



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	$\Delta p = 100 \text{ bar (1450 psi)}$	8 cm ³ /min (0.48 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.

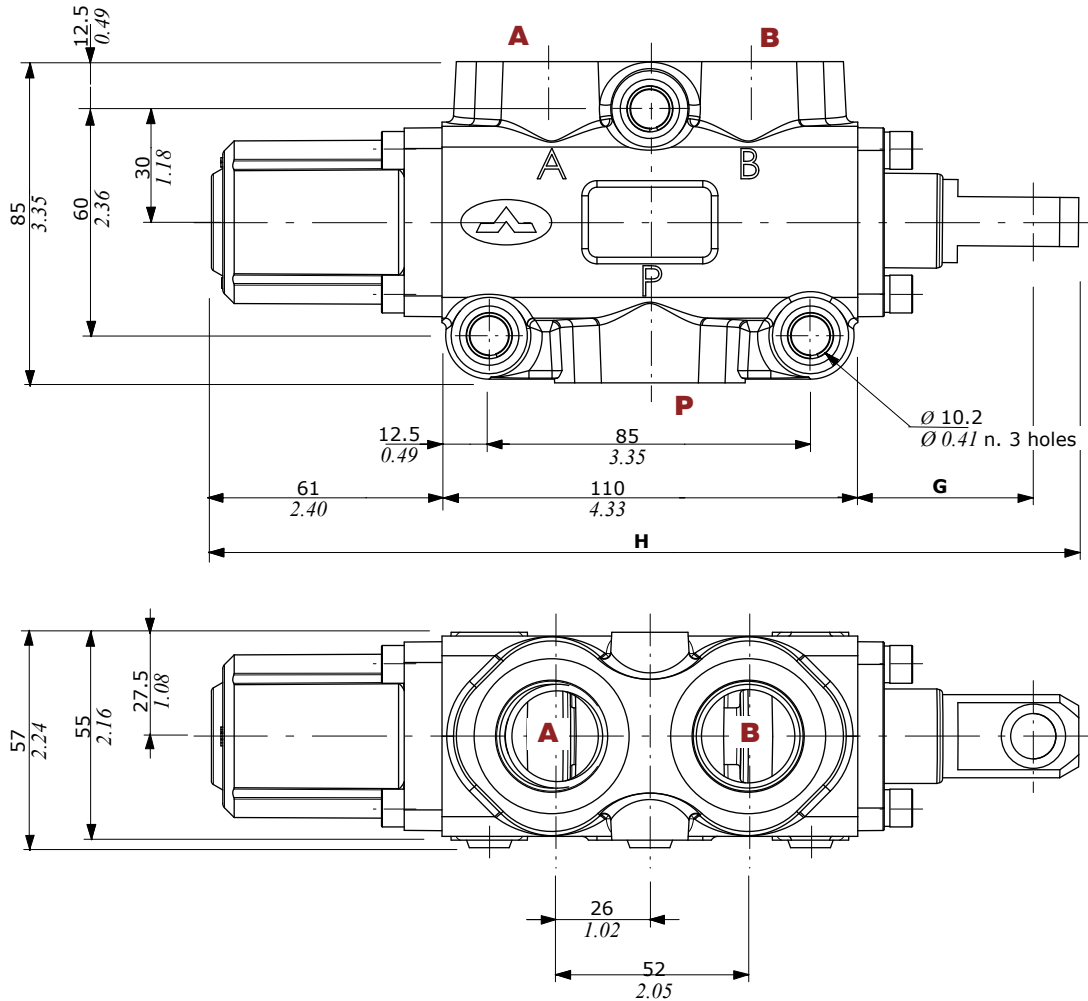
Available threads

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

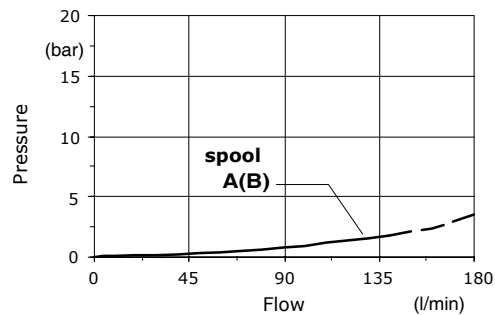
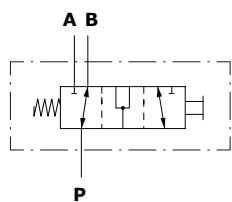
It's possible to obtain 2 ways diverter valve plugging port



