Part number:

HYDROMA
HYDRAULICKÉ SYSTÉMY

HIDROMA SISTEMS
UKŁADY HYDRAULICZNE

HYDROMA
ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

6/2 ways/positions flow diverters

RE 18302-05/12.09

L721.... (VS151-VS152-VS155)

Size 6
Series 01
Maximum operating pressure 310 bar *[4500 psi]*
Maximum flow 60 l/min *[15.85 gpm]*
Ports G 3/8 - G 1/2 - SAE8

Summary

General specifications

- 6 way 2 position valve.
- Directional spool valve with direct solenoid control.
- Upon request, hydraulic / pneumatic pilot , or manual push and twist control.
- Usable as stand-alone, or as multiple stackable units
- Control spool operated by screwed-in solenoid, with easily extractable coil fastened by a ring nut.
- Wet pin tube for DC coil, with push rod for mechanical override in case of voltage shortage.
- Unrestricted 360° orientation of DC coil.
- Control spool held in normal position by return spring.
- Optional manual override (push-button or screw type).
- Connectors available: DIN 43650 – ISO 4400, AMP Junior, DT04-2P (Deutsch), Free leads.

Ordering details

L	7	2 1	_	_ _	_ _	_	_ _	_ _	0

Family
Compact directional valve

Type
Flow Diverters

Ports
G 3/8 DIN 3852 = 3
G 1/2 DIN 3852 = 4
3/4-16 UNF (SAE8) = C

Control type
Solenoid (coil C 48) without emergency = 11
Solenoid (coil C 48) with push-button type emergency = 1P
Solenoid (coil C 48) with screw type emergency = 1F
Hydraulic / pneumatic control = P1
Manual push and twist control = H1

Spool Variants
6 way / 2 position P1 side = 6_

Electric connections
00 = Without coil
01 = With coil, without connector
02 = With coil and with non-assembled connector, type DIN 43650 – ISO 4400
03 = With coil having AMP Junior connector
07 = With coil having DEUTSCH DT 04-2P connect.
31 = With coil and bipolar sheathed lead 350mm *[13.8"]* long

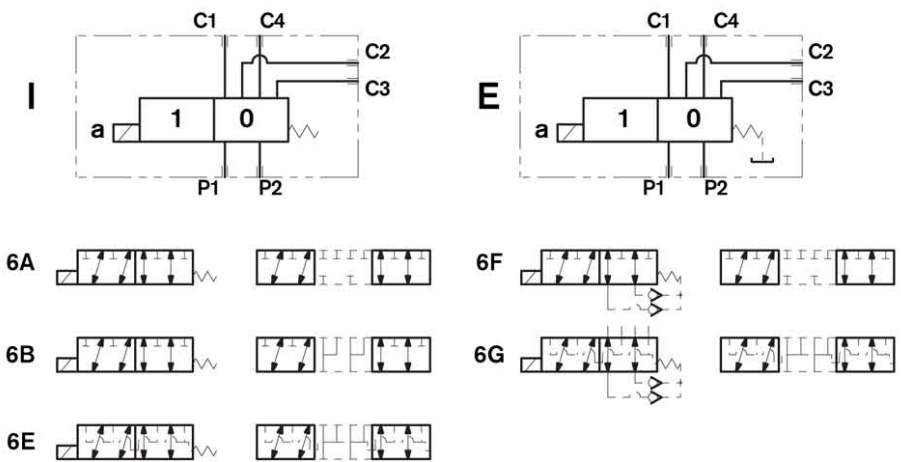
Voltage supply

	31	07	03	02	01	00	
SG =							Manual push and twist control
00 =						■	Without coil
OB =	■	■	■	■	■		12V DC
AD =		■		■	■		13V DC
OC =	■	■	■	■	■		24V DC
AC =		■		■	■		27V DC
OD =				■	■		48V DC

Available connections

Drain type
I = Internal drain
E = External drain

Spool variants



Principles of operation, cross section

A valve basically consists of a housing (1), a control spool (2), a return spring (3) and a solenoid (5). It is designed to connect two inlet lines P1 – P2 (normally a set of hoses) and divert them to either the outlet ports (C1 – C4) with spool in position "0", when the solenoid is de-energized, or to the outlet ports (C2 – C3) with spool in position "1", when the solenoid is energized.

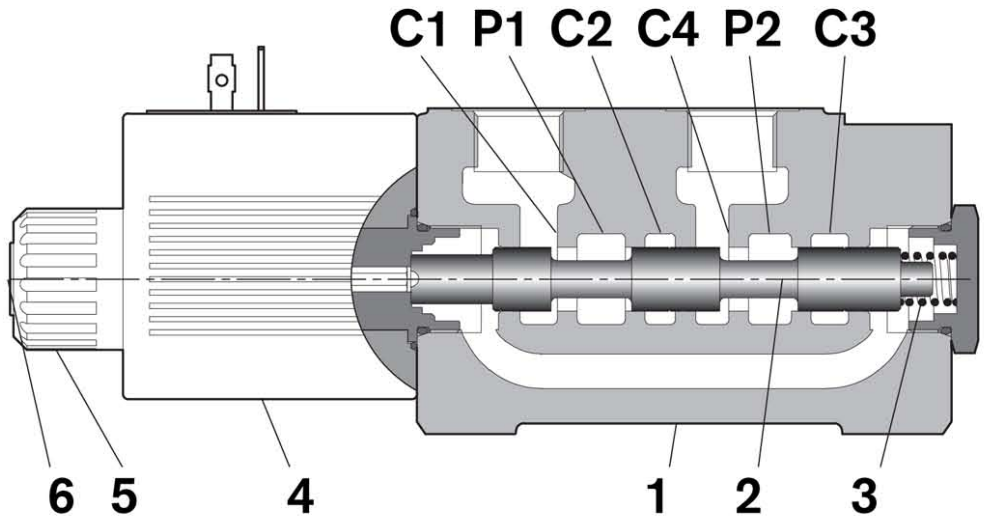
With the coil de-energized, the return spring (3) pushes back the spool (2) and holds it in position "0".

The coil (5) is fastened to the tube by the ring nut (6).

The manual override (6) allows to shift the spool (2) also in case of voltage shortage.

An external drain, to be connected to tank, ensures shifting operations also at higher working pressure.

Hydraulic / pneumatic pilot control, or manual push and twist control for spool shifting are available upon request.



Technical Data (for applications with different specifications consult us)

General

Valve weight	kg *[lbs]*	2.85 *[6.29]*
Mounting position		unrestricted
Ambient Temperature	°C *[°F]*	–20....+50 *[-4....+122]* (NBR seals)

Hydraulic

Maximum pressure with external drain	bar *[psi]*	310 *[4500]*
Maximum pressure with internal drain	bar *[psi]*	250 *[3625]*
Maximum pressure with internal drain and 6F or 6G scheme	bar *[psi]*	310 *[4500]*
Maximum flow	l/min *[gpm]*	60 *[15.85]*
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:		Mineral oil based hydraulic fluids HL (DIN 51524 part 1). Mineral oil based hydraulic fluids HLP (DIN 51524 part 2). For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult us.
Fluid Temperature	°C *[°F]*	–20....+80 *[-4....+176]* (NBR seals)
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=12...15 ISO 4406: classe 20/18/15 NAS 1638: classe 9
Viscosity range	mm^2/s	5....420
Internal leakage with 100 bar *[1450 psi]* secondary pressure at C	cc/min *[in^3/min]*	min. 10 *[0.61]* - max. 20 *[1.2]*

Electrical

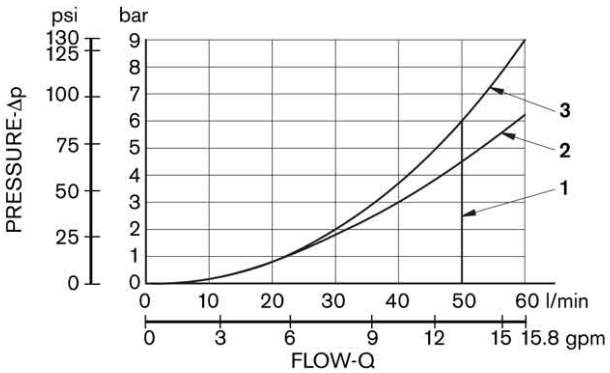
Voltage type		DC								
Voltage tolerance (nominal voltage)	%	-10 .... +10								
Duty	%	Continuous, with ambient temperature ≤ 50°C *[122°F]*								
Maximum coil temperature	°C *[°F]*	150 *[302]*								
Insulation class		H								
Compliance with		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC								
Coil weight with DIN 43650 – ISO 4400 connector	kg *[lbs]*	0.5 *[1.1]*								
Voltage	V	12	13	24	27	48				
Voltage type		DC	DC	DC	DC	DC				
Power consumption	W	36	36	36	36	36				
Current [1]	A	3.0	2.77	1.53	1.32	0.75				
Resistance [2]	Ω	3.97	4.68	15.67	20.42	63.60				

[1] Nominal - [2] ± 7% at temperature 20°C *[68°F]*

	Voltage (V)	Connector type	Coil description	Marking	Coil Mat no.
=OB 01 **=OB 02**	12 DC	EN 175301-803 (Ex. DIN 43650)	C4801 12DC	12 DC	R933000063
=OB 03	12 DC	AMP JUNIOR	C4803 12DC	12 DC	R933000065
=OB 07	12 DC	DEUTSCH DT 04-2P	C4807 12DC	12 DC	R933000068
=OB 31	12 DC	Cable 350 mm long	C4831 12DC	12 DC	R933000064
=AD 01 **=AD 02**	13 DC	EN 175301-803 (Ex. DIN 43650)	C4801 13DC	13 DC	R933000069
=AD 07	13 DC	DEUTSCH DT 04-2P	C4807 13DC	13 DC	R933000073
=OC 01 **=OC 02**	24 DC	EN 175301-803 (Ex. DIN 43650)	C4801 24DC	24 DC	R933000076
=OC 03	24 DC	AMP JUNIOR	C4803 24DC	24 DC	R933000071
=OC 07	24 DC	DEUTSCH DT 04-2P	C4807 24DC	24 DC	R933000075
=OC 31	24 DC	Cable 350 mm long	C4831 24DC	24 DC	R933000070
=AC 01 **=AC 02**	27 DC	EN 175301-803 (Ex. DIN 43650)	C4801 27DC	27 DC	R933000077
=AC 07	27 DC	DEUTSCH DT 04-2P	C4807 27DC	27 DC	R933000074
=OD 01	48 DC	DIN EN 175301-803 ISO 4400	C4801 48DC	48 DC	R933000078

Characteristic curves

Measured with hydraulic fluid ISO-VG32 at 45° ± 5° C *[113° ± 9° F]*; ambient temperature 20° C *[68° F]*.

