



Hydraulic integrated circuits

WARNING!

Variations and modifications of technical features and dimensions are reserved.

WALVOIL S.p.A. also reserves the right to stop production of each and any model listed in the catalogue with no notice.

Copyrights on the text contained herein belong to **WALVOIL S.p.A.** . Partial and full reproductions or copies of this catalogue are forbidden.

WALVOIL IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN INCORRECT USE OF THE PRODUCT.

1st EDITION MAY 2010

Fluid:best use mineral oil with viscosity ranging between 10 and 200 cSt.

Filter:dirty oil is the main reason for failure and troubles of hydraulic parts and systems.

The table below contains **OLEOSTAR S.p.A.** recommendations about the minimum oil contamination level according to individual specifications of different items. For further safety of your hydraulic equipment and of all valves assembled on it, we either recommend use suction filters (rather than return filters) or separated filter lines.

TYPE OF EQUIPMENT - TYPE OF VALVE	CONTAMINATION LEVEL According to ISO 4406
<ul style="list-style-type: none"> - Heavy duty equipment - Equipment running at 210-350 bar (3050-5100 psi) working pressure - Equipment using proportional controls - Equipment with high frequency cycles 	-/16/13
<ul style="list-style-type: none"> - Equipment running up to 210 bar (3050 psi) working pressure - Spool-type valves - Valves with calibrated ports 	-/18/14
<ul style="list-style-type: none"> - Equipment running at low working pressure - Pilot plants and equipment - Equipment with low frequency cycles 	-/19/15

Installation:make sure to provide suitable gasket lubrication with clean oil before screwing the cartridge on the valve body . Also make sure to screw the cartridge manually in to reach against the gaskets in the valve body.

Material:internal components made out of high grade steel duly treated and fabricated.

For more information please ask our technical office .

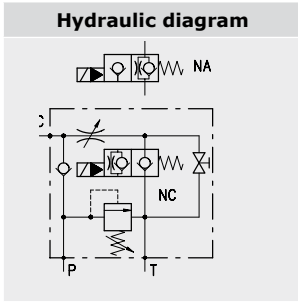
Working temperature:min. -25°C (-13°F) max. 90°C (194°F) with standard BUNA N seals.

min. -20°C (-4°F) max. 200°C (392°F) with optional VITON seals.

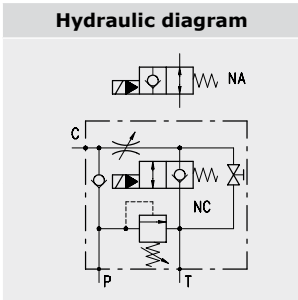
Rating diagrams:all rating diagrams of this catalogue are measured with mineral oil of 46 cSt viscosity at 40° (104°F) temperature.

All drawings dimensions are defined as $\frac{\text{mm}}{\text{in}}$

Index



Type	Description	Maximum flow up to		Maximum pressure		Page
		l/min	US gpm	bar	psi	
VE/B/VMP/VUI/SR 14 (38 VP)	Control valves for single acting cylinders	20	5.3	210	3050	7



Type	Description	Maximum flow up to		Maximum pressure		Page
		l/min	US gpm	bar	psi	
VE/B/VMP/VUI/SR...	Control valves for single acting cylinders	150	40	350	5100	9

Coils

Introduction.....page 13
Coil BE.....page 14
Coil BT page 15

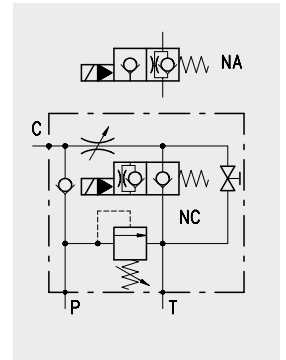
Solenoid Connectors

Introduction, solenoid connectors CC-CA, CL and CP page 16



Operation

This valve allows performance at all functions required by lifting systems using single acting cylinders.



