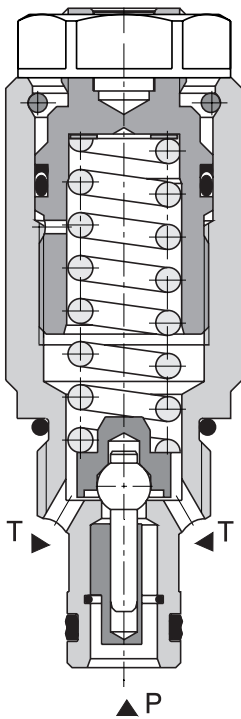


Pressure Relief Valve, Poppet Type, Direct Acting

SR1A-A2

3/4-16 UNF • Q_{max} 30 l/min (8 GPM) • p_{max} 350 bar (5100 PSI)



Technical Features

- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop through CFD optimized flow paths
- › Wide pressure range up to 350 bar
- › Hardened precision parts
- › Sharp-edged steel seats for dirt-tolerant performance
- › Leak-free closing, suitable for fast cycling with long life
- › Adjustable by allen key or hand screw
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

A poppet type, direct acting hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device for common hydraulic circuit protection. The spring acts on the poppet and presses it onto the valve seat. If the hydraulic pressure is below the pre-set value, the valve is closed. If the hydraulic force exceeds the pre-set value the valve opens and flow passes to the tank port until the system pressure falls below the spring pre-set value and the valve closes again.

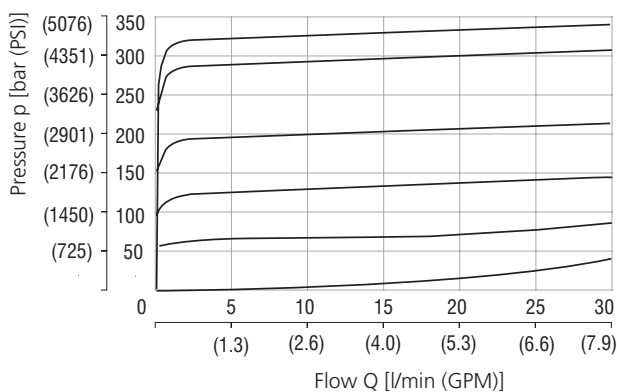


Technical Data

Valve size / Cartridge cavity		3/4-16 UNF-2A / A2 (C-8-2)	
Max. flow	l/min (GPM)	30 (7.9)	
Max. operating pressure	bar (PSI)	350 (5100)	
Max. pressure (port T)	bar (PSI)	160 (2320)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)	
Weight	kg (lbs)	0.13 (0.29)	
	Datasheet	Type	
General information	HA 0060	Products and operating conditions	
Valve bodies	In-line mounted	HA 0018	SB-A2*
	Sandwich mounted	HA 0028	SB-*A2*
Cavity details / Form tools	HA 0019	SMT-A2*	
Spare parts	HA 8010		

Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

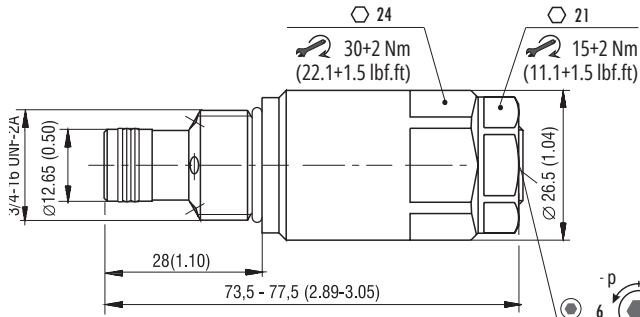
Relief pressure related to flow rate



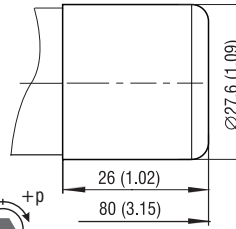
	Pressure range
6	35
5	25
4	16
3	10
2	6
1	Min. pressure setting

Dimensions in millimeters (inches)

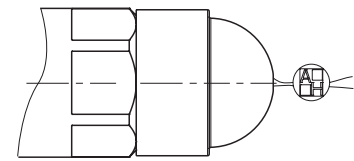
Model S



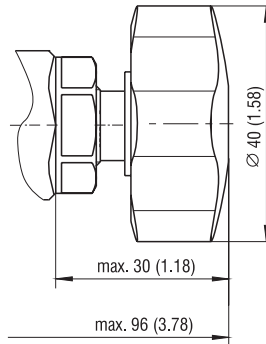
Model T



Model L



Typ RP



Ordering Code

SR1A-A2 / L [] [] [] - []

Pressure relief valve, poppet type, direct acting

Valve cavity
3/4-16 UNF (C-8-2)

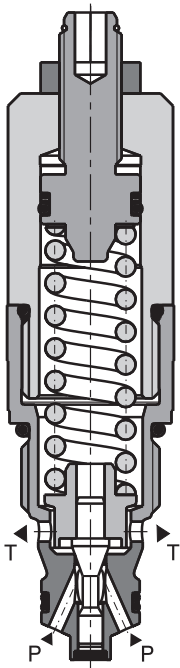
Model
Lightline

Pressure range
up to 63 bar (914 PSI) 6
up to 100 bar (1450 PSI) 10
up to 160 bar (2320 PSI) 16
up to 250 bar (3630 PSI) 25
up to 350 bar (5080 PSI) 35

Surface treatment
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi), ISO 9227 (520 h)

Seals
No designation V
NBR
FPM (Viton)

Adjustment option
S allen key (hex. 6), without protective cap
T allen key (hex. 6), with protective cap
L allen key (hex. 6), with protective cap, sealable (lockwire holes)
RP hand screw, plastic

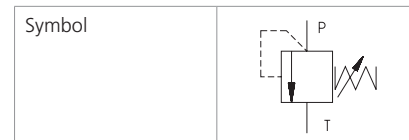


Technical Features

- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop through CFD optimized flow paths
- › Wide pressure range up to 420 bar
- › Hardened precision parts
- › Sharp-edged steel seats for dirt-tolerant performance
- › Leak-free closing, suitable for fast cycling with long life
- › Adjustable by allen key or hand screw
- › In the standard version, the valve is zinc-coated for 1000 h protection acc. to ISO 9227

Functional Description

A poppet type, direct acting hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device for common hydraulic circuit protection. The spring acts on the poppet and presses it onto the valve seat. If the hydraulic pressure is below the pre-set value, the valve is closed. If the hydraulic force exceeds the pre-set value the valve opens and flow passes to the tank port until the system pressure falls below the spring pre-set value and the valve closes again.



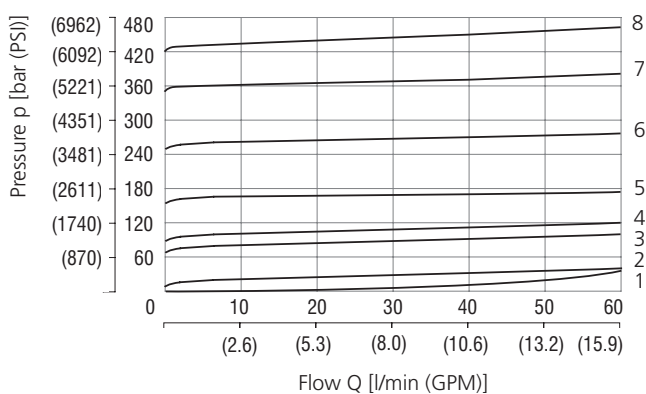
Technical Data

Valve size / Cartridge cavity		7/8-14 UNF-2A / B2 (C-10-2)
Max. flow	l/min (GPM)	60 (15.9)
Max. operating pressure	bar (PSI)	420 (6100)
Max. pressure (port T)	bar (PSI)	250 (3630)
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)
Weight	kg (lbs)	0.25 (0.55)

		Datasheet	Type
General information		HA 0060	Products operating conditions
Valve bodies	In-line mounted	HA 0018	SB-B2*
	Sandwich mounted	HA 0028	SB-*B2*
Cavity details / Form tools		HA 0019	SMT-B2*
Spare parts		HA 8010	

Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

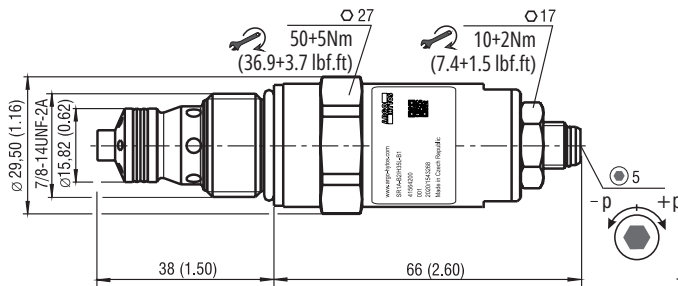
Relief pressure related to flow rate



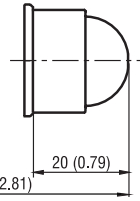
	Pressure range
8	42
7	35
6	25
5	16
4	10
3	6
2	2
1	Min. pressure setting

Dimensions in millimeters (inches)

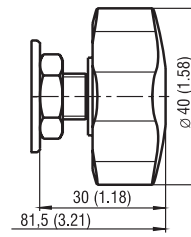
Model S



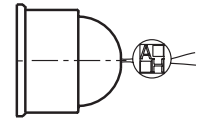
Model T



Model RP



Model L



Ordering Code

SR1A - B2 / H - **B1**

Pressure relief valve, poppet type, direct acting

Valve cavity
7/8-14 UNF (C-10-2)

Model
High performance

Pressure range

adjustable pressure 25 bar (360 PSI)	2
adjustable pressure 63 bar (910 PSI)	6
adjustable pressure 100 bar (1450 PSI)	10
adjustable pressure 160 bar (2320 PSI)	16
adjustable pressure 250 bar (3630 PSI)	25
adjustable pressure 350 bar (5080 PSI)	35
adjustable pressure 420 bar (6090 PSI)	42

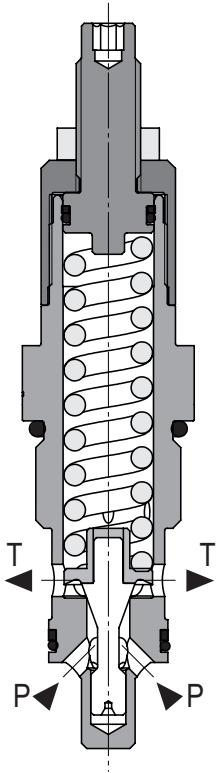
Surface treatment
zinc-coated (ZnNi), ISO 9227 (1000 h)

No designation
V

Seals
NBR
FPM (Viton)

S
T
RP
L

Adjustment option
allen key (hex. 5), without protective cap
allen key (hex. 5), with protective cap
hand screw, plastic
allen key (hex. 5), with protective cap, sealable (lockwire holes)



Technical Features

- › High flow rate up to 120 l/min
- › Four pressure ranges
- › Stable function over the entire flow range with quick response to the pressure changes
- › Failure resistant design
- › Low leakages of closed valve thanks to quality material of seat and hardened poppet
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227

Functional Description

SIC pressure relief valve, direct acting, is intended to set maximum pressure in the circuit and protect the hydraulic circuits against overloading. The hardened poppet is pressed to the sealing edge of seat by spring force. The valve is closed in the basic position. If the system pressure exceeds the value of cracking pressure, set by compressing the spring, the poppet is pushed out of the seat and the circuit is relieved by the fluid draining to the tank. After the pressure drop in the circuit, the valve closes again.



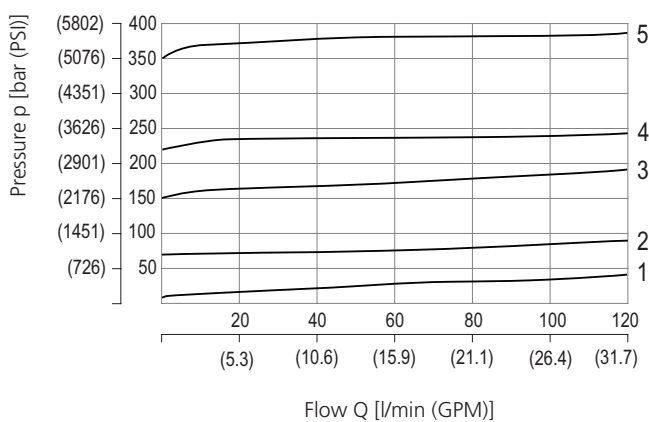
Technical Data

Valve size / Cartridge cavity		1-1/16 12 UN / CA2
Max. flow	l/min (GPM)	120 (32)
Max. operating pressure	bar (PSI)	350 (5100)
Fluid temperature range (NBR)	°C (°F)	-20 ... +90 (-4 ... 194)
Weight	kg (lbs)	0.30 (0.66)

	Datasheet	Type
General information	HA 0060	Products operating conditions
Cavity details / Form tools	HA 0019	SMT-CA2*
Spare parts	HA 8010	

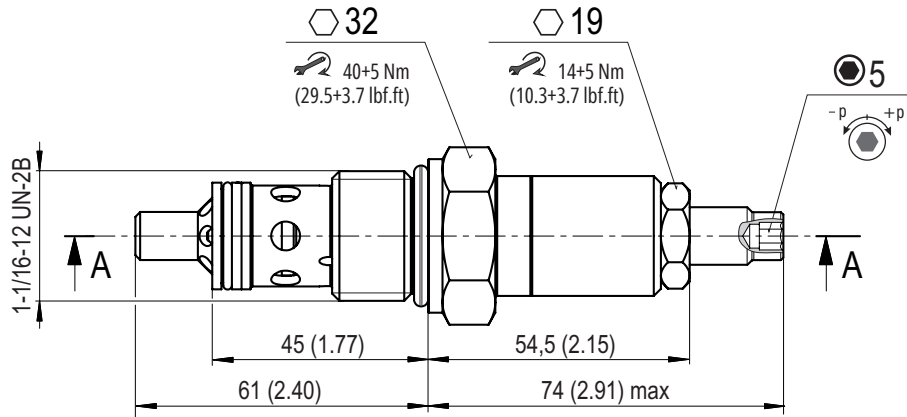
Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Relief pressure related to flow rate

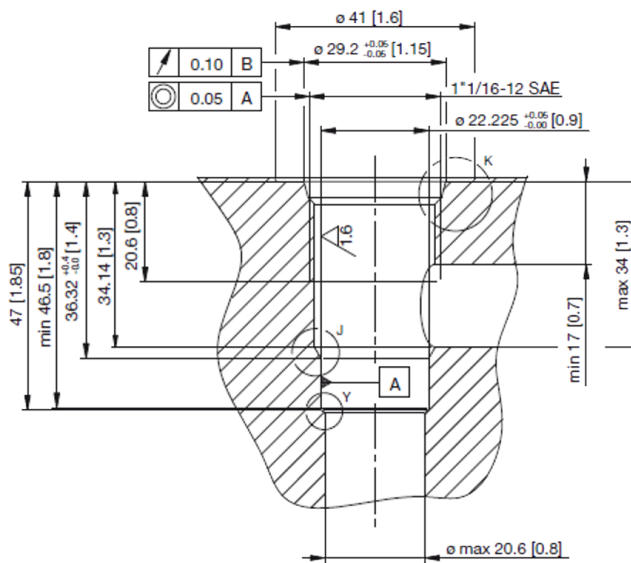


	Pressure range	Adjustable pressure range
5	35	230-350 bar
4	23	150-230 bar
3	15	70-150 bar
2	7	10-70 bar
1	7	Δp

Dimensions in millimeters (inches)



Cavity Details



Ordering Code

SR1A-CA2 / H S - A

Pressure relief valve, poppet type, direct acting

Valve cavity
1-1/16-12 UN / CA2

Model
High performance

Pressure range
adjustable pressure 10-70 bar (150-1020 PSI) **7**
adjustable pressure 70-150 bar (1020-2180 PSI) **15**
adjustable pressure 150-230 bar (2180-3340 PSI) **23**
adjustable pressure 230-350 bar (3340-5080 PSI) **35**

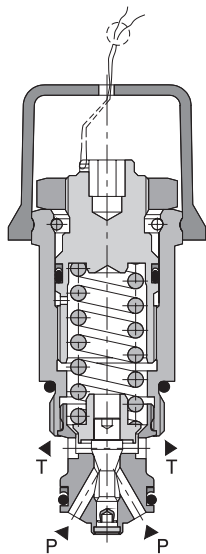
Surface treatment*
zinc-coated (ZnCr-3), ISO 9227 (240 h)

*For alternative surface treatment contact our technical support.

No designation

Seals
NBR

Adjustment option
allen key (hex. 5), without protective cap



Technical Features

- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 320 bar
- › Hardened precision parts
- › Sharp-edged steel seats for dirt-tolerant performance
- › Leak-free closing, suitable for fast cycling with long life
- › Adjustable by allen key or hand screw
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

A poppet type, direct acting hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device for common hydraulic circuit protection. The spring acts on the poppet and presses it onto the valve seat. If the hydraulic pressure is below the pre-set value, the valve is closed. If the hydraulic force exceeds the pre-set value the valve opens and flow passes to the tank port until the system pressure falls below the spring pre-set value and the valve closes again.



