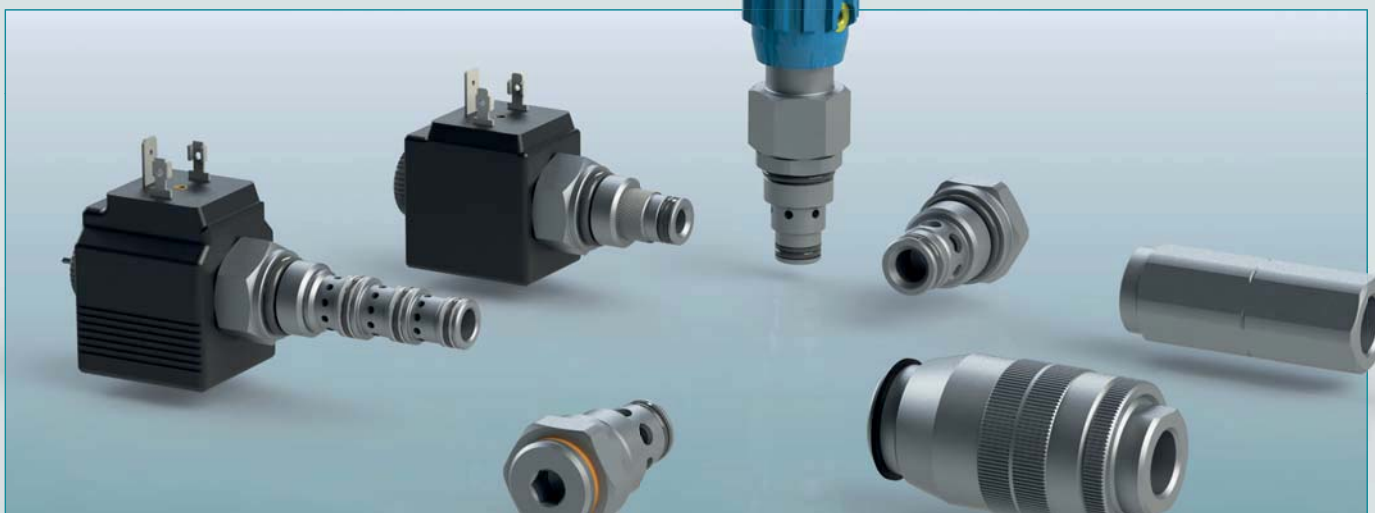


CARTRIDGE VALVES / IN-LINE VALVES

Technical Catalogue

June
2017





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.

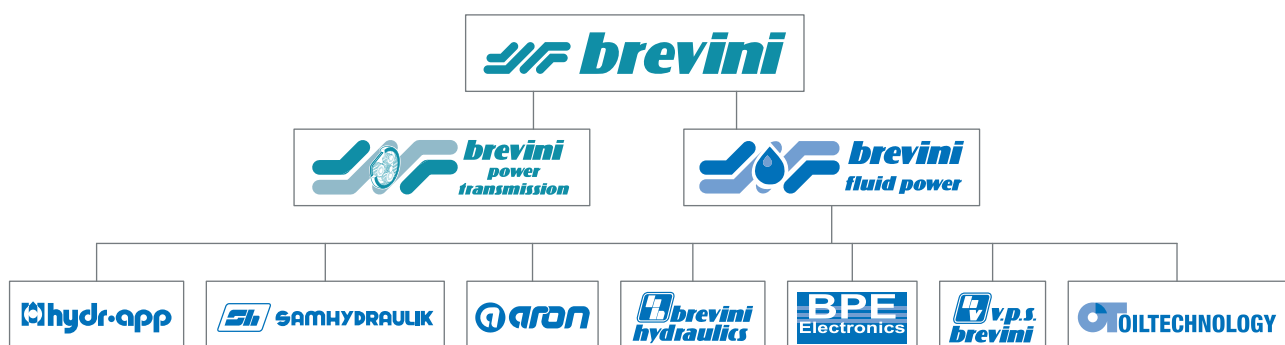
Aron Product Line: Directional, flow, on-off and proportional pressure control valves. Modular and cartridge valves, subplates and blocks.

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 *i*

Index and technical information	<i>i</i>
Pressure relief valves.....	1
Sequence, pressure reducing and unloading valves	2
Double cross relief valves.....	3
One-way check valves.....	4
Overcenter valves.....	5
Pilot check valves.....	6
Manual and pneumatic operated valves	7
End-off stroke valves.....	8
Solenoid valves 2-way	9
Solenoid valves 3-4 way	10
Proportional solenoid valves.....	11
Diverter valves	12
Soft start valves.....	13
Flow control valves	14
Hand pumps	15
Valve housings	16
Cavities.....	17
Standard plugs	18
Coils.....	18
Connectors	20

© 2017 Dana Brevini Fluid Power S.p.A. all rights reserved. Hydr-App, SAM Hydraulik, Aron, Brevini Hydraulics, BPE Electronics, VPS Brevini, OT Oiltechnology, logos are trademarks or are registered trademarks of Dana Brevini Fluid Power S.p.A. or other companies Dana in Italy and other countries.

The technical features supplied in this catalogue are non binding and no legal action can be taken against such material. Dana Brevini Fluid Power will not be held responsible for information and specifications which may lead to error or incorrect interpretations. Given the continuous technical research aimed at improved technical features of our products, Dana Brevini Fluid Power reserves the right to make change that are considered appropriate without any prior notice. This catalogue cannot be reproduced (in whole or in part) without the prior written consent of Dana Brevini Fluid Power. This catalogue supersedes all previous ones.

Use of the products in this catalogue must comply with the operating limits given in the technical specifications. The type of application and operating conditions must be assessed as normal or in malfunction in order to avoid endangering the safety of people and/or items.

General terms and conditions of sale: see website www.brevinifluidpower.com.

The products shown on this catalog are parts of  line.

1 PRESSURE RELIEF VALVES (PAGE 13)

Code	Thread	Flow (l/min)	Symbol	Description	Page
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

1 PRESSURE RELIEF VALVES (PAGE 13)

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

2 SEQUENCE, PRESSURE REDUCING AND UNLOADING VALVES (PAGE 37)

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 OVERCENTER VALVES (PAGE 63)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CCB04	3/4-16UNF	20		DIRECT ACTING OVERCENTER VALVES	64

6 PILOT CHECK VALVES (PAGE 65)

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	66
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	67
VBPSA-VBPDA DIN	BSP: 1/4" - 3/8"	20 - 25		SINGLE AND DOUBLE ACTING PILOT CHECK VALVES-DIN 2353 PORTS	69

7 MANUAL AND PNEUMATIC OPERATED VALVES (PAGE 71)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CMF04	3/4-16UNF	15		LEVER OPERATED VALVES	72
CPE04	3/4-16UNF	30		BUTTON OPERATED VALVES	73
CRD04P	3/4-16UNF	30		PNEUMATIC OPERATED VALVES	74

8 END-OFF STROKE VALVES (PAGE 75)

Code	Thread	Flow (l/min)	Symbol	Description	Page
VFC	3/8" BSP	40		END-OFF STROKE VALVES IN-LINE MOUNTING	76
VD40	1/2" BSP	40		DECELERATION VALVES IN-LINE MOUNTING	77

9 SOLENOID VALVES 2-WAY (PAGE 79)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CRB04	3/4-16UNF	40		PILOTED OPERATED CARTRIDGE SOLENOID VALVE BIDIRECTIONAL	80
CRP04	3/4-16UNF	40		PILOTED OPERATED CARTRIDGE SOLENOID VALVE UNIDIRECTIONAL	80
CRP04HP	3/4-16UNF	30		HIGH PRESSURE PILOTED OPERATED CARTRIDGE SOLENOID VALVE	82
CRP04X	3/4-16UNF	20		VALVES IN ACCORDANCE WITH ATEX 94/9/CE DIRECTIVE	84
CRD04	3/4-16UNF	15 - 30		DIRECT OPERATED CARTRIDGE SOLENOID VALVE	86
C2V04	3/4-16UNF	15		CARTRIDGE SOLENOID VALVES 2 WAY 2 POSITIONS	88

10 SOLENOID VALVES 3-4 WAY (PAGE 89)

Code	Thread	Flow (l/min)	Symbol	Description	Page
C3V0422	3/4-16UNF	12		SOLENOID VALVES 3-WAY/2-POSITION	90
C3V0427	3/4-16UNF	20		SOLENOID VALVES 3-WAY/2-POSITION	91
C3V03	7/8-14UNF	20		SOLENOID VALVES 3 WAY 2 POSITIONS	92
C4V0422*2	3/4-16UNF	18		SOLENOID VALVES 4 WAY 2 POSITIONS	93
C4V0422*3	3/4-16UNF	18		SOLENOID VALVES 4 WAY 3 POSITIONS	94

11 PROPORTIONAL SOLENOID VALVES (PAGE 95)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CQT04-X	3/4" 16 UNF	11.5		COMPENSATED FLOW PROPORTIONAL VALVE NC POPPET TYPE	96

12 DIVERTER VALVES (PAGE 97)

Code	Thread	Flow (l/min)	Symbol	Description	Page
MR	1/4" BSP 1/4" BSPT	—		PRESSURE GAUGE SHUT-OFF IN-LINE MOUNTING	98
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	99
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	100
DDF	BSP: 1/4" - 3/8" 1/2" - 3/4" - 1"	60 - 90 120 - 200		DIVERTER VALVES IN-LINE MOUNTING	101

13 SOFT START VALVES (PAGE 103)

Code	Thread	Flow (l/min)	Symbol	Description	Page
VAM04	1/4" BSP	20		SINGLE-PHASE MOTOR START VALVE IN-LINE MOUNTING	104
VAMS04	1/4" BSP	8		SOFT START VALVE IN-LINE MOUNTING	105

14 FLOW CONTROL VALVES (PAGE 107)

Code	Thread	Flow (l/min)	Symbol	Description	Page
SU/SB	M10x1	15		UNIDIRECTIONAL AND BIDIRECTIONAL FLOW REGULATOR VALVES	108
VSU	1/4" BSP	20		FIXED UNIDIRECTIONAL FLOW CONTROL VALVE	109
CSB04	3/4-16UNF	40		BIDIRECTIONAL NOT COMPENSATED FLOW CONTROL VALVE	110
CSC04	3/4-16UNF	29		UNIDIRECTIONAL COMPENSATED FLOW CONTROL VALVE	111
VSC04	1/4" BSP	11,7		FIXED PRESSURE COMPENSATED FLOW CONTROL VALVE	112
VSC06	3/8" BSP	18,5		PRESSURE COMPENSATED FLOW CONTROL VALVES	113
CRF06	7/8-14UNF	50		PRIORITY FLOW CONTROL VALVE	114
CCI06	7/8-14UNF	80		PRESSURE COMPENSATOR VALVE	115
CCP20	M22x1.5	50		TWO-WAY PRESSURE COMPENSATOR VALVE	116
VSR/VSU	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	117
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	118
STC	3/8" BSP	29		PRESSURE COMPENSATED FLOW UNIDIRECTIONAL FLOW REGULATOR VALVES - IN-LINE MOUNTING	119

15 HAND PUMPS (PAGE 121)

Code	Thread	Flow (l/min)	Symbol	Description	Page
CPM04	3/4-16UNF	1cc - 2cc		HAND PUMP	122

VALVE	PAGE	VALVE	PAGE
BK3.....	100	CVR20.....	42
C2V04.....	88	CVS20.....	40
C3V03.....	92	DDF.....	101
C3V0422.....	90	MR.....	98
C3V0427.....	91	RBS.....	99
C4V0422*2.....	93	RVLV0.....	61
C4V0422*3.....	94	RVLV1.....	62
CCB04.....	64	SH01.....	58
CCI06.....	115	SH02.....	59
CCP20.....	116	SH03.....	60
CMF04.....	72	STC.....	119
CMP02.....	16	STU/STB.....	118
CMP04.....	17	SU/SB.....	108
CMP06.....	26	VADIL.....	46
CMP20.....	28	VAM04.....	104
CMP30.....	29	VAMS04.....	105
CMP-HPV.....	14	VBPSA-VBPDA.....	67
CMPHR04.....	23	VBPSA-VBPDA DIN.....	69
CMP-MC/MS.....	25	VD40.....	77
CMP-MR/MW.....	15	VFC.....	76
CMPR04 (serie 1).....	22	VMP02.....	30
CMPR04 (serie 2).....	18	VMP06.....	31
CP06.....	27	VMP10.....	32
CPE04.....	73	VMP12.....	35
CPM04.....	122	VMP20.....	33
CPMC04.....	24	VMP30.....	34
CPMK04.....	20	VR06.....	53
CQT04-X.....	96	VRS.....	66
CRB04 / CRP04.....	80	VRU.....	55
CRC1.....	44	VSC04.....	112
CRD04.....	86	VSC06.....	113
CRD04P.....	74	VSR/VSB.....	117
CRF06.....	114	VSU.....	109
CRI04.....	52	VUBA.....	56
CRP04HP.....	82	VUI.....	54
CRP04X.....	84		
CRU04.....	50		
CRU06.....	51		
CRU-MC/MS.....	49	Section index.....	1
CRU-MR.....	48	Technical information.....	10
CSB04.....	110	Valve housings.....	124
CSC04.....	111	Cavities.....	128
CSMK04.....	39	Standard plugs.....	136
CSQ04.....	38	Coils.....	140
CVE06.....	43	Connectors.....	146
CVR06.....	41		



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.

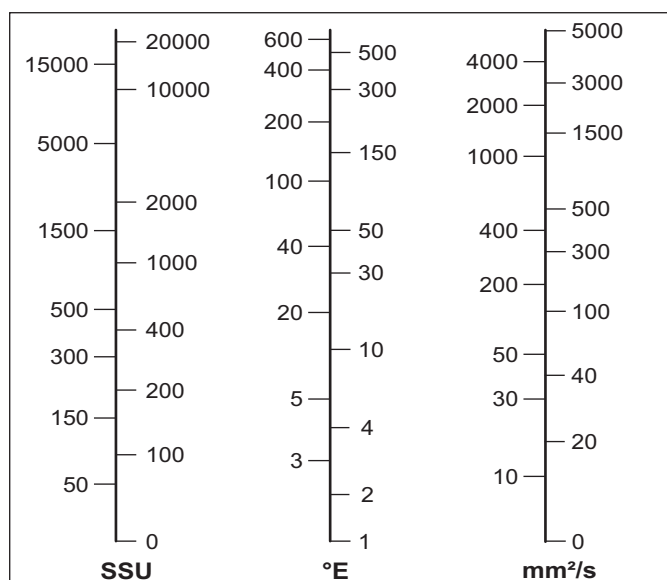
Recommended oil viscosity 46 mm²/s (32 mm²/s for Cartridge valves)

Table 1: ISO viscosity grades

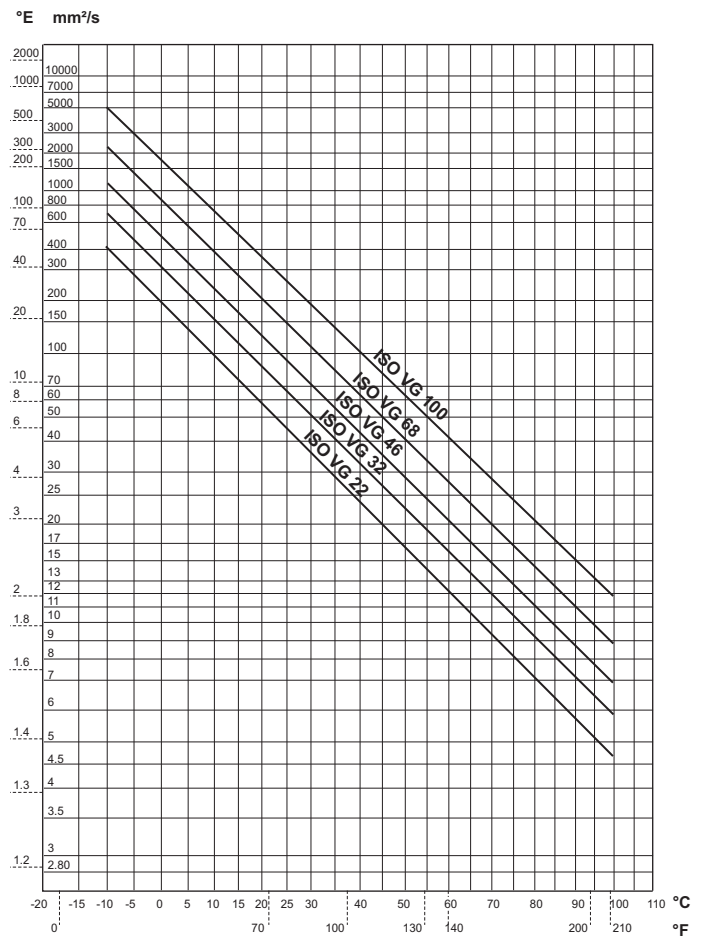
Viscosity grade	Average kinematic viscosity mm ² /s @ 40°C	Kinematic-viscosity limits mm ² /s @ 40°C	
		min.	max.
ISO VG 10	10	9.00	11.0
ISO VG 15	15	13.5	16.5
ISO VG 22	22	19.8	24.2
ISO VG 32	32	28.8	35.2
ISO VG 46	46	41.4	50.6
ISO VG 68	68	61.2	74.8
ISO VG 100	100	90.0	110

= 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 fluid.

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

Table 2: Recommended 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 spherical particle which 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 compo-

nents 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 $Ra \leq 1.6\mu\text{m}$ and flatness $\leq 0.03\text{ mm}$ over 100 mm length. Normally in cartridge valve for sealing diameters of the cavities, is required roughness $Ra \leq 1.6\mu\text{m}$. 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.

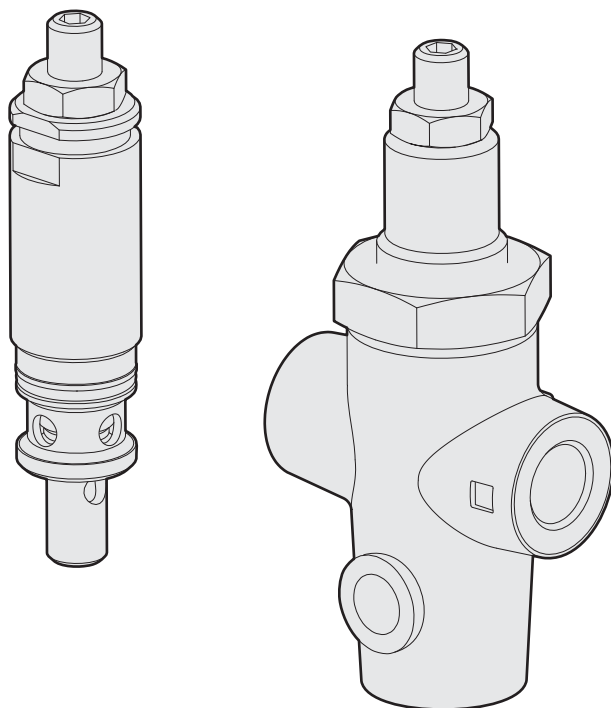
WARRANTY AND SUPPLY CONDITIONS

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

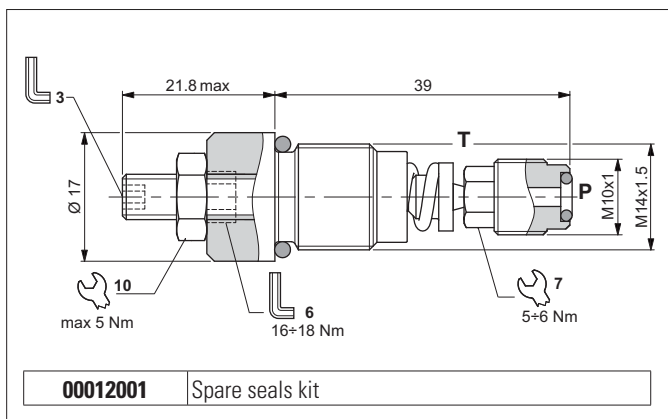
Type	SI units		Alternative units		Conversion factor
Force	Newton	(N) [kgm/s ²]	Kilogram force	(kgf)	1 kgf = 9.807 N
			pound force	(lbf) [lbf/s ²]	1 lbf = 4.448 N
Length	millimeter	(mm) [10 m]	inch	(in)	1 in = 25.4 mm
	meter	(km) [1000 m]	yard	(yd) [3ft]	1 m = 1.0936 yd
	kilometer	(km) [1000 m]	mile	(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/mm ²]	bar		1 MPa = 10 bar
			psi (lbf/in ²)		1 MPa = 145 psi
			ton/f/in ²		1 ton/f/in ² = 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)	Fahrenheit	(°F)	1°F = 1.8 °C+32

PRESSURE RELIEF VALVES



DIRECT ACTING PRESSURE RELIEF VALVES (FOR HPV VALVES)

1

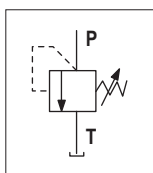


The direct acting relief valve limits the pressure in a hydraulic circuit to within the specified calibration range. It has a galvanised steel body. The tapered poppet is in tempered steel.

HYDRAULIC FEATURES

Max. working pressure	400 bar
Max. Flow	5 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 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	0.038 kg
Tightening torque	see draw
Cavity (M14x1.5)	CN032005 (See section 17)

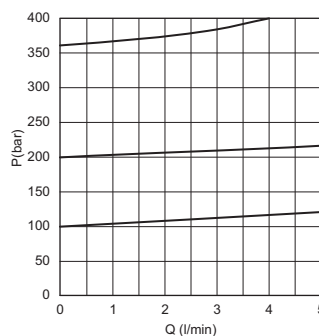
HYDRAULIC SYMBOL



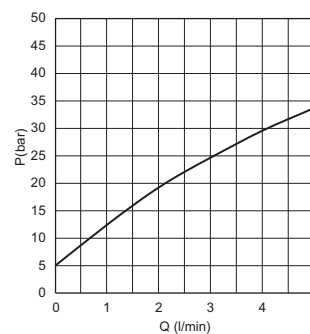
ORDERING CODE

Code	Description
RKVL1130002	Direct acting relief valve

PRESSURE-FLOW RATE

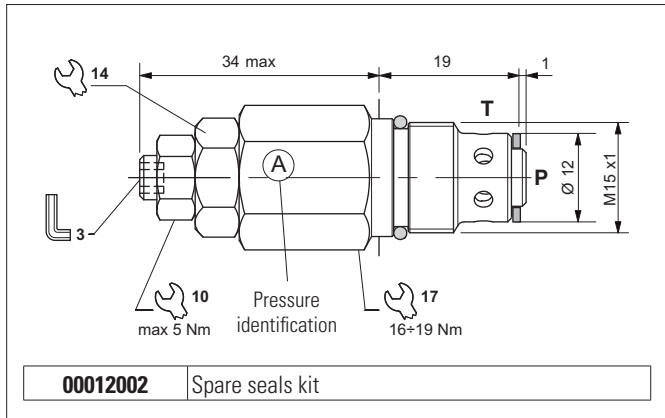


MIN.SETTING PRESSURE



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

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



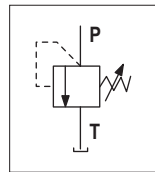
The direct acting relief valve limits the pressure in a hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop. It has a galvanised steel body. The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

1

HYDRAULIC FEATURES

Max. working pressure	220 bar
Setting range:	
Spring A	25 ÷ 80 bar
Spring B	75 ÷ 220 bar
Spring C	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)

HYDRAULIC SYMBOL

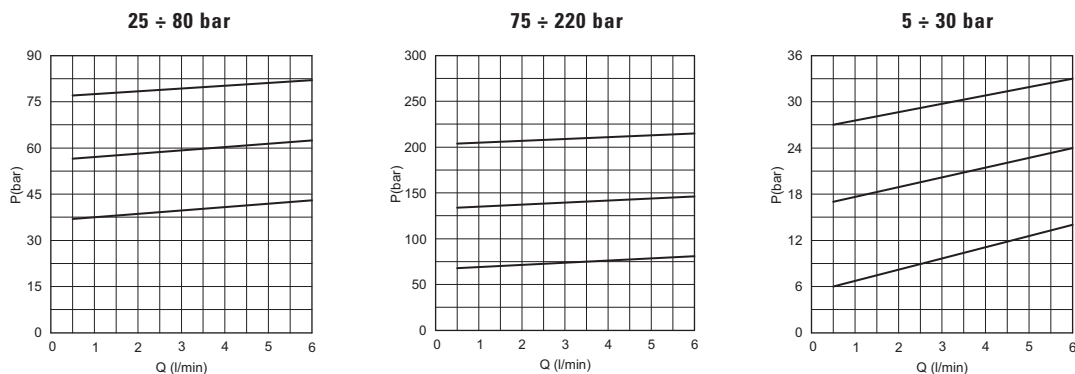


ORDERING CODE

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%

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

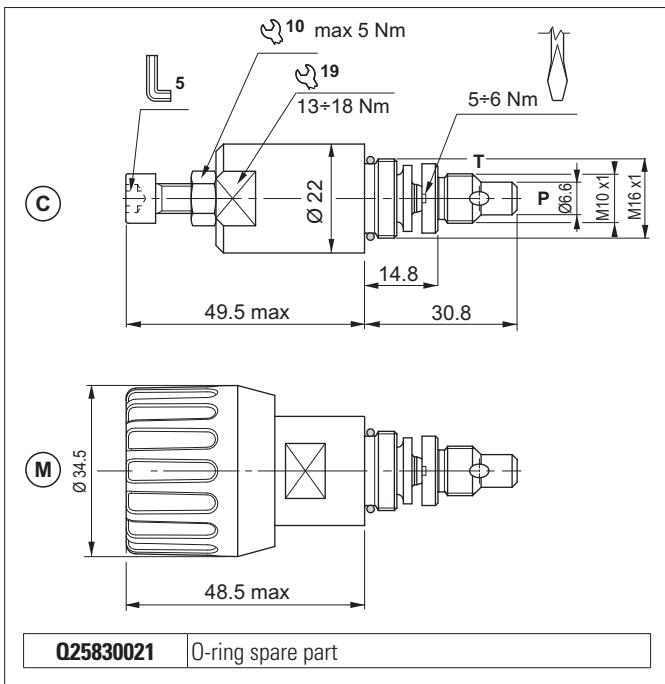
PRESSURE-FLOW RATE



Fluid used: mineral based oil with viscosity 32 mm²/s at 50°C.

DIRECT ACTING PRESSURE RELIEF VALVES

1

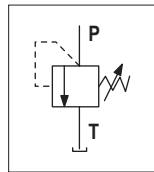


The direct acting relief valve limits the pressure in a hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop (only standard screw and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

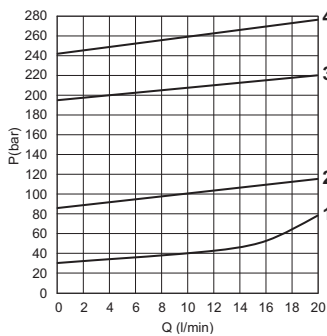
HYDRAULIC FEATURES

Max. working pressure	250 bar
Setting range:	
Spring 1 (white)	max 30 bar
Spring 2 (yellow)	max 90 bar
Spring 3 (green)	max 180 bar
Spring 4 (orange)	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)

HYDRAULIC SYMBOL

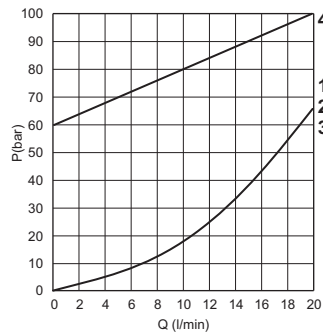


PRESSURE-FLOW RATE



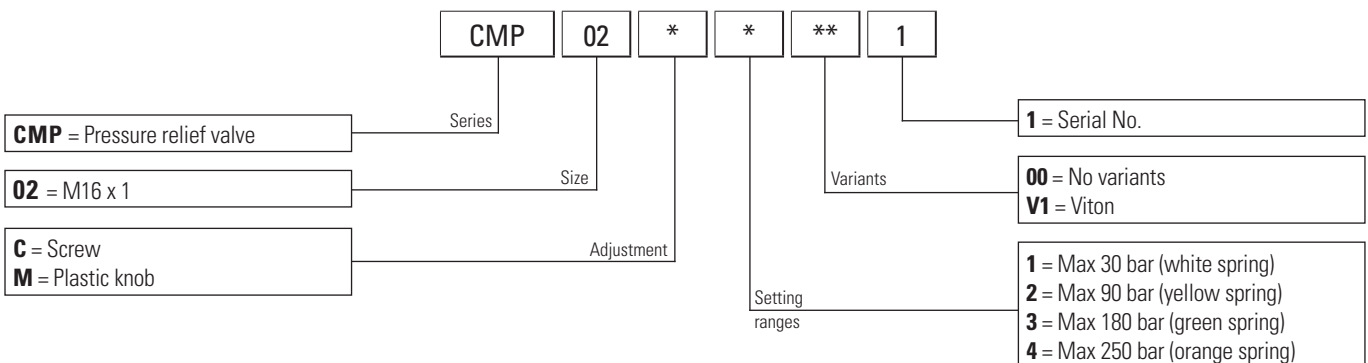
1 = CMP02C1.. - 2 = CMP02C2.. - 3 = CMP02C3.. - 4 = CMP02C4..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

MIN.SETTING PRESSURE



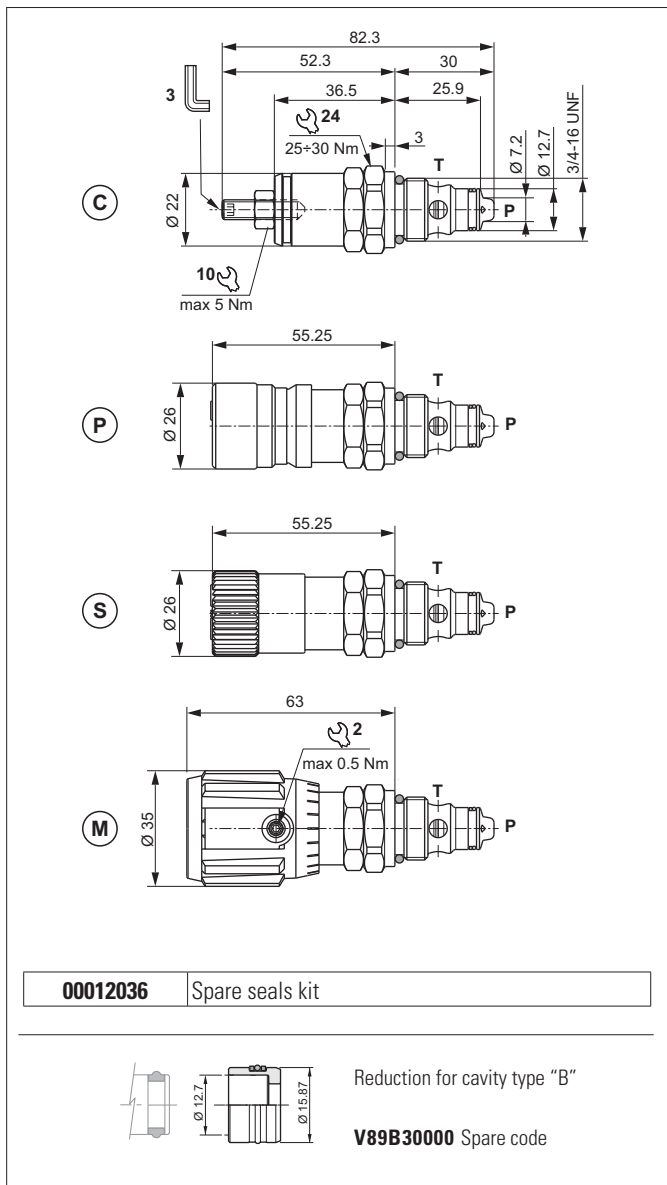
The minimum permissible setting pressure depending on the spring: see curves below

ORDERING CODE



DIRECT ACTING PRESSURE RELIEF VALVES

1



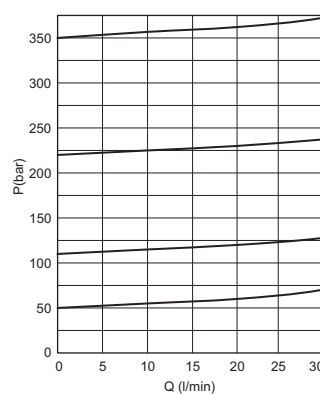
The direct acting relief valve limits the pressure in a hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop. It has a galvanised steel body. The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

HYDRAULIC FEATURES

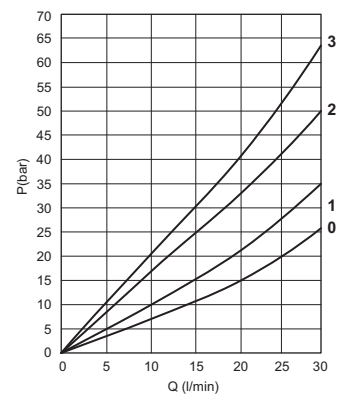
Max. working pressure	350 bar
Setting range:	
Spring 0 (white)	max 50 bar
Spring 1 (green)	max 110 bar
Spring 2 (yellow)	max 220 bar
Spring 3 (red)	max 350 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-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

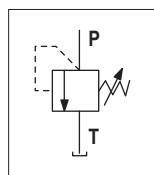


MIN. SETTING PRESSURE



0 = CMP04*0 - 1 = CMP04*1.. - 2 = CMP04*2.. - 3 = CMP04*3..
 Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

HYDRAULIC SYMBOL



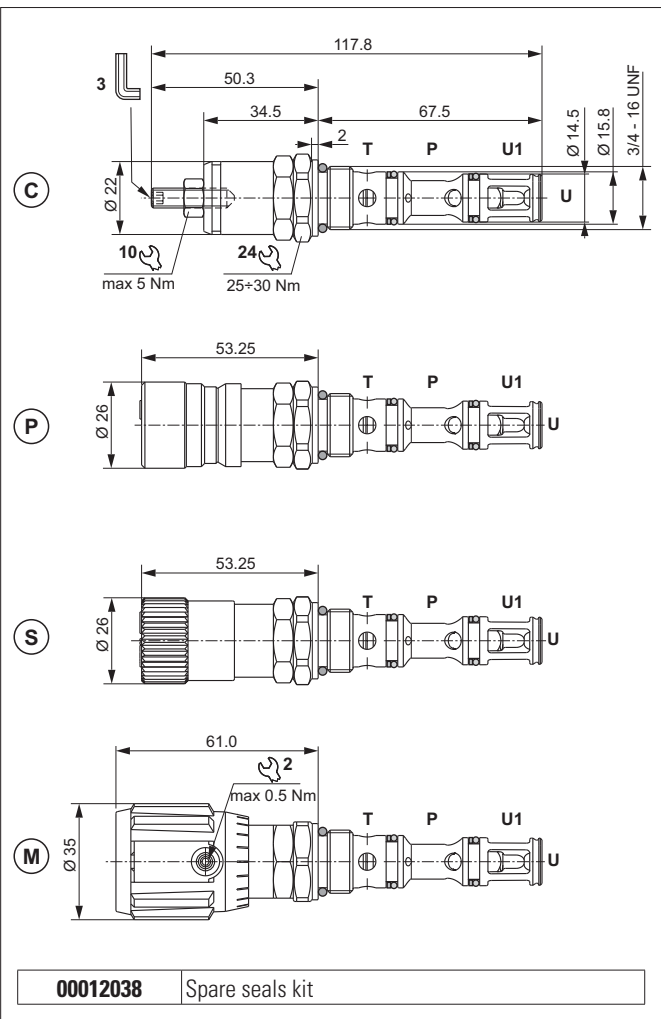
ORDERING CODE

Ordering code: **CMP 04 * * * 00 2**

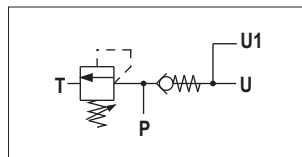
- CMP** = Pressure relief valve (Series)
- 04** = 3/4 - 16 UNF (Size)
- A** = Standard - Ø 12.7 mm (Tip side)
- B** = With reduction - Ø 15.9 mm (Tip side)
- C** = Screw (Adjustment)
- P** = C + Plug no detachable closing (unremovable version) (Adjustment)
- S** = C + Plug detachable closing (Adjustment)
- M** = Plastic knob (Adjustment)
- 00** = No variants (Variants)
- 2** = Serial No. (Variants)
- 0** = Max 50 bar (white spring) (Setting ranges)
- 1** = Max 110 bar (green spring) (Setting ranges)
- 2** = Max 220 bar (yellow spring) (Setting ranges)
- 3** = Max 350 bar (red spring) (Setting ranges)

DIRECT ACTING PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE

1



HYDRAULIC SYMBOL



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.

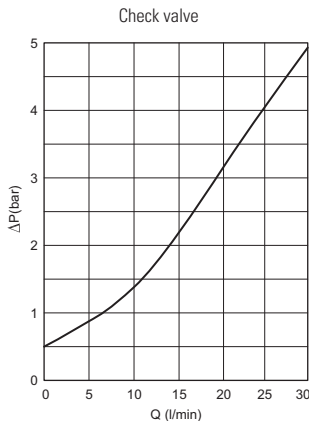
The spring in the check valve enables the cartridge to be mounted in any position.

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.

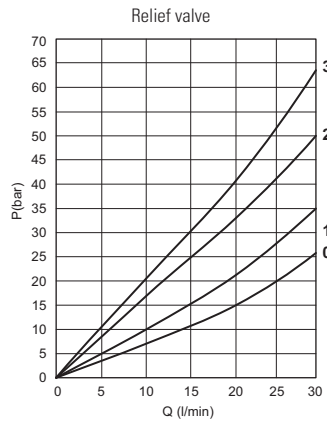
HYDRAULIC FEATURES

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)

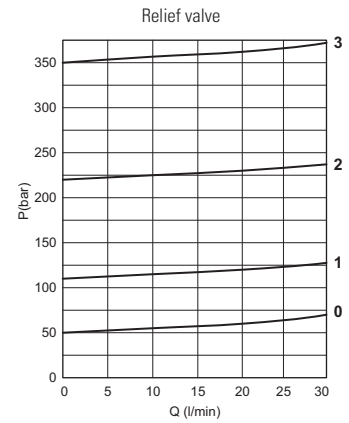
PRESSURE DROPS (P → U)



MIN. SETTING PRESSURE (P → T)

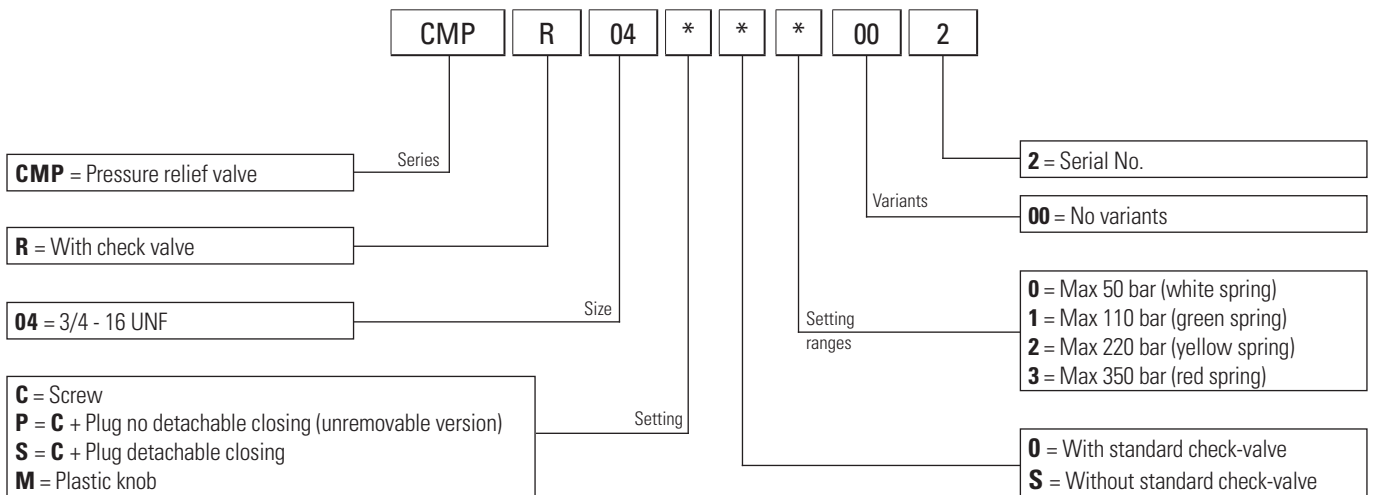


PRESSURE - FLOW (P → T)



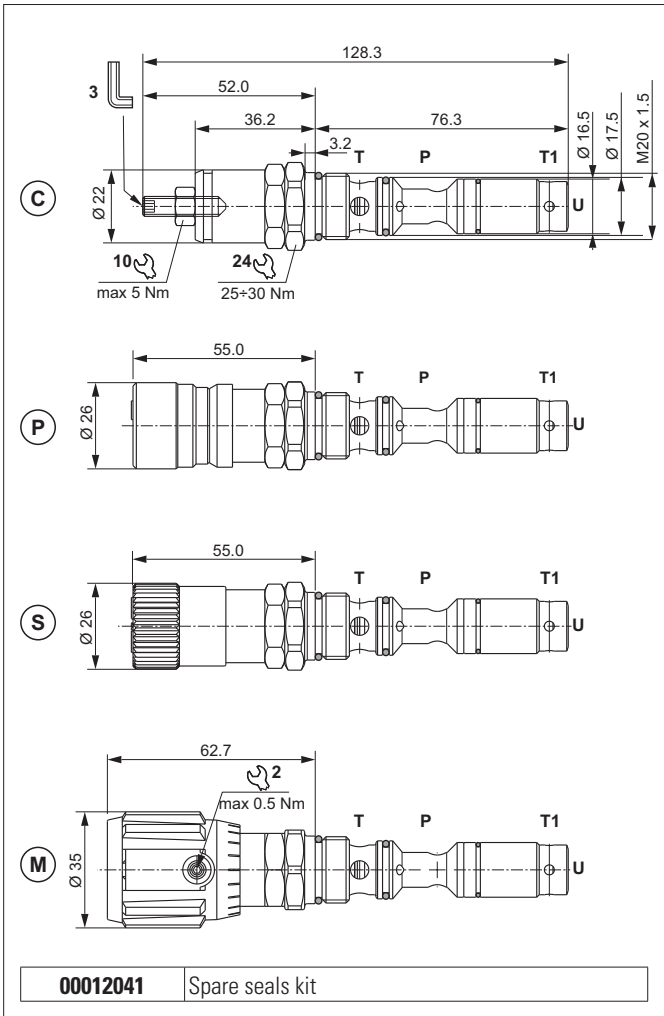
0 = CMPR04*0 - 1 = CMPR04*1.. - 2 = CMPR04*2.. - 3 = CMPR04*3..
 Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



DIRECT ACTING PRESSURE RELIEF VALVES WITH LOGIC VALVE

1



This valve provides 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.

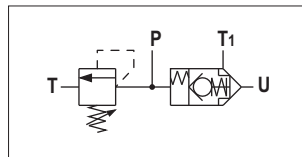
Pressure relief valve setting can be adjusted within the allowed pressure range, avoiding to increase the pressure over the maximum value. Springs into the check valve allow to assemble the valve in any preferred position and orientation.

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.

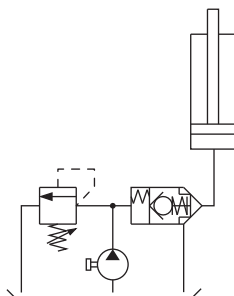
HYDRAULIC FEATURES

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)

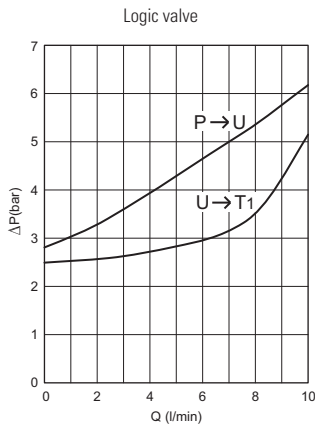
HYDRAULIC SYMBOL



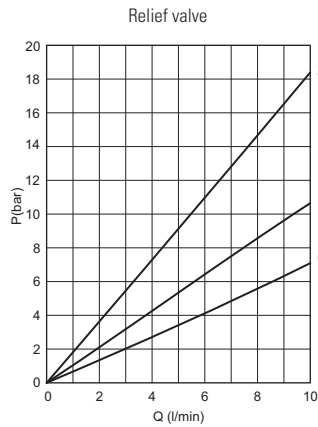
SERVICE EXAMPLE



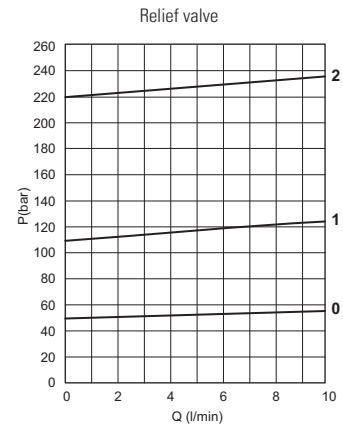
PRESSURE DROPS (P → U - U → T₁)



MIN. SETTING PRESSURE (P → T)

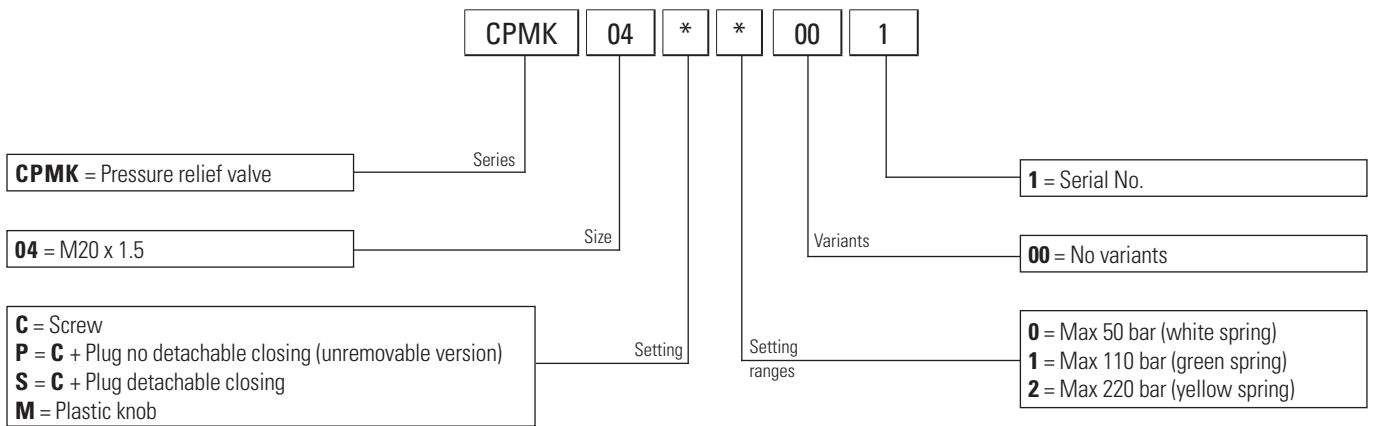


PRESSURE - FLOW (P → T)



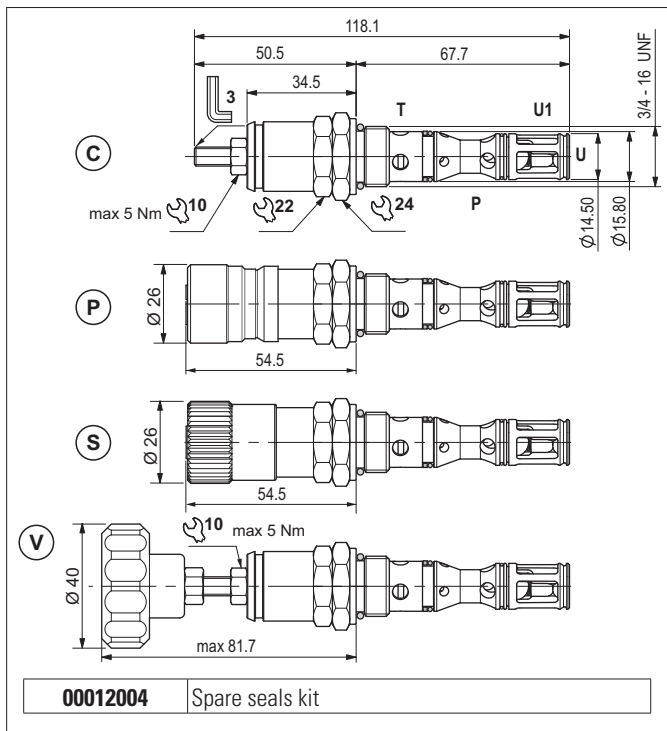
0 = CPMK04*0 - 1 = CPMK04*1.. - 2 = CPMK04*2..
 Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



DIRECT ACTING PRESSURE RELIEF VALVES WITH ONE-WAY CHECK VALVE

1

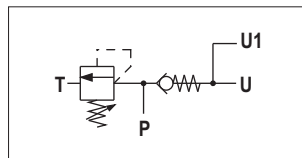


The valve has a combined function in a single cartridge. It consists of a direct acting maximum pressure valve and a unidirectional check valve. The relief valve raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue.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

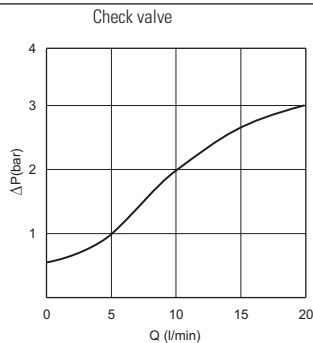
HYDRAULIC FEATURES

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)

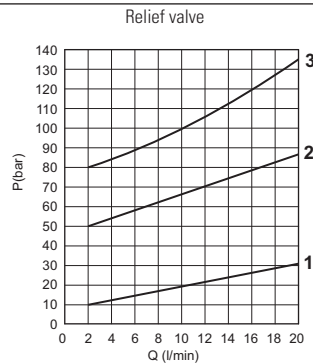
HYDRAULIC SYMBOL



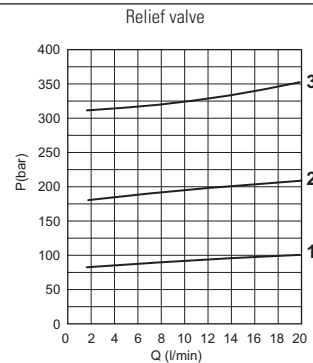
PRESSURE DROPS (P → U)



MIN. SETTING PRESSURE (P → T)



PRESSURE - FLOW (P → T)



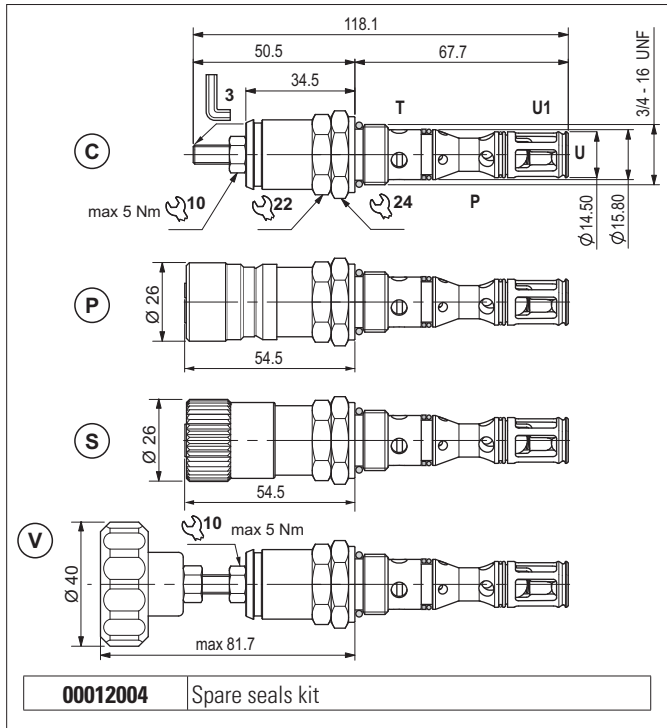
Fluid used: mineral based oil with viscosity 32 mm²/s at 50°C.