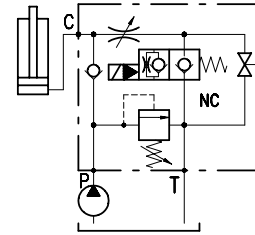
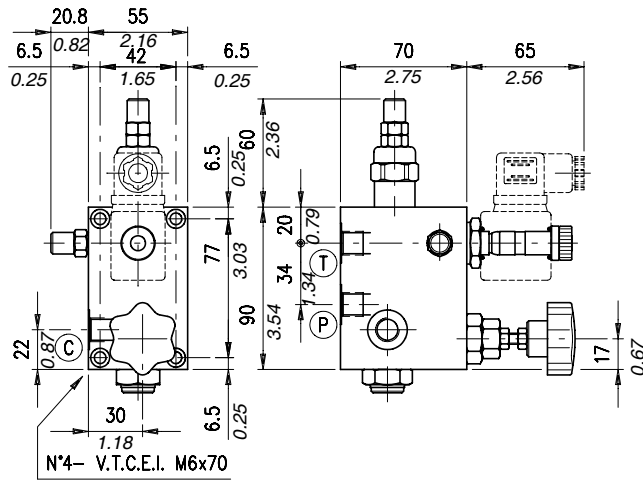
Performance

Body Valves

Tipo	Maximum flow		Maximum pressure bar	Coils*	Oil leak from C to T	Weight	
	l/min	US gpm				kg	lb
VE/B/VMP/VUI/SR 14 (38 VP)	20	5.3	350 -5100 psi-	BE see page 12	0,25 cm ³ /min -15x10 ⁻³ in ³ /min- (5 drops) at 210 bar -3050 psi-	1,27 (alum.) 2,65 (steel)	2,80 (alum.) 5,84 (steel)

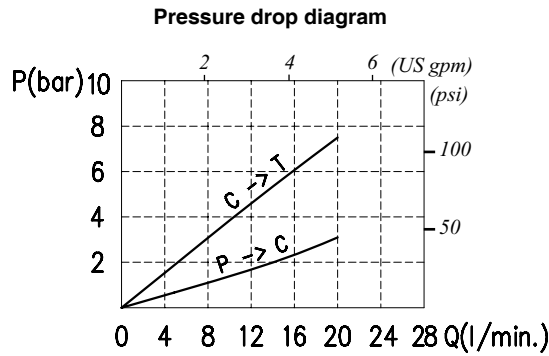
*Warning: BE...RAC solenoids and special connector should be strictly used with the NA version powered by AC current

Dimensions and hydraulic circuit



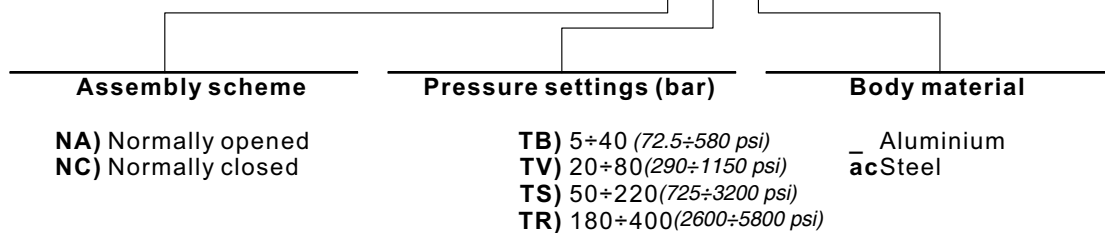
VE/B/VMP/VUI/SR	P-C	T
14	G 1/4	G 1/4
38/VP	G 3/8	G 3/8

Rating diagrams



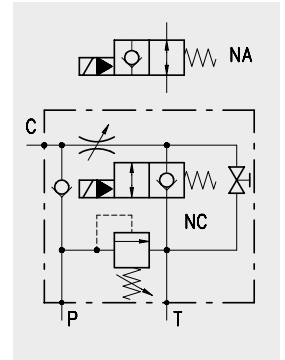
Order code

VE / B / VMP / VUI / SR 14 38 VP / □ / □ / □



Operation

This valve allows performance at all functions required by lifting systems using single acting cylinders.



