



DF20

Mechanical control monoblock diverter valves

- 3 - 6 ways configuration
- Mechanical lever, cam, hydraulic, electrohydraulic, pneumatic controls

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm²/s (46 cSt) viscosity at 40°C - (104°F) temperature.

WORKING CONDITIONS		
N. of available ways		3 - 6
Max. flow rating		140 l/min (37 US gpm)
Max. pressure		315 bar (4600 psi)
Internal leakage A(B)⇒T	Δp = 100 bar (1450 psi)	15 cm ³ /min (0.92 in ³ /min)
Fluid		Mineral based oil
Fluid temperature	with NBR (BUNA-N) seals	from -20°C to 80°C (from -4°F to 176°F)
	with FPM (VITON) seals	from -20°C to 100°C (from -4°F to 212°F)
Viscosity	operating range	from 15 to 75 mm ² /s (from 15 to 75 cSt)
	min.	12 mm ² /s (12 cSt)
	max.	400 mm ² /s (400 cSt)
Max. level of contamination		21/19/16 - ISO 4406 - NAS 1638 - class 10
Ambient temperature for working conditions	with mechanical controls	from -40°C to 60°C (from -40°F to 140°F)
	with hydraulic and pneumatic controls	from -30°C to 60°C (from -22°F to 140°F)
	with electric controls	from -20°C to 50°C (from -4°F to 122°F)

NOTE - For different working conditions please contact Sales Dept.

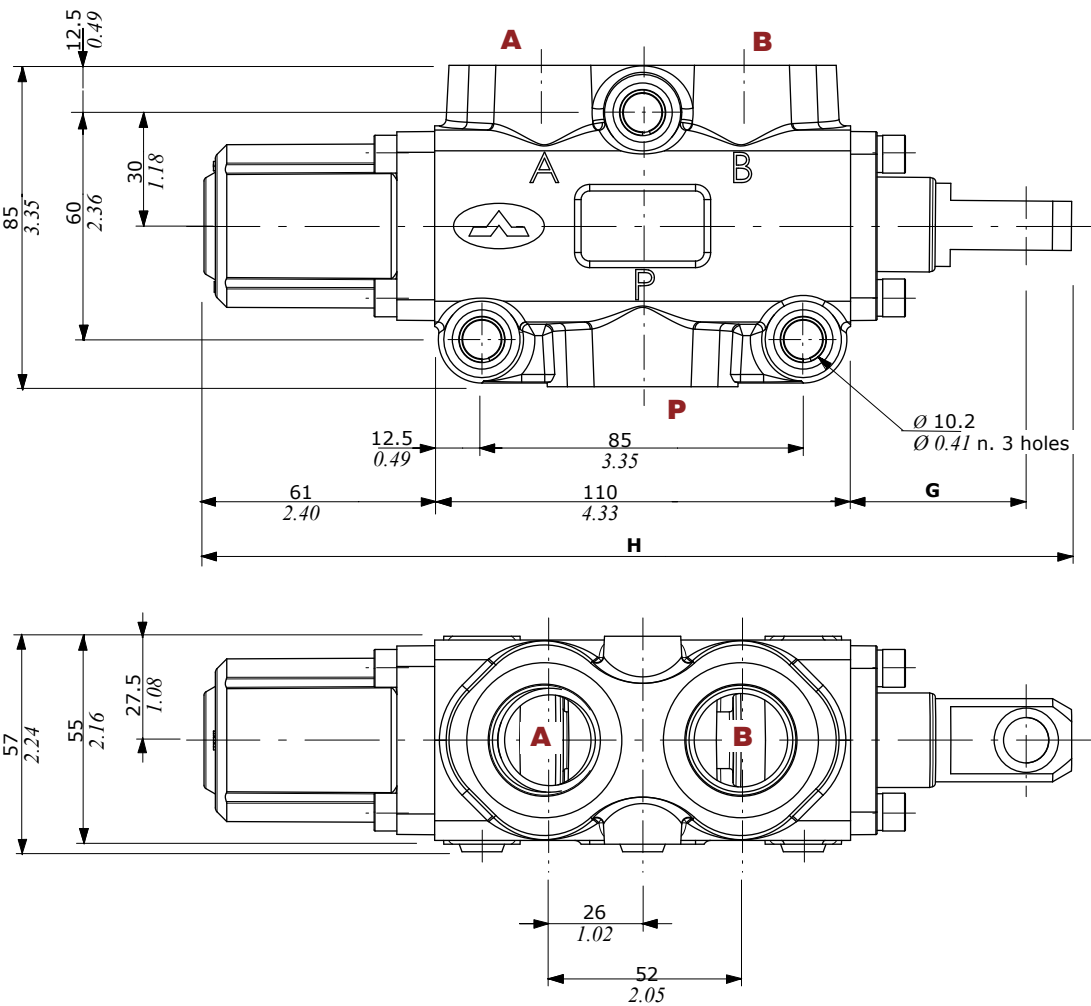
Available threads

PORTS THREAD		
ALL PORTS	BSP	UN-UNF
DF20	G 3/4	1" 1/16-12 (SAE 12)
PILOT PORTS		
Pneumatic	NPT 1/8-27	NPT 1/8-27
Hydraulic	G 1/4	9/16-18 (SAE 6)

Dimensional data - hydraulic circuit - performance data

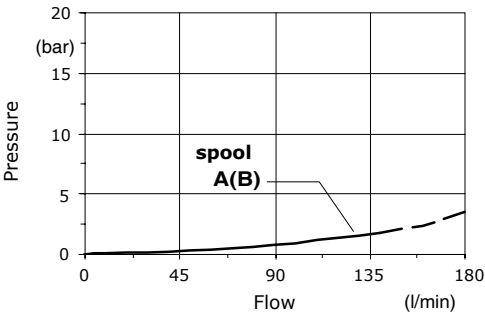
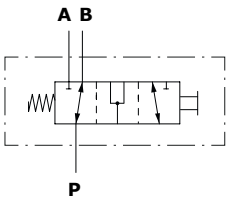
3 ways

