR-10	350	07: 6~70 14: 10~140	60	0.22
VGR-12		28: 70~280 35: 140~350	120	0.29

Dimensions / Performance curves

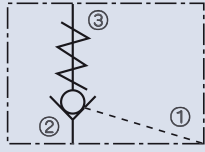
VGR-10

VGR-12

Unit: mm (inch)



CARTRIDGE CHECK, PILOT TO OPEN



How to order

VPN - 08 - 30

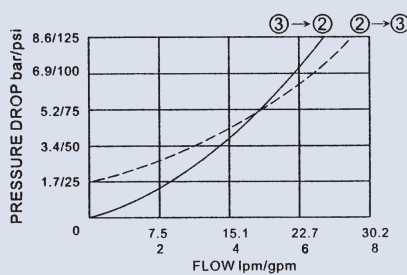
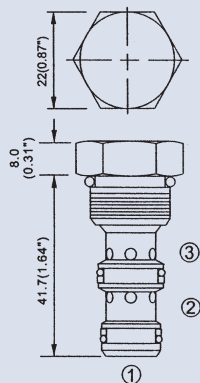
1	2	3
1	Model	
2	Mounting size 08: Size 08 Cavity CS08-3N (see page 163) 10: Size 10 Cavity CS10-3N (see page 163)	
3	Design no	

Specifications

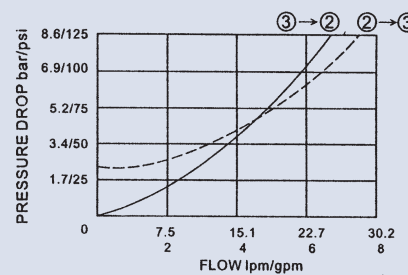
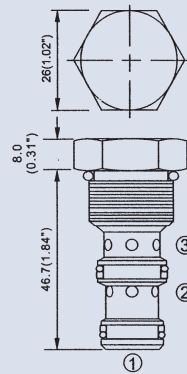
Model	Max. Pressure (bar)	Flow (lpm)	Weight (kg)
VPN-08	250	23	0.1
VPN-10		25	0.1

Dimensions / Performance curves

VPN-08

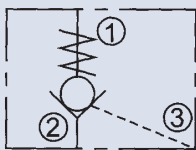


VPN-10



Unit: mm (inch)

CARTRIDGE CHECK, PILOT TO OPEN



E

How to order

VCK - 03

1 2

1 Model

2 Mounting size

Model	Size	Cavity	See Page
VCK-02	T-11A	CST-11A	167
VCK-03	T-2A	CST-2A	166

Model	Size	Cavity	See Page
VCK-06	T-17A	CST-17A	167
VCK-10	T-19A	CST-19A	167

Specifications

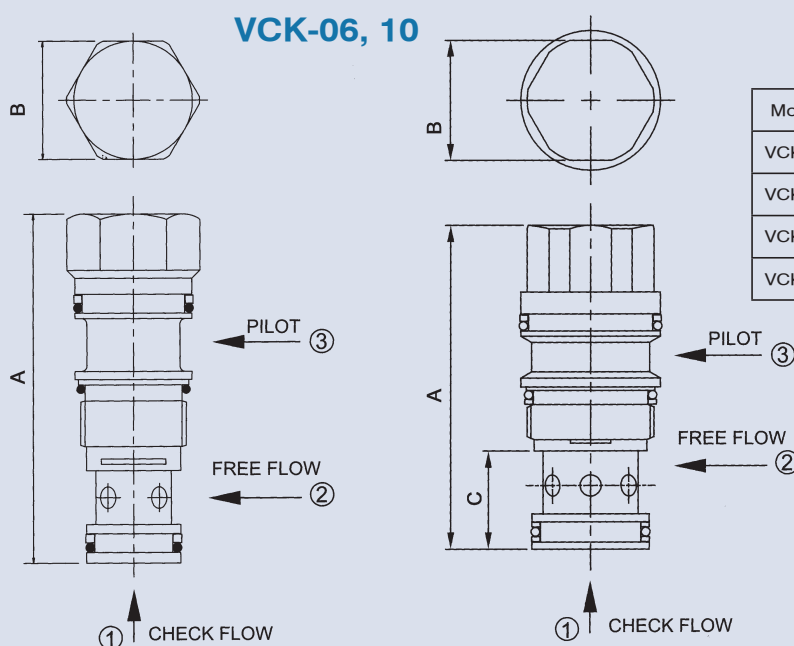
Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VCK-02	315	60	0.13
VCK-03		120	0.23
VCK-06	350	200	0.53
VCK-10		460	1.18

Dimensions

VCK-02, 03

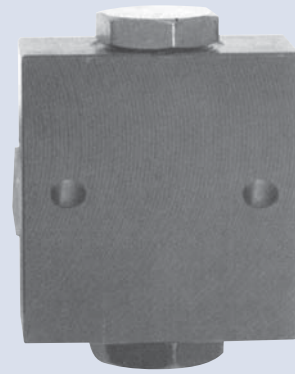
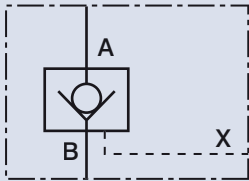
VCK-06, 10

Unit: mm (inch)



Model	A	B	C
VCK-02	65 (2.56")	22 (0.87")	-
VCK-03	70 (2.76")	29 (1.14")	-
VCK-06	91.8 (3.61")	34 (1.34")	27.8 (1.09")
VCK-10	121.7 (4.79")	42 (1.65")	39.7 (1.56")

CARTRIDGE CHECK, PILOT TO OPEN WITH BODY



How to order

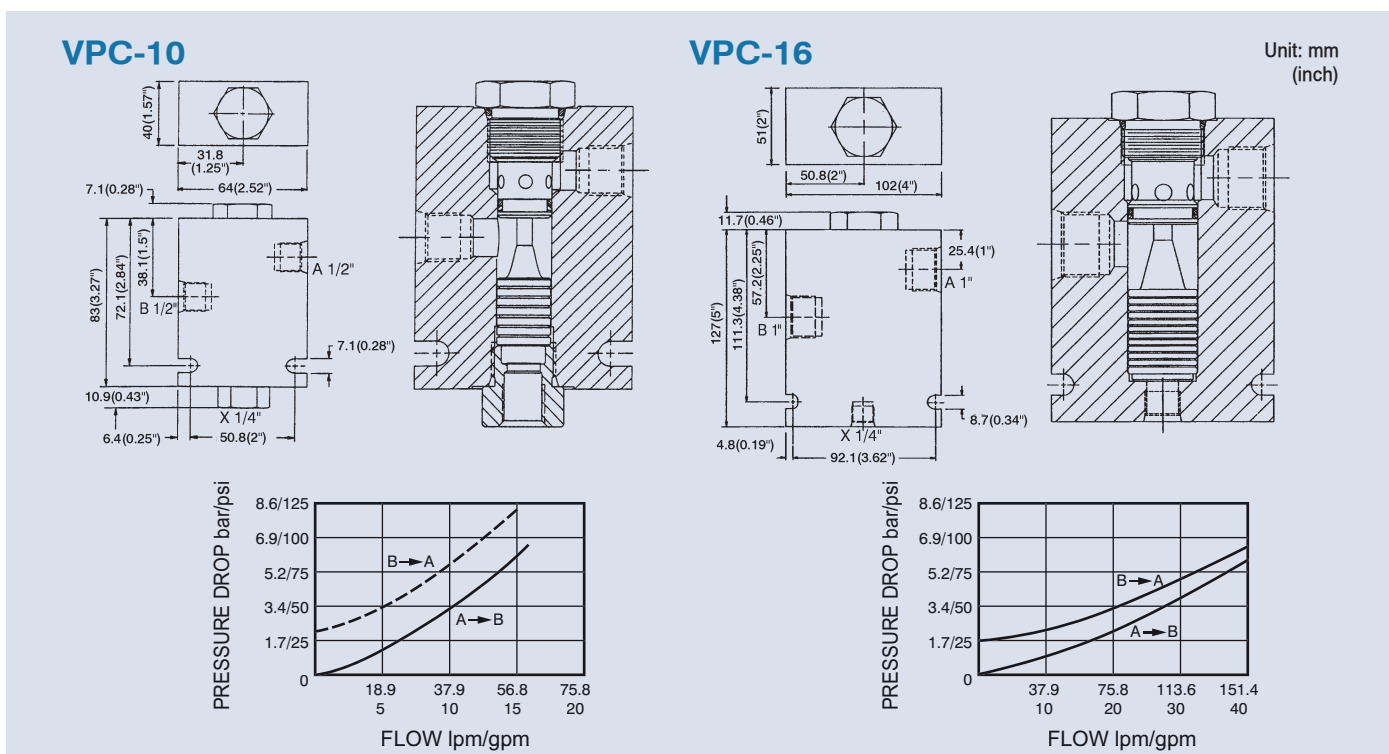
VPC - 10 - ✖ - 10

1	2	3	4
1	Model		
2	Port size 10: 1/2" 16: 1"		
3	Port thread 1: PT 2: NPT 3: SAE 4: BSP		
4	Design no		

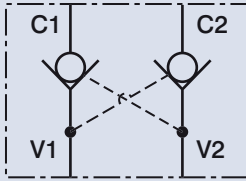
Specifications

Model	Max. Pressure (bar)	Flow (lpm)	Weight (kg)
VPC-10	350	70	2.2
VPC-16		150	5.8

