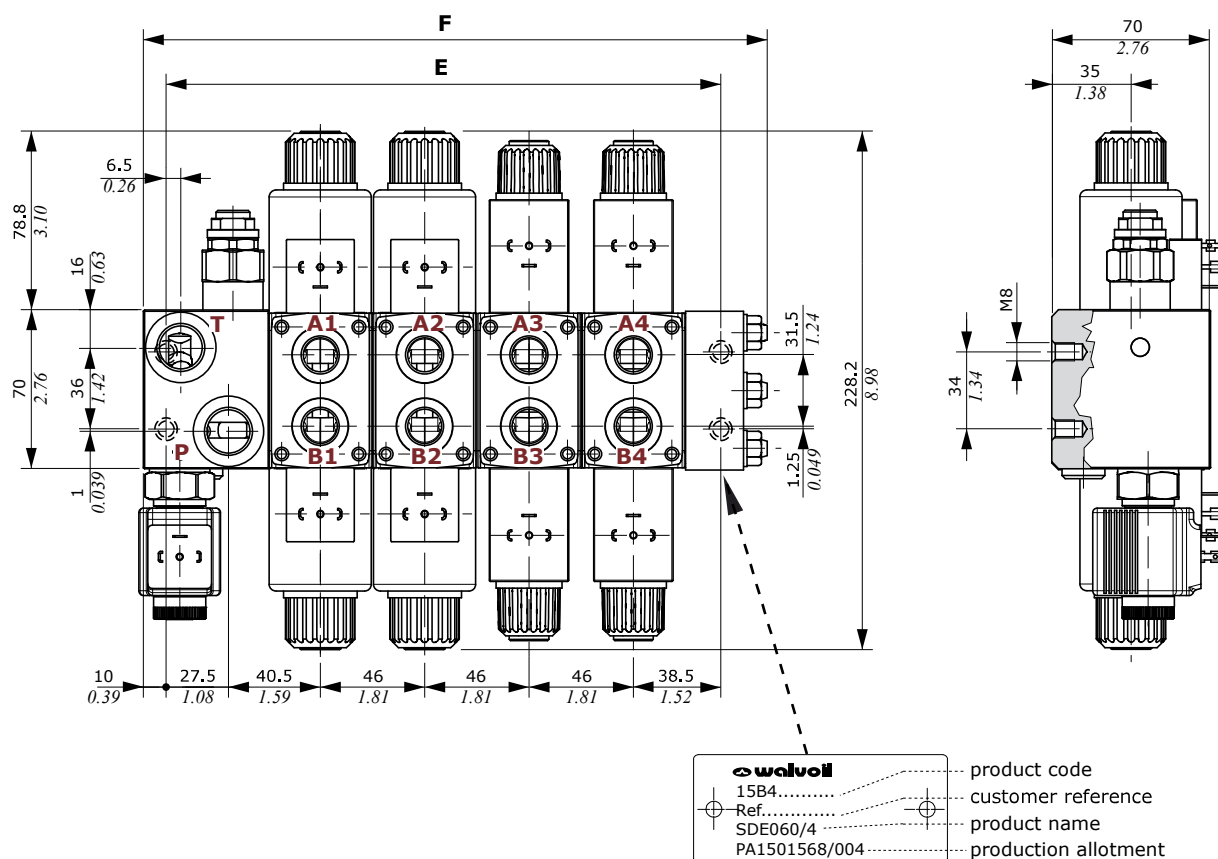


Dimensions

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.

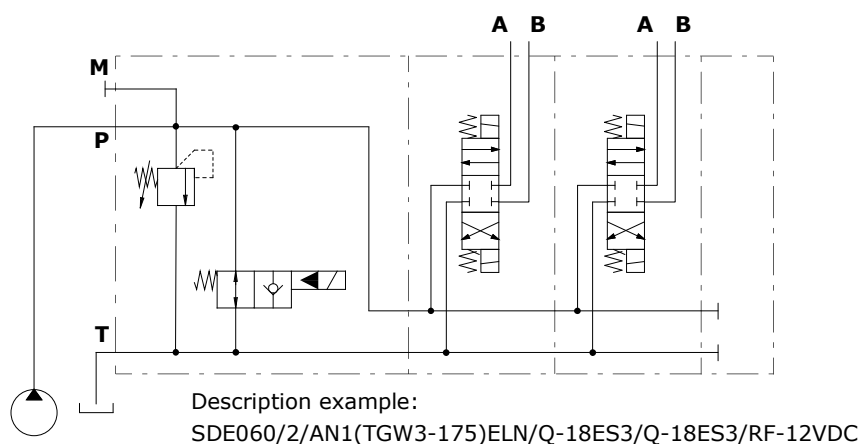


AN type inlet section					AN1 type inlet section (see drawing)						AN2 type inlet section			
TYPE	E		F		E		F		Weight		E		F	
	mm	in	mm	in	mm	in	mm	in	Kg	lb	mm	in	mm	in
SDE060/1	84.5	3.33	117.5	4.63	106.5	4.19	139.5	5.49	5.08	11.20	137	5.12	170	6.69
SDE060/2	130.5	5.14	163.5	6.44	152.5	6.00	185.5	7.30	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

Parallel circuit

A parallel circuit can be composed using P or Q working sections.

The outlet section can be with or without port arrangement.

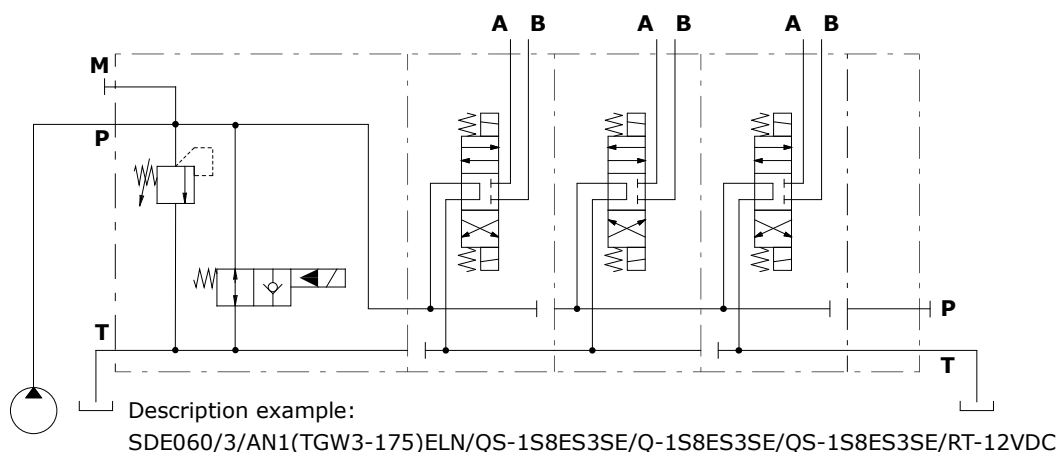
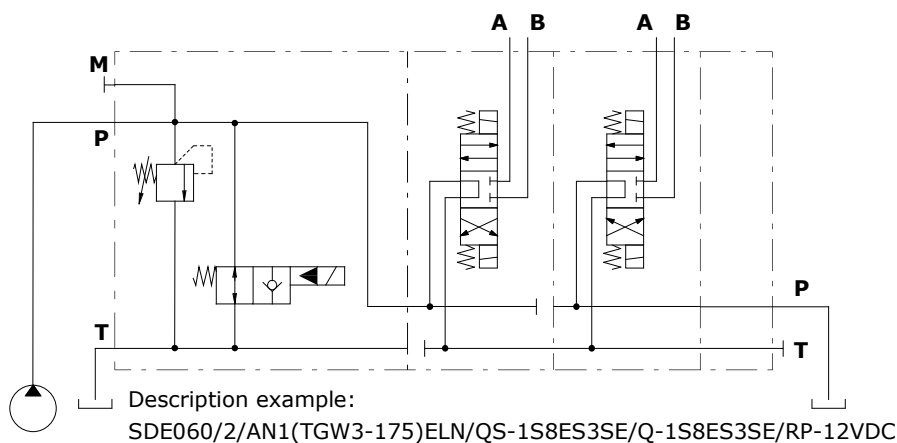


Series circuit: only for 60 l/min (15.8 US gpm) sections

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.