ORDERING CODE

CMP = Pressure relief valve	Series	R = With check valve	Size	04 = 3/4 - 16 UNF	Setting	*	*	*	00 = No variants	1 = Serial No.
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

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

1

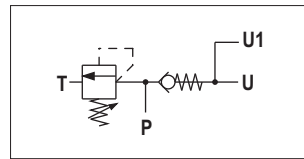


The valve has a combined function in a single cartridge. It consists of a direct acting maximum pressure valve and a unidirectional check valve. The relief valve raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue.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

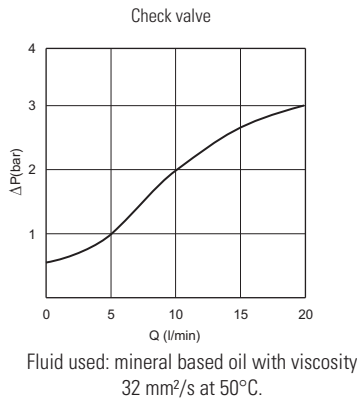
HYDRAULIC FEATURES

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)

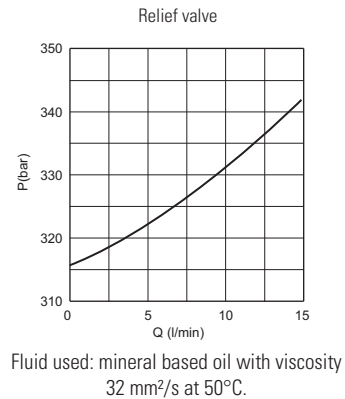
HYDRAULIC SYMBOL



PRESSURE DROPS (P → U)



PRESSURE - FLOW (P → T)

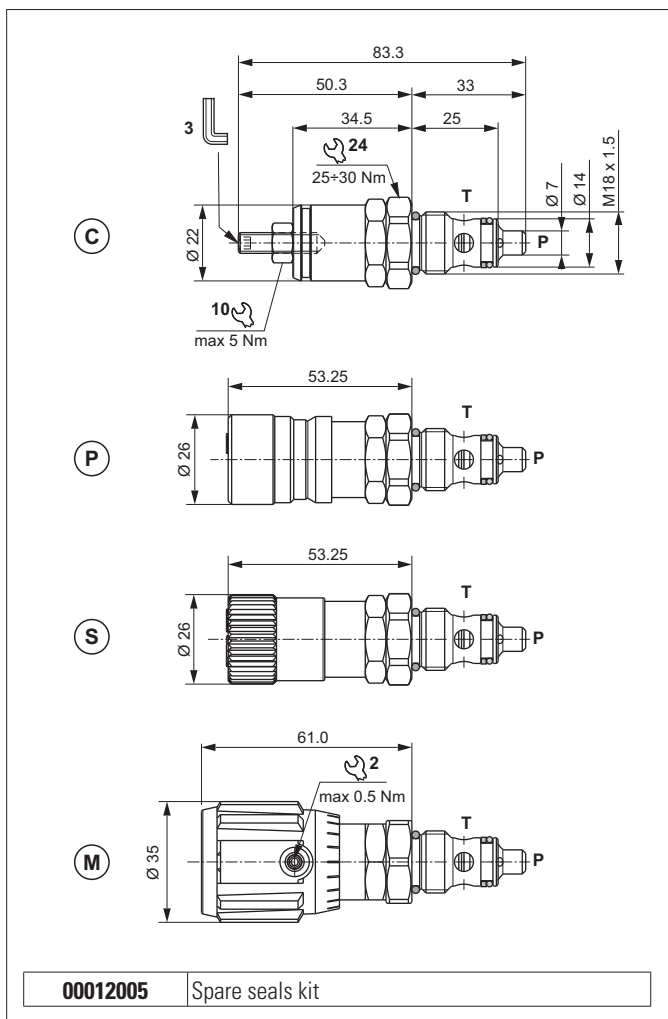


ORDERING CODE

CMPH = High pressure relief valve	Series	R = With check valve	Size	04 = 3/4 - 16 UNF	Setting	*	*	1	Setting ranges	00 = No variants	1 = Serial No.
C = Screw		P = C + Plug no detachable closing (unremovable version)								0 = With standard check-valve	
S = C + Plug detachable closing		V = Handwheel								S = Without standard check-valve	

DIRECT ACTING PRESSURE RELIEF VALVES

1



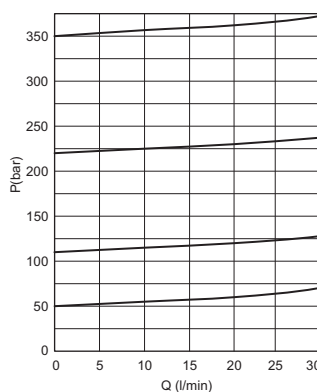
The direct acting relief valve limits the pressure in a hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop. It has a galvanised steel body. The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

HYDRAULIC FEATURES

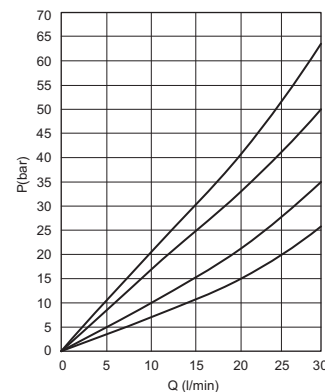
Max. working pressure	350 bar
Setting range:	
Spring 0 (white)	max 50 bar
Spring 1 (green)	max 110 bar
Spring 2 (yellow)	max 220 bar
Spring 3 (red)	max 350 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-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

PRESSURE-FLOW RATE

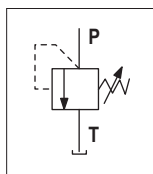


MIN. SETTING PRESSURE

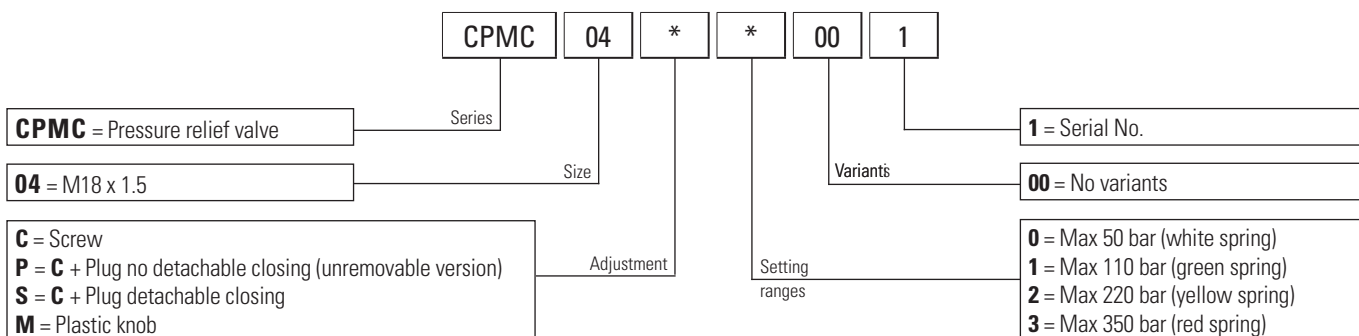


0 = CPMC04*0 - 1 = CPMC04*1.. - 2 = CPMC04*2.. - 3 = CPMC04*3..
 Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

HYDRAULIC SYMBOL

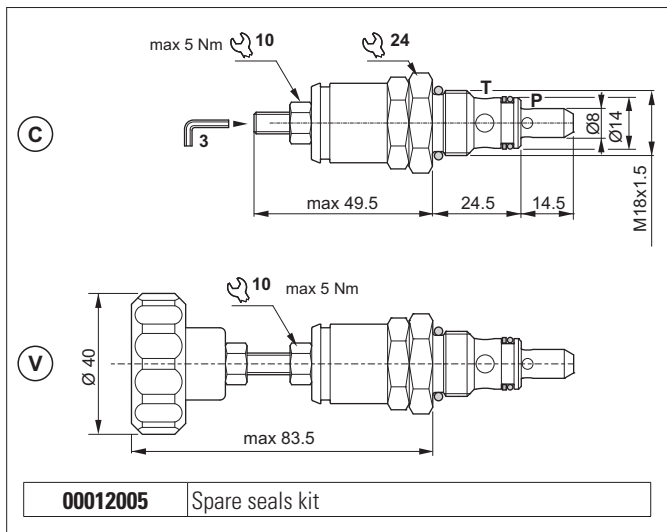


ORDERING CODE



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

1



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

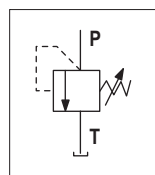
Max. working pressure	290 bar
Setting range:	
Spring 0 (white)	max 50 bar
Spring 1 (green)	max 90 bar
Spring 2 (yellow)	max 190 bar
Spring 3 (red)	max 290 bar
Max. Flow	20 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-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)	CNO41009 (See section 17)

ACCESSORIES

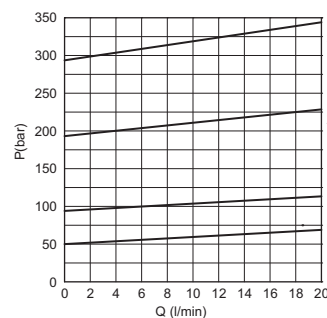
Detachable plug	Code
Unremovable version 	60309200
Removable version 	60309100

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

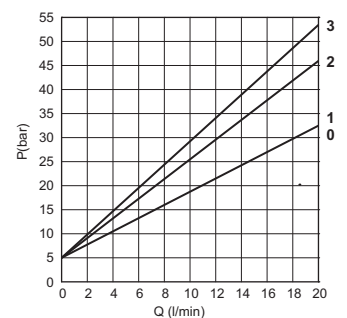
HYDRAULIC SYMBOL



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 mm²/s at 40°C.

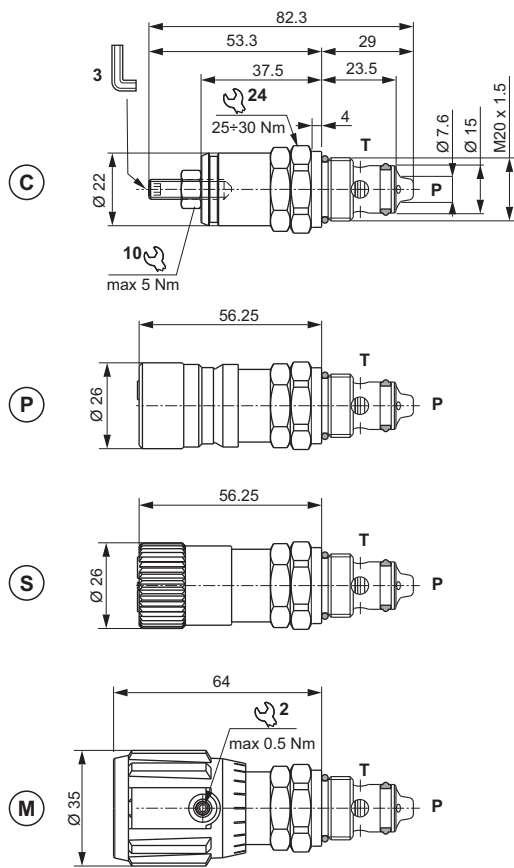
ORDERING CODE

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)	21000003.000
	75 ÷ 190 bar (yellow spring)	21000004.000
	160 ÷ 290 bar (red spring)	21000005.000

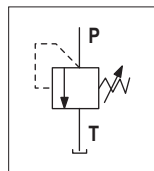
DIRECT ACTING PRESSURE RELIEF VALVES

1



00012006 Spare seals kit

HYDRAULIC SYMBOL



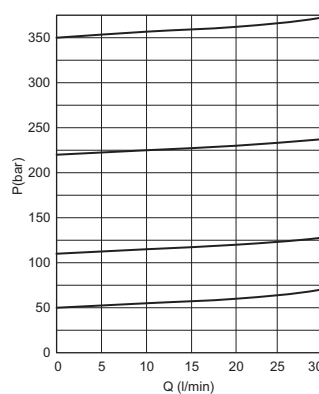
The direct acting relief valve limits the pressure in a hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop. It has a galvanised steel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

HYDRAULIC FEATURES

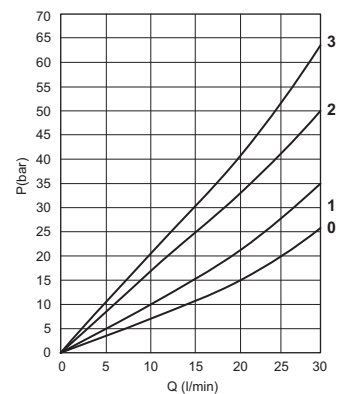
Max. working pressure	350 bar
Setting range:	
Spring 0 (white)	max 50 bar
Spring 1 (green)	max 110 bar
Spring 2 (yellow)	max 220 bar
Spring 3 (red)	max 350 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-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

PRESSURE-FLOW RATE

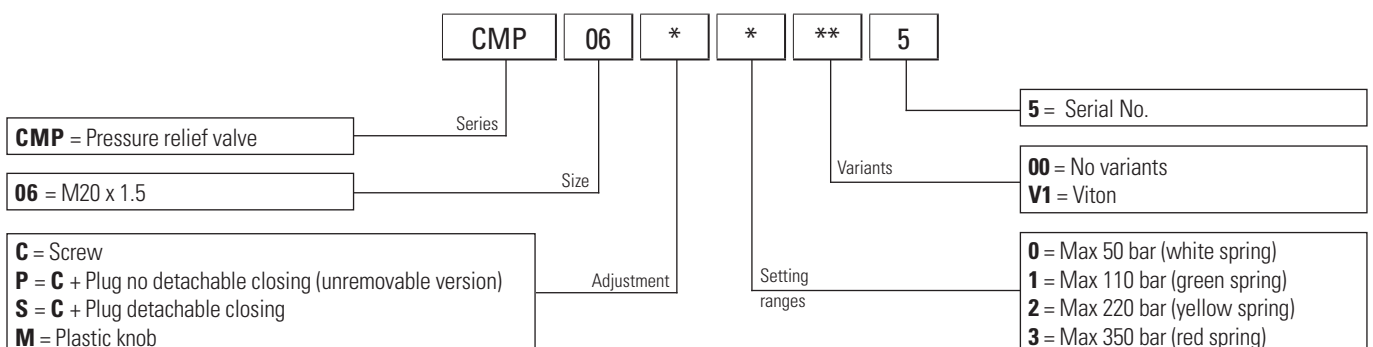


MIN. SETTING PRESSURE



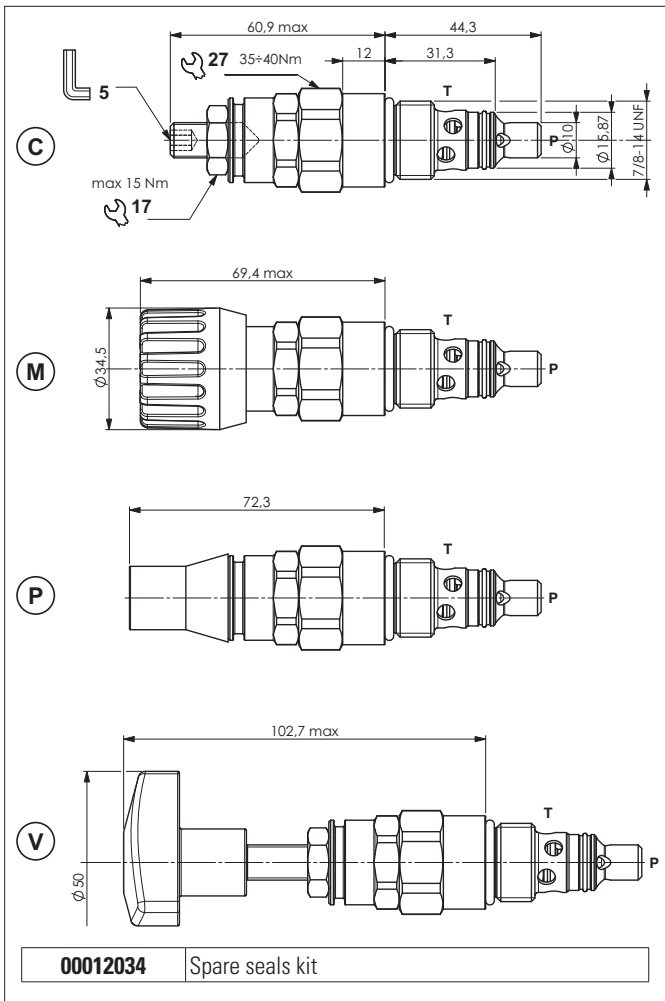
0 = CMP06*0 - 1 = CMP06*1.. - 2 = CMP06*2.. - 3 = CMP06*3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



DIRECT ACTING PRESSURE RELIEF VALVES

1



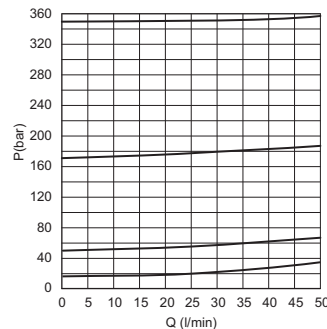
The direct acting relief valve limits the pressure in a hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop. It has a galvanised steel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

HYDRAULIC FEATURES

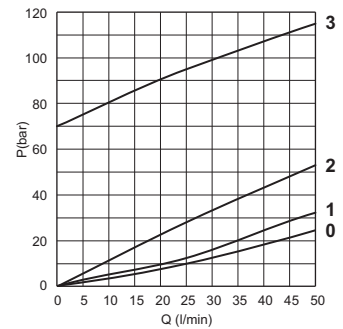
Max. working pressure	350 bar
Setting range:	
Spring 1 (orange)	max 15 bar
Spring 1 (white)	max 50 bar
Spring 2 (yellow)	max 170 bar
Spring 3 (neutral)	70 ÷ 350 bar
Max. Flow	50 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-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

PRESSURE-FLOW RATE

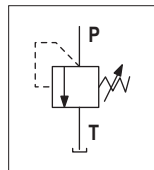


MIN. SETTING PRESSURE

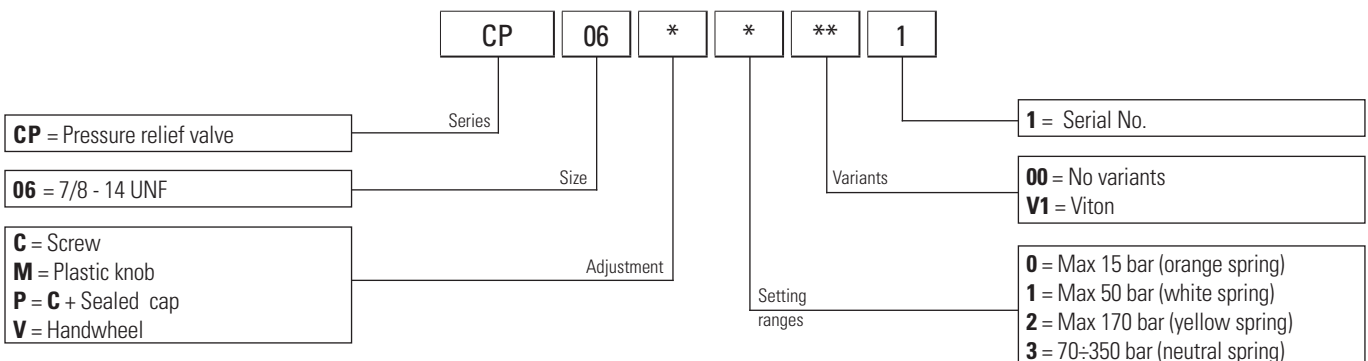


0 = CP06.0.. - 1 = CP06.1.. - 2 = CP06.2.. - 3 = CP06.3..
 Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

HYDRAULIC SYMBOL

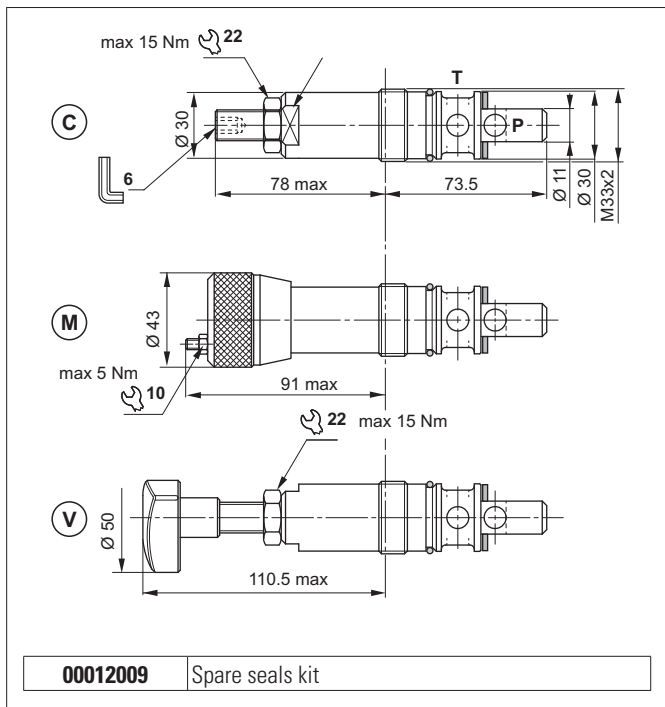


ORDERING CODE



DIRECT ACTING PRESSURE RELIEF VALVES

1

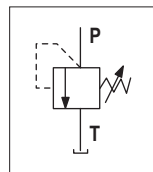


The direct acting relief valve limits the pressure in the hydraulic circuit to the calibration levels specified in the catalogue. It has a galvanised steel body. The guided ball poppet is in tempered and ground steel.

HYDRAULIC FEATURES

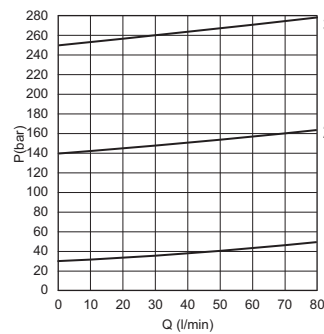
Max. working pressure	250 bar
Setting range:	
Spring 1 (white)	max 30 bar
Spring 2 (yellow)	max 140 bar
Spring 3 (green)	max 250 bar
Max. Flow	80 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin.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

HYDRAULIC SYMBOL

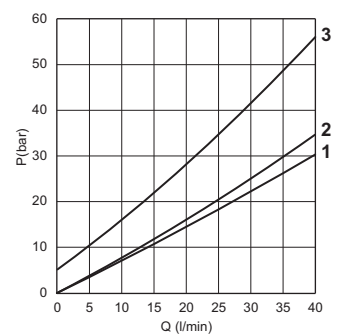


The minimum permissible setting pressure depending on the spring: see curves below

PRESSURE-FLOW RATE



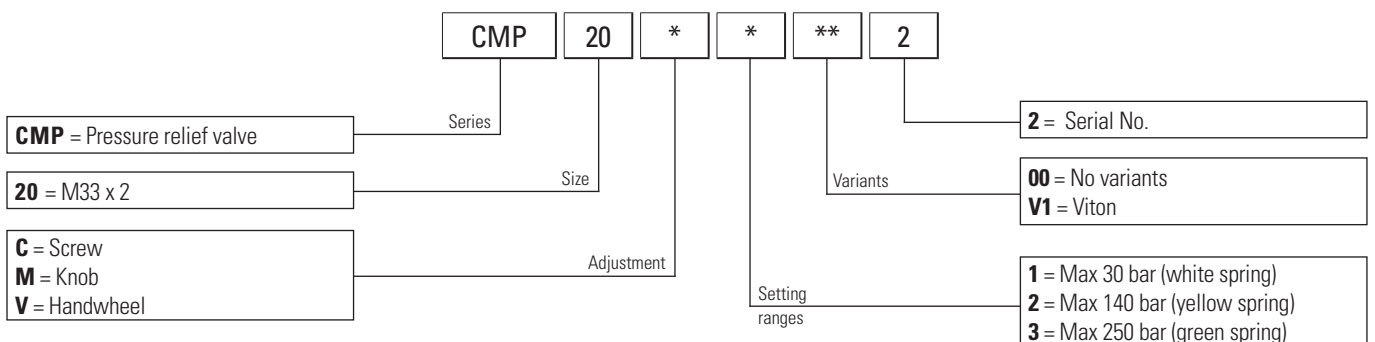
MIN. SETTING PRESSURE



1 = CMP20.1.. - 2 = CMP20.2.. - 3 = CMP20.3..

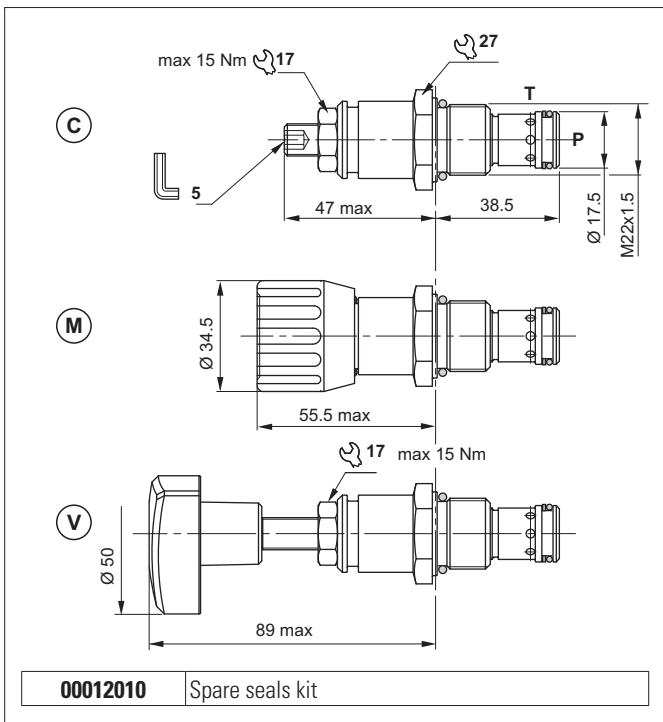
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



PILOT OPERATED PRESSURE RELIEF VALVES

1



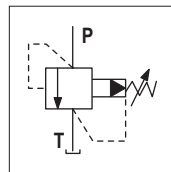
The pilot-operated relief valve limits the pressure in the hydraulic circuit. Slight leakage is tolerated for this type of valve. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with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

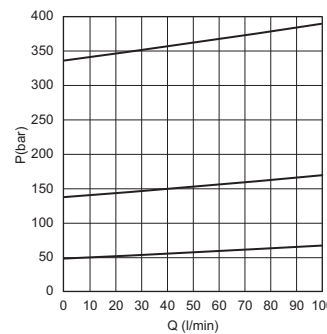
Max. working pressure	350 bar
Setting range: Spring 1 (white) Spring 2 (yellow) Spring 3 (green)	max 50 bar max 140 bar max 350 bar
Max. Flow	100 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. 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

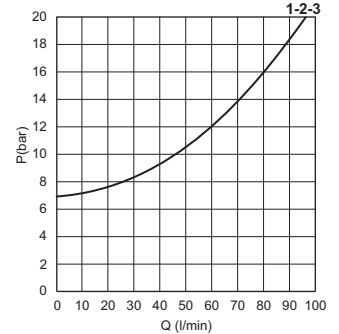
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



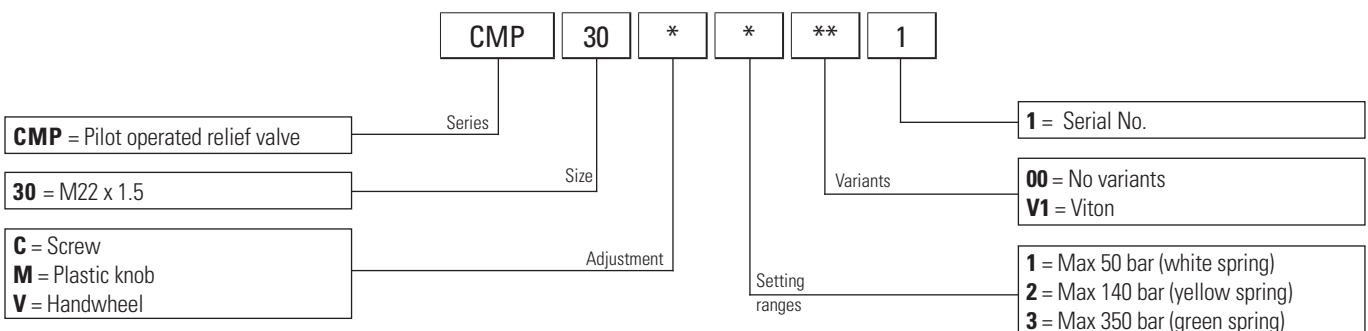
MIN.SETTING PRESSURE



1 = CMP30.1.. - 2 = CMP30.2.. - 3 = CMP30.3..

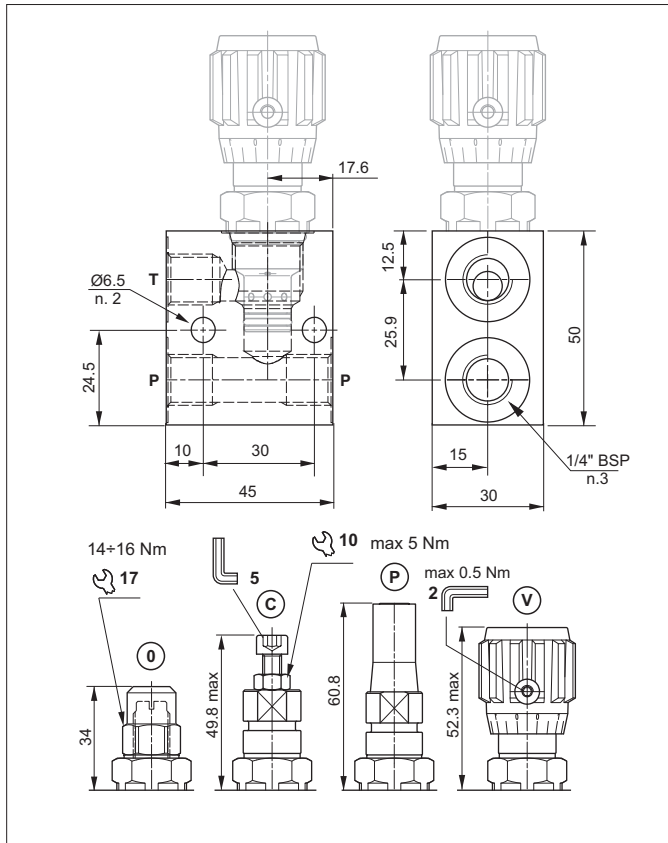
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING

1

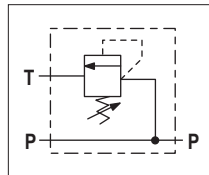


The direct acting relief valve with CMP04 cartridge limits the pressure in the hydraulic circuit. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack spring with a mechanical stop (only standard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

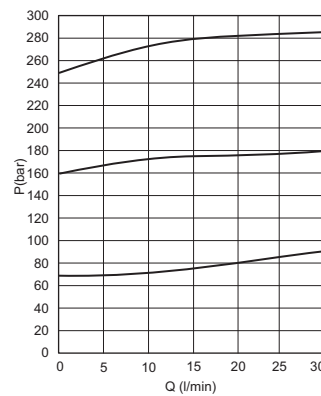
Max. working pressure	330 bar
Setting range:	
Spring B (white)	max 70 bar
Spring G (yellow)	max 160 bar
Spring V (green)	max 330 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight (0 version)	0.235 kg

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

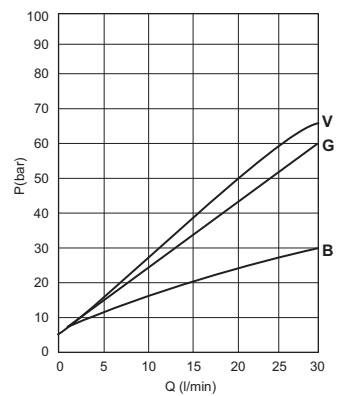
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



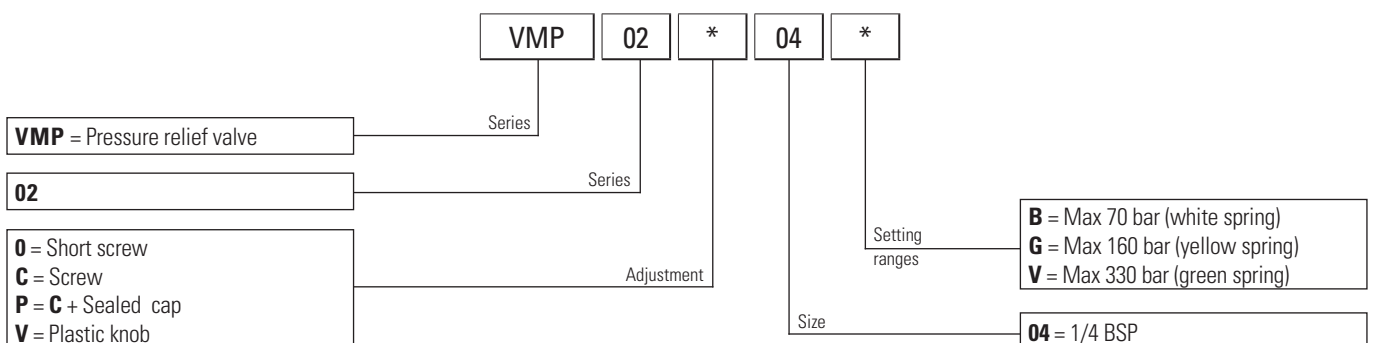
MIN.SETTING PRESSURE



1 = VMP02*B.. - 2 = VMP02*G.. - 3 = VMP02*V..

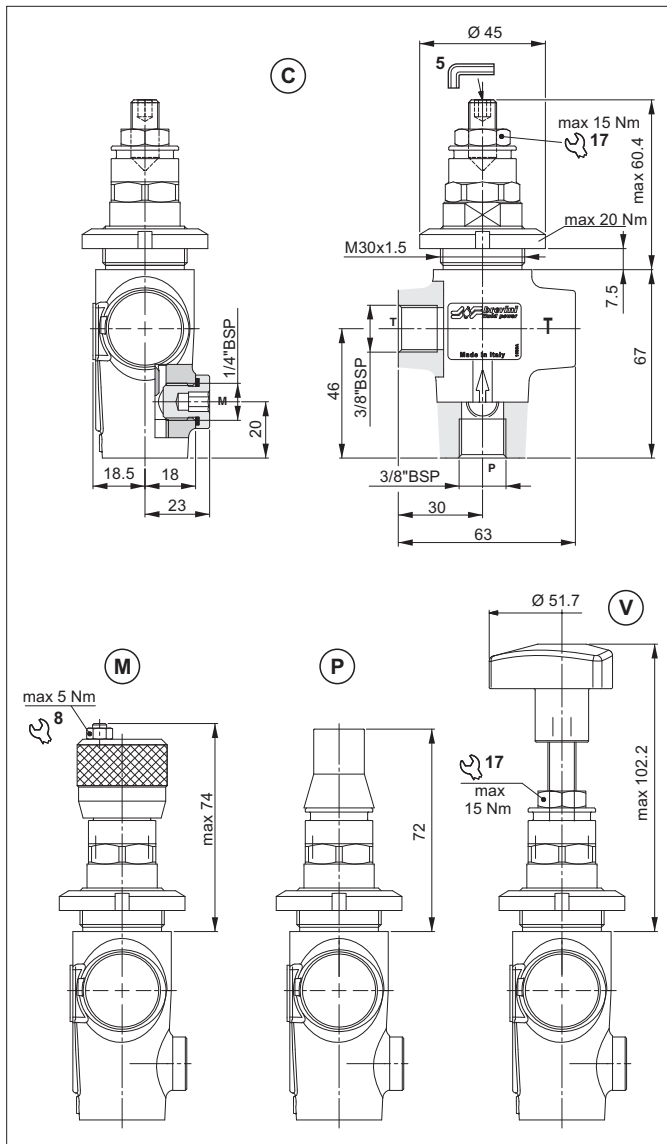
Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE



DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING

1



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.

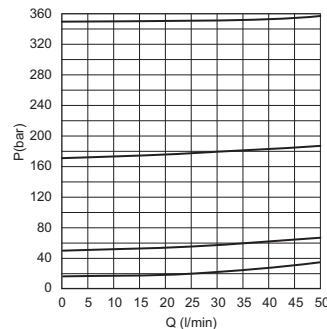
It has a manganese phosphate coated cast iron body. The cartridge is in galvanized steel.

HYDRAULIC FEATURES

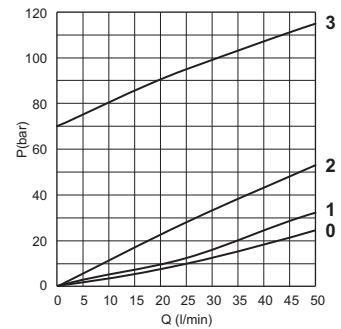
Max. working pressure	350 bar
Setting range:	
Spring 1 (orange)	max 15 bar
Spring 1 (white)	max 50 bar
Spring 2 (yellow)	max 170 bar
Spring 3 (neutral)	70 ÷ 350 bar
Max. Flow	50 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature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

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

PRESSURE-FLOW RATE

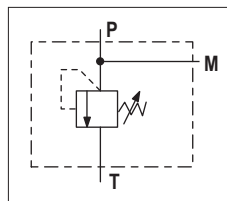


MIN. SETTING PRESSURE



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.

HYDRAULIC SYMBOL



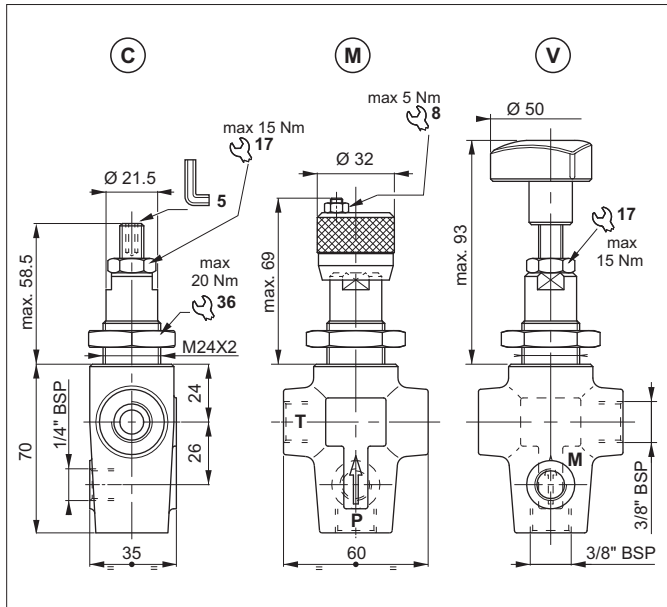
ORDERING CODE

VMP 06 * * ** 1

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

DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING

1



The direct acting relief valve with CMP10 cartridge limits the pressure in the hydraulic circuit.

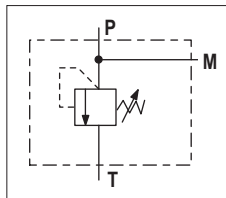
It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. This is limited by a pack spring with a mechanical stop, which prevents temporary P closures caused by pressure peaks.

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

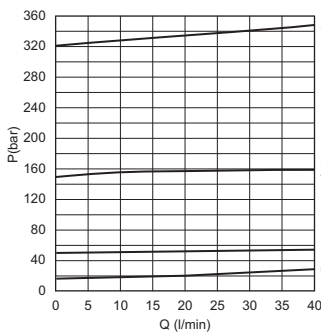
HYDRAULIC FEATURES

Max. working pressure	320 bar
Setting range:	
Spring 1 (orange)	max 15 bar
Spring 1 (white)	max 50 bar
Spring 2 (yellow)	max 150 bar
Spring 3 (green)	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

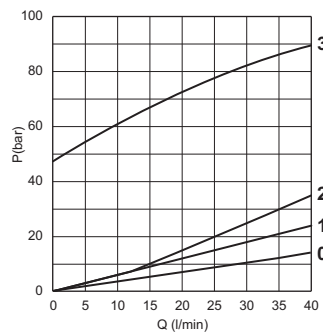
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN.SETTING PRESSURE

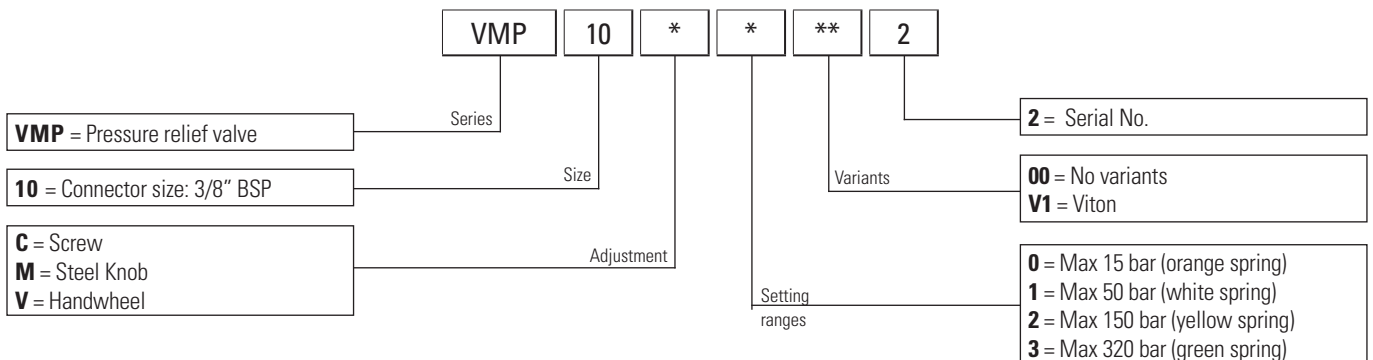


0 = VMP10.0.. - 1 = VMP10.1.. - 2 = VMP10.2.. - 3 = VMP10.3..

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

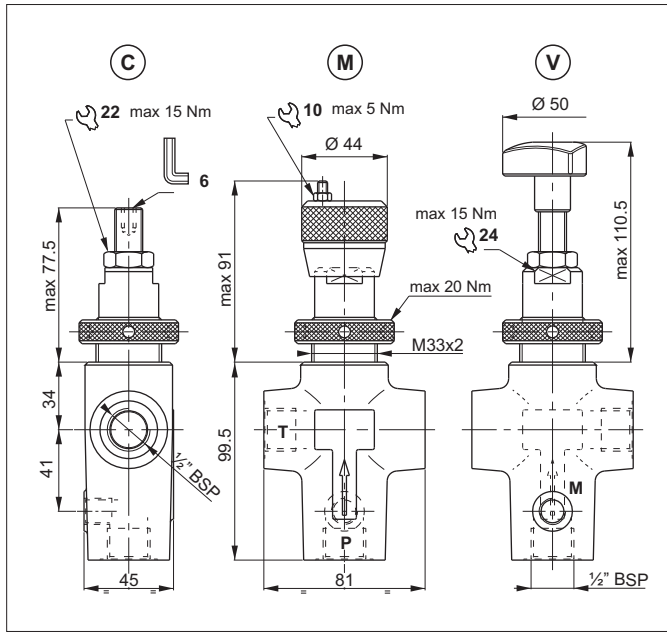
The minimum permissible setting pressure depending on the spring: see curves.

ORDERING CODE



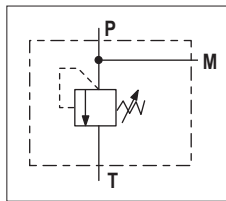
DIRECT ACTING PRESSURE RELIEF VALVES - IN-LINE MOUNTING

1



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 galvanized steel.

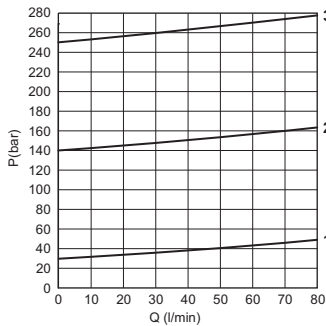
HYDRAULIC SYMBOL



HYDRAULIC FEATURES

Max. working pressure	250 bar
Setting range:	
Spring 1 (white)	max 30 bar
Spring 2 (yellow)	max 140 bar
Spring 3 (green)	max 250 bar
Max. Flow	80 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	1.7 kg

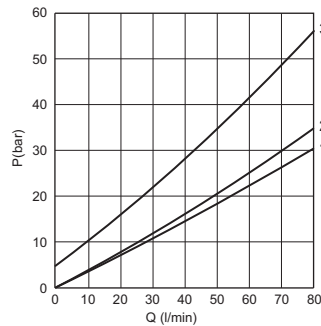
PRESSURE-FLOW RATE



1 = VMP20.1.. - 2 = VMP20.2.. - 3 = VMP20.3..

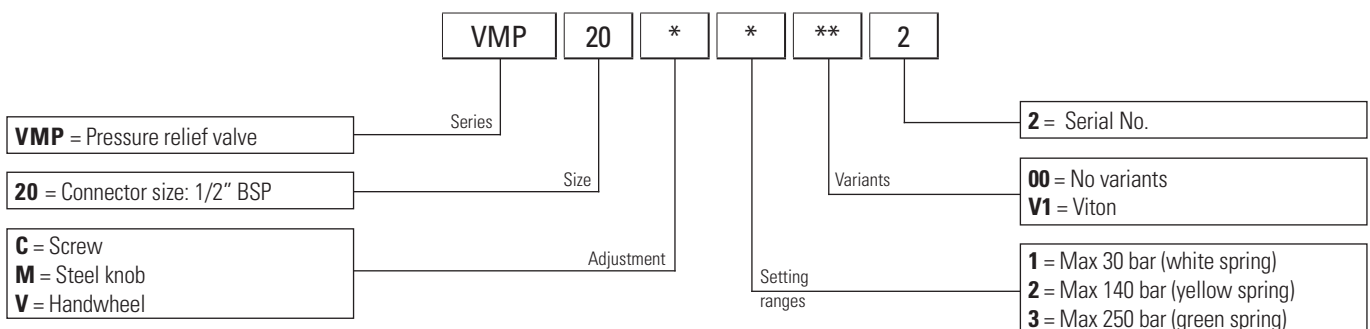
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

MIN.SETTING PRESSURE



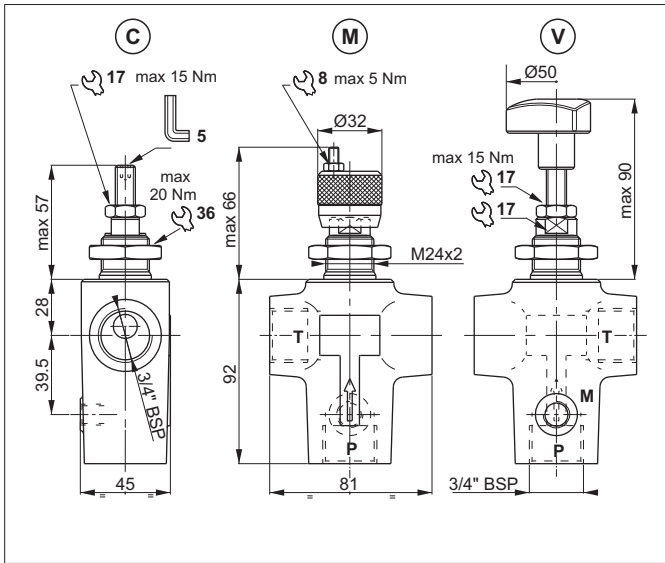
The minimum permissible setting pressure depending on the spring: see curves.

ORDERING CODE



PILOT OPERATED PRESSURE RELIEF VALVES - IN-LINE MOUNTING

1



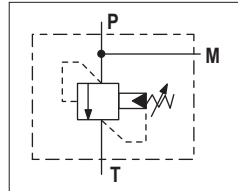
The direct acting relief valve with CMP30 cartridge limits the pressure in the hydraulic circuit.

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 galvanized steel.

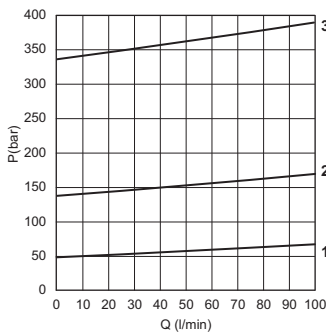
HYDRAULIC SYMBOL



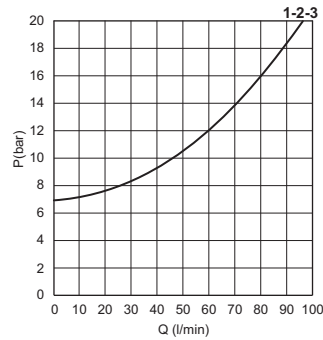
HYDRAULIC FEATURES

Max. working pressure	350 bar
Setting range:	
Spring 1 (white)	max 50 bar
Spring 2 (yellow)	max 140 bar
Spring 3 (green)	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

PRESSURE-FLOW RATE



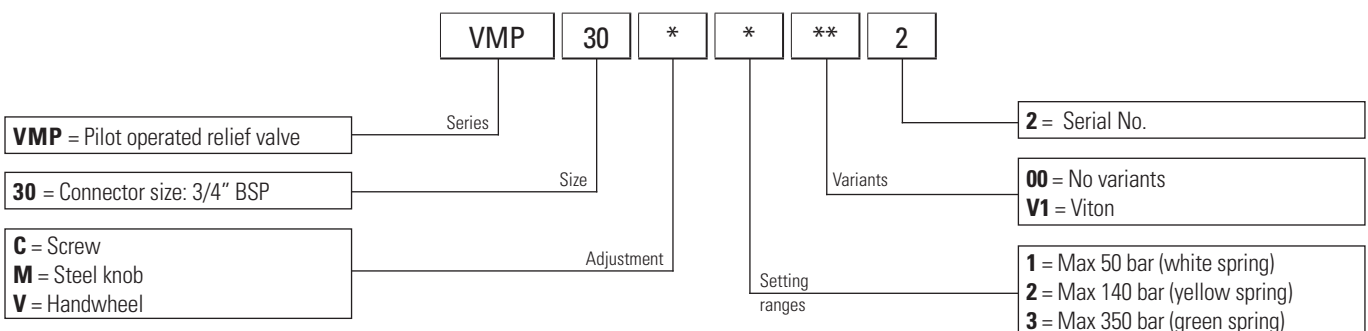
MIN.SETTING PRESSURE



1 = VMP30.1.. - 2 = VMP30.2.. - 3 = VMP30.3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

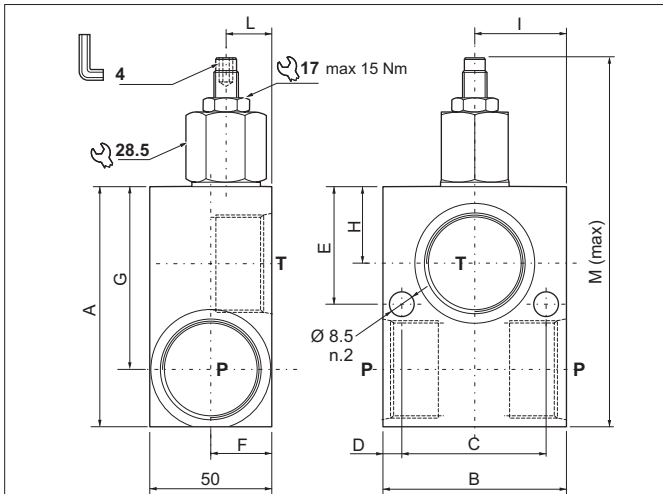
The minimum permissible setting pressure depending on the spring: see curves.

ORDERING CODE



PILOT OPERATED PRESSURE RELIEF VALVES - IN-LINE MOUNTING

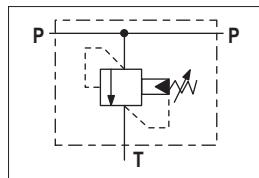
1



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.