	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

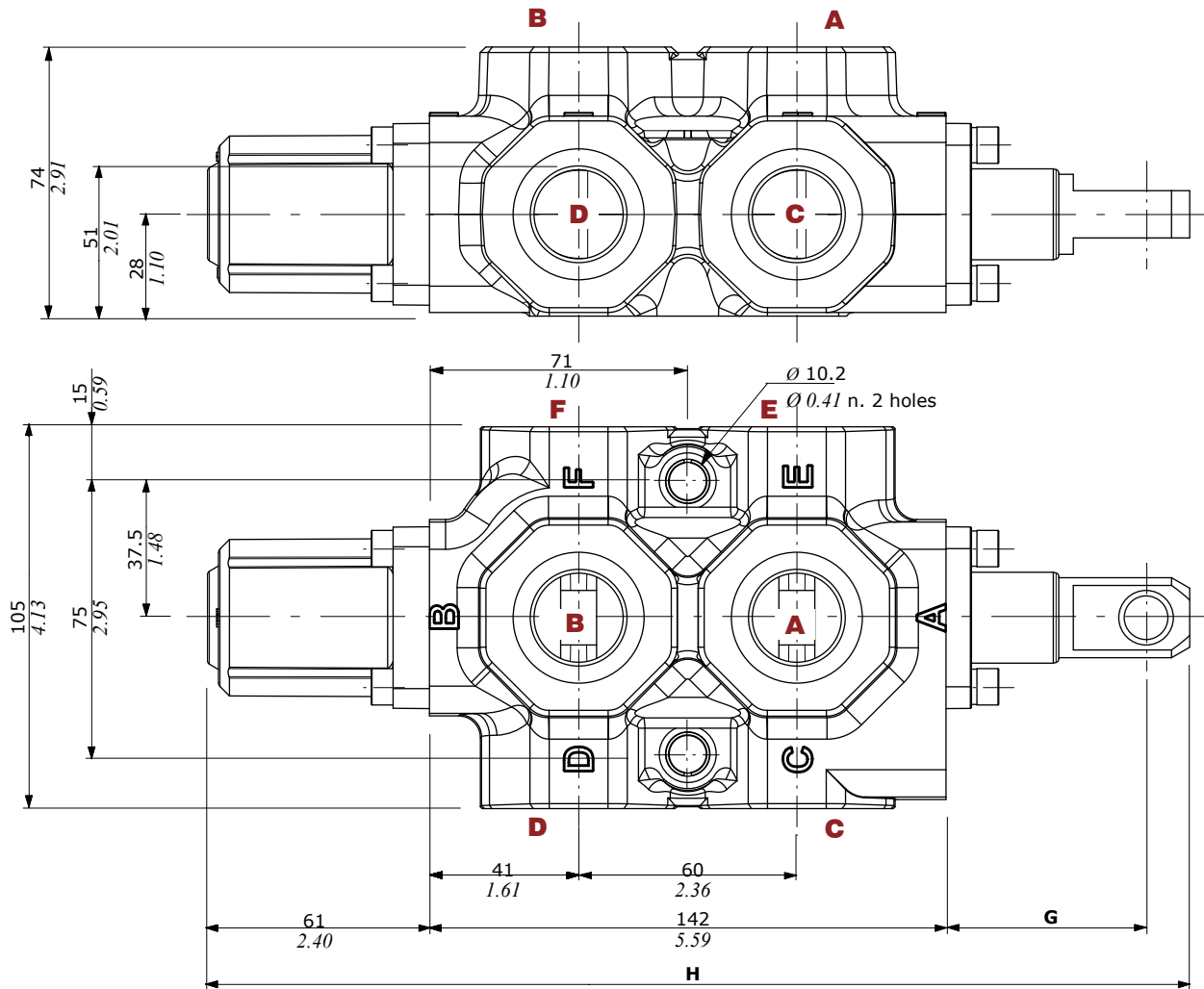
Pressure drop versus flow

P → A(B)



Dimensional data - hydraulic circuit - performance data

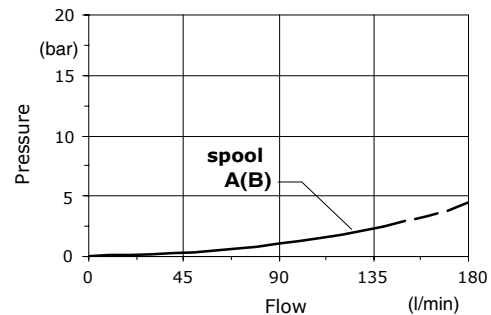
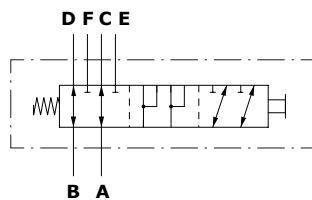
6 ways