Dimensions / Performance curves



CARTRIDGE DOUBLE PILOT OPERATED CHECK VALVE WITH BODY



How to order

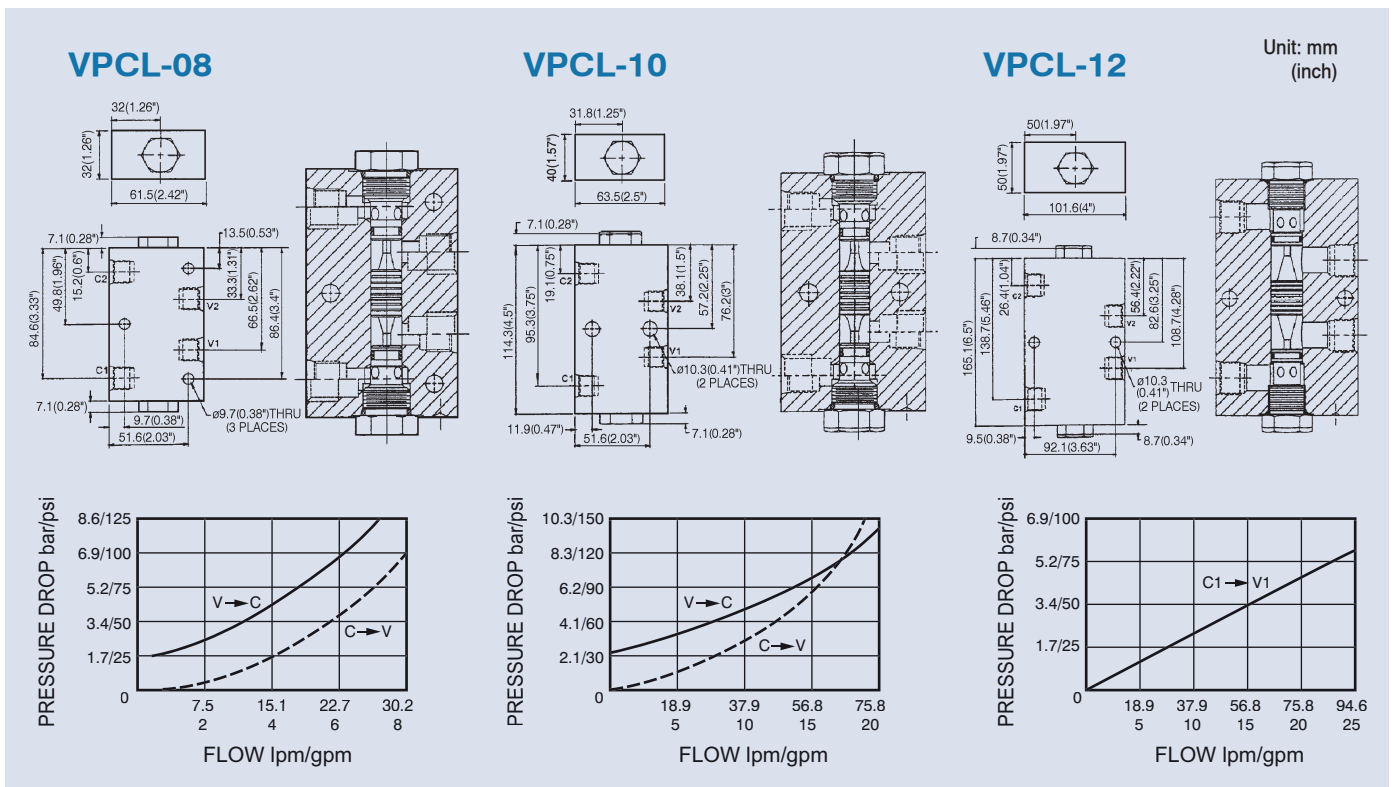
VPCL - 08 - ✖

- | | |
|---|--|
| 1 | Model |
| 2 | Port size 08: 3/8" 10: 1/2" 12: 3/4" |
| 3 | Port thread 1: PT 2: NPT 3: SAE 4: BSP |

Specifications

Model	Max. Pressure (bar)	Flow (lpm)	Weight (kg)
VPCL-08	350	30	2.5
VPCL-10		75	3.0
VPCL-12		95	7.5

Dimensions / Performance curves



CARTRIDGE CHECK VALVE



How to order

VCV - 08 - 05 - 10

1 2 3 4

1 Model

2 Mounting size

Model	Size	Cavity	See Page
VCV-08	08	CS08-2N	163
VCV-10	10	CS10-2N	163
VCV-12	12	CS12-2N	163
VCV-16	16	CS16-2N	163
VCV-42	42	CS42-2N	163

3 Cracking pressure

Model	Cracking Pressure	Model	Cracking Pressure
VCV-08-**-10	0.5: 0.5 bar 50: 4 bar	VCV-08-**-21	20: 2 bar
VCV-10-**-10	0.5: 0.3 bar 50: 4 bar	VCV-10-**-21	0.5: 0.3 bar 20: 1.7 bar 50: 3.9 bar
VCV-12-**-10	0.5: 0.5 bar 50: 4 bar	VCV-12-**-21	0.5: 0.5 bar 20: 1.8 bar 50: 3.8 bar
VCV-16-**-10	0.5: 0.35 bar 50: 4 bar		
VCV-42-**-10	0.5: 0.35 bar 50: 4 bar		

4 Control port

10:



21:



Specifications

Model	Max. Pressure (bar)	Flow (lpm)	Weight (kg)
VCV-08-**-10	350	30	0.06
VCV-10-**-10		75	0.08
VCV-12-**-10		94	0.18
VCV-16-**-10		150	0.26
VCV-42-**-10		380	0.43
VCV-08-**-21	250	30	0.06
VCV-10-**-21		50	0.1
VCV-12-**-21		100	0.2

Dimensions

Model	A	B	C
VCV-08-**-10	27.7 (1.09")	8 (0.31")	22 (0.87")
VCV-10-**-10	31.8 (1.25")	8 (0.31")	26 (1.02")
VCV-12-**-10	46 (1.81")	10 (0.39")	32 (1.26")
VCV-16-**-10	44.5 (1.75")	13 (0.51")	38 (1.5")
VCV-42-**-10	55.6 (2.19")	20.3 (0.83")	48 (1.89")
VCV-08-**-21	27.7 (1.09")	8 (0.31")	22.4 (0.88")

Unit: mm
(inch)

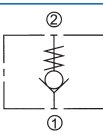
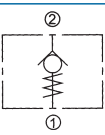
Model	A	B	C	D
VCV-10-**-21	34.5 (1.36")	8 (0.31")	26 (1.02")	2.3 (0.9)
VCV-12-**-21	48 (1.89")	10 (0.39")	32 (1.26")	4 (0.16")

CARTRIDGE CHECK VALVE



How to order

VCX VCXE - 02 - 05

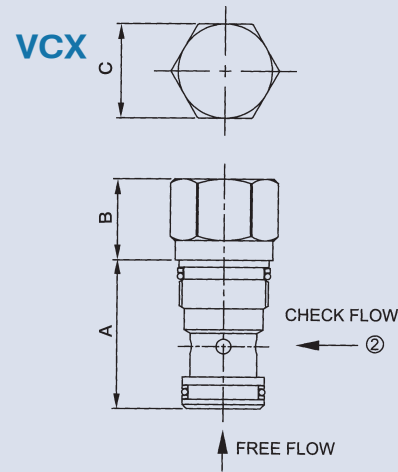
	1	2	3						
1	Model	VCX		VCXE					
2	Mounting size	Model	Size	Cavity	See Page	Model	Size	Cavity	See Page
		VCX (VCXE)-02	T-13A	CST-13A	167	VCX (VCXE)-06	T-16A	CST-16A	167
		VCX (VCXE)-03	T-5A	CST-5A	166	VCX (VCXE)-10	T-18A	CST-18A	167
3	Cracking pressure	0.5: 0.35 bar	50: 5 bar						

Specifications

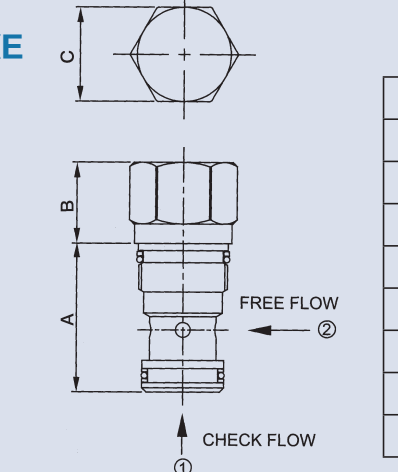
Model	Max. Pressure (bar)	Flow (lpm)	Weight (kg)
VCX-02	350	80	0.15
VCX-03		140	0.19
VCX-06		320	0.63
VCX-10		640	1.3
VCXE-02		60	0.15
VCXE-03		100	0.19
VCXE-06		210	0.63
VCXE-10		420	1.3

Dimensions

VCX



VCXE



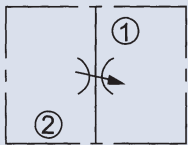
Unit: mm
(inch)

Model	A	B	C
VCX-02	34.9 (1.37")	19.1 (0.75")	22.2 (0.87")
VCX-03	41.3 (1.63")	17.5 (0.69")	28.6 (1.13")
VCX-06	61.9 (2.44")	24.6 (0.97")	31.8 (1.25")
VCX-10	79.5 (3.13")	30.2 (1.19")	41 (1.61")
VCXE-02	34.9 (1.37")	19.1 (0.75")	22.2 (0.87")
VCXE-03	41.3 (1.63")	17.5 (0.69")	28.6 (1.13")
VCXE-06	61.9 (2.44")	24.6 (0.97")	31.8 (1.25")
VCXE-10	79.5 (3.13")	30.2 (1.19")	41 (1.61")