SDE060

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

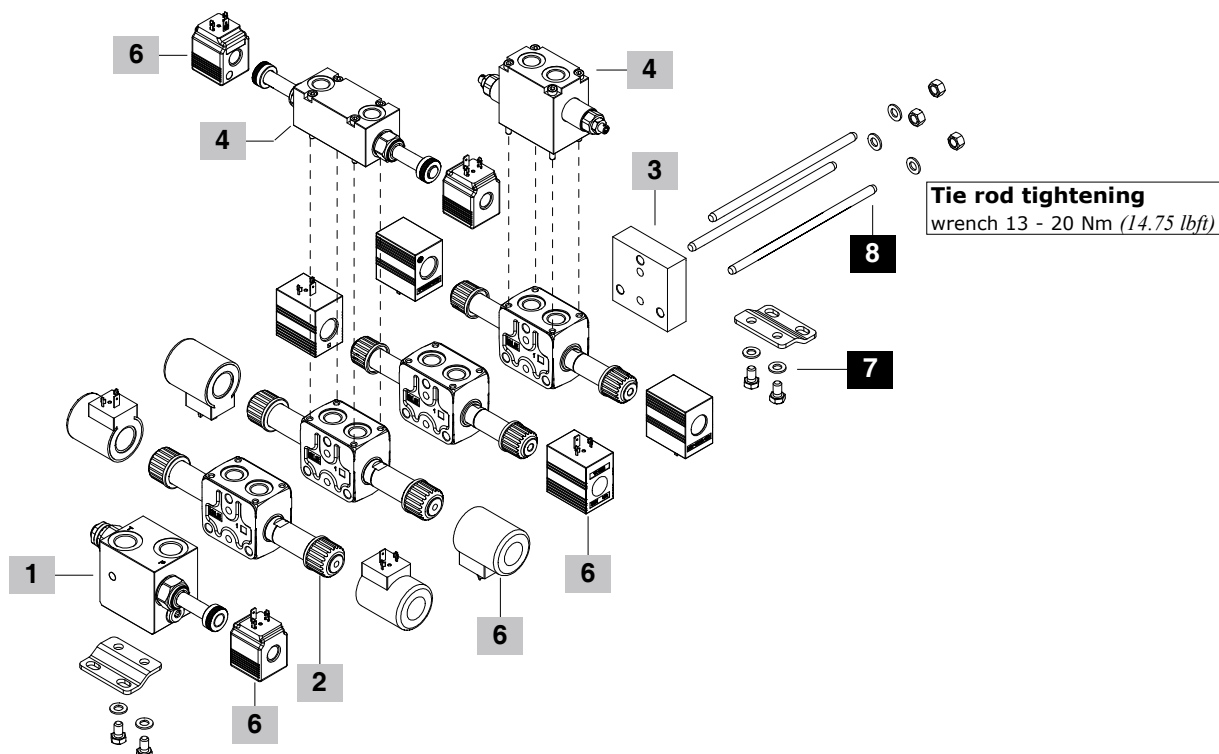
2

4

3

5

6



SDE060/2/AN1B(JNG3-120)ELN/Q-18ES3B/Q-18ES3B.PS3(DC3-100)/RF-.....-12VDC

Nr. of working sections

1

2

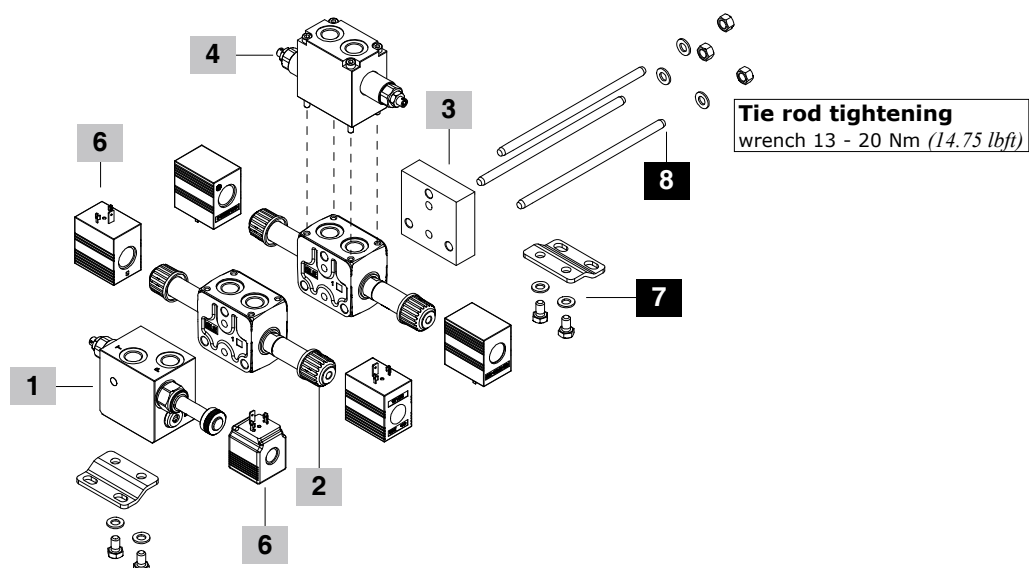
2

4

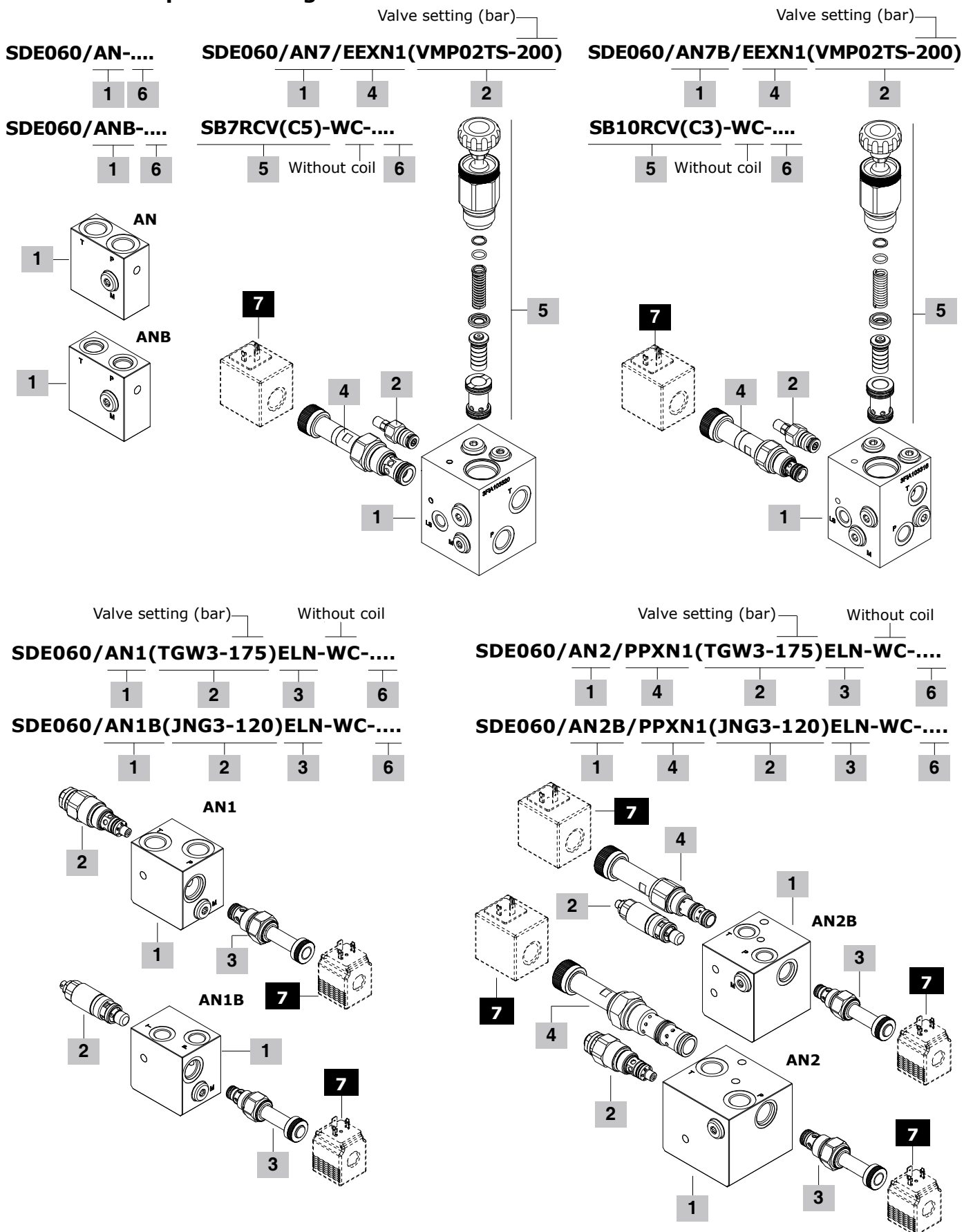
3

5

6

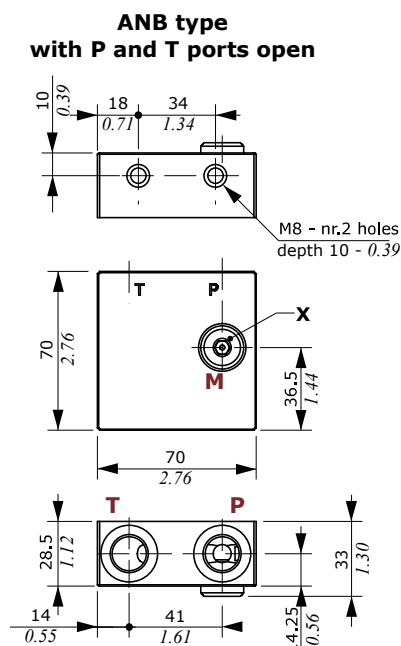
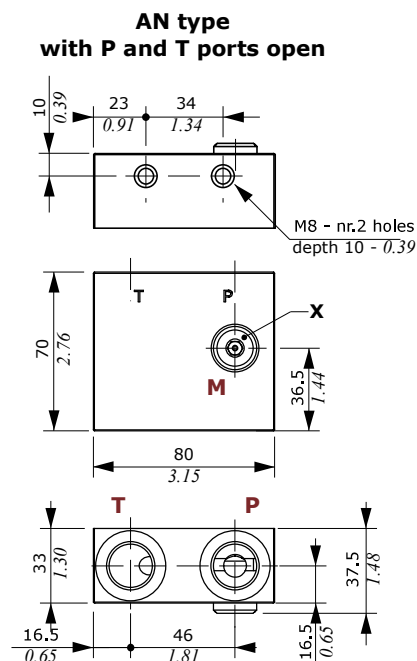