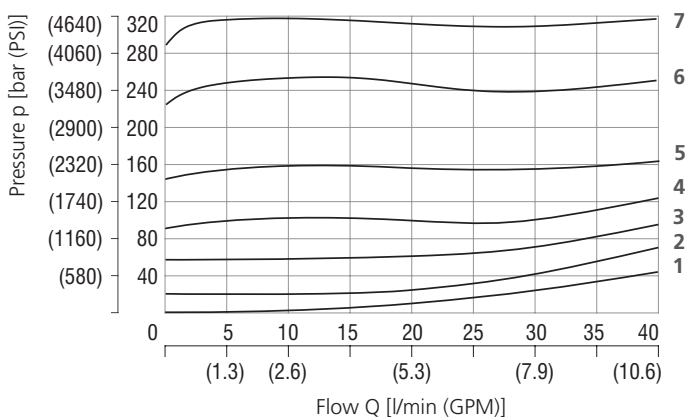
Technical Data

Valve size / Cartridge cavity		M22x1.5 / QG2
Max. flow	l/min (GPM)	40 (10.6)
Max. operating pressure	bar (PSI)	320 (4600)
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)
Weight	kg (lbs)	0.17 (0.37)

		Datasheet	Type
General information		HA 0060	Products and operating conditions
Valve bodies	In-line mounted	HA 0018	SB-QG2*
	Sandwich mounted	HA 0028	SB-*QG2*
Cavity details		HA 0019	SMT-QG2*
Spare parts		HA 8010	SMT-B2*

Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

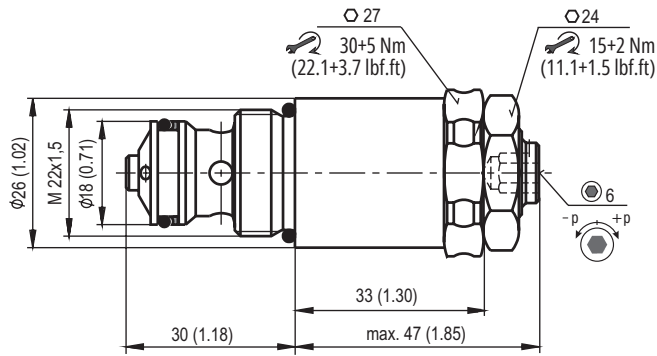
Relief pressure related to flow rate



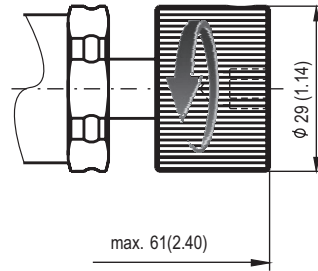
	Pressure range
7	32
6	25
5	16
4	10
3	6
2	2
1	Min. pressure setting

Dimensions in millimeters (inches)

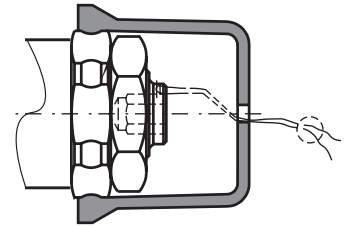
Model S



Model RS



Model L



Ordering Code

VPP2-04 / S

Pressure relief valve, poppet type, direct acting

M22x1,5

Model screw-in cartridge

Pressure range

up to 25 bar (360 PSI)	2
up to 63 bar (910 PSI)	6
up to 100 bar (1450 PSI)	10
up to 160 bar (2320 PSI)	16
up to 250 bar (3630 PSI)	25
up to 320 bar (4600 PSI)	32

No designation V

Surface treatment
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi), ISO 9227 (520 h)

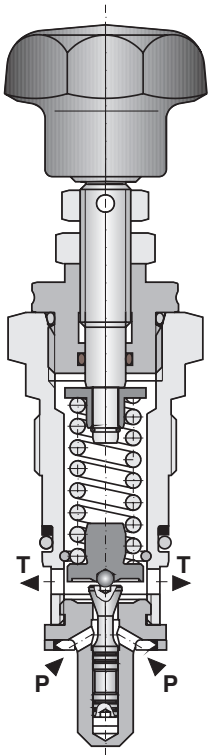
Seals
NBR
FPM (Viton)

Adjustment option
S allen key (hex. 6), without protective cap
RS hand screw, metal
L allen key (hex. 6), with protective cap, sealable (lockwire holes)

Pressure Relief Valve, Poppet Type, Direct Acting

VPP2-06

M28 x 1,5 • Q_{max} 50 l/min (13 GPM) • p_{max} 320 bar (4600 PSI)



Technical Features

- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 320 bar
- › Hardened precision parts
- › Sharp-edged steel seats for dirt-tolerant performance
- › Leak-free closing, suitable for fast cycling with long life
- › Adjustable by allen key or hand screw
- › In the standard version, the valve surface is black oxide coated and the valve housing is phosphated. Alternatively, they are zinc-coated with corrosion protection of 240 h or 520 h in NSS acc. to ISO 9227

Functional Description

A poppet type, direct acting hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device for common hydraulic circuit protection. The spring acts on the poppet and presses it onto the valve seat. If the hydraulic pressure is below the pre-set value, the valve is closed. If the hydraulic force exceeds the pre-set value the valve opens and flow passes to the tank port until the system pressure falls below the spring pre-set value and the valve closes again.



Technical Data

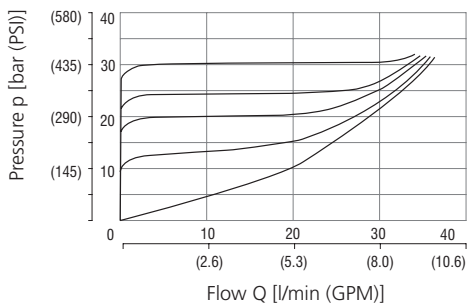
Valve size / Cartridge cavity		M28 x 1,5 / QP2
Max. flow	l/min (GPM)	50 (13.2)
Max. operating pressure	bar (PSI)	320 (4600)
Fluid temperature range (NBR)	°C (°F)	-30...+100 (-22 ...212)
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... +248)
Weight	kg (lbs)	0.4 (0.88)

		Datasheet	Type
General information		HA 0060	Products and operating conditions
Valve bodies	In-line mounted	HA 0018	SB-QP2*
Cavity details		HA 0019	SMT-QP2*
Spare parts		HA 8010	

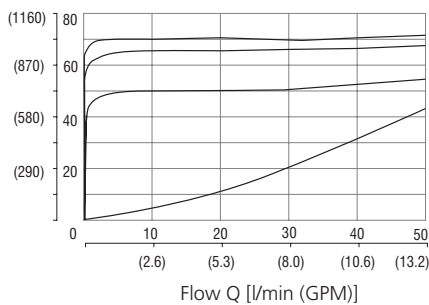
Characteristics measured at v = 32 mm²/s (156 SUS)

Relief pressure related to flow rate

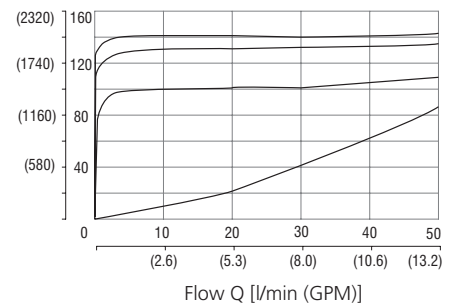
Pressure range 2.5



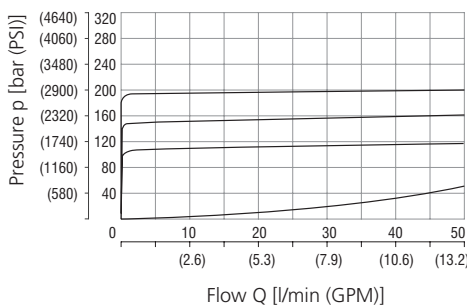
Pressure range 6.3



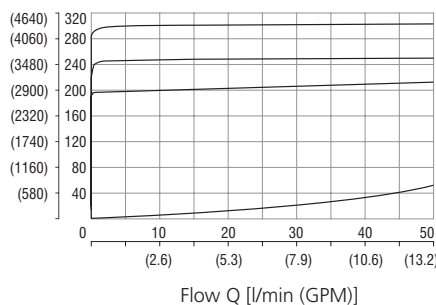
Pressure range 10



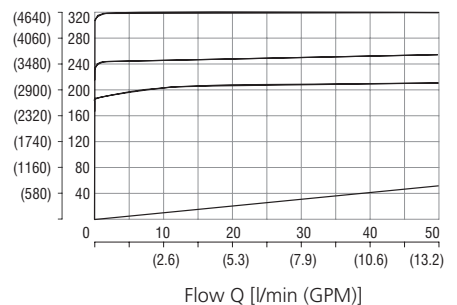
Pressure range 16



Pressure range 25

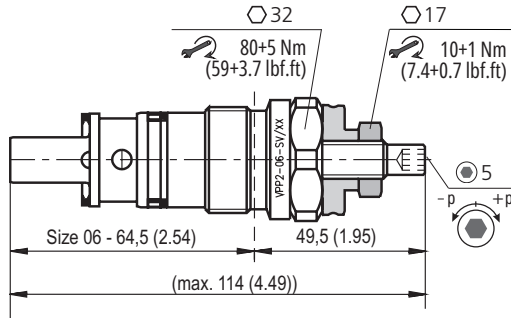


Pressure range 32

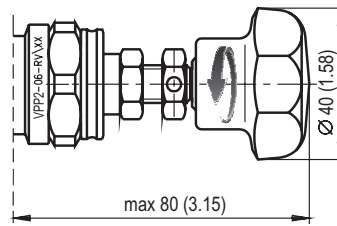


Dimensions in millimeters (inches)

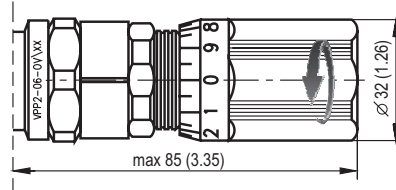
Model S



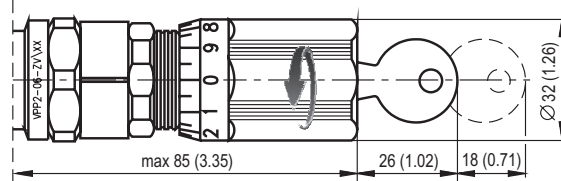
Model RP



Model O

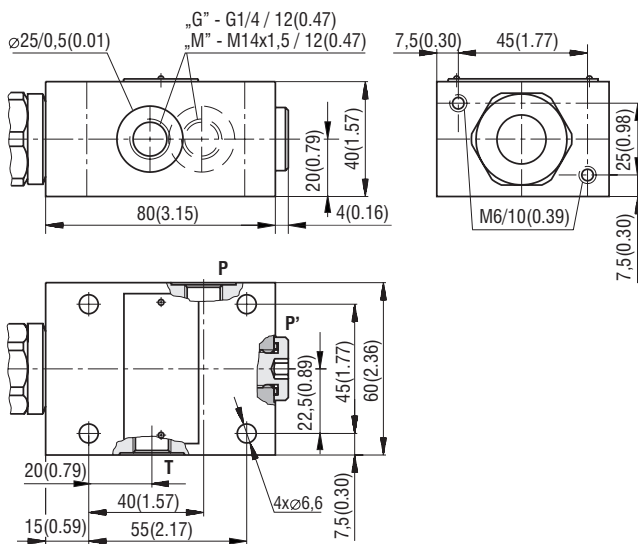


Model Z

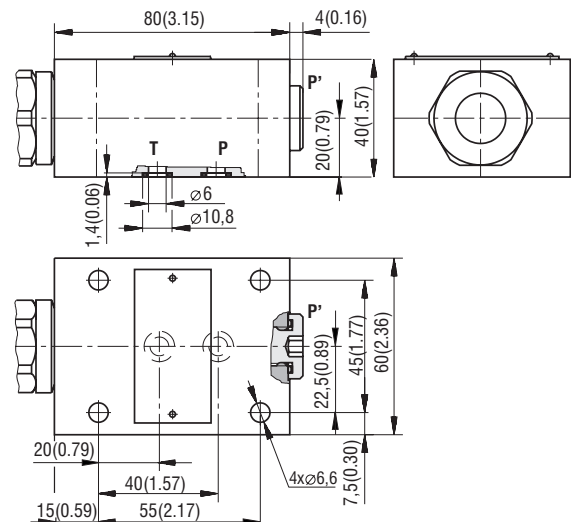


Dimensions in millimeters (inches)

Cartridge in threaded housing - models „M“ and „G“



Cartridge in subplate mounted housing - model „P“



Port P' (either P or P' can be used as input port), thread G1/4 (M14x1,5), depth 12 mm (0.47 in)

Port P' (e.g. for pressure measuring), thread M14x1,5, depth 12 mm (0.47 in)
Note: subplates - see catalog HA 0002

Ordering Code

VPP2-06 - [] [] / [] [] - []

Pressure relief valve, poppet type, direct acting
M28 x 1,5

Adjustment option
allen key (hex. 5), without protective cap
hand screw, plastic
non-lockable cylindrical hand screw
lockable cylindrical hand screw

Model
screw-in cartridge
cartridge in threaded housing - metric threads
cartridge in threaded housing - with BSP threads
cartridge in subplate mounted housing

S
RP
O
Z

V
M
G
P

Surface treatment (cartridge valve only)
No designation black oxide coating
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi), ISO 9227 (520 h)

No designation
V

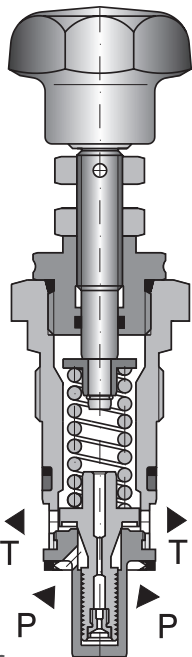
Seals
NBR
FPM (Viton)

Pressure range
2.5 up to 25 bar (360 PSI)
6.3 up to 63 bar (910 PSI)
10 up to 100 bar (1450 PSI)
16 up to 160 bar (2320 PSI)
25 up to 250 bar (3630 PSI)
32 up to 320 bar (4600 PSI)

Pressure Relief Valve, Poppet Type, Direct Acting

VPP1-06(10)

M28x1,5 / M35x1,5 • Q_{max} 50 l/min (13 GPM) / 120 l/min (32 GPM) • p_{max} 320 bar (4600 PSI)



Size 06



Size 10

Technical Features

- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 320 bar
- › Hardened precision parts
- › Sharp-edged steel seats for dirt-tolerant performance
- › Low volume leaks, suitable for fast cycling with long life
- › Adjustable by allen key or hand screw
- › In the standard version, the valve surface is black oxide coated and the valve housing is phosphated. Alternatively, they are zinc-coated with corrosion protection of 240 h or 520 h in NSS acc. to ISO 9227

Functional Description

A poppet type, direct acting hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device for common hydraulic circuit protection. The spring acts on the poppet and presses it onto the valve seat. If the hydraulic pressure is below the pre-set value, the valve is closed. If the hydraulic force exceeds the pre-set value the valve opens and flow passes to the tank port until the system pressure falls below the spring pre-set value and the valve closes again.



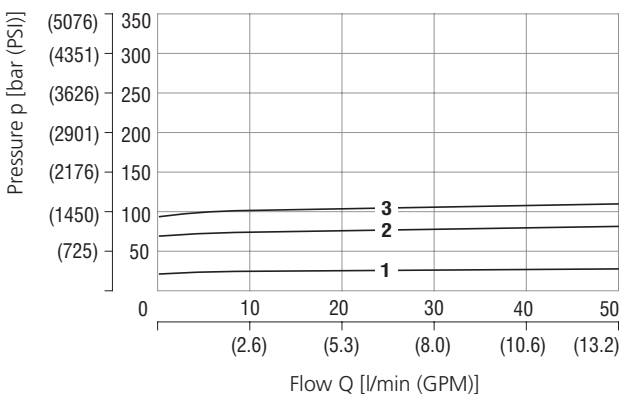
Technical Data

Valve size		size 06	size 10
Valve size / Cartridge cavity		M28x1,5 / QP2	M35x1,5 / QT2
Max. flow	l/min (GPM)	50 (13.2)	120 (31.7)
Max. operating pressure	bar (PSI)	320 (4600)	
Fluid temperature range (NBR)	°C (°F)	-30...+100 (-22 ...212)	
Fluid temperature range (FPM)	°C (°F)	-20...+120 (-4...248)	
Weight	kg (lbs)	0.4 (0.88)	0.5 (1.10)
		Datasheet	Type
General information		HA 0060	Products and operating conditions
Valve bodies	In-line mounted	HA 0018	SB-QP2* SB-QT2*
Cavity details		HA 0019	SMT-QP2* SMT-QT2*
Spare parts		HA 8010	

Characteristics measured at v = 32 mm²/s (156 SUS)

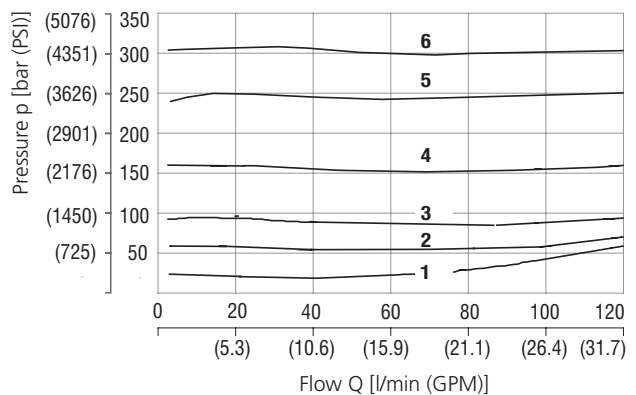
Relief pressure related to flow rate

Size 06



	Pressure range
3	10
2	6.3
1	2.5

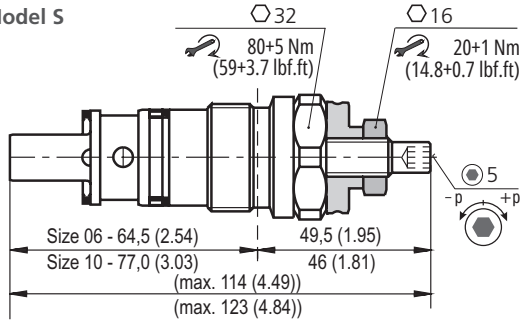
Size 10



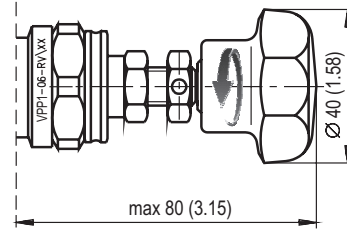
	Pressure range
6	32
5	25
4	16
3	10
2	6.3
1	2.5

