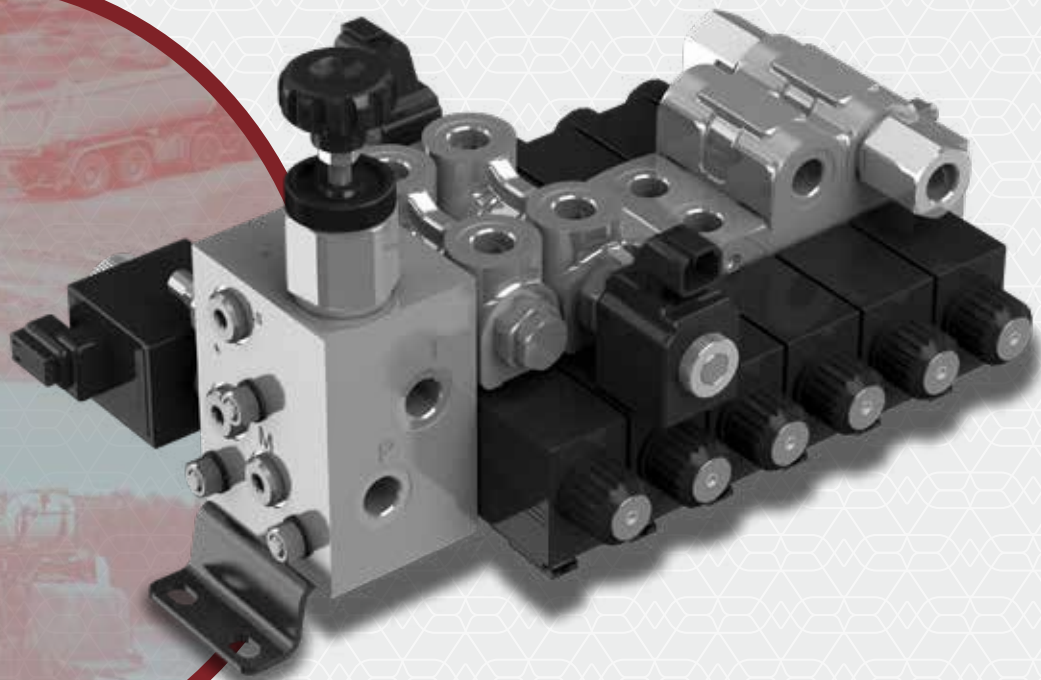


SDE030 – SDE060

Bankable solenoid valves



COMPACT HYDRAULICS

General informations

Simple, compact and heavy duty designed sectional valves from 1 to 10 sections.

SDE030

- Aluminium alloy inlet sections, available in several configurations.
- Cast iron working sections
- Different types of spools.
- Optional check valves on workports.
- Available for parallel circuit.
- On/off solenoid controls.
- Emergency handlever available.

SDE060

- Steel inlet sections, available in several configurations.
- Cast iron working sections
- Different types of spools.
- Different options to be flanged on the workports side
- Available for parallel and series circuits.
- On/off solenoid controls.
- Emergency handlever available.

Additional information

This catalogue shows the product in the most standard configurations.
Please contact Sales Dpt. for more detailed information or special request.

WARNING!

All specifications of this catalogue refer to the standard product at this date.
Walvoil, oriented to a continuous improvement, reserves the right to discontinue, modify or revise the specifications, without notice.

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

1st edition November 2024

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SDE030

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SDE060

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SDE030-SDE060

Working conditions

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

		SDE030	SDE060
Nominal flow rating		30 l/min - 7.9 US gpm	30 l/min - 60 l/min 7.9 US gpm - 15.8 US gpm
Operating pressure (max.)	<i>parallel circuit</i>	250 bar - 3600 psi	315 bar - 4600 psi
	<i>series circuit</i>	-	210 bar - 3050 psi
Back pressure (max.)	<i>outlet port T</i>	210 bar - 3050 psi	
	<i>outlet port T, with lever control</i>	30 bar - 435 psi	
Internal leakage (max.) A(B)⇒T	$\Delta p = 100 \text{ bar} - 1450 \text{ psi}$ fluid and valve at 40°C - 104°F	30 cm ³ /min - 0.85 in ³ /min	
Fluid		Mineral based oil	
Fluid temperature	<i>with NBR (BUNA-N) seals</i>	from -20°C to 80°C - from -4°F to 176°F	
	<i>with FPM (VITON) seals</i>	from -20°C to 100°C - from -4°F to 212°F	
Viscosity	<i>operating range</i>	from 15 to 75 mm ² /s - from 15 to 75 cSt	
	<i>min.</i>	12 mm ² /s - 12 cSt	
	<i>max.</i>	400 mm ² /s - 400 cSt	
Max. contamination level		-/19/16 - ISO 4406 - NAS 1638 - class 10	
Ambient temperature for working conditions		from -20°C to 50°C - from -4°F to 122°F	

NOTE - For different conditions please contact Sales Dept.

Standard threads

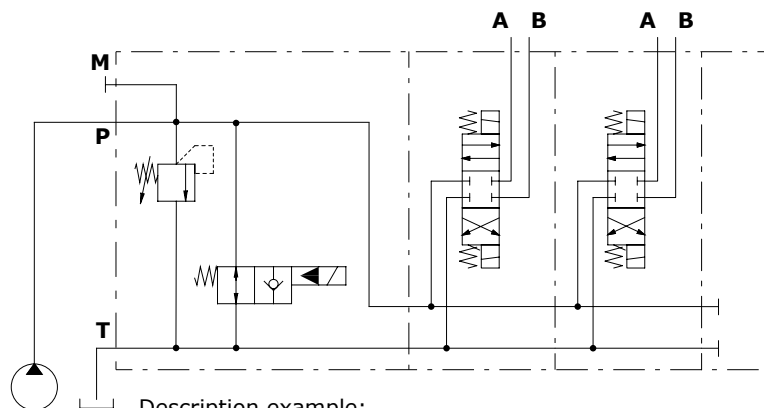
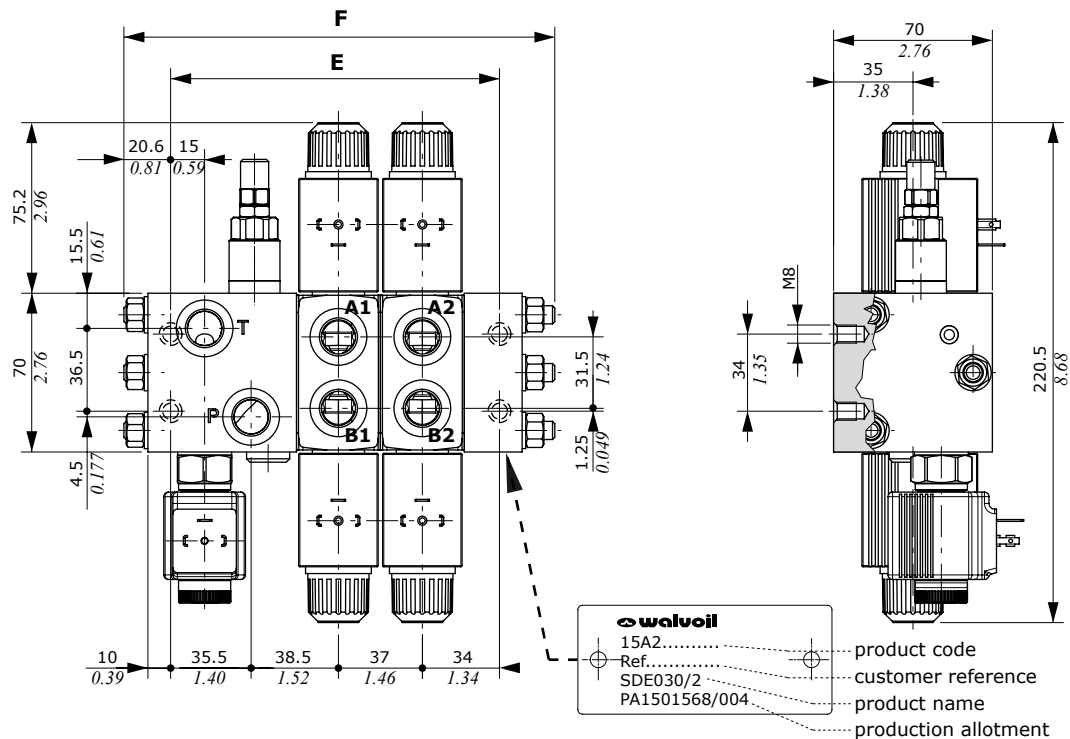
REFERENCE STANDARD			
		BSP	UN-UNF
THREAD ACCORDING TO		ISO 228/1	ISO 263
		BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	1179	11926
	SAE		J11926
	DIN	3852-2 shape X or Y	

PORT THREADING	SDE030		SDE060			
			30 l/min (7.9 US gpm) sections		60 l/min (15.8 US gpm) sections	
	BSP	UN-UNF	BSP	UN-UNF	BSP	UN-UNF
Inlet P and outlet T	G 3/8	3/4-16 (SAE 8)	G 3/8	3/4-16 (SAE 8)	G 1/2	3/4-16 (SAE 8)
Working ports A and B	G 3/8	9/16-18 (SAE 6)	G 3/8	9/16-18 (SAE 6)	G 3/8	9/16-18 (SAE 6)
					G 1/2*	3/4-16 (SAE 8)*
Port M	G 1/4	9/16-18 (SAE 6)	G 1/4	7/16-20 (SAE 4) 9/16-18 (SAE 6)**	G 1/4	7/16-20 (SAE 4) 9/16-18 (SAE 6)**
Port LS	G 1/4	9/16-18 (SAE 6)	G 1/4	9/16-18 (SAE 6)	/	/

NOTE (*) Optional thread - (**) Only for type N inlet section

Dimensions

This drawing is referred to directional valve with 2 working sections and AN1 type inlet section.



Description example:
SDE030/2/AN1(JNS3-120)ELN/Q-18ES3B/Q-18ES3B/RF-12VDC

AN type inlet section					AN1 type inlet section (see drawing)						AN2-AN6-AN7 type inlet sections				AN14-AN15-AN16 type inlet sections			
TYPE	E		F		E		F		Weight		E		F		E		F	
	mm	in	mm	in	mm	in	mm	in	Kg	lb	mm	in	mm	in	mm	in	mm	in
SDE030/1	71	2.80	116	4.57	108	4.25	153	6.02	3.80	8.38	108	4.25	153	6.02	108	4.25	153	6.02
SDE030/2	108	4.25	153	6.02	145	5.71	190	7.48	5.99	13.21	145	5.71	190	7.48	145	5.71	190	7.48
SDE030/3	145	5.71	190	7.48	182	7.17	227	8.94	8.10	17.86	182	7.17	227	8.94	182	7.17	227	8.94
SDE030/4	182	7.17	227	8.94	279	10.98	264	10.39	10.22	22.53	279	8.62	264	10.39	279	8.62	264	10.39
SDE030/5	219	8.62	264	10.39	256	10.08	301	11.85	12.33	27.18	256	10.08	301	11.85	256	10.08	301	11.85
SDE030/6	256	10.08	301	11.85	293	11.54	338	13.31	14.44	31.83	293	11.54	338	13.31	293	11.54	338	13.31
SDE030/7	293	11.54	338	13.31	330	12.99	375	14.76	16.56	36.51	330	12.99	375	14.76	330	12.99	375	14.76
SDE030/8	330	12.99	375	14.76	367	14.45	412	16.22	18.67	41.16	367	14.45	412	16.22	367	14.45	412	16.22
SDE030/9	367	14.45	412	16.22	404	15.91	449	17.68	20.78	45.81	404	15.91	449	17.68	404	15.91	449	17.68
SDE030/10	404	15.91	449	17.68	441	17.36	486	19.13	22.89	50.46	441	17.36	486	19.13	441	17.36	486	19.13

Complete section ordering codes

SDE030/4/ AN1(JNG3-120)ELN / Q-18ES3B / Q-18ES3B / QL-18ES3B /

Nr. of working
sections

1

2

2

2

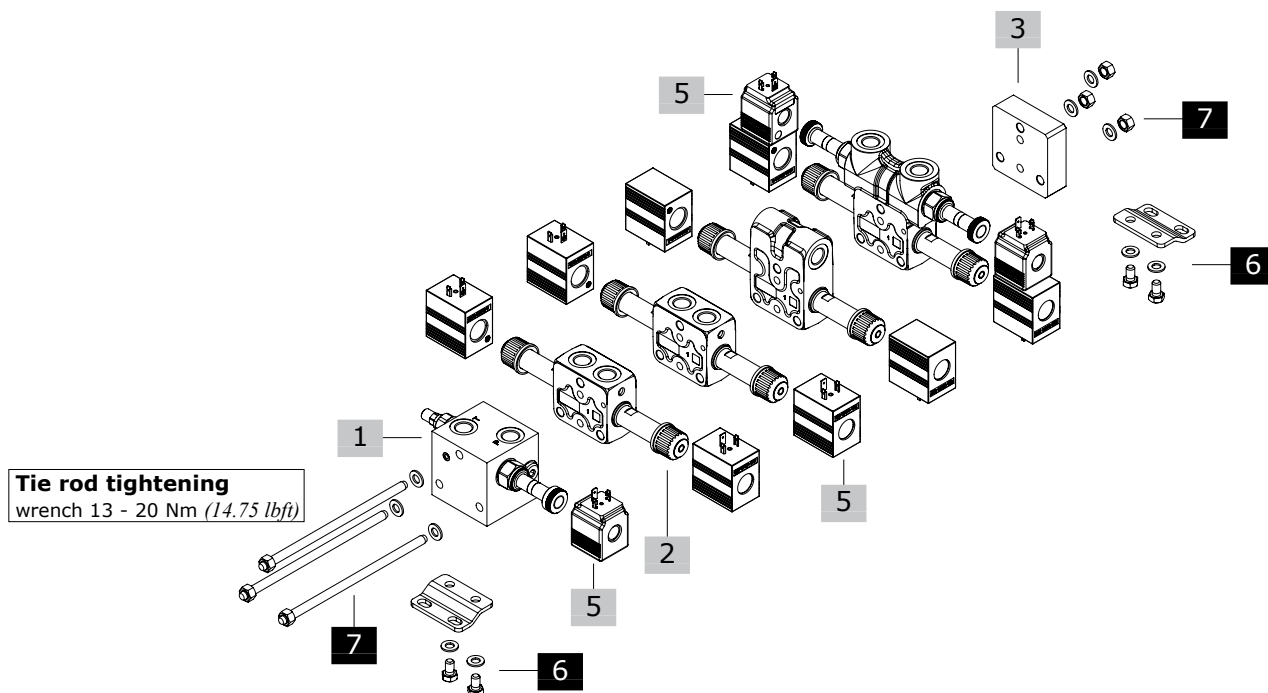
QBPE-18ES3B.BPEN(NC)3 / RF - - 12VDC

2

3

4

5



Complete section ordering codes

1 Complete inlet section * page 10

Section bodies are aluminium alloy made

TYPE: AN	CODE: 6192G0000
DESCRIPTION: Without valves arrangement, P and T ports open	
TYPE: ANP	CODE: 6192G0001
DESCRIPTION: As AN, port P open and T plugged	
TYPE: ANT	CODE: 6192G0002
DESCRIPTION: As AN, port P plugged and T open	
TYPE: ANS	CODE: 6192G0003
DESCRIPTION: As AN, ports P and T plugged	
TYPE: AN1(JNS3-120)ELN-WC	CODE: Y61S3A3001
DESCRIPTION: Relief and unloader valves arrangement, P and T ports open	
TYPE: AN1P(JNS3-120)ELN-WC	CODE: Y61S3A3002
DESCRIPTION: As AN1, port P open and T plugged	
TYPE: AN2/PPXN1(JNS3-120)ELN-WC	CODE: Y61S3A3001
DESCRIPTION: Relief, unloader and flow control valves arrangement, P and T ports open	
TYPE: AN2P/PPXN1(JNS3-120)ELN-WC	CODE: Y61S3A3005
DESCRIPTION: As AN2, port P open and T plugged	
TYPE: AN6/EEXL1(VMP02TR-220)-SB10RC(C3)-WC	
CODE: Y61S3A3006	
DESCRIPTION: With pressure relief valve and flow control valve, for Open Center circuit, compensator with 10 bar (145 psi) stand-by, P and T ports open	
TYPE: AN7/EEEXN1(VMP02TR-200)-SB10RCV(C3)-WC	
CODE: Y61S3A3007	
DESCRIPTION: As previous one, compensator with handwheel actuation for Open to Closed Center switching, P and T ports open.	
TYPE: AN11/EEEXN1(VMP02TR-200)-SB10RCV(C3)-WC	
CODE: Y61S3A3009	
DESCRIPTION: With pressure relief valve and flow control valve, for Closed Center Circuit with compensator blanking plug, P and T ports open.	
TYPE: AN14/EEXL1(VMP02TR-250)SB10RC(C3)-ELN-WC	
CODE: Y61S3A3011	
DESCRIPTION: With pressure relief valve, flow control valve and electric solenoid operated unloading valve on LS, for Open Center circuit, compensator with 10 bar (145 psi) stand-by, P and T ports open	
TYPE: AN15/EEEXN1(VMP02TR-250)-SB10RCV(C3)-ELN-WC	
CODE: Y61S3A3010	
DESCRIPTION: As previous one, compensator with handwheel actuation for Open to Closed Center switching, P and T ports open.	
TYPE: AN16/EEEXN1(VMP02TR-250)-CL-ELN-WC	
CODE: Y61S3A3012	
DESCRIPTION: With pressure relief valve and flow control valve, for Closed Center Circuit with compensator blanking plug, P and T ports open.	

2 Complete working section * page 17

Section bodies are cast iron made

TYPE: Q-18ES3B-WC	CODE: Y63S3A3001
DESCRIPTION: Parallel circuit, type 1 double acting spool	
TYPE: Q-28ES3B-WC	CODE: Y63S3A3006
DESCRIPTION: Parallel circuit, type 2 double acting spool	
TYPE: QBP-18ES3B.BPC3-WC	CODE: Y63S3A3002
DESCRIPTION: Parallel circuit, type 1 double acting spool, check valves on workports	
TYPE: QBPE-18ES3B.BPEN(NC)3-WC	CODE: Y63S3A3005
DESCRIPTION: Parallel circuit, type 1 double acting spool, solenoid operated check valves on workports	
TYPE: PFL3(150)-18ES3B-WC	CODE: Y63S3A3011
DESCRIPTION: Parallel circuit, type 1 double acting spool and side relief valve with 150 bar (2175 psi)	
TYPE: QL-18ES3B-WC	CODE: Y63S3A3004
DESCRIPTION: Parallel circuit, side workports, type 1 double acting spool	
TYPE: QBPL-18ES3B.BPA3-WC	CODE: Y63S3A3003
DESCRIPTION: As previous one with check valves on workports	

3 Complete outlet section* page 27

Section bodies are aluminium alloy made

TYPE	CODE	DESCRIPTION
RF	3FIA203000	Without ports
RS	6193A1200	P and T ports plugged
RP	6193A3100	P port open and T port plugged
RT	6193A3000	T port open and P port plugged

4 Valve threading

Specify threading always when it is different from BSP standard (see page 4).

5 Coils page 62

Coils voltage specification; for list of available coils see pages of related sections

6 Fixing bracket page 65

TYPE	CODE	DESCRIPTION
STAF	5STA148065	Brackets with fixing screws

7 Assembling kit

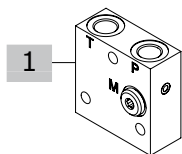
CODE	DESCRIPTION	CODE	DESCRIPTION
For AN inlet sections			
5TIR108116	For 1 section valve	5TIR108305	For 6 sections valve
5TIR108154	For 2 sections valve	5TIR108341	For 7 sections valve
5TIR108194	For 3 sections valve	5TIR108377	For 8 sections valve
5TIR108227	For 4 sections valve	5TIR108412	For 9 sections valve
5TIR108264	For 5 sections valve	5TIR108449	For 10 sections valve
For AN1-AN2-AN6-AN7-AN14-AN15-AN16 inlet sections			
5TIR108154	For 1 section valve	5TIR108341	For 6 sections valve
5TIR108194	For 2 sections valve	5TIR108377	For 7 sections valve
5TIR108227	For 3 sections valve	5TIR108412	For 8 sections valve
5TIR108264	For 4 sections valve	5TIR108449	For 9 sections valve
5TIR108305	For 5 sections valve	5TIR108486	For 10 sections valve

NOTE (*) – Codes are referred to **BSP** thread.

Inlet section: part ordering codes

SDE030/AN-....

1 6

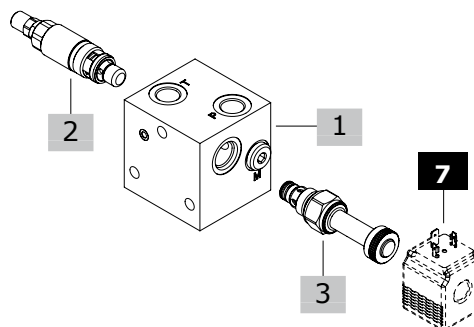


SDE030/AN1(JNS3-120)ELN-WC-....

Valve setting (bar)

Without coil

1 2 3 6

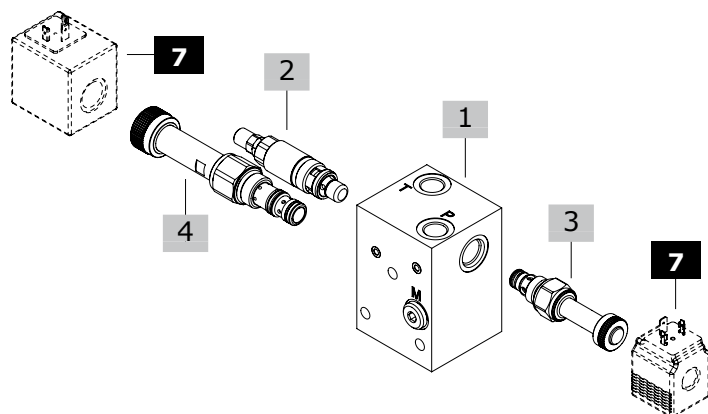


SDE030/AN2/PPXN1(JNS3-120)ELN-WC-....

Valve setting (bar)

Without coil

1 4 2 3 6



SDE030/AN14/EEXL1(VMP02TS-150)

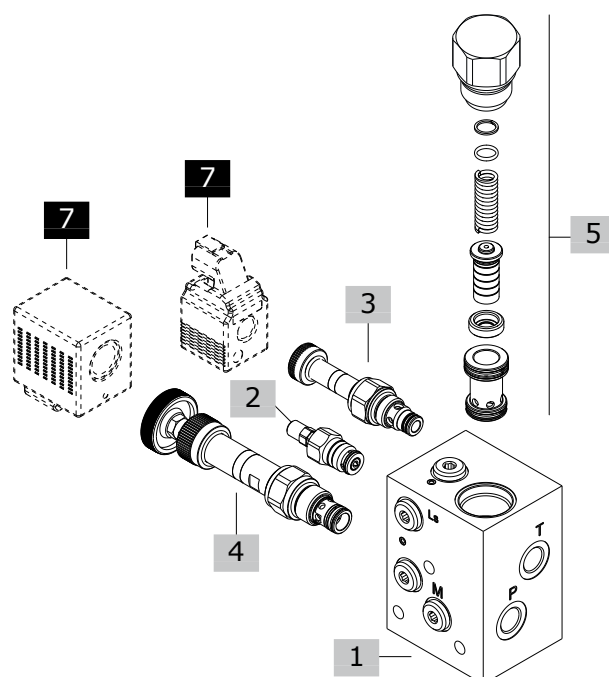
Valve setting (bar)

1 4 2

SB10RC(C3)-ELN-WC-....

5 3 6

Without coil



Inlet section: part ordering codes

1 Inlet section body kit * page 10

Section bodies are aluminium alloy made

TYPE	CODE	DESCRIPTION
AN	5FIA109303	Without valves arrangement, P and T ports open
ANP	5FIA109303PT	As AN, port P open and T plugged
ANT	5FIA109303PT	As AN, port P plugged and T open
ANS	5FIA109303S	As AN, ports P and T plugged
AN1	5FIA109300	Relief and unloader valves arrangement, P and T ports open
AN1P	5FIA109300P	As AN1, port P open and T plugged
AN2	5FIA109302	Relief, unloader and flow control valves arrangement, P and T open ports
AN2P	5FIA109302P	As AN2, port P open and T plugged
AN6	5FIA109301	For Open Center, relief and flow control valves arrangement, compensator, LS port plugged, P and T ports open
AN7/AN11	5FIA109304	As AN6, for Closed Center, with LS port open
AN14	5FIA109306	For Open Center, relief and flow control valves arrangement, electric solenoid operated unloading valve on LS, compensator, LS port plugged, P and T ports open
AN15/AN16	5FIA109306A	As AN14, for Closed Center, with LS port open

2 Main relief valve page 14

TYPE	CODE	DESCRIPTION
------	------	-------------

For sections AN1-AN2 type

Valve standard setting is referred to 10 l/min (2.6 US gpm) flow, considering the valve mounted on inlet section.

(JNS2-63)	5KIT105570	Range 40-63 bar (580-900 psi) std setting 63 bar (900 psi)
(JNS3-120)	5KIT105571	Range 50-200 bar (725-2900 psi) std setting 120 bar (1750 psi)
(JNS4-220)	5KIT105572	Range 160-315 bar (2300-4600 psi) std setting 220 bar (3200 psi)
(JNH2-63)	5KIT105517	As type JNS2, set and locked
(JNH3-120)	5KIT105516	As type JNS3, set and locked
(JNH4-220)	5KIT105515	As type JNS4, set and locked
(JNZT2-63)	5KIT105562	As type JNS2, anti-tampering type
(JNZT3-120)	5KIT105563	As type JNS3, anti-tampering type
(JNZT4-220)	5KIT105564	As type JNS4, anti-tampering type
SV	XTAP623282	Relief valve blanking plug

For sections AN6-AN7-AN11-AN14-AN15-AN16 type

Valve standard setting is referred to 1 l/min (0.26 US gpm) flow, considering the valve mounted on inlet section.

(VMP02TV-50)	1100000120	Range 5-80 bar (73-1160 psi) std setting 50 bar (725 psi)
(VMP02TS-150)	1100000113	Range 50-220 bar (725-3200 psi) std setting 150 bar (2200 psi)
(VMP02TR-250)	1100000119	Range 180-350 bar (2600-5100 psi) std setting 250 bar (3600 psi)

3 Solenoid operated unloading valve page 15

TYPE	CODE	DESCRIPTION
------	------	-------------

For sections AN1-AN2 type

ELN	0EC08002031	Without emergency actuation
ELV	0EC08002034	With screw type emergency actuation
ELP	0EC08002033	With push-button emergency actuation
ELT	0EC08002035	With "twist & push" emergency actuation
LT	XTAP510320	Unloading valve blanking plug

For sections AN14-AN15-AN16 type

ELN	0EC08002031	On LS signal without emergency actuation
------------	-------------	--

4 Flow control valve page 15

TYPE	CODE	DESCRIPTION
------	------	-------------

For sections AN1-AN2 type

PPAL1	0PP10002000	Hand-wheel setting type
PPAV1	0PP10002005	Screw setting type
PPXN1	0PP10002031	Solenoid operated, without emergency
PPXV1	0PP10002033	Solenoid operated, screw emergency
PPXL1	0PP10002035	Solenoid operated, hand-wheel emergency

LT 3XTP3545700 Flow control valve blanking plug**For sections AN6-AN7-AN11-AN14-AN15-AN16 type**

EEXN1	0EE10002009	Solenoid operated, without emergency
EEXL1	0EE10002008	Solenoid operated, hand-wheel emergency

5 Compensator kit page 16

TYPE	CODE	DESCRIPTION
------	------	-------------

For section AN6-AN7-AN14-AN15 type

SB10RCV(C3)	5KT6200227	With 10 bar (145 psi) stand-by, hand-wheel actuation for Open Center to Closed Center switching
SB10RC(C3)	5KT6200222	With 10 bar (145 psi) stand-by, for Open Center circuit

For section AN11-AN16 type

CL	X451810000	Compensator blanking plug, for Closed Center circuit
-----------	------------	--

6 Section threading

Specify threading always when it is different from BSP standard (see page 4).

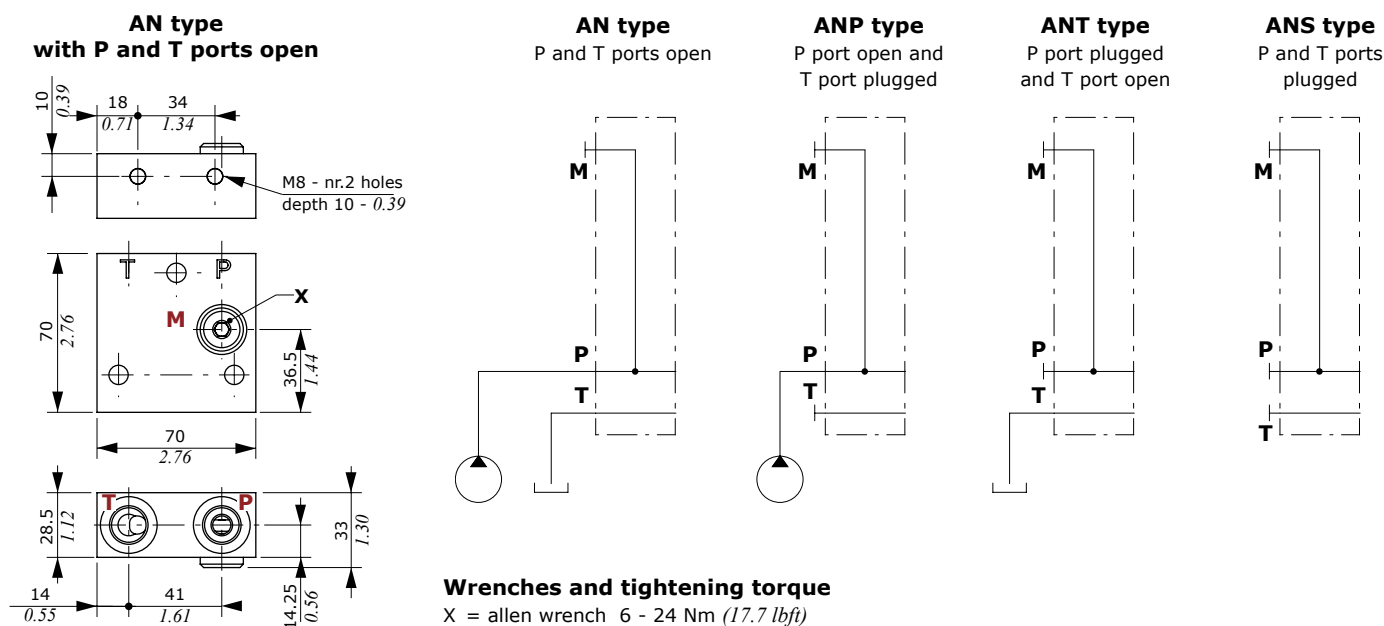
7 Optional coil page 62

For list of available coils see pages of related section.

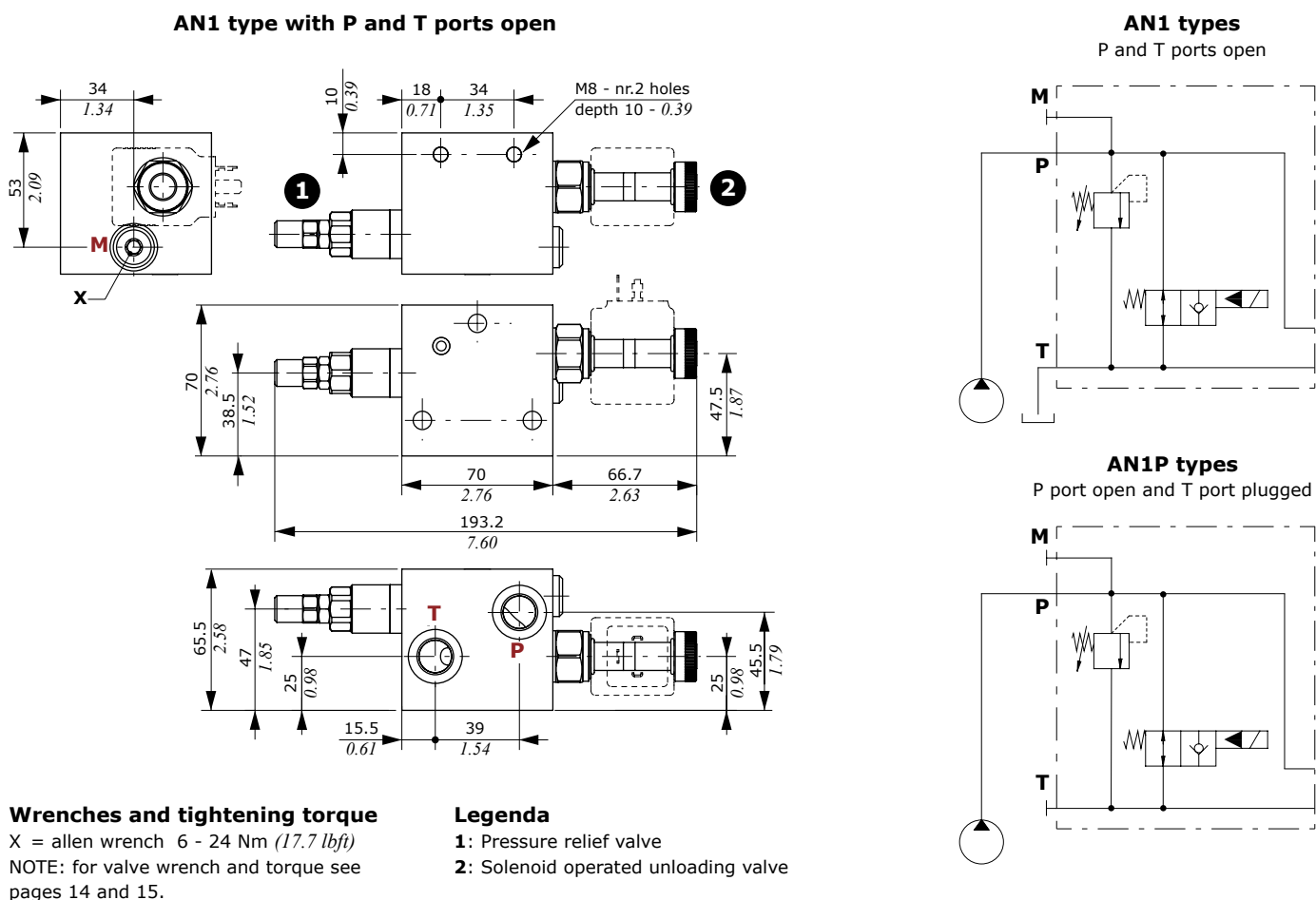
NOTE (*) – Codes are referred to **BSP** thread.