Inlet section: part ordering codes



Inlet section: dimension and hydraulic circuit

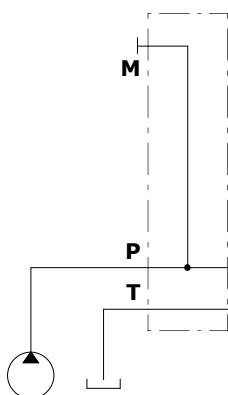
AN-ANB inlet sections



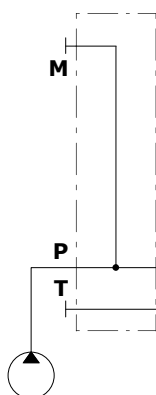
Wrenches and tightening torque

X = allen wrench 6 - 24 Nm (17.7 lbf ft)

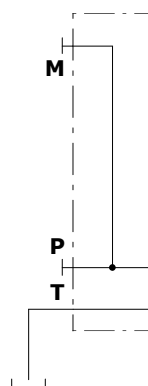
AN-ANB type
P and T ports open



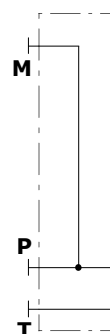
ANP-ANPB type
P port open and T port plugged



ANT-ANTB type
P port plugged and T port open



ANS-ANSB type
P and T ports plugged



Inlet section: dimension and hydraulic circuit

AN6B-AN7B-AN11B inlet sections

AN7B type; configuration for Open and Closed Center

Legenda

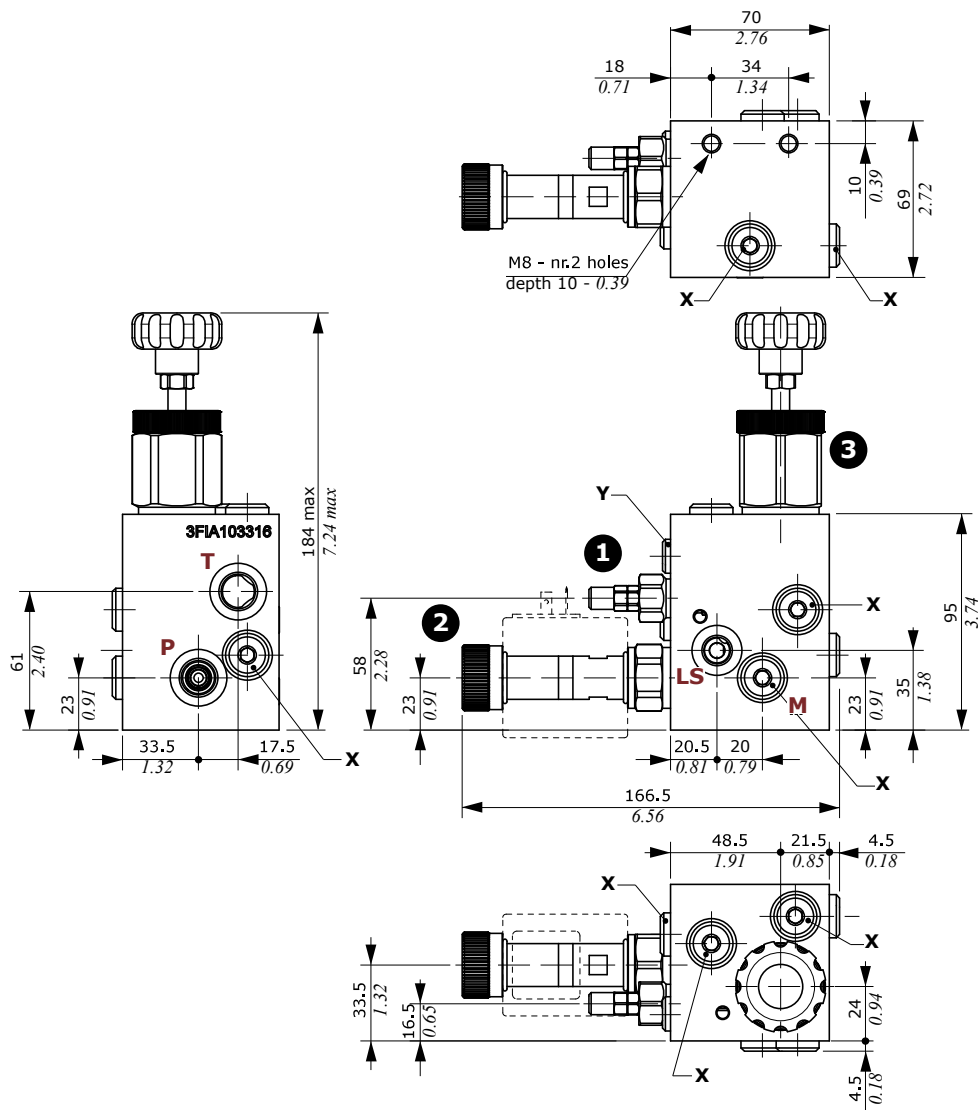
- 1: Pressure relief valve
- 2: Flow control valve
- 3: Excludable compensator

Wrenches and tightening torque

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

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

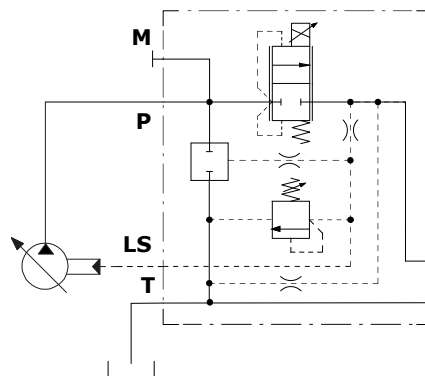
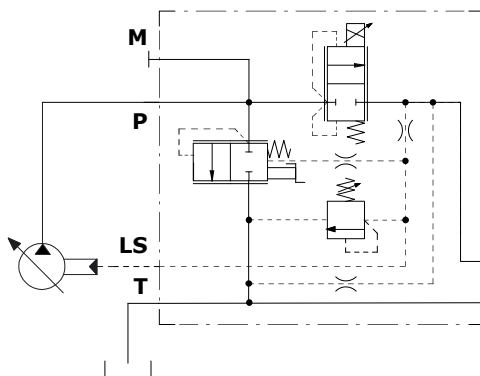
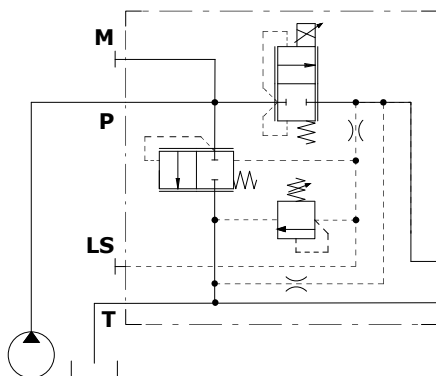
NOTE: for valve wrench and torque see pages 40 and 45.



AN6B type
for Open Center circuit

AN7B type
for Closed and Open Center circuits

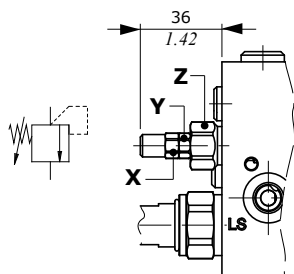
AN11B type
for Closed Center circuit



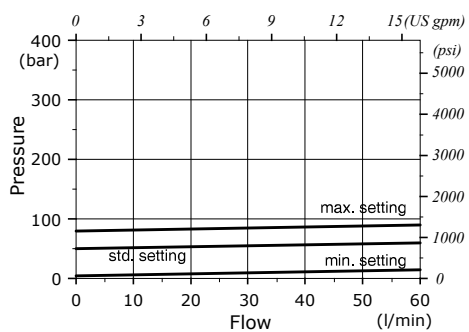
Inlet section: options

Main relief valve

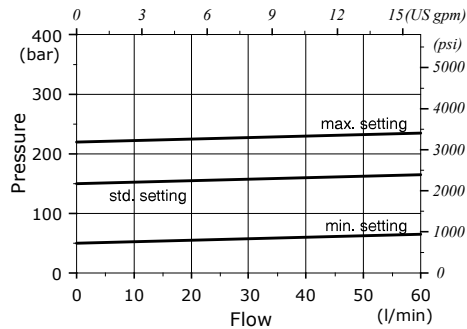
For sections AN6 - AN7 - AN11 - AN6B - AN7B and AN11B type