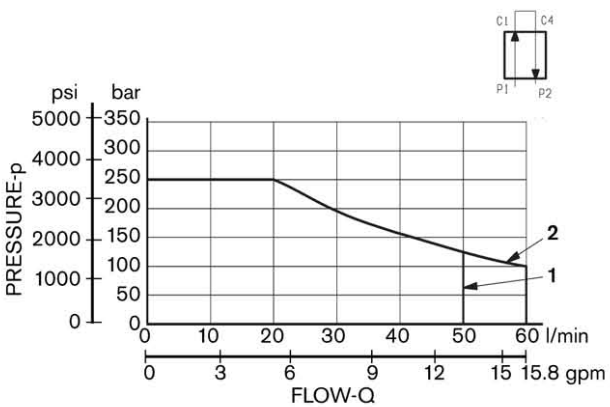


Flow diverter	Curve n.			
	P1>C1	P1>C2	C4> P2	C3>P2
VS151-G3/8	1	1	1	1
VS152-G1/2	2	2	3	3
VS155-SAE8	2	2	3	3

Measured with port G1/2 DIN 3852

DI performance limits

The performance limits refer to the following conditions: coils at operating temperature, voltage supply 10% below nominal, no back pressure in the tank line.

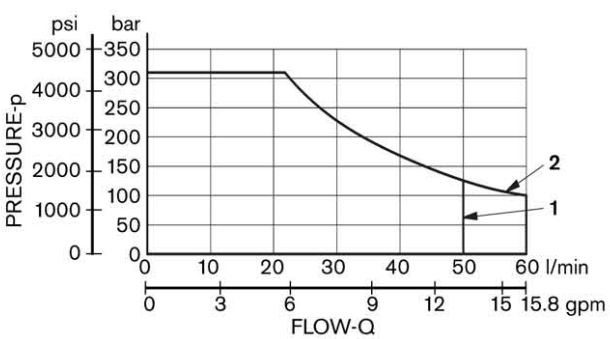


Flow diverter	Curve n.
VS151	1
VS152 - VS 155	2

Flow across both ways: forward across P1>C1 and reverse across C4>P2

DE performance limits

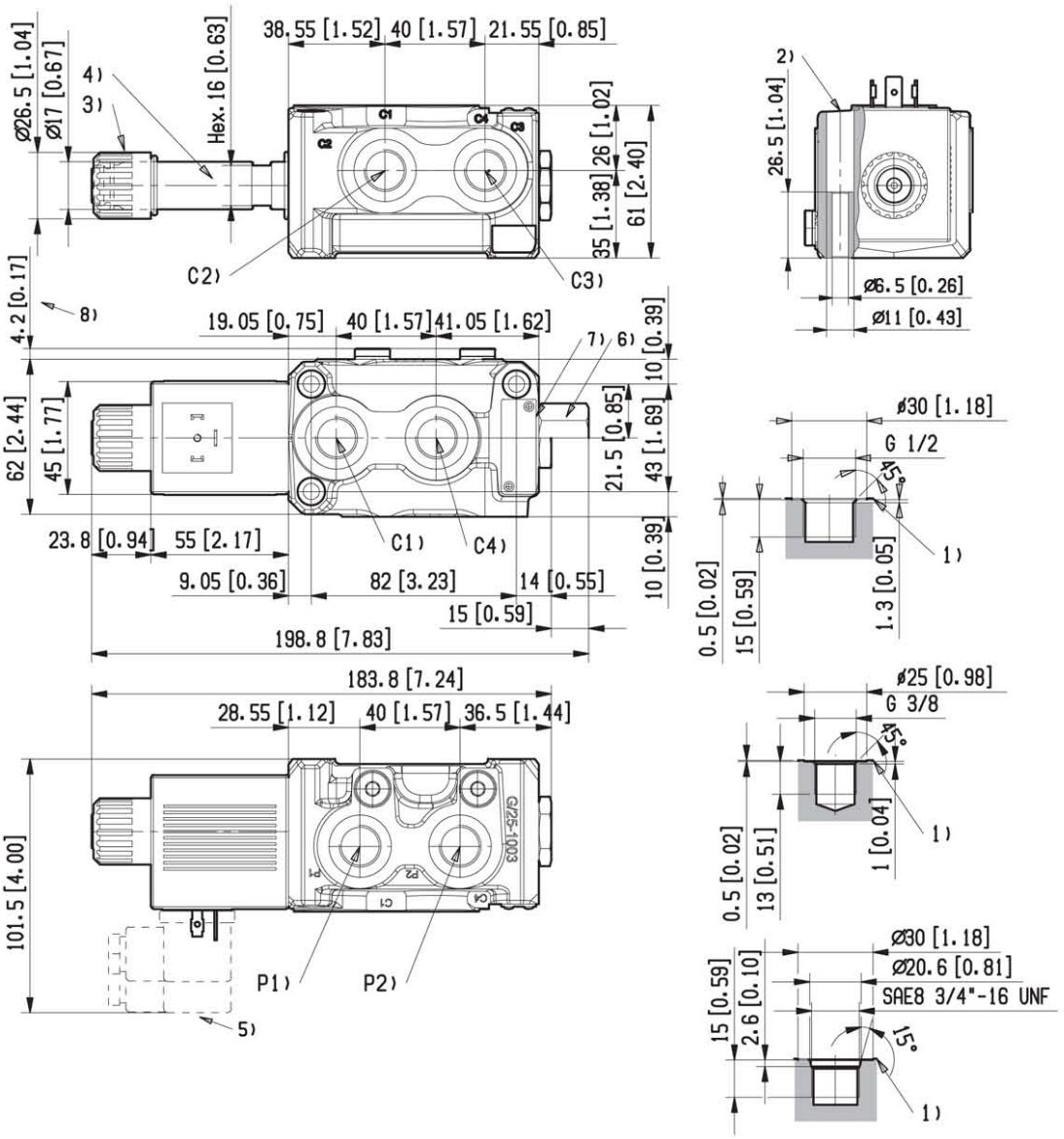
The performance limits refer to the following conditions: coils at operating temperature, voltage supply 10% below nominal, no back pressure in the tank line.



Flow diverter	Curve n.
VS151	1
VS152 - VS 155	2

Flow across both ways: forward across P1>C1 and reverse across C4>P2

External Dimensions and Fittings



1 Ports P1, P2, C1, C2, C3, C4.

2 Two fixation screws M6x40 with strength class DIN 8.8. Torque 9-10 Nm *[14.7 – 16.2 ft-lb].*

3 Ring nut for coil locking OD 26.5 mm [1 .04 in]. Torque 6-7 Nm *[4.4-5.2 ft-lb].*

4 Solenoid tube hex 17 mm. Torque 22-24 Nm *[16.2 – 17.7 ft-lb].*

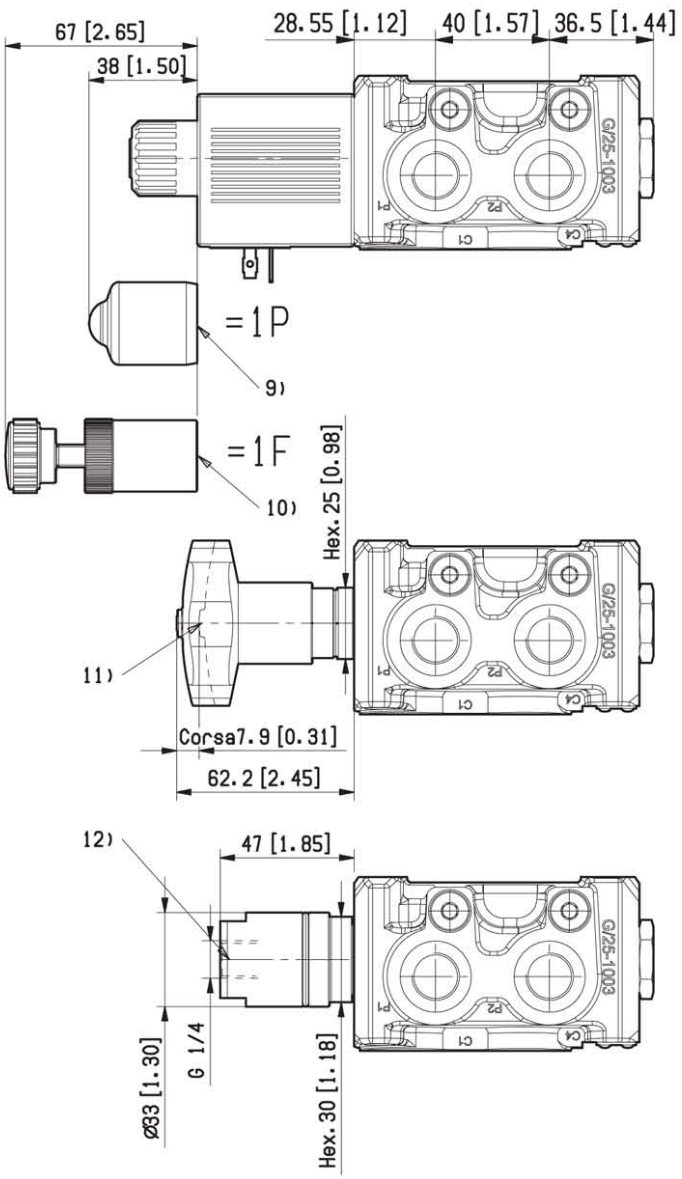
5 Minimum clearance needed for connector removal.