It's possible to obtain 2 ways diverter valve plugging port



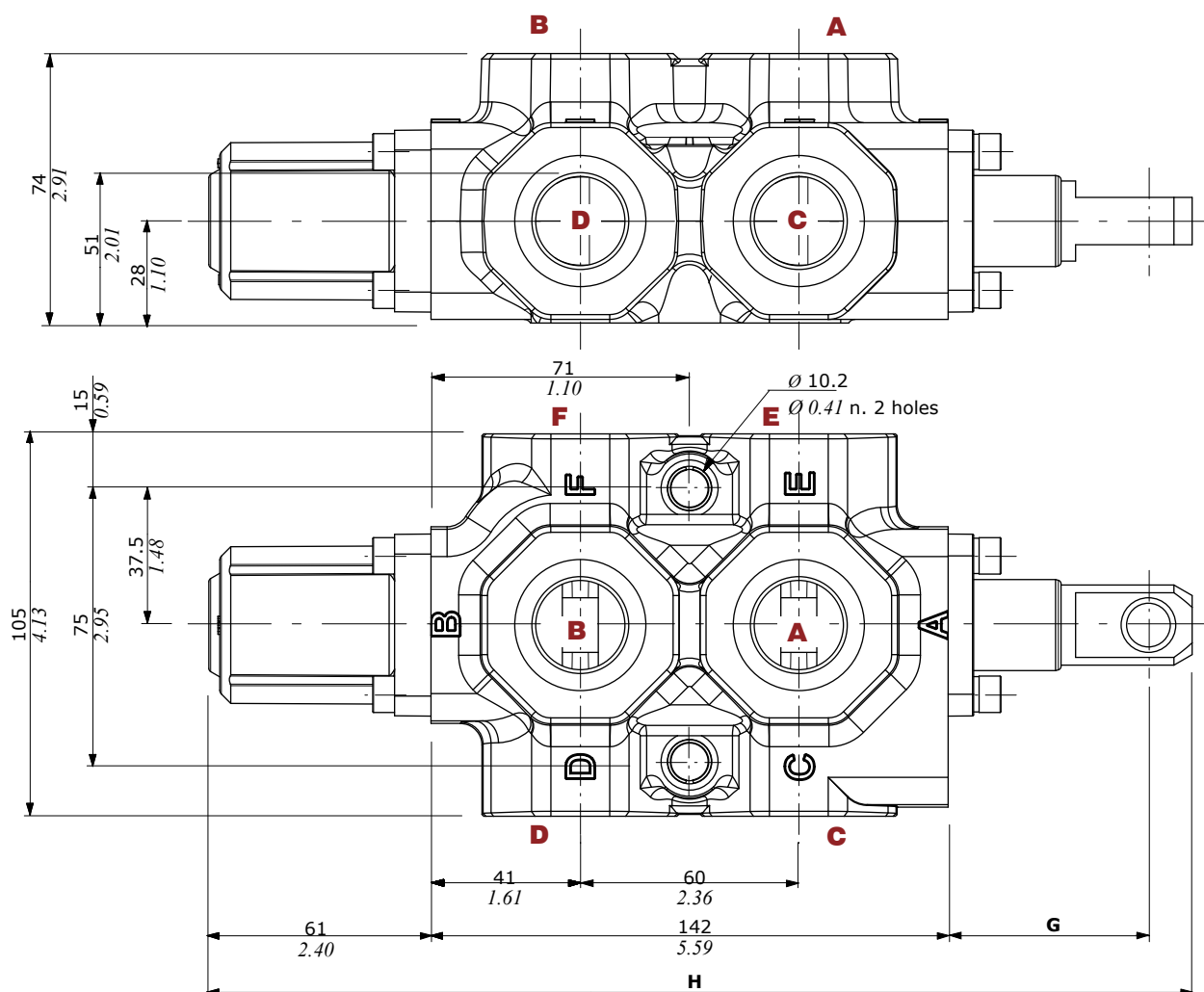
	G	H
With spool out	55 mm 2.16 in	238 mm 9.37 in
With spool in	35 mm 1.37 in	218 mm 8.58 in

Pressure drop versus flow
P → A(B)



Dimensional data - hydraulic circuit - performance data

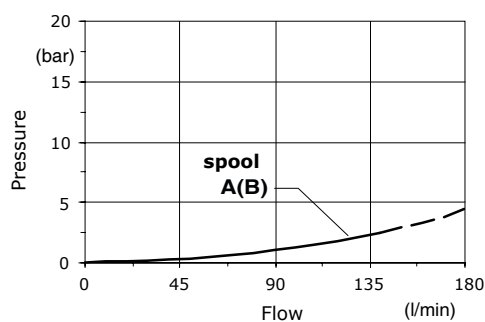
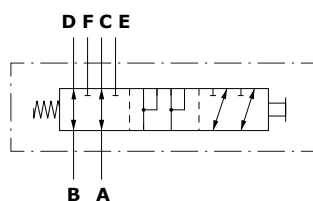
6 ways



	G	H
With spool out	55 mm 2.16 in	270 mm 10.6 in
With spool in	35 mm 1.37 in	250 mm 9.84 in

Pressure drop versus flow

A → C(E)



Part ordering codes

Example:

DF20/3 A 17 SLP - ... - (CVN)

1

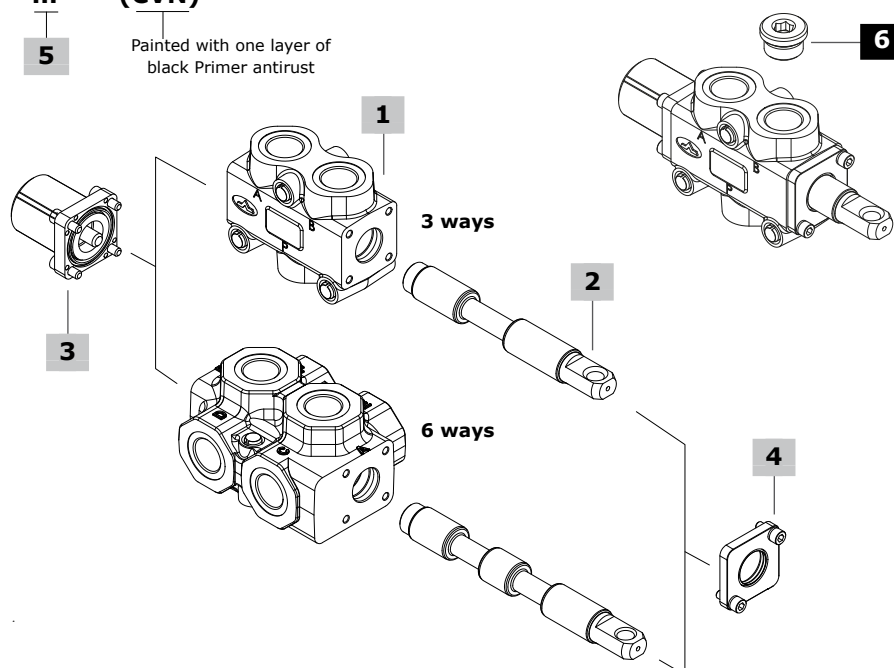
2

3

4

5

Painted with one layer of black Primer antirust



1 Body kit*

TYPE	CODE	DESCRIPTION
DF20/3	5CO2261300	3 ways body kit
DF20/6	5CO2262300	6 ways body kit
	5CO2263400	6 ways body kit with G1" ports