Inlet section: dimension and hydraulic circuit

AN inlet sections



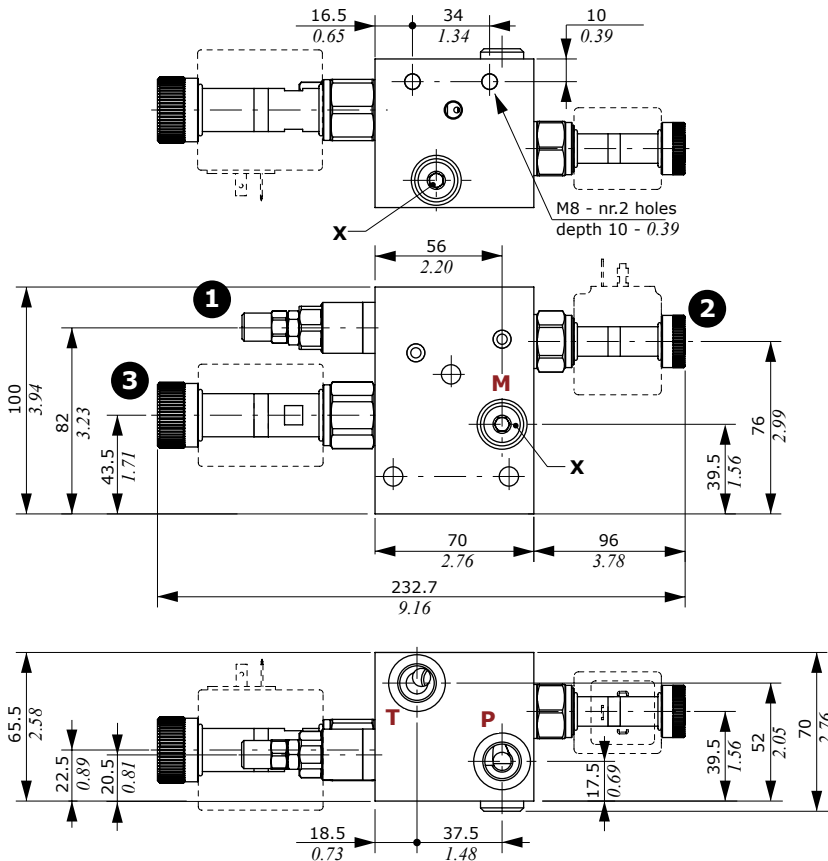
AN1 inlet sections



Inlet section: dimension and hydraulic circuit

AN2 inlet sections

AN2 type with P and T ports open



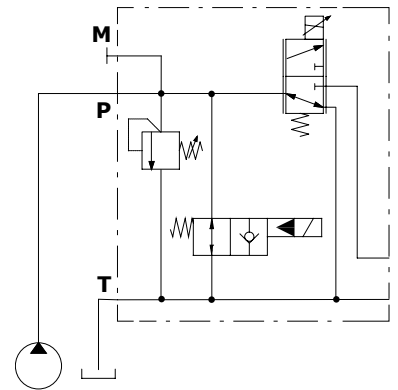
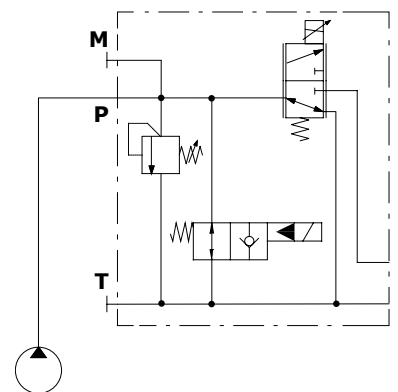
Legenda

- 1: Pressure relief valve
- 2: Solenoid operated unloading valve
- 3: Pressure compensated flow control valve

Wrenches and tightening torque

X = allen wrench 6 - 24 Nm (17.7 lbft)

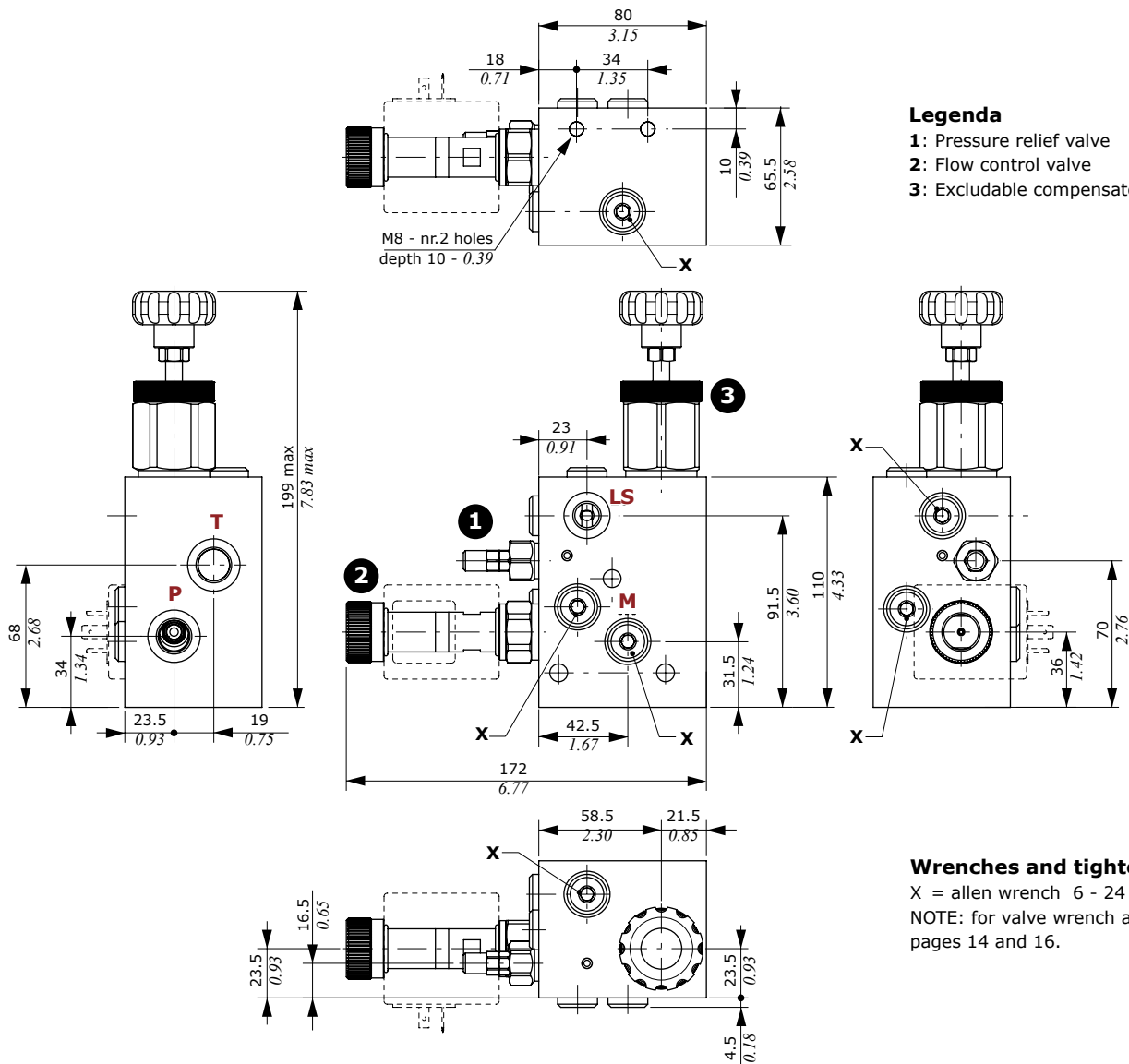
NOTE: for valve wrench and torque see pages 14 and 15.

AN2 types
P and T ports openAN2P types
P port open and T port plugged

Inlet section: dimension and hydraulic circuit

AN6-AN7-AN11 inlet sections

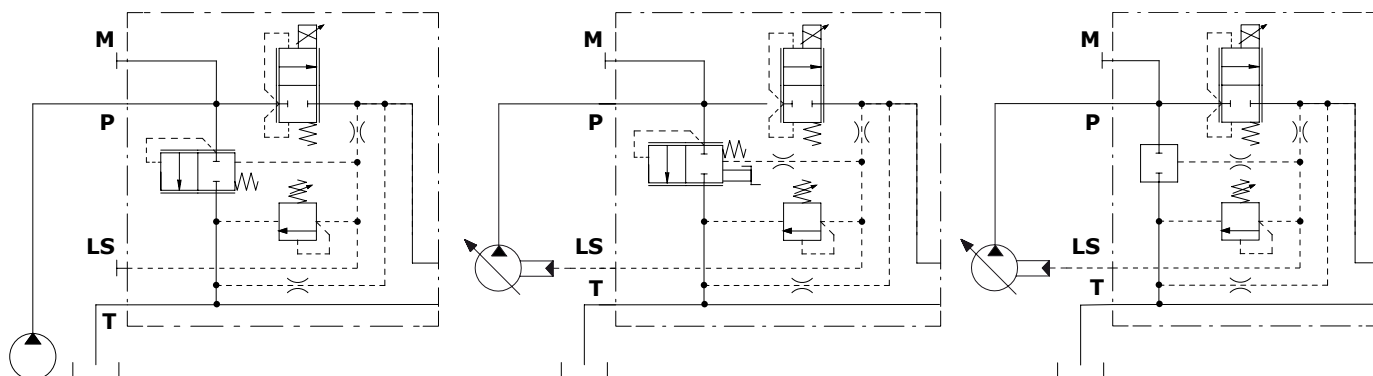
AN7 type; configuration for Open and Closed Center



AN6 type
for Open Center circuit

AN7 type
for Closed and Open Center circuits

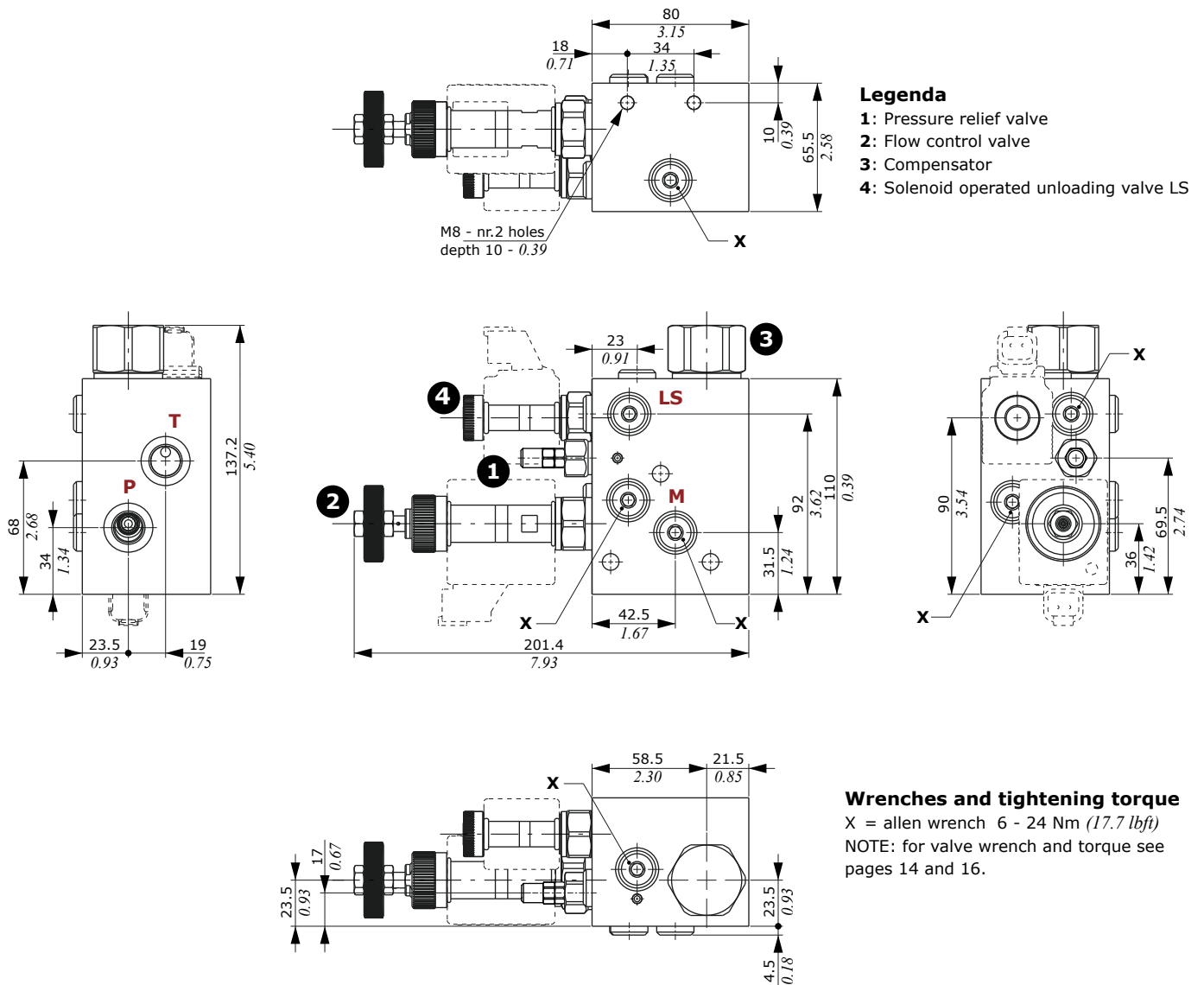
AN11 type
for Closed Center circuit



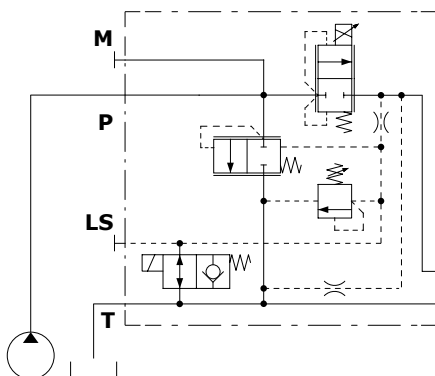
Inlet section: dimension and hydraulic circuit

AN14-AN15-AN16 inlet sections

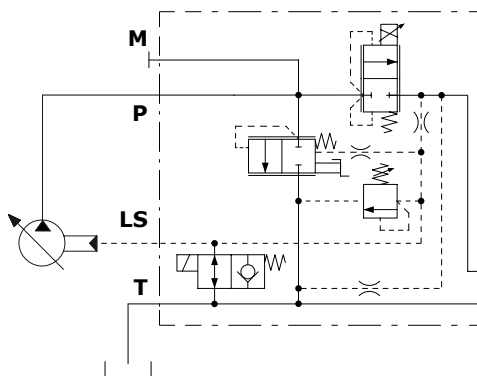
AN14 type; configuration for Open Center



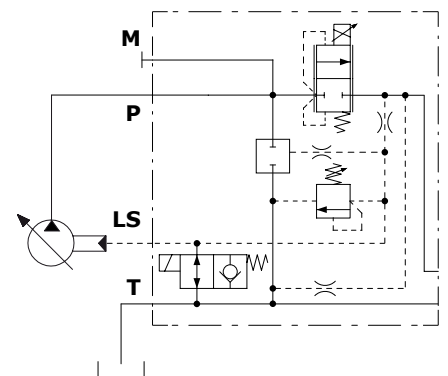
AN14 type
for Open Center circuit



AN15 type
for Closed and Open Center circuits



AN16 type
for Closed Center circuit

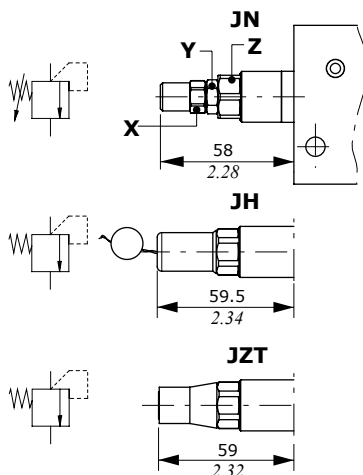


Inlet section: options

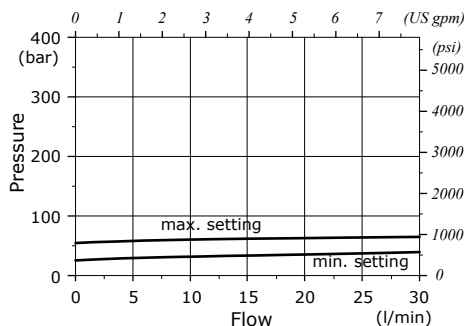
Main relief valve

For sections AN1 and AN2 type

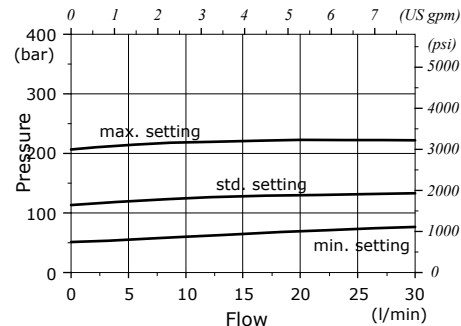
Setting types



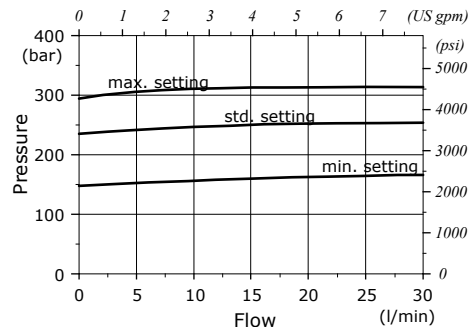
Setting range: JNS2 type



Setting range: JNS3 type



Setting range: JNS4 type



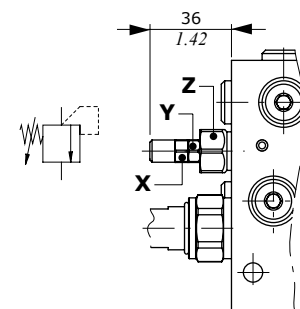
Legenda

JN: Adjustment locking nut
(nut code 3COP117260)
JH: valve set and locked
(cap code 3COP117260)
JZT: valve set and locked
(cap code 4COP120420)

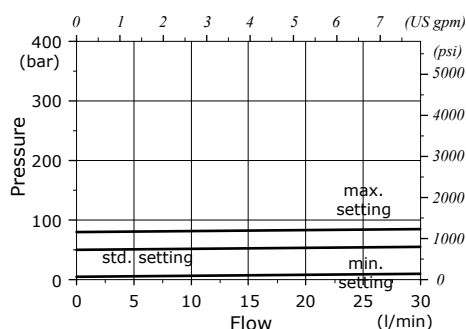
Wrenches and tightening torque

X = wrench 13 - 6.6 Nm (4.9 lbft)
Y = wrench 13 - 24 Nm (17.7 lbft)
Z = wrench 19 - 24 Nm (17.7 lbft)

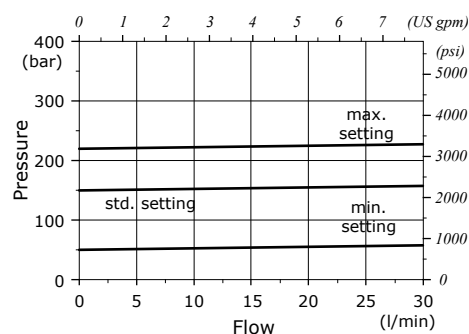
For sections AN6, AN7, AN11, AN14, AN15 and AN16 type



Setting range: VMP02TV type



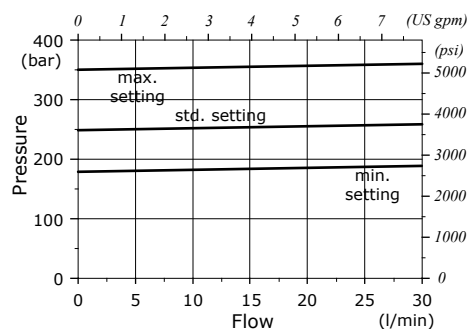
Setting range: VMP02TS type



Wrenches and tightening torque

X = wrench 10
Y = wrench 10 - 6.6 Nm (4.9 lbft)
Z = wrench 19 - 24 Nm (17.7 lbft)

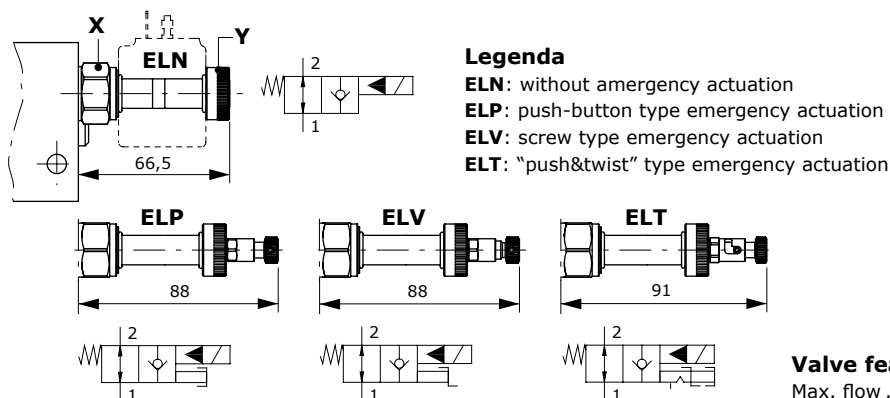
Setting range: VMP02TR type



Inlet section: options

Unloading valve

For sections AN1-AN2 type and on LS signal for sections AN14-AN15-AN16

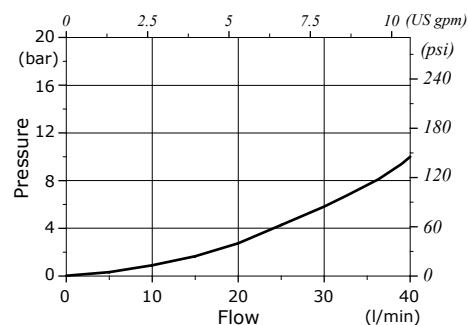


Wrenches and tightening torque

X = wrench 24 - 30 Nm (22 lbf ft)

Y = 5 Nm (3.7 lbf ft)

Pressure drop diagram



Valve features

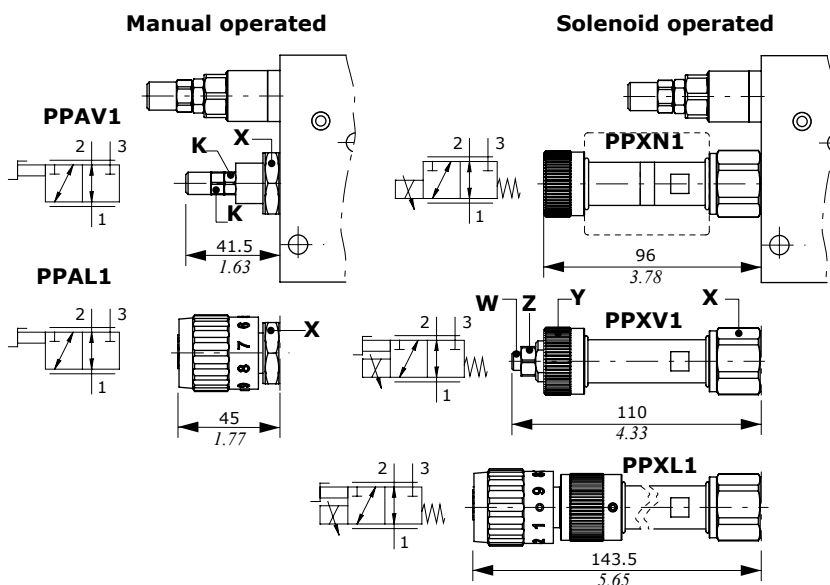
Max. flow: 40 l/min (10.6 US gpm)

Max. pressure.: 380 bar (5500 psi)

Internal leakage: 0.25 cm³/min @ 210 bar
(0.015 in³/min @ 3050 psi)For coil features and options see **BER** coil on pages 62 and 63.

Pressure compensated flow control valve

For section AN2 type



Legenda

PPAV1: screw setting type**PPAL1:** hand-wheel setting type**PPXN1:** without emergency actuation**PPXV1:** screw type emergency actuation**PPXL1:** hand-wheel emergency actuation

Wrenches and tightening torque

K = wrench 10 - 6.6 Nm (4.9 lbf ft)

X = wrench 27 - 50 Nm (37 lbf ft)

Y = 5 Nm (3.7 lbf ft)

W = allen wrench 4

Z = wrench 8 - 15 Nm (11 lbf ft)

Valve features

Max. inlet flow: 50 l/min (13.2 US gpm)

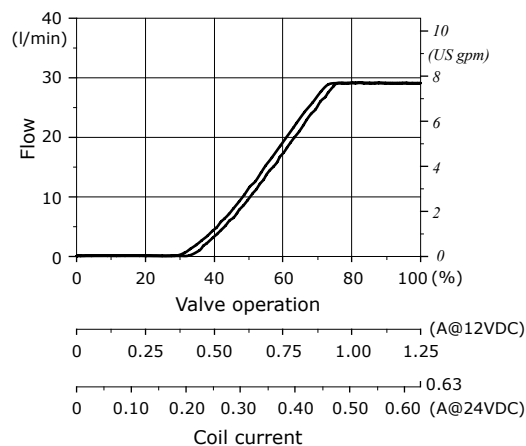
Max. regulated flow: 30 l/min (7.9 US gpm)

Inlet flow (PPX types): regulated flow +5%

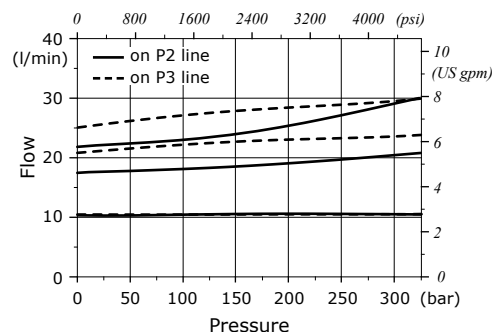
Max. pressure.: 350 bar (5100 psi) - PPA types / 315 bar (4600 psi) - PPX types

Internal leakage (PPX types) : 150 cm³/min @ 210 bar (9.1 in³/min @ 3050 psi)For coil features and options see **BQP19** or **BH** coils on pages 62 and 63.

Flow regulation diagram



Flow vs. Pressure diagram

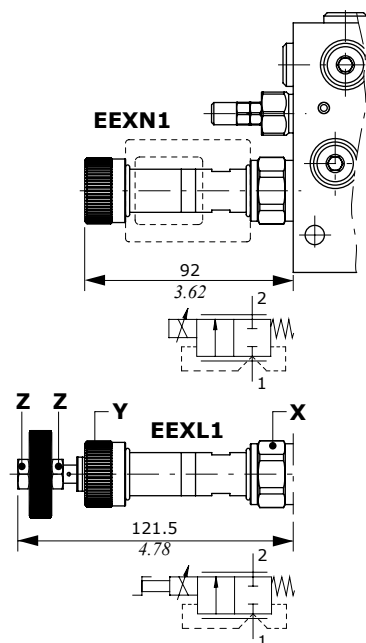


Inlet section: options

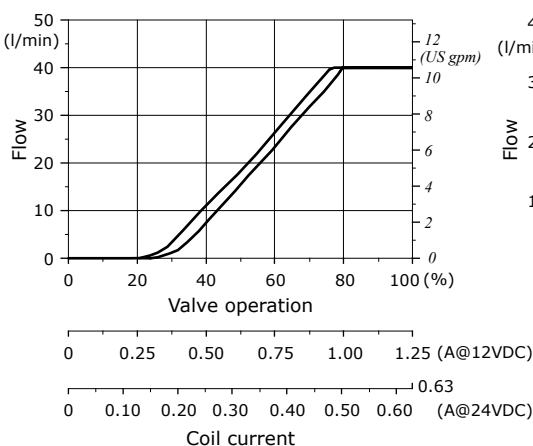
Pressure compensated flow control valve

For sections AN6-AN7-AN11-AN14-AN15-AN16 type

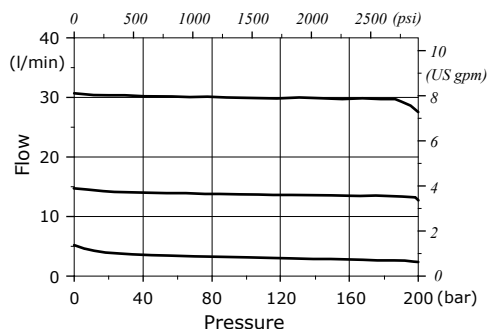
Curves are measured using the standard compensator mounted on section, with 10 bar (145 psi) stand-by.



Flow regulation diagram



Flow vs. Pressure diagram



Legenda

EEXN1: without emergency actuation
EEXL1: hand-wheel emergency actuation

Wrenches and tightening torque

K = wrench 10 - 6.6 Nm (4.9 lbf ft)
 X = wrench 27 - 50 Nm (37 lbf ft)
 Y = 5 Nm (3.7 lbf ft)
 Z = wrench 13 - 9.8 Nm (7.2 lbf ft)

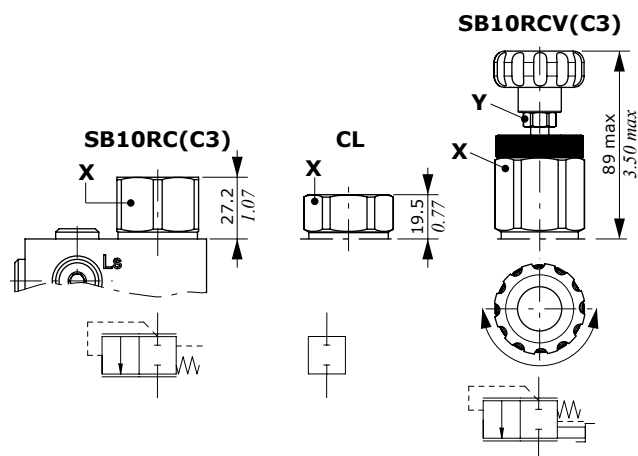
Valve features

Max. flow 40 l/min (10.6 US gpm)
 Max. pressure 300 bar (5500 psi)
 Internal leakages 150 cm³/min @ 150 bar
 (9.1 in³/min @ 2175 psi)

For coil features and options see **BQP19** or **BH** coils on pages 62 and 63.

Compensator kit

For sections AN6-AN7-AN11-AN14-AN15-AN16 type



Legenda

SB10RC(C3): compensator with 10 bar (145 psi) stand-by, for Open Center circuit
CL: compensator blanking plug, for Closed Center circuit (for AN11 type)
SB10RCV(C3): compensator with 10 bar (145 psi) stand-by, hand-wheel actuation for Open Center to Closed Center circuit switching

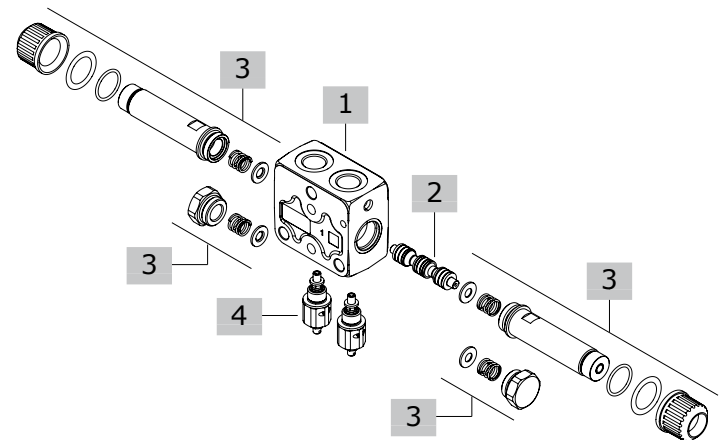
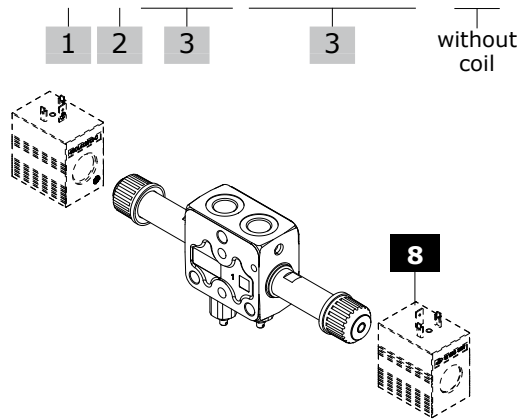
Wrenches and tightening torque

X = wrench 36 - 42 Nm (31 lbf ft)
 Y = wrench 13 - 6.6 Nm (4.9 lbf ft)

Working section: part ordering codes

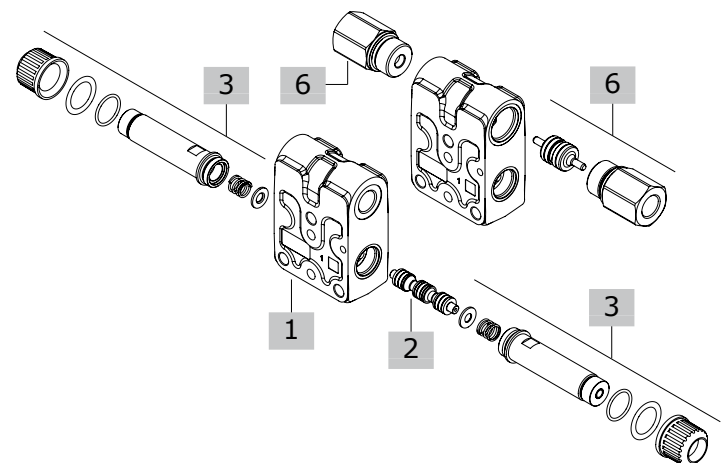
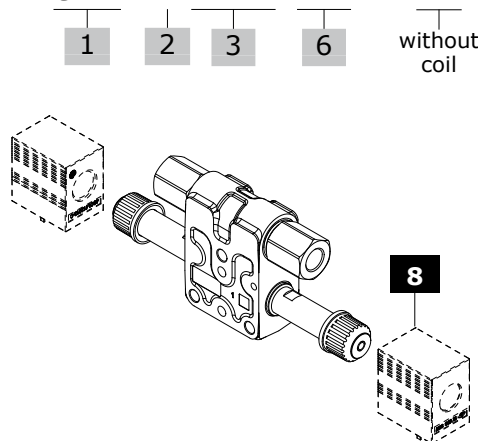
Valve setting (bar)

SDE030/P - 1 8ES3B.P3(G3-100) - WC -



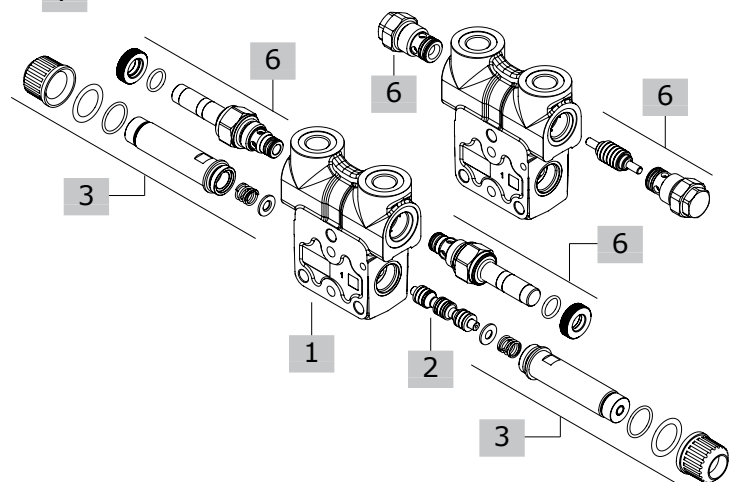
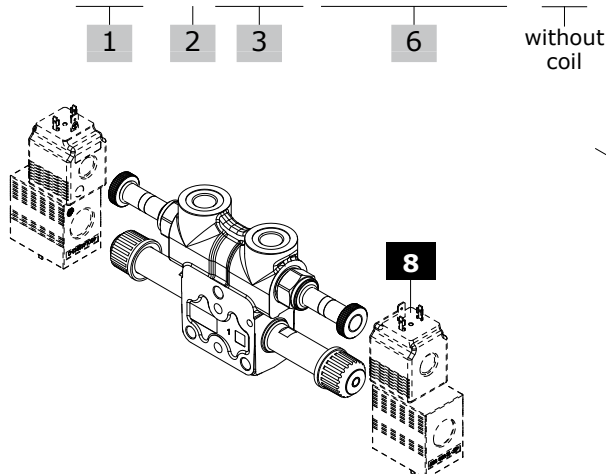
valve on port A - 1
valve on port B - 2
valve on ports A and B - 3

SDE030/QBPL - 1 8ES3B.BPA 3 - WC -



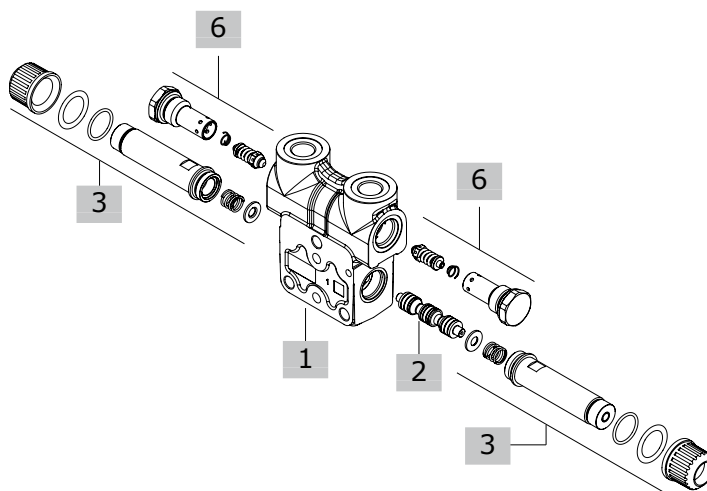
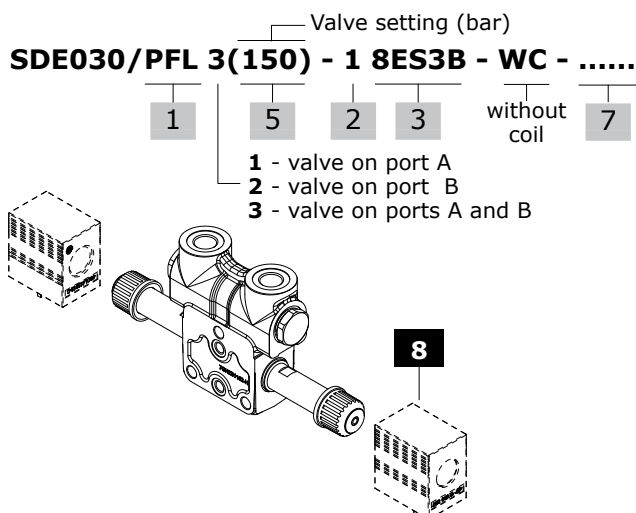
valve on port A - 1
valve on port B - 2
valve on ports A and B - 3

SDE030/QBPE - 1 8ES3B.QBPEN3(NC) - WC -



Working section: part ordering codes

SDE030/PFL 3(150) - 1 8ES3B - WC -

**1 Working section body kit *** page 19

Section bodies are cast iron made

TYPE CODE DESCRIPTION

Working sections with upper ports

Q	5EL1093000	Parallel type
P	5EL1093005	As type Q, lower port relief valve arrangement
QBP	5EL1093003	As type Q with check valve arrangement
QBPE	5EL1093004	As type Q with solenoid operated check valve arrangement

PFL 5EL1093006 As type Q, side port relief valve arrangement

Working sections with side ports

QL	5EL1093002	Parallel type,
QBPL	5EL1093001	As type QL with check valve arrangement

2 Spool page 21

TYPE CODE DESCRIPTION

For ON/OFF solenoid control

1	3CU9010102	Double acting, A and B closed in neutral pos.
1A	3CU9010103	Double acting, A to tank in neutral pos. For connect B to tank (type 1B) is necessary to turn the spool
2	3CU9025100	Double acting, A and B to tank in neutral pos.
2H	3CU9025225	Double acting, A and B partially to tank in neutral position

For ON/OFF solenoid control with emergency lever operation

1LHD	3CU9010300	As type 1
1ALHD	3CU9010303	As type 1A
2LHD	3CU9020300	As type 2
2HLHD	3CU9020310	As type 2H

3 On/off solenoid control page 22

TYPE CODE DESCRIPTION

8ES1B	5CAN08E114C	Single acting on port A
8ES2B	5CAN08E114C	Single acting on port B
8ES3B	5CAN08E115C	Double acting
8ES3BLHD	5CAN08E315	Double acting with emergency lever operation: needs dedicated spools

4 Lower port relief valves page 24

Standard setting is referred to 10 l/min (2.6 US gpm) flow.