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

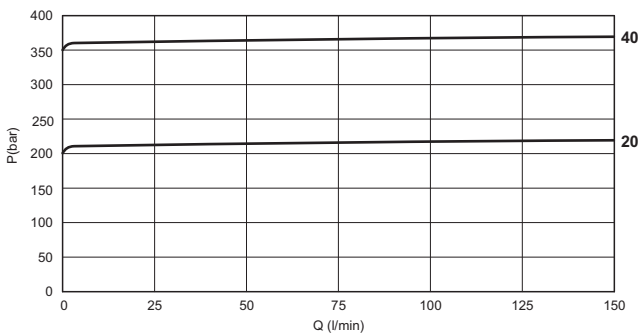
HYDRAULIC SYMBOL



HYDRAULIC FEATURES

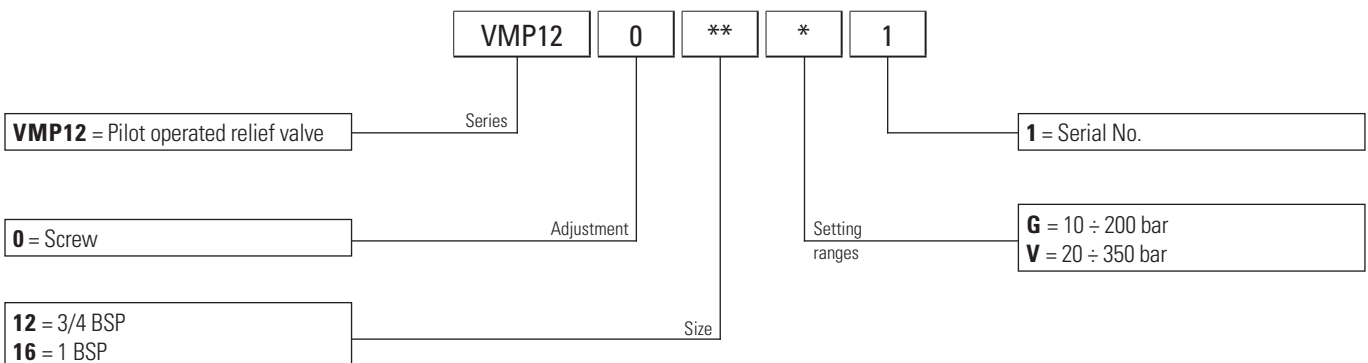
Max. working pressure	350 bar
Max. Flow	150 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.65 kg (3/4 BSP) 0.91 kg (1 BSP)
Cavity	(1" - 14 UNS) - Ø 19.05 mm

PRESSURE-FLOW RATE

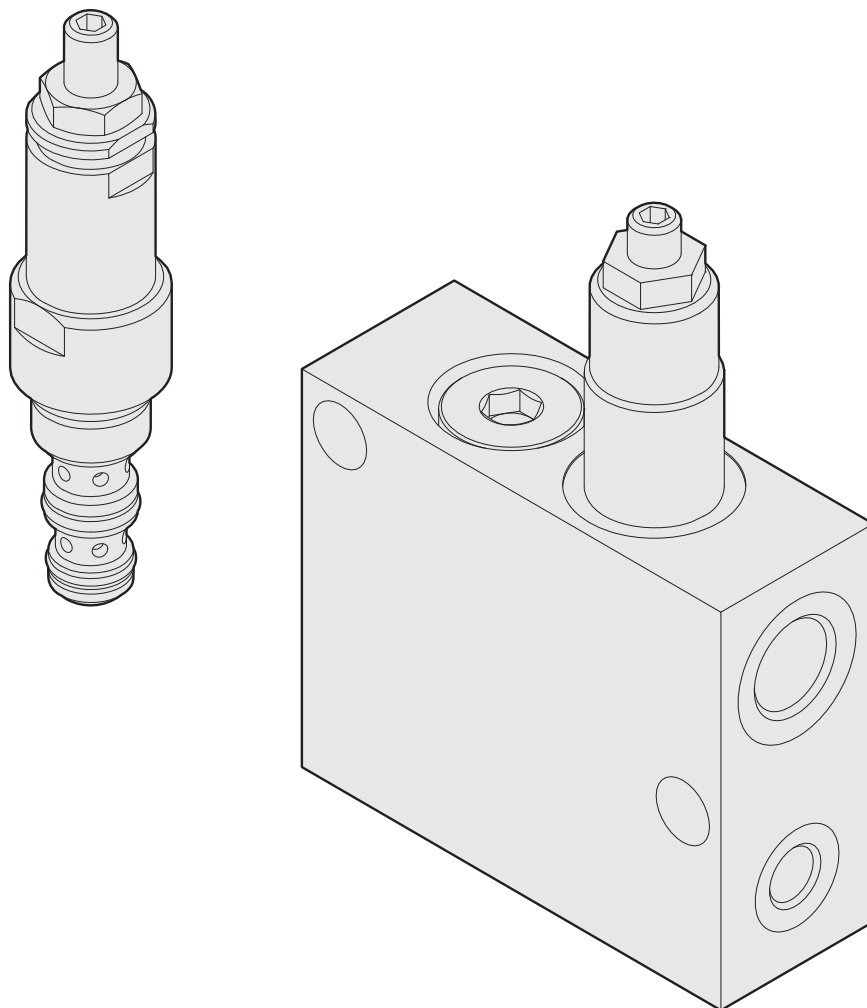


Fluid used: mineral based oil with viscosity 24 mm²/s at 50°C.

ORDERING CODE

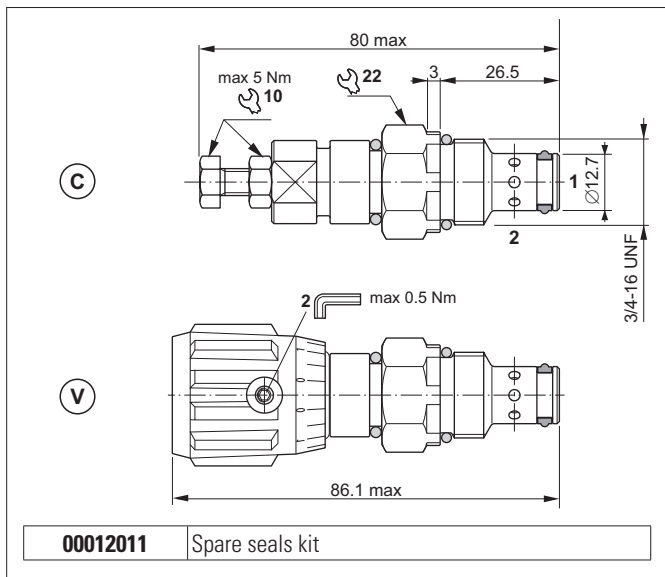


SEQUENCE, PRESSURE REDUCING AND UNLOADING VALVES



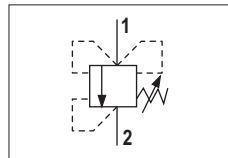
SEQUENCE VALVES - DIRECTLY OPERATED

2

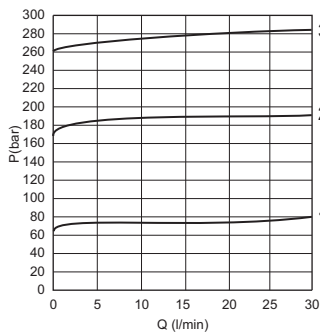


The direct acting sequence valve feeds a secondary branch of a circuit when a set pressure value is reached and suppresses the primary pressure. It raises the safety level by making it impossible for the plant operators to set a higher pressure rating, than that specified in the catalogue. It has a pack 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.

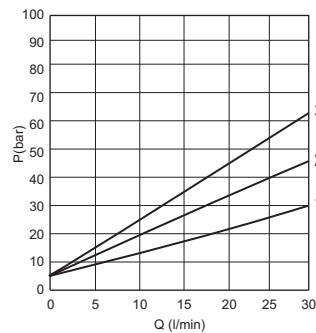
HYDRAULIC SYMBOL



PRESSURE-FLOW RATE



MIN. SETTING PRESSURE



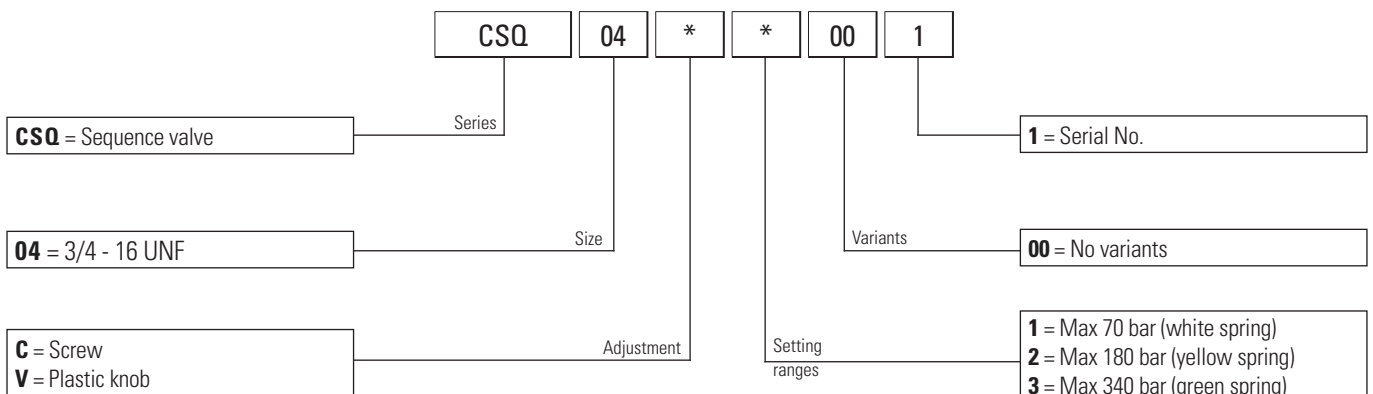
1 = CSQ04.1.. - 2 = CSQ04.2.. - 3 = CSQ04.3..
Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

HYDRAULIC FEATURES

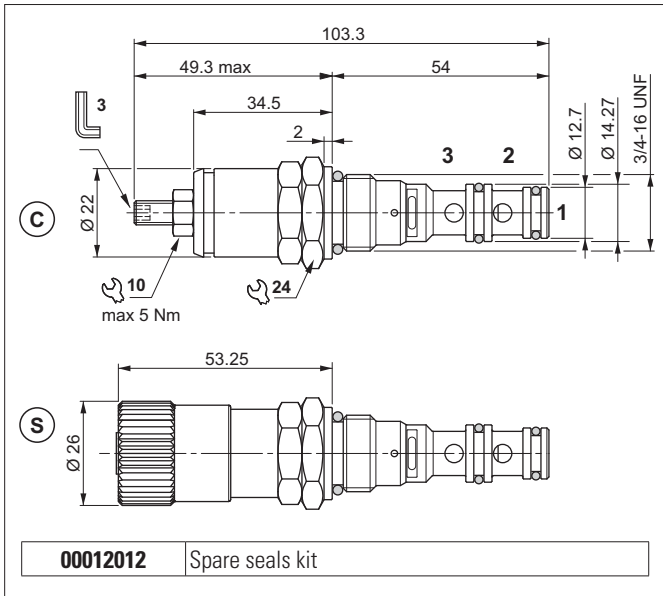
Max. working pressure	350 bar
Setting range:	
Spring 1 (white)	max 70 bar
Spring 2 (yellow)	max 180 bar
Spring 3 (green)	max 340 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin.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

ORDERING CODE



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



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 normally 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.

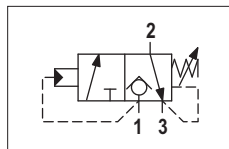
2

HYDRAULIC FEATURES

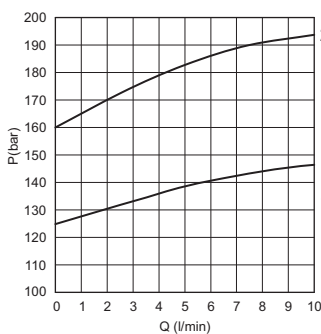
Max. pressure	210 bar
Setting range:	
Spring 1 (neutral)	max 125 bar
Spring 2 (yellow)	max 160 bar
Max. Flow	10 l/min
Leakage at 70% of the spring calibration (flow 1 l/min)	
Spring 1: 0 ÷ 30 drops/min	Spring 1: 0 ÷ 1.5 cm ³ /min
Spring 2: 0 ÷ 60 drops/min	Spring 2: 0 ÷ 3 cm ³ /min
Hydraulic fluid	DIN 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)	CDD18001 (See section 17)

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

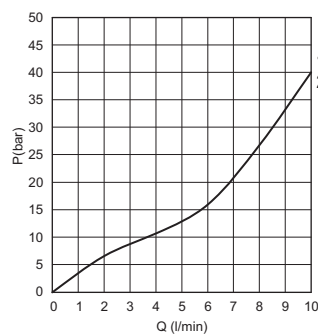
HYDRAULIC SYMBOL



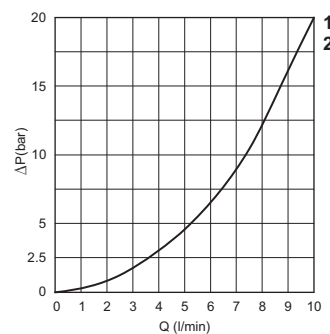
PRESSURE-FLOW RATE (1 → 2)



MIN. SETTING PRESSURE (1 → 2)



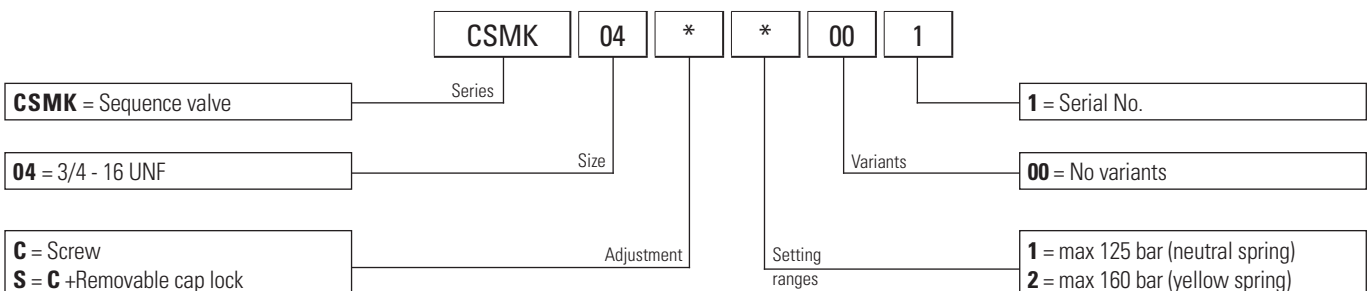
PRESSURE DROPS (2 → 3)



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

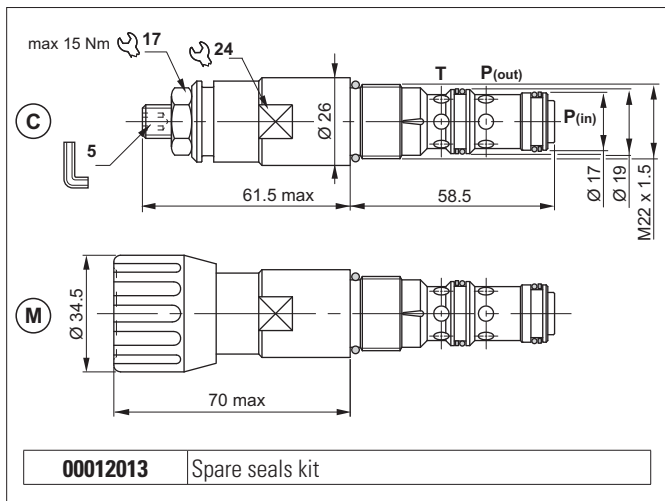
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



SEQUENCE VALVES - PILOT OPERATED

2

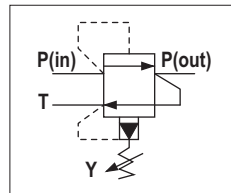


The pilot-operated sequence valve feeds a secondary branch of a circuit when a set pressure value is reached, guaranteeing minimum variation of the set pressure with flow alterations of up to 90 l/min. Slight leakage is tolerated for this type of valve. It raises the safety level by making it impossible 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.

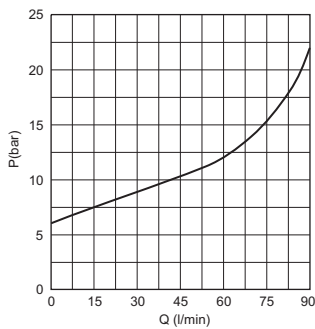
HYDRAULIC FEATURES

Max. pressure	350 bar
Setting range:	
Spring 1 (white)	max 60 bar
Spring 2 (yellow)	max 120 bar
Spring 3 (green)	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 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	0.25 kg
Tightening torque	30 ÷ 40 Nm
Cavity (M22 x 1.5)	CN047002 (See section 17)

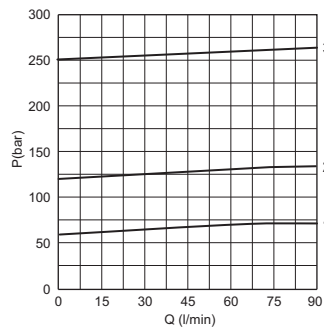
HYDRAULIC SYMBOL



MIN.SETTING PRESSURE



PRESSURE-FLOW RATE

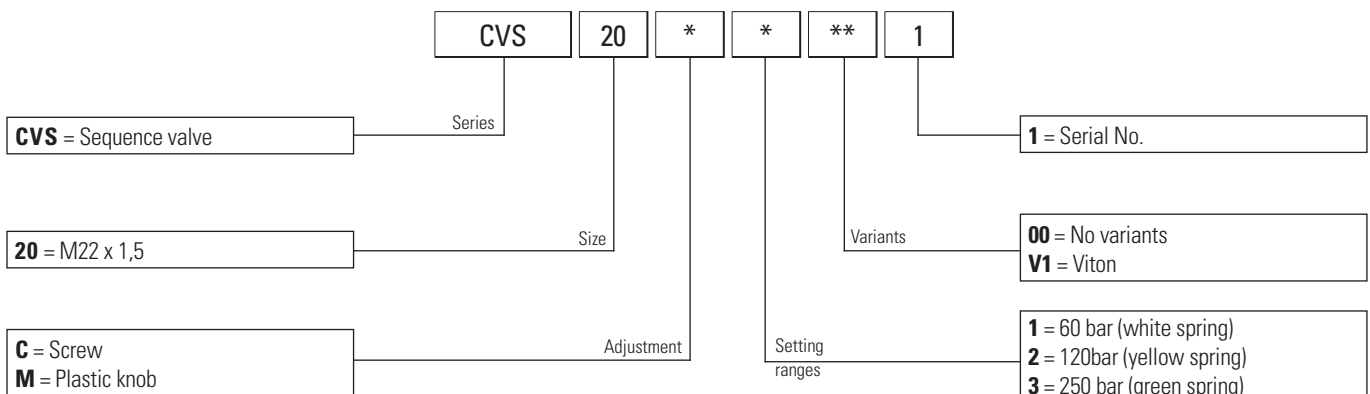


1 = CVS20.1.. - 2 = CVS20.2.. - 3 = CVS20.3..

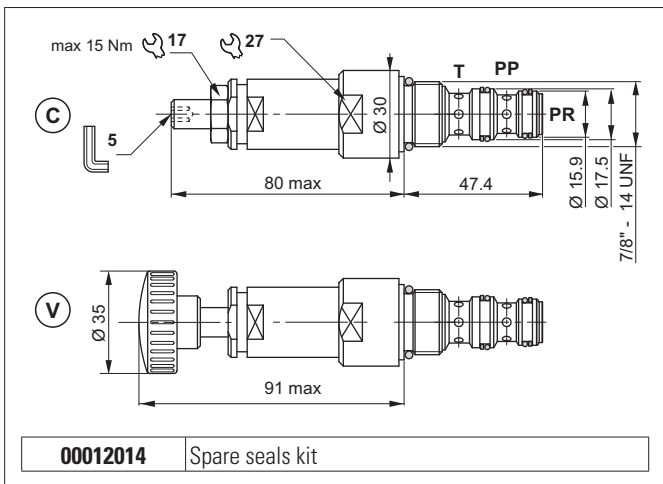
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

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

ORDERING CODE



PRESSURE REDUCING VALVES WITH RELIEVING - DIRECT OPERATED



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.

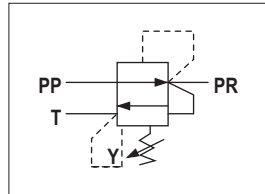
It has a galvanised steel body. The plunger is in tempered and ground steel.

2

HYDRAULIC FEATURES

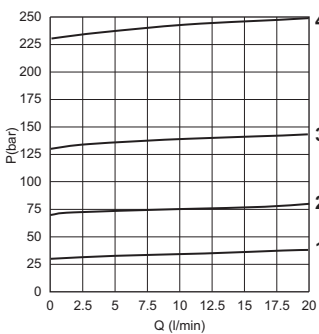
Max. pressure	320 bar
Setting range:	
Spring 1 (white)	max 2 ÷ 30 bar
Spring 2 (yellow)	max 6 ÷ 70 bar
Spring 3 (green)	max 35 ÷ 130 bar
Spring 4 (blue)	max 65 ÷ 230 bar
Max. Flow	20 l/min
Max. draining on port T	0.2 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid 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	0.3 kg
Tightening torque	35 ÷ 40 Nm
Cavity (7/8 - 14 UNF)	CD019006 (See section 17)

HYDRAULIC SYMBOL

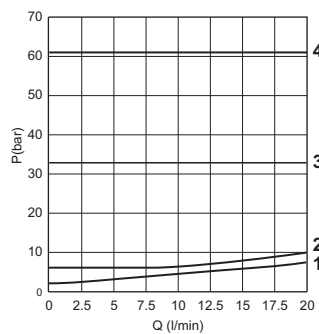


The minimum permissible setting pressure depending on the spring: see curves.

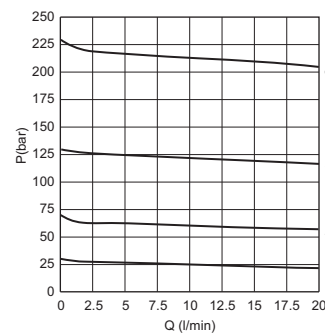
PRESSURE-FLOW OF RELIEVING



MIN. SETTING PRESSURE



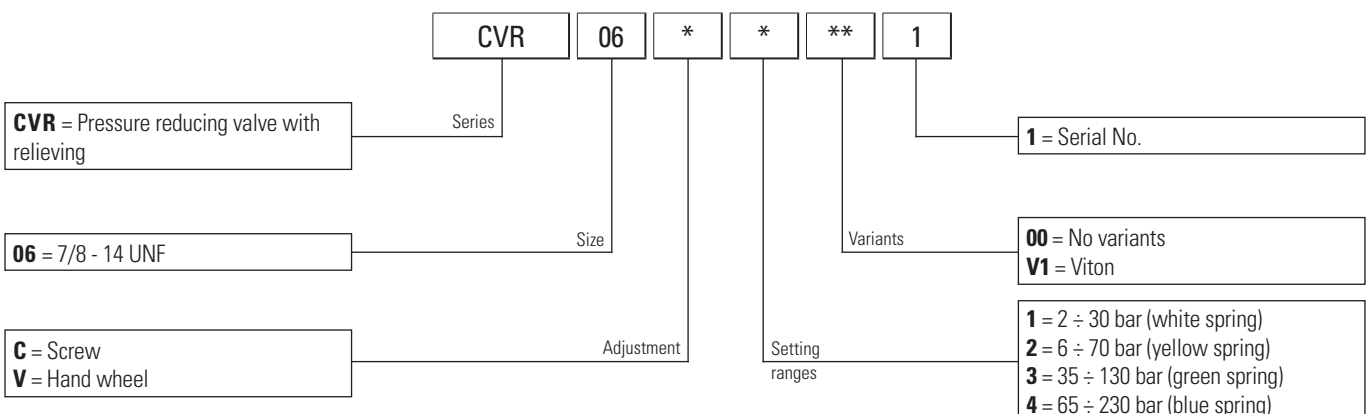
PRESSURE-FLOW RATE



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

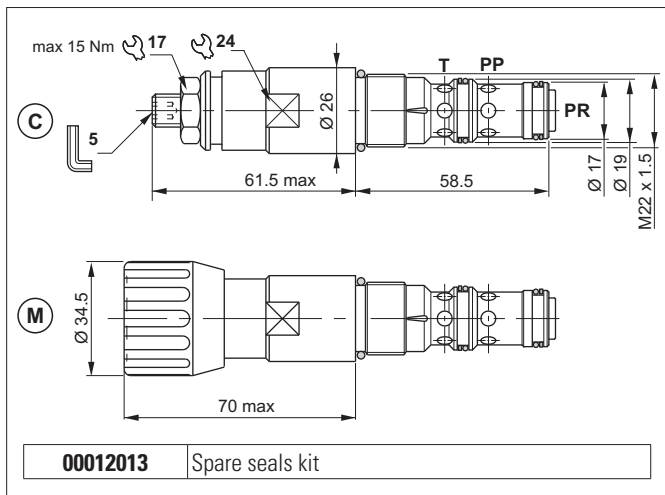
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



PRESSURE REDUCING VALVES WITH RELIEVING - PILOT OPERATED

2



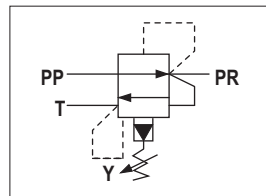
The pilot-operated pressure reducing valve feeds a secondary branch of a circuit at a lower pressure, guaranteeing minimum variation of the set pressure with flow alterations of up to 90 l/min. Slight leakage is tolerated for this type of valve.

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.

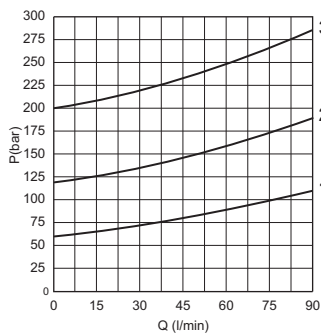
HYDRAULIC FEATURES

Max. pressure	350 bar
Setting range:	
Spring 1 (white)	max 60 bar
Spring 2 (yellow)	max 120 bar
Spring 3 (green)	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 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	0.25 kg
Tightening torque	30 ÷ 40 Nm
Cavity (M22 x 1.5)	CN047002 (See section 17)

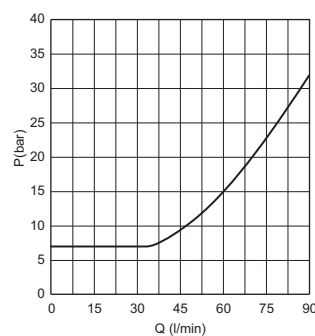
HYDRAULIC SYMBOL



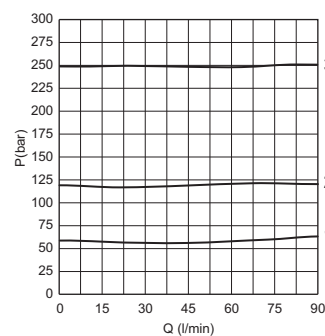
PRESSURE-FLOW OF RELIEVING



MIN. SETTING PRESSURE

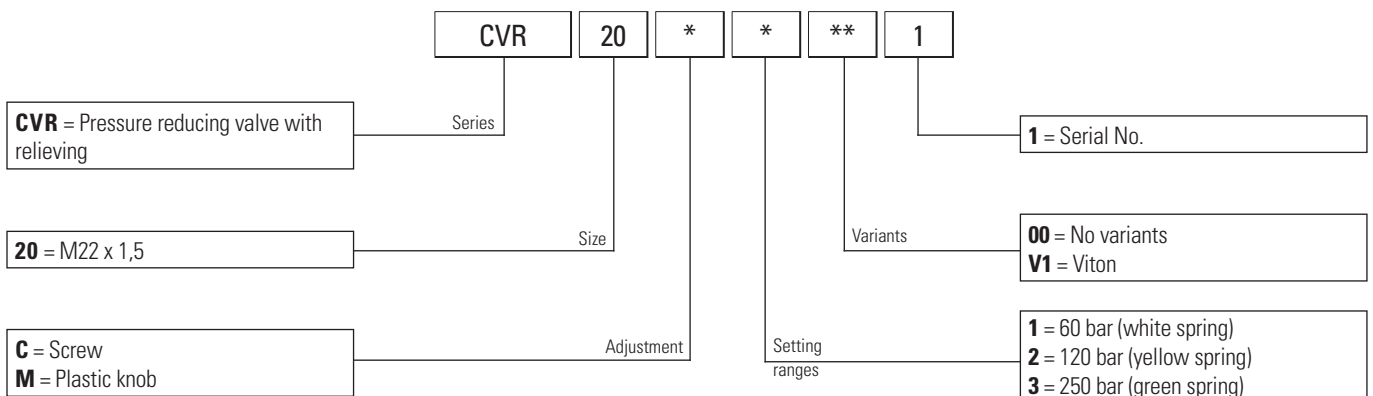


PRESSURE-FLOW RATE

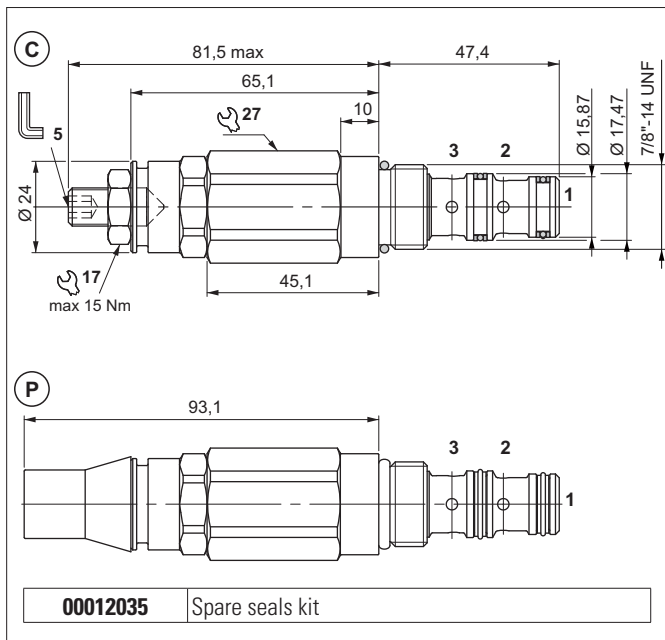


1 = CVR20.1..
2 = CVR20.2..
3 = CVR20.3..
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



SEQUENCE VALVES



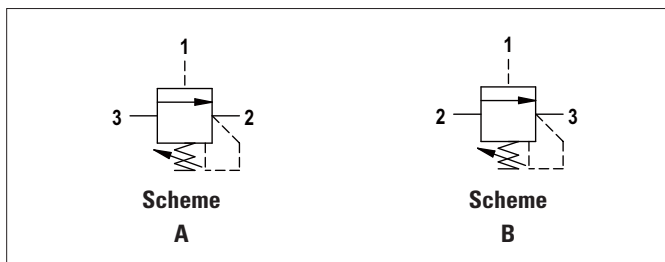
The 3-way sequence valve connects a pressurised branch to drain line when the pilot branch calibration setting is reached (port 1). Slight leakage is tolerated for this type of valve. It has a galvanised steel body. The plunger is in tempered and ground steel.

2

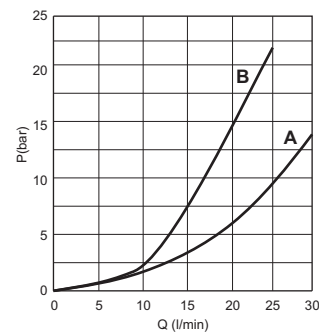
HYDRAULIC FEATURES

Max. pressure	400 bar
Max. Flow	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 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	0.3 kg
Tightening torque	30 ÷ 40 Nm
Cavity (7/8 - 14 UNF)	CD019006 (See section 17)

HYDRAULIC SYMBOL



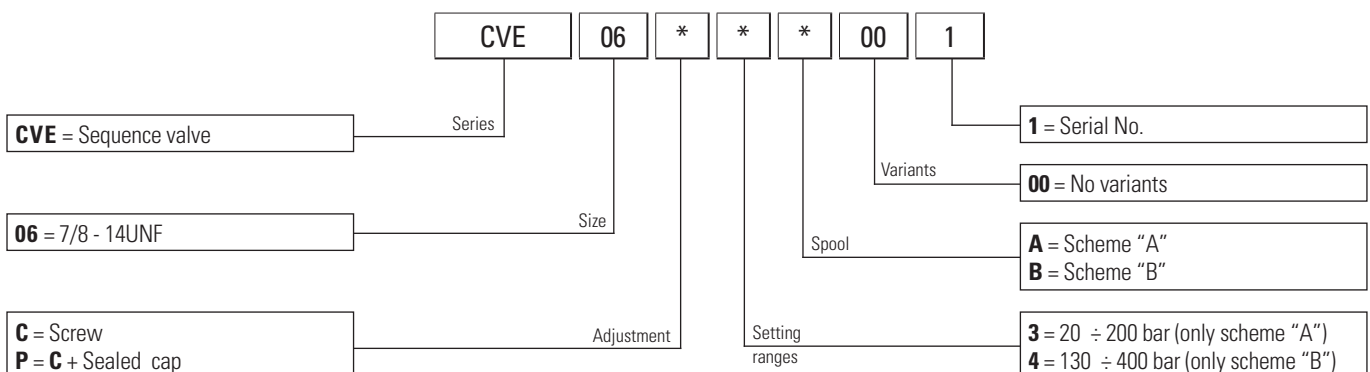
PRESSURE DROPS



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

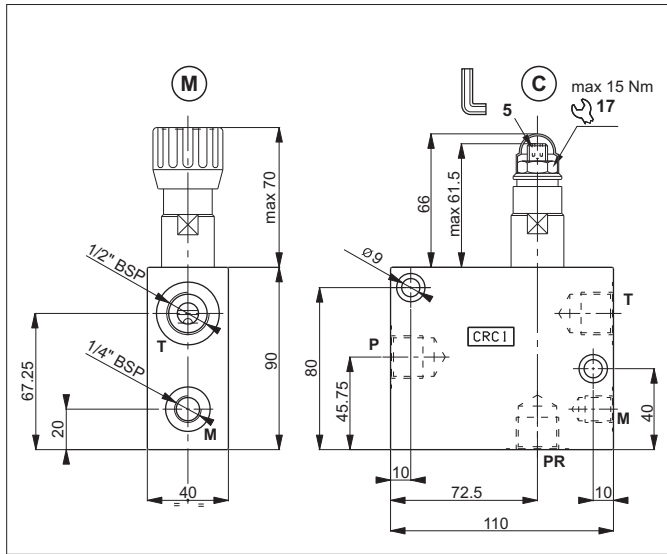
Spool scheme	Connections	Flow max l/min
A	3 → 2	30
B	2 → 3	25

ORDERING CODE



PRESSURE REDUCING AND SEQUENCE VALVES - IN-LINE MOUNTING

2



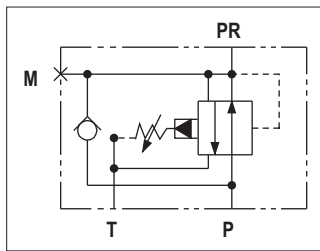
The CRC.1 aluminium body allows the in-line mounting connections for CVS.20 sequence and CVR.20 pressure reducing valves. In the version with pressure reducing valve the pump supply is connected to the port P, while in the version sequence valve is connected to the mouth PR.

For pressure reducing version the body is provided with a one-way check valve, which allows free flow to opposite direction (PR toward P)

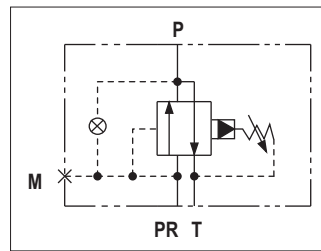
For the sequence version a blind grub screw has been placed instead of a check valve.

- 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

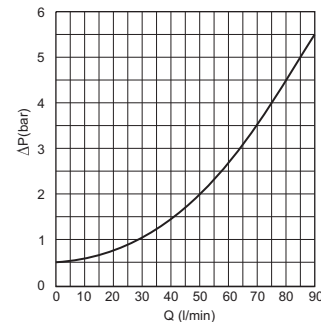


Sequence valve version

HYDRAULIC FEATURES

Max. pressure	350 bar
Setting range:	
Spring 1 (white)	max 60 bar
Spring 2 (yellow)	max 120 bar
Spring 3 (green)	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 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	1.224 kg

FREE FLOW THROUGH THE CHECK VALVE

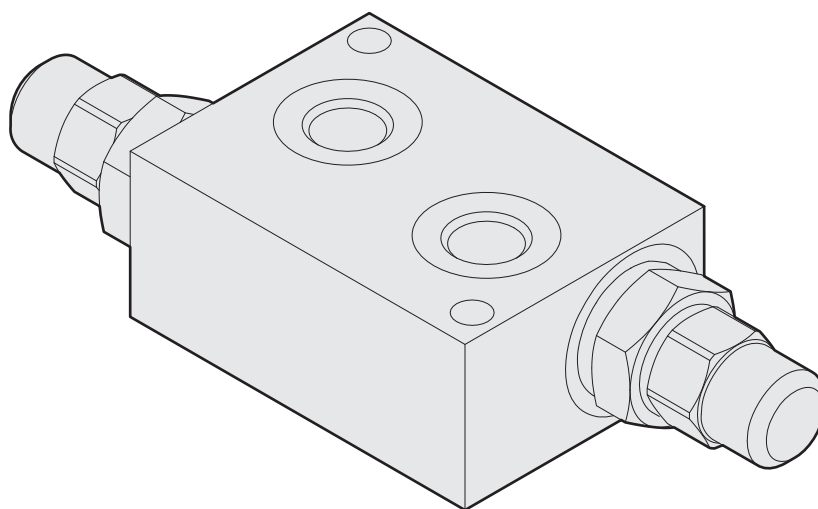


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE

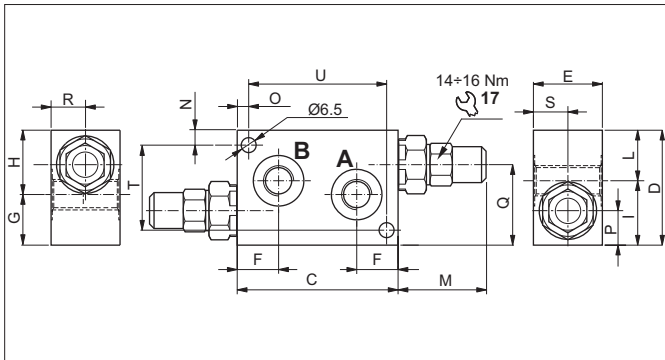
CRC = Sequence and pressure reducing cartridge valve Size 20 (seat M22x1,5)	Series	CRC
1 = Size connection 1/2" BSP	Size	1
R = Pressure reducing cartridge valve S = Sequence cartridge valve	Adjustment	*
M = Plastic knob C = Screw O = Without cartridge valve	Adjustment	*
	Setting ranges	*
	Settings	**
	Serial No.	1
	Material	00 = No variants V1 = Viton
	Setting ranges	1 = 60 bar (white spring) 2 = 120bar (yellow spring) 3 = 250 bar (green spring) 0 = Without cartridge valve

DOUBLE CROSS RELIEF VALVES



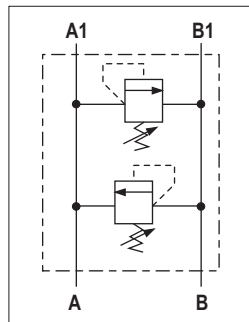
DOUBLE CROSS RELIEF VALVES DIRECT ACTING - IN-LINE MOUNTING

3



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.

HYDRAULIC SYMBOL

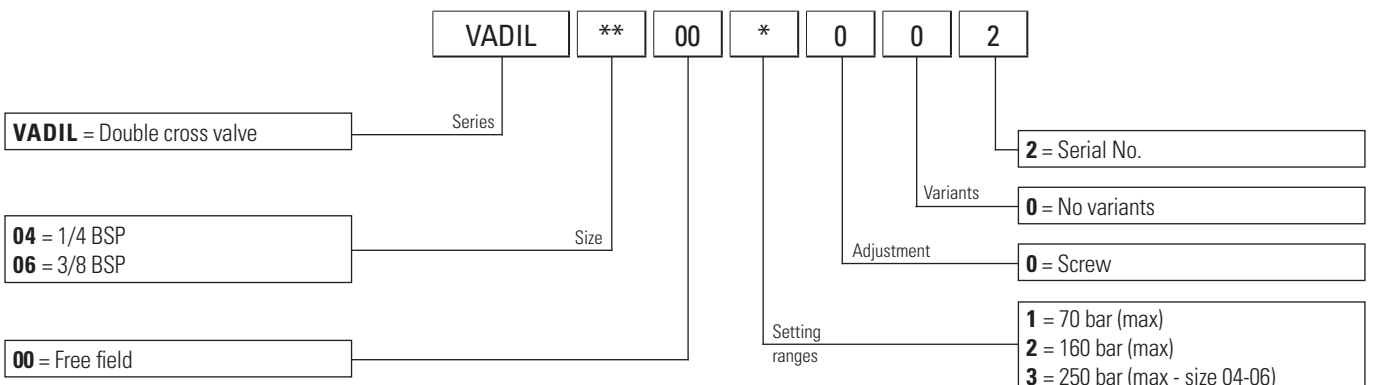


HYDRAULIC FEATURES

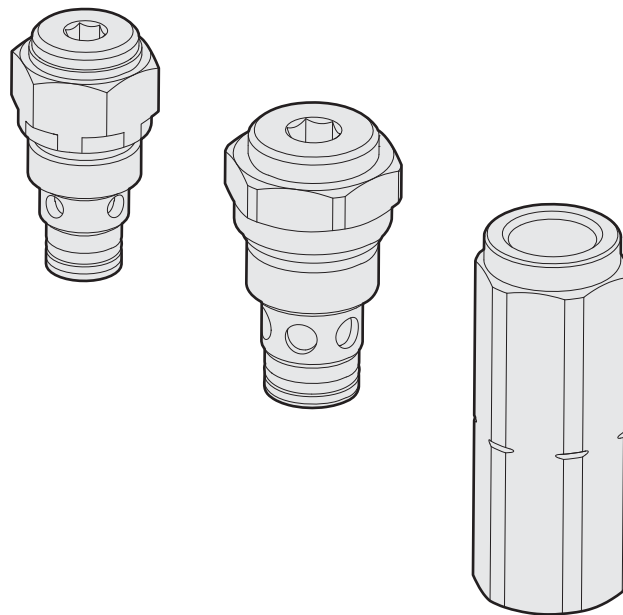
Max. pressure	
Size 1/4 BSP	250 bar
Size 3/8 BSP	250 bar
Max. Flow	
Size 1/4 BSP	30 l/min
Size 3/8 BSP	30 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999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

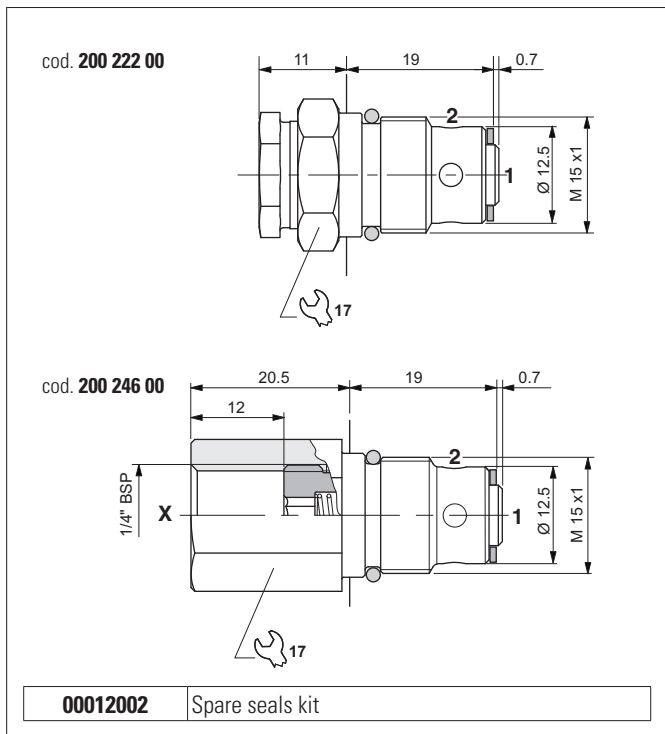


ONE-WAY CHECK VALVES



ONE-WAY CHECK VALVES

4

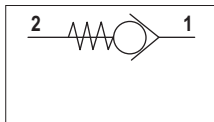


The unidirectional check valve allows oil to flow in only one direction. The guided ball seal is made of tempered and ground steel. The spring allows the valve to be mounted in any position. Also available with 1/4" BSP auxiliary pressure outlet. It has a galvanised steel body.

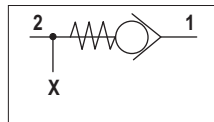
HYDRAULIC FEATURES

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

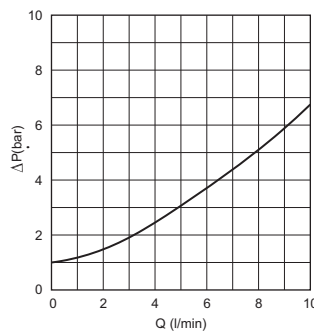


cod. 20024600

ORDERING CODE

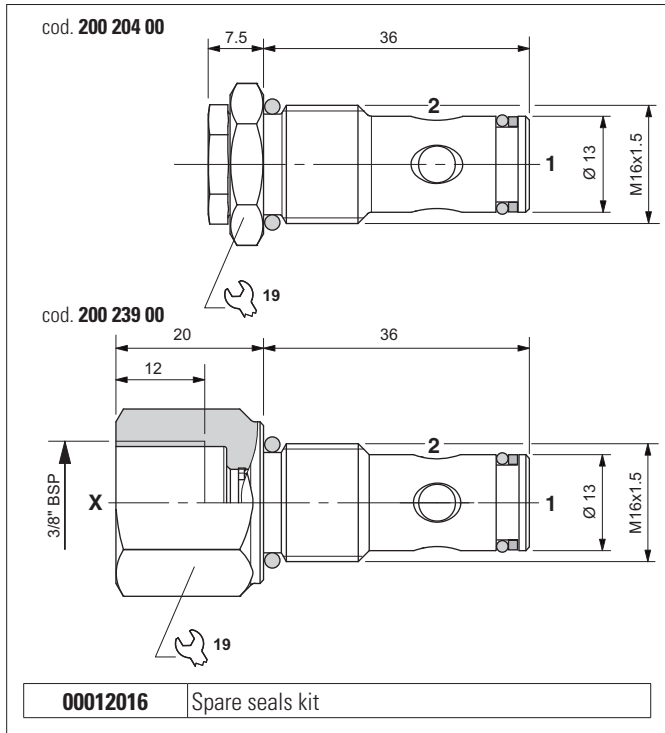
Code	Type	Weight
20022200	2 way	0.035 kg
20024600	3 way	0.042 kg

PRESSURE DROPS



Fluid used: mineral based oil with viscosity 32 mm²/s at 50°C.

ONE-WAY CHECK VALVES



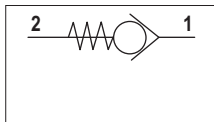
The unidirectional check valve allows oil to flow in only one direction. The guided ball seal is made of tempered and ground steel. The spring allows the valve to be mounted in any position. Also available with 1/4" BSP auxiliary pressure outlet. It has a galvanised steel body.

HYDRAULIC FEATURES

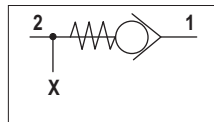
Max. working pressure	210 bar
Max. Flow	20 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm ³ /min
Crack pressure	0.5 bar
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO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

4

HYDRAULIC SYMBOLS



cod. 20020400

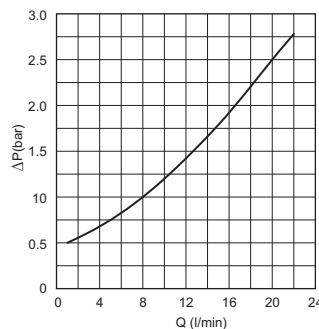


cod. 20023900

ORDERING CODE

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

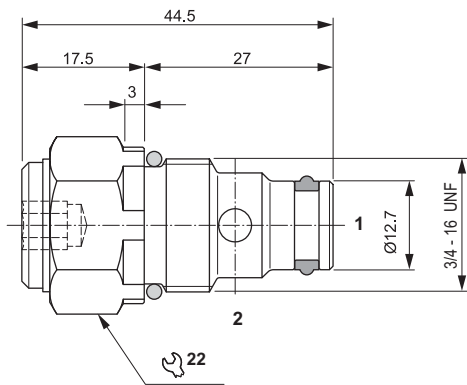
PRESSURE DROPS



Fluid used: mineral based oil with viscosity 32 mm²/s at 50°C.

ONE-WAY CHECK VALVES

4



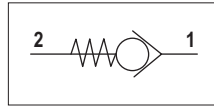
00012003 Spare seals kit

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

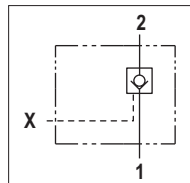
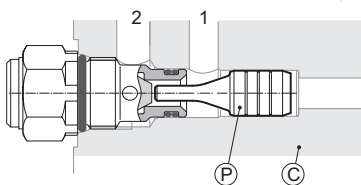
Max. working pressure	350 bar
Max. Flow	40 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm ³ /min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14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

HYDRAULIC SYMBOL

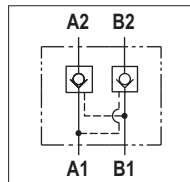
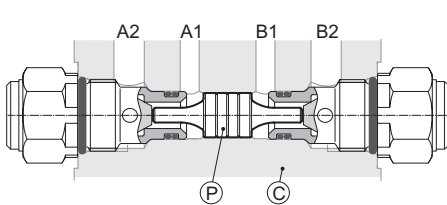


PILOT SPOOL

Single

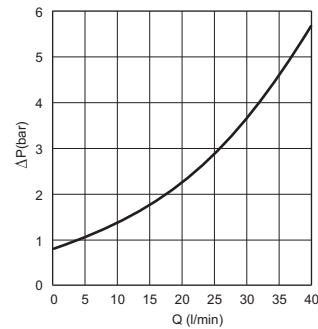


Double



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 mm²/s at 40°C.

ORDERING CODE

CRU 04 ** 00 2

CRU = Check valve

Series

2 = Serial No.

04 = 3/4 - 16 UNF

Size

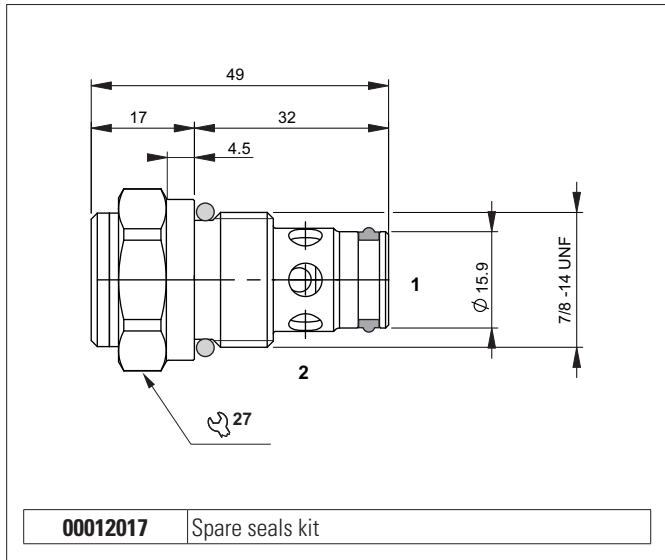
01 = 0.3 bar
00 = 0.7 bar (standard)
04 = 4.5 bar
07 = 7.5 bar
10 = 10 bar

Opening pressure

Variants

00 = No variants

ONE-WAY CHECK VALVES



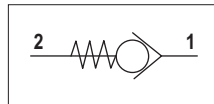
The check-valves permit one-directional oil flow only. On the opposite side the sealing is guaranteed by a hardened and ground taper steel poppet. The spring permits an easy valve installation in any position. External steel body protected on surface by zinc plating.