2 Spools

page 45

TYPE	CODE	DESCRIPTION
for DF20/3:		
A	3CAS120310	Flow in B in pos. 1. Ports connected in transit position
B	3CAS120410	Flow in B in pos. 1. Ports closed in transit position
AC	3CAS120320	As type A, for cam control
BC	3CAS120420	As type B, for cam control
for DF20/6:		
A	3CAS120610	Flow in C and D. E and F closed in pos. 1 Ports connected in transit position
B	3CAS120710	Flow in C and D. E and F closed in pos. 1 Ports closed in transit position
AC	3CAS120620	As type A, for cam control

3 "A" side spool positioners

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TYPE	CODE	DESCRIPTION
12	5V12120000	Detent in positions 1 and 2
17	5V17120000	Spring return in position 1
17ME	5V17320000	As kit 17, with heavier spring type E
18	5V18120000	Spring return in position 2
<u>Pneumatic controls: must be coupled to the control kit side B with lever, with plate or cap</u>		
17P	5V17110700	On/off, with spring return in pos. 1
18P	5V18120700	On/off, with spring return in pos. 2
18PNCWP	5V18120713	On/off, with spring return in pos. 2, waterproof

3 "A" side spool positioners (cont.) page 46

TYPE	CODE	DESCRIPTION
<u>Hydraulic controls: must be coupled to the control kit side B with lever, with plate or cap</u>		
18IA1	5V18120820*	On/off high pressure hydraulic kit with spring return in position 2
18IB1	5V18120810*	On/off low pressure hydraulic kit with spring return in position 2
<u>Electrohydraulic controls: must be coupled to the control kit side B with lever, with plate or cap</u>		
Control requires collector kit; see page 50		
18E11	5V18120350	Spring return in pos. 2, 12VDC
	5V18120351	Spring return in pos. 2, 24VDC

4 "B" side options

page 51

TYPE	CODE	DESCRIPTION
SLP	5COP120000	Without lever box, with dust-proof plate kit
SLC	5COP220000	Without lever box, with cap
L	5LEV120000	Aluminum lever box
CA	5CAM120000	Steel ball bearing cam operation
CB	5CAM120020	Bronze cam operation
<u>Hydraulic controls</u>		
IA2	5IDR520000*	On/off with high pressure pilot, need 17ME control type
IB2	5IDR720000*	On/off with low pressure pilot, need 17ME control type

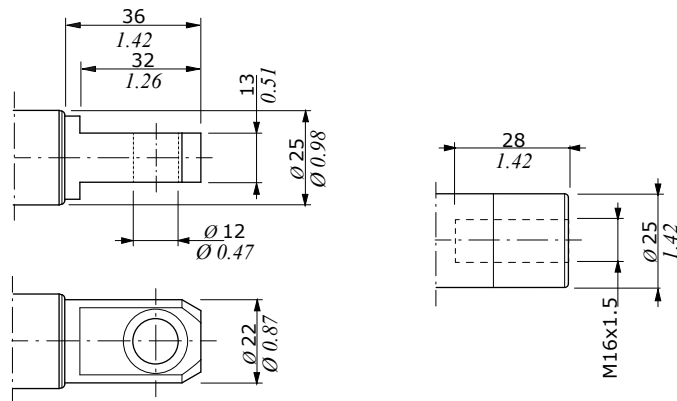
5 Body threading

Specify threading always when it is different from **BSP** standard

6 Port plugs*

CODE	DESCRIPTION
3XTAP732200	G3/4 plug

(*) - Codes are referred to **BSP** thread



Standard:
spool type **A, B**

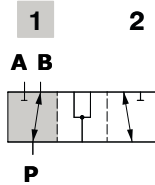
Rotary cam arrangement:
spool type **AC, BC**

Spool circuits

3 ways

Type A/AC

Ports connected
in transit position

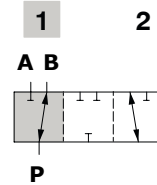


Spool stroke

Position 2: - 20 mm (- 0.78 in)

Type B/BC

Ports closed
in transit position



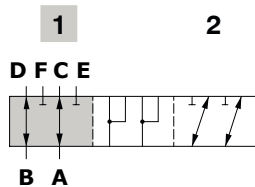
Spool stroke

Position 2: - 20 mm (- 0.78 in)

6 ways

Type A/AC

Flow in C and D. E and F closed in pos. 1
Ports connected in transit position

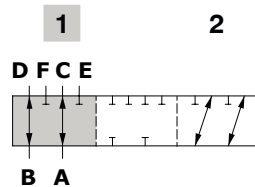


Spool stroke

Position 2: - 20 mm (- 0.78 in)

Type B

Flow in C and D. E and F closed in pos. 1
Ports closed in transit position



Spool stroke

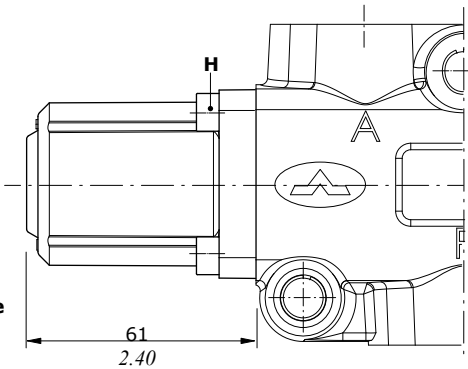
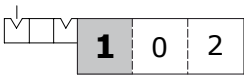
Position 2: - 20 mm (- 0.78 in)