	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** - **SAE** - **(CVN)**

1

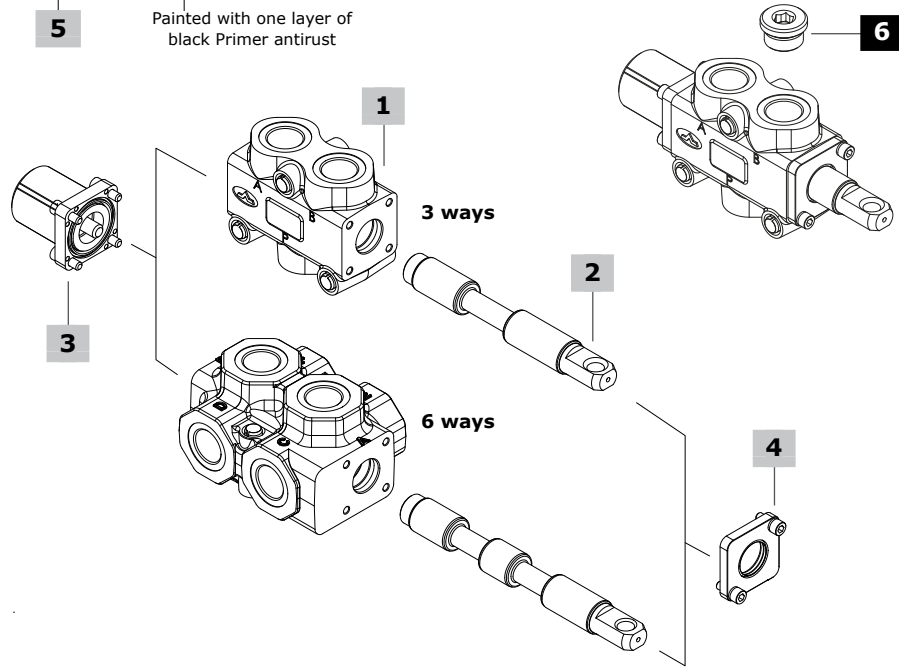
2

3

4

5

Painted with one layer of black Primer antirust



1 Body kit*

TYPE	CODE	DESCRIPTION
DF20/3	5CO2261700	3 ways body kit
DF20/6	5CO2263700	6 ways body kit

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 page 46

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

Pneumatic controls: must be coupled to the control kit side B with lever, with plate or cap

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

Hydraulic controls: must be coupled to the control kit side B with lever, with plate or cap

18IA1	5V18120825*	On/off high pressure hydraulic kit with spring return in position 2
18IB1	5V18120815*	On/off low pressure hydraulic kit with spring return in position 2

Electrohydraulic controls: must be coupled to the control kit side B with lever, with plate or cap

Control requires collector kit; see page 50

18EI1	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

Hydraulic controls

IA2	5IDR520700*	On/off with high pressure pilot, need 17ME control type
IB2	5IDR720700*	On/off with low pressure pilot, need 17ME control type

5 Body threading

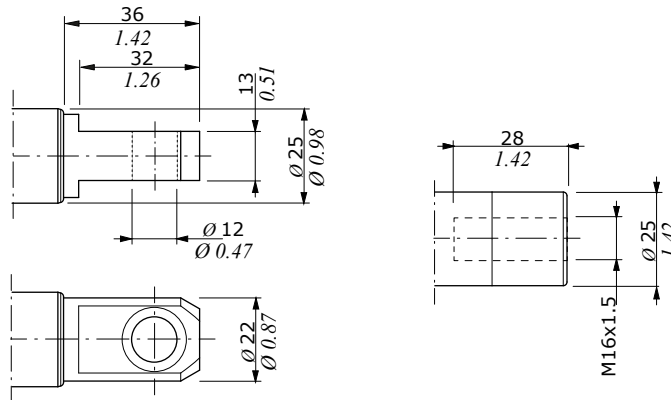
Specify threading always when it is different from **BSP** standard

6 Port plugs*

It's possible to obtain 2 ways diverter valve plugging DF20/3 port

CODE	DESCRIPTION
3XTAP832200	SAE12 plug

(*) - Codes are referred to **UN-UNF** thread



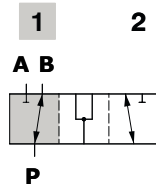
Standard:
spool type **A, B**

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

3 ways

Type A/AC

Ports connected
in transit position

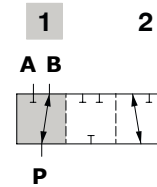


Spool stroke

Position 2: - 20 mm (- 0.78 in)

Type B/BC

Ports closed
in transit position



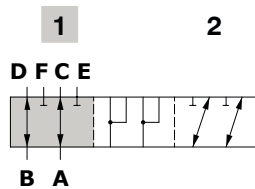
Spool stroke

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

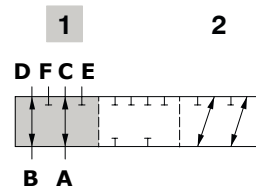


Spool stroke

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

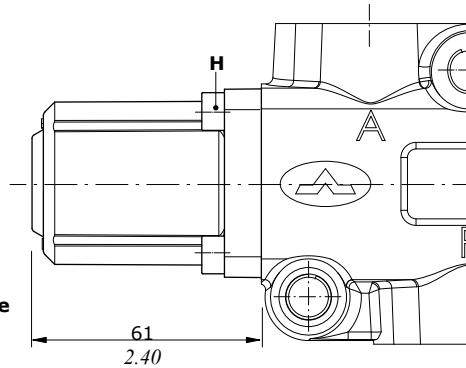
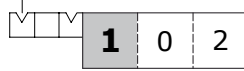
Position 2: - 20 mm (- 0.78 in)

"A" side spool positioners

With detent

Type 12

Detent in positions 1 and 2

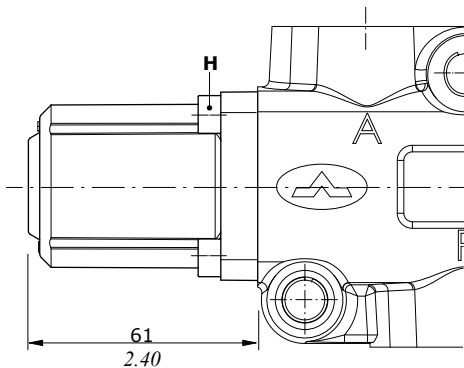


Wrenches and tightening torque
 H = wrench 5 - 9.8 Nm (7.2 lbf)