HYDRAULIC FEATURES

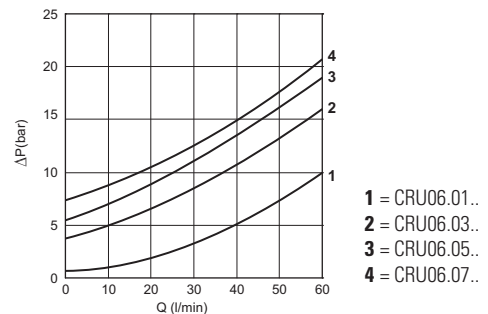
Max. working pressure	350 bar
Max. Flow	60 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm ³ /min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14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

4

HYDRAULIC SYMBOL

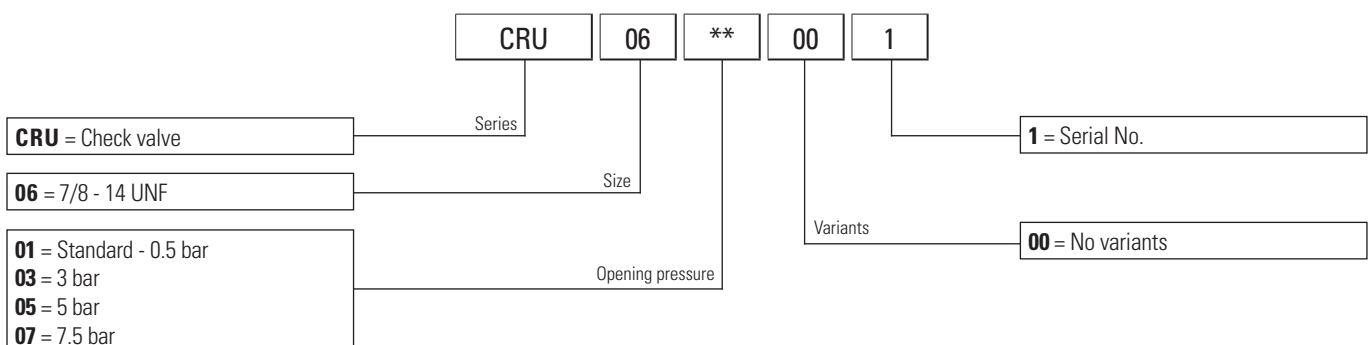


PRESSURE DROPS

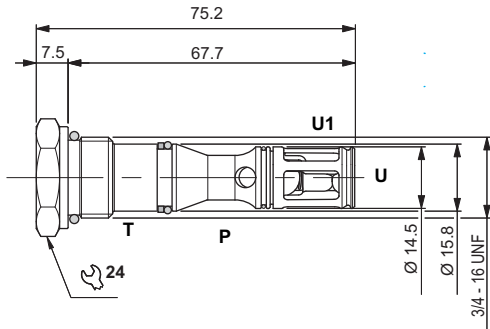


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



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



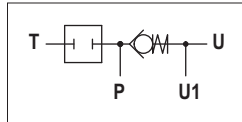
00012004 Spare seals kit

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.

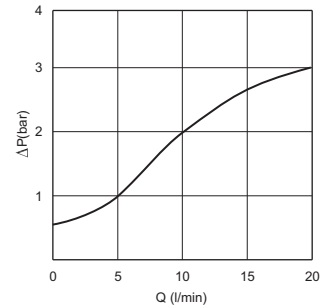
HYDRAULIC FEATURES

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

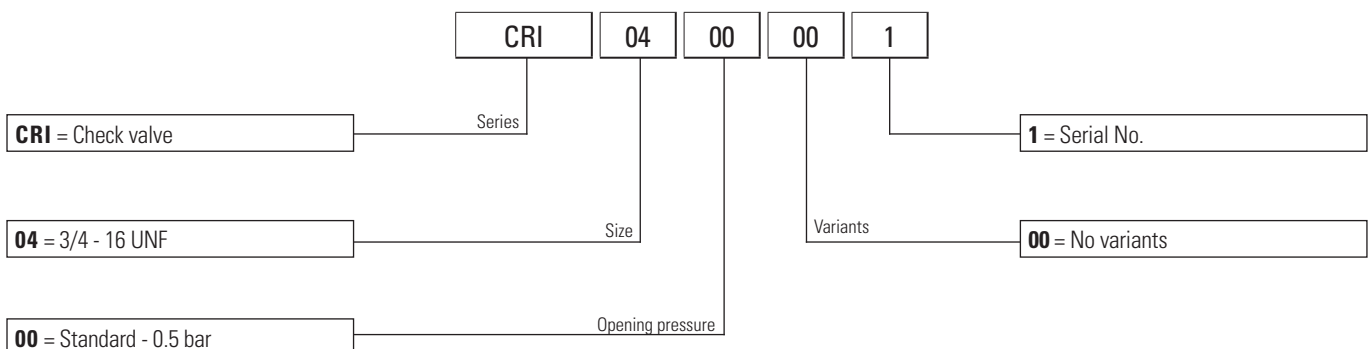


PRESSURE DROPS (P → U)

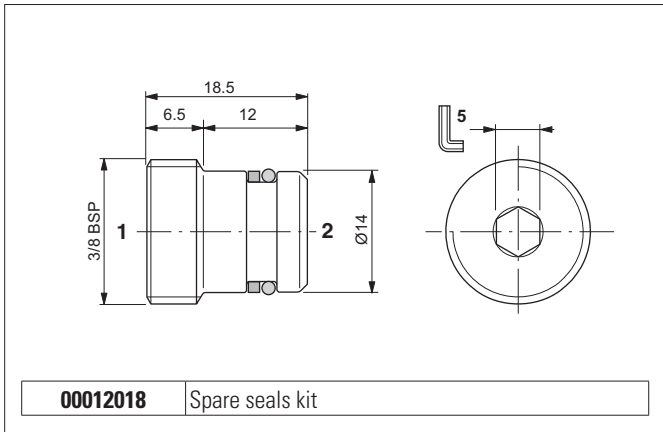


Fluid used: mineral based oil with viscosity 32 mm²/s at 50°C.

ORDERING CODE



ONE-WAY CHECK VALVES



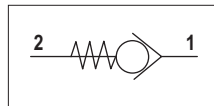
The unidirectional check valve allows oil to flow in only one direction. The guided ball seal is made of tempered and ground steel. The spring allows the valve to be mounted in any position. Steel body.

HYDRAULIC FEATURES

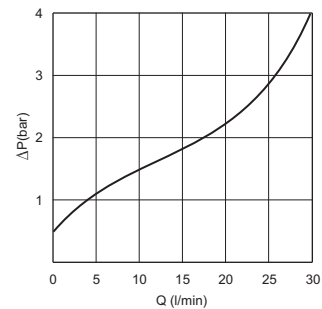
Max. working pressure	300 bar
Max. Flow	30 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm ³ /min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14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

4

HYDRAULIC SYMBOL

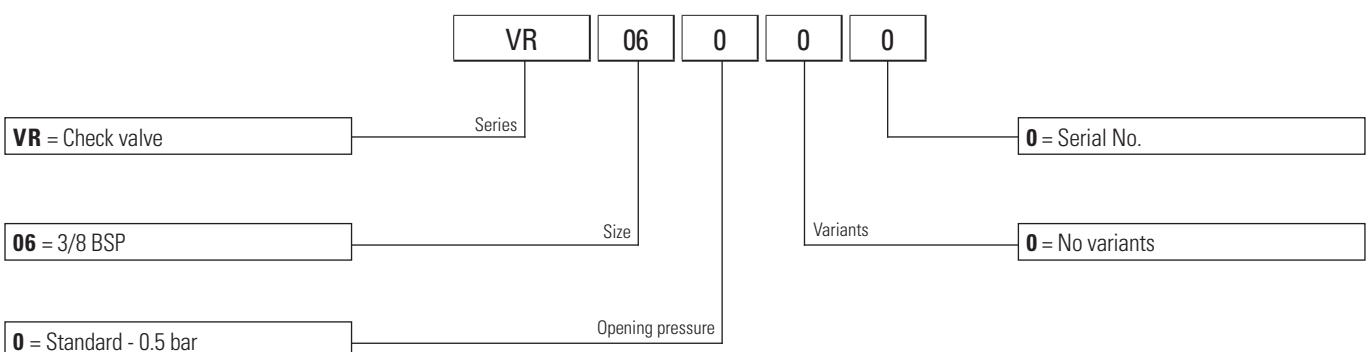


PRESSURE DROPS

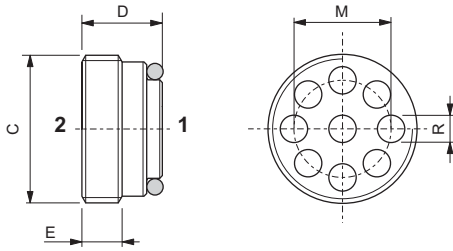


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE



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.

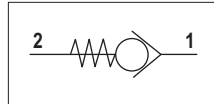
HYDRAULIC FEATURES

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

4

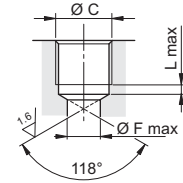
C	Flow max (l/min)	Pressure max (bar)	M (mm)	R (mm)	D (mm)	E (mm)	Tightening torque (Nm)	Weight (kg)
1/4 BSP	20	350	8.5	2.2	8.5	4.4	6	0.005
3/8 BSP	50	350	10.8	3	11.3	6	6	0.011
1/2 BSP	80	350	14.2	3.8	12.7	6.5	10	0.019

HYDRAULIC SYMBOL



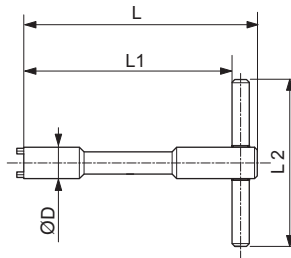
SEAL

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

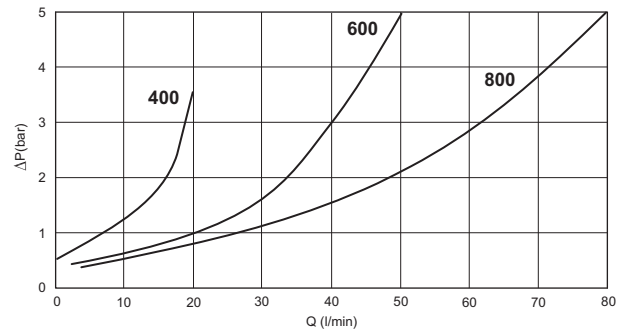


KEY FOR TIGHTENING VALVE

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

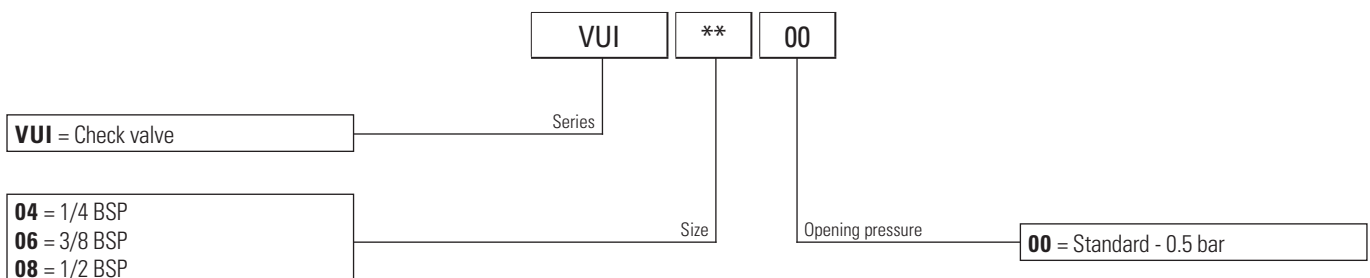


PRESSURE DROPS

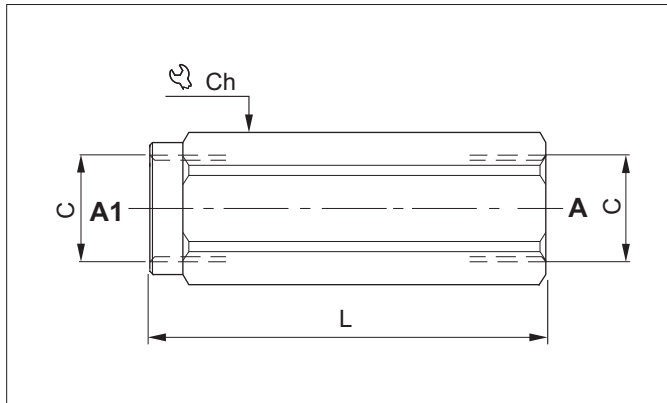


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE



ONE-WAY CHECK VALVES - IN-LINE MOUNTING



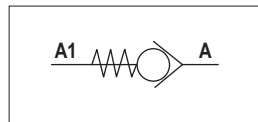
The check-valves permit one-directional oil flow only. On the opposite side the sealing is guaranteed by a hardened and ground taper steel poppet. The spring permits an easy valve installation in any position. External steel body protected on surface by a zinc plating.

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

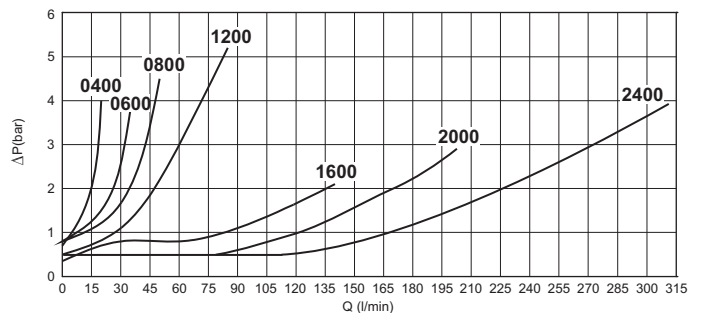
4

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 mm²/s at 40°C.

ORDERING CODE

VRU = Check valve

VRU

Series: **VRU**

Size: **04, 06, 08, 12, 16, 20, 24**

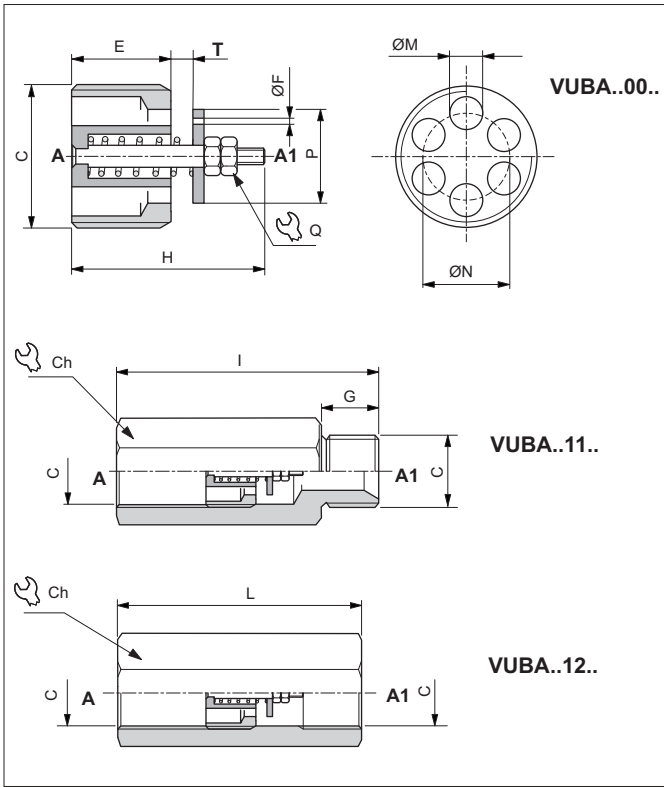
Setting pressure: **00, 02, 03, 05, 10**

CODE	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

4

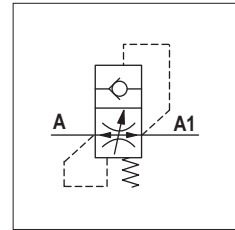


The pipe-pressure check valve is fitted directly on cylinder connections to prevent uncontrolled drops due to system faults. Supplied on request with a flow reducer hole F on the plate to enable leakage from A1 to A and allow the load to drop slowly. Steel body and plate. Seal surfaces lapped.

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

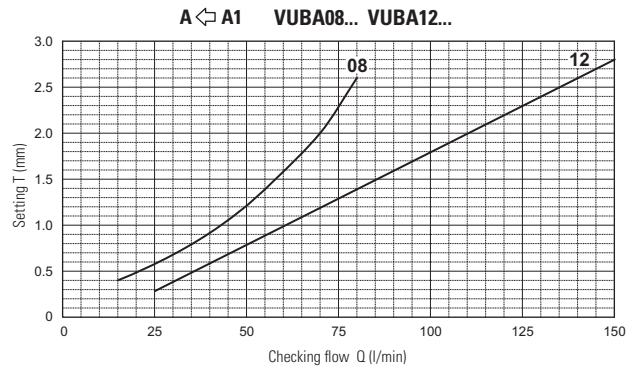
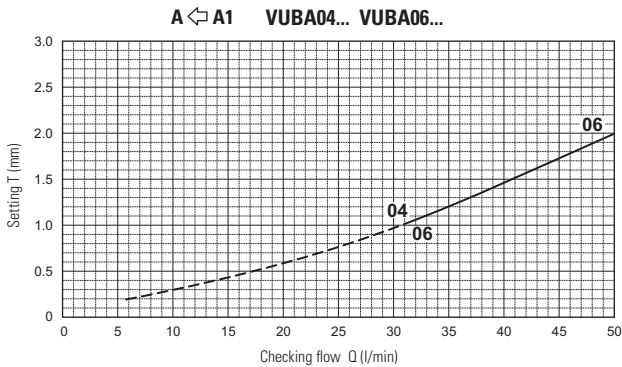
HYDRAULIC SYMBOL



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	17	30.5	104	72	6	16	18	7	0.3 ÷ 2.8	32	10	0.047	0.25	0.21

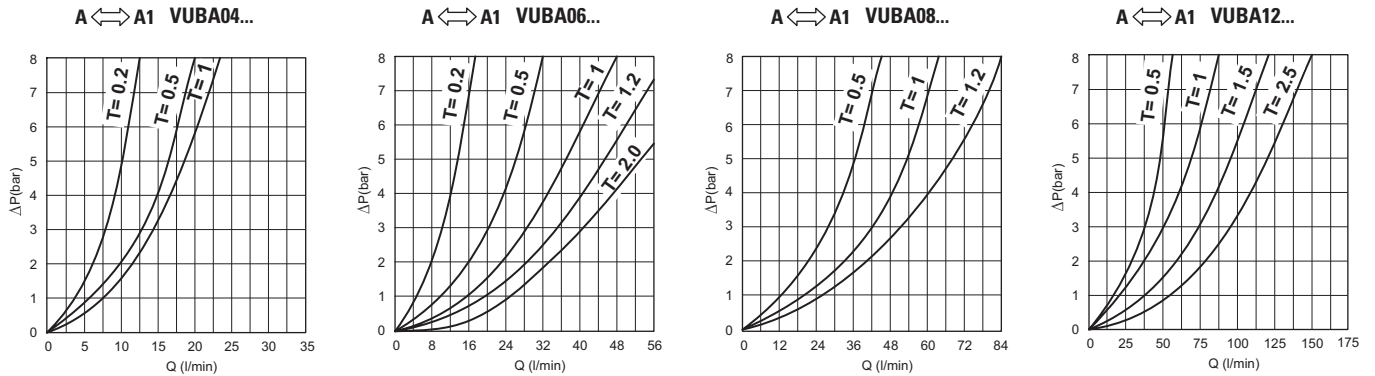
* Specify distance "T" with decimal progression. Standard distance "T" is 0.5 mm (for 1/4 and 3/8 BSP valves) and 0.7 mm (for 1/2 and 3/4 BSP valves). Response flow depends on distance "T" see "T adjustment curves".

DIAGRAMS FOR "T" ADJUSTEMENT



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 mm²/s at 40°C.

FLOW PRESSURE DROP ACCORDING ADJUSTEMENT "T"

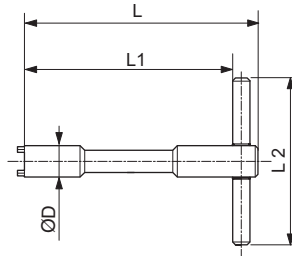


Diagrams flow pressure drop according adjustment length of "T"

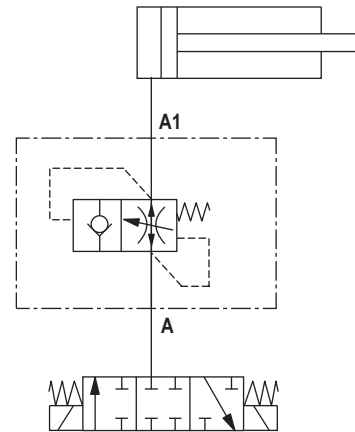
4

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

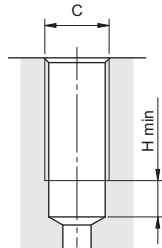


SERVICE EXAMPLE



SEAL

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



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

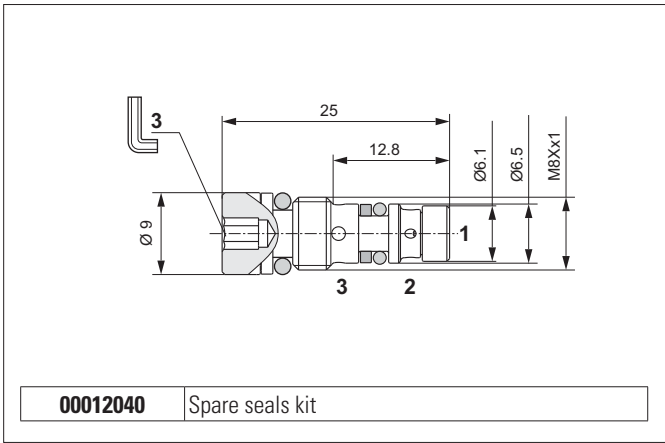
NOTE:
(1-2) Special, minimum 100 pieces.
(2) Specify distance "T" with decimal progression (e.g. T020 = 0.20 mm).

Standard, without hole (omit code)	
Special holes (1)	
05 = 0.5 (mm)	13 = 1.3 (mm)
06 = 0.6 (mm)	15 = 1.5 (mm)
08 = 0.8 (mm)	19 = 1.9 (mm)
10 = 1.0 (mm)	20 = 2.0 (mm)
12 = 1.2 (mm)	

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	

4



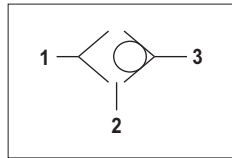
00012040 Spare seals kit

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.

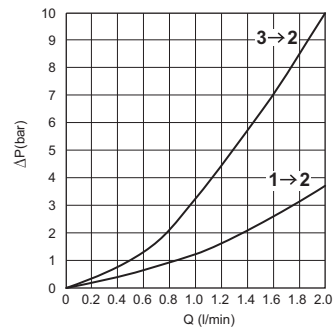
HYDRAULIC FEATURES

Max. working pressure	350 bar
Max. Flow	2 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 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	0.0065 kg
Tightening torque	16 ÷ 18 Nm
Cavity (M8 x 1)	CA007001 (See section 17)

HYDRAULIC SYMBOL

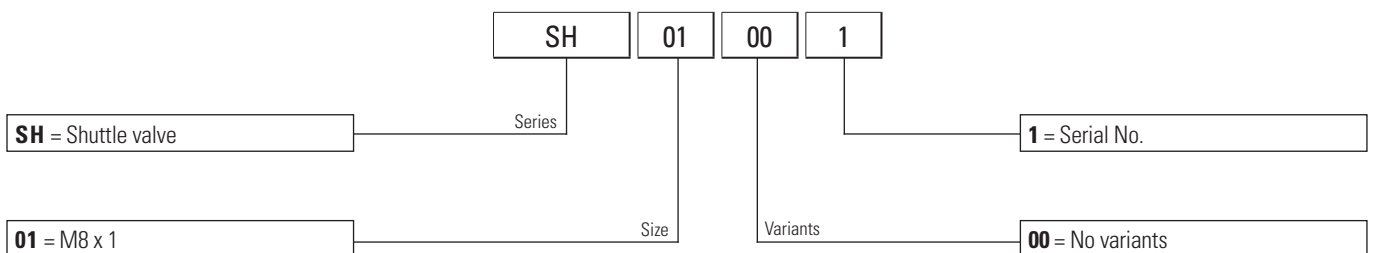


PRESSURE DROPS

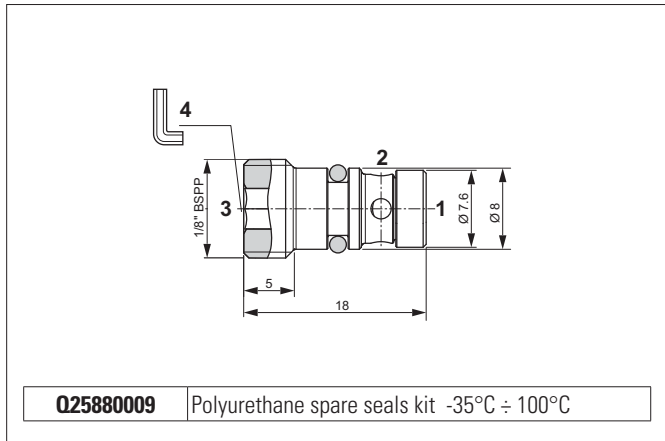


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE



SHUTTLE VALVES



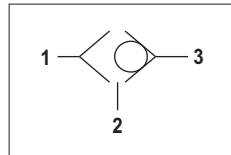
The shuttle type cartridge valves allow taking of the highest pressure signal to the external port via displacement of tempered and ground steel ball. There are usually employed to signal the actuator load to a load sensing pump pressure compensator. External steel body.

HYDRAULIC FEATURES

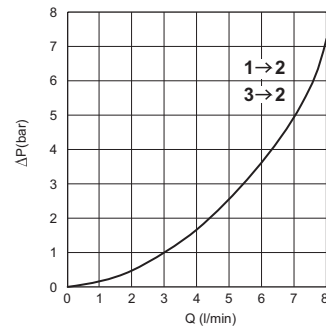
Max. working pressure	400 bar
Max. Flow	8 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.006 kg
Tightening torque	16 ÷ 18 Nm
Cavity (G 1/8)	CG001002 (See section 17)

4

HYDRAULIC SYMBOL

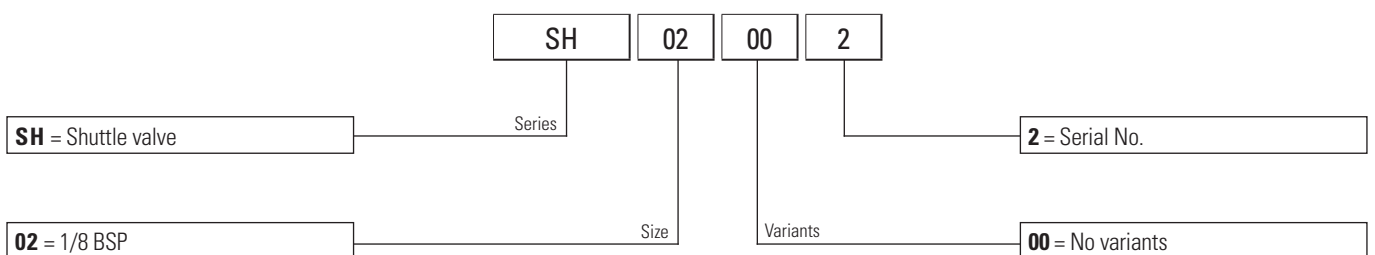


PRESSURE DROPS



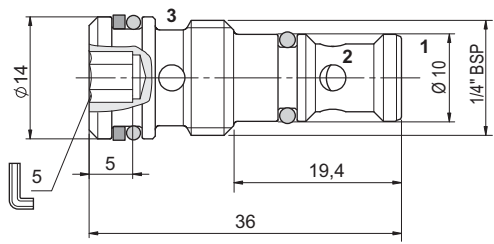
Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

ORDERING CODE



SHUTTLE VALVES

4



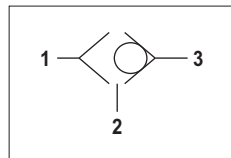
00012019 Spare seals kit

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.

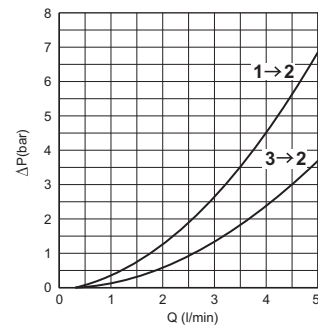
HYDRAULIC FEATURES

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

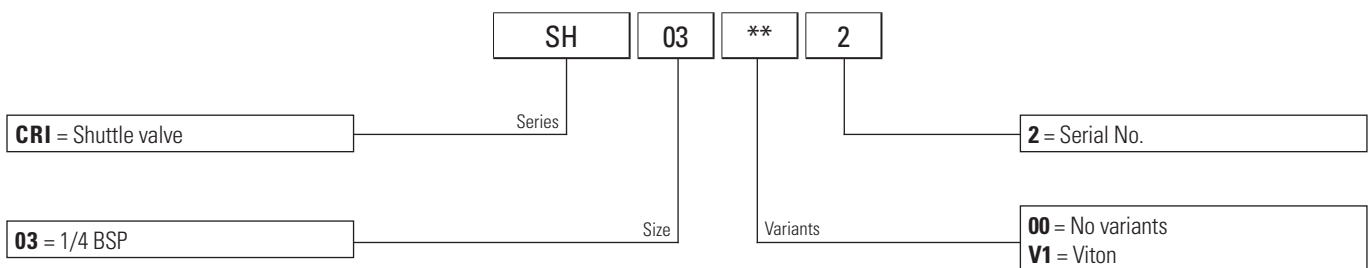


PRESSURE DROPS

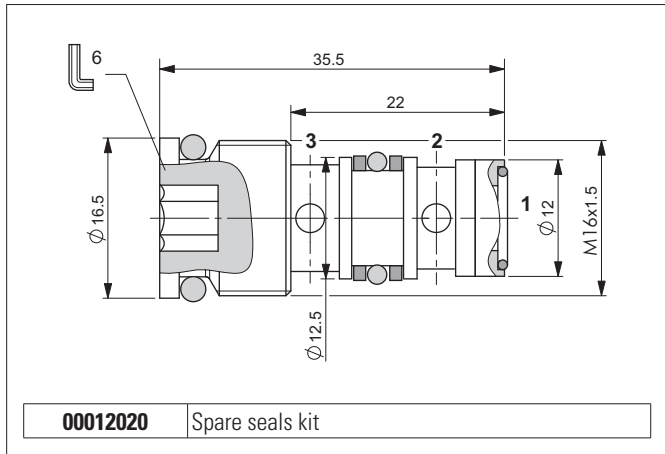


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

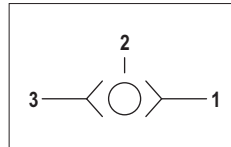
ORDERING CODE



SHUTTLE VALVES



HYDRAULIC SYMBOL



ORDERING CODE

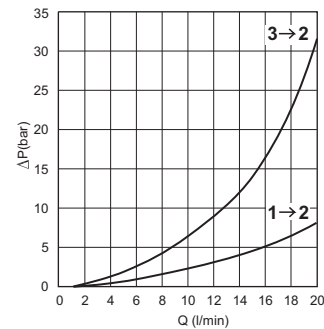
Code	Type
RVLV0101160	Shuttle valve

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

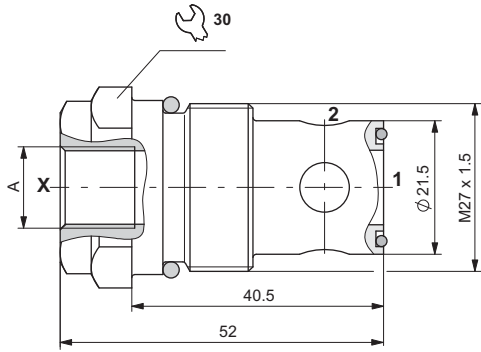
Max. working pressure	380 bar
Max. Flow	10 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm ³ /min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14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

PRESSURE DROPS



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

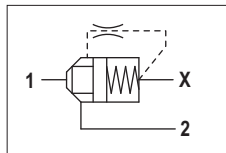
PUMP UNLOADING VALVES



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

00012021 Spare seals kit

HYDRAULIC SYMBOL



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.

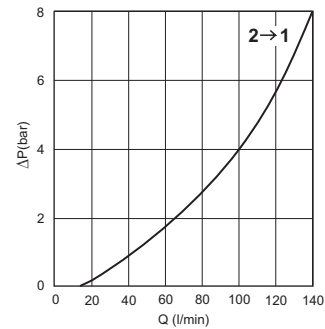
HYDRAULIC FEATURES

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

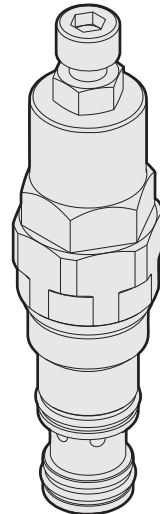
Code	Type
RVLV1202270	Pump unloading valve (A = 1/4 BSP)
RVLV12021S0	Pump unloading valve (A = SAE 7/16 20UNF)

PRESSURE DROPS

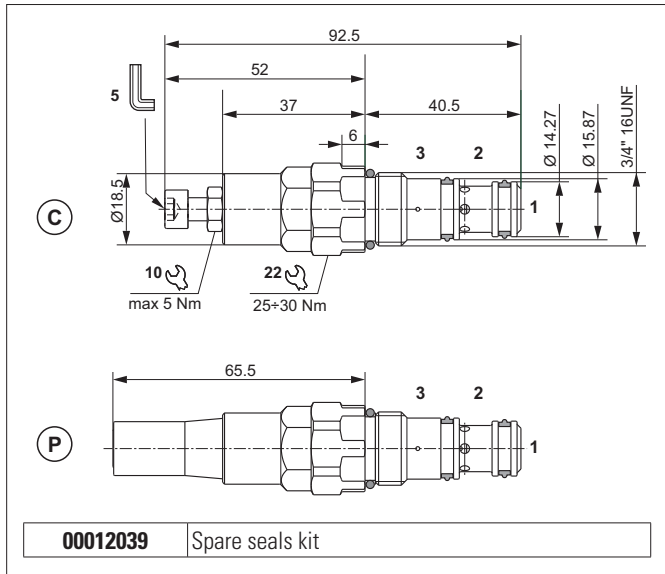


Fluid used: mineral based oil with viscosity
46 mm²/s at 40°C.

OVERCENTER VALVES



DIRECT ACTING OVERCENTER VALVES



Counterbalance valves direct acting control the movement and the hold of an hydraulic actuator, for example a cylinder or a motor.

During the movement upward of the load the flow moves free in direction 2 → 1 through the check valve, and when the flow from the pump stop, the valve permits the stop of the movement (flow direction 1 → 2) limiting shocks generated by system inertia (antishock function).

The controlled movement downward of the load is obtained when the valves are both supplied with flow 1 → 2, (coming from the actuator) and on pilot port 3 (coming from the pump), that is also connected to the other port of the actuator restoring the constant filling to avoid cavitation. The valves are sensible to pressure on port 2.

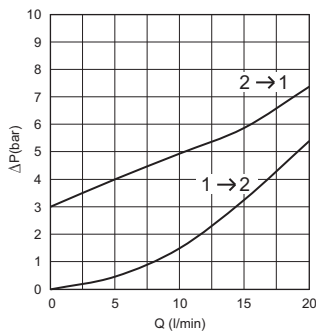
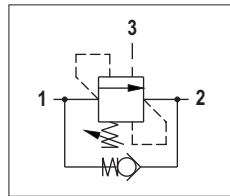
The valves are equipped with a mechanical end stroke that avoids the compression of the spring till solid block. The body is made of steel zinc coated, and the tapered spool is made of steel tempered and grinded.

5

HYDRAULIC FEATURES

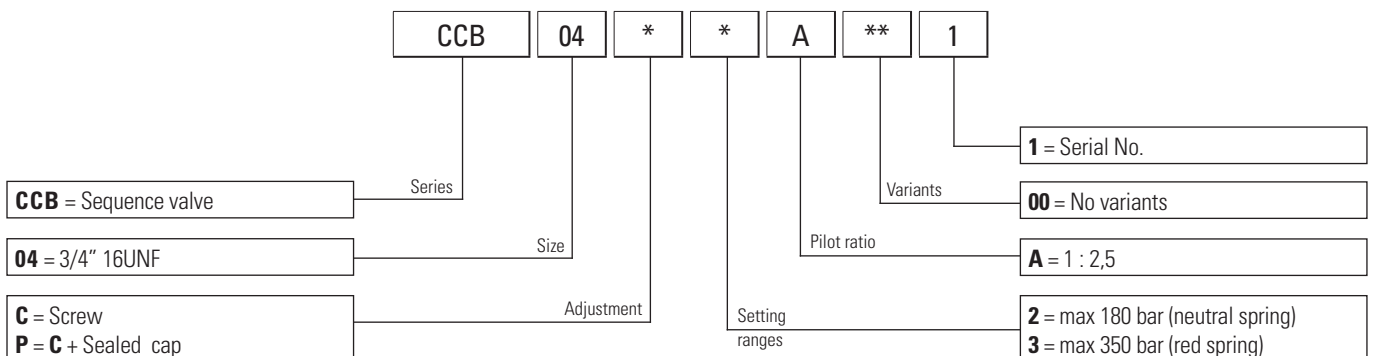
Max. pressure	350 bar
Setting range: Spring 2 (neutral) Spring 3 (red)	max 180 bar max 350 bar
Pressure one-way check valve 2 → 1	3 bar
Valve leakage at 70% of pressure setting (0 ÷ 10 drops/min)	0 ÷ 0.5 cm ³ /min
Max. Flow	20 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /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	0.14 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4" 16UNF)	C018003 (See section 17)

HYDRAULIC SYMBOL

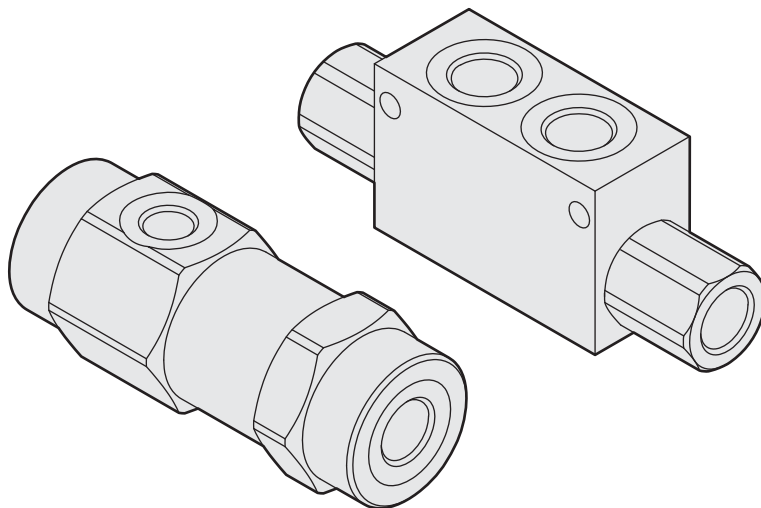


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

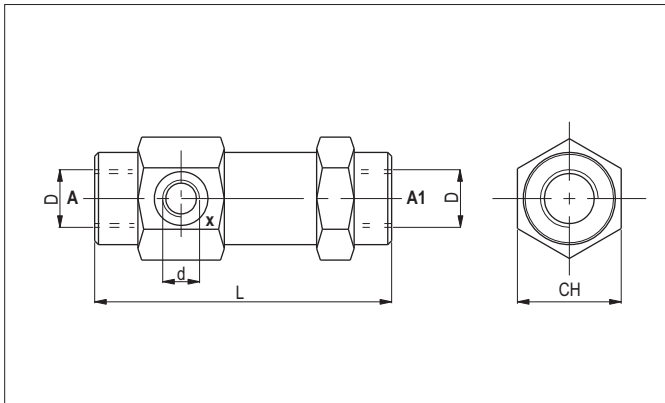
ORDERING CODE



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.

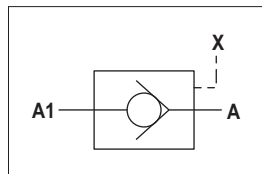
6

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

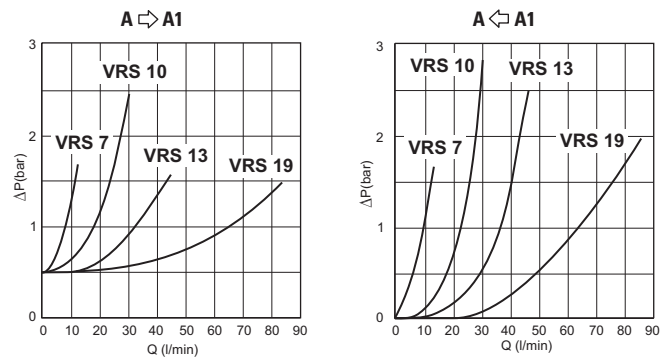
HYDRAULIC FEATURES

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

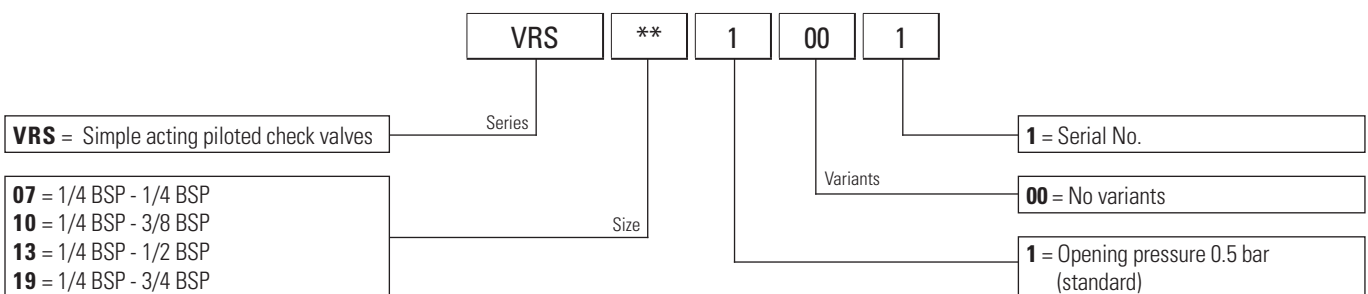


PRESSURE DROPS - FLOW

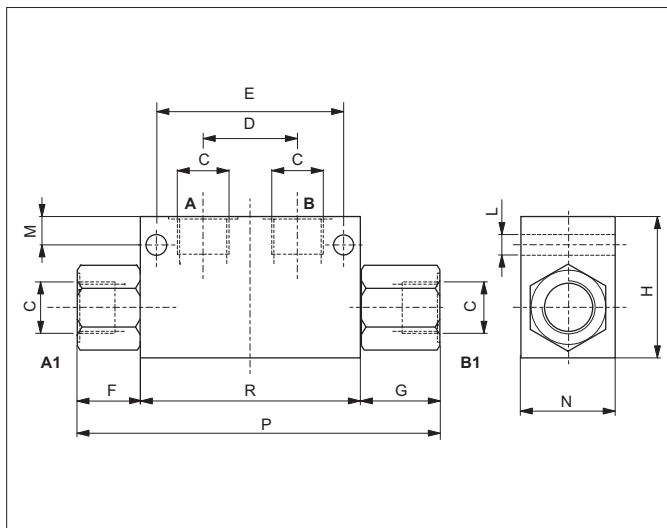


Fluid used: mineral based oil with viscosity 24 mm²/s at 50°C.

ORDERING CODE



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.

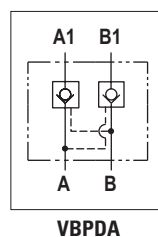
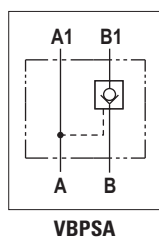
HYDRAULIC FEATURES

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

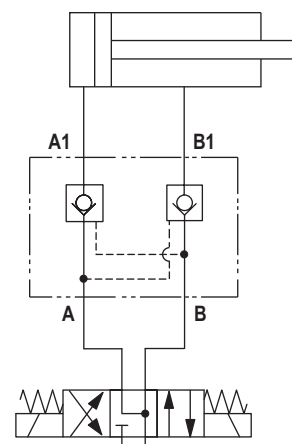
6

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

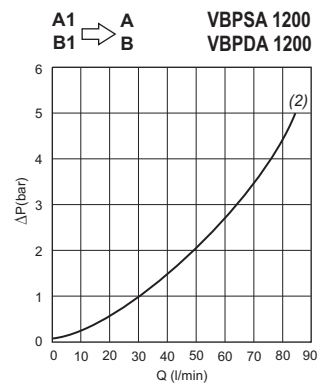
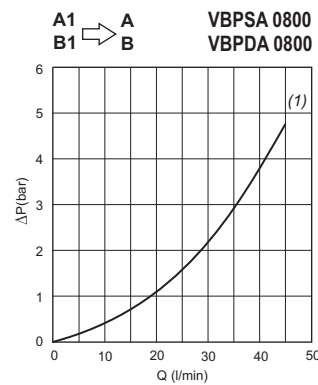
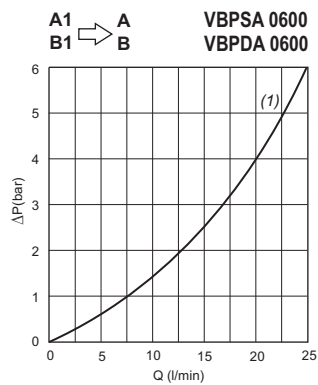
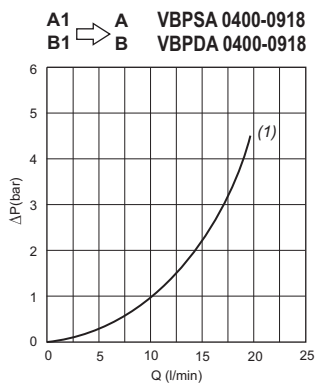
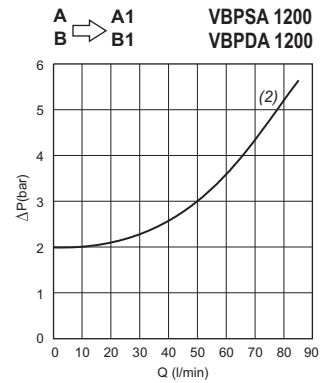
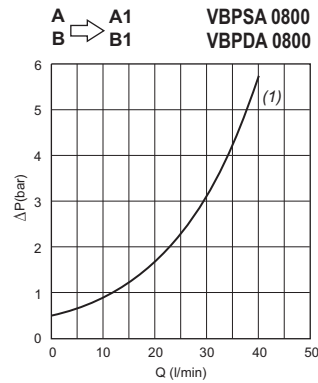
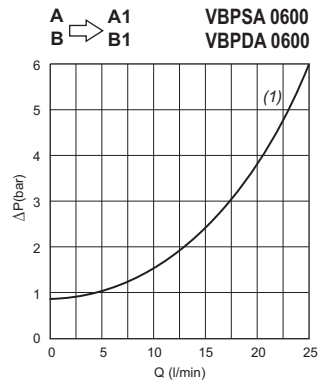
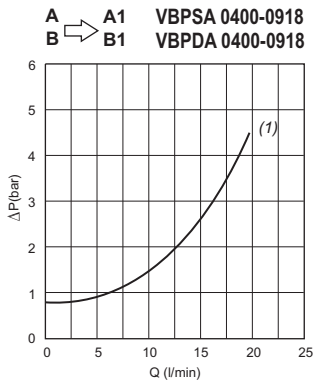


SERVICE EXAMPLE



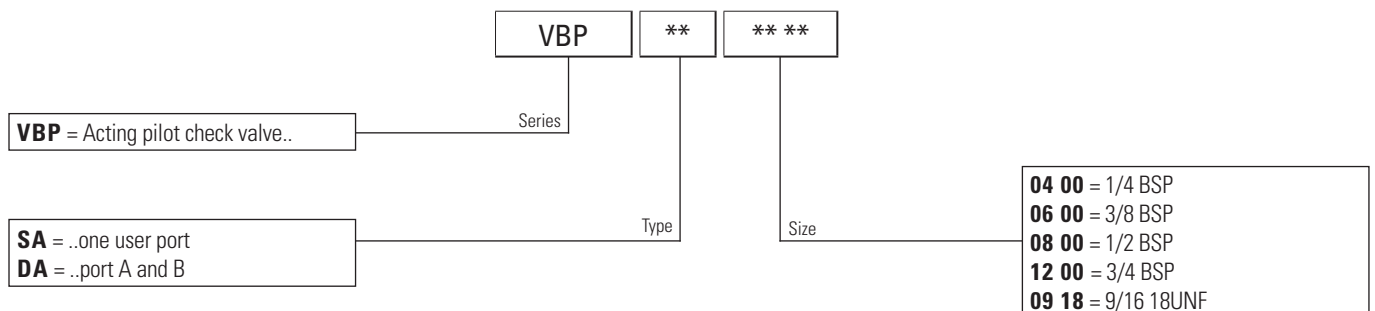
PRESSURE DROPS

6

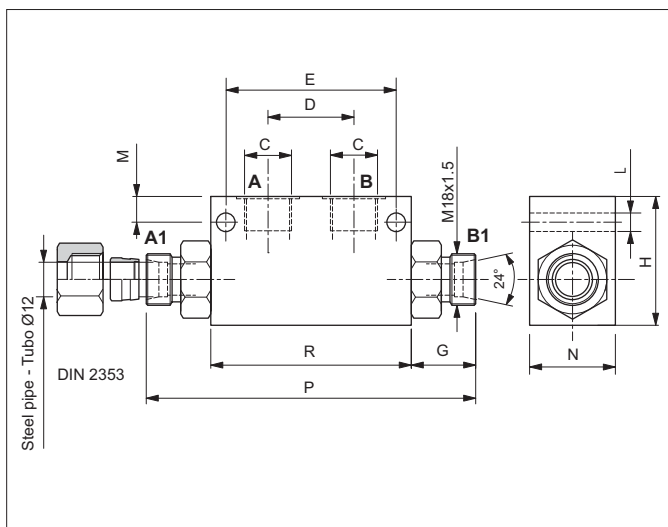


(1) Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.
 (2) Fluid used: mineral based oil with viscosity 24 mm²/s at 50°C.

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.