"A" side spool positioners

With detent

Type 12

Detent in positions 1 and 2

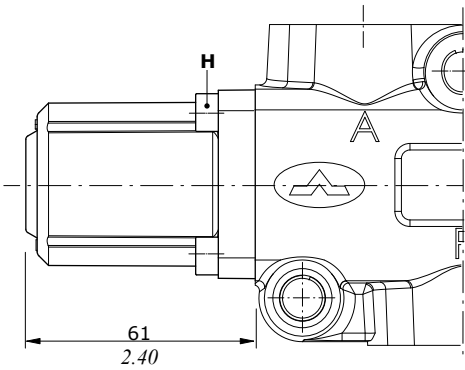
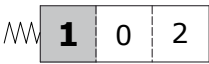


Wrenches and tightening torque
H = wrench 5 - 9.8 Nm (7.2 lbf·ft)

With spring return in position 1

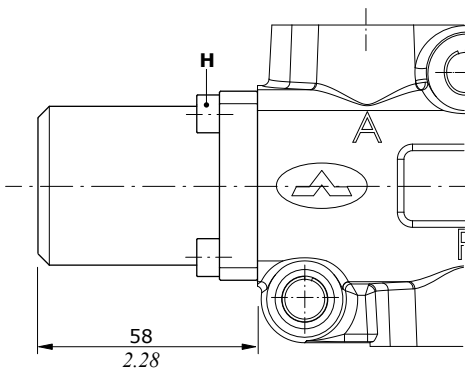
With heavier spring type "E"

Type 17

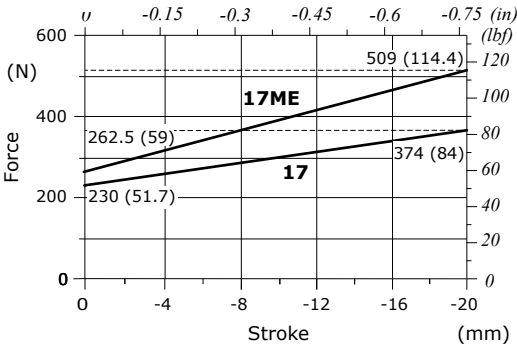


Wrenches and tightening torque
H = wrench 5 - 9.8 Nm (7.2 lbf·ft)

Type 17ME



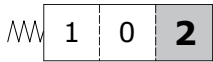
Force-Stroke diagram



"A" side spool positioners

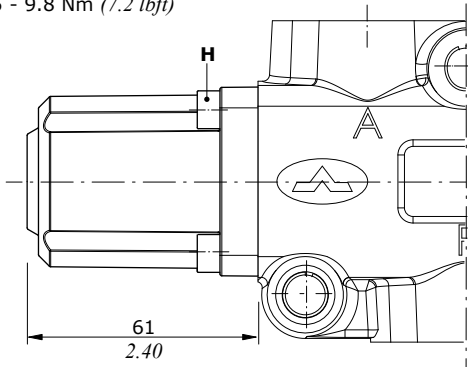
With spring return in position 2

Type 18

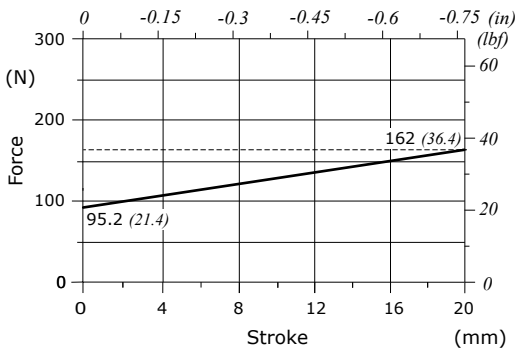


Wrenches and tightening torque

H = wrench 5 - 9.8 Nm (7.2 lbf ft)



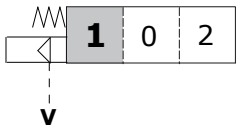
Force-Stroke diagram



ON/OFF pneumatic controls

Type 17P

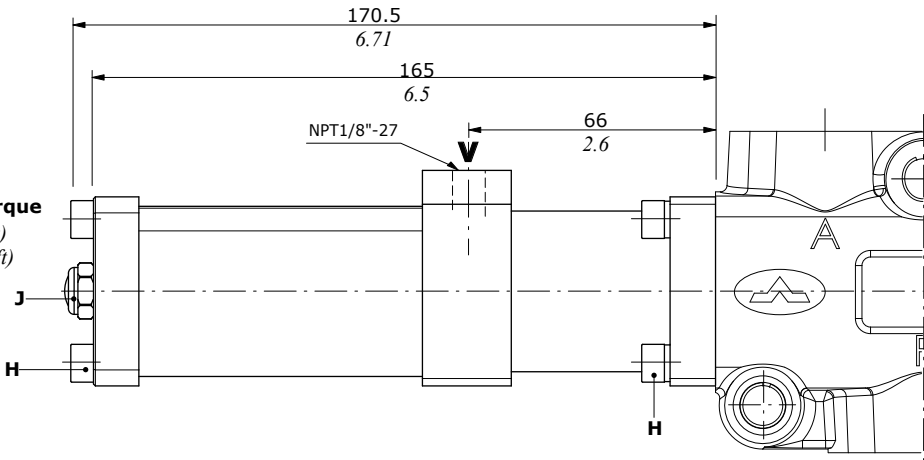
Spring return in position 1



Wrenches and tightening torque

H = wrench 5 - 9.8 Nm (7.2 lbf ft)

J = wrench 13 - 9.8 Nm (7.2 lbf ft)