Setting range: VMP02TV type



Setting range: VMP02TS type



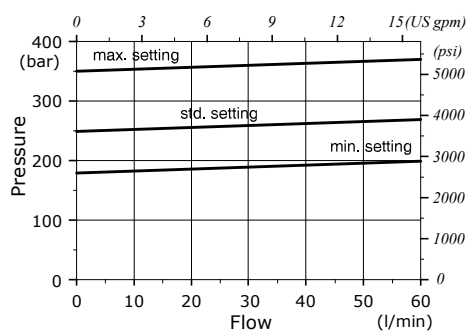
Wrenches and tightening torque

X = wrench 10

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

Z = wrench 19 - 24 Nm (17.7 lbf ft)

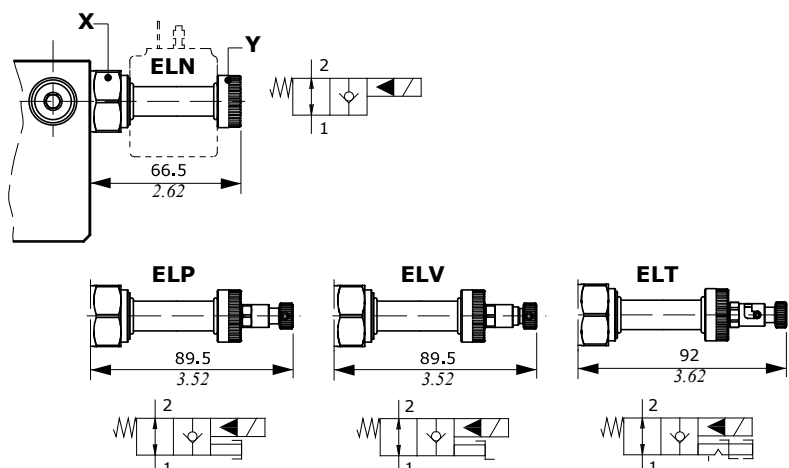
Setting range: VMP02TR type



Unloading valve

For sections AN1 and AN2 type

Emergency actuation types



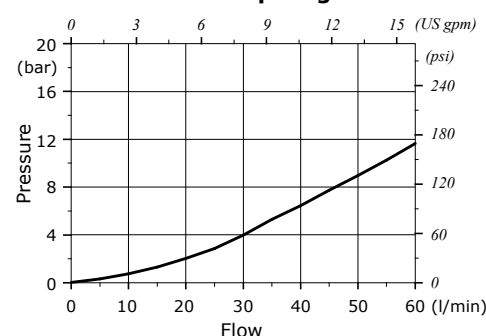
Legenda

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



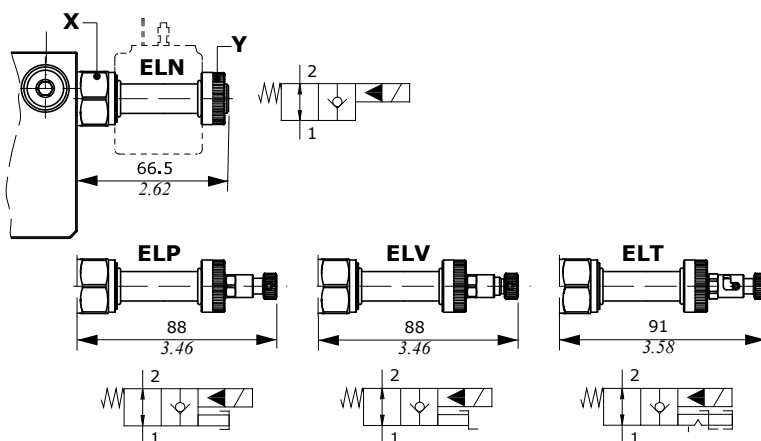
Valve features

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 58 and 59

For sections AN1B and AN2B type

Emergency actuation types



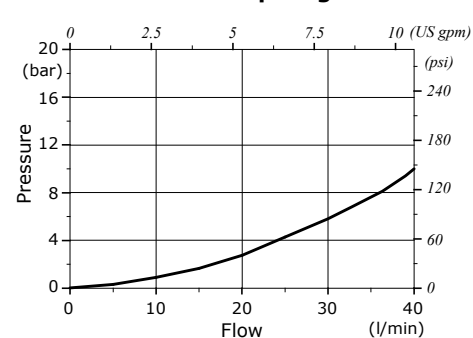
Legenda

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

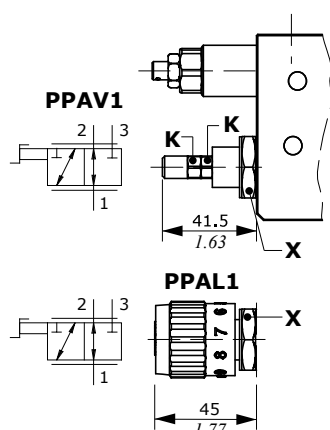
Max. flow : 40 l/min (10.6 US gpm)
 Max. pressure : 380 bar (5500 psi)
 Internal leakage : 0.25 cm³/min @ 210 bar
 (0.015 in³/min @ 3050 psi)

For coil features and options see **BER** coil on pages 58 and 59

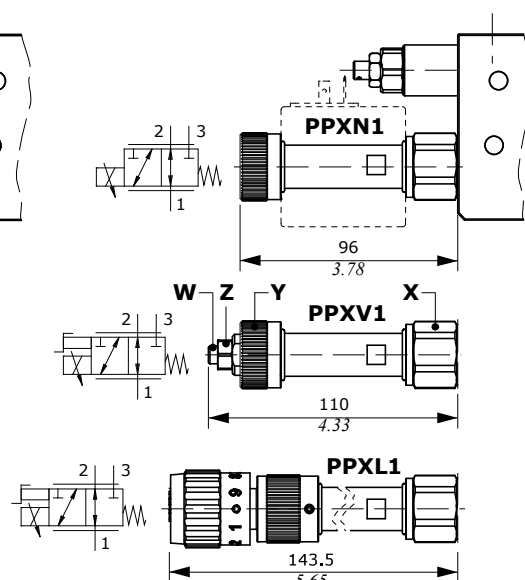
Pressure compensated flow control valve

For section AN2B type

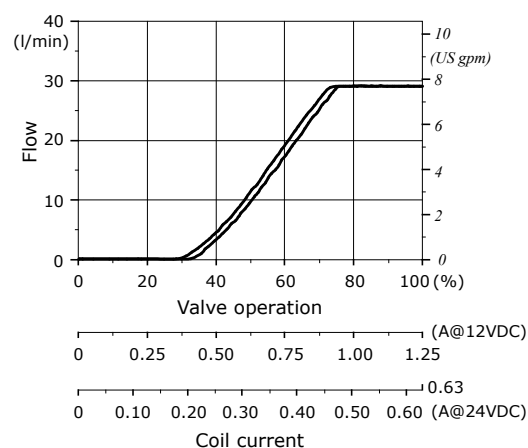
Manual operated



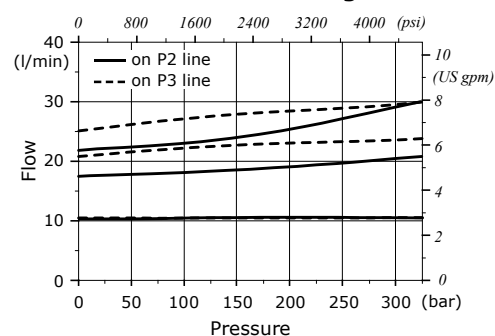
Solenoid operated



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)

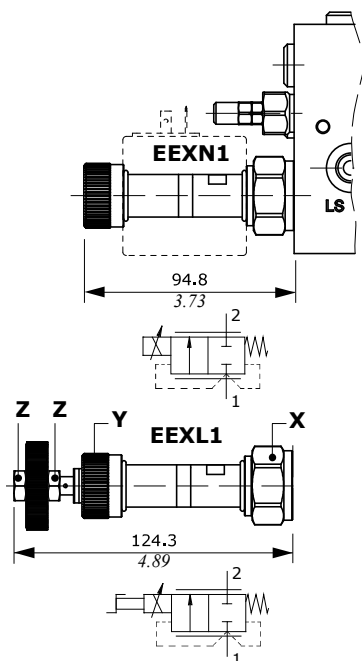
For coil features and options see **BQP19** or **BH** coils on pages 58 and 59.