TYPE CODE DESCRIPTION

P(G3-100)	5KIT060000	From 50 to 200 bar (725 to 2900 psi), standard setting 100 bar (1450 psi)
P(G4-200)	5KIT060001	From 200 to 315 bar (2900 to 4600 psi), standard setting 200 bar (2900 psi)
P3T	5KIT060100	A and B ports valve blanking plugs

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

5 Side port relief valve page 24

The codes are referred to parts with FPM o-ring seals

TYPE	CODE	DESCRIPTION
PT	5TAP324460	Valve blanking plug

Fixed setting antishock valves:

setting is referred to 10 l/min (2.6 US gpm)

TYPE: P 100	CODE: 5KIT308	100 A
	setting (bar)	setting (bar)

SETTING:

40 bar (580 psi)	50 bar (725 psi)	60 bar (870 psi)
80 bar (1150 psi)	100 bar (1450 psi)	120 bar (1750 psi)
130 bar (1900 psi)	140 bar (2050 psi)	150 bar (2150 psi)
165 bar (2400 psi)	175 bar (2550 psi)	185 bar (2700 psi)
200 bar (2900 psi)	210 bar (3050 psi)	220 bar (3200 psi)
235 bar (3400 psi)	250 bar (3600 psi)	

6 Check valve page 25

TYPE CODE DESCRIPTION

For arranged setions with upper ports, QBPE type

BPC3	5KIT430030	Valves kit for A and B ports
BPC1-BPC2	5KIT430012	Valve kit por single port

For arranged setions with upper ports, QBPE type

TBP	3XTAP822150	Valve blanking plug
------------	-------------	---------------------

Normally closed circuit (NC)

BPEN(NC)	0EC08002032	Without manual emergency
BPEV(NC)	0EC08002037	With screw type emergency
BPEP(NC)	0EC08002036	With pull-button emergency
BPET(NC)	0EC08002038	With "pull & twist" emergency

Normally open circuit (NO)

BPEN(NA)	0EC08002031	Without manual emergency
BPEV(NA)	0EC08002034	With screw type emergency
BPEP(NA)	0EC08002033	With push-button emergency
BPET(NA)	0EC08002035	With "push & twist" emergency

For arranged setions with side ports, QBPL type

BPA3	5KIT430130	Valves kit for A and B ports
BPA1-BPA2	5KIT430112	Valve kit for single port

7 Section threading

Specify threading always when it is different from BSP standard (see page 4).

8 Optional coils page 62

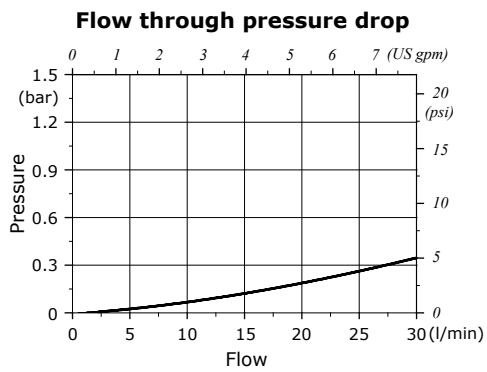
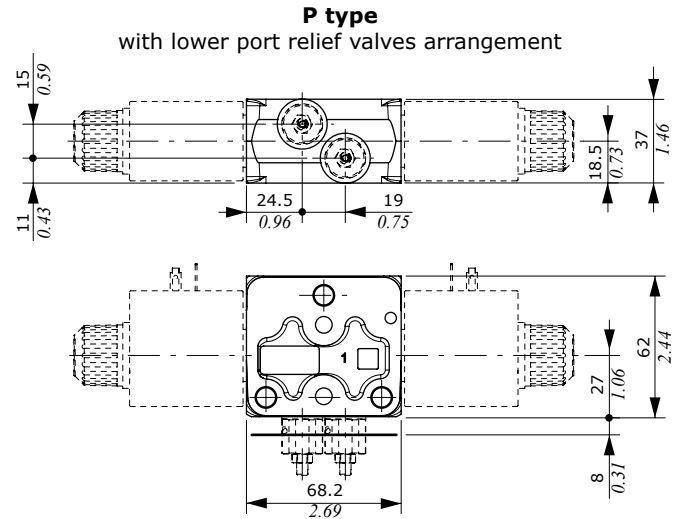
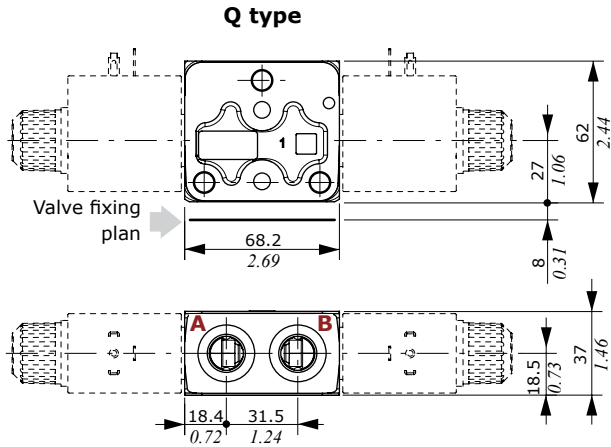
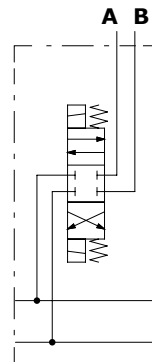
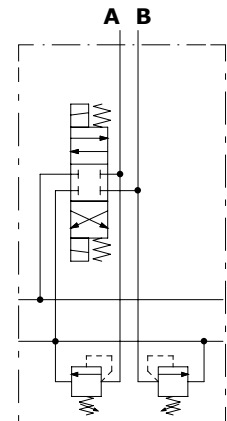
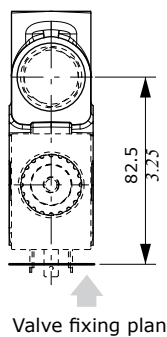
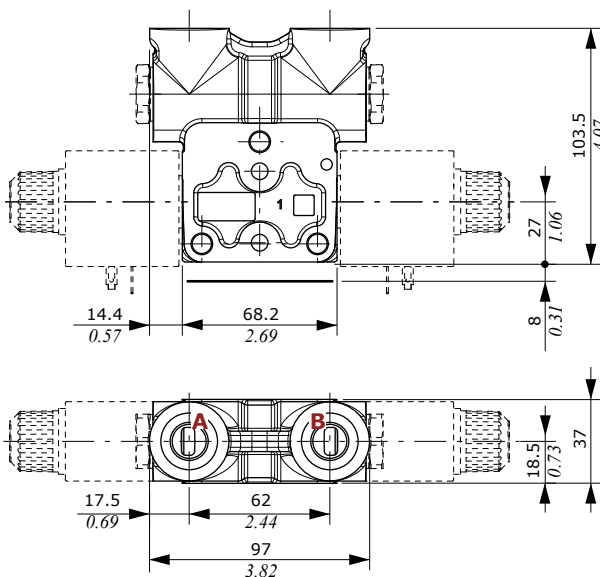
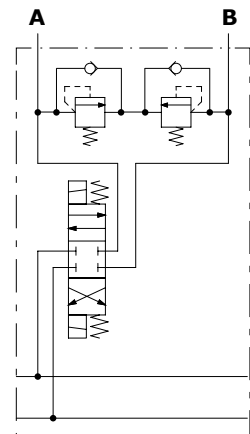
For list of available coils see pages of related section.

9 Protective bellow page 23

TYPE	CODE	DESCRIPTION
-	4ACC512-C	Cap for solenoid ring nut D12C

Dimension and hydraulic circuit

Working section Q type with upper ports

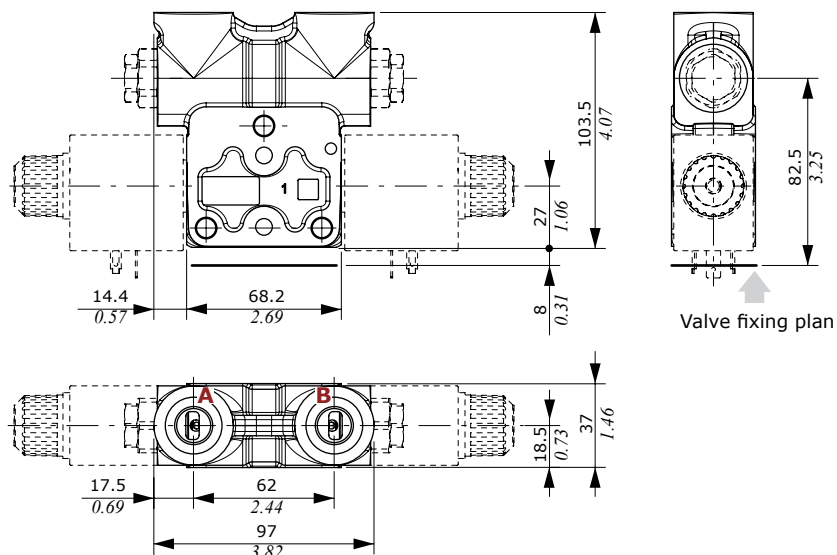
Q type example
(with spool 1)P type example
(with spool 1)**PFL type**
with side port relief valves arrangement**PFL type example**
(with spool 1)

Working section

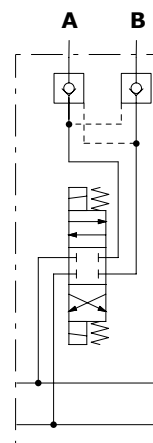
Dimension and hydraulic circuit

Working section with upper ports

QBP - QBPE types
with check valve arrangement

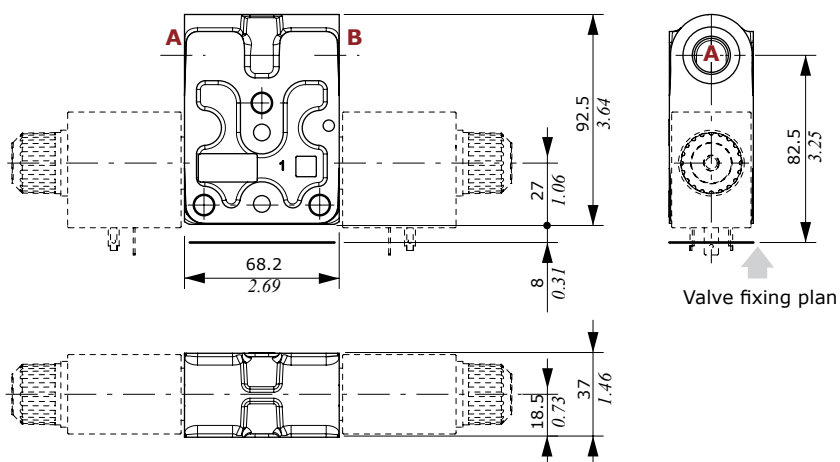


QBP type example
(with spool 1)

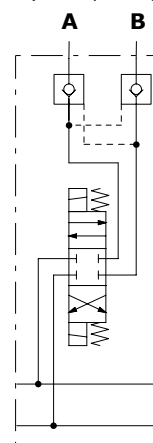


Working section with side ports

QL - QBPL types
with or without check valves arrangement



QBPL type example
(with spool 1)

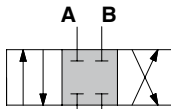


Spools

Types 1-1LHD

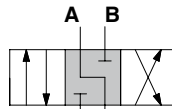
Double acting, A and B closed in neutral position

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**Types 1A-1ALHD**

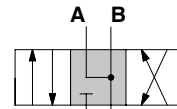
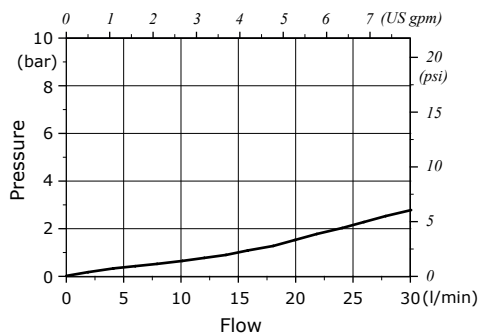
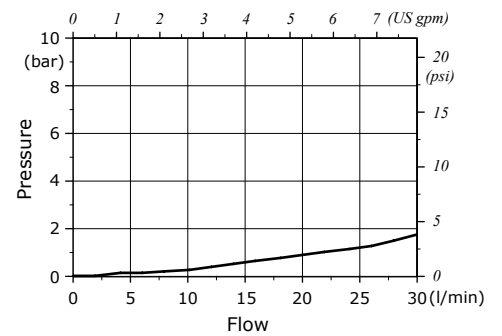
Double acting, A to tank in neutral position

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**Types 2-2LHD**

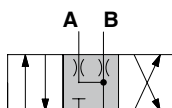
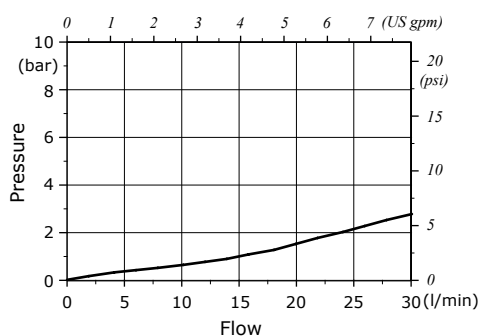
Double acting, A and B to tank in neutral position

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**P⇒port - port⇒T pressure drops**
(curves are matched)**P⇒port - port⇒T pressure drops**
(curves are matched)**Types 2H-2HLHD**

Double acting, A and B partially to tank in neutral position

1 0 2

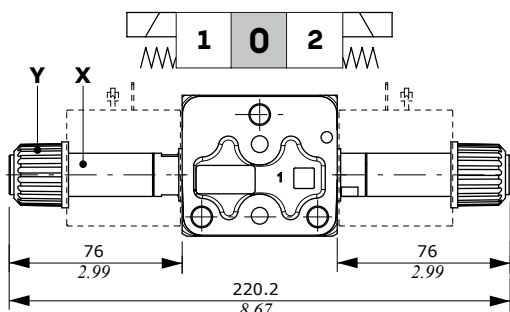
**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**P⇒port - port⇒T pressure drops**
(curves are matched)

Working section

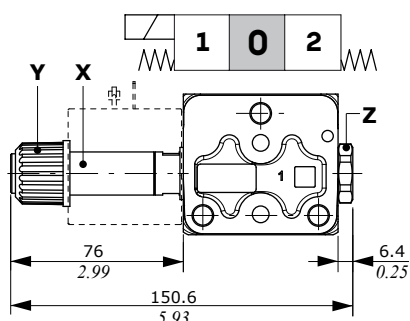
On/off solenoid control: 8ES3B - 8ES1B - 8ES2B types

When the section is configured with check valves, the coils on control must be rotated 180°.

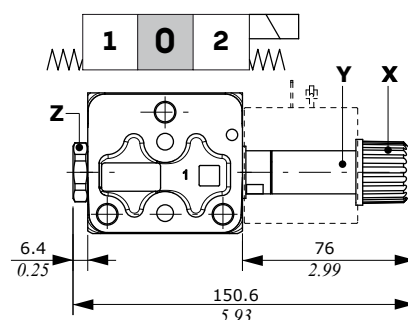
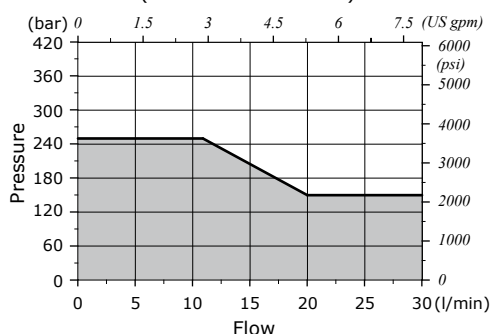
8ES3B: double acting control kit



8ES1B: single acting on A control kit



8ES2B: single acting on B control kit

Operating condition
(stroke 3 mm - 0.12 in)

Wrenches and tightening torque

X = wrench 17 - 24 Nm (17.7 lbft)
Y = 6.6 Nm (4.9 lbft)
Z = wrench 24 - 24 Nm (17.7 lbft)

For coil features and options see **D12C** coil on pages 62 and 64.

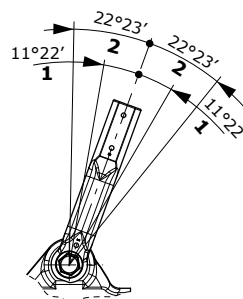
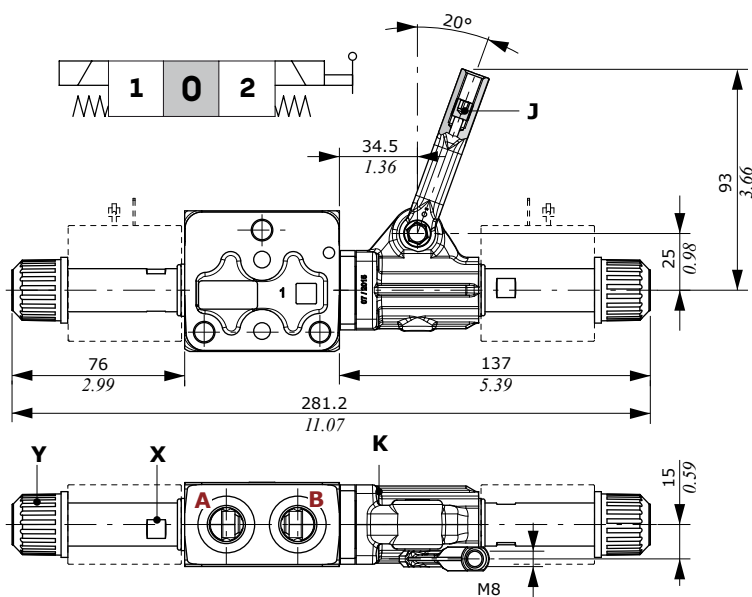
On/off solenoid control with lever: 8ES3BLHD type

When the section is configured with side ports or with check valves, control and coils must be rotated 180°.

If the section is configured with solenoid check valves the control can't be used.

The control needs dedicated spools: see page 18 for list.

IMPORTANT: lever to be used only for emergency operation, not for continuative use.



1: idle stroke angles
2: total operation angles

Wrenches and tightening torque

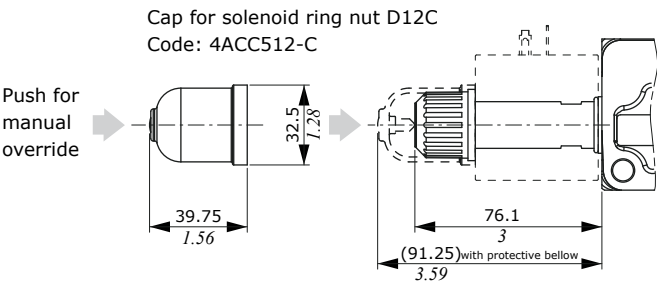
J = wrench 4 - 9.8 Nm (7.2 lbft)
K = allen wrench 4 - 6.6 Nm (4.9 lbft)
X = wrench 17 - 24 Nm (17.7 lbft)
Y = 6.6 Nm (4.9 lbft)

Control features

Max. back pressure on T : 30 bar (435 psi)

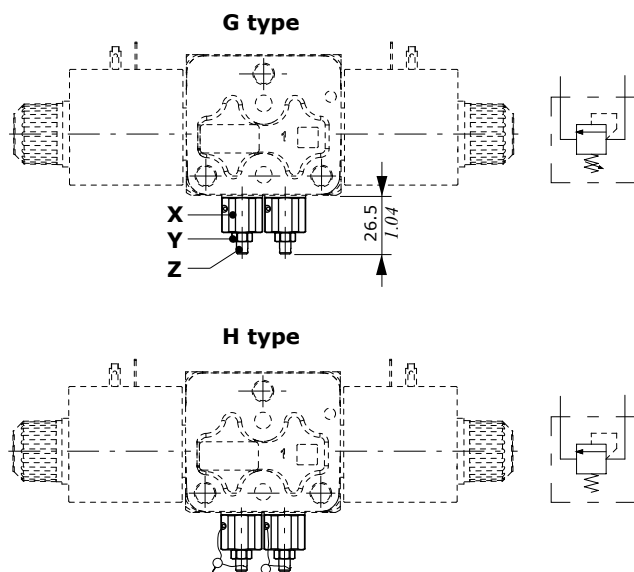
For coil features and options see **D12C** coil on pages 62 and 64.

Protective bellow



Working section

Lower port relief valves



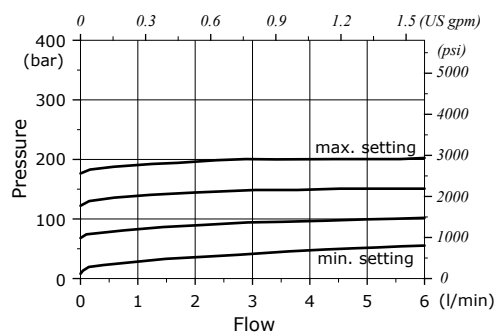
Legenda

G: screw setting type
H: valve set and locked

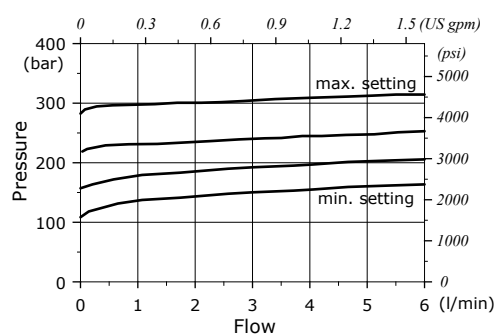
Wrenches and tightening torque

X = wrench 17 - 24 Nm (17.7 lbft)
 Y = wrench 8 - 6.6 Nm (4.9 lbft)
 Z = allen wrench 2.5

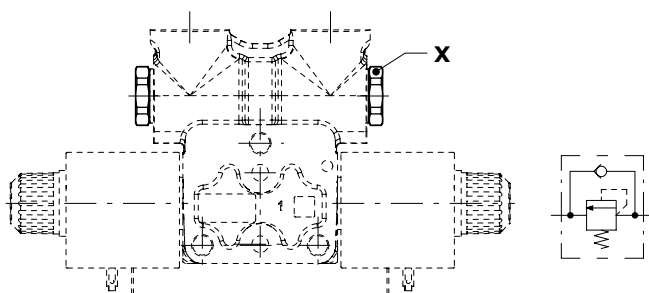
Setting range: G3 type



Setting range: G4 type



Side port relief valves

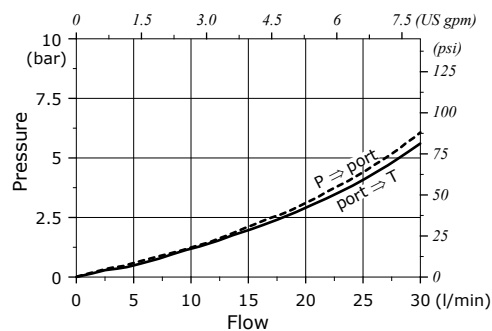


Wrenches and tightening torque

X = wrench 24 - 42 Nm (31 lbft)

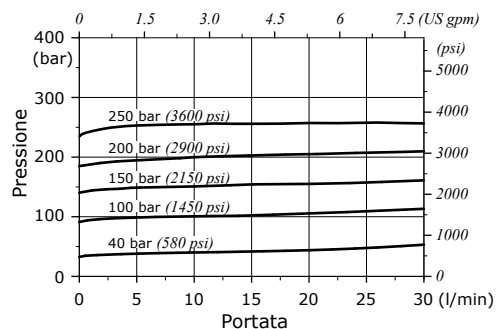
Pressure drop

(working section included)



Setting example

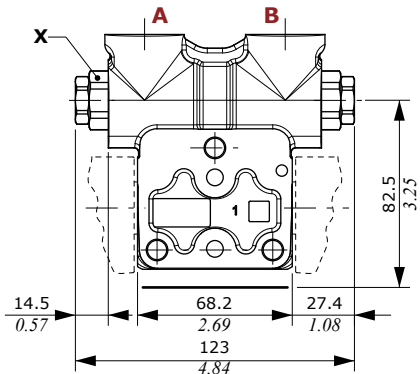
(10 l/min - 2.6 US gpm)



Check valves

When the section is configured with check valves, the coils on control must be rotated 180°.

For sections with upper ports



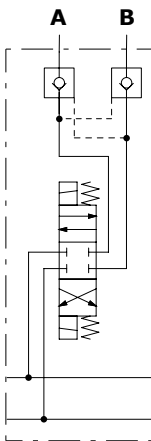
Wrenches and tightening torque

X = wrench 24 - 42 Nm (31 lbft)

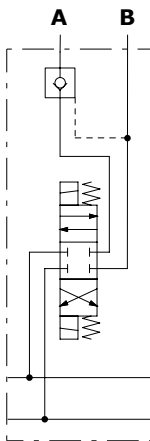
Parts ordering codes

TYPE	CODE	DESCRIPTION
BP	1300020402	Check valve
TBP	XTAP627260	Valve blanking plug
-	3PIS214480	Piston

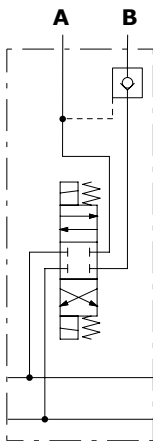
BPC3 type



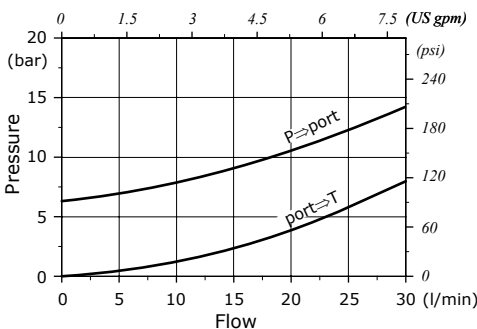
BPC1 type



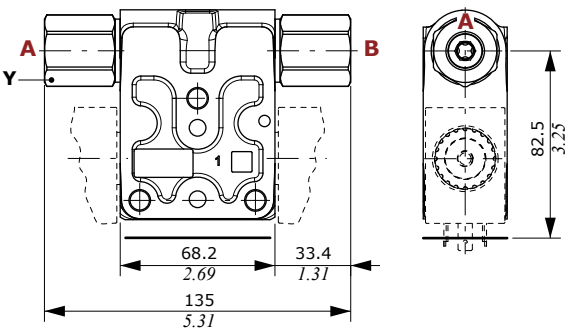
BPC2 type



Pressure drop diagram (working section included)



For sections with side ports



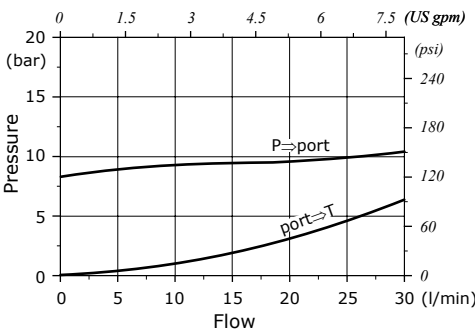
Wrenches and tightening torque

X = wrench 28 - 50 Nm (37 lbft)

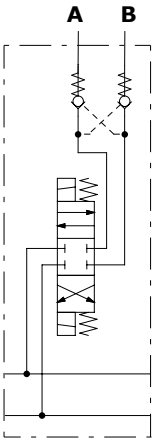
Parts ordering codes

TYPE	CODE	DESCRIPTION
BPA	3XCA0422800	Check valve
-	3PIS3180460	Piston

Pressure drop diagram (working section included)



BPA3 type

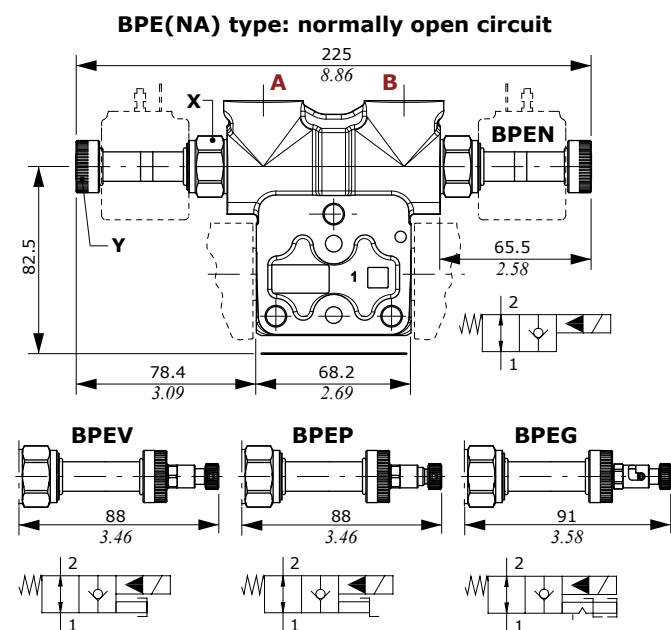
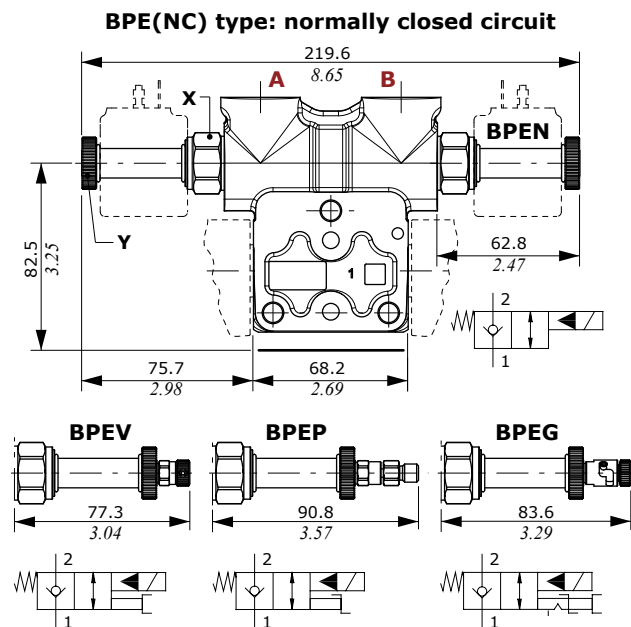


Working section

Solenoid operated check valves

When the section is configured with check valves, the coils on control must be rotated 180°.