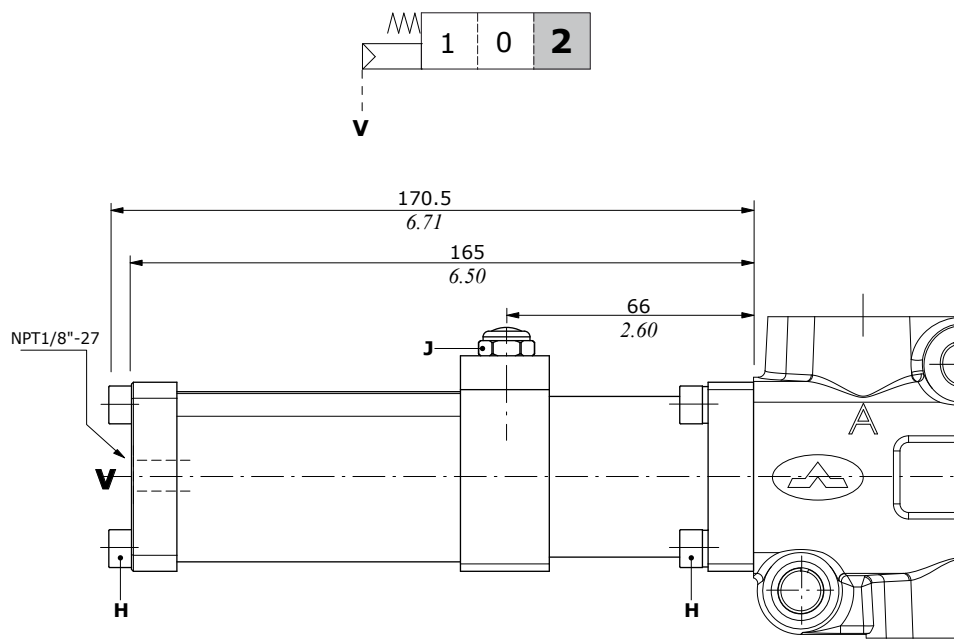
Pilot pressure... : min. 7 bar (101 psi) - max. 10 bar (145 psi)

"A" side spool positioners

ON/OFF pneumatic controls

Type 18P

Spring return in position 2



Pilot pressure... : min. 7 bar (101 psi) - max. 10 bar (145 psi)

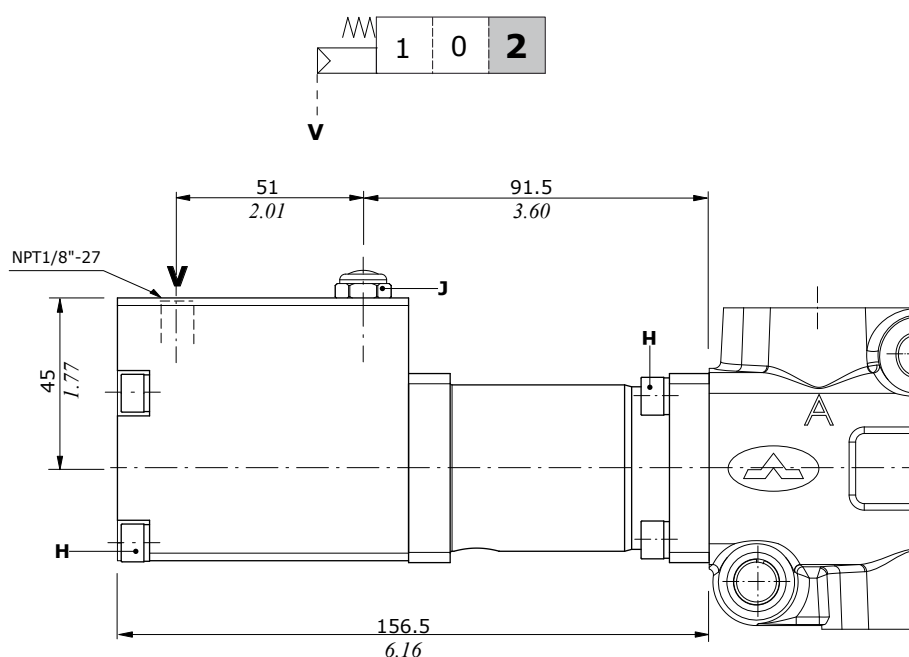
Wrenches and tightening torque

H = wrench 5 - 9.8 Nm (7.2 lbft)

J = wrench 13 - 9.8 Nm (7.2 lbft)

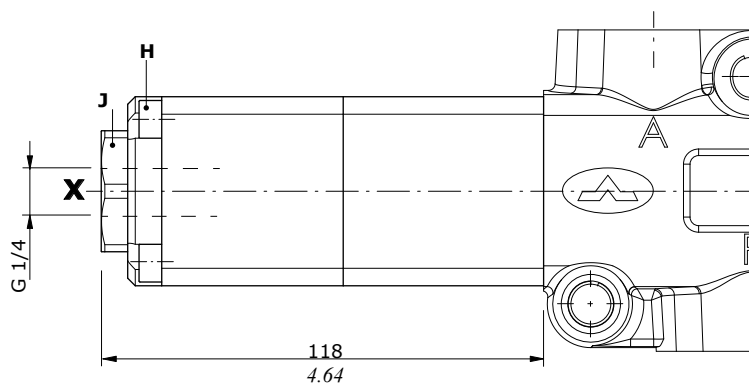
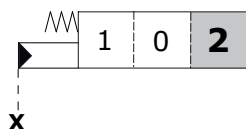
Type 18PNCWP

Spring return in position 2, waterproof



"A" side spool positioners**Hydraulic controls****Type 18IA1**

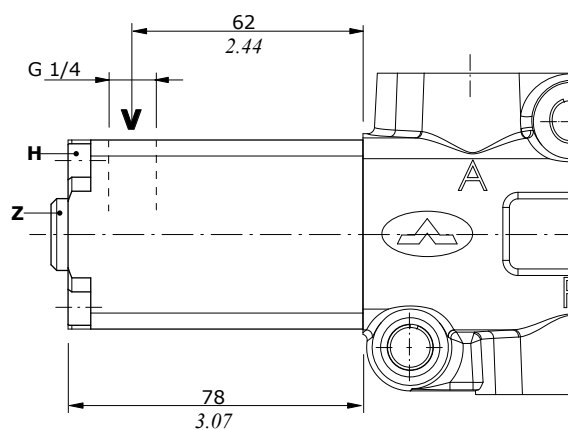
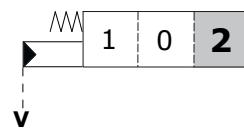
High pressure hydraulic kit with
spring return in position 2



Pilot pressure max. = 250 bar (3620 psi)

Type 18IB1

Low pressure hydraulic kit with
spring return in position 2



Pilot pressure max. = 50 bar (725 psi)

Wrenches and tightening torque

H = wrench 5 - 9.8 Nm (7.2 lbf ft)

Z = wrench 6 - 24 Nm (17.7 lbf ft)

