brevini

CARTRIDGE VALVES / IN-LINE VALVES

Technical Catalogue

August
2017

web edition

The company

Dana Brevini Fluid Power, part of the Dana group, was established in 2003 in Reggio Emilia where it has its head office.
Dana Brevini Fluid Power manufactures hydraulic components and application packages: a very large range suited to several operational requirements and applications thanks to a strict interaction between mechanical, hydraulic and electronic components.
Dana Brevini Fluid Power is among the top manufacturers in Italy and a major player in Europe and in the world.

International presence

Dana Brevini Fluid Power operates internationally with 15 branches all over the world placed in major industrialized countries: Italy, France, Germany, English, Romania, Holland, Finland, China, India, Singapore and the United States. The network is constantly expanding by opening new branches in just a few years.
The branches are guided by managers that have an excellent knowledge of their own country.
The advantages this brings are evident:

- Reduced delivery times thanks to the branches warehouses;
- Easy customization of products and systems basing on the customer's needs, thanks to the competence and professional skills of the branches' own technical and servicing departments;
- Quick servicing;
- A ready sales staff at hand and closer to the customers, which ensures high flexibility plus experience.

The production facilities are located throughout Reggio Emilia, Ozzano Emilia (BO), Noceto (PR), Novellara (RE), Yancheng (province of Jiangsu, China) which was inaugurated in 2009 and became operative since 2010.

Competitive Strategy

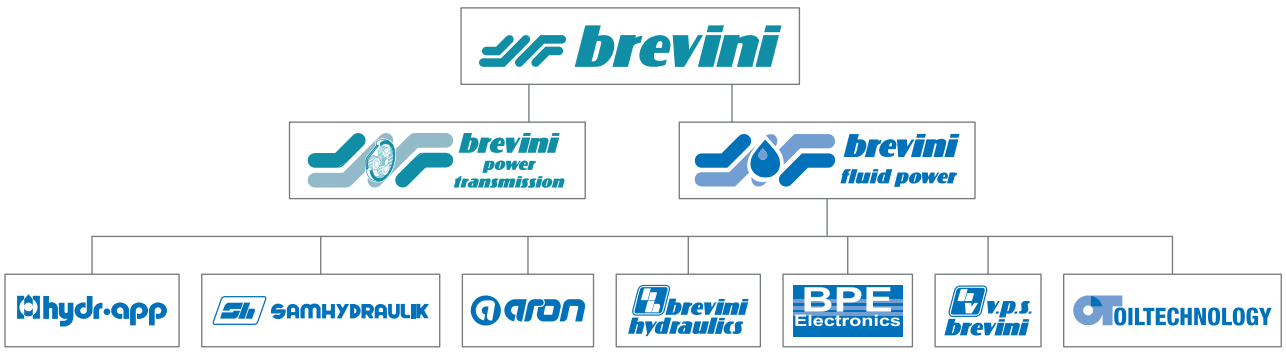
Innovation combined with the focus on customers is the strength of the Dana Brevini Fluid Power "brand", born from the forty-year-long experiences of Aron, Hydr-App, SAM Hydraulik, Oleodinamica Reggiana, VPS Brevini and Brevini Hydraulics.
Dana Brevini Fluid Power proposes itself as a "local hub", as it happened to BPE Electronics in 2008 and OT Oiltechnology in 2009, in order to create a new Made in Italy global player in the world of hydraulics, increasingly more integrated with electronics.
The purpose is still the development of a very large range of products forming together integrated packages able to meet various application needs. Our ten-year-long partnership relations with hundreds of customers all over the world are the best synthesis of Dana Brevini Fluid Power's operational philosophy.

Sharing of know-how and several experiences have made Dana Brevini Fluid Power a more global company, more incisive in international markets and closer to its customers.

Product lines

The product lines are numerous and well-structured aimed to cover every needs: a strong basis on which to develop the engineering of application packages and complete systems. The offer is improving in the direction of a solution supplier often developed in co-design with the customer, both for the mobile and industrial sector.

Hydr-App Product Line: Hydraulic power packs and mini hydraulic packs (whether standard or customised), cartridge valves and solenoid valves, gear boxes and transmission components.
S.A.M. Hydraulik Product Line: Axial piston pumps and motors for medium and high pressure, orbital motors.
Aron Product Line: Directional, flow, on-off and proportional pressure control valves. Modular and cartridge valves, subplates and blocks.
Brevini Hydraulics Product Line: Proportional directional valves, joysticks and electronic modules.
BPE Electronics Product Line: Sensors, load cells, boards and electronic controls via CAN, display units, planarity indicators.
VPS Brevini Product Line: Mono-block and modular mobile valves.
OT Oiltechnology Product Line: Gear pumps and motors, flow dividers.



Section index

The products shown on this catalog are parts of hydr-app line.

1 PRESSURE RELIEF VALVES (PAGE 13)

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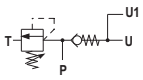
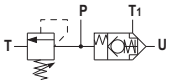
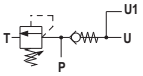
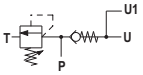
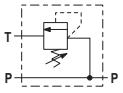
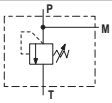
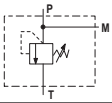
CMP-HPV	M14x1.5	5		DIRECT ACTING PRESSURE RELIEF VALVES (FOR HPV VALVES)	14
CMP-MR/MW	M15x1	6		DIRECT ACTING PRESSURE RELIEF VALVES (FOR POWER PACKS SERIES MR/MW)	15
CMP02	M16x1	20		DIRECT ACTING PRESSURE RELIEF VALVES	16
CMP04	3/4-16UNF	30		DIRECT ACTING PRESSURE RELIEF VALVES	17
CMPR04 (serie 2)	3/4-16UNF	30		DIRECT ACTING PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE	18
CPMK04	3/4-16UNF	10		DIRECT ACTING PRESSURE RELIEF VALVES WITH LOGIC VALVE	20
CMPR04 (serie 1)	3/4-16UNF	20		DIRECT ACTING PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE	22
CMPHR04	3/4-16UNF	15		DIRECT ACTING HIGH PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE	23
CPMC04	M18x1.5	30		DIRECT ACTING PRESSURE RELIEF VALVES	24
CMP-MC/MS	M18x1.5	20		DIRECT ACTING PRESSURE RELIEF VALVES (FOR POWER PACKS SERIES MC/MS)	25
CMP06	M20x1.5	30		DIRECT ACTING PRESSURE RELIEF VALVES	26
CP06	7/8-14UNF	50		DIRECT ACTING PRESSURE RELIEF VALVES	27
CMP20	M33x2	80		DIRECT ACTING PRESSURE RELIEF VALVES	28
CMP30	M22x1.5	100		PILOT OPERATED PRESSURE RELIEF VALVES	29
VMP02	1/4" BSP	30		DIRECT ACTING PRESSURE RELIEF VALVES **IN-LINE MOUNTING**	30
VMP06	3/8" BSP	50		DIRECT ACTING PRESSURE RELIEF VALVES **IN-LINE MOUNTING**	31
VMP10	3/8" BSP	40		DIRECT ACTING PRESSURE RELIEF VALVES **IN-LINE MOUNTING**	32

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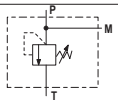
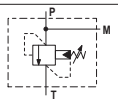
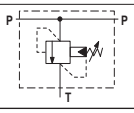
Code	Thread	Flow (l/min)	Symbol	Description	Page
VMP20	1/2" BSP	80		VALVOLE DI MASSIMA PRESSIONE AD AZIONE DIRETTA **MONTAGGIO IN LINEA**	33
VMP30	3/4" BSP	100		VALVOLE DI MASSIMA PRESSIONE AD AZIONE PILOTATA **MONTAGGIO IN LINEA**	34
VMP12	BSP: 3/4" - 1"	150		VALVOLE DI MASSIMA PRESSIONE AD AZIONE PILOTATA **MONTAGGIO IN LINEA**	35

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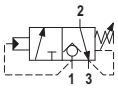
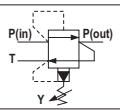
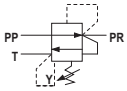
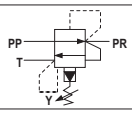
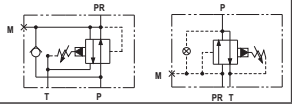
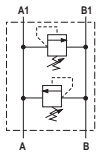
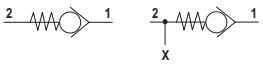
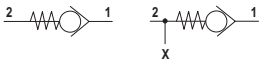
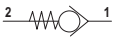
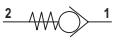
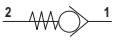
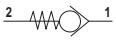
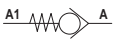
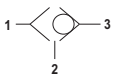
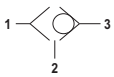
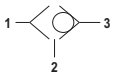
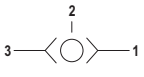
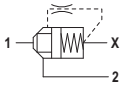
Code	Thread	Flow (l/min)	Symbol	Description	Page
CSQ04	3/4-16UNF	30		SEQUENCE VALVES - DIRECTLY OPERATED	38
CSMK04	3/4-16UNF	10		SEQUENCE VALVES - DIRECTLY OPERATED (FOR MK3 SERIES POWER PACKS)	39
CVS20	M22x1.5	90		SEQUENCE VALVES - PILOT OPERATED	40
CVR06	7/8-14UNF	20		PRESSURE REDUCING VALVES WITH RELIEVING - DIRECT OPERATED	41
CVR20	M22x1.5	150		PRESSURE REDUCING VALVES WITH RELIEVING - PILOT OPERATED	42
CVE06	7/8-14UNF	30		SEQUENCE VALVES	43
CRC1	1/2" BSP	90		PRESSURE REDUCING AND SEQUENCE VALVES **IN-LINE MOUNTING**	44

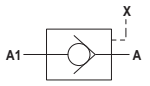
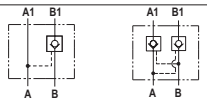
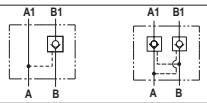
3 DOUBLE CROSS RELIEF VALVES (PAGE 45)

Code	Thread	Flow (l/min)	Symbol	Description	Page
VADIL	BSP: 1/4" - 3/8"	30		DOUBLE CROSS RELIEF VALVES DIRECT ACTING **IN-LINE MOUNTING**	46

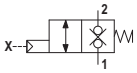
4 ONE-WAY CHECK VALVES (PAGE 47)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CRU-MR	M15x1	10		ONE-WAY CHECK VALVES	48
CRU-MC/MS	M16x1.5	20		ONE-WAY CHECK VALVES	49
CRU04	3/4-16UNF	40		ONE-WAY CHECK VALVES	50
CRU06	7/8-14UNF	60		ONE-WAY CHECK VALVES	51
CRI04	3/4-16UNF	20		ONE-WAY CHECK VALVES (FOR POWER PACKS SERIES FP)	52
VR06	3/8" BSP	30		ONE-WAY CHECK VALVES	53
VUI	BSP: 1/4" - 3/8" - 1/2"	20 - 50 - 80		ONE-WAY CHECK VALVES	54
VRU	BSP: 1/4" - 3/8" 1/2" - 3/4 - 1" 1" 1/4 - 1" 1/2	20 - 35 - 50 80 - 140 200 - 310		ONE-WAY CHECK VALVES **IN-LINE MOUNTING**	55
VUBA	BSP: 1/4" - 3/8" 1/2" - 3/4	4 - 6.3 16 - 25		CHECK VALVES FOR PIPES	56
SH01	M8x1	2		SHUTTLE VALVES	58
SH02	1/8" BSP	8		SHUTTLE VALVES	59
SH03	1/4" BSP	5		SHUTTLE VALVES	60
RVLV0	M16x1.5	7		SHUTTLE VALVES	61
RVLV1	M27x1.5	140		PUMP UNLOADING VALVES	62

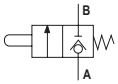
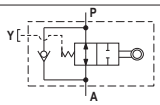
5 PILOT CHECK VALVES (PAGE 63)

Code	Thread	Flow (l/min)	Symbol	Description	Page
VRS	1/4" BSP BSP: 1/4"-3/8"-1/2"-3/4"	12 - 30 45 - 85		SINGLE ACTING PILOTED CHECK VALVES	64
VBPSA-VBPDA	BSP: 1/4" - 3/8" 1/2" - 3/4" 9/16-18 UNF	20 - 25 45 - 85		SINGLE AND DOUBLE ACTING PILOT CHECK VALVES	65
VBPSA-VBPDA DIN	BSP: 1/4" - 3/8"	20 - 25		SINGLE AND DOUBLE ACTING PILOT CHECK VALVES-DIN 2353 PORTS	67

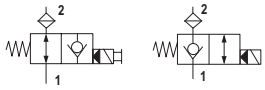
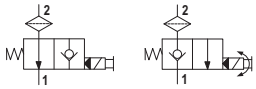
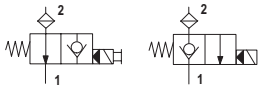
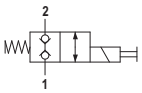
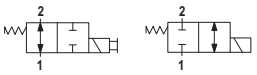
6 MANUAL AND PNEUMATIC OPERATED VALVES (PAGE 69)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CMF04	3/4-16UNF	15		LEVER OPERATED VALVES	70
CPE04	3/4-16UNF	30		BUTTON OPERATED VALVES	71
CRD04P	3/4-16UNF	30		PNEUMATIC OPERATED VALVES	72

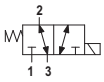
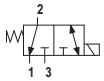
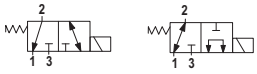
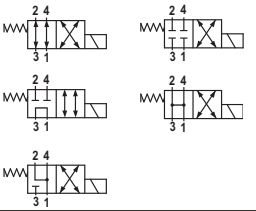
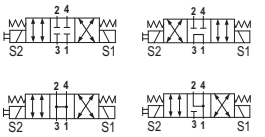
7 END-OFF STROKE VALVES (PAGE 73)

Code	Thread	Flow (l/min)	Symbol	Description	Page
VFC	3/8" BSP	40		END-OFF STROKE VALVES **IN-LINE MOUNTING**	74
VD40	1/2" BSP	40		DECELERATION VALVES **IN-LINE MOUNTING**	75

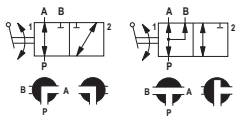
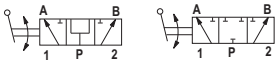
8 SOLENOID VALVES 2-WAY (PAGE 77)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CRB04	3/4-16UNF	40		PILOTED OPERATED CARTRIDGE SOLENOID VALVE BIDIRECTIONAL	78
CRP04	3/4-16UNF	40		PILOTED OPERATED CARTRIDGE SOLENOID VALVE UNIDIRECTIONAL	78
CRP04HP	3/4-16UNF	30		HIGH PRESSURE PILOTED OPERATED CARTRIDGE SOLENOID VALVE	80
CRP04X	3/4-16UNF	20		VALVES IN ACCORDANCE WITH ATEX 94/9/CE DIRECTIVE	82
CRD04	3/4-16UNF	15 - 30		DIRECT OPERATED CARTRIDGE SOLENOID VALVE	84
C2V04	3/4-16UNF	15		CARTRIDGE SOLENOID VALVES 2 WAY 2 POSITIONS	86

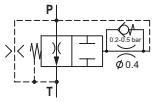
9 SOLENOID VALVES 3-4 WAY (PAGE 87)

Code	Thread	Flow (l/min)	Symbol	Description	Page
C3V0422	3/4-16UNF	12		SOLENOID VALVES 3-WAY/2-POSITION	88
C3V0427	3/4-16UNF	20		SOLENOID VALVES 3-WAY/2-POSITION	89
C3V03	7/8-14UNF	20		SOLENOID VALVES 3 WAY 2 POSITIONS	90
C4V0422*2	3/4-16UNF	18		SOLENOID VALVES 4 WAY 2 POSITIONS	91
C4V0422*3	3/4-16UNF	18		SOLENOID VALVES 4 WAY 3 POSITIONS	92

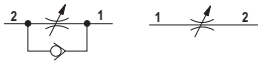
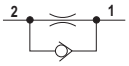
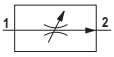
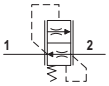
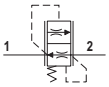
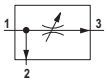
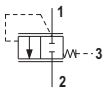
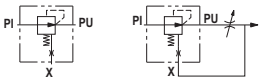
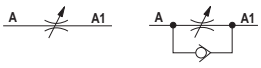
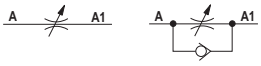
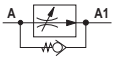
11 DIVERTER VALVES (PAGE 93)

Code	Thread	Flow (l/min)	Symbol	Description	Page
MR	1/4" BSP 1/4"BSPT	—		PRESSURE GAUGE SHUT-OFF **IN-LINE MOUNTING**	94
RBS	BSP: 1/8" - 1/4" 3/8"- 1/2" - 3/4" 1" - 1"1/4 - 1"1/2	5 - 10 - 25 40 - 100 - 150		HIGH PRESSURE - 2 WAY BALL VALVES **IN-LINE MOUNTING**	95
BK3	BSP: 1/8" - 1/4" 3/8" - 1/2" - 3/4" 1" - 1"1/4 - 1"1/2	5 - 10 - 25 70 - 100 - 150		HIGH PRESSURE - 3 WAY BALL VALVES **IN-LINE MOUNTING**	96
DDF	BSP: 1/4" - 3/8" 1/2" - 3/4" - 1"	60 - 90 120 - 200		DIVERTER VALVES **IN-LINE MOUNTING**	97

12 SOFT START VALVES (PAGE 99)

Code	Thread	Flow (l/min)	Symbol	Description	Page
VAM04	1/4" BSP	20		SINGLE-PHASE MOTOR START VALVE **IN-LINE MOUNTING**	100
VAMS04	1/4" BSP	8		SOFT START VALVE **IN-LINE MOUNTING**	101

13 FLOW CONTROL VALVES (PAGE 103)

Code	Thread	Flow (l/min)	Symbol	Description	Page
SU/SB	M10x1	15		UNIDIRECTIONAL AND BIDIRECTIONAL FLOW REGULATOR VALVES	104
VSU	1/4" BSP	20		FIXED UNIDIRECTIONAL FLOW CONTROL VALVE	105
CSB04	3/4-16UNF	40		BIDIRECTIONAL NOT COMPENSATED FLOW CONTROL VALVE	106
CSC04	3/4-16UNF	29		UNIDIRECTIONAL COMPENSATED FLOW CONTROL VALVE	107
VSC04	1/4" BSP	11,7		FIXED PRESSURE COMPENSATED FLOW CONTROL VALVE	108
VSC06	3/8" BSP	18,5		PRESSURE COMPENSATED FLOW CONTROL VALVES	109
CRF06	7/8-14UNF	50		PRIORITARY FLOW CONTROL VALVE	110
CCI06	7/8-14UNF	80		PRESSURE COMPENSATOR VALVE	111
CCP20	M22x1.5	50		TWO-WAY PRESSURE COMPENSATOR VALVE	112
VSR/VSB	BSP: 1/4" - 3/8" 1/2" - 3/4" - 1"	15 - 30 45 - 85 - 100		SLEEVE FLOW CONTROL VALVES UNIDIRECTIONAL AND BIDIRECTIONAL - **IN-LINE MOUNTING**	113
STU/STB	BSP: 1/4" - 3/8" 1/2" - 3/4" - 1"	20 - 30 50 - 85 - 150		UNIDIRECTIONAL AND BIDIRECTIONAL FLOW REGULATOR VALVES - **IN-LINE MOUNTING**	114
STC	3/8" BSP	29		PRESSURE COMPENSATED FLOW UNIDIRECTIONAL FLOW REGULATOR VALVES - **IN-LINE MOUNTING**	115

14 HAND PUMPS (PAGE 117)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CPM04	3/4-16UNF	1cc - 2cc		HAND PUMP	118

Cartridge valves / In-line valves

INTRODUCTION

Read this instructions carefully before installation. All operations must be carried out by qualified personnel following the instructions.

The user must periodically inspect, based on the conditions of use and the substances used, the presence of corrosion, dirt, the state of wear and correct function of the valves.

Always observe first the operating conditions given in datasheet of the valve.

HYDRAULIC FLUID

Observe the recommendations given in the data sheet of the valve. Use only mineral oil (HL, HLP) according to DIN 51524. Use of other different fluids may damage the good operation of the valve.

VISCOSITY

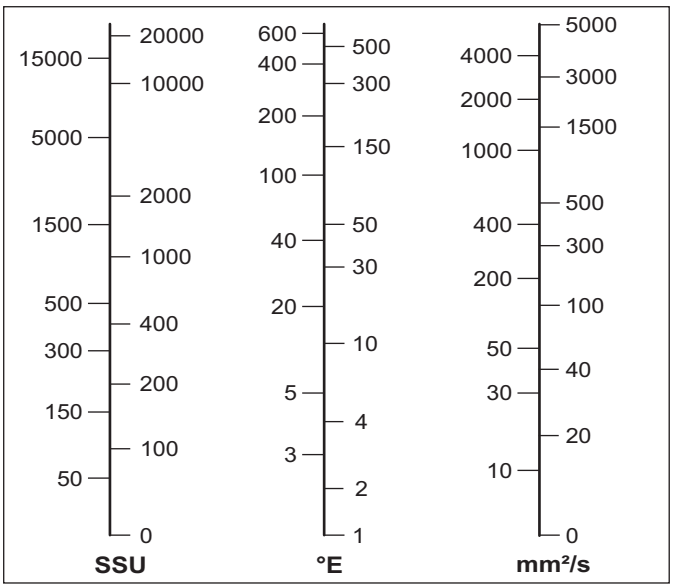
Observe the recommendations given in the data sheet of the valve.The oil viscosity must be in the range of 10 mm²/s to 500 mm²/s.
Recommended oil viscosity 46 mm²/s (32 mm²/s for Cartridge valves)

Table 1: ISO viscosity grades

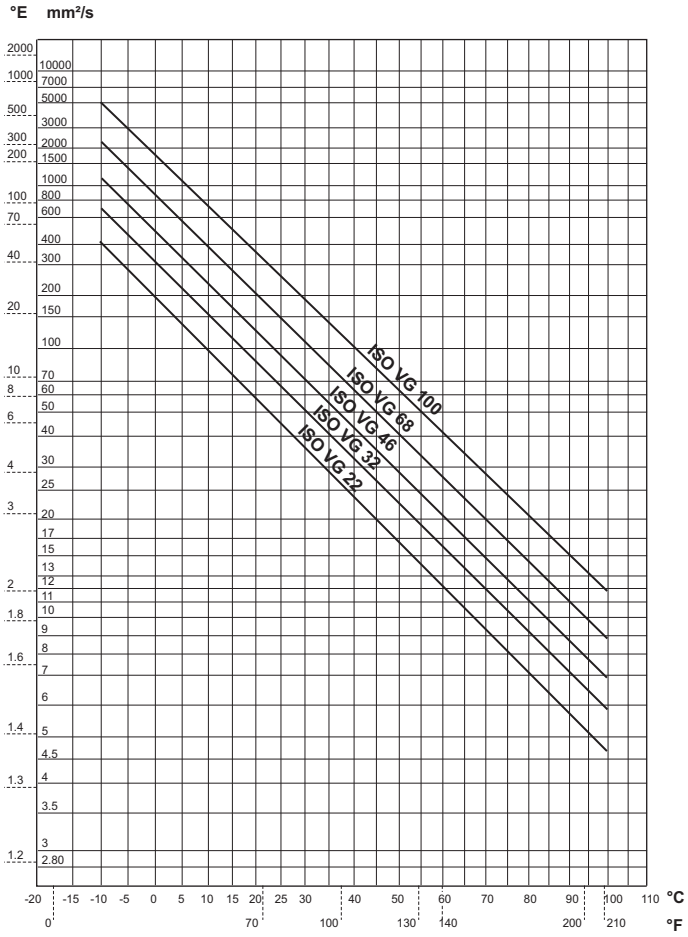
Viscosity grade	Average kinematic viscosity mm²/s @ 40°C	Kinematic-viscosity limits mm²/s @ 40°C	
		min.	max.
ISO VG 10	10	9.00	11.0
ISO VG 15	15	13.5	16.5
ISO VG 22	22	19.8	24.2
ISO VG 32	32	28.8	35.2
ISO VG 46	46	41.4	50.6
ISO VG 68	68	61.2	74.8
ISO VG 100	100	90.0	110

= Values used in the chart "Oil viscosity according to temperature"

CONVERSION TABLE SSU / °E / mm²/s



OIL VISCOSITY ACCORDING TO TEMPERATURE



CONTAMINATION

Oil contamination is the main cause of faults and malfunction in hydraulic systems. Abrasive particles in the fluid erode or block moving parts, leading to system malfunction.
The valves we are offering do not require filtering characteristics any higher than those needed for usual hydraulic components such as pumps, motors, etc.

However, accurate filtering does guarantee reliability and a long life to all the system's hydraulic parts. Reliable performance and long working life for all oil-pressure parts is assured by maintaining the level of fluid contamination within the limits specified in the data sheet of the valve.

Hydraulic fluid must also be cleaned properly before filling the hydraulic circuit, especially when commissioning a new system, as this is when the oil contamination generally peaks due to its flushing effect on the components, and the running-in of the pump.
Maximum contamination level is required on datasheet of the valve according to ISO 4406:1999.

In the following table there is the correspondence between ISO 4406:1999 and old standard NAS 1638 for information purpose:
The standard ISO 4406:1999 defines the contamination level with three numbers that relate with the number of particles of average dimension equal or greater than 4 µm, 6 µm e 14 µm, in 1 ml of fliuid.

In following table there is a reference to reccomended contamination level and correspondence with old NAS 1638 standard.

Table 2: Reccomanded contamination level.

Type of system Type of valve	Oil filtration recommendations		
	Cleanliness class recommended		Absolute filtration micron rating (**)
	ISO 4406 : 1999	NAS 1638 (*)	
Systems or components operating at HIGH PRESSURE > 250 bar (3600 psi) HIGH DUTY CYCLE APPLICATIONS Systems or components with LOW dirt tolerance	18 / 16 / 13	7 - 8	5
Systems or components operating at MEDIUM / HIGH PRESSURE Systems and components with moderate dirt tolerance	19 / 17 / 14	9	10
Systems or components operating at LOW PRESSURE < 100 bar (1500 psi) LOW DUTY CYCLE APPLICATIONS Systems and components with GOOD dirt tolerance	20 / 18 / 15	10 - 11	20

* Contamination class NAS 1638: it is determined by counting the total particles of different size ranges contained in 100 ml of fluid.

** Absolute filtration: it is a characteristic of each filter, it refers the size (in micron) of the largest sperical particle wich may pass through the filter.

WORKING TEMPERATURES

Ambient temperature range: -25°C to +60°C
Fluid temperature range (NBR seals): -25°C to +75°C
Thermal shocks can affect the performance and the expected life of the product, hence it is necessary to protect the product from these conditions.

SEALS

O-rings made in Acrylonitrile Butadiene (NBR) are normally fitted on the valves. The backup rings that protect the O-rings are also made in NBR, or sometimes PTFE. Both the O-rings and the backup rings are suitable for the working temperatures mentioned above.
In the case of fluid temperatures > 75°C, FKM seals must be used (identified with "V1" variant).

ELECTRICAL POWER SUPPLY

Solenoid valves coils are designed to operate safely in the voltage range of ±10% of nominal voltage at max. 60°C ambient temperature. The combination of permanent overvoltage and very hot temperatures can stress the solenoid. Therefore always a good heat dissipation and voltage level has to be assured. Faulty coils may only be replaced by new, interchangeable, tested components in original-equipment quality.
Before removing a coil, voltage must be disconnected.
When replacing the coil, be aware to insert O-Rings in order to avoid the entrance of water.

INSTALLATION

The mounting surface must feature surface quality specified in data sheet of the valve: for example for Cetop valves generally is required Ra ≤ 1.6µm and flatness ≤ 0.03 mm over 100 mm length. Normally in cartridge valve for sealing diameters of the cavities, is required roughness Ra ≤ 1.6µm. The surfaces and openings in the assembly plate must be free from impurity or dirt.
Make sure the O-Rings fit correctly in their seats.
Fixing screws must comply with the dimensions and the strength class specified in the data sheet and must be tightened at the specified tightening torque.
Complete the electrical wiring. For circuit examples and pin assignments, see the relevant datasheet.

USE AND MAINTENANCE

Observe the functional limits indicated in the technical catalogue
On a periodic basis and based on the conditions of use, check for cleanliness, state of wear or fractures and correct performance of the valve.
If the O-rings are damaged, replace them with those supplied by the manufacturer.
To assure the best working conditions at all time, check the oil
and replace it periodically (after the first 100 working hours and then after every 2000 working hours or at least once every year).
Attention: all installation and maintenance intervention must be performed by qualified staff.

TRANSPORT AND STORAGE

The valve must be handled with care to avoid damage caused by impact, which could compromise its efficiency.
In the case of storage, keep the valves in a dry place and protect against dust and corrosive substances.
When storing for periods of more than 6 months, fill the valve with preserving oils and seal it.

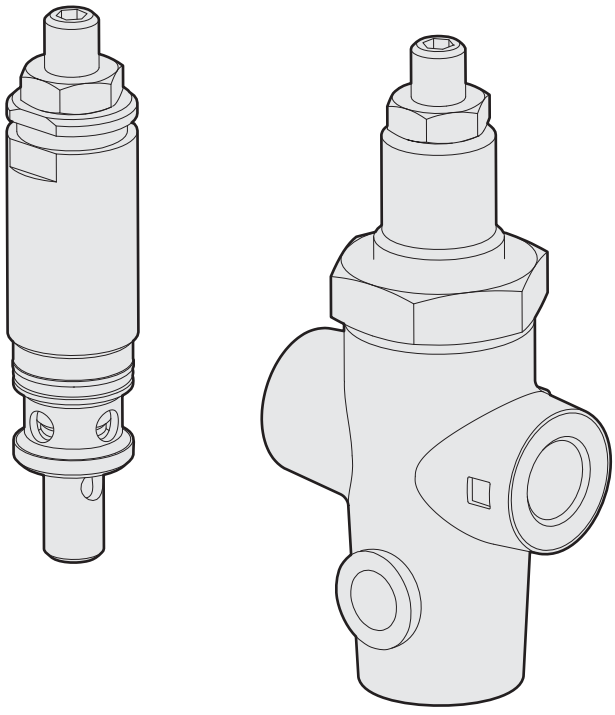
WARRANTY AND SUPPLY CONDITIONS

For the general warranty and supply conditions, please consult the specific sales contract or the "General terms and conditions of sale" document IOP 7-2-05. Downloaded from the website: www.brevinifluidpower.com

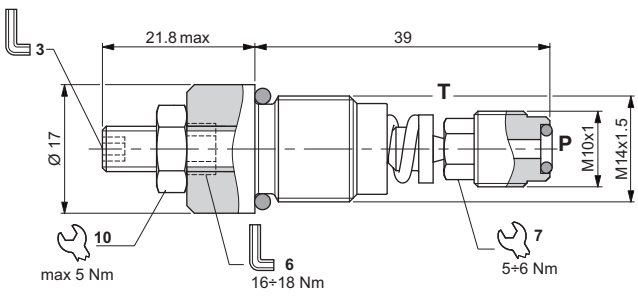
CONVERSION CHART

Type	SI units		Alternative units		Conversion factor
Force	Newton	(N) [kgm/s²]	Kilogram force	(kgf)	1 kgf = 9.807 N
			pound force	(lbf) [lbf/s²]	1 lgf = 4.448 N
Length	millimeter	(mm) [10 m]	inch	(in)	1 in = 25.4 mm
	meter	(km) [1000 m]	yard	(yd) [3ft]	1 m = 1.0936 yd
	kilometer	(km) [1000 m]	mile	(mile) [1760 yd]	1 mile = 1.609 km
Torque	Newton meter	(Nm)	pound force.feet	(lbf.ft)	1 lbf.ft = 1.356 Nm
Power	kiloWatt (kW)	[1000 Nm/s]	horsepower	(hp)	1 kW = 1.341 hp
			metric horsepower	(CV)	1 kW = 1.36 CV
Pressure	MegaPascal	(MPa) [N/mm²]	bar		1 MPa = 10 bar
			psi (lbf/ln²)		1 MPa = 145 psi
			ton/f/ln²		1 ton/f/ln² = 15.45 MPa
Flow rate	liter/min	(l/min)	UK gal/min		1 UK gal/min = 4.546 l/min
			US gal/min		1 US gal/min = 3.785 l/min
Temperature	Degrees Celsius	(°C)	Farenheit	(°F)	1°F = 1.8 °C+32

PRESSURE RELIEF VALVES



DIRECT ACTING PRESSURE RELIEF VALVES (FOR HPV VALVES)



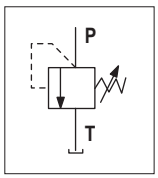
00012001	Spare seals kit

The direct acting relief valve limits the pressure in a hydraulic circuit to within the specified calibration range.
It has a galvanised steel body. The tapered poppet is in tempered steel.

HYDRAULIC FEATURES

Max. working pressure	400 bar
Max. Flow	5 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.038 kg
Tightening torque	see draw
Cavity (M14x1.5)	CN032005 (See section 17)

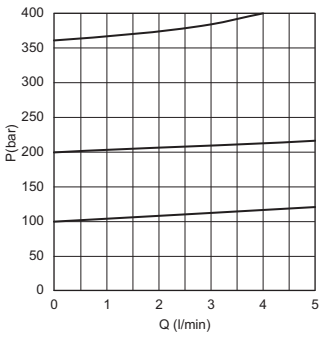
HYDRAULIC SYMBOL



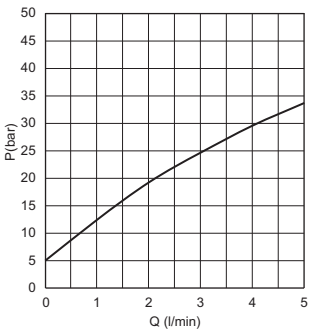
ORDERING CODE

Code	Description
RKVL1130002	Direct acting relief valve

PRESSURE-FLOW RATE

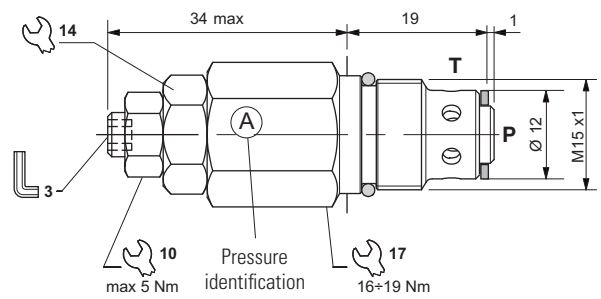


MIN.SETTING PRESSURE



Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

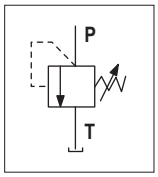
DIRECT ACTING PRESSURE RELIEF VALVES (FOR POWER PACKS SERIES MR/MW)



00012002	Spare seals kit

The direct acting relief valve limits the pressure in a hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop.
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC SYMBOL



HYDRAULIC FEATURES

Max. working pressure	220 bar
Setting range: Spring A Spring C Spring C	 25 ÷ 80 bar 75 ÷ 220 bar 5 ÷ 30 bar
Max. Flow	6 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.05 kg
Tightening torque	see draw
Cavity (M15x1)	CN033001 (See section 17)

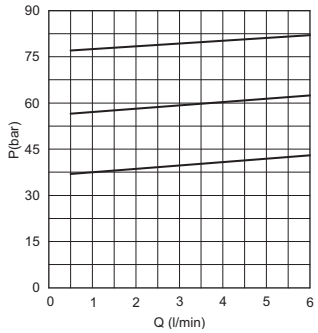
The minimum permissible setting pressure depending on the spring: see curves below

ORDERING CODE

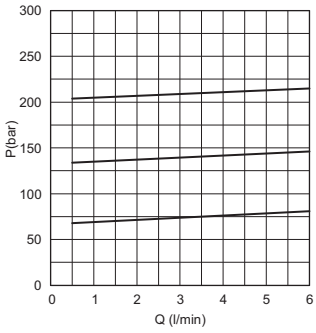
Code	Identification (see draw)	Setting range	Pressure increasing at each turn of screw
21000010.000	A	25 ÷ 80 bar	17 bar ± 10%
21000011.000	B	75 ÷ 220 bar	45 bar ± 10%
21000009.000	C	5 ÷ 30 bar	7 bar ± 10%

PRESSURE-FLOW RATE

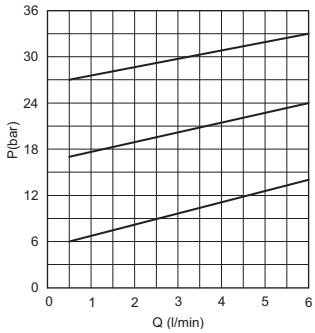
25 ÷ 80 bar



75 ÷ 220 bar

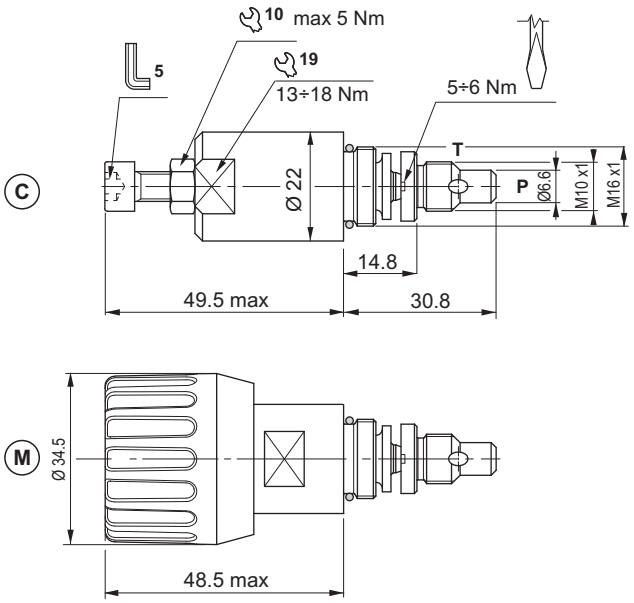


5 ÷ 30 bar



Fluid used: mineral based oil with viscosity 32 mm^2/s at 50°C.

DIRECT ACTING PRESSURE RELIEF VALVES



Q25830021	O-ring spare part

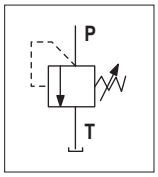
The direct acting relief valve limits the pressure in a hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop (only standard screw and nut), which prevents temporary P closures caused by pressure peaks.
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

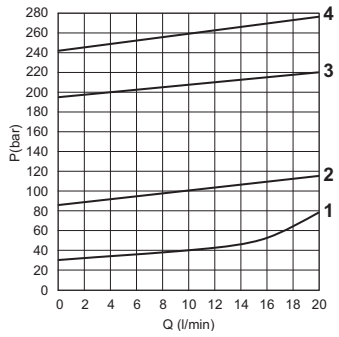
Max. working pressure	250 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green) Spring 4 (orange)	 max 30 bar max 90 bar max 180 bar max 250 bar
Max. Flow	20 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.1 kg
Tightening torque	see draw
Cavity (M16x1)	CN036001 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

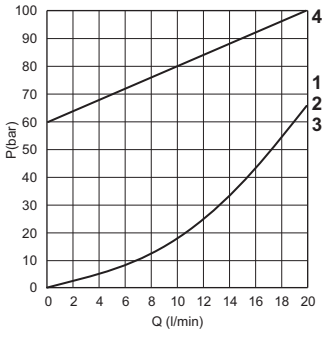
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



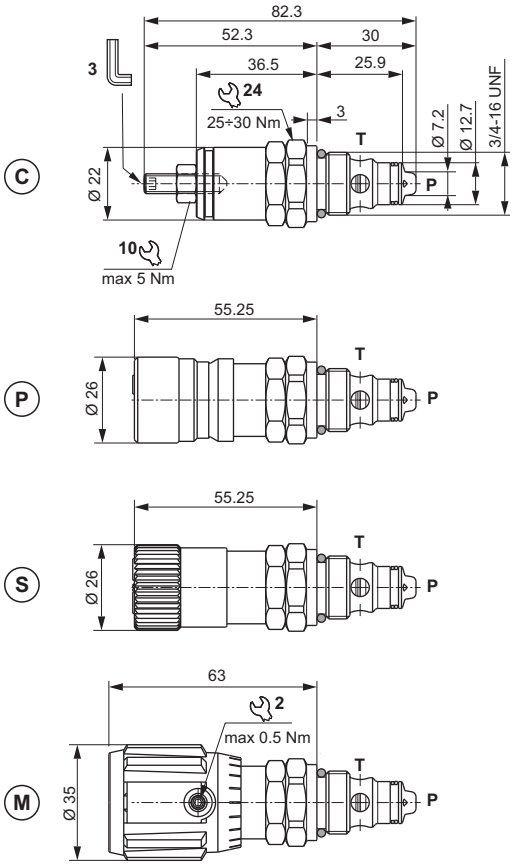
1 = CMP02C1.. - **2** = CMP02C2.. - **3** = CMP02C3.. - **4** = CMP02C4..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

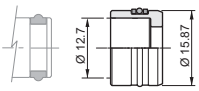
CMP	02	*	*	**	1

- Series: **CMP** = Pressure relief valve
- Size: **02** = M16 x 1
- Adjustment: **C** = Screw; **M** = Plastic knob
- Setting ranges: **1** = Max 30 bar (white spring); **2** = Max 90 bar (yellow spring); **3** = Max 180 bar (green spring); **4** = Max 250 bar (orange spring)
- Variants: **00** = No variants; **V1** = Viton
- **1** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES



00012036	Spare seals kit



Reduction for cavity type "B"

V89B30000 Spare code

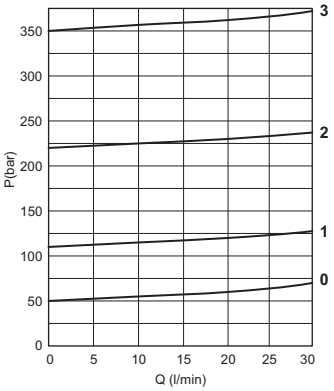
The direct acting relief valve limits the pressure in a hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop.
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

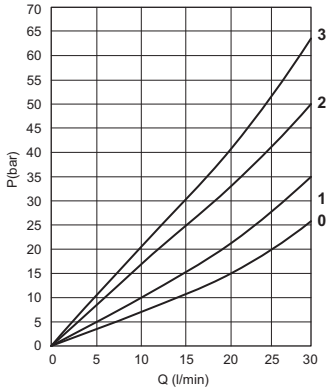
Max. working pressure	350 bar
Setting range: Spring 0 (white) Spring 1 (green) Spring 2 (yellow) Spring 3 (red)	 max 50 bar max 110 bar max 220 bar max 350 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.15 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

PRESSURE-FLOW RATE

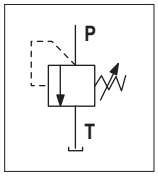


MIN.SETTING PRESSURE



0 = CMP04*0 - **1** = CMP04*1.. - **2** = CMP04*2.. - **3** = CMP04*3..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

HYDRAULIC SYMBOL



ORDERING CODE

CMP	04	*	*	*	00	2
Series	Size	Tip side	Seal side	Adjustment	Setting ranges	Variants	

CMP = Pressure relief valve

04 = 3/4 - 16 UNF

A = Standard - Ø 12.7 mm
B = With reduction - Ø 15.9 mm

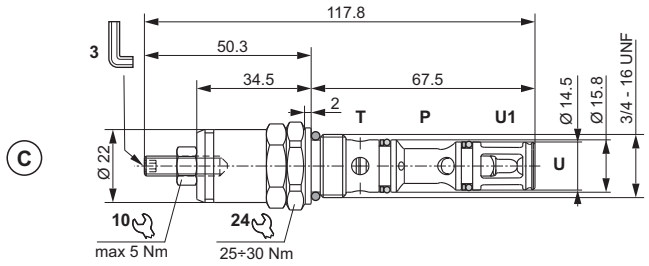
C = Screw
P = **C** + Plug no detachable closing (unremovable version)
S = **C** + Plug detachable closing
M = Plastic knob

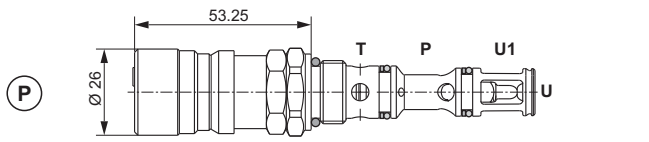
0 = Max 50 bar (white spring)
1 = Max 110 bar (green spring)
2 = Max 220 bar (yellow spring)
3 = Max 350 bar (red spring)

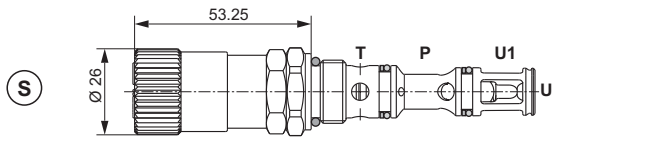
00 = No variants

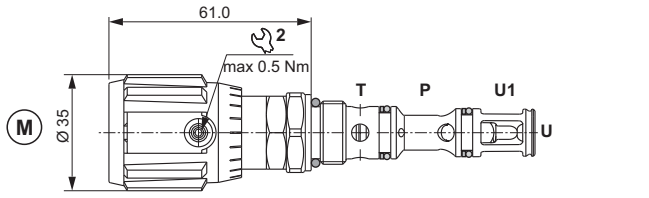
2 = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE









00012038	Spare seals kit

The valve has a combined function in a single cartridge. It consists of a direct acting maximum pressure valve and a unidirectional check valve.
The relief valve raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue.
It has a pack spring with a mechanical stop.

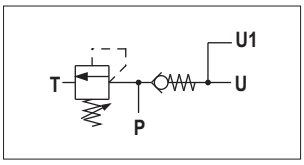
The spring in the check valve enables the cartridge to be mounted in any position.

It has a galvanised steel body. The tapered poppet of the relief valve and the guided ball poppet are made from tempered and ground steel.

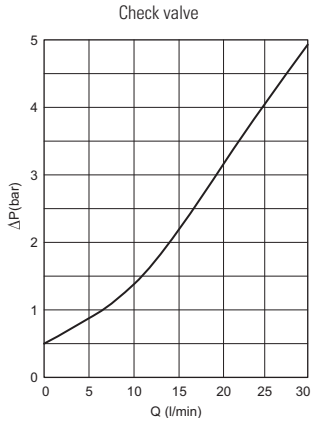
HYDRAULIC FEATURES

Max. working pressure	350 bar
Max. Flow	30 l/min
Setting range: Spring 0 (white) Spring 1 (green) Spring 2 (yellow) Spring 3 (red)	 max 50 bar max 110 bar max 220 bar max 350 bar
One-way check valve	0,5 bar (standard)
Check valve leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.15 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018013 (See section 17)

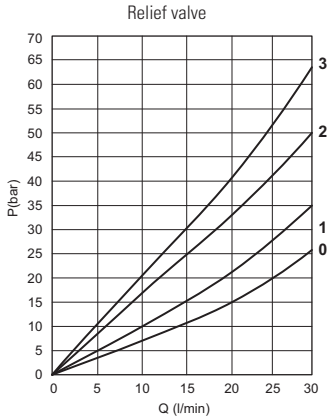
HYDRAULIC SYMBOL



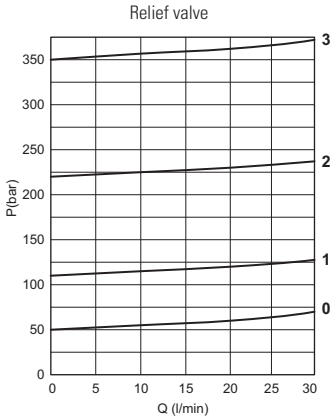
PRESSURE DROPS (P → U)



MIN. SETTING PRESSURE (P → T)



PRESSURE - FLOW (P → T)



0 = CMPR04*0 - **1** = CMPR04*1.. - **2** = CMPR04*2.. - **3** = CMPR04*3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CMP	R	04	*	*	*	00	2

Series
CMP = Pressure relief valve

R = With check valve

Size
04 = 3/4 - 16 UNF

Setting
C = Screw
P = **C** + Plug no detachable closing (unremovable version)
S = **C** + Plug detachable closing
M = Plastic knob

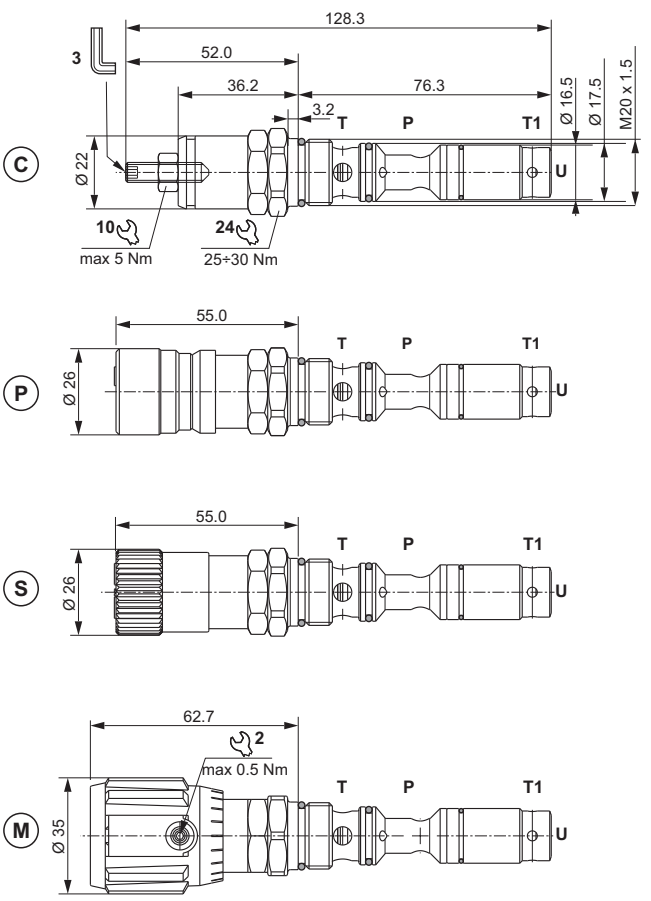
Setting ranges
0 = Max 50 bar (white spring)
1 = Max 110 bar (green spring)
2 = Max 220 bar (yellow spring)
3 = Max 350 bar (red spring)

0 = With standard check-valve
S = Without standard check-valve

Variants
00 = No variants

2 = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES WITH LOGIC VALVE



00012041	Spare seals kit

This valve provide two combined functions in a single cartridge: a direct acting pressure relief valve and a logic check valve that allow automatic flow to tank from port U when there is no flow on P port.

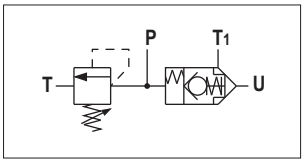
Pressure relief valve setting can be adjusted within the allowed pressure range, avoiding to increase the pressure over the maximum value.
Springs into the check valve allow to assemble the valve in any preferred position and orientation.

Zinc plated steel housing, pressure relief valve's poppet made of tempered ground steel, check valve's ball made of tempered steel, steel logic valve poppet.