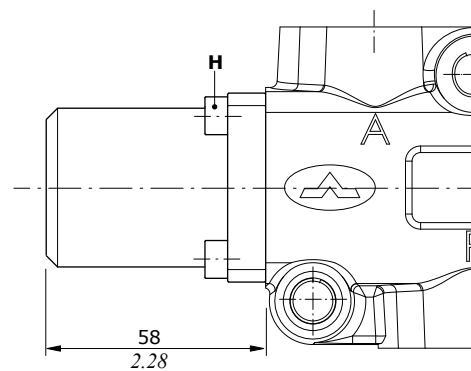
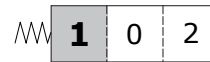
With spring return in position 1

With heavier spring type "E"

Type 17

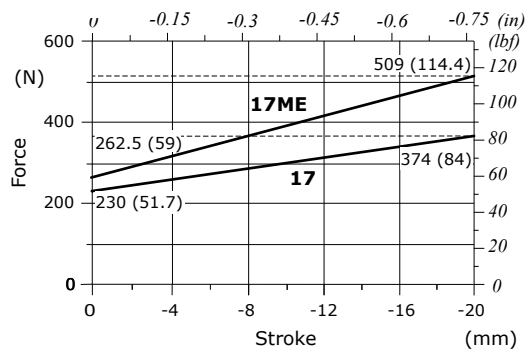


Type 17ME



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

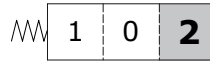
Force-Stroke diagram



"A" side spool positioners

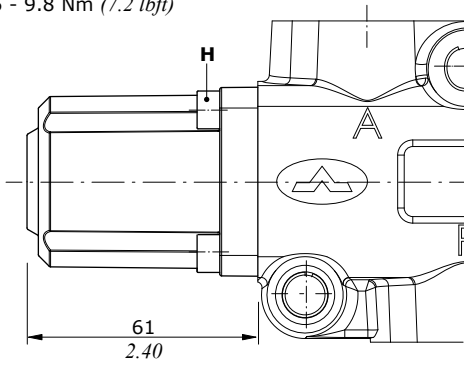
With spring return in position 2

Type 18

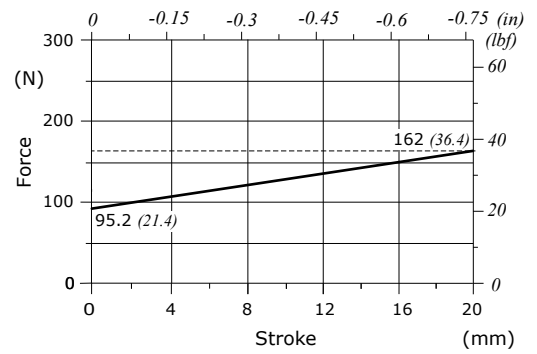


Wrenches and tightening torque

H = wrench 5 - 9.8 Nm (7.2 lbf^t)



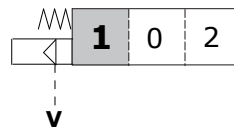
Force-Stroke diagram



ON/OFF pneumatic controls

Type 17P

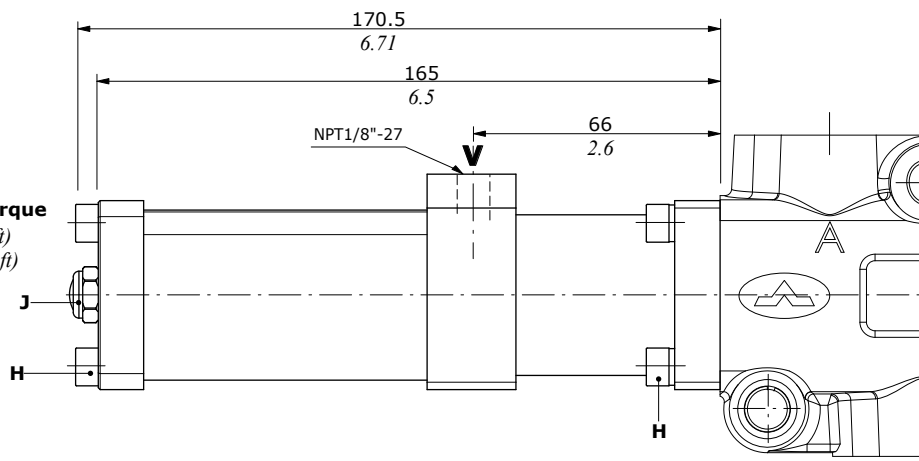
Spring return in position 1



Wrenches and tightening torque

H = wrench 5 - 9.8 Nm (7.2 lbf^t)

J = wrench 13 - 9.8 Nm (7.2 lbf^t)