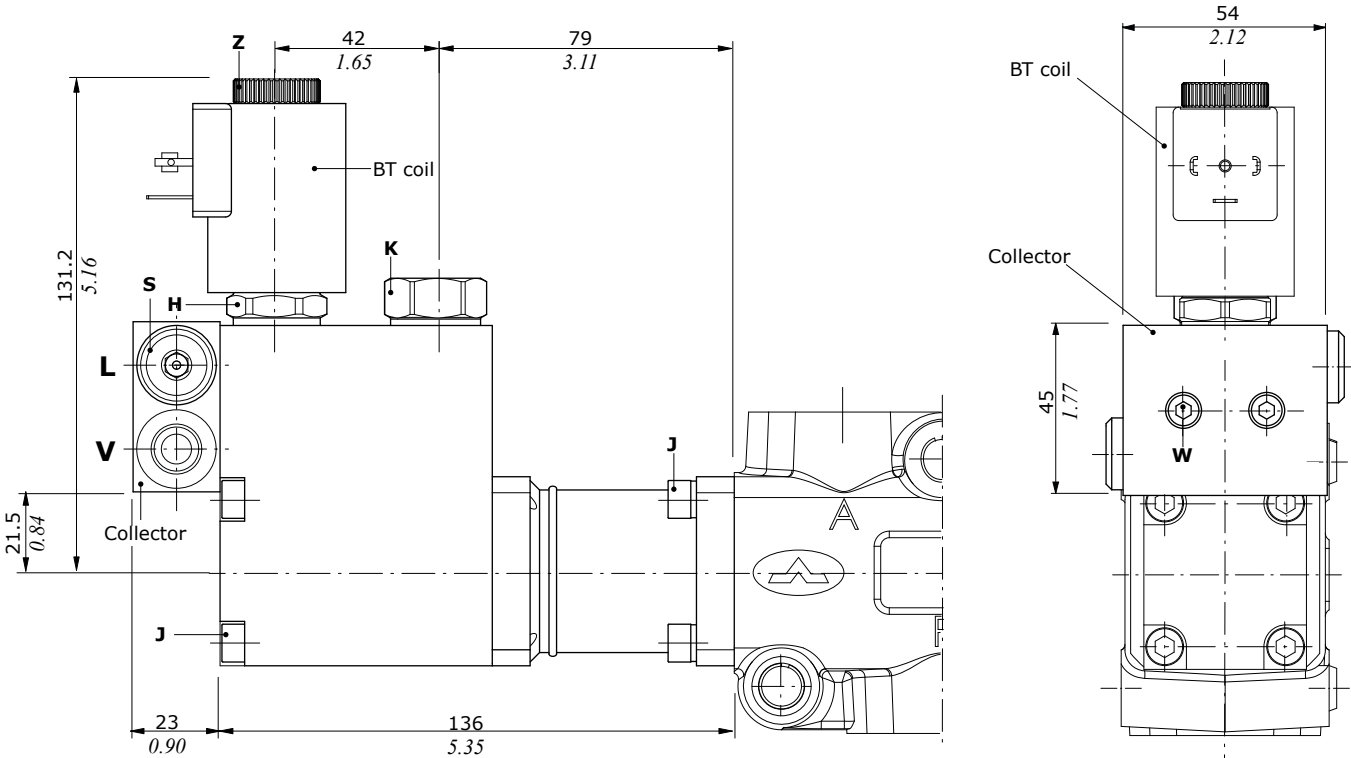
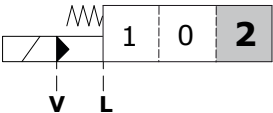
J = wrench 32 - 42 Nm (31 lbf ft)

"A" side spool positioners

ON/OFF electrohydraulic control

Type 18E11

Spring return in pos. 2,
with external pilot and drain



Wrenches and tightening torque

- J = wrench 5 - 9.8 Nm (7.2 lbft)
- K = wrench 24 - 30 Nm (22.1 lbft)
- Z = 5 Nm (3.68 lbft)
- S = wrench 6 - 24 Nm (17.7 lbft)
- H* = wrench 24 - 9.8 Nm (7.2 lbft)
- W = wrench 4 - 6.6 Nm (4.9 lbft)
- (*)Tightening with dynamometric wrench or screwer

Collector kit for external pilot and drain

COLLECTOR KIT CODE		
Type	Code	Description

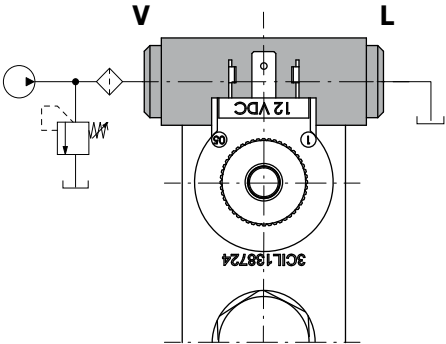
KE1S0 5KE1S00030 kit for 1 section

Codes are referred to BSP thread

Features

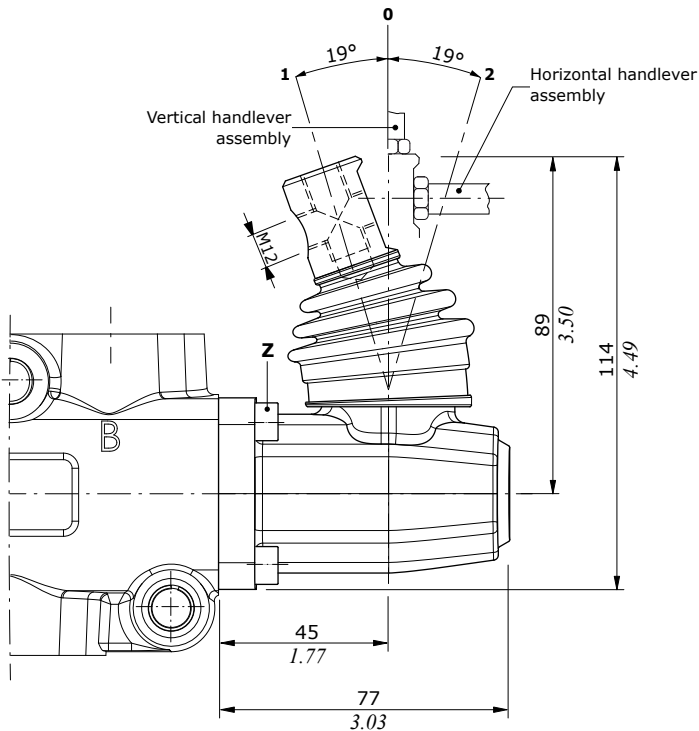
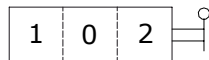
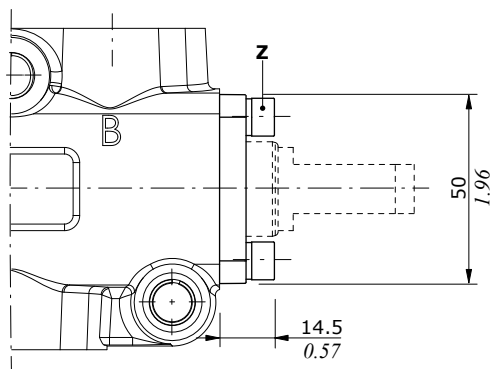
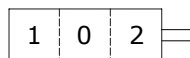
- Pilot pressure: : min. 10 bar (145 psi)
- : max. 50 bar (725 psi)
- Max backpressure on drain L....: 25 bar (362.5 psi)