6 External drain plug available with G 1/4 and SAE 4 port. Hex.24 Torque 22-24 Nm *[16.2 – 17.7 ft-lb].*

7 Identification label.

8 Overall dimensions with 6F and 6G spools.

External Dimensions and Fittings



9 Optional push-button, P type, emergency for spool opening: it is pressure stuck to the ring nut for coil locking. Mat no. R933000043.

10 Optional screw type emergency, F type, for spool opening: it is screwed (torque 6-7Nm *[4.4-5.2 ft-lb]*) to the tube as replacement of the coil ring nut. (Mat no. R933007215)

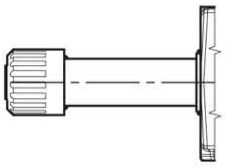
11 Dimensions of optional manual version, push and twist type. Hex 25 mm, torque 20-22 Nm *[16.2-17.7 ft-lb]*.

12 Dimensions of optional hydraulic / pneumatic piloted version. Pilot port plug available with G 1/4: hex 30 mm, torque 25-27 Nm *[18.4-19.9 ft-lb]*.

Electric connection

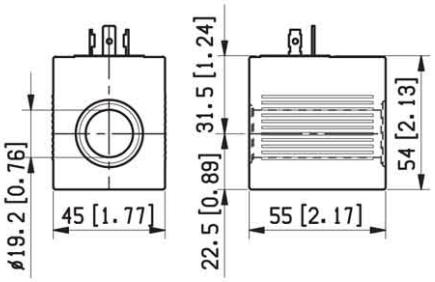
=00

Without coils, but with ring nut and O-Rings for coil fitting (solution recommended for flexible stock handling)



=01

With coils having plug-in pins EN 175301-803, without connectors



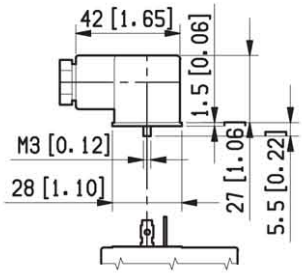
=02

With coils and with connectors non-assembled, type EN 175301-803.

Protection class: IP 65 when connector with seal is properly screwed down, and cable clamp is correctly tightened.

182-09: Standard.
182-LED-T-A1: with LED monitoring presence of voltage.
182-09-G-DO-2-1: with VDR (Voltage Dependent Resistor), to prevent input voltage over-shootings.

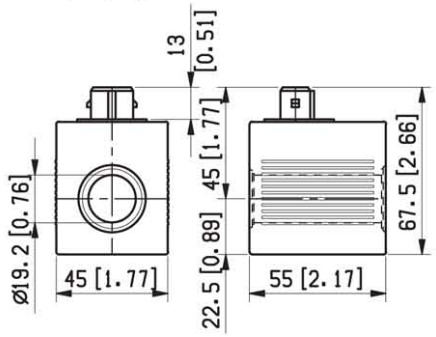
Mat. No.	Description
R933002885	182-09 GRAY
R933002889	182-09 BLACK
R933002893	182-LED-T-A1 12 DC
R933002894	182-LED-T-A1 24 DC
R933002896	182-LED-T-A1 48 DC
R933002886	182-09-G-DO-2-1 12DC with VDR
R933002887	182-09-G-DO-2-1 24DC with VDR



=03

With coils having AMP Junior connector, and with bi-directional diode.

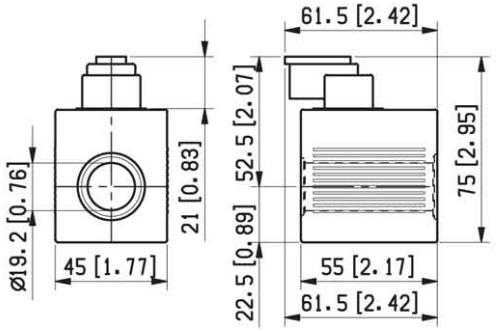
Protection class: IP 65 with female connector properly fitted (see drawing).



=07

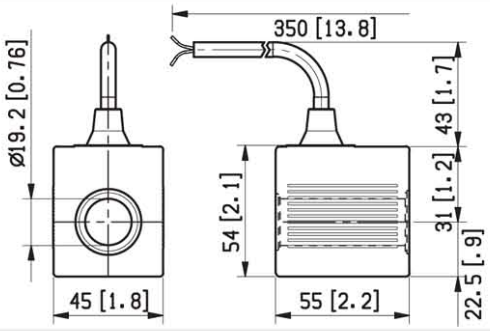
With coils having DEUTSCH DT 04-2P connector, and with bi-directional diode.

Protection class: IP 69 K with female connector properly fitted (see drawing).



=31

With coils having bi-directional diode and bipolar sheathed free lead, 350 mm long, without pins.



Bosch Rexroth Oil Control S.p.A.
Oleodinamica LC Division
Via Artigianale Sedrio, 12
42030 Vezzano sul Crostolo
Reggio Emilia - Italy
Tel. +39 0522 601 801
Fax +39 0522 606 226 / 601 802
compact-directional-valves@oilcontrol.com
www.boschrexroth.com

3/2 ways/positions flow diverters

RE 18302-02/12.09

L705... (VS81-VS82-VS84-VS85)

DVI0048

Size 6
Series 00
Maximum operating pressure 310 bar *[4500 psi]*
Maximum flow 60 l/min *[15.85 gpm]*
Ports G 3/8 - G 1/2 - SAE6 - SAE8

Summary

General specifications

- 3 way 2 position valve
- Directional spool valve with direct solenoid control
- Upon request, hydraulic / pneumatic pilot, or manual push and twist control.
- Control spool operated by screwed-in solenoid, with easily extractable coil fastened by a ring nut.
- Wet pin tube for DC coil, with push rod for mechanical override in case of voltage shortage.
- Unrestricted 360° orientation of DC coil.
- Control spool held in normal position by return spring.
- Optional manual override (push-button or screw type).
- Connectors available: DIN 43650 – ISO 4400, AMP Junior, DT04-2P (Deutsch), Free leads.

Ordering details

L	7	0 5	_	_ _	_ _	_	_ _	_ _	0

Family
Compact directional valve

Type
Flow Diverters

Ports

G3/8 DIN 3852	= 3
G1/2 DIN 3852	= 4
9/16-18 UNF-2B (SAE6)	= B
3/4-16 UNF-2B (SAE8)	= C

Control type

Solenoid (coil C 48) without emergency	= 11
Solenoid (coil C 48) with push-button type emergency	= 1P
Solenoid (coil C 48) with screw type emergency	= 1F
Hydraulic / pneumatic control	= P1
Manual push and twist control	= H1

Spool variants

3 Ways / 2 position	= 3_

Electric connections

00 =	Without coil
01 =	With coil, without connector
02 =	With coil and with non-assembled connector, type DIN 43650 – ISO 4400
03 =	With coil having AMP Junior connector
07 =	With coil having DEUTSCH DT 04-2P connect.
31 =	With coil and bipolar sheathed lead 350mm *[13.8"]* long

Voltage supply

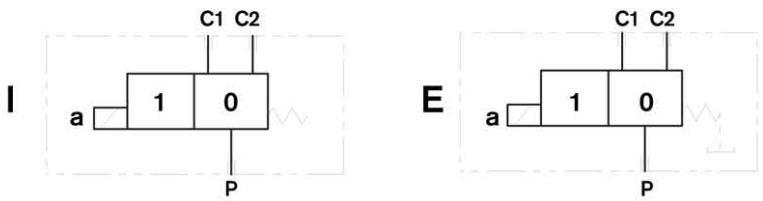
SG =							Manual push and twist control
00 =						■	Without coil
OB =	■	■	■	■	■		12V DC
AD =		■		■	■		13V DC
OC =	■	■	■	■	■		24V DC
AC =		■		■	■		27V DC
OD =				■	■		48V DC
	31	07	03	02	01	00	

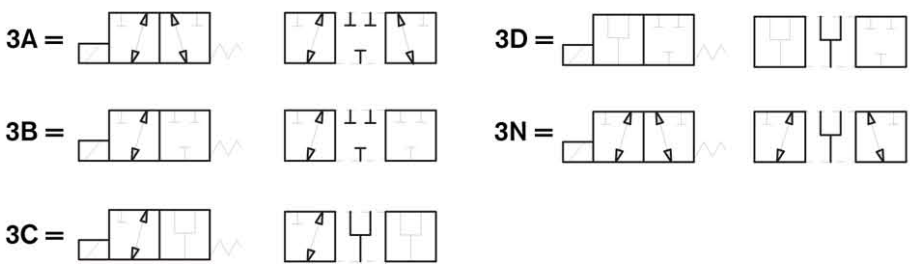
Available connections

Drain type

I =	Internal drain
E =	External drain

Spool variants





Principles of operation, cross section

A valve basically consists of a housing (1), a control spool (2), a return spring (3) and a solenoid (5). It is designed to select which one of two circuits (C1 or C2) is to be supplied with the oil delivered from one single hose (P): with spool in position "0", when the solenoid is de-energized, the flow goes from P to C1, with spool in position "1", when the solenoid is energized the flow goes from P to C2.