Inlet section: options

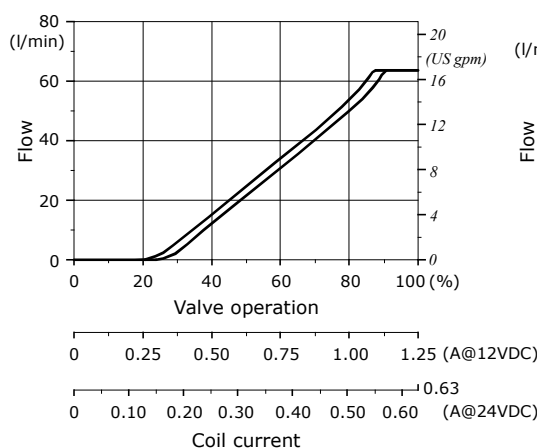
Pressure compensated flow control valve

For sections AN6-AN7-AN11 type

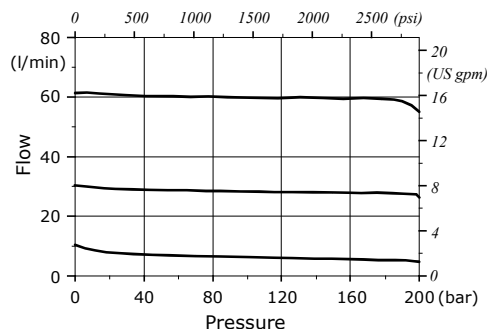
Curves are measured using the standard compensator mounted on section, with 7 bar (100 psi) stand-by.



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

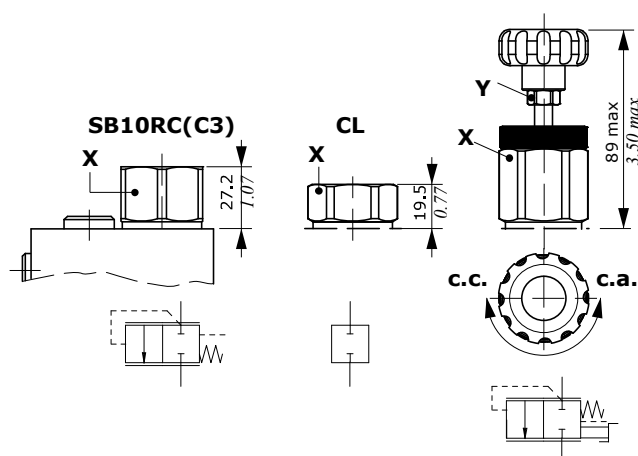
Max. flow: 60 l/min (15.8 US gpm)
 Max. pressure.: 315 bar (4560 psi)
 Internal leakages: 200 cm³/min @ 150 bar
 (12.2 in³/min @ 2175 psi)

For coil features and options see **BOP19** or **BH** coils on pages 58 and 59.

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

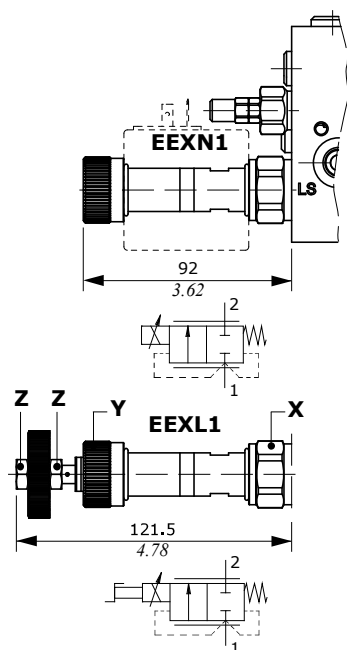
X = wrench 36 - 42 Nm (31 lbf ft)
 Y = wrench 13 - 6.6 Nm (4.9 lbf ft)

Inlet section: options

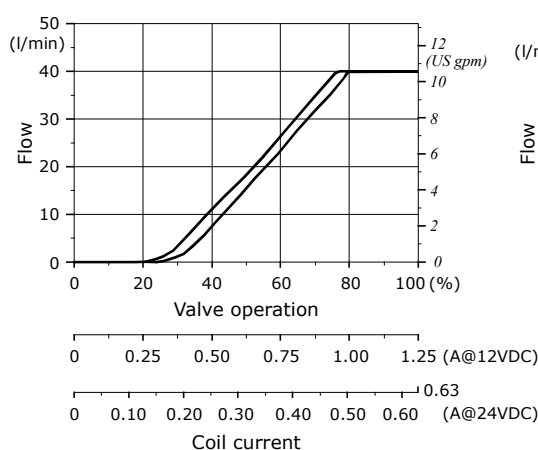
Pressure compensated flow control valve

For sections AN6B-AN7B-AN11B type

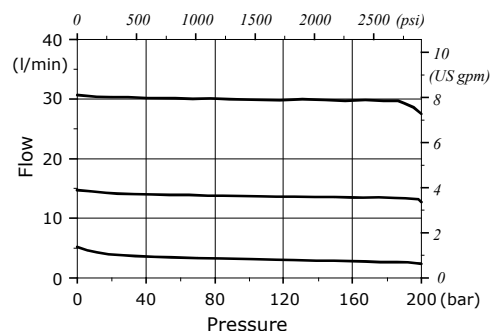
Curves are measured using the standard compensator mounted on section, with 10 bar (145 psi) stand-by.



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)

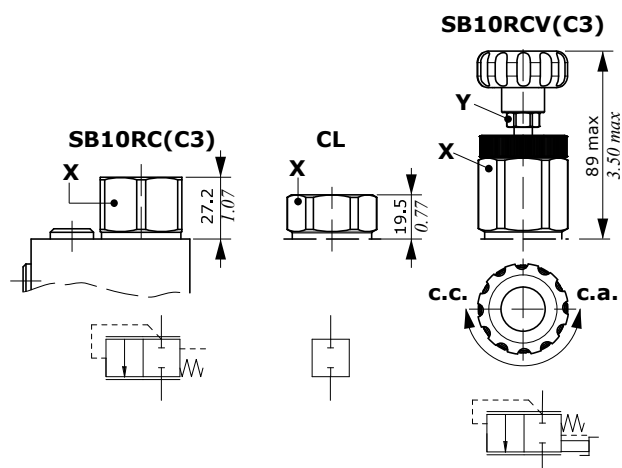
Valve features

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 **BOP19** or **BH** coils on pages 58 and 59.

Compensator kit

For sections AN6B-AN7B-AN11B type



Legenda

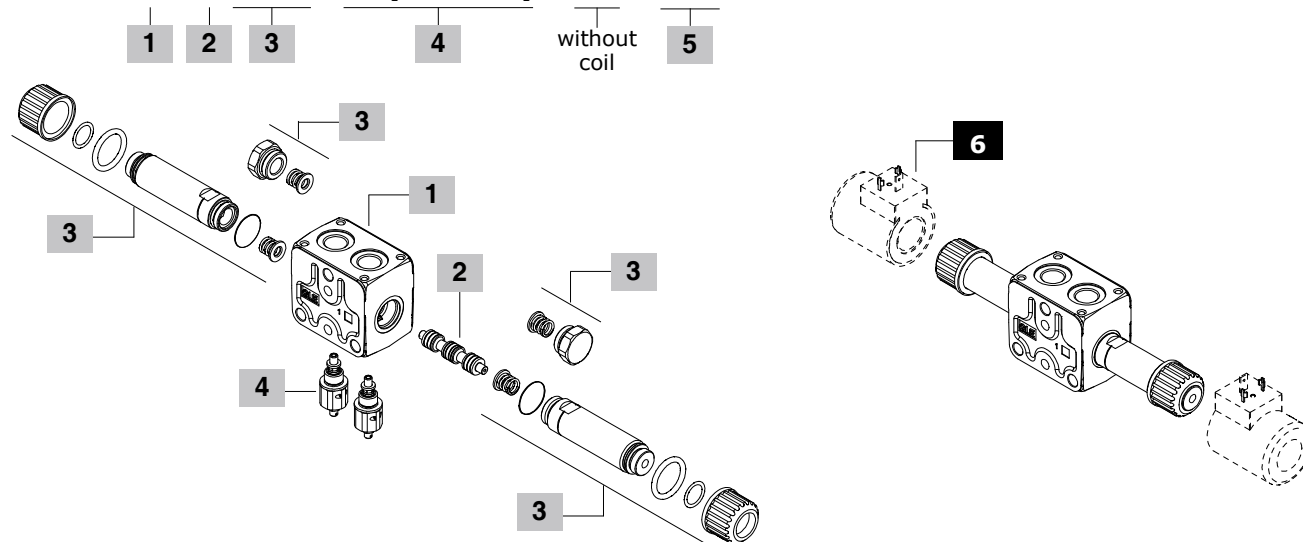
SB10RC(C3): compensator with 10 bar (145 psi) stand-by, for Open Center circuit
CL: compensator blanking plug, for Closed Center circuit (for AN11B type)
SB10RCV(C3): compensator with 10 bar (145 psi) stand-by, hand-wheel actuation for Open Center to Closed Center circuit switching

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 47

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 50

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

2 Spool page 49

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 48

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 58

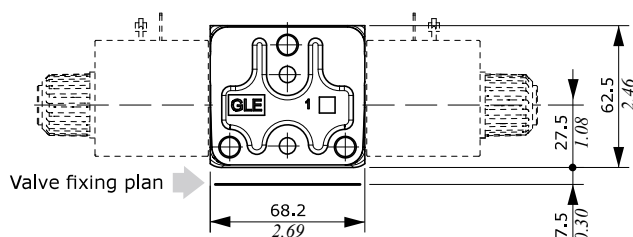
For list of available coils see pages of related sections

NOTES (#) - For Series circuit configuration rules see page 29.