Note: for complete available BT coils list and features see page 53



"B" side options**Lever control kit**

Aluminium with protection boot lever pivot box; it can be rotated 180° (execution **L180**)

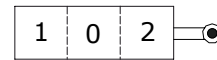
Type L**Without lever, with flange****Type SLP****Wrenches and tightening torque**

Z = wrench 5 - 9.8 Nm (7.2 lbft)

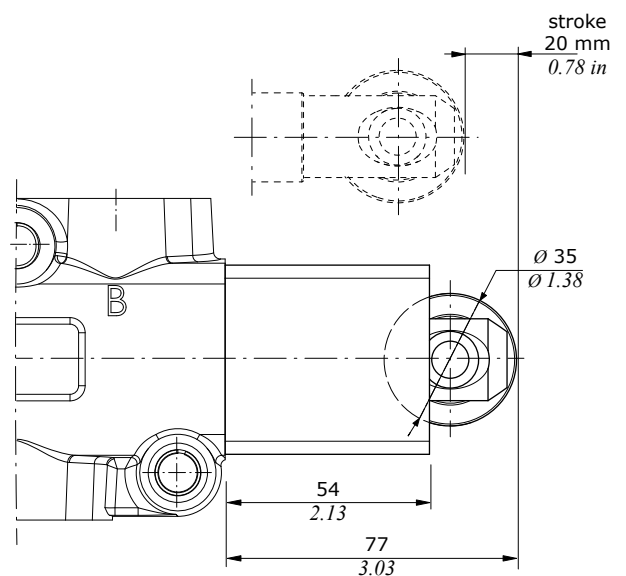
W = wrench 8 - 24 Nm (7.2 lbft)

Cam control kit

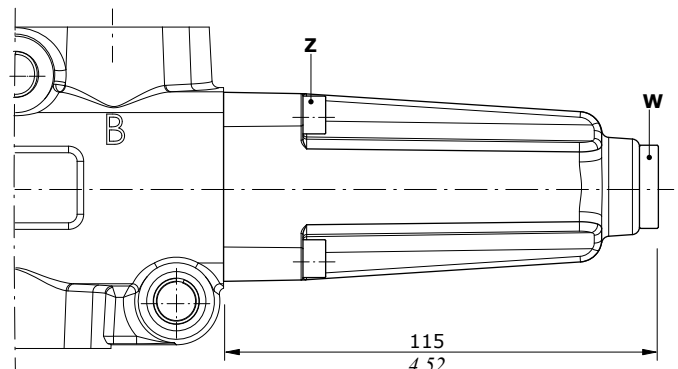
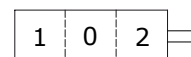
Steel ball bearing cam operation (CA), and bronze cam operation (CB); it must be coupled to 17 control kit

Type CA-CB**Wrenches and tightening torque**

Z = wrench 5 - 9.8 Nm (7.2 lbft)

**Without lever, with cap**

Protection cap to use with pneumatic, hydraulic and electrohydraulic spool positioner kits

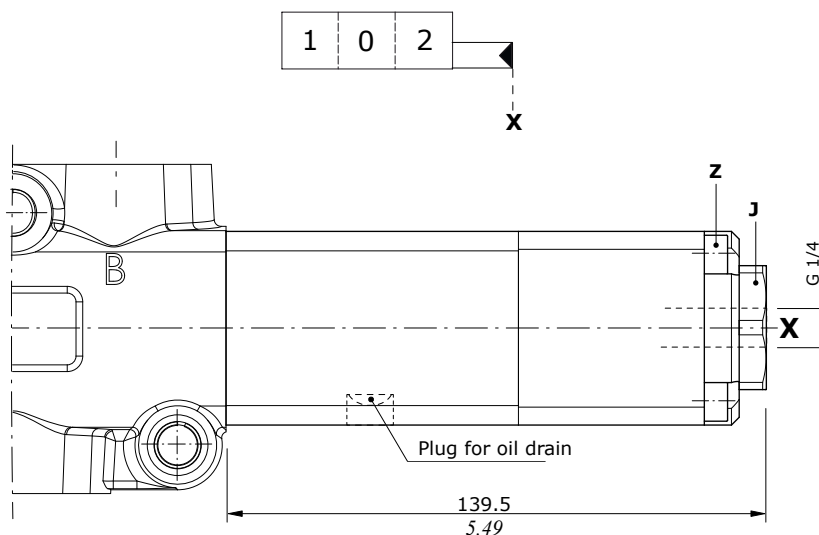
Type SLC

"B" side options

Hydraulic controls

ON/OFF controls with high and low pressure pilot it must be only coupled to 17ME control kit

Type IA2 High pressure pilot



Wrenches and tightening torque

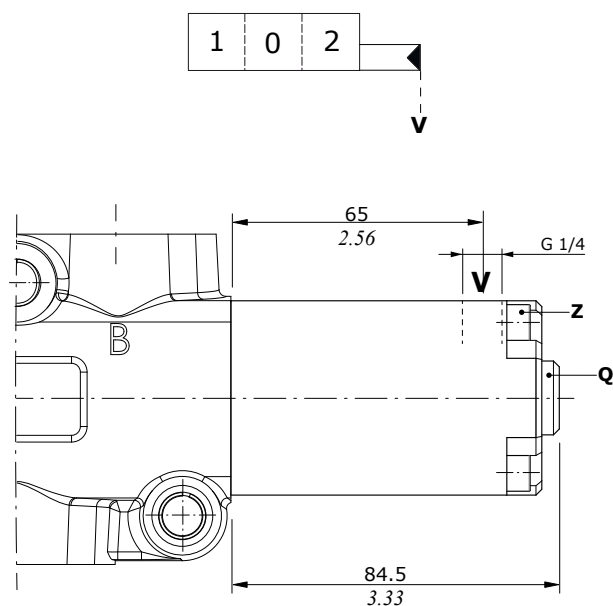
Z = wrench 5 - 9.8 Nm (7.2 lbft)