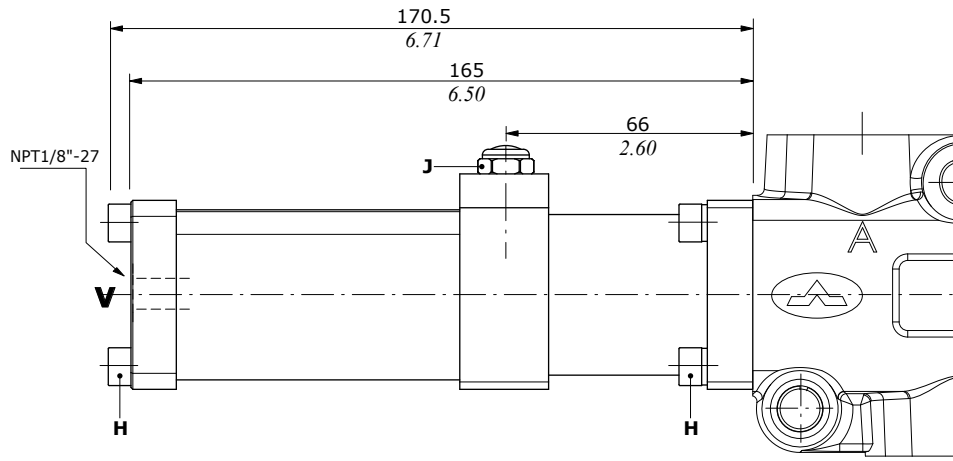
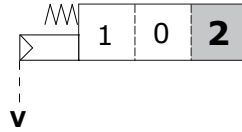
Pilot pressure... : min. 7 bar (101 psi) - max. 10 bar (145 psi)

"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)

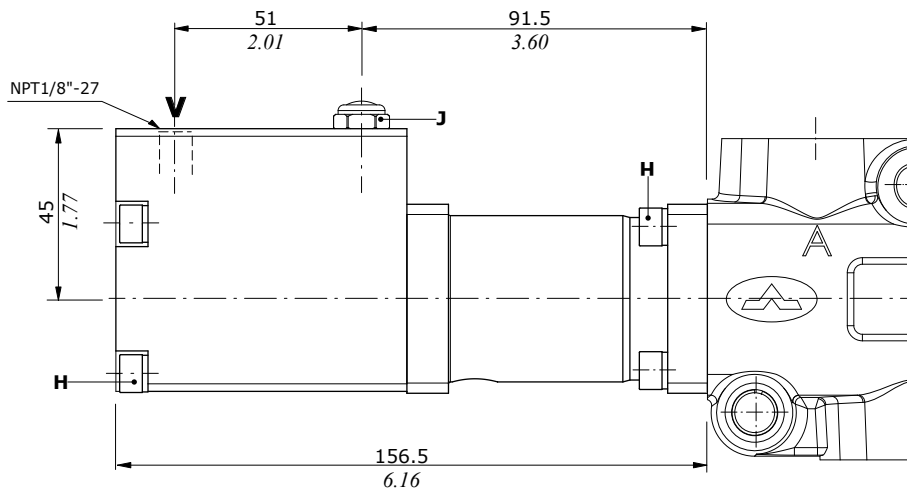
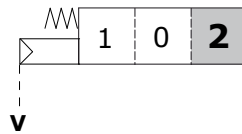
Wrenches and tightening torque

H = wrench 5 - 9.8 Nm (7.2 lbft)

J = wrench 13 - 9.8 Nm (7.2 lbft)

Type 18PNCWP

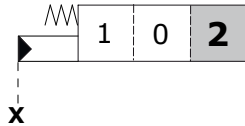
Spring return in position 2, waterproof



Hydraulic controls

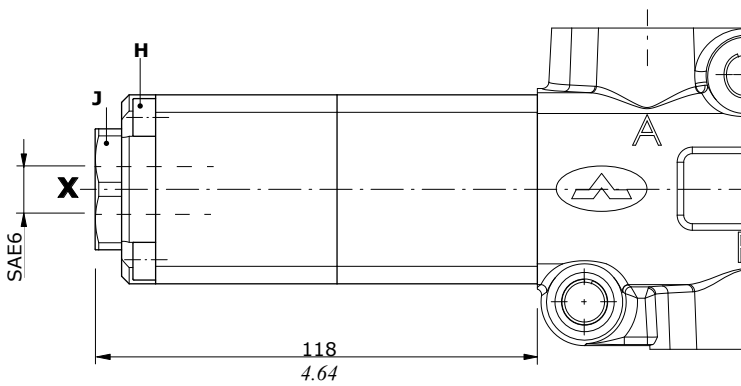
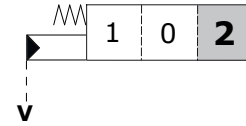
Type 18IA1

High pressure hydraulic kit with
spring return in position 2

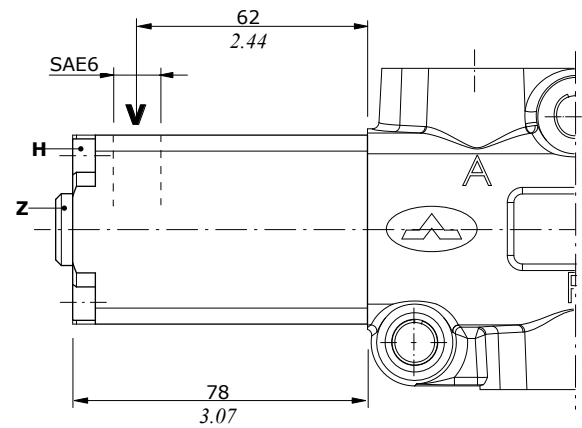


Type 18IB1

Low pressure hydraulic kit with
spring return in position 2



Pilot pressure max. = 250 bar (3620 psi)



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)