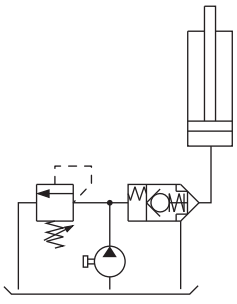
HYDRAULIC FEATURES

Max. working pressure	220 bar
Max. Flow	10 l/min
Setting range: Spring 0 (white) Spring 1 (green) Spring 2 (yellow)	 max 50 bar max 110 bar max 220 bar
Logic valve opening pressure P → U	2,8 bar
One-way check valve U → T_1	2,5 bar
Logic valve leakage (0 ÷ 20 drops/min)	0 ÷ 1 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.17 kg
Tightening torque	25 ÷ 30 Nm
Cavity (M20 x 1,5)	CN044003 (See section 17)

HYDRAULIC SYMBOL

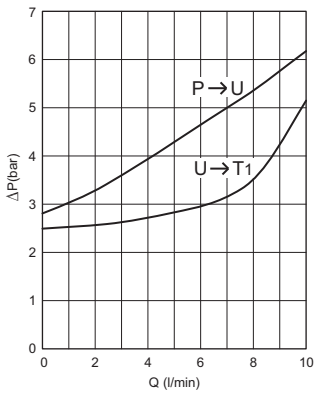


SERVICE EXAMPLE



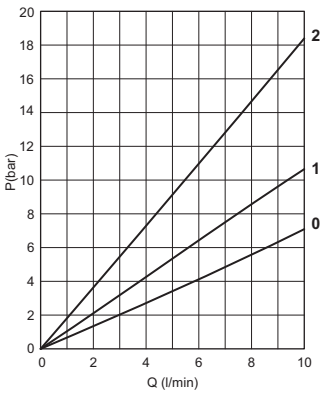
PRESSURE DROPS (P → U - U → T1)

Logic valve



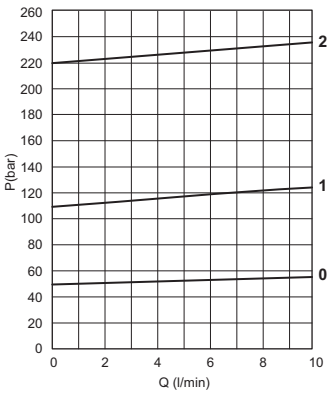
MIN. SETTING PRESSURE (P → T)

Relief valve



PRESSURE - FLOW (P → T)

Relief valve



0 = CPMK04*0 - **1** = CPMK04*1.. - **2** = CPMK04*2..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CPMK	04	*	*	00	1

Series
CPMK = Pressure relief valve

Size
04 = M20 x 1.5

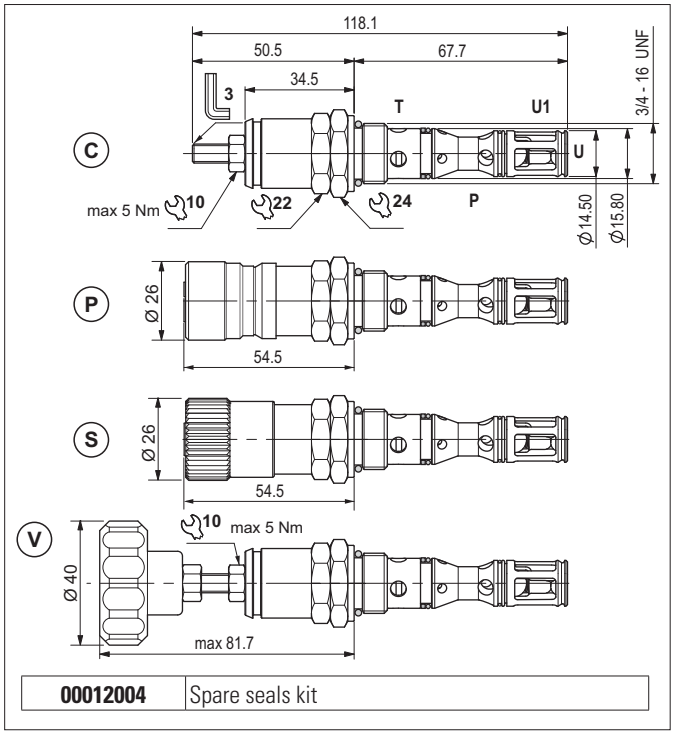
Setting
C = Screw
P = **C** + Plug no detachable closing (unremovable version)
S = **C** + Plug detachable closing
M = Plastic knob

Setting ranges
0 = Max 50 bar (white spring)
1 = Max 110 bar (green spring)
2 = Max 220 bar (yellow spring)

Variants
00 = No variants

1 = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE



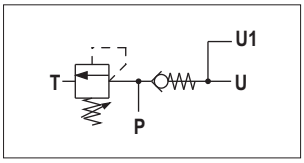
00012004	Spare seals kit

The valve has a combined function in a single cartridge. It consists of a direct acting maximum pressure valve and a unidirectional check valve.
The relief valve raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue.
It has a pack spring with a mechanical stop.
The spring in the check valve enables the cartridge to be mounted in any position.
It has a galvanised steel body. The tapered poppet of the relief valve and the guided ball poppet are made from tempered and ground steel.

HYDRAULIC FEATURES

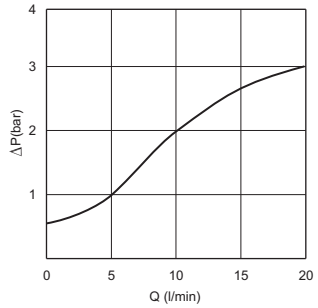
Max. working pressure	320 bar
Max. Flow	20 l/min
Setting ranges (spring)	**1** = 10 ÷ 60 bar (green) **2** = > 60 ÷ 180 bar (yellow) **3** = > 180 ÷ 320 bar (blue)
One-way check	0,5 bar (standard)
Check valve leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.18 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018013 (See section 17)

HYDRAULIC SYMBOL



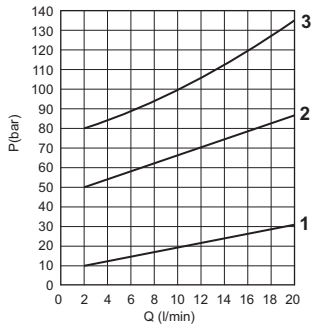
PRESSURE DROPS (P → U)

Check valve



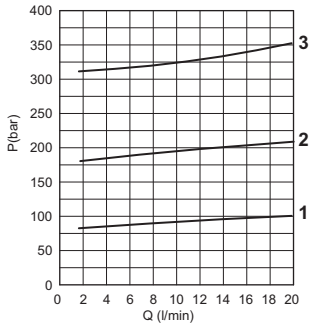
MIN. SETTING PRESSURE (P → T)

Relief valve



PRESSURE - FLOW (P → T)

Relief valve



Fluid used: mineral based oil with viscosity 32 mm^2/s at 50°C.

ORDERING CODE

CMP	R	04	*	*	*	00	1
Series		Size	Setting		Setting ranges	Variants	

CMP = Pressure relief valve

R = With check valve

04 = 3/4 - 16 UNF

C = Screw
P = **C** + Plug no detachable closing (unremovable version)
S = **C** + Plug detachable closing
V = Handwheel

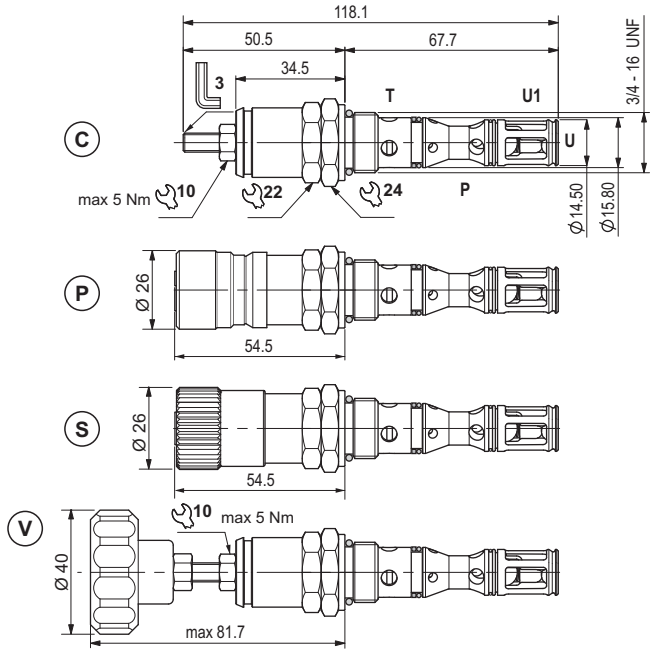
1 = 10 ÷ 60 bar (green spring)
2 = > 60 ÷ 180 bar (yellow spring)
3 = > 180 ÷ 320 bar (blue spring)

0 = With standard check-valve
S = Without standard check-valve

00 = No variants

1 = Serial No.

DIRECT ACTING HIGH PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE



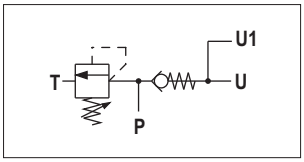
00012004	Spare seals kit

The valve has a combined function in a single cartridge. It consists of a direct acting maximum pressure valve and a unidirectional check valve.
The relief valve raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue.
It has a pack spring with a mechanical stop.
The spring in the check valve enables the cartridge to be mounted in any position.
It has a galvanised steel body. The tapered poppet of the relief valve and the guided ball poppet are made from tempered and ground steel.

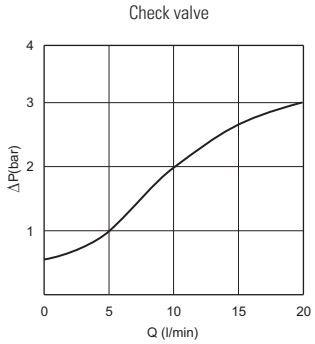
HYDRAULIC FEATURES

Max. working pressure	360 bar
Max. Flow	15 l/min
Setting ranges (spring)	**1** = > 320 ÷ 360 bar (blue)
One-way check	0.5 bar (standard)
Check valve leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.18 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018013 (See section 17)

HYDRAULIC SYMBOL

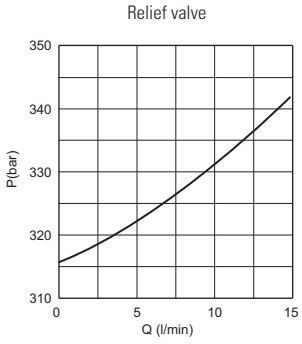


PRESSURE DROPS (P → U)



Fluid used: mineral based oil with viscosity 32 mm^2/s at 50°C.

PRESSURE - FLOW (P → T)



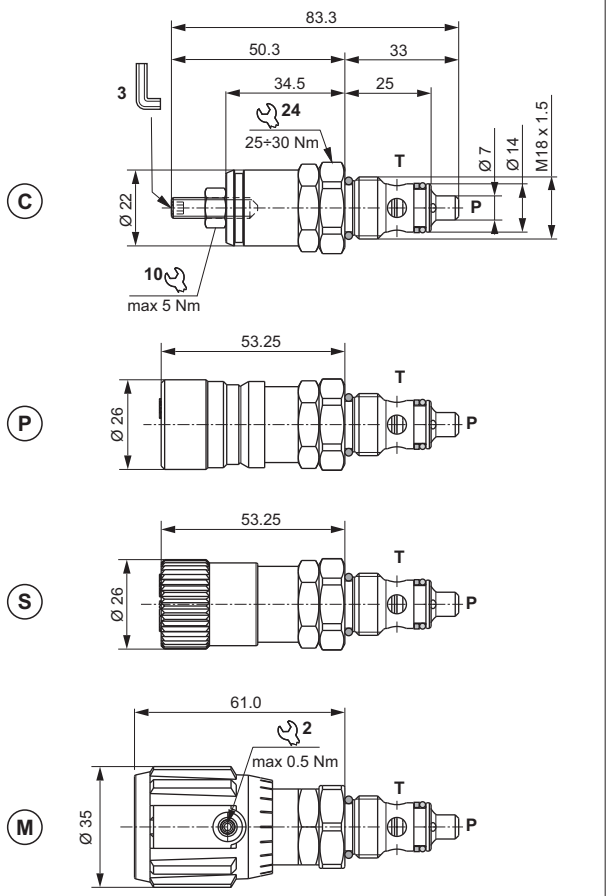
Fluid used: mineral based oil with viscosity 32 mm^2/s at 50°C.

ORDERING CODE

CMPH	R	04	*	*	1	00	1
Series		Size	Setting		Setting ranges	Variants	

- **CMPH** = High pressure relief valve
- **R** = With check valve
- **04** = 3/4 - 16 UNF
- **C** = Screw
  P = **C** + Plug no detachable closing (unremovable version)
  S = **C** + Plug detachable closing
  V = Handwheel
- **1** = > 320 ÷ 360 bar (blue spring)
- **0** = With standard check-valve
  S = Without standard check-valve
- **00** = No variants
- **1** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES



00012005	Spare seals kit

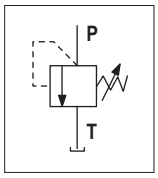
The direct acting relief valve limits the pressure in a hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop.
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

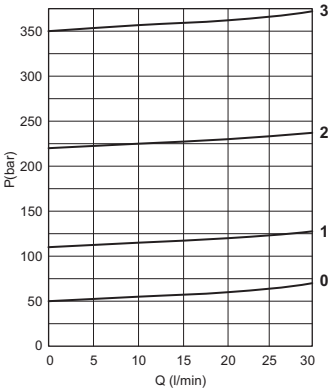
Max. working pressure	350 bar
Setting range: Spring 0 (white) Spring 1 (green) Spring 2 (yellow) Spring 3 (red)	 max 50 bar max 110 bar max 220 bar max 350 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.14 kg
Tightening torque	28 ÷ 32 Nm
Cavity (M18 x 1.5)	CN041009 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

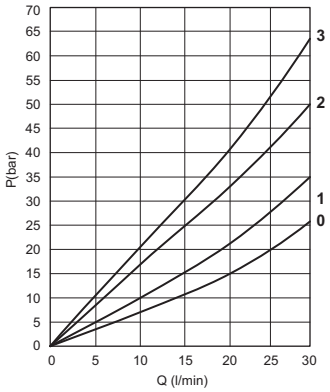
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



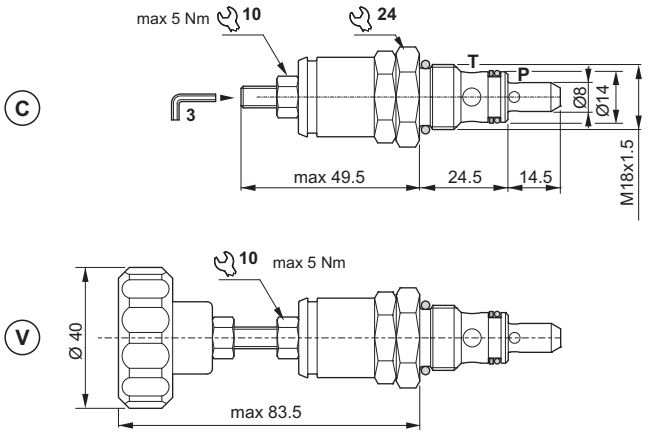
0 = CPMC04*0 - **1** = CPMC04*1.. - **2** = CPMC04*2.. - **3** = CPMC04*3..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

CPMC	04	*	*	00	1

- Series: **CPMC** = Pressure relief valve
- Size: **04** = M18 x 1.5
- Adjustment: **C** = Screw; **P** = **C** + Plug no detachable closing (unremovable version); **S** = **C** + Plug detachable closing; **M** = Plastic knob
- Setting ranges: **0** = Max 50 bar (white spring); **1** = Max 110 bar (green spring); **2** = Max 220 bar (yellow spring); **3** = Max 350 bar (red spring)
- Variants: **00** = No variants
- **1** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES (FOR POWER PACKS SERIES MC/MS)



00012005	Spare seals kit

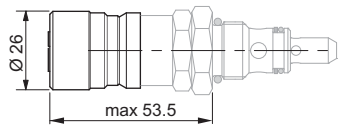
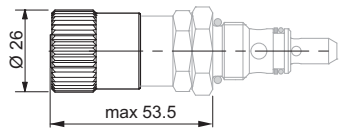
The direct acting relief valve limits the pressure in a hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop. It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

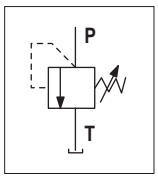
Max. working pressure	290 bar
Setting range: Spring 0 (white) Spring 1 (green) Spring 2 (yellow) Spring 3 (red)	 max 50 bar max 90 bar max 190 bar max 290 bar
Max. Flow	20 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0,12 kg
Tightening torque	28 ÷ 32 Nm
Cavity (M18x1.5)	CN041009 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

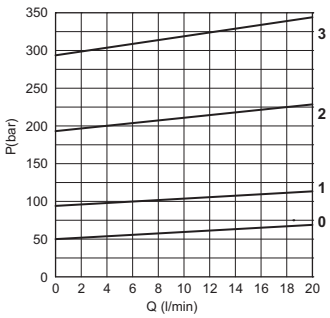
ACCESSORIES

Detachable plug	Code
Unremovable version 	**60309200**
Removable version 	**60309100**

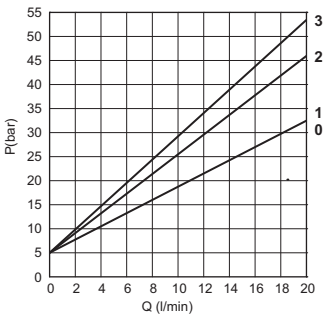
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



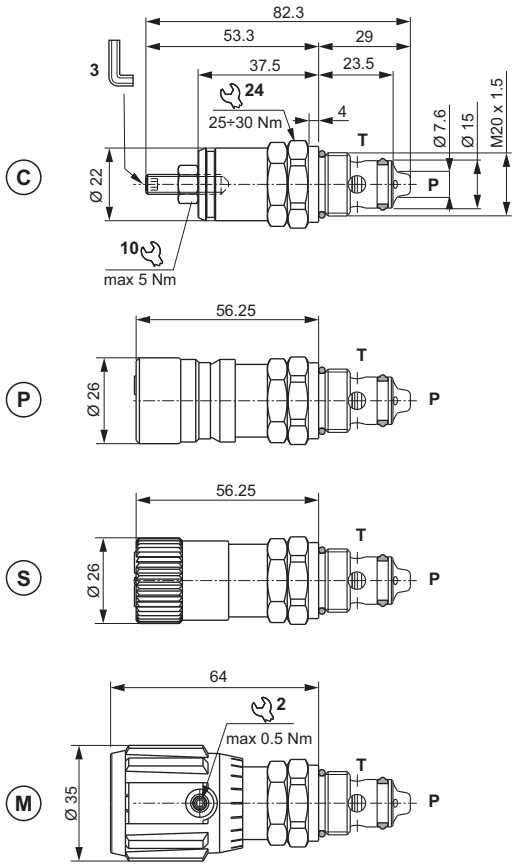
0 = 0 ÷ 50 bar - **1** = 35 ÷ 90 bar - **2** = 75 ÷ 190 bar - **3** = 160 ÷ 290 bar
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

Adjustment	Setting ranges	Code
C Screw	0 ÷ 50 bar (white spring)	**21000016.000**
	35 ÷ 90 bar (green spring)	**21000000.000**
	75 ÷ 190 bar (yellow spring)	**21000001.000**
	160 ÷ 290 bar (red spring)	**21000002.000**

Adjustment	Setting ranges	Code
V Handwheel	0 ÷ 50 bar (white spring)	**21000017.000**
	35 ÷ 90 bar (green spring)	**210000 03.000**
	75 ÷ 190 bar (yellow spring)	**21000004.000**
	160 ÷ 290 bar (red spring)	**21000005.000**

DIRECT ACTING PRESSURE RELIEF VALVES



00012006	Spare seals kit

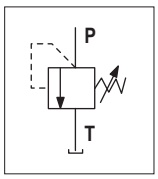
The direct acting relief valve limits the pressure in a hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop.
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

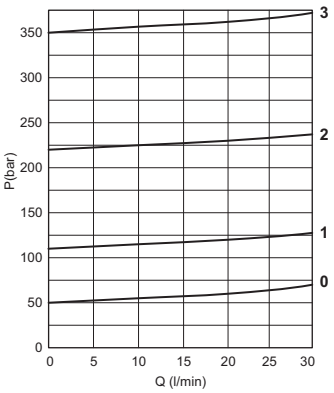
Max. working pressure	350 bar
Setting range: Spring 0 (white) Spring 1 (green) Spring 2 (yellow) Spring 3 (red)	 max 50 bar max 110 bar max 220 bar max 350 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.16 kg
Tightening torque	30 ÷ 35 Nm
Cavity (M20 x 1.5)	CN044001 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

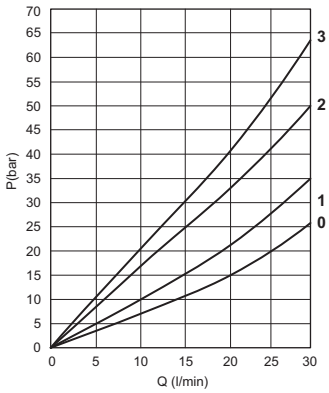
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



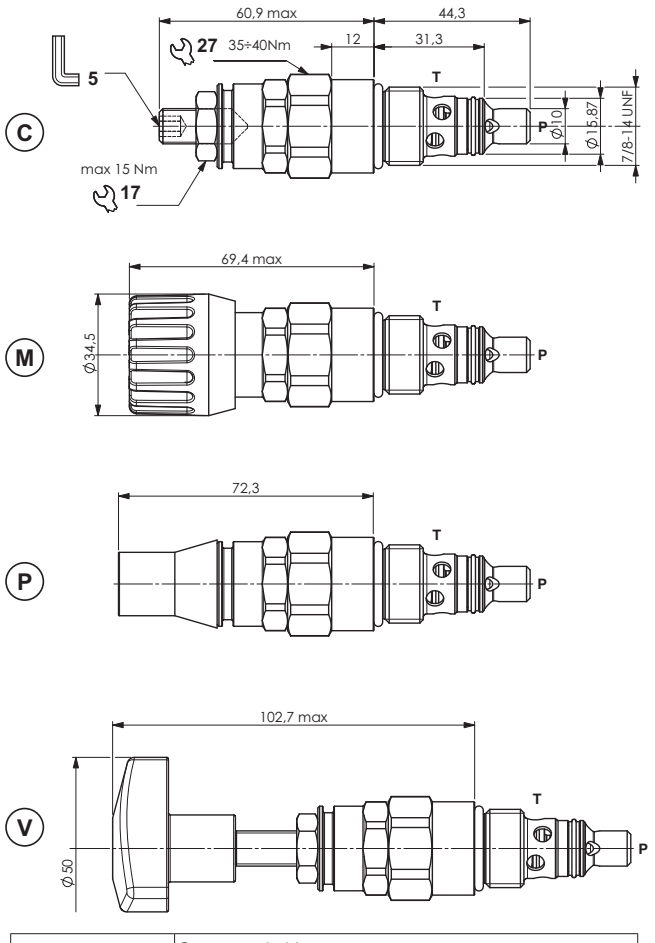
0 = CMP06*0 - **1** = CMP06*1.. - **2** = CMP06*2.. - **3** = CMP06*3..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

CMP	06	*	*	**	5

- **CMP** = Pressure relief valve — Series
- **06** = M20 x 1.5 — Size
- **C** = Screw
  P = **C** + Plug no detachable closing (unremovable version)
  S = **C** + Plug detachable closing
  M = Plastic knob — Adjustment
- Setting ranges:
  0 = Max 50 bar (white spring)
  1 = Max 110 bar (green spring)
  2 = Max 220 bar (yellow spring)
  3 = Max 350 bar (red spring)
- Variants:
  00 = No variants
  V1 = Viton
- **5** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES



00012034	Spare seals kit

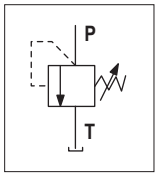
The direct acting relief valve limits the pressure in a hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop.
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

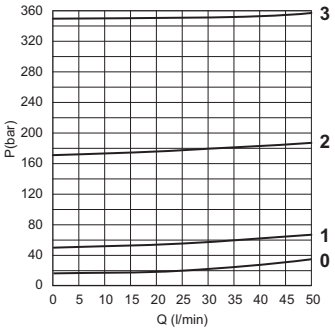
Max. working pressure	350 bar
Setting range: Spring 1 (orange) Spring 1 (white) Spring 2 (yellow) Spring 3 (neutral)	 max 15 bar max 50 bar max 170 bar 70 ÷ 350 bar
Max. Flow	50 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.22 kg
Tightening torque	35 ÷ 40 Nm
Cavity (7/8 - 14 UNF)	CD019011 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

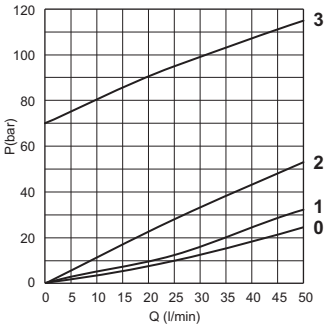
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



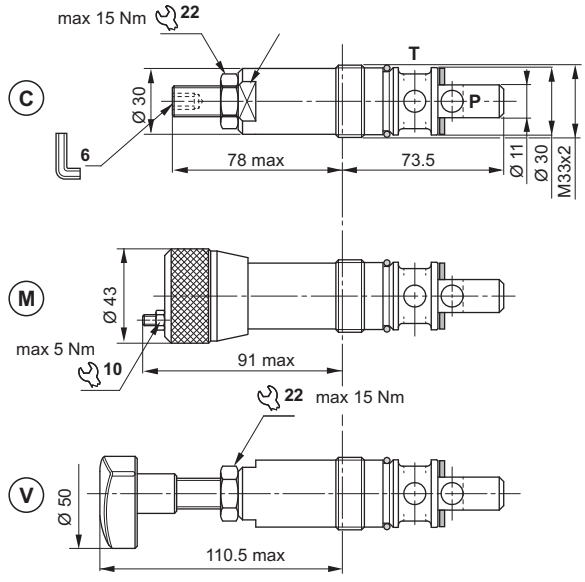
0 = CP06.0.. - **1** = CP06.1.. - **2** = CP06.2.. - **3** = CP06.3..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

CP	06	*	*	**	1

- Series: **CP** = Pressure relief valve
- Size: **06** = 7/8 - 14 UNF
- Adjustment: **C** = Screw; **M** = Plastic knob; **P** = **C** + Sealed cap; **V** = Handwheel
- Setting ranges: **0** = Max 15 bar (orange spring); **1** = Max 50 bar (white spring); **2** = Max 170 bar (yellow spring); **3** = 70÷350 bar (neutral spring)
- Variants: **00** = No variants; **V1** = Viton
- **1** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES



00012009	Spare seals kit

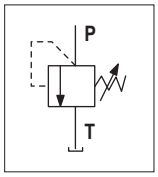
The direct acting relief valve limits the pressure in the hydraulic circuit to the calibration levels specified in the catalogue.
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

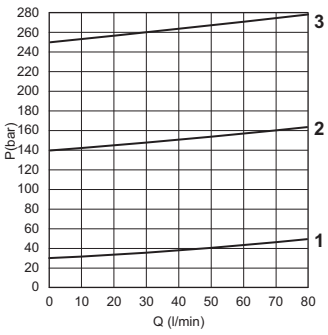
Max. working pressure	250 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 30 bar max 140 bar max 250 bar
Max. Flow	80 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.5 kg
Tightening torque	80 ÷ 90 Nm
Cavity (M33x2)	CN070001 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

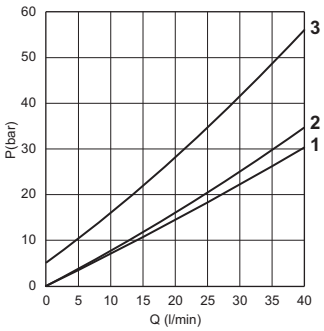
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



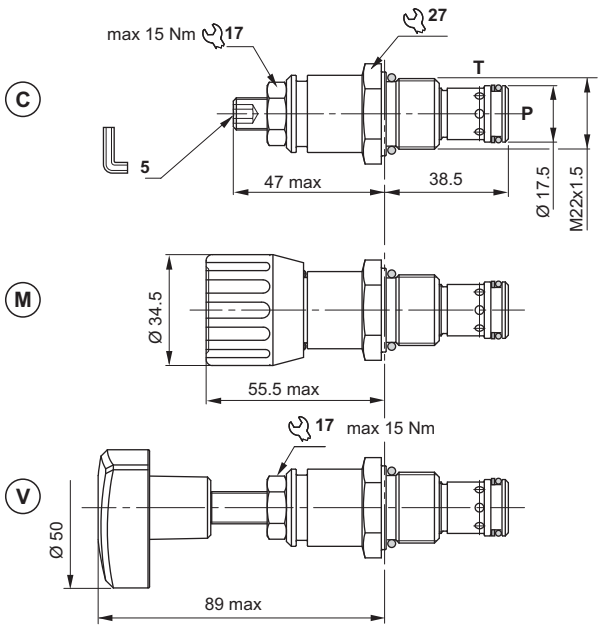
1 = CMP20.1.. - **2** = CMP20.2.. - **3** = CMP20.3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CMP | 20 | * | * | ** | 2

- Series: **CMP** = Pressure relief valve
- Size: **20** = M33 x 2
- Adjustment: **C** = Screw; **M** = Knob; **V** = Handwheel
- Setting ranges: **1** = Max 30 bar (white spring); **2** = Max 140 bar (yellow spring); **3** = Max 250 bar (green spring)
- Variants: **00** = No variants; **V1** = Viton
- **2** = Serial No.

PILOT OPERATED PRESSURE RELIEF VALVES



00012010	Spare seals kit

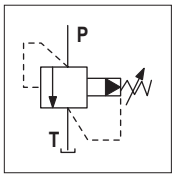
The pilot-operated relief valve limits the pressure in the hydraulic circuit.
Slight leakage is tolerated for this type of valve.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop.
It has a galvanised steel body. The tapered pilot poppet and cylindrical main plunger are made from tempered and ground steel.

HYDRAULIC FEATURES

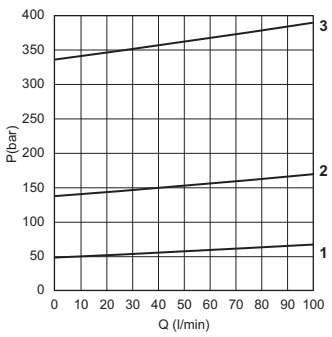
Max. working pressure	350 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 50 bar max 140 bar max 350 bar
Max. Flow	100 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.18 kg
Tightening torque	30 ÷ 40 Nm
Cavity (M22x1.5)	CN047003 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves below

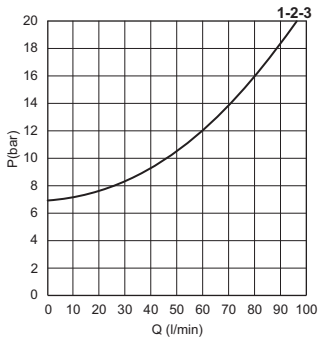
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



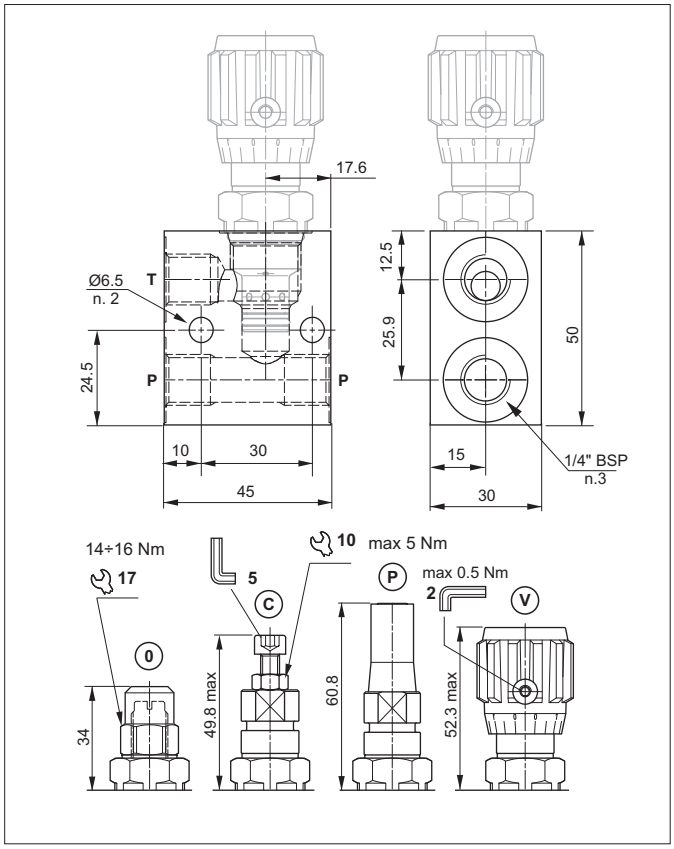
1 = CMP30.1.. - **2** = CMP30.2.. - **3** = CMP30.3..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

CMP	30	*	*	**	1

- **CMP** = Pilot operated relief valve — Series
- **30** = M22 x 1.5 — Size
- **C** = Screw; **M** = Plastic knob; **V** = Handwheel — Adjustment
- Setting ranges:
  - **1** = Max 50 bar (white spring)
  - **2** = Max 140 bar (yellow spring)
  - **3** = Max 350 bar (green spring)
- Variants:
  - **00** = No variants
  - **V1** = Viton
- **1** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING

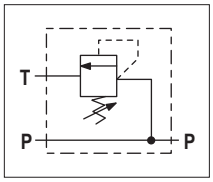


The direct acting relief valve with CMP04 cartridge limits the pressure in the hydraulic circuit
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop (only standard screw and nut).
It has a high-resistance aluminium body. The cartridge is in galvanised steel.

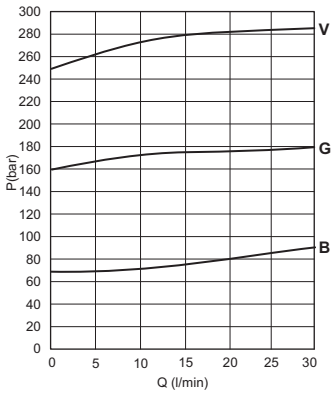
Max. working pressure	330 bar
Setting range: Spring B (white) Spring G (yellow) Spring V (green)	 max 70 bar max 160 bar max 330 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight (0 version)	0.235 kg

The minimum permissible setting pressure depending on the spring: see curves below

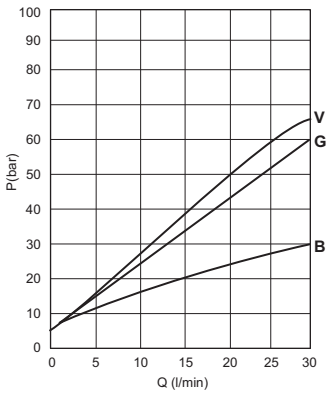
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



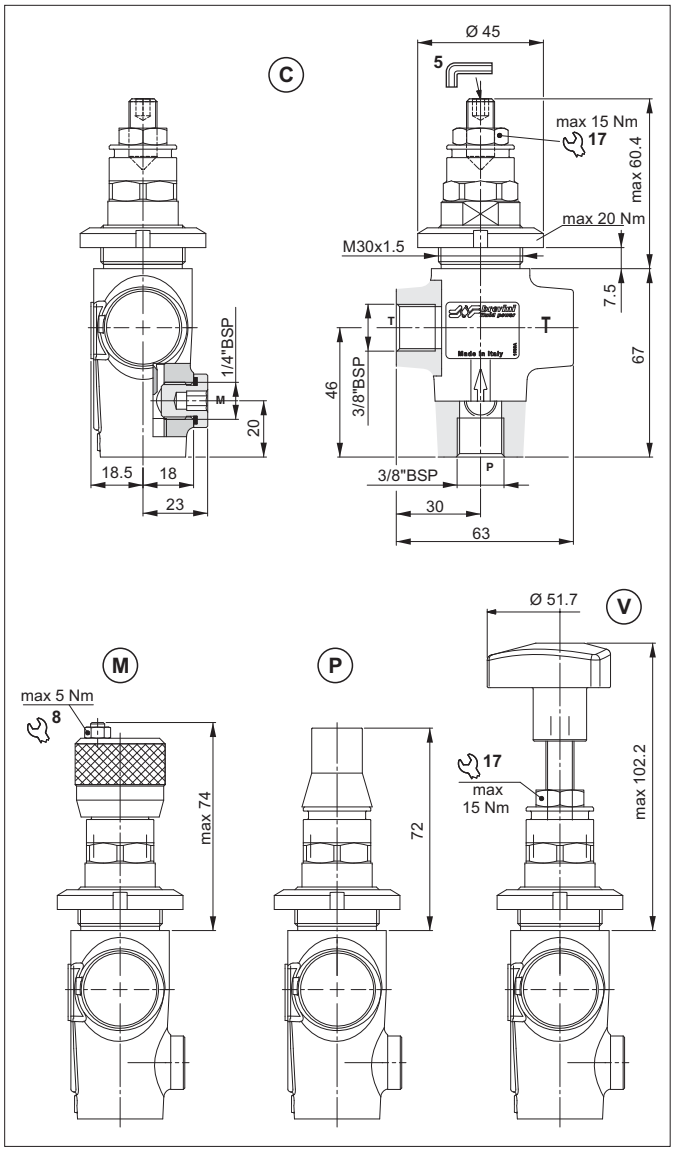
1 = VMP02*B.. - **2** = VMP02*G.. - **3** = VMP02*V..
Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE

VMP | 02 | * | 04 | *

- VMP — Series: **VMP** = Pressure relief valve
- 02 — Series: **02**
- * — Adjustment:
  - **0** = Short screw
  - **C** = Screw
  - **P** = **C** + Sealed cap
  - **V** = Plastic knob
- 04 — Size: **04** = 1/4 BSP
- * — Setting ranges:
  - **B** = Max 70 bar (white spring)
  - **G** = Max 160 bar (yellow spring)
  - **V** = Max 330 bar (green spring)

DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING



The direct acting relief valve with CP06 cartridge limits the pressure in the hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop.

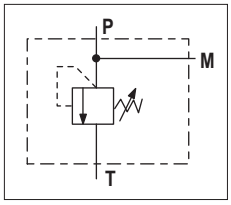
It has a manganese phosphate coated cast iron body. The cartridge is in galvanised steel.

HYDRAULIC FEATURES

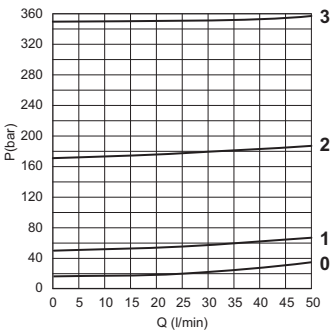
Max. working pressure	350 bar
Setting range: Spring 1 (orange) Spring 1 (white) Spring 2 (yellow) Spring 3 (neutral)	 max 15 bar max 50 bar max 170 bar 70 ÷ 350 bar
Max. Flow	50 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.8 kg

The minimum permissible setting pressure depending on the spring: see curves below

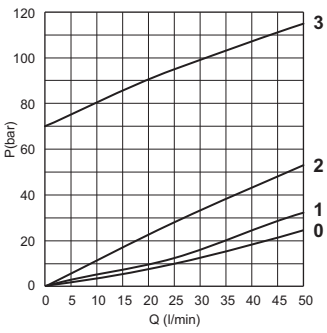
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



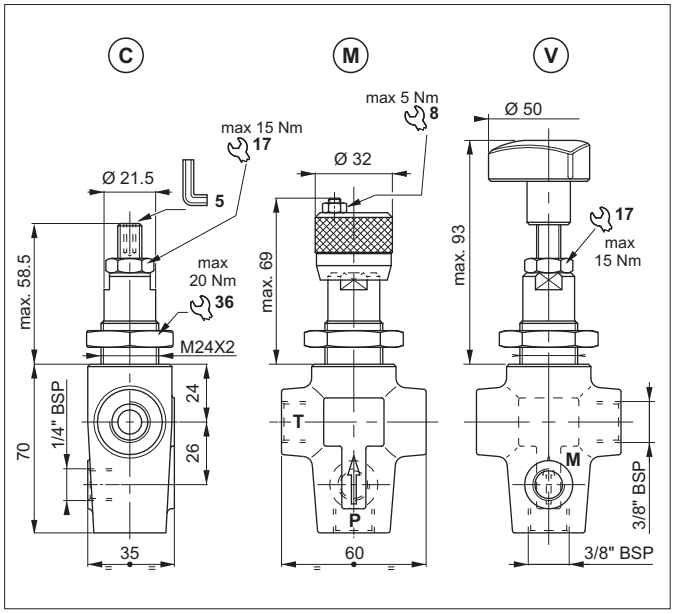
0 = VMP06.0.. - **1** = VMP06.1.. - **2** = VMP06.2.. - **3** = VMP06.3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

VMP	06	*	*	**	1

- **VMP** = Pressure relief valve (Series)
- **06** = Connector size: 3/8" BSP (Size)
- **C** = Screw; **M** = Plastic knob; **P** = **C** + Sealed cap; **V** = Handwheel (Adjustment)
- Setting ranges:
  - **0** = Max 15 bar (orange spring)
  - **1** = Max 50 bar (white spring)
  - **2** = Max 170 bar (yellow spring)
  - **3** = 70÷350 bar (neutral spring)
- Variants:
  - **00** = No variants
  - **V1** = Viton
- **1** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING



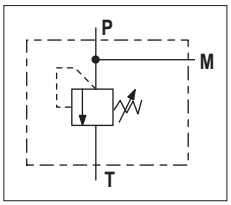
The direct acting relief valve with CMP10 cartridge limits the pressure in the hydraulic circuit.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop, which prevents temporary P closures caused by pressure peaks.
It has a manganese phosphate coated cast iron body. The cartridge is in galvanised steel.

HYDRAULIC FEATURES

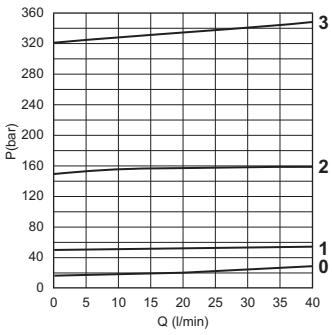
Max. working pressure	320 bar
Setting range: Spring 1 (orange) Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 15 bar max 50 bar max 150 bar max 320 bar
Max. Flow	40 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.8 kg

The minimum permissible setting pressure depending on the spring: see curves.

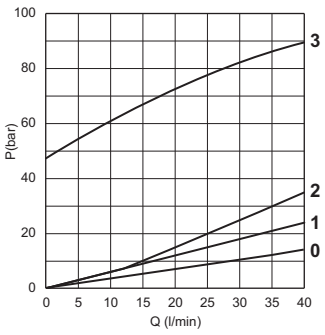
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



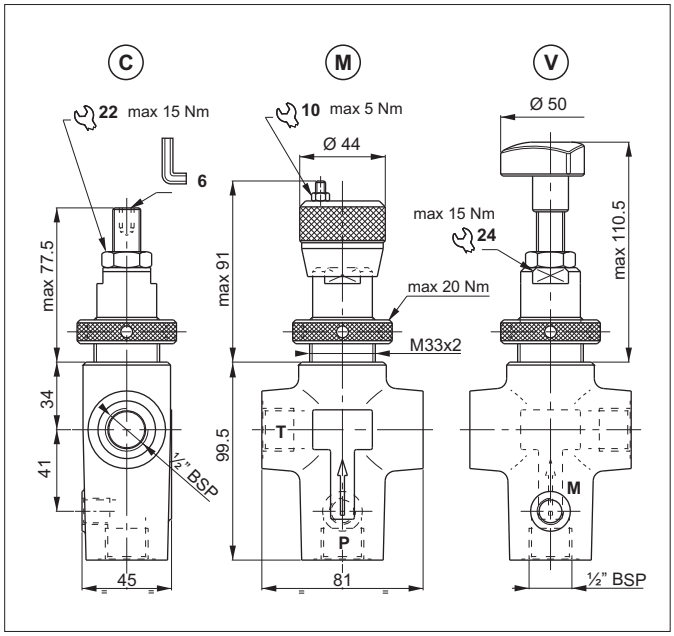
0 = VMP10.0.. - **1** = VMP10.1.. - **2** = VMP10.2.. - **3** = VMP10.3..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

VMP	10	*	*	**	2

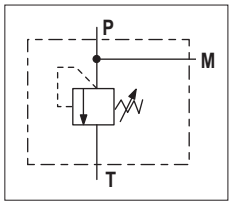
- Series: **VMP** = Pressure relief valve
- Size: **10** = Connector size: 3/8" BSP
- Adjustment: **C** = Screw; **M** = Steel Knob; **V** = Handwheel
- Setting ranges: **0** = Max 15 bar (orange spring); **1** = Max 50 bar (white spring); **2** = Max 150 bar (yellow spring); **3** = Max 320 bar (green spring)
- Variants: **00** = No variants; **V1** = Viton
- **2** = Serial No.

DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING



The direct acting relief valve with CMP20 cartridge limits the pressure in the hydraulic circuit to the calibration field specified in the catalogue.
It has a manganese phosphate coated cast iron body. The cartridge is in galvanised steel.

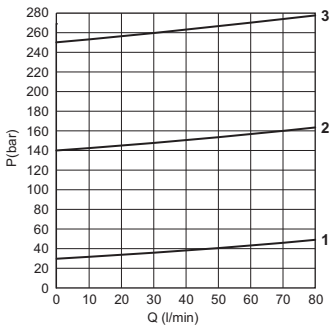
HYDRAULIC SYMBOL



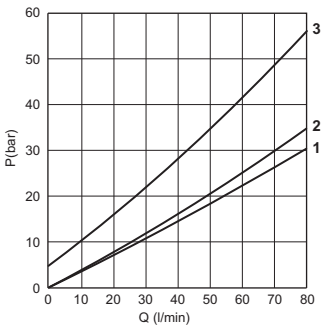
HYDRAULIC FEATURES

Max. working pressure	250 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 30 bar max 140 bar max 250 bar
Max. Flow	80 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	1.7 kg

PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



The minimum permissible setting pressure depending on the spring: see curves.

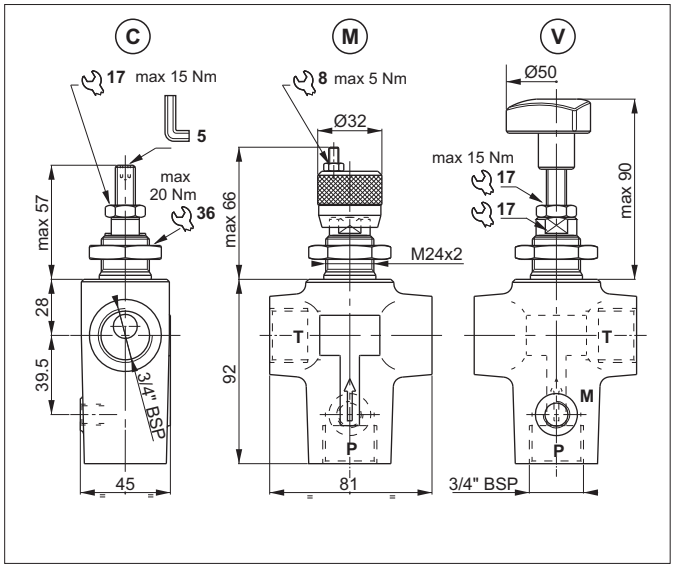
1 = VMP20.1.. - **2** = VMP20.2.. - **3** = VMP20.3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

VMP	20	*	*	**	2

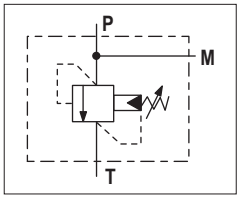
- **VMP** = Pressure relief valve (Series)
- **20** = Connector size: 1/2" BSP (Size)
- **C** = Screw; **M** = Steel knob; **V** = Handwheel (Adjustment)
- Setting ranges:
  - **1** = Max 30 bar (white spring)
  - **2** = Max 140 bar (yellow spring)
  - **3** = Max 250 bar (green spring)
- Variants:
  - **00** = No variants
  - **V1** = Viton
- **2** = Serial No.

PILOT OPERATED PRESSURE RELIEF VALVES - IN-LINE MOUNTING



The direct acting relief valve with CMP30 cartridge limits the pressure in the hydraulic circuit.
Slight leakage is tolerated for this type of valve.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop.
It has a manganese phosphate coated cast iron body. The cartridge is in galvanised steel.

HYDRAULIC SYMBOL

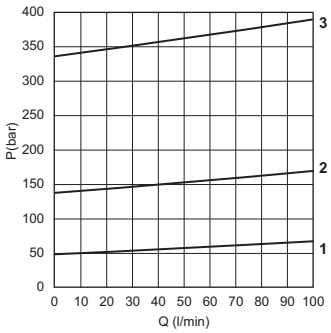


HYDRAULIC FEATURES

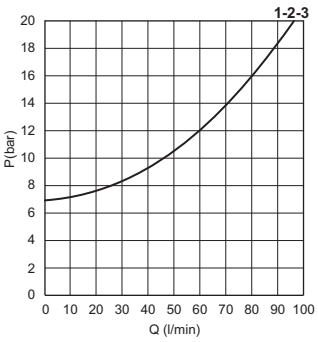
Max. working pressure	350 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 50 bar max 140 bar max 350 bar
Max. Flow	100 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	1.4 kg

The minimum permissible setting pressure depending on the spring: see curves.

PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



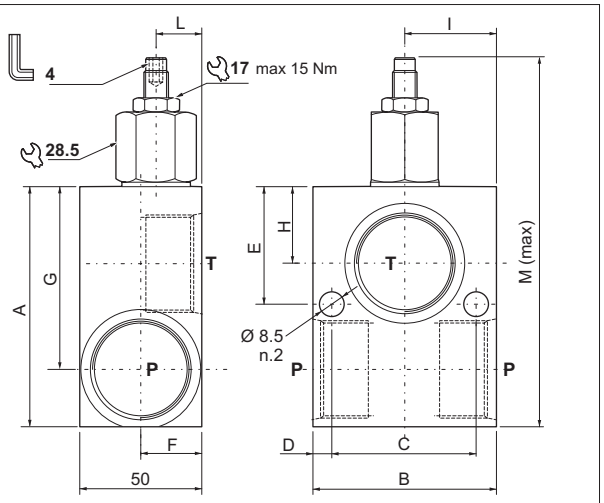
1 = VMP30.1.. - **2** = VMP30.2.. - **3** = VMP30.3..
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

VMP	30	*	*	**	2

- **VMP** = Pilot operated relief valve — Series
- **30** = Connector size: 3/4" BSP — Size
- **C** = Screw; **M** = Steel knob; **V** = Handwheel — Adjustment
- Setting ranges:
  - **1** = Max 50 bar (white spring)
  - **2** = Max 140 bar (yellow spring)
  - **3** = Max 350 bar (green spring)
- Variants:
  - **00** = No variants
  - **V1** = Viton
- **2** = Serial No.

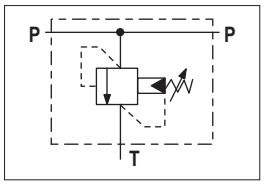
PILOT OPERATED PRESSURE RELIEF VALVES - IN-LINE MOUNTING



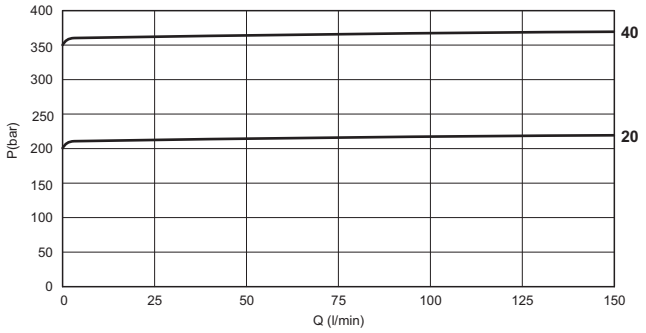
CODE	P - T Attacchi/Ports	A	B	C	D	E	F	G	H	I	L	M
VMP12012	3/4" BSP	92	50	37	6	12.5	31	71.5	35	25	31	145.4
VMP12016	1" BSP	100	77	60	8.5	49	25	76	32	38	17	154

The pilot-operated relief valve limits the pressure in the hydraulic circuit.
Slight leakage is tolerated for this type of valve.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop.
It has a high-resistance aluminium body. The cartridge is in galvanised steel.

HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



Fluid used: mineral based oil with viscosity 24 mm²/s at 50°C.