For sections with upper ports



Wrenches and tightening torque

X = wrench 24 - 30 Nm (22 lbf·ft)

Y = 5 Nm (3.7 lbf·ft)

Legenda

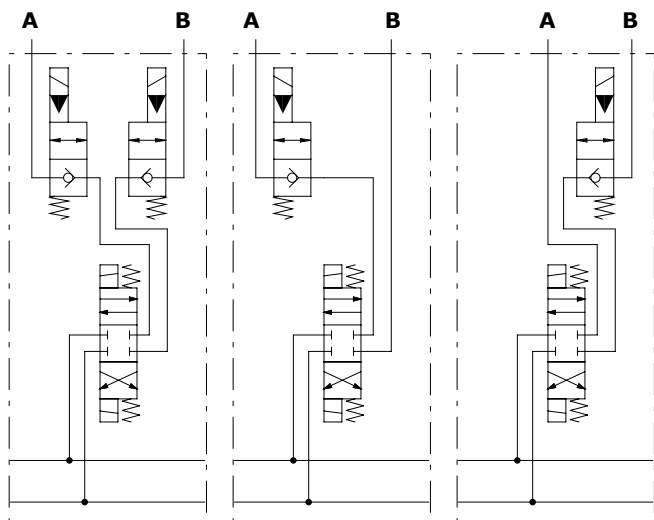
BPEN: without emergency actuation

BPEP: push-button type emergency actuation

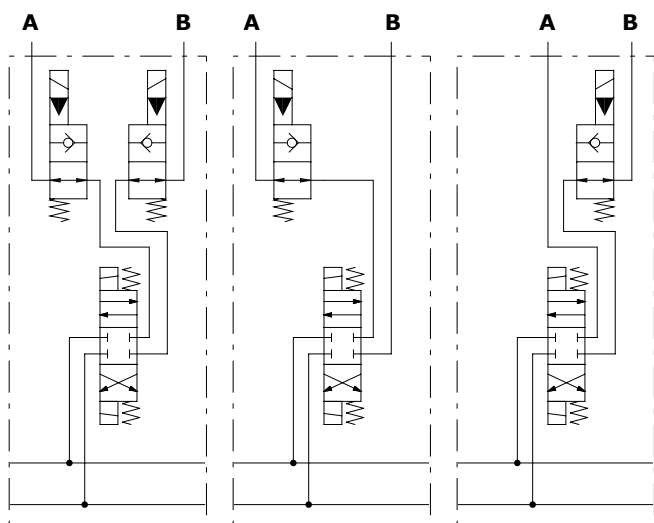
BPEV: screw type emergency actuation

BPET: "push&twist" type emergency actuation

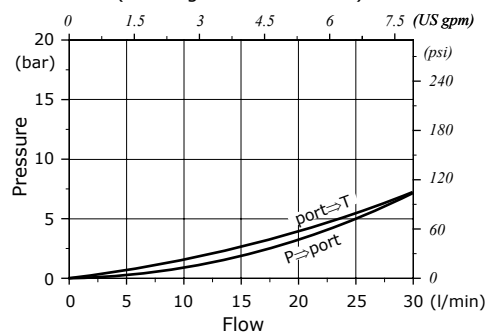
BPEN3(NC) type BPEN1(NC) type BPEN2(NC) type



BPEN3(NA) type BPEN1(NA) type BPEN2(NA) type



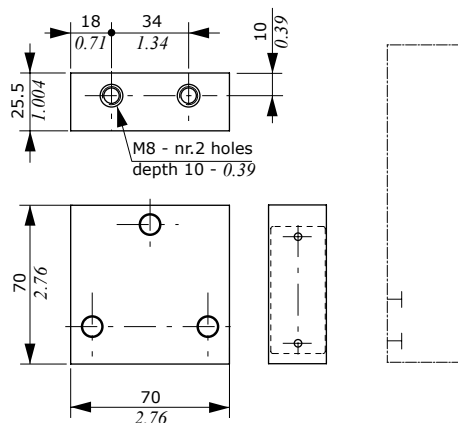
Pressure drop diagram (working section included)



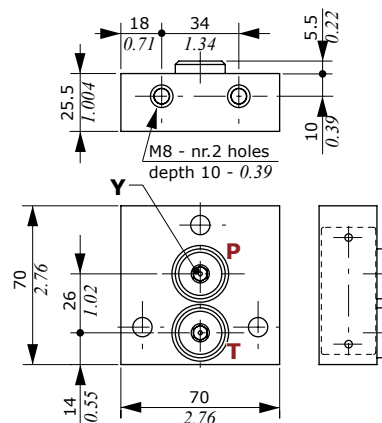
Dimensions and hydraulic circuit

Without port arrangement

RF type



With port arrangement

RS - RP - RT types
drawing shows RS type

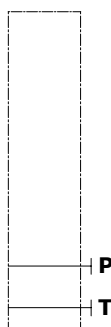
Wrenches and tightening torque

X = allen wrench 8 - 24 Nm (17.7 lbft)

Y = allen wrench 6 - 24 Nm (17.7 lbft)

RS type

P and T ports plugged



RP type

P open, T plugged



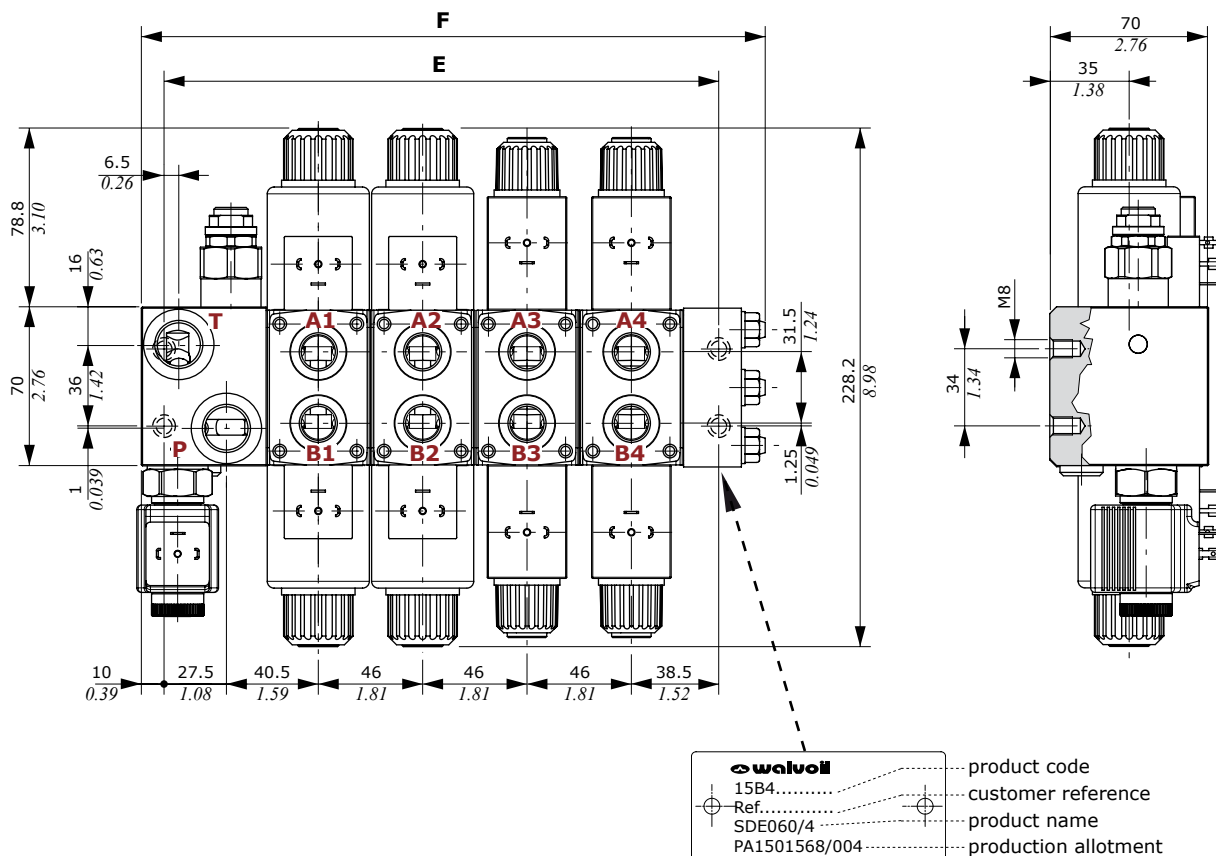
RT type

T open, P plugged



Dimensions

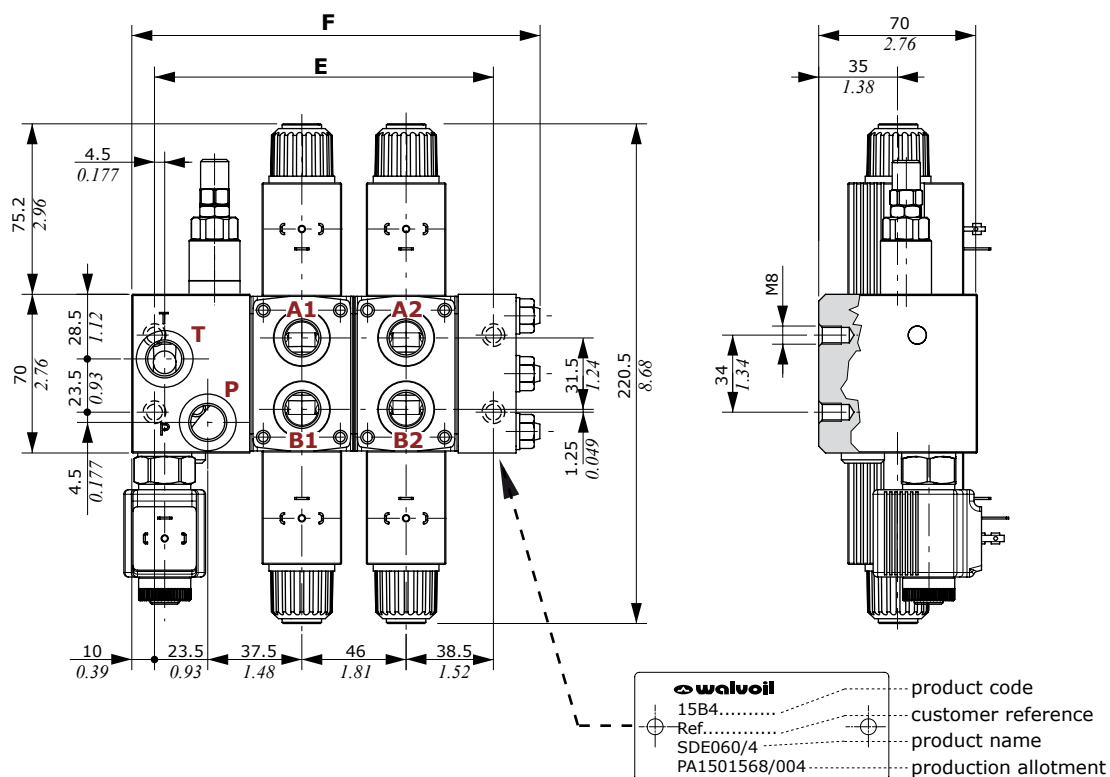
This drawing is referred to directional valve with mixed working sections (2 sections up 60 to l/min-15.8 US gpm and 2 sections up to 30 l/min-7.9 US gpm), and AN1 type inlet section.



AN type inlet section					AN1 type inlet section (see drawing)						AN2 type inlet section			
TYPE	E		F		E		F		Weight		E		F	
	mm	in	mm	in	mm	in	mm	in	Kg	lb	mm	in	mm	in
SDE060/1	84.5	3.33	117.5	4.63	106.5	4.19	139.5	5.49	5.08	11.20	137	5.12	170	6.69
SDE060/2	130.5	5.14	163.5	6.44	152.5	6.00	185.5	7.30	7.43	16.38	183	7.21	216	8.50
SDE060/3	176.5	6.95	209.5	8.25	198.5	7.82	231.5	9.11	9.78	21.56	229	9.02	262	10.31
SDE060/4	222.5	8.76	255.5	10.06	244.5	9.63	277.5	10.93	12.13	26.74	275	10.83	308	12.13
SDE060/5	268.5	10.57	301.5	11.87	290.5	11.44	323.5	12.74	14.48	31.92	321	12.64	354	13.94
SDE060/6	314.5	12.38	347.5	13.68	336.5	13.26	369.5	14.55	16.83	37.10	367	14.45	400	15.75
SDE060/7	360.5	14.19	393.5	15.49	382.5	15.06	415.5	16.36	19.18	42.28	413	16.26	446	17.56
SDE060/8	406.5	16.00	439.5	17.30	428.5	16.87	461.5	18.17	21.53	47.47	459	18.07	492	19.37
SDE060/9	452.5	17.81	485.5	19.11	474.5	18.68	507.5	19.98	23.88	52.65	505	19.88	538	21.18
SDE060/10	498.5	19.63	531.5	20.93	520.5	20.49	553.5	21.79	26.23	57.83	551	21.69	584	22.99

Dimensions

This drawing is referred to directional valve with all working sections up to 30 l/min (*up to 7.9 US gpm*), and N1B type inlet section.

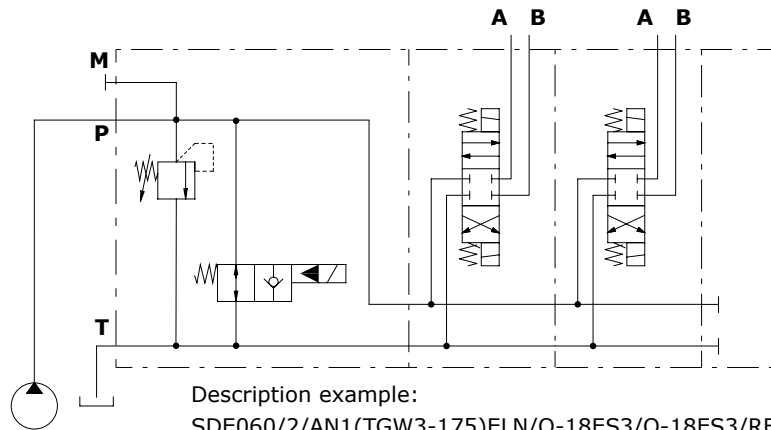


TYPE	ANB type inlet section				AN1B type inlet section (see drawing)				Weight	
	E		F		E		F		Kg	lb
	mm	in	mm	in	mm	in	mm	in		
SDE060/1	80	3.15	113	4.45	101.5	3.97	134.5	5.30	4.58	10.10
SDE060/2	126	4.96	159	6.26	147.5	5.81	180.5	7.11	6.61	14.57
SDE060/3	172	6.77	205	8.07	193.5	7.62	226.5	8.92	8.64	19.05
SDE060/4	218	8.58	251	9.88	239.5	9.43	272.5	10.73	10.67	23.52
SDE060/5	264	10.39	297	11.69	285.5	11.24	318.5	12.54	12.70	28.00
SDE060/6	310	12.20	343	13.50	331.5	13.05	364.5	14.35	14.73	32.47
SDE060/7	356	14.02	389	15.31	377.5	14.86	410.5	16.16	16.76	36.95
SDE060/8	402	15.83	435	17.13	423.5	16.67	456.5	17.97	18.79	41.42
SDE060/9	448	17.64	481	18.94	469.5	18.48	502.5	19.78	20.82	45.90
SDE060/10	494	19.45	527	20.75	515.5	20.29	548.5	21.59	22.85	50.38

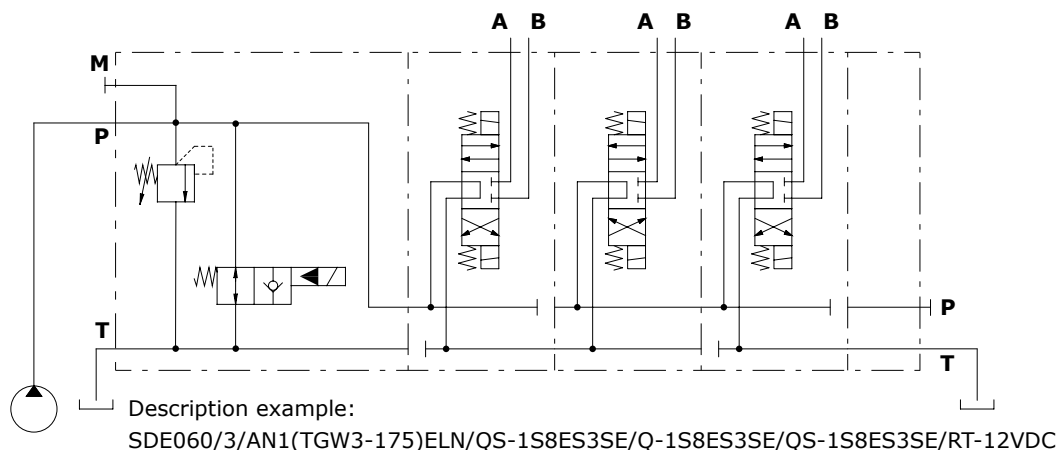
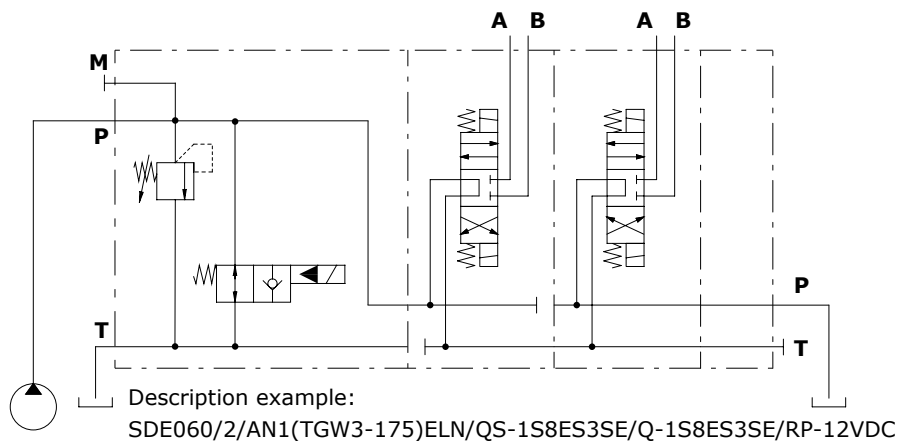
TYPE	AN2B type inlet section				AN6B-AN7B type inlet sections			
	E		F		E		F	
	mm	in	mm	in	mm	in	mm	in
SDE060/1	128	5.04	161	6.34	120.5	4.74	153.5	6.04
SDE060/2	174	6.85	207	8.15	166.5	6.56	199.5	7.85
SDE060/3	220	8.66	253	9.96	212.5	8.37	245.5	9.67
SDE060/4	266	10.47	299	11.77	258.5	10.18	291.5	11.48
SDE060/5	312	12.28	345	13.58	304.5	11.99	337.5	13.29
SDE060/6	358	14.09	391	15.39	350.5	13.80	383.5	15.10
SDE060/7	404	15.91	437	17.20	396.5	15.61	429.5	16.91
SDE060/8	450	17.72	483	19.02	442.5	17.42	475.5	18.72
SDE060/9	496	19.53	529	20.83	488.5	19.23	521.5	20.53
SDE060/10	542	21.34	575	22.64	534.5	21.04	567.5	22.34

Parallel circuit

A parallel circuit can be composed using P or Q working sections.
The outlet section can be with or without port arrangement.

**Series circuit: only for 60 l/min (15.8 US gpm) sections**

The series circuit is composed using alternately QS and Q working sections, both with 1S series spool.
The circuit starts always with QS working section.
The outlet section depends on total number of working sections: if it is even, the outlet section must have P port open, if it is odd, the outlet section must have T port open.



Complete section ordering codes

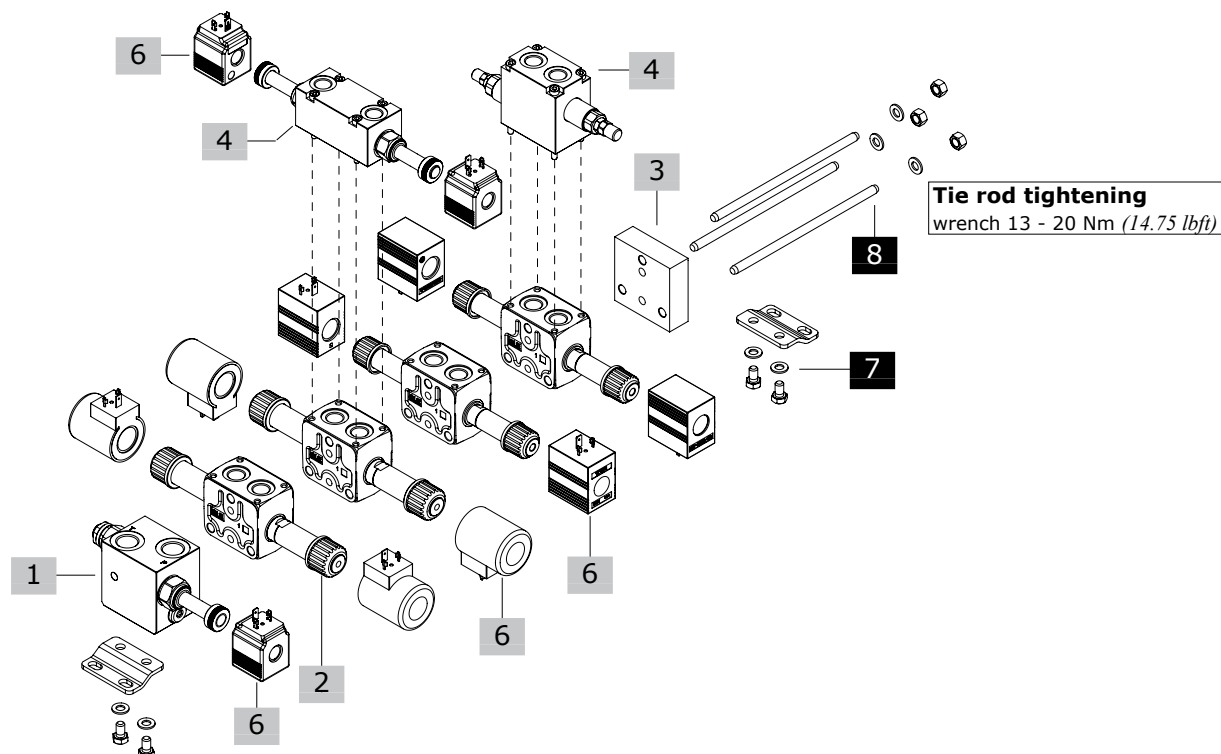
SDE060/4/AN1(TGW3-120)ELN/Q-18ES3/Q-18ES3.BPEN3/Q-18ES3B/

Nr. of working sections

1 2 2 4 2

Q-18ES3B.PS3(DC3-100)/RF-.....-12VDC

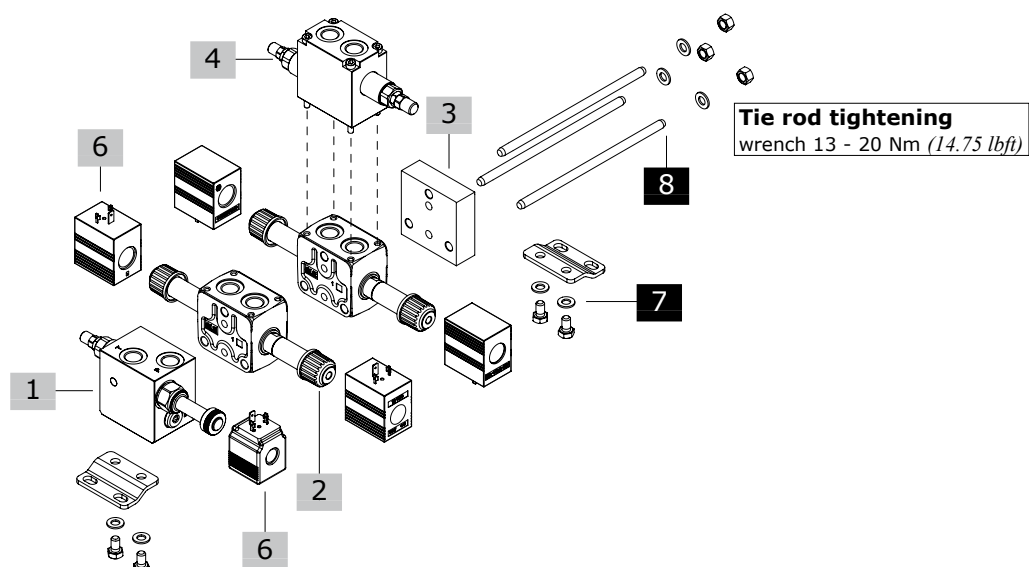
2 4 3 5 6



SDE060/2/AN1B(JNS3-120)ELN/Q-18ES3B/Q-18ES3B.PS3(DC3-100)/RF-.....-12VDC

Nr. of working sections

1 2 2 4 3 5 6



Complete section ordering codes

1 Complete inlet section * **page 34**

Section bodies are steel made

TYPE: AN	CODE: 5FIA103103
DESCRIPTION: Without valves arrangement, G1/2 ports P and T open	
TYPE: ANP	CODE: 5FIA103304
DESCRIPTION: As type AN, port P open and T plugged	
TYPE: ANT	CODE: 5FIA103304
DESCRIPTION: As type AN, port P plugged and T open	
TYPE: ANS	CODE: 5FIA103305
DESCRIPTION: As type AN, ports P and T plugged	
TYPE: AN1(TGW3-175)ELN-WC	CODE: Y61S603000
DESCRIPTION: With pressure relief valve and solenoid operated unloading valve, G1/2 ports P and T open	
TYPE: AN1P(TGW3-175)ELN-WC	CODE: Y61S603003
DESCRIPTION: As type AN1, port P open and T plugged	
TYPE: AN2/PPXN1(TGW3-175)ELN-WC	CODE: Y61S603001
DESCRIPTION: With pressure relief valve, solenoid operated unloading valve and pressure compensated flow control valve, G1/2 ports P and T open	
TYPE: AN2P/PPXN1(TGW3-175)ELN-WC	CODE: Y61S603006
DESCRIPTION: As type AN2, port P open and T plugged	
TYPE: AN6/EEXL1(VMP02TR-220)-SB7RC(C5)-WC	
CODE: Y61S603010	
DESCRIPTION: With pressure relief valve and flow control valve, for Open Center circuit, compensator with 7 bar (100 psi) stand-by, G3/8 ports P and T open	
TYPE: AN7/EEXL1(VMP02TR-220)-SB7RCV(C5)-WC	
CODE: Y61S603011	
DESCRIPTION: As AN6, compensator with handwheel actuation for Open to Closed Center switching, G3/8 ports P and T open	
TYPE: AN11/EEFN1(VMP02TR-200)-CL-WC	
CODE: Y61S603008	
DESCRIPTION: As AN6, for Closed Center circuit, compensator blanking plug, G3/8 ports P and T open	
TYPE: ANB	CODE: 5FIA103306
DESCRIPTION: As AN type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: ANPB	CODE: 5FIA103302
DESCRIPTION: As ANP type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: ANTB	CODE: 5FIA103302
DESCRIPTION: As ANT type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: ANSB	CODE: 5FIA103303
DESCRIPTION: As ANS type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: AN1B(JNS3-120)ELN-WC	CODE: Y61S303000
DESCRIPTION: As AN1 type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: AN1PB(JNS3-120)ELN-WC	CODE: Y61S303002
DESCRIPTION: As AN1P type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: AN2B/PPXN1(JNS3-120)ELN-WC	CODE: Y61S303001
DESCRIPTION: As AN2 type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: AN2PB/PPXN1(JNS3-120)ELN-WC	CODE: Y61S303005
DESCRIPTION: As AN2P type, G3/8 ports, up to 30 l/min (7.9 US gpm)	
TYPE: AN6B/EEXL1(VMP02TR-220)-SB10RC(C3)-WC	
CODE: Y61S303006	
DESCRIPTION: As AN6 type, compensator with 10 bar (145 psi) stand-by, up to 30 l/min (7.9 US gpm)	
TYPE: AN7B/EEFN1(VMP02TR-200)-SB10RCV(C3)-WC	
CODE: Y61S303007	
DESCRIPTION: As AN6B, compensator with handwheel actuation for Open to Closed Center switching, G3/8 ports P and T open, up to 30 l/min (7.9 US gpm)	
TYPE: AN11B/EEFN1(VMP02TR-200)-CL-WC	
CODE: Y61S303008	
DESCRIPTION: As AN6B, for Closed Center circuit, compensator blanking plug, G3/8 ports P and T open, up to 30 l/min (7.9 US gpm)	

NOTE (*) – Codes are referred to **BSP** thread.**2 Complete working section *** **page 48**

Section bodies are cast iron made

Sections are arranged for flangeable valve blocks

TYPE	CODE	DESCRIPTION
Q-18ES3-WC	Y63S603001C	Parallel circuit, type 1 double acting spool
Q-28ES3-WC	Y63S603002C	Parallel circuit, type 2 double acting spool
QS-1S8ES3SE-WC	Y63S603003C	Series circuit, type 1S double acting series spool
Q-1S8ES3SE-WC	Y63S603005C	Parallel circuit, type 1S double acting series spool: placed after QS series section only
Q-18ES3B-WC	Y63S303001C	As Q-18ES3-WC type, up to 30 l/min (7.9 US gpm)
Q-28ES3B-WC	Y63S303002C	As Q-28ES3-WC type, up to 30 l/min (7.9 US gpm)

3 Complete outlet section * **page 61**

Unless otherwise stated, outlet section bodies are steel made.

TYPE	CODE	DESCRIPTION
RF	3FIA203000	Without ports, aluminium alloy body, up to 30 l/min (7.9 US gpm) and 60 l/min (15.8 US gpm)
RS	619303200	G1/2 ports, P and T plugged
RP	619303100	G1/2 ports, P open and T plugged
RSB	619301200	As RS type with G3/8 ports, up to 30 l/min (7.9 US gpm)
RPB	619301100	As RP type with G3/8 ports, up to 30 l/min (7.9 US gpm)
RT	619303000	G1/2 ports, T open and P plugged
RTB	619301000	As RT type with G3/8 ports, up to 30 l/min (7.9 US gpm)

4 Complete flangeable valve block

Antishock valves	page 55
Check valves	page 56
Solenoid operated check valves (without coils)	page 57
Single counterbalance valves	page 59
Double counterbalance valves	page 59

5 Valve threading

Specify threading always when it is different from BSP standard (see page 4).

6 Coils **page 62**

Coils voltage specification; for list of available coils see pages of related sections

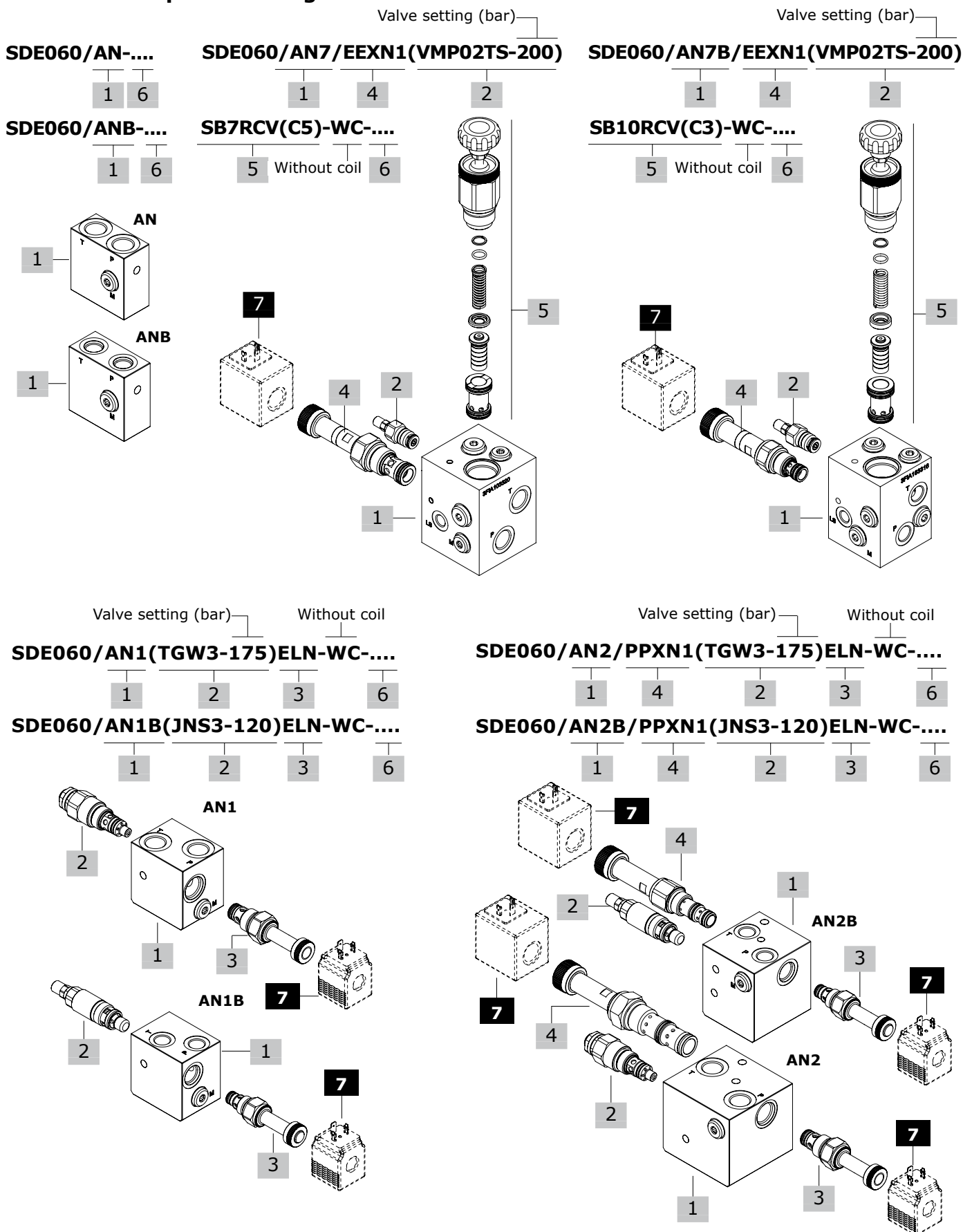
7 Fixing bracket **page 65**

TYPE	CODE	DESCRIPTION
STAF	5STA148065	Brackets with fixing screws

8 Assembling kit

CODE	DESCRIPTION	CODE	DESCRIPTION
5TIR108099	For 1 section valve	5TIR108329	For 6 section valve
5TIR108144	For 2 sections valve	5TIR108375	For 7 sections valve
5TIR108191	For 3 sections valve	5TIR108420	For 8 sections valve
5TIR108236	For 4 sections valve	5TIR108466	For 9 sections valve
5TIR108282	For 5 sections valve	5TIR108512	For 10 sections valve

Inlet section: part ordering codes



Inlet section: part ordering codes

1 Inlet section body kit * page 36

Section bodies are steel made

TYPE	CODE	DESCRIPTION
AN	5FIA103103	Without valves arrangement, G1/2 ports, P and T open
ANP	5FIA103304	As AN, port P open and T plugged
ANT	5FIA103304	As AN, port P plugged and T open
ANS	5FIA103305	As AN, ports P and T plugged
AN1	5FIA103307	Relief and unloader valves arrangement, G1/2 ports, P and T open
AN1P	5FIA103314	As AN1, port P open and T plugged
AN2	5FIA103310	Relief, unloader and flow control valves arrangement, G1/2 ports, P and T open
AN2P	5FIA103315	As AN2, port P open and T plugged
AN6	5FIA103320	For Open Center, relief and flow control valves arrangement, compensator, LS port plugged, G3/8 P and T ports open
AN7/AN11	5FIA103320A	As AN6, for Closed Center, with LS port open
ANB	5FIA103306	As AN, G3/8 ports, up to 30 l/min (7.9 US gpm)
ANPB	5FIA103302	As ANP, G3/8 ports, up to 30 l/min (7.9 US gpm)
ANTB	5FIA103302	As ANT, G3/8 ports, up to 30 l/min (7.9 US gpm)
ANSB	5FIA103303	As ANS, G3/8 ports, up to 30 l/min (7.9 US gpm)
AN1B	5FIA103300	As AN1, G3/8 ports, up to 30 l/min (7.9 US gpm)
AN1PB	5FIA103312	As AN1P, G3/8 ports, up to 30 l/min (7.9 US gpm)
AN2B	5FIA103309	As AN2, G3/8 ports, up to 30 l/min (7.9 US gpm)
AN2PB	5FIA103313	As AN2P, G3/8 ports, up to 30 l/min (7.9 US gpm)
AN6B	5FIA103316	As AN6, G3/8 ports, up to 30 l/min (7.9 US gpm)
AN7B/AN11B	5FIA103317	As AN6B, for Closed Center, with LS port open, up to 30 l/min (7.9 US gpm)