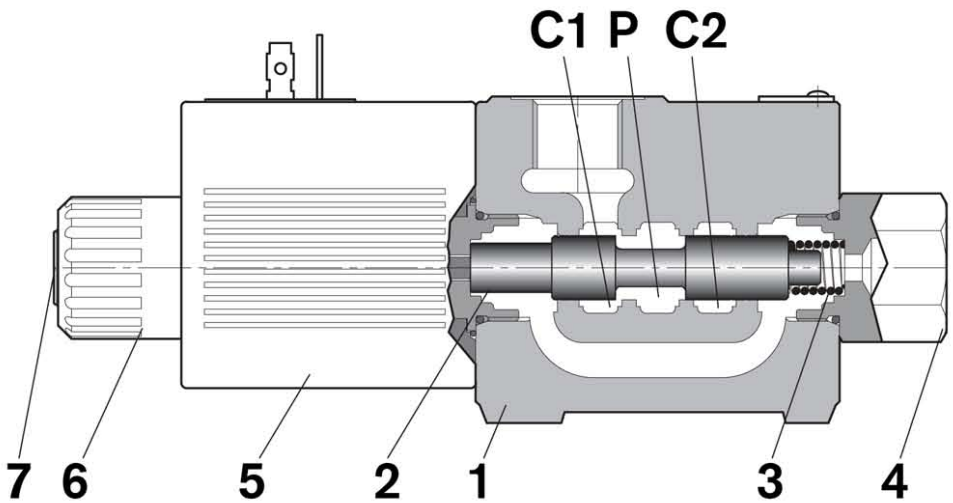
With the coil de-energized, the return spring (3) pushes back the spool (2) and holds it in position "0".

The coil (5) is fastened to the tube by the ring nut (6).

The manual override (7) allows to shift the spool (2) also in case of voltage shortage.

An external drain, to be connected to tank, ensures shifting operations also at higher working pressure.

Hydraulic / pneumatic pilot control, or manual push and twist control for spool shifting are available upon request.



Technical Data (for applications with different specifications consult us)

General

Valve weight	kg *[lbs]*	2.06 *[4.54]*
Ambient Temperature	°C *[°F]*	–20....+50 *[-4....+122]* (NBR seals)

Hydraulic

Maximum pressure with external drain	bar *[psi]*	310 *[4500]*
Maximum pressure with internal drain	bar *[psi]*	250 *[3625]*
Maximum flow	l/min *[gpm]*	60 *[15.85]*
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:		Mineral oil based hydraulic fluids HL (DIN 51524 part 1). Mineral oil based hydraulic fluids HLP (DIN 51524 part 2). For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult us.
Fluid Temperature	°C *[°F]*	–20....+80 *[-4....+176]* (NBR seals)
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=12...15 ISO 4406: classe 20/18/15 NAS 1638: classe 9
Viscosity range	mm^2/s	5....420
Internal leakage with 100 bar *[1450 psi]* secondary pressure at C	cc/min *[in^3/min]*	min.10 *[0.61]* max. 20 *[1.2]*

Electrical

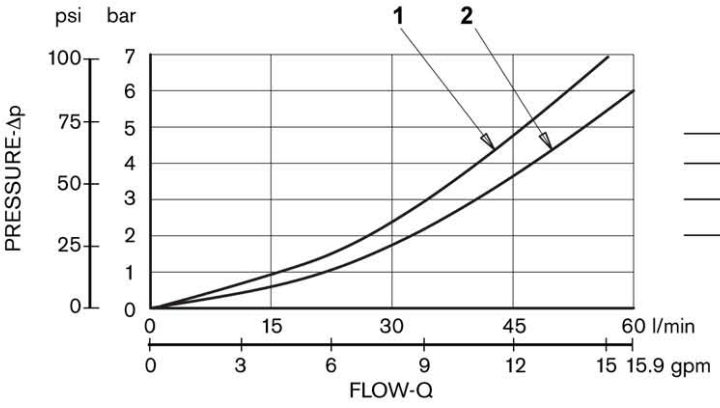
Voltage type		DC								
Voltage tolerance (nominal voltage)	%	-10 .... +10								
Duty	W	36								
Maximum coil temperature	%	Continuous, with ambient temperature ≤ 50°C *[122°F]*								
Insulation class	°C *[°F]*	150 *[302]*								
Compliance with		H								
Coil weight with DIN 43650 – ISO 4400 connector		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC								
Voltage	kg *[lbs]*	0.215 *[0.44]*								
Voltage type	V	12	13	24	27	48				
Power consumption		DC	DC	DC	DC	DC				
Current [1]	W	36	36	36	36	36				
Resistance [2]	A	3.0	2.77	1.53	1.32	0.75				
Resistenza [2]	Ω	3.97	4.68	15.67	20.42	63.60				

[1] Nominal - [2] ± 7% at temperature 20°C *[68°F]*

	Voltage (V)	Connector type	Coil description	Marking	Coil Mat no.
=OB 01 **=OB 02**	12 DC	EN 175301-803 (Ex. DIN 43650)	C4801 12DC	12 DC	R933000063
=OB 03	12 DC	AMP JUNIOR	C4803 12DC	12 DC	R933000065
=OB 07	12 DC	DEUTSCH DT 04-2P	C4807 12DC	12 DC	R933000068
=OB 31	12 DC	Cable 350 mm long	C4831 12DC	12 DC	R933000064
=AD 01 **=AD 02**	13 DC	EN 175301-803 (Ex. DIN 43650)	C4801 13DC	13 DC	R933000069
=AD 07	13 DC	DEUTSCH DT 04-2P	C4807 13DC	13 DC	R933000073
=OC 01 **=OC 02**	24 DC	EN 175301-803 (Ex. DIN 43650)	C4801 24DC	24 DC	R933000076
=OC 03	24 DC	AMP JUNIOR	C4803 24DC	24 DC	R933000071
=OC 07	24 DC	DEUTSCH DT 04-2P	C4807 24DC	24 DC	R933000075
=OC 31	24 DC	Cable 350 mm long	C4831 24DC	24 DC	R933000070
=AC 01 **=AC 02**	27 DC	EN 175301-803 (Ex. DIN 43650)	C4801 27DC	27 DC	R933000077
=AC 07	27 DC	DEUTSCH DT 04-2P	C4807 27DC	27 DC	R933000074
=OD 01 **=OD 02**	48 DC	EN 175301-803 (Ex. DIN 43650)	C4801 48DC	48 DC	R933000078

Characteristic curves

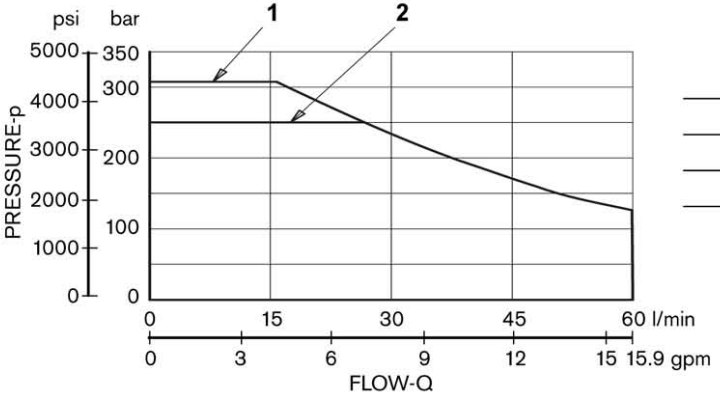
Measured with hydraulic fluid ISO-VG32 at 45° ± 5° C *[113° ± 9° F]*; ambient temperature 20° C *[68° F]*.