Dimensions in millimeters (inches)

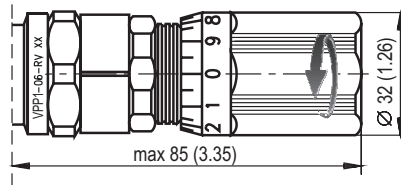
Model S



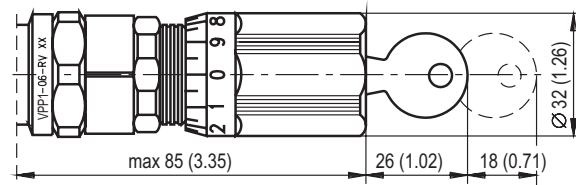
Model RP



Model O

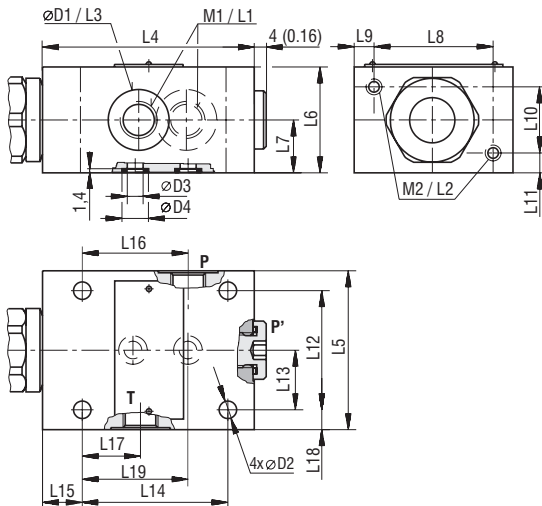


Model Z



Dimensions in millimeters (inches)

Cartridge in threaded housing - models „M“, „G“ and „P“



Port P' (as input can be used P or P') thread M1/L1

Model	06-xM/x	06-xG/x	06-xP/x	10-xM/x	10-xG/x	10-xP/x
M1	M14x1,5	G1/4	G1/4	M22x1,5	G1/2	G1/4
M2	M6			M8		
ØD1	25 (0.98)			34 (1.34)		
ØD2	6.6 (0.26)			9 (0.35)		
ØD3			6 (0.24)			10 (0.39)
ØD4			10.8 (0.43)			15.6 (0.61)
L1	12 (0.47)			16 (0.63)		
L2	10 (0.39)			20 (0.79)		
L3	0.5 (0.02)			0.5 (0.02)		
L4	80 (3.15)			100 (3.94)		
L5	60 (2.36)			80 (3.15)		
L6	40 (1.57)			60 (2.36)		
L7	20 (0.79)			30 (1.18)		
L8	45 (1.77)			60 (2.36)		
L9	7.5 (0.30)			10 (0.39)		
L10	25 (0.98)			40 (1.57)		
L11	7.5 (0.30)			10 (0.39)		
L12	45 (1.77)			60 (2.36)		
L13	22.5 (0.89)			30 (1.18)		
L14	55 (2.17)			70 (2.76)		
L15	15 (0.59)			20 (0.79)		
L16	40 (1.57)			49 (1.93)		
L17	20 (0.79)			21 (0.83)		
L18	7.5 (0.30)			10 (0.39)		
L19			40 (1.57)			45 (1.77)

Ordering Code

VPP1- [] - [] / [] - []

Pressure relief valve, poppet type, direct acting M28x1,5 / M35x1,5

Nominal size

size 06 06*
size 10 10

* VPP1-06 only available for pressure range 2.5; 6.3 and 10

Adjustment option

allen key (hex. 5), without protective cap
hand screw, plastic
non-lockable cylindrical hand screw
lockable cylindrical hand screw

S
RP
O
Z

Model

screw-in cartridge V
cartridge in threaded housing - with metric threads M
cartridge in threaded housing - with BSP threads G
cartridge in subplate mounted housing P

Surface treatment (cartridge valve only)

No designation black oxide coating
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi), ISO 9227 (520 h)

No designation V

Seals
NBR
FPM (Viton)

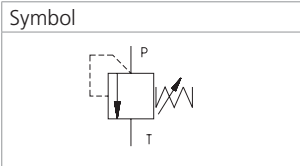
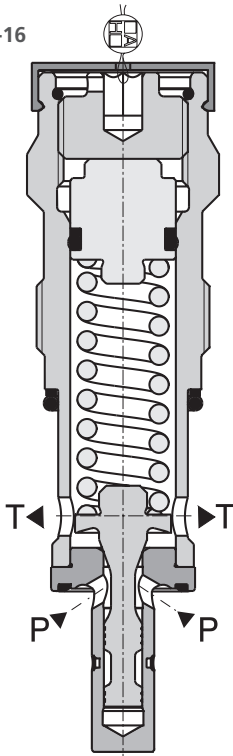
Pressure range
2.5 up to 25 bar (360 PSI)
6.3 up to 63 bar (910 PSI)
10 up to 100 bar (1450 PSI)
16 up to 160 bar (2320 PSI)
25 up to 250 bar (3630 PSI)
32 up to 320 bar (4600 PSI)

Pressure Relief Valve, Poppet Type, Direct Acting

VPP-R-16(25)

M36x2 / M42x2 • Q_{max} 120 / 400 l/min (32 / 106 GPM) • p_{max} 350 bar (5100 PSI)

VPP-R-16



Technical Features

- › Pressure relief valve, direct-acting, intended for installation in a manifold
- › Wide pressure range up to 350 bar
- › Large flow range
- › Low hysteresis, accurate pressure control and low pressure drop
- › Hardened precision parts
- › Leak-free closing, suitable for fast cycling with long life
- › Adjustment option with sealable allen head and a protective cap
- › In the standard version, the valve is zinc coated for 240 h (for size 25) and 520 h (for size 16) protection acc. to ISO 9227

Functional Description

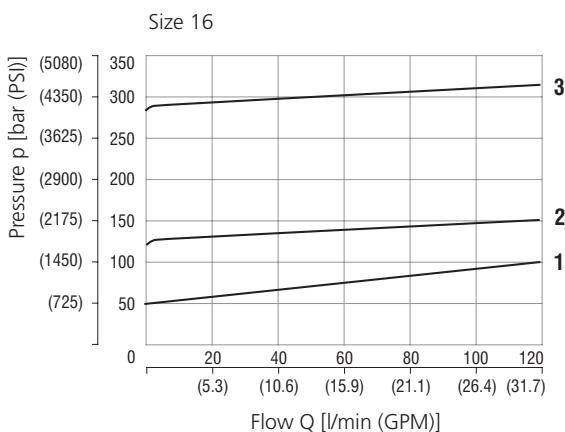
A poppet type, direct acting hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device for common hydraulic circuit protection. The spring acts on the poppet and presses it onto the valve seat. If the hydraulic pressure is below the pre-set value, the valve is closed. If the hydraulic force exceeds the pre-set value the valve opens and flow passes to the tank port until the system pressure falls below the spring pre-set value and the valve closes again.

Technical Data

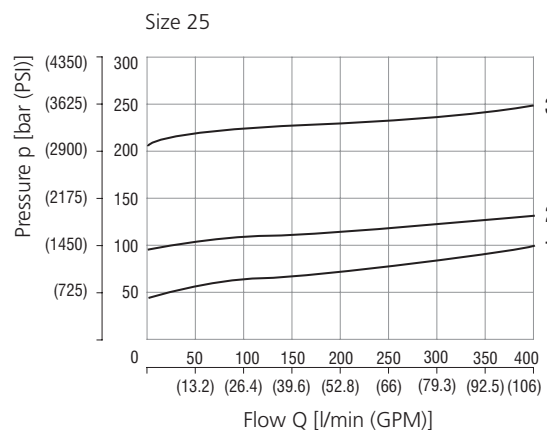
Valve size		Size 16	Size 25
Connection thread		M36x2	M42x2
Max. flow	l/min (GPM)	120 (31.7)	400 (106)
Max. inlet pressure (port P)	bar (PSI)	350 (5100)	
Max. outlet pressure (port T)	bar (PSI)	160 (2320)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)	
Kinematic viscosity range	mm ² /s (SUS)	10 ... 500 (49 ... 2450)	
Weight	valve	0.56 (1.23)	1.03 (2.27)
	valve with body	3.06 (6.75)	5.5 (12.1)
		Datasheet	Type
General information		HA 0060	Products and operating conditions
Spare parts		HA 8010	

Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Relief pressure related to flow rate



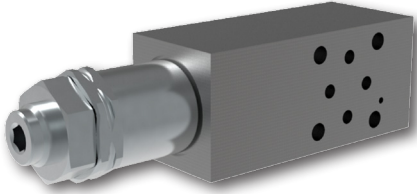
	Pressure stage	Pressure range bar (PSI)
3	28	280 - 350 (4060 - 5080 PSI)
2	13	130 - 280 (1890 - 4060 PSI)
1	5	50 - 130 (730 - 1890 PSI)



	Pressure stage	Pressure range bar (PSI)
3	20	200 - 350 (2900 - 5080 PSI)
2	10	100 - 200 (1450 - 2900 PSI)
1	5	50 - 100 (730 - 1450 PSI)

VPP2-04/M(R)

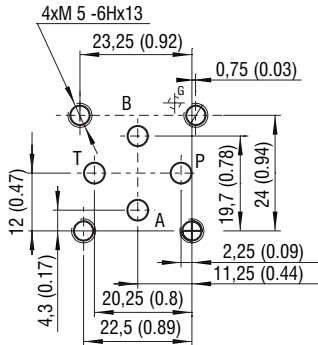
Size 04 (D02), 06 (D03) • Q_{max} 40 l/min (11 GPM) • p_{max} 320 bar (4600 PSI)



Technical Features

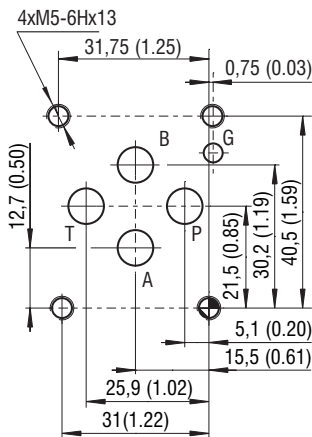
- › Pressure relief valve, poppet type, direct acting, modular with mounting interface acc. to ISO 4401, DIN 24340 (CETOP 02 and 03) or in-line design
- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 320 bar
- › Hardened precision parts
- › Sharp-edged steel seats for dirt-tolerant performance
- › Leak-free closing, suitable for fast cycling with long life
- › Adjustable by allen key or hand screw
- › In the standard version, the sandwich plate of valve is phosphated for basic surface corrosion protection and as preparation for painting. Steel parts are zinc-coated for corrosion protection 240 h in NSS acc. to ISO 9227.
- › Enhanced surface protection for mobile applications is available. The sandwich plate and steel parts are zinc-coated with corrosion protection 520 h in NSS

ISO 4401-02-01-0-05



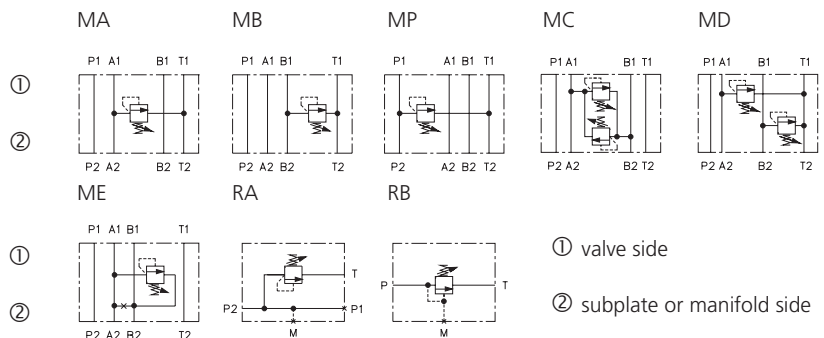
Ports P, A, B, T - max. Ø4.5 mm (0.18 in)

ISO 4401-03-02-0-05



Ports P, A, B, T - max. Ø7.5 mm (0.29 in)

Functional Symbols



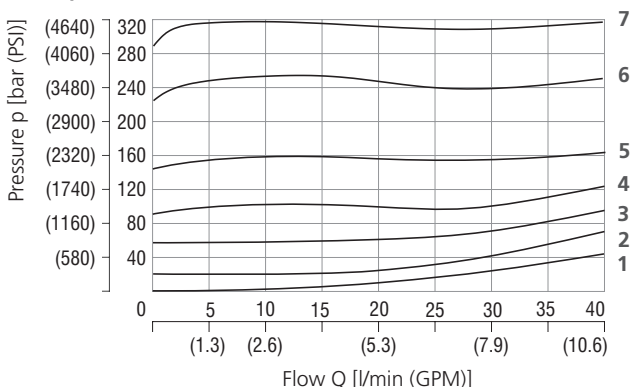
Notice: The orientation of the symbol on the name plate corresponds with the valve function.

Technical Data

Valve size	04 (D02), 06 (D03)	
Max. flow	l/min (GPM)	40 (10.6)
Max. pressure	bar (PSI)	320 (4600)
Fluid temperature range (NBR)	°C (°F)	-30...+100 (-22...+212)
Fluid temperature range (FPM)	°C (°F)	-20...+120 (-4...+248)
Weight - models MA (B, P) 04	kg (lbs)	0.82 (1.81)
- models MC (D, E) 04		1.32 (2.91), ME 1.25 (2.76)
- models MA (B, P) 06		1.12 (2.46)
- models MC (D, E) 06		1.42 (3.12), ME 1.35 (2.98)
- models RA1 (2), RB1 (2)		1.17 (2.57)
	Datasheet	Type
General information	HA 0060	Products operating conditions
Mounting interface	HA 0019	Size 04 / 06
Spare parts	HA 8010	

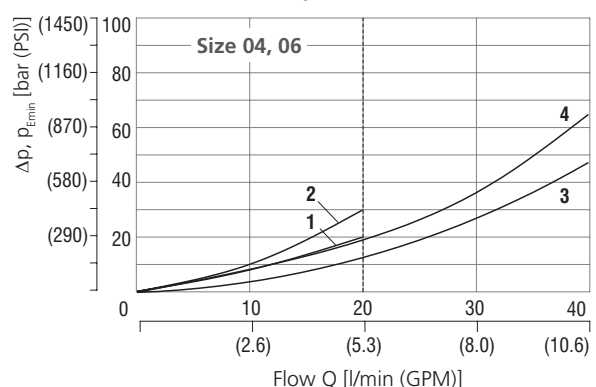
Characteristics measured at v = 32 mm²/s (156 SUS)

Relief pressure related to flow rate



Pressure range	Min. pressure setting	2	6	10	16	25	32
		1	2	3	4	5	6

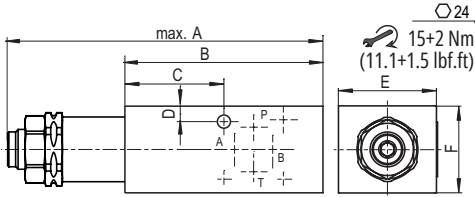
Minimum set and circulation pressure



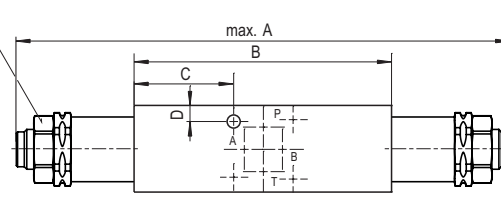
Size 04	Size 06	Models
1	3	MA, MB, MP, MD
2	4	MC, ME

Dimensions in millimeters (inches)