2 Main relief valve page 41

TYPE	CODE	DESCRIPTION
For sections AN1-AN2 type		
Valve standard setting is referred to 5 l/min (1.3 US gpm) flow.		
(TGW2-80)	OMC10002023	Range 10-120 bar (145-1750 psi) std setting 80 bar (1160 psi)
(TGW3-175)	OMC10002024	Range 40-200 bar (580-2900 psi) std setting 175 bar (2550 psi)
(TGW4-250)	OMC10002025	Range 200-350 bar (2900-5100 psi) std setting 250 bar (3600 psi)
SV	XTAP526360	Relief valve blanking plug
For sections AN1B-AN2B type		
Valve standard setting is referred to 10 l/min (2.6 US gpm) flow, considering the valve mounted on inlet section.		
(JNS2-63)	SKIT105570	Range 40-63 bar (580-900 psi) std setting 63 bar (900 psi)
(JNS3-120)	SKIT105571	Range 50-200 bar (725-2900 psi) std setting 120 bar (1750 psi)
(JNS4-220)	SKIT105572	Range 160-315 bar (2300-4600 psi) std setting 220 bar (3200 psi)
(JNH2-63)	SKIT105517	As type JNG2, set and locked
(JNH3-120)	SKIT105516	As type JNG3, set and locked
(JNH4-220)	SKIT105515	As type JNG4, set and locked
(JNZT2-63)	SKIT105562	As type JNG2, anti-tampering type
(JNZT3-120)	SKIT105563	As type JNG3, anti-tampering type
(JNZT4-220)	SKIT105564	As type JNG4, anti-tampering type
SV	XTAP623282	Relief valve blanking plug
For sections AN6-AN7-AN6B-AN7B-AN11-AN11B type		
Valve standard setting is referred to 1 l/min (0.26 US gpm) flow, considering the valve mounted on inlet section.		
(VMP02TV-50)	1100000120	Range 5-80 bar (73-1160 psi) std setting 50 bar (725 psi)
(VMP02TS-150)	1100000113	Range 50-220 bar (725-3200 psi) std setting 150 bar (2200 psi)
(VMP02TR-250)	1100000119	Range 180-350 bar (2600-5100 psi) std setting 250 bar (3600 psi)

3 Solenoid operated unloading valve page 43

TYPE	CODE	DESCRIPTION
For sections AN1-AN2 type		
ELN	0EC10002012	Without emergency override
ELV	0EC10002015	With screw type emergency override
ELP	0EC10002014	With push-button emergency override
ELT	0EC10002016	With "twist & push" emergency override
LT	XTAP327460	Unloading valve blanking plug
For sections AN1B-AN2B type		
ELN	0EC08002031	Without emergency actuation
ELV	0EC08002034	With screw type emergency actuation
ELP	0EC08002033	With push-button emergency actuation
ELT	0EC08002035	With "twist & push" emergency actuation
LT	XTAP510320	Unloading valve blanking plug

4 Flow control valve page 44

TYPE	CODE	DESCRIPTION
For sections AN1-AN2 type		
PPAL1	0PP12002000	Hand-wheel setting type
PPAV1	0PP12002004	Screw setting type
PPXN1	0PP12002037	Solenoid operated, without emergency
PPXV1	0PP12002039	Solenoid operated, screw emergency
PPXL1	0PP12002041	Solenoid operated, hand-wheel emergency
LT	3XTP3558200	Flow control valve blanking plug
For sections AN1B-AN2B type		
PPAL1	0PP10002000	Hand-wheel setting type
PPAV1	0PP10002005	Screw setting type
PPXN1	0PP10002031	Solenoid operated, without emergency
PPXV1	0PP10002033	Solenoid operated, screw emergency
PPXL1	0PP10002035	Solenoid operated, hand-wheel emergency
LT	3XTP3545700	Flow control valve blanking plug
For sections AN6-AN7-AN11 type		
EEXN1	0EE12002007	Solenoid operated, without emergency
EEXL1	0EE12002009	Solenoid operated, hand-wheel emergency
For sections AN6B-AN7B-AN11B type		
EEXN1	0EE10002009	Solenoid operated, without emergency
EEXL1	0EE10002008	Solenoid operated, hand-wheel emergency

5 Compensator kit page 46

TYPE	CODE	DESCRIPTION
For section type AN6		
SB7RC(C5)	5KT6200230	With 7 bar (100 psi) stand-by, for Open Center circuit
For section type AN7		
SB7RCV(C5)	5KT6200231	With 7 bar (100 psi) stand-by, hand-wheel actuation for Open Center to Closed Center switching
For section type AN6B		
SB10RC(C3)	5KT6200222	With 10 bar (145 psi) stand-by, for Open Center circuit
For section type AN7B		
SB10RCV(C3)	5KT6200227	With 10 bar (145 psi) stand-by, hand-wheel actuation for Open Center to Closed Center switching
For section type AN11-AN11B		
CL	X451810000	Compensator blanking plug, for Closed Center circuit

6 Section threading

Specify threading always when it is different from BSP standard (see page 4).

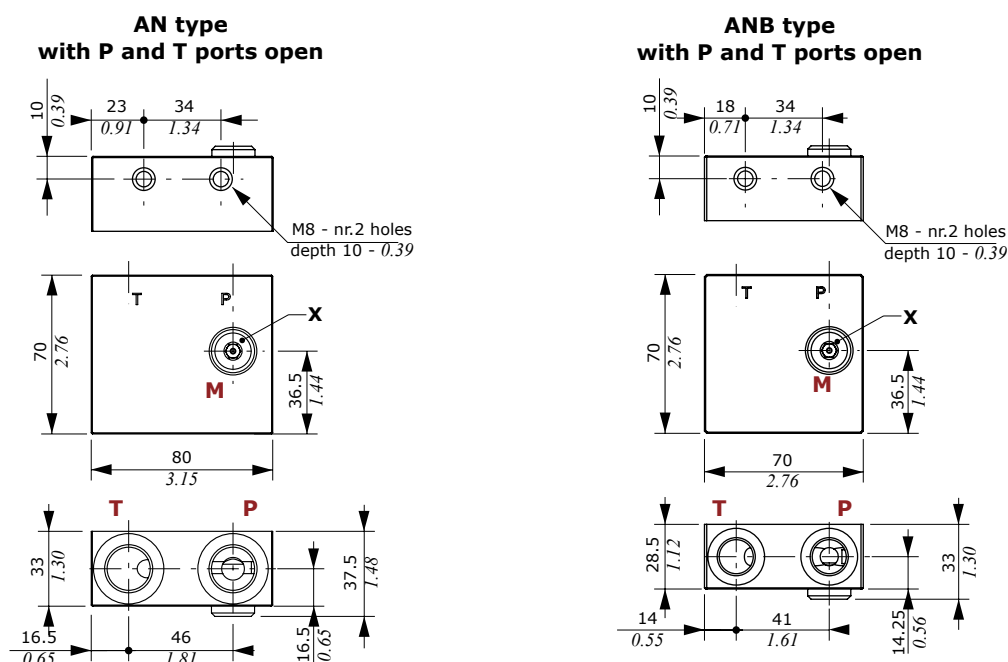
7 Optional coil page 62

For list of available coils see pages of related section.

NOTE (*) – Codes are referred to **BSP** thread.

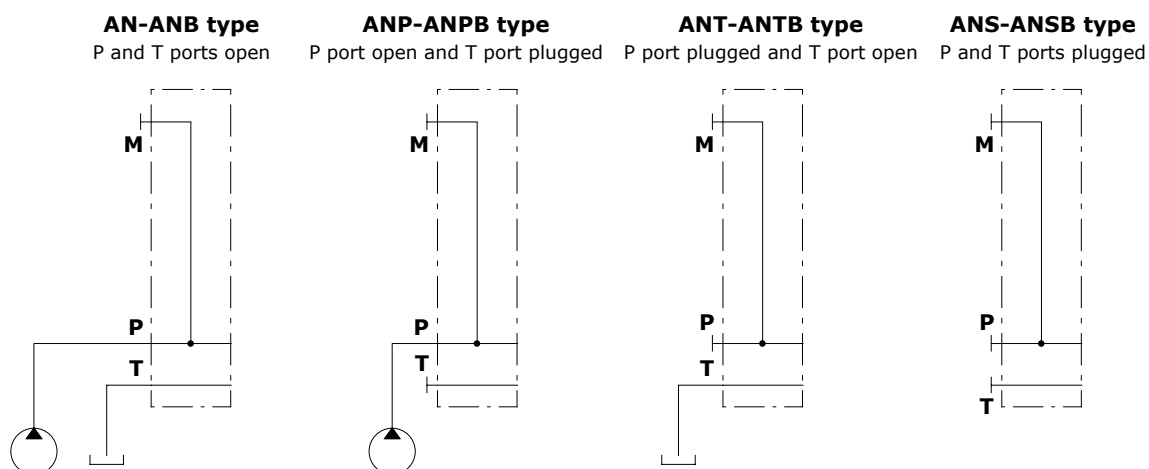
Inlet section: dimension and hydraulic circuit

AN-ANB inlet sections



Wrenches and tightening torque

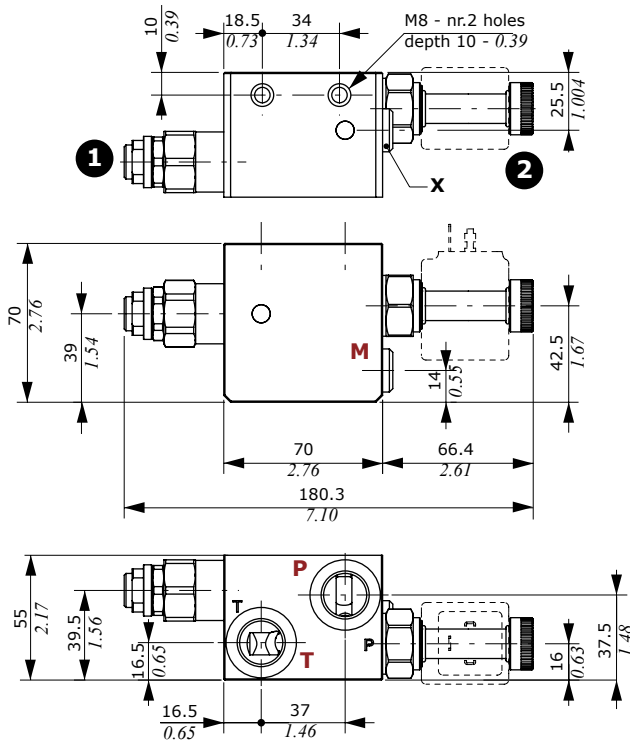
X = allen wrench 6 - 24 Nm (17.7 lbft)



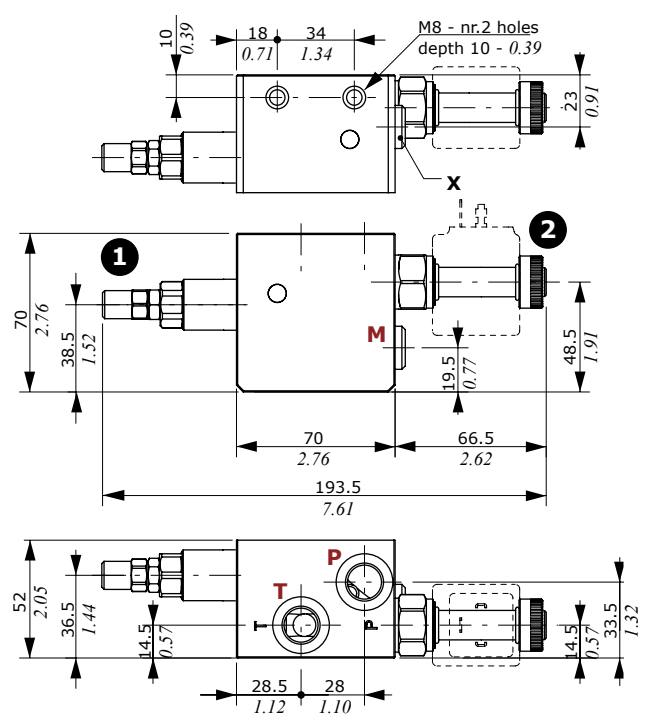
Inlet section: dimension and hydraulic circuit

AN1-AN1B inlet sections

AN1 type with P and T ports open



AN1B type with P and T ports open



Legenda

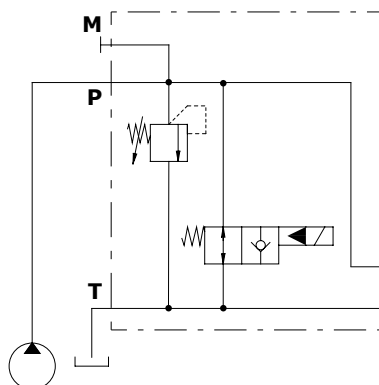
- 1: Pressure relief valve
- 2: Solenoid operated unloading valve

Wrenches and tightening torque

X = allen wrench 6 - 24 Nm (17.7 lbft)
 NOTE: for valve wrench and torque see pages 41 and 43.

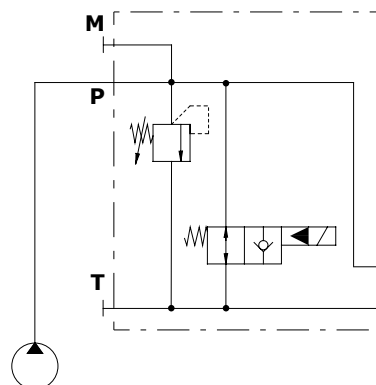
AN1-AN1B types

P and T ports open



AN1P-AN1PB types

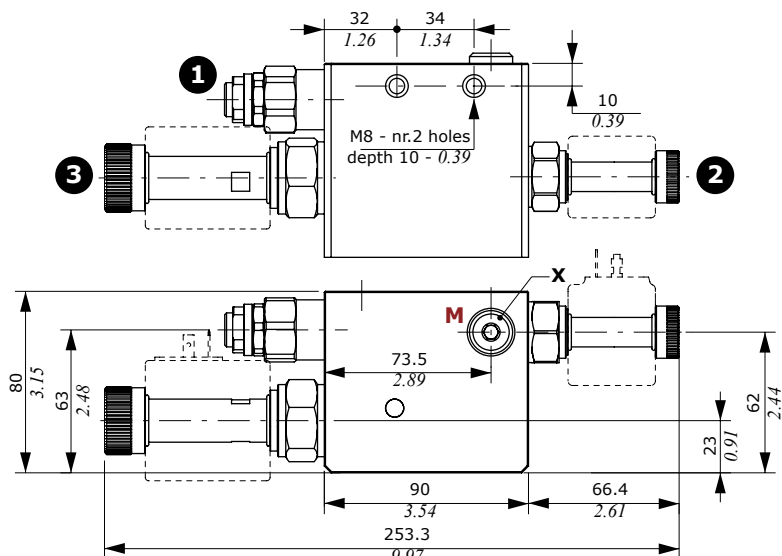
P port open and T port plugged



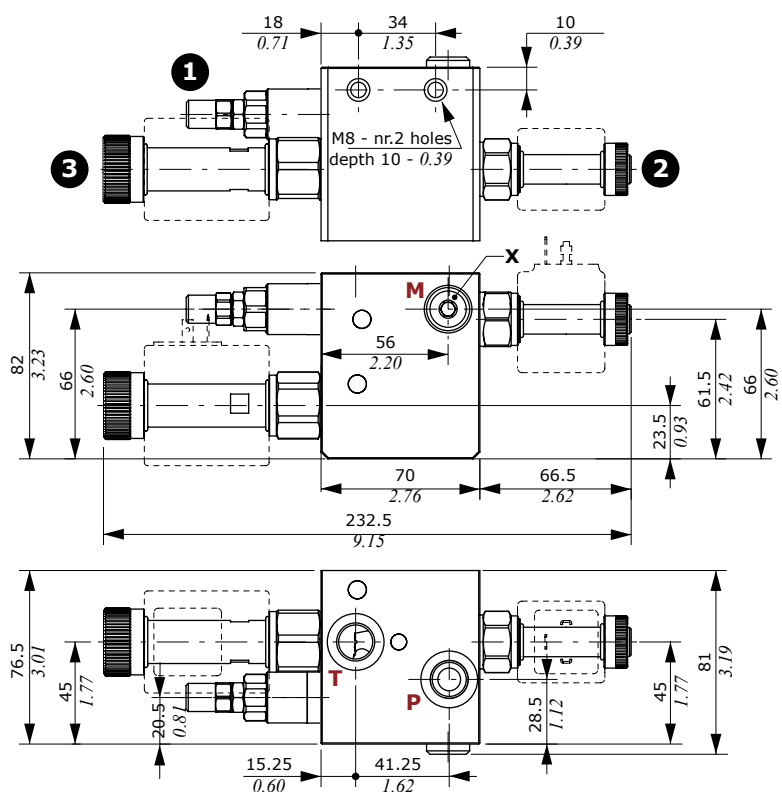
Inlet section: dimension and hydraulic circuit

AN2-AN2B inlet sections

AN2 type with P and T ports open



AN2B type with P and T ports open



Legenda

- 1: Pressure relief valve
- 2: Solenoid operated unloading valve
- 3: Pressure compensated flow control valve

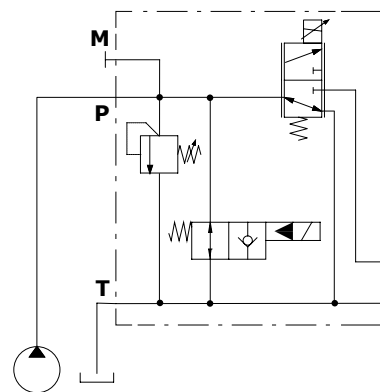
Wrenches and tightening torque

X = allen wrench 6 - 24 Nm (17.7 lbft)

NOTE: for valve wrench and torque see pages from 41 to 47.

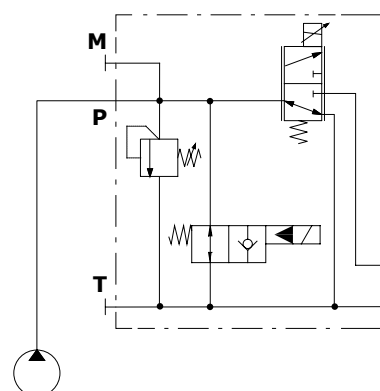
AN2-AN2B types

P and T ports open



AN2P-AN2PB types

P port open and T port plugged



Inlet section: dimension and hydraulic circuit

AN6-AN7-AN11 inlet sections

AN7 type; configuration for Open and Closed Center

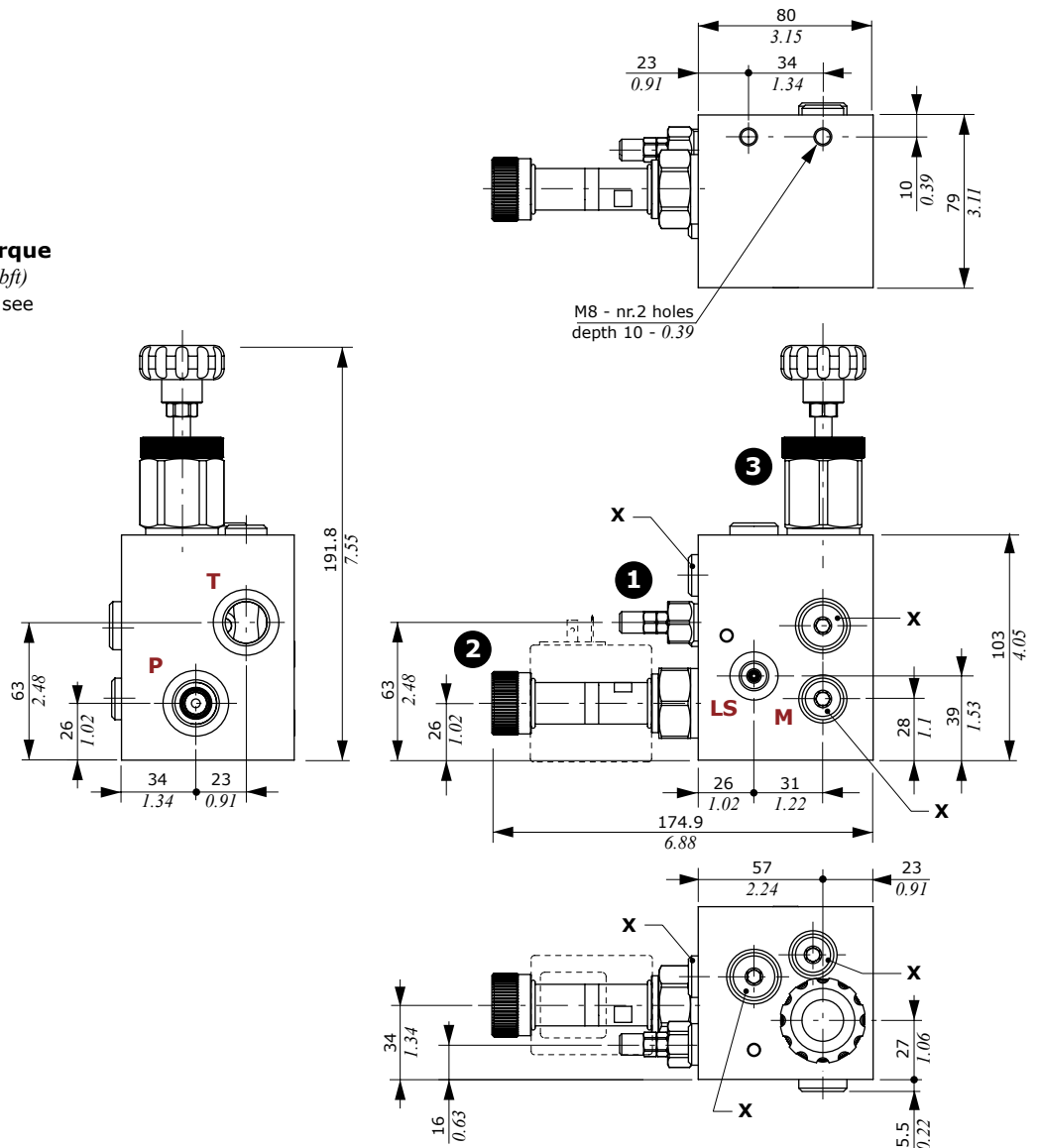
Legenda

- 1: Pressure relief valve
- 2: Flow control valve
- 3: Excludable compensator

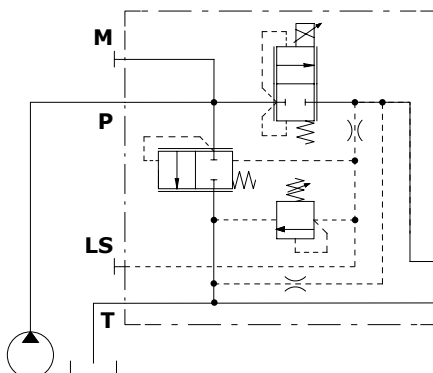
Wrenches and tightening torque

X = allen wrench 6 - 24 Nm (17.7 lbft)

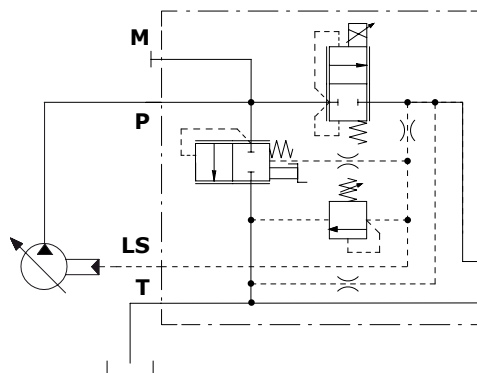
NOTE: for valve wrench and torque see pages 42 and 46.



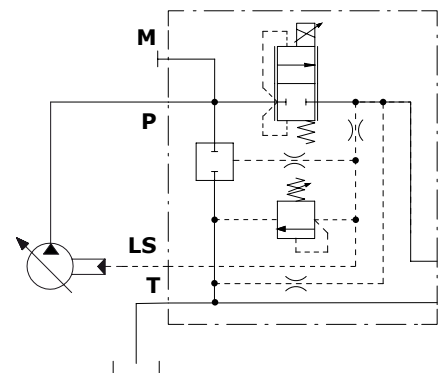
AN6 type
for Open Center circuit



AN7 type
for Closed and Open Center circuits



AN11 type
for Closed Center circuit



Inlet section: dimension and hydraulic circuit

AN6B-AN7B-AN11B inlet sections

AN7B type; configuration for Open and Closed Center

Legenda

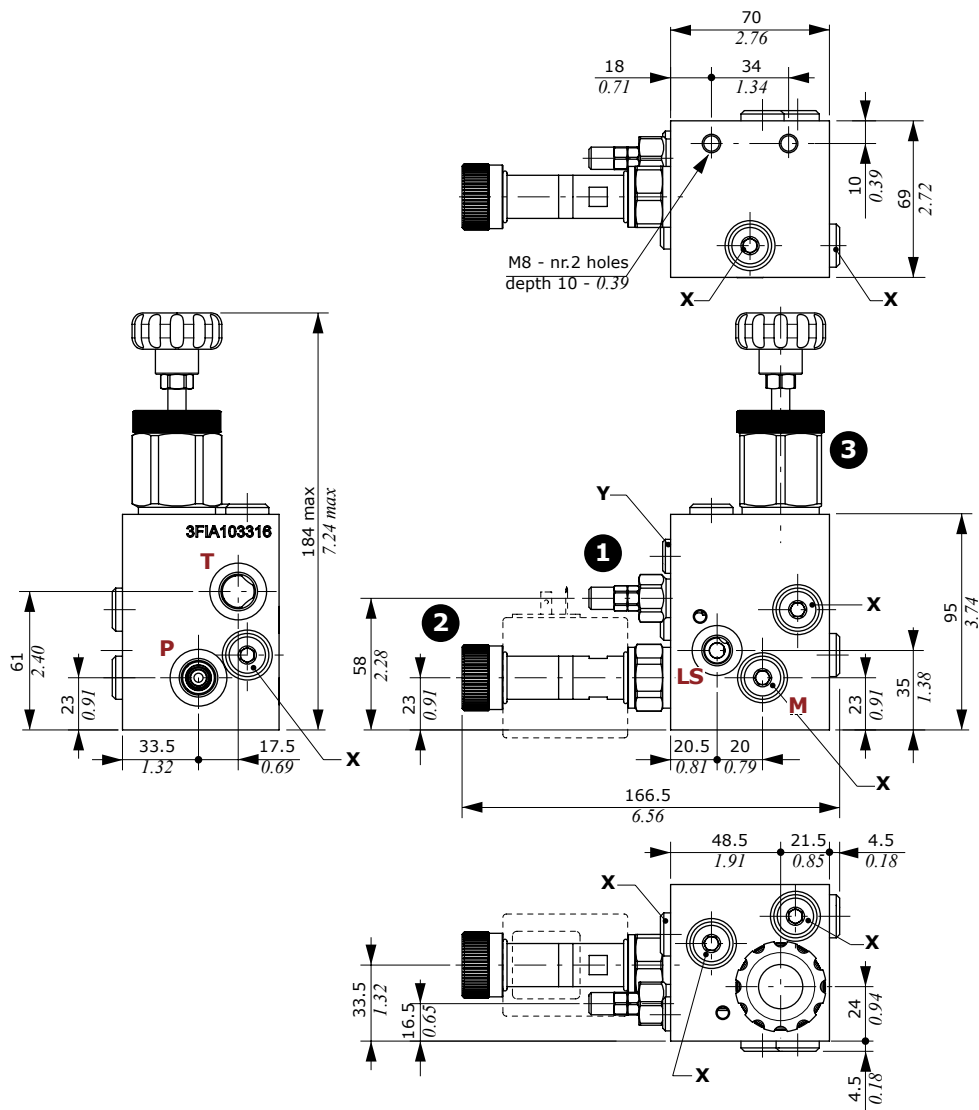
- 1: Pressure relief valve
- 2: Flow control valve
- 3: Excludable compensator

Wrenches and tightening torque

X = allen wrench 6 - 24 Nm (17.7 lbf_t)

Y = allen wrench 4 - 9.8 Nm (7.2 lbf_t)

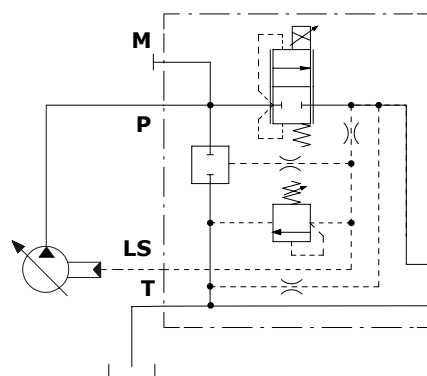
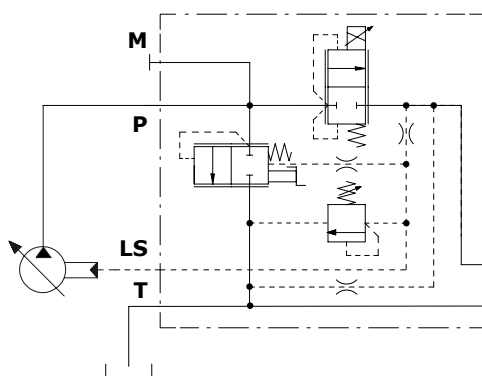
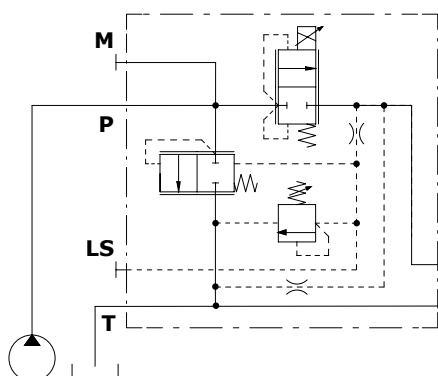
NOTE: for valve wrench and torque see pages 42 and 47.