HYDRAULIC FEATURES

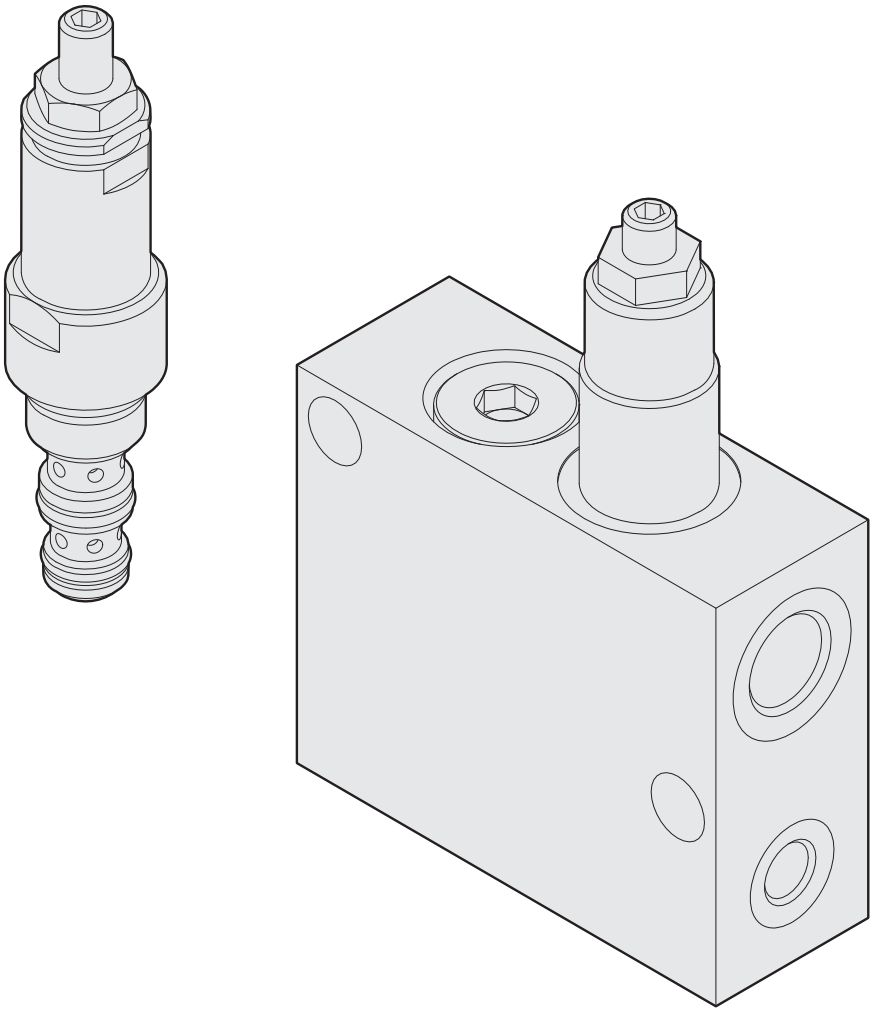
Max. working pressure	350 bar
Max. Flow	150 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.65 kg (3/4 BSP) 0.91 kg (1 BSP)
Cavity	(1" - 14 UNS) - Ø 19.05 mm

ORDERING CODE

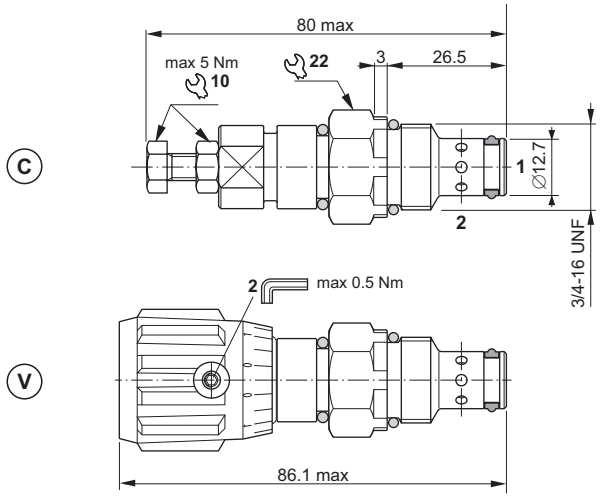
VMP12	0	**	*	1

- **VMP12** = Pilot operated relief valve — Series
- **0** = Screw — Adjustment
- **12** = 3/4 BSP, **16** = 1 BSP — Size
- Setting ranges: **G** = 10 ÷ 200 bar, **V** = 20 ÷ 350 bar
- **1** = Serial No.

SEQUENCE, PRESSURE REDUCING AND UNLOADING VALVES



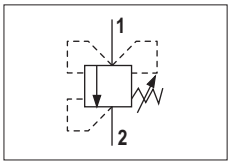
SEQUENCE VALVES - DIRECTLY OPERATED



00012011	Spare seals kit

The direct acting sequence valve feeds a secondary branch of a circuit when a set pressure value is reached and suppresses the primary pressure.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop (only standard screw and nut).
It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

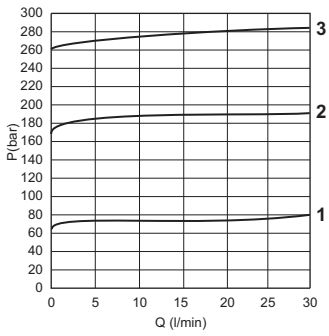
HYDRAULIC SYMBOL



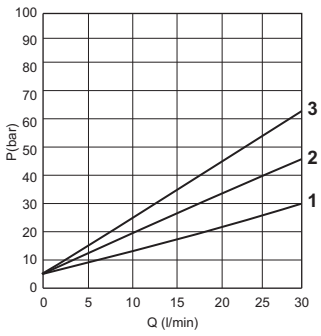
HYDRAULIC FEATURES

Max. working pressure	350 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 70 bar max 180 bar max 340 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	CSQ04C: 0.115 kg CSQ04V: 0.150 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

PRESSURE-FLOW RATE



MIN.SETTING PRESSURE



The minimum permissible setting pressure depending on the spring: see curves below

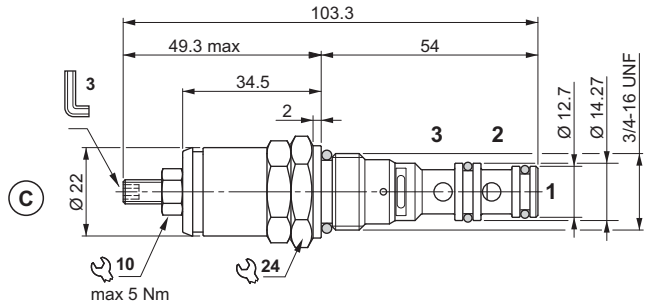
1 = CSQ04.1.. - **2** = CSQ04.2.. - **3** = CSQ04.3..
Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

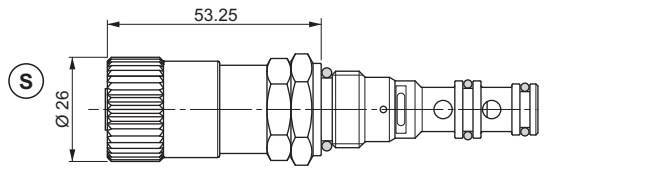
ORDERING CODE

CSQ	04	*	*	00	1

- **CSQ** = Sequence valve — Series
- **04** = 3/4 - 16 UNF — Size
- **C** = Screw, **V** = Plastic knob — Adjustment
- Setting ranges:
  - **1** = Max 70 bar (white spring)
  - **2** = Max 180 bar (yellow spring)
  - **3** = Max 340 bar (green spring)
- **00** = No variants — Variants
- **1** = Serial No.

SEQUENCE VALVES - DIRECTLY OPERATED (FOR MK3 SERIES POWER PACKS)





00012012	Spare seals kit

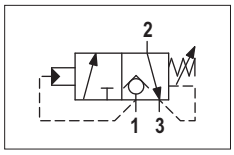
3 way direct acting sequence valve feeds with 1 → 2 flow, a secondary branch of a circuit when a set pressure value is reached.
While the port 3 is normaly connected to tank. When the port 1 is at a lower pressure than the setting pressure, the ports 2 and 3 are connected to tank.
Back pressure on port 3 adds to the valve setting.
Back pressure on port 2 does not effect the valve setting when there is flow from port 1 to 2. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue.
It has a pack spring with a mechanical stop (only standard screw and nut).
The body is made of steel with nitrocarburizing treatment while the spool is made of tempered and ground steel.

HYDRAULIC FEATURES

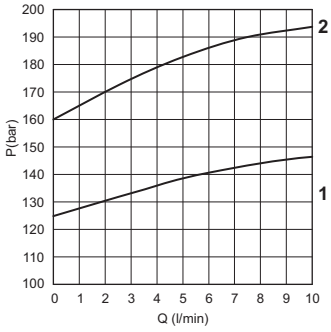
Max. pressure	210 bar
Setting range: Spring 1 (neutral) Spring 2 (yellow)	 max 125 bar max 160 bar
Max. Flow	10 l/min
Leakage at 70% of the spring calibration (flow 1 l/min) Spring 1: 0 ÷ 30 drops/min Spring 2: 0 ÷ 60 drops/min	 Spring 1: 0 ÷ 1.5 cm^3/min Spring 2: 0 ÷ 3 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	CSMK04C.. : 0.145 kg CSMK04S.. : 0.152 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018001 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves.

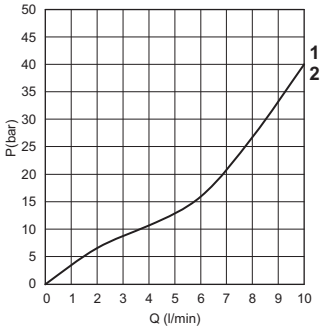
HYDRAULIC SYMBOL



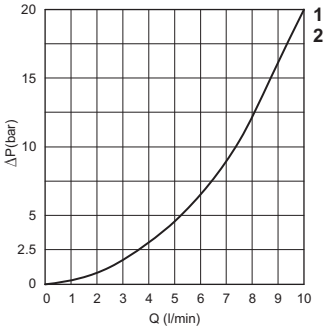
PRESSURE-FLOW RATE (1 → 2)



MIN.SETTING PRESSURE (1 → 2)



PRESSURE DROPS (2 → 3)



1 = CSMK04.1..
2 = CSMK04.2..

Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

CSMK	04	*	*	00	1
Series	Size	Adjustment	Setting ranges	Variants	

CSMK = Sequence valve

04 = 3/4 - 16 UNF

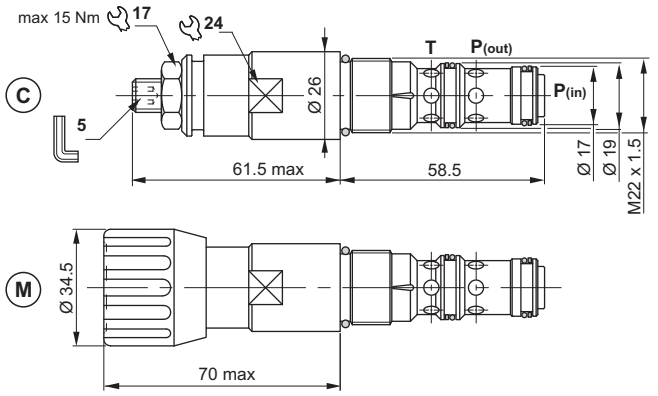
C = Screw
S = **C** +Removable cap lock

1 = max 125 bar (neutral spring)
2 = max 160 bar (yellow spring)

00 = No variants

1 = Serial No.

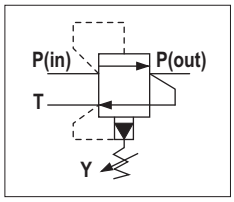
SEQUENCE VALVES - PILOT OPERATED



00012013	Spare seals kit

The pilot-operated sequence valve feeds a secondary branch of a circuit when a set pressure value is reached, guaranteeing minimum variation of the set pressure with flow alterations of up to 90 l/min.
Slight leakage is tolerated for this type of valve.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop.
It has a galvanised steel body. The guided ball pilot poppet and cylindrical main plunger are made from tempered and ground steel.

HYDRAULIC SYMBOL

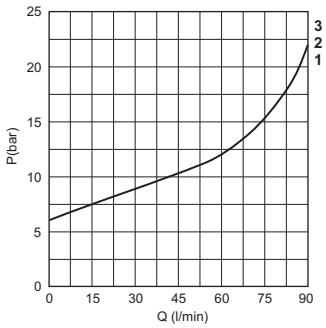


HYDRAULIC FEATURES

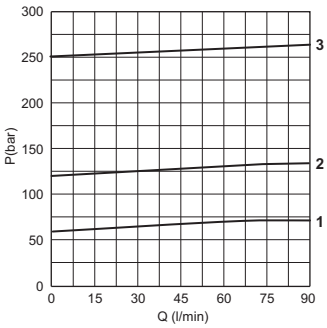
Max. pressure	350 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 60 bar max 120 bar max 250 bar
Max. Flow	90 l/min
Max. draining on port T	0.5 ÷ 0.7 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.25 kg
Tightening torque	30 ÷ 40 Nm
Cavity (M22 x 1.5)	CN047002 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves.

MIN.SETTING PRESSURE



PRESSURE-FLOW RATE



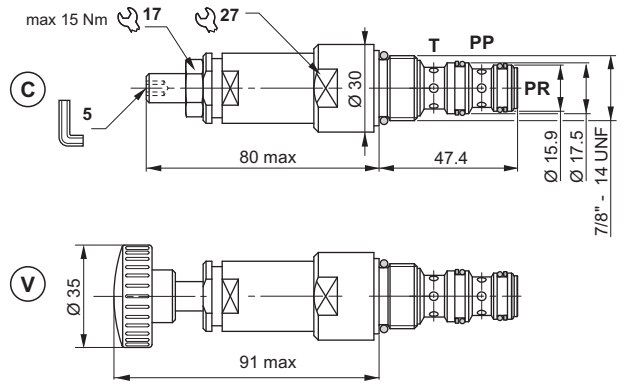
1 = CVS20.1.. - **2** = CVS20.2.. - **3** = CVS20.3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CVS	20	*	*	**	1

- **CVS** = Sequence valve — Series
- **20** = M22 x 1,5 — Size
- **C** = Screw, **M** = Plastic knob — Adjustment
- Setting ranges:
  - **1** = 60 bar (white spring)
  - **2** = 120bar (yellow spring)
  - **3** = 250 bar (green spring)
- Variants:
  - **00** = No variants
  - **V1** = Viton
- **1** = Serial No.

PRESSURE REDUCING VALVES WITH RELIEVING - DIRECT OPERATED



00012014	Spare seals kit

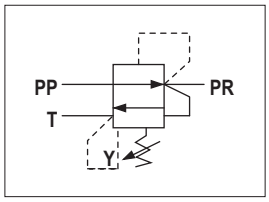
The direct acting pressure reducing valve feeds a secondary branch of a circuit at a lower pressure than the main branch, guaranteeing minimum variation of the set pressure with flow alterations of up to 20 l/min.
Slight leakage is tolerated for this type of valve.
It raises the safety level with the RELIEVING system that enables fluid to pass through the valve from PR to T, preventing pressure increases in the controlled branch and protecting the load, and by making it impossible for plant operators to set a higher pressure rating than that specified in the catalogue. It has a pack spring with mechanical stop.
It has a galvanised steel body. The plunger is in tempered and ground steel.

HYDRAULIC FEATURES

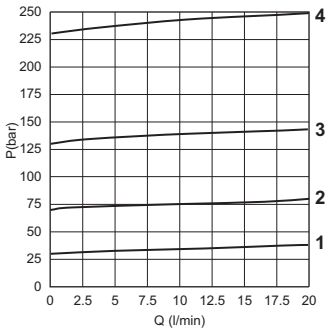
Max. pressure	320 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green) Spring 4 (blue)	 max 2 ÷ 30 bar max 6 ÷ 70 bar max 35 ÷ 130 bar max 65 ÷ 230 bar
Max. Flow	20 l/min
Max. draining on port T	0.2 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.3 kg
Tightening torque	35 ÷ 40 Nm
Cavity (7/8 - 14 UNF)	CD019006 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves.

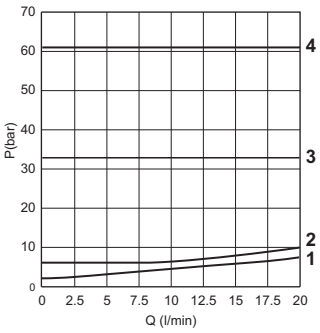
HYDRAULIC SYMBOL



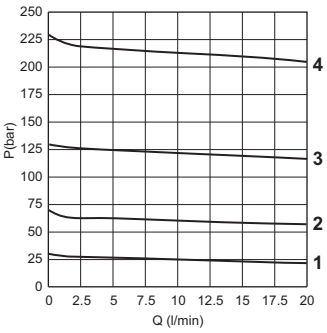
PRESSURE-FLOW OF RELIEVING



MIN.SETTING PRESSURE



PRESSURE-FLOW RATE



1 = CVR06.1..
2 = CVR06.2..
3 = CVR06.3..
4 = CVR06.4..

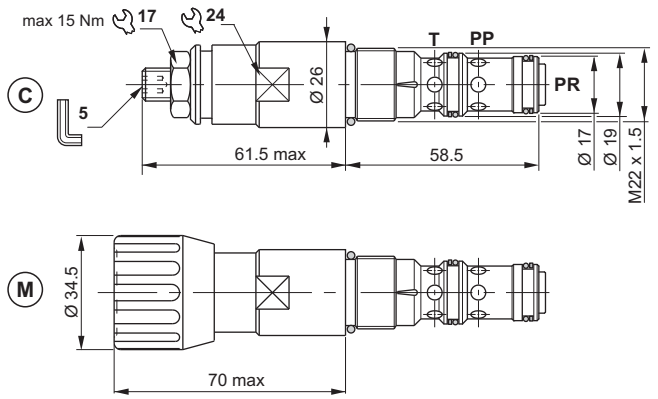
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CVR	06	*	*	**	1

- **CVR** = Pressure reducing valve with relieving — Series
- **06** = 7/8 - 14 UNF — Size
- **C** = Screw, **V** = Hand wheel — Adjustment
- Setting ranges:
  - **1** = 2 ÷ 30 bar (white spring)
  - **2** = 6 ÷ 70 bar (yellow spring)
  - **3** = 35 ÷ 130 bar (green spring)
  - **4** = 65 ÷ 230 bar (blue spring)
- Variants:
  - **00** = No variants
  - **V1** = Viton
- **1** = Serial No.

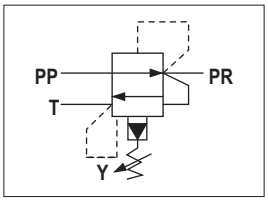
PRESSURE REDUCING VALVES WITH RELIEVING - PILOT OPERATED



00012013	Spare seals kit

The pilot-operated pressure reducing valve feeds a secondary branch of a circuit at a lower pressure, guaranteeing minimum variation of the set pressure with flow alterations of up to 90 l/min.
Slight leakage is tolerated for this type of valve.
It raises the safety level with the RELIEVING system that enables fluid to pass through the valve from PR to T, preventing pressure increases in the controlled branch and protecting the load, and by making it impossible for plant operators to set a higher pressure rating than that specified in the catalogue. It has a pack spring with mechanical stop.
It has a galvanised steel body. The plunger is in tempered and ground steel.

HYDRAULIC SYMBOL

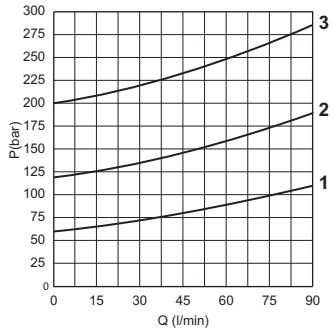


HYDRAULIC FEATURES

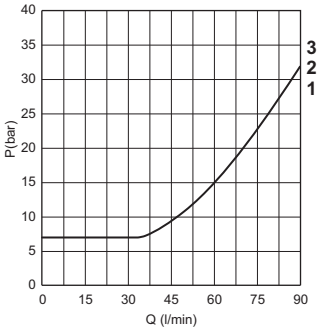
Max. pressure	350 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 60 bar max 120 bar max 250 bar
Maximum allowed Δp pressure between the inlet an outlet pressure	150 bar
Max. Flow	90 l/min
Max. draining on port T	0.5 ÷ 0.7 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.25 kg
Tightening torque	30 ÷ 40 Nm
Cavity (M22 x 1.5)	CN047002 (See section 17)

The minimum permissible setting pressure depending on the spring: see curves.

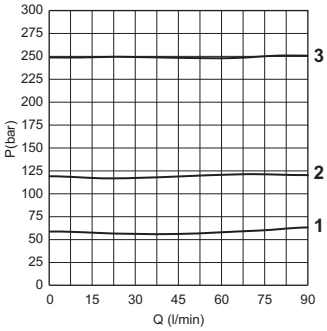
PRESSURE-FLOW OF RELIEVING



MIN.SETTING PRESSURE



PRESSURE-FLOW RATE



1 = CVR20.1..
2 = CVR20.2..
3 = CVR20.3..

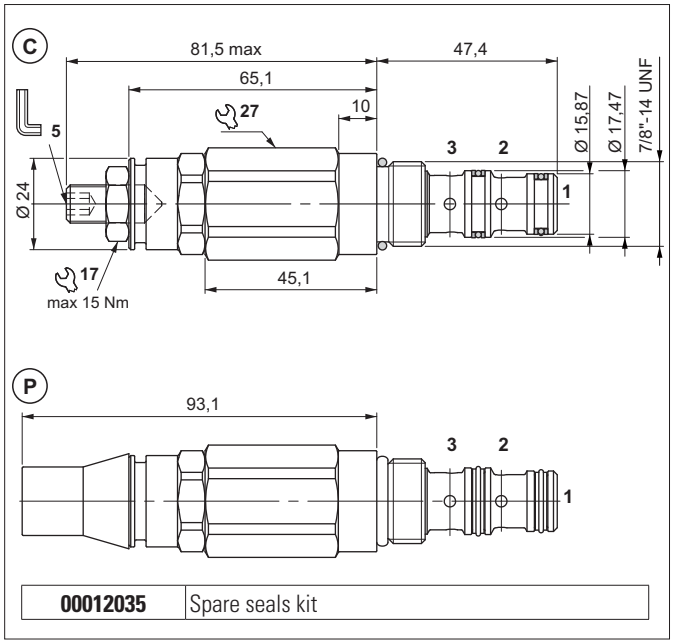
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CVR	20	*	*	**	1

- **CVR** = Pressure reducing valve with relieving — Series
- **20** = M22 x 1,5 — Size
- **C** = Screw; **M** = Plastic knob — Adjustment
- Setting ranges:
  - **1** = 60 bar (white spring)
  - **2** = 120 bar (yellow spring)
  - **3** = 250 bar (green spring)
- Variants:
  - **00** = No variants
  - **V1** = Viton
- **1** = Serial No.

SEQUENCE VALVES



00012035	Spare seals kit

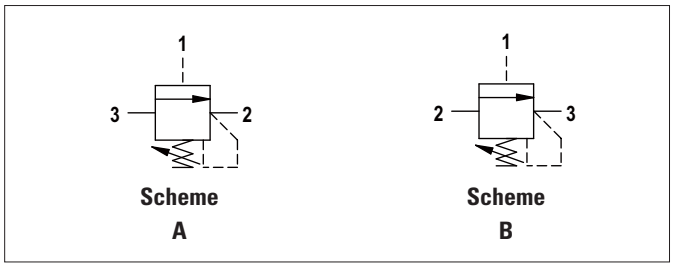
The 3-way sequence valves valve connects a pressurised branch to drain line when the pilot branch calibration setting is reached (port 1).
Slight leakage is tolerated for this type of valve.
It has a galvanised steel body. The plunger is in tempered and ground steel.

2

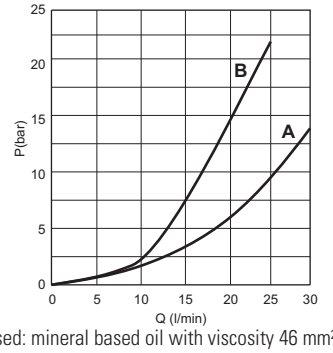
HYDRAULIC FEATURES

Max. pressure	400 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.3 kg
Tightening torque	30 ÷ 40 Nm
Cavity (7/8 - 14 UNF)	CD019006 (See section 17)

HYDRAULIC SYMBOL



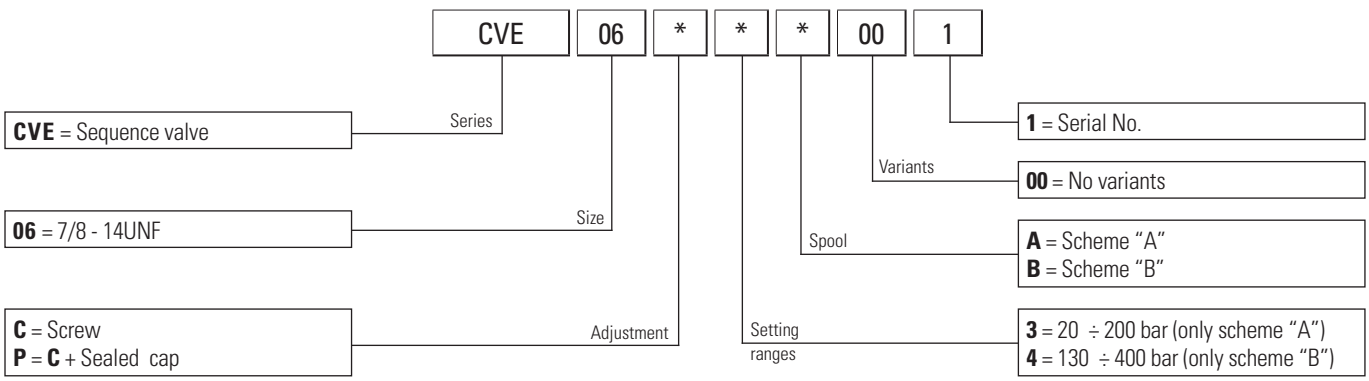
PRESSURE DROPS



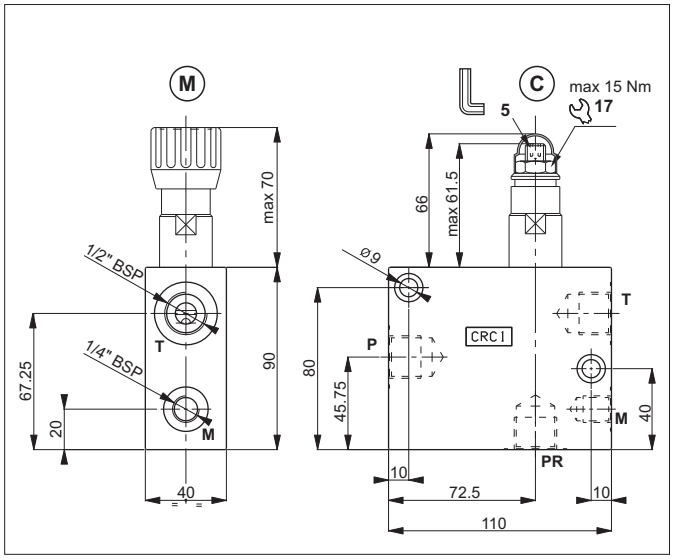
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

Spool scheme	Connections	Flow max l/min
A	**3 → 2**	30
B	**2 → 3**	25

ORDERING CODE



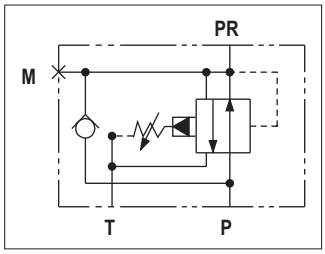
PRESSURE REDUCING AND SEQUENCE VALVES - IN-LINE MOUNTING



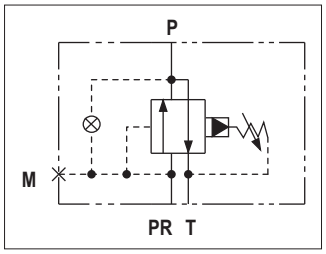
The CRC.1 aluminium body allows the in-line mounting connections for CVS.20 sequence and CVR.20 pressure reducing valves. In the version with pressure reducing valve the pump supply is connected to the port P, while in the version sequence valve is connected to the mouth PR.
For pressure reducing version the body is provided with a one-way check valve, which allows free flow to opposite direction (PR toward P)
For the sequence version a blind grub screw has been placed instead of a check valve.

- Mounting the blind grub screw , code **M78100013**, it is possible to transform the body from reducing valve to sequence valve.
- Mounting the blind grub screw , code **V70052204**, it is possible to transform the body from sequence valve to reducing valve.

HYDRAULIC SYMBOLS



Reducing valve version

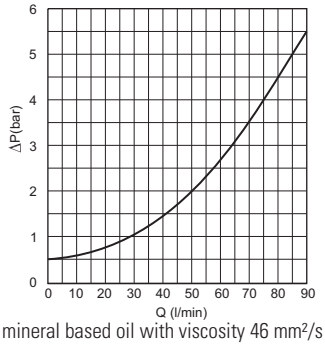


Sequence valve version

HYDRAULIC FEATURES

Max. pressure	350 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	 max 60 bar max 120 bar max 250 bar
Max. Flow	90 l/min
Max. draining on port T	0.5 ÷ 0.7 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	1.224 kg

FREE FLOW TROUGHT THE CHECK VALVE



Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CRC	1	*	*	*	**	1

CRC = Sequence and pressure reducing cartridge valve Size 20 (seat M22x1,5) — Series

1 = Size connection 1/2" BSP — Size

R = Pressure reducing cartridge valve
S = Sequence cartridge valve

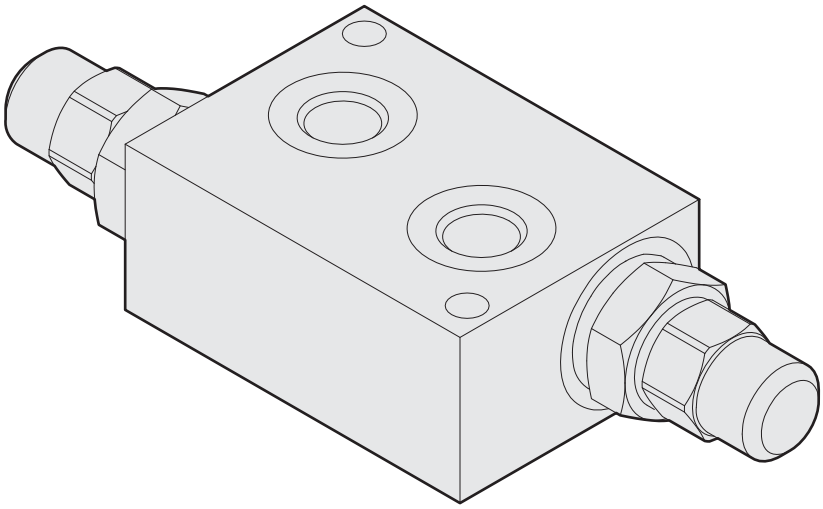
M = Plastic knob
C = Screw
0 = Without cartridge valve — Adjustment

1 = 60 bar (white spring)
2 = 120bar (yellow spring)
3 = 250 bar (green spring)
0 = Without cartridge valve — Setting ranges

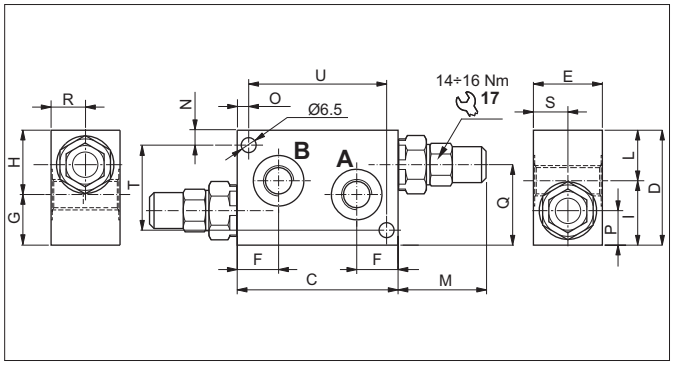
00 = No variants
V1 = Viton — Variants

1 = Serial No.

DOUBLE CROSS RELIEF VALVES



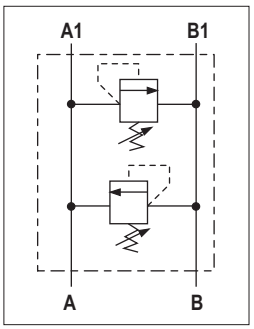
DOUBLE CROSS RELIEF VALVES DIRECT ACTING - IN-LINE MOUNTING



The direct acting compensator valves with CMP04 type cartridge protects the hydraulic components from impact or peaks in pressure.
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop (only standard screw and nut).
The body is in high-resistance aluminium and the cartridge is in galvanised steel.

3

HYDRAULIC SYMBOL



HYDRAULIC FEATURES

Max. pressure Size 1/4 BSP Size 3/8 BSP	 250 bar 250 bar
Max. Flow Size 1/4 BSP Size 3/8 BSP	 30 l/min 30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

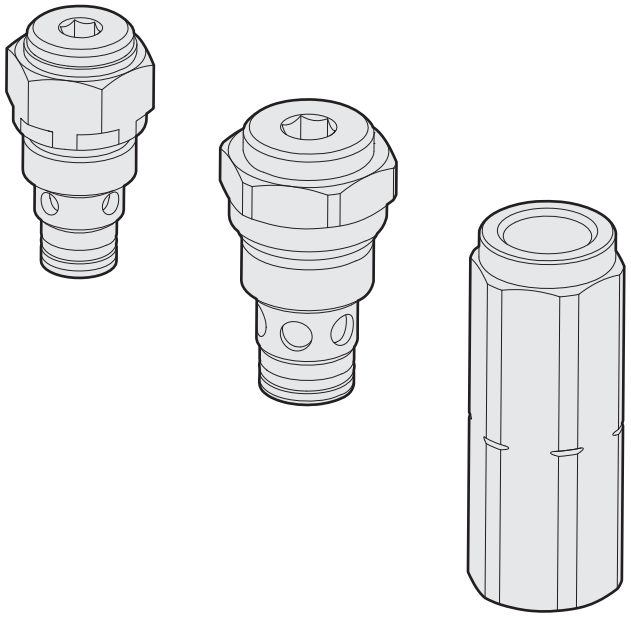
Size	Ports A-B	Valve features see:	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	M (mm)	N (mm)	O (mm)	P (mm)	Q (mm)	R (mm)	S (mm)	T (mm)	U (mm)	Weight (kg)
04	1/4 BSP	CMP04	70	50	30	17.5	22	28	28	22	32	6.5	5	15	35	15	15	37	60	0.394
06	3/8 BSP	CMP04	70	50	30	18	20	30	30	20	32	6.5	5	15	35	15	15	37	60	0.400

ORDERING CODE

VADIL | ** | 00 | * | 0 | 0 | 2

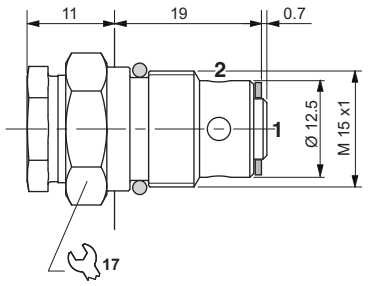
- Series: **VADIL** = Double cross valve
- Size: **04** = 1/4 BSP; **06** = 3/8 BSP
- **00** = Free field
- Setting ranges: **1** = 70 bar (max); **2** = 160 bar (max); **3** = 250 bar (max - size 04-06)
- Adjustment: **0** = Screw
- Variants: **0** = No variants
- **2** = Serial No.

ONE-WAY CHECK VALVES

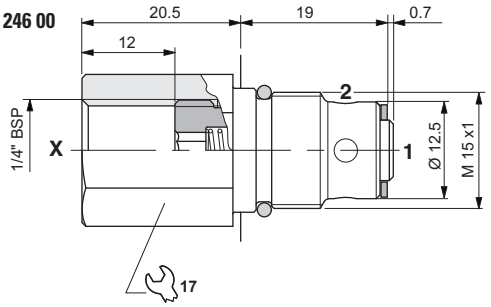


ONE-WAY CHECK VALVES

cod. **200 222 00**



cod. **200 246 00**



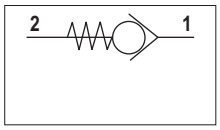
00012002	Spare seals kit

The unidirectional check valve allows oil to flow in only one direction. The guided ball seal is made of tempered and ground steel.
The spring allows the valve to be mounted in any position.
Also available with 1/4"BSP auxiliary pressure outlet.
It has a galvanised steel body.

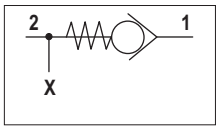
HYDRAULIC FEATURES

Max. working pressure	220 bar
Max. Flow	10 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Crack pressure	1 bar
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Tightening torque	16 ÷ 19 Nm
Cavity (M15x1)	CN033001 (See section 17)

HYDRAULIC SYMBOLS



cod. **20022200**

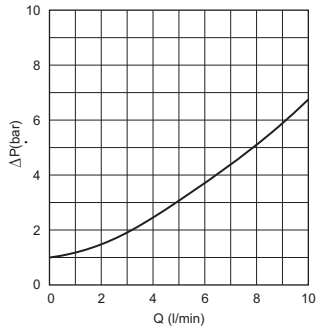


cod. **20024600**

ORDERING CODE

Code	Type	Weight
20022200	2 way	0.035 kg
20024600	3 way	0.042 kg

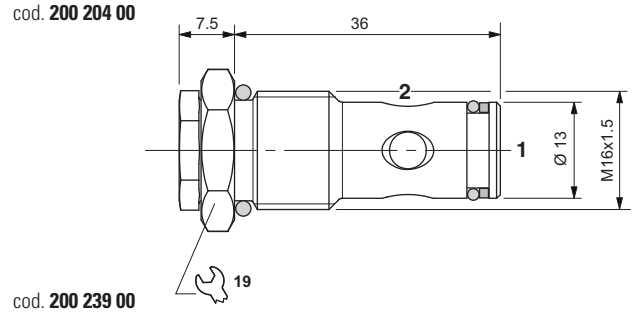
PRESSURE DROPS



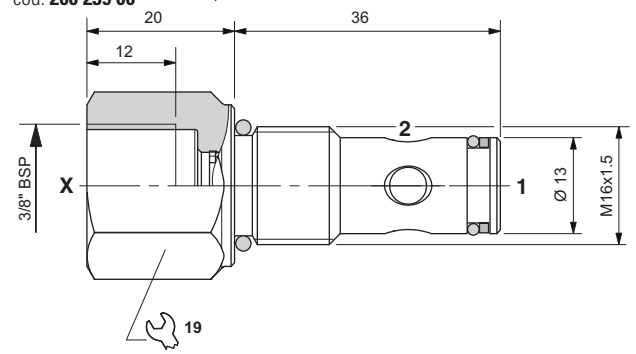
Fluid used: mineral based oil with viscosity 32 mm^2/s at 50°C.

ONE-WAY CHECK VALVES

cod. **200 204 00**



cod. **200 239 00**



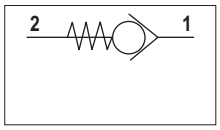
00012016	Spare seals kit

The unidirectional check valve allows oil to flow in only one direction. The guided ball seal is made of tempered and ground steel.
The spring allows the valve to be mounted in any position.
Also available with 1/4"BSP auxiliary pressure outlet.
It has a galvanised steel body.

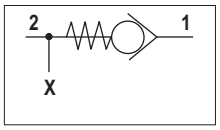
HYDRAULIC FEATURES

Max. working pressure	210 bar
Max. Flow	20 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Crack pressure	0.5 bar
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Tightening torque	28 ÷ 32 Nm
Cavity (M16x1.5)	CN03704 (See section 17)

HYDRAULIC SYMBOLS



cod. **20020400**

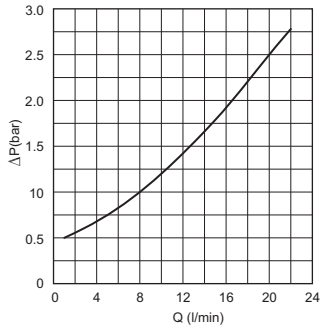


cod. **20023900**

ORDERING CODE

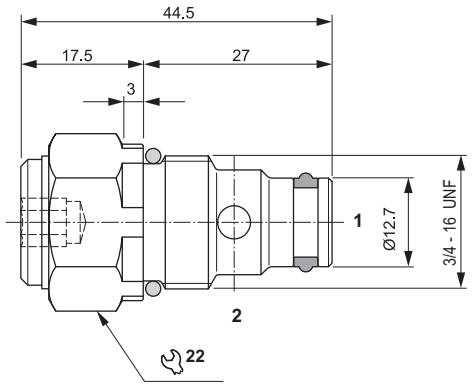
Code	Type	Weight
20020400	2 way	0.041 kg
20023900	3 way	0.070 kg

PRESSURE DROPS



Fluid used: mineral based oil with viscosity 32 mm^2/s at 50°C.

ONE-WAY CHECK VALVES



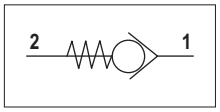
00012003	Spare seals kit

The check-valves permit one-directional oil flow only. On the opposite side the sealing is guaranteed by a hardened and ground taper steel poppet. The spring permits an easy valve installation in any position. External steel body protected on surface by zinc plating.

HYDRAULIC FEATURES

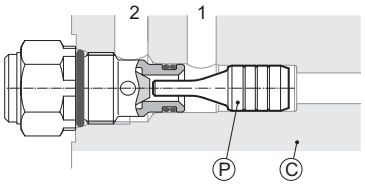
Max. working pressure	350 bar
Max. Flow	40 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.08 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

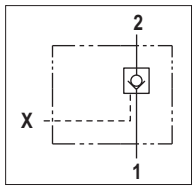
HYDRAULIC SYMBOL



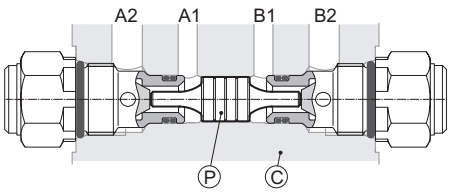
PILOT SPOOL

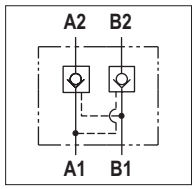
Single





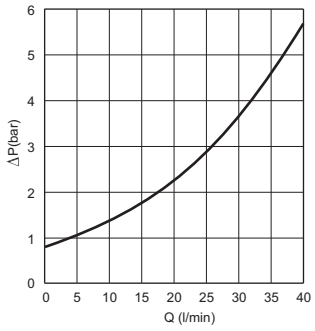
Double





Type	Spool (P) code	Cavity (C) (See section 17)	Pilot ratio
Single	**F63400002**	**CD018015**	1 : 2.9
Double	**F63400003**	**CD018016**	1 : 2.9

PRESSURE DROPS



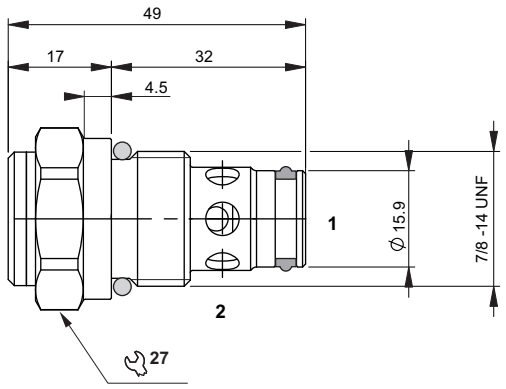
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

CRU | 04 | ** | 00 | 2

- Series: **CRU** = Check valve
- Size: **04** = 3/4 - 16 UNF
- Opening pressure: **01** = 0.3 bar; **00** = 0.7 bar (standard); **04** = 4.5 bar; **07** = 7.5 bar; **10** = 10 bar
- Variants: **00** = No variants
- **2** = Serial No.

ONE-WAY CHECK VALVES



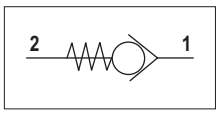
00012017	Spare seals kit

The check-valves permit one-directional oil flow only. On the opposite side the sealing is guaranteed by a hardened and ground taper steel poppet. The spring permits an easy valve installation in any position. External steel body protected on surface by zinc plating.

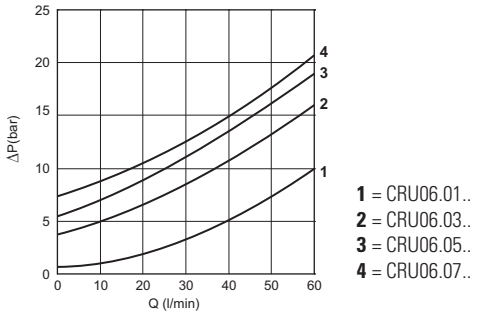
HYDRAULIC FEATURES

Max. working pressure	350 bar
Max. Flow	60 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.10 kg
Tightening torque	35 ÷ 40 Nm
Cavity (7/8 - 14 UNF)	CD019007 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS



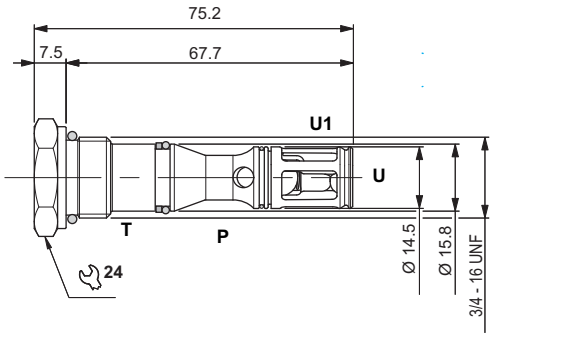
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

CRU	06	**	00	1

- Series: **CRU** = Check valve
- Size: **06** = 7/8 - 14 UNF
- Opening pressure: **01** = Standard - 0.5 bar; **03** = 3 bar; **05** = 5 bar; **07** = 7.5 bar
- Variants: **00** = No variants
- **1** = Serial No.

ONE-WAY CHECK VALVES (FOR POWER PACKS SERIES FP)



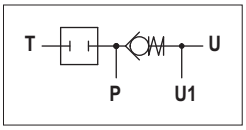
00012004	Spare seals kit

The check-valves permit one-directional oil flow only. On the opposite side the sealing is guaranteed by a ball steel poppet. The spring permits an easy valve installation in any position. External steel body protected on surface by zinc plating.

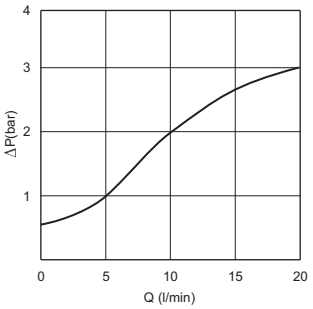
HYDRAULIC FEATURES

Max. working pressure	320 bar
Max. Flow	20 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.09 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018013 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS (P → U)



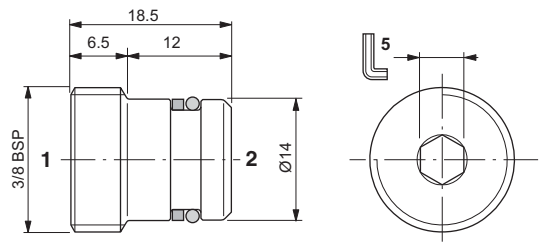
Fluid used: mineral based oil with viscosity 32 mm^2/s at 50°C.

ORDERING CODE

CRI	04	00	00	1

- Series: **CRI** = Check valve
- Size: **04** = 3/4 - 16 UNF
- Opening pressure: **00** = Standard - 0.5 bar
- Variants: **00** = No variants
- **1** = Serial No.

ONE-WAY CHECK VALVES



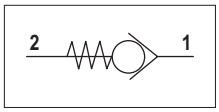
00012018	Spare seals kit

The unidirectional check valve allows oil to flow in only one direction. The guided ball seal is made of tempered and ground steel.
The spring allows the valve to be mounted in any position.
Steel body.

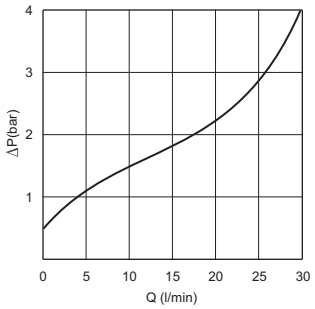
HYDRAULIC FEATURES

Max. working pressure	300 bar
Max. Flow	30 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.09 kg
Tightening torque	16 ÷ 18 Nm
Cavity (3/8 BSP)	CG03004 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS



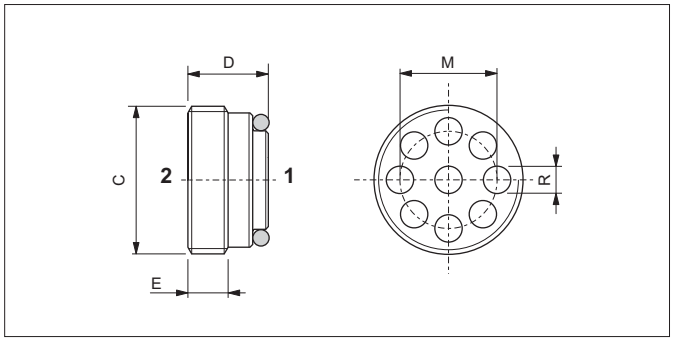
Fluid used: mineral based oil with viscosity 32 mm^2/s at 40°C.

ORDERING CODE

VR	06	0	0	0

- **VR** = Check valve — Series
- **06** = 3/8 BSP — Size
- **0** = Standard - 0.5 bar — Opening pressure
- Variants — **0** = No variants
- **0** = Serial No.

ONE-WAY CHECK VALVES



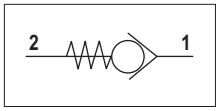
The unidirectional check valve allows oil to flow in only one direction. The guided half-ball seal is made of tempered and ground steel.
The spring allows the valve to be mounted in any position.
Steel body.

C	Flow max (l/min)	Pressure max (bar)	M (mm)	R (mm)	D (mm)	E (mm)	Tightening torque (Nm)	Weight (kg)
1/4 BSP	20	350	8.5	2.2	8.5	4,4	6	0.005
3/8 BSP	50	350	10.8	3	11.3	6	6	0.011
1/2 BSP	80	350	14.2	3.8	12.7	6.5	10	0.019

HYDRAULIC FEATURES

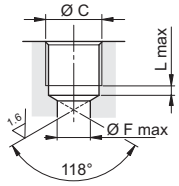
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

HYDRAULIC SYMBOL



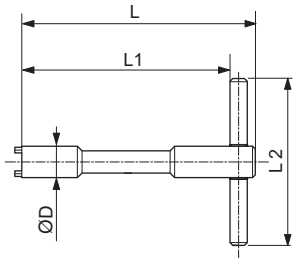
SEAL

C	F (mm)	L (mm)
1/4 BSP	7	3
3/8 BSP	9	3.5
1/2 BSP	12	4.5

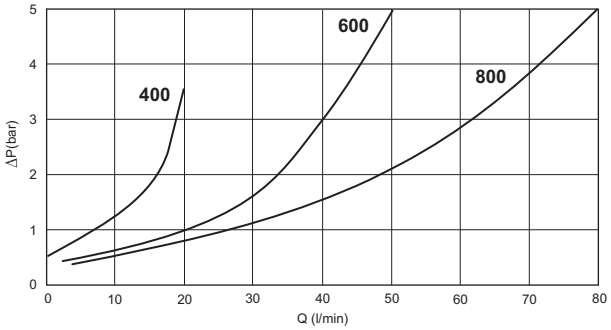


KEY FOR TIGHTENING VALVE

Code key	For valve	D (mm)	L (mm)	L1 (mm)	L2 (mm)
AVA174	VUI0400	11.4	120	105.5	100
AVA176	VUI0600	14.9	120	105.5	100
AVA178	VUI0800	18.6	120	105.5	100



PRESSURE DROPS



Fluid used: mineral based oil with viscosity 32 mm^2/s at 40°C.

ORDERING CODE

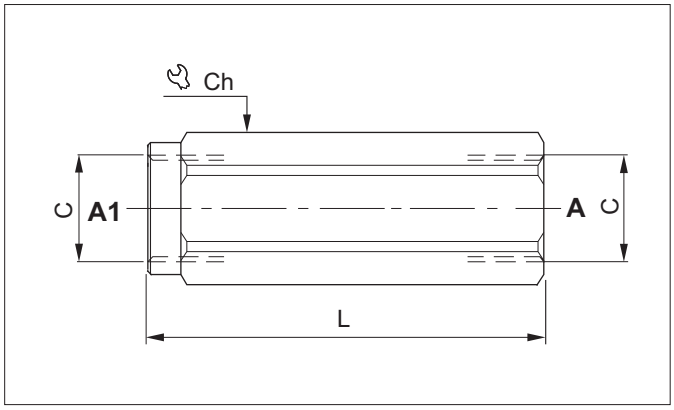
VUI | ** | 00

Series: **VUI** = Check valve

Size:
04 = 1/4 BSP
06 = 3/8 BSP
08 = 1/2 BSP

Opening pressure: **00** = Standard - 0.5 bar

ONE-WAY CHECK VALVES - IN-LINE MOUNTING

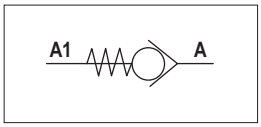


The check-valves permit one-directional oil flow only. On the opposite side the sealing is guaranteed by a hardened and ground taper steel poppet. The spring permits an easy valve installation in any position.
Exsternal steel body protected on surface by a zinc plating.