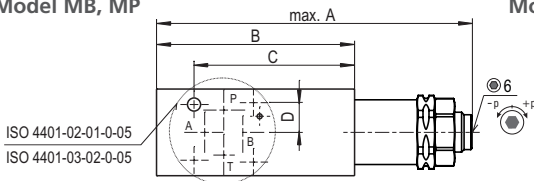
Model MA



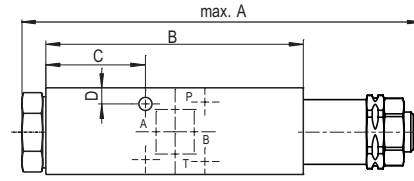
Model MC,MD



Model MB, MP

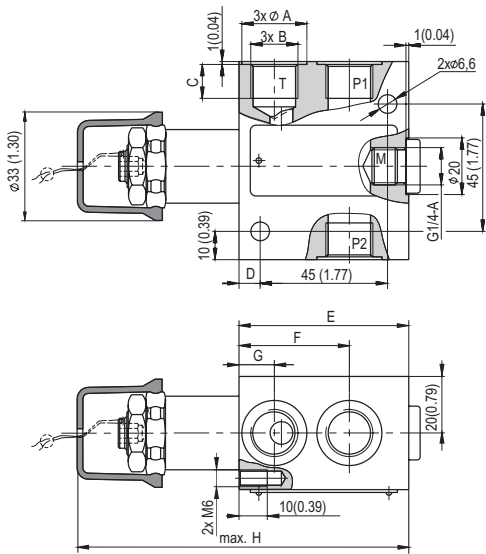


Model ME

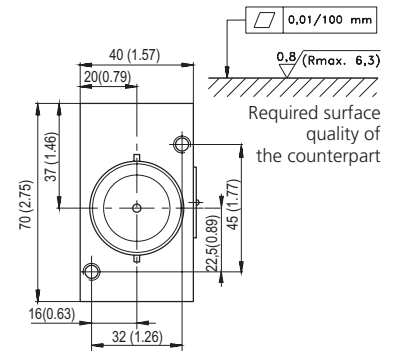
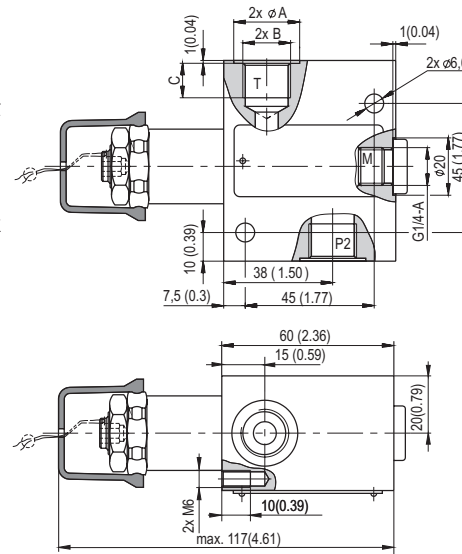


Version	Size	04 (D02)	06 (D03)
MA (B,P)	A	127 (5.00)	
MC (D)		198 (7.80)	188 (7.40)
ME		160 (6.30)	150 (5.91)
MA (B,P)	B	80 (3.15)	
MC (D,E)		104 (4.09)	94 (3.70)
MA (C,D,E)	C	40 (1.57)	25.5 (1.0)
MB (P)		64 (2.52)	68.5 (2.7)
MA (B,C) MD (E,P)	D	6.25 (0.25)	7 (0.28)
	E	35 (1.38)	40 (1.57)
	F	35 (1.38)	45 (1.77)

Model RA1, RA2



Model RB1, RB2



	RA1, RB1	RA2, RB2
A	∅ 23	∅ 28
B	G 3/8-A	G 1/2-A
C	12 (0.47)	14 (0.55)
D	7.5 (0.3)	18 (0.71)
E	60 (2.36)	70 (2.76)
F	39 (1.54)	46 (1.81)
G	12.5 (0.49)	16 (0.63)
H	117 (4.61)	127 (5)

Ordering Code

VPP2-04 / [] - [] - [] - [] - []

Pressure relief valve, poppet type, direct acting, modular

Model

modular, valve from A to T **MA**
 modular, valve from B to T **MB**
 modular, valve from P to T **MP**
 modular, valve from A to B and B to A **MC**
 modular, valve from A to T and B to T **MD**
 modular, valve from A to B **ME**
 in-line valve, three ports, thread G 3/8 (P1, P2, T) **RA1**
 in-line valve, three ports, thread G 1/2 (P1, P2, T) **RA2**
 in-line valve, two ports, thread G 3/8 (P, T) **RB1**
 in-line valve, two ports, thread G 1/2 (P, T) **RB2**

Modular plate size

ISO 4401-02-01-0-05, DIN 24340 (CETOP 02), size 04 **04**
 ISO 4401-03-02-0-05, DIN 24340 (CETOP 03), size 06 **06**

Surface treatment
 standard
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi), ISO 9227 (520 h)

Seals
 NBR
 FPM (Viton)

Adjustment option*
 allen key (hex. 6), without protective cap
RS hand screw, metal
L allen key (hex. 6), with protective cap, sealable (lockwire holes)

Model with two pressure relief cartridges
S/RS A side, allen key (hex. 6), without protective cap
 B side, hand screw, metal

*for dimensions of adjustment options see datasheet No.5093

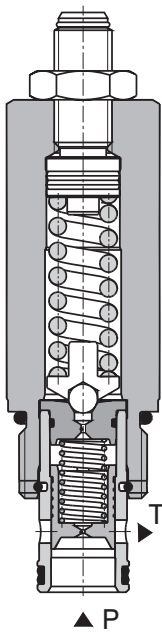
Pressure range
2 up to 25 bar (360 PSI)
6 up to 63 bar (910 PSI)
10 up to 100 bar (1450 PSI)
16 up to 160 bar (2320 PSI)
25 up to 250 bar (3630 PSI)
32 up to 320 bar (4600 PSI)

Model with two pressure relief cartridges
32/10 320 bar (4600 PSI) in port A, 100 bar (1450 PSI) in port B

Pressure Relief Valve, Spool Type, Pilot Operated

SR4A-B2

7/8-14 UNF • Q_{max} 100 l/min (26 GPM) • p_{max} 350 bar (5100 PSI)

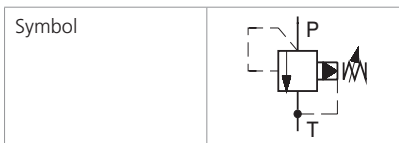


Technical Features

- › Low hysteresis, accurate pressure control and low pressure drop through CFD optimized flow paths
- › Wide pressure range up to 350 bar
- › High flow capacity
- › Hardened precision parts
- › Ideal for use as control valve where accuracy and repeatability is required
- › Adjustable by allen key hand screw
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

A pilot operated, spool type hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device. Fast-acting with low hysteresis. Because of the absence of any internal seals, the valve shows excellent reseating and repeatability characteristics. It may be used as a main pressure control element but due to its two stage design it is not recommended for safety applications where operating speed is critical.

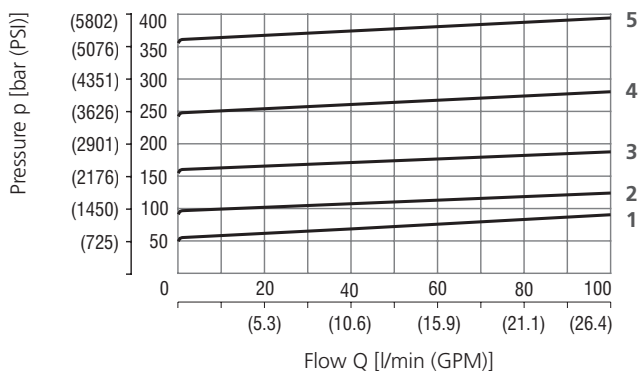


Technical Data

Valve size / Cartridge cavity		7/8-14 UNF-2A / B2 (C-10-2)	
Max. flow	l/min (GPM)	100 (26)	
Max. operating pressure	bar (PSI)	350 (5100)	
Max. pressure (T port)	bar (PSI)	100 (1450)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)	
Weight	kg (lbs)	0.24 (0.53)	
		Datasheet	Type
General information		HA 0060	Products and operating conditions
Valve bodies	In-line mounted	HA 0018	SB-B2*
	Sandwich mounted	HA 0028	SB-*B2*
Cavity details / Form tools		HA 0019	SMT-B2*
Spare parts		HA 8010	

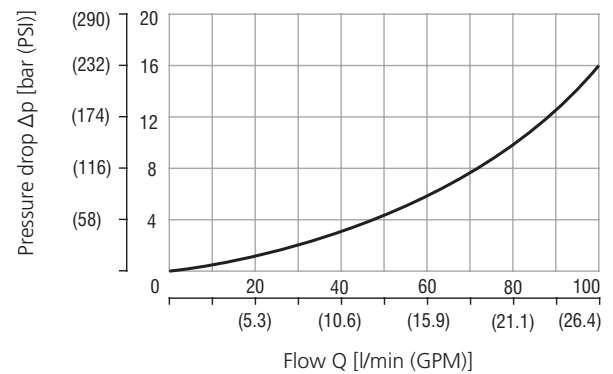
Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Relief pressure related to flow rate



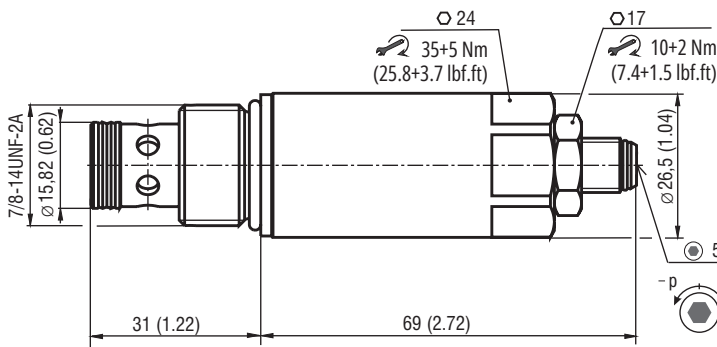
	Pressure range
5	35
4	25
3	16
2	10
1	6

Minimum set and circulation pressure

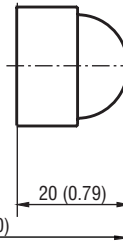


Dimensions in millimeters (inches)

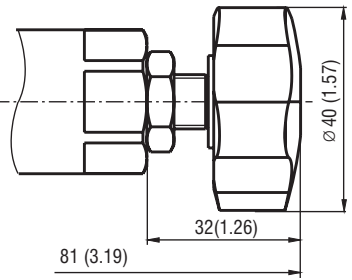
Model S



Model T



Model RP



Ordering Code

SR4A-B2 / H

Pressure relief valve, spool type, pilot operated

Valve cavity
7/8-14 UNF (C-10-2)

Model
High performance

Pressure range

up to 63 bar (910 PSI)	6
up to 100 bar (1450 PSI)	10
up to 160 bar (2320 PSI)	16
up to 250 bar (3630 PSI)	25
up to 350 bar (5080 PSI)	35

No designation
V

Surface treatment

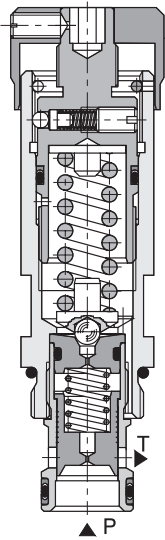
A	zinc-coated (ZnCr-3), ISO 9227 (240 h)
B	zinc-coated (ZnNi), ISO 9227 (520 h)

Seals
NBR
FPM (Viton)

Adjustment option

S	allen key (hex. 5), without protective cap
T	allen key (hex. 5), with protective cap
RP	hand screw, plastic

Model S



Technical Features

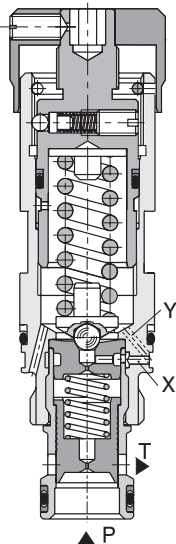
- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 320 bar
- › High flow capacity
- › Hardened precision parts
- › Ideal for use as control valve where accuracy and repeatability is required
- › External pilot and drain option
- › Adjustable by allen key or hand screw, optionally sealable (lockwire holes)
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

A pilot operated, spool type hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device. Fast-acting with low hysteresis. Because of the absence of any internal seals, the valve shows excellent reseating and repeatability characteristics. It may be used as a main pressure control element but due to its two stage design it is not recommended for safety applications where operating speed is critical. Version SX has an external pilot line, version SY allows a separate drain connection.

Model	S	SX	SY
Symbol			

Model SX (SY)



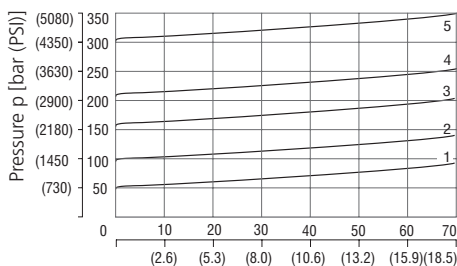
Technical Data

Valve size / Cartridge cavity		M22 x 1,5 / QG2	M22 x 1,5 / QF2
Model		S	SX, SY
Max. flow	l/min (GPM)	70 (18.5)	
Max. operating pressure	bar (PSI)	320 (4600)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)	
Weight	kg (lbs)	0.25 (0.55)	
		Datasheet	Type
General information		HA 0060	Products and operating conditions
Valve bodies	In-line mounted	HA 0018	SB-QG2*
	Sandwich mounted	HA 0028	SB-*QG2*
Cavity details		HA 0019	SMT-QG2*
Spare parts		HA 8010	

Characteristics measured at v = 32 mm²/s (156 SUS)

Relief pressure related to flow rate

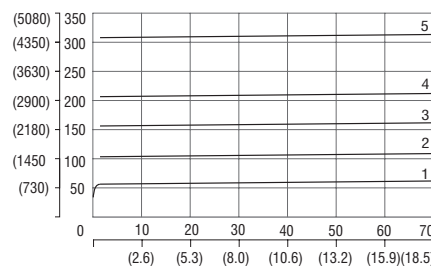
Model S, SX



	Pressure range
5	32
4	21
3	16
2	10
1	6

Relief pressure related to flow rate

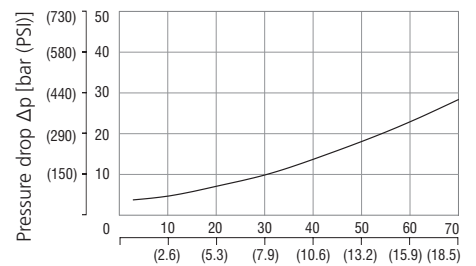
Model SY



	Pressure range
5	32
4	21
3	16
2	10
1	6

Minimum set and circulation pressure

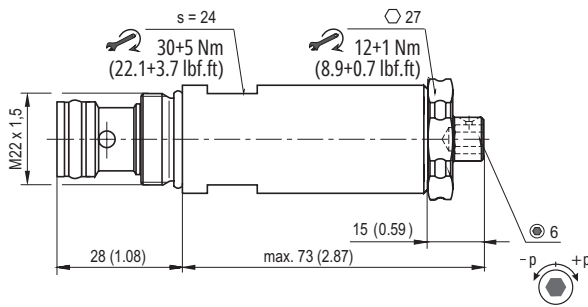
Model S, SX, SY



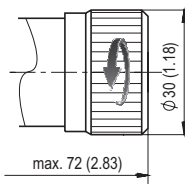
Dimensions in millimeters (inches)

VPN1-06/S

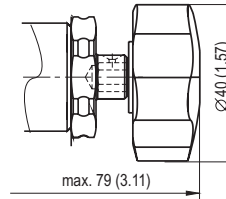
Model S



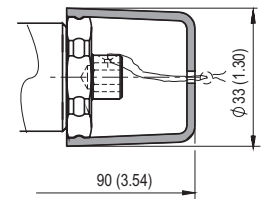
Model RS



Model RP

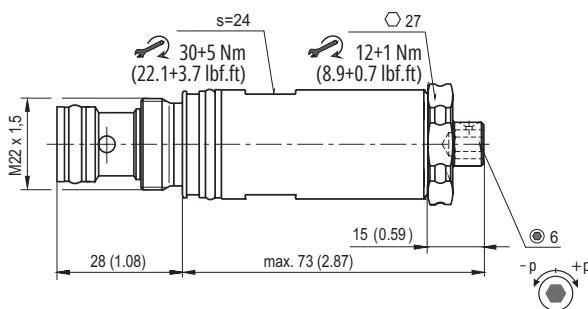


Model L

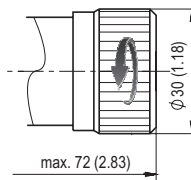


VPN1-06/SX (SY)

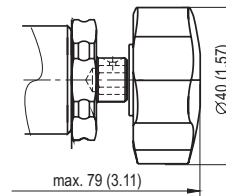
Model S



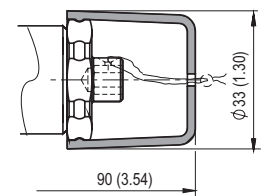
Model RS



Model RP



Model L



Ordering Code

VPN1-06 / [] - [] [] [] - []

Pressure relief valve, spool type,
pilot operated,
external pilot and drain M22 x 1,5

Model
internal pilot and drain S
external pilot, internal drain SX
internal pilot, external drain SY

Pressure range
up to 63 bar (910 PSI) 6
up to 100 bar (1450 PSI) 10
up to 160 bar (2320 PSI) 16
up to 210 bar (3050 PSI) 21
up to 320 bar (4640 PSI) 32

Surface treatment
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi, ISO 9227 (520 h)

No designation V

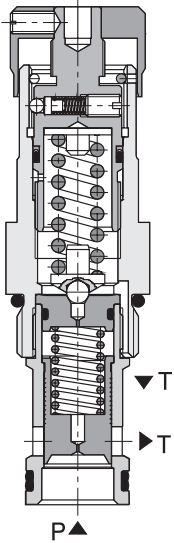
Seals
NBR
FPM (Viton)

Adjustment option
allen key (hex. 6), without protective cap
hand screw, metal
hand screw, plastic
allen key (hex. 6), with protective cap, sealable
(lockwire holes)

VPN2-10/S

M27 x 2 • Q_{max} 150 l/min (40 GPM) • p_{max} 350 bar (5100 PSI)

Model S



Technical Features

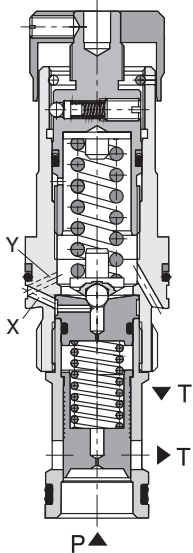
- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 350 bar
- › High flow capacity
- › Hardened precision parts
- › Ideal for use as control valve where accuracy and repeatability is required
- › External pilot and drain option
- › Adjustable by allen key or hand screw, optionally sealable (lockwire holes)
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

A pilot operated, spool type hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device. Fast-acting with low hysteresis. Because of the absence of any internal seals, the valve shows excellent reseating and repeatability characteristics. It may be used as a main pressure control element but due to its two stage design it is not recommended for safety applications where operating speed is critical. Version SX has an external pilot line, version SY allows a separate drain connection.