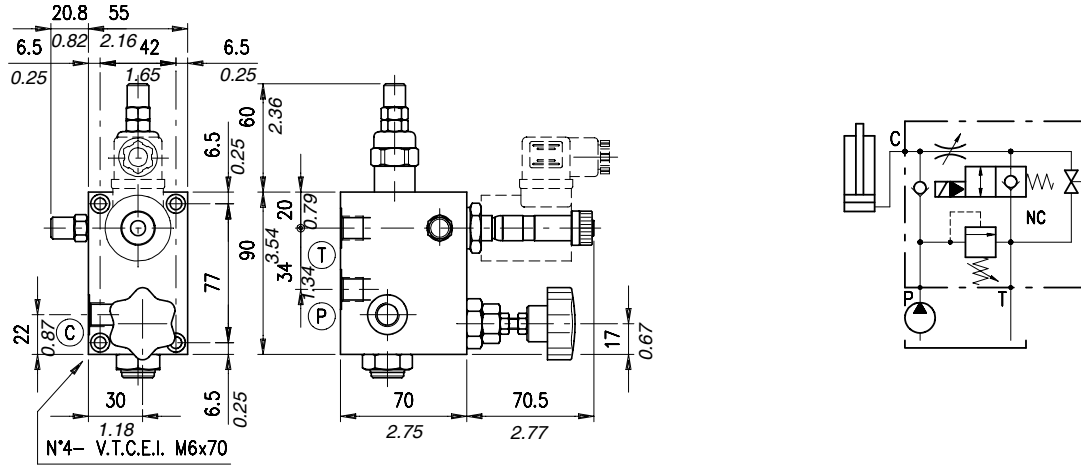
Performance

Body Valves

Type	Maximum flow		Maximum pressure bar	Coils*	Oil leak from C to T	Weight	
	l/min	US gpm				kg	lb
VE/B/VMP/VUI/SR 38	35	9.2	210 -3050 psi- (aluminium body) 350 -5100 psi- (steel body)	BT see page 13	0,25 cm ³ /min -15x10 ⁻³ in ³ /min- (5 drops) at 210 bar -3050 psi-	1,27 (alum.)	2,80 (alum.)
VE/B/VMP/VUI/SR 12	65	17				2,65 (steel)	5,84 (steel)
VE/B/VMP/VUI/SR 34	70	18				2,73 (alum.)	6,02 (alum.)
VE/B/VMP/VUI/SR 100	150	40				3,19 (steel)	7,03 (steel)
						4,65 (alum.)	10,25 (alum.)
						10,03 (steel)	22,11 (steel)

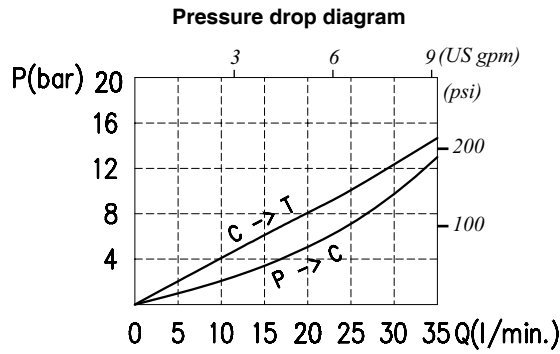
*Warning:BT...RAC solenoids and special connector should be strictly used with the NA version powered by AC current

Dimensions and hydraulic circuit



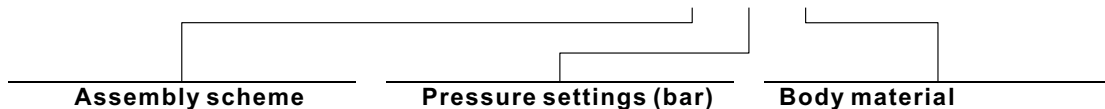
P-C	T
G 3/8	G 3/8

Rating diagrams



Order code

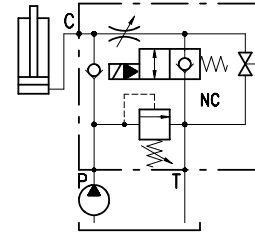
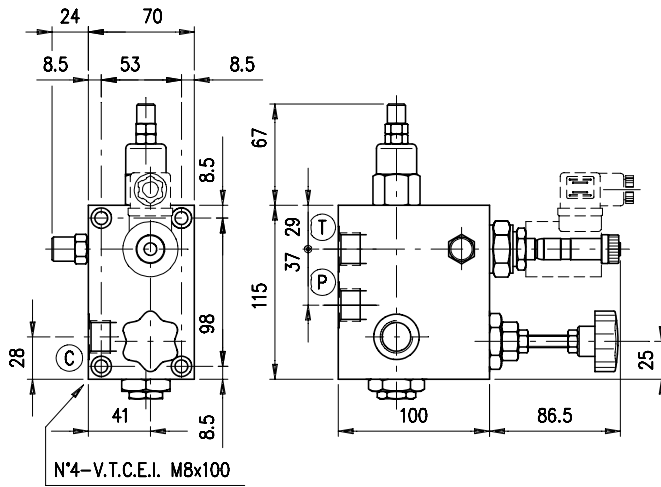
VE / B / VMP / VUI / SR 38 / □ / □ / □