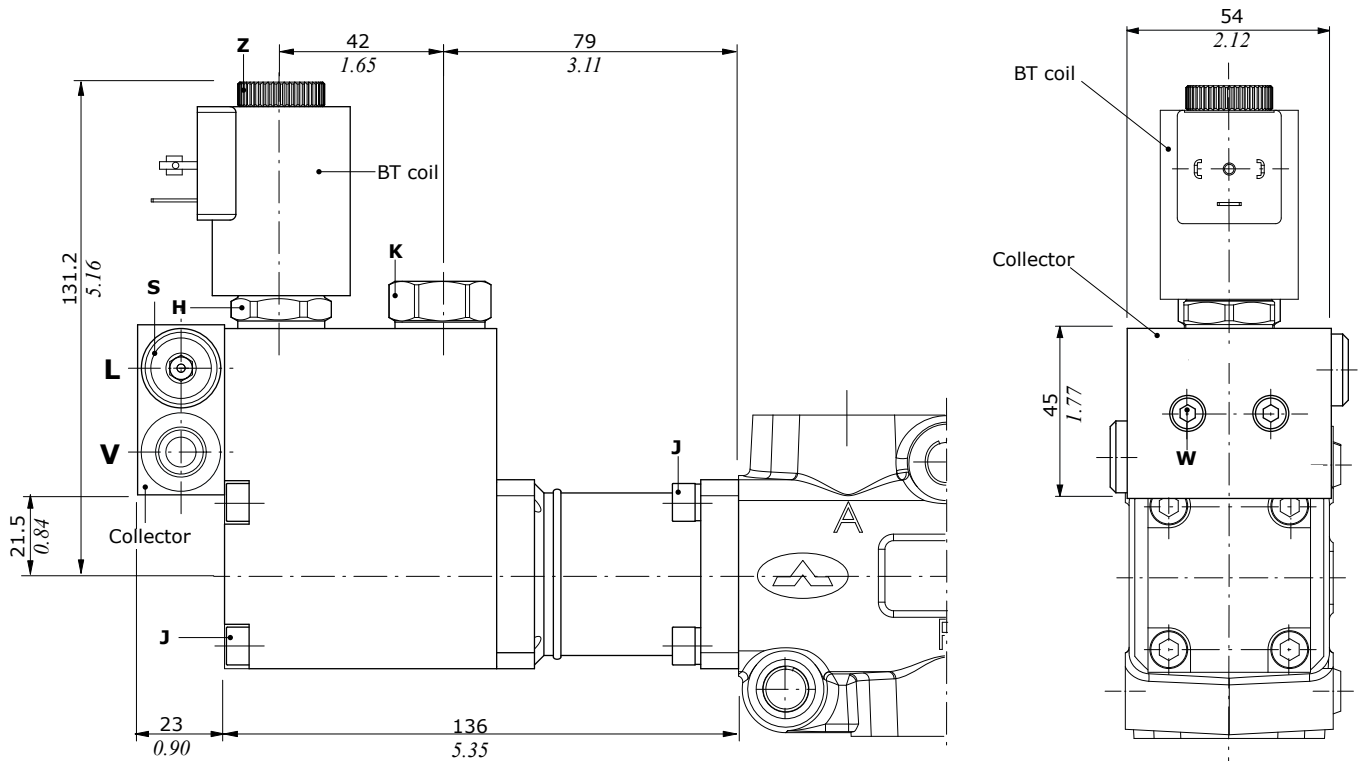
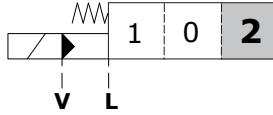
J = wrench 32 - 42 Nm (31 lbf·ft)

"A" side spool positioners

ON/OFF electrohydraulic control

Type 18EI1

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



Wrenches and tightening torque

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

Collector kit for external pilot and drain

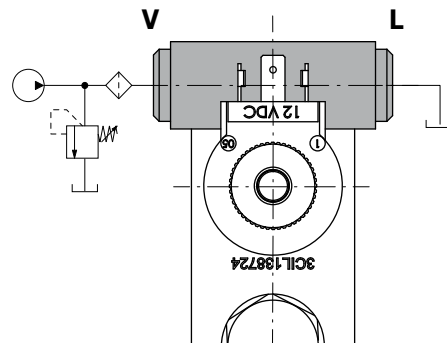
COLLECTOR KIT CODE		
Type	Code	Description
KE1S0	5KE1S00070	kit for 1 section

Codes are referred to UN-UNF 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

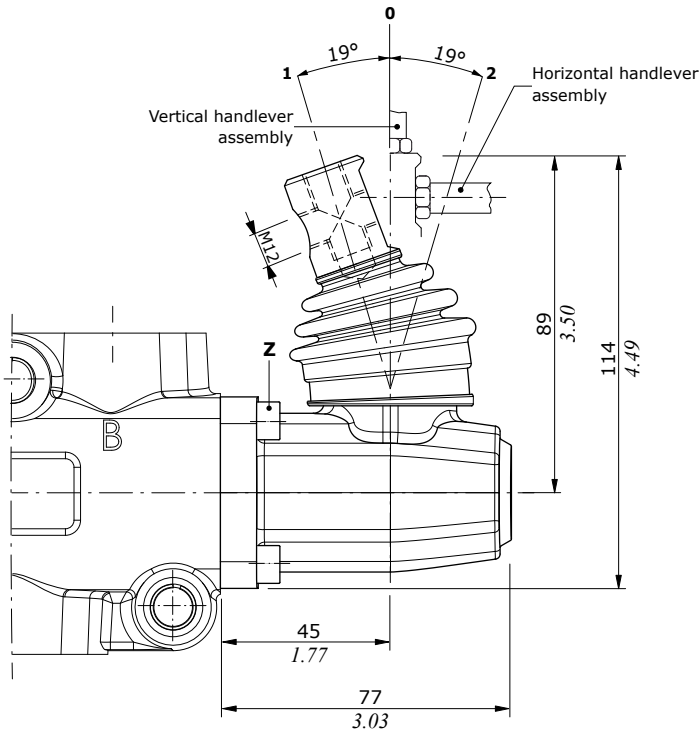
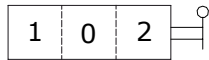