Model	S	SX	SY
Symbol			

Model SX (SY)



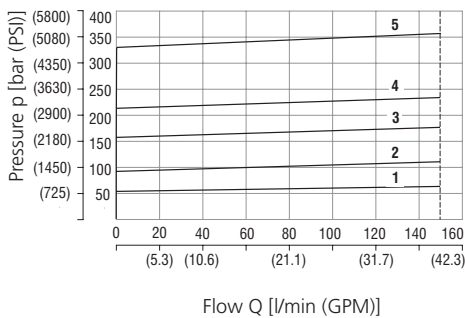
Technical Data

Valve size / Cartridge cavity		M27 x 2 / QK2	M27 x 2 / QL3
Model		S	SX, SY
Max. flow	l/min (GPM)	150 (39.6)	
Max. operating pressure	bar (PSI)	350 (5100)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)	
Weight	kg (lbs)	0.3 (0.66)	
Datasheet		Type	
General information		HA 0060	Products operating conditions
Valve bodies	In-line mounted	HA 0018	SB-QK2* SB-QL3*
	Sandwich mounted	HA 0028	SB-*QK2* -
Cavity details		HA 0019	SMT-QK2* SMT-QL3*
Spare parts		HA 8010	

Characteristics measured at v = 32 mm²/s (156 SUS)

Relief pressure related to flow rate

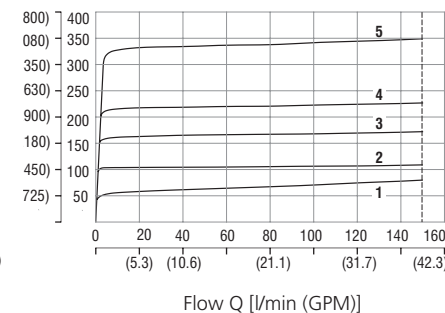
Model S, SX



	Pressure range
5	32
4	21
3	16
2	10
1	6

Relief pressure related to flow rate

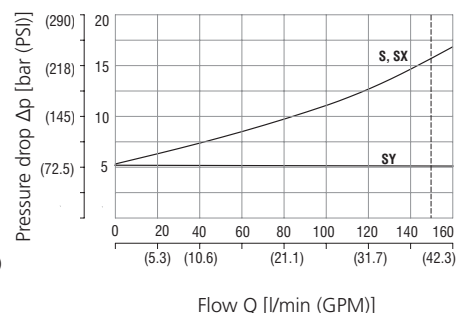
Model SY



	Pressure range
5	32
4	21
3	16
2	10
1	6

Minimum set and circulation pressure

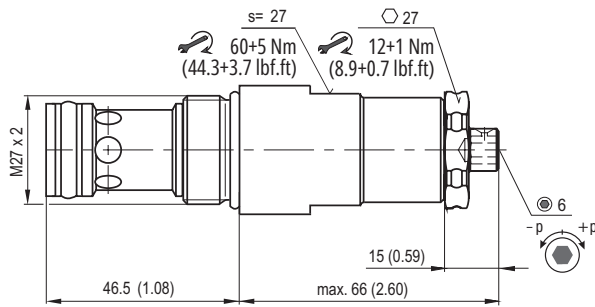
Model S, SX, SY



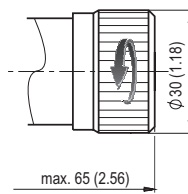
Dimensions in millimeters (inches)

VPN2-10/S

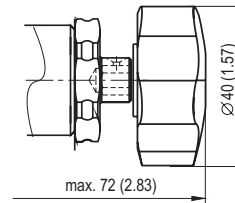
Model S



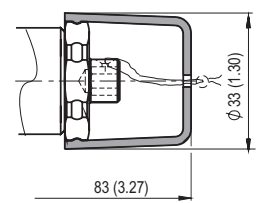
Model RS



Model RP

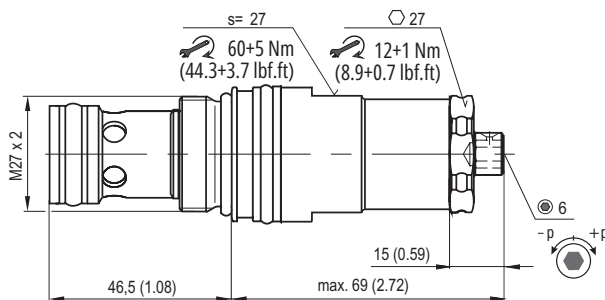


Model L

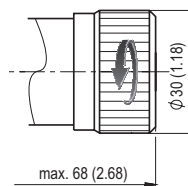


VPN2-10/SX (SY)

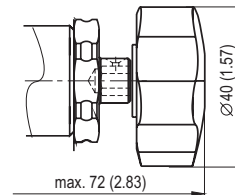
Model S



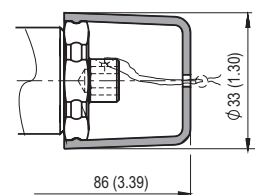
Model RS



Model RP



Model L



Ordering Code

VPN2-10 / [] - [] [] [] - []

Pressure relief valve, spool type, pilot operated, external pilot and drain M27 x 2

Model

internal pilot and drain
external pilot, internal drain
internal pilot, external drain

S
SX
SY

Pressure range

up to 63 bar (910 PSI)
up to 100 bar (1450 PSI)
up to 160 bar (2320 PSI)
up to 210 bar (3050 PSI)
up to 320 bar (4600 PSI)

6
10
16
21
32

Surface treatment

A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi, ISO 9227 (520 h)

No designation
V

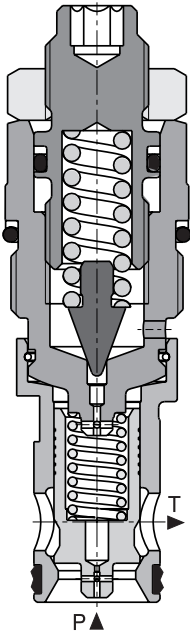
Seals

NBR
FPM (Viton)

Adjustment option

allen key (hex. 6), without protective cap
hand screw, metal
hand screw, plastic
allen key (hex. 6), with protective cap, sealable (lockwire holes)

Model S



Technical Features

- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 420 bar
- › High flow capacity
- › Hardened precision parts
- › Ideal for use as control valve where accuracy and repeatability is required
- › External pilot and drain option
- › Adjustable by allen key or hand screw, optionally sealable (lockwire holes)
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

A pilot-operated, spool-type hydraulic relief valve in the form of a screw-in cartridge intended for use as a pressure limiting device. Fast-acting with low hysteresis. Because of the absence of any internal seals, the valve shows excellent reseating and repeatability characteristics. It may be used as a main pressure control element but due to its two stage design it is not recommended for safety applications where operating speed is critical. Version SX has an external pilot line, version SY allows a separate drain connection.

Model	S	SX	SY
Symbol			

Technical Data

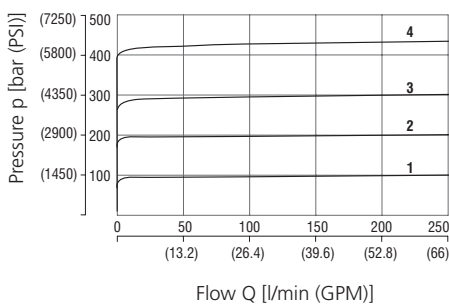
Valve size		M30 x 1,5/RB2	M30 x 1,5/RB3
Model		S, SY	SX
Max. flow	l/min (GPM)	250 (66)	
Max. pressure ports (P, X)	bar (PSI)	420 (6100)	
Max. pressure ports (T, Y)	bar (PSI)	160 (2320)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)	
Weight	kg (lbs)	0.3 (0.66)	

	Datasheet	Type	
General information	HA 0060	Products operating conditions	
Valve bodies	In-line mounted HA 0018	SB-RB2*	SB-RB3*
Cavity details	HA 0019	SMT-RB2*	SMT-RB3*
Spare parts	HA 8010		

Characteristics measured at v = 32 mm²/s (156 SUS)

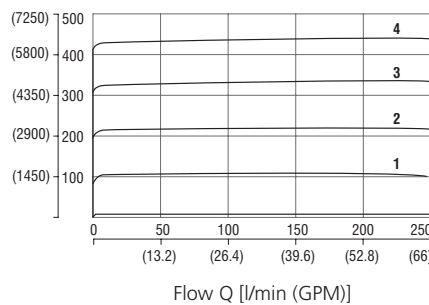
Relief pressure related to flow rate

Model S



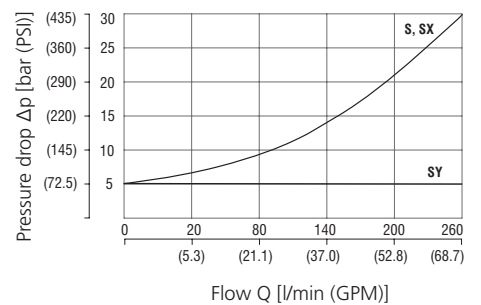
Relief pressure related to flow rate

Model SY



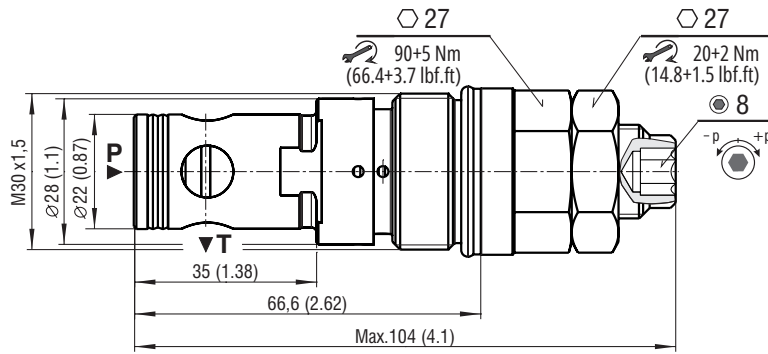
Minimum set and circulation pressure

Model S, SX, SY

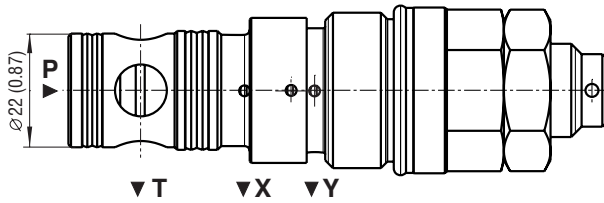


Dimensions in millimeters (inches)

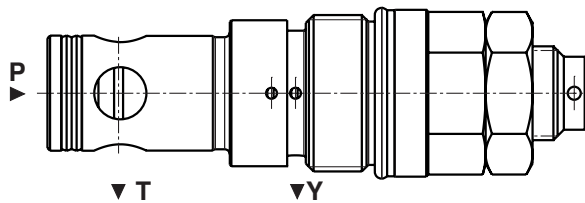
VPN1-20/S



VPN1-20/SX



VPN1-20/SY



Ordering Code

VPN1-20 / [] - 42 S [] - []

Pressure relief valve, spool-type, pilot-operated, external pilot and drain M30 x 1,5

Model
internal pilot and drain S
external pilot, external drain SX
internal pilot, external drain SY

Pressure range
10 ... 420 bar (145 ... 6100 PSI)

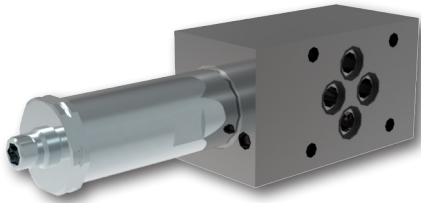
Surface treatment
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi), ISO 9227 (520 h)

Seals
No designation V NBR
FPM (Viton)

Adjustment option
allen key (hex. 6), without protective cap

VPN1-06/M(R)

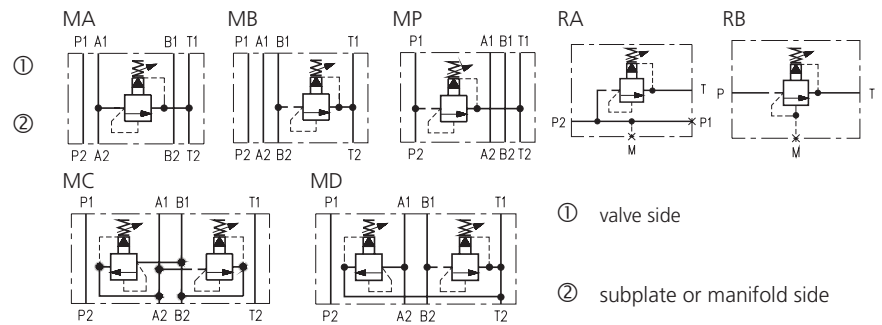
Size 04 (D02), 06 (D03) • Q_{max} 70 l/min (18.5 GPM) • p_{max} 320 bar (4600 PSI)



Technical Features

- › Pressure relief valve, spool type, pilot operated, with mounting interface acc. to ISO 4401, DIN 24340 (CETOP 02 and 03) or in-line design
- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 320 bar
- › High flow capacity
- › Hardened precision parts
- › Ideal for use as control valve where accuracy and repeatability is required
- › Adjustable by allen key or hand screw, optionally sealable (lockwire holes)
- › In the standard version, the valve housing is phosphated for basic surface corrosion protection and as preparation for painting. Steel parts are zinc-coated for 240 h salt spray protection acc. to ISO 9227
- › Enhanced surface protection for mobile sector available for the valve housing and steel parts (ISO 9227, 520 h salt spray)

Functional Symbols



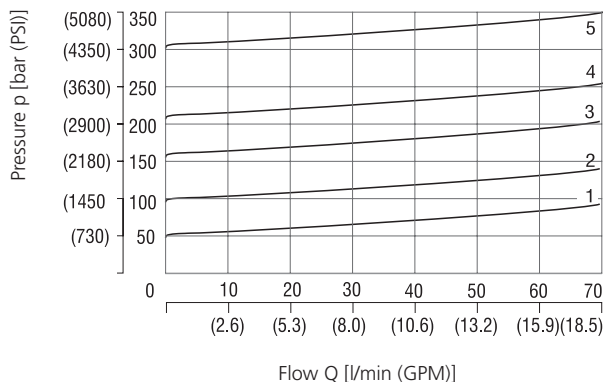
Notice: The orientation of the symbol on the name plate corresponds with the valve function.