NA) Normally opened
NC) Normally closed

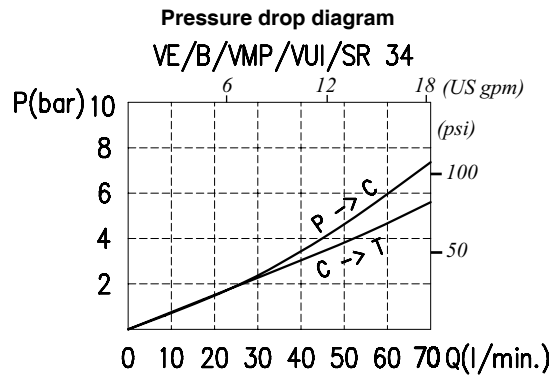
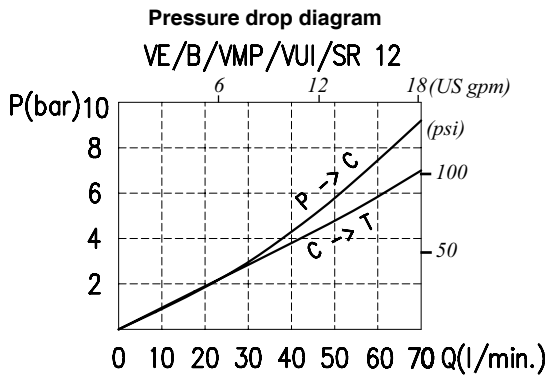
TB) 5÷40 (72.5÷580 psi) _ Aluminium
TV) 20÷80 (290÷1150 psi) acSteel
TS) 50÷220 (725÷3200 psi)
TR) 180÷400 (2600÷5800 psi)

Dimensions and hydraulic circuit



VE/B/VMP/VUI/SR	P-C	T
12	G 1/2	G 1/2
34	G 3/4	G 3/4

Rating diagrams



Order code

VE / B / VMP / VUI / SR / □ / □ / □ / □

Port size

12 G 1/2
34 G 3/4

Assembly scheme

NA) Normally opened
NC) Normally closed

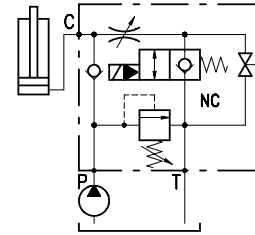
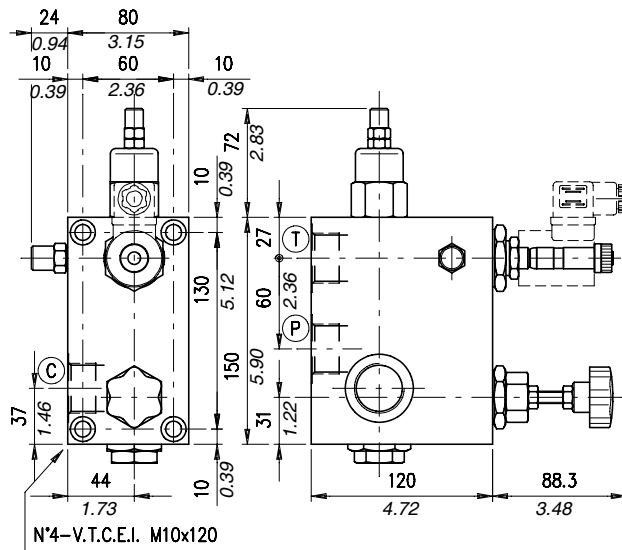
Pressure settings (bar)

TB) 5÷40 (72.5÷580 psi)
TV) 20÷80 (290÷1150 psi)
TS) 50÷220 (725÷3200 psi)
TR) 180÷400 (2600÷5800 psi)