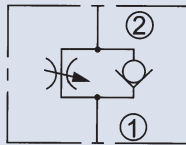
CARTRIDGE FLOW CONTROL VALVE



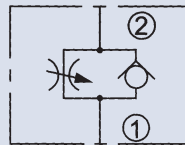
Control Port



VTV-**-*



VTC-**-*-20



VTC-**-*-22

How to order

VTV
VTC - 08 - * - *

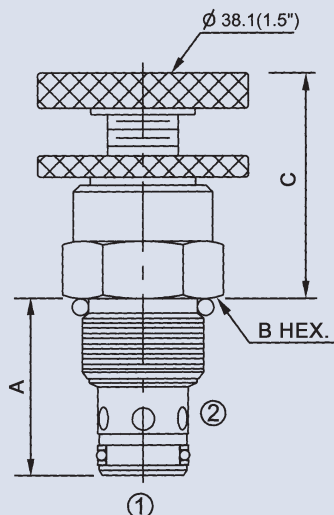
1 2 3 4

1	Model	VTV: Without check	VTC: With check		
2	Mounting size	Model	Size	Cavity	See Page
		VTV (VTC)-08	08	CS08-2N	163
		VTV (VTC)-10	10	CS10-2N	163
		VTV (VTC)-12	12	CS12-2N	163
3	Adjustment option	None: Tool adjustment	K: Hand-bar adjustment		
4	Control port	20, 22: For model VTC only			

Specifications

Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VTV-08	350	45	0.13
VTV-10		56	0.18
VTV-12		128	0.32
VTC-08-*-20	240	45	0.14
VTC-10-*-20		45	0.17
VTC-10-*-22		57	0.17
VTC-12-*-20		130	0.2

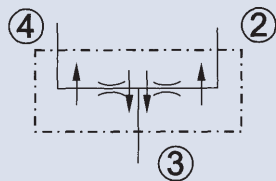
Dimensions



Unit: mm
(inch)

Model	A	B	C
VTV-08	27.7 (1.09")	22 (0.87")	40 (1.57")
VTV-10	31.8 (1.25")	25 (0.98")	40 (1.57")
VTV-12	46 (1.81")	32 (1.26")	49 (1.93")
VTC-08-*-20	27.7 (1.09")	22 (0.87")	40 (1.57")
VTC-10-*-20	31.8 (1.25")	26 (1.02")	40.1 (1.58")
VTC-10-*-22	34.5 (1.36")	26 (1.02")	40.1 (1.58")
VTC-12-*-20	46 (1.81")	32 (1.26")	47.9 (1.89")

CARTRIDGE FLOW DIVIDER



How to order

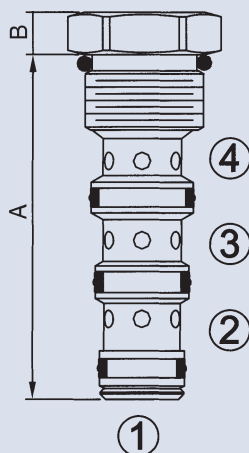
VFD - 10 - 45

1	2	3																									
1	Model																										
2	Mounting size	10: Size 10 Cavity: CS10-4N (see page 164) 12: Size 12 Cavity: CS12-4N (see page 164) 16: Size 16 Cavity: CS16-4N (see page 164)																									
3	Flow range	<table border="1"> <thead> <tr> <th>Model</th> <th colspan="5">Flow Range (lpm)</th> </tr> </thead> <tbody> <tr> <td>VFD-10-※</td> <td>07: 2.3~7.6</td> <td>15: 4.5~15</td> <td>22: 6.8~22.7</td> <td>30: 9~30</td> <td>37: 11~37</td> <td>45: 13.5~45</td> </tr> <tr> <td>VFD-12-※</td> <td>60: 30~60</td> <td>70: 43~74</td> <td>90: 53~90</td> <td colspan="2"></td> </tr> <tr> <td>VFD-16-※</td> <td>90: 90</td> <td>110: 110</td> <td>150: 150</td> <td>190: 194</td> <td colspan="1"></td> </tr> </tbody> </table>	Model	Flow Range (lpm)					VFD-10-※	07: 2.3~7.6	15: 4.5~15	22: 6.8~22.7	30: 9~30	37: 11~37	45: 13.5~45	VFD-12-※	60: 30~60	70: 43~74	90: 53~90			VFD-16-※	90: 90	110: 110	150: 150	190: 194	
Model	Flow Range (lpm)																										
VFD-10-※	07: 2.3~7.6	15: 4.5~15	22: 6.8~22.7	30: 9~30	37: 11~37	45: 13.5~45																					
VFD-12-※	60: 30~60	70: 43~74	90: 53~90																								
VFD-16-※	90: 90	110: 110	150: 150	190: 194																							
Division or combination ratio 50%-50%																											

Specifications

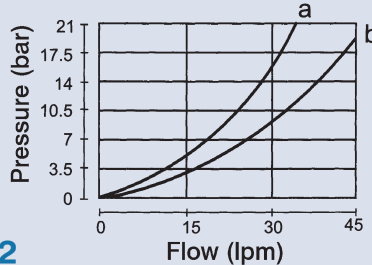
Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VFD-10	350	45	0.15
VFD-12		90	0.3
VFD-16		194	0.4

Dimensions / Performance curves

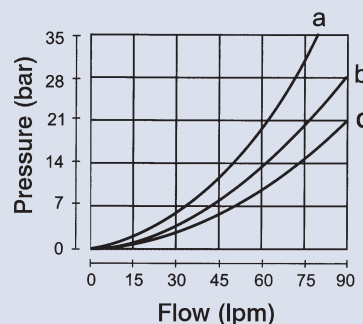


Model	A	B
VFD-10	64 (2.52")	7.9 (0.31")
VFD-12	98.6 (3.88")	9.5 (0.37")
VFD-16	104.6 (4.12")	12.5 (0.49")

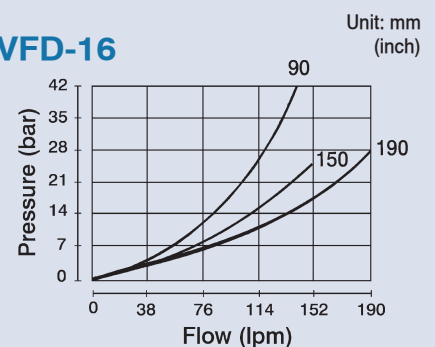
VFD-10



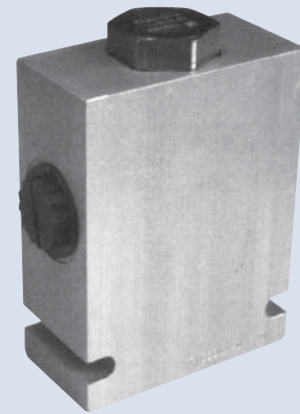
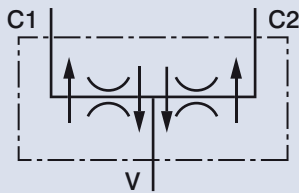
VFD-12



VFD-16



CARTRIDGE FLOW DIVIDER WITH BODY



How to order

VFD - 04 - 11 - ✱

1	2	3	4
1	Model		
2	Port size 03: 3/8" 04: 1/2" 05: 3/4" 06: 3/4" 08: 1"		
3	Flow range	Model	Flow Range (lpm)
		VFD-03	07: 2.3~7.6 15: 4.5~15 22: 6.8~22.7 30: 9~30 37: 11~37 45: 13.5~45
		VFD-04	11: 6.5~11 25: 10~25 38: 25~38
		VFD-05	60: 30~60 70: 43~74 90: 53~90
		VFD-06	90: 90 110: 110 150: 150
		VFD-08	90: 90 110: 110 150: 150 190: 194
		Division or combination ratio 50%-50%	
4	Port thread 1P: PT 2N: NPT 3G: PF (G) 4A: SAE		

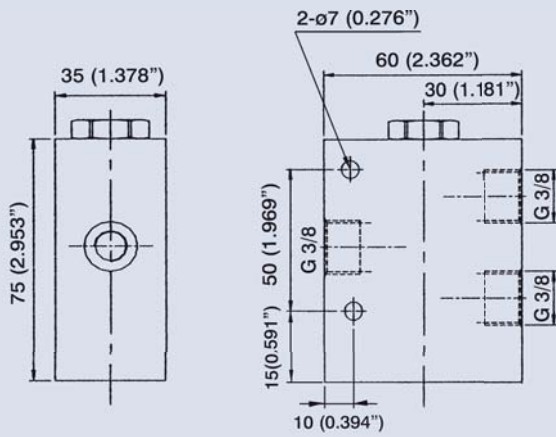
Specifications

Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VFD-03	250	45	0.6
VFD-04	210	38	0.8
VFD-05	250	90	2.05
VFD-06		150	2
VFD-08		194	2