Modello	N° Curva
VS81/84	1
VS82/85	2

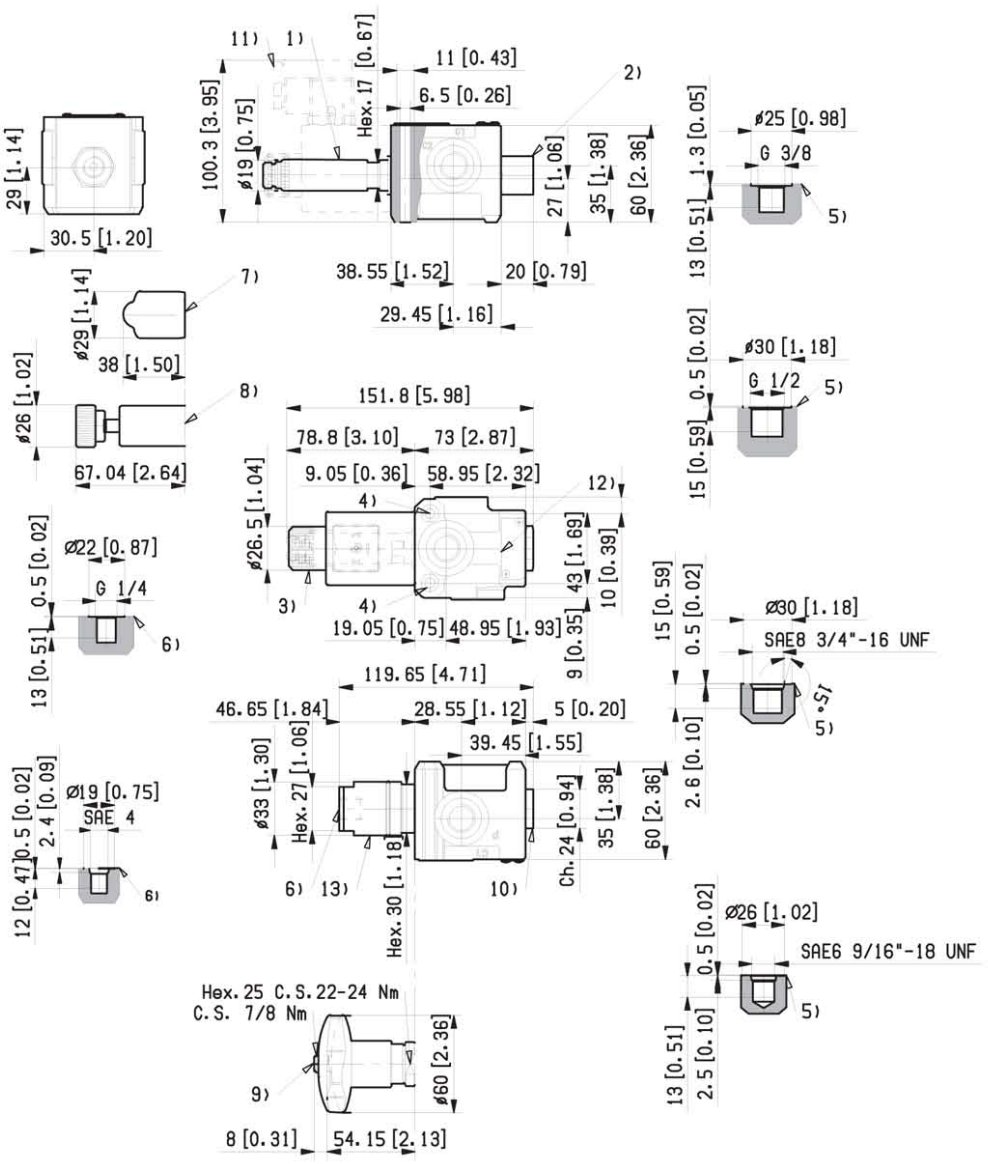
Performances limits

The performance limits refer to the following conditions: coils at operating temperature, voltage supply 10% below nominal, no back pressure in the tank line.



Curve n.	Drain type
1	External (-E-)
2	Internal (-I-)

External Dimensions and Fittings



1 Solenoid tube hex 17 mm. Torque 22-24 Nm *[16.2-17.7 ft-lb].*

2 Plug for version with external drain hex 24 mm. Torque 22-24 Nm *[16.2-17.7 ft-lb].*

3 Ring nut for coil locking OD 26.5 mm *[1.04 in].* Torque 5-6Nm *[3.6-4.4 ft-lb].*

4 Two through holes for installation. Recommended screws M6 with strength class DIN 8.8. Torque 9-10 Nm *[6.6-7.4 ft-lb].*

5 Ports P, C1, C2: G 3/8, G 1/2, SAE 6, SAE 8.

6 External drain and hydraulic, or pneumatic pilot port G 1/4, SAE 4.

7 Optional push-button type emergency for spool opening: it is pressure stuck to the ring nut for coil locking. Mat no. R933000043.

8 Optional screw type emergency for spool opening: it is screwed (torque 6-7Nm *[4.4-5.2 ft-lb]*) to the tube as replacement of the coil ring nut. Mat no. R933007215.

9 Dimensions of optional manual version, push and twist type. Hex 25mm, torque 22-24 Nm *[16.2-17.7 ft-lb].*

10 Plug for version with internal drain hex 24 mm. Torque 22-24 Nm *[16.2-17.7 ft-lb].*

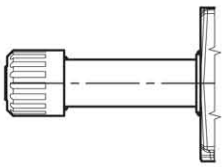
11 Minimum clearance needed for connector removal.

12 Identification label.

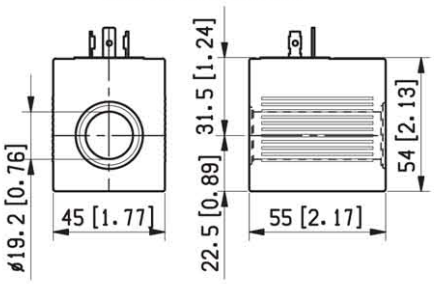
13 Hydraulic, or pneumatic pilot connector: hex 30 mm. Torque 25-27 Nm *[18.4-19.9 ft-lb].*

Electric connection

=00 Without coils, but with ring nut and O-Rings for coil fitting (solution recommended for flexible stock handling)



=01 With coils having plug-in pins EN 175301-803, without connectors

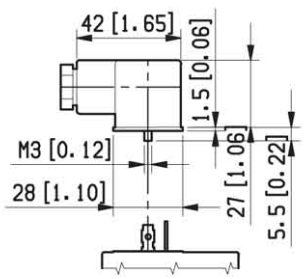


=02 With coils and with connectors non-assembled, type EN 175301-803.

Protection class: IP 65 when connector with seal is properly screwed down, and cable clamp is correctly tightened.

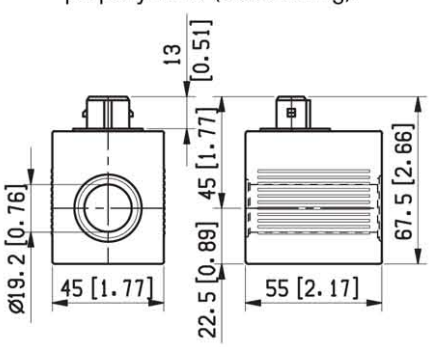
182-09: Standard.
182-LED-T-A1: with LED monitoring presence of voltage.
182-09-G-DO-2-1: with VDR (Voltage Dependent Resistor), to prevent input voltage over-shootings.

Mat. No.	Description
R933002885	182-09 GRAY
R933002889	182-09 BLACK
R933002893	182-LED-T-A1 12 DC
R933002894	182-LED-T-A1 24 DC
R933002896	182-LED-T-A1 48 DC
R933002886	182-09-G-DO-2-1 12DC with VDR
R933002887	182-09-G-DO-2-1 24DC with VDR



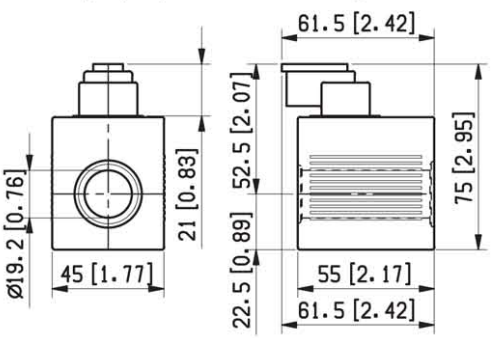
=03 With coils having AMP Junior connector, and with bi-directional diode.

Protection class: IP 65 with female connector properly fitted (see drawing).

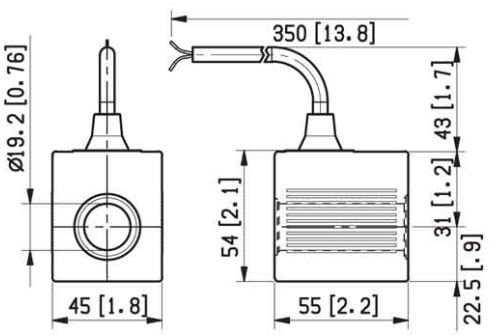


=07 With coils having DEUTSCH DT 04-2P connector, and with bi-directional diode.

Protection class: IP 69 K with female connector properly fitted (see drawing).



=31 With coils having bi-directional diode and bipolar sheathed free lead, 350 mm long, without pins.



6 to14/2 ways/positions bankable flow diverters flangeable

RE 18302-09/12.09

L732.... (VS241F-VS245F-VS246F-VS247F)

Size 6
Series 00
Maximum operating pressure 310 bar *[4500 psi]*
Maximum flow 50 l/min *[13.2 gpm]*
Ports G 3/8 - SAE8 - M18x1,5

Summary

General specifications

- 6 way 2 position valve.
- Directional spool valve with direct solenoid control.
- Upon request, hydraulic / pneumatic pilot , or manual push and twist control.
- Usable as stand-alone, or as multiple stackable units.
- Control spool operated by screwed-in solenoid, with easily extractable coil fastened by a ring nut.
- Wet pin tube for DC coil, with push rod for mechanical override in case of voltage shortage.
- Unrestricted 360° orientation of DC coil.
- Control spool held in normal position by return spring.
- Optional manual override (push-button or screw type).
- Connectors available: DIN 43650 – ISO 4400, AMP Junior, DT04-2P (Deutsch), Free leads.