HYDRAULIC FEATURES

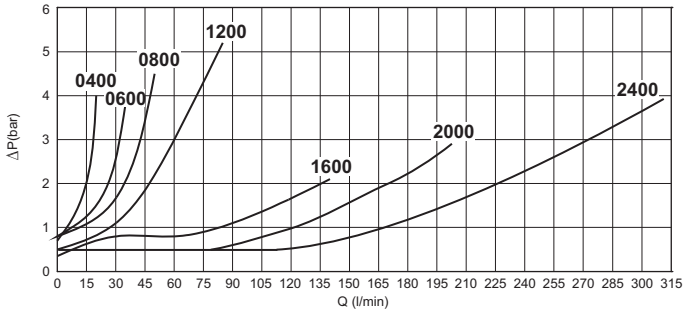
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

HYDRAULIC SYMBOL



Code	C	Flow **max** (l/min)	Pressure **max** (bar)	L (mm)	Ch (mm)	Weight (kg)
VRU0400	1/4 BSP	20	350	59	19	0.10
VRU0600	3/8 BSP	35	350	66	24	0.17
VRU0800	1/2 BSP	50	350	78	27	0.24
VRU1200	3/4 BSP	85	300	90	36	0.49
VRU1600	1 BSP	140	250	112	40	0.67
VRU2000	1- 1/4 BSP	200	250	142	55	1.68
VRU2400	1- 1/2 BSP	310	210	155	60	2.10

PRESSURE DROPS



Fluid used: mineral based oil with viscosity
15 mm^2/s at 40°C.

ORDERING CODE

VRU ** **

Series

VRU = Check valve

04 = 1/4 BSP
06 = 3/8 BSP
08 = 1/2 BSP
12 = 3/4 BSP
16 = 1 BSP
20 = 1- 1/4 BSP
24 = 1- 1/2 BSP

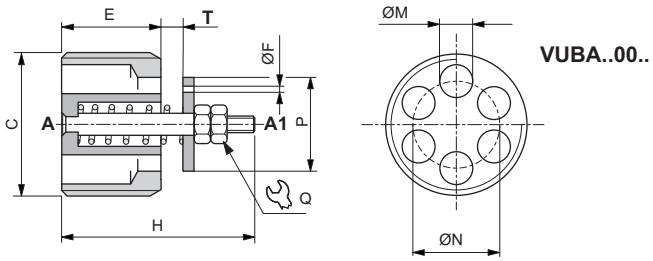
Size

Setting pressure

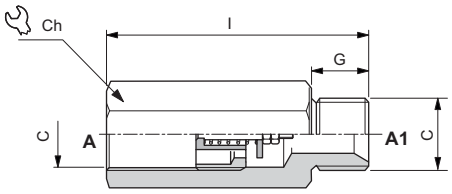
CODE	VRU						
	04	**06**	**08**	**12**	**16**	**20**	**24**
00	0.7*	0.5*	0.5*	0.5*	0.5*	0.5*	0.5*
02				2*	2*		
03	4.5*	3*	3*	3*			
05	7.5*	5*	5*				
10	10*				10*		

Standard
* Pressure - bar

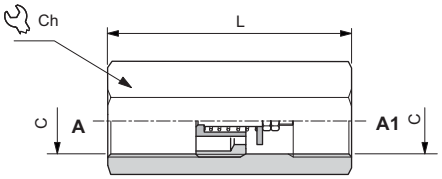
CHECK VALVES FOR PIPES



VUBA..00..



VUBA..11..



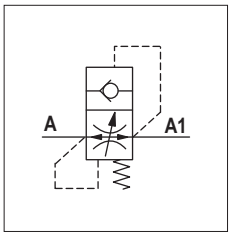
VUBA..12..

The pipe-pressure check valve is fitted directly on cylinder connections to prevent uncontrolled drops due to system faults.
Supplied on request with a flow reducer hole F on the plate to enable leakage from A1 to A and allow the load to drop slowly.
Steel body and plate. Seal surfaces lapped.

HYDRAULIC FEATURES

Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

HYDRAULIC SYMBOL

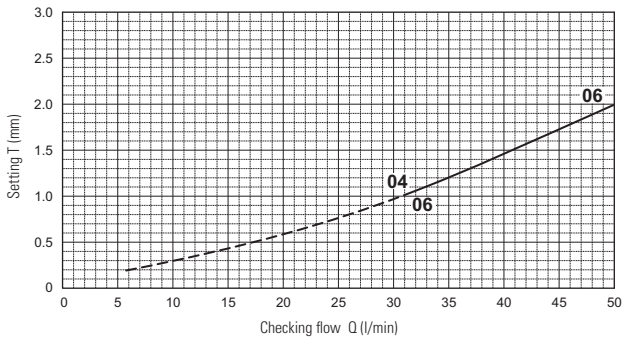


Code	C	Flow min (l/min)	Flow max (l/min)	Pressure max (bar)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	T * (mm)	Ch (mm)	Tightening torque (Nm)	Weight (kg)		
																		VUBA..00.	VUBA..11.	VUBA..12.
VUBA0400..	1/4 BSP	4	25	350	8	0.5 - 0.6	11	17.5	61	61	2.4	8.5	9.5	5.5	0.2 ÷ 1.0	19	2	0.007	0.07	0.09
VUBA0600 ..	3/8 BSP	6	50	350	10.5	0.8 - 1.0	13	23	63	63	3.5	10.5	12.5	5.5	0.2 ÷ 2.0	22	3	0.012	0.10	0.11
VUBA0800 ..	1/2 BSP	16	80	350	12	1.2 - 1.3	14	25	72	65	4.5	13	15	7	0.4 ÷ 2.6	27	4	0.023	0.17	0.16
VUBA1200 ..	3/4 BSP	25	150	350	17	1.5 - 1.9 2.0	17	30.5	104	72	6	16	18	7	0.3 ÷ 2.8	32	10	0.047	0.25	0.21

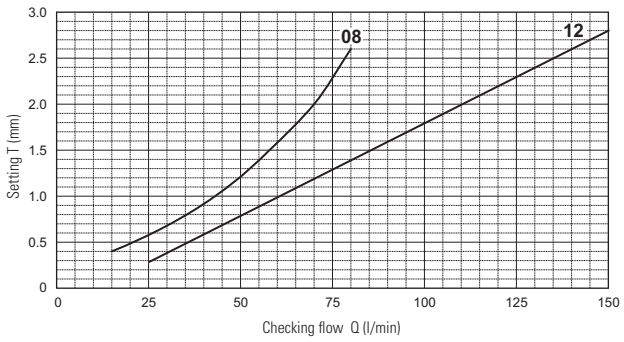
* Specify distance "T" with decimal progression. Standard distance "T" is 0.5 mm (for 1/4 and 3/8 BSP valves) and 0.7 mm (for 1/2 and 3/4 BSP valves).
Response flow depends on distance "T" see "T adjustment curves".

DIAGRAMS FOR "T" ADJUSTEMENT

A ⇦ A1 VUBA04... VUBA06...



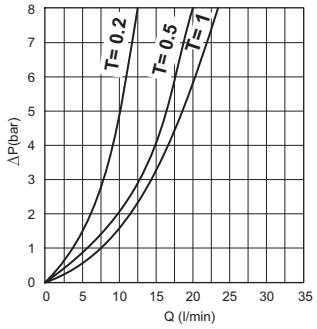
A ⇦ A1 VUBA08... VUBA12...



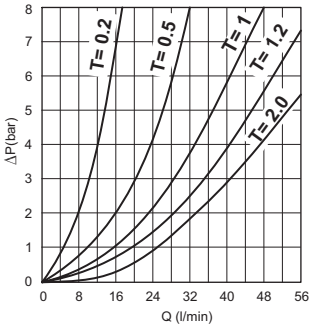
Distance "T" must correspond to a flow rate of at least 50% top than the set flow.
The flow of checking flow may be ±10% on given curve.
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

FLOW PRESSURE DROP ACCORDING ADJUSTEMENT "T"

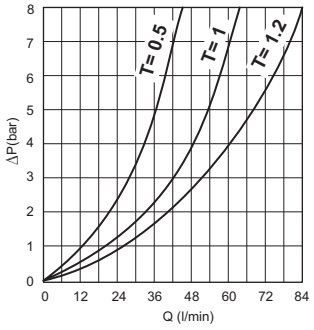
A ⟺ A1 VUBA04...



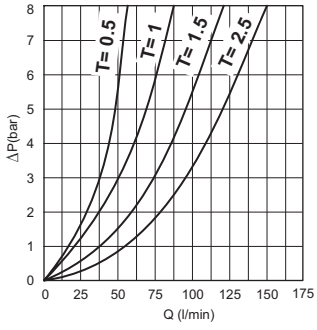
A ⟺ A1 VUBA06...



A ⟺ A1 VUBA08...



A ⟺ A1 VUBA12...

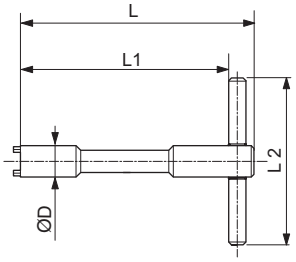


Diagrams flow pressure drop according adjustement length of "T"

4

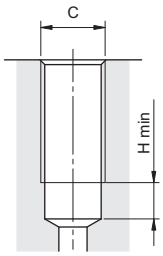
KEY FOR TIGHTENING VALVE

Code key	For valve	D (mm)	L (mm)	L1 (mm)	L2 (mm)
AVA184	VUBA04..	11.3	120	110	60
AVA186	VUBA06..	15	120	110	80
AVA188	VUBA08..	18.8	120	108	80
AVA1812	VUBA12..	24	120	108	80

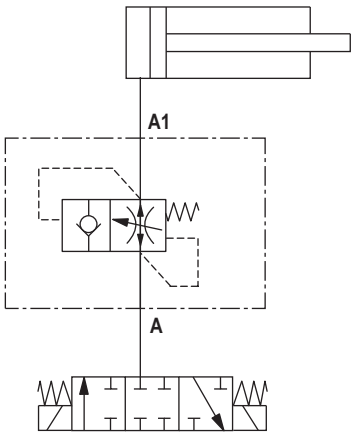


SEAL

C	H (mm)
1/4 BSP	11
3/8 BSP	11
1/2 BSP	15
3/4 BSP	16



SERVICE EXAMPLE



ORDERING CODE

VUBA	**	**	T***	F**
Series	Size	Versions	Setting T	Hole on the plate

VUBA = Check valve

04 = 1/4 BSP
06 = 3/8 BSP
08 = 1/2 BSP
12 = 3/4 BSP

00 = Cartridge only
11 = Complete valve M/F
12 = Complete valve F/F
01 = Only column M/F
02 = Only column F/F

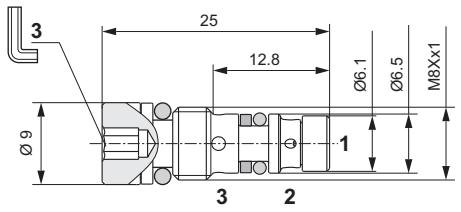
Standard settings (omit code)
0.5 mm for dimensions 04-06
0.7 mm for dimensions 08-12

Special settings (2)
020 ÷100 = 0.2 ÷ 1.0 mm for dimension 04
020 ÷200 = 0.2 ÷ 2.0 mm for dimension 06
040 ÷260 = 0.4 ÷ 2.6 mm for dimension 08
030 ÷280 = 0.3 ÷ 2.8 mm for dimension 12

Standard, without hole (omit code)

Special holes (1)
05 = 0.5 (mm)
06 = 0.6 (mm)
08 = 0.8 (mm)
10 = 1.0 (mm)
12 = 1.2 (mm)
13 = 1.3 (mm)
15 = 1.5 (mm)
19 = 1.9 (mm)
20 = 2.0 (mm)

NOTE:
(1-2) Special, minimum 100 pieces.
(2) Specify distance "T" with decimal progression (e.g. T020 = 0.20 mm).



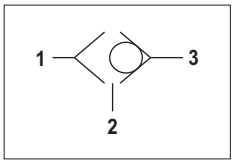
00012040	Spare seals kit

The shuttle type cartridge valves allow taking of the highest pressure signal to the external port via displacement of tempered and ground steel ball. There are usually employed to signal the actuator load to a load sensing pump pressure compensator. External steel body.

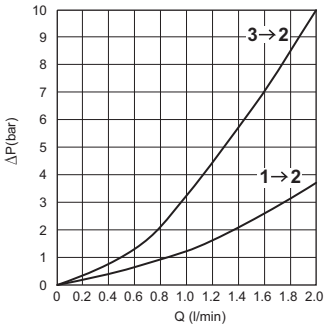
HYDRAULIC FEATURES

Max. working pressure	350 bar
Max. Flow	2 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.0065 kg
Tightening torque	16 ÷ 18 Nm
Cavity (M8 x 1)	CA007001 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS



Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE

SH	01	00	1
Series	Size	Variants	

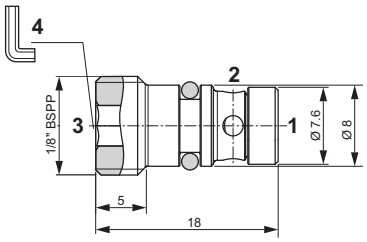
SH = Shuttle valve

01 = M8 x 1

00 = No variants

1 = Serial No.

SHUTTLE VALVES



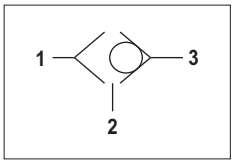
Q25880009	Polyurethane spare seals kit -35°C ÷ 100°C

The shuttle type cartridge valves allow taking of the highest pressure signal to the external port via displacement of tempered and ground steel ball. There are usually employed to signal the actuator load to a load sensing pump pressure compensator. External steel body.

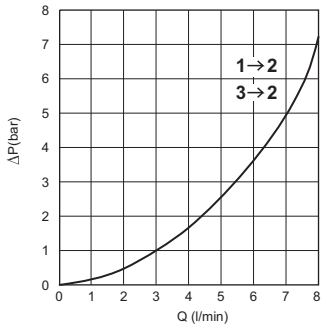
HYDRAULIC FEATURES

Max. working pressure	400 bar
Max. Flow	8 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.006 kg
Tightening torque	16 ÷ 18 Nm
Cavity (G 1/8)	CG001002 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS



Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

SH	02	00	2
Series	Size	Variants	

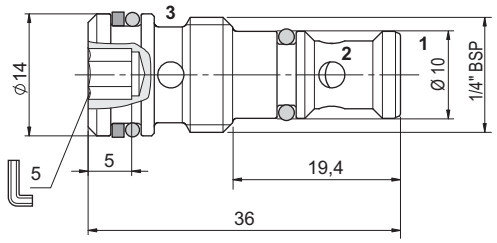
SH = Shuttle valve

02 = 1/8 BSP

00 = No variants

2 = Serial No.

SHUTTLE VALVES



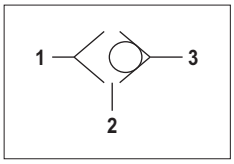
00012019	Spare seals kit

The shuttle type cartridge valves allow taking of the highest pressure signal to the external port via displacement of ball in tempered and ground steel. There are usually employed to signal the actuator load to a load sensing pump pressure compensator. External steel body protected on surface by zinc plating.

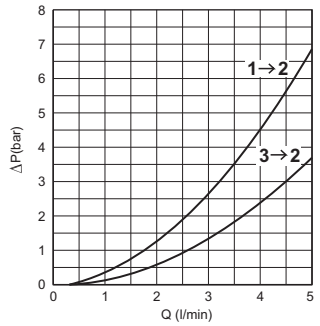
HYDRAULIC FEATURES

Max. working pressure	350 bar
Max. Flow	5 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.023 kg
Tightening torque	18 ÷ 20 Nm
Cavity (1/4 BSP)	CA012001 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS



Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

SH	03	**	2

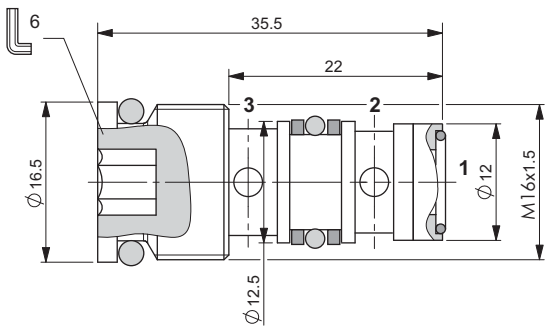
Series: **CRI** = Shuttle valve

Size: **03** = 1/4 BSP

Variants: **00** = No variants; **V1** = Viton

2 = Serial No.

SHUTTLE VALVES



00012020	Spare seals kit

The shuttle type cartridge valves allow taking of the highest pressure signal to the external port via displacement of ball in tempered and ground steel. There are usually employed to signal the actuator load to a load sensing pump pressure compensator. External steel body protected on surface by zinc plating.

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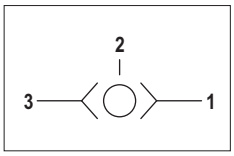
HYDRAULIC FEATURES

Max. working pressure	380 bar
Max. Flow	10 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.029 kg
Tightening torque	16 ÷ 18 Nm
Cavity (M16x1.5)	CN037003 (See section 17)

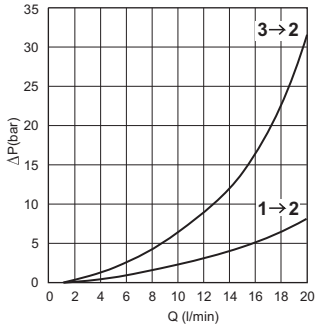
HYDRAULIC SYMBOL



ORDERING CODE

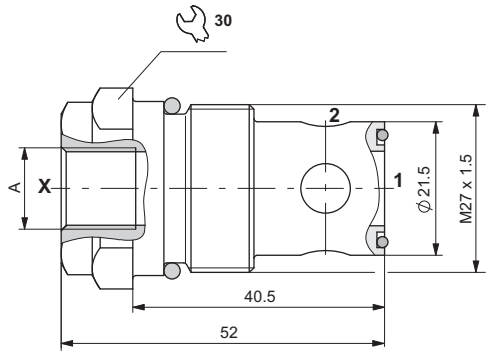
Code	Type
RVLV0101160	Shuttle valve

PRESSURE DROPS



Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

PUMP UNLOADING VALVES

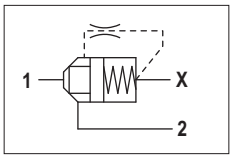


A = 1/4 BSP (RVLV1..2270)
SAE 7/16 20UNF (RVLV1..2150)

00012021	Spare seals kit

The normally-closed 2-way 2-position valve is used to connect a normally pressurised branch to the outlet in order to allow fluid to flow through the valve from 2 to 1.
Tapered poppet in tempered and ground steel, released when the pilot branch X is connected to the outlet.
It has a galvanised steel body.

HYDRAULIC SYMBOL



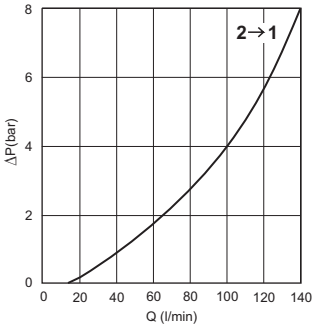
HYDRAULIC FEATURES

Max. working pressure	380 bar
Max. Flow	140 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.1422 kg
Tightening torque	22 ÷ 26 Nm
Cavity (M27x1.5)	CN059001 (See section 17)

ORDERING CODE

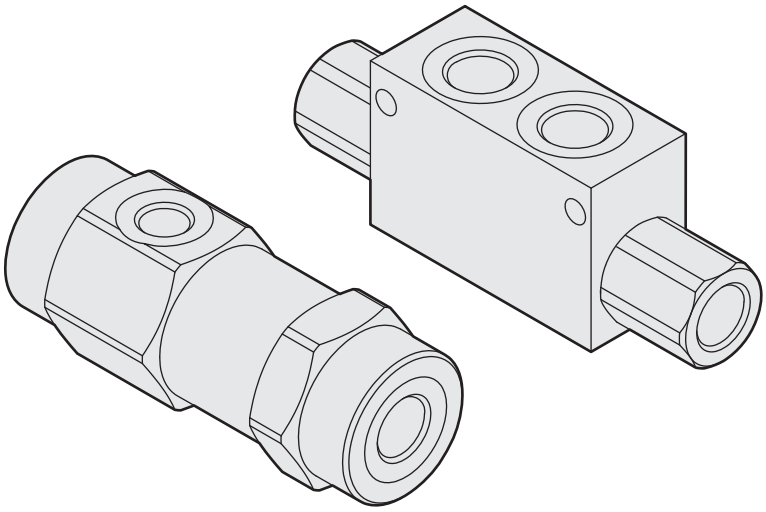
Code	Type
RVLV1202270	Pump unloading valve (A = 1/4 BSP)
RVLV12021S0	Pump unloading valve (A = SAE 7/16 20UNF)

PRESSURE DROPS

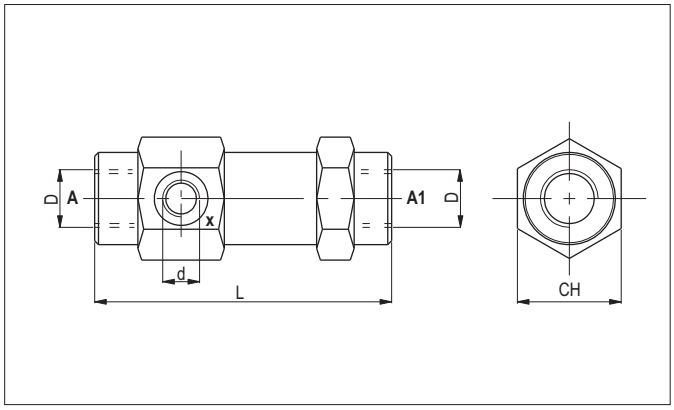


Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

PILOT CHECK VALVES



SINGLE ACTING PILOTED CHECK VALVES - IN-LINE MOUNTING



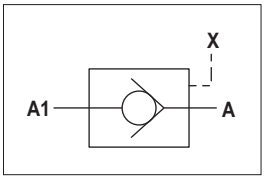
The pilot-operated check valve blocks a single-acting actuator in any position. Tapered poppet in tempered and ground steel, released by feeding the piloted opening X.
Can be mounted in any position; galvanised.

Code	Flow max (l/min)	Pressure max (bar)	L (mm)	Ch (mm)	Piloting ratio	d	D	Weight (kg)
VRS07	12	350	103	36	1:9	1/4 BSP	1/4 BSP	0.65
VRS10	30	310	109	40	1:6	1/4 BSP	3/8 BSP	0.82
VRS13	45	310	120	42	1:4.5	1/4 BSP	1/2 BSP	0.96
VRS19	85	300	131	55	1:3.7	1/4 BSP	3/4 BSP	1.95

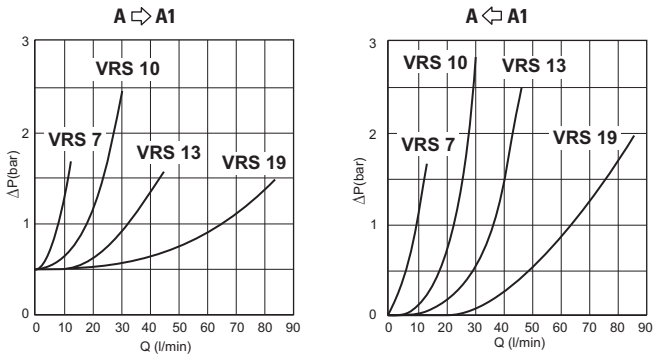
HYDRAULIC FEATURES

Max. working pressure	350 bar
Standard opening pressure	0.5 bar
Max. Leakage (0 ÷ 20 drops/min)	0 ÷ 1 cm^3/min
Piloting ratio	See table
Max. Flow	85 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	2.8 ÷ 380 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	See table

HYDRAULIC SYMBOL



PRESSURE DROPS - FLOW



Fluid used: mineral based oil with viscosity 24 mm^2/s at 50°C.

ORDERING CODE

VRS	**	1	00	1

Series

VRS = Simple acting piloted check valves

Size

07 = 1/4 BSP - 1/4 BSP
10 = 1/4 BSP - 3/8 BSP
13 = 1/4 BSP - 1/2 BSP
19 = 1/4 BSP - 3/4 BSP

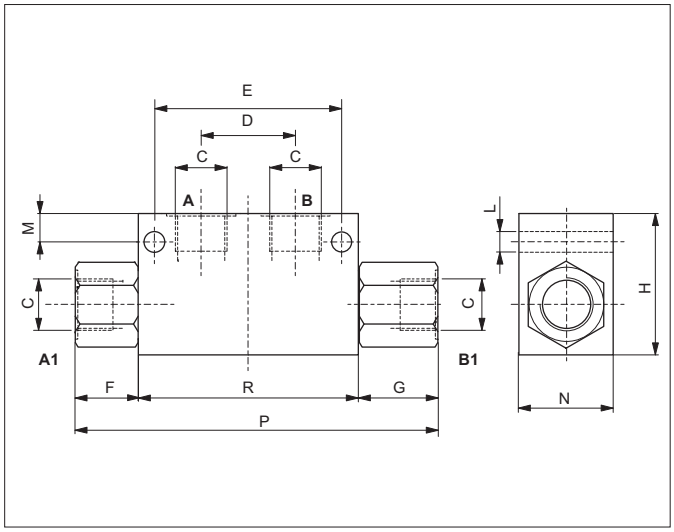
Variants

00 = No variants

1 = Opening pressure 0.5 bar (standard)

1 = Serial No.

SINGLE AND DOUBLE ACTING PILOT CHECK VALVES - IN-LINE MOUNTING



With the acting pilot check valves, a single or double acting actuator can be locked in any position.
Sealing is guaranteed by tempered, ground, tapered steel poppets, releasing is by venting the piloted openings "A" and "B" according to the valve pilot ratio. The valves can be mounted in any position and are protected externally by a zinc plating.

HYDRAULIC FEATURES

Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

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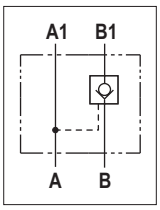
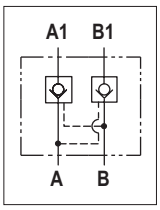
Code	C	Flow max (l/min)	Pressure max (bar)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	L (mm)	M (mm)	N (mm)	P (mm)	R (mm)	Weight (kg)	Pilot ratio
VBPSA0400	1/4 BSP	20	350	30	60	20	27	45	6.5	9	30	117	70	0.76	1:4
VBPSA0600	3/8 BSP	25	350	30	60	20	27	45	6.5	9	30	117	70	0.72	1:4
VBPSA0918	9/16-18 UNF	20	350	30	60	30.5	30.5	45	6.5	9	30	131	70	0.72	1:4
VBPSA0800	1/2 BSP	45	300	40	75	35	42	60	8	17	40	170	90	1.65	1:4
VBPSA1200	3/4 BSP	85	280	60	104	46	46	70	9	16	50	212	120	3.10	1:3.6
VBPDA0400	1/4 BSP	20	350	30	60	27	27	45	6.5	9	30	124	70	0.80	1:4
VBPDA0600	3/8 BSP	25	350	30	60	27	27	45	6.5	9	30	124	70	0.75	1:4
VBPDA0918	9/16-18 UNF	20	350	30	60	30.5	30.5	45	6.5	9	30	131	70	0.75	1:4
VBPDA0800	1/2 BSP	45	300	40	75	42	42	60	8	17	40	174	90	1.78	1:4
VBPDA1200	3/4 BSP	85	280	60	104	46	46	70	9	16	50	212	120	3.25	1:3.6

HYDRAULIC SYMBOLS

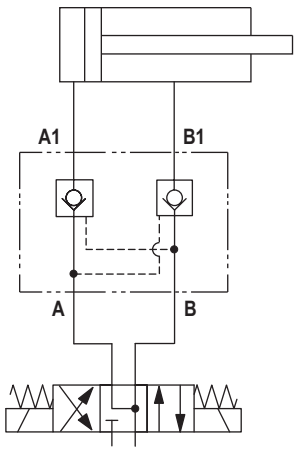


VBPSA

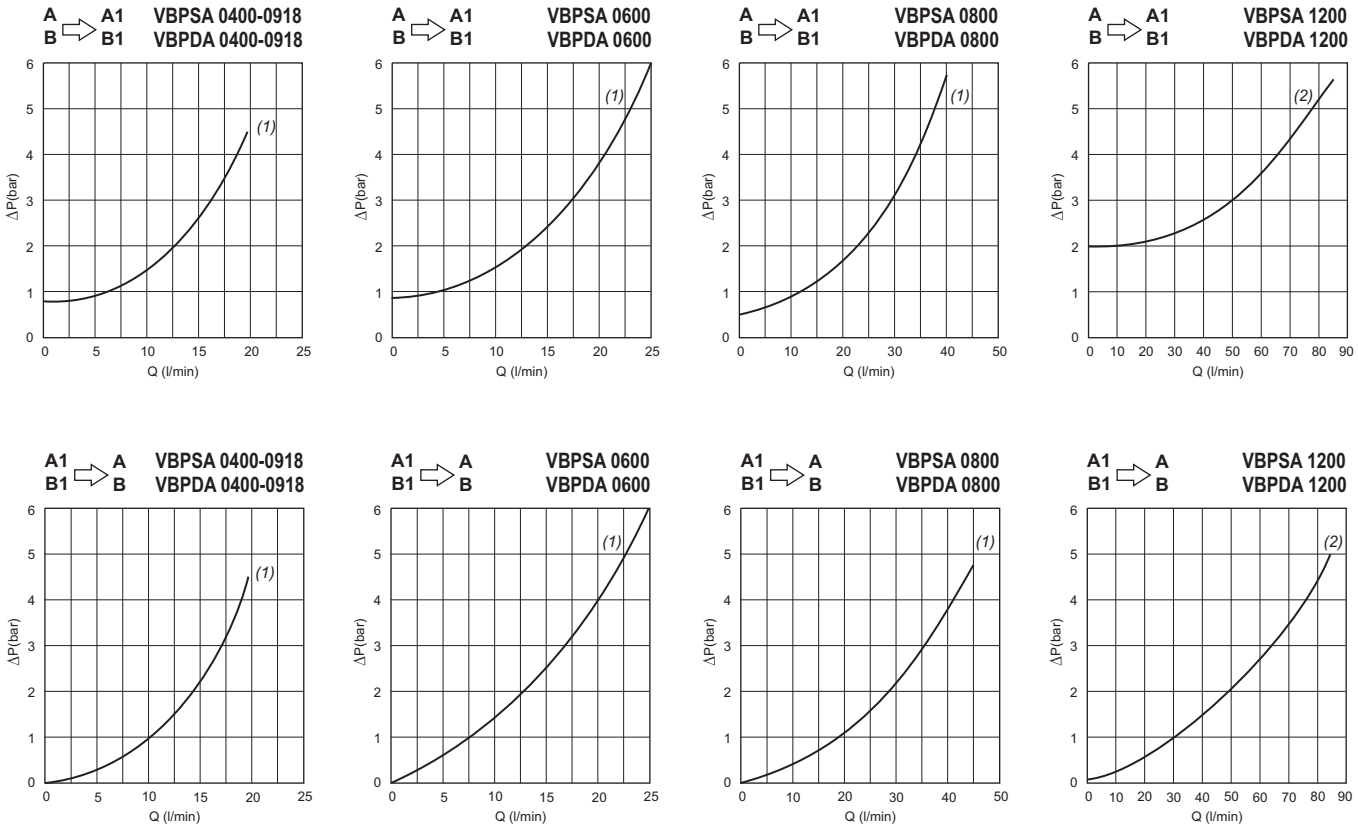


VBPDA

SERVICE EXAMPLE

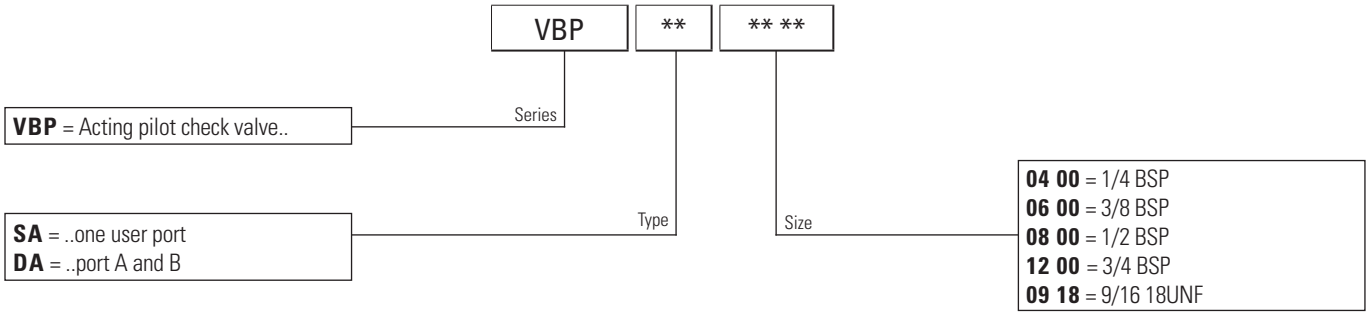


PRESSURE DROPS

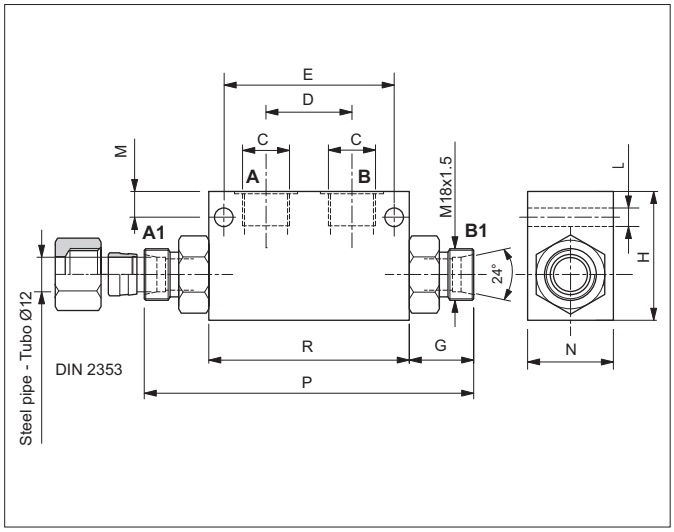


(1) Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.
(2) Fluid used: mineral based oil with viscosity 24 mm²/s at 50°C.

ORDERING CODE



SINGLE AND DOUBLE ACTING PILOT CHECK VALVES-DIN 2353 PORTS - IN-LINE MOUNTING



With the acting pilot check valves, a single or double acting actuator can be locked in any position.
Sealing is guaranteed by tempered, ground, tapered steel poppets, releasing is by venting the piloted openings "A" and "B" according to the valve pilot ratio. The valves can be mounted in any position and are protected externally by a zinc plating.

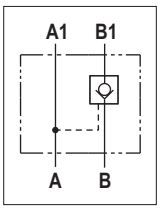
HYDRAULIC FEATURES

Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

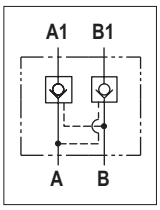
5

Code	C	Flow max (l/min)	Pressure max (bar)	D (mm)	E (mm)	G (mm)	H (mm)	L (mm)	M (mm)	N (mm)	P (mm)	R (mm)	Weight (kg)	Pilot ratio
VBPSA0412	1/4 BSP	20	350	30	60	22.5	45	6.5	9	30	115	70	0.83	1:4
VBPSA0612	3/8 BSP	25	350	30	60	22.5	45	6.5	9	30	115	70	0.75	1:4
VBPDA0412	1/4 BSP	20	350	30	60	22.5	45	6.5	9	30	115	70	0.83	1:4
VBPDA0612	3/8 BSP	25	350	30	60	22.5	45	6.5	9	30	115	70	0.75	1:4

HYDRAULIC SYMBOLS

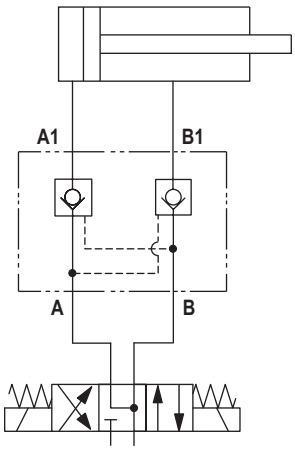


VBPSA

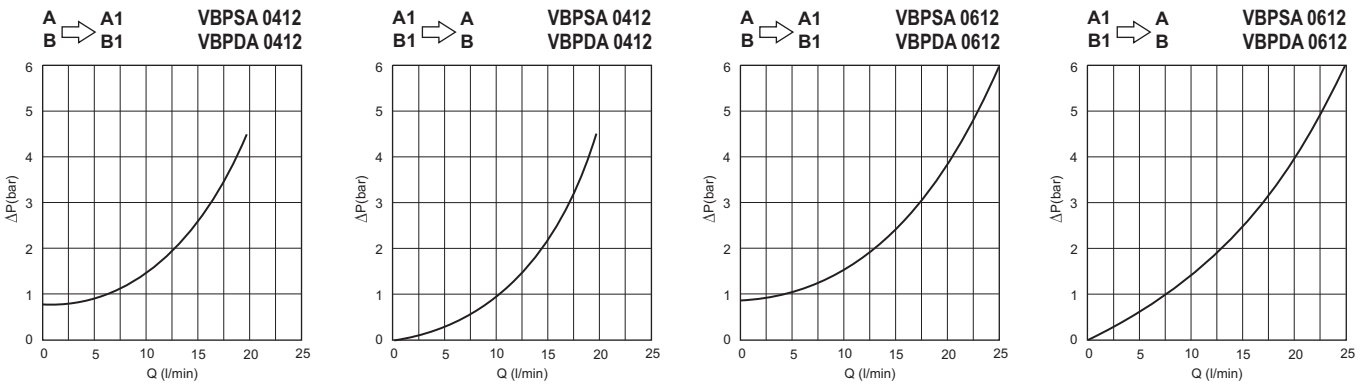


VBPDA

SERVICE EXAMPLE

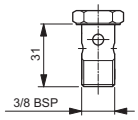
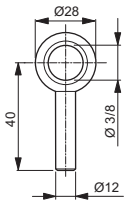


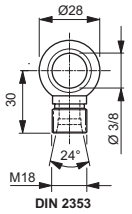
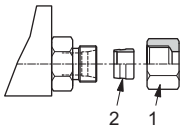
PRESSURE DROPS

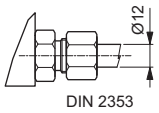


Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.

ACCESSORIES AND SPARE PARTS

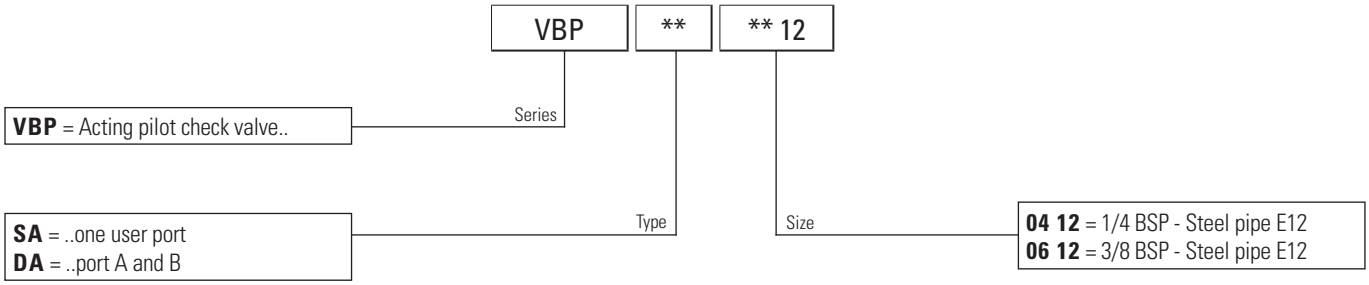
	**Q51435044**	Copper Washer
	**RF05060000**	Hollow screw
	**OT0506T12**	Banjo

	**OD050612L**	DIN Banjo
	1: **E341L12** 2: **E342L12**	Nut (spare) Cutting ring (spare)

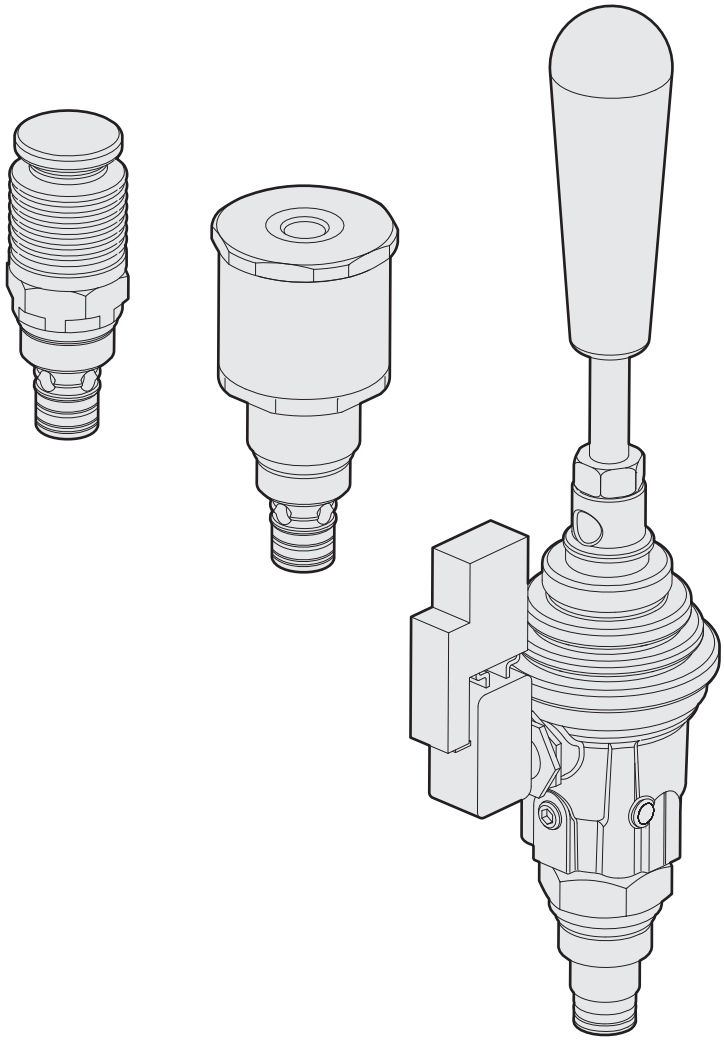


Assembly example with steel pipe
Ø 12 mm

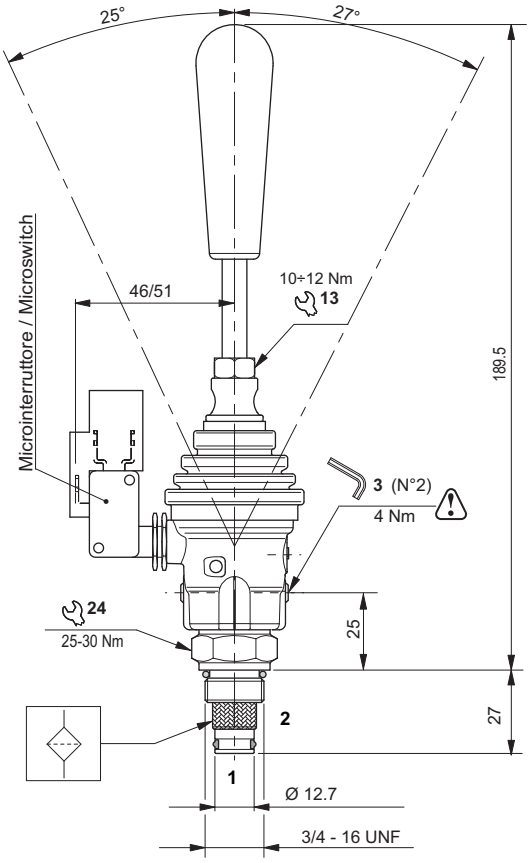
ORDERING CODE



MANUAL AND PNEUMATIC OPERATED VALVES



LEVER OPERATED VALVES



00012003	Spare seals kit

The direct acting, normally closed 2-way 2 position directional valve with manual control releases (load sensitive) pressure enabling fluid to flow through the valve from 2 to 1.
Tapered poppet is in tempered and ground steel.
Micro switch controlling a motor-driven pump relay supplied on request.
The lever body is in die-cast aluminium and the valve body in galvanised steel.

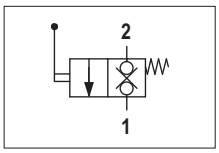
HYDRAULIC FEATURES

Max. working pressure	300 bar
Max. Flow	25 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Working Temperature	-25°C ÷ 60°C
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Tightening torque	25 ÷ 30 Nm
Weight	0.25 kg
Cavity (3/4 - 16 UNF)	CD018014 (See section 17)

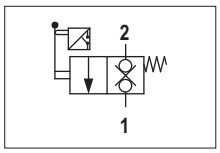
Microswitch version

Mechanical life endurance at 250 Vac	10A (1E4) - 5A (5E4)
Protection degree with connector	IP40

HYDRAULIC SYMBOLS

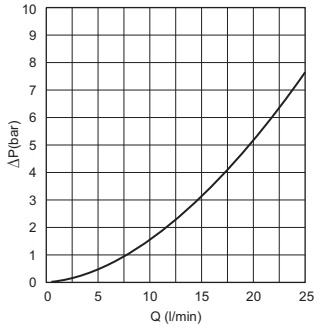


CMF04L
Without microswitch



CMF04M
With microswitch

PRESSURE DROPS (With valve completely open)



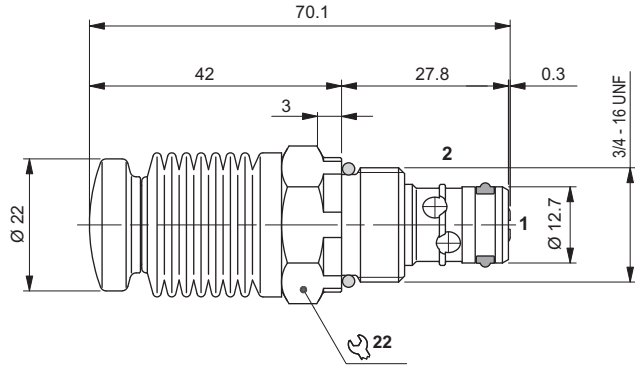
Fluid used: mineral based oil with viscosity 32 mm^2/s at 40°C.

ORDERING CODE

CMF	04	*	0	0	1

- Series: **CMF** = Lever operated valve
- Size: **04** = 3/4 - 16 UNF
- Version: **L** = Without microswitch; **M** = With microswitch
- **0** = Vertical positioning (Standard) See drawing
- Variants: **0** = No variants
- **1** = Serial No.

BUTTON OPERATED VALVES



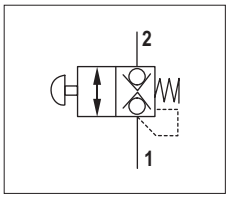
00012003	Spare seals kit

The direct acting, normally closed 2-way 2 position directional valve with manual control is used for emergencies.
It is opened by pressing the button.
The bi-directional tapered poppet is in tempered and ground steel.
The valve body is in galvanised steel.

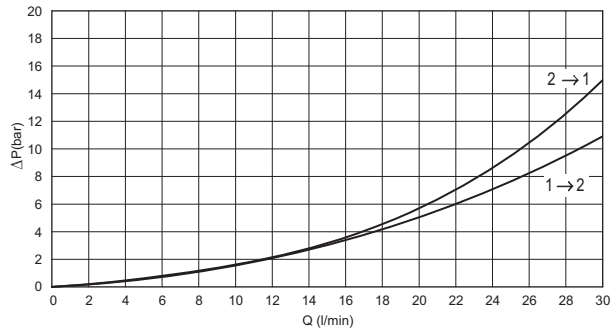
HYDRAULIC FEATURES

Max. working pressure	300 bar
Max. Flow	30 l/min
Max. Leakage (0 ÷ 20 drops/min)	0 ÷ 1 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.107 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

HYDRAULIC SYMBOL

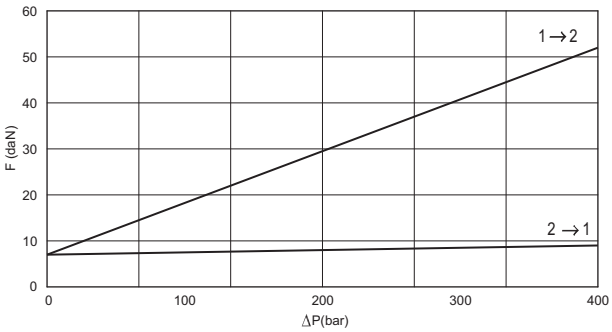


PRESSURE DROPS



Fluid used: mineral based oil with viscosity 32 mm^2/s at 40°C.

OPERAT. FORCE ON THE PUSH BUTTON



Fluid used: mineral based oil with viscosity 32 mm^2/s at 40°C.

ORDERING CODE

CPE	04	P0	00	•	1

Series
CPE = Button operated valve

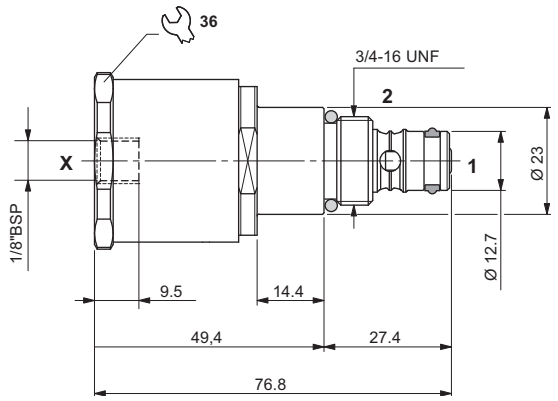
Size
04 = 3/4 - 16 UNF

Version
P0 = Starting by push button

Variants
00 = No variants
FH = Mesh filter

1 = Serial No.

PNEUMATIC OPERATED VALVES



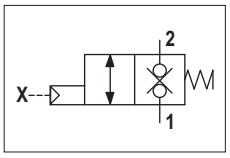
00012003	Spare seals kit

The direct acting, bi-directional way normally closed 2-way 2 position valve with pneumatic control releases the pressure enabling fluid to flow through the valve in both directions.
The bi-directional tapered poppet is in tempered and ground steel, released when the pilot branch X is connected to a pneumatic pressure signal.
The valve body is in galvanised steel.

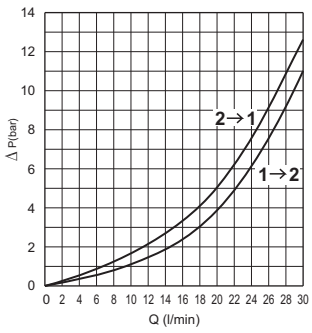
HYDRAULIC FEATURES

Max. working pressure	250 bar
Min. piloting pressure 1 → 2 Min. piloting pressure 2 → 1 Max. piloting pressure	5.5 bar 3.5 bar 20 bar
Max. Flow	30 l/min
Max. Leakage (0 ÷ 20 drops/min)	0 ÷ 1 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.107 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

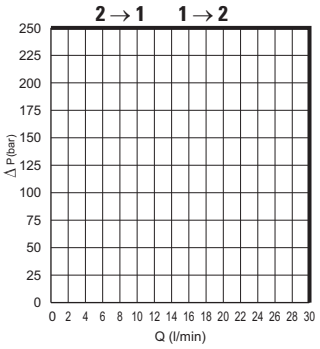
HYDRAULIC SYMBOL



PRESSURE DROPS



LIMITS OF USE



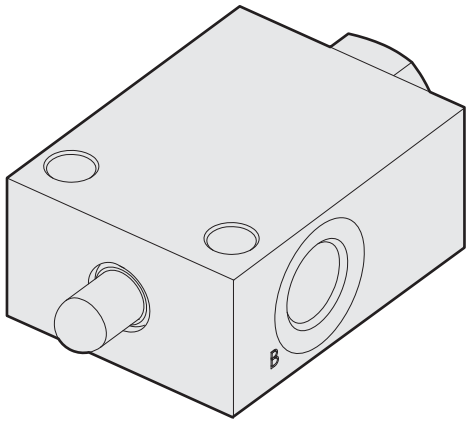
Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

ORDERING CODE

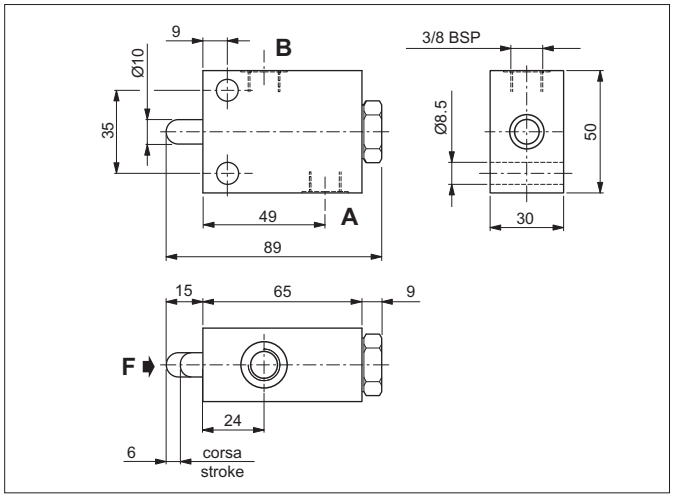
CRD	04	P	NC	A	**	2

- **CRD** = Pneumatic operated valve (Series)
- **04** = 3/4 - 16 UNF (Size)
- **P** = Pneumatic (Control)
- **NC** = Normally closed
- **A** = Standard - Ø12.7mm
- **00** = No variants; **FH** = Mesh filter (Variants)
- **2** = Serial No.