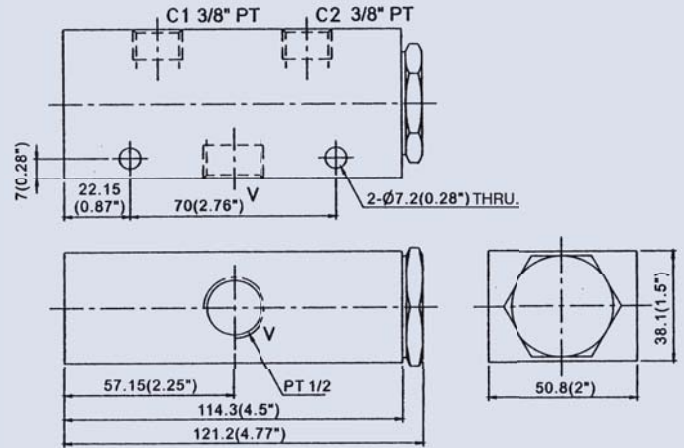
CARTRIDGE FLOW DIVIDER WITH BODY

Dimensions

VFD-03

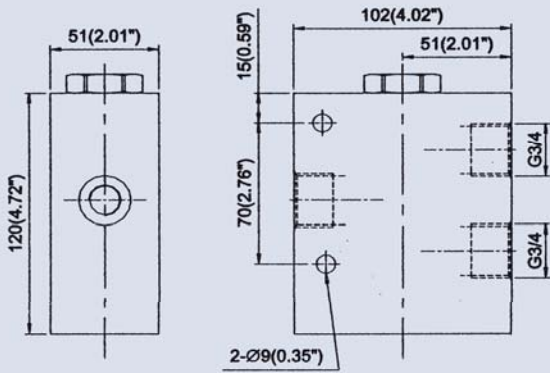


VFD-04

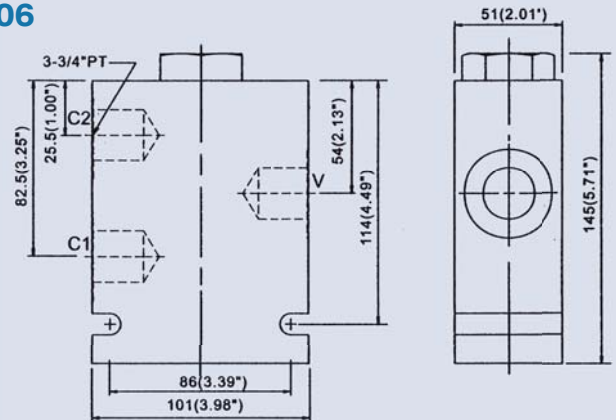


Unit: mm
(inch)

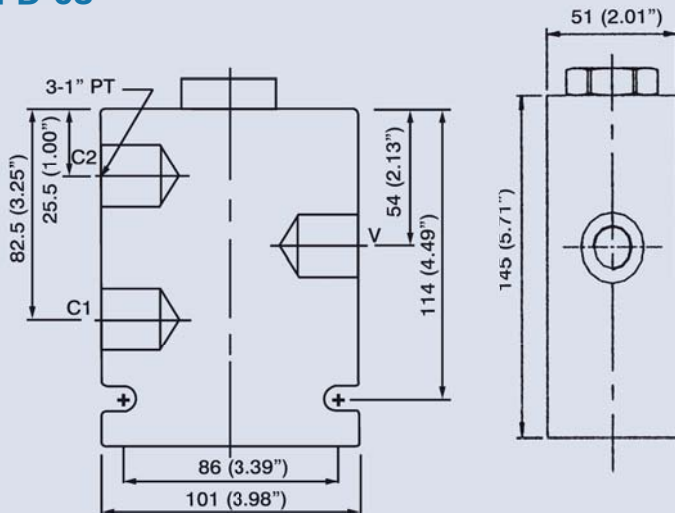
VFD-05



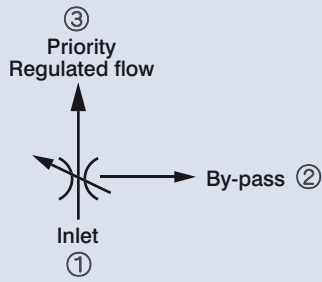
VFD-06



VFD-08



CARTRIDGE PRIORITY FLOW DIVIDER



How to order

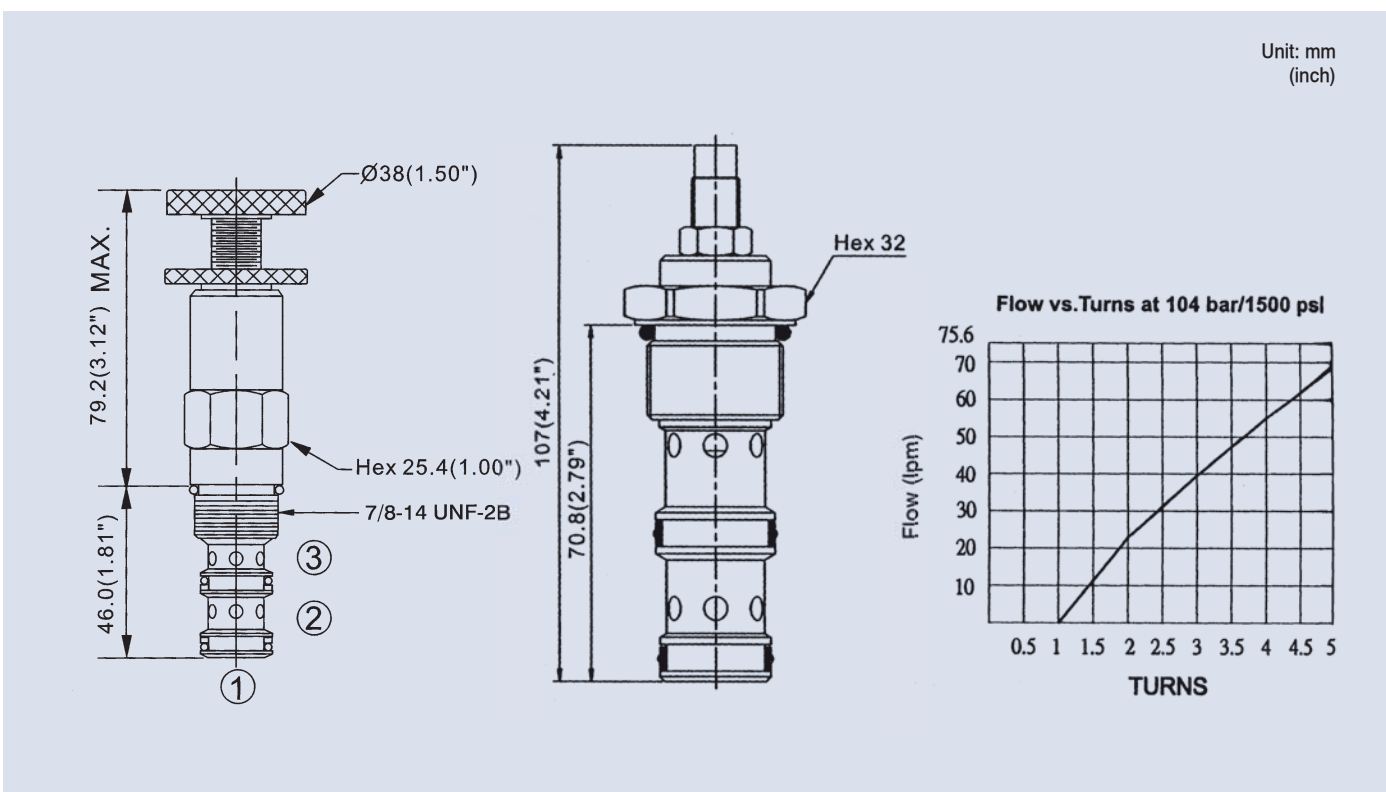
VF - 10 - ✱

- 1** Model
- 2** Mounting size 10: Size 10 Cavity CS10-3N (see page 163) 12: Size 12 Cavity CS12-3N (see page 164)
- 3** Adjustment option None: Tool adjustment K: Hand-bar adjustment

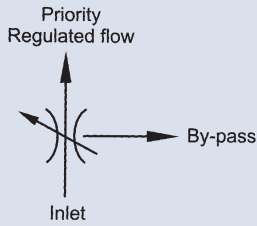
Specifications

Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VF-10	210	57	0.24
VF-12	240	75	0.4

Dimensions



CARTRIDGE PRIORITY FLOW DIVIDER



How to order

VF - 50 - 30 - T

1 2 3

- 1 Model
- 2 Flow adjusting range 15: 0~16 lpm 30: 0~32 lpm
- 3 Mounting type T: Thread connecting G: Sub-plate mounting

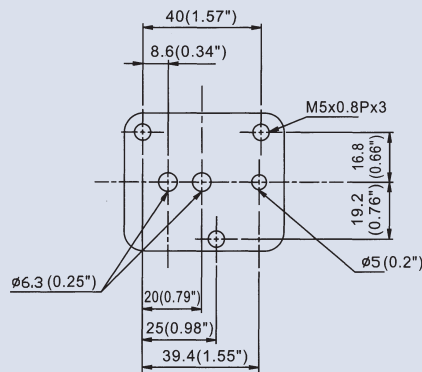
Specifications

Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VF-50	248	49	0.75

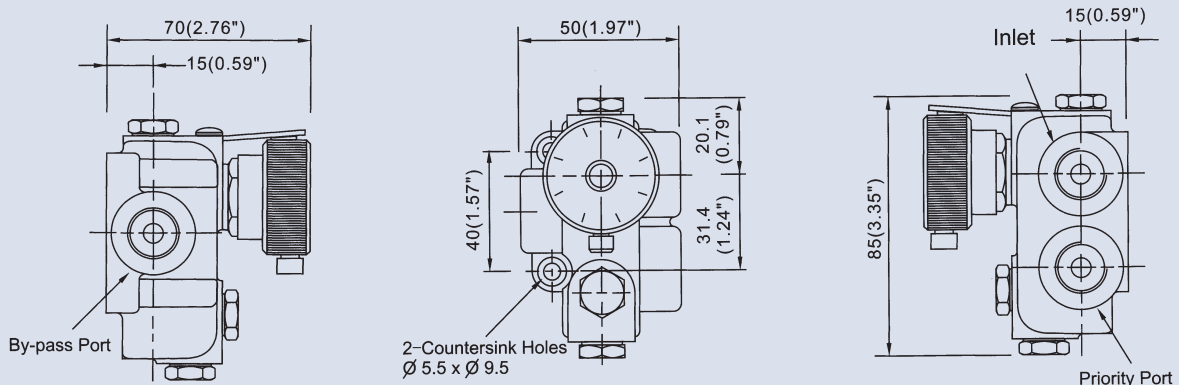
Dimensions

SUBPLATE

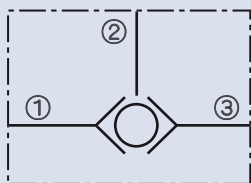
Unit: mm (inch)