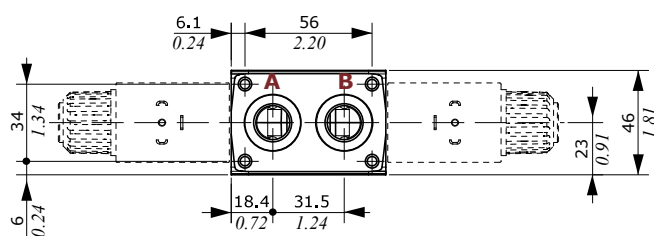
(*) - Codes are referred to **BSP** thread.

Dimensions and hydraulic circuit

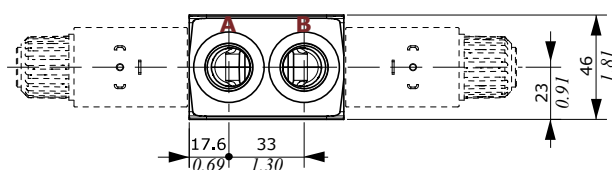
Working section Q type



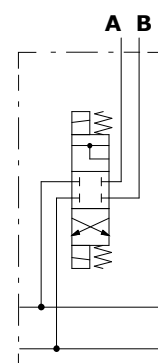
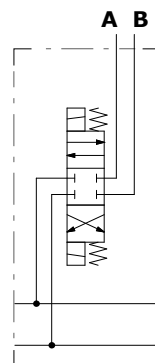
Standard port thread: G3/8
with arrangement for valve blocks



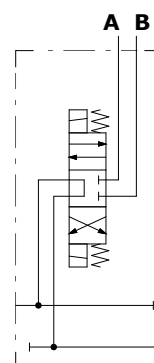
Increased port thread: G1/2
without arrangement for valve blocks (NF type)



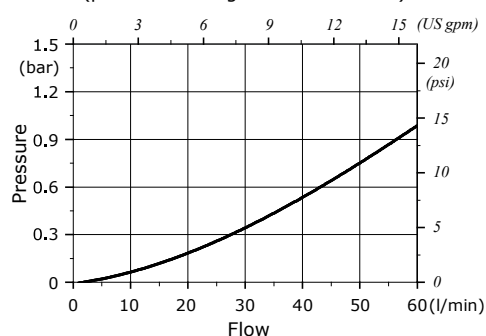
Q type: parallel circuit (with spool type 1) **Q8 type: regenerative circuit** (needs spool type 8)



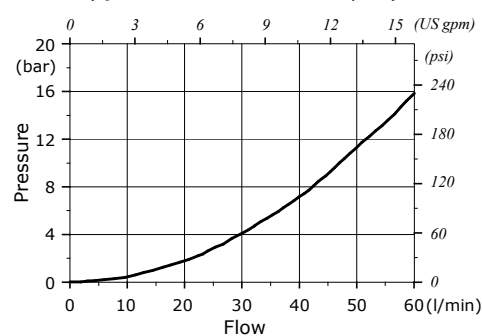
QS type for series circuit
(needs spool type 1S)



Flow through pressure drop
(parallel and regenerative circuits)



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



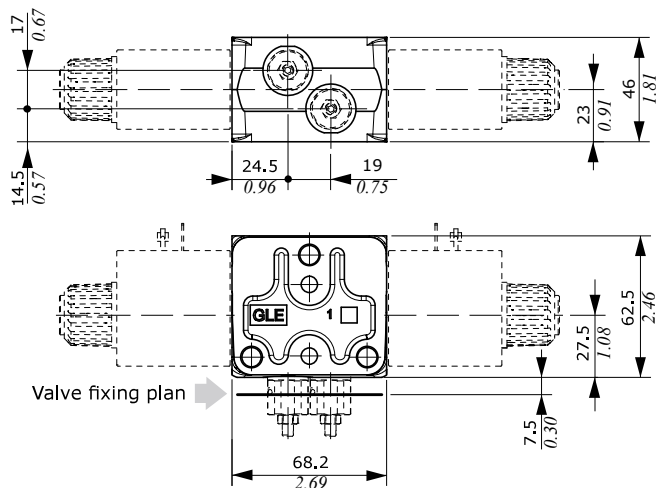
Working section

Dimension and hydraulic circuit

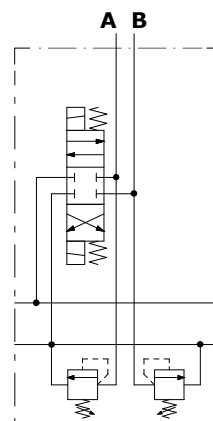
Working section P type

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.

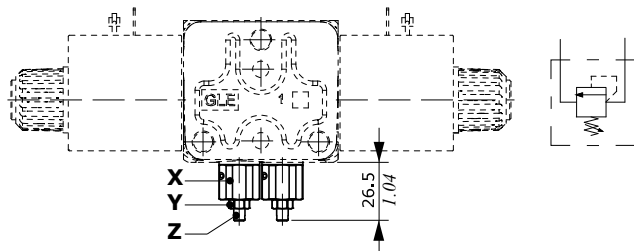


P type: parallel circuit (with spool type 1)

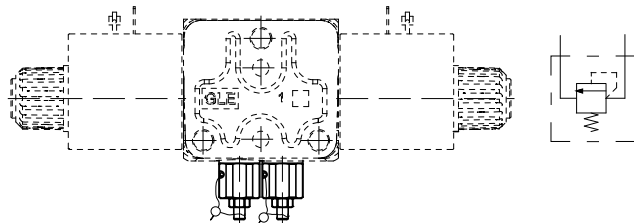


Port relief valves

G type



H type



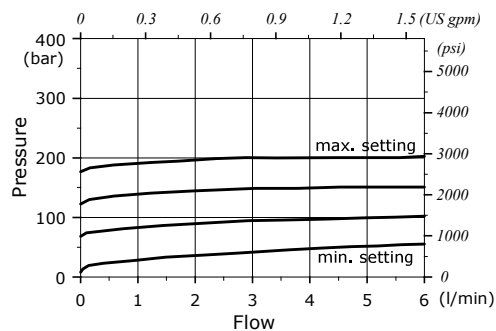
Legenda

- G: screw setting type
- H: valve set and locked

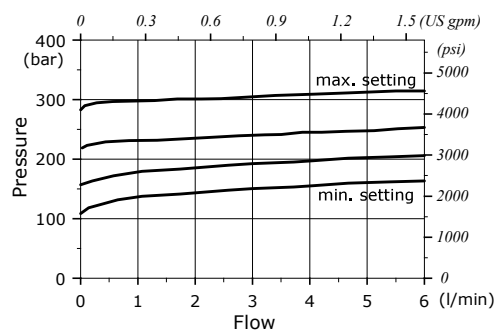
Wrenches and tightening torque

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

Setting range: G3 type



Setting range: G4 type



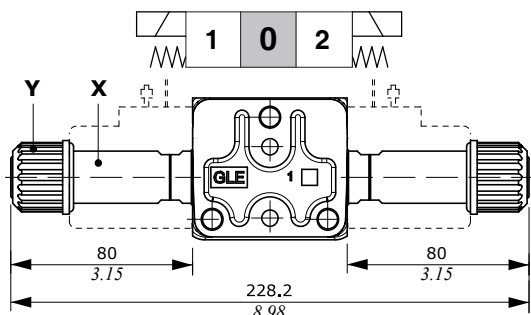
Working section

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

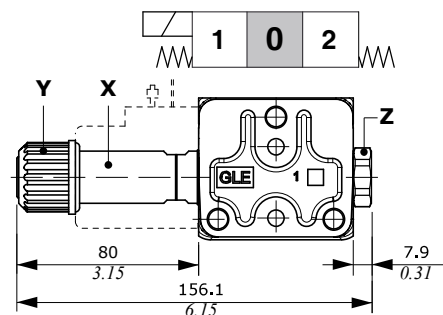
For section configuration up to 60 l/min (15.8 US gpm) flow rate.

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

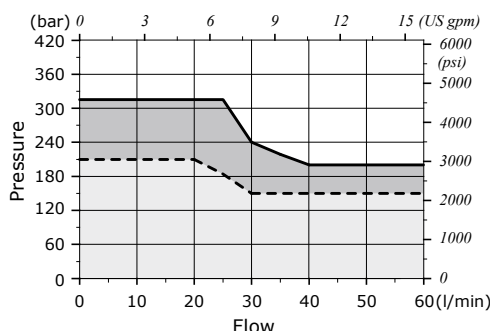
8ES3 - 8ES3SE: double acting control kit



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)

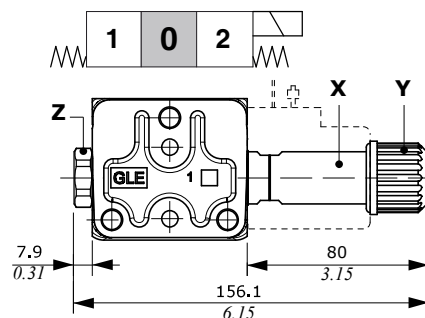
Y = 15 Nm (11 lbft)

Z = wrench 24 - 24 Nm (17.7 lbft)

For coil options and features see **D15C** coil on pages 58 and 60.