AN6B type
for Open Center circuit

AN7B type
for Closed and Open Center circuits

AN11B type
for Closed Center circuit

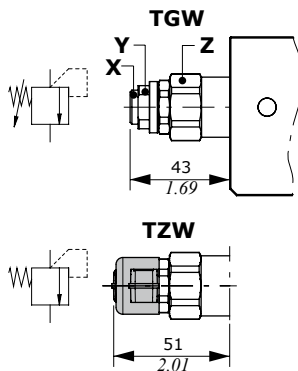


Inlet section: options

Main relief valve

For sections AN1 and AN2 type

Setting types



Legenda

TGW: screw setting type

TZW: with anti-tampering cap

(cap code 4COP126300, nr. 2 pcs)

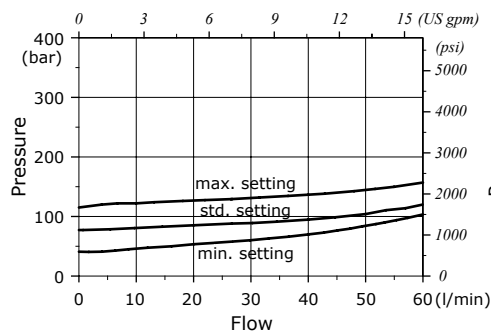
Wrenches and tightening torque

X = allen wrench 5

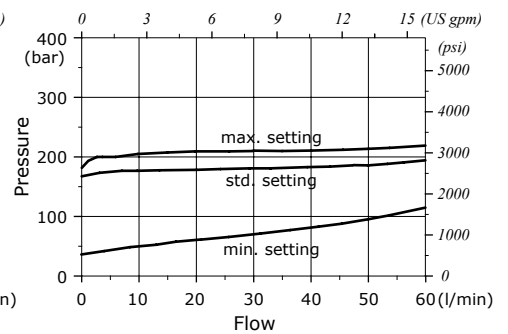
Y = wrench 19 - 20 Nm (14.8 lbft)

Z = wrench 27 - 50 Nm (37 lbft)

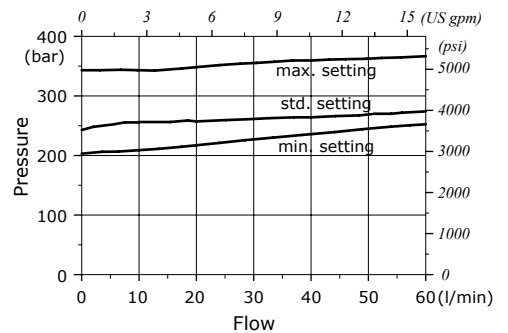
Setting range: TGW2 type



Setting range: TGW3 type

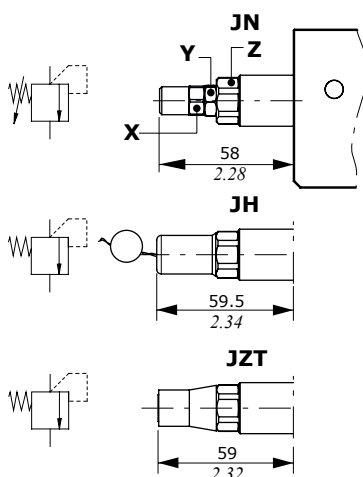


Setting range: TGW4 type

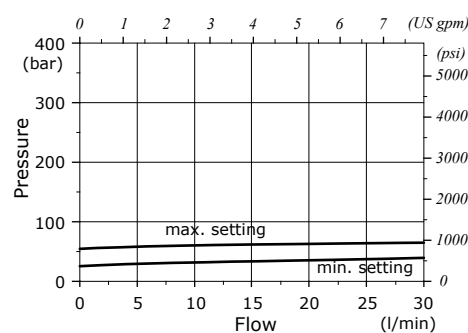


For sections AN1B and AN2B type

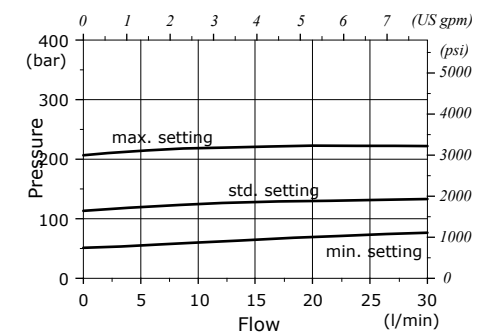
Setting types



Setting range: JNS2 type



Setting range: JNS3 type



Legenda

JN: Adjustment locking nut

(nut code 3COP117260)

JH: valve set and locked

(cap code 3COP117260)

JZT: valve set and locked

(cap code 4COP120420)

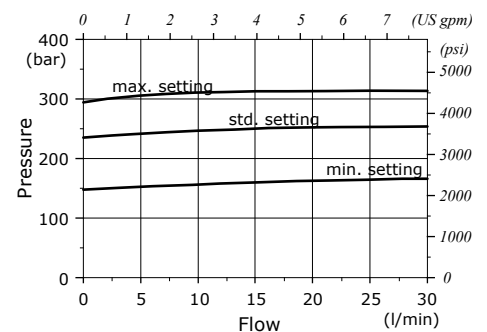
Wrenches and tightening torque

X = wrench 13 - 6.6 Nm (4.9 lbft)

Y = wrench 13 - 24 Nm (17.7 lbft)

Z = wrench 19 - 24 Nm (17.7 lbft)

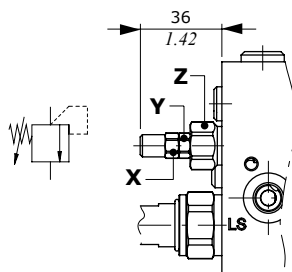
Setting range: JNS4 type



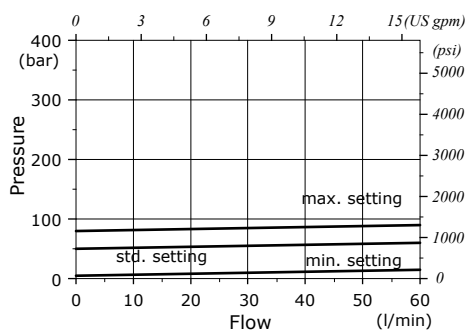
Inlet section: options

Main relief valve

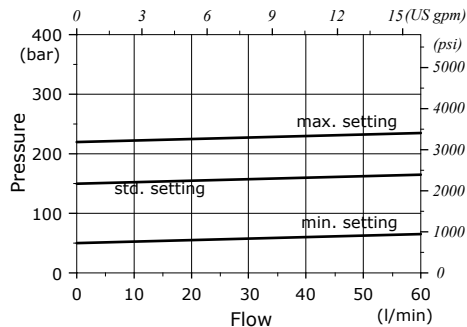
For sections AN6 - AN7 - AN11 - AN6B - AN7B and AN11B type



Setting range: VMP02TV type



Setting range: VMP02TS type



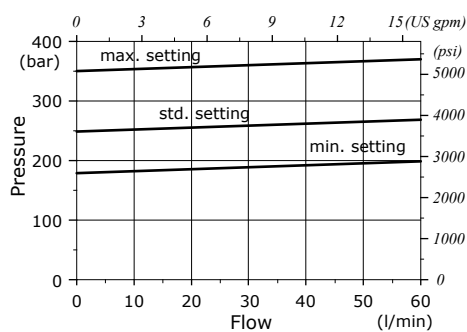
Wrenches and tightening torque

X = wrench 10

Y = wrench 10 - 6.6 Nm (4.9 lbft)

Z = wrench 19 - 24 Nm (17.7 lbft)

Setting range: VMP02TR type

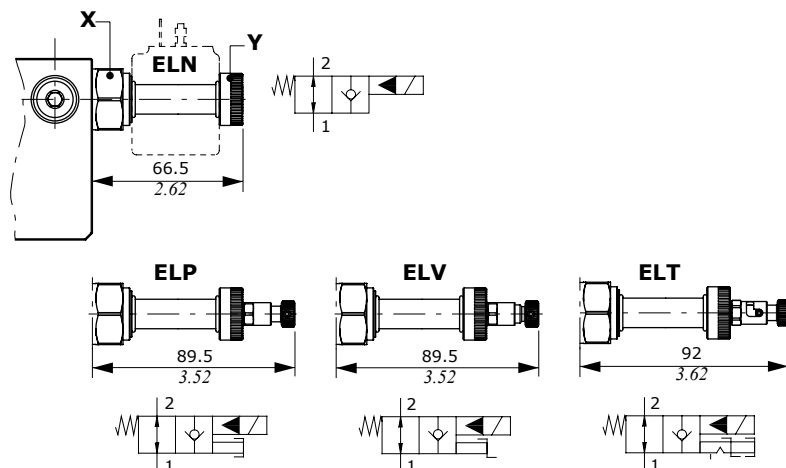


Inlet section: options

Unloading valve

For sections AN1 and AN2 type

Emergency actuation types



Legenda

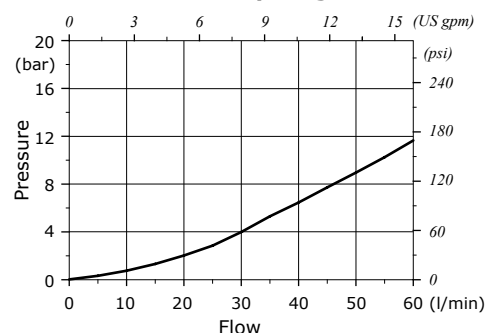
ELN: without emergency actuation
ELP: push-button type emergency actuation
ELV: screw type emergency actuation
ELT: "push&twist" type emergency actuation

Wrenches and tightening torque

X = wrench 27 - 50 Nm (37 lbf ft)

Y = 5 Nm (3.7 lbf ft)

Pressure drop diagram



Valve features

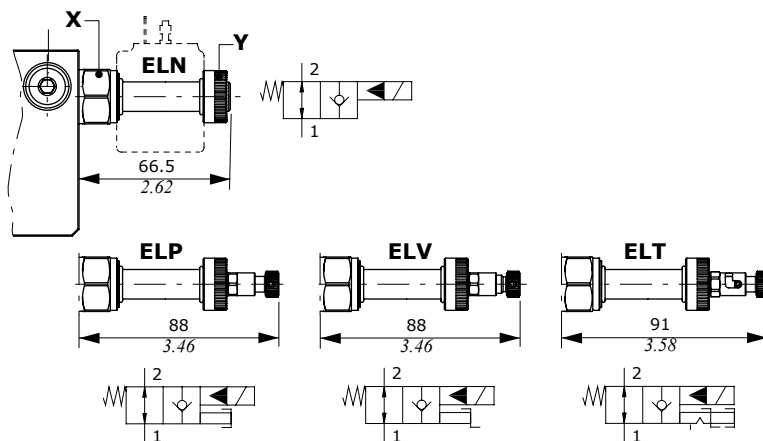
Max. flow: 60 l/min (15.8 US gpm)

Max. pressure: 380 bar (5500 psi)

Internal leakage: 0.25 cm³/min @ 210 bar
(0.015 in³/min @ 3050 psi)For coil features and options see **BER** coil on pages 62 and 63.

For sections AN1B and AN2B type

Emergency actuation types



Legenda

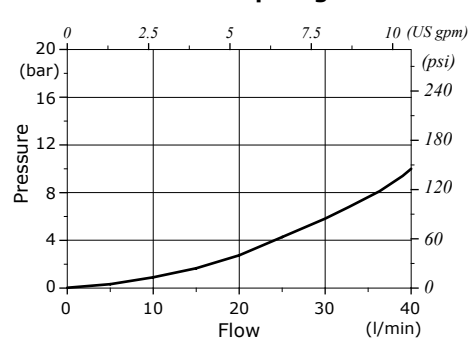
ELN: without emergency actuation
ELP: push-button type emergency actuation
ELV: screw type emergency actuation
ELT: "push&twist" type emergency actuation

Wrenches and tightening torque

X = wrench 24 - 30 Nm (22 lbf ft)

Y = 5 Nm (3.7 lbf ft)

Pressure drop diagram



Valve features

Max. flow: 40 l/min (10.6 US gpm)

Max. pressure: 380 bar (5500 psi)

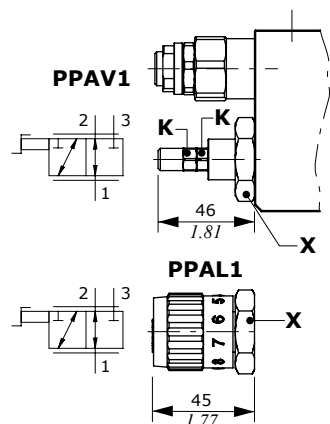
Internal leakage: 0.25 cm³/min @ 210 bar
(0.015 in³/min @ 3050 psi)For coil features and options see **BER** coil on pages 62 and 63.

Inlet section: options

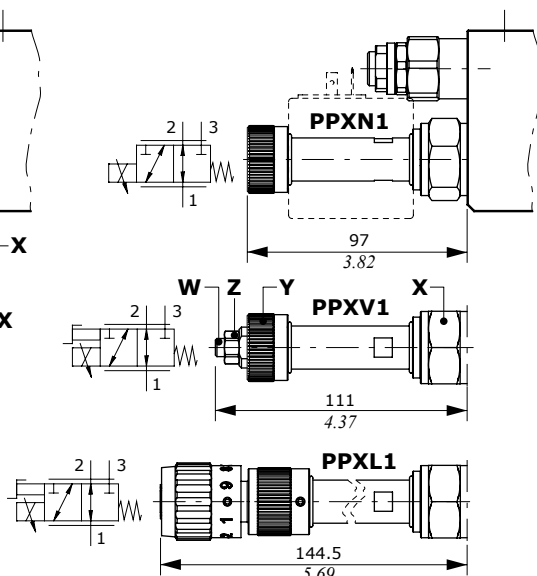
Pressure compensated flow control valve

For section AN2 type

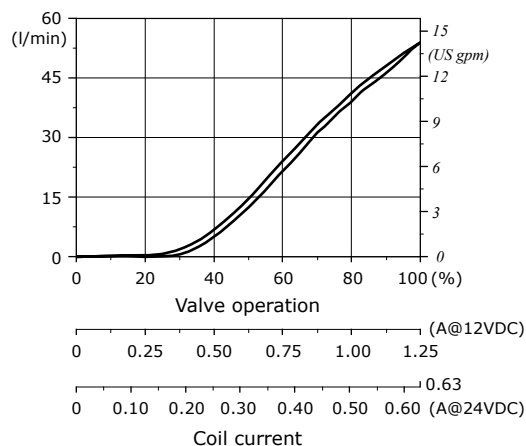
Manual operated



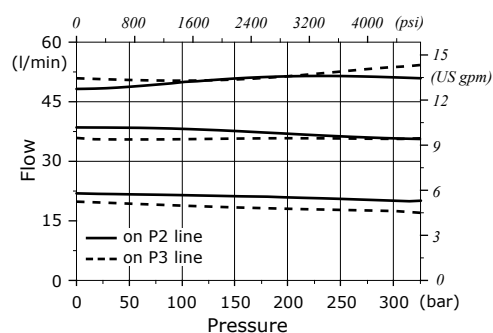
Solenoid operated



Flow regulation diagram



Flow vs. Pressure diagram



Legenda

- PPAV1:** screw setting type
- PPAL1:** hand-wheel setting type
- PPXN1:** without emergency actuation
- PPXV1:** screw type emergency actuation
- PPXL1:** hand-wheel emergency actuation

Wrenches and tightening torque

- K = wrench 10 - 6.6 Nm (4.9 lbf ft)
- X = wrench 32 - 80 Nm (59 lbf ft)
- Y = 5 Nm (3.7 lbf ft)
- W = allen wrench 4
- Z = wrench 8 - 15 Nm (11 lbf ft)

Valve features

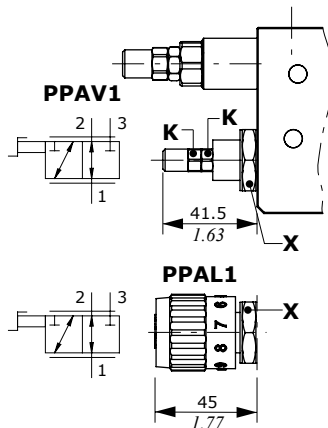
- Max. inlet flow: 90 l/min (23.8 US gpm)
 - Max. regulated flow: 50 l/min (13.2 US gpm) - PPA types
60 l/min (16 US gpm) - PPX types
 - Inlet flow (PPX types): regulated flow +15%
 - Max. pressure.: 350 bar (5100 psi) - PPA types
315 bar (4600 psi) - PPX types
 - Internal leakage (PPX types) . . .: 250 cm³/min a 210 bar
(15.3 in³/min @ 3050 psi)
- For coil features and options see **BQP19** or **BH** coils on pages 62 and 63.

Inlet section: options

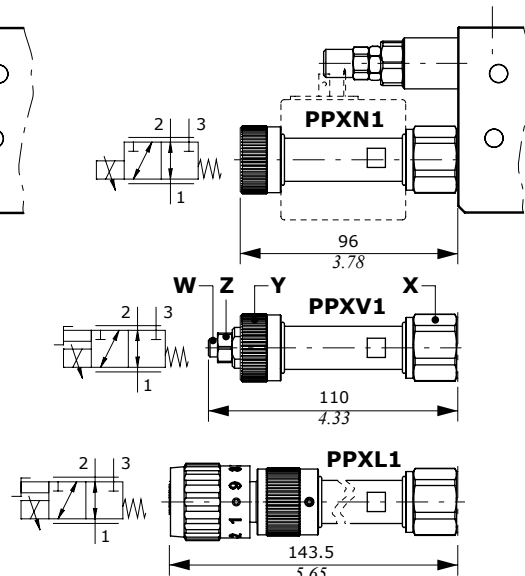
Pressure compensated flow control valve

For section AN2B type

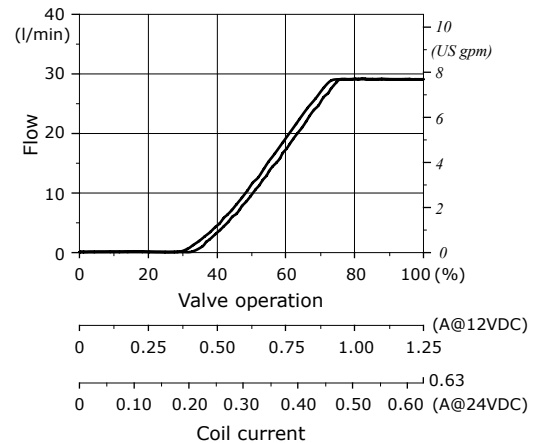
Manual operated



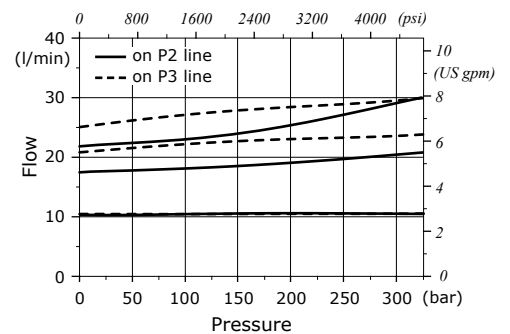
Solenoid operated



Flow regulation diagram



Flow vs. Pressure diagram



Legenda

PPAV1: screw setting type

PPAL1: hand-wheel setting type

PPXN1: without emergency actuation

PPXV1: screw type emergency actuation

PPXL1: hand-wheel emergency actuation

Wrenches and tightening torque

K = wrench 10 - 6.6 Nm (4.9 lbft)

X = wrench 27 - 50 Nm (37 lbft)

Y = 5 Nm (3.7 lbft)

W = allen wrench 4

Z = wrench 8 - 15 Nm (11 lbft)

Valve features

Max. inlet flow: 50 l/min (13.2 US gpm)

Max. regulated flow: 30 l/min (7.9 US gpm)

Inlet flow (PPX types): regulated flow +5%

Max. pressure.: 350 bar (5100 psi) - PPA types

315 bar (4600 psi) - PPX types

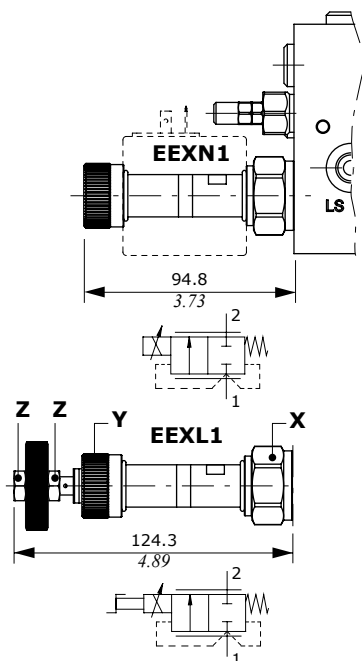
Internal leakage (PPX types) . . .: 150 cm³/min @ 210 bar(9.1 in³/min @ 3050 psi)For coil features and options see **BQP19** or **BH** coils on pages 62 and 63.

Inlet section: options

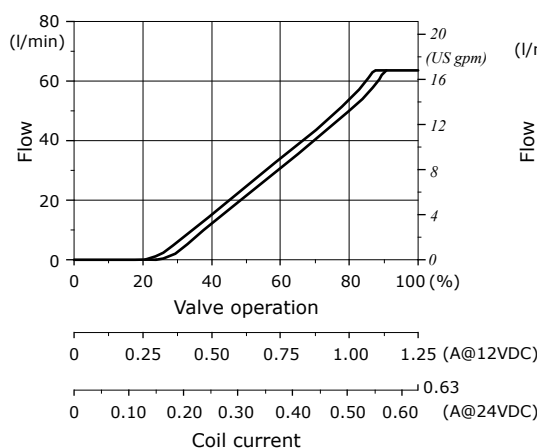
Pressure compensated flow control valve

For sections AN6-AN7-AN11 type

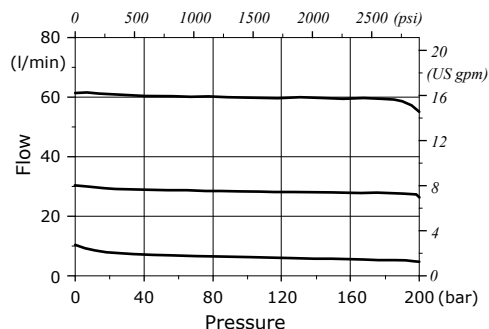
Curves are measured using the standard compensator mounted on section, with 7 bar (100 psi) stand-by.



Flow regulation diagram



Flow vs. Pressure diagram



Legenda

EEXN1: without emergency actuation
EEXL1: hand-wheel emergency actuation

Wrenches and tightening torque

K = wrench 10 - 6.6 Nm (4.9 lbf ft)
 X = wrench 32 - 80 Nm (59 lbf ft)
 Y = 5 Nm (3.7 lbf ft)
 Z = wrench 13 - 9.8 Nm (7.2 lbf ft)

Valve features

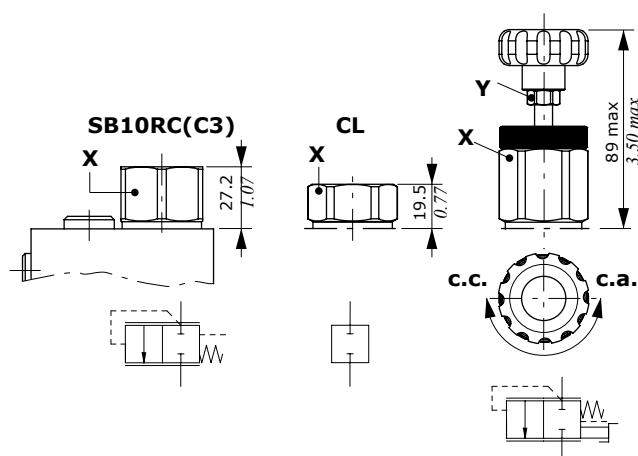
Max. flow: 60 l/min (15.8 US gpm)
 Max. pressure.: 315 bar (4560 psi)
 Internal leakages: 200 cm³/min @ 150 bar
 (12.2 in³/min @ 2175 psi)

For coil features and options see **BQP19** or **BH** coils on pages 62 and 63.

Compensator kit

For sections AN6-AN7-AN11 type

SB7RCV(C5)



Legenda

SB7RC(C5): compensator with 7 bar (100 psi) stand-by, for Open Center circuit
CL: compensator blanking plug, for Closed Center circuit (for AN11 type)
SB7RCV(C5): compensator with 7 bar (100 psi) stand-by, hand-wheel actuation for Open Center to Closed Center circuit switching

Wrenches and tightening torque

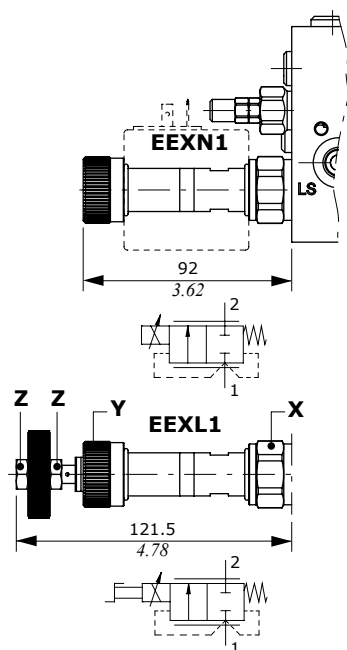
X = wrench 36 - 42 Nm (31 lbf ft)
 Y = wrench 13 - 6.6 Nm (4.9 lbf ft)

Inlet section: options

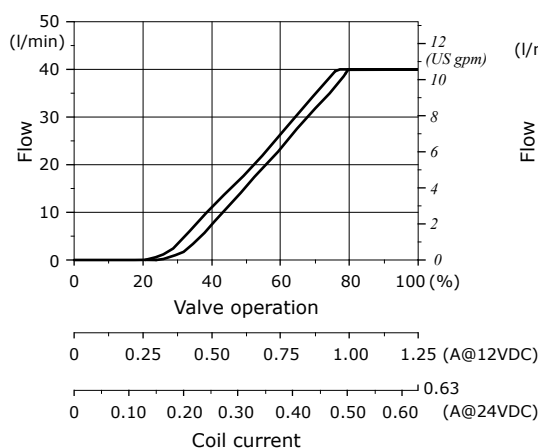
Pressure compensated flow control valve

For sections AN6B-AN7B-AN11B type

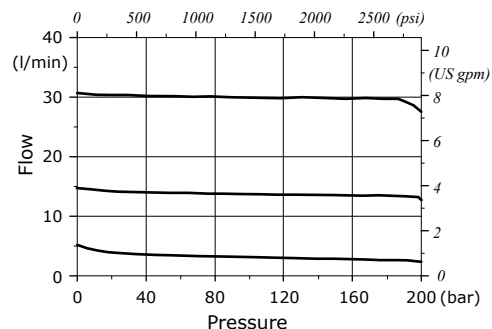
Curves are measured using the standard compensator mounted on section, with 10 bar (145 psi) stand-by.



Flow regulation diagram



Flow vs. Pressure diagram



Legenda

EEXN1: without emergency actuation

EEXL1: hand-wheel emergency actuation

Wrenches and tightening torque

K = wrench 10 - 6.6 Nm (4.9 lbft)

X = wrench 27 - 50 Nm (37 lbft)

Y = 5 Nm (3.7 lbft)

Z = wrench 13 - 9.8 Nm (7.2 lbft)

Valve features

Max. flow 40 l/min (10.6 US gpm)

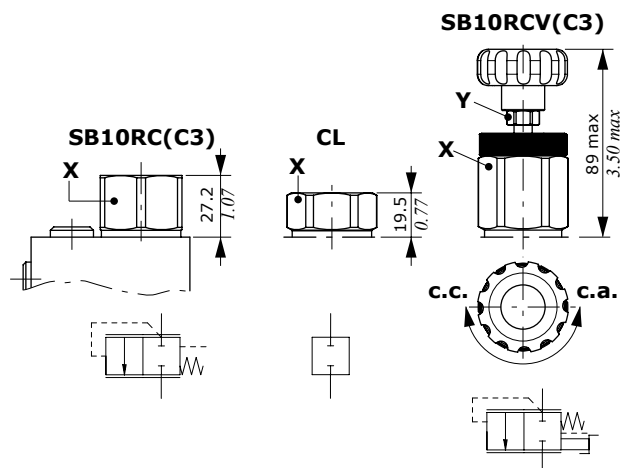
Max. pressure. 300 bar (4350 psi)

Internal leakages 150 cm³/min @ 150 bar
(9.1 in³/min @ 2175 psi)

For coil features and options see **BQP19** or **BH** coils on pages 62 and 63.

Compensator kit

For sections AN6B-AN7B-AN11B type



Legenda

SB10RC(C3): compensator with 10 bar (145 psi) stand-by, for Open Center circuit

CL: compensator blanking plug, for Closed Center circuit (for AN11B type)

SB10RCV(C3): compensator with 10 bar (145 psi) stand-by, hand-wheel actuation for Open Center to Closed Center circuit switching

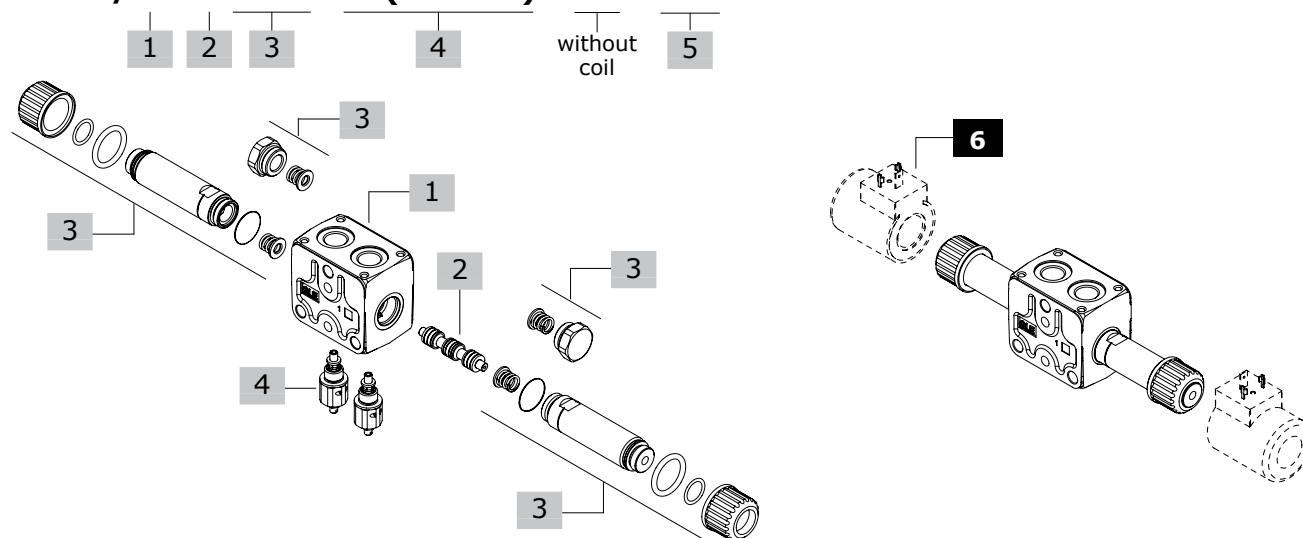
Wrenches and tightening torque

X = wrench 36 - 42 Nm (31 lbft)

Y = wrench 13 - 6.6 Nm (4.9 lbft)

Working section: part ordering codes

SDE060 / P - 1 8ES3 . P3(G3-100) - WC -
 Valve setting (bar)



1 Working section body kit * page 49

Section bodies are cast iron made

TYPE CODE DESCRIPTION

Sections with standard threads: G3/8

Q	5EL1033000	Parallel type, with arrangement for upper flangeable valve block
QS	5EL2033000	As type Q, for series circuit: need spool type 1S# . Only for section up to 60 l/min (15.8 US gpm)
Q(8)	5EL1033500	As type Q, for regenerative circuit on port A: need spool type 8
P	5EL1033010	As type Q, with arrangement for secondary relief valve

Sections with increased threads: G1/2

NF-BSP12	5EL1034010	Parallel type, without arrangement for upper flangeable valve block
QSNF-BSP12	5EL1034011	As type Q, for series circuit: needs spool type 1S# . Only for SDE060 valve
QNF(8)-BSP12	5EL1034500	As type Q, for regenerative circuit on port A: needs spool type 8
PNF-BSP12	5EL1034000	As type Q, with arrangement for secondary port valves

3 On/off solenoid control page 52

TYPE CODE DESCRIPTION

For section up to 60 l/min (15.8 US gpm)

8ES1	5CAN08E110C	Single acting on port A
8ES2	5CAN08E110C	Single acting on port B
8ES3	5CAN08E111C	Double acting
8ES3LHD	5CAN08E311	Double acting with emergency lever operation: needs dedicated spools
8ES3SE	5CAN08E116C	Double acting: for spool type 1S#

For section up to 30 l/min (7.9 US gpm)

8ES1B	5CAN08E114C	Single acting on port A
8ES2B	5CAN08E114C	Single acting on port B
8ES3B	5CAN08E115C	Double acting
8ES3BLHD	5CAN08E315	Double acting with emergency lever operation: needs dedicated spools

NOTES (#) - For Series circuit configuration rules see page 31.

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

2 Spool page 51

TYPE CODE DESCRIPTION

For ON/OFF solenoid control

1	3CU9010102	Double acting, A and B closed in neutral pos.
1A	3CU9010103	Double acting, A to tank in neutral pos. For connect B to tank (type 1B) is necessary to turn the spool
2	3CU9025100	Double acting, A and B to tank in neutral pos.
2H	3CU9025225	Double acting, A and B partially to tank in neutral position
1S	3CU9010101	Double acting, for series circuit: needs control type 8ES3SE and section type QS-QSNF#
8	3CU9080100	Double acting, for regenerative circuit, for 30 l/min (7.9 US gpm): needs section type Q8

For ON/OFF solenoid control with emergency lever operation

1LHD	3CU9010300	As type 1
1ALHD	3CU9010303	As type 1A
2LHD	3CU9020300	As type 2
2HLHD	3CU9020310	As type 2H

4 Port relief valves page 50

Standard setting is referred to 10 l/min (2.6 US gpm) flow.

TYPE CODE DESCRIPTION

P(G3-100)	5KIT060000	From 50 to 200 bar (725 to 2900 psi), standard setting 100 bar (1450 psi)
P(G4-200)	5KIT060001	From 200 to 315 bar (2900 to 4600 psi), standard setting 200 bar (2900 psi)
P3T	5KIT060100	A and B ports valve blanking plugs

5 Section threading

Specify threading always when it is different from BSP standard (see page 4).

6 Optional coils page 62

For list of available coils see pages of related sections

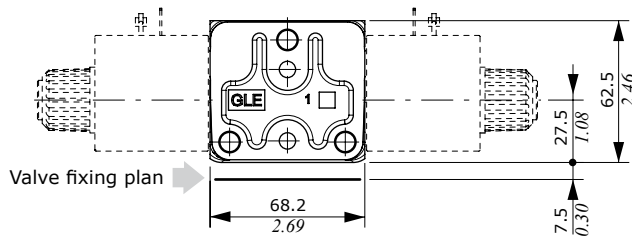
7 Protective bellow page 54

TYPE CODE DESCRIPTION

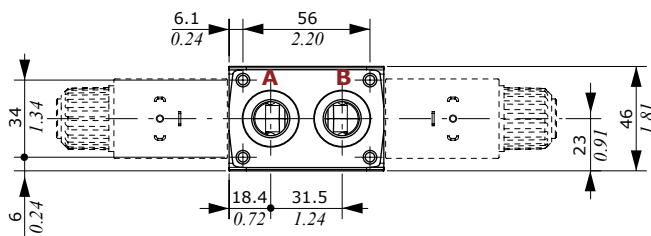
-	4ACC512-C	Cap for solenoid ring nut D12C
-	4ACC515-C	Cap for solenoid ring nut D15C

Dimensions and hydraulic circuit

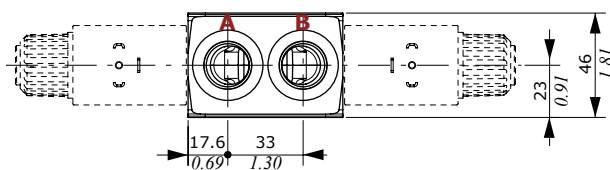
Working section Q type



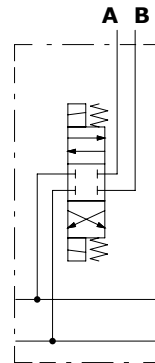
Standard port thread: G3/8
with arrangement for valve blocks



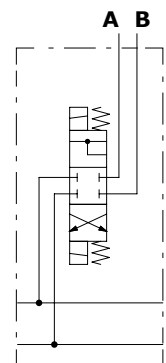
Increased port thread: G1/2
without arrangement for valve blocks (NF type)



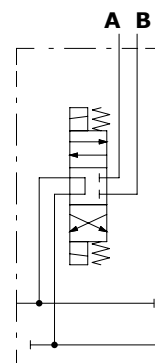
Q type: parallel circuit
(with spool type 1)



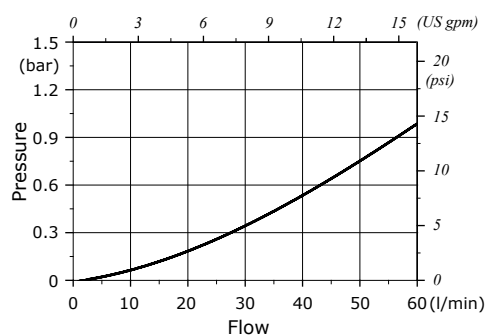
Q8 type: regenerative circuit
(needs spool type 8)



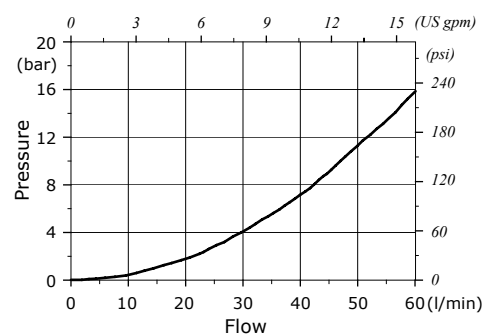
QS type for series circuit
(needs spool type 1S)



Flow through pressure drop
(parallel and regenerative circuits)



Flow through pressure drop
(QS series section with 1S spool)



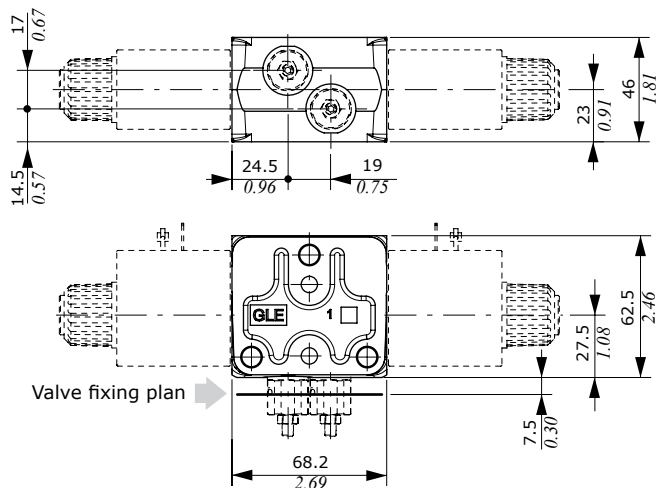
Working section

Dimension and hydraulic circuit

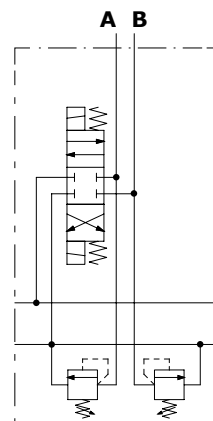
Working section P type

With arrangement for secondary port valves.

P type section is available also with increased port threads (G1/2): see Q type section for dimensional data.