DIMENSIONS



CARTRIDGE SHUTTLE VALVE



How to order

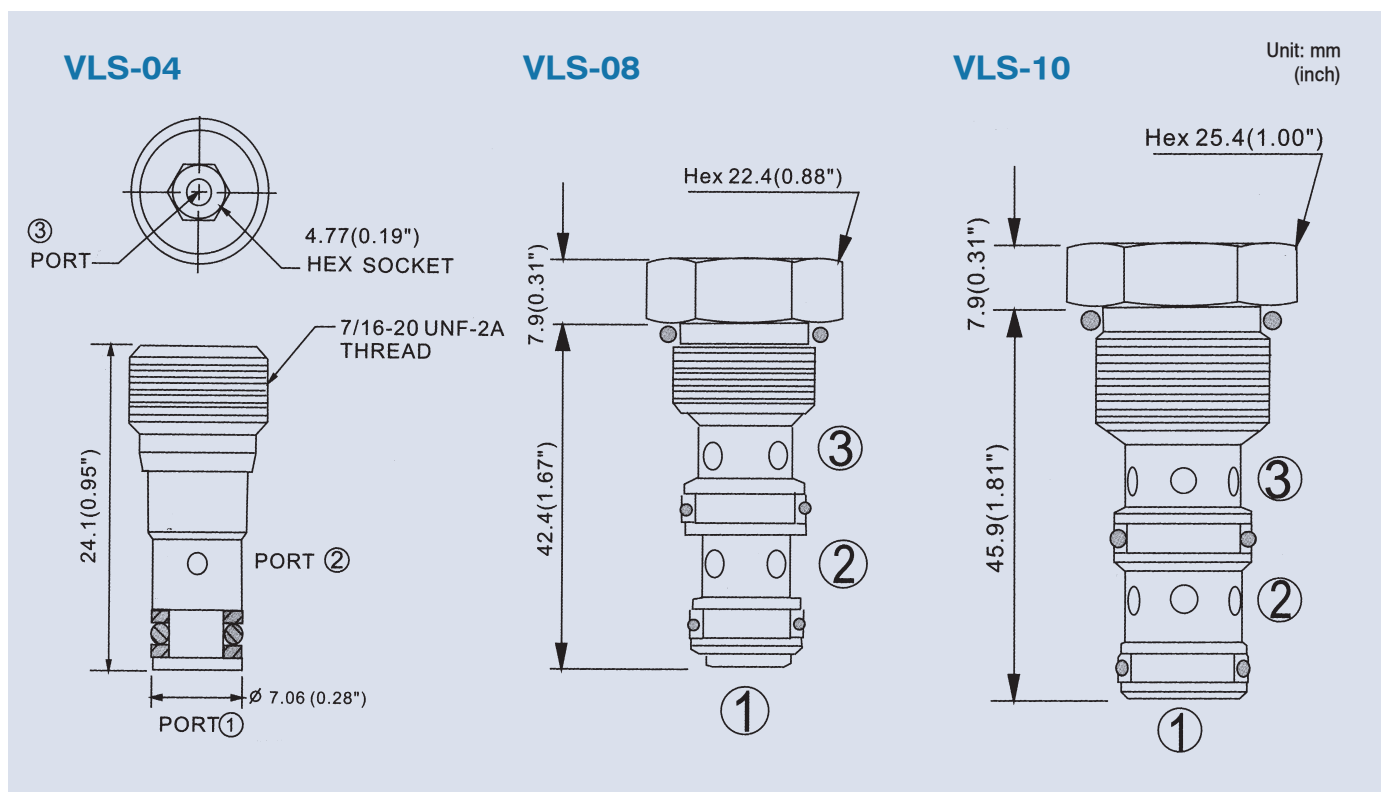
VLS - 04

1	2
1	Model
2	Mounting size 04: Size 04 Cavity CS04 (see page 163) 08: Size 08 Cavity CS08-3N (see page 163) 10: Size 10 Cavity CS10-3N (see page 163)

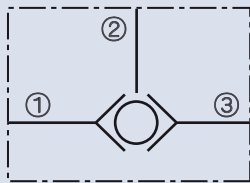
Specifications

Model	Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)
VLS-04	350	6	0.01
VLS-08		19	0.07
VLS-10		30	0.09

Dimensions



SHUTTLE VALVE



E

How to order

SH - 02 G

- 1 Model
- 2 Valve size 02: 1/4" 03: 3/8"
- 3 Mounting type G: Sub-plate mounting T: Thread connection

Specifications

Model		Max. Pressure (bar)	Max. Flow (lpm)	Weight (kg)	
Sub-Plate Mounting	Thread Connection			SH-02G	SH-02T SH-03T
SH-02G	SH-02T	250	20	1.08	0.2
	SH-03T		25		0.8

Dimensions / Performance curves

SH-02G

SH-02T

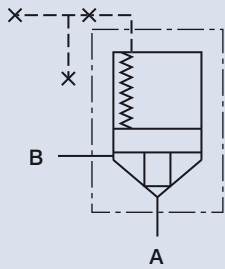
SH-03T

Unit: mm (inch)

Typical Pressure Drop

Flow Rate (Q) [lpm]	Pressure (P) [bar]
0	0
5	~2.5
10	~5.5
15	~10.5
20	~18

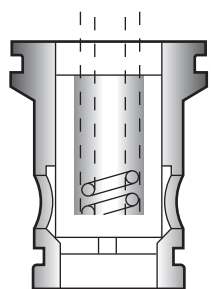
LOGIC VALVE



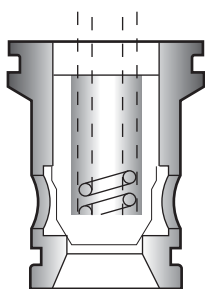
How to order

LCV - 16 - 05 - E - NC

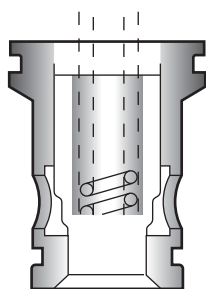
1	2	3	4	5
1	Model			
2	Valve size			
3	Cracking pressure 05: 0.5 bar 20: 2 bar 50: 5 bar			
4	Valve type B: Pressure control E: Directional / flow control D: Directional / flow control with cushion			
5	Control type NC: Normal closed NO: Normal open			



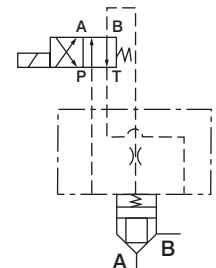
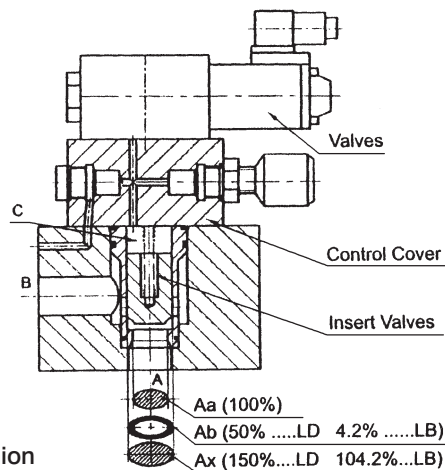
B: Pressure



E: Directional / Flow



D: Directional / Flow With Cushion



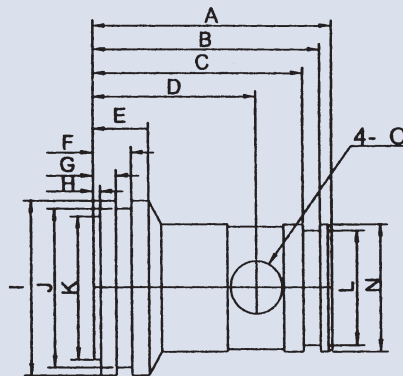
Specifications

Model	Max. Flow (lpm)	Rated Flow (lpm)	Max. Pressure (bar)	Cracking Pressure (bar)	Ratio of Poppet Area	Weight (kg)
LCV-16	200	130	315	05: 0.5 20: 2 50: 5	2 : 1	0.18
LCV-20	310	230				0.32
LCV-25	450	350				0.43
LCV-32	700	500				0.87
LCV-40	1100	850				1.59
LCV-50	1700	1400				2.74
LCV-63	2800	2100				5.80

LOGIC VALVE

Dimensions / Performance curves

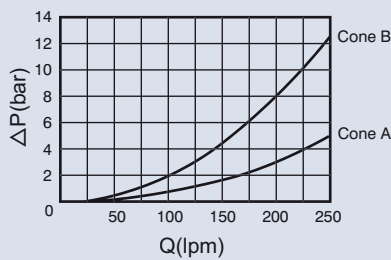
LCV



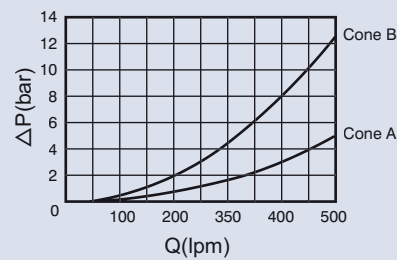
Unit: mm
(inch)