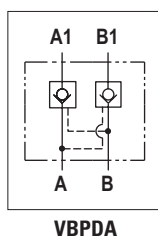
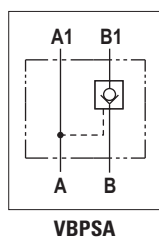
HYDRAULIC FEATURES

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

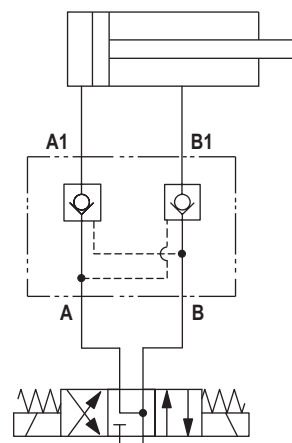
6

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

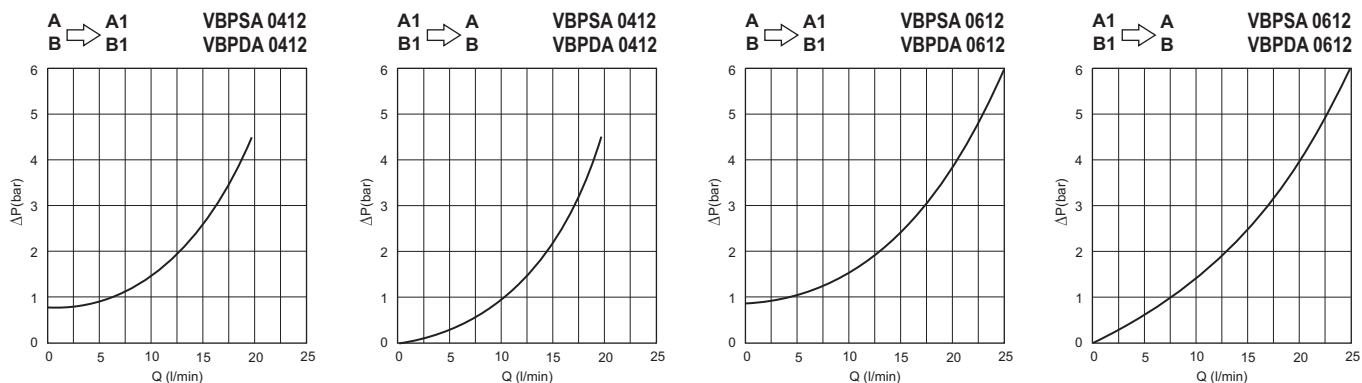
HYDRAULIC SYMBOLS



SERVICE EXAMPLE



PRESSURE DROPS



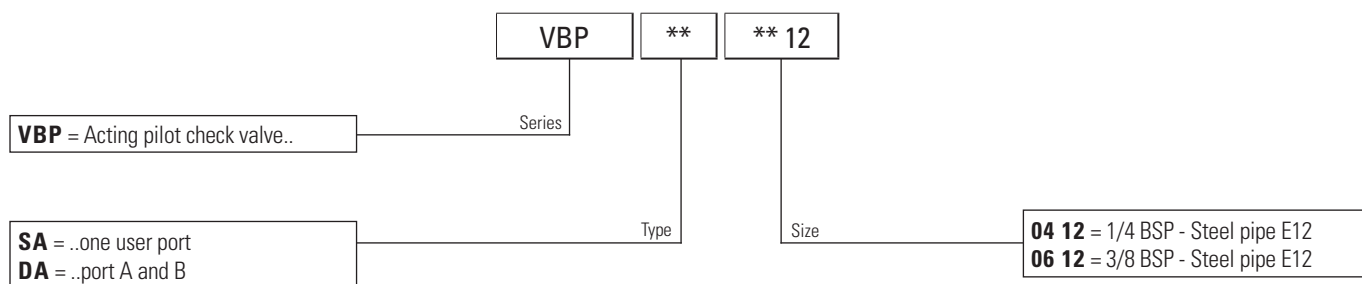
Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.

6

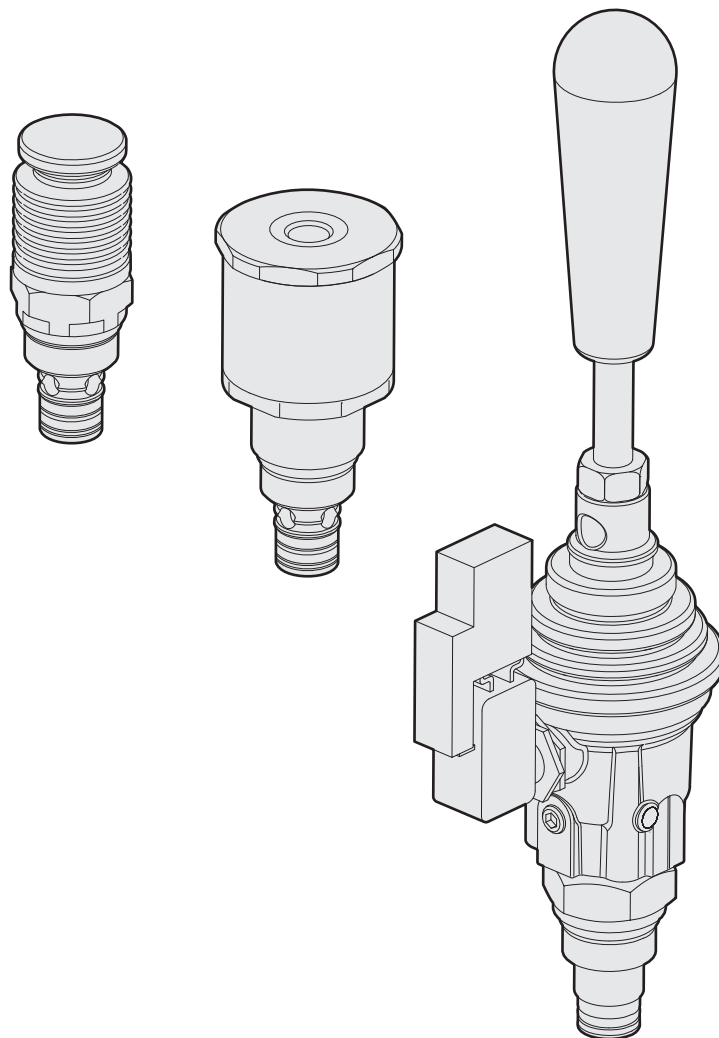
ACCESSORIES AND SPARE PARTS

	<p>Q51435044</p>	<p>Copper Washer</p>		<p>OD050612L</p>	<p>DIN Banjo</p>
	<p>RF05060000</p>	<p>Hollow screw</p>		<p>1: E341L12 2: E342L12</p>	<p>Nut (spare) Cutting ring (spare)</p>
	<p>OT0506T12</p>	<p>Banjo</p>		<p>Assembly example with steel pipe Ø 12 mm DIN 2353</p>	

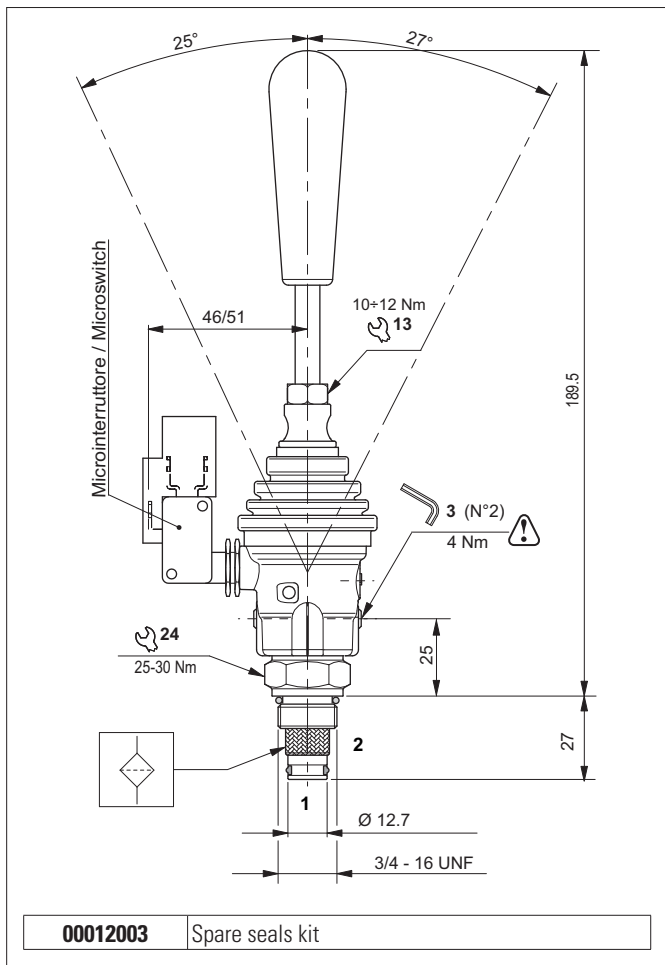
ORDERING CODE



MANUAL AND PNEUMATIC OPERATED VALVES



LEVER OPERATED VALVES



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.

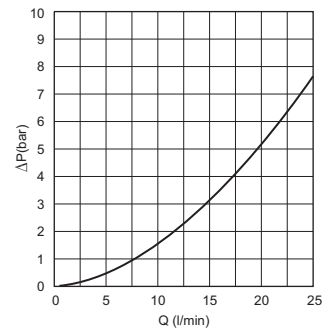
HYDRAULIC FEATURES

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

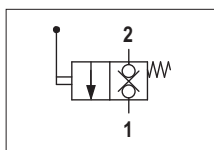
Mechanical life endurance at 250 Vac	10A (1E4) - 5A (5E4)
Protection degree with connector	IP40

PRESSURE DROPS (With valve completely open)

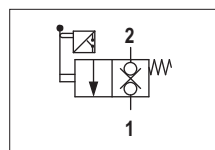


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

HYDRAULIC SYMBOLS

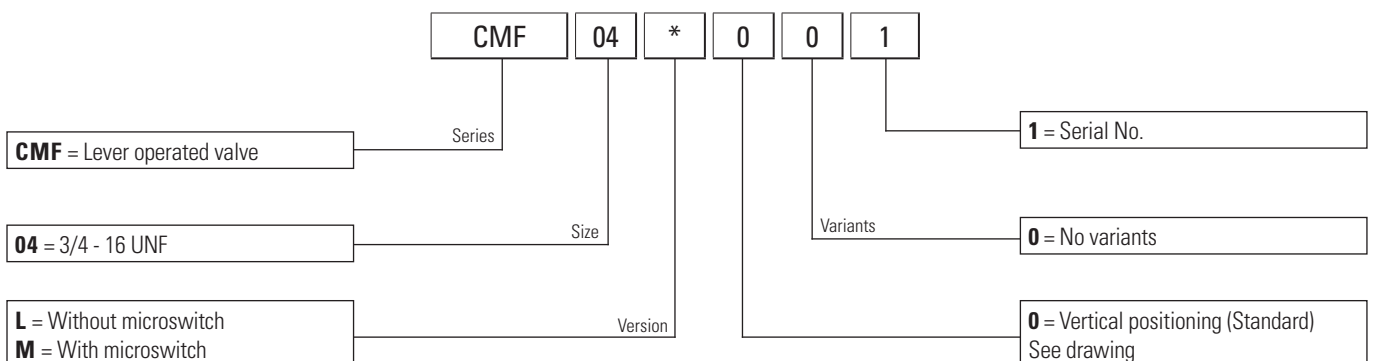


CMF04L
Without microswitch

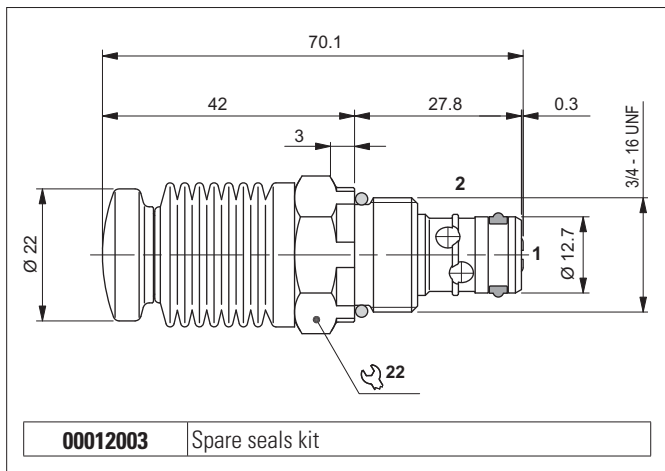


CMF04M
With microswitch

ORDERING CODE



BUTTON OPERATED VALVES

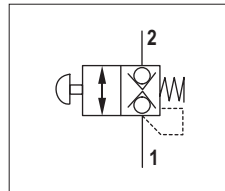


The direct acting, normally closed 2-way 2 position directional valve with manual control is used for emergencies. It is opened by pressing the button. The bi-directional tapered poppet is in tempered and ground steel. The valve body is in galvanised steel.

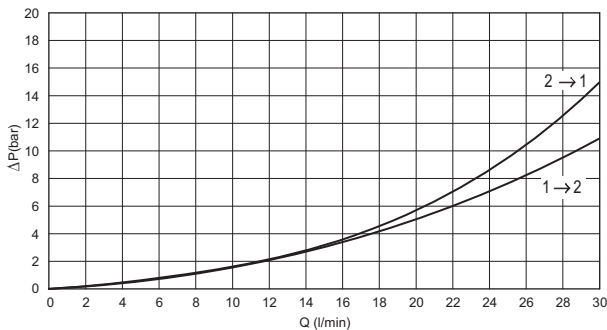
HYDRAULIC FEATURES

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

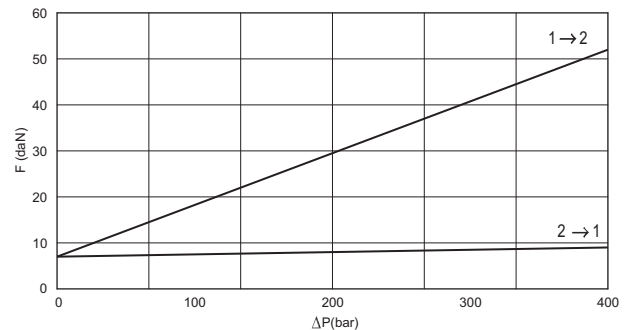


PRESSURE DROPS



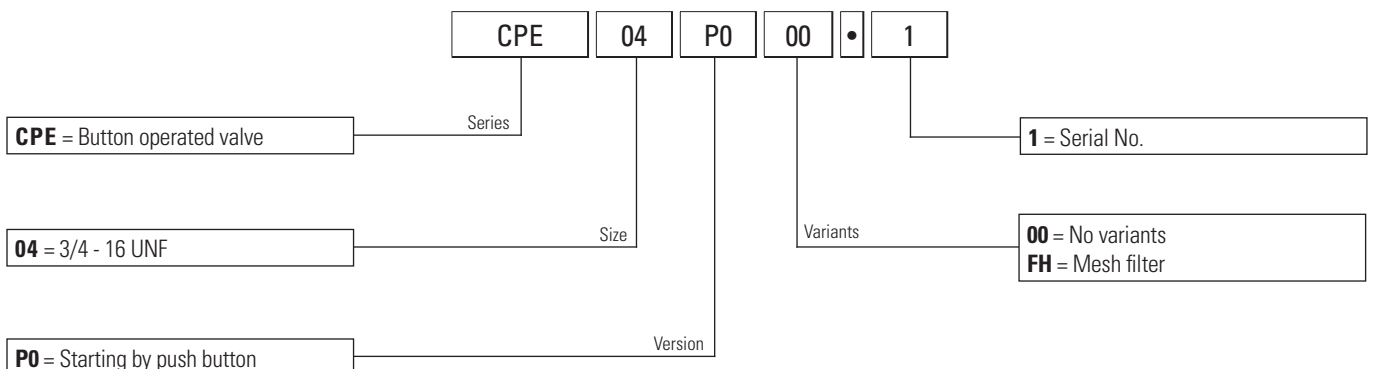
Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

OPERAT. FORCE ON THE PUSH BUTTON

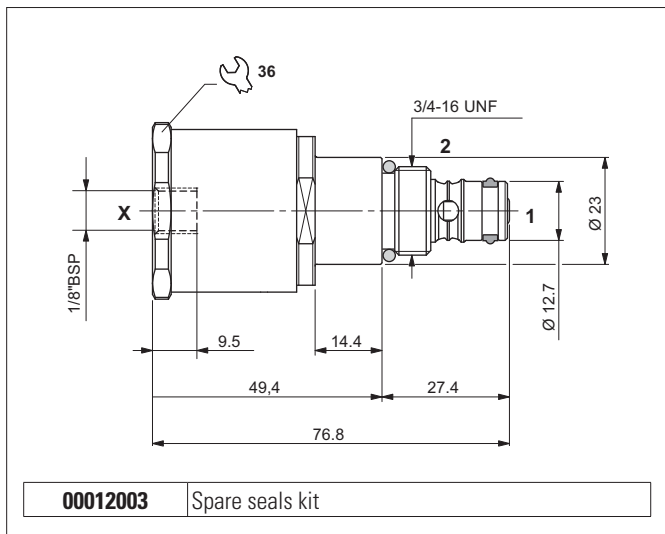


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE



PNEUMATIC OPERATED VALVES



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.

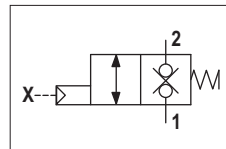
The bi-directional tapered poppet is in tempered and ground steel, released when the pilot branch X is connected to a pneumatic pressure signal. The valve body is in galvanised steel.

HYDRAULIC FEATURES

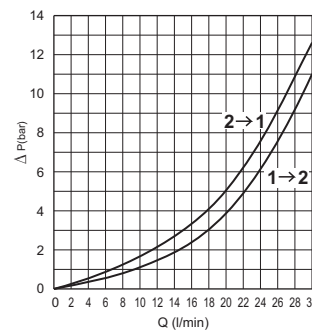
Max. working pressure	250 bar
Min. piloting pressure 1 → 2	5.5 bar
Min. piloting pressure 2 → 1	3.5 bar
Max. piloting pressure	20 bar
Max. Flow	30 l/min
Max. Leakage (0 ÷ 20 drops/min)	0 ÷ 1 cm ³ /min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
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)

7

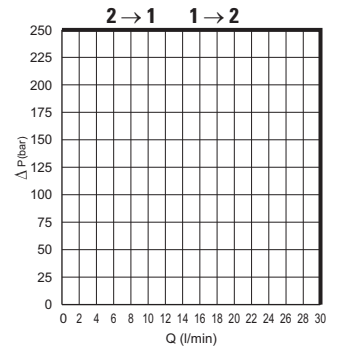
HYDRAULIC SYMBOL



PRESSURE DROPS

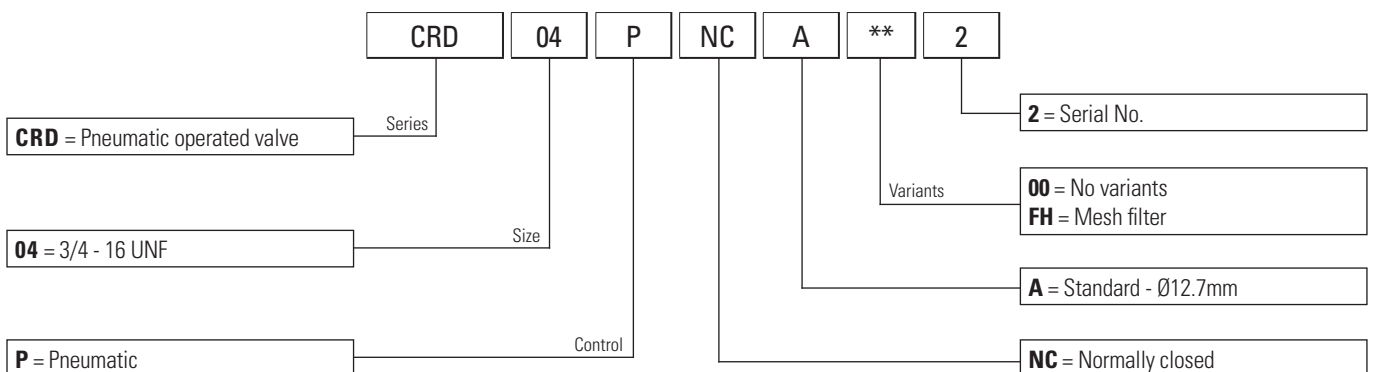


LIMITS OF USE

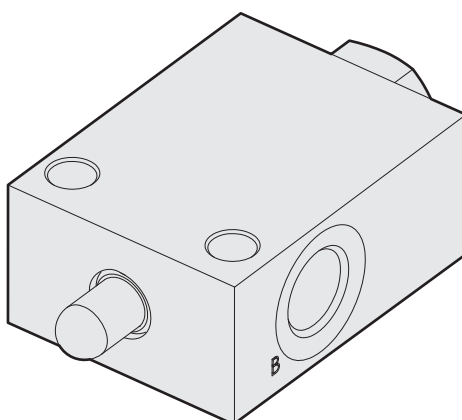


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

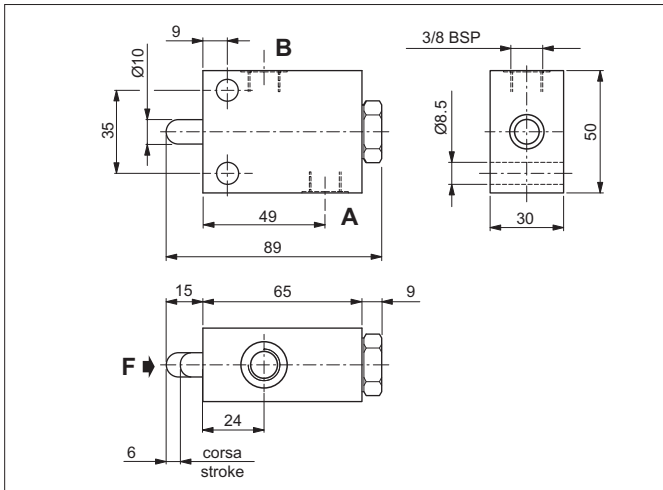
ORDERING CODE



END-OFF STROKE VALVES



END-OFF STROKE VALVES - IN-LINE MOUNTING



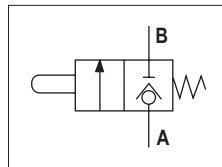
The direct acting normally closed 2-way 2-position directional valve with manual control is fitted on a branch to release the pressure; a pusher enables the fluid to pass through the valve from A to B. Tapered poppet is in tempered and ground steel. The valve body is in galvanised steel.

HYDRAULIC FEATURES

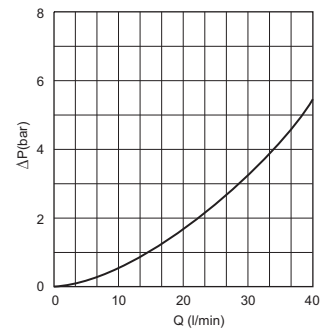
Max. working pressure	300 bar
Max. Flow	40 l/min
Max. Leakage (0 ÷ 5 drops/min)	0 ÷ 0.25 cm ³ /min
Max. mechanical push force (F) required at 300 bar	240 daN
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin.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

8

HYDRAULIC SYMBOL

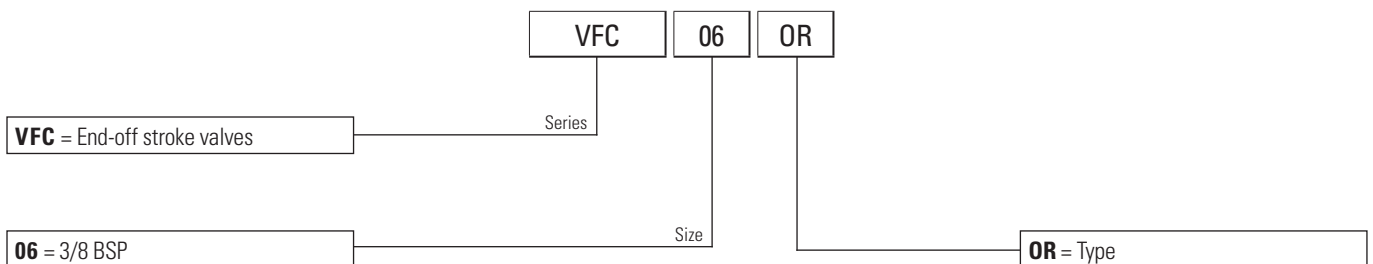


PRESSURE DROPS

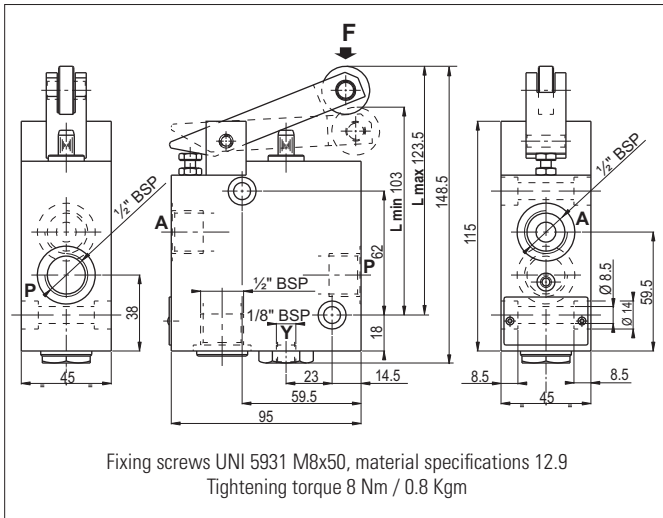


Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.

ORDERING CODE



DECELERATION VALVES - IN-LINE MOUNTING

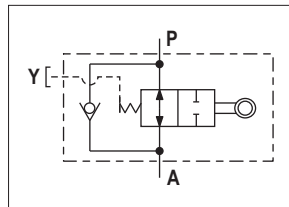


These valves are used as cam controlled unidirectional flow regulators. Normally mounted in line between actuator and directional valve for the displacement of carriages or slides, they enable cam controlled acceleration or deceleration of the moving mass. A special internal check valve allows free flow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

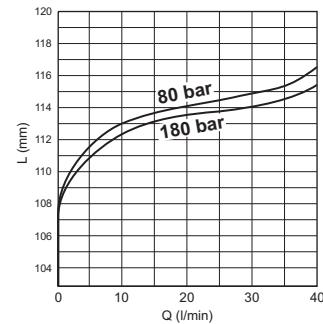
HYDRAULIC FEATURES

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

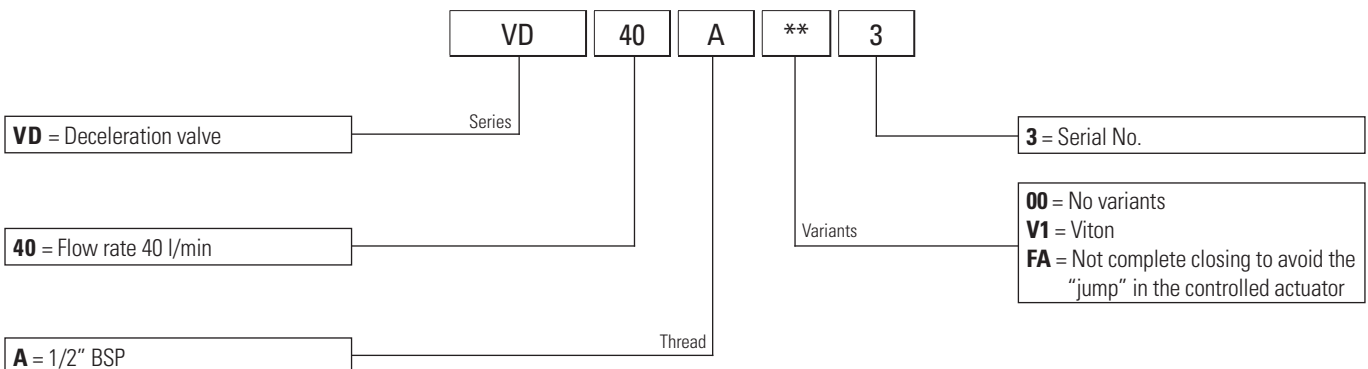
HYDRAULIC SYMBOL



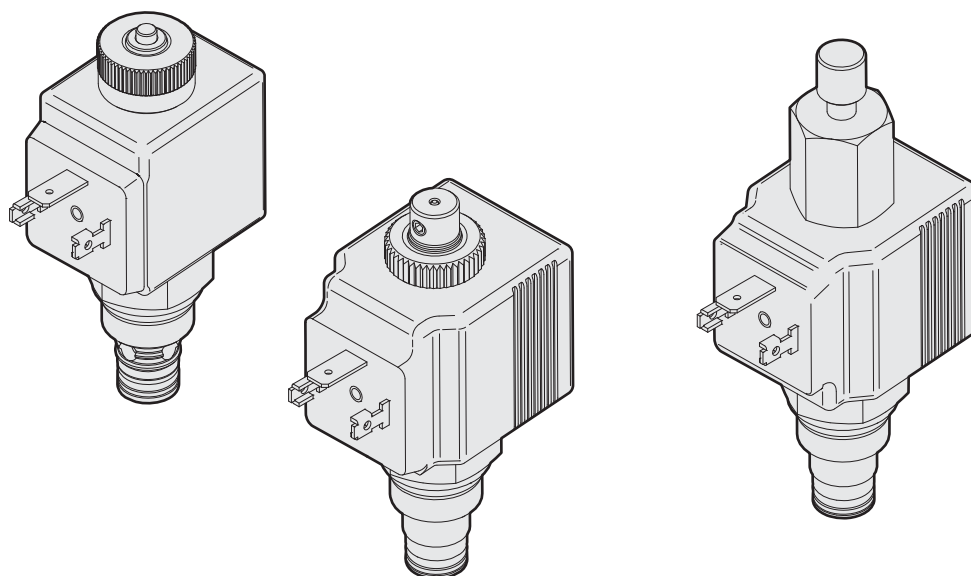
FLOW RATE / Lmin-Lmax



ORDERING CODE



SOLENOID VALVES 2-WAY



PILOTED OPERATED SOLENOID VALVE

Emergency (NC)

2.3 Corsa (Stroke)

CRP 04 18..
Cavity type "A"

Variants (NA)

19 max 7 Nm

3.3 Corsa (Stroke)

38.2 max

2.3 Corsa (Stroke)

max 7 Nm

29.5

Removable cup

2.3 Corsa (Stroke)

max 7 Nm

27

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.

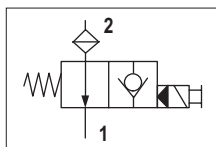
Valve	Free passage	Coil	Type
CRP..NA	2 → 1	DE-ENERGISED	Unidirectional
CRP..NC	2 → 1 1 → 2	ENERGISED DE-ENERGISED	
CRB..NA	1 → 2 2 → 1	DE-ENERGISED	Bidirectional
CRB..NC	1 → 2 2 → 1	ENERGISED / DE-ENERGISED ENERGISED	

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 nickel coated.

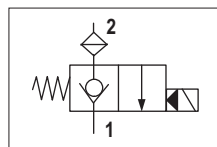
FEATURES

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	7 Nm
Emergency tightening torque	
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)

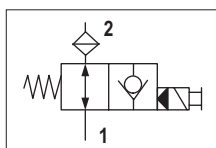
HYDRAULIC SYMBOLS



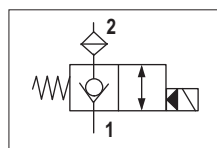
CRP - Normally open



CRP - Normally closed



CRB - Normally open

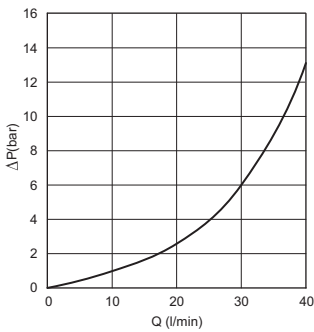


CRB - Normally closed

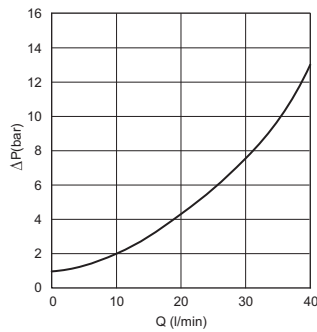
PRESSURE DROPS

LIMITS OF USE

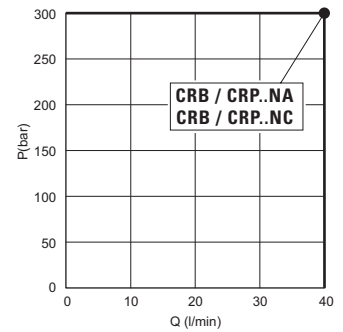
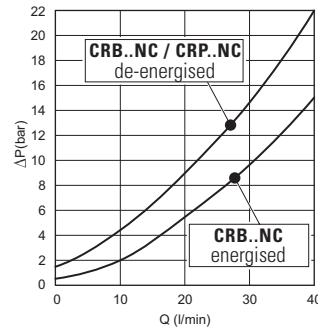
CRB..NA (1 → 2 2 → 1)
CRP..NA (2 → 1)



CRB..NC (2 → 1)
CRP..NC (2 → 1)



CRB..NC (1 → 2)
CRP..NC (1 → 2)



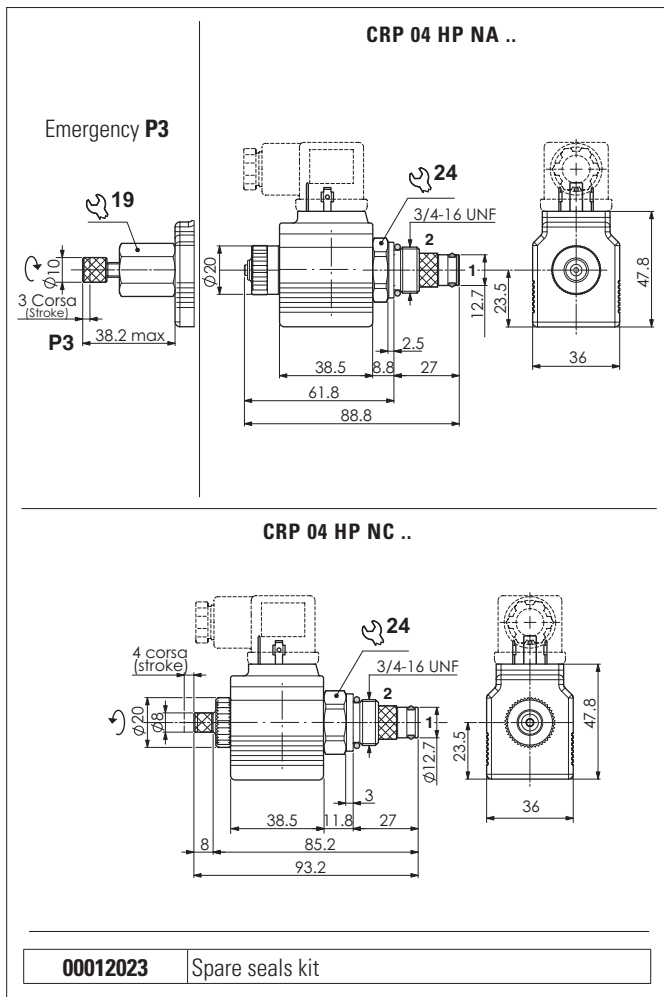
The tests were carried out with the solenoids at operating temperature, with a supply voltage 10% below nominal value and with a 40°C fluid temperature. The fluid used is a mineral oil with viscosity of 46 mm²/s at 40°C.

ORDERING CODE

	CR*	04	18	**	*	*	*	**	*																
	Series	Size	Coil	Version	Seat size	Version	Voltage	Variants																	
<p>CRB = Piloted solenoid valve bidirectional</p> <p>CRP = Piloted solenoid valve unidirectional</p>		<p>04 = 3/4 - 16 UNF</p>	<p>18 = 18W dc (NA-NC) - C30</p>	<p>NA = Normally open (solo con bobine DC o RAC)</p> <p>NC = Normally closed</p>	<p>A = Standard - Ø 12.7 mm</p> <p>B = With reduction - Ø 15.9 mm</p>	<p>S = Without emergency (NC)</p> <p>E = With emergency (NA-NC)</p>		<p>00 = No variants</p> <p>P4 = Push button Emergency with removable protection (..NA)</p> <p>P3 = Rotary Emergency (..NA)</p> <p>E9 = Push button Emergency direct control (..NA)</p> <p>SF = Without cartridge filter</p> <p>FK = With flying leads 600 mm (1)</p> <p>CX = Deutsch connection with bidirectional diode (2)</p> <p><i>Connector to be ordered separately, see sect. 20</i></p>	<p>1 = CRB - Serial No.</p> <p>3 = CRP - Serial No.</p>																
								<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">DC 18W (C30)</th> <th style="text-align: left;">AC 18W (C30) (7)</th> </tr> </thead> <tbody> <tr> <td>L = 12 VDC</td> <td>A = 24 VAC 50 Hz</td> </tr> <tr> <td>M = 24 VDC</td> <td>J = 115 VAC 50 Hz</td> </tr> <tr> <td>N = 48 VDC</td> <td>I = 230 VAC 50 Hz</td> </tr> <tr> <td>2 = 21.6 VDC RAC (3)</td> <td>F = 24 VAC 60 Hz</td> </tr> <tr> <td>Z = 102 VDC RAC (4)</td> <td>C = 110 VAC 60 Hz</td> </tr> <tr> <td>X = 205 VDC RAC (5)</td> <td>D = 220 VAC 60 Hz</td> </tr> <tr> <td>W = Without coil (6)</td> <td>K = Without coil (6-8)</td> </tr> </tbody> </table> <p><i>Coils technical data, see sect. 19</i></p>	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)	
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)																								

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

HIGH PRESSURE PILOTED OPERATED SOLENOID VALVE



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.

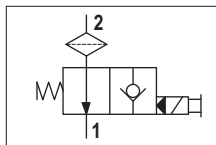
The valves work with DC coils whereas RAC coils with a connector with incorporated rectifier must be used for AC applications.

The sleeve is in galvanised steel.

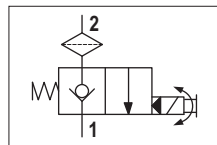
FEATURES

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



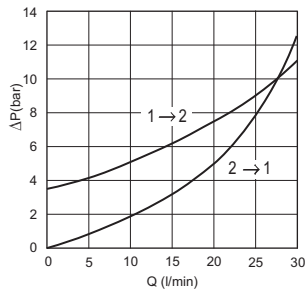
Normally open



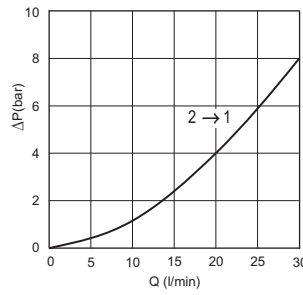
Normally closed

PRESSURE DROPS

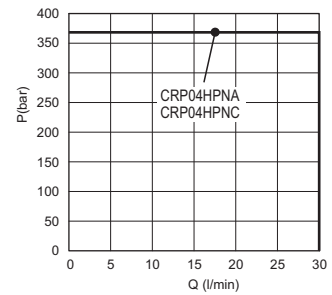
CRP 04 HP NC.



CRP 04 HP NA.



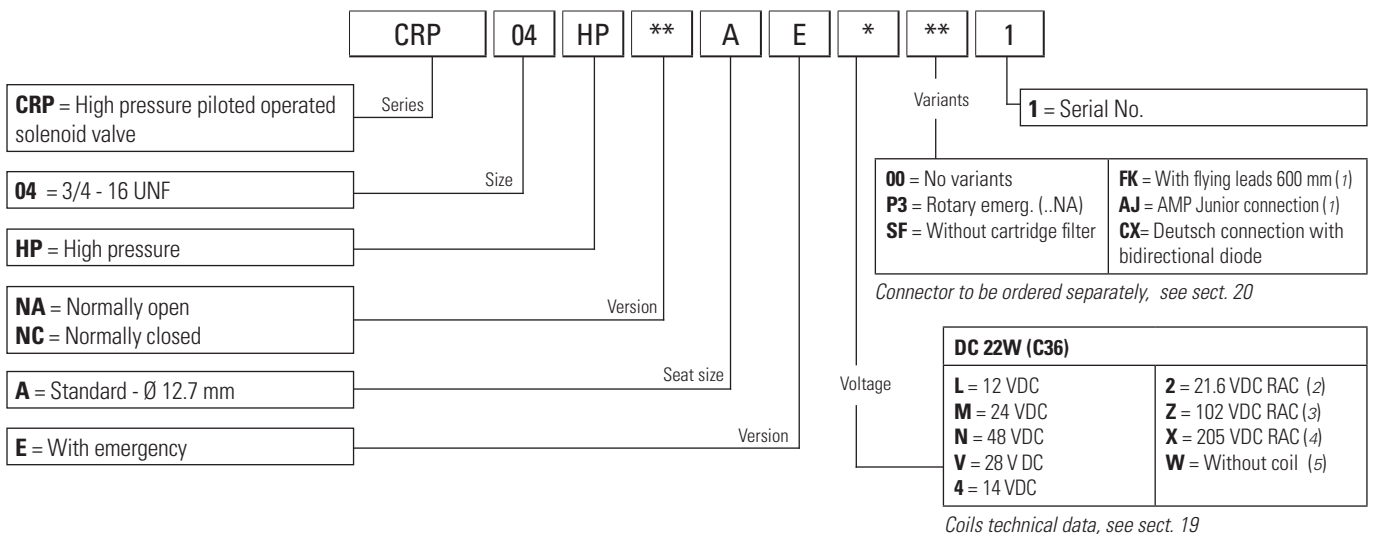
LIMITS OF USE



1 → 2 Only with coil not energised

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.

ORDERING CODE

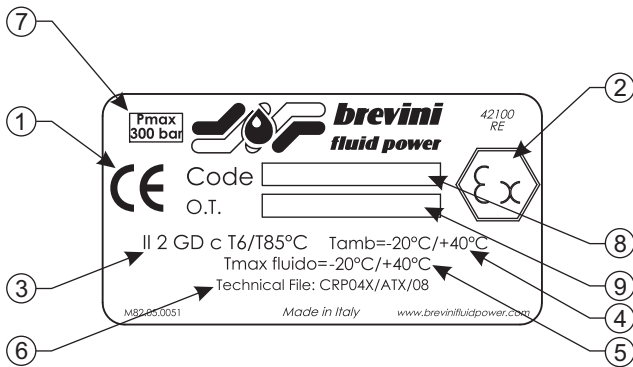




(1) Only voltages 12 VDC - 24 VDC (2) With rectifier: 24 VAC/50-60Hz (3) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz	(4) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz (5) Performance are guaranteed only using valves completed with BFP coil
--	---

REGISTERED MARK AND IDENTIFICATION PLATE

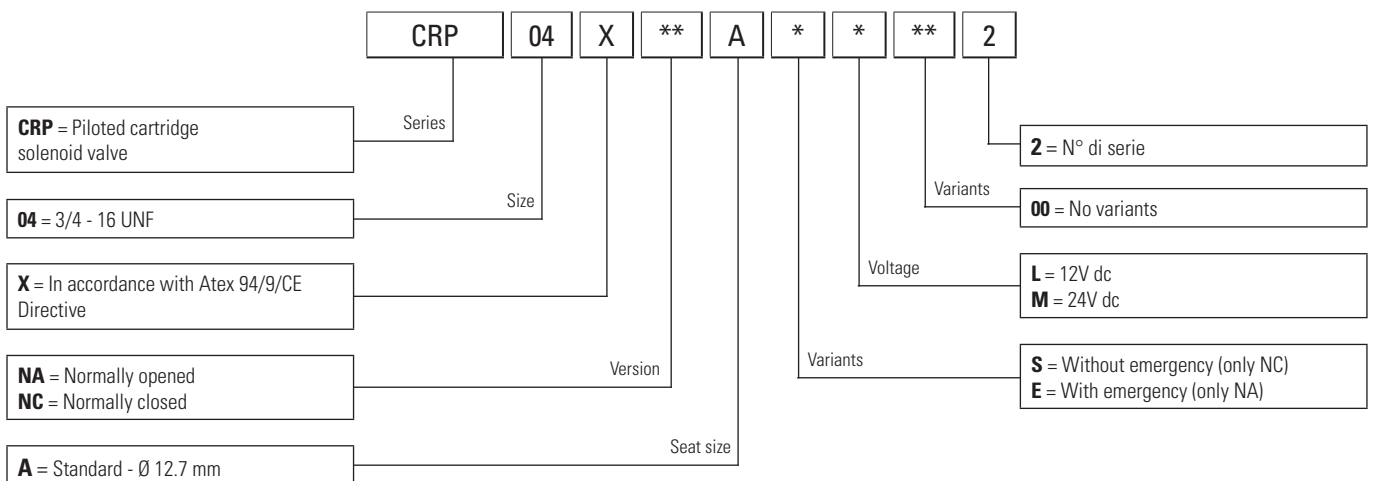
Every moduls are supply with its "Identification Plate" and with the "Declaration of Conformity" in accordance with the 94/4/CE Atex Directive.

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



1		In accordance with Europe Directive
2		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

Variants

CRD 04 18 NC ...
18W coil version

Variants

CRD 04 22 NC ...
22W coil version

Variants

CRD 04 NC ...
30W coil version

Flux	Emergency 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

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.

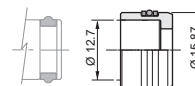
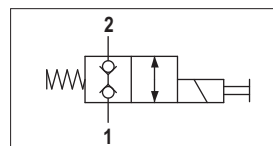
CRD0418NC - CRD0422NC: nickel-plated steel sleeve.

CRD04NC: phosphate-coating 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

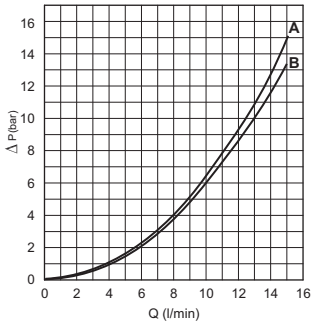
Bidirectional 2 → 1 and 1 → 2 = 210 bar

Connector to be ordered separately, see sect. 20

PRESSURE DROPS

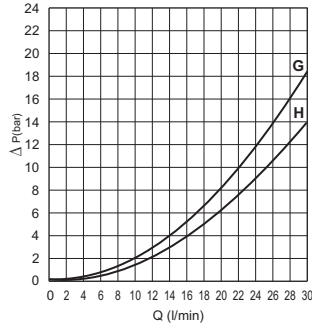
18W / 22W

A = 2 → 1
B = 1 → 2



30W

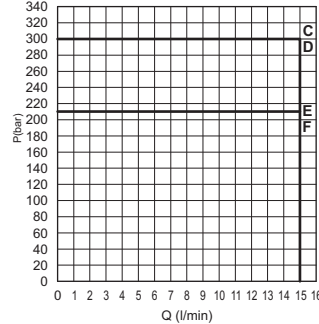
G = 2 → 1
H = 1 → 2



LIMITS OF USE

22W

C = 2 → 1
D = 1 → 2

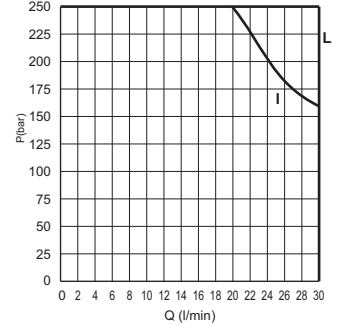


18W

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.

ORDERING CODE

	CRD	04	**	NC	*	*	*	**	*																
	Series	Size		Version				Variants																	
CRD = Direct operated solenoid valve		04 = 3/4 - 16 UNF						2 = Serial No. CRD 04 18 NC.. CRD 04 22 NC.. CRD 04 00 NC.. 1 = Serial No. CRD 04 NC..																	
								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 <i>Connector to be ordered separately, see sect. 20</i>																	
									Voltage																
									<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">DC 18W/22W (C30-C36)</th> <th style="width: 50%;">DC 30W (D12)</th> </tr> <tr> <td>L = 12 VDC</td> <td>L = 12 VDC</td> </tr> <tr> <td>M = 24 VDC</td> <td>M = 24 VDC</td> </tr> <tr> <td>N = 48 VDC</td> <td>W = Without coil (6)</td> </tr> <tr> <td>2 = 21.6 VDC RAC (3)</td> <td></td> </tr> <tr> <td>Z = 102 VDC RAC (4)</td> <td></td> </tr> <tr> <td>X = 205 VDC RAC (5)</td> <td></td> </tr> <tr> <td>W = Without coil (6)</td> <td></td> </tr> </table>	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)	
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

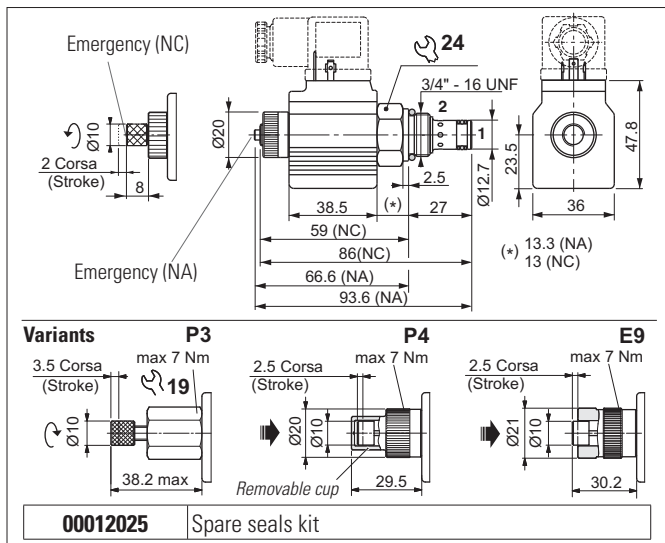
(3) With rectifier: 24 VAC/50-60Hz

(4) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz

(5) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz

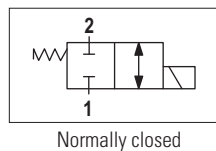
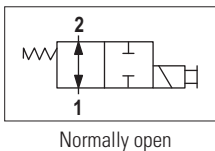
(6) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 2 WAY 2 POSITIONS

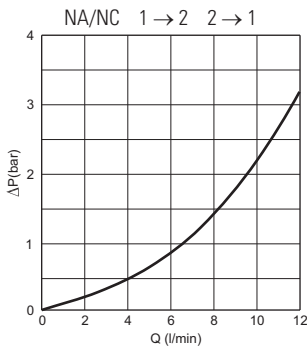


Connector to be ordered separately, see sect. 20

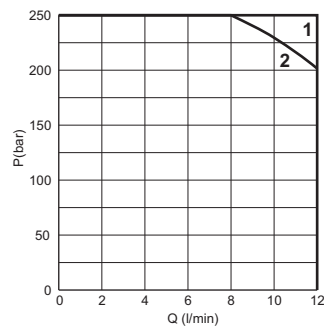
HYDRAULIC SYMBOLS



PRESSURE DROPS



LIMIT OF USE



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 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 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)

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 valve 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		Size		Coil		Version		Seat	
Emergency		Voltage		Variants		Voltage			

C2V = Solenoid valve 3 way / 2 positions

04 = 3/4 - 16 UNF

22 = 22W (C36)

NC = Normally closed
NA = Normally open

A = Ø 12.7 mm (standard)

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

00 = No variants
P3 = Rotary emerg.(..NA)
P4 = Push butt. emerg.(..NA)
E9 = Push butt. emerg.(..NA)

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

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

(1) Only voltages 12 VDC - 24 VDC

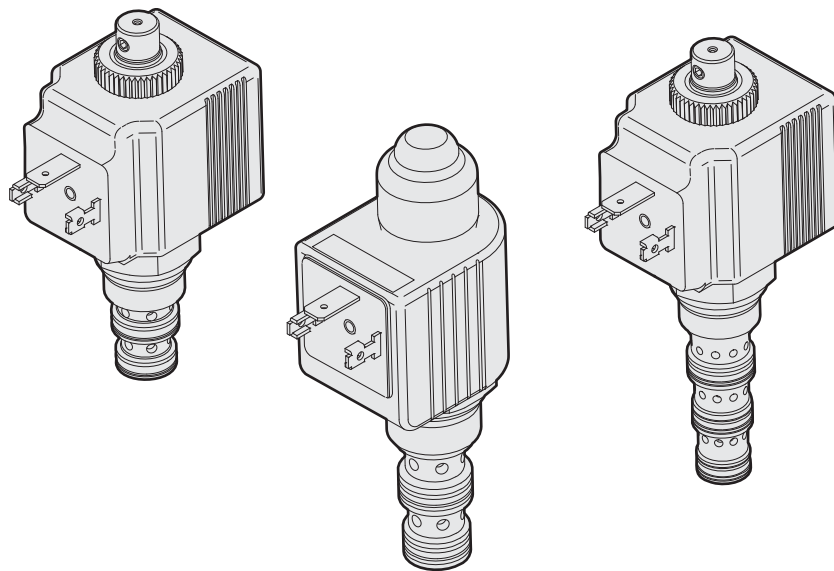
(2) With rectifier: 24 VAC/50-60Hz

(3) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz

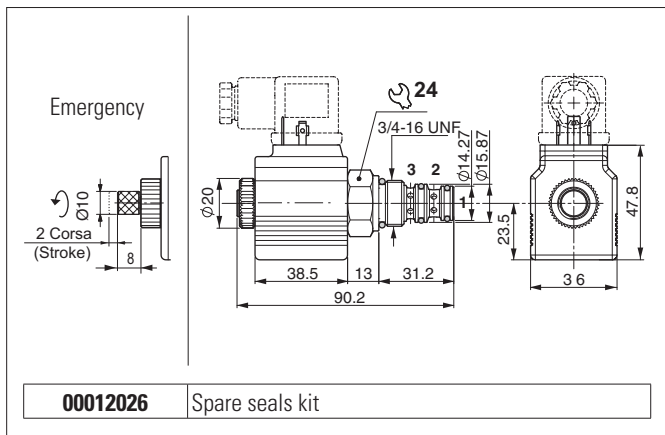
(4) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz

(5) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 3-4 WAY

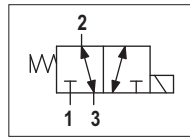


SOLENOID VALVES 3-WAY/2-POSITION

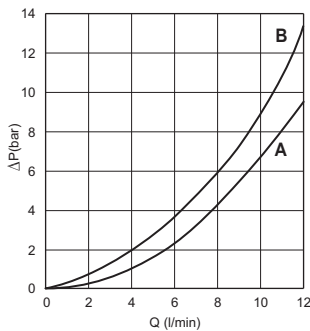


Connector to be ordered separately, see sect. 20

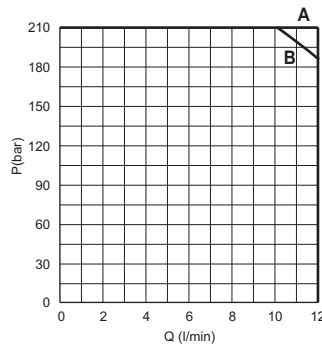
HYDRAULIC SYMBOL



PRESSURE DROPS



LIMIT OF USE



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)

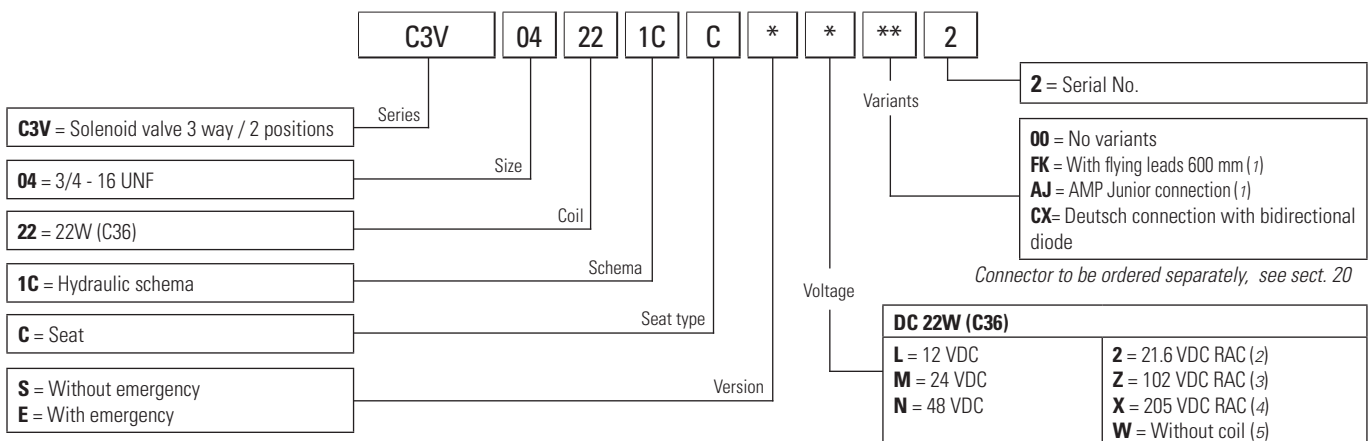
Flow	Pressure drops	Limit of use
1 → 2	A	A
2 → 1	A	A
2 → 3	B	B
3 → 2	B	B

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 mm²/s at 40°C.