Technical Data

Valve size	04 (D02), 06 (D03)	
Max. flow	l/min (GPM)	70 (18.5)
Max. pressure (ports P, T)	bar (PSI)	320 (4600)
Fluid temperature range (NBR)	°C (°F)	-30...+100 (-22...+212)
Fluid temperature range (FPM)	°C (°F)	-20...+120 (-4...+248)
Weight - models MA (B, P) 04	kg (lbs)	0.82 (1.81)
- models MC (D) 04		1.32 (2.91)
- models MA (B, P) 06		1.2 (2.64)
- models MC (D) 06		1.5 (3.31)
- models RA1 (2), RB1 (2)		1.25 (2.76)
	Datasheet	Type
General information	HA 0060	Products operating conditions
Mounting interface	HA 0019	Size 04 / 06
Spare parts	HA 8010	

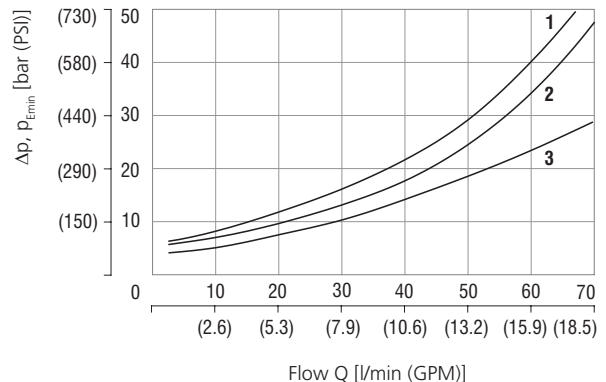
Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Relief pressure related to flow rate



Pressure range	6	10	16	21	32
	1	2	3	4	5

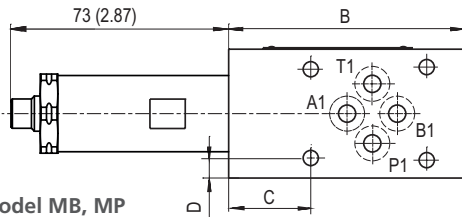
Minimum set and circulation pressure



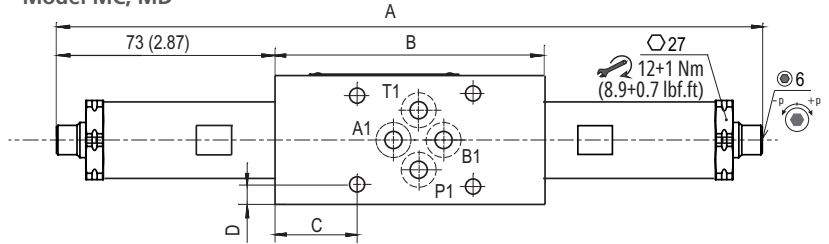
Models	MC	MA, MB, MP, MD	RA, RB
	1	2	3

Dimensions in millimeters (inches)

Model MA

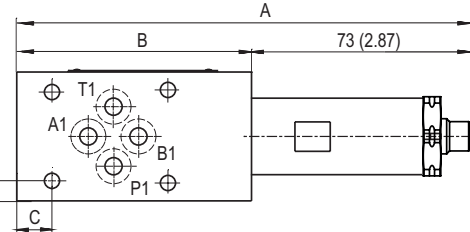


Model MC, MD

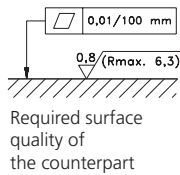


Model MB, MP

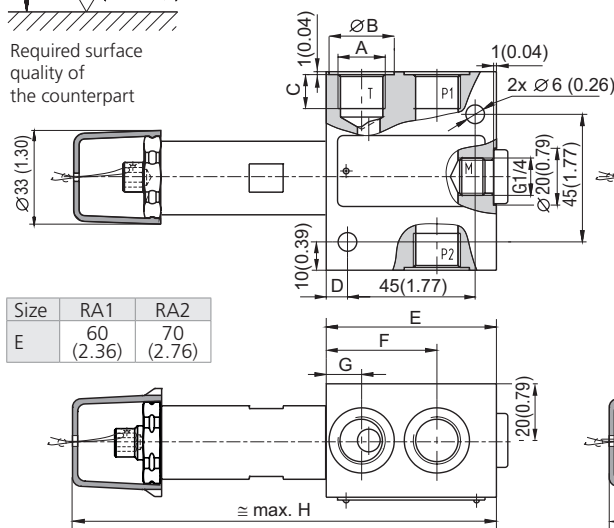
Size	04 (D02)	06 (D03)
MA, MB, MC, MD, MP		
D	6.25 (0.25)	7 (0.28)
E	34.6 (1.36)	40 (1.57)
F	35 (1.38)	45 (1.77)



Version	Size	04 (D02)	06 (D03)
MA (B,P)	A	153 (6.02)	
MC (D)		250 (9.84)	240 (9.45)
MA (B,P)	B	80 (3.15)	
MC (D)		104 (4.09)	94 (3.70)
MA (C,D)	C	40 (1.57)	25.5 (1.0)
MB (P)		16 (0.63)	11.5 (0.45)

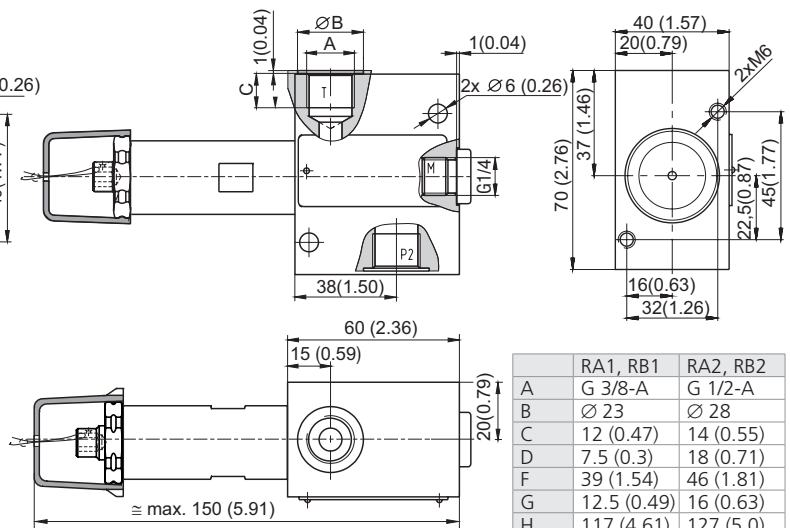


Model RA1, RA2



Size	RA1	RA2
E	60 (2.36)	70 (2.76)

Model RB1, RB2



	RA1, RB1	RA2, RB2
A	G 3/8-A	G 1/2-A
B	Ø 23	Ø 28
C	12 (0.47)	14 (0.55)
D	7.5 (0.3)	18 (0.71)
F	39 (1.54)	46 (1.81)
G	12.5 (0.49)	16 (0.63)
H	117 (4.61)	127 (5.0)

Ordering Code

VPN1-06 / [] - [] - [] - [] - []

Pressure relief valve, spool type, pilot operated, modular

Model

modular, valve from A to T **MA**
 modular, valve from B to T **MB**
 modular, valve from P to T **MP**
 modular, valve from A to B and B to A **MC**
 modular, valve from A to T and B to T **MD**
 in-line valve, three ports, thread G 3/8 (P1, P2, T) **RA1**
 in-line valve, three ports, thread G 1/2 (P1, P2, T) **RA2**
 in-line valve, two ports, thread G 3/8 (P, T) **RB1**
 in-line valve, two ports, thread G 1/2 (P, T) **RB2**

Modular plate size

ISO 4401-02-01-0-05, DIN 24340 (CETOP 02), size 04* **04**
 ISO 4401-03-02-0-05, DIN 24340 (CETOP 03), size 06 **06**

* For the modular design Dn 04, only the MP type is available.
 If you are interested in other types, please contact the manufacturer's technical department.

No designation

Surface treatment
 standard
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi, ISO 9227 (520 h))

No designation

Seals
 NBR
V FPM (Viton)

S
RS
RP
L

Adjustment option*

allen key (hex. 6), without protective cap
 hand screw, metal
 hand screw, plastic
 allen key (hex. 6), with protective cap, sealable (lockwire holes)

Model with two pressure relief cartridges

A side, allen key (hex. 6), without protective cap
 B side, hand screw, metal

*for dimensions of adjustment options see datasheet No.5161

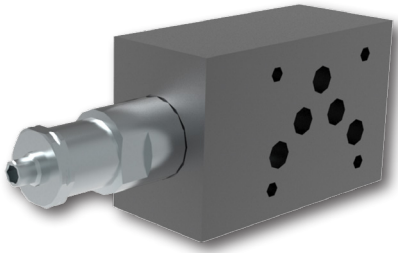
6
10
16
21
32

Pressure range

up to 63 bar (910 PSI)
 up to 100 bar (1450 PSI)
 up to 160 bar (2320 PSI)
 up to 210 bar (3050 PSI)
 up to 320 bar (4600 PSI)

VPN2-10/M(R)

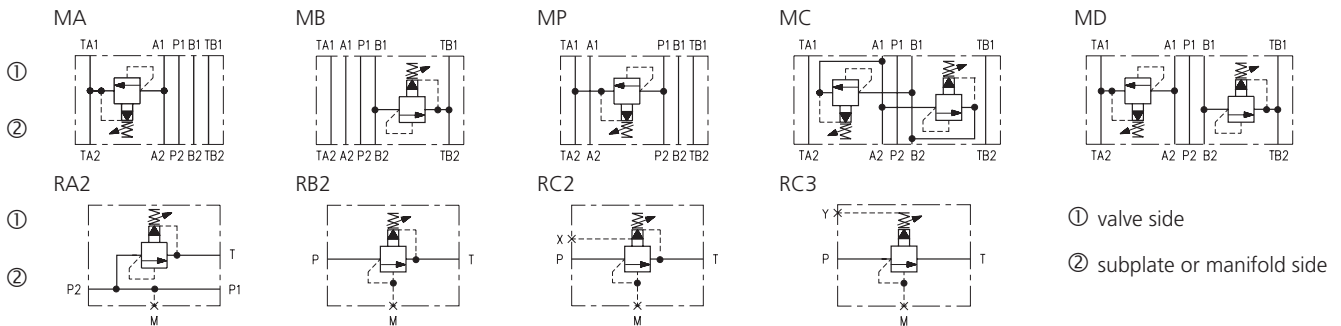
Size 10 (D05) • Q_{max} 150 l/min (40 GPM) • p_{max} 350 bar (5100 PSI)



Technical Features

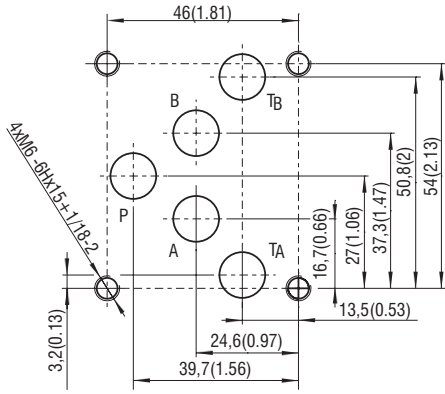
- › Pressure relief valve, spool type, pilot operated, with mounting interface acc. to ISO 4401, DIN 24340 (CETOP 05) or in-line design
- › Low hysteresis, accurate pressure control and low pressure drop
- › Wide pressure range up to 350 bar
- › High flow capacity
- › Hardened precision parts
- › Ideal for use as control valve where accuracy and repeatability is required
- › Adjustable by allen key or hand screw, optionally sealable (lockwire holes)
- › In the standard version, the valve housing is phosphated for basic surface corrosion protection and as preparation for painting. Steel parts are zinc-coated for 240 h salt spray protection acc. to ISO 9227
- › Enhanced surface protection for mobile sector available for the valve housing and steel parts (ISO 9227, 520 h salt spray)

Functional Symbols



Notice: The orientation of the symbol on the name plate corresponds with the valve function.

ISO 4401-05-04-0-05



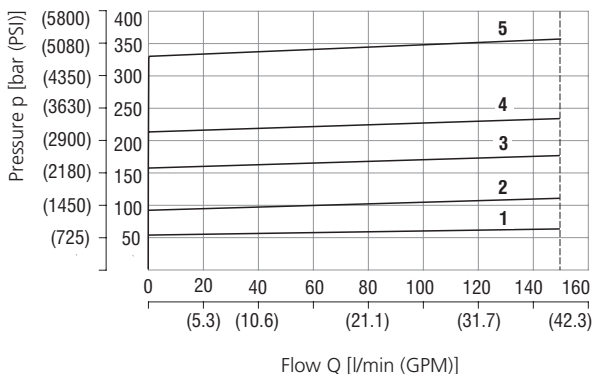
Technical Data

Valve size	10 (D05)	
Max. flow	l/min (GPM)	150 (40)
Max. operating pressure	bar (PSI)	350 (5100)
Fluid temperature range (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)
Weight - models MA (B, P) 10	kg (lbs)	2.15 (4.74)
- models MC (D) 10		3.0 (6.61)
- models RA2, RB2, RC2 (3)		2.7 (5.95)

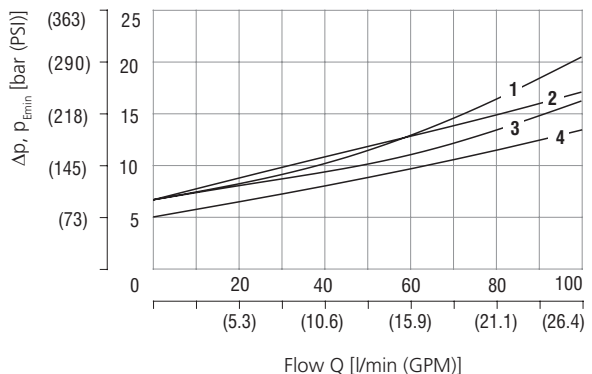
	Datasheet	Type
General information	HA 0060	Products and operating conditions
Mounting interface	HA 0019	Size 10
Spare parts	HA 8010	

Characteristics measured at v = 32 mm²/s (156 SUS)

Relief pressure related to flow rate

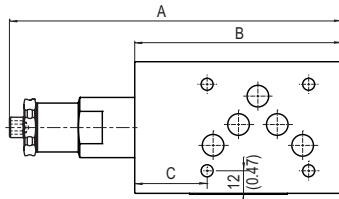


Minimum set and circulation pressure

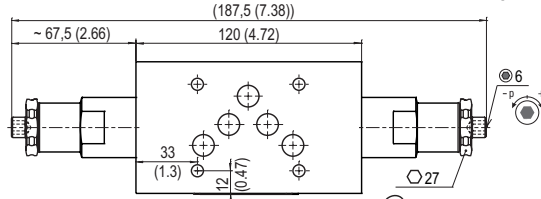


Dimensions in millimeters (inches)

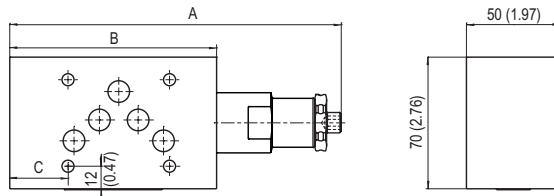
Model MA, MP



Model MC, MD



Model MB



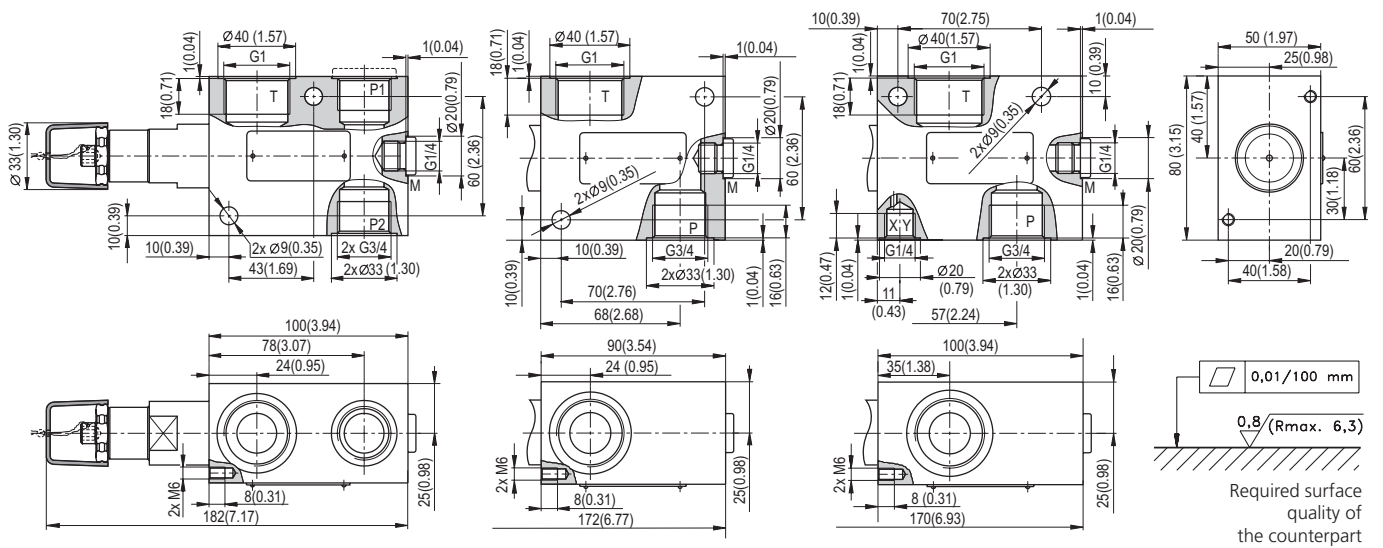
12+1 Nm
(8.9+0.7 lbf.ft)

Size 10	A	B	C
MA	172.5 (6.79)	105 (4.13)	33 (1.30)
MB			38.5 (1.52)
MP	177.5 (6.99)	110 (4.33)	18 (0.71)

Model RA2

Model RB2

Model RC2, RC3



Ordering Code

VPN2-10 / [] - [] - [] - [] - []

Pressure relief valve, spool type, pilot operated, modular

Model

modular, valve from A to TA **MA**
 modular, valve from B to TB **MB**
 modular, valve from P to TA **MP**
 modular, valve from A to B and B to A **MC**
 modular, valve from A to TA and B to TB **MD**
 in-line valve, three ports, thread P1, P2-G3/4, T-G1 **RA2**
 in-line valve, two ports, thread P-G3/4, T-G1 **RB2**
 in-line valve, two ports, thread P-G3/4, T-G1, X-G1/4 **RC2**
 in-line valve, two ports, thread P-G3/4, T-G1, Y-G1/4 **RC3**

Modular plate size

ISO 4401-05-04-0-05, DIN 24340 (CETOP 05), size 10 **10**

Surface treatment
 No designation standard
A zinc-coated (ZnCr-3), ISO 9227 (240 h)
B zinc-coated (ZnNi), ISO 9227 (520 h)

Seals
 No designation NBR
V FPM (Viton)

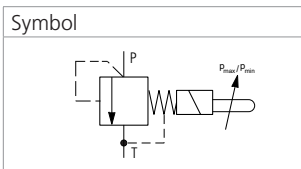
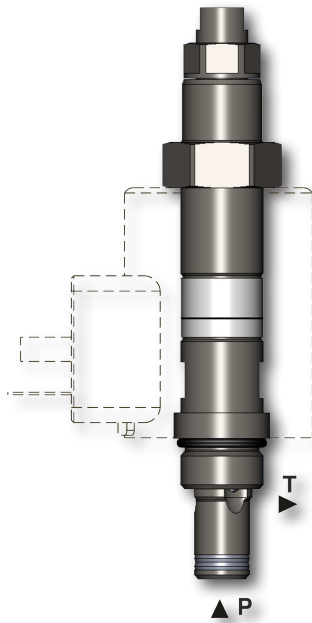
Adjustment option*
S allen key (hex. 6), without protective cap
RS hand screw, metal
RP hand screw, plastic
L allen key (hex. 6), with protective cap, sealable (lockwire holes)

Model with two pressure relief cartridges
S/RS A side, allen key (hex. 6), without protective cap
 B side, hand screw, metal

*for dimensions of adjustment options see datasheet No.5163

Pressure range
6 up to 63 bar (910 PSI)
10 up to 100 bar (1450 PSI)
16 up to 160 bar (2320 PSI)
21 up to 210 bar (3050 PSI)
32 up to 320 bar (4600 PSI)

Model with two pressure relief cartridges
32/10 320 bar (4600 PSI) in port A, 100 bar (1450 PSI) in port B



Technical Features

- › Screw-in cartridge direct acting pressure relief valve used as a pilot valve or a valve for small flow rate up to 1.5 l/min
- › Solenoid operated remote switching between minimum and maximum set pressure
- › Possible combined function of pressure relief and unloading valve
- › Five pressure ranges with a maximum settable pressure of 350 bar
- › Accurate pressure control
- › Easily interchangeable solenoid coil and easy connector positioning
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

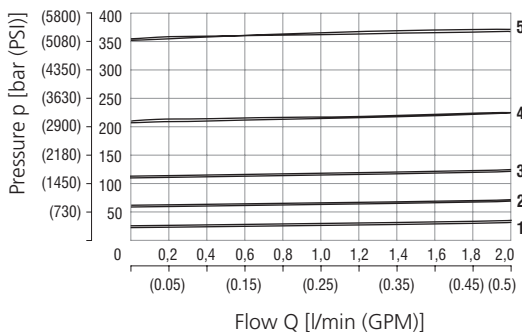
Screw-in cartridge pressure valve, direct acting, is used as a pilot valve for pressure valves SR4E2-B2 and SP4E1-B3 or as a direct acting pressure relief valve for small flow rate up to 1,5 l/min. The input system pressure is permanently compared with mechanically adjusted cracking pressure. The system pressure higher than set cracking pressure opens the valve and unloads the circuit by connection to the tank. The valve thus protects the connected circuit against pressure overloading. Additionally, it is possible to mechanically adjust two values of cracking pressure with the help of adjusting screws built into the end plug of the solenoid actuating system. The two set pressure values can be remotely switched by solenoid.
CAUTION: A pressure change in T channel will cause a change of the set cracking pressure of 1:1.