Size	A	B	C	D	E	F	G	H	I	J	K	L	N	O
16	56 (2.20")	52 (2.05")	46.5 (1.83")	37 (1.46")	16 (0.63")	10.5 (0.41")	7 (0.28")	2.4 (0.09")	32 (1.26")	29.2 (1.15")	23.7 (0.93")	22.2 (0.87")	25 (0.98")	10 (0.39")
20	64 (2.52")	61 (2.40")	53.5 (2.11")	40 (1.57")	14 (0.55")	11.4 (0.45")	6 (0.24")	2.3 (0.09")	40 (1.57")	35 (1.38")	26 (1.02")	25 (0.98")	30 (1.18")	11 (0.43")
25	72 (2.83")	69 (2.72")	62.6 (2.46")	43 (1.69")	16 (0.63")	13.5 (0.53")	8.8 (0.35")	1.8 (0.07")	45 (1.77")	40.8 (1.61")	37 (1.46")	29.8 (1.17")	34 (1.34")	14 (0.55")
32	85 (3.35")	81 (3.19")	74.6 (2.94")	58 (2.28")	20 (0.79")	13.6 (0.54")	8 (0.31")	2.4 (0.09")	60 (2.36")	55 (2.17")	47.5 (1.87")	40.8 (1.61")	45 (1.77")	18 (0.71")
40	105 (4.13")	97 (3.82")	90.6 (3.57")	66.5 (2.62")	24 (0.94")	15.6 (0.61")	10 (0.39")	2.4 (0.09")	75 (2.95")	70 (2.76")	62 (2.44")	50.8 (2")	55 (2.17")	23.5 (0.93")
50	122 (4.8")	114 (4.49")	107.6 (4.24")	83 (3.27")	20 (0.79")	14.6 (0.57")	9 (0.35")	2.4 (0.09")	90 (3.54")	85 (3.35")	76.8 (3.02")	63.8 (2.51")	68 (2.68")	28 (1.10")
63	155 (6.10")	145.5 (5.73")	134 (5.28")	115 (4.53")	27 (1.06")	21 (0.83")	12 (0.47")	4.6 (0.18")	120 (4.72")	110 (4.33")	94 (3.7")	80 (3.15")	90 (3.54")	25 (0.98")

LCV-16

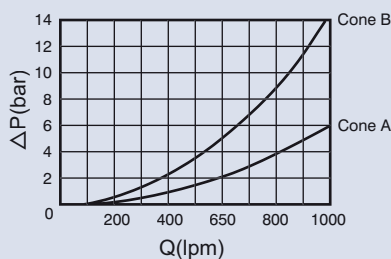


LCV-25

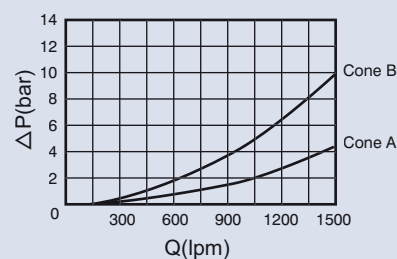


Test conditions: Without spring
Oil temperature: 50° Viscosity: 35 cst

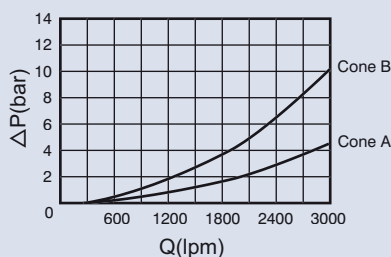
LCV-32



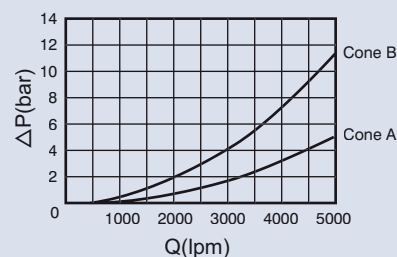
LCV-40



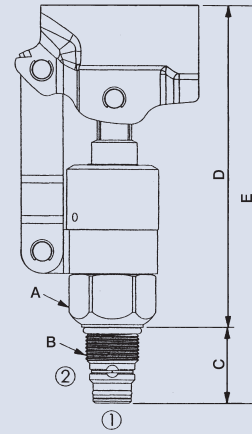
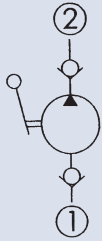
LCV-50



LCV-63



CARTRIDGE HAND PUMP



How to order

HP - 10W - 20 - A - N

1	2	3	4	5
1	Model			
2	Mounting size	10W: 10W-2 Cavity CS10-2N (see page 163)	16W: 16W-2 Cavity CS16-2N (see page 163)	
3	Operation 20: Push to pressurize			
4	Output cc/stroke	10W A: 7.4 B: 10.6	16W A: 21.3	
5	N: Non-adjustable			

* Lever must be ordered separately. Code no: 7G YAG001 Length: 405 mm

Specifications

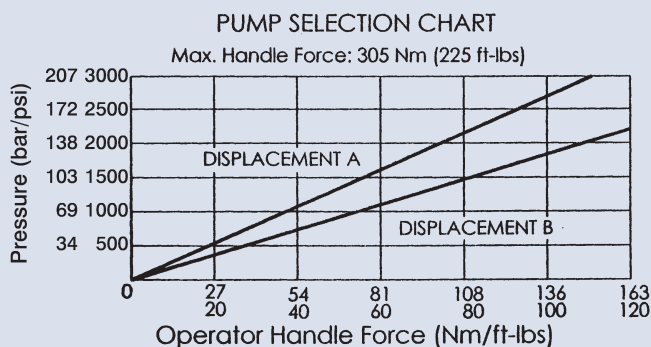
Model	Max. Pressure (bar)	Displacement Per Stroke (cc)		Installation Torque (nm)	Weight (kg)
		A	B		
HP-10W	210	7.4	10.6	35~45	0.83
HP-16W		21.3	-	60~70	1.35

Dimensions

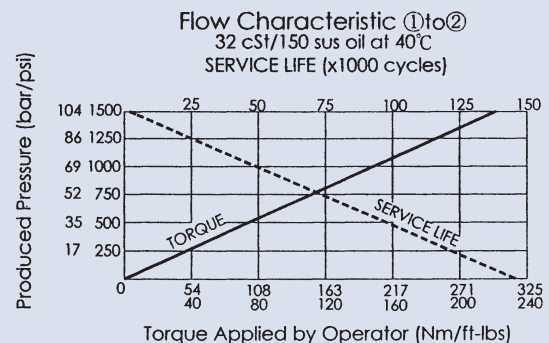
Model	Dimensions (mm)		B	Dimensions (mm)		
	A			C	D	E
HP-10W	25.4 Hex.		7/8"-14 UNF-2A	32	130	162
HP-16W	38 Hex.		1-5/16"-12 UNF-2A	44.5	144	189

Performance curves

HP-10W



HP-16W

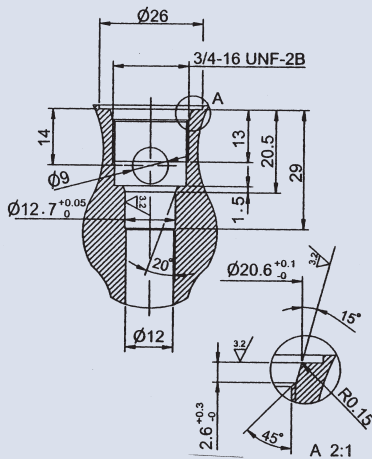


CAVITY DIMENSIONS FOR CARTRIDGE VALVE

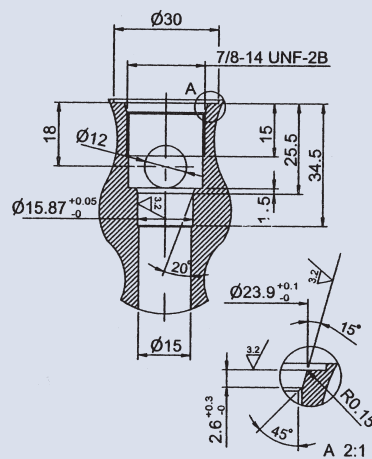
Dimensions

Unit: mm
(inch)