ORDERING CODE



Connector to be ordered separately, see sect. 20

Coils technical data, see sect. 19

(1) Only voltages 12 VDC - 24 VDC

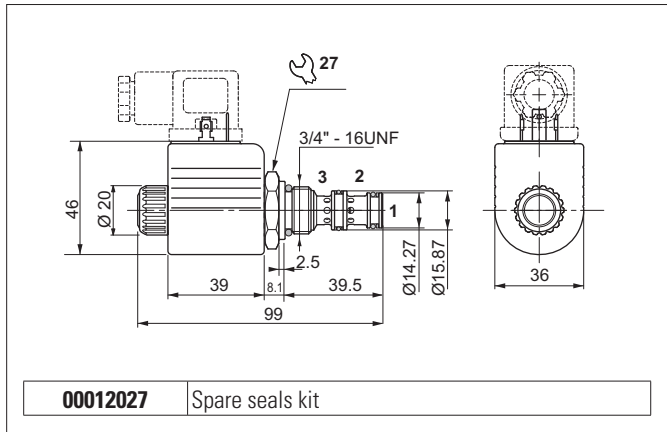
(2) With rectifier: 24 VAC/50-60Hz

(3) With rectifier: 115 VAC/50Hz - 120 VAC/60Hz

(4) With rectifier: 230 VAC/50Hz - 240 VAC/60Hz

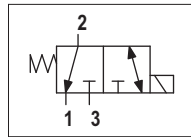
(5) Performance are guaranteed only using valves completed with BFP coil

SOLENOID VALVES 3-WAY/2-POSITION

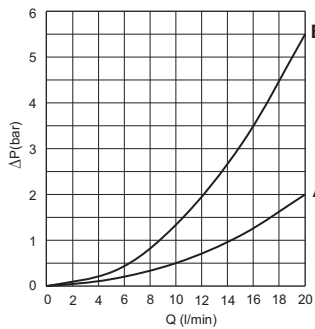


Connector to be ordered separately, see sect. 20

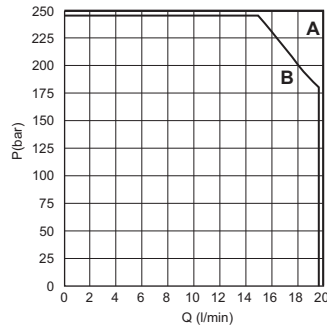
HYDRAULIC SYMBOL



PRESSURE DROPS



LIMIT OF USE



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)

10

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 mm²/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)
- *** = Variants
- **** = Variants
- 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

DC 27W (A09)

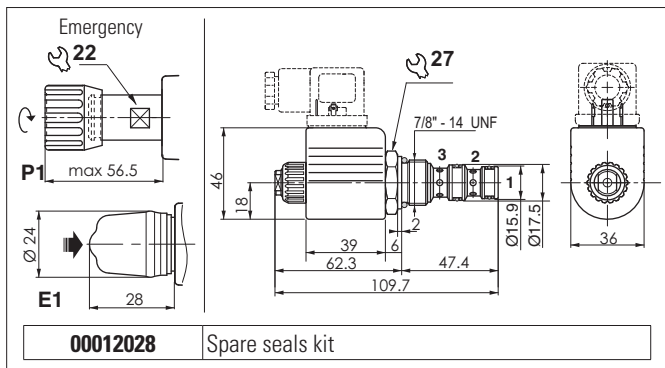
L = 12 VDC	Z = 102 VDC RAC (2)
M = 24 VDC	X = 205 VDC RAC (3)
N = 48 VDC	W = Without coil (4)
P = 110 VDC	

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

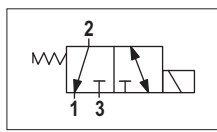
SOLENOID VALVES 3 WAY 2 POSITIONS



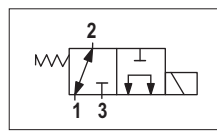
Connector to be ordered separately, see sect. 20

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

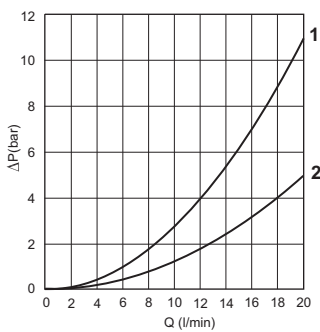


1D

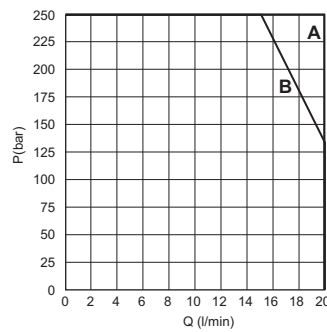


1E

PRESSURE DROPS



LIMIT OF USE



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.

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.

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)

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.

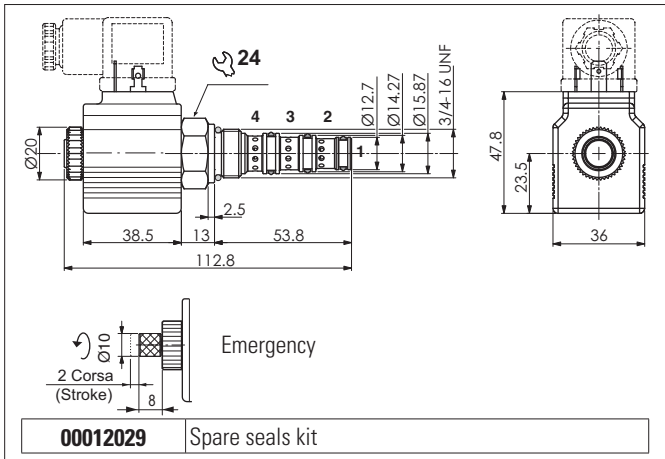
ORDERING CODE

	C3V 03 ** E * * ** 1				
C3V = Solenoid valve 3 way / 2 positions	Series	03 = 27W Coil (A09)	Coil	** = See "Spool scheme"	Spool
E = Seat	Seat type	* = Hirschmann coil	Connection type	* = AMP Junior coil (1)	Voltage
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)	
				** = No variants	Variants
				E1 = Rubber emergency	Variants
				P1 = Rotary emergency button	Variants
				Connector to be ordered separately, see sect. 20	
				1 = Serial No.	
				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 4 WAY 2 POSITIONS



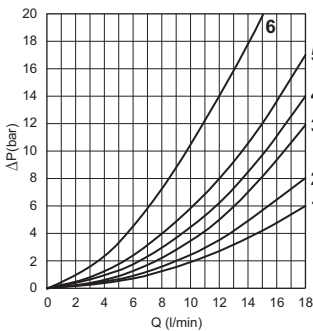
Connector to be ordered separately, see sect. 20

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.

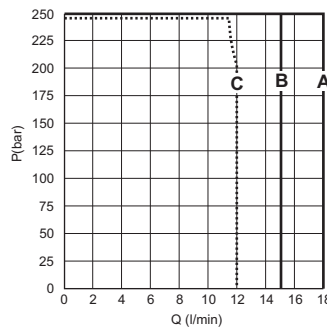
HYDRAULIC FEATURES

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 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	0.34 kg
Cartridge tightening torque	25 ÷ 30 Nm
Emergency P1 tightening torque	7 Nm
Cavity (3/4 - 16 UNF)	CD018001 (See section 17)

PRESSURE DROPS



LIMIT OF USE



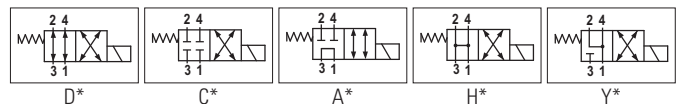
Spool type	Connections (pressure drops)			
	3→1	3→2	3→4	2→1
D	—	5	5	3
C	—	—	4	3
A	2	6	—	—
H	2	—	4	1
Y	—	—	5	3

Curve No.

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.

C3V = Solenoid valve 4 way / 2 positions

04 = 3/4 - 16 UNF

22 = 22 W (C36)

***** = See "Spool scheme"

2 = Position number

F = Seat

00 = No variants

FK = Flying 600 mm (1)

AJ = AMP Junior connection (1)

CX = Deutsch connection with bidirectional diode

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)

S = Without emergency

E = With emergency

Coils technical data, see sect. 19

(1) Only voltages 12 VDC - 24 VDC

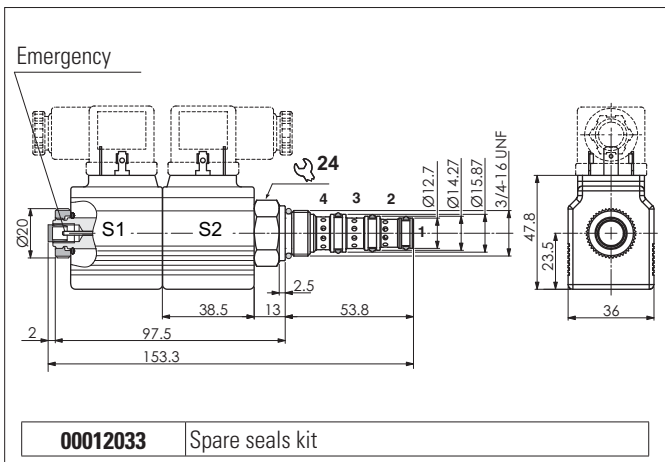
(2) With rectifier: 24Vac/50-60Hz

(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



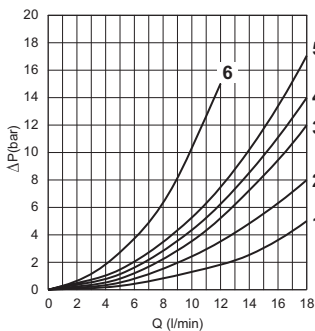
Connector to be ordered separately, see sect. 20

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.

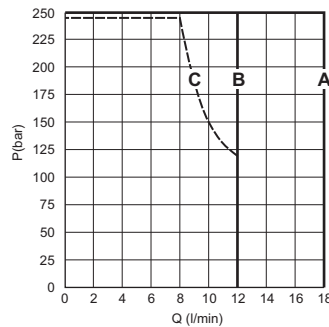
HYDRAULIC FEATURES

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 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	0.34 kg
Cartridge tightening torque	25 ÷ 30 Nm
Emergency P1 tightening torque	7 Nm
Cavity (3/4 - 16 UNF)	CD018001 (See section 17)

PRESSURE DROPS



LIMIT OF USE



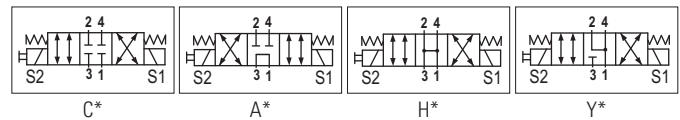
Spool type	Connections (pressure drops)				
	3→1	3→2	3→4	2→1	4→1
C	—	4	4	3	4
A	2	6	6	4	4
H	2	2	2	1	1
Y	—	5	5	3	4

Curve

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

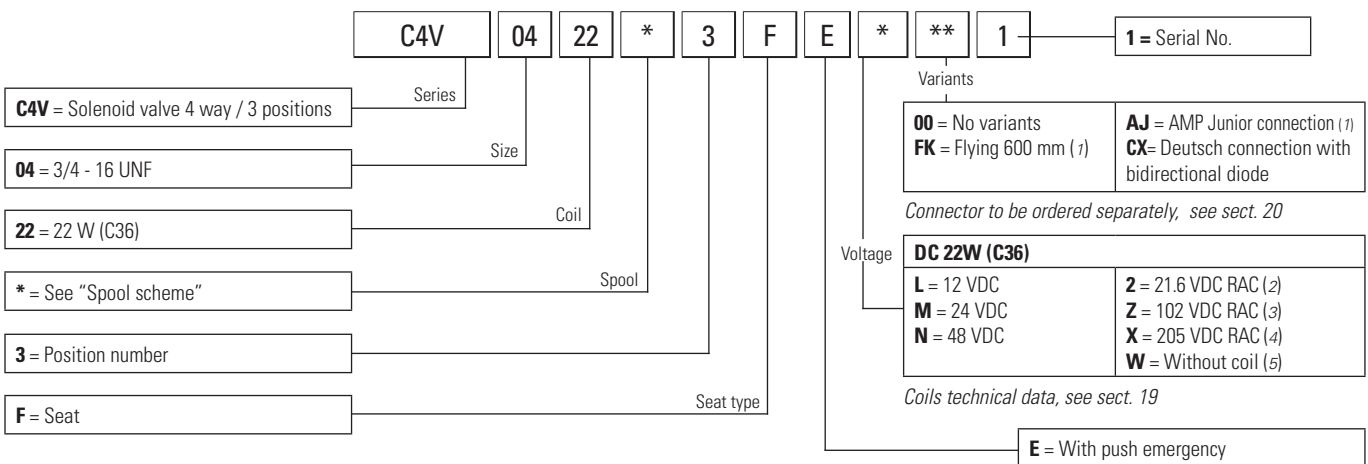
Curve

SPOOL SCHEME



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



(1) Only voltages 12 VDC - 24 VDC

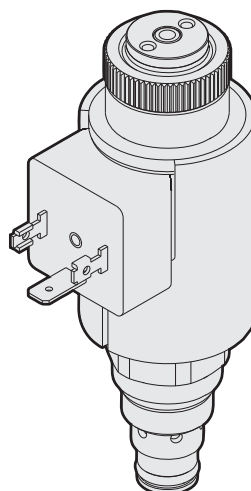
(2) With rectifier: 24VAC/50-60Hz

(3) With rectifier: 115VAC/50Hz - 120VAC/60Hz

(4) With rectifier: 230VAC/50Hz - 240VAC/60Hz

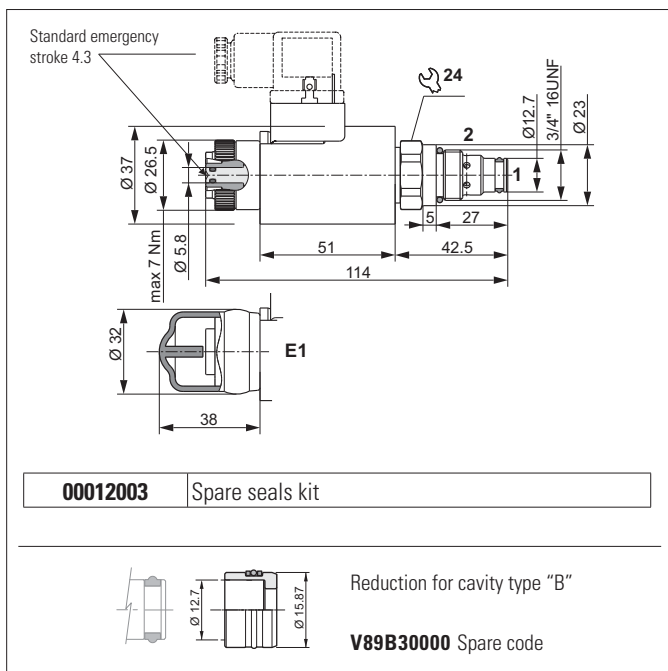
(5) Performance are guaranteed only using valves completed with BFP coil

PROPORTIONAL SOLENOID VALVES



11

COMPENSATED FLOW PROPORTIONAL VALVE NC POPPET TYPE

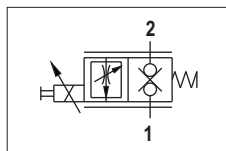


Flow control cartridge valves direct acting, are normally closed 2 ways 2 positions with double sealing in both directions 1 → 2 and 2 → 1, and movement of the load downward at constant speed in direction 2 → 1 with no regard to the pressure. The multiple function is possible with the innovative principle that permits to combine two functions in a single valve. The sealing in both directions is obtained with a tapered spool made of steel tempered and grinded, also the compensation is obtained with a spool made of steel tempered and grinded. The tubes are made of steel with zinc coating surface treatment.

HYDRAULIC FEATURES

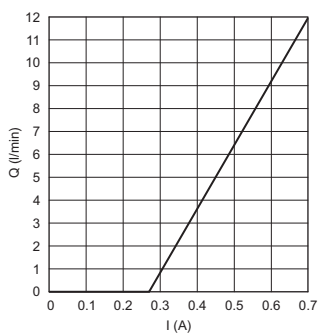
Max. working pressure	250 bar
ΔP setting	4.5 bar
Flow at 250 bar	12 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.47kg
Tightening torque	25 ÷ 30 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 SYMBOL

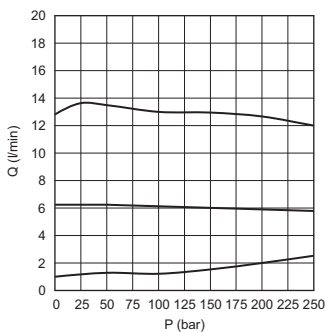


11

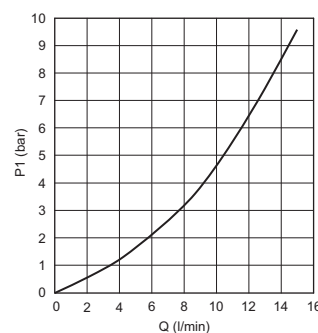
CURRENT - FLOW (at 250 bar)



FLOW - PRESSURE



ΔP 1 → 2



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

ORDERING CODE

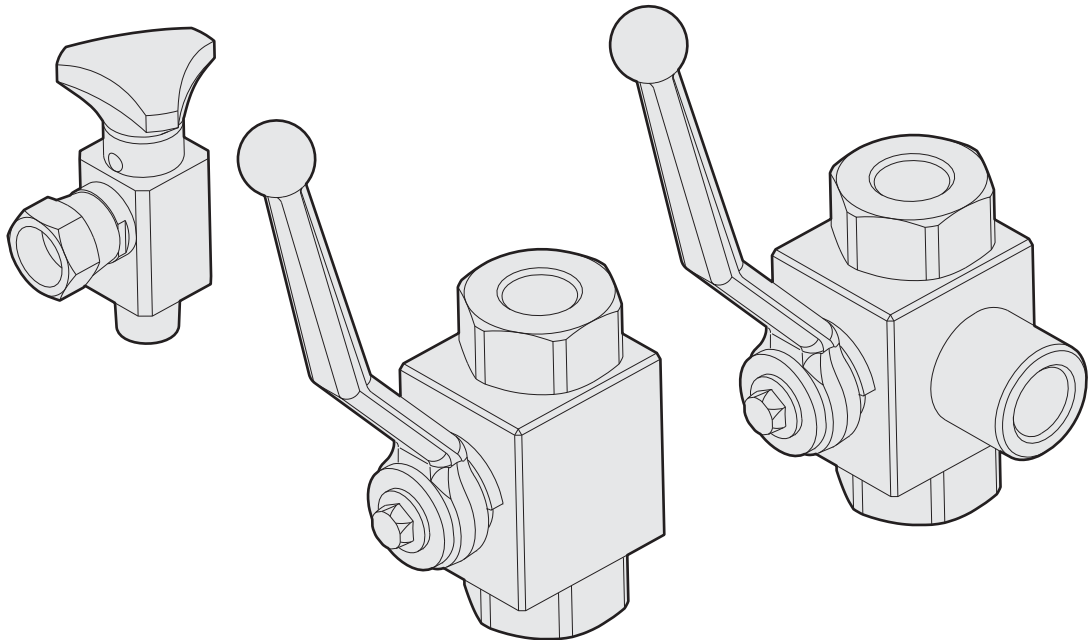
CQT 04 * X NC 9 E ** ** 1

- CQT** = Proportional valve (Series)
- 04** = 3/4 - 16 UNF (Size)
- A** = Standard - Ø 12.7 mm (Seat size)
- B** = With reduction - Ø 15.9 mm (Seat size)
- X** = Proportional
- NC** = Normally closed
- 9** = Flow max 12 l/min
- E** = Standard emergency (Voltage)
- **** = No variants (Variants)
- **** = Rubber emergency (Variants)
- 1** = Serial No.

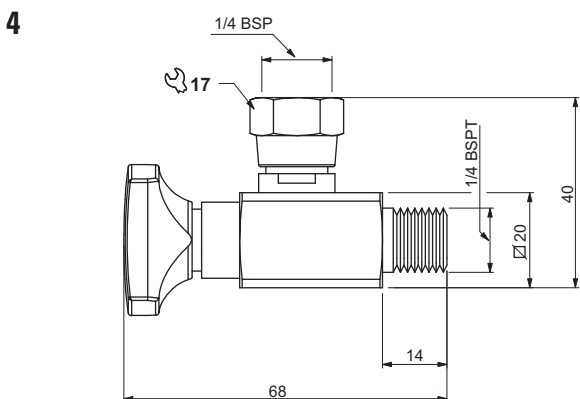
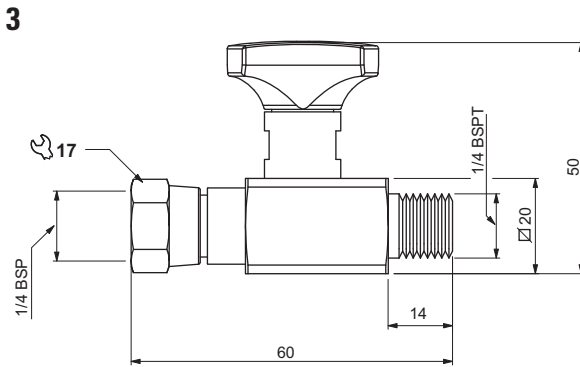
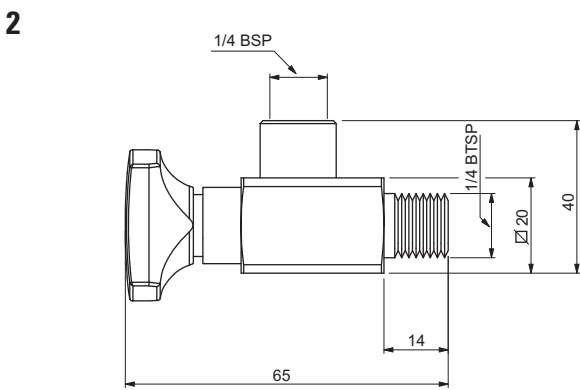
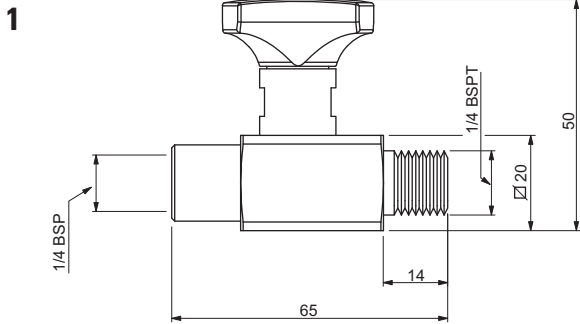
Connector to be ordered separately, see sect. 20

DC 23 (D12)
F = 12 VDC
G = 24 VDC
 Coils technical data, see sect. 19

DIVERTER VALVES



PRESSURE GAUGE SHUT-OFF - IN-LINE MOUNTING



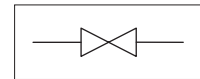
MR.7... in line - MRA.7... at 90°

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 over 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.

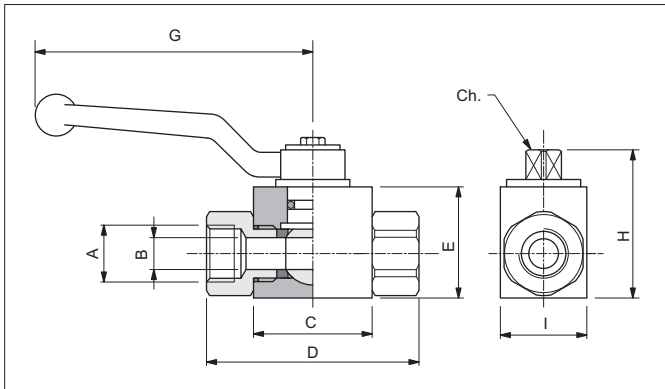
HYDRAULIC SYMBOL



ORDERING CODE

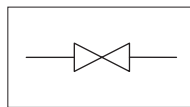
Ref	Code	Description	Pressure max (bar)	Weight (kg)
1	MR7002	In line	400	0.115
2	MRA7002	At 90°	400	0.130
3	MRG7002	In line with revolving nut	400	0.120
4	MRAG7002	At 90° with revolving nut	400	0.135

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

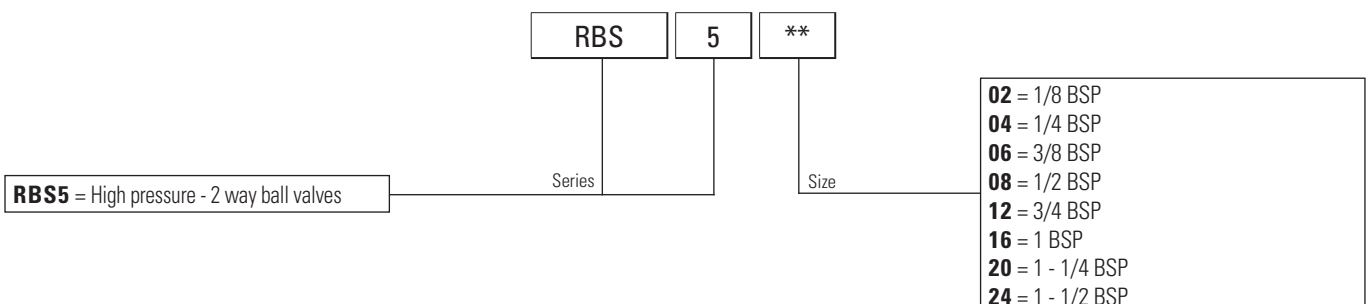


HYDRAULIC FEATURES

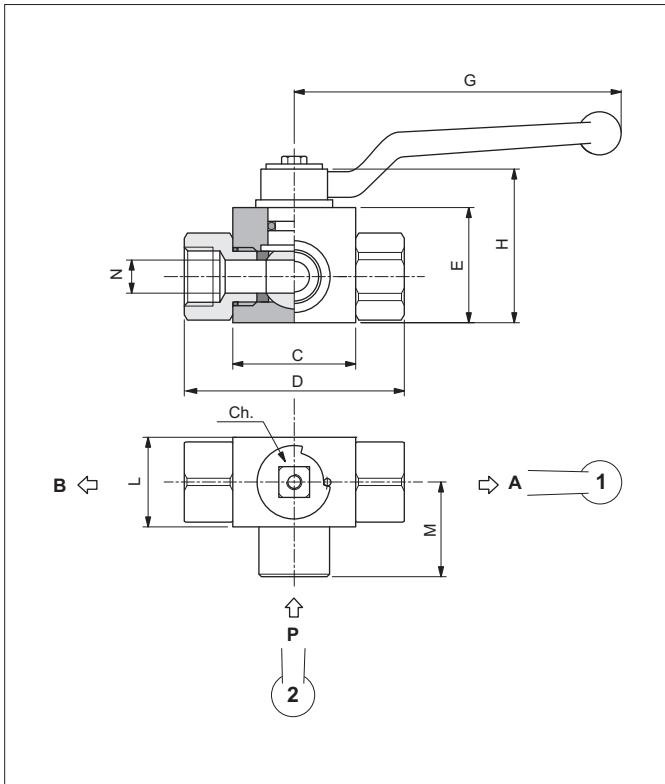
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

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



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

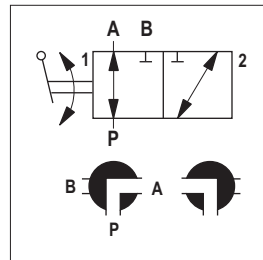


High pressure 3 way ball valves for in line mounting.
Steel body with external zinc plating. Cromed steel ball, aluminium lever.

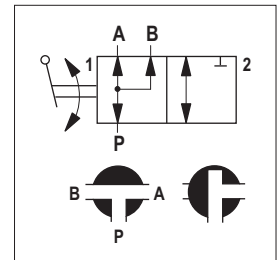
HYDRAULIC FEATURES

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"

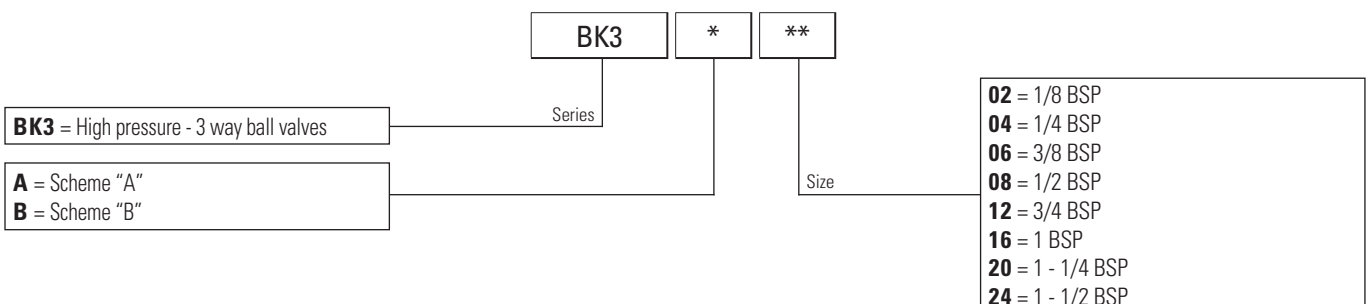


SCHEME "B"

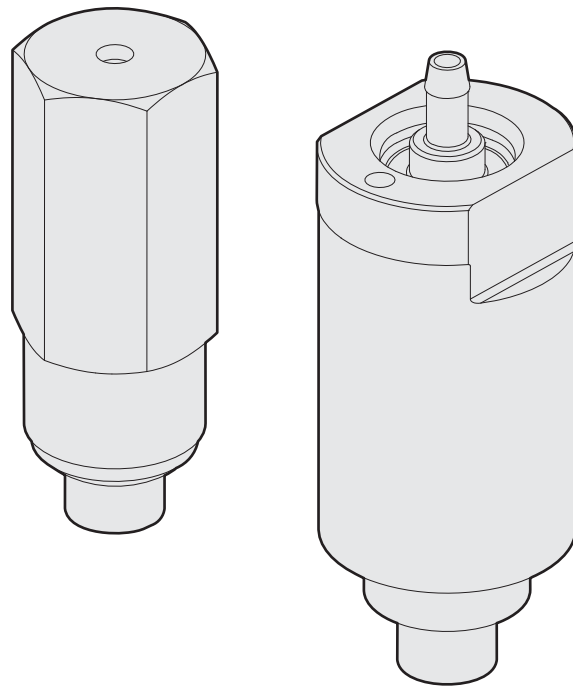
Code	Thread A-B-P	Flow max (l/min)	Pressure max (bar)	C (mm)	D (mm)	E (mm)	G (mm)	H (mm)	L (mm)	M (mm)	N (mm)	Ch (mm)	Weight (kg)
BK3 A/B 02	1/8 BSP	5	400	42	71	35	110	49	30	33.5	4	9	0.50
BK3 A/B 04	1/4 BSP	10	400	42	71	35	110	49	30	33.5	6	9	0.50
BK3 A/B 06	3/8 BSP	25	400	44	73	40	110	54	35	37.0	10	9	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

12

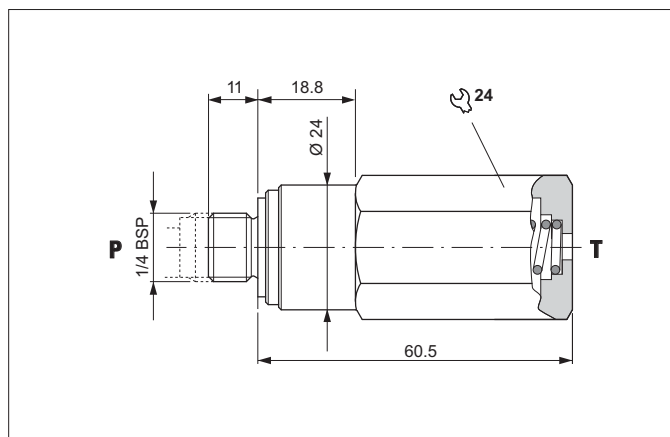
ORDERING CODE



SOFT START VALVES

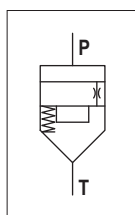


SINGLE-PHASE MOTOR START VALVE - IN-LINE MOUNTING



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.

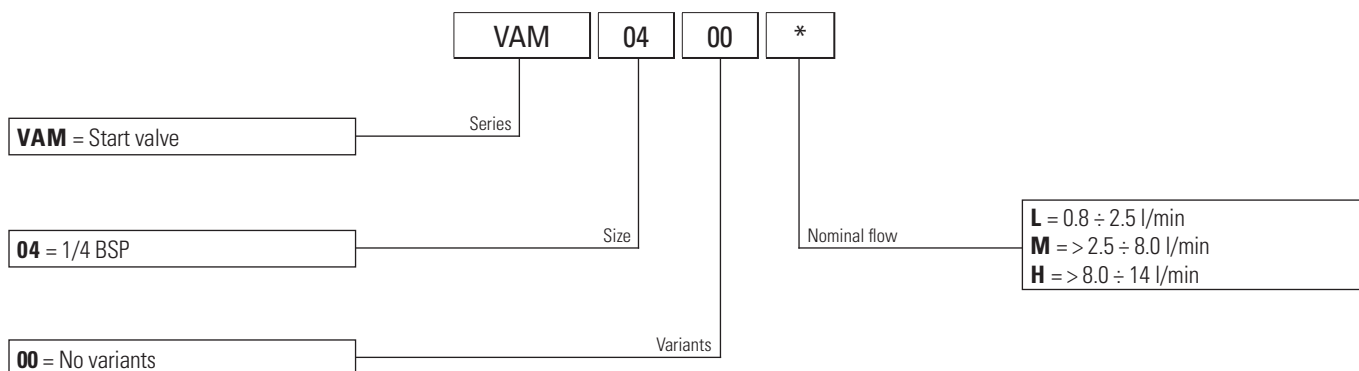
HYDRAULIC SYMBOL



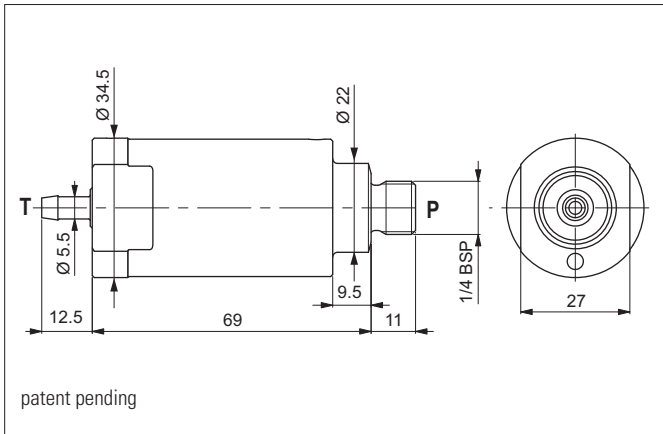
HYDRAULIC FEATURES

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

ORDERING CODE



SOFT START VALVE - IN-LINE MOUNTING

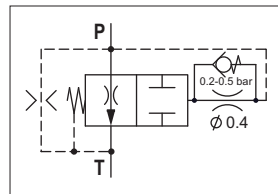


Valve used on power units to generate a flow rate ramp on the actuator to delay system pressurisation and allow the single phase motor to reach the required speed.

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.

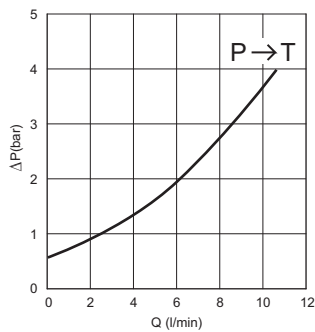
HYDRAULIC SYMBOL



HYDRAULIC FEATURES

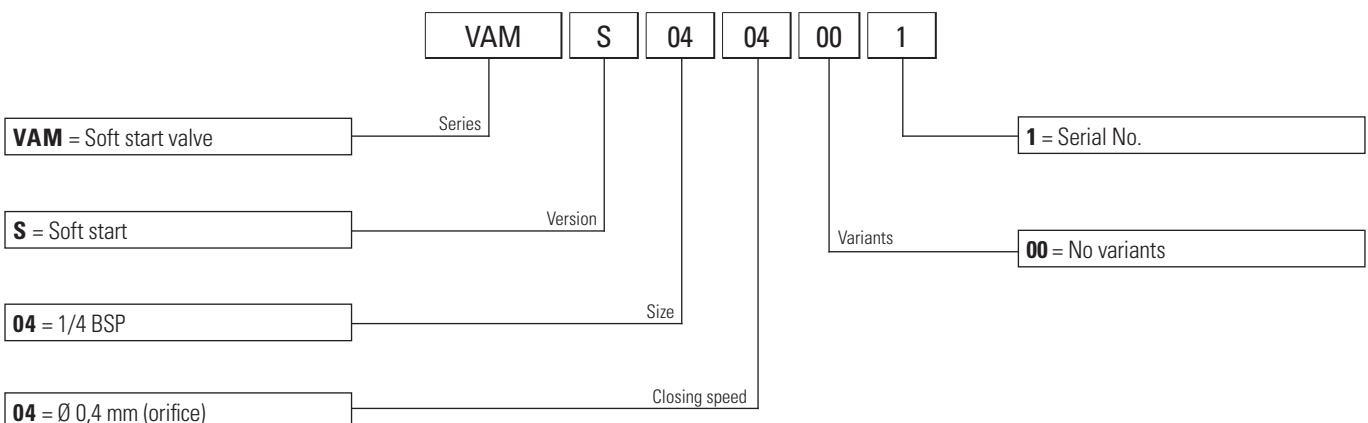
Max. working pressure	210 bar
Flow	8 ÷ 15 l/min
Rump up time (at 100 bar of working pressure)	600 ms
Max. Leakage at 100 bar	0.8 l/min
Operating frequency	0.7 Hz
Working Temperature	-25°C ÷ 60°C
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.4 kg
Tightening torque	25 ÷ 30 Nm

PRESSURE DROPS

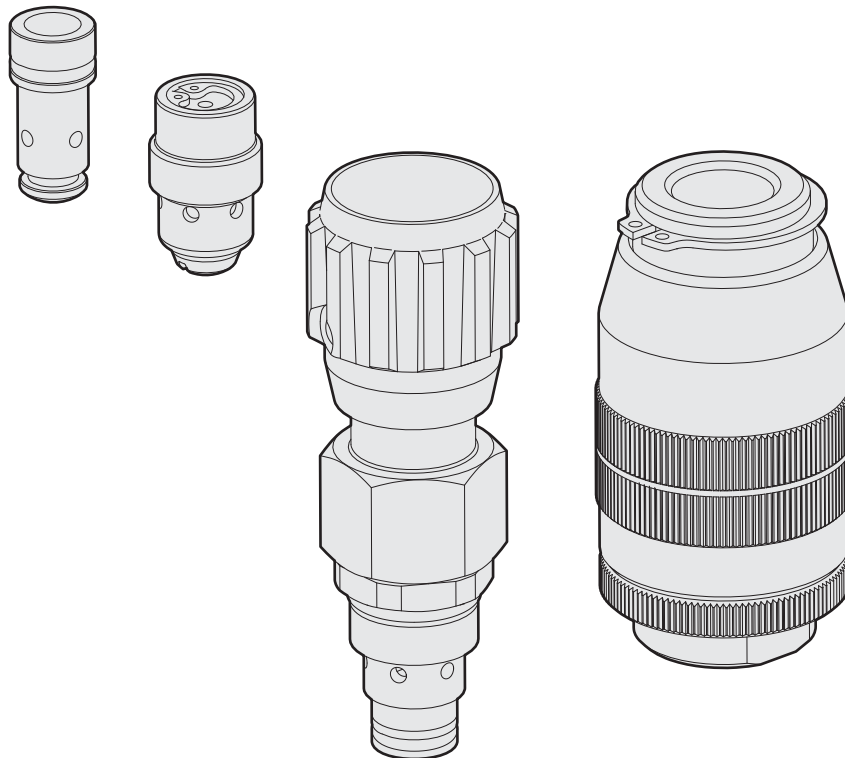


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

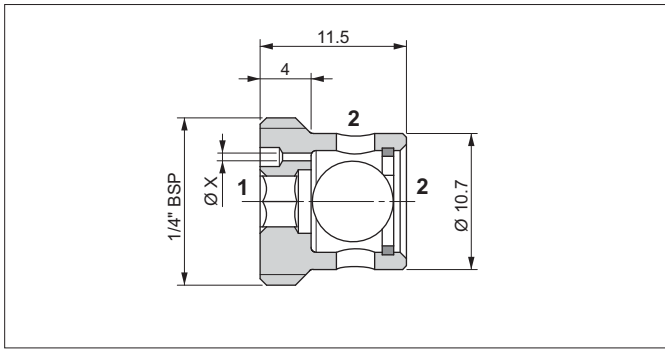
ORDERING CODE



FLOW CONTROL VALVES



FIXED UNIDIRECTIONAL FLOW CONTROL VALVE

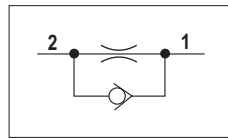


The valves control the flow in a single direction (2 to 1, the flow in opposite direction in free).
The flow is reduced by the control hole X which determines the flow rate (not compensated). Valves made steel.

HYDRAULIC FEATURES

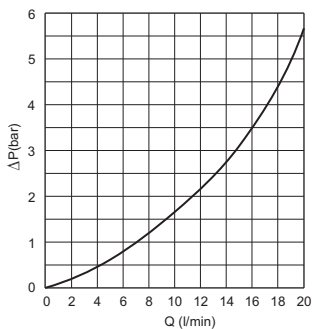
Max. working pressure	210 bar
Max. Flow	20 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.022 kg
Tightening torque	16 ÷ 18 Nm

HYDRAULIC SYMBOL

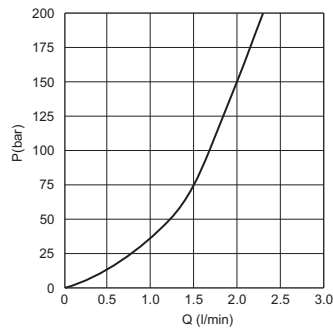


PRESSURE DROPS

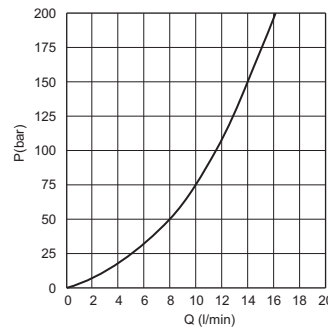
Free flow 1 → 2



Controlled flow 2 → 1
(VSU 04 06...)

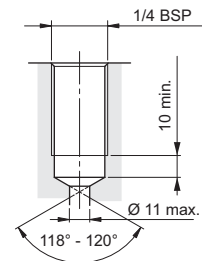


Controlled flow 2 → 1
(VSU 04 16...)

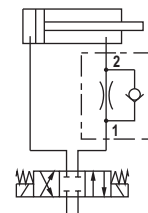


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

SEAL

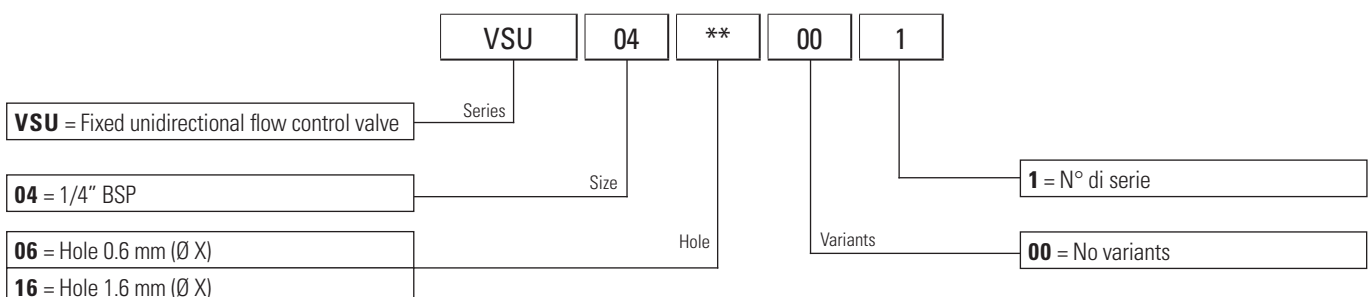


SERVICE EXAMPLE

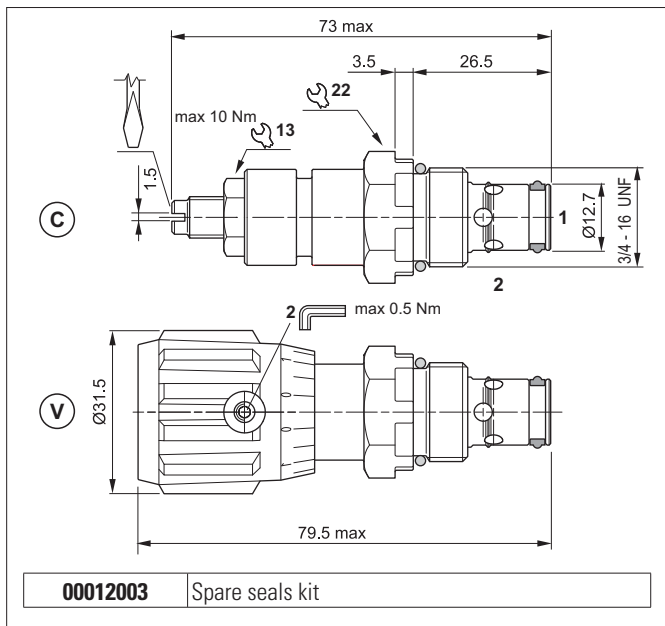


14

ORDERING CODE



BIDIRECTIONAL FLOW CONTROL VALVE

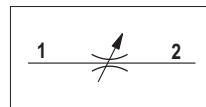


Flow control valve using non compensated throttling.
The flow is reduced in both directions, turning the screw or wheel right or left.
Guarantees excellent mechanical seal with negligible leakage.
It has a galvanised steel body.

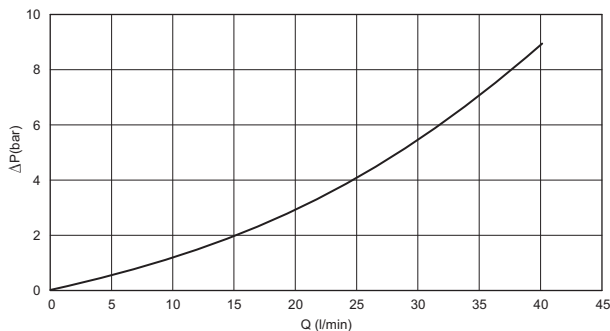
HYDRAULIC FEATURES

Max. working pressure	315 bar
Max. Flow	40 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 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	0.11 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

HYDRAULIC SYMBOL

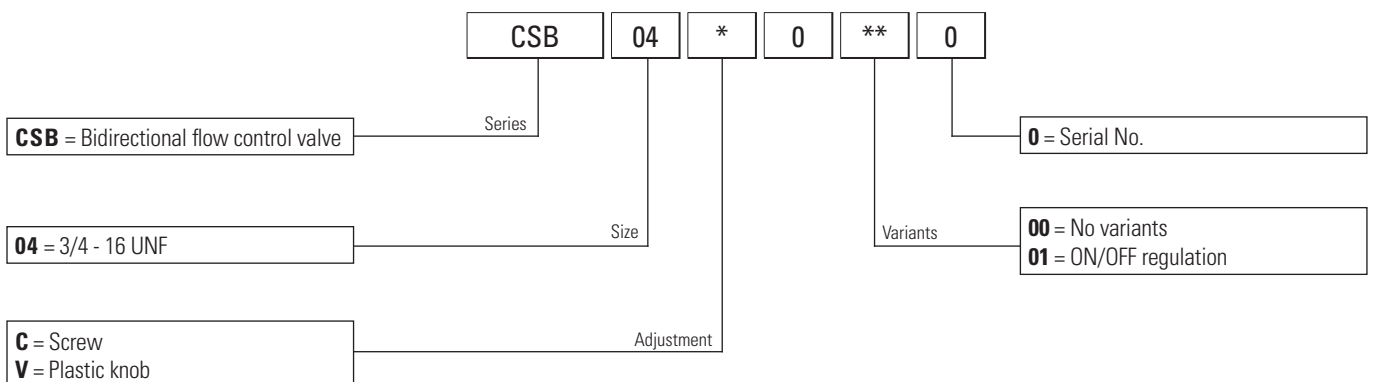


PRESSURE DROPS

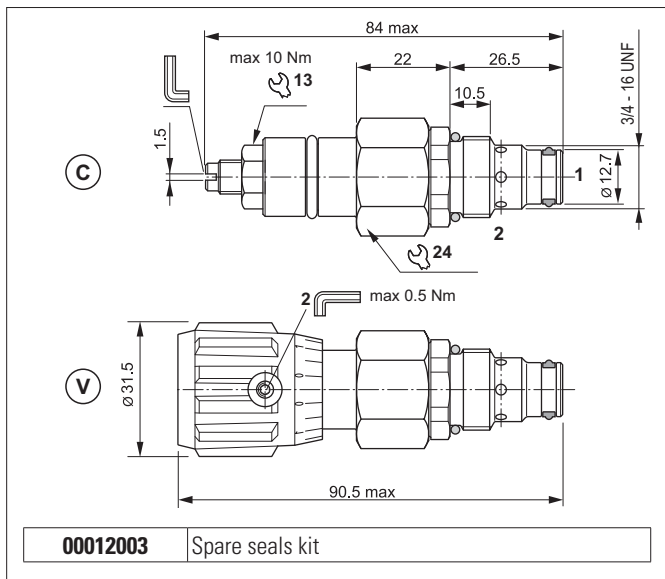


Fluid used: mineral based oil with viscosity 15 mm²/s at 40°C.