Technical Data

Valve size / Cartridge cavity		3/4-16 UNF-2A / A2 (C-8-2)	
Max. flow	l/min (GPM)	1.5 (0.40)	
Max. operating pressure (port P)	bar (PSI)	350 (5100)	
Max. operating pressure (port T)	bar (PSI)	100 (1450)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +80 (-22 ... 176)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +80 (-4 ... 176)	
Ambient temperature range (NBR)	°C (°F)	-30 ... +50 (-22 ... 122)	
Ambient temperature range (FPM)	°C (°F)	-20 ... +50 (-4 ... 122)	
Supply voltage tolerance	%	AC, DC ± 10	
Max. switching frequency	1/h	5 000	
Weight	kg (lbs)	0.44 (0.97)	
Mounting position: If possible, the valve should be mounted with the coil vertically downward.			
	Datasheet	Type	
General information	HA 0060	Products and operating conditions	
Coil types	HA 8007	C 19B*	
Valve bodies	In-line mounted	HA 0018	SB-A2*
	Sandwich mounted	HA 0028	SB-*A2*
Cavity details / Form tools	HA 0019	SMT-A2*	
Spare Parts	HA 8010		

Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

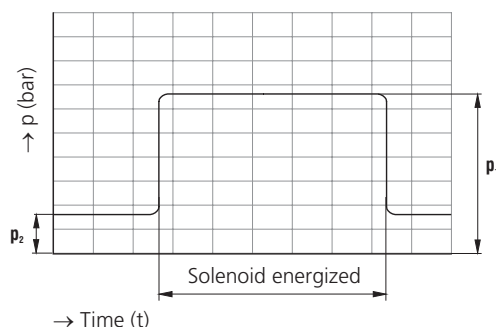
Relief pressure related to flow rate



Pressure range	3	6	12	21	35
	1	2	3	4	5

Example showing the adjustable pressures p_1 and p_2 ($p_1 \geq p_2$)

p_1 (p_{max} , relief pressure) is set as the higher working pressure (solenoid energized)
 p_2 (p_{min} , vented pressure) is set as a lower working pressure (solenoid de-energized)

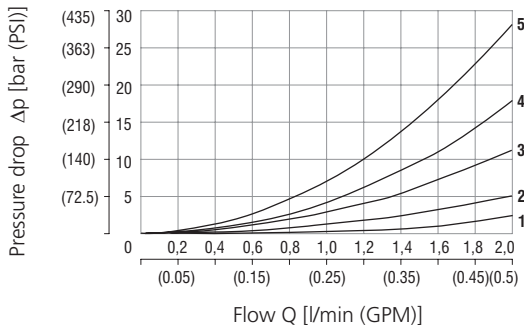


Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

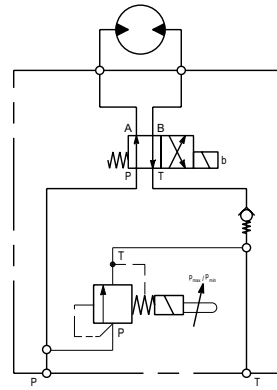
Application example

Pressure drop related to flow rate

0 % of control current, P-T direction



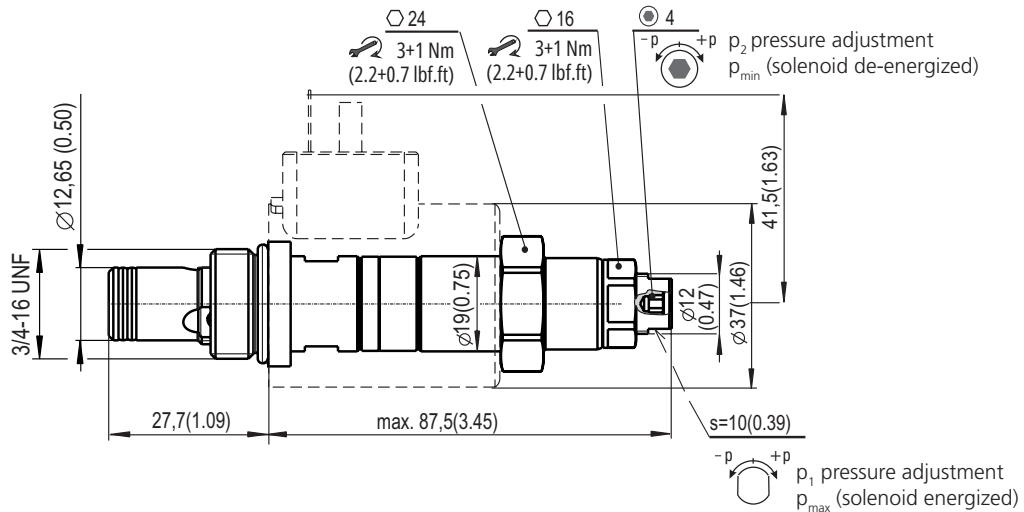
Pressure range	3	6	12	21	35
	1	2	3	4	5



The valve is used to unload a pump to tank with a very low pressure drop. This results in less heating of the oil and therefore lower energy costs for the user.

p_1 (p_{max}) must be set before p_2 (p_{min}). To set p_1 , the solenoid is energized and the pressure adjusted with a flat wrench (size 10). The solenoid is then de-energized and the lower pressure adjusted with an allen key (hex. 3).

Dimensions in millimetres (in)



Ordering Code

SR1E2 - A2 / H -

Pressure relief solenoid-operated
On/Off valve, direct acting

Valve cavity
3/4-16 UNF (C-8-2)

Model
High performance

Max. reduced pressure

up to 30 bar (435 PSI)	3
up to 60 bar (870 PSI)	6
up to 120 bar (1740 PSI)	12
up to 210 bar (3050 PSI)	21
up to 350 bar (5080 PSI)	35

No designation
V

Surface treatment

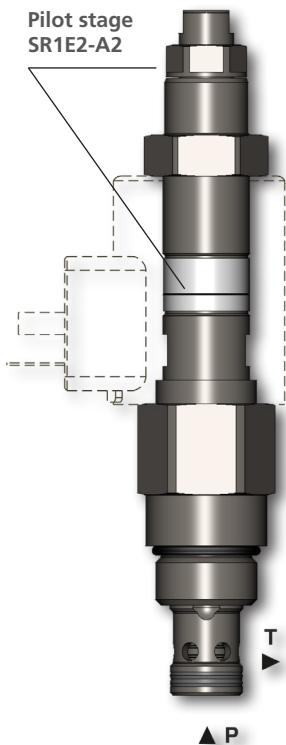
- A zinc-coated (ZnCr-3), ISO 9227 (240 h)
- B zinc-coated (ZnNi), ISO 9227 (520 h)

Seals
NBR
FPM (Viton)

Pressure relief solenoid-operated On/Off valve, piloted

SR4E2-B2

7/8-14 UNF • Q_{max} 80 l/min (21.1 GPM) • p_{max} 350 bar (5100 PSI)



Technical Features

- › Screw-in cartridge pilot operated pressure relief valve
- › Solenoid operated remote switching between minimum and maximum set pressure
- › Possible combined function of pressure relief and unloading valve
- › Five pressure ranges with a maximum settable pressure of 350 bar
- › Excellent stability throughout the flow range to 80 l/min
- › Low hysteresis and accurate pressure control
- › Easily interchangeable solenoid coil and easy connector positioning
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

Screw-in cartridge pressure relief valve, pilot operated, protects the connected circuit against pressure overloading. The input system pressure is permanently compared with mechanically adjusted cracking pressure. The system pressure higher than set cracking pressure opens the valve and unloads the circuit by connection to the tank. Additionally, it is possible to mechanically adjust two values of cracking pressure with the help of adjusting screws built into the end plug of the solenoid actuating system. The two set pressure values can be remotely switched by solenoid. When the solenoid is switched on the valve is set to maximum pressure. The maximum adjustable pressure is defined by pressure range of valve. The minimum circuit pressure can be set from 7 bar to the set maximum pressure. The valve can be used in two ways – as a switcher between two set pressure values or as a combined relief – unloading valve when one pressure value is adjusted on min. system pressure 7 bar.

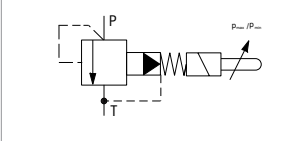
The complete valve consists of direct acting poppet valve with, main spool valve with connecting thread 7/8-14 UNF and a control solenoid with two adjusting screws.

CAUTION: A pressure change in T channel will cause a change of the set cracking pressure of 1:1.

Technical Data

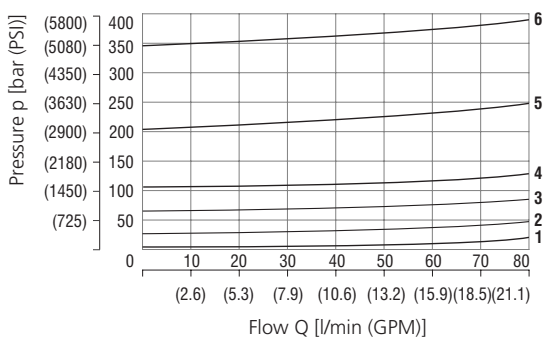
Valve size / Cartridge cavity	7/8-14 UNF-2A / B2 (C-10-2)		
Max. flow	l/min (GPM)	80 (21.1)	
Max. operating pressure	bar (PSI)	350 (5100)	
Max. pressure (port T)	bar (PSI)	100 (1450)	
Min. adjustable pressure	bar (PSI)	7 (102)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +80 (-22 ... 176)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +80 (-4 ... 176)	
Ambient temperature range (NBR)	°C (°F)	-30 ... +50 (-22 ... 122)	
Ambient temperature range (FPM)	°C (°F)	-20 ... +50 (-4 ... 122)	
Supply voltage tolerance	%	AC, DC ± 10	
Max. switching frequency	1/h	5 000	
Weight	kg (lbs)	0.57 (1.23)	
Mounting position: If possible, the valve should be mounted with the coil vertically downward.			
	Datasheet	Type	
General information	HA 0060	Products and operating conditions	
Coil types	HA 8007	C19B*	
Valve bodies	In-line mounted	HA 0018	SB-B2*
	Sandwich mounted	HA 0028	SB-*B2*
Cavity details / Form tools	HA 0019	SMT-B2*	
Spare parts	HA 8010		

Symbol



Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Relief pressure related to flow rate

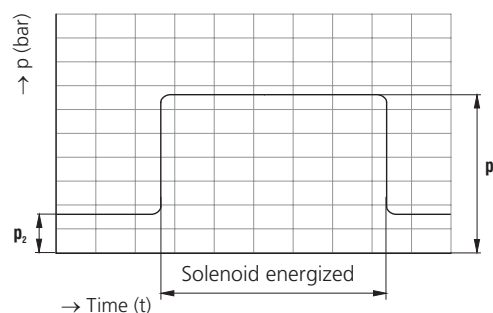


Pressure range	Min. pressure setting	3	6	12	21	35
1		2	3	4	5	6
	Solenoid de-energized	Typical performance				

Example showing the adjustable pressures p_1 and p_2 ($p_1 \geq p_2$)

p_1 (p_{max} , relief pressure) is set as the higher working pressure (solenoid energized)

p_2 (p_{min} , vented pressure) is set as a lower working pressure (solenoid de-energized)

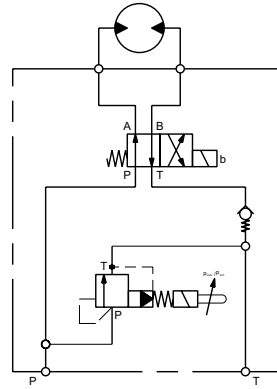
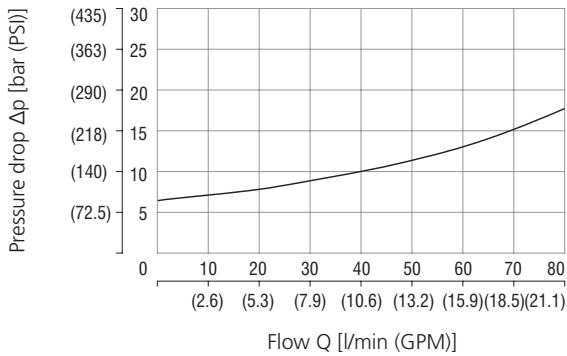


Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Application example

Pressure drop related to flow rate

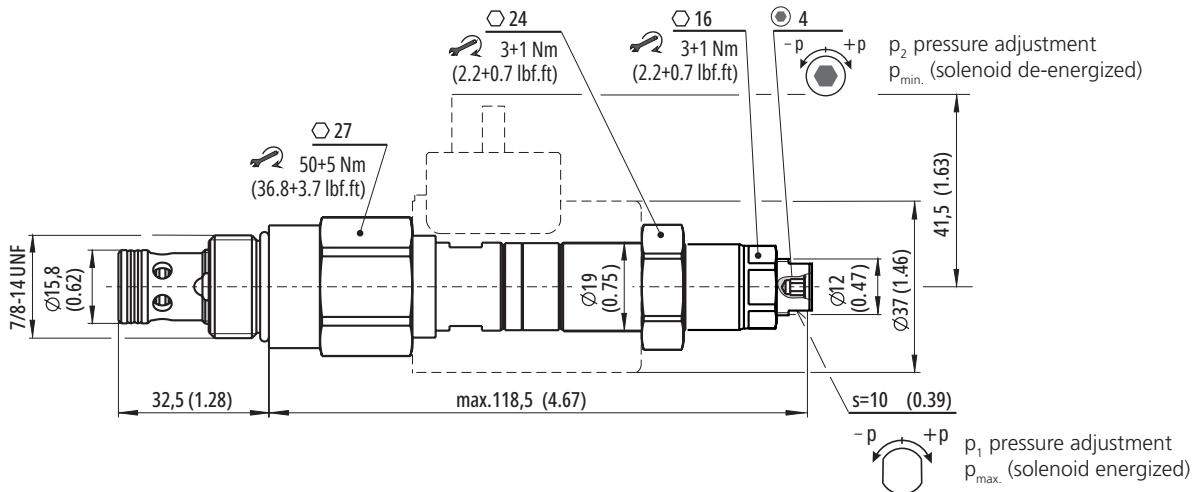
0 % of control current, P-T direction



The valve is used to unload a pump to tank with a very low pressure drop. This results in less heating of the oil and therefore lower energy costs for the user.

p_1 (p_{max}) must be set before p_2 (p_{min}). To set p_1 , the solenoid is energized and the pressure adjusted with a flat wrench (size 10). The solenoid is then de-energized and the lower pressure adjusted with an allen key (hex. 4).