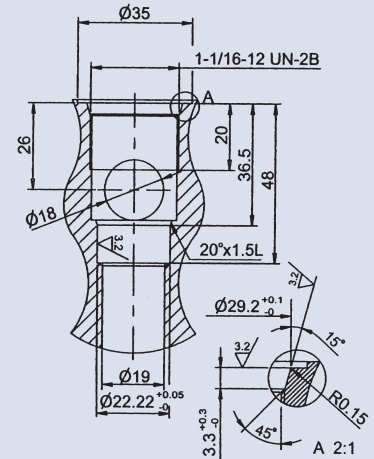
CS08-2N



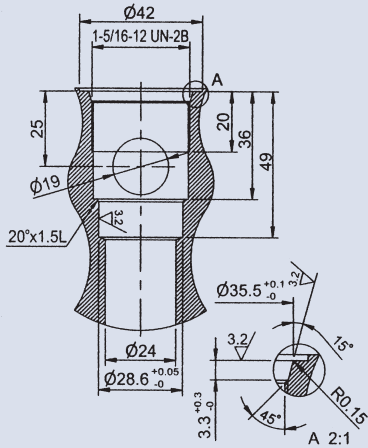
CS10-2N



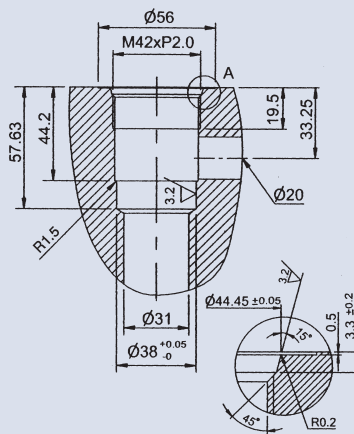
CS12-2N



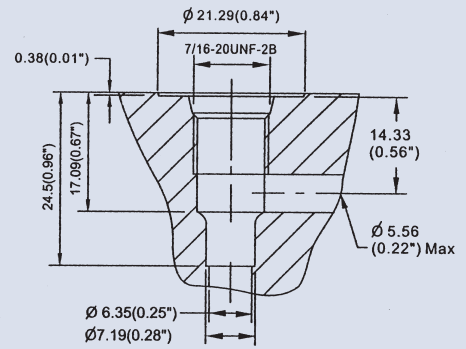
CS16-2N



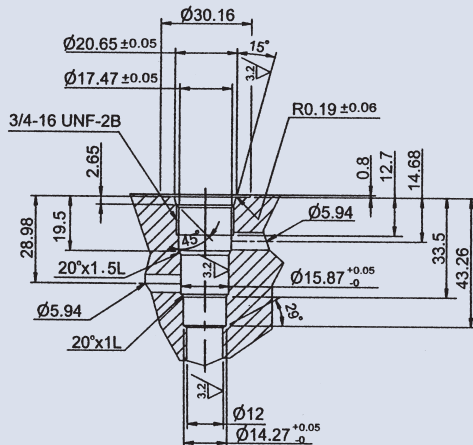
CS42-2N



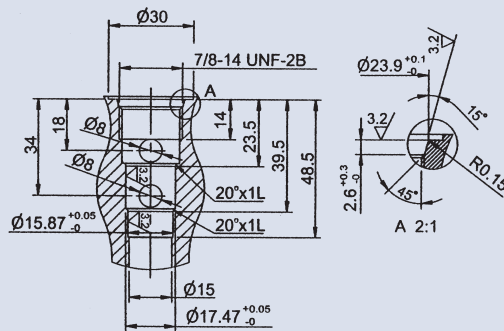
CS04



CS08-3N



CS10-3N

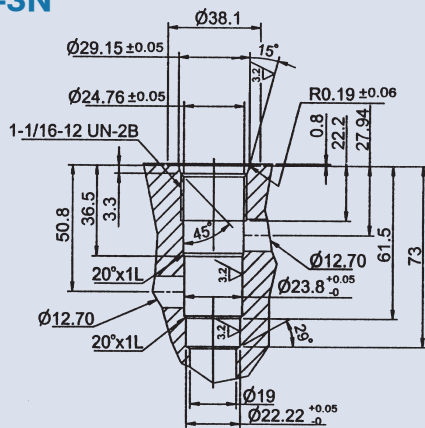


CAVITY DIMENSIONS FOR CARTRIDGE VALVE

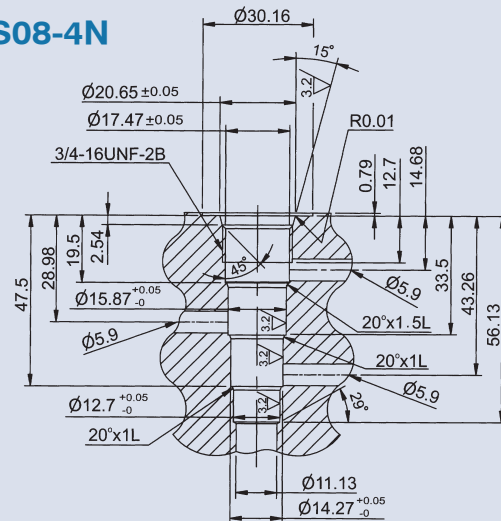
Dimensions

Unit: mm

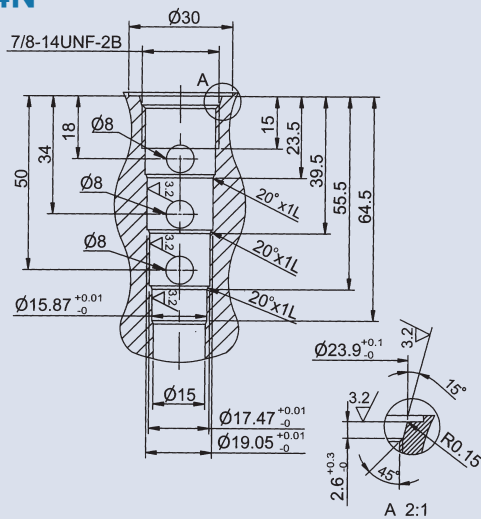
CS12-3N



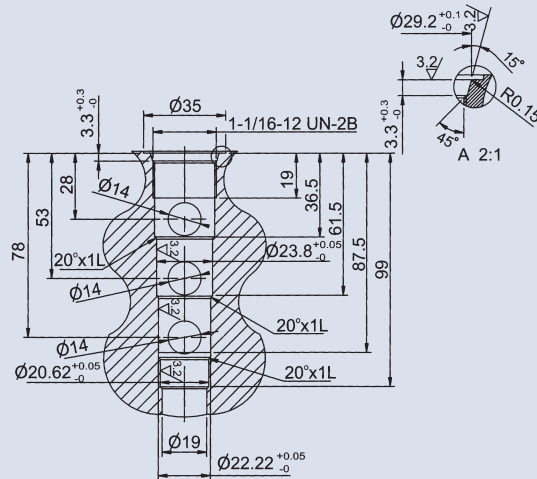
CS08-4N



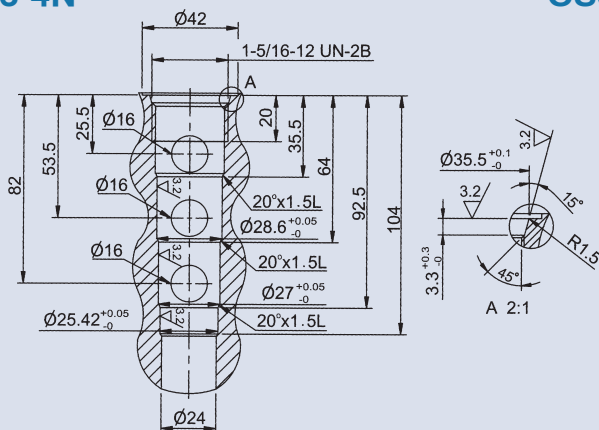
CS10-4N



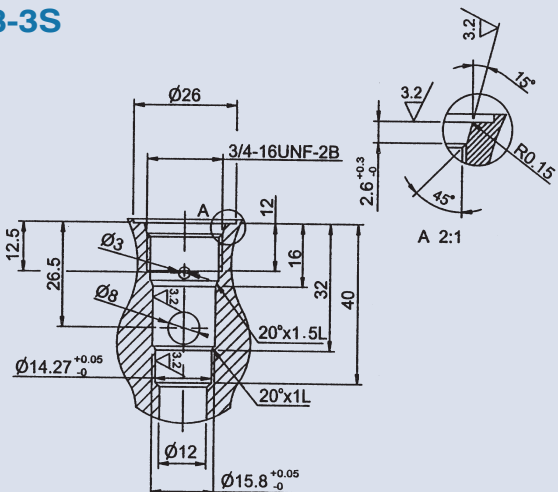
CS12-4N



CS16-4N



CS08-3S



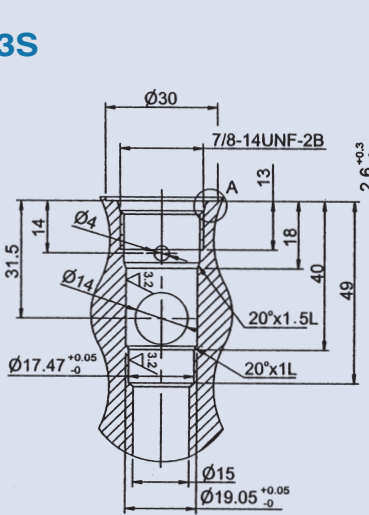
CAVITY DIMENSIONS FOR CARTRIDGE VALVE

Dimensions

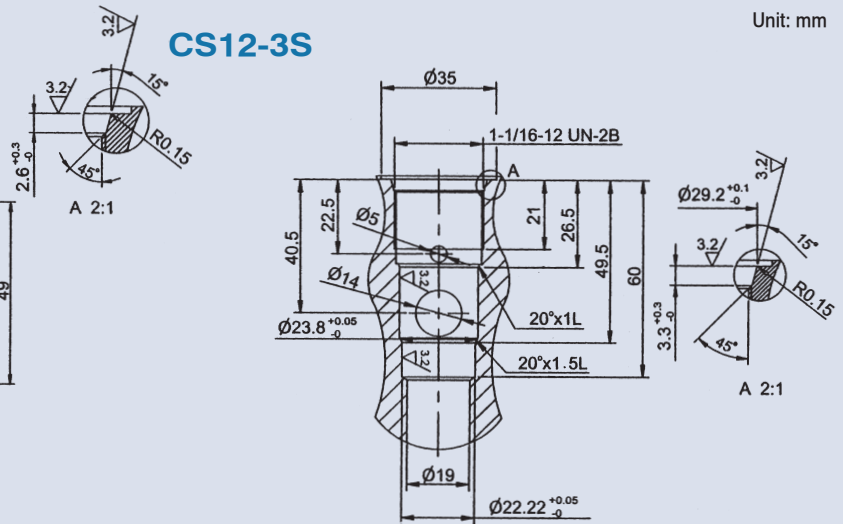
E

Unit: mm