— 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

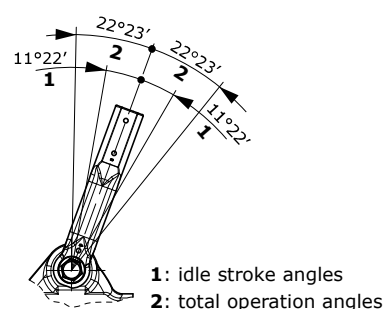
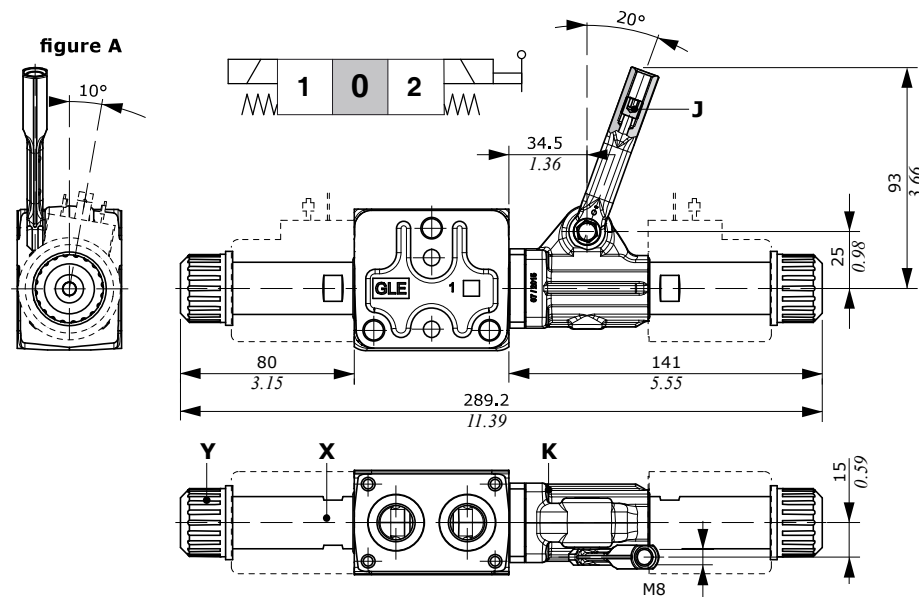
For section configuration up to 60 l/min (15.8 US gpm) flow rate; this control is not suitable for series circuit.

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 46 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

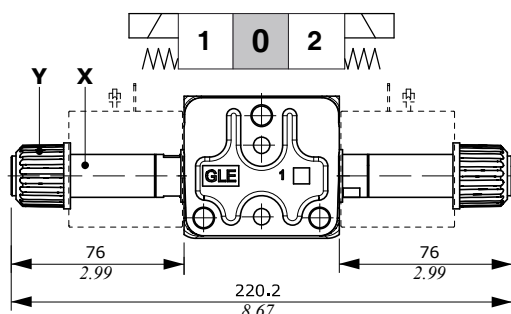
Max. back pressure on T : 30 bar (435 psi)

For coil options and features see **D15C** coil on pages 58 and 60.

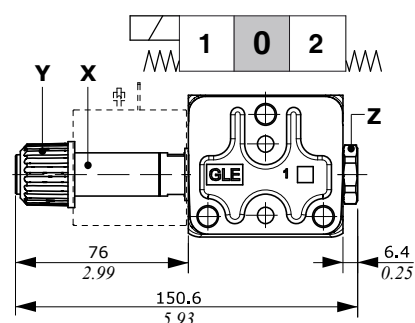
On/off solenoid control: 8ES3B - 8ES1B - 8ES2B types

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°

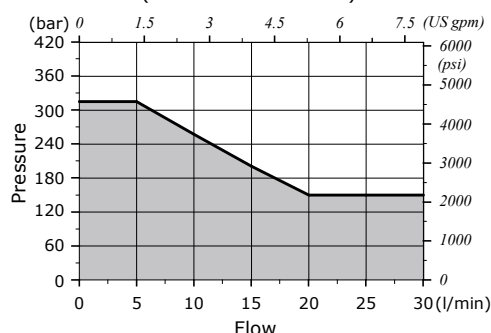
8ES3B: double acting control kit



8ES1B: single acting on A control kit



Operating condition (stroke 3 mm - 0.12 in)

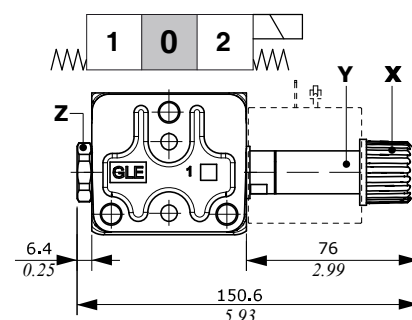


Wrenches and tightening torque

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

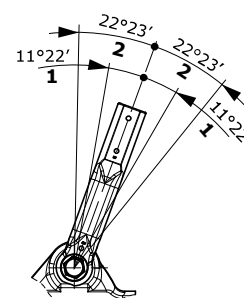
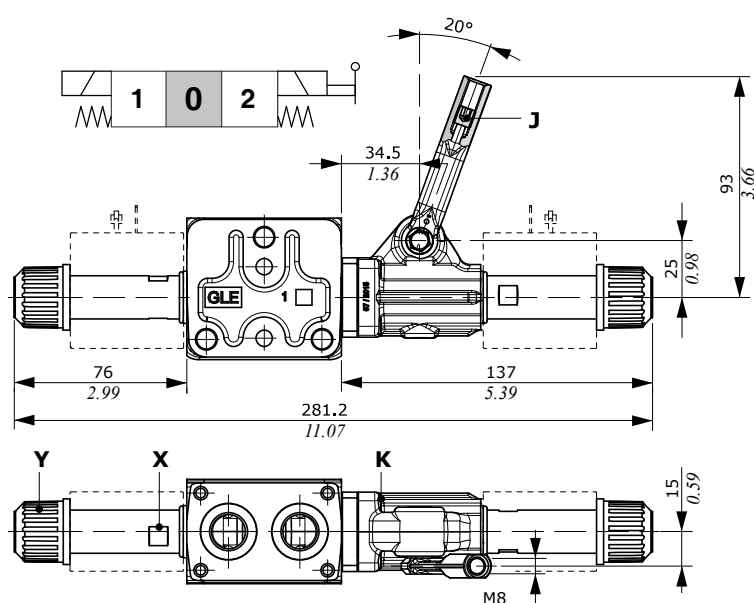
For coil options and features see **D12C** coil on pages 58 and 60.

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 46 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)

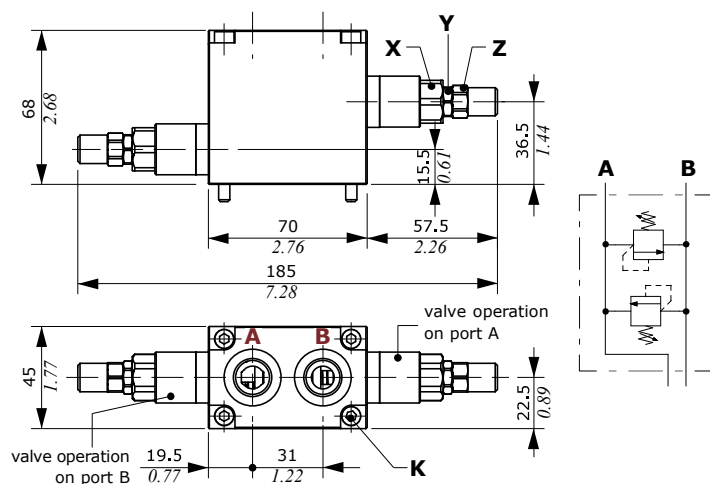
For coil options and features see **D12C** coil on pages 58 and 60.

Flangeable valve blocks

Antishock valves with cross operation

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

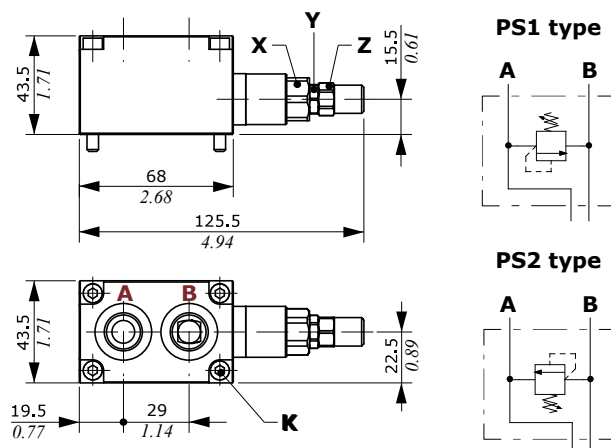
PS3 type: valves on both ports



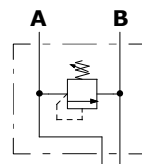
NOTE: for valve block assembly direction refer to ports name

PS1 or PS2 types: valve on single port

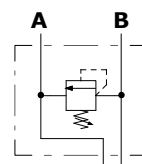
(PS1 type is drawn: PS2 type has the valve mounted on the opposite side and the same dimensions)



PS1 type



PS2 type



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.