Body material

_ Aluminium
ac Steel

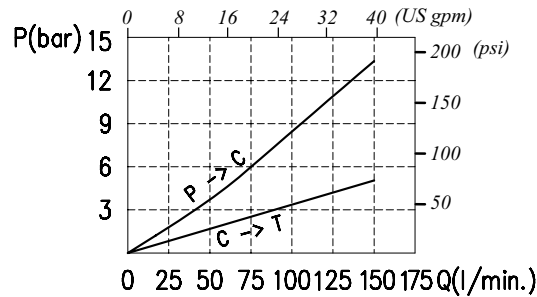
Dimensions and hydraulic circuit



P-C	T
G 1	G 1

Rating diagrams

Pressure drop diagram



Order code

VE / B / VMP / VUI / SR 100 / □ / □ / □

Assembly scheme	Pressure settings (bar)	Body material
NA) Normally opened NC) Normally closed	TB) 5÷40 (72.5÷580 psi) TV) 20÷80 (290÷1150 psi) TS) 50÷220 (725÷3200 psi) TR) 180÷400 (2600÷5800 psi)	_ Aluminium acSteel

Operation

Multiple coil versions are available to allow use with direct and alternated current.

Thermal insulation class: F ($T_{max} = 155^{\circ}\text{C}-303^{\circ}\text{F}$ -) - (VDE 0580)

Relative duty cycle: ED 100% (VDE 0580)

To assure ED = 100% and perform continuous coil operation, the following conditions should be met:

$T_A + \Delta T < T_{max}$

Whereas:

- T_A = ambient temperature

- ΔT = temperature increase due to operation

- T_{max} = maximum admissible temperature according to insulation class

We therefore recommend always checking that the maximum ambient temperature is same as $T_{max} - \Delta T$ (providing no special operating requirement are there).

Safety standards (DIN 40050): IP54 without connector

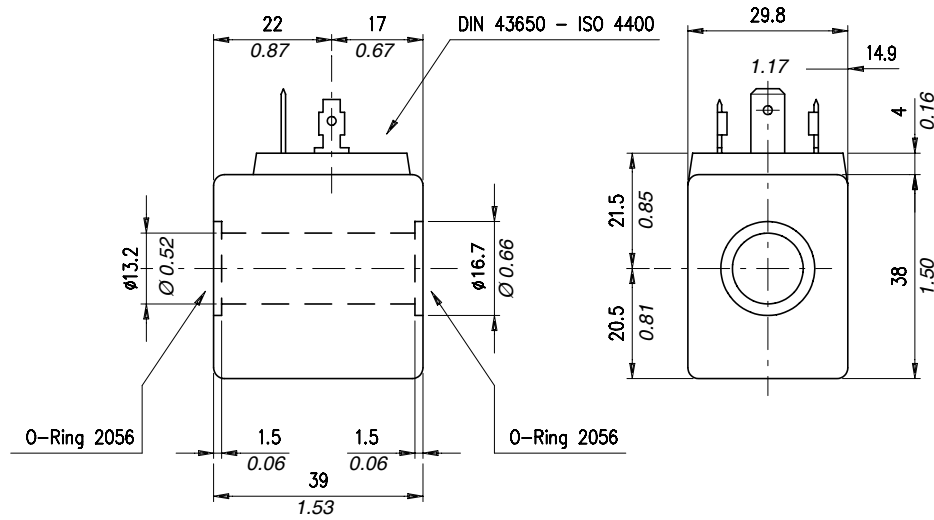
IP65 with connector

Admissible voltage range for long lasting and trouble free operations life: nominal voltage $\pm 10\%$