Dimensions in millimeters (inches)



Ordering Code

SR4E2 - B2 / H [] [] - []

Pressure relief solenoid-operated On/Off valve, piloted

Valve cavity
7/8-14 UNF (C-10-2)

Model
High performance

Max. reduced pressure

up to 30 bar (440 PSI)	3
up to 60 bar (870 PSI)	6
up to 120 bar (1740 PSI)	12
up to 210 bar (3050 PSI)	21
up to 350 bar (5080 PSI)	35

Surface treatment

A	zinc-coated (ZnCr-3), ISO 9227 (240 h)
B	zinc-coated (ZnNi), ISO 9227 (520 h)

No designation
V

Seals
NBR
FPM (Viton)

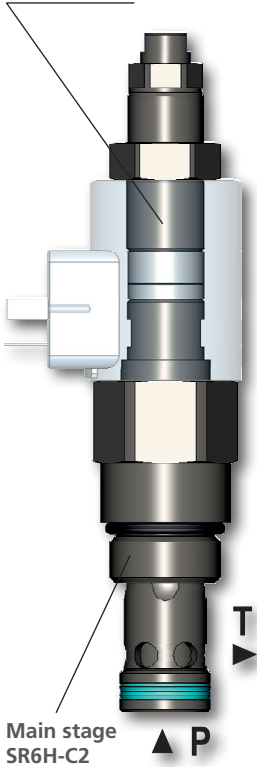
Factory setting:

If the valve does not have a specific setting in accordance with the customer's order, standard valves are set to a minimum value of approx 7 bar after function tests.

SR4E2-C2

1 1/16-12 UN • Q_{max} 180 l/min (48 GPM) • p_{max} 350 bar (5100 PSI)

Pilot stage
SR1E2-A2



Main stage
SR6H-C2

Technical Features

- › Screw-in cartridge pilot operated pressure relief valve
- › Solenoid operated remote switching between minimum and maximum set pressure
- › Possible combined function of pressure relief and unloading valve
- › Five pressure ranges with a maximum settable pressure of 350 bar
- › Excellent stability throughout the flow range to 180 l/min
- › Low hysteresis and accurate pressure control
- › Easily interchangeable solenoid coil and easy connector positioning
- › The valve is zinc-coated with corrosion protection 520 h in NSS acc. to ISO 9227

Functional Description

Screw-in cartridge pressure relief valve, pilot operated, protects the connected circuit against pressure overloading. The input system pressure is permanently compared with mechanically adjusted cracking pressure. The system pressure higher than set cracking pressure opens the valve and unloads the circuit by connection to the tank. Additionally, it is possible to mechanically adjust two values of cracking pressure with the help of adjusting screws built into the end plug of the solenoid actuating system. The two set pressure values can be remotely switched by solenoid. When the solenoid is switched on the valve is set to maximum pressure. The maximum adjustable pressure is defined by pressure range of valve. The minimum circuit pressure can be set from 2.5 bar to the set maximum pressure. The valve can be used in two ways – as a switcher between two set pressure values or as a combined relief – unloading valve when one pressure value is adjusted on min. system pressure 2.5 bar.

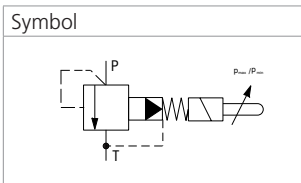
The complete valve consists of direct acting poppet valve with, main spool valve with connecting thread 1 1/16-12 UN and a control solenoid with two adjusting screws.

CAUTION: A pressure change in T channel will cause a change of the set cracking pressure of 1:1.

Technical Data

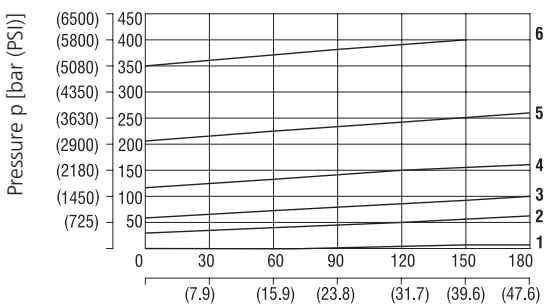
Valve size / Cartridge cavity		1 1/16-12 UN-2A / C2 (VC12-2)	
Max. flow	l/min (GPM)	180 (47.6)	
Max. operating pressure	bar (PSI)	350 (5100)	
Max. pressure (port T)	bar (PSI)	100 (1450)	
Min. adjustable pressure	bar (PSI)	2.5 (36.3)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +80 (-22 ... 176)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +80 (-4 ... 176)	
Ambient temperature range (NBR)	°C (°F)	-30 ... +50 (-22 ... 122)	
Ambient temperature range (FPM)	°C (°F)	-20 ... +50 (-4 ... 122)	
Supply voltage tolerance	%	AC, DC ± 10	
Max. switching frequency	1/h	5 000	
Weight	kg (lbs)	0.69 (1.52)	
Mounting position: If possible, the valve should be mounted with the coil vertically downward.			
	Datasheet	Type	
General information	HA 0060	Products and operating conditions	
Coil types	HA 8007	C 19B*	
Valve bodies	In-line mounted	HA 0018	SB-C2*
	Sandwich mounted	HA 0028	SB-*C2*
Cavity details / Form tools	HA 0019	SMT-C2*	
Spare parts	HA 8010		

Symbol



Characteristics measured at v = 32 mm²/s (156 SUS)

Relief pressure related to flow rate

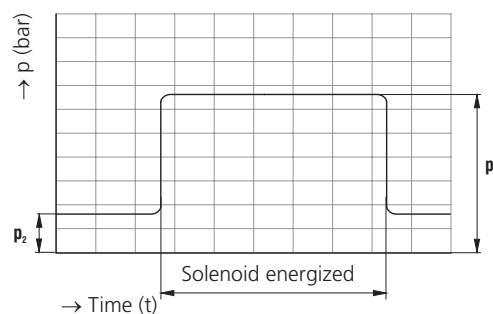


Pressure range	Min. pressure setting	3	6	12	21	35
1	2	3	4	5	6	
Solenoid de-energized		Typical performance				

Example showing the adjustable pressures p₁ and p₂ (p₁ ≥ p₂)

p₁ (p_{max}, relief pressure) is set as the higher working pressure (solenoid energized)

p₂ (p_{min}, vented pressure) is set as a lower working pressure (solenoid de-energized)

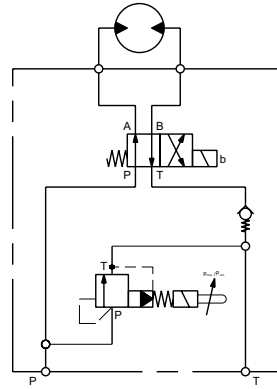
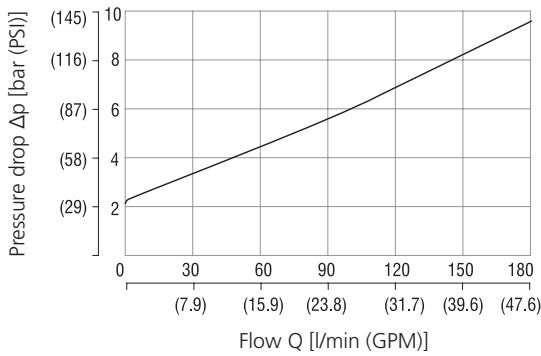


Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Application example

Pressure drop related to flow rate

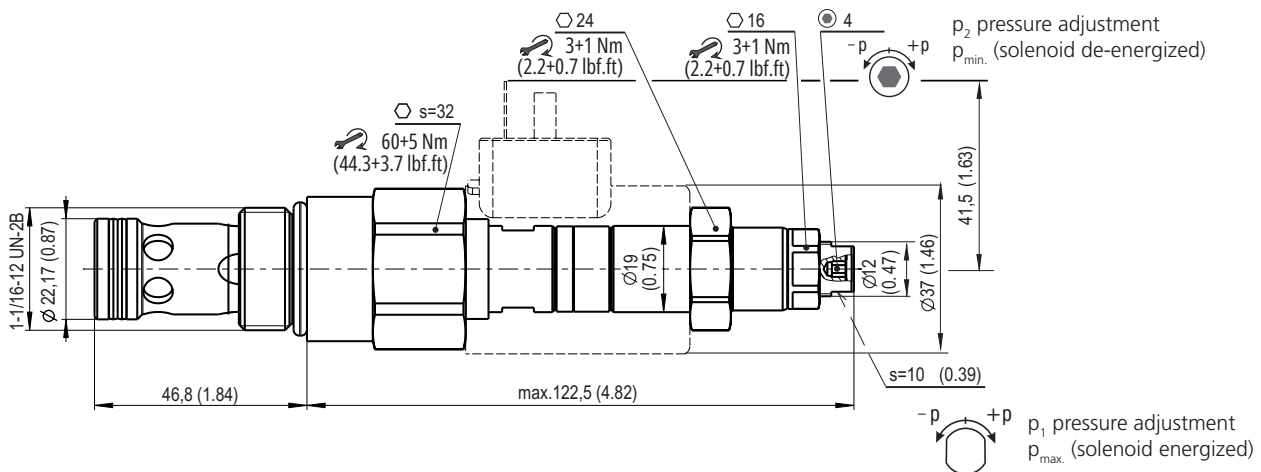
0 % of control current, P-T direction



The valve is used to unload a pump to tank with a very low pressure drop. This results in less heating of the oil and therefore lower energy costs for the user.

p_1 (p_{max}) must be set before p_2 (p_{min}). To set p_1 , the solenoid is energized and the pressure adjusted with a flat wrench (size 10). The solenoid is then de-energized and the lower pressure adjusted with an allen key (hex. 3).

Dimensions in millimeters (inches)



Ordering Code

SR4E2 - C2 / H **- B**

Pressure relief solenoid-operated On/Off valve, piloted

Valve cavity
1 1/16-12 UN (VC12-2)

Model
High performance

Pressure range

up to 30 bar (440 PSI)	3
up to 60 bar (870 PSI)	6
up to 120 bar (1740 PSI)	12
up to 210 bar (3050 PSI)	21
up to 350 bar (5080 PSI)	35

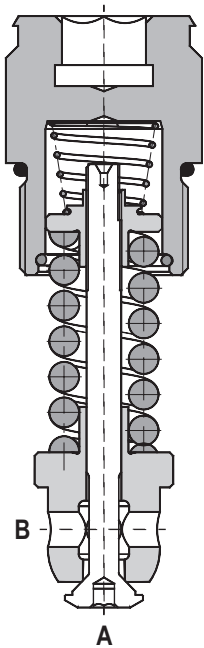
Surface treatment
zinc-coated (ZnNi), ISO 9227 (520 h)

No designation
V

Seals
NBR
FPM (Viton)

Factory setting:

If the valve does not have a specific setting in accordance with the customer's order, standard valves are set to a minimum value of approx 2.5 bar after function tests.

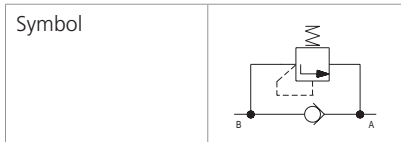


Technical Features

- › Excellent stability throughout flow range with rapid response to dynamic pressure changes
- › Low hysteresis, accurate pressure control and low pressure drop through CFD optimized flow paths
- › Adjustable pressure range 160-480 bar
- › Factory pre-set, non adjustable version only
- › Hardened precision parts
- › Sharp-edged steel seats for dirt-tolerant performance
- › Leak-free closing, suitable for fast cycling with long life
- › One-way bypass valve with suction function
- › In the standard version, the valve is zinc-coated for 240 h protection acc. to ISO 9227. Enhanced surface protection for mobile sector available for the steel parts (ISO 9227, 520 h salt spray)

Functional Description

A direct acting, poppet type hydraulic relief valve in the form of a screw-in cartridge with reverse flow check intended for use as a pressure limiting and anti-cavitation device for common hydraulic circuit protection. The spring acts on the poppet and presses it on the valve seat. If the hydraulic pressure is below the pre-set value, the valve is closed. If the hydraulic force exceeds the pre-set value, the valve opens and flow passes to the tank port until the system pressure drops below the spring pre-set value and the valve closes again.



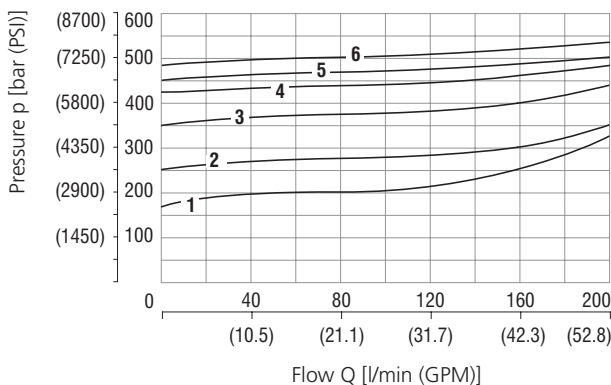
Technical Data

Valve size / Cartridge cavity		M24 x 1,5 / QH2
Max. flow	l/min (GPM)	200 (52.8)
Max. operating pressure	bar (PSI)	480 (7000)
Fluid temperature range (NBR)	°C (°F)	-30... + 100 (-22 ... +212)
Fluid temperature range (FPM)	°C (°F)	-20 ... +120 (-4 ... +248)
Weight	kg (lbs)	0.16 (0.36)
	Datasheet	Type
General information	HA 0060	Products and operating conditions
Cavity details	HA 0019	SMT-QH2*
Spare parts	HA 8010	

Characteristics measured at $v = 32 \text{ mm}^2/\text{s}$ (156 SUS)

Relief pressure related to flow rate

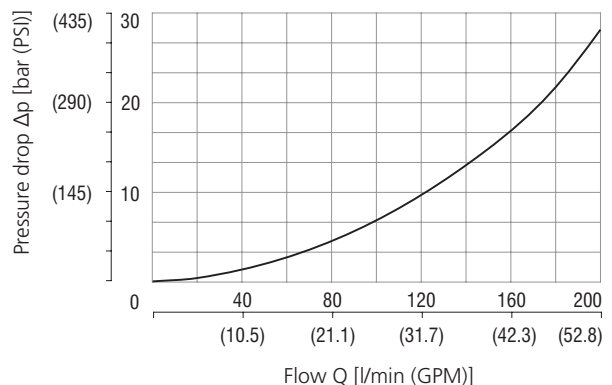
Pressure relief function, flow direction 2 - 1



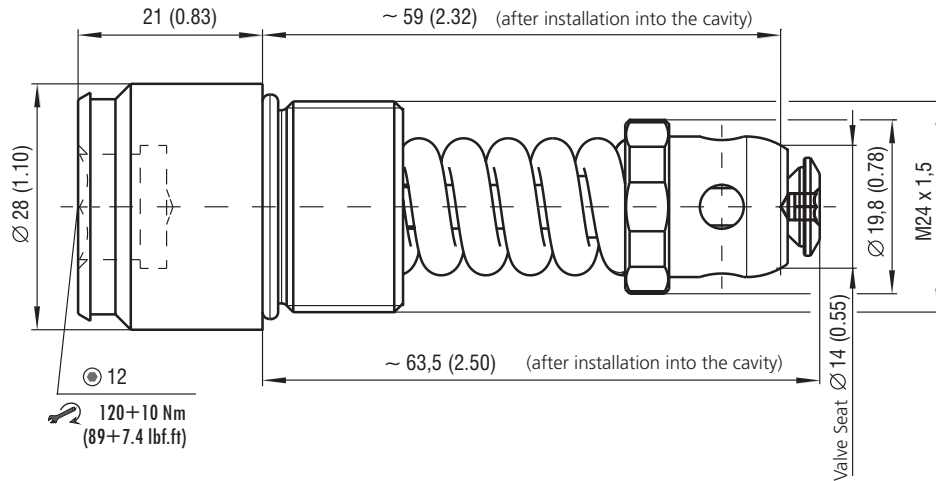
Pressure range					
1	2	3	4	5	6
160	250	350	420	450	480

Pressure drop related to flow rate

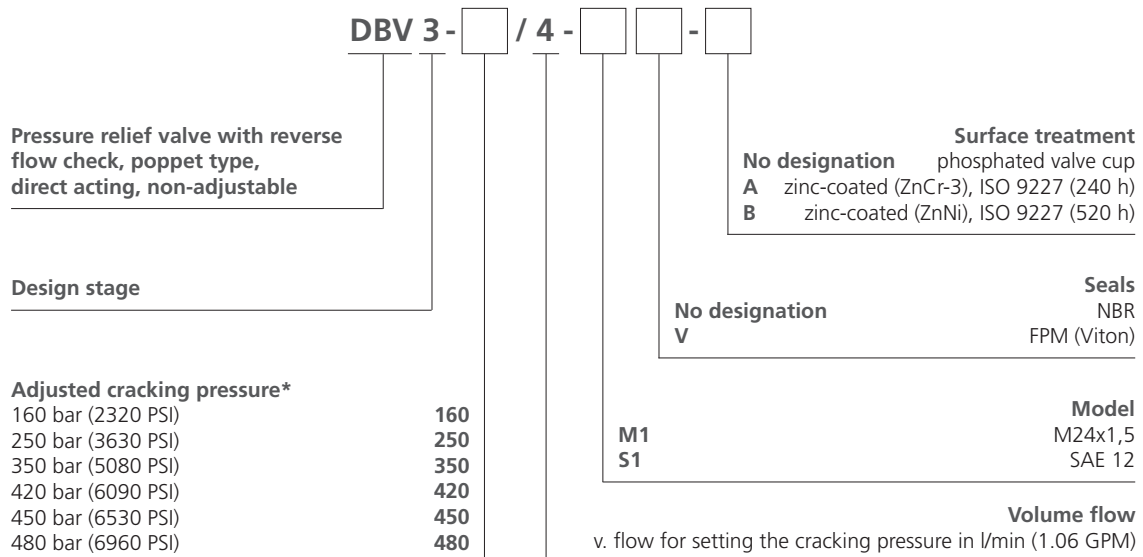
Check valve function, flow direction 1 - 2



Dimensions in millimeters (inches)



Ordering Code



*All standard valves settings are at flow 4 l/min (1.06 GPM)