Ordering details

L	7	3 2	_	_ _	_ _	_	_ _	_ _	_

Family
Compact directional valve

Type
Flow Diverters

Ports

G 3/8 DIN 3852	= 3
3/4" - 16 UNF (SAE8)	= C
M18x1.5 UNI-ISO 6149-1	= Y
M18x1.5 DIN 3852	= Z

Control type

Solenoid (coil C48) without emerg.	= 11
Solenoid (coil C48) with push-button type emergency	= 1P
Solenoid (coil C48) with screw type emergency	= 1F
Hydraulic/pneumatic pilot	= P1
Manual push and twist control	= H1

Spool variants

6 way / 2 position P1 side	= 6_

Drain type

Internal drain	= I
External drain	= E

Assembly

0 =	Single diverter
2 =	2 Pre-assembled diverters
3 =	3 Pre-assembled diverters
4 =	4 Pre-assembled diverters
5 =	5 Pre-assembled diverters

Electric connections

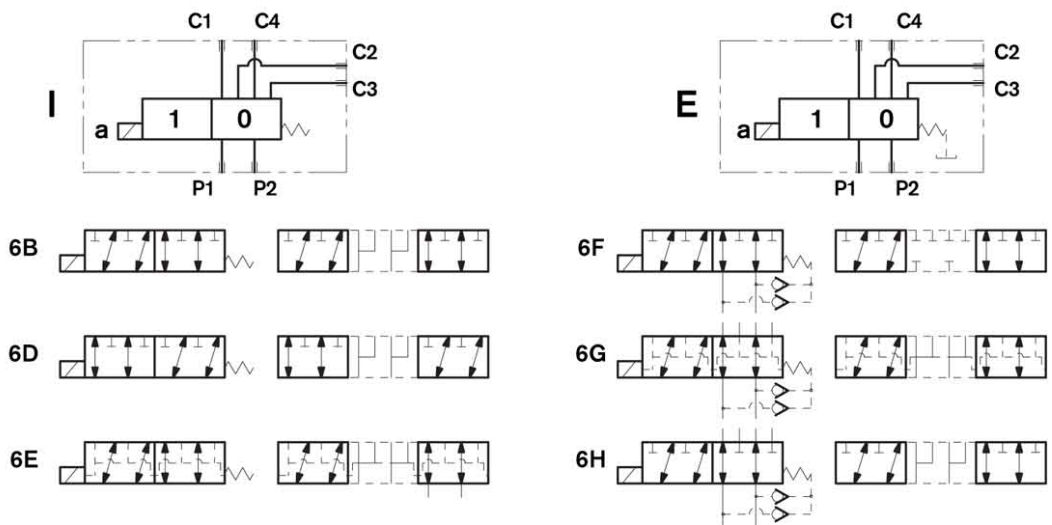
00 =	Without coil
01 =	With coil, without connector
02 =	With coil and with non-assembled connector, type DIN 43650 – ISO 4400
03 =	With coil having AMP Junior connector
07 =	With coil having DEUTSCH DT 04-2P connect.
31 =	With coil and bipolar sheathed lead 350mm *[13.8"]* long

Voltage supply

	31	07	03	02	01	00	
SG =							Manual push and twist control
00 =						■	Without coil
OB =	■	■	■	■	■		12V DC
AD =		■		■	■		13V DC
OC =	■	■	■	■	■		24V DC
AC =		■		■	■		27V DC
OD =				■	■		48V DC

Available connections

Spool variants



Principles of operation, cross section

A valve basically consists of a housing (1), a control spool (2), a return spring (3) and a solenoid (5). It is designed to connect two inlet lines P1 – P2 (normally a set of hoses) and divert them to either the outlet ports (C1 – C4) with spool in position "0", when the solenoid is de-energized, or to the outlet ports (C2 – C3) with spool in position "1", when the solenoid is energized.

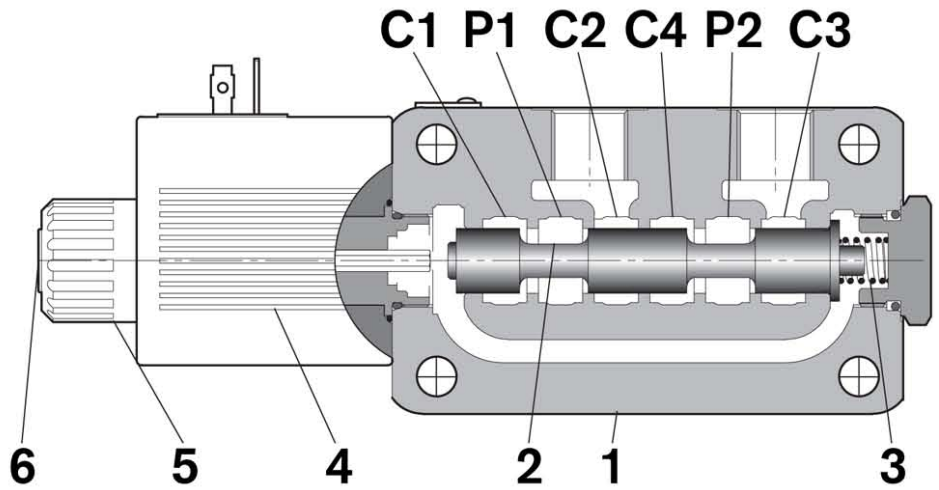
With the coil de-energized, the return spring (3) pushes back the spool (2) and holds it in position "0"

The coil (5) is fastened to the tube by the ring nut (6).

The manual override (6) allows to shift the spool (2) also in case of voltage shortage.

An external drain, to be connected to tank, ensures shifting operations also at higher working pressure.

Hydraulic / pneumatic pilot control, or manual push and twist control for spool shifting are available upon request.



Technical Data (for applications with different specifications consult us)

General

Valve weight	kg *[lbs]*	3.2 *[7.06]*
Mounting position		unrestricted
Ambient Temperature	°C *[°F]*	–20....+50 *[-4....+122]* (NBR seals)

Hydraulic

Maximum pressure with external drain	bar *[psi]*	310 *[4500]*
Maximum pressure with internal drain	bar *[psi]*	250 *[3625]*
Maximum pressure with internal drain and 6F or 6G or 6H scheme	bar *[psi]*	310 *[4500]*
Maximum inlet flow	l/min *[gpm]*	50 *[13.2]*
Hydraulic fluid General properties: it must have physical lubricating and chemical properties suitable for use in hydraulic systems such as, for example:		Mineral oil based hydraulic fluids HL (DIN 51524 part 1). Mineral oil based hydraulic fluids HLP (DIN 51524 part 2). For use of environmentally acceptable fluids (vegetable or polyglycol base) please consult us.
Fluid Temperature	°C *[°F]*	–20....+80 *[-4....+176]* (NBR seals)
Permissible degree of fluid contamination		ISO 4572: $\beta_x \geq 75$ X=12...15 ISO 4406: classe 20/18/15 NAS 1638: classe 9
Viscosity range	mm^2/s	5....420
Internal leakage with 100 bar *[1450 psi]* secondary pressure at C	cc/min *[in^3/min]*	min.10 *[0.61]* max. 25 *[1.52]*

Electrical

Voltage type		DC
Voltage tolerance (nominal voltage)	%	-10 .... +10
Duty	%	Continuous, with ambient temperature ≤ 50°C *[122°F]*
Maximum coil temperature	°C *[°F]*	150 *[302]*
Insulation class		H
Compliance with		Low Voltage Directive LVD 73/23/EC (2006/95/EC), 2004/108/EC
Coil weight with DIN 43650 – ISO 4400 connector	kg *[lbs]*	0.5 *[1.1]*

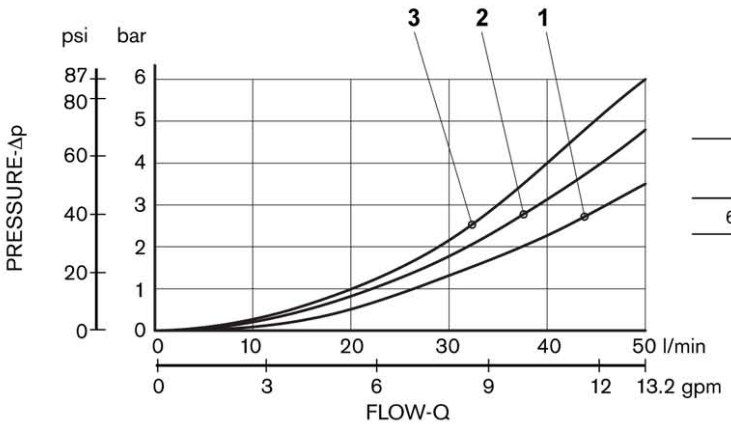
Voltage	V	12	13	24	27	48				
Voltage type		DC	DC	DC	DC	DC				
Power consumption	W	36	36	36	36	36				
Current (1)	A	3.0	2.77	1.53	1.32	0.75				
Resistance (2)	Ω	3.97	4.68	15.67	20.42	63.60				

1) Nominal - 2) ± 7% at temperature 20°C *[68°F]*

	Voltage (V)	Connector type	Coil description	Marking	Coil Mat no.
=OB 01 **=OB 02**	12 DC	EN 175301-803 (Ex. DIN 43650)	C4801 12DC	12 DC	R933000063
=OB 03	12 DC	AMP JUNIOR	C4803 12DC	12 DC	R933000065
=OB 07	12 DC	DEUTSCH DT 04-2P	C4807 12DC	12 DC	R933000068
=OB 31	12 DC	Cable 350 mm long	C4831 12DC	12 DC	R933000064
=AD 01 **=AD 02**	13 DC	EN 175301-803 (Ex. DIN 43650)	C4801 13DC	13 DC	R933000069
=AD 07	13 DC	DEUTSCH DT 04-2P	C4807 13DC	13 DC	R933000073
=OC 01 **=OC 02**	24 DC	EN 175301-803 (Ex. DIN 43650)	C4801 24DC	24 DC	R933000076
=OC 03	24 DC	AMP JUNIOR	C4803 24DC	24 DC	R933000071
=OC 07	24 DC	DEUTSCH DT 04-2P	C4807 24DC	24 DC	R933000075
=OC 31	24 DC	Cable 350 mm long	C4831 24DC	24 DC	R933000070
=AC 01 **=AC 02**	27 DC	EN 175301-803 (Ex. DIN 43650)	C4801 27DC	27 DC	R933000077
=AC 07	27 DC	DEUTSCH DT 04-2P	C4807 27DC	27 DC	R933000074
=OD 01	48 DC	DIN EN 175301-803 ISO 4400	C4801 48DC	48 DC	R933000078