"B" side options

Lever control kit

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

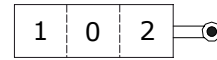
Type L



Cam control kit

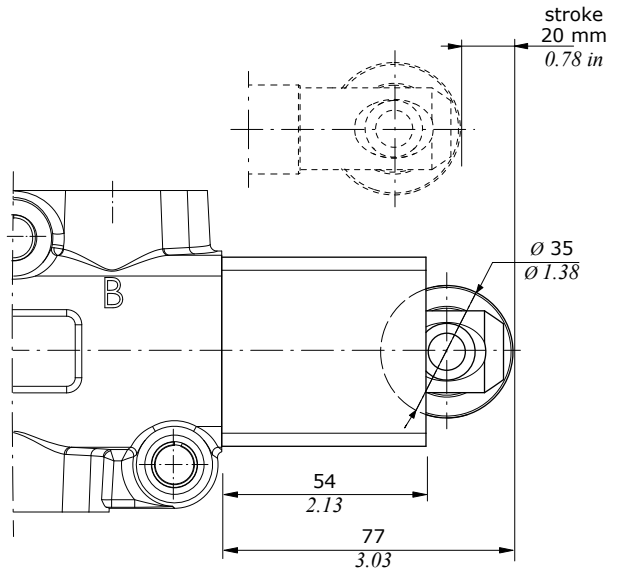
Steel ball bearing cam operation (CA), and bronze cam operation (CB); it must be coupled to 17 control kit

Type CA-CB



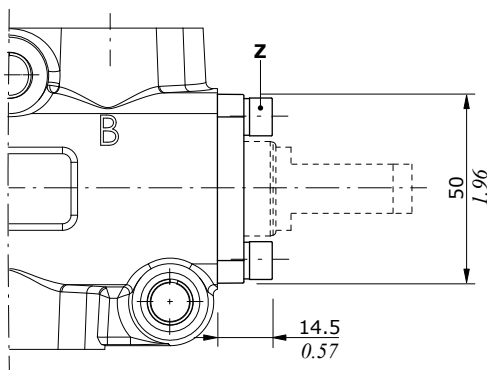
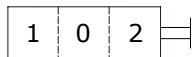
Wrenches and tightening torque

Z = wrench 5 - 9.8 Nm (7.2 lbf_t)



Without lever, with flange

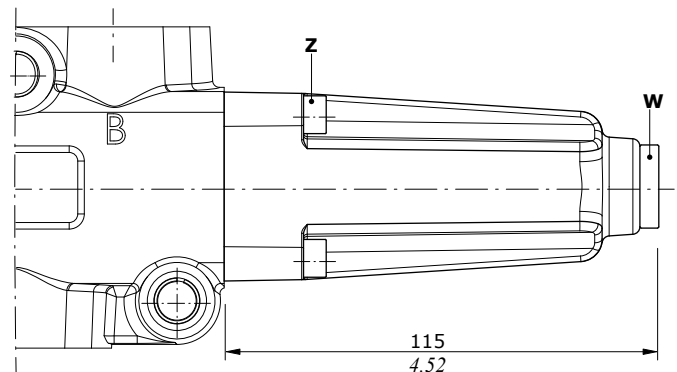
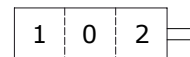
Type SLP



Without lever, with cap

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

Type SLC



Wrenches and tightening torque

Z = wrench 5 - 9.8 Nm (7.2 lbf_t)

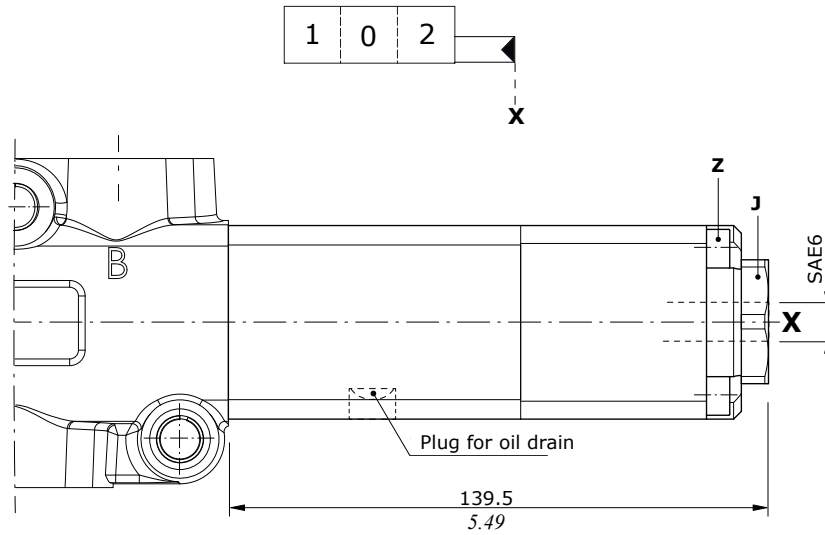
W = wrench 8 - 24 Nm (7.2 lbf_t)