END-OFF STROKE VALVES



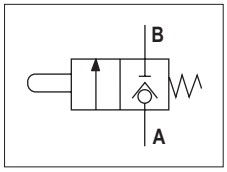
END-OFF STROKE VALVES - IN-LINE MOUNTING



The direct acting normally closed 2-way 2-position directional valve with manual control is fitted on a branch to release the pressure; a pusher enables the fluid to pass through the valve from A to B.
Tapered poppet is in tempered and ground steel.
The valve body is in galvanised steel.

7

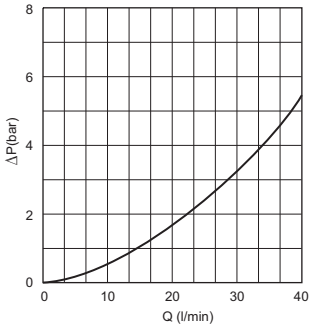
HYDRAULIC SYMBOL



HYDRAULIC FEATURES

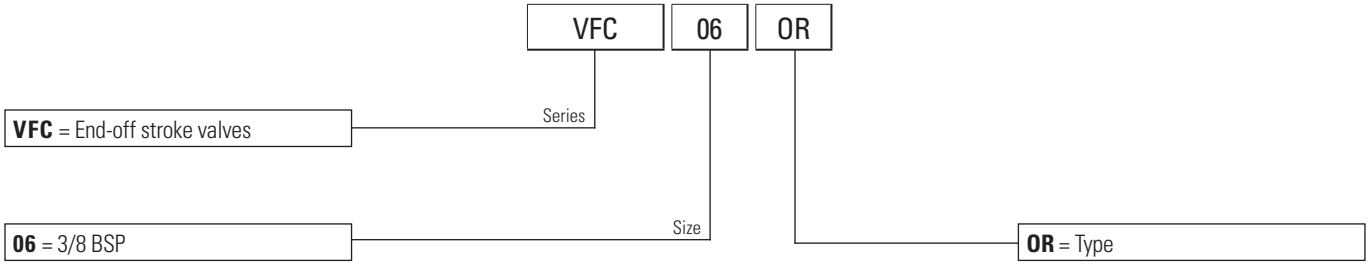
Max. working pressure	300 bar
Max. Flow	40 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Max. mechanical push force (F) required at 300 bar	240 daN
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.68 kg

PRESSURE DROPS

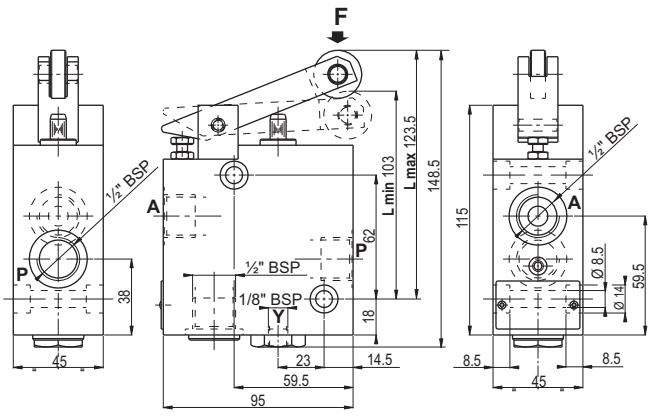


Fluid used: mineral based oil with viscosity 15 mm^2/s at 40°C.

ORDERING CODE



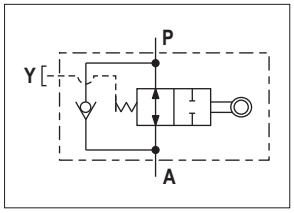
DECELERATION VALVES - IN-LINE MOUNTING



Fixing screws UNI 5931 M8x50, material specifications 12.9
Tightening torque 8 Nm / 0.8 Kgm

These valves are used as cam controlled unidirectional flow regulators. Normally mounted in line between actuator and directional valve for the displacement of carriages or slides, they enable cam controlled acceleration or deceleration of the moving mass.
A special internal check valve allows free flow the opposite direction.
To ensure correct functionning, connect "Y" to draining line.

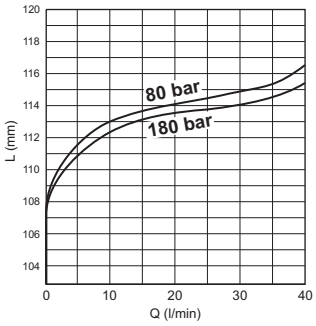
HYDRAULIC SYMBOL



HYDRAULIC FEATURES

Max. working pressure	180 bar
Max. Flow	40 l/min
Max. Leakage	0.06 l/min
Cam travel	See diagram
Max. mechanical push force (F)	100 N
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	2.8 kg

FLOW RATE / Lmin-Lmax

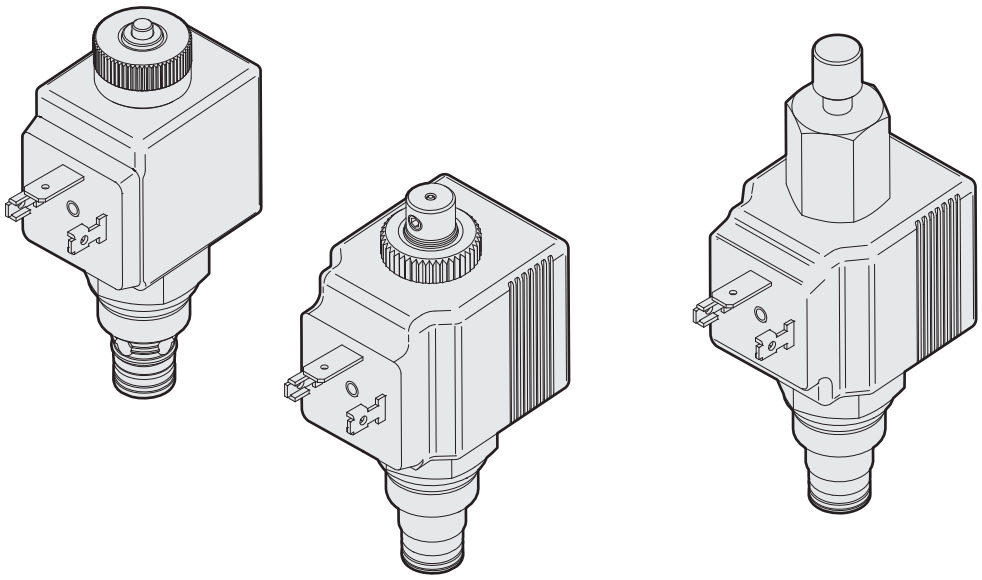


ORDERING CODE

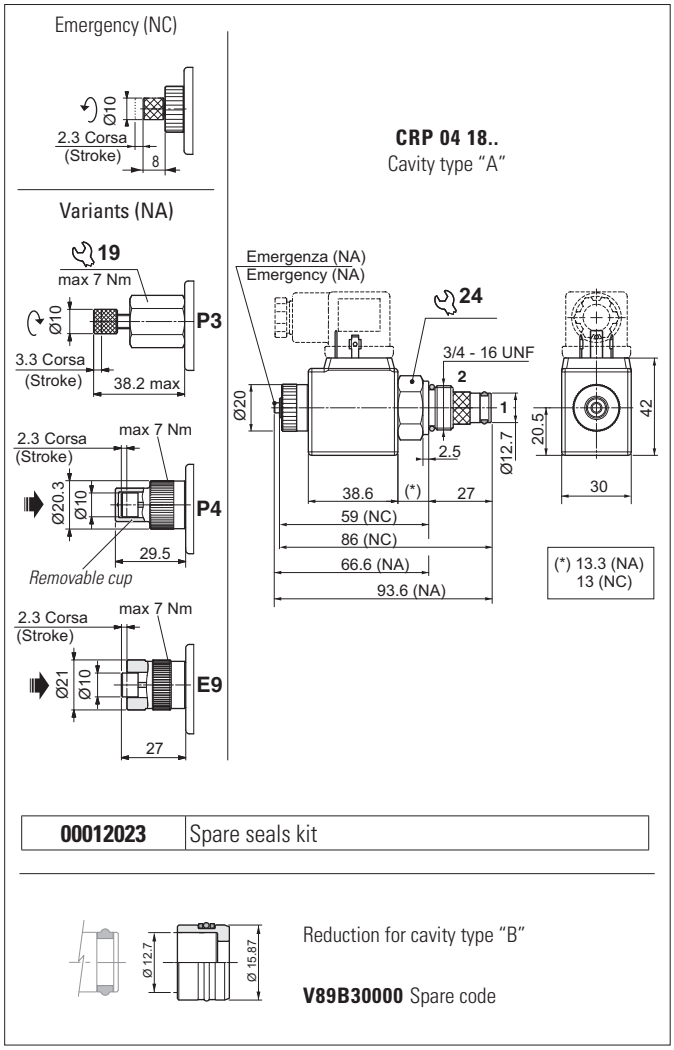
VD	40	A	**	3

- **VD** = Deceleration valve (Series)
- **40** = Flow rate 40 l/min
- **A** = 1/2" BSP (Thread)
- **00** = No variants
  V1 = Viton
  FA = Not complete closing to avoid the "jump" in the controlled actuator (Variants)
- **3** = Serial No.

SOLENOID VALVES 2-WAY



PILOTED OPERATED SOLENOID VALVE



00012023	Spare seals kit

Reduction for cavity type "B"

V89B30000 Spare code

Connector to be ordered separately, see sect. 20

The pilot-operated electric 2-way 2-position directional valve is controlled electrically.
The tapered poppet is in tempered and ground steel.
Available in normally open (NA) or normally closed (NC) versions.

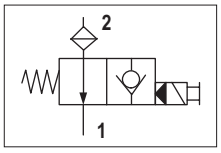
Valve	Free passage	Coil	Type
CRP..NA	2 → 1	DE-ENERGISED	Unidirectional
CRP..NC	2 → 1	ENERGISED	
	1 → 2	DE-ENERGISED	
CRB..NA	1 → 2	DE-ENERGISED	Bidirectional
	2 → 1		
CRB..NC	1 → 2	ENERGISED / DE-ENERGISED	
	2 → 1	ENERGISED	

AC normally closed valves (NC) can work also with coils in DC.
Normally open valves work with DC coils whereas RAC coils with a connector and incorporated rectifier must be used for AC applications.
The NC valve sleeve is in galvanised steel and the NA valve sleeve with nikel coated.

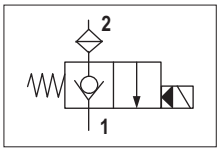
FEATURES

Max. pressure	300 bar
Max. Flow	40 l/min
Max. Leakage (0 ÷ 10 drops/min)	0 ÷ 0.5 cm^3/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluids	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Cartridge filter	280µm
Type of protection (in relation to the connection used)	IP65
Weight (with coil)	0.27 kg
Cartridge tightening torque	25 ÷ 30 Nm
Coil ring nut tightening torque Emergency tightening torque	7 Nm
Cavity standard "A" (3/4 - 16 UNF)	CD018006 (See section 17)
Cavity standard "A" + seat VSCOA**01	CD018009 (See section 17)
Cavity with reduction "B" (3/4 - 16 UNF)	CD018012 (See section 17)

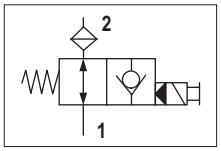
HYDRAULIC SYMBOLS



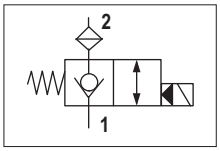
CRP - Normally open



CRP - Normally closed



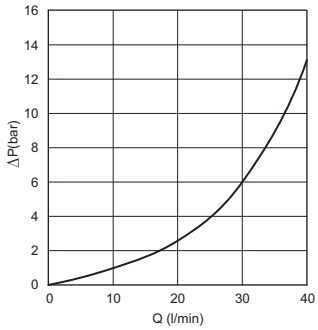
CRB - Normally open



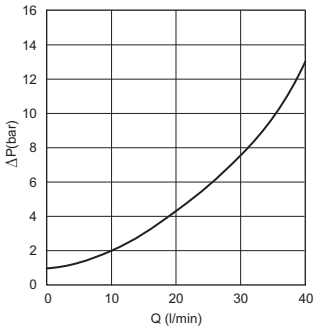
CRB - Normally closed

PRESSURE DROPS

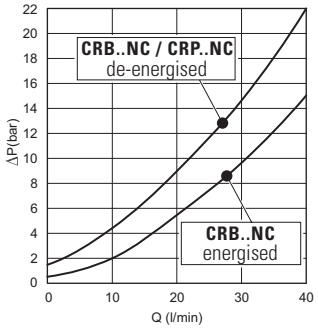
CRB..NA (1 → 2 2 → 1)
CRP..NA (2 → 1)



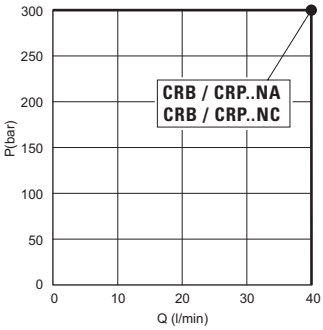
CRB..NC (2 → 1)
CRP..NC (2 → 1)



CRB..NC (1 → 2)
CRP..NC (1 → 2)



LIMITS OF USE



The tests were carried out with the solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature. The fluid used is a mineral oil with viscosity of 46 mm²/s at 40°C.

8

ORDERING CODE

CR*	04	18	**	*	*	*	**	*

CRB = Piloted solenoid valve bidirectional
CRP = Piloted solenoid valve unidirectional
(Series)

04 = 3/4 - 16 UNF
(Size)

18 = 18W dc (NA-NC) - C30
(Coil)

NA = Normally open (solo con bobine DC o RAC)
NC = Normally closed
(Version)

A = Standard - Ø 12.7 mm
B = With reduction - Ø 15.9 mm
(Seat size)

S = Without emergency (NC)
E = With emergency (NA-NC)
(Version)

1 = **CRB** - Serial No.
3 = **CRP** - Serial No.

Variants

00 = No variants
P4 = Push button Emergency with removable protection (..NA)
P3 = Rotary Emergency (..NA)
E9 = Push button Emergency direct control (..NA)
SF = Without cartridge filter
FK = With flying leads 600 mm (*1*)
CX = Deutsch connection with bidirectional diode (*2*)

Connector to be ordered separately, see sect. 20

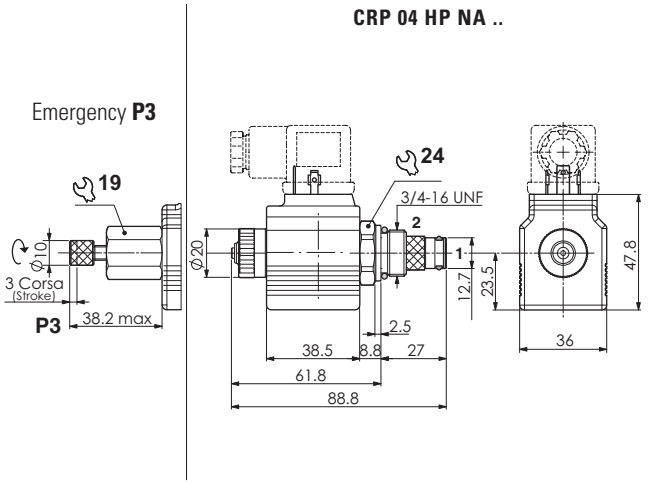
Voltage

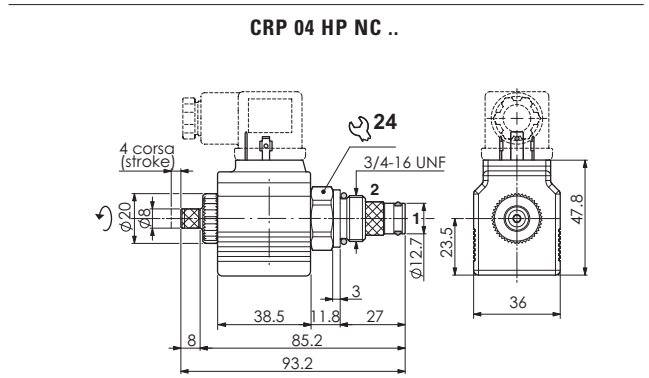
DC 18W (C30)	AC 18W (C30) (*7*)
L = 12 VDC	**A** = 24 VAC 50 Hz
M = 24 VDC	**J** = 115 VAC 50 Hz
N = 48 VDC	**I** = 230 VAC 50 Hz
2 = 21.6 VDC RAC (*3*)	**F** = 24 VAC 60 Hz
Z = 102 VDC RAC (*4*)	**C** = 110 VAC 60 Hz
X = 205 VDC RAC (*5*)	**D** = 220 VAC 60 Hz
W = Without coil (*6*)	**K** = Without coil (*6-8*)

Coils technical data, see sect. 19

(*1*) Only voltages 12 VDC - 24 VDC
(*2*) Only voltages 12 VDC - 24 VDC
(*3*) With rectifier: 24 VAC/50-60Hz
(*4*) With rectifier: 115 VAC/50Hz - 120VAC/60Hz
(*5*) With rectifier: 230 VAC/50Hz - 240VAC/60Hz
(*6*) Performance are guaranteed only using valves completed with BFP coil
(*7*) Only for NC valves
(*8*) Tested for working in AC and DC

HIGH PRESSURE PILOTED OPERATED SOLENOID VALVE





00012023	Spare seals kit

Connector to be ordered separately, see sect. 20

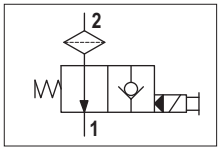
The pilot-operated electric 2-way 2-position directional valve is controlled electrically. For high pressures.
The tapered poppet is in tempered and ground steel.
Available in normally open (NA) or normally closed (NC) versions.
- NA, free passage from 2 to 1 with de-energised coil.
- NC, free passage from 2 to 1 with energised coil or from 1 to 2 with de-energised coil.

The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
The sleeve is in galvanised steel.

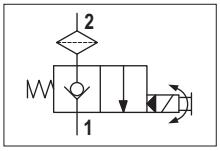
FEATURES

Max. pressure	370 bar
Max. Flow	30 l/min
Max. Leakage (0 ÷ 10 drops/min)	0 ÷ 0.5 cm^3/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluids	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Cartridge filter	280µm
Type of protection (in relation to the connection used)	IP65
Weight (with coil)	0.35 kg
Cartridge tightening torque	25 ÷ 30 Nm
Coil ring nut tightening torque	7 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

HYDRAULIC SYMBOLS



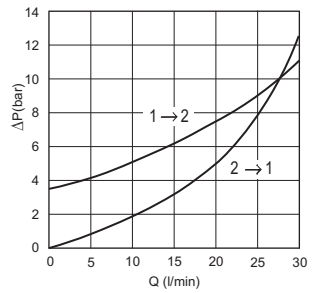
Normally open



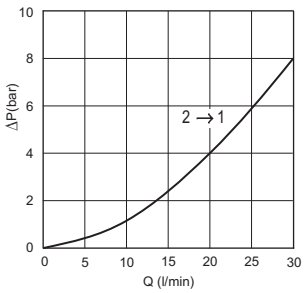
Normally closed

PRESSURE DROPS

CRP 04 HP NC.

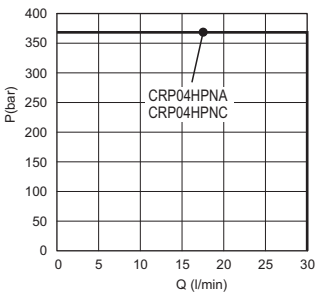


CRP 04 HP NA.



1 → 2 Only with coil not energised

LIMITS OF USE



The tests were carried out with the solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature. The fluid used is a mineral oil with viscosity of 46 mm²/s at 40°C.

8

ORDERING CODE

CRP	04	HP	**	A	E	*	**	1

CRP = High pressure piloted operated solenoid valve (Series)

04 = 3/4 - 16 UNF (Size)

HP = High pressure

NA = Normally open
NC = Normally closed (Version)

A = Standard - Ø 12.7 mm (Seat size)

E = With emergency (Version)

Variants

00 = No variants **P3** = Rotary emerg. (..NA) **SF** = Without cartridge filter	**FK** = With flying leads 600 mm (*1*) **AJ** = AMP Junior connection (*1*) **CX**= Deutsch connection with bidirectional diode

Connector to be ordered separately, see sect. 20

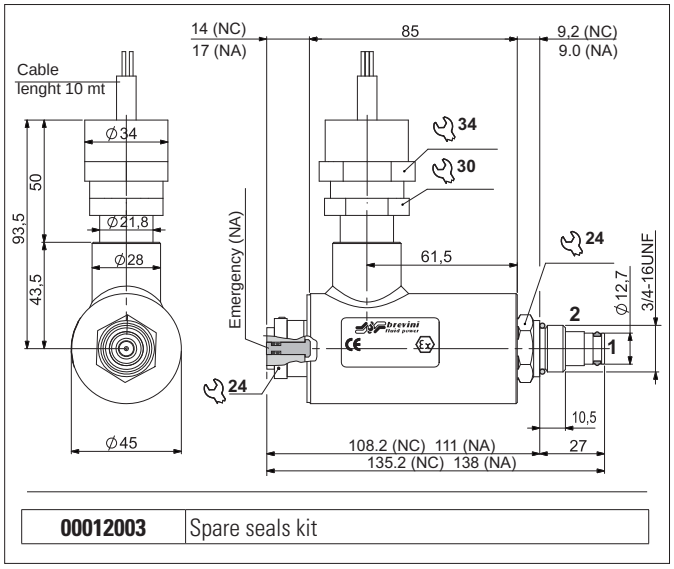
Voltage

DC 22W (C36)	
L = 12 VDC **M** = 24 VDC **N** = 48 VDC **V** = 28 V DC **4** = 14 VDC	**2** = 21.6 VDC RAC (*2*) **Z** = 102 VDC RAC (*3*) **X** = 205 VDC RAC (*4*) **W** = Without coil (*5*)

Coils technical data, see sect. 19

(*1*) Only voltages 12 VDC - 24 VDC
(*2*) With rectifier: 24 VAC/50-60Hz
(*3*) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz
(*4*) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz
(*5*) Performance are guaranteed only using valves completed with BFP coil

VALVES IN ACCORDANCE WITH ATEX 94/9/CE DIRECTIVE



00012003	Spare seals kit

The CRP04X series of valves are electrically-controlled, 2-way / 2-position directional valves, available in 12V and 24V versions.
The "2" to "1" seal is guaranteed by a tapered shutter.

Available in normally open (NA) or normally closed (NC) versions.
- NA, free passage (from "2" to "1") with de-energised coil
- NC, free passage (from "2" to "1") with energised coil or "1" to "2" with de-energised coil

The valves work with the coils in DC.

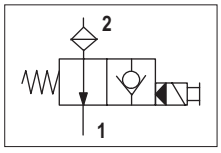
These coils have separate certification marking II 2 GD Ex d IIC T6/T85°C. The coils are supplied with a three-pole lead whose wires have a section of at least 1.5 mm² , lenght 10 mt.

Operating intermittence: ED100% if the room temperature does not exceed 40 ° C. Degree of protection: IP67 according to EN 60529.
Supply voltage: must not exceed +5% / -10% of the nominal value. The sleeves are made of steel with galvanised surface protection (NC) or burnishing and nichel-plating (NA).

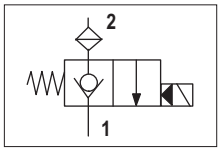
The CRP04X series of valves are Group II equipment, for use in areas classed for the presence of gas (category 2 G) and combustible dust (category 2 D). They are designed and manufactured according to the ATEX 94/9/EC directive, according to European standards: EN 1127-1, EN 13463-1, EN 13463-5.
The fluids used are hydraulic fluids for oil-pressure applications, such as: mineral oils, water-glycol solutions, biocompatible oils, etc.. whose viscosity ranges between 10 and 500 mm ² / s.

The coil used for the CRP04X series is certified for a room temperature range of -20 ° C / + 40 ° C; it is used with fluid temperatures up to +40 ° C.

HYDRAULIC SYMBOLS

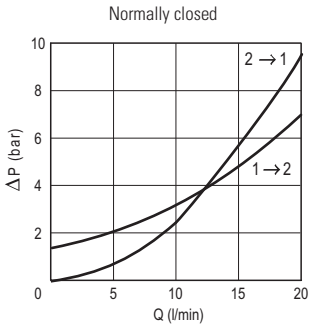


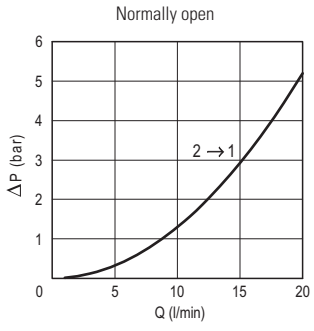
Normally open



Normally closed

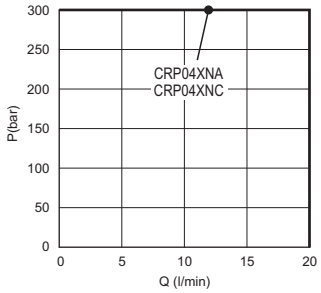
PRESSURE DROPS





1 → 2 Only with coil not energised

LIMITS OF USE



FEATURES

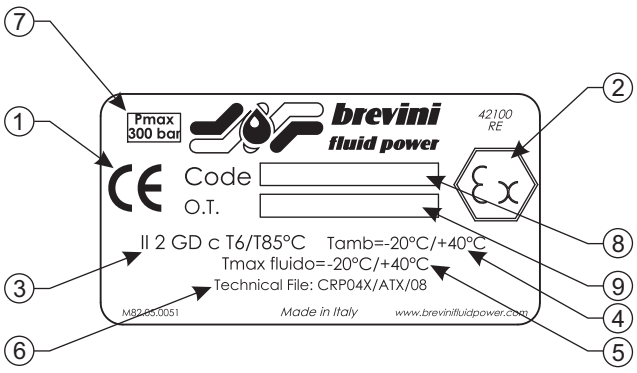
Max. pressure	300 bar
Max. Flow	20 l/min
Max. Leakage (0 ÷ 10 drops/min)	0 ÷ 0.5 cm³/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluids	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-20 ÷ +40 °C
Ambient temperature	-20 ÷ +40 °C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Cartridge filter	280µm
Coil power	7 W
Supply tolerance	-5 ÷ +10 %
Type of protection (in relation to the connection used)	IP67
Weight (with coil)	1.29 kg
Cartridge tightening torque	25 ÷ 30 Nm (2.5 ÷ 3 kgm)
Coil ring nut tightening torque	6 Nm (0.6 kgm)
Cavity (3/4 - 16 UNF)	CD018006

The tests were carried out with the solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature. The fluid used is a mineral oil with viscosity of 46 mm²/s at 40°C.

REGISTRED MARK AND IDENTIFICATION PLATE

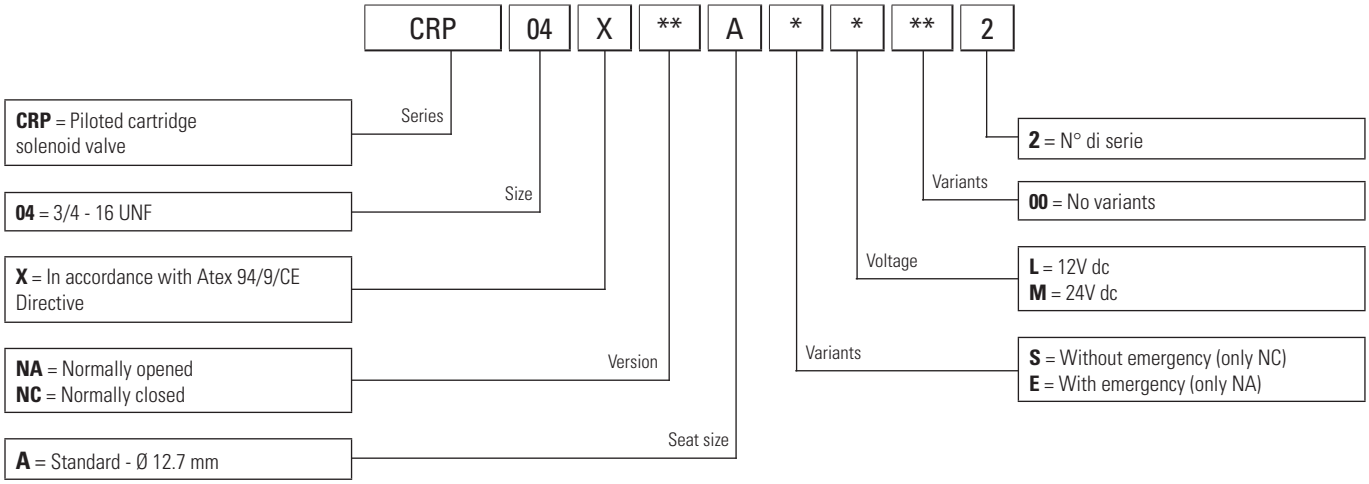
Every moduls are supply with its "Identification Plate" and with the "Declaration of Conformity" in accordance with the 94/4/CE Atex Directive.

The identification plate shows the most important technical perfomance and constructive specifications so it has to be always integral and visible.



1	CE	In accordance with Europe Directive
2	Ex	In accordance with Atex 94/9/CE Directive
3	II 2 GD c T6/T85°C	Explosive atmosphere which is comprised of gas, vapours or mist
4	Tamb = -20°C ÷ +40°C	Operating ambient temperature
5	Tmax fluid = -20°C ÷ +40°C	Operating fluid temperature
6	CRP04X/ATX/08	Reference of the Technical issue put down at the Notifying Body
7	P max = 300 bar	Max. operating pressure
8	Code	Orediering code (10 characters printed)
9	O.T.	Technical ordering code (printed)

ORDERING CODE



SAFETY INSTRUCTIONS

Carefully read everything reported in the instruction sheet attached to the valves, before installation. All maintenance operations must be performed according to the manual.

The CRP04X series valves must be installed and maintained in compliance with plant and maintenance regulations for environments classified against the risk of explosion because of presence of gas (for example: EN 60079-14, EN 60079-17 or other national regulations/standards).

The valves must be connected to earth using the special anti-loosening and anti-rotation connection element.

For all safety aspects tied to the use of the coil see the relative use and maintenance instructions. The electrical appliances/components must not be opened when live.

The user must periodically control, depending on the conditions of use and the substances used, the presence of deposits, cleaning, wear and correct functioning of the valves..

All installation and maintenance interventions must be performed by qualified staff.

INSTRUCTIONS FOR A CORRECT INSTALLATION

Carry out wiring of the solenoids according to the user instructions of the relative coils (a copy is always supplied with each solenoid).

- The valves must be connected to earth using the special anti-loosening and anti-rotation connection element.
- When mounting the valve onto the base (manifold) ensure not to damage the OR sealing rings on the surface.
- For the aspects tied to the installation of the solenoids, see the relative safety instructions. The electrical components must not be opened when live.
- If it is necessary to loosen the ring nuts on the external ends of the coil to opportunely position the cable-holders, they must be tightened again to the respective tightening torques.

INSTRUCTIONS FOR A CORRECT USE AND MAINTENANCE

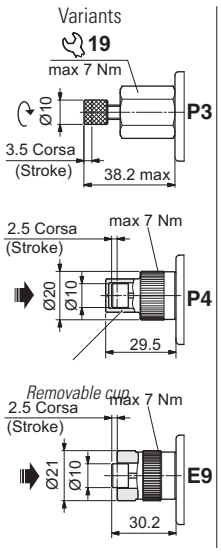
USE

- Respect functional limits indicated in the technical features section and those, where restrictive, indicated in the solenoid safety instructions.
- The oil used must be within the types envisioned by the manufacturer and its contamination level must be maintained within the indicated limits.

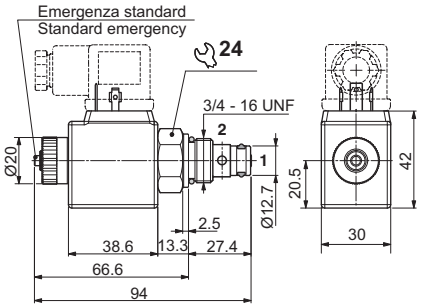
MAINTENANCE

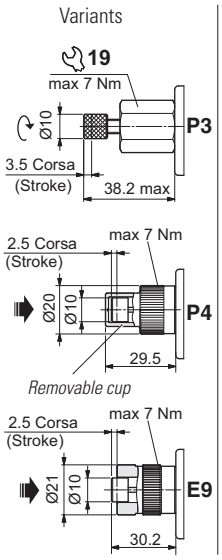
- The user must periodically control, depending on the conditions of use and the substances used, the presence of deposits, cleaning, wear and correct functioning of the valves.
- If the OR sealing rings are damaged, only replace them with those specifically supplied by the manufacturer.

DIRECT OPERATED SOLENOID VALVE

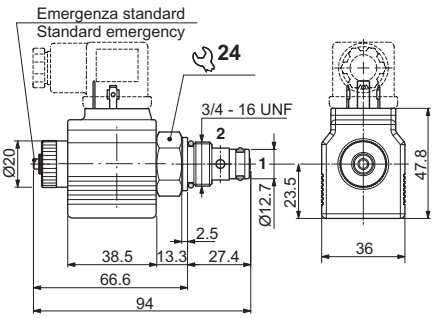


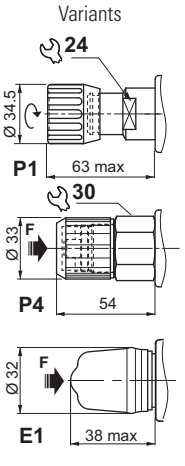
CRD 04 18 NC ...
18W coil version



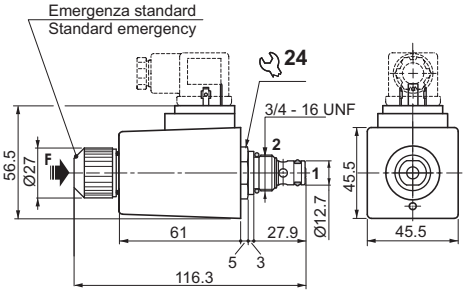


CRD 04 22 NC ...
22W coil version





CRD 04 NC ...
30W coil version



Flux	Emercency Force (F)
2 → 1	10N
1 → 2	10 + (2,5 x p) N

p = used pressure (bar)

00012023	Spare seals kit CRD0418NC - CRD0422NC
00012037	Spare seals kit CRD04NC

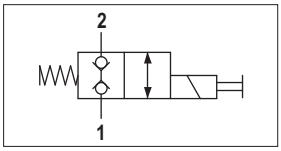
Connector to be ordered separately, see sect. 20

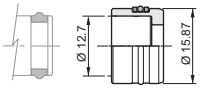
The direct acting, normally closed 2-way 2 position bi-directional electric control valve releases pressure and enables fluid to flow through the valve in both directions.
The bi-directional tapered poppet is in tempered and ground steel.
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
CRD0418NC - CRD0422NC: nickel-plated steel sleeve.
CRD04NC: phosphate-coateing steel sleeve.

FEATURES

Max. pressure - see note (*)	CRD 04 22 NC = 300 bar CRD 04 18 NC = 210 bar CRD 04 NC = 250 bar
Max. Flow	CRD 04 22 NC /18 NC = 15 l/min CRD 04 NC = 30 l/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Max. Leakage (0 ÷ 20 drops/min)	0 ÷ 1 cm^3/min
Hydraulic fluids	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Cartridge filter	280µm
Type of protection (in relation to the connection used)	IP65
Weight (with coil)	CRD 04 18 NC = 0.27 kg CRD 04 22 NC = 0.35 kg CRD 04 NC = 0.63 kg
Cartridge tightening torque	25 ÷ 30 Nm
Coil ring nut tightening torque Emergency tightening torque	7 Nm
Cavity standard "A" (3/4 - 16 UNF)	CD018006 (See section 17)
Cavity with reduction "B" (3/4 - 16 UNF)	CD018012 (See section 17)

HYDRAULIC SYMBOLS





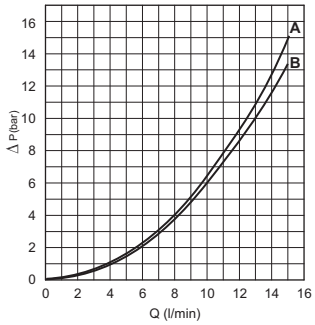
Reduction for cavity type "B"

V89B30000 Spare code

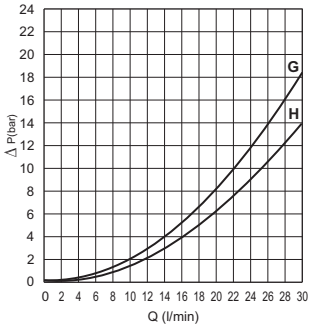
*** Max. pressure with reduction:**
Unidirectional 2 → 1 = 300 bar
Bidirectional 2 → 1 and 1 → 2 = 210 bar

PRESSURE DROPS

18W / 22W
A = 2 → 1
B = 1 → 2



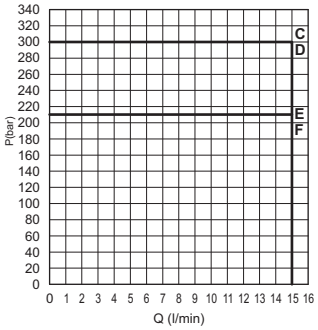
30W
G = 2 → 1
H = 1 → 2



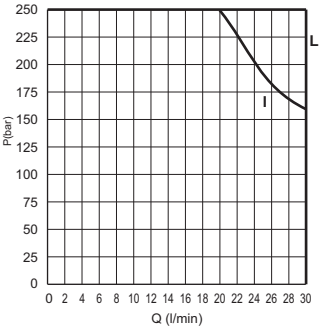
LIMITS OF USE

22W
C = 2 → 1
D = 1 → 2

18W
E = 2 → 1
F = 1 → 2



30W
I = 2 → 1
L = 1 → 2



The tests were carried out with the solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature. The fluid used is a mineral oil with viscosity of 46 mm²/s at 40°C.

8

ORDERING CODE

CRD	04	**	NC	*	*	*	**	*

CRD = Direct operated solenoid valve — Series

04 = 3/4 - 16 UNF — Size

18 = 18W (C30)
22 = 22W (C36)
00= Without coil (*7*)
Omit for 30W version (D12) — Coil

NC = Normally closed — Version

A = Standard - Ø 12.7 mm
B = With reduction - Ø 15.9 mm — Seat size

E = With emergency
Omit for 30W version (D12) — Version

Variants

00 = No variants
E1 = Rubber emergency (30W)
P1 = Rotary emergency (30W)
P3 = Rotary emergency (18W/22W)
P4 = Push button Emergency with removable protection
E9 = Push button Emergency direct control
FY = Emergency P3 + FH (18W/22W)
FH = Cartridge filter
PJ = FH + P4 emergency
FK = With flying leads 600 mm (1)
AJ = AMP Junior connection (2)
CX = Deutsch connection with bidirectional diode

Connector to be ordered separately, see sect. 20

2 = Serial No. — CRD 04 18 NC.. / CRD 04 22 NC.. / CRD 04 00 NC..
1 = Serial No. — CRD 04 NC..

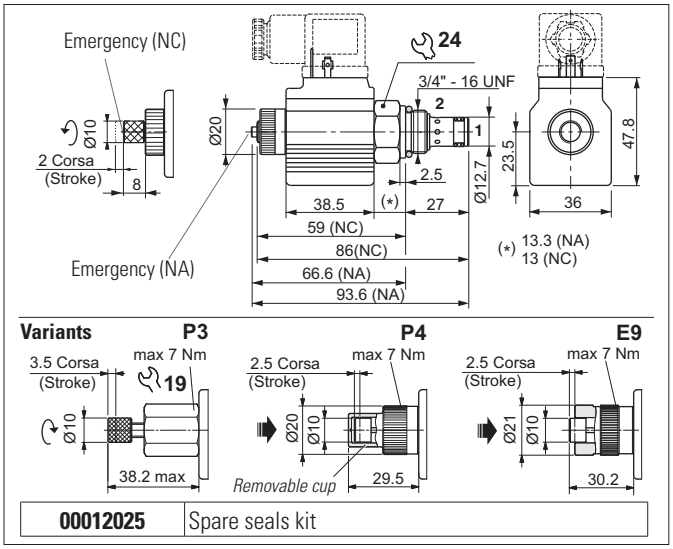
Voltage

DC 18W/22W (C30-C36)	DC 30W (D12)
L = 12 VDC	**L** = 12 VDC
M = 24 VDC	**M** = 24 VDC
N = 48 VDC	**W** = Without coil (*6*)
2 = 21.6 VDC RAC (*3*)	
Z = 102 VDC RAC (*4*)	
X = 205 VDC RAC (*5*)	
W = Without coil (*6*)	

Coils technical data, see sect. 19

(*1*) Only voltages 12 VDC - 24 VDC and coils 18W/22W
(*2*) Only voltages 12 VDC - 24 VDC and coil 22W
(*3*) With rectifier: 24 VAC/50-60Hz
(*4*) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz
(*5*) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz
(*6*) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 2 WAY 2 POSITIONS



00012025	Spare seals kit

Connector to be ordered separately, see sect. 20

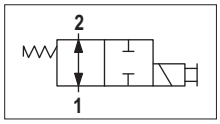
The electric valve is a 2-way 2-position bidirectional electrically controlled valve.
Slight leakage is tolerated for this type of valve.
Available in normally open (NA) or normally closed (NC) versions.
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
The sleeve is in galvanised steel (C2V0422NC..) or nickel-plated (C2V0422NA..). The plunger is in tempered and ground steel.

FEATURES

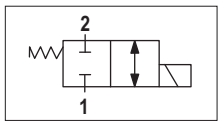
Max. pressure	250 bar
Max. Flow	12 l/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluids	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Type of protection (in relation to the connection used)	IP65
Weight (with coil)	0.30 kg
Cartridge tightening torque	25 ÷ 30 Nm
Coil ring nut tightening torque	7 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

8

HYDRAULIC SYMBOLS

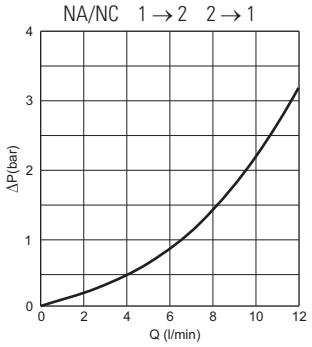


Normally open

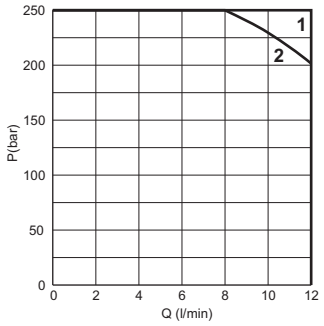


Normally closed

PRESSURE DROPS



LIMIT OF USE



Limits of use

Flow	C2V04 NA	C2V04 NC
1 → 2	Curve 2	Curve 1
2 → 1	Curve 1	Curve 1

The tests were carried out with the 22W solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature.

The fluid used is a mineral oil with viscosity of 46 mm²/s at 40°C.

ORDERING CODE

C2V	04	22	**	A	*	*	00	2

2 = Serial No.

Series
C2V = Solenoid valve 3 way / 2 positions

Size
04 = 3/4 - 16 UNF

Coil
22 = 22W (C36)

Version
NC = Normally closed
NA = Normally open

Seat
A = Ø 12.7 mm (standard)

Emergency
S = Without emergency (NC)
E = With emergency (NA - NC)

Variants

00 = No variants	**FK** = With flying leads 600 mm (*1*)
P3 = Rotary emerg.(..NA)	**AJ** = AMP Junior connection (*1*)
P4 = Push butt. emerg.(..NA)	**CX**= Deutsch connection with bidirectional diode
E9 = Push butt. emerg.(..NA)	

Connector to be ordered separately, see sect. 20

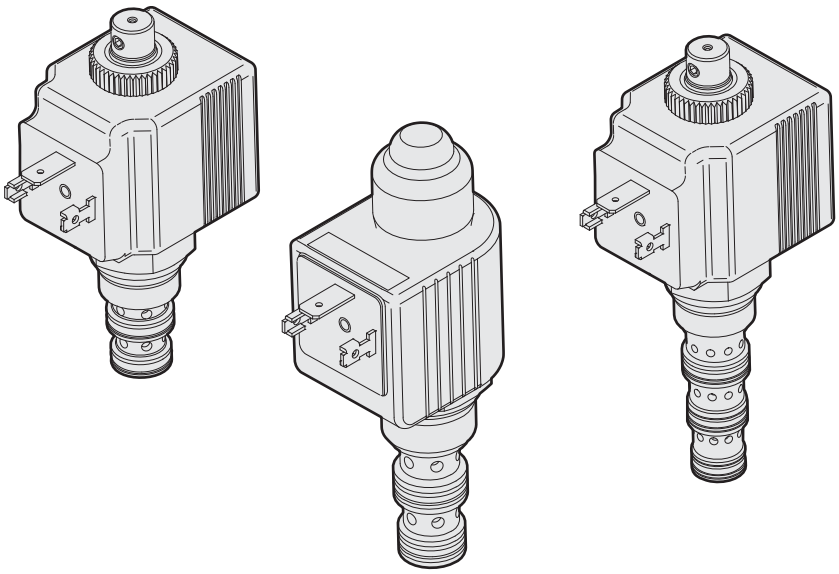
Voltage

DC 22W (C36)	
L = 12 VDC	**2** = 21.6 VDC RAC (*2*)
M = 24 VDC	**Z** = 102 VDC RAC (*3*)
N = 48 VDC	**X** = 205 VDC RAC (*4*)
	W = Without coil (*5*)

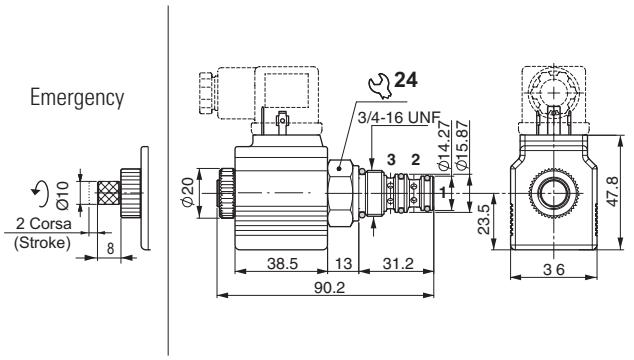
Coils technical data, see sect. 19

(*1*) Only voltages 12 VDC - 24 VDC
(*2*) With rectifier: 24 VAC/50-60Hz
(*3*) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz
(*4*) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz
(*5*) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 3-4 WAY



SOLENOID VALVES 3-WAY/2-POSITION



00012026	Spare seals kit

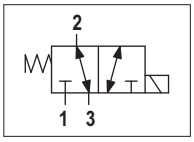
Connector to be ordered separately, see sect. 20

The electric valve is a 3-way 2-position directional electrically controlled valve.
Slight leakage is tolerated for this type of valve.
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
The sleeve is in galvanised steel. The plunger is in tempered and ground steel.

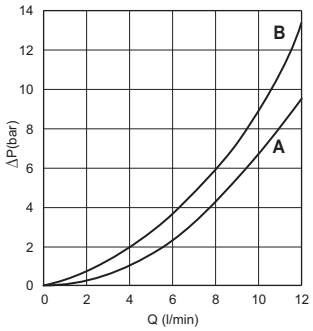
HYDRAULIC FEATURES

Max. working pressure	210 bar
Max. Flow	12 l/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Type of protection (in relation to the connector used)	IP 65
Weight	0.30 kg
Cartridge tightening torque	25 ÷ 30 Nm
Coil ring nut tightening torque	7 Nm
Cavity (3/4 - 16 UNF)	CD018005 (See section 17)

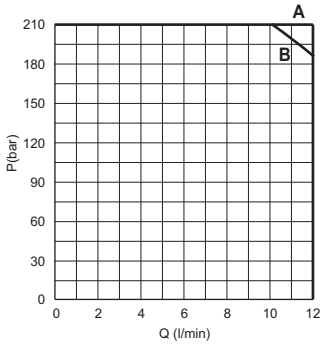
HYDRAULIC SYMBOL



PRESSURE DROPS



LIMIT OF USE



Flow	Pressure drops	Limit of use
1 → 2	A	A
2 → 1	A	A
2 → 3	B	B
3 → 2	B	B
	Curve	

The tests were carried out with the 22W solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature.

The fluid used is a mineral oil with viscosity of 46 mm^2/s at 40°C.

ORDERING CODE

C3V	04	22	1C	C	*	*	**	2

- **C3V** = Solenoid valve 3 way / 2 positions (Series)
- **04** = 3/4 - 16 UNF (Size)
- **22** = 22W (C36) (Coil)
- **1C** = Hydraulic schema (Schema)
- **C** = Seat (Seat type)
- **S** = Without emergency, **E** = With emergency (Version)
- Voltage:

DC 22W (C36)	
L = 12 VDC	**2** = 21.6 VDC RAC (*2*)
M = 24 VDC	**Z** = 102 VDC RAC (*3*)
N = 48 VDC	**X** = 205 VDC RAC (*4*)
	W = Without coil (*5*)

Coils technical data, see sect. 19

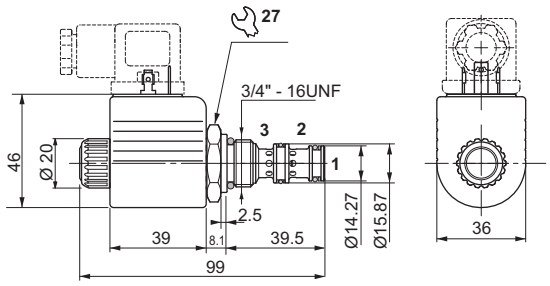
- Variants:
  - **00** = No variants
  - **FK** = With flying leads 600 mm (*1*)
  - **AJ** = AMP Junior connection (*1*)
  - **CX**= Deutsch connection with bidirectional diode

Connector to be ordered separately, see sect. 20

- **2** = Serial No.

(*1*) Only voltages 12 VDC - 24 VDC
(*2*) With rectifier: 24 VAC/50-60Hz
(*3*) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz
(*4*) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz
(*5*) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 3-WAY/2-POSITION



00012027	Spare seals kit

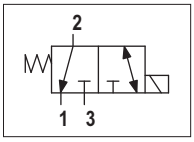
Connector to be ordered separately, see sect. 20

The electric valve is a 3-way 2-position directional electrically controlled valve.
Slight leakage is tolerated for this type of valve.
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
The sleeve is in phosphate steel. The plunger is in tempered and ground steel.

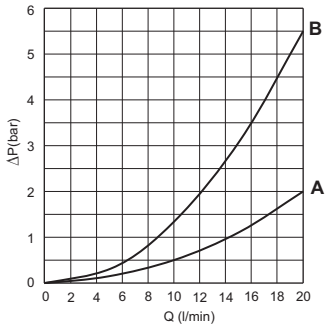
HYDRAULIC FEATURES

Max. working pressure	250 bar
Max. Flow	20 l/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 50°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Type of protection (in relation to the connector used)	IP 65
Weight	0.30 kg
Cartridge tightening torque	25 ÷ 30 Nm
Coil ring nut tightening torque	4.5 Nm
Cavity (3/4 - 16 UNF)	CD018003 (See section 17)

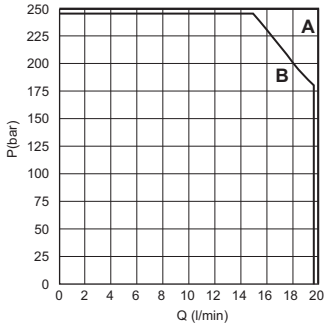
HYDRAULIC SYMBOL



PRESSURE DROPS



LIMIT OF USE



Flow	Pressure drops	Limit of use
2 → 1	A	A
2 → 3	B	A
3 → 2	B	B
	Curve	

The tests were carried out with the 27W solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature.

The fluid used is a mineral oil with viscosity of 46 mm^2/s at 40°C.