Performance

Type	Resistance Ω $T_A=20^{\circ}\text{C}$ 68°F	Current (A)		Power (W) or (VA) Cold	ΔT	
		Cold	Warm		After 1 hour at: - $T_A=20-25^{\circ}\text{C}$ $68-77^{\circ}\text{F}$ -Nominal voltage	
					($^{\circ}\text{C}$)	($^{\circ}\text{F}$)
BE 12 Vcc	7,7	1,56	1,16	18,7 W	110	230
BE 24 Vcc	31	0,77	0,58	18,6 W	110	230
BE 48 Vcc	116	0,41	0,3	19,8 W	115	238
BE 110 Vcc	700	0,157	0,12	17,3 W	105	221
BE 24 Vca (50 Hz)	5,3	1,16	0,87	28 VA	105	221
BE 48 Vca (50 Hz)	21,3	0,6	0,45	28,8 VA	105	221
BE 110 Vca (50 Hz)	108	0,26	0,19	28,6 VA	105	221
BE 220 Vca (50 Hz)	438	0,13	0,09	28,6 VA	105	221
BE 380 Vca (50 Hz)	1400	0,09	0,06	34,2 VA	105	221
BE 24 RAC	27	0,8	0,6	17,3 W	105	221
BE 110 RAC	630	0,157	0,12	15,6 W	100	212
BE 220 RAC	2500	0,08	0,06	15,7 W	100	212
BT 12 Vcc	6,8	1,77	1,15	21 W	-	-
BT 24 Vcc	27	0,89	0,58	21 W	-	-
BT 48 Vcc	110	0,43	0,32	20,3 W	105	221
BT 110 Vcc	700	0,15	0,11	15,7 W	100	212
BT 24 Vca (50 Hz)	4,2	0,94	0,83	22,6 VA	-	-
BT 48 Vca (50 Hz)	15,3	0,73	0,54	35 VA	105	221
BT 110 Vca (50 Hz)	89	0,21	0,18	23,1 VA	-	-
BT 220 Vca (50 Hz)	350	0,1	0,08	22 VA	-	-
BT 24 RAC	90	0,47	0,37	20,7 W	105	221
BT 110 RAC	540	0,2	0,16	21,6 W	110	230
BT 220 RAC	2170	0,1	0,08	21,7 W	105	221

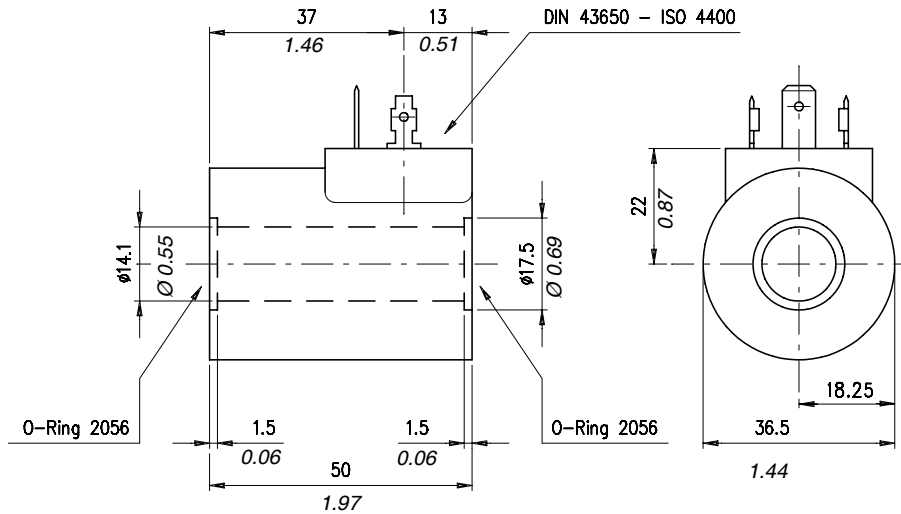
Dimensions



Order code

Type	Ordering code	Ordering code with standard connector	Standard connector code	Connector page
BE 12 Vcc	4SL1000120	5SL1000120	4CN1009990	Page 16 (CC-CA)
BE 24 Vcc	4SL1000240	5SL1000240		
BE 48 Vcc	4SL1000480	5SL1000480		
BE 110 Vcc	4SL1001100	5SL1001100		
BE 24 Vca (50 Hz)	4SL1010240	5SL1010240		
BE 48 Vca (50 Hz)	4SL1010480	5SL1010480		
BE 110 Vca (50 Hz)	4SL1011100	5SL1011100		
BE 220 Vca (50 Hz)	4SL1012200	5SL1012200		
BE 380 Vca (50 Hz)	4SL1013800	5SL1013800	4CN1010240	Page 16 (CL)
BE 24 RAC	4SL1030240	5SL1030240		
BE 110 RAC	4SL1031100	5SL1031100		
BE 220 RAC	4SL1032200	5SL1032200	4CN1012200	