"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

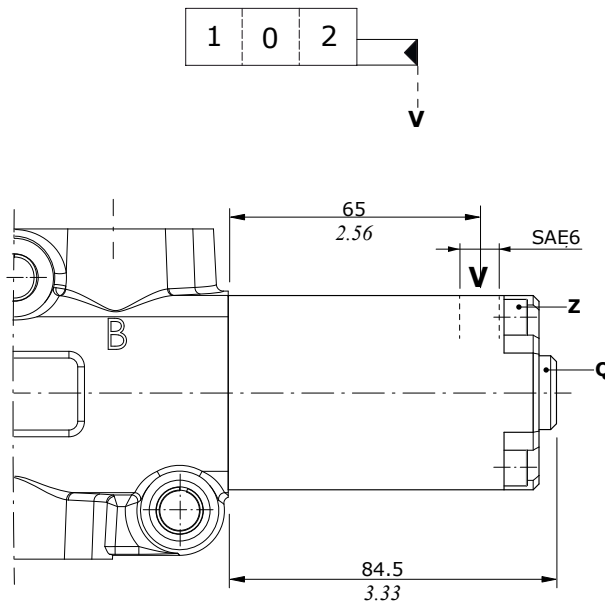


Wrenches and tightening torque

- Z = wrench 5 - 9.8 Nm (7.2 lbf^t)
- J = wrench 24 - 42 Nm (31 lbf^t)
- Q = wrench 6 - 24 Nm (17.7 lbf^t)

Pilot pressure max. = 250 bar (3620 psi)

Type IB2
Low pressure pilot



Pilot pressure max. = 50 bar (725 psi)

Coils and accessories for 18E11 control

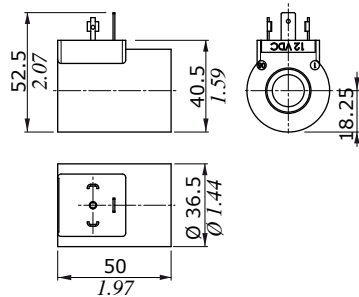
Type	Voltage	Ordering codes					Flying leads without connector
		ISO4400	Deutsch DT	AMP JPT	Packard Weatherpack	Packard Metri-pack	
BT	10 VDC	4SL3000100	-	-	-	-	-
	12 VDC	4SL3000120	4SL3000130 ⁽⁶⁾	4SL3000122 ⁽⁵⁾	4SL3000124 ⁽²⁾	4SL3000127 ⁽²⁾	4SL300012C
		4SL3000126 ⁽⁴⁾	4SL3000134 ⁽³⁻⁶⁾	4SL3001200 ⁽³⁻⁵⁾			
	24 VDC	4SL3000240	4SL3000249 ⁽⁶⁾	4SL3000248 ⁽⁵⁾	-	-	4SL3000246
		4SL3030240 ⁽¹⁾	4SL300024C ⁽³⁻⁶⁾				
	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

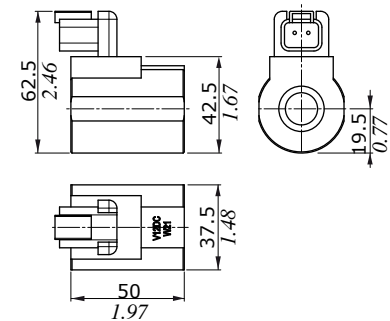
Features

- Nominal voltage tolerance: ±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%

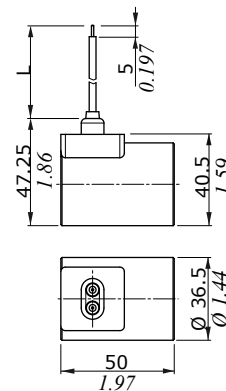
ISO4400 connector



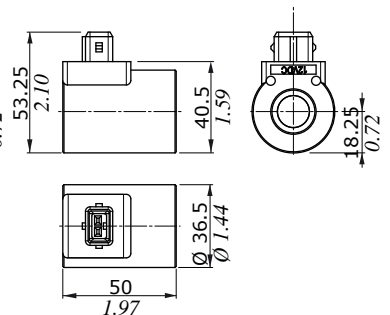
DEUTSCH DT04 connector (Parallel type)



Flying leads



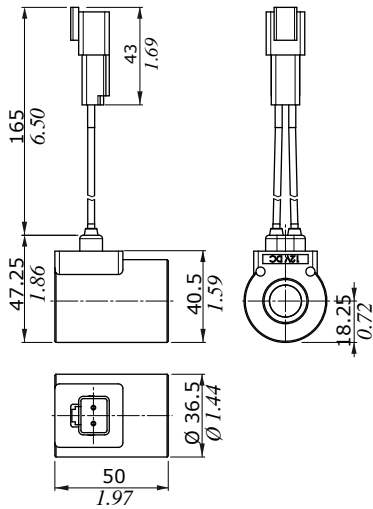
AMP JPT connector (Perpendicular type)



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

Coils and accessories for 18E11 control

Flying leads with DEUTSCH DT04 connector



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