Characteristic curves

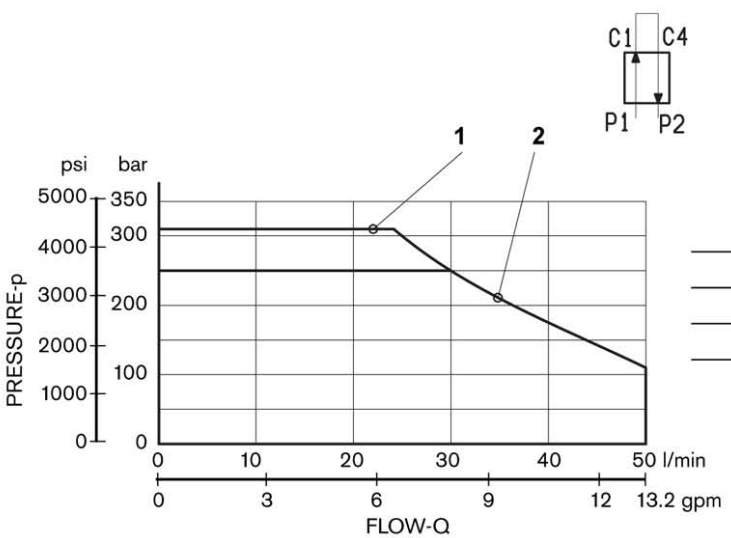
Measured with hydraulic fluid ISO-VG32 at 45° ± 5° C *[113° ± 9° F]*; ambient temperature 20° C *[68° F]*.



Scheme	Curve n.			
	P1>C1	P1>C2	P2>C4	P2>C3
6B - 6D - 6E - 6F - 6G - 6H	1	2	2	3

Performances limits

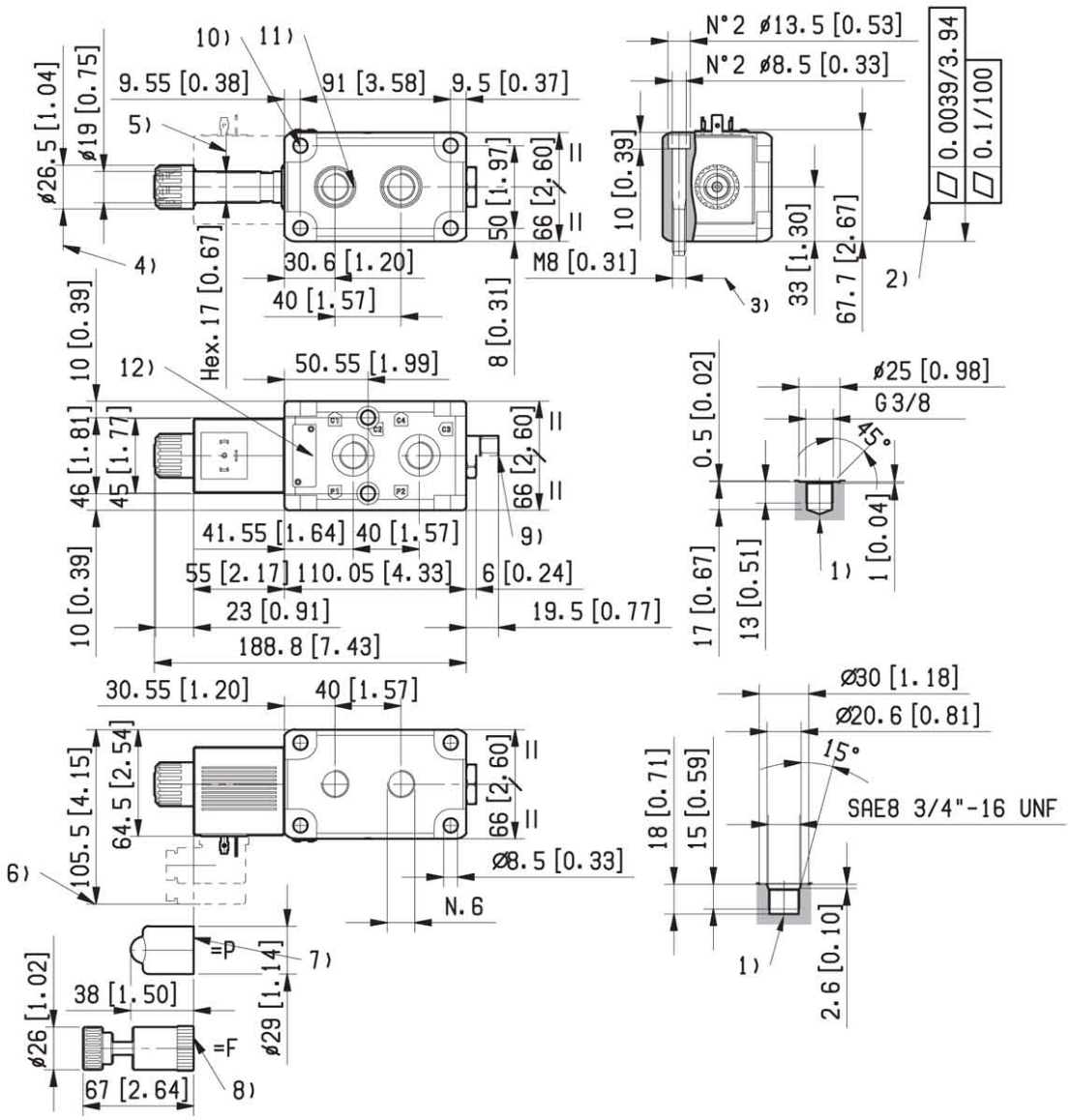
The performance limits refer to the following conditions: coils at operating temperature, voltage supply 10% below nominal, no back pressure in the tank line.



Scheme	Drain type
1	External (-E-)
2	Internal (-I-)

Flow across both ways: forward across P1>C1 and reverse across C4>P2

External Dimensions and Fittings



1 Ports P1, P2, C1, C2, C3, C4.

2 The mounting surface flatness must comply with specifications.

3 Two fixation screws M8x65 with strength class DIN 8.8. Torque 15 – 16 Nm *[11,1-11,8 ft-lb].*

4 Ring nut for coil locking OD 26.5 mm [1 .04 in]. Torque 5-6 Nm *[3.6-4.4 ft-lb].*

5 Solenoid tube hex 17 mm. Torque 22-24 Nm *[16.2 – 17.7 ft-lb].*

6 Minimum clearance needed for connector removal.

7 Optional push-button, P type, emergency for spool opening: it is pressure stuck to the ring nut for coil locking. Mat no. R933000043

8 Optional screw type emergency, F type, for spool opening: it is screwed (torque 6-7Nm *[4.4-5.2 ft-lb]*) to the tube as replacement of the coil ring nut. Mat no. R933007215.

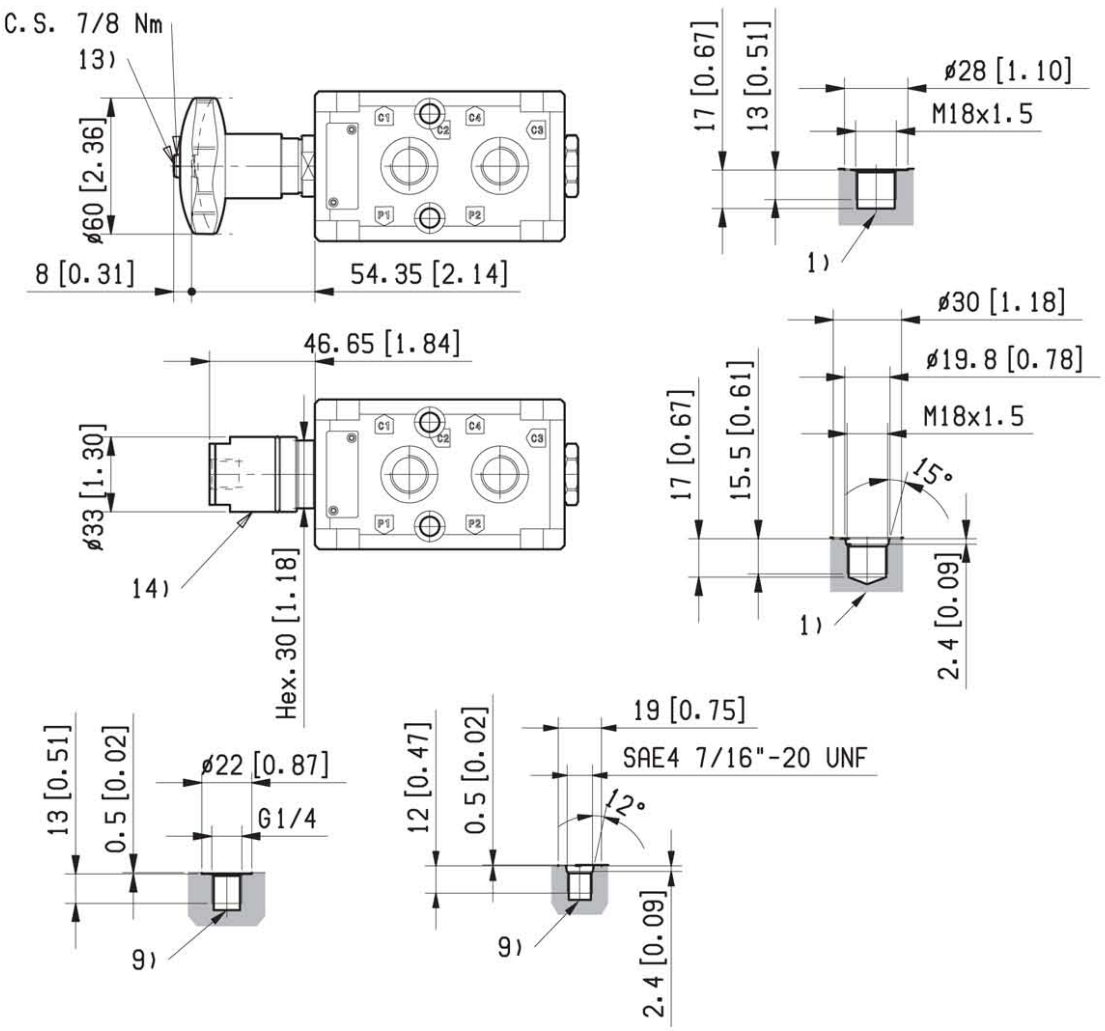
9 External drain plug available with G 1/4 and SAE 4 port; Hex.24 torque 22-24 Nm *[16.2 – 17.7 ft-lb].*