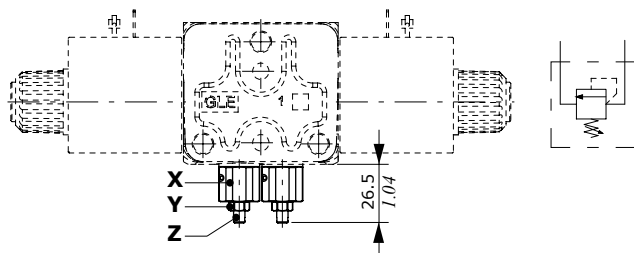


P type: parallel circuit (with spool type 1)

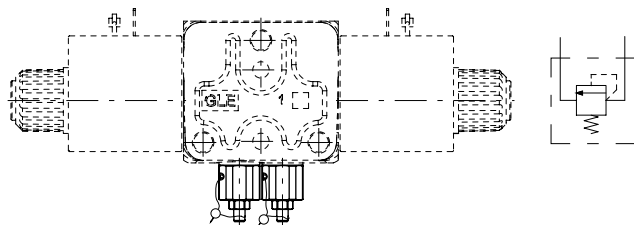


Port relief valves

G type



H type



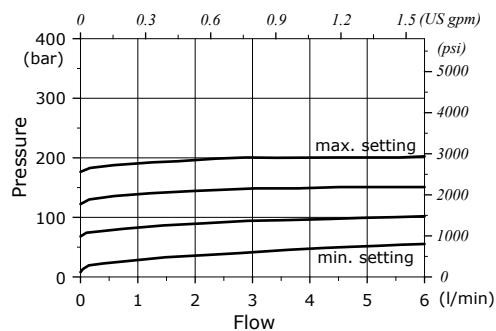
Legenda

G: screw setting type
H: valve set and locked

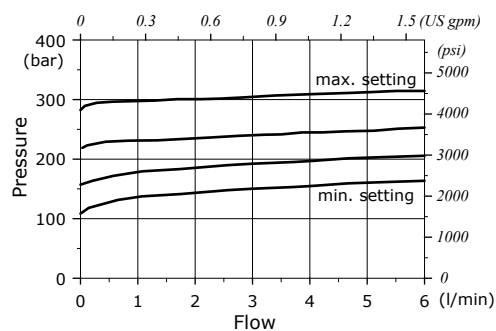
Wrenches and tightening torque

X = wrench 17 - 24 Nm (17.7 lbf ft)
Y = wrench 8 - 6.6 Nm (4.9 lbf ft)
Z = allen wrench 2.5

Setting range: G3 type



Setting range: G4 type

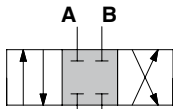


Spools

Types 1-1LHD

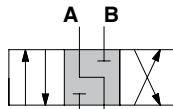
Double acting, A and B closed in neutral position

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**Types 1A-1ALHD**

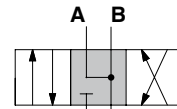
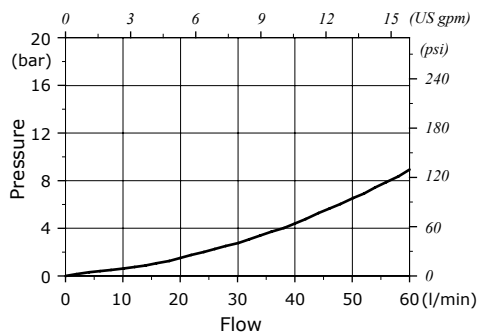
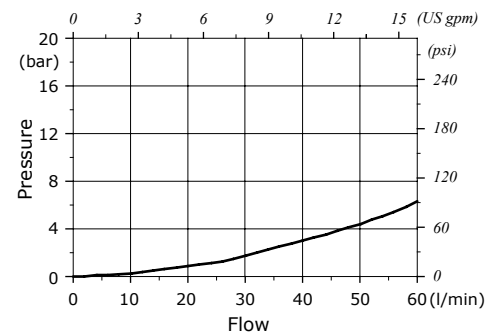
Double acting, A to tank in neutral position

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**Types 2-2LHD**

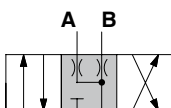
Double acting, A and B to tank in neutral position

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**P⇒port - port⇒T pressure drops**
(curves are matched)**P⇒port - port⇒T pressure drops**
(curves are matched)**Types 2H-2HLHD**

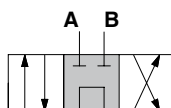
Double acting, A and B partially to tank in neutral position

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**Types 1S**

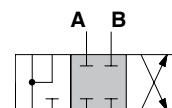
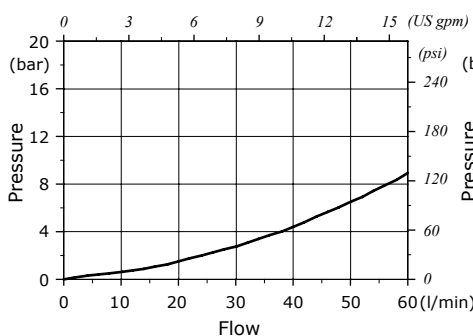
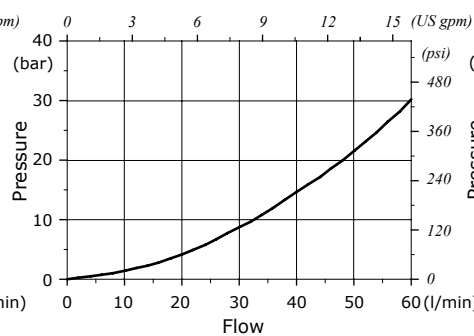
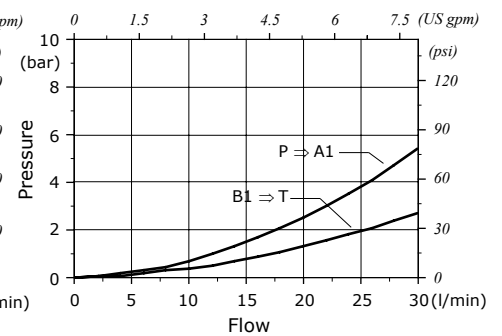
Double acting, for series circuit

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**Types 8**

Double acting, for regenerative circuit

1 0 2

**Stroke**position 1: + 3 mm (+ 0.12 in)
position 2: - 3 mm (- 0.12 in)**P⇒port - port⇒T pressure drops**
(curves are matched)**P⇒port - port⇒T pressure drops**
(curves are matched)**P⇒port - port⇒T pressure drops**
indicated for 30 l/min (7.9 US gpm) max

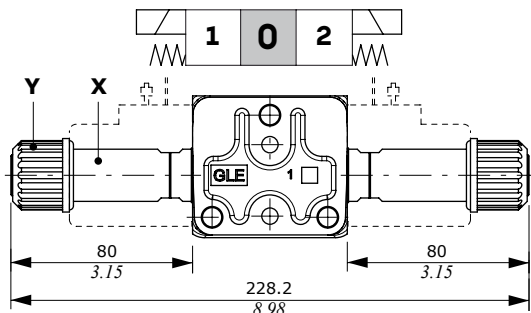
Working section

On/off solenoid control: 8ES3 - 8ES1 - 8ES2 - 8ES3SE types

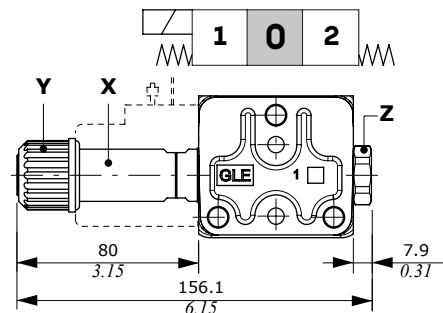
For section configuration up to 60 l/min (15.8 US gpm) flow rate.

When the section is configured with flangeable valve block, the coils on control must be rotated 180°

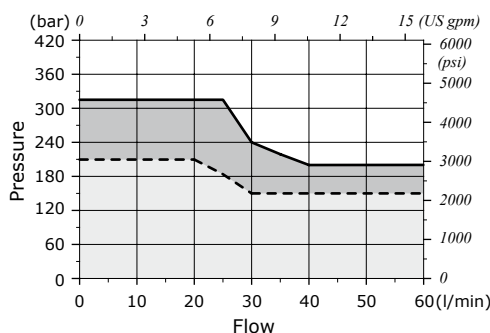
8ES3 - 8ES3SE: double acting control kit



8ES1: single acting on A control kit



Operating condition (stroke 3 mm - 0.12 in)



Wrenches and tightening torque

X = wrench 20 - 24 Nm (17.7 lbft)

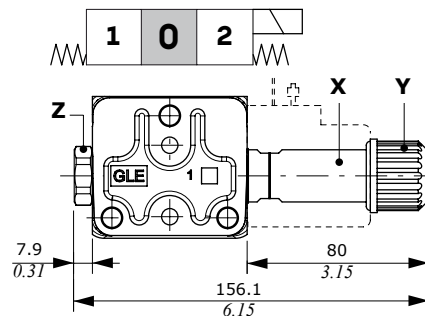
Y = 15 Nm (11 lbft)

Z = wrench 24 - 24 Nm (17.7 lbft)

For coil options and features see **D15C** coil on pages 62 and 64.

— SDE060 with 8ES3 control kit;
parallel circuit
--- SDE060 with 8ES3SE control kit;
series circuit

8ES2: single acting on B control kit



On/off solenoid control with lever: type 8ES3LHD

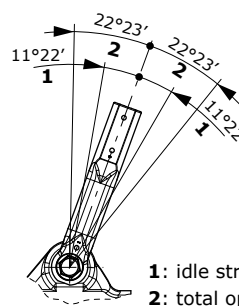
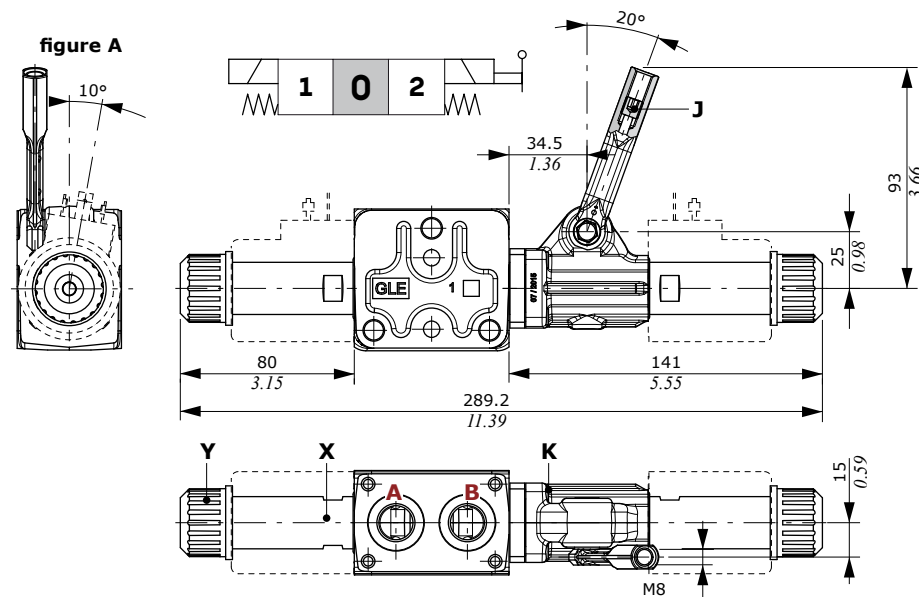
For section configuration up to 60 l/min (15.8 US gpm) flow rate; this control is not suitable for series circuit.

To properly operation the coil on lever side must be rotated 10° (figure A).

When the section is configured with flangeable valve block, the control (with coil) must be rotated 180°.

The control needs dedicated spools: see page 48 for list.

IMPORTANT: lever to be used only for emergency operation, not for continuative use.



Wrenches and tightening torque

J = wrench 4 - 9.8 Nm (7.2 lbft)

K = allen wrench 4 - 6.6 Nm (4.9 lbft)

X = wrench 20 - 24 Nm (17.7 lbft)

Y = 15 Nm (11 lbft)

Control features

Max. back pressure on T : 30 bar (435 psi)

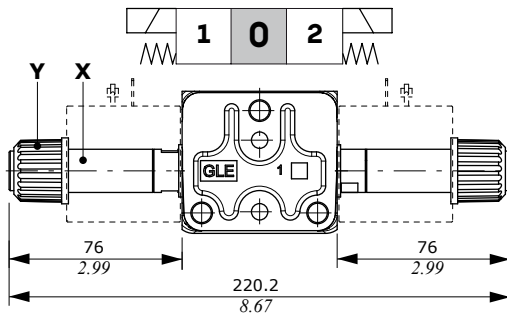
For coil options and features see **D15C** coil on pages 62 and 64.

Working section

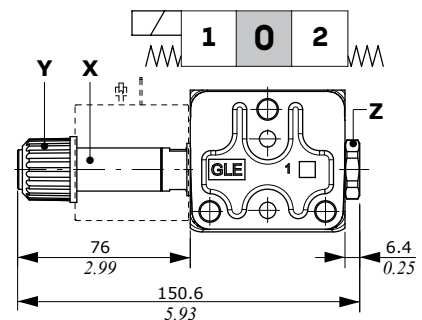
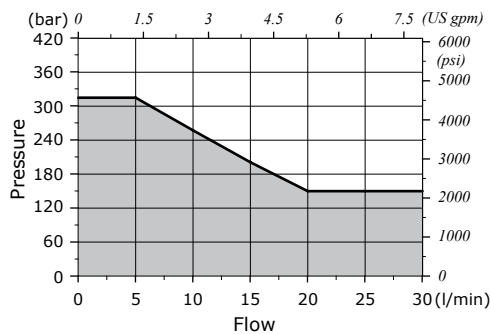
On/off solenoid control: 8ES3B - 8ES1B - 8ES2B types

For section configuration up to 30 l/min (7.9 US gpm) flow rate; control is not suitable for series circuit
When the section is configured with flangeable valve block, the coils on control must be rotated 180°

8ES3B: double acting control kit



8ES1B: single acting on A control kit

Operating condition
(stroke 3 mm - 0.12 in)

Wrenches and tightening torque

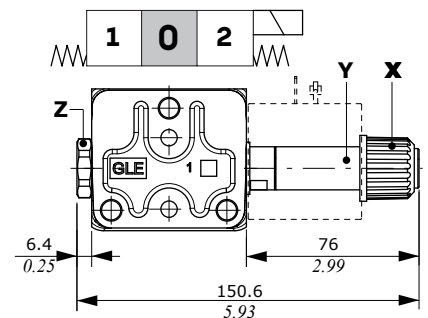
X = wrench 17 - 24 Nm (17.7 lbft)

Y = 6.6 Nm (4.9 lbft)

Z = wrench 24 - 24 Nm (17.7 lbft)

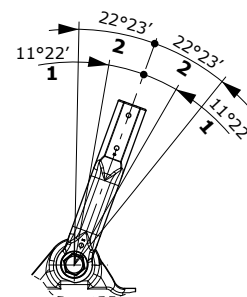
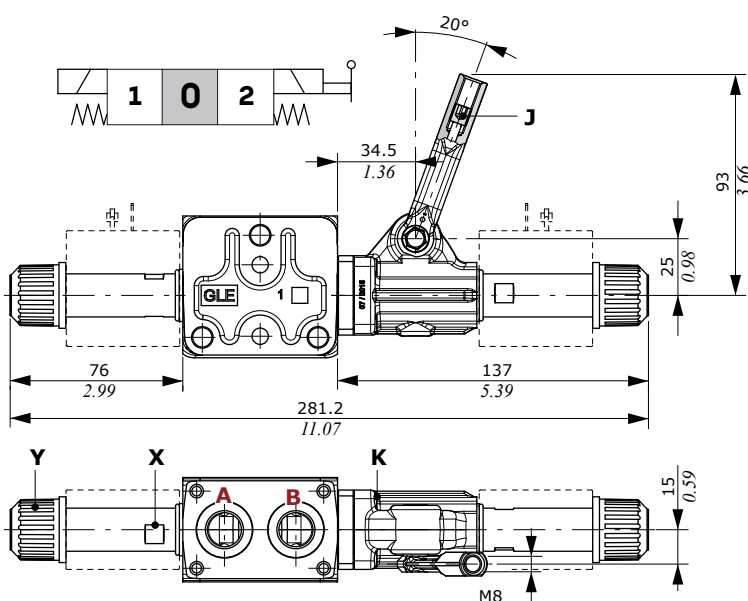
For coil options and features see **D12C** coil on pages 62 and 64.

8ES2B: single acting on B control kit



On/off solenoid control with lever: 8ES3BLHD type

For section configuration up to 30 l/min (7.9 US gpm) flow rate; this control is not suitable for series circuit
When the section is configured with flangeable valve block, the control (with coil) must be rotated 180°.
The control needs dedicated spools: see page 48 for list.
IMPORTANT: lever to be used only for emergency operation, not for continuative use.



1: idle stroke angles
2: total operation angles

Wrenches and tightening torque

J = wrench 4 - 9.8 Nm (7.2 lbft)

K = allen wrench 4 - 6.6 Nm (4.9 lbft)

X = wrench 17 - 24 Nm (17.7 lbft)

Y = 6.6 Nm (4.9 lbft)

Control features

Max. back pressure on T : 30 bar (435 psi)

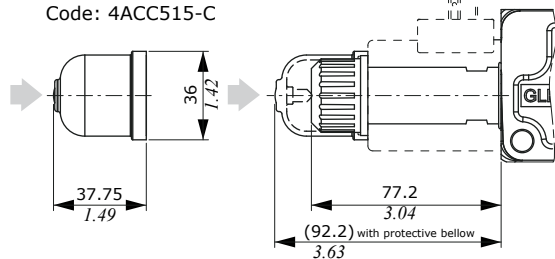
For coil options and features see **D12C** coil on pages 62 and 64.

Working section

Protective bellow

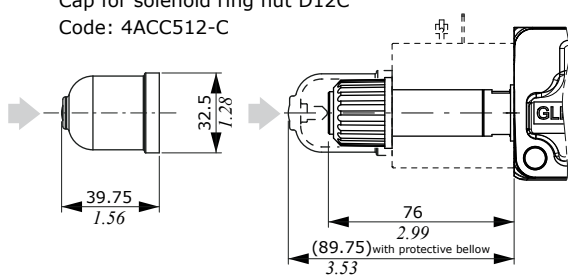
Cap for solenoid ring nut D15C
Code: 4ACC515-C

Push for
manual
override



Cap for solenoid ring nut D12C
Code: 4ACC512-C

Push for
manual
override

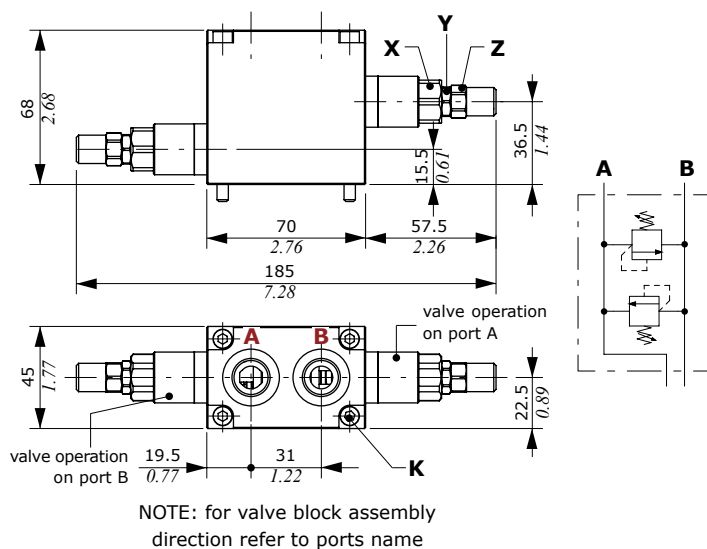


Flangeable valve blocks

Antishock valves with cross operation

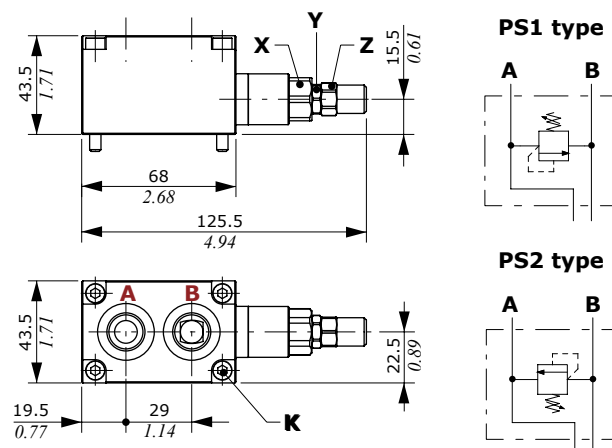
8ES on/off solenoid controls (with or without lever operation) must be rotated 180°.

PS3 type: valves on both ports



PS1 or PS2 types: valve on single port

(PS1 type is drawn: PS2 type has the valve mounted on the opposite side and the same dimensions)



Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbft)

X = wrench 19 - 42 Nm (31 lbft)

Y = wrench 13 - 24 Nm (17.7 lbft)

Z = wrench 13 - 6.6 Nm (4.9 lbft)

Ordering codes

TYPE	CODE	DESCRIPTION
Complete antishock valves		
PS1(DC3-160)	619001000	Valve with operation on port A
PS2(DC3-160)	619001000	Valve with operation on port B
PS3(DC3-160\DC4-200)	619001103	Valves with operation on port A (160) and B (200)

Part #1: Valve kit

Valve standard setting is referred to 5 l/min (1.3 US gpm) flow, considering the valve mounted on block.

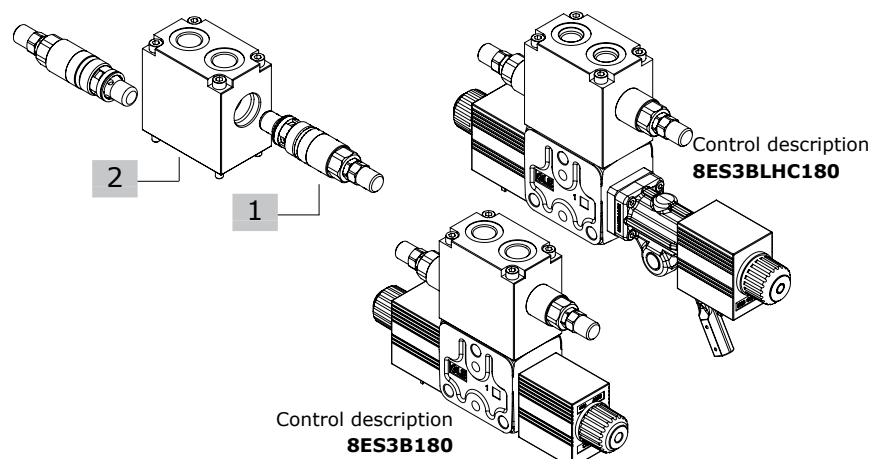
(DC2-60)	1100520460	Range 20-80 bar (290-1150 psi) std setting 60 bar (870 psi)
(DC3-160)	1100520408	Range 50-220 bar (725-3200 psi) std setting 160 bar (2300 psi)
(DC4-280)	1100520414	Range 180-350 bar (2600-5100 psi) std setting 280 bar (4050 psi)

PST XTAP623282 Valve blanking plug

Part #2: Block body kit

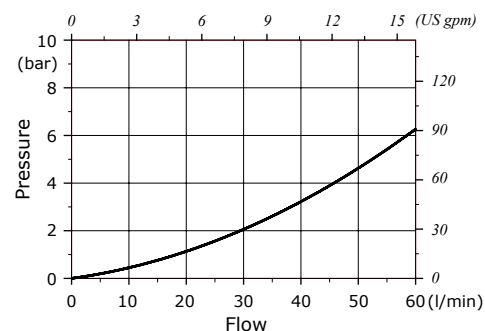
PS1-PS2 5COR245682 For single valve on port A or B

PS3 5COR245680 For valves on port A and B

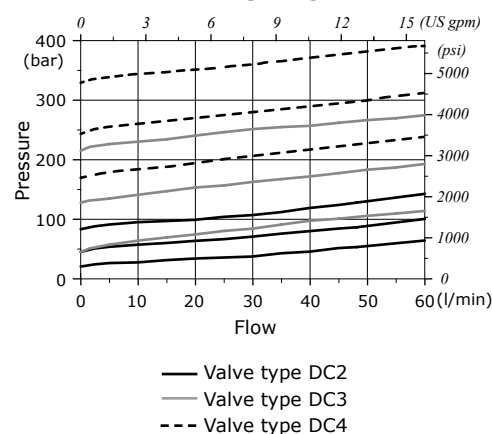


Antishock valve pressure drops

P → port - port → T
(curves are matched)



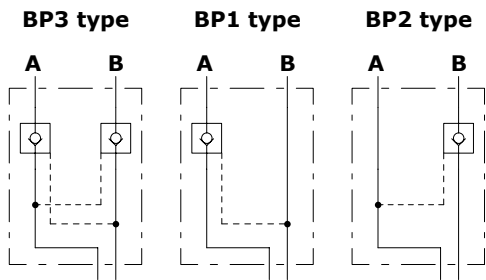
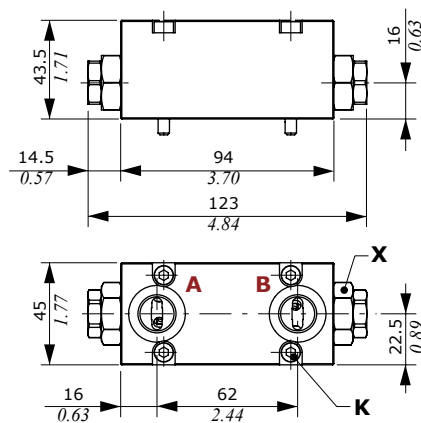
Setting range



Flangeable valve blocks

Check valves

8ES on/off solenoid controls (with or without lever operation) must be rotated 180°.

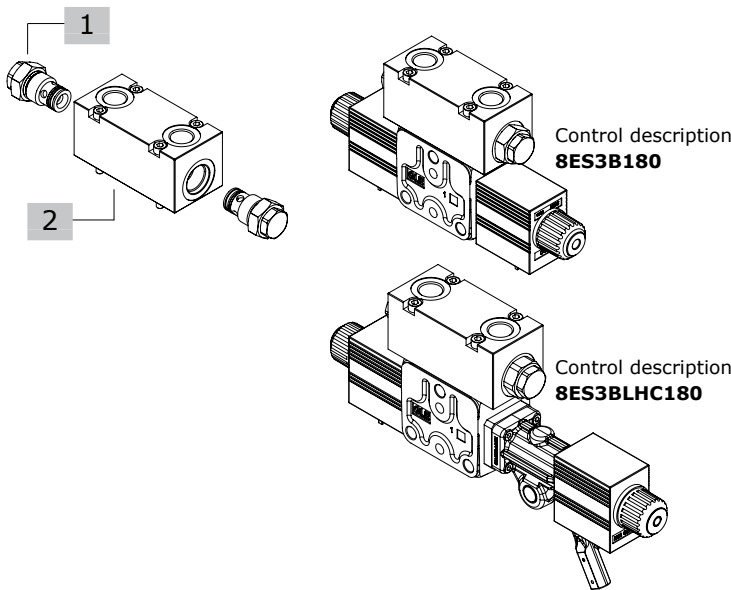
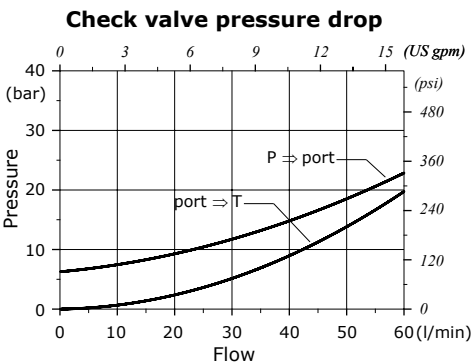


Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbft)
X = wrench 29 - 42 Nm (31 lbft)

Ordering codes

TYPE	CODE	DESCRIPTION
Complete valve block		
BP1	619002000	Valve on port A
BP2	619002000	Valve on port B
BP3	619002100	Valves on ports A and B
Part #1: Valve kit		
BP	1300020402	Check valve
TBP	XTAP627260	Valve blanking plug
Part #2: Body kit and piston		
-	5COR245892	Block body kit
-	3PIS214480	Piston

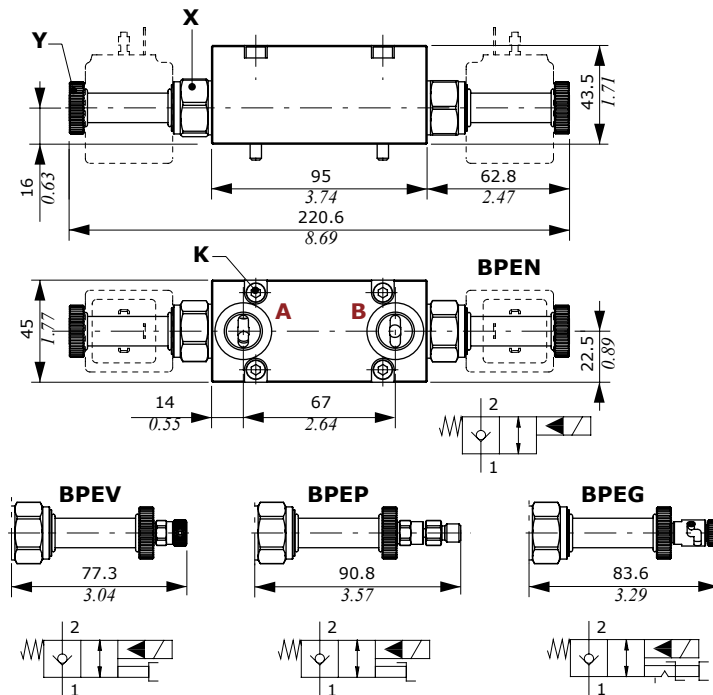


Flangeable valve blocks

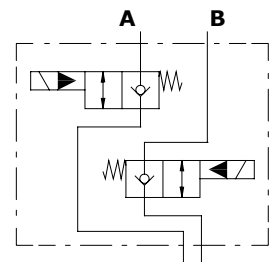
Solenoid operated check valves

8ES on/off solenoid controls (with or without lever operation) must be rotated 180°.

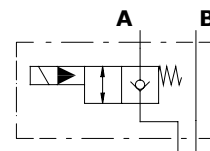
BPE(NC) type: normally closed circuit



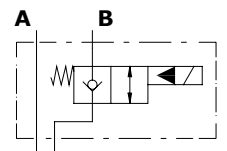
BPEN3(NC) type



BPEN1(NC) type



BPEN2(NC) type



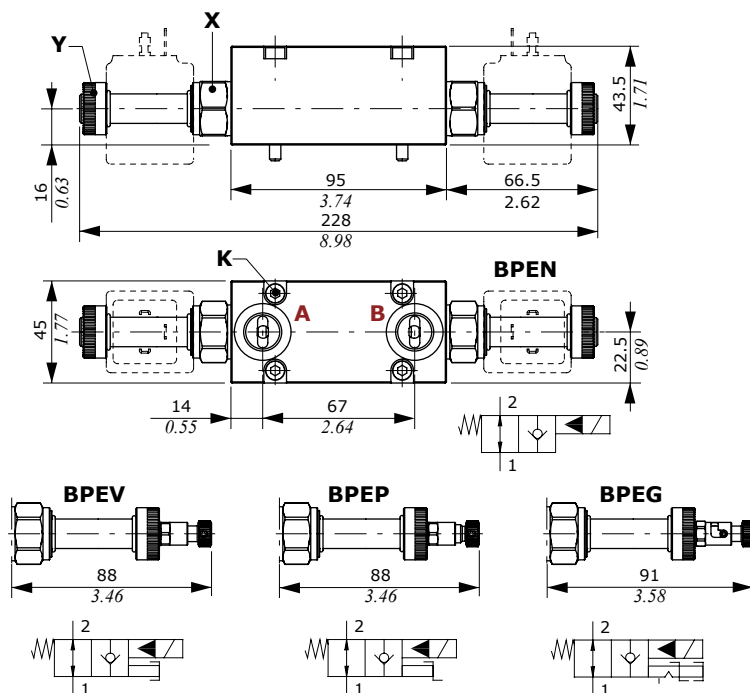
Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbf ft)

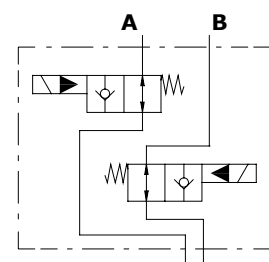
X = wrench 24 - 30 Nm (22 lbf ft)

Y = 5 Nm (3.7 lbf ft)

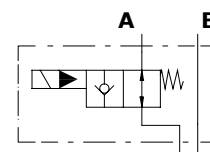
BPE(NA) type: normally open circuit



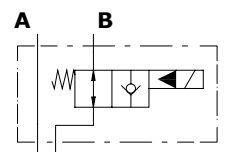
BPEN3(NA) type



BPEN3(NA) type



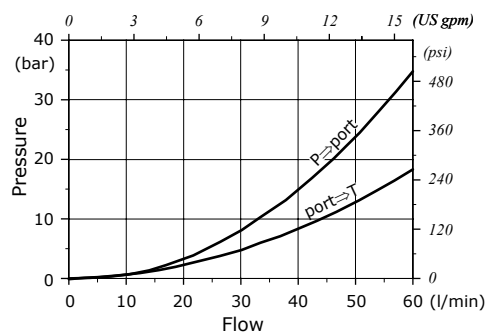
BPEN3(NA) type



Flangeable valve blocks

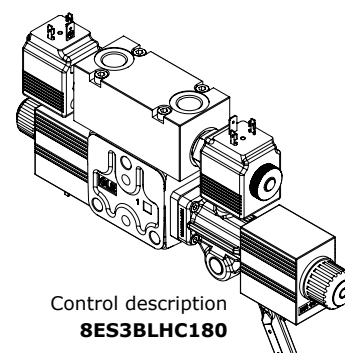
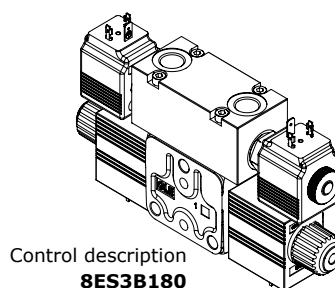
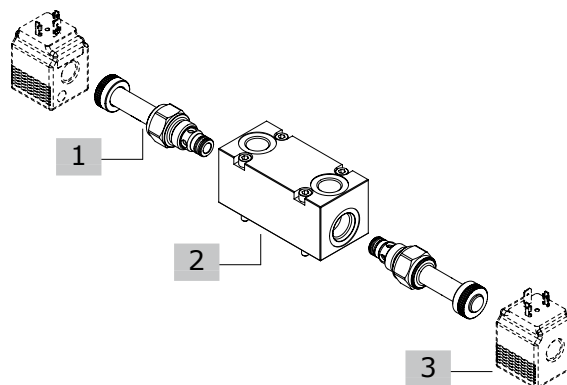
Solenoid operated check valves

Check valve pressure drop
(curves without section)



Ordering codes

TYPE	CODE	DESCRIPTION
Complete valve block, without coil		
BPEN1(NC)-WC	Y64S363001	On ports A, NC circuit, without manual emergency
BPEN2(NC)-WC	Y64S363001	As previous, on port B
BPEN3(NC)-WC	Y64S363000	As previous, on ports A and B
Part #1: Valve kit		
TBPE	3XTAP822150	Valve blanking plug
Normally closed circuit		
BPEN(NC)	0EC08002032	Without manual emergency
BPEV(NC)	0EC08002037	With screw type emergency
BPEP(NC)	0EC08002036	With pull-button emergency
BPET(NC)	0EC08002038	With "pull & twist" emergency
Normally open circuit		
BPEN(NA)	0EC08002031	Without manual emergency
BPEV(NA)	0EC08002034	With screw type emergency
BPEP(NA)	0EC08002033	With push-button emergency
BPET(NA)	0EC08002035	With "push & twist" emergency
Part #2: Block body kit		
BPE3	5COR245950	Block body kit
Part #3: Coil		
Valves needs type BER coil, see page 62.		