Dimensions



Order code

Type	Ordering code	Ordering code with standard connector	Standard connector code	Connector page
BT 12 Vcc	4SL3000120	5SL3000120	4CN1009990	Page 16 (CC-CA)
BT 24 Vcc	4SL3000240	5SL3000240		
BT 48 Vcc	4SL3000480	5SL3000480		
BT 110 Vcc	4SL3001100	5SL3001100		
BT 24 Vca (50 Hz)	4SL3010240	5SL3010240		
BT 48 Vca (50 Hz)	4SL3010480	5SL3010480		
BT 110 Vca (50 Hz)	4SL3011100	5SL3011100		
BT 220 Vca (50 Hz)	4SL3012200	5SL3012200		
BT 24 RAC	4SL3030240	5SL3030240	4CN3010240	Page 16 (CP)
BT 48 RAC	4SL3030480	5SL3030480	4CN3010480	
BT 110 RAC	4SL3031100	5SL3031100	4CN3011100	
BT 220 RAC	4SL3032200	5SL3032200	4CN3012200	

Operation

There are 3 types of different solenoid connectors:

"CC-CA" 2-poles + GROUND electric connectors in compliance with DIN and A/ISO standards 43650 and 4400. Electric connectors suitable for connection of DC and AC current coils. Type of current must be same as for the coil used.

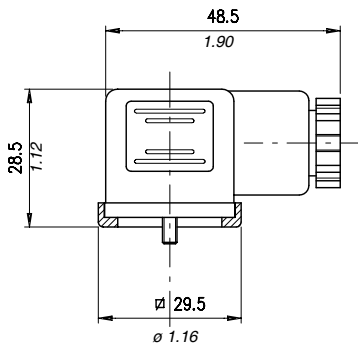
"CL" 2-poles + rectifier + GROUND electric connectors in compliance with DIN and A/ISO standards 43650 and 4400.

Electric connectors suitable for connection of DC current coils BE...RAC. AC current operation only. Use of these poles depends on the type of valve used.

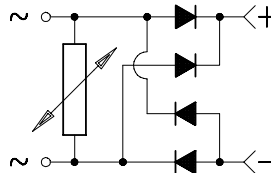
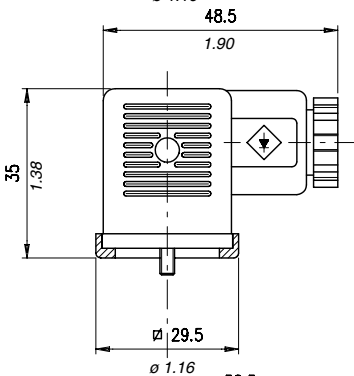
"CP" 2-poles + rectifier + GROUND electric connectors in compliance with DIN and A/ISO standards 43650 and 4400.

Electric connectors suitable for connection of DC current coils BT...RAC. AC current operation only. Use of these poles depends on the type of valve used.

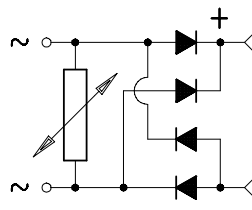
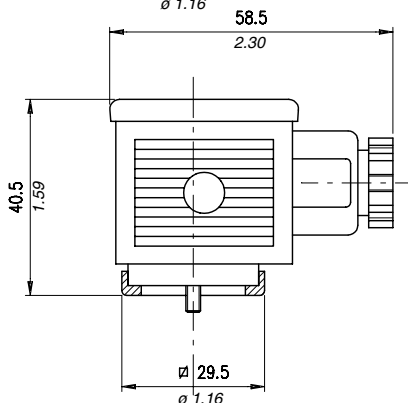
Type	Nominal voltage	Maximum capacity of in-built diode	Nominal poles voltage	Max poles voltage	Poles resistance	Max poles section	Cable size options	Cable diameter	Safety standards	Insulation index
CC-CA	AC	-	10 A	16 A	≤ 4 m Ohm	1,5 mm ² 0.002 in ²	Pg09	6-8 mm 0.24-0.31 in	IP65 (DIN 40050)	VDE0110-1/89
CL	max 250 V DC	1 A								
CP	max 300 V	3 A								



Order code: CC-CA Connector



Order code: CL Connector



Order code: CP Connector

1st edition May 2010

WWW.WALVOIL.COM

 **walvoil**
HYDRAULIC CONTROL SYSTEMS

D1WWEV01E