ORDERING CODE



UNIDIRECTIONAL COMPENSATED FLOW CONTROL VALVES



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.

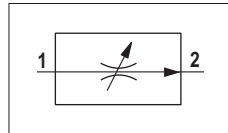
Slight leakage is tolerated when the control screw or wheel is screwed down completely.

It has a galvanised steel body. The compensator plunger is in tempered and ground steel.

HYDRAULIC FEATURES

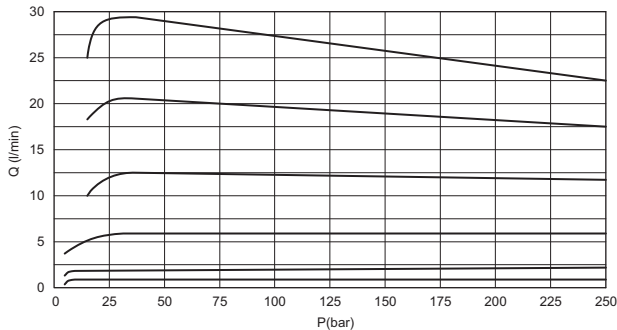
Max. working pressure	250 bar
ΔP of regulation	12.6 bar
Max. Flow	29 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.2 kg
Tightening torque	25 ÷ 30 Nm
Cavity (3/4 - 16 UNF)	CD018006 (See section 17)

HYDRAULIC SYMBOL



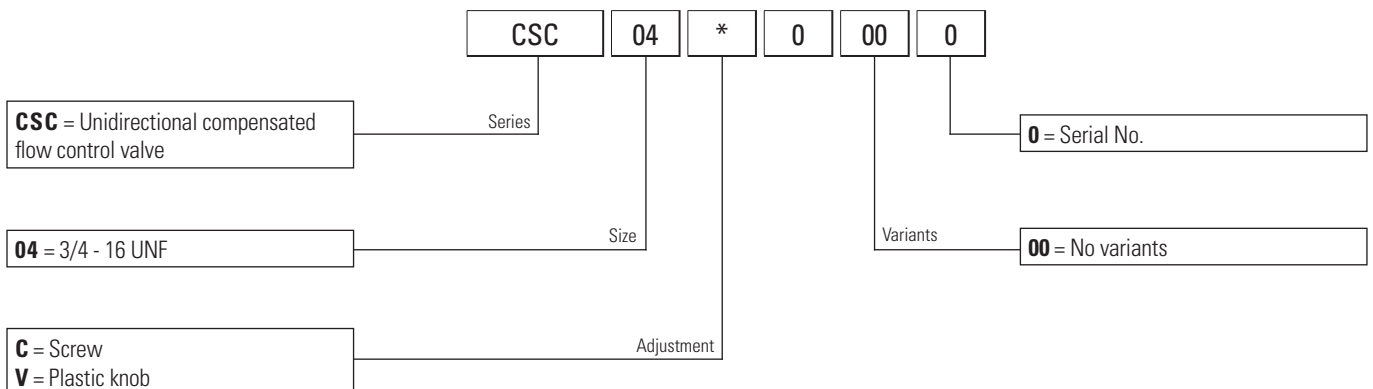
PRESSURE DROPS

Controlled flow 1 → 2

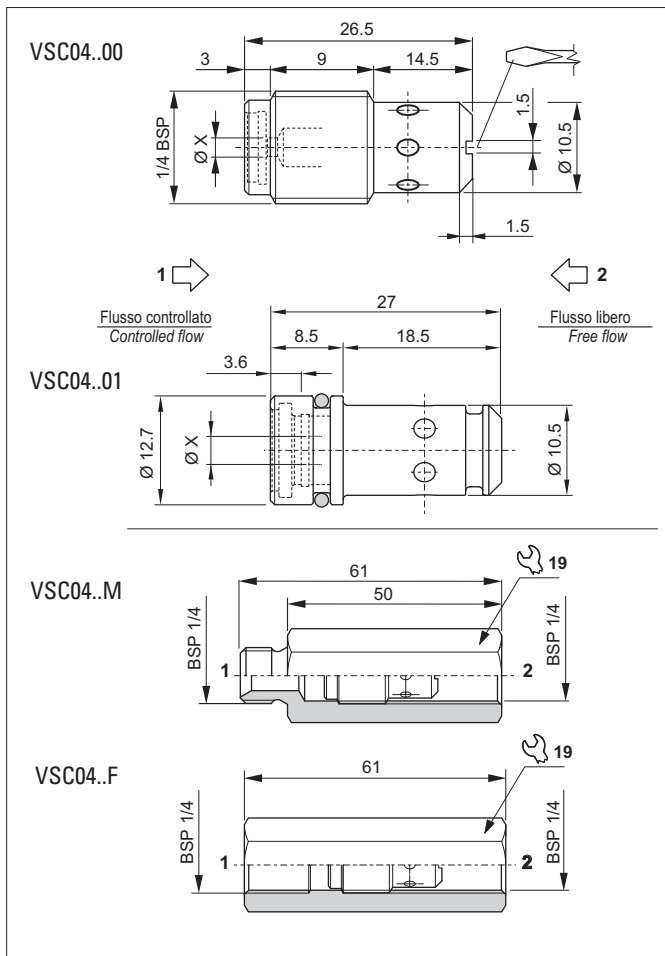


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE



FIXED COMPENSATED FLOW CONTROL VALVE

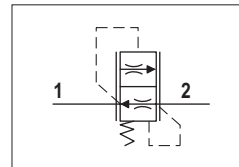


The flow control valve maintains a steady flow in a single direction (1 to 2) regardless of oil pressure.
 The flow is reduced by the control hole X which determines the flow rate.
 Steel body. Compensator plunger in ground steel.

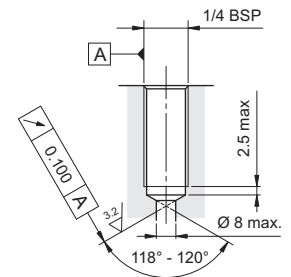
HYDRAULIC FEATURES

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 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	0.014 kg
Tightening torque	6 ÷ 8 Nm
Cavity (for VSC04..01)	CD018009 (See section 17)

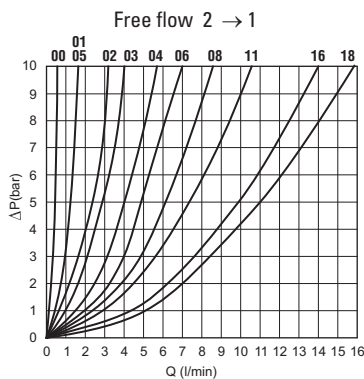
HYDRAULIC SYMBOL



SEAL (FOR VSC04..00)



PRESSURE DROPS



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

FLOW CONTROLLED BY "X" PORT

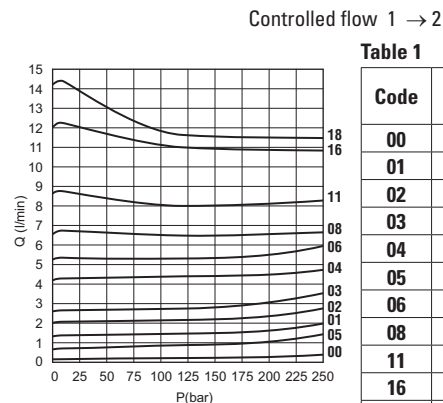
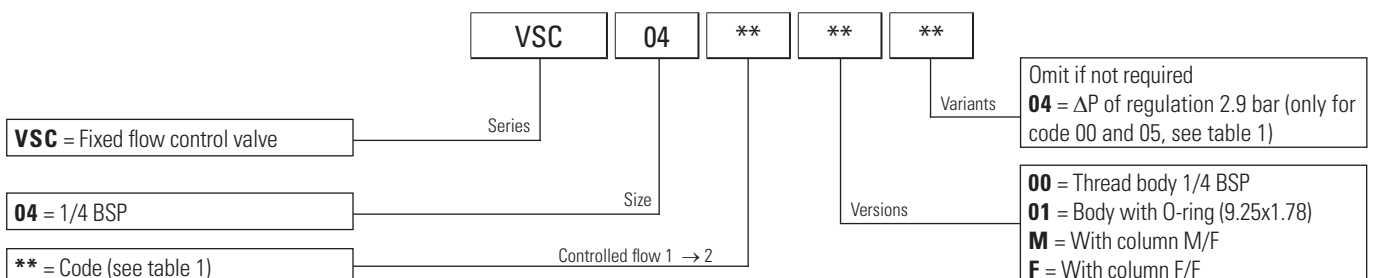


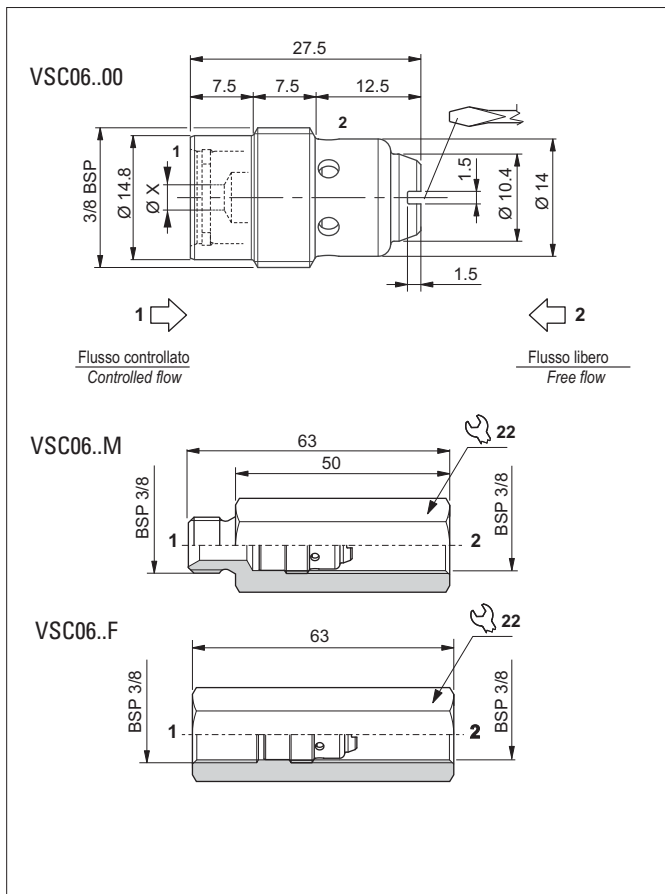
Table 1

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



FIXED COMPENSATED FLOW CONTROL VALVE

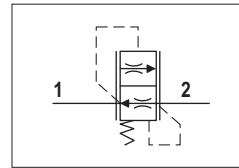


The flow control valve maintains a steady flow in a single direction (1 to 2) regardless of oil pressure. The flow is reduced by the control hole X which determines the flow rate. Steel body. Compensator plunger in ground steel.

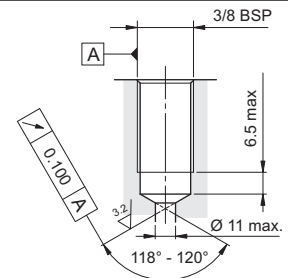
HYDRAULIC FEATURES

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 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	0.026 kg
Tightening torque	6 ÷ 8 Nm

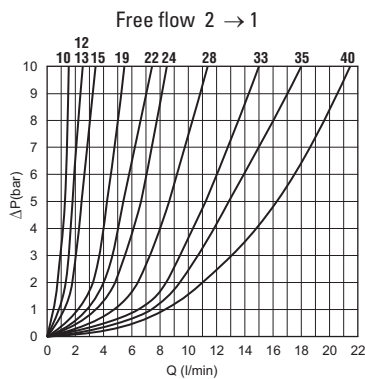
HYDRAULIC SYMBOL



SEAL (FOR VSC06..00)



PRESSURE DROPS



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

FLOW CONTROLLED BY "X" PORT

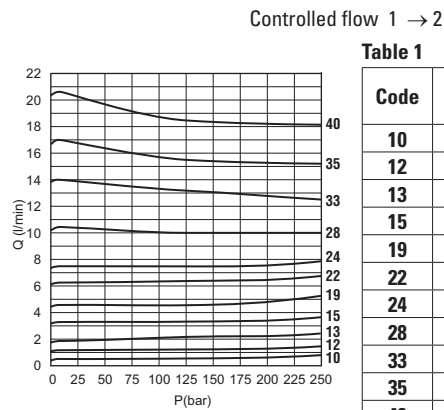
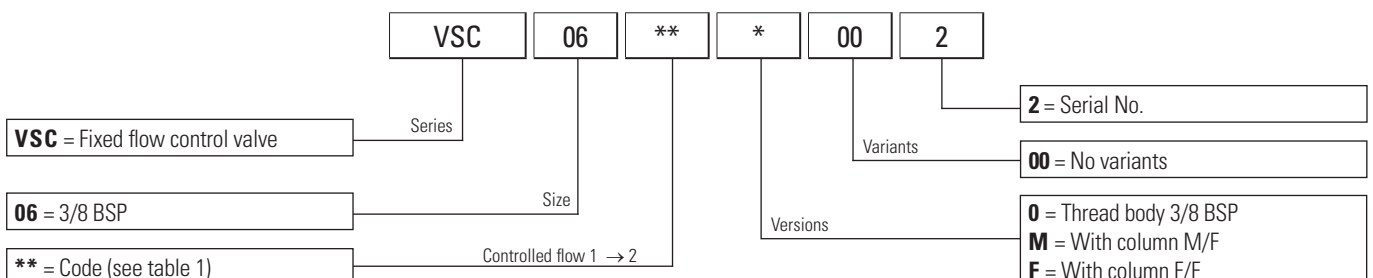


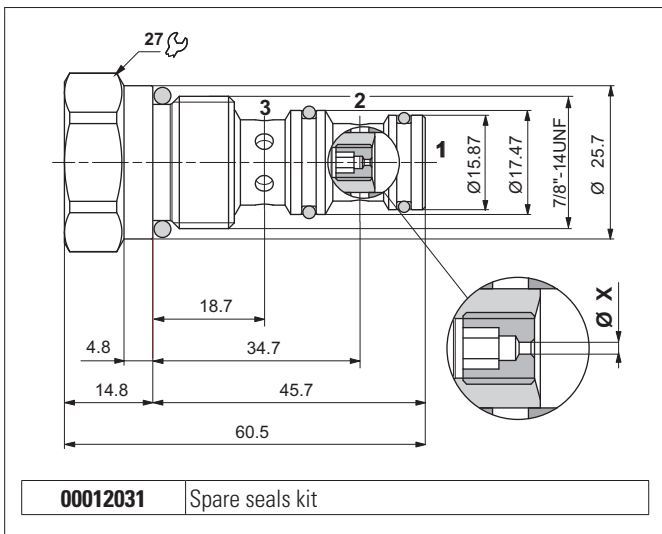
Table 1

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



PRIORITY FLOW CONTROL VALVE



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.

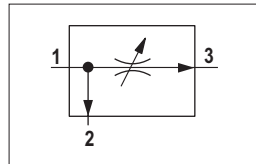
The flow is reduced by the control hole X which determines the flow rate.

It has a galvanised steel body. The compensator plunger is in tempered and ground steel.

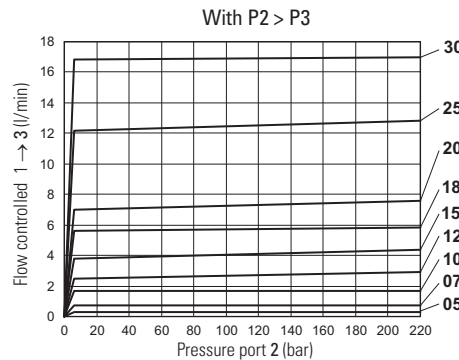
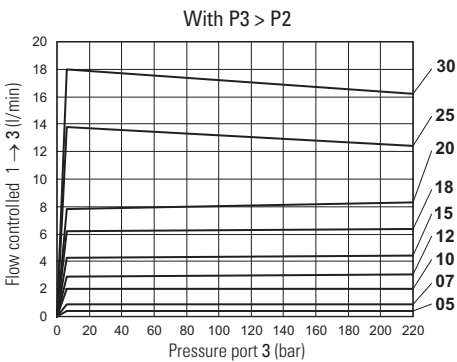
HYDRAULIC FEATURES

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 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



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.

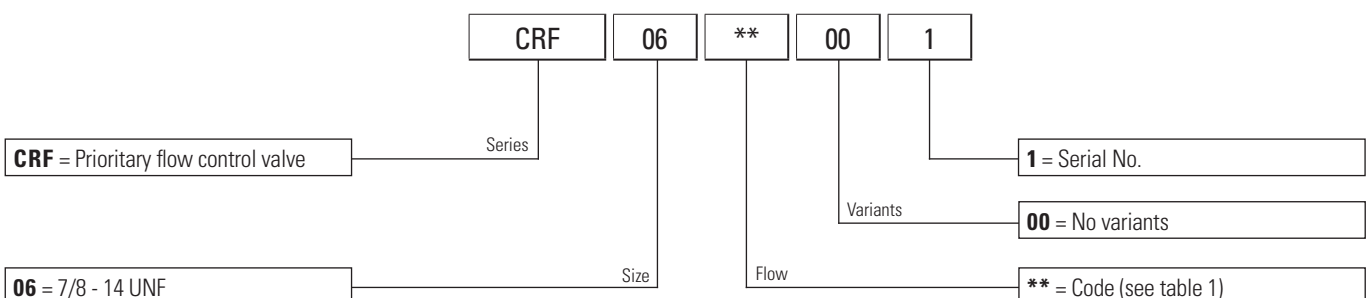
Table 1

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

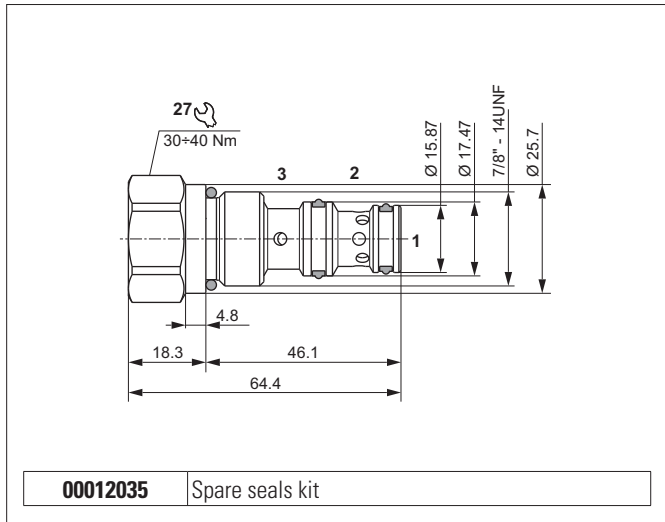
* Flow rate tolerance: ±15% up to 5 l/min, ±10% over 5 l/min

** Tolerance on hole: ±0.02 mm

ORDERING CODE



PRESSURE COMPENSATOR VALVE



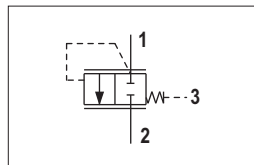
Pressure compensator valves allow to control flow and pressure. The valve is normally closed and with external pilot additive to the spring bias pressure. When the pressure at port 1 rises above the spring bias pressure with the addition of external pilot pressure, then the valve shifts to allow flow 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.

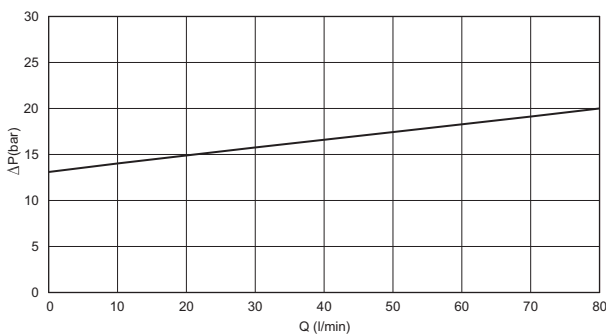
HYDRAULIC FEATURES

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

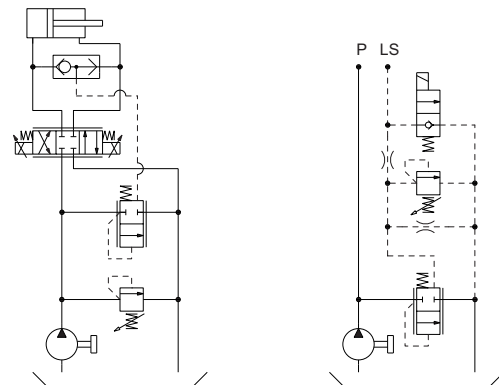


PRESSURE DROPS (1 → 2)

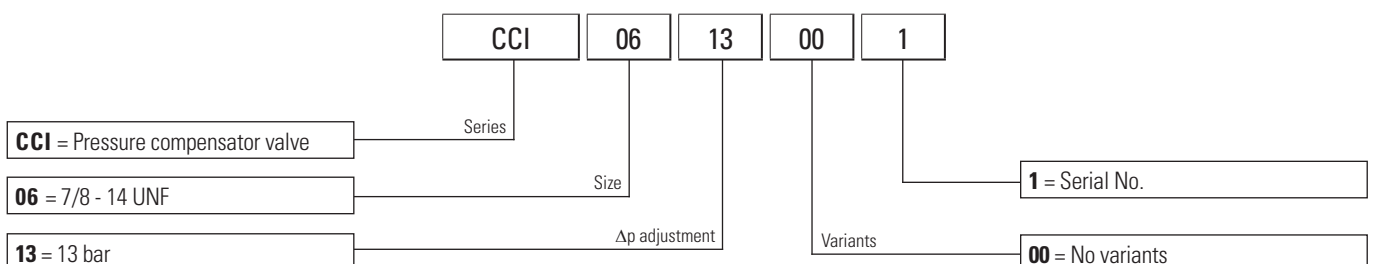


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

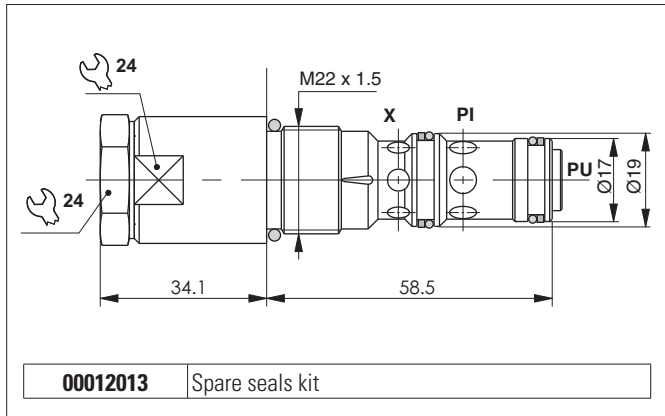
SERVICE EXAMPLE



ORDERING CODE



TWO-WAY PRESSURE COMPENSATOR VALVE

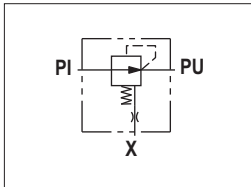


00012013 Spare seals kit

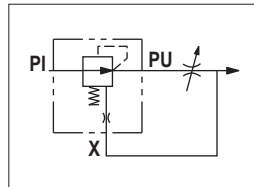
Pressure compensator type CCP maintains a constant pressure drop (Δp) regardless of downstream and up stream set pressure variation.

- 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

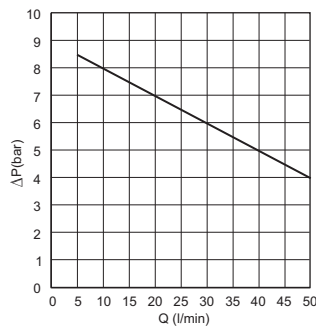


APPLICATION SCHEME

HYDRAULIC FEATURES

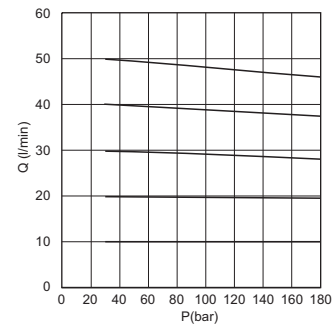
Max. working pressure	250 bar
ΔP of regulation (standard)	8 bar
Max. Flow	50 l/min
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14
Weight	0.2 kg
Tightening torque	30 ÷ 40 Nm
Cavity (M22x1.5)	CN047002 (See section 17)

ΔP BETWEEN PU AND X - FLOW

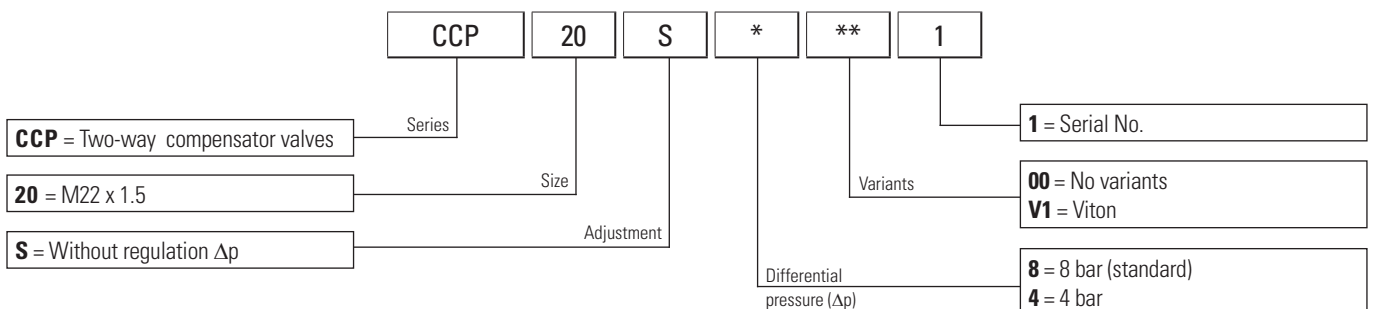


Fluid used: mineral based oil with viscosity 46 mm²/s at 40°C.

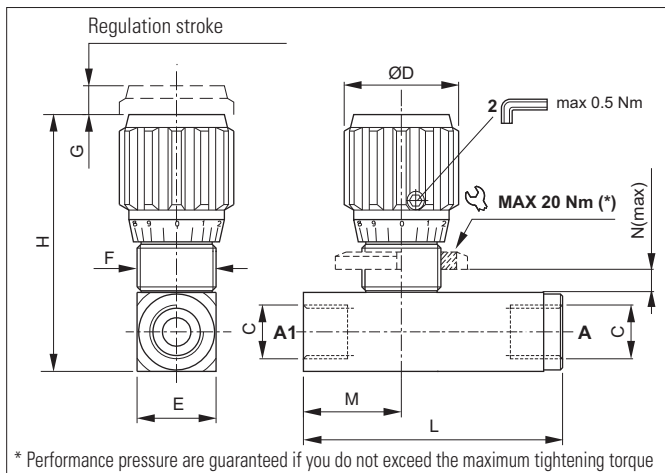
PRESSURE - FLOW RATE



ORDERING CODE



UNIDIRECTIONAL AND BIDIRECTIONAL FLOW CONTROL VALVES - IN-LINE MOUNTING



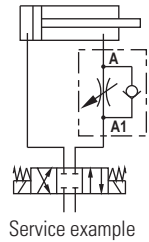
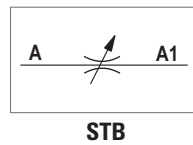
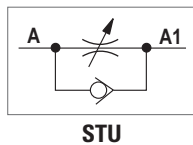
Flow control valve using non compensated throttling. The flow is reduced in only one direction (A to A1) for STU valves and in both directions for STB valves, turning the wheel with locking screw right or left. Guarantees excellent mechanical seal with negligible leakage. It has a galvanised steel body.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

HYDRAULIC FEATURES

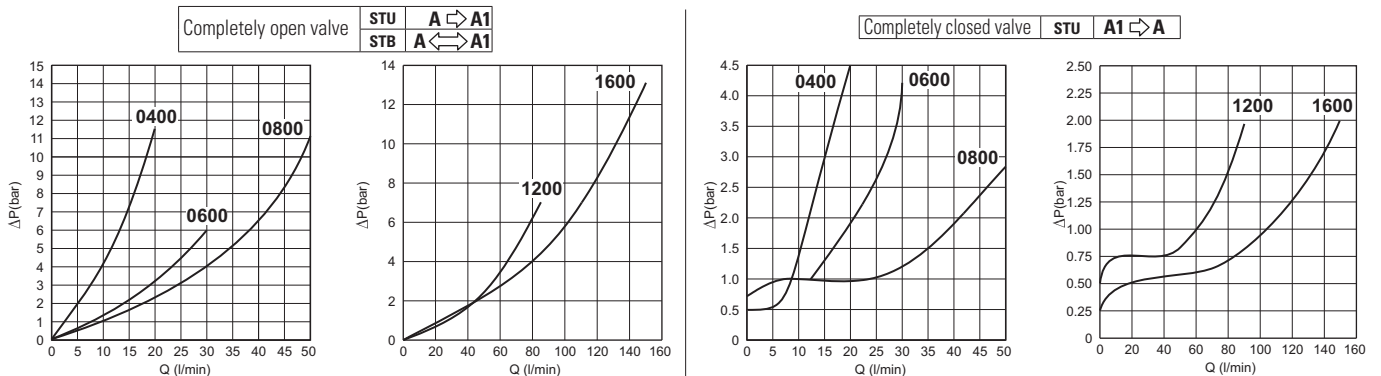
Hydraulic fluid	DIN 51524 Mineral oils
Fluid viscosity	10 ÷ 500 mm ² /s
Fluid temperature	-25°C ÷ 75°C
Ambient temperature	-25°C ÷ 60°C
Max. contamin. level class with filter	ISO 4406:1999 - class 19/17/14

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

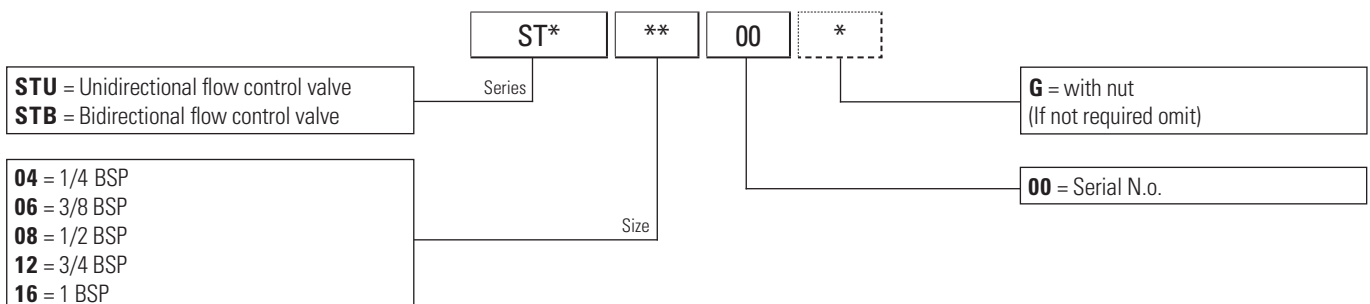
HYDRAULIC SYMBOLS



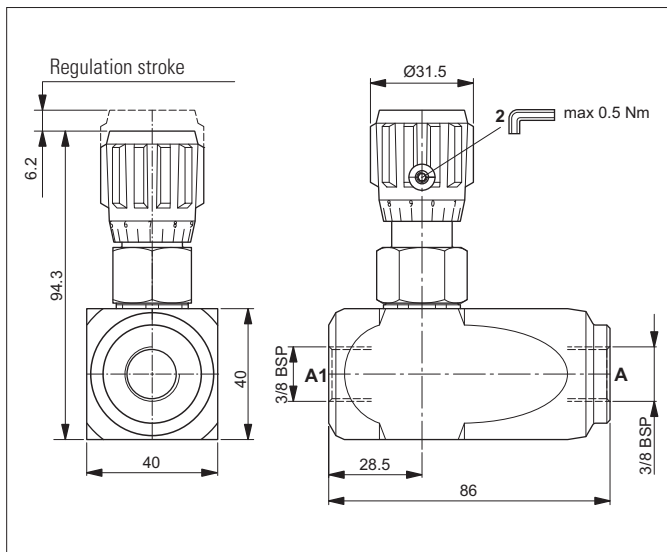
PRESSURE DROPS



ORDERING CODE



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

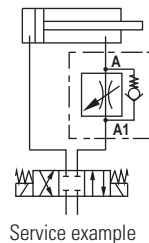
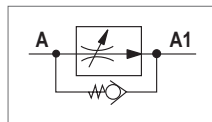


The valve maintains the flow rate in one direction (A to A1) regardless of oil pressure; the oil flows freely in the opposite direction. The flow is reduced by turning the wheel right or left. Slight leakage is tolerated when the control screw or wheel is screwed down completely. It has a galvanised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

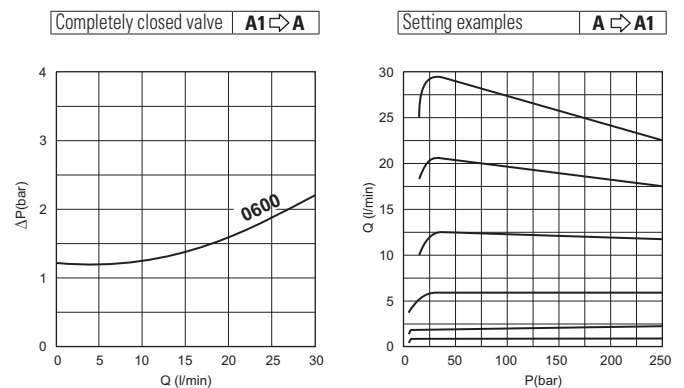
HYDRAULIC FEATURES

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 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	0.95 kg

HYDRAULIC SYMBOL

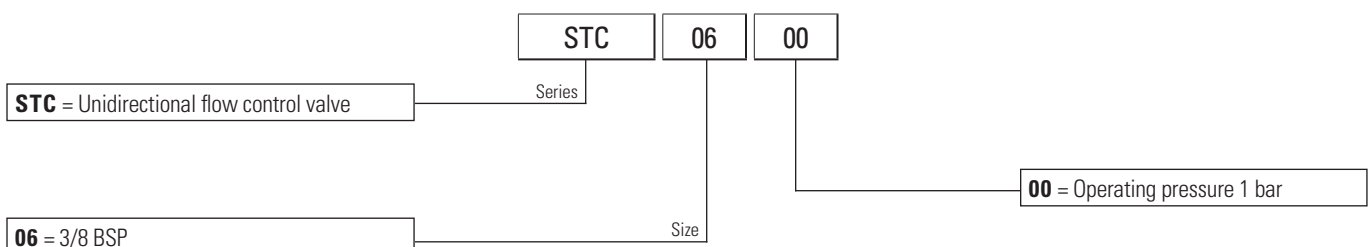


PRESSURE DROPS

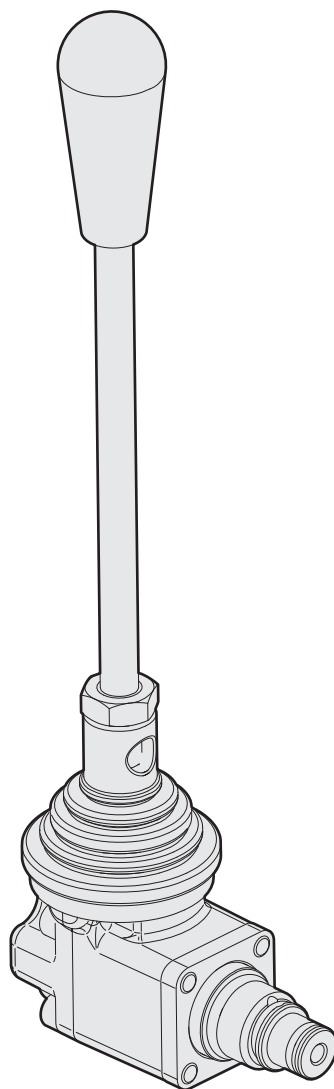


Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

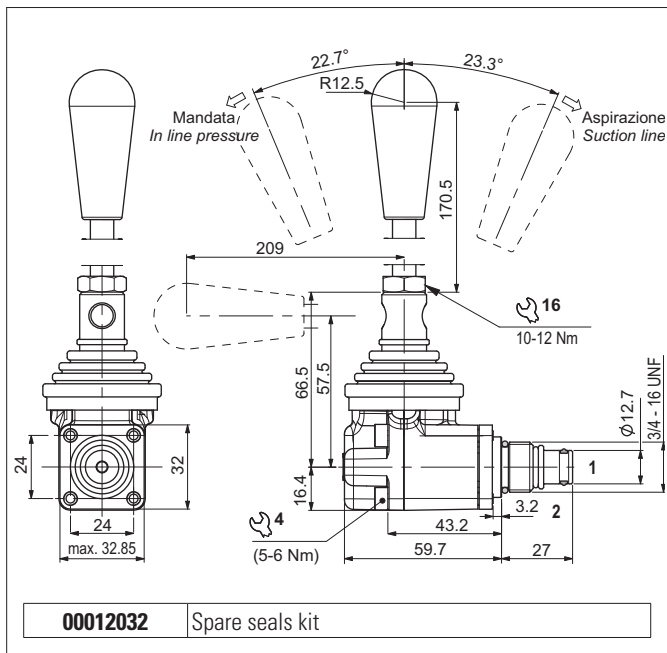
ORDERING CODE



HAND PUMPS



HAND PUMPS

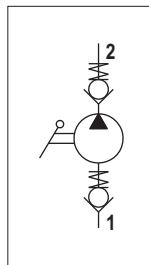


This hand pump handles emergencies manually in small systems. Available in 1cc/pump stroke and 2cc/pump stroke displacement versions. The lever body is in diecast aluminium. The cartridge is steel with tempered and ground steel ball check valves.

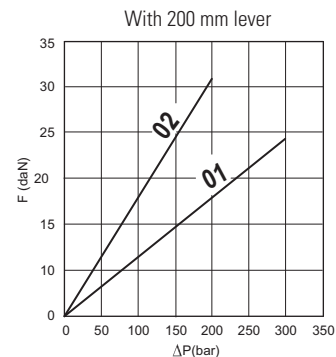
HYDRAULIC FEATURES

Max. working pressure	CPM041 = 300 bar CPM042 = 160 bar
Displacement	CPM041 = 1 cc stroke CPM042 = 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

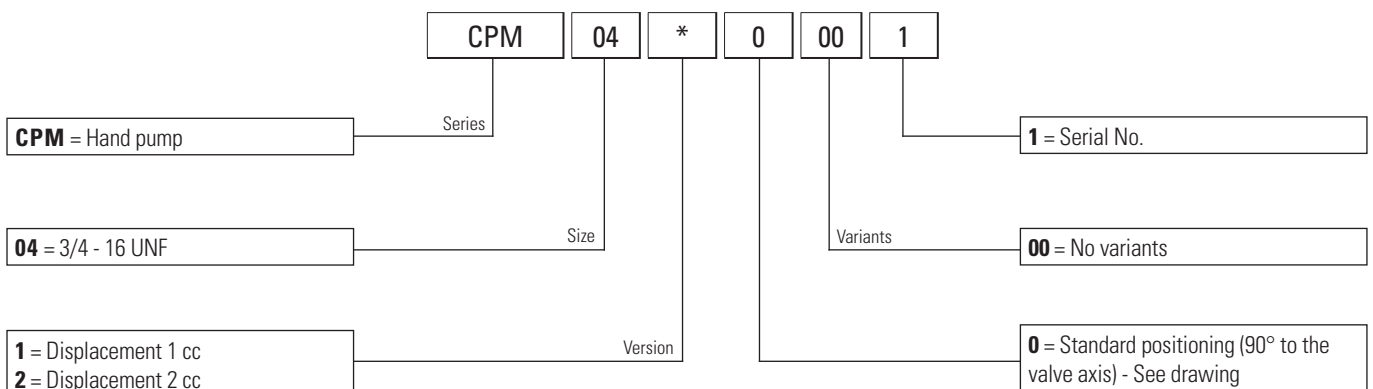


OPERATION FORCE ON THE LEVER

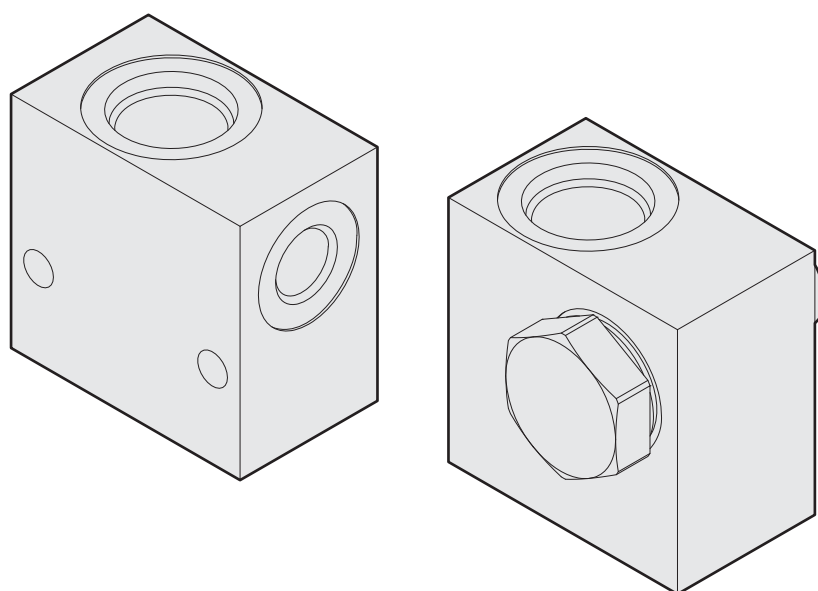


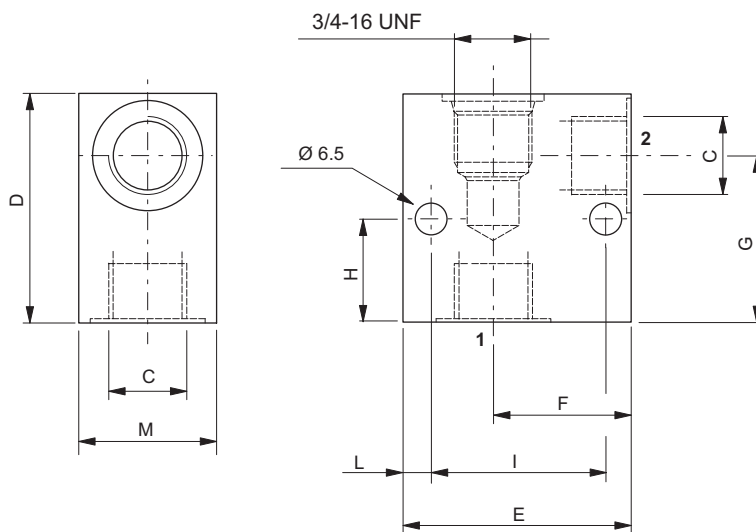
Fluid used: mineral based oil with viscosity 32 mm²/s at 40°C.