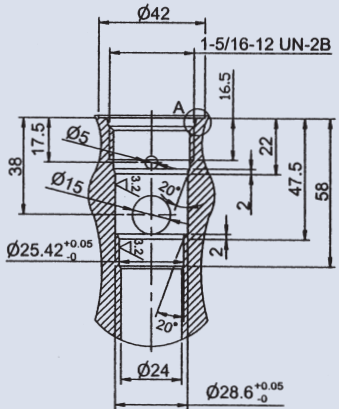
CS10-3S



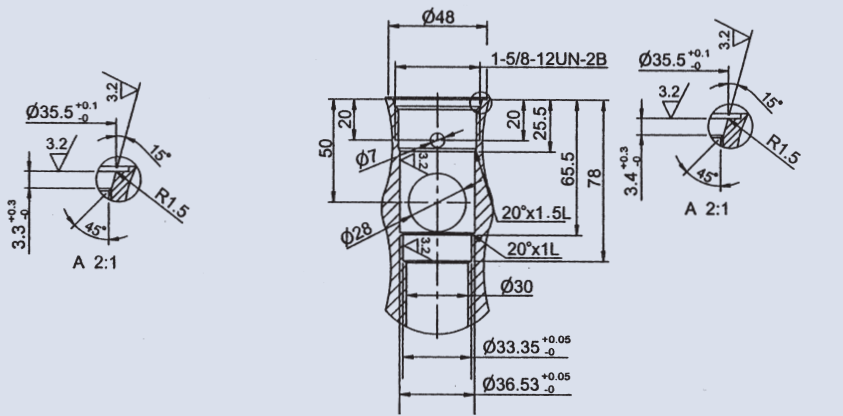
CS12-3S



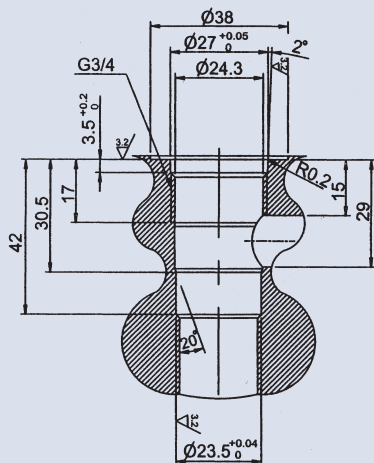
CS16-3S



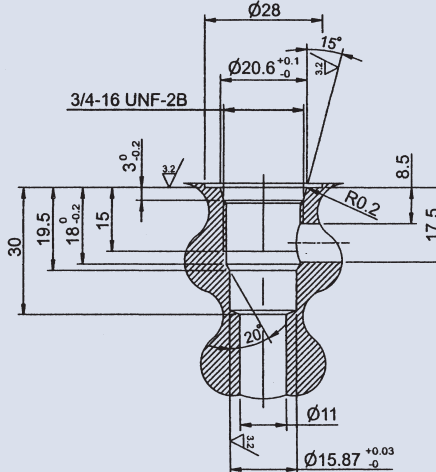
CS20-3S



CSE017-2N



CSE019-2N

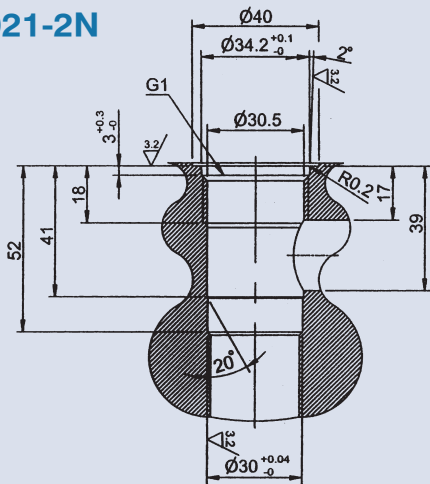


CAVITY DIMENSIONS FOR CARTRIDGE VALVE

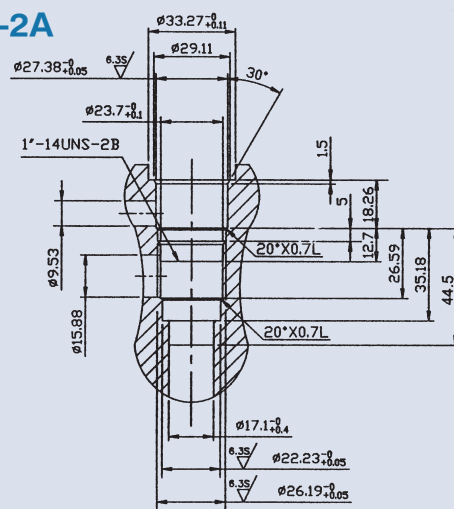
Dimensions

Unit: mm

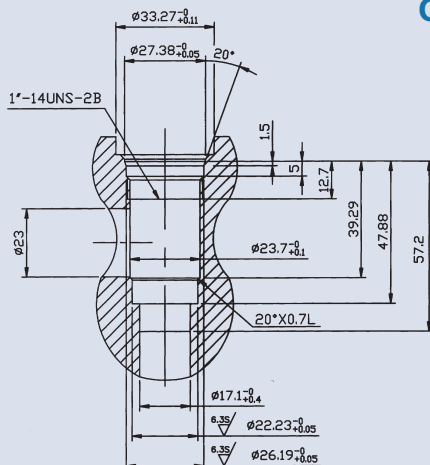
CSE021-2N



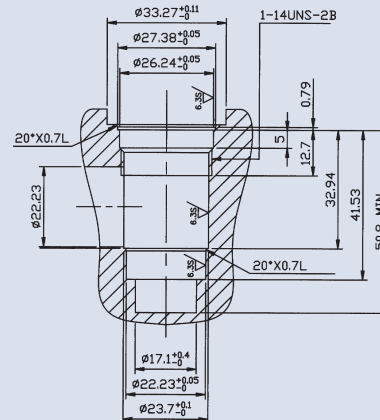
CST-2A



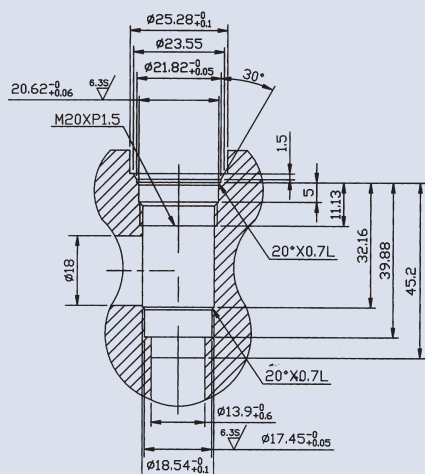
CST-3A



CST-5A



CST-10A



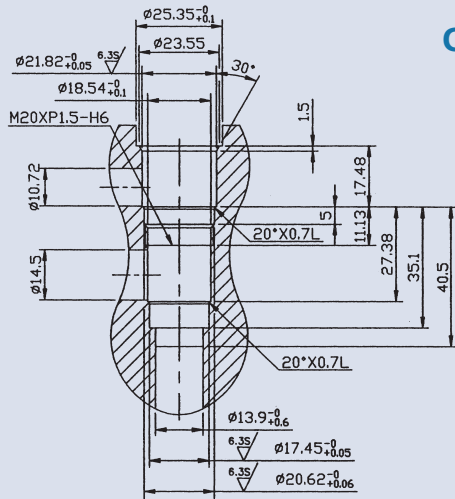
CAVITY DIMENSIONS FOR CARTRIDGE VALVE

Dimensions

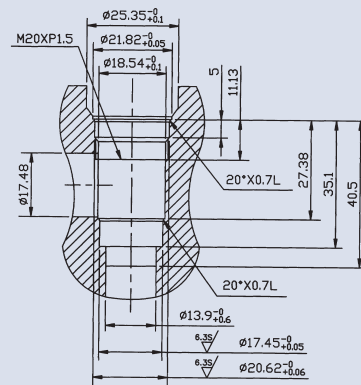
E

Unit: mm

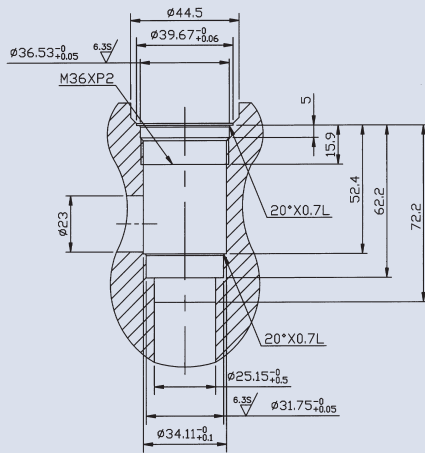
CST-11A



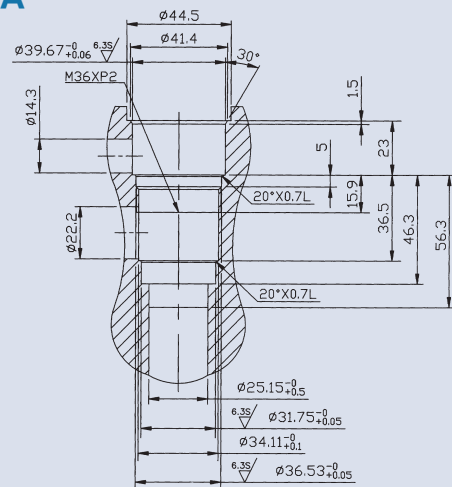
CST-13A



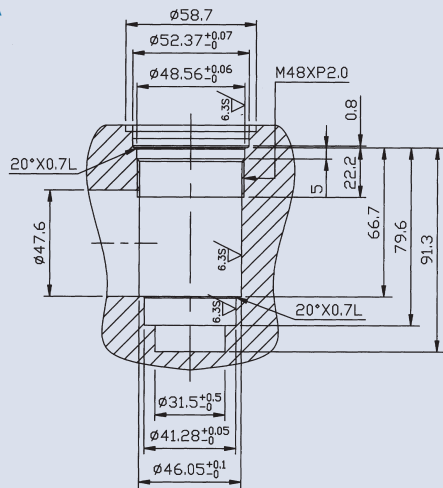
CST-16A



CST-17A



CST-18A



CST-19A