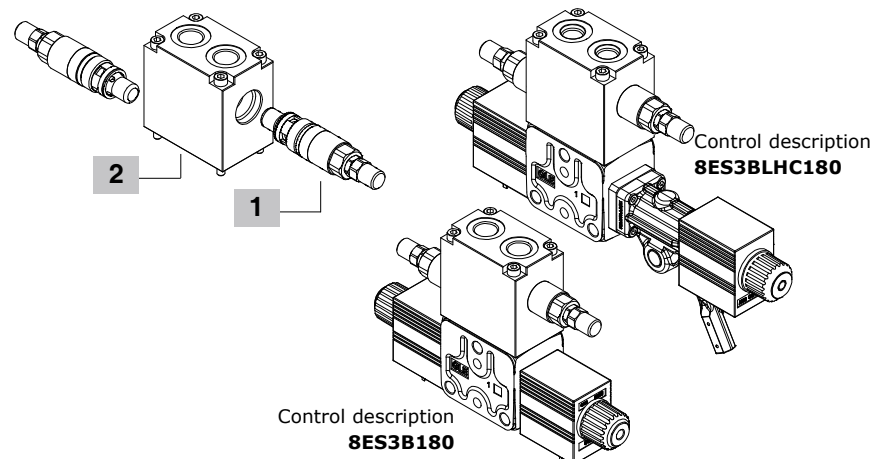
(DC2-60)	1100520460	Range 20-80 bar (290-1150 psi) std setting 60 bar (870 psi)
(DC3-160)	1100520408	Range 50-220 bar (725-3200 psi) std setting 160 bar (2300 psi)
(DC4-280)	1100520414	Range 180-350 bar (2600-5100 psi) std setting 280 bar (4050 psi)

PST XTAP623282 Valve blanking plug

Part #2: Block body kit

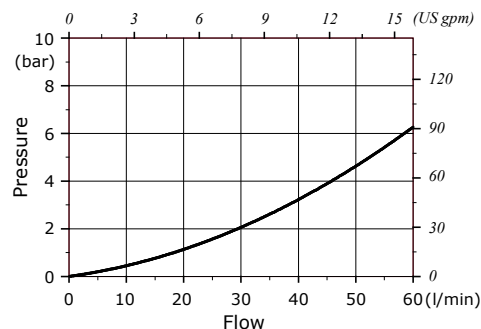
PS1-PS2 5COR245682 For single valve on port A or B

PS3 5COR245680 For valves on port A and B

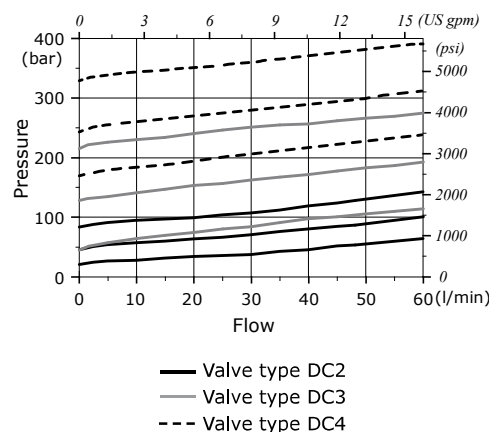


Antishock valve pressure drops

P⇒port - port⇒T
(curves are matched)



Setting range

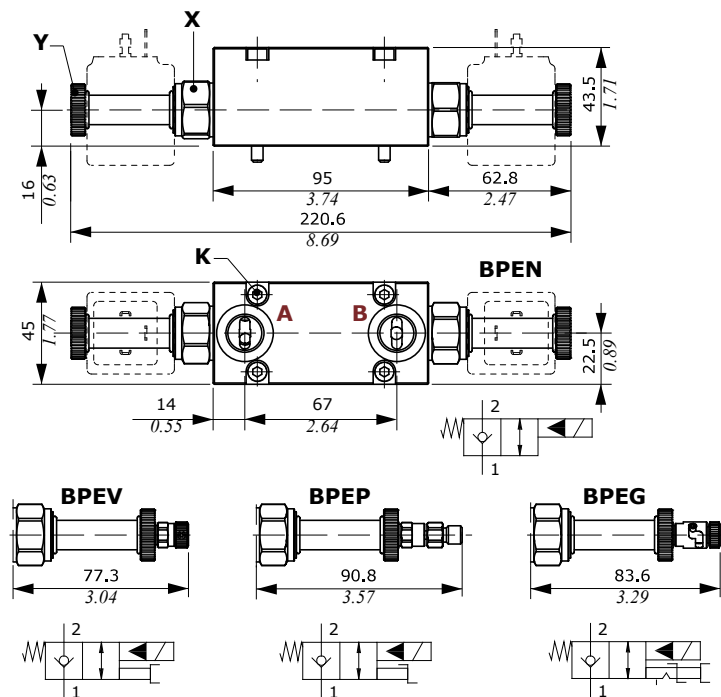


Flangeable valve blocks

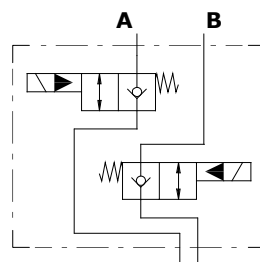
Solenoid operated check valves

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

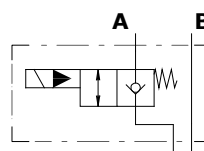
BPE(NC) type: normally closed circuit



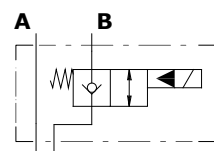
BPEN3(NC) type



BPEN1(NC) type



BPEN2(NC) type



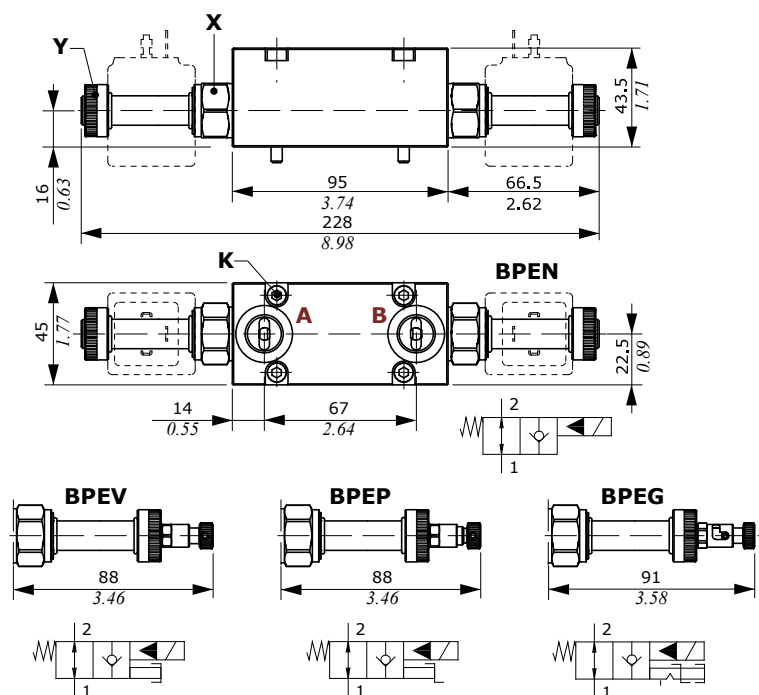
Wrenches and tightening torque

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

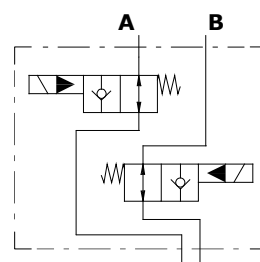
X = wrench 24 - 30 Nm (22 lbft)

Y = 5 Nm (3.7 lbft)

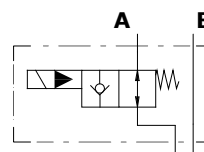
BPE(NA) type: normally open circuit



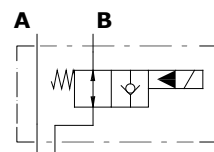
BPEN3(NA) type



BPEN3(NA) type

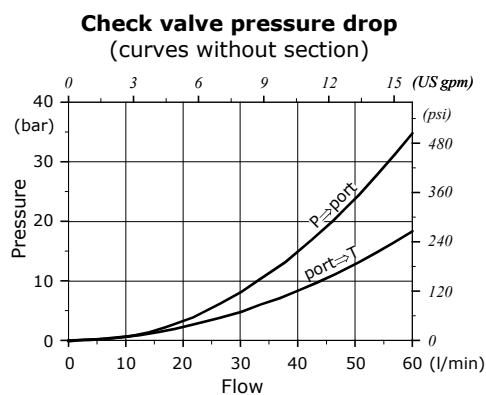


BPEN3(NA) type



Flangeable valve blocks

Solenoid operated check valves



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 58.		