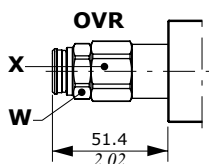
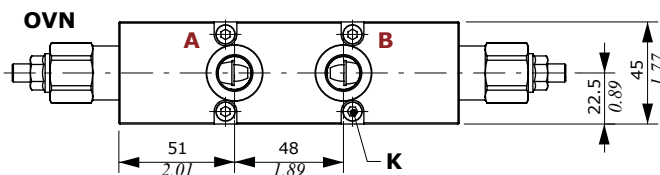
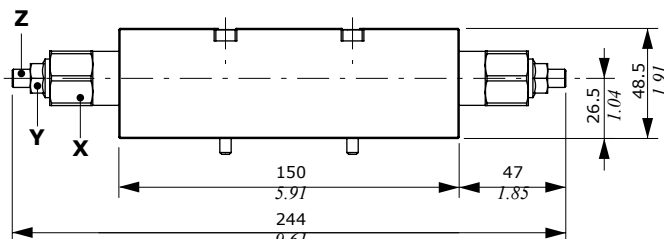


Flangeable valve blocks

Counterbalance valves

8ES on/off solenoid controls (with or without lever operation) must be rotated 180°.

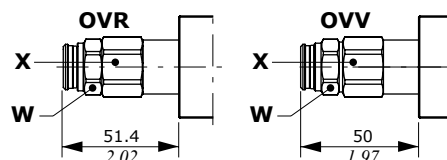
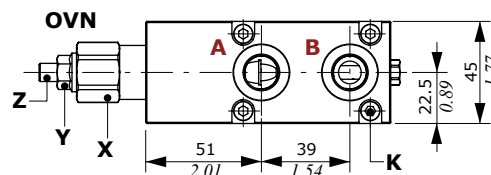
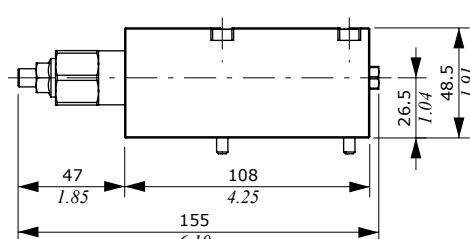
Double acting valve



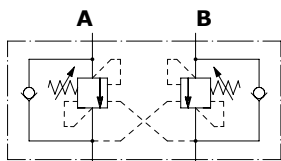
Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbft)
 X = allen wrench 24 - 50 Nm (37 lbft)
 Y = wrench 13 - 15 Nm (11 lbft)
 Z = allen wrench 4
 W = wrench 22 - 35 Nm (25.8 lbft)

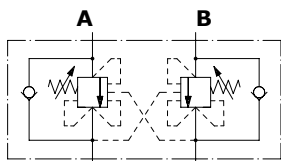
Single acting valve



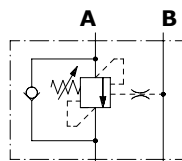
OVN301 type



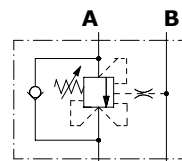
OVR301 type



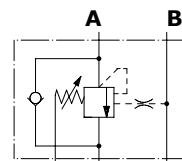
OVR101 type



OVR101 type



OVV101 type



Ordering codes

TYPE CODE DESCRIPTION

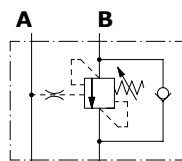
Single counterbalance valves

OVN101	1515322100	On port A, load sensitive, pilot ratio = 4
OVN201	1515322100	As previous, on ports B
OVR101	1515422100	On port A, relief compens., pilot ratio = 4
OVR201	1515422100	As previous, on ports B
OVV101	1515522100	On port A, vented type, pilot ratio = 4
OVV201	1515522100	As previous, on port B

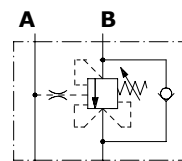
Double counterbalance valves

OVN301	1555222100	Load sensitive, pilot ratio = 4
OVR301	1555322100	Relief compensated, pilot ratio = 4

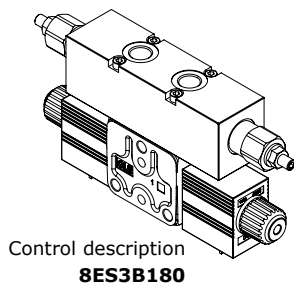
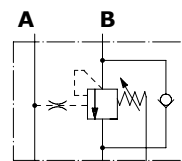
OVN201 type



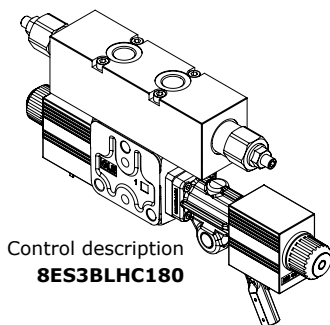
OVR201 type



OVV201 type

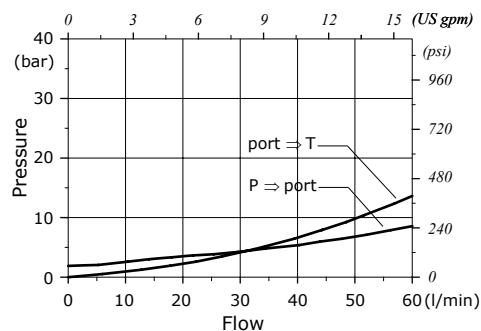


Control description
8ES3B180



Control description
8ES3BLHC180

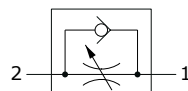
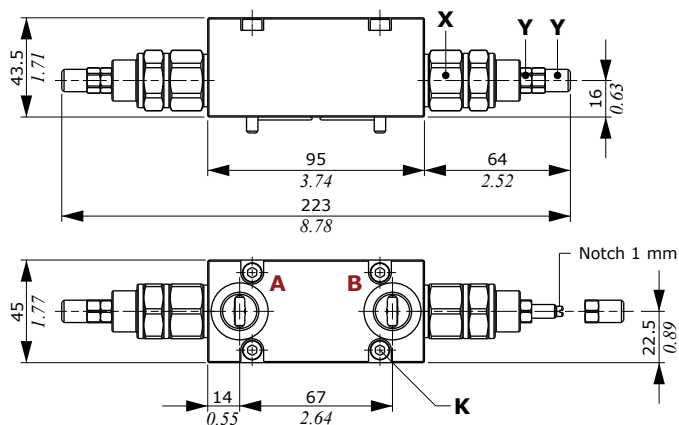
Counterbalance valves pressure drop



Flangeable valve blocks

Flow control valves

8ES on/off solenoid controls (with or without lever operation) must be rotated 180°.



Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbf ft)

X = wrench 24 - 30 Nm (22 lbf ft)

Y = wrench 10 - 6,6 Nm (4.9 lbf ft)

Ordering codes

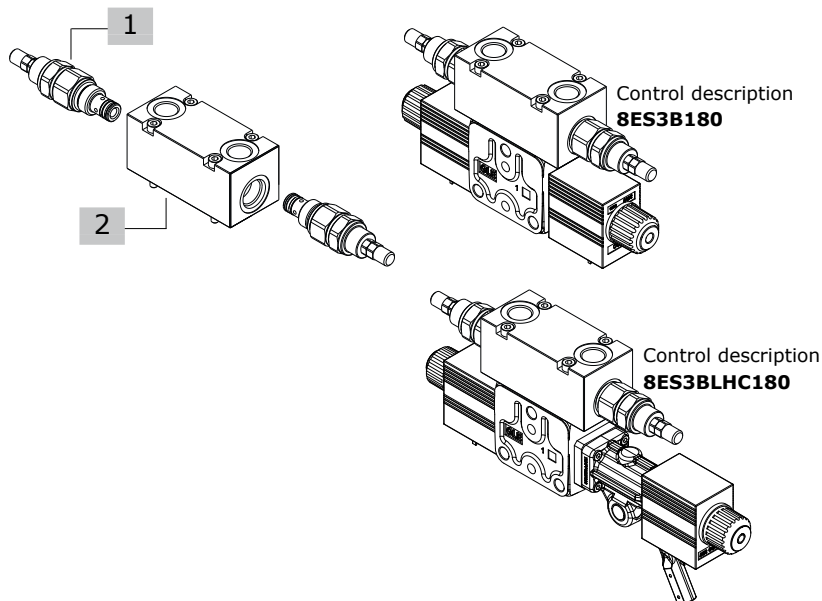
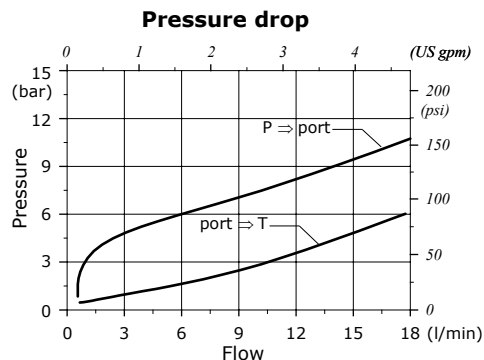
TYPE	CODE	DESCRIPTION
Complete valve block		
NU08A/AS1B1	619004000	Valve on port A
NU08A/AS1B2	619004000	Valve on port B
NU08A/AS1B3	619004100	Valves on ports A and B

Part #1: Valve kit

NU08A/AS1B	0NU08002001	Check valve
-	3XTAP822150	Valve blanking plug

Part #2: Body kit

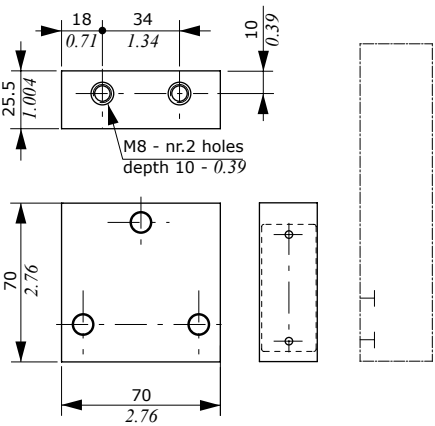
-	5COR245950	Block body kit
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Dimensions and hydraulic circuit

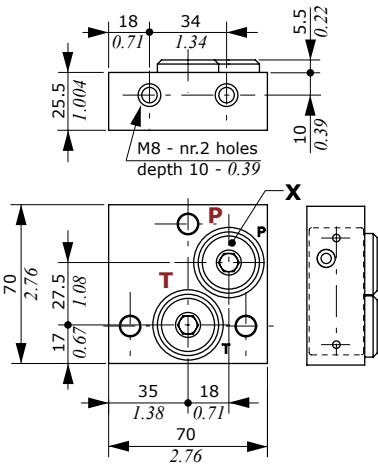
Without port arrangement

RF type

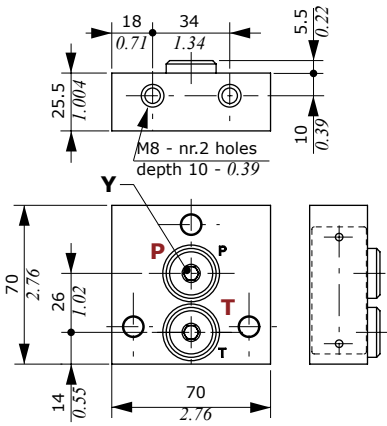


With port arrangement

RS - RP - RT types
drawing shows RS type



RSB - RPB - RTB types
drawing shows RS type



Wrenches and tightening torque

X = allen wrench 8 - 24 Nm (17.7 lbft)
Y = allen wrench 6 - 24 Nm (17.7 lbft)

RS-RSB types
P and T ports plugged



RP-RPB types
P open, T plugged



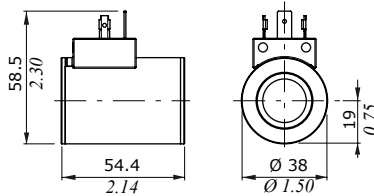
RT-RTB types
T open, P plugged



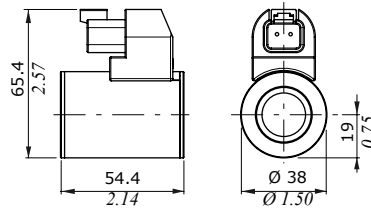
Coils and connectors

BH type

ISO4400 connector



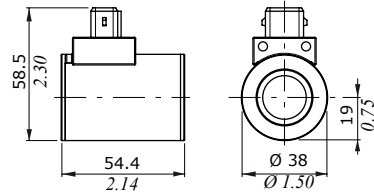
DEUTSCH DT04 connector



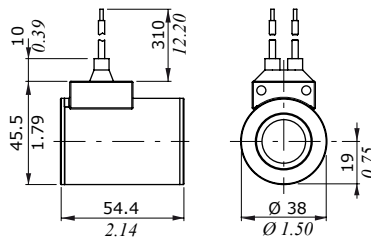
Features

Nominal voltage tolerance : $\pm 10\%$
 Power rating : 33 W - 12/24 VDC
 Max. oper. current (on/off) : 2.75 A - 12 VDC
 : 1.38 A - 24 VDC
 Max. prop. control current : 1.7 A - 12 VDC
 : 0.85 A - 24 VDC
 Coil insulation : Class H
 (180°C - 356°F)
 Weather protection : IP65 - ISO4400
 : IP69K - Deutsch DT
 : IP65 - AMP JPT
 Insertion : 100%

AMP JPT connector

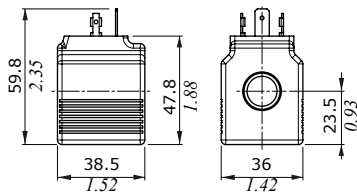


Flying leads

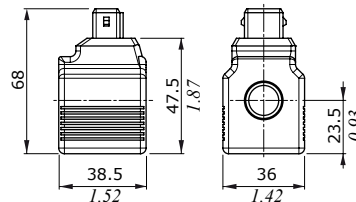


BER type

ISO4400 connector



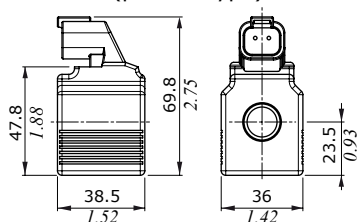
DEUTSCH DT04 connector
(perpendicular type)



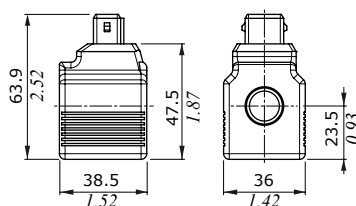
Features

Nominal voltage tolerance : $\pm 10\%$
 Power rating : 19.2 W @ 10/12/24/48/
 110/220 VDC
 : 19 W @ 24/110/220 RAC
 : 19.2 W @ 48 RAC
 Max. operating current : 1.9 A @ 10 VDC
 : 1.61 A @ 12 VDC
 : 0.80 A @ 24 VDC
 : 0.40 A @ 48 VDC
 : 0.17 A @ 110 VDC
 : 0.09 A @ 220 VDC
 : 0.89 A @ 24 RAC
 : 0.45 A @ 48 RAC
 : 0.19 A @ 110 RAC
 : 0.09 A @ 220 RAC
 Coil insulation : Class H (180°C - 356°F)
 Weather protection : IP65 - ISO4400
 : IP69K - Deutsch DT
 : IP65 - AMP JPT
 : IP67 - Weatherpack
 : IP67 - Metri-pack
 Insertion : 100%

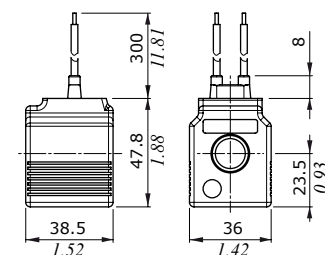
DEUTSCH DT04 connector
(parallel type)



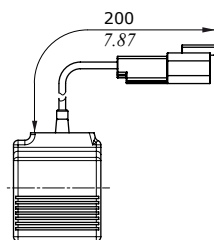
AMP JPT connector



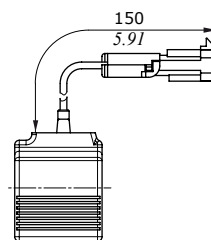
Flying leads



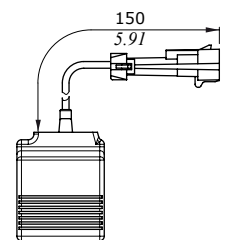
Flying leads with
DEUTSCH DT04 connector



Flying leads with PACKARD
WEATHER-PACK connector



Flying leads with PACKARD
METRI-PACK connector

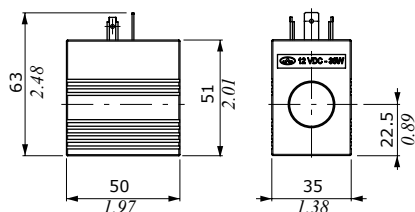


Accessories

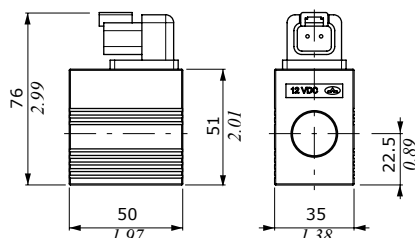
Coils and connectors

D12C type

ISO4400 connector



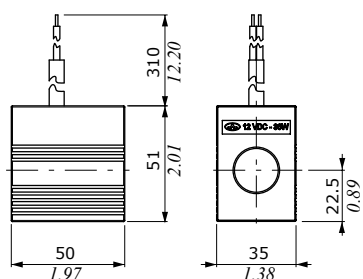
DEUTSCH DT04 connector



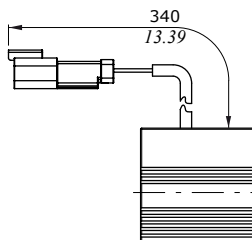
Features

Nominal voltage tolerance : $\pm 10\%$
 Power rating : 36 W @
 : 10.5/12/24 VDC
 Max. operating current . . : 3.43 A @ 10.5 VDC
 : 3 A @ 12 VDC
 : 1.5 A @ 24VDC
 Coil insulation : Class H (180°C - 356°F)
 Weather protection : IP65 - ISO4400
 : IP69K - Deutsch DT
 : IP65 - AMP JPT
 Insertion : 100%

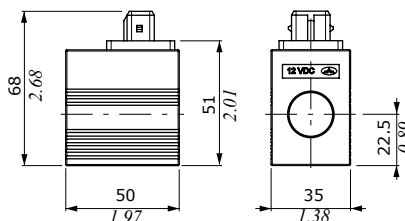
Flying leads



Flying leads with DEUTSCH DT04 connector

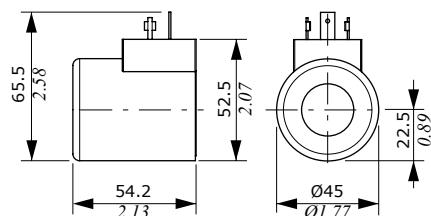


AMP JPT connector

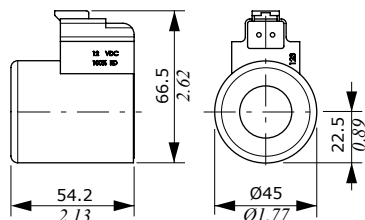


D15C type

ISO4400 connector



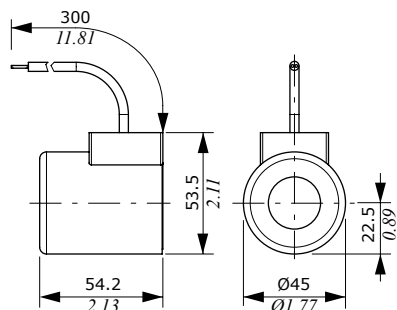
DEUTSCH DT04 connector



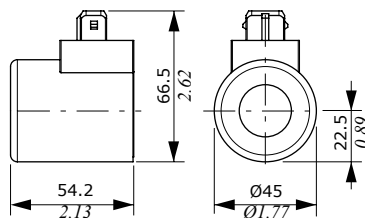
Features

Nominal voltage tolerance : $\pm 10\%$
 Power rating : 38 W @
 : 12/14/24/ VDC
 Max. operating current . . : 3.16 A @ 12 VDC
 : 2.75 A @ 14VDC
 : 1.58 A @ 24VDC
 Coil insulation : Class H
 : (180°C - 356°F)
 Weather protection : IP65 - ISO4400
 : IP69K - Deutsch DT
 : IP65 - AMP JPT
 Insertion : 100%

Flying leads



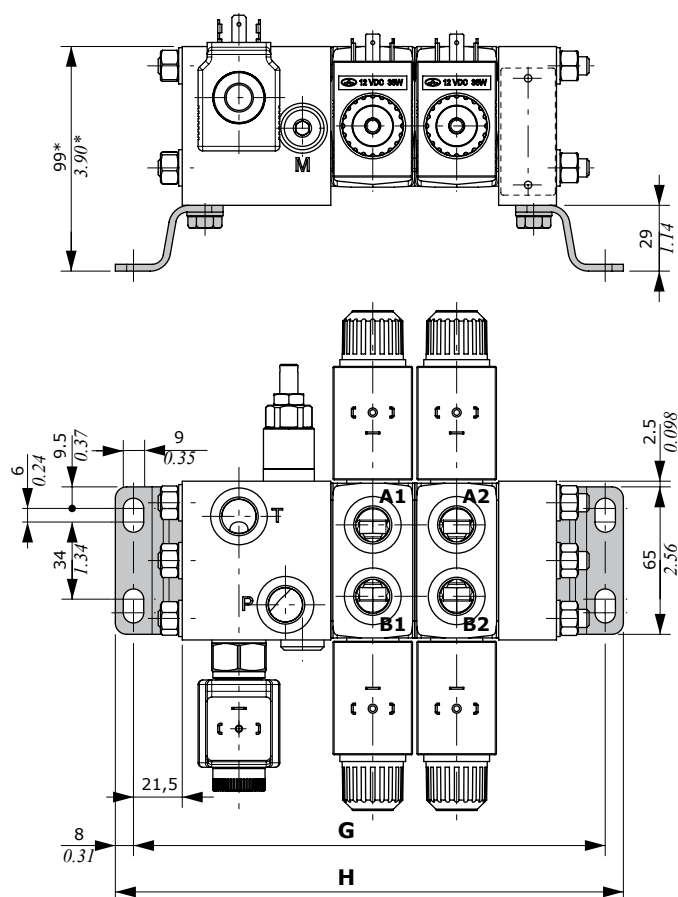
AMP JPT connector



Fixing brackets

SDE030

Dimensions (*) are referred to directional valve with N1 type inlet section.



TYPE	with section N type				with sections N1-N2-N6-N7 type				with sections N14-N15-N16 type			
	G		H		G		H		G		H	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
SDE030/1	134	5.28	150	5.91	171	6.73	187	7.36	171	6.73	187	7.36
SDE030/2	171	6.73	187	7.36	208	8.19	224	8.82	208	8.19	224	8.82
SDE030/3	208	8.19	224	8.82	245	9.65	261	10.28	245	9.65	261	10.28
SDE030/4	245	9.65	261	10.28	282	11.10	298	11.73	282	11.10	298	11.73
SDE030/5	282	11.10	298	11.73	319	12.56	335	13.19	319	12.56	335	13.19
SDE030/6	319	12.56	335	13.19	356	14.02	372	14.65	356	14.02	372	14.65
SDE030/7	356	14.02	372	14.65	393	15.47	409	16.10	393	15.47	409	16.10
SDE030/8	393	15.47	409	16.10	430	16.93	446	17.56	430	16.93	446	17.56
SDE030/9	430	16.93	446	17.56	467	18.39	483	19.02	467	18.39	483	19.02
SDE030/10	467	18.39	483	19.02	504	19.84	520	20.47	504	19.84	520	20.47

SDE030-SDE060

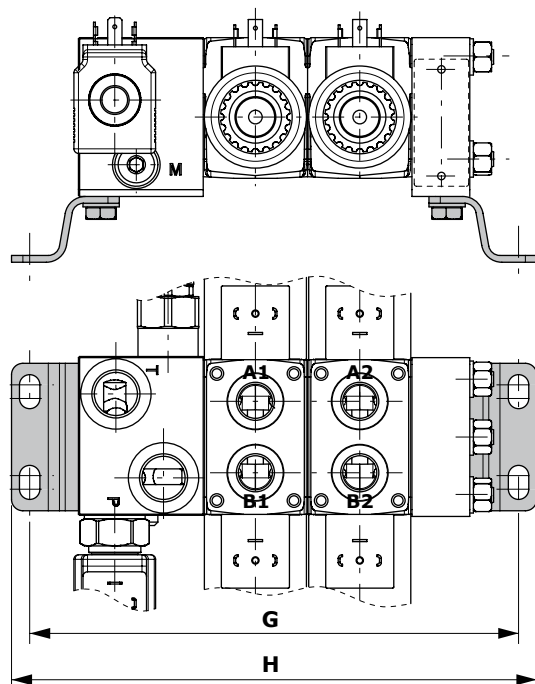
Accessories

Fixing brackets

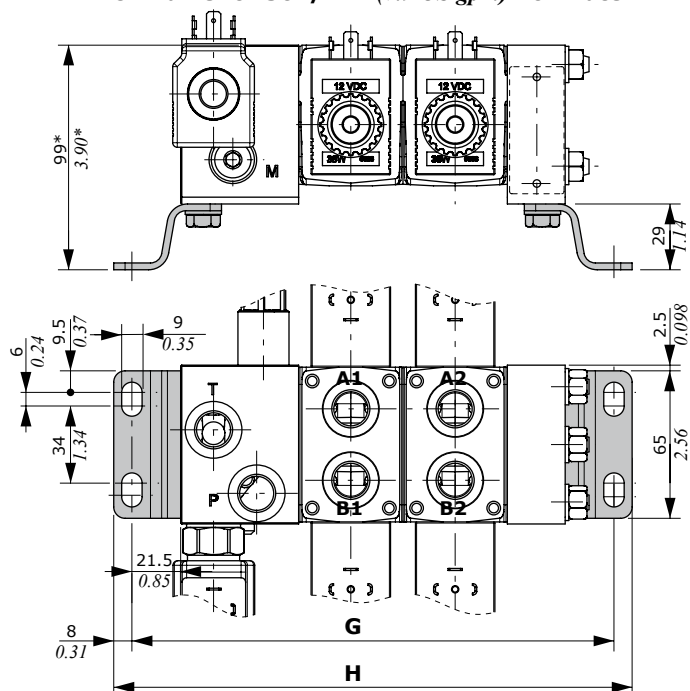
SDE060

Dimensions (*) are referred to directional valve with N1 type inlet section.

On valve for 60 l/min (15.8 US gpm) flow rate



On valve for 30 l/min (7.9 US gpm) flow rate



Valve for 60 l/min (15.8 US gpm) flow rate

TYPE	with section N type				with section N1 type				with section N2 type			
	G		H		G		H		G		H	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
SDE060/1	147.5	5.81	163.5	6.44	169.5	6.67	185.5	7.30	200	7.87	216	8.50
SDE060/2	193.5	7.62	209.5	8.25	215.5	8.48	231.5	9.11	246	9.69	262	10.31
SDE060/3	239.5	9.43	255.5	10.06	261.5	10.29	277.5	10.93	292	11.50	308	12.13
SDE060/4	285.5	11.24	301.5	11.87	307.5	12.11	323.5	12.74	338	13.31	354	13.94
SDE060/5	331.5	13.05	347.5	13.68	353.5	13.92	369.5	14.55	384	15.12	400	15.75
SDE060/6	377.5	14.86	393.5	15.49	399.5	15.73	415.5	16.36	430	16.93	446	17.56
SDE060/7	423.5	16.67	442.5	17.42	445.5	17.54	461.5	18.17	476	18.74	492	19.37
SDE060/8	469.5	18.48	485.5	19.11	491.5	19.35	507.5	19.98	522	20.55	538	21.18
SDE060/9	515.5	20.30	531.5	20.93	537.5	21.16	553.5	21.79	568	22.36	584	22.99
SDE060/10	561.5	22.11	577.5	22.74	583.5	22.97	599.5	23.60	614	24.17	630	24.80

Valve for 30 l/min (7.9 US gpm) flow rate

TYPE	with section NB type				with section N1B type				with section N2B type				with sections N6B-N7B type			
	G		H		G		H		G		H		G		H	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
SDE060/1	143	5.63	159	6.26	164.5	6.48	180.5	7.11	191	7.52	207	8.15	183.5	7.22	199.5	7.85
SDE060/2	189	7.44	205	8.07	210.5	8.29	226.5	8.92	237	9.33	253	9.96	229.5	9.04	245.5	9.66
SDE060/3	235	9.25	251	9.88	256.5	10.10	272.5	10.73	283	11.14	299	11.77	275.5	10.85	291.5	11.48
SDE060/4	281	11.06	297	11.69	302.5	11.91	318.5	12.54	329	12.95	345	13.58	321.5	12.66	337.5	13.29
SDE060/5	327	12.87	343	13.50	348.5	13.72	364.5	14.35	375	14.76	391	15.39	367.5	14.47	383.5	15.10
SDE060/6	373	14.69	389	15.31	394.5	15.53	410.5	16.16	421	16.57	437	17.20	413.5	16.28	429.5	16.91
SDE060/7	419	16.50	435	17.13	440.5	17.34	456.5	17.97	467	18.39	483	19.02	459.5	18.09	475.5	18.72
SDE060/8	465	18.31	481	18.94	486.5	19.15	502.5	19.78	513	20.20	529	20.83	505.5	19.90	521.5	20.53
SDE060/9	511	20.12	527	20.75	532.5	20.96	548.5	21.59	559	22.01	575	22.64	551.5	21.71	567.5	22.34
SDE060/10	557	21.93	573	22.56	578.5	22.76	594.5	23.41	605	23.82	621	24.45	597.5	23.52	613.5	24.15

Installation and maintenance

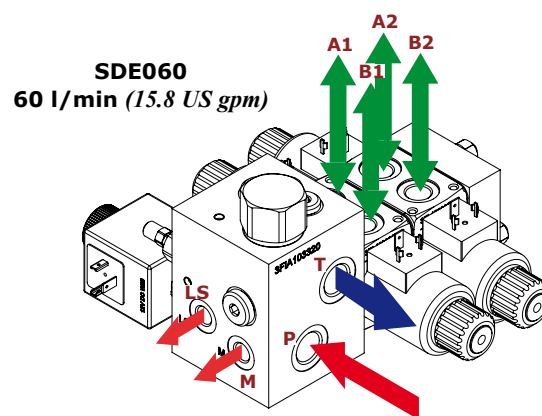
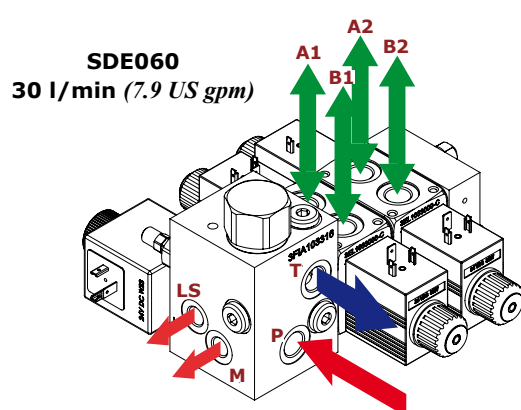
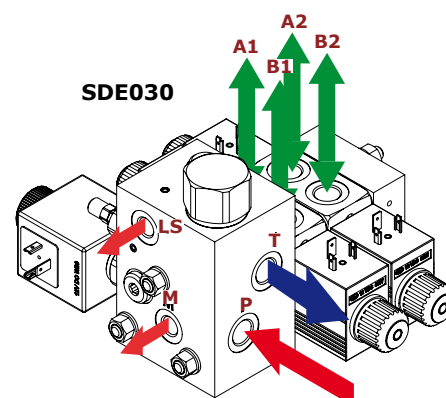
The SDE060-SDE030 valves are assembled and tested as per the technical specifications of this catalogue.

Before the final installation on your equipment, kindly follow the recommendations below:

- the valves can be assembled in any position; in order to prevent body deformation and spool sticking, mount the products on a flat surface;
- In order to prevent the possibility of water entering into the spool control kit, do not use high pressure wash down directly on the valves;
- Before painting, ensure plastic port plugs are tightly in their place.

Fittings tightening torque (Nm-lbft)

SDE030			
THREAD TYPE	P-T ports	A-B ports	M-LS ports
BSP	G 3/8	G 3/8	G 1/4
With O-Ring seal	35 - 25.8	35 - 25.8	25 - 18.4
With copper washer	40 - 29.5	40 - 29.5	30 - 22
With steel and rubber washer	30 - 22	30 - 22	16 - 11.8
UN-UNF	3/4-16 (SAE 8)	9/16-18 (SAE 6)	7/16-20(SAE 4) 9/16-18 (SAE 6)**
With O-Ring seal	35 - 25.8	30 - 22	18-13.3 • 30**- 22**



SDE060						
THREAD TYPE	Section for 30 l/min (7.9 US gpm)			Section for 60 l/min (15.8 US gpm)		
	P-T ports	A-B ports	M-LS ports	P-T ports	A-B ports	M-LS ports
BSP	G 3/8	G 3/8	G 1/4	G 1/2	G 3/8 • G 1/2*	G 1/4
With O-Ring seal	35 - 25.8	35 - 25.8	25 - 18.4	50 - 37	35-25.8 • 50*-37*	25 - 18.4
With copper washer	40 - 29.5	40 - 29.5	30 - 22	60 - 44.3	40-29.5 • 60*-44.3*	30 - 22
With steel and rubber washer	30 - 22	30 - 22	16 - 11.8	60 - 44.3	30-22 • 60*-44.3*	16 - 11.8
UN-UNF	3/4-16 (SAE 8)	9/16-18 (SAE 6)	7/16-20(SAE 4) 9/16-18 (SAE 6)**	3/4-16 (SAE 8)	9/16-18 (SAE 6) 3/4-16 (SAE 8)**	7/16-20 (SAE 4) 9/16-18 (SAE 6)**
With O-Ring seal	35 - 25.8	30 - 22	18-13.3 • 30**- 22**	35 - 25.8	30-22 • 35**- 25.8**	18-13.3 • 30**- 22**

NOTE – These torques are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finishing. The manufacturer must be consulted.

Malfunction	Cause	Remedy
External leakage from electric control	Control spool seal due to mechanical wear.	Replace the seal.
Excessive internal leakage on A and B ports.	Increase clearance between spools and body due to high wear.	Replace the directional control valve and check the oil contamination level.
Inability to build pressure on A and B	Main pressure relief valve blocked open.	Remove, clean or replace the main relief valve.
	Port relief valve open.	Remove, clean or replace the port relief valve.
	Low pump pressure and flow.	Check the pump and the circuit.

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