J = wrench 24 - 42 Nm (31 lbft)

Q = wrench 6 - 24 Nm (17.7 lbft)

Pilot pressure max. = 250 bar (3620 psi)

Type IB2 Low pressure pilot



Pilot pressure max. = 50 bar (725 psi)

Coils and accessories for 18EI1 control

		Ordering codes					
Type	Voltage	Connector types					
		ISO4400	Deutsch DT	AMP JPT	Packard Weatherpack	Packard Metri-pack	Flying leads without connector
BT	10 VDC	4SL3000100	-	-	-	-	-
	12 VDC	4SL3000120 4SL3000126 ⁽⁴⁾	4SL3000130 ⁽⁶⁾ 4SL3000134 ⁽³⁻⁶⁾ 4SL3000128 ⁽²⁾	4SL3000122 ⁽⁵⁾ 4SL3001200 ⁽³⁻⁵⁾	4SL3000124 ⁽²⁾	4SL3000127 ⁽²⁾	4SL300012C
	24 VDC	4SL3000240 4SL3030240 ⁽¹⁾	4SL3000249 ⁽⁶⁾ 4SL300024C ⁽³⁻⁶⁾	4SL3000248 ⁽⁵⁾	-	-	4SL3000246
	26 VDC	4SL3000260	-	-	-	-	-
	48 VDC	4SL3000480 4SL3030480 ⁽¹⁾	-	-	-	-	-
	110 VDC	4SL3001100 4SL3031100 ⁽¹⁾	-	-	-	-	-
	220 VDC	4SLE022000A 4SLE322000A ⁽¹⁾	-	-	-	-	-
	Mating connectors						
With rectifier		4CN1009995	5CON140031	5CON003	5CON001	5CON017	-
	24 VDC	4CN3010240	-	-	-	-	-
	48 VDC	4CN3010480	-	-	-	-	-
	110 VDC	4CN3011100	-	-	-	-	-
	220 VDC	4CN3012200	-	-	-	-	-

Notes: ⁽¹⁾ supply with AC and use only with rectifier connector - ⁽²⁾ with flying leads - ⁽³⁾ with bidirectional diode - ⁽⁴⁾ with unidirectional diode - ⁽⁵⁾ integrated perpendicular type - ⁽⁶⁾ integrated parallel type

Features

Nominal voltage tolerance: $\pm 10\%$

Nominal power.....: 19 W - 10 VDC
: 21 W - 12/24/26 VDC
: 20.3 W - 48 VDC
: 17.3 W - 110 VDC
: 17.7 W - 220 VDC

Nominal current.....: 1.9 A @ 10 VDC
: 1.77 A @ 12 VDC
: 0.89 A @ 24VDC
: 0.84 A @ 26 VDC
: 0.43 A @ 48 VDC
: 0.16 A @ 110 VDC
: 0.08 A @ 220 VDC

Insulation.....: Class F (155°C - 311°F)

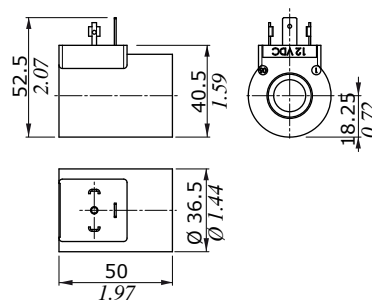
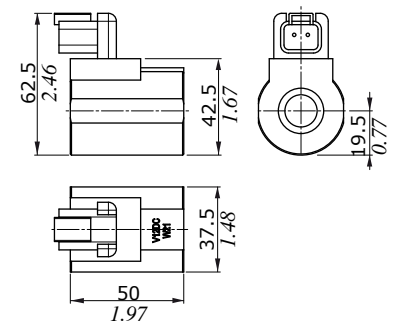
Weather protection...: IP65 - ISO4400 / AMP JPT

: IP69K - Deutsch DT

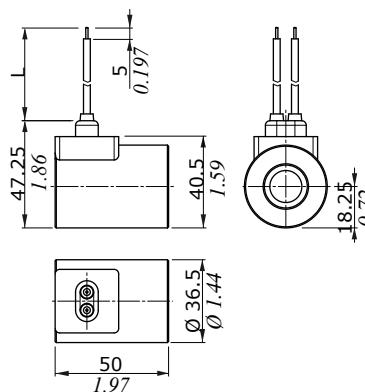
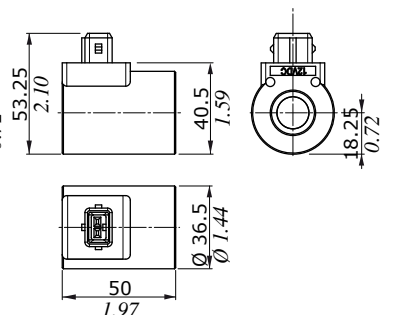
: IP67 - Weatherpack / Metri-pack

Insertion.....: 100%

ISO4400 connector

DEUTSCH DT04 connector
(Parallel type)

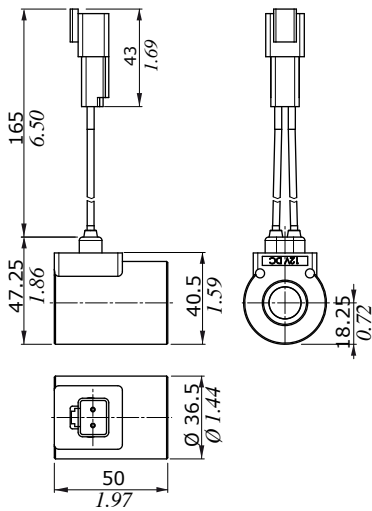
Flying leads

AMP JPT connector
(Perpendicular type)

Coil type	L dimension	
	(mm)	(in)
12 VDC	240	9.45
24 VDC	600	23.62

Coils and accessories for 18EI1 control

Flying leads with DEUTSCH DT04 connector



Flying leads with PACKARD METRI-PACK connector Flying leads with PACKARD WEATHER-PACK connector