ORDERING CODE

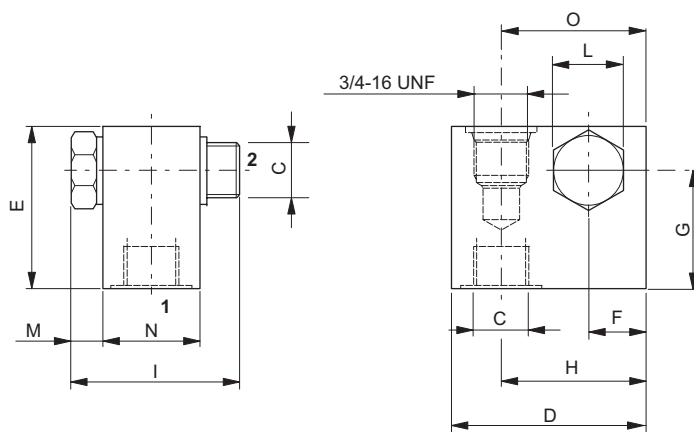


VALVE HOUSINGS

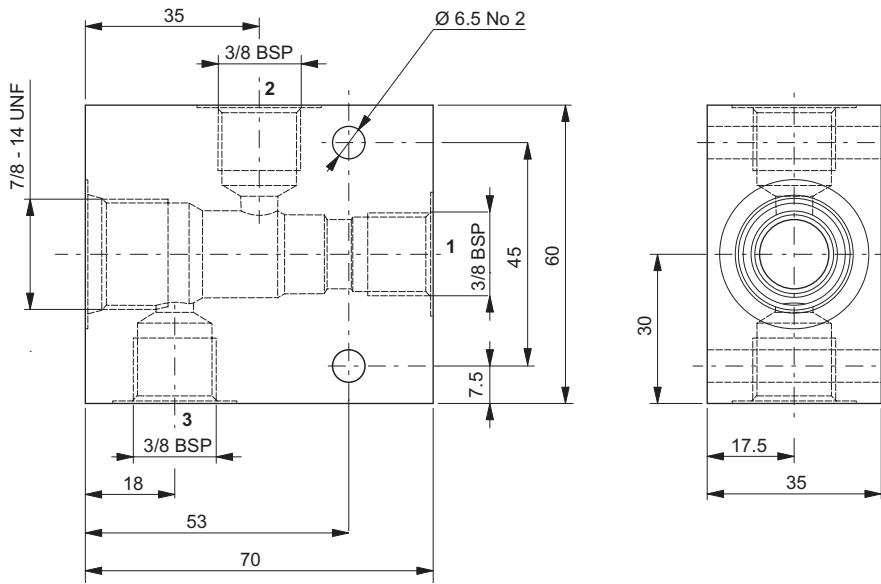




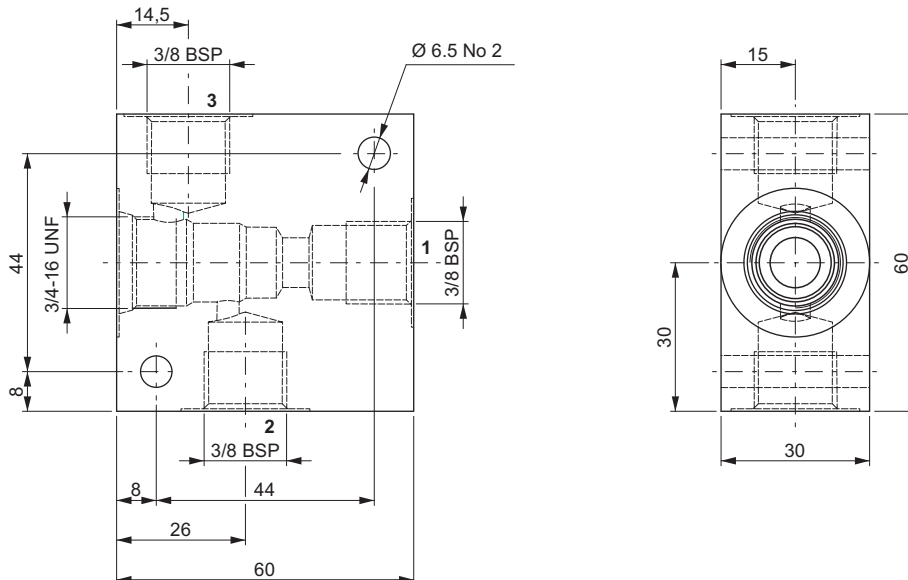
Code	C	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	L (mm)	M (mm)	Material	Cavity
F07100013	1/4 BSP	46	50	30,5	33	18	38	6	30	Alluminio EN AW 2011	CD018006
M18400061	3/8 BSP	55	60	38	41,25	25	45	7,5	30		
M18400071	1/2 BSP	60	60	35	41	6	48	6	40		



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	Alluminio EN AW 2011	CD018006
V10500034	1/4 BSP	40	46	11	31	26	49	19	8	30	26		

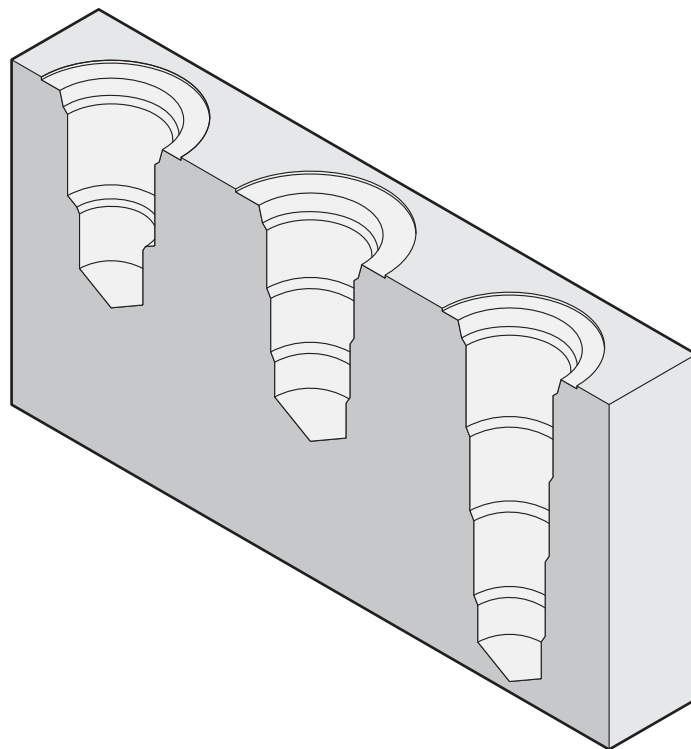


Code	Material	Cavity
M10850319	Alluminium - EN AW 2011	CD019006



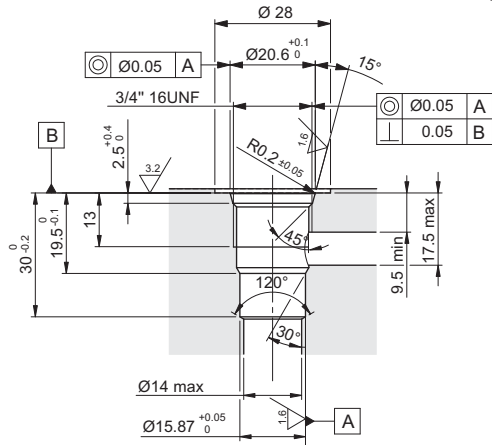
Code	Material	Cavity
M10850206	Alluminium - EN AW 2011	CD018005

CAVITIES



CD018012

3/4 16UNF

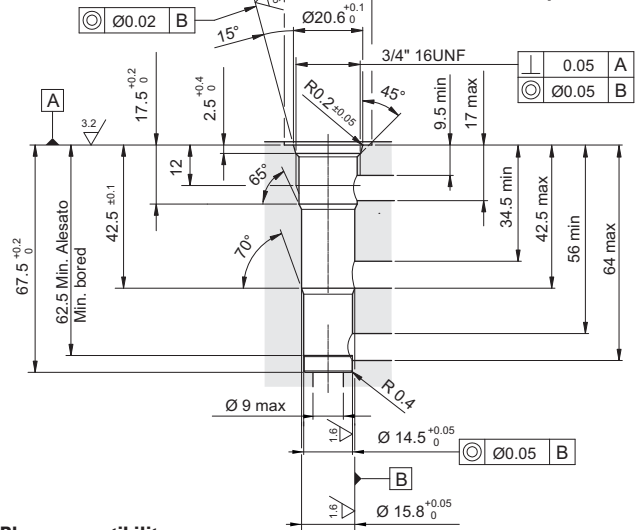


Plugs compatibility:

R78200A19	20001700	20001900		
-----------	----------	----------	--	--

CD018013

3/4 16UNF

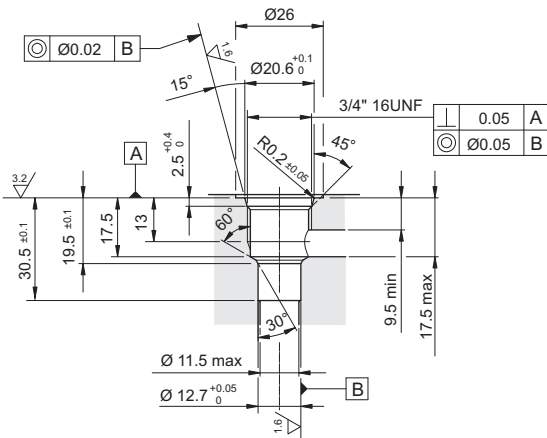


Plugs compatibility:

R78150100				
-----------	--	--	--	--

CD018014

3/4 16UNF

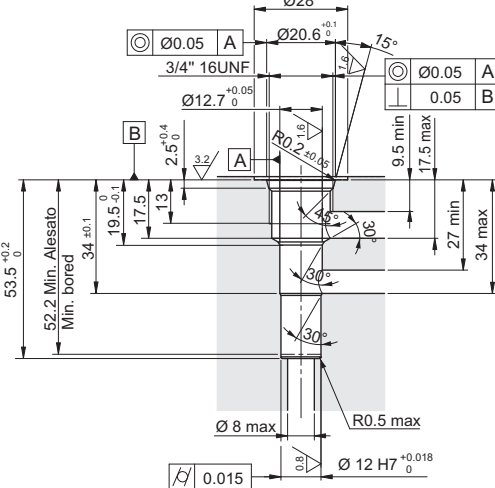


Plugs compatibility:

20001900	20001700	20003800	20009400	20018000
----------	----------	----------	----------	----------

CD018015

3/4 16UNF

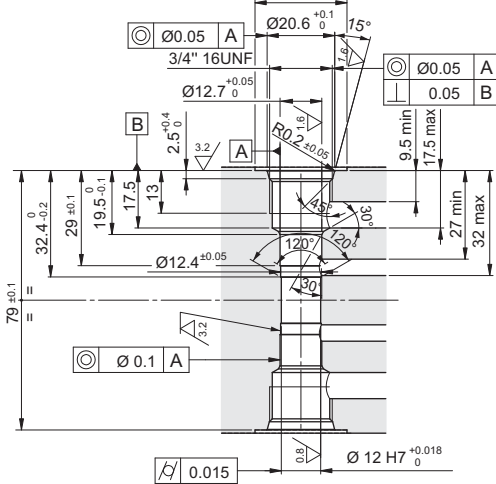


Plugs compatibility:

20018000	20001700	20001900	20003800	20009400
----------	----------	----------	----------	----------

CD018016

3/4 16UNF

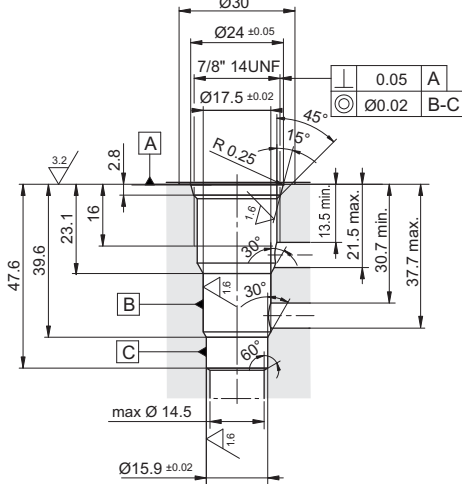


Plugs compatibility:

20018000	20001700	20001900	20003800	20009400
----------	----------	----------	----------	----------

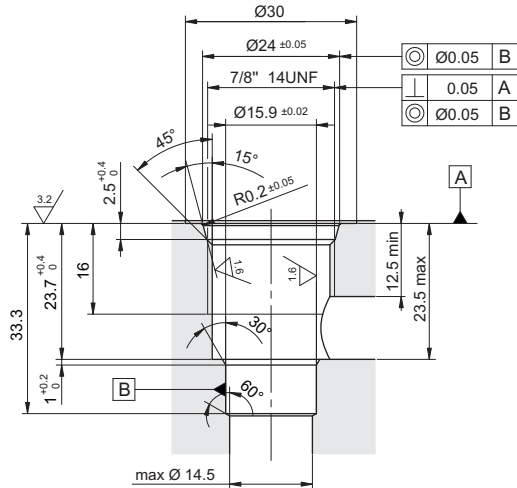
CD019006

7/8 14UNF

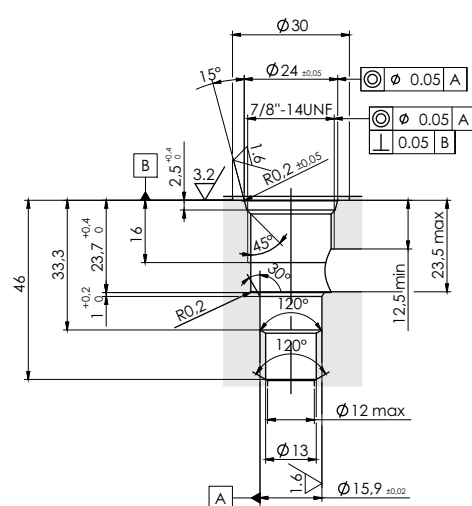


Plugs compatibility:

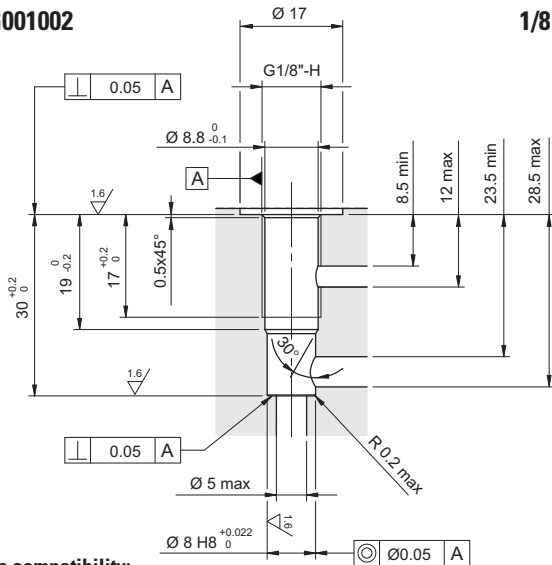
--	--	--	--	--

CD019007
7/8 14UNF

Plugs compatibility:

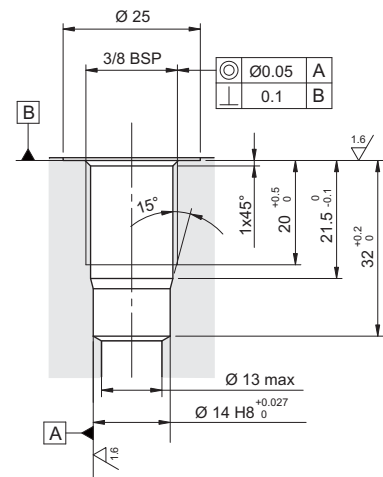
R78100033				
-----------	--	--	--	--

CD019011
7/8 14UNF

Plugs compatibility:

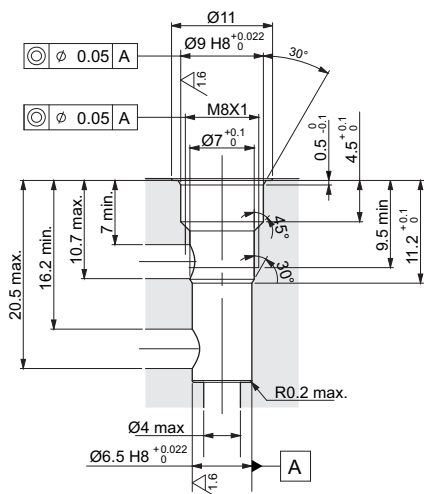
R78100033				
-----------	--	--	--	--

CG001002
1/8 BSP

Plugs compatibility:

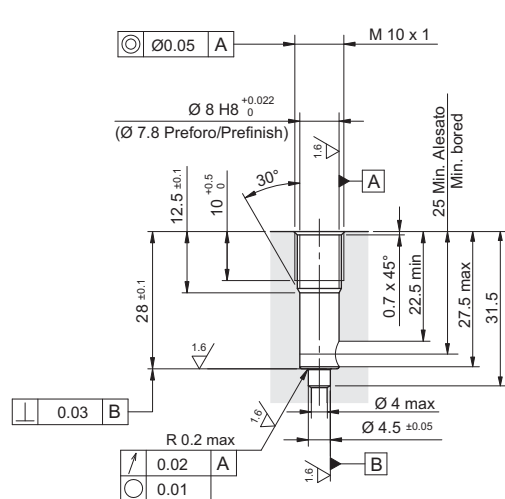
--	--	--	--	--

CG003004
3/8 BSP

Plugs compatibility:

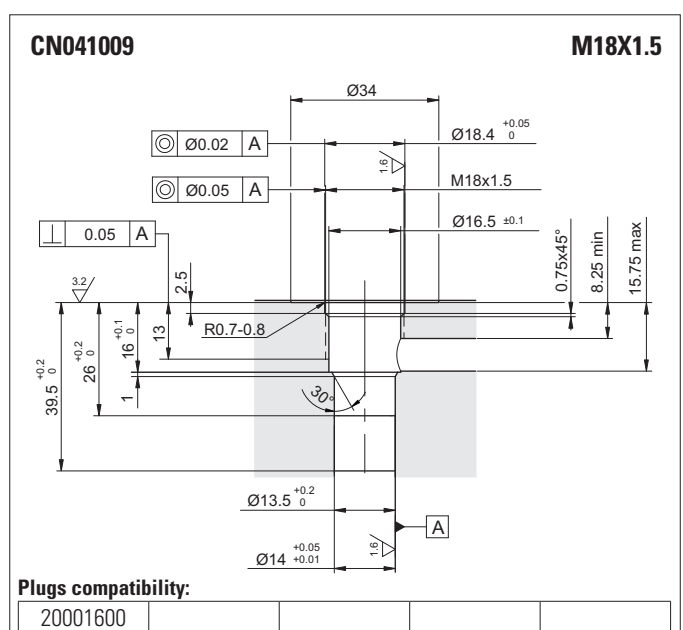
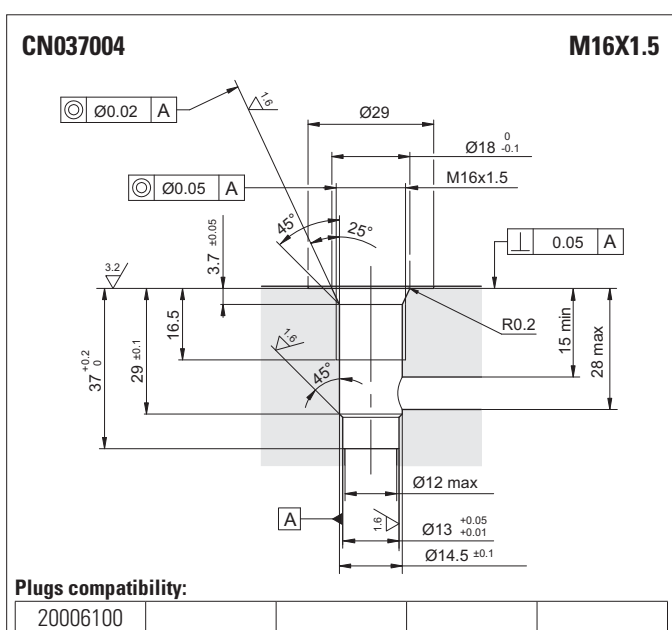
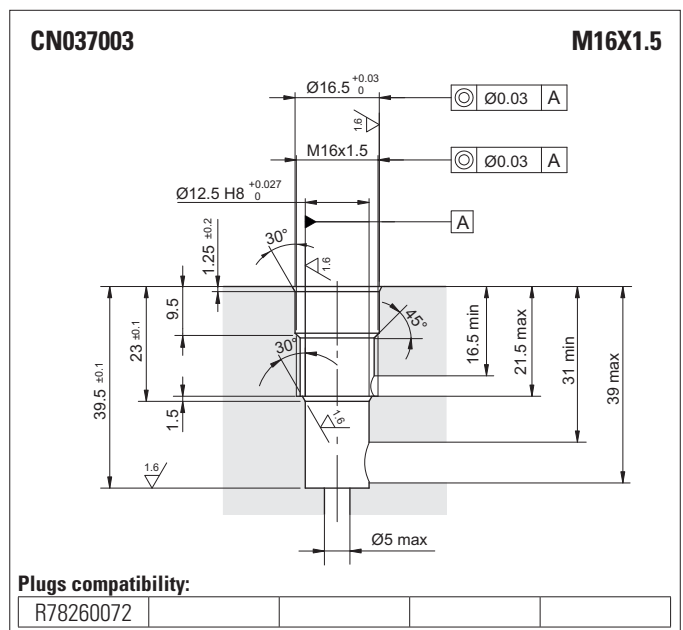
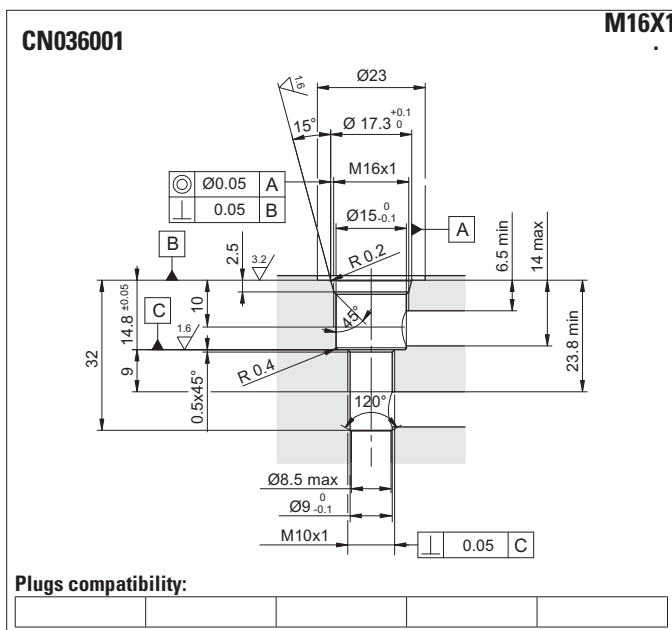
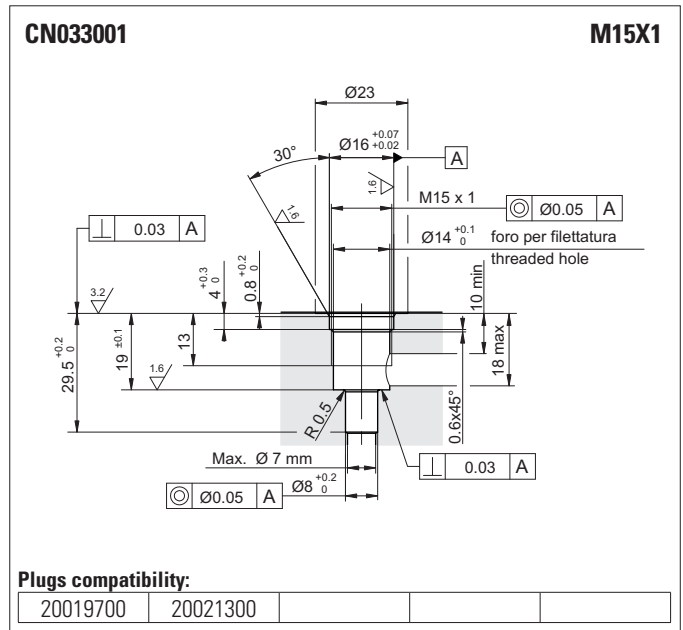
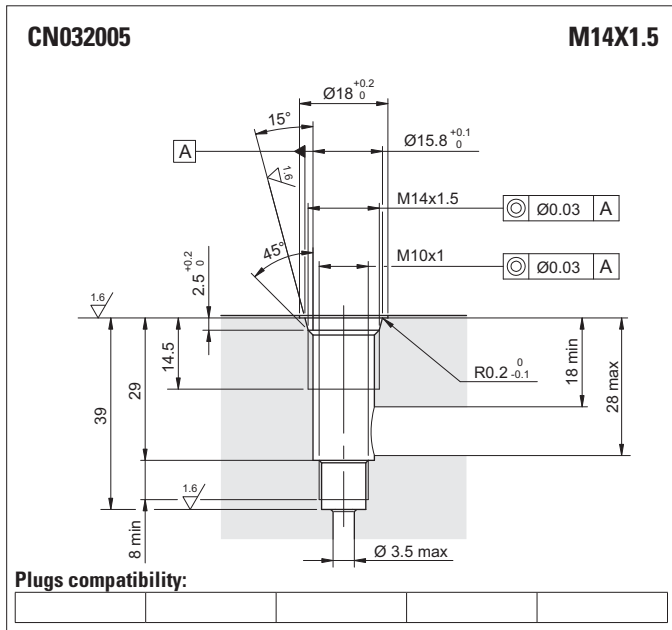
--	--	--	--	--

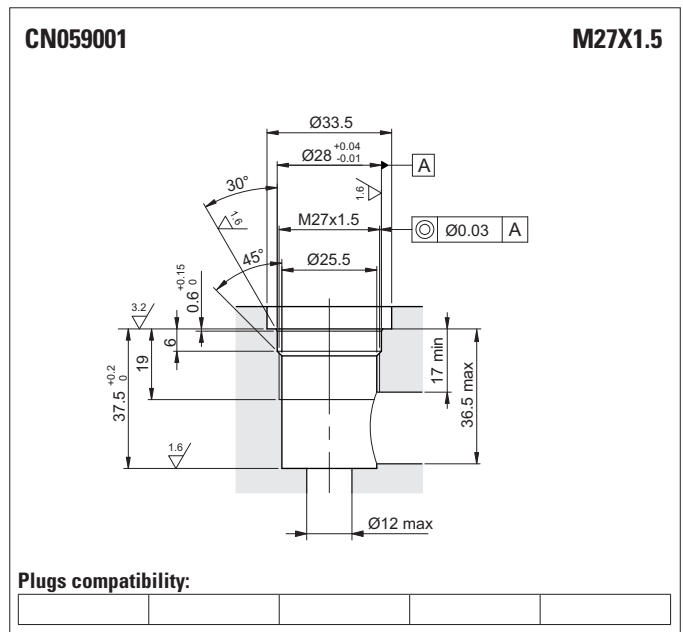
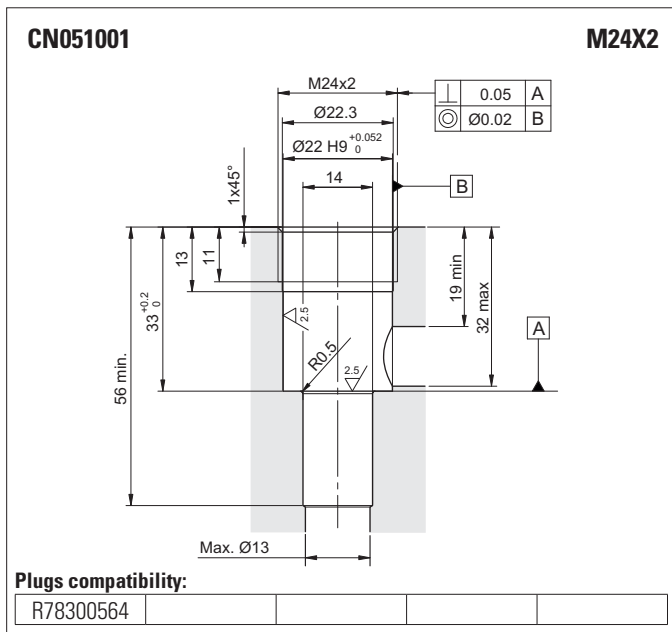
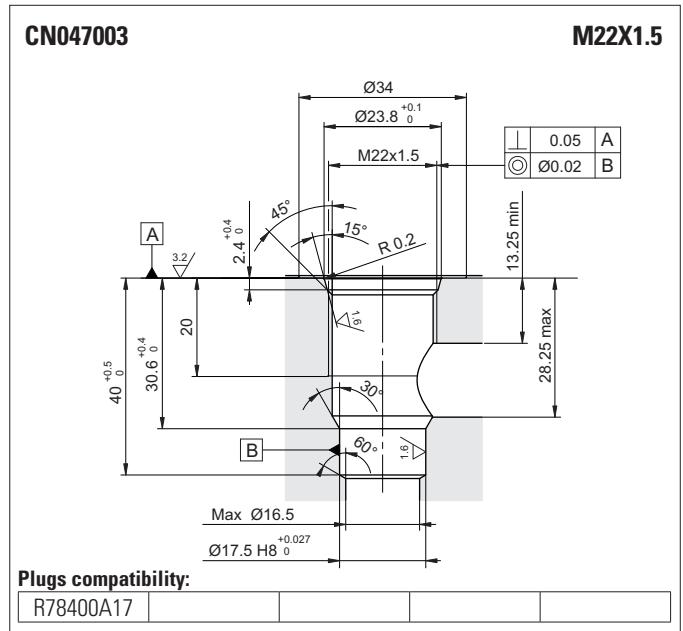
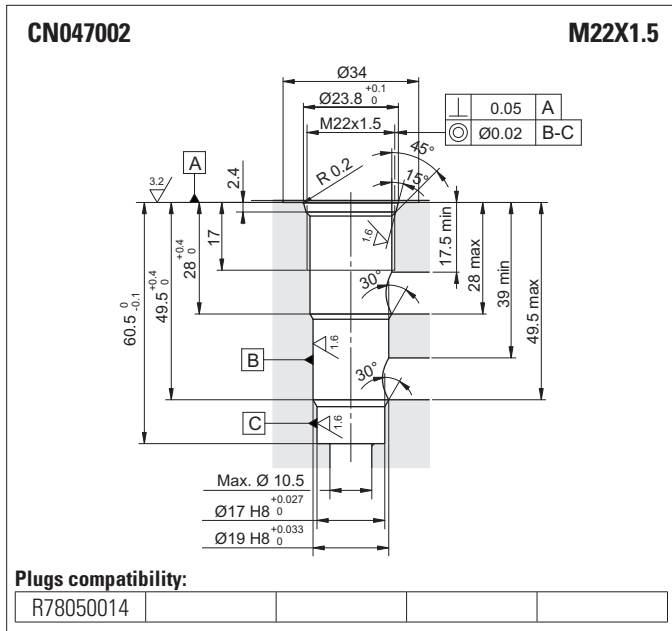
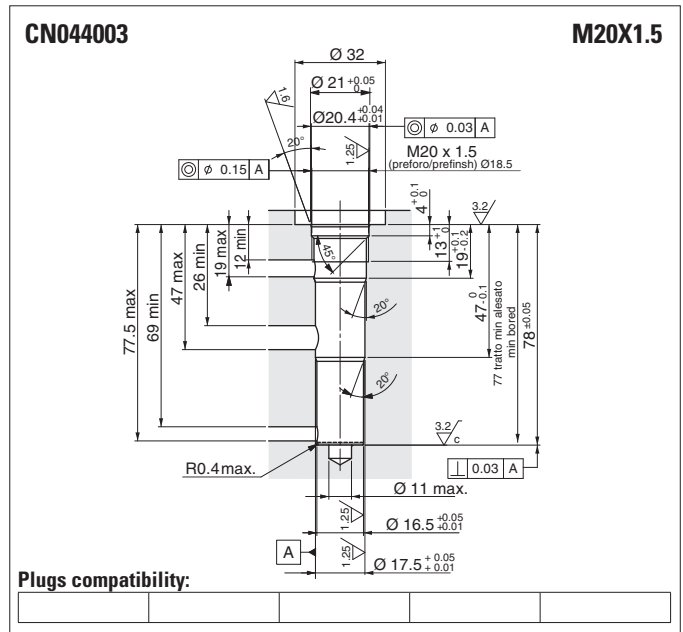
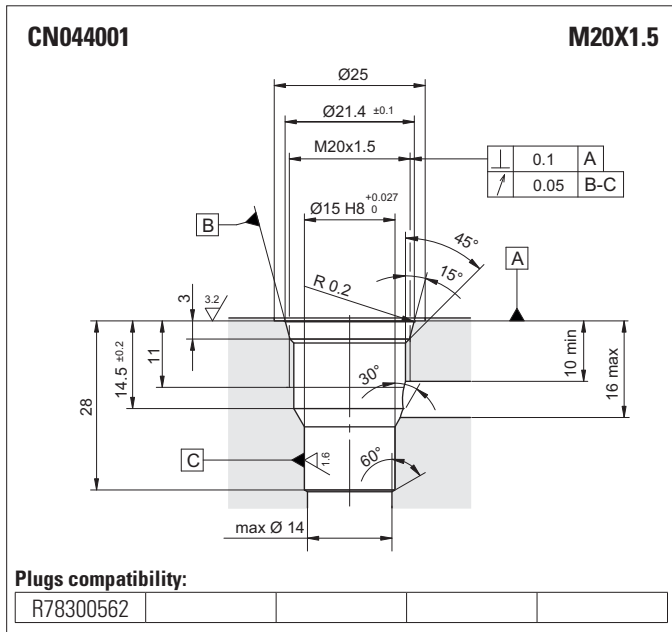
CA007001
M8X1

Plugs compatibility:

--	--	--	--	--

CN019002
M10X1

Plugs compatibility:

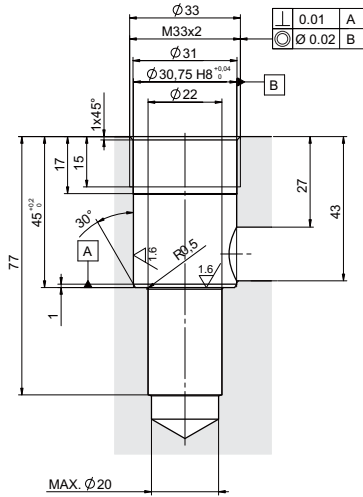
--	--	--	--	--





CN070001

M33X2



Plugs compatibility:

R78400568				
-----------	--	--	--	--

Plugs compatibility:

--	--	--	--	--

Plugs compatibility:

--	--	--	--	--

Plugs compatibility:

--	--	--	--	--

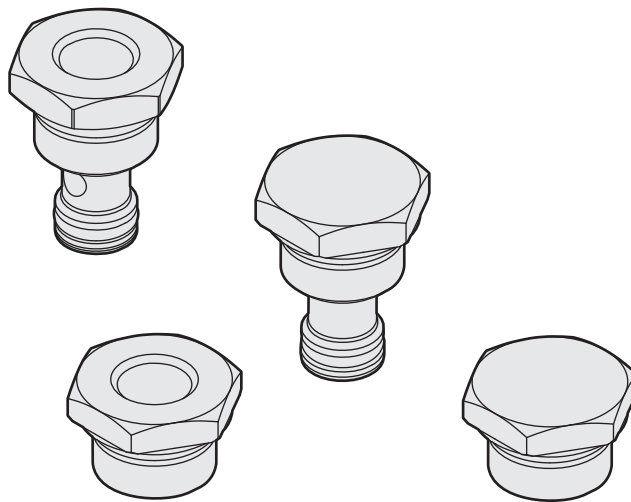
Plugs compatibility:

--	--	--	--	--

Plugs compatibility:

--	--	--	--	--

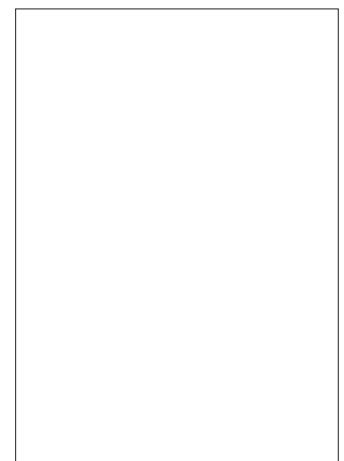
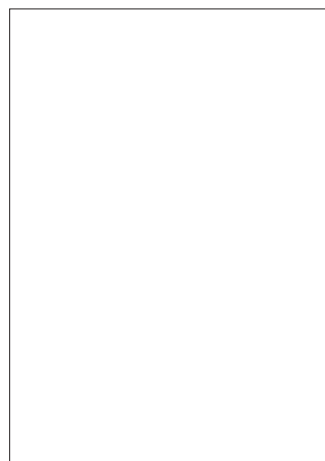
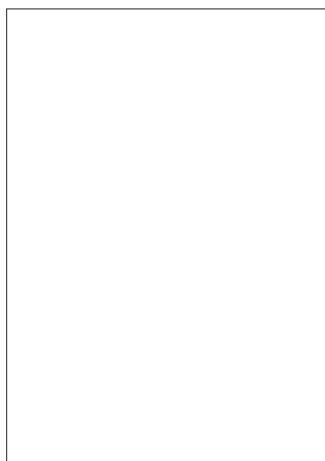
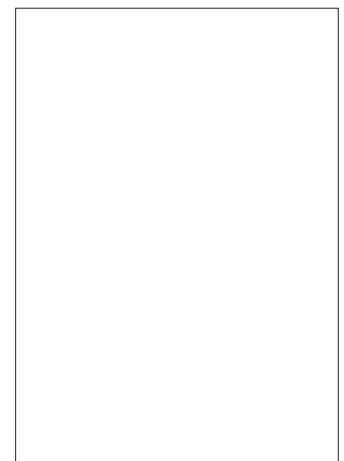
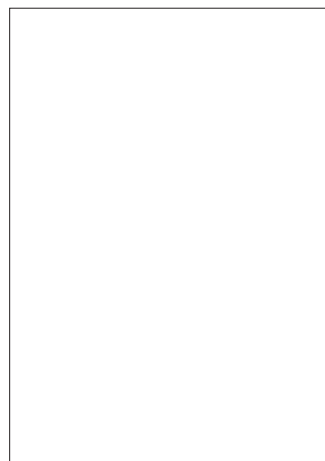
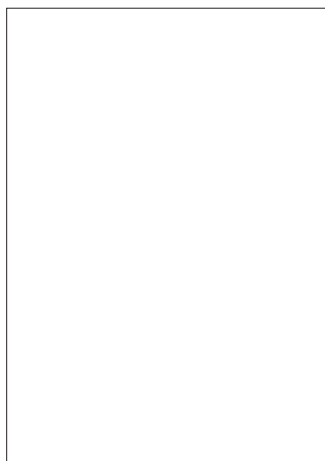
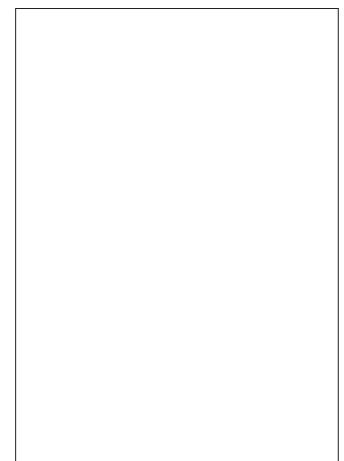
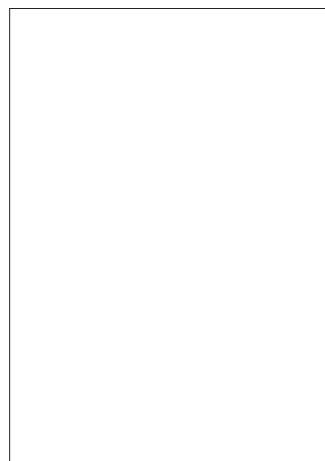
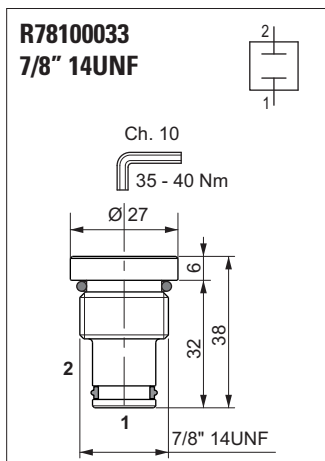
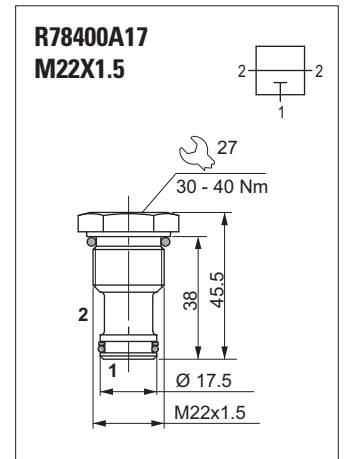
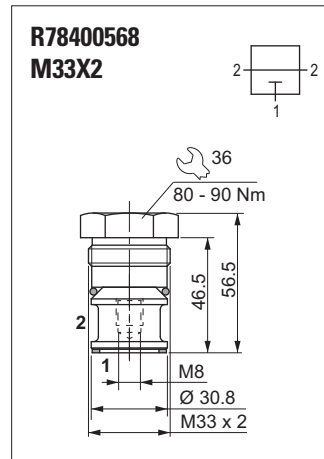
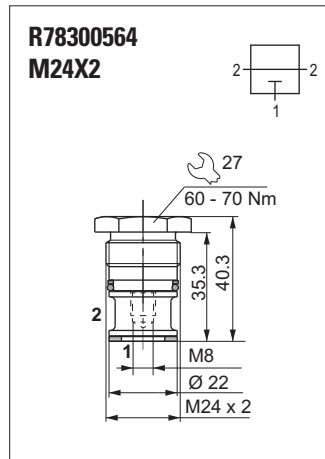
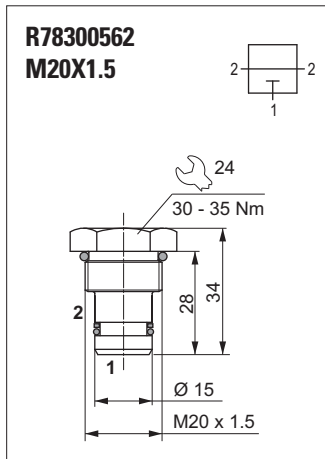
STANDARD PLUGS



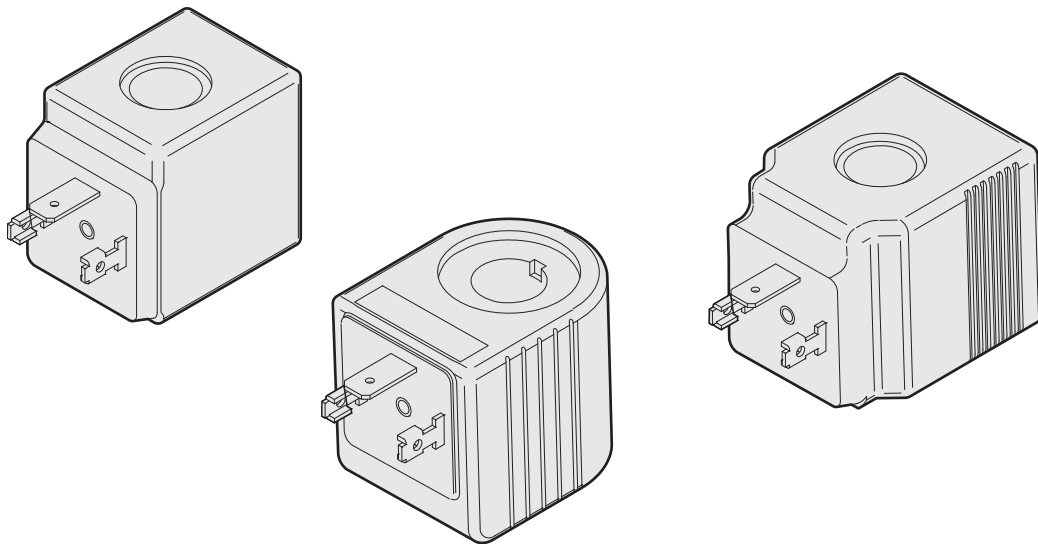
Standard plugs

<p>20001600 M18X1.5</p>	<p>20001700 3/4 16UNF</p>	<p>20018000 3/4 16UNF</p>	<p>20001900 3/4 16UNF</p>
<p>20003800 3/4 16UNF</p>	<p>20006100 M16X1.5</p>	<p>20009400 3/4 16UNF</p>	<p>20019700 M15X1</p>
<p>20021300 M15X1</p>	<p>R78050014 M22X1.5</p>	<p>R78150100 3/4 16UNF</p>	<p>R78150109 3/4 16UNF</p>
<p>R78150111 3/4 16UNF</p>	<p>R78150114 3/4 16UNF</p>	<p>R78200A19 3/4 16UNF</p>	<p>R78260072 M16x1.5</p>

Standard plugs



COILS

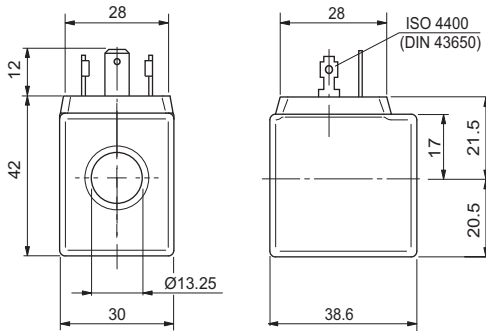


C30 - COILS 18W

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

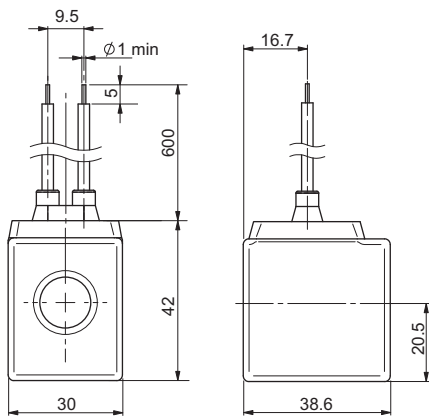
Standard (Hirschmann ISO 4400 DIN43650)



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

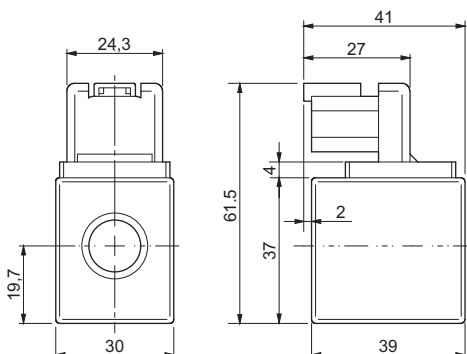
(3) The european low voltage directive is applied to electronical equipments used at a nominal voltages between 50 and 1000 VAC or 75 and 1500 VDC. In conformity with the low directive each part of the manifold or the subplate on which the valve is mounted should be connected to a protective earth with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

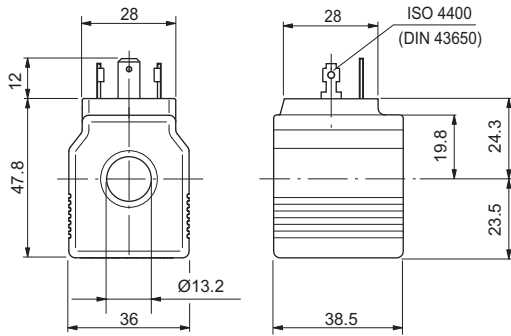
Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	110 °C	18 W	7.7 Ω	M14760001
M	24 VDC	110 °C	18 W	31 Ω	M14760002

(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

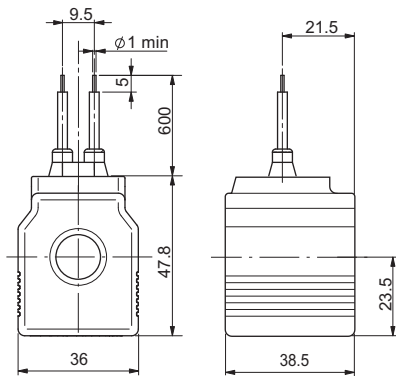


Standard (Hirschmann ISO 4400 DIN43650)

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

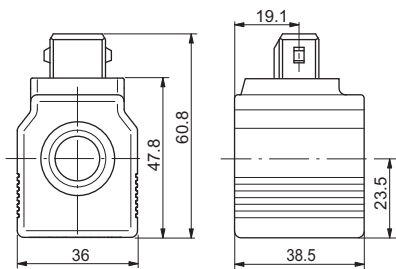
(3) The european low voltage directive is applied to electronical equipments used at a nominal voltages between 50 and 1000 VAC or 75 and 1500 VDC. In conformity with the low directive each part of the manifold or the subplate on which the valve is mounted should be connected to a protective earth with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

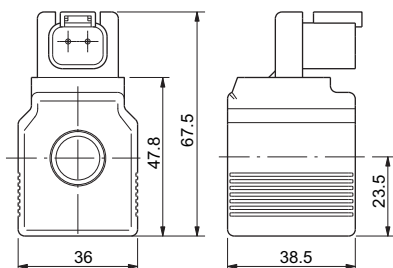
(1) Ambient temperature 25 °C - (2) Ambient temperature 20 °C



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)

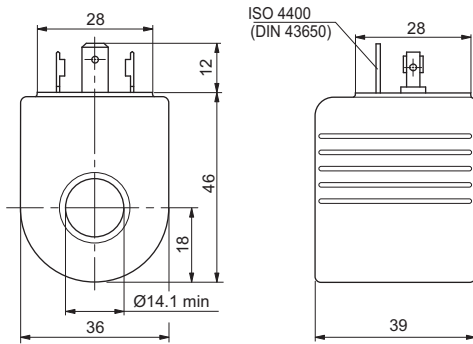
Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	115 °C	22 W	6.3 Ω	M14040201
4	14 VDC	115 °C	22 W	8.9 Ω	M14040209
M	24 VDC	115 °C	22 W	25.6 Ω	M14040202
V	28 VDC	115 °C	22 W	32.8 Ω	M14040208

(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

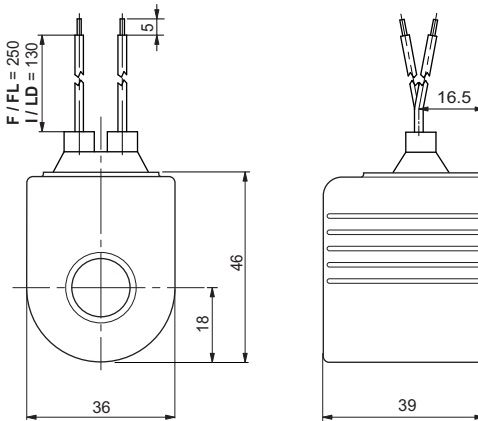


Hirschmann ISO 4400 DIN43650 (connection H)

Code	Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare 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

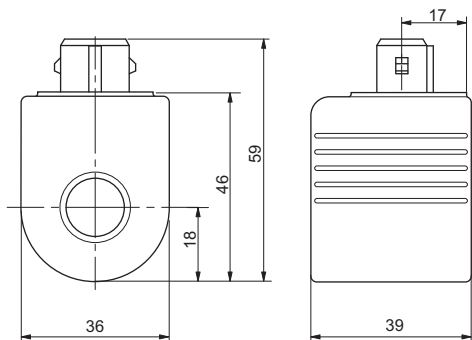
(3) The european low voltage directive is applied to electronical equipments used at a nominal voltages between 50 and 1000 VAC or 75 and 1500 VDC. In conformity with the low directive each part of the manifold or the subplate on which the valve is mounted should be connected to a protective earth with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



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

Codice	Bobina		Wires (mm)	Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
	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

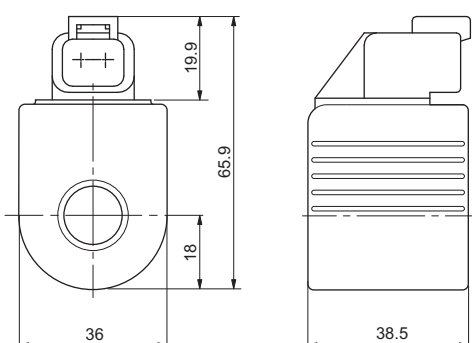
(1) Ambient temperature 25 °C - (2) Ambient temperature 20 °C



AMP Junior (connection A / variant AJ)

Code	Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare 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)

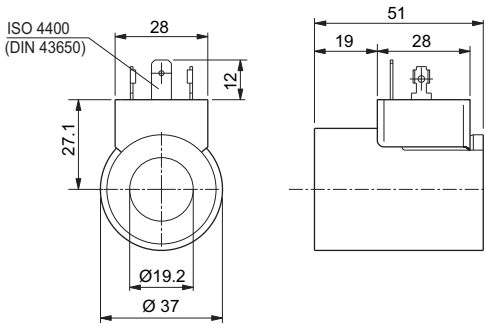
Code	Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
	Voltage					
L	12 VDC		123 °C	27 W	5.3 Ω	M14340001
M	24 VDC		123 °C	27 W	21.3 Ω	M14340002

(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)

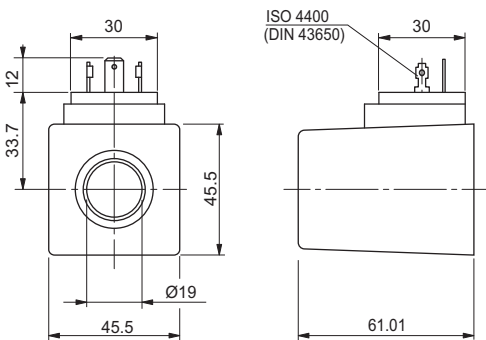
Coil		Max winding temperature (1)	Rated power	Resistance ±5% (2)	Spare code
Code	Voltage				
F	12 VDC	115 °C	23 W	5.3 Ω	M14850001
G	24 VDC	115 °C	23 W	25.3 Ω	M14850002

(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

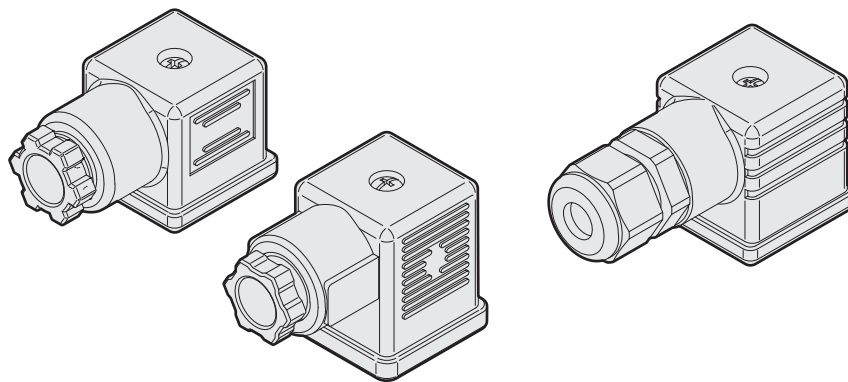


Standard (Hirschmann ISO 4400 DIN43650)

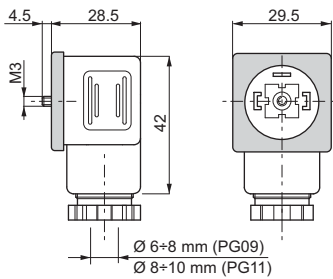
Coil		Max winding temperature (1)	Rated power	Resistance ±7% (2)	Spare code
Code	Voltage				
L	12 VDC	108 °C	30 W	4.7 Ω	M14100010
M	24 VDC	108 °C	30 W	18.8 Ω	M14100011

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

CONNECTORS

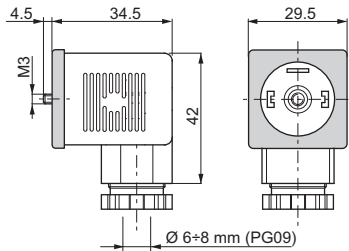


CONNECTORS FOR CONTROL VALVES IN ACCORDANCE WITH DIN 43650 / ISO 4400



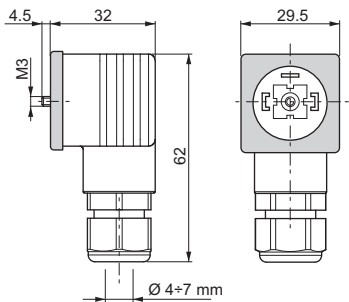
Connector	Protection level	Type	Cable gland	Code
Standard	IP65	Black color	PG09	V86 05 0002
		Grey color	PG09	V86 05 0004
		Black color	PG11	V86 05 0006
		Grey color	PG11	V86 05 0008
Lens cover with pilot light (1)	IP65	12 VAC/VDC	PG09	V86 10 0018
		24 VAC/VDC	PG09	V86 10 0012
		115 VAC/VDC	PG09	V86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

(1) do not use for proportional versions



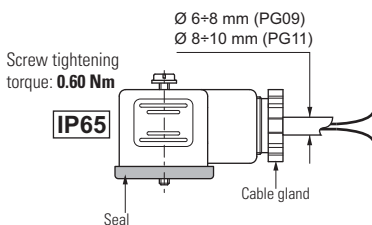
Connector	Protection level	Type	Cable gland	Code
With rectifier (1) Inlet voltage 12÷230 VAC Outlet voltage 9÷205 VDC	IP65	Black color	PG09	V86 20 0002
		Grey color	PG09	V86 20 0004
Lens cover with pilot light and rectifier (1) Inlet voltage 12÷230 VAC Outlet voltage 9÷205 VDC	IP65	12 VAC	PG09	V86 25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



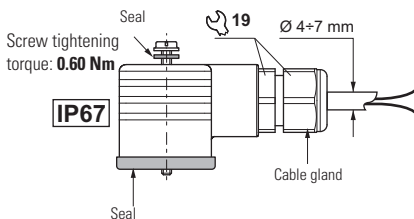
Connector	Protection level	Type	Cable gland	Code
With protection level IP67	IP67	Black color	—	V86 28 0001
		Grey color	—	V86 28 0002

Electrical features of connectors

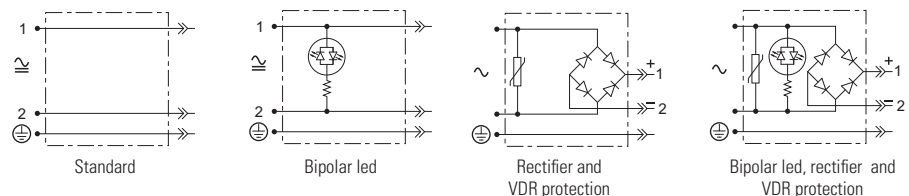


Description	IP65	IP67
AC rated voltage	Max. 250 V	Max. 250 V
DC rated voltage	Max. 300 V	Max. 300 V
Pin contact nominal current	10A	10A
Pin contact max. current	16A	16A
Max. section cable	1.5 mm ²	1.5 mm ²
Cable gland PG09 - M16x1,5	Ø cable 6 ÷ 8 mm	Ø cable 4 ÷ 7 mm
Cable gland PG11 - G 1/2" - M20x1,5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

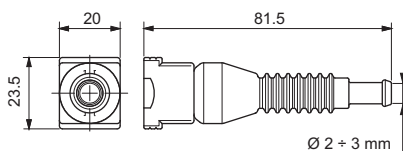
The degrees of protection indicate is guaranteed only if the connectors were properly mounted with his original seals.



Electrical circuits



AMP JUNIOR CONNECTORS



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



Code DOC00044 - Rev. 07

Brevini Fluid Power S.p.A.

Via Moscova, 6

42124 Reggio Emilia - Italy

Tel. +39 0522 270711

Fax +39 0522 270660

www.brevinifluidpower.com

info@brevinifluidpower.com