10 Four through holes, 8.5 mm dia., for coupling of other similar diverter valve.

11 O-Ring (NBR) for P1 and P2 ports.

12 Identification label.

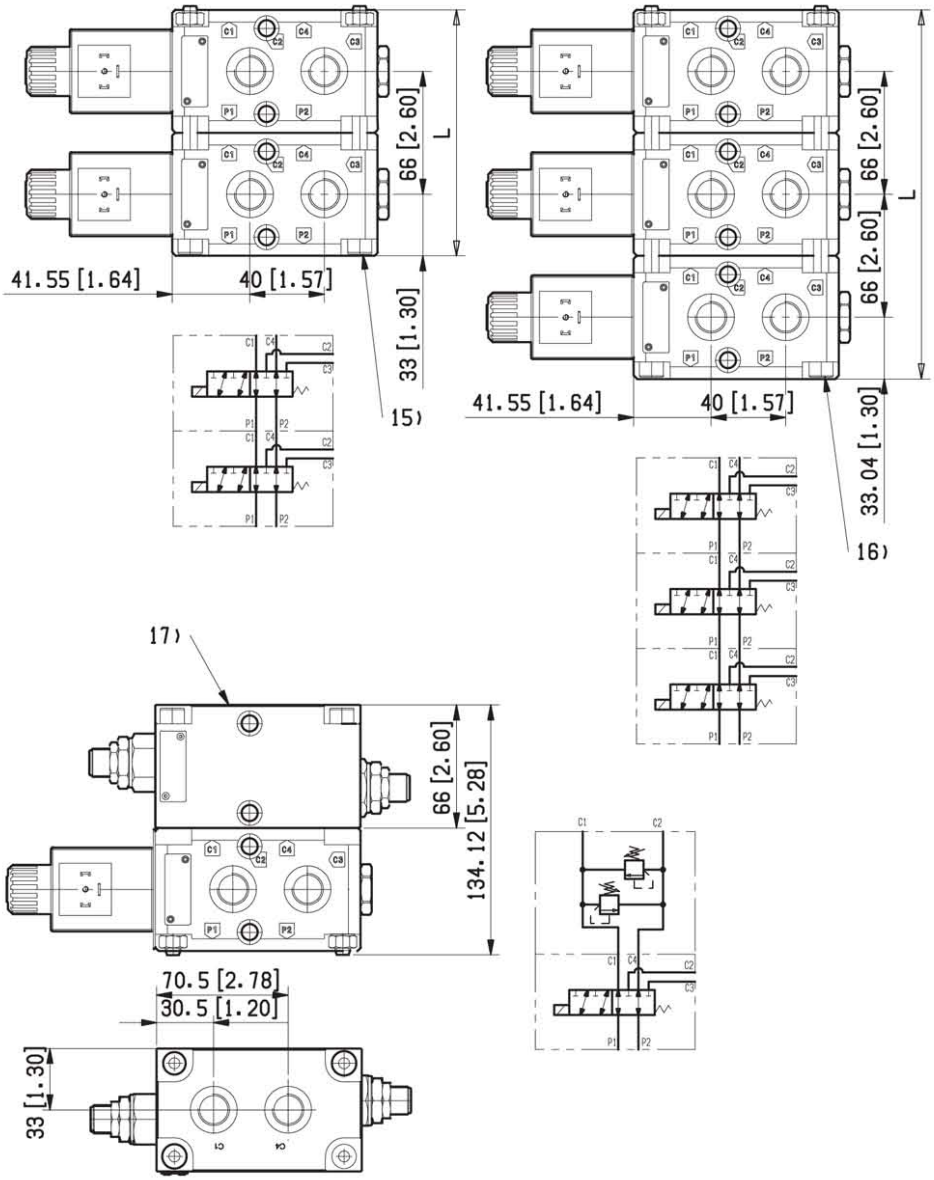
External Dimensions and Fittings



13 Dimensions of optional manual version, push and twist type. Hex 25 mm, torque 22-24 Nm *[16.2-17.7 ft-lb].*

14 Dimensions of optional hydraulic / pneumatic piloted version. Pilot port plug available with G 1/4: hex 30 mm, torque 25-27 Nm *[18.4-19.9 ft-lb].*

External Dimensions and Fittings



Total stacked units	Total ports	Total length mm	Bolts (v) or Tie Rods (t)	*Torque Nm / ft-lb*
2	8	132	M8x125 (v)	16-18 / *[11.8-13.2]*
3	10	198	M8x190 (v)	16-18 / *[11.8-13.2]*
4	12	264	M8x270 (t)	16-18 / *[11.8-13.2]*
5	14	330	M8x330 (t)	16-18 / *[11.8-13.2]*

15 Four screws M8x125 DIN 912 for coupling together 2 diverter valves. Suggested bolt strength class DIN 8.8. Torque 16 – 18 Nm *[11.8-13.3 ft-lb].*

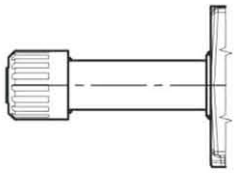
16 Four screws M8x190 DIN 912 for coupling together 3 diverter valves. Suggested bolt strength class DIN 8.8. Torque 16-18 Nm *[11.-13.3 ft lb].*

17 Modular relief valves (cartridges VMD1040SV):
with G 3/8 ports, code L7313610214SV00
with SAE 6 ports, code L731C610214SV00.
Max pressure 250 bar *[3625psi].*

Electric connection

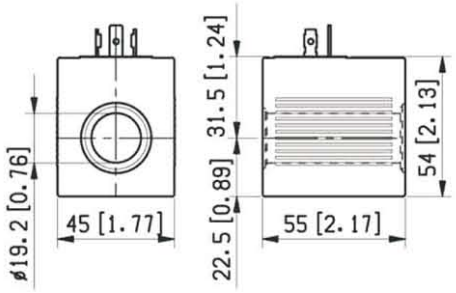
=00

Without coils, but with ring nut and O-Rings for coil fitting (solution recommended for flexible stock handling)



=01

With coils having plug-in pins EN 175301-803, without connectors



=02

With coils and with connectors non-assembled, type EN 175301-803.

Protection class: IP 65 when connector with seal is properly screwed down, and cable clamp is correctly tightened.

182-09: Standard.
182-LED-T-A1: with LED monitoring presence of voltage.
182-09-G-DO-2-1: with VDR (Voltage Dependent Resistor), to prevent input voltage over-shootings.

Mat. No.	Description
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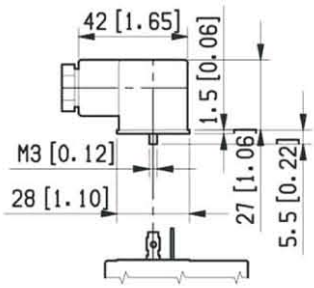
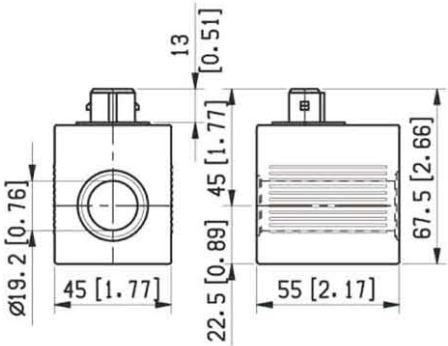
R933002896	182-LED-T-A1 48 DC
R933002886	182-09-G-DO-2-1 12DC with VDR
R933002887	182-09-G-DO-2-1 24DC with VDR



=03

With coils having AMP Junior connector, and with bi-directional diode.

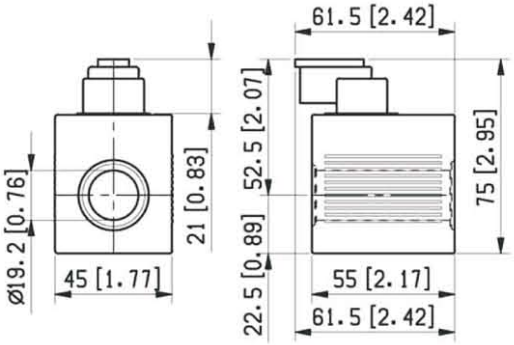
Protection class: IP 65 with female connector properly fitted (see drawing).



=07

With coils having DEUTSCH DT 04-2P connector, and with bi-directional diode.

Protection class: IP 69 K with female connector properly fitted (see drawing).



=31

With coils having bi-directional diode and bipolar sheathed free lead, 350 mm long, without pins.