ORDERING CODE

C3V	04	27	1D	D	S	*	**	2

C3V = Solenoid valve 3 way / 2 positions (Series)

04 = 3/4 - 16 UNF (Size)

27 = 27W (A09) (Coil)

1D = Hydraulic schema (Schema)

D = Seat (Seat type)

S = Without emergency (Version)

2 = Serial No.

Variants:
00 = No variants
FL = Coil with flying leads (250 mm) (*1*)
LD = Coil with flying leads (130 mm) and integrated diode (*1*)
AJ = AMP Junior coil (*1*)
CX = Deutsch coil and integrated diode (*1*)

Connector to be ordered separately, see sect. 20

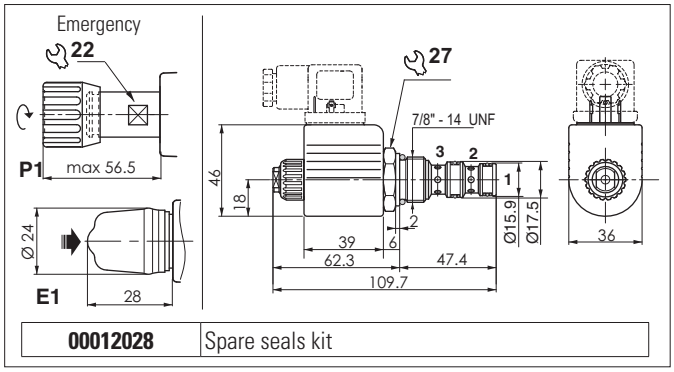
Voltage:

DC 27W (A09)	
L = 12 VDC	**Z** = 102 VDC RAC (*2*)
M = 24 VDC	**X** = 205 VDC RAC (*3*)
N = 48 VDC	**W** = Without coil (*4*)
P = 110 VDC	

Coils technical data, see sect. 19

(*1*) Only voltages 12 VDC - 24 VDC
(*2*) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz
(*3*) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz
(*4*) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 3 WAY 2 POSITIONS

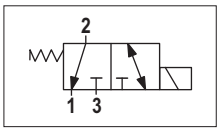


00012028	Spare seals kit

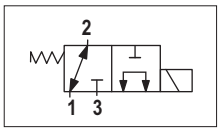
Connector to be ordered separately, see sect. 20

The electric valve is a 3-way 2-position directional electrically controlled valve.
Slight leakage is tolerated for this type of valve.
Available in 2 layouts.
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
The sleeve is in galvanised steel. The plunger is in tempered and ground steel.

SPOOL HYDRAULIC SCHEME



1D



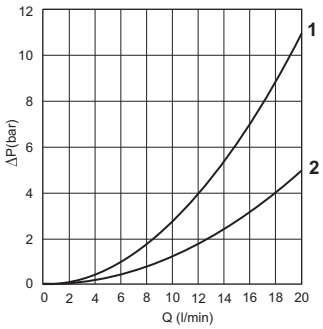
1E

HYDRAULIC FEATURES

Max. working pressure	250 bar
Max. Flow	20 l/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 50°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Type of protection (in relation to the connector used)	IP 65
Weight	0.37 kg
Cartridge tightening torque	45 ÷ 50 Nm
Emergency P1 tightening torque	6 ÷ 9 Nm
Coil ring nut tightening torque	4.5 Nm
Cavity (7/8 - 14 UNF)	CD019006 (See section 17)

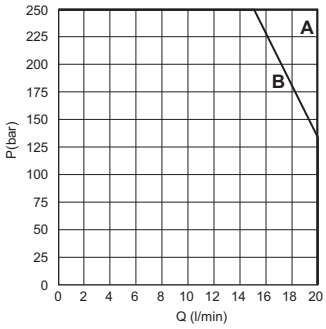
9

PRESSURE DROPS



Spool type	Connections (pressure drops)					
	2→1	2→3	1→2	1→3	3→1	3→2
1D	2	1	—	—	—	1
1E	2	—	2	1	1	—
	Curve No.					

LIMIT OF USE



Spool type	Connections (limits of use)					
	2→1	2→3	1→2	1→3	3→1	3→2
1D	A	A	—	—	—	B
1E	A	—	B	B	A	—
	Curve No.					

The tests were carried out with the solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature.
The fluid used is a mineral oil with viscosity of 46 mm^2/s at 40°C.

ORDERING CODE

C3V	03	**	E	*	*	**	1

Series

C3V = Solenoid valve 3 way / 2 positions

Coil

03 = 27W Coil (A09)

Spool

****** = See "Spool scheme"

Seat type

E = Seat

Connection type

H = Hirschmann coil
A = AMP Junior coil (*1*)
F = Coil with flying leads (250 mm) (*1*)
I = Coil with flying leads (130 mm) and integrated diode (*1*)
D = Deutsch coil and integrated diode (*1*)

Voltage

DC 27W (A09)	
L = 12 VDC	**Z** = 102 VDC RAC (*2*)
M = 24 VDC	**X** = 205 VDC RAC (*3*)
N = 48 VDC	**W** = Without coil (*4*)
P = 110 VDC	

Coils technical data, see sect. 19

Variants

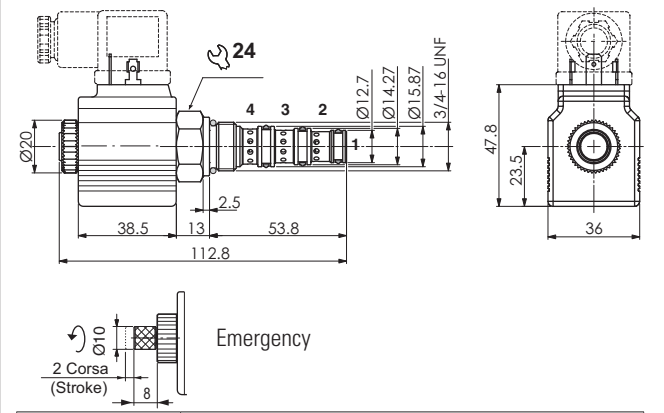
00 = No variants	**P1** = Rotary emergency button
E1 = Rubber emergency	

Connector to be ordered separately, see sect. 20

1 = Serial No.

(*1*) Only voltages 12 VDC - 24 VDC	(*4*) Performance are guaranteed only using valves completed with BFP coil
(*2*) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz	
(*3*) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz	

SOLENOID VALVES 4 WAY 2 POSITIONS



00012029	Spare seals kit

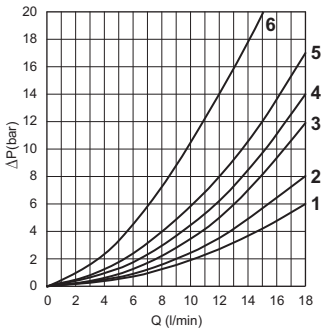
Connector to be ordered separately, see sect. 20

The electric valve is a 4-way 2-position directional electrically controlled valve.
Slight leakage is tolerated for this type of valve.
Available in 5 layouts.
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
The sleeve is in galvanised steel. The plunger is in tempered and ground steel.

HYDRAULIC FEATURES

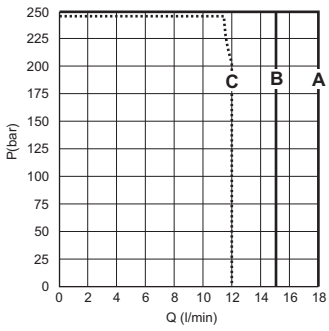
Max. working pressure	250 bar
Max. Flow	18 l/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Type of protection (in relation to the connector used)	IP 65
Weight	0.34 kg
Cartridge tightening torque	25 ÷ 30 Nm
Emergency P1 tightening torque	7 Nm
Cavity (3/4 - 16 UNF)	CD018001 (See section 17)

PRESSURE DROPS



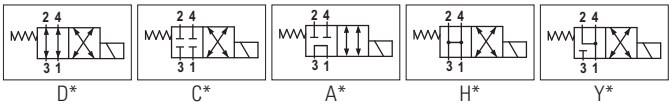
Spool type	Connections (pressure drops)				
	3→1	3→2	3→4	2→1	4→1
D	—	5	5	3	3
C	—	—	4	3	—
A	2	6	—	—	3
H	2	—	4	1	—
Y	—	—	5	3	3
	Curve No.				

LIMIT OF USE



Spool type	Limits of use - inlet flow port 3	
	Pressure in 2	Pressure in 4
D	A	A
C	A	A
A	B	C
H	—	A
Y	—	A
	Curve No.	

SPOOL SCHEME



The tests were carried out with the solenoids 22W at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature.
The fluid used is a mineral oil with viscosity of 46 mm²'/s at 40°C.

ORDERING CODE

C4V	04	22	*	2	F	*	*	**	1

1 = Serial No.

Variants

00 = No variants
FK = Flying 600 mm (*1*)
AJ = AMP Junior connection (*1*)
CX= Deutsch connection with bidirectional diode

Connector to be ordered separately, see sect. 20

Voltage

DC 22W (C36)	
L = 12 VDC	**2** = 21.6 VDC RAC (*2*)
M = 24 VDC	**Z** = 102 VDC RAC (*3*)
N = 48 VDC	**X** = 205 VDC RAC (*4*)
	W = Without coil (*5*)

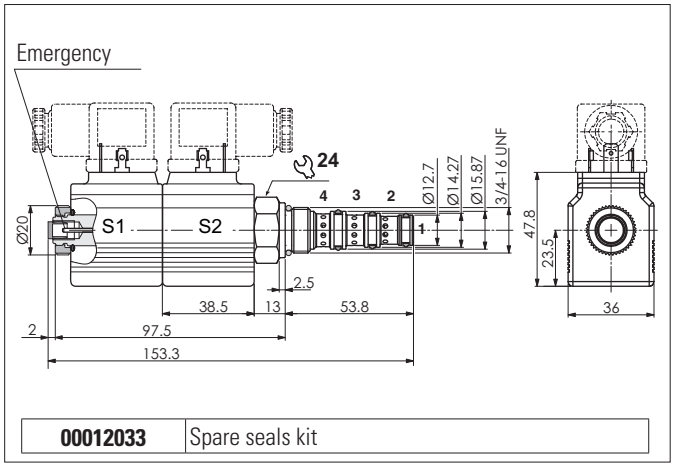
Coils technical data, see sect. 19

S = Without emergency
E = With emergency

Series: **C3V** = Solenoid valve 4 way / 2 positions
Size: **04** = 3/4 - 16 UNF
Coil: **22** = 22 W (C36)
Spool: ***** = See "Spool scheme"
2 = Position number
Seat type: **F** = Seat

(*1*) Only voltages 12 VDC - 24 VDC
(*2*) With rectifier: 24VAC/50-60Hz
(*3*) With rectifier: 115Vac/50Hz - 120Vac/60Hz
(*4*) With rectifier: 230Vac/50Hz - 240Vac/60Hz
(*5*) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 4 WAY 3 POSITIONS



00012033	Spare seals kit

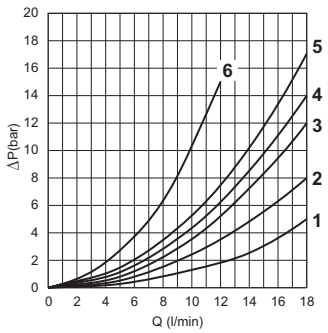
Connector to be ordered separately, see sect. 20

The electric valve is a 4-way 3-position directional electrically controlled valve.
Slight leakage is tolerated for this type of valve.
Available in 4 layouts.
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.
The sleeve is in galvanised steel. The plunger is in tempered and ground steel.

HYDRAULIC FEATURES

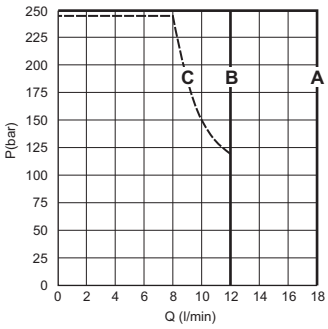
Max. working pressure	250 bar
Max. Flow	18 l/min
Max. excitation frequency	2 Hz
Duty cycle	100% ED
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Type of protection (in relation to the connector used)	IP 65
Weight	0.34 kg
Cartridge tightening torque	25 ÷ 30 Nm
Emergency P1 tightening torque	7 Nm
Cavity (3/4 - 16 UNF)	CD018001 (See section 17)

PRESSURE DROPS



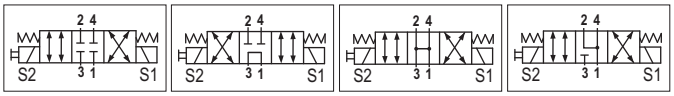
Spool type	Connections (pressure drops)				
	3→1	3→2	3→4	2→1	4→1
C	—	4	4	3	4
A	2	6	6	4	4
H	2	2	2	1	1
Y	—	5	5	3	4
	Curve				

LIMIT OF USE



Spool type	Connections (limits of use)				
	3→1	3→2	3→4	2→1	4→1
C	—	A	A	A	B
A	B	B	B	B	C
H	A	A	A	A	A
Y	—	A	A	A	A
	Curve				

SPOOL SCHEME



C* A* H* Y*

The tests were carried out with the solenoids 22W at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature.
The fluid used is a mineral oil with viscosity of 46 mm²'/s at 40°C.

ORDERING CODE

C4V	04	22	*	3	F	E	*	**	1

1 = Serial No.

Variants

00 = No variants
FK = Flying 600 mm (*1*)
AJ = AMP Junior connection (*1*)
CX= Deutsch connection with bidirectional diode

Connector to be ordered separately, see sect. 20

Voltage

DC 22W (C36)

L = 12 VDC
M = 24 VDC
N = 48 VDC
2 = 21.6 VDC RAC (*2*)
Z = 102 VDC RAC (*3*)
X = 205 VDC RAC (*4*)
W = Without coil (*5*)

Coils technical data, see sect. 19

E = With push emergency

Series: **C4V** = Solenoid valve 4 way / 3 positions

Size: **04** = 3/4 - 16 UNF

Coil: **22** = 22 W (C36)

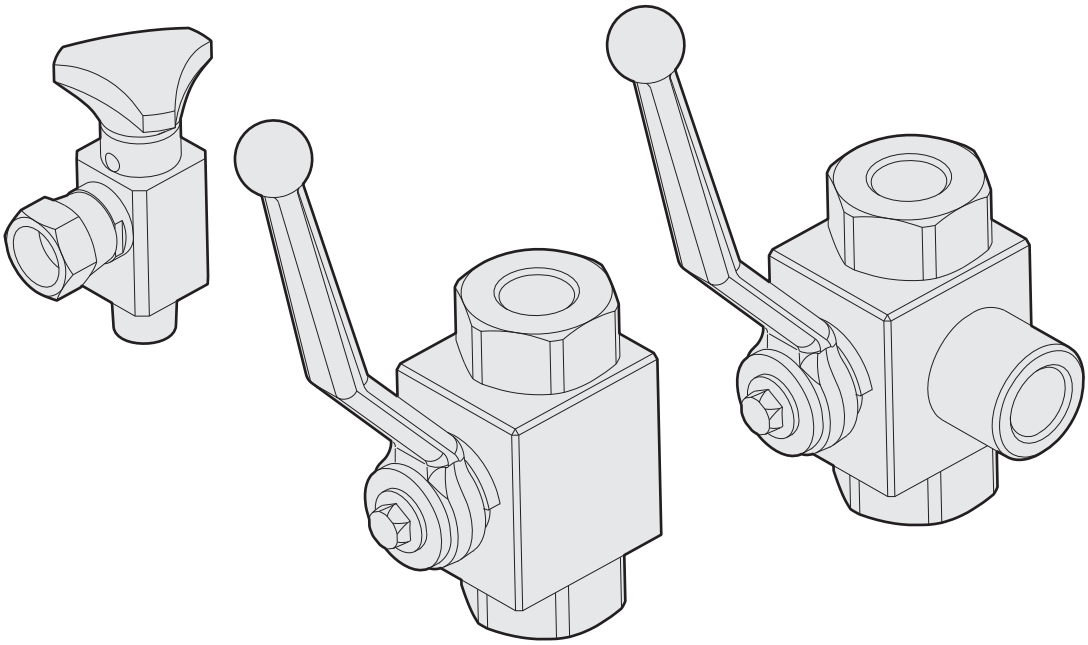
Spool: ***** = See "Spool scheme"

3 = Position number

Seat type: **F** = Seat

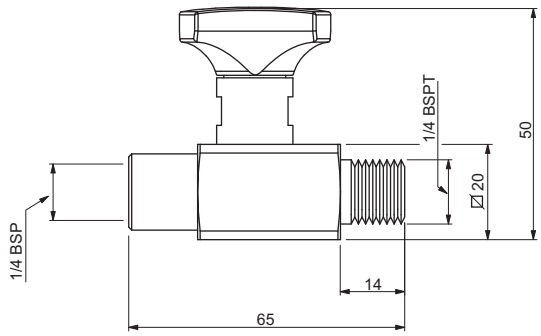
(*1*) Only voltages 12 VDC - 24 VDC
(*2*) With rectifier: 24VAC/50-60Hz
(*3*) With rectifier: 115Vac/50Hz - 120Vac/60Hz
(*4*) With rectifier: 230Vac/50Hz - 240Vac/60Hz
(*5*) Performance are guaranteed only using valves completed with BFP coil

DIVERTER VALVES

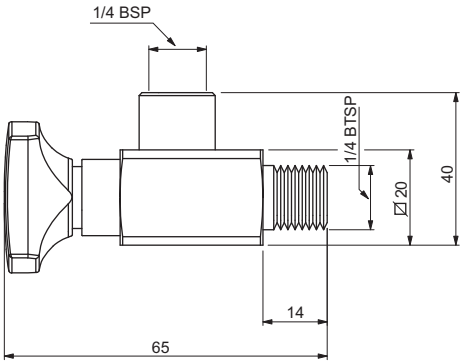


PRESSURE GAUGE SHUT-OFF - IN-LINE MOUNTING

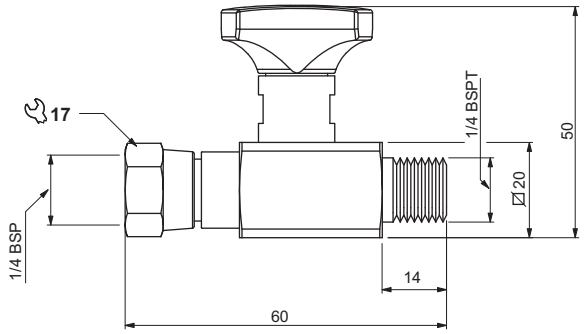
1



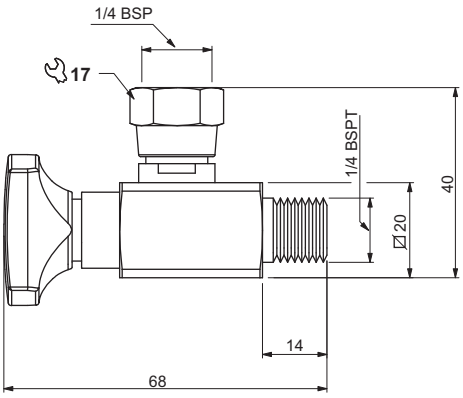
2



3



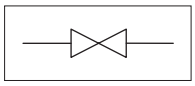
4



MR.7... in line - MRA.7... at 90°
This in-line mounting shut-off is completely steel made and allows for operating pressure of up to 400 bar. Its uses is essential to protect measuring gauge in the eventuality of fluid hammer.

MRG.7... in line with revolving nut
MRAG.7... at 90° with revolving nut
This in-line mounting shut-off is completely steel made and allows for operating pressure of up to 400 bar. It has been designed to allow for independent mounting of the measuring gauge aver a 360° angle, obviating in this way any problem relative to the gauge dimensions and mounting position. Its uses is essential to protect measuring gauge in the eventuality of fluid hammer.

HYDRAULIC SYMBOL

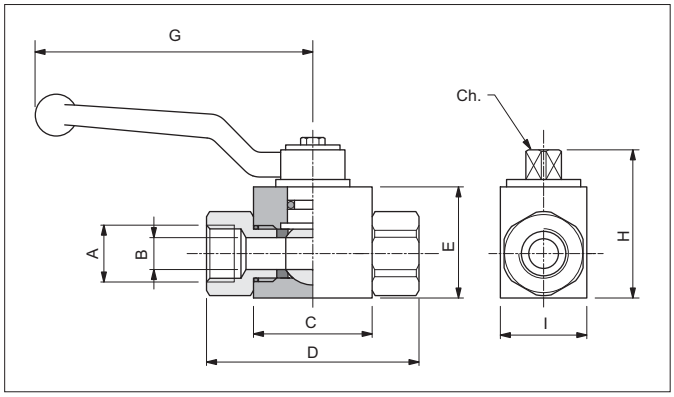


ORDERING CODE

Ref	Code	Description	Pressure **max** (bar)	Weight (kg)
1	**MR7002**	In line	400	0.115
2	**MRA7002**	At 90°	400	0.130
3	**MRG7002**	In line with revolving nut	400	0.120
4	**MRAG7002**	At 90° with revolving nut	400	0.135

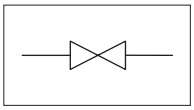
10

HIGH PRESSURE - 2 WAY BALL VALVES - IN-LINE MOUNTING



High pressure 2 way ball valves for in line mounting.
Steel body with external zinc plating. Cromed steel ball, aluminium lever.

HYDRAULIC SYMBOL



HYDRAULIC FEATURES

Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

10

Code	Thread A	Flow max (l/min)	Pressure max (bar)	B (mm)	C (mm)	D (mm)	E (mm)	G (mm)	H (mm)	I (mm)	Ch (mm)	Weight (kg)
RBS502	1/8 BSP	5	500	4	42	71	35	110	49	30	9	0.50
RBS504	1/4 BSP	10	500	6	42	71	35	110	49	30	9	0.50
RBS506	3/8 BSP	25	500	10	44	73	40	110	54	35	9	0.65
RBS508	1/2 BSP	40	500	13	48	83	43	110	57	37	9	0.75
RBS512	3/4 BSP	100	400	20	62	95	55	180	73	45	14	1.40
RBS516	1 BSP	150	350	25	66	113	65	180	83	55	14	2.15
RBS520	1-1/4 BSP	150	350	25	66	121	65	180	83	55	14	2.25
RBS524	1-1/2 BSP	150	350	25	66	124	65	180	83	55	14	2.35

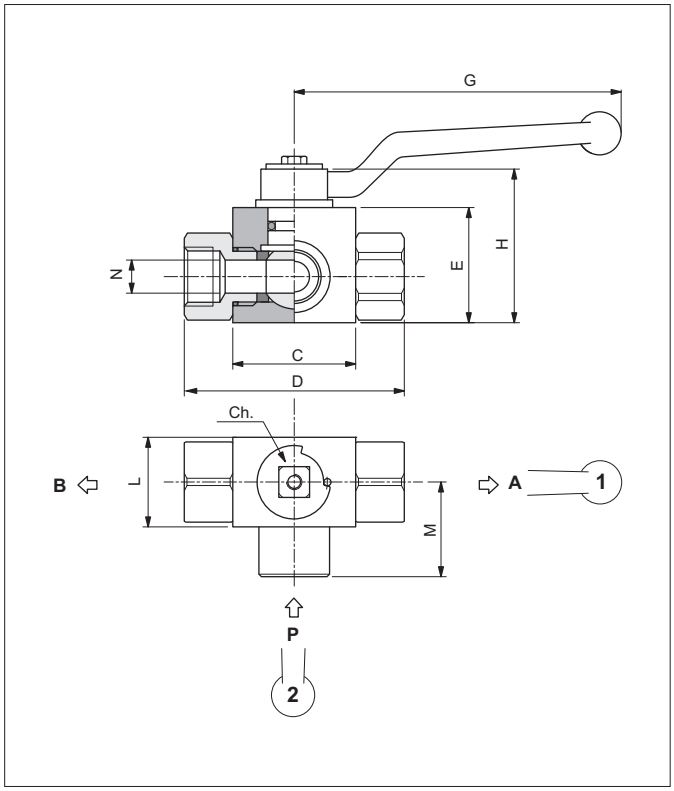
ORDERING CODE

RBS | 5 | **

Series: **RBS5** = High pressure - 2 way ball valves

Size:
02 = 1/8 BSP
04 = 1/4 BSP
06 = 3/8 BSP
08 = 1/2 BSP
12 = 3/4 BSP
16 = 1 BSP
20 = 1 - 1/4 BSP
24 = 1 - 1/2 BSP

HIGH PRESSURE - 3 WAY BALL VALVES - IN-LINE MOUNTING

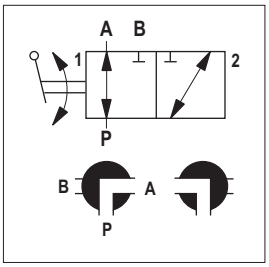


High pressure 3 way ball valves for in line mounting.
Steel body with external zinc plating. Cromed steel ball, aluminium lever.

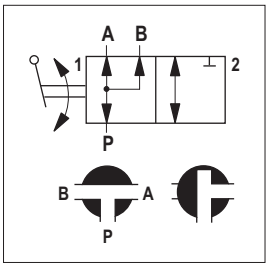
HYDRAULIC FEATURES

Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

HYDRAULIC SYMBOLS



SCHEME "A"



SCHEME "B"

Code	Thread A-B-P	Flow max (l/min)	Pressure max (bar)	C (mm)	D (mm)	E (mm)	G (mm)	H (mm)	L (mm)	M (mm)	N (mm)	Ch (mm)	Weight (kg)
BK3 A/B 02	1/8 BSP	5	400	42	71	35	110	49	30	33.5	4	9	0.50
BK3 A/B 04	1/4 BSP	10	400	42	71	35	110	49	30	33.5	6	9	0.50
BK3 A/B 06	3/8 BSP	25	400	44	73	40	110	54	35	37.0	10	9	0.70
BK3 A/B 08	1/2 BSP	70	350	48	83	43	110	57	37	40.0	13	9	0.80
BK3 A/B 12	3/4 BSP	100	350	62	95	55	180	73	45	52.0	20	14	1.50
BK3 A/B 16	1 BSP	150	350	66	113	65	180	83	55	60.0	25	14	2.35
BK3 A/B 20	1-1/4 BSP	150	350	66	121	65	180	83	55	61.5	25	14	2.50
BK3 A/B 24	1-1/2 BSP	150	350	66	124	65	180	83	55	61.5	25	14	2.70

ORDERING CODE

BK3 | * | **

Series

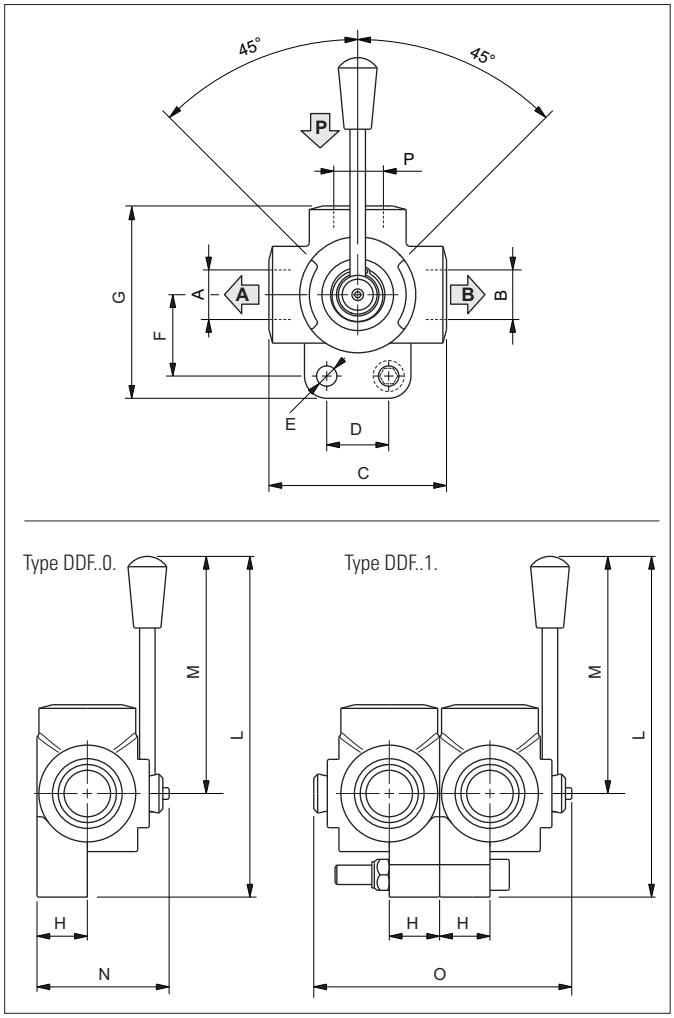
BK3 = High pressure - 3 way ball valves

A = Scheme "A"
B = Scheme "B"

Size

02 = 1/8 BSP
04 = 1/4 BSP
06 = 3/8 BSP
08 = 1/2 BSP
12 = 3/4 BSP
16 = 1 BSP
20 = 1 - 1/4 BSP
24 = 1 - 1/2 BSP

DIVERTER VALVES - IN-LINE MOUNTING

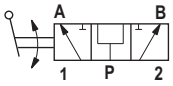
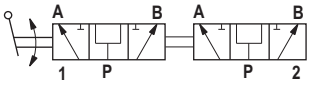
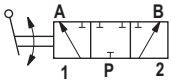
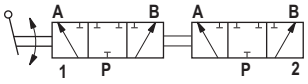


These valves allow the flow to be diverted to user points A or B by turning the control lever cursor to the left or right.
They can be the 3- or 6-way type, with closed or open centre. Iron cast boby black colour, white zinc plated external parts.

HYDRAULIC FEATURES

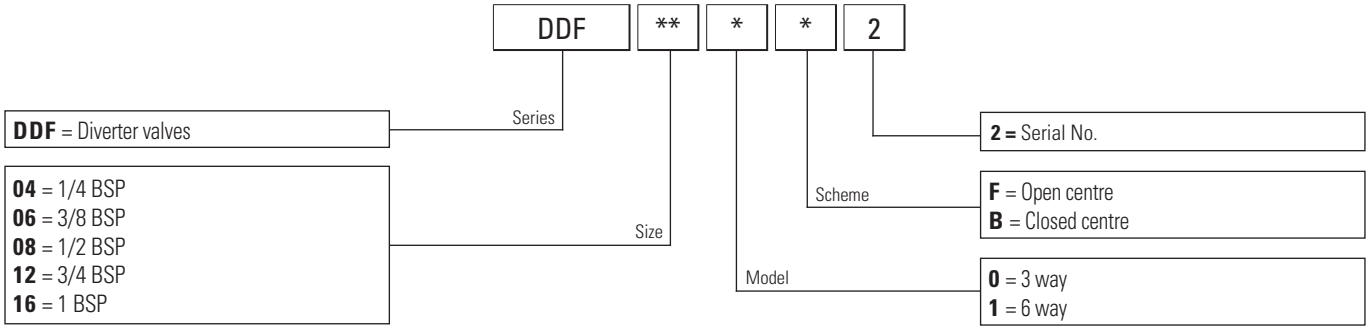
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

HYDRAULIC SCHEME

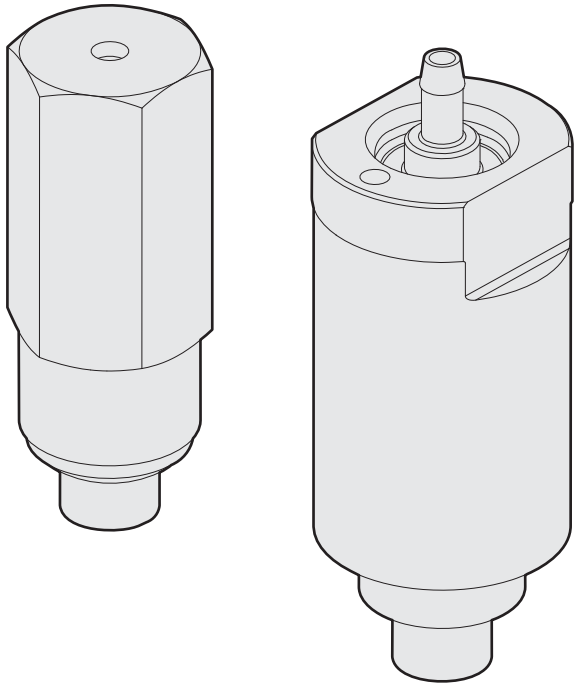
Scheme	Model	
	0 (3 Way)	**1** (6 Way)
F open centre		
B closed centre		

Code	Thread P-A-B	Flow max (l/min)	Pressure max (bar)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	L (mm)	M (mm)	N (mm)	O (mm)	Weight DDF..0.. (kg)	Weight DDF..1.. (kg)
DDF 04 ..	1/4 BSP	60	350	70	25	8.5	32	75.5	21	155.5	115	57	112	0.8	1.5
DDF 06 ..	3/8 BSP	60	350	70	25	8.5	32	75.5	21	155.5	115	57	112	0.8	1.5
DDF 08 ..	1/2 BSP	90	350	80	32	8.5	36	86	24	161	115	63	124	1.2	2.3
DDF 12 ..	3/4 BSP	120	350	90	32	10.5	42	98.5	26	168.5	115	67	132	1.8	3.5
DDF 16 ..	1 BSP	200	350	98	32	10.5	50	110	31	176.5	115	77	152	2.7	5.3

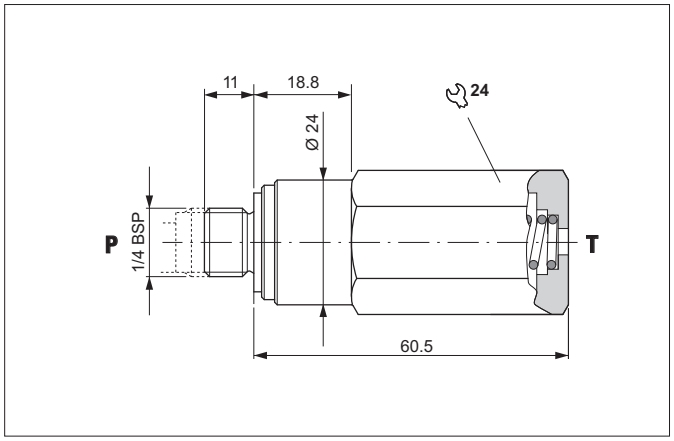
ORDERING CODE



SOFT START VALVES

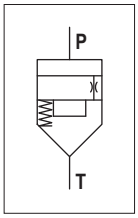


SINGLE-PHASE MOTOR START VALVE - IN-LINE MOUNTING



Valve used on power units to delay system pressurisation to allow a single-phase motor to reach the required speed.
Fitted directly on the auxiliary pressure delivery line of unit 1 pumps or on the delivery branch between pump and unidirectional valve.
The body is in steel and the tapered poppet in tempered and ground steel.

HYDRAULIC SYMBOL



HYDRAULIC FEATURES

Max. working pressure	300 bar
Max. Flow	20 l/min
Min. working pressure	15 bar
Max operating frequency (with manual operated)	1 Hz
Working Temperature	-25°C ÷ 60°C
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.14 kg
Tightening torque	25 ÷ 30 Nm

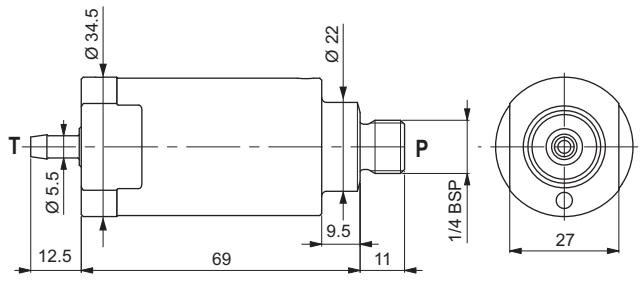
11

ORDERING CODE

VAM | 04 | 00 | *

- Series: **VAM** = Start valve
- Size: **04** = 1/4 BSP
- Variants: **00** = No variants
- Nominal flow:
  - **L** = 0.8 ÷ 2.5 l/min
  - **M** = > 2.5 ÷ 8.0 l/min
  - **H** = > 8.0 ÷ 14 l/min

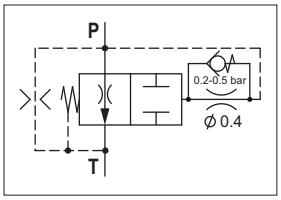
SOFT START VALVE - IN-LINE MOUNTING



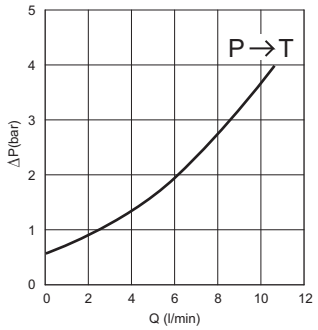
patent pending

Valve used on power units to generat a flow rate ramp on the actuator to delay system pressurisation and allow the single phase motor to reach the required speed.
Fitted directly on the auxiliary pressure delivery line of unit 1 pumps or on the delivery branch between pump and unidirectional valve.
The body is in steel and the tapered poppet in tempered and ground steel.

HYDRAULIC SYMBOL



PRESSURE DROPS



Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

HYDRAULIC FEATURES

Max. working pressure	210 bar
Flow	8 ÷ 15 l/min
Rump up time (at 100 bar of working pressure)	600 ms
Max. Leakage at 100 bar	0.8 l/min
Operating frequency	0.7 Hz
Working Temperature	-25°C ÷ 60°C
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.4 kg
Tightening torque	25 ÷ 30 Nm

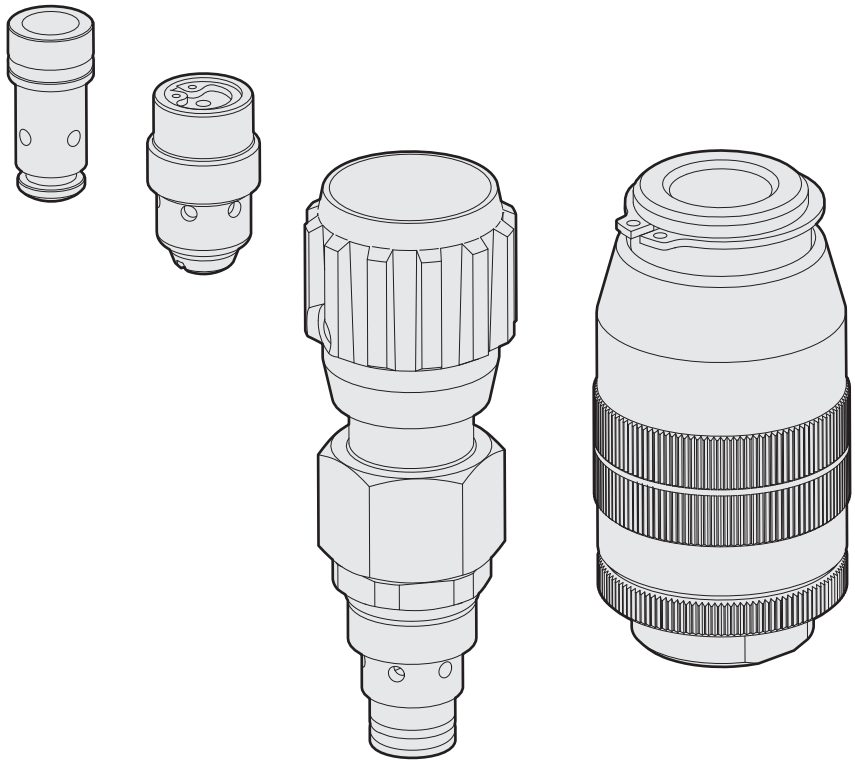
11

ORDERING CODE

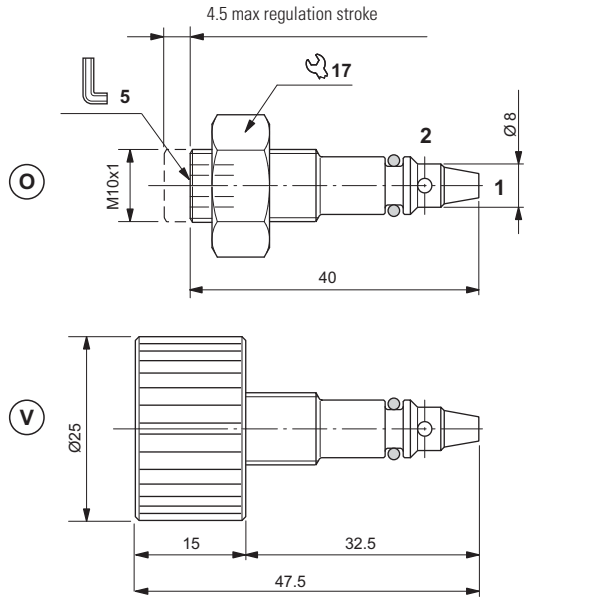
VAM	S	04	04	00	1

- Series: **VAM** = Soft start valve
- Version: **S** = Soft start
- Size: **04** = 1/4 BSP
- Closing speed: **04** = Ø 0,4 mm (orifice)
- Variants: **00** = No variants
- **1** = Serial No.

FLOW CONTROL VALVES



UNIDIRECTIONAL AND BIDIRECTIONAL FLOW CONTROL VALVES



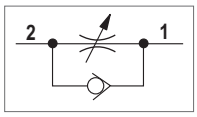
Q25831009	O-ring spare part

Flow control valve using non compensated throttling.
The flow is reduced in one direction only, from 2 to 1, for SU valves and in both directions for SB valves.
Guarantees excellent mechanical seal with negligible leakage.
It has a galvanised steel body. The check valve guided ball poppet is in tempered and ground steel.

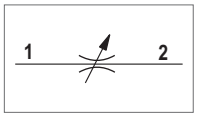
HYDRAULIC FEATURES

Max. working pressure	210 bar
Max. Flow	15 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.022 kg
Nut tightening torque	15 Nm
Cavity (M10x1)	CN019002 (See section 17)

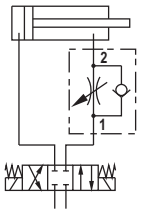
HYDRAULIC SYMBOLS



SU



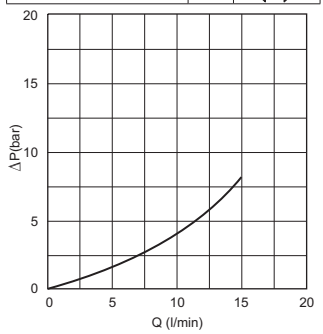
SB



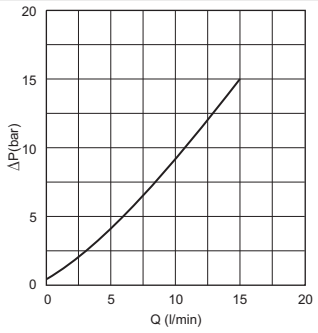
Service example

PRESSURE DROPS

Completely open valve	SU	2 ⇨ 1
	SB	1 ⇔ 2



Completely closed valve	SU	1 ⇨ 2



Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE

S*	1010	0	*	1
Series	Size	Pressure	Variants	

SU = Unidirectional flow control valve
SB = Bidirectional flow control valve

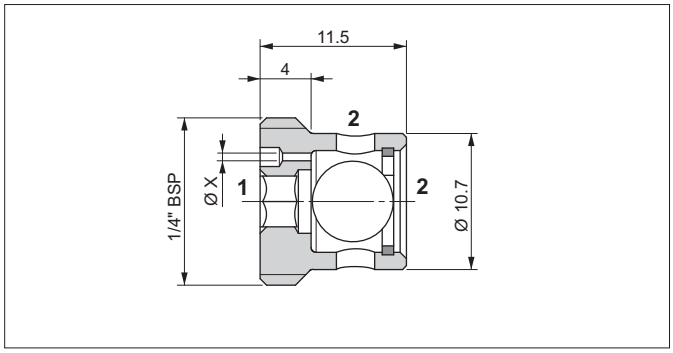
1010 = M10x1

0 = Standard opening pressure 0.4 bar

1 = Serial No.

O = Screw
V = Handwheel

FIXED UNIDIRECTIONAL FLOW CONTROL VALVE

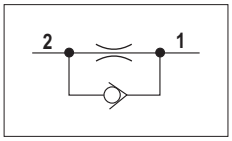


The valves control the flow in a single direction (2 to 1, the flow in opposite direction in free.
The flow is reduced by the control hole X which determines the flow rate (not compensated). Valves made steel.

HYDRAULIC FEATURES

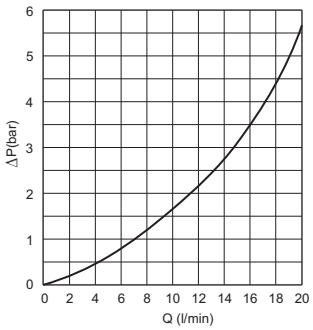
Max. working pressure	210 bar
Max. Flow	20 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.022 kg
Tightening torque	16 ÷ 18 Nm

HYDRAULIC SYMBOL

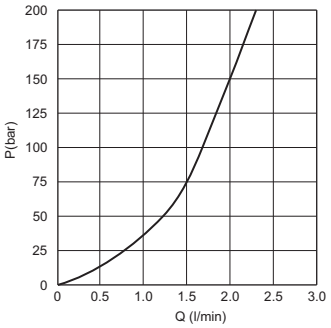


PRESSURE DROPS

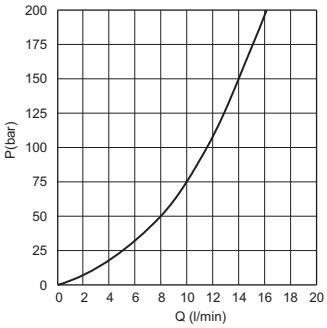
Free flow 1 → 2



Controlled flow 2 → 1 (VSU 04 06...)

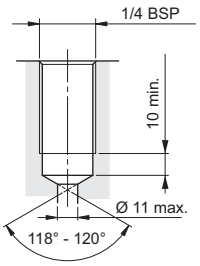


Controlled flow 2 → 1 (VSU 04 16...)

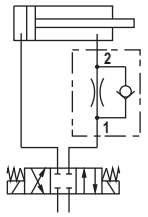


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

SEAL



SERVICE EXAMPLE



ORDERING CODE

VSU	04	**	00	1
Series	Size	Hole	Variants	

VSU = Fixed unidirectional flow control valve

04 = 1/4" BSP

06 = Hole 0.6 mm (Ø X)
16 = Hole 1.6 mm (Ø X)

1 = N° di serie

00 = No variants

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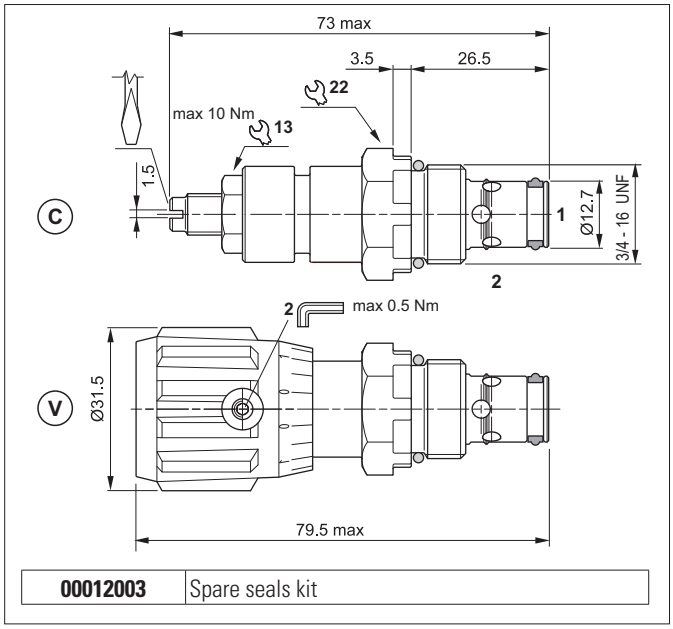
BIDIRECTIONAL FLOW CONTROL VALVE



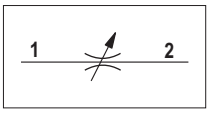
00012003	Spare seals kit

Flow control valve using non compensated throttling.
The flow is reduced in both directions, turning the screw or wheel right or left.
Guarantees excellent mechanical seal with negligible leakage.
It has a galvanised steel body.

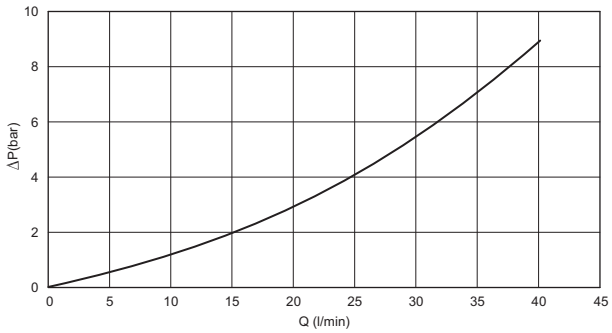
HYDRAULIC FEATURES

Max. working pressure	315 bar
Max. Flow	40 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.11 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS



Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.

ORDERING CODE

CSB	04	*	0	**	0

Series: **CSB** = Bidirectional flow control valve

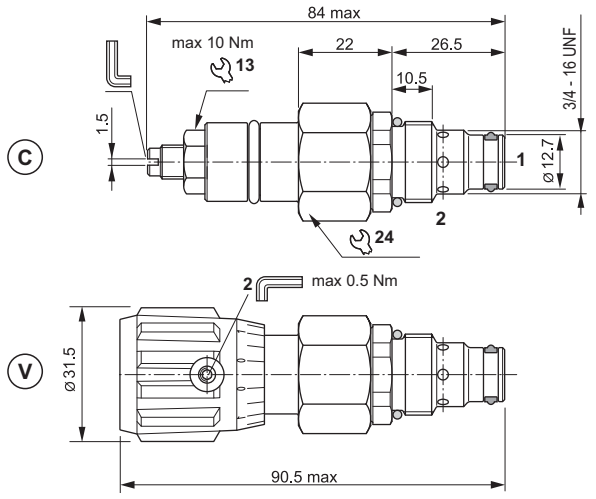
Size: **04** = 3/4 - 16 UNF

Adjustment: **C** = Screw; **V** = Plastic knob

Variants: **00** = No variants; **01** = ON/OFF regulation

0 = Serial No.

UNIDIRECTIONAL COMPENSATED FLOW CONTROL VALVES



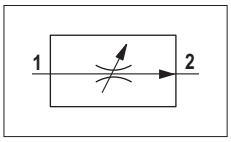
00012003	Spare seals kit

The flow control valve maintains a steady flow in a single direction (1 to 2) regardless of oil pressure.
The flow is reduced by turning the screw or wheel right or left.
Slight leakage is tolerated when the control screw or wheel is screwed down completely.
It has a galvanised steel body. The compensator plunger is in tempered and ground steel.

HYDRAULIC FEATURES

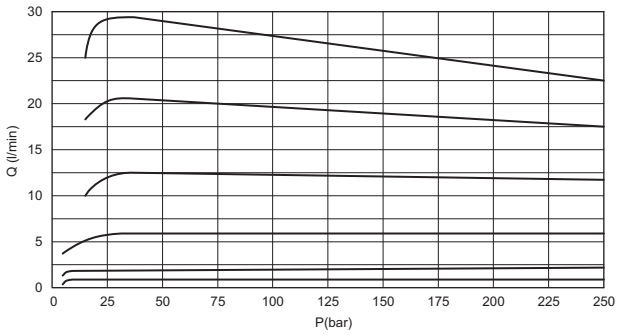
Max. working pressure	250 bar
ΔP of regulation	12.6 bar
Max. Flow	29 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.2 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

HYDRAULIC SYMBOL



PRESSURE DROPS

Controlled flow 1 → 2



Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE

CSC	04	*	0	00	0

Series: **CSC** = Unidirectional compensated flow control valve

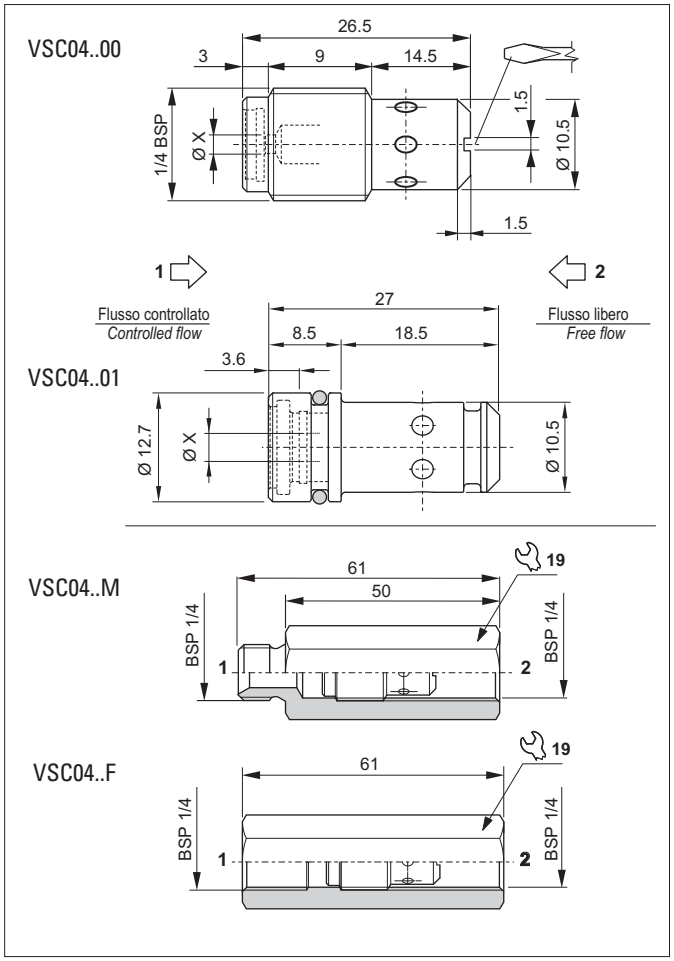
Size: **04** = 3/4 - 16 UNF

Adjustment: **C** = Screw; **V** = Plastic knob

Variants: **00** = No variants

0 = Serial No.

FIXED COMPENSATED FLOW CONTROL VALVE

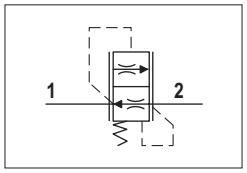


The flow control valve maintains a steady flow in a single direction (1 to 2) regardless of oil pressure.
The flow is reduced by the control hole X which determines the flow rate.
Steel body. Compensator plunger in ground steel.

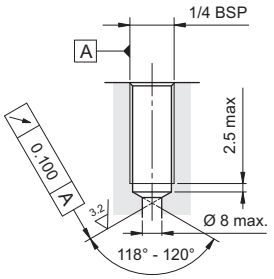
HYDRAULIC FEATURES

Max. working pressure	250 bar
ΔP of regulation	5.4 ÷ 6.3 bar (2.3 bar variant 04)
Max. Flow	11.7 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.014 kg
Tightening torque	6 ÷ 8 Nm
Cavity (for VSC04..01)	CD018009 (See section 17)

HYDRAULIC SYMBOL

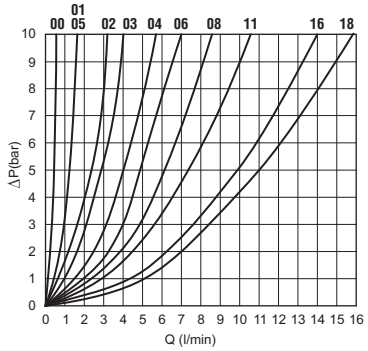


SEAL (FOR VSC04..00)



PRESSURE DROPS

Free flow 2 → 1



Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

FLOW CONTROLLED BY "X" PORT

Controlled flow 1 → 2

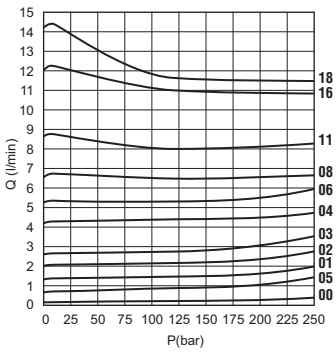


Table 1

Code	Ø X (mm)	Nominal flow at 120 bar (l/min)
00	0.50	0.3 (variant 04)
01	1.00	1.4
02	1.25	2.3
03	1.50	2.8
04	1.75	4.3
05	1.00	1.0 (variant 04)
06	2.00	5.2
08	2.25	6.5
11	2.50	8.0
16	3.00	11.1
18	3.20	11.7

ORDERING CODE

VSC	04	**	**	**
Series	Size	Controlled flow 1 → 2	Versions	Variants

VSC = Fixed flow control valve

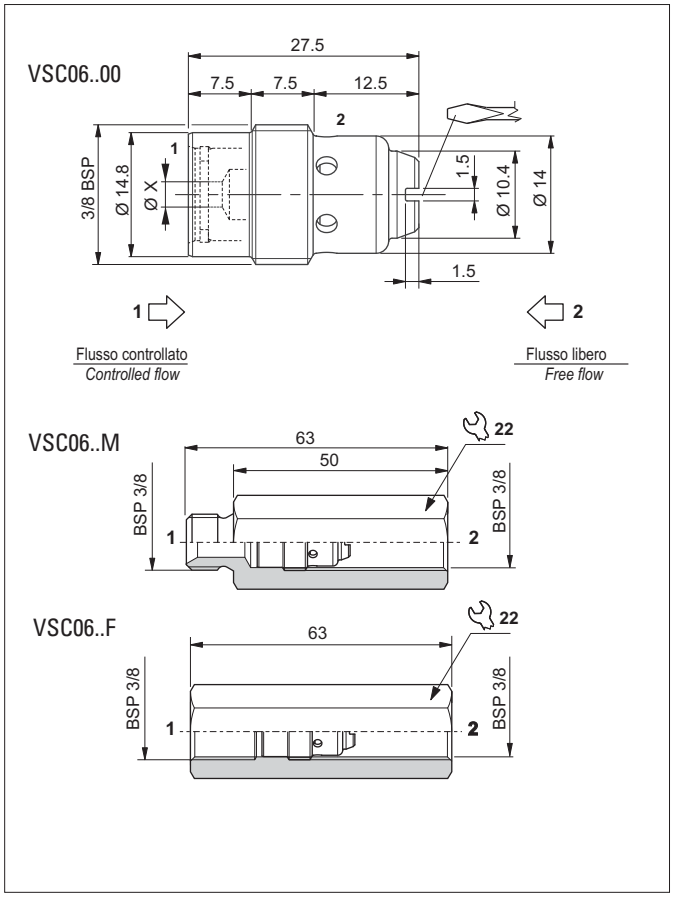
04 = 1/4 BSP

****** = Code (see table 1)

Omit if not required
04 = ΔP of regulation 2.9 bar (only for code 00 and 05, see table 1)

00 = Thread body 1/4 BSP
01 = Body with O-ring (9.25x1.78)
M = With column M/F
F = With column F/F

FIXED COMPENSATED FLOW CONTROL VALVE

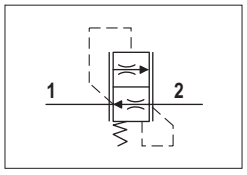


The flow control valve maintains a steady flow in a single direction (1 to 2) regardless of oil pressure.
The flow is reduced by the control hole X which determines the flow rate.
Steel body. Compensator plunger in ground steel.

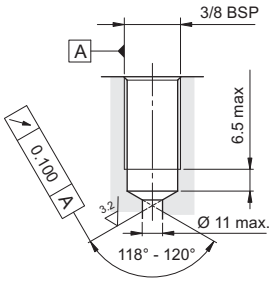
HYDRAULIC FEATURES

Max. working pressure	250 bar
ΔP of regulation	6.0 ÷ 6.8 bar 2,2 bar (code 10-12 tab. 1)
Max. Flow	18.5 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.026 kg
Tightening torque	6 ÷ 8 Nm

HYDRAULIC SYMBOL

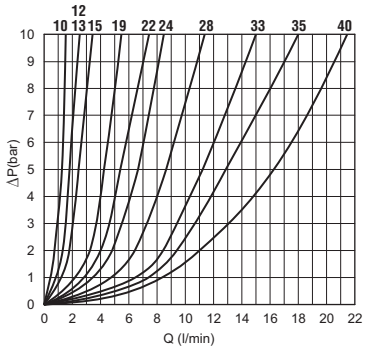


SEAL (FOR VSC06..00)



PRESSURE DROPS

Free flow 2 → 1



Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

FLOW CONTROLLED BY "X" PORT

Controlled flow 1 → 2

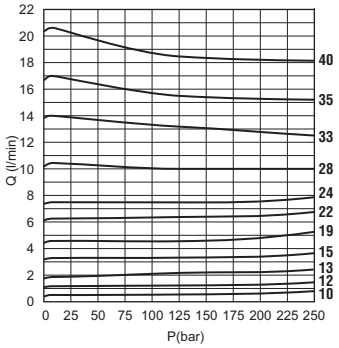


Table 1

Code	Ø X (mm)	Nominal flow at 120 bar (l/min)
10	1.00	0.7
12	1.25	1.1
13	1.25	2.1
15	1.50	3.2
19	1.90	4.7
22	2.20	6.3
24	2.40	7.5
28	2.75	10.0
33	3.25	13.2
35	3.50	15.7
40	4.00	18.5

ORDERING CODE

VSC	06	**	*	00	2

- Series: **VSC** = Fixed flow control valve
- Size: **06** = 3/8 BSP
- Controlled flow 1 → 2: ** = Code (see table 1)
- Versions: **0** = Thread body 3/8 BSP; **M** = With column M/F; **F** = With column F/F
- Variants: **00** = No variants
- **2** = Serial No.

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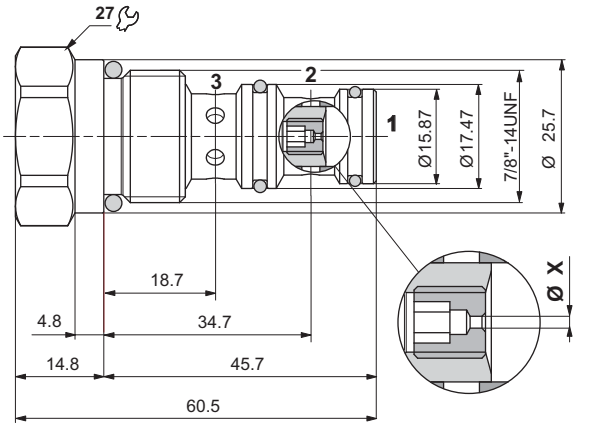
PRIORITARY FLOW CONTROL VALVE



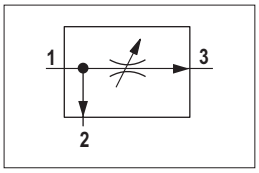
00012031	Spare seals kit

The priority flow control valve sends a constant flow from branch 1, first to priority branch 3 and then the remaining flow to overflow branch 2, regardless of the downstream oil pressure.
Both branches 2 and 3 can be pressurised.
The flow is reduced by the control hole X which determines the flow rate.
It has a galvanised steel body. The compensator plunger is in tempered and ground steel.

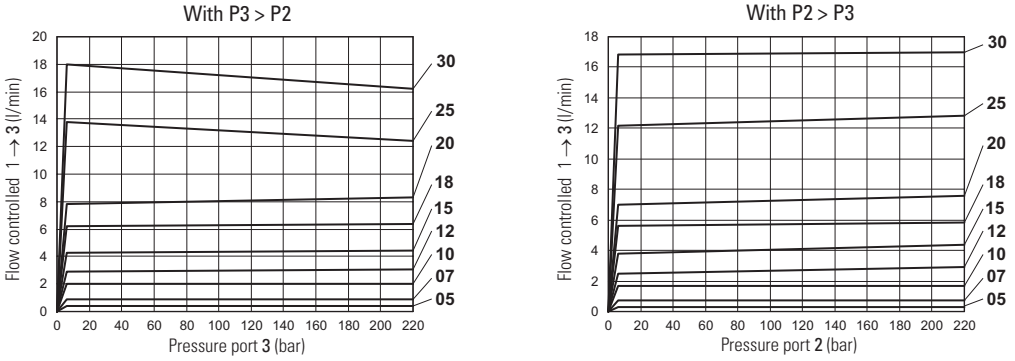
HYDRAULIC FEATURES

Max. working pressure	210 bar
ΔP of regulation	6.1 ÷ 6.7 bar
Input max. Flow	50 l/min
Control max. Flow	17 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.2 kg
Tightening torque	30 ÷ 40 Nm
Cavity (7/8 - 14 UNF)	CD019006 (See section 17)

HYDRAULIC SYMBOL



FLOW CONTROLLED



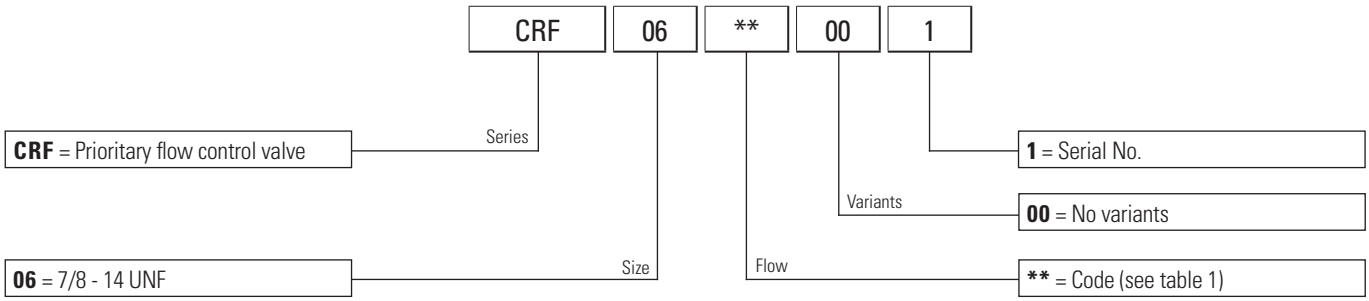
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.
The regulated flow rate depends on the inlet flow rate and the oil viscosity.

Table 1

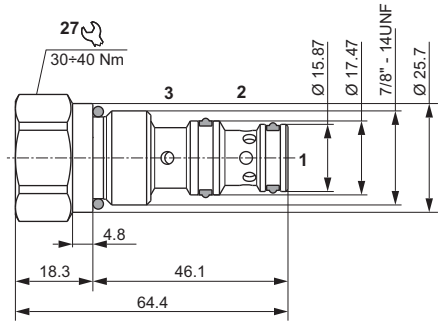
Code	Ø X (mm) **	Nominal flow (l/min) *
05	0.5	0.3
07	0.7	0.7
10	1.0	1.7
12	1.2	2.5
15	1.5	4.0
18	1.8	5.6
20	2.0	7.0
25	2.5	12.2
30	3.0	17.0

* Flow rate tolerance: ±15% up to 5 l/min, ±10% over 5 l/min
** Tolerance on hole ±0.02 mm

ORDERING CODE



PRESSURE COMPENSATOR VALVE



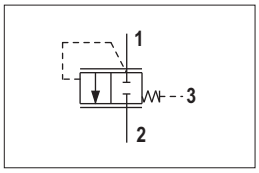
00012035	Spare seals kit

Pressure compensator valves allow to control flow and pressure. The valve is normally closed and with external pilot additive to the spring bias pressure. When the pressure at port 1 rises above the spring bias pressure with the addition of external pilot pressure, then the valve shifts to allow flow from port 1 to port 2 connected to tank. The valve is used as a bypass for a fixed displacement pump in Load Sensing circuits or to proportionally control the speed of an actuator (see examples).
The valve body is made of steel zinc coated and the pressure compensating spool is made of steel tempered and grinded.

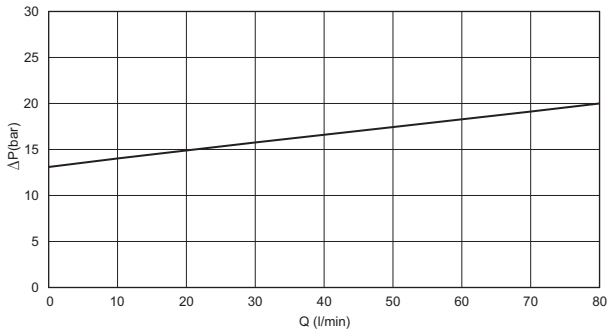
HYDRAULIC FEATURES

Max. working pressure	250 bar
ΔP of regulation	8 bar
Input max. Flow	50 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.2 kg
Tightening torque	30 ÷ 40 Nm
Cavity (7/8" - 14 UNF)	CD019006 (See section 17)

HYDRAULIC SYMBOL

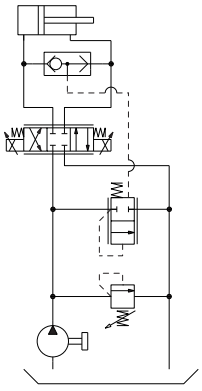


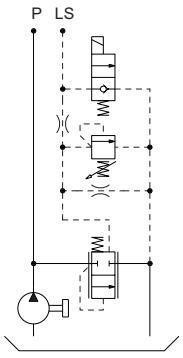
PRESSURE DROPS (1 → 2)



Fluid used: mineral based oil with viscosity 46 mm^2/s at 40°C.

SERVICE EXAMPLE



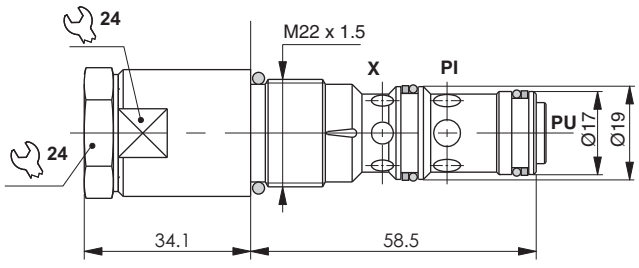


ORDERING CODE

CCI	06	13	00	1

- Series: **CCI** = Pressure compensator valve
- Size: **06** = 7/8 - 14 UNF
- Δp adjustment: **13** = 13 bar
- Variants: **00** = No variants
- **1** = Serial No.

TWO-WAY PRESSURE COMPENSATOR VALVE

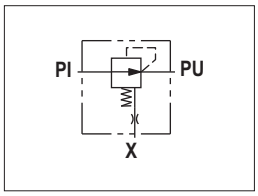


00012013	Spare seals kit

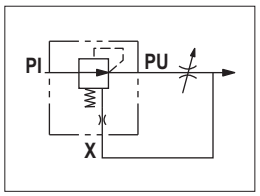
Pressure compensator type CCP maintains a constant pressure drop (Δp) regardless of downstream and up stream set pressure variation.

- Connecting a choke regulator between Pu port and Pil - piloting port - (see hydraulic scheme) it is possible to get a load independent flow regulation.
- This kind of compensator, named "meter in" (check in entrance), is suitable for application on special manifold or in line mounting bodies.

HYDRAULIC SYMBOLS



SIMPLIFIED SCHEME



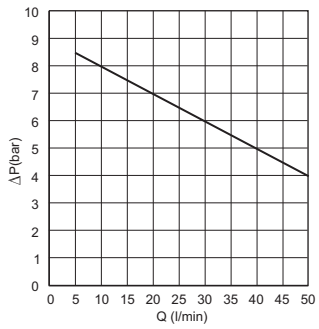
APPLICATION SCHEME

HYDRAULIC FEATURES

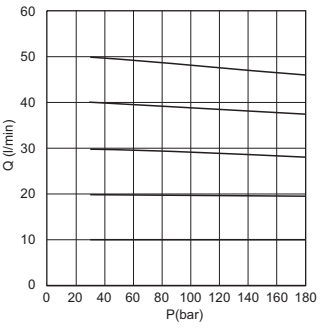
Max. working pressure	250 bar
ΔP of regulation (standard)	8 bar
Max. Flow	50 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.2 kg
Tightening torque	30 ÷ 40 Nm
Cavity (M22x1.5)	CN047002 (See section 17)

12

ΔP BETWEEN PU AND X - FLOW



PRESSURE - FLOW RATE



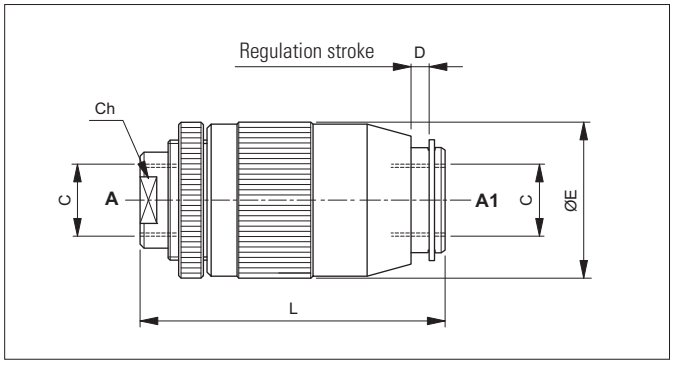
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

CCP	20	S	*	**	1

- **CCP** = Two-way compensator valves (Series)
- **20** = M22 x 1.5 (Size)
- **S** = Without regulation Δp (Adjustment)
- Differential pressure (Δp): **8** = 8 bar (standard); **4** = 4 bar
- Variants: **00** = No variants; **V1** = Viton
- **1** = Serial No.

SLEEVE FLOW CONTROL VALVES UNIDIRECTIONAL AND BIDIRECTIONAL - IN-LINE MOUNTING



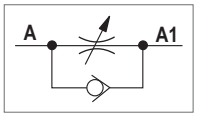
Flow control valve using non compensated throttling.
The flow is reduced in only one direction (A to A1) for VSR valves and in both directions for VSB valves, by turning the outer casing of the valve right or left. Slight leakage is tolerated when the control screw or wheel is completely unscrewed.
It has a galvanised steel body. The check valve ball poppet is in tempered and ground steel.

Code	C	Flow max (l/min)	Pressure max (bar)	L (mm)	E (mm)	D (mm)	Ch	Weight (kg)
VSR-VSB 0400	1/4 BSP	15	350	62	31	4.2	19	0.23
VSR-VSB 0600	3/8 BSP	30	350	73	38	4	24	0.42
VSR-VSB 0800	1/2 BSP	45	350	83	45	7.5	30	0.66
VSR-VSB 1200	3/4 BSP	85	300	102	54	10.5	36	1.12
VSR-VSB 1600	1 BSP	130	250	122	65	10	41	1.94

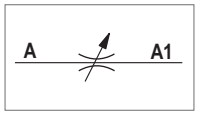
HYDRAULIC FEATURES

Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

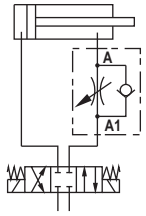
HYDRAULIC SYMBOLS



VSR



VSB

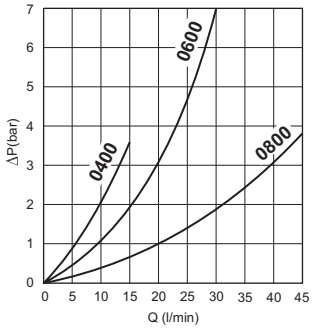


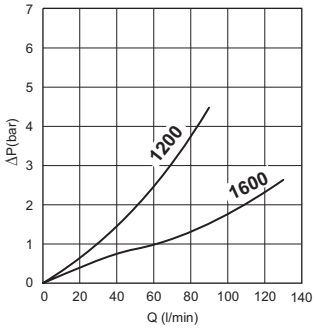
Service example

12

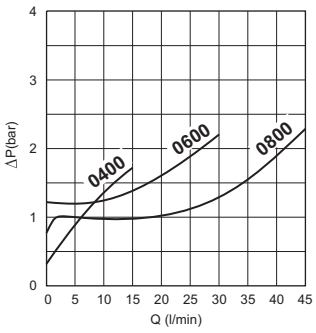
PRESSURE DROPS

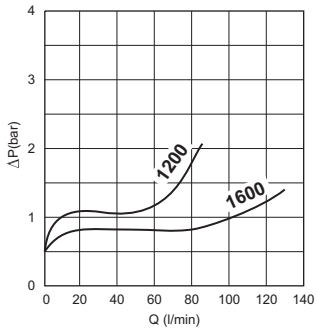
Completely open valve | VSR A ⇨ A1 | VSB A ⇔ A1





Completely closed valve | VSR A1 ⇨ A





Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.

ORDERING CODE

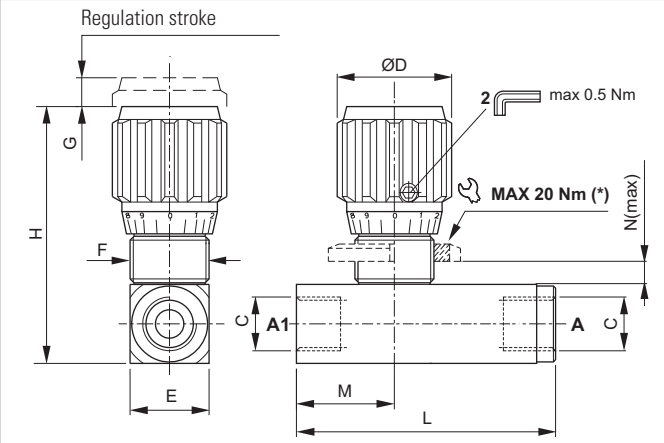
VS*	**	00
Series	Size	

VSR = Unidirectional flow control valve
VSB = Bidirectional flow control valve

04 = BSPP 1/4
06 = BSPP 3/8
08 = BSPP 1/2
12 = BSPP 3/4
16 = BSPP 1

00 = Serial N.o.

UNIDIRECTIONAL AND BIDIRECTIONAL FLOW CONTROL VALVES - IN-LINE MOUNTING



* Performance pressure are guaranteed if you do not exceed the maximum tightening torque

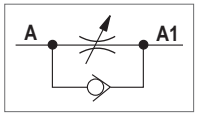
Flow control valve using non compensated throttling.
The flow is reduced in only one direction (A to A1) for STU valves and in both directions for STB valves, turning the wheel with locking screw right or left.
Guarantees excellent mechanical seal with negligible leakage.
It has a galvanised steel body. The check valve tapered poppet is in tempered and ground steel.

HYDRAULIC FEATURES

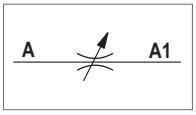
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

Code	C	Flow max (l/min)	Pressure max (bar)	L - STU (mm)	L - STB (mm)	H (mm)	D (mm)	E (mm)	F (mm)	G (mm)	M (mm)	N max (mm)	Weight - STU (kg)	Weight - STB (kg)	Weight screw (kg)
STU-STB 0400	1/4 BSP	20	400	73	54	68.5	31.5	20	M20x1	6	27	7	0.26	0.21	0.020
STU-STB 0600	3/8 BSP	30	400	82	62	80.5	35.5	25	M25x1.5	9.5	31	7	0.44	0.37	0.031
STU-STB 0800	1/2 BSP	50	350	98	73	93	41	30	M30x1.5	8	36.5	9	0.73	0.59	0.043
STU-STB 1200	3/4 BSP	85	320	112	84	110	47	40	M35x1.5	13	42	11	1.36	1.10	0.067
STU-STB 1600	1 BSP	150	300	142	100	121.5	47	45	M40x1.5	11.5	50	15	2	1.52	0.090

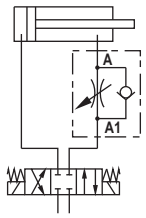
HYDRAULIC SYMBOLS



STU



STB

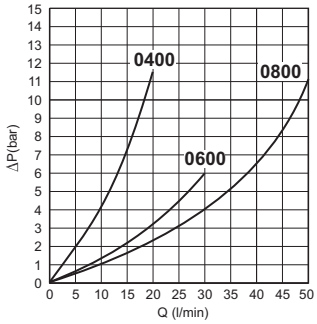


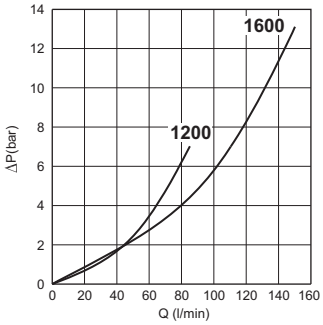
Service example

12

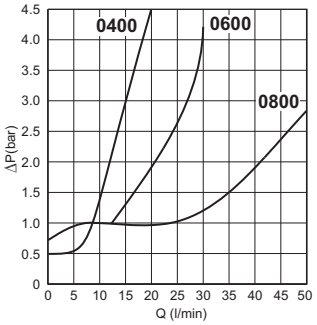
PRESSURE DROPS

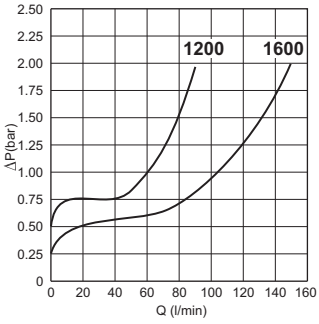
Completely open valve | STU A ⇨ A1 | STB A ⇔ A1





Completely closed valve | STU A1 ⇨ A





Fluid used: mineral based oil with viscosity 15 mm²/s (for STU0400 mm²/s) 32 at 40°C.

ORDERING CODE

ST*	**	00	*
Series	Size		

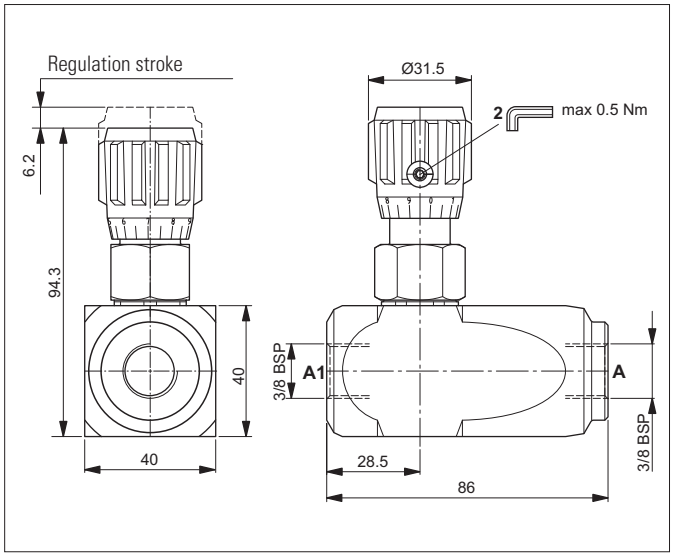
STU = Unidirectional flow control valve
STB = Bidirectional flow control valve

04 = 1/4 BSP
06 = 3/8 BSP
08 = 1/2 BSP
12 = 3/4 BSP
16 = 1 BSP

G = with nut
(If not required omit)

00 = Serial N.o.

PRESSURE COMPENSATED FLOW UNIDIRECTIONAL FLOW CONTROL VALVES - IN-LINE MOUNTING

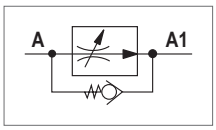


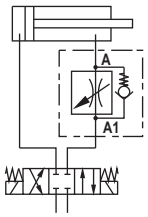
The valve maintains the flow rate in one direction (A to A1) regardless of oil pressure; the oil flows freely in the opposite direction.
The flow is reduced by turning the wheel right or left.
Slight leakage is tolerated when the control screw or wheel is screwed down completely.
It has a galvanised steel body. The compensator plunger and check valve ball poppet are in tempered and ground steel.

HYDRAULIC FEATURES

Max. working pressure	250 bar
ΔP of regulation	12.6 bar
Max. Flow	29 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm²/s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.95 kg

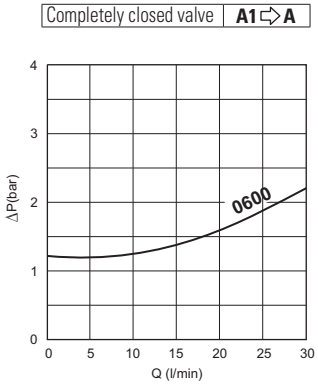
HYDRAULIC SYMBOL

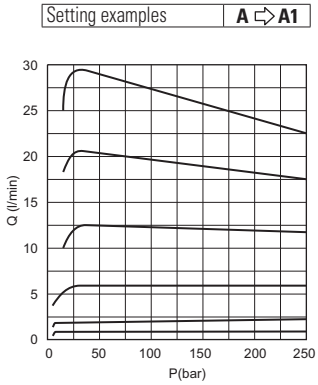




Service example

PRESSURE DROPS





Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE

STC | 06 | 00

Series

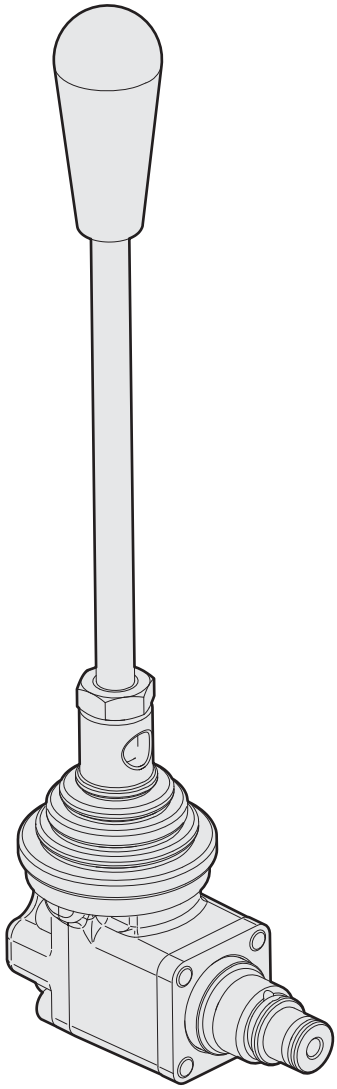
STC = Unidirectional flow control valve

06 = 3/8 BSP

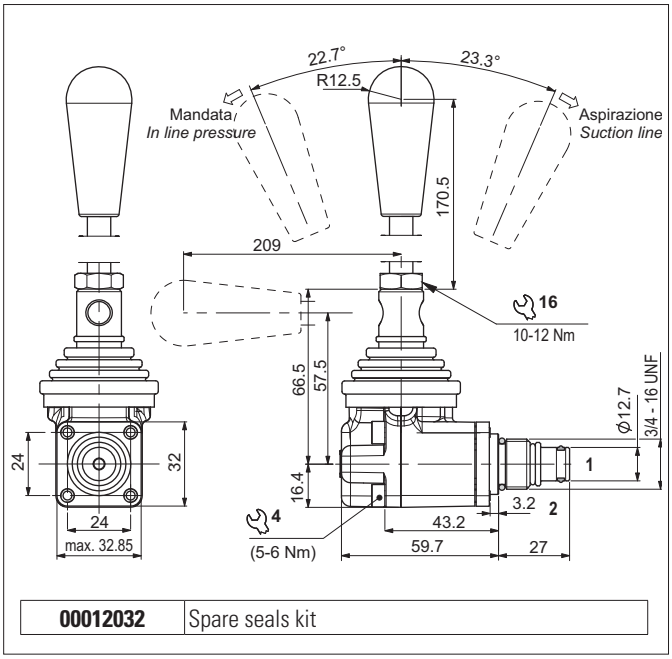
Size

00 = Operating pressure 1 bar

HAND PUMPS



HAND PUMPS



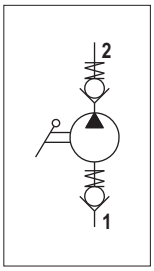
00012032	Spare seals kit

This hand pump handles emergencies manually in small systems.
Available in 1cc/pump stroke and 1cc/pump stroke displacement versions.
The lever body is in diecast aluminium. The cartridge is steel with tempered and ground steel ball check valves.

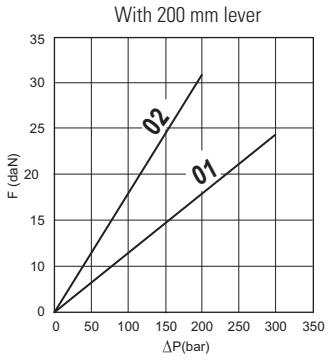
HYDRAULIC FEATURES

Max. working pressure	CPM041 = 300 bar CPM042 = 160 bar
Displacement	CPM041 = 1 cc stroke CP0M42 = 2 cc stroke
Working Temperature	-25°C ÷ 60°C
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm^3/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm^2/s
Fluid temperature	-25°C ÷ 75°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.41 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

HYDRAULIC SYMBOL



OPERATION FORCE ON THE LEVER



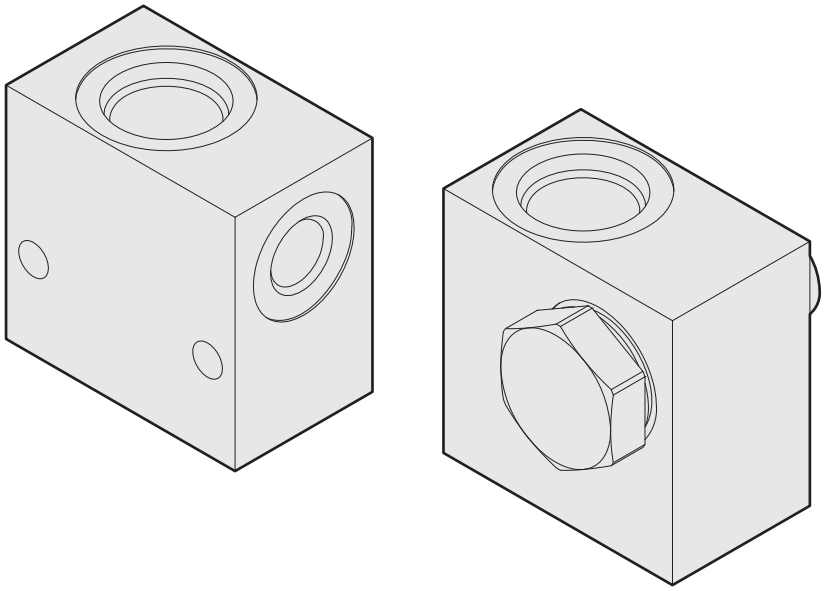
Fluid used: mineral based oil with viscosity 32 mm^2/s at 40°C.

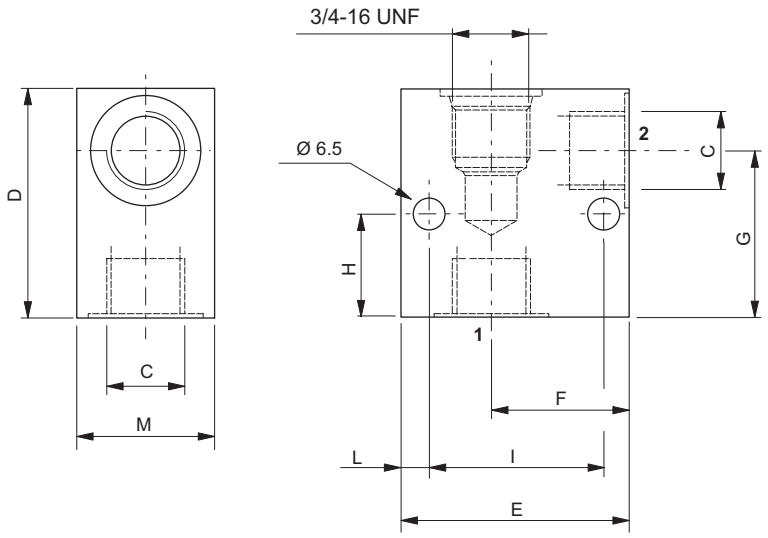
ORDERING CODE

CPM	04	*	0	00	1

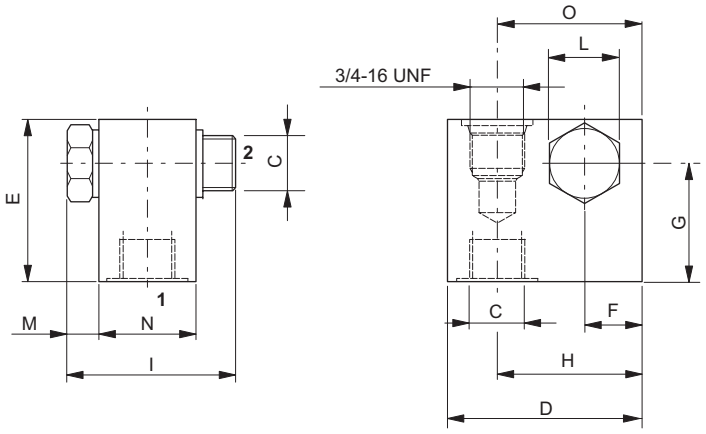
- **CPM** = Hand pump (Series)
- **04** = 3/4 - 16 UNF (Size)
- **1** = Displacement 1 cc
  2 = Displacement 2 cc (Version)
- **0** = Standard positioning (90° to the valve axis) - See drawing (Version)
- **00** = No variants (Variants)
- **1** = Serial No.

VALVE HOUSINGS

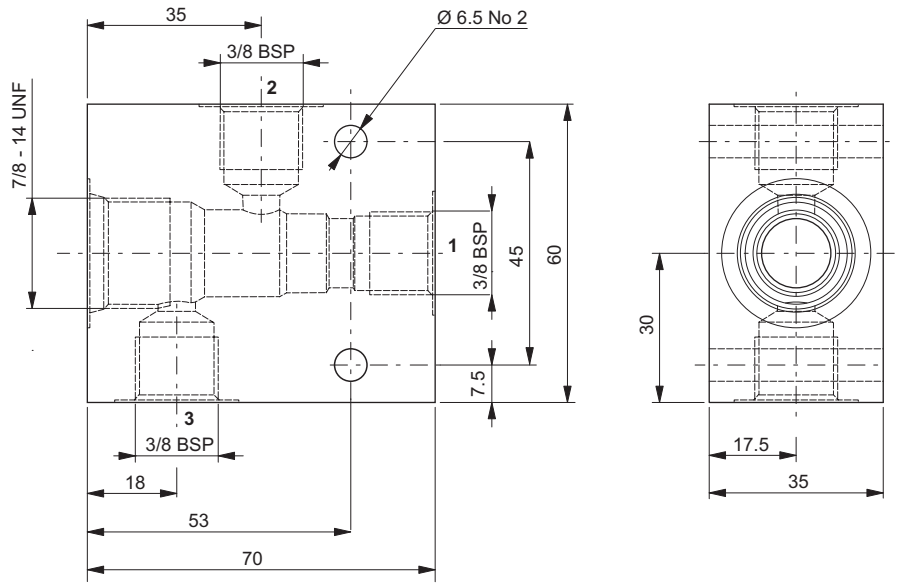




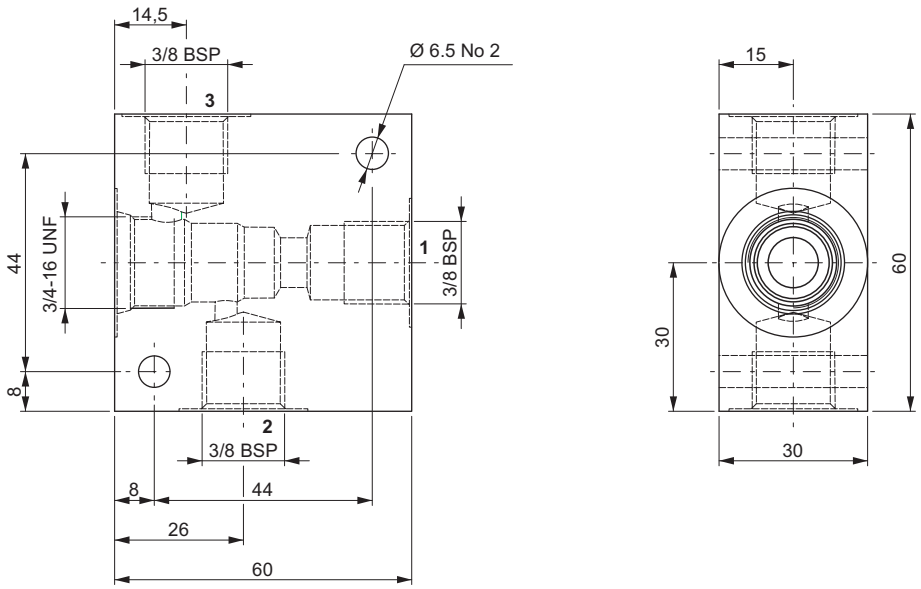
Code	C	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	M (mm)	Material	Cavity
F07100013	1/4 BSP	46	50	30,5	33	18	38	6	30	Alluminio EN AW 2011	CD018006
M18400061	3/8 BSP	55	60	38	41,25	25	45	7,5	30		
M18400071	1/2 BSP	60	60	35	41	6	48	6	40		



Code	C	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	M (mm)	N (mm)	O (mm)	Material	Cavity
17030532	3/8 BSP	50	50	16	32	35	51	22	9	30	34.5	Alluminium EN AW 2011	CD018006
V10500034	1/4 BSP	40	46	11	31	26	49	19	8	30	26		



Code	Material	Cavity
M10850319	Alluminium - EN AW 2011	CD019006



Code	Material	Cavity
M10850206	Alluminium - EN AW 2011	CD018005

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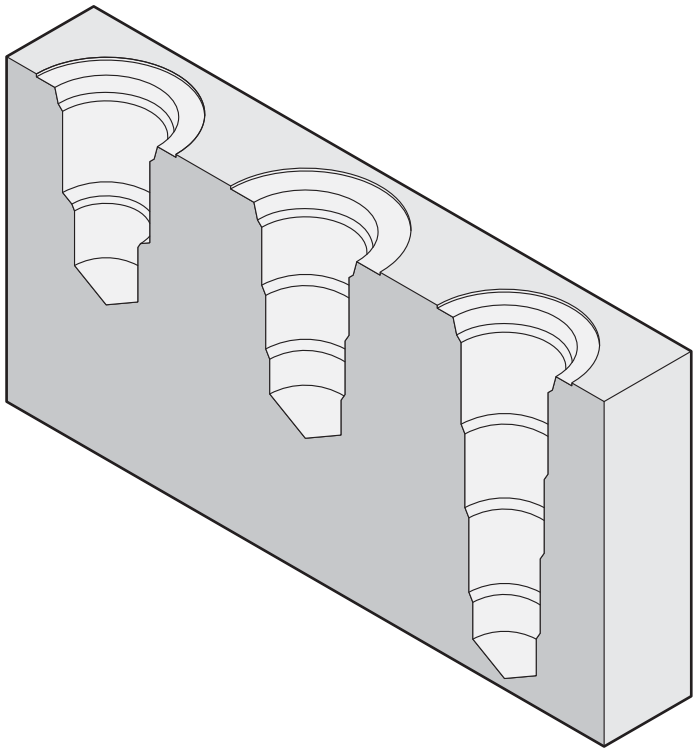
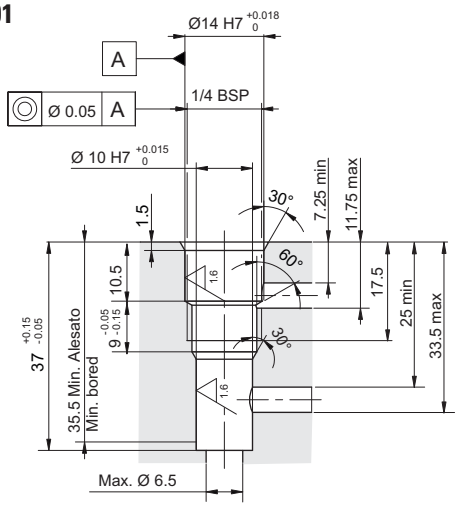
CAVITIES

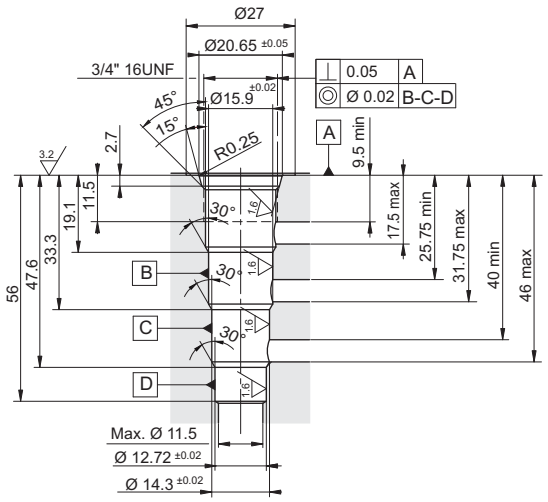


CA012001 — 1/4 BSP



Plugs compatibility:

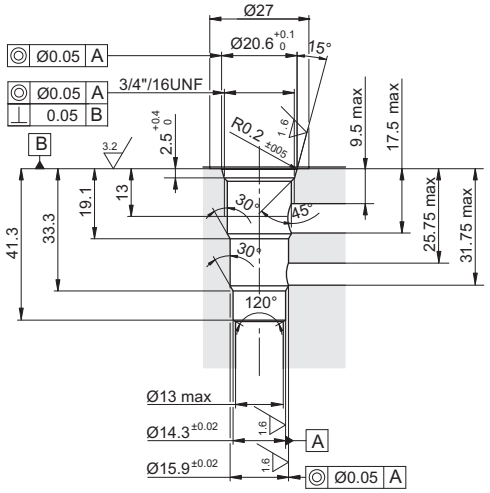
CD018001 — 3/4 16UNF



Plugs compatibility:

R78150114	R78150109	R78150111		

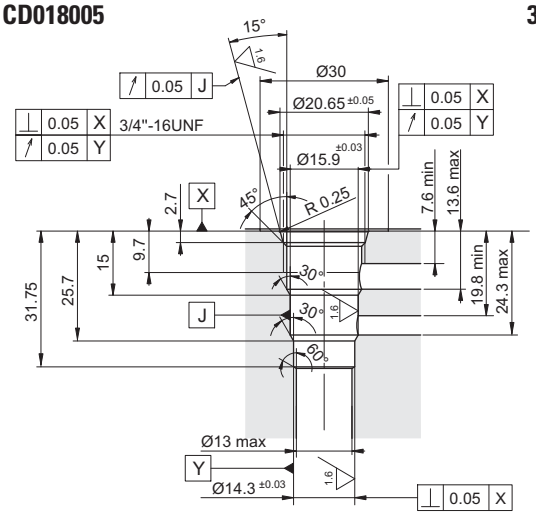
CD018003 — 3/4 16UNF



Plugs compatibility:

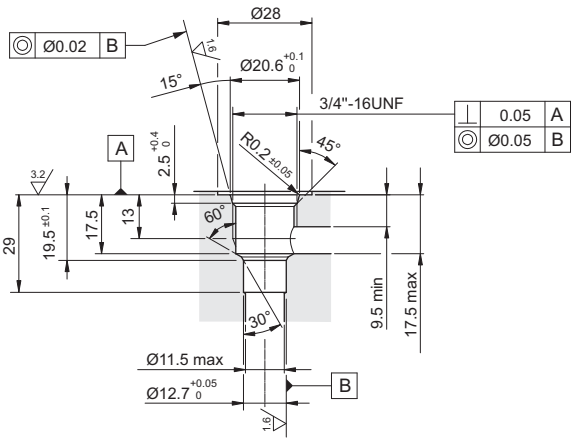
20001700	20001900			

CD018005 — 3/4 16UNF



Plugs compatibility:

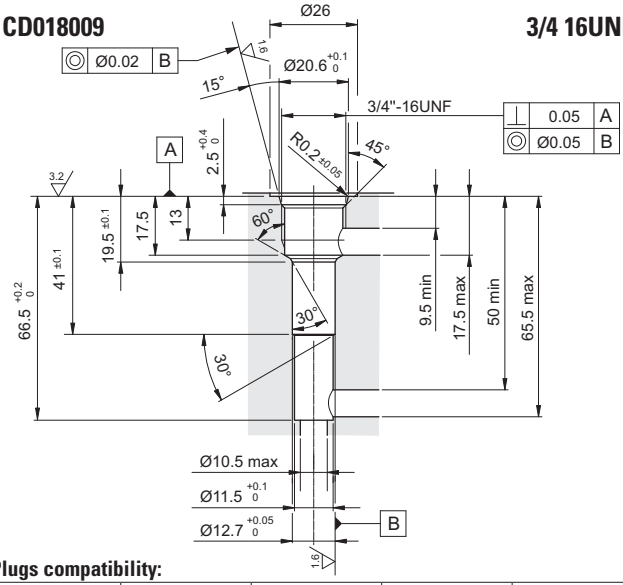
CD018006 — 3/4 16UNF



Plugs compatibility:

20001900	20001700	20003800	20009400	20018000

CD018009 — 3/4 16UNF

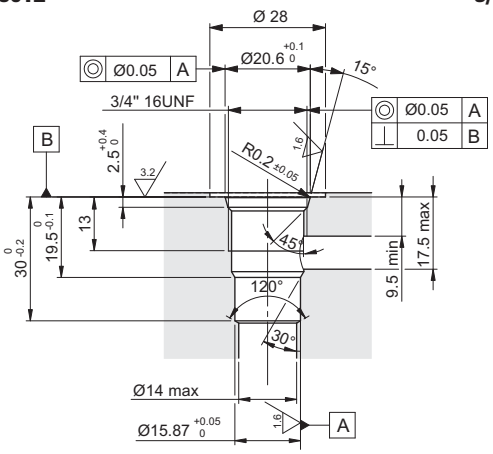


Plugs compatibility:

20001900	20001700	20003800	20009400	20018000

15

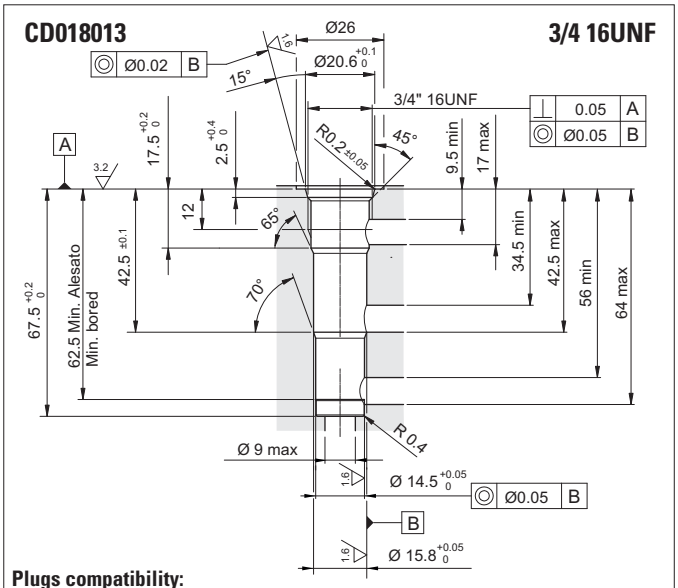
CD018012 — 3/4 16UNF



Plugs compatibility:

R78200A19	20001700	20001900		

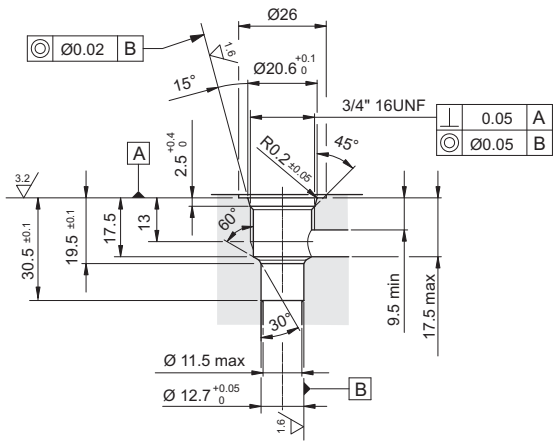
CD018013 — 3/4 16UNF



Plugs compatibility:

R78150100				

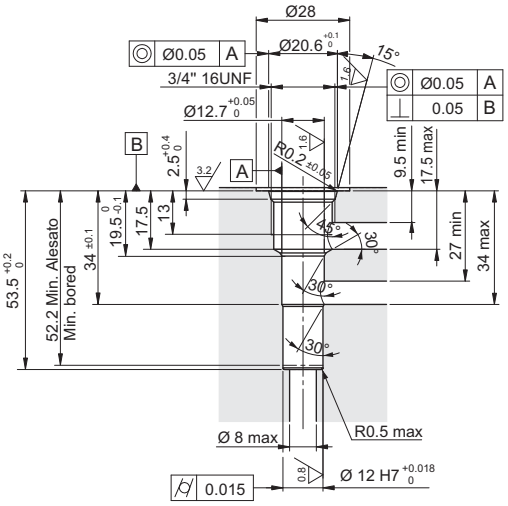
CD018014 — 3/4 16UNF



Plugs compatibility:

20001900	20001700	20003800	20009400	20018000

CD018015 — 3/4 16UNF



Plugs compatibility:

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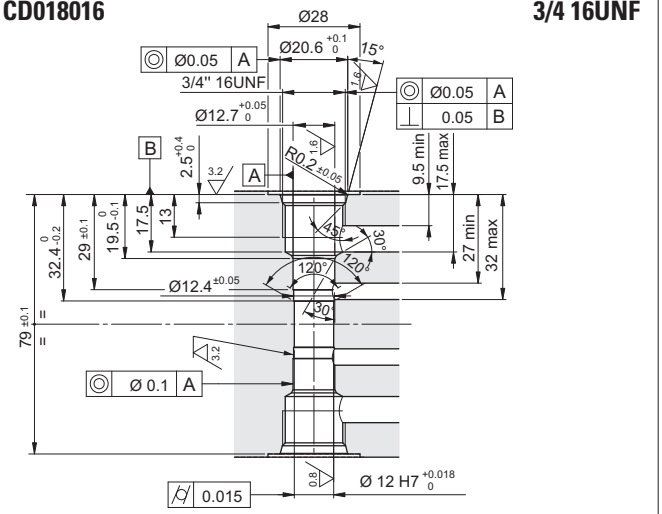
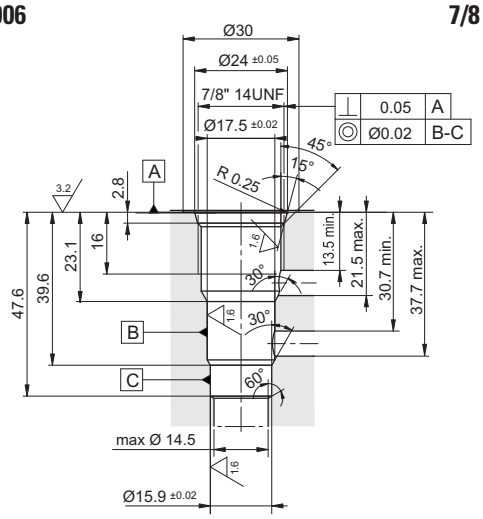
CD018016 — 3/4 16UNF



Plugs compatibility:

20018000	20001700	20001900	20003800	20009400

CD019006 — 7/8 14UNF



Plugs compatibility:

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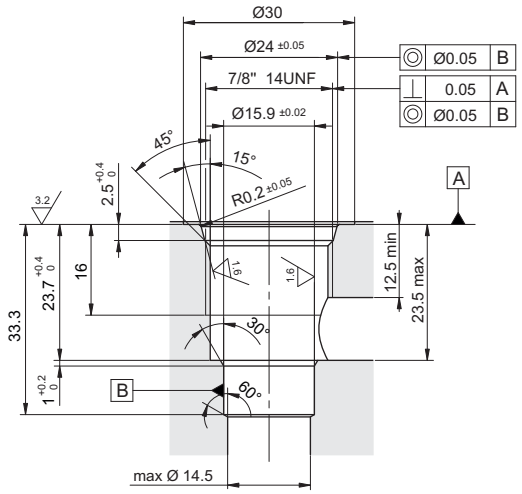
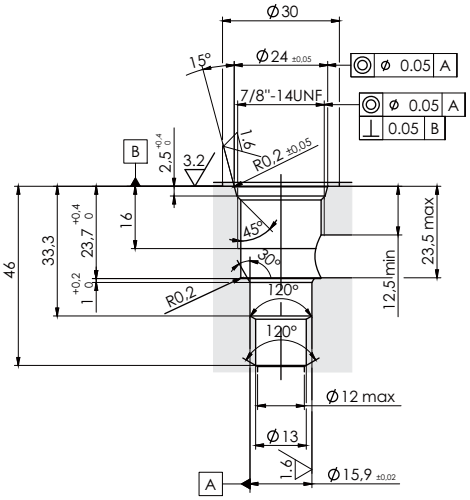


Plugs compatibility:

R78100033				

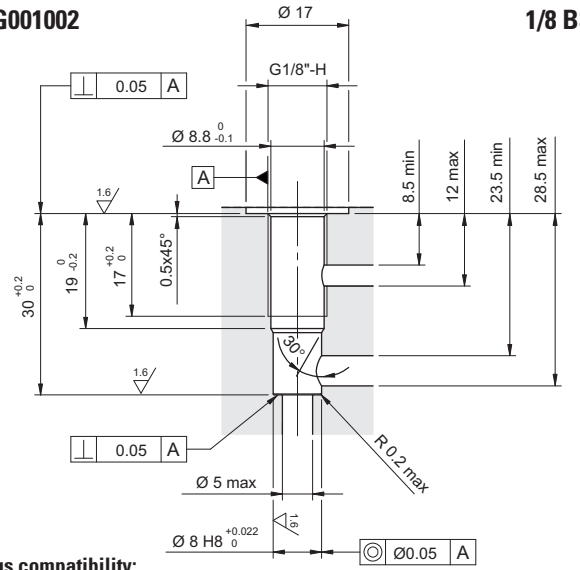
CD019011 — 7/8 14UNF



Plugs compatibility:

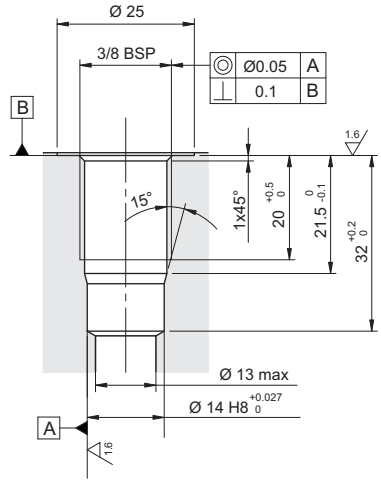
R78100033				

CG001002 — 1/8 BSP



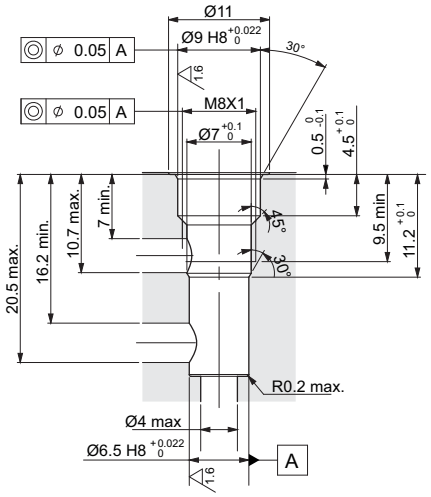
Plugs compatibility:

CG003004 — 3/8 BSP



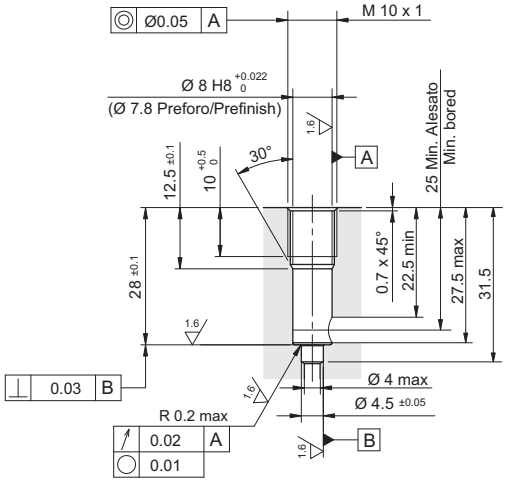
Plugs compatibility:

CA007001 — M8X1



Plugs compatibility:

CN019002 — M10X1



Plugs compatibility:

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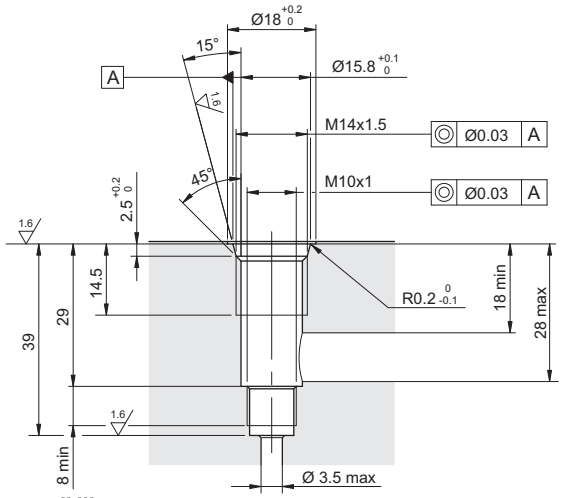
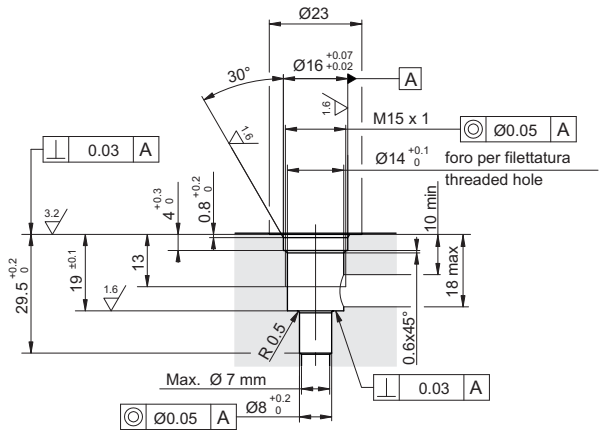
CN032005 — M14X1.5



Plugs compatibility:

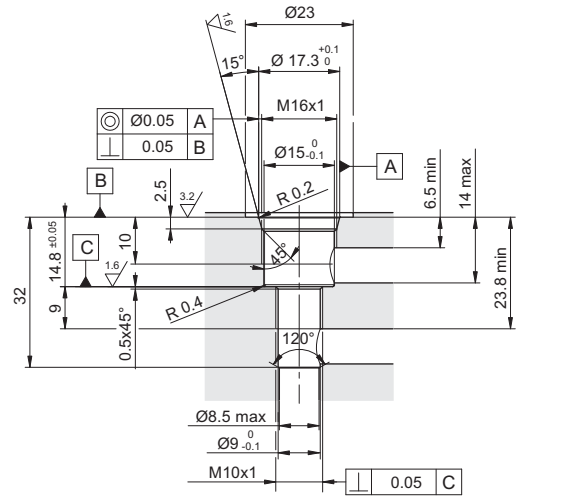
CN033001 — M15X1



Plugs compatibility:

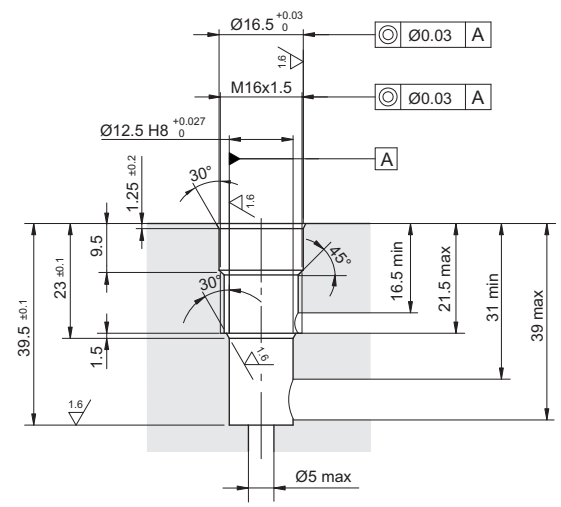
20019700	20021300			

CN036001 — M16X1



Plugs compatibility:

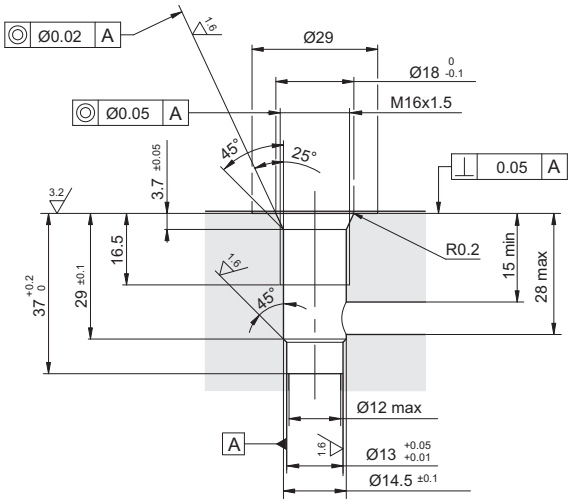
CN037003 — M16X1.5



Plugs compatibility:

R78260072				

CN037004 — M16X1.5



Plugs compatibility:

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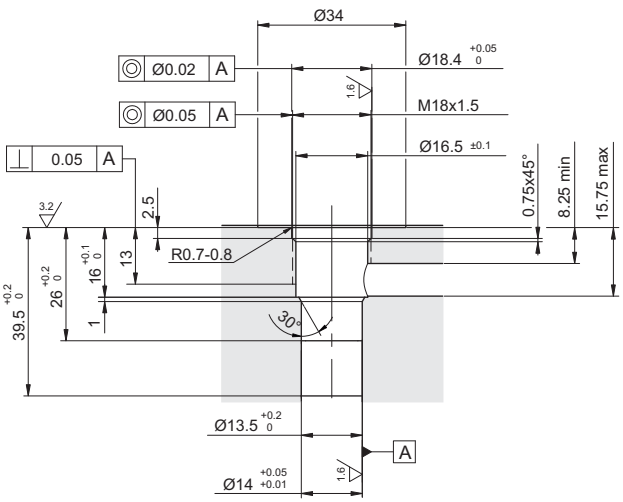
CN041009 — M18X1.5



Plugs compatibility:

20001600				

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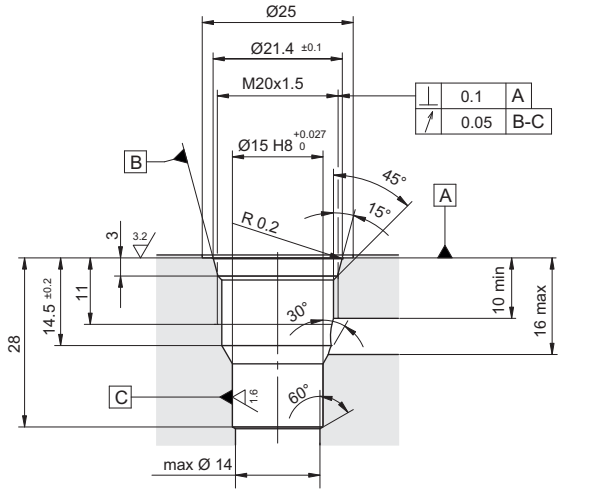
CN044001 — M20X1.5



Plugs compatibility:

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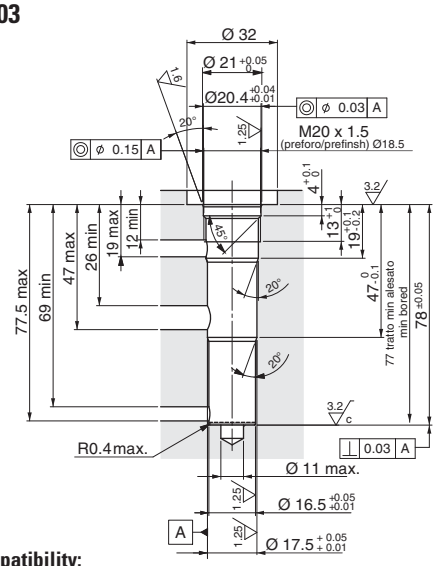
CN044003 — M20X1.5



Plugs compatibility:

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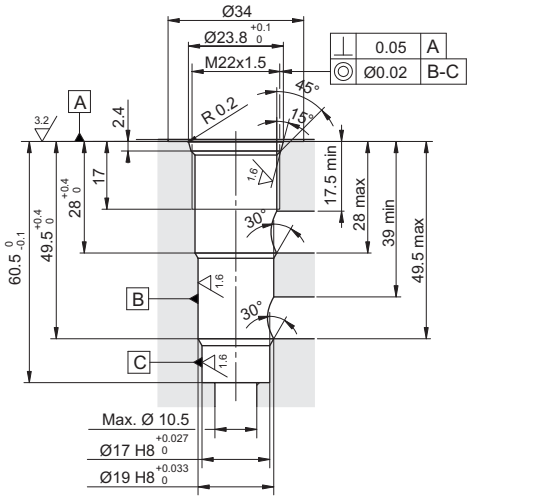
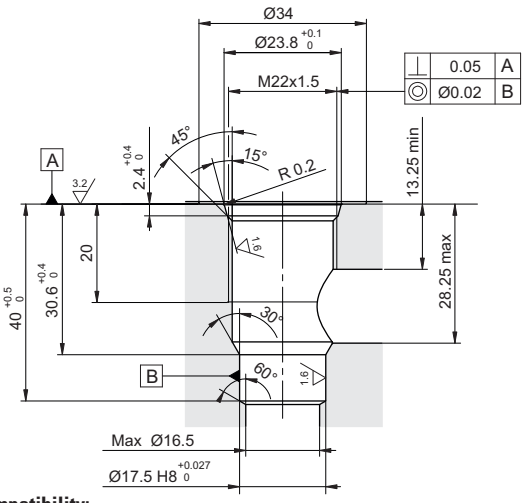


Plugs compatibility:

R78050014				

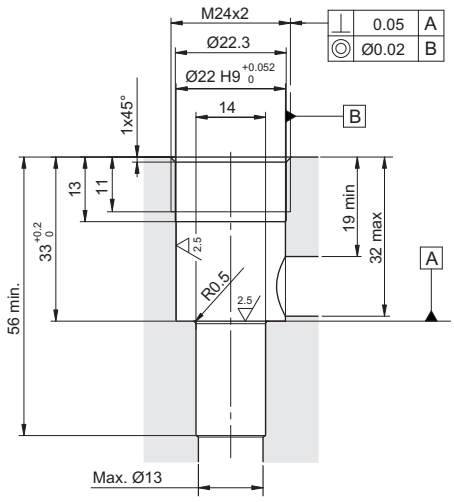
CN047003 — M22X1.5



Plugs compatibility:

R78400A17				

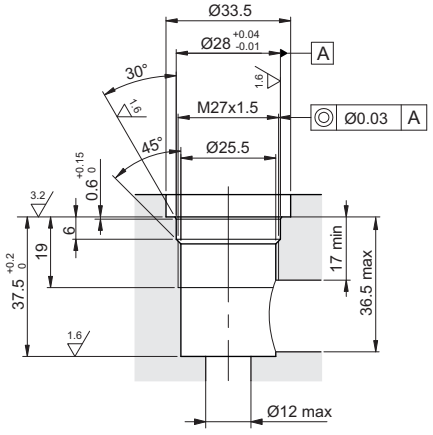
CN051001 — M24X2



Plugs compatibility:

R78300564				

CN059001 — M27X1.5



Plugs compatibility:

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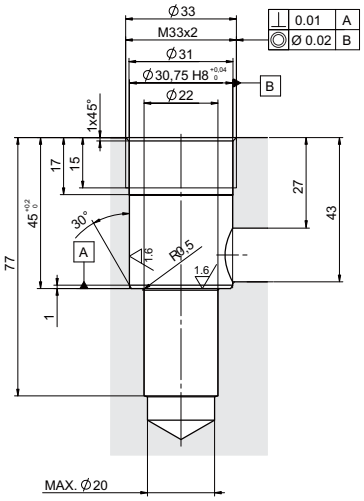


Plugs compatibility:

R78400568				

Plugs compatibility:

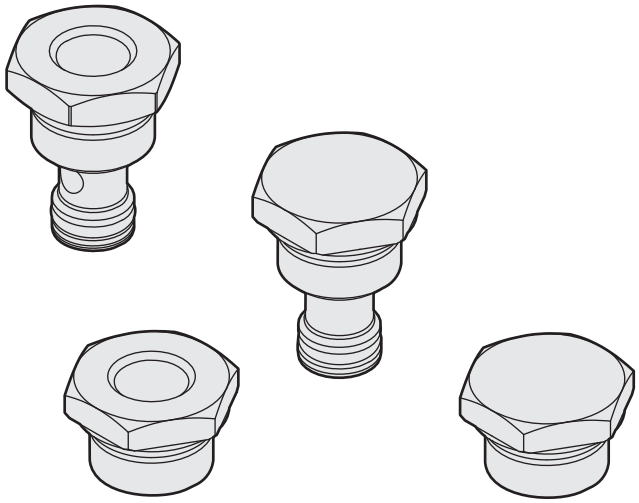
Plugs compatibility:

Plugs compatibility:

Plugs compatibility:

Plugs compatibility:

STANDARD PLUGS



20001600
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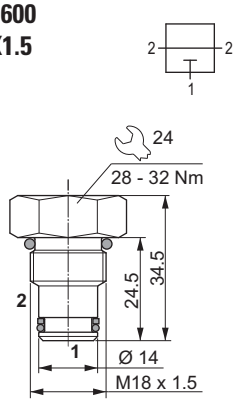
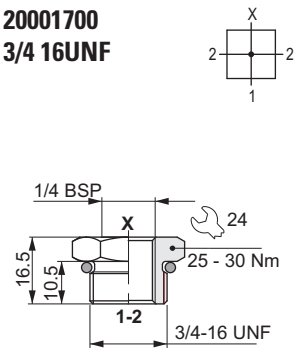


20001700
3/4 16UNF



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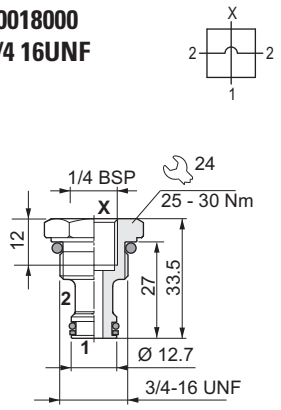
3/4 16UNF



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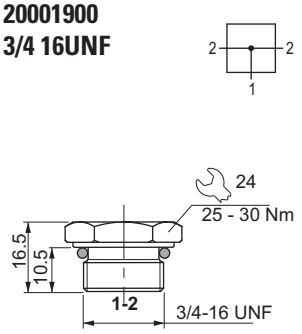
3/4 16UNF



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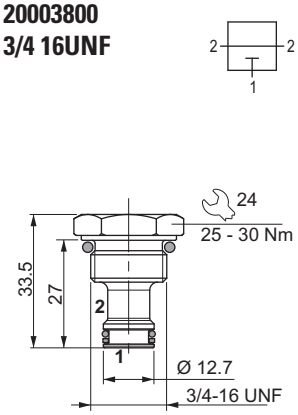
3/4 16UNF



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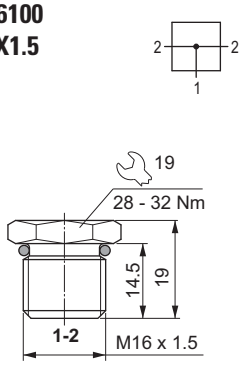

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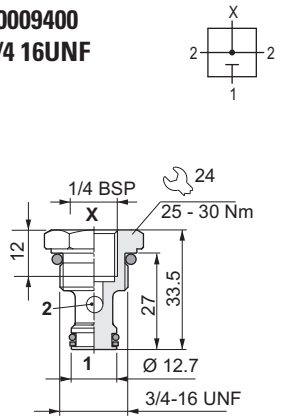
3/4 16UNF



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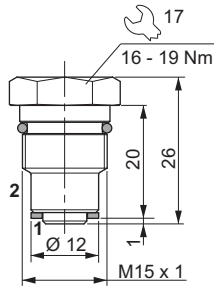

20021300
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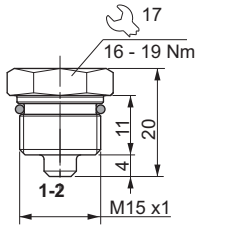

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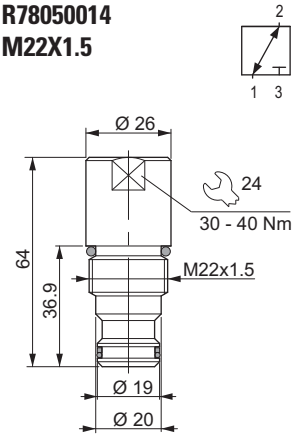
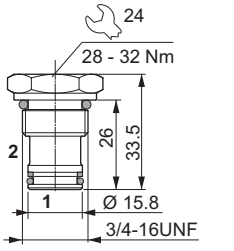
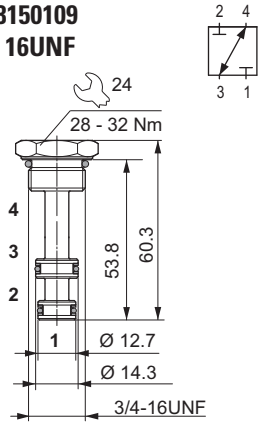


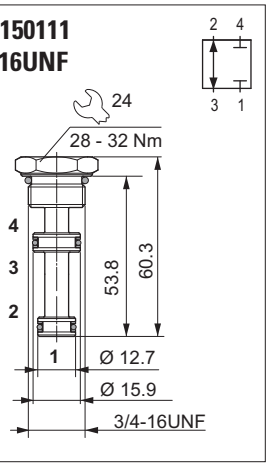
R78150100
3/4 16UNF



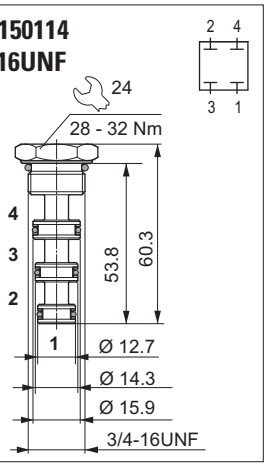
R78150109
3/4 16UNF



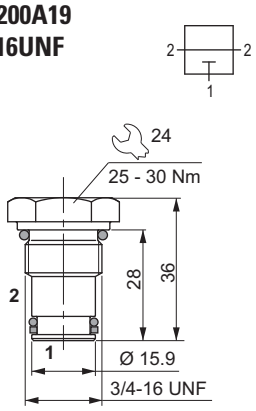
R78150111
3/4 16UNF



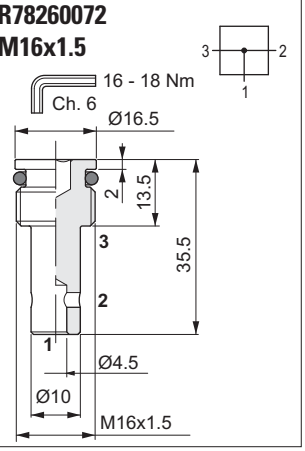
R78150114
3/4 16UNF



R78200A19
3/4 16UNF



R78260072
M16x1.5



16

Standard plugs

R78300562
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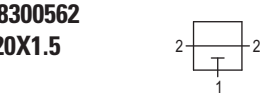
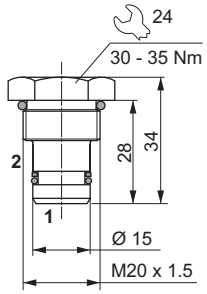
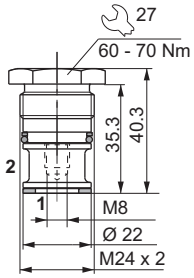
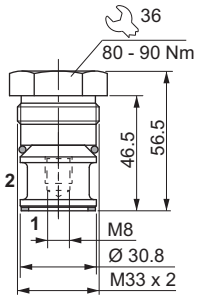




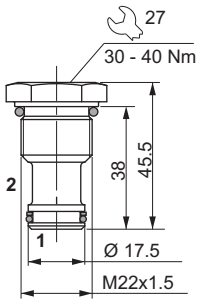
R78300564
M24X2



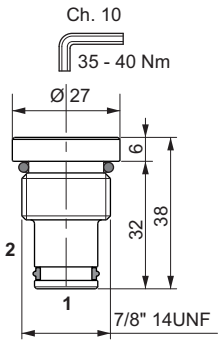
R78400568
M33X2



R78400A17
M22X1.5

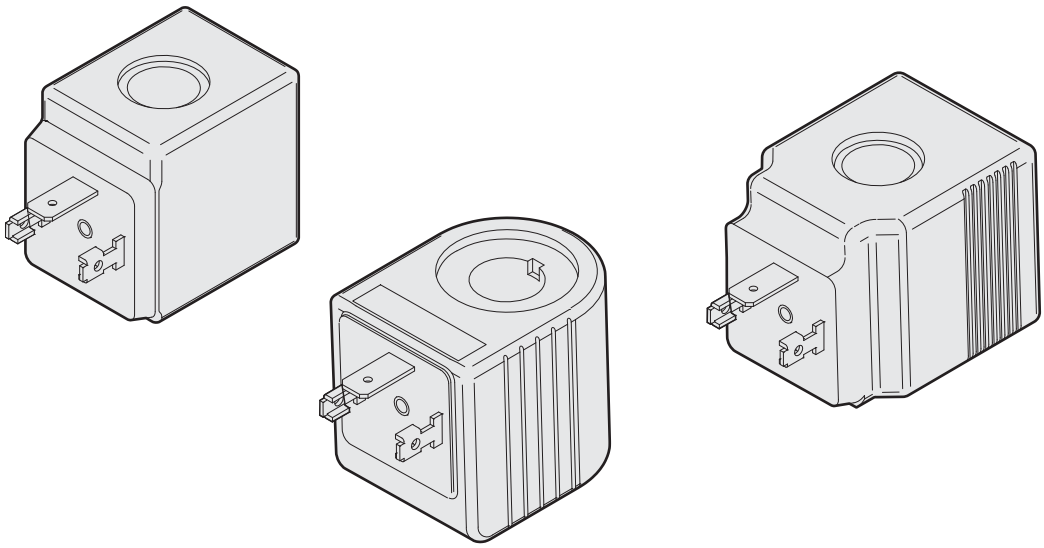


R78100033
7/8" 14UNF



16

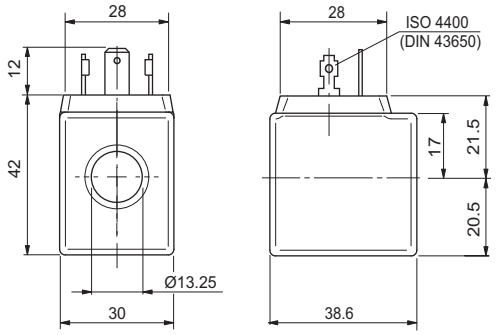
COILS



C30 - COILS 18W

Type of protection	IP 65
Number of cycle	18000/h
Supply tolerance	±10%
Ambient temperature	-30°C ÷ 60°C

Duty cycle	100% ED
Insulation class wire	H
Weight	0.141 kg

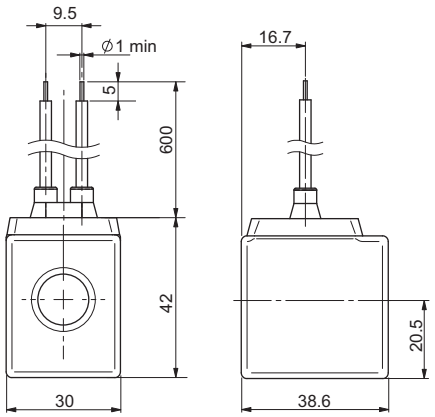


Standard (Hirschmann ISO 4400 DIN43650)

Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	110 °C	18 W	7.7 Ω	M14000001
M	24 VDC	110 °C	18 W	31 Ω	M14000002
N	48 VDC	110 °C	18 W	116 Ω	M14000003
2	21.6 VDC	110 °C	18 W	27 Ω	M14000009
Z	102 VDC (3)	110 °C	18 W	578 Ω	M14000006
X	205 VDC (3)	110 °C	18 W	2627 Ω	M14000007
A	24 VAC/50 Hz	100 °C	35 VA	5.3 Ω	M14001002
J	115 VAC/50 Hz (3)	100 °C	35 VA	108 Ω	M14001004
I	230 VAC/50 Hz (3)	100 °C	35 VA	438 Ω	M14001005
F	24 VAC/60 Hz	100 °C	35 VA	3.8 Ω	M14001012
C	110 VAC/60 Hz (3)	100 °C	35 VA	92 Ω	M14001014
D	220 VAC/60 Hz (3)	100 °C	35 VA	375 Ω	M14001015

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

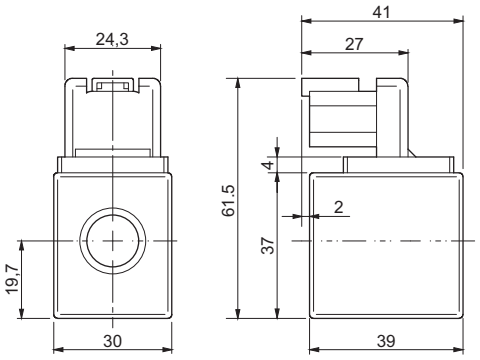
(*3*) The european low voltage directive is applied to electronical equipments used at a nominal voltages between 50 and 1000 VAC or 75 and 1500 VDC. In conformity with the low directive each part of the manifold or the subplate on which the valve is mounted should be connected to a protective earth with a resistence less than 0.1 ohms.



With wires (variant FK)

Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	110 °C	18 W	7.7 Ω	M14000101
M	24 VDC	110 °C	18 W	31 Ω	M14000102

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C



DEUTSCH and bidirectional integrated diode (variant CX)

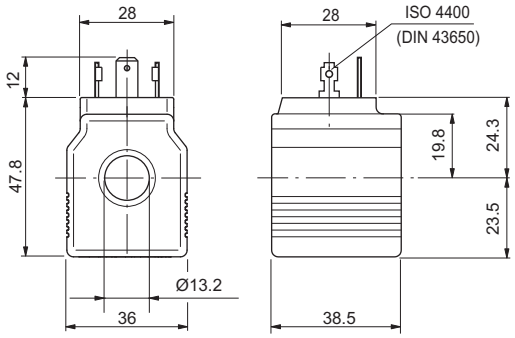
Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	110 °C	18 W	7.7 Ω	M14760001
M	24 VDC	110 °C	18 W	31 Ω	M14760002

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

C36 - COILS 22W

Type of protection	IP 65
Number of cycle	18000/h
Supply tolerance	±10%
Ambient temperature	-30°C ÷ 60°C

Duty cycle	100% ED
Insulation class wire	H
Weight	0.2 kg

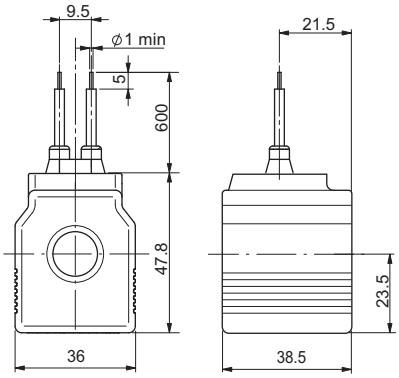


Standard (Hirschmann ISO 4400 DIN43650)

Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	115 °C	22 W	6.3 Ω	M14040001
4	14 VDC	115 °C	22 W	8.9 Ω	M14040009
M	24 VDC	115 °C	22 W	25.6 Ω	M14040002
V	28 VDC	115 °C	22 W	32.8 Ω	M14040008
N	48 VDC	115 °C	22 W	102 Ω	M14040003
2	21.6 VDC	115 °C	22 W	20.2 Ω	M14040000
Z	102 VDC (3)	115 °C	22 W	467.85 Ω	M14040006
X	205 VDC (3)	115 °C	22 W	1954 Ω	M14040007

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

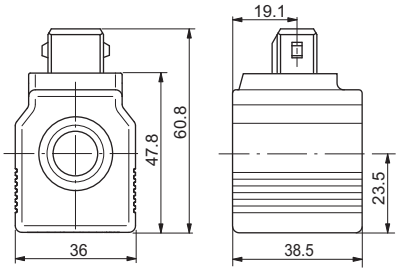
(*3*) The european low voltage directive is applied to electronical equipments used at a nominal voltages between 50 and 1000 VAC or 75 and 1500 VDC. In conformity with the low directive each part of the manifold or the subplate on which the valve is mounted should be connected to a protective earth with a resistence less than 0.1 ohms.



With wires (variant FK)

Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	115 °C	22 W	6.3 Ω	M14040101
4	14 VDC	115 °C	22 W	8.9 Ω	M14040109
M	24 VDC	115 °C	22 W	25.6 Ω	M14040102
V	28 VDC	115 °C	22 W	32.8 Ω	M14040108

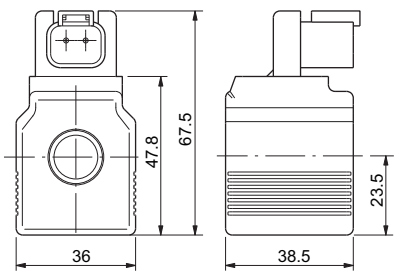
(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C



AMP Junior (variant AJ)

Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	115 °C	22 W	6.3 Ω	M14730001
M	24 VDC	115 °C	22 W	25.6 Ω	M14730002

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C



Deutsch + bidirectional diode - DT04-2P (connection D / variant CX)

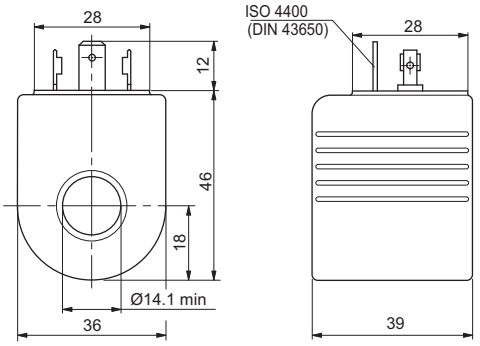
Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	115 °C	22 W	6.3 Ω	M14040201
4	14 VDC	115 °C	22 W	8.9 Ω	M14040209
M	24 VDC	115 °C	22 W	25.6 Ω	M14040202
V	28 VDC	115 °C	22 W	32.8 Ω	M14040208

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

A09 - COILS 27W

Type of protection	IP 65
Number of cycle	18000/h
Supply tolerance	±10%
Ambient temperature	-30°C ÷ 50°C

Duty cycle	100% ED
Insulation class wire	H
Weight	0.215 kg

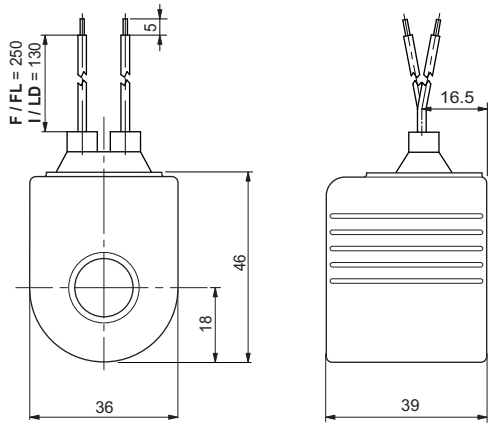


Hirschmann ISO 4400 DIN43650 (connection H)

Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	123 °C	27 W	5.3 Ω	M14310001
M	24 VDC	123 °C	27 W	21.3 Ω	M14310002
N	48 VDC	123 °C	27 W	85.3 Ω	M14310003
Z	102 VDC (3)	123 °C	27 W	392 Ω	M14310008
P	110 VDC (3)	123 °C	27 W	448 Ω	M14310005
X	205 VDC (3)	123 °C	27 W	1577 Ω	M14310009

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

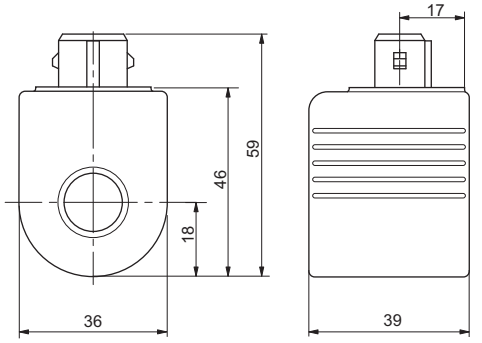
(*3*) The european low voltage directive is applied to electronical equipments used at a nominal voltages between 50 and 1000 VAC or 75 and 1500 VDC. In conformity with the low directive each part of the manifold or the subplate on which the valve is mounted should be connected to a protective earth with a resistence less than 0.1 ohms.



With wires and integrated bidirectional diode (connection F-I / variants FL-LD)

Bobina		Wires (mm)	Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Codice	Tensione					
L	12 VDC	F = 250	123 °C	27 W	5.3 Ω	M14070011
M	24 VDC	F = 250	123 °C	27 W	21.3 Ω	M14070012
L	12 VDC	I = 130	123 °C	27 W	5.3 Ω	M14330001
M	24 VDC	I = 130	123 °C	27 W	21.3 Ω	M14330002

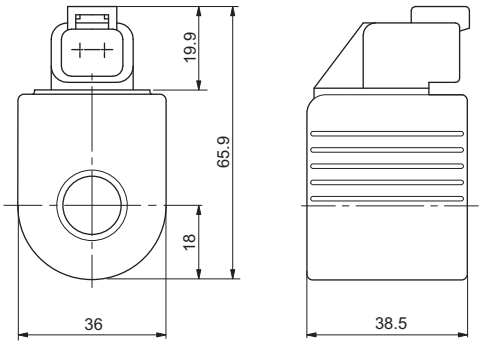
(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C



AMP Junior (connection A / variant AJ)

Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	123 °C	27 W	5.3 Ω	M14320001
M	24 VDC	123 °C	27 W	21.3 Ω	M14320002

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C



Deutsch + bidirectional diode - DT04-2P (connection D / variant CX)

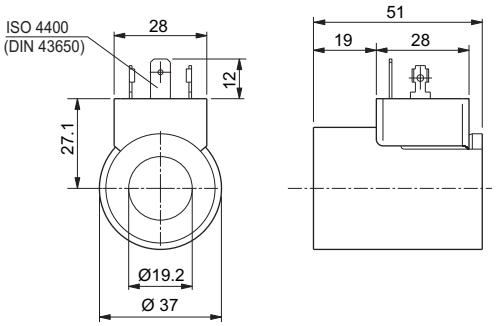
Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	123 °C	27 W	5.3 Ω	M14340001
M	24 VDC	123 °C	27 W	21.3 Ω	M14340002

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

A12 - COILS 23W

Type of protection	IP 65
Number of cycle	18000/h
Supply tolerance	±10%
Ambient temperature	-30°C ÷ 60°C

Duty cycle	100% ED
Insulation class wire	H
Weight	0.22 kg



Standard (Hirschmann ISO 4400 DIN43650)

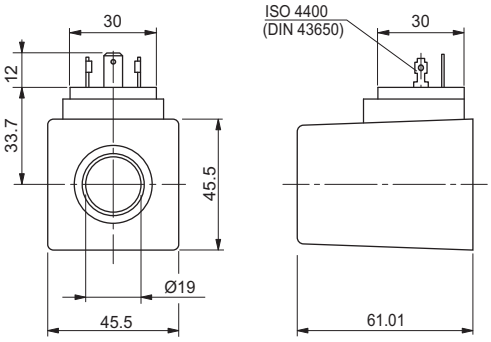
Coil		Max winding temperature (1)	Rated power	Resistance ±5% (2)	Spare code
Code	**Voltage**				
F	12 VDC	115 °C	23 W	5.3 Ω	M14850001
G	24 VDC	115 °C	23 W	25.3 Ω	M14850002

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

D12 - COILS 30W

Type of protection	IP 65
Number of cycle	18000/h
Supply tolerance	±10%
Ambient temperature	-30°C ÷ 60°C

Duty cycle	100% ED
Insulation class wire	H
Weight	0.2 kg

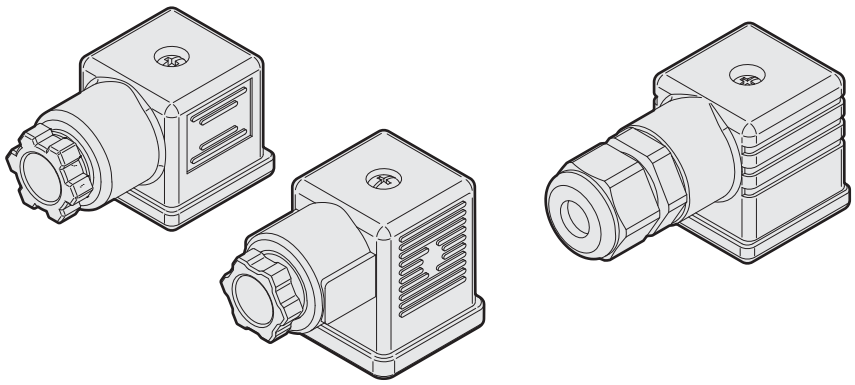


Standard (Hirschmann ISO 4400 DIN43650)

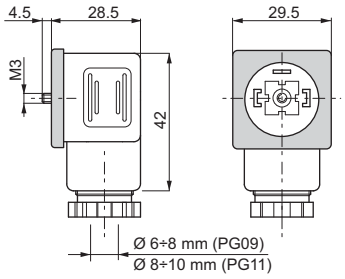
Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	**Voltage**				
L	12 VDC	108 °C	30 W	4.7 Ω	M14100010
M	24 VDC	108 °C	30 W	18.8 Ω	M14100011

(*1*) Ambient temperature 25 °C - (*2*) Ambient temperature 20 °C

CONNECTORS

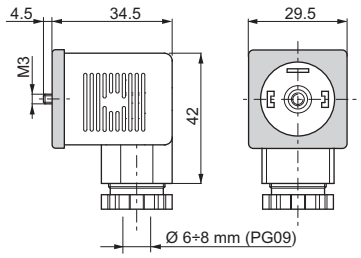


CONNECTORS FOR CONTROL VALVES IN ACCORDANCE WITH DIN 43650 / ISO 4400



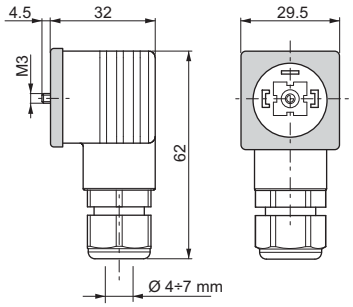
Connector	Protection level	Type	Cable gland	Code
Standard	IP65	Black color	PG09	V86 05 0002
		Grey color	PG09	V86 05 0004
		Black color	PG11	V86 05 0006
		Grey color	PG11	V86 05 0008
Lens cover with pilot light *(1)*	IP65	12 VAC/VDC	PG09	V86 10 0018
		24 VAC/VDC	PG09	V86 10 0012
		115 VAC/VDC	PG09	V86 10 0020
		230 VAC/VDC	PG09	V86 10 0022

(1) do not use for proportional versions

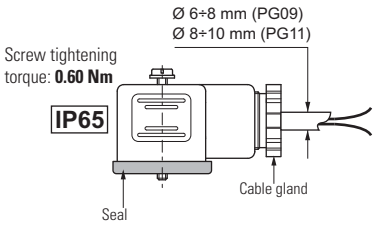


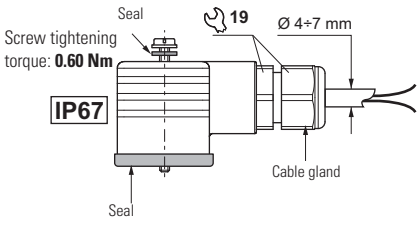
Connector	Protection level	Type	Cable gland	Code
With rectifier *(1)* *Inlet voltage 12÷230 VAC* *Outlet voltage 9÷205 VDC*	IP65	Black color	PG09	V86 20 0002
		Grey color	PG09	V86 20 0004
Lens cover with pilot light and rectifier *(1)* *Inlet voltage 12÷230 VAC* *Outlet voltage 9÷205 VDC*	IP65	12 VAC	PG09	V86 25 0018
		24 VAC	PG09	V86 25 0019
		48 VAC	PG09	V86 25 0020
		115 VAC	PG09	V86 25 0021
		230 VAC	PG09	V86 25 0022

(1) do not use for proportional versions



Connector	Protection level	Type	Cable gland	Code
With protection level IP67	IP67	Black color	—	V86 28 0001
		Grey color	—	V86 28 0002



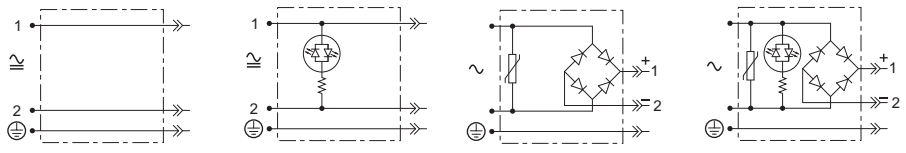


Electrical features of connectors

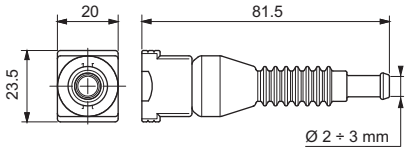
Description	IP65	IP67
AC rated voltage DC rated voltage	Max. 250 V Max. 300 V	Max. 250 V Max. 300 V
Pin conctat nominal current Pin conctat max. current	10A 16A	10A 16A
Max. section cable	1.5 mm²	1.5 mm²
Cable gland PG09 - M16x1,5 Cable gland PG11 - G 1/2" - M20x1,5	Ø cable 6 ÷ 8 mm Ø cable 8 ÷ 10 mm	Ø cable 4 ÷ 7 mm —
Protection level Insulation class Operating temperature	IP65 EN60529 VDE 0110-1/89 -40°C ÷ 90 C°	IP67 EN60529 VDE 0110-1/89 -20°C ÷ 80 C°

The degrees of protection indicate is guaranteed only if the connectors were properly mounted with his original seals.

Electrical circuits



AMP JUNIOR CONNECTORS



Connector	Type	Cable section	Pin conctat max current	Code
AMP Junior connector Timer 2 conctat	Black color	0,5 ÷ 1,5 mm²	10A	RKRC0808000

Note

Note

brevini

Code DOC00044 - Rev. 09

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