walvoil

Hydraulic pilot control valves and Feed units



TECHNICAL CATALOGUE

Additional information
This catalogue shows the product in the most standard configurations.
Please contact our Sales Department for more detailed information or special requests.

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.

5th edition November 2021

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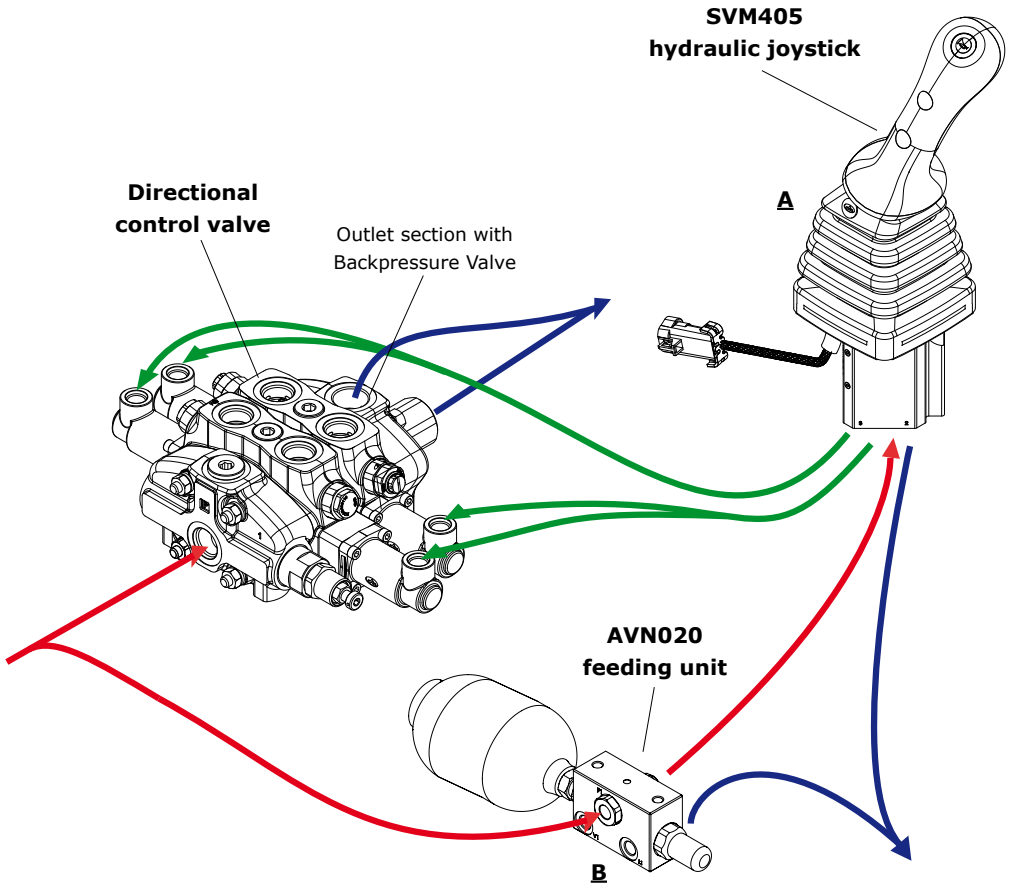
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System description

This is an ideal hydraulic proportional remote control system when max. movement precision and long-lasting reliability are required.
The system needs a secondary circuit with low pressure pilotage, fed separately by a dedicated pump and in derivation to the primary one. In this last case, it is necessary to include a feeding unit with eventual accumulator for emergency interventions into the circuit.



A - SVM hydraulic pilot control valve

Walvoil offers a wide range of hydraulic control valves.
The main product lines are:

1) Hydraulic joysticks

- SVM100 - SVM101
Hydraulic joysticks, single function available with wide range of handles. Hydraulic control valves available single or assembled from 1 to 10 sections.

- SVM400
Hydraulic joystick, double function available with wide range of handles. Single lever joystick to control two directional control valve working sections.

- SVM430 series (SVM430 - SVM431 - SVM432)
Special version operation of translation motors and hydrostatic transmission.

- SVM400-EMD
Single electromagnetic detent on all ports or double on opposite ports.

- SVM405
Configuration with damping system.

- SVM320
Hydraulic joystick with low operating effort.

2) Hydraulic joysticks with differential area

- SVM980
Hydraulic joystick, double function, with low operating effort and possibility to manage and regulate high flow rates.

3) Hydraulic joysticks with electromagnetic detent

- SVM150
Hydraulic joystick, single axis with electromagnetic detent available in every acting directions. It can be assembled up to 5 sections.

- SVM450
Hydraulic joystick, double axis available with a wide range of handles. It can be configured with up to 3 electromagnetic detents.

- SVM600
Combined joystick single axis-double axis for three working sections. It can be configured with up to 4 electromagnetic detents.

4) Hydraulic joysticks with pedal and other actuations

- SVM510 - SVM520 - SVM521
Pedal joystick to control one or two directional control valve working sections, reduced dimensions and weight.

- SVM500 series
Pedal hydraulic pilot valves, available in different configurations. High sensitivity and low force, reduced weight.
For agricultural machines and earth moving machines.

- SVM540
Double pedal hydraulic pilot valves for mini-excavator application.

- SVM702 - SVM710
Unit with single work port, handweel or pusher operating.

B - Feed unit and accessories

Feed unit can be chosen between two distinct series available:

1) AVN020
2 way series with or without unloader valve

2) FU series
Range from 1 to 4 stages, with or without hydraulic accumulator.



SVM hydraulic joysticks

SVM100-SVM101 / SVM400 / SVM430 series/SVM405/ SVM320

- Single and double function
- Special configuration for hydrostatic transmission
- Wide range of handles available

Working conditions

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

Nominal flow rating		from 5 to 20 l/min - *from 1.32 to 5.28 USgpm* (12 l/min for SVM320 - *3.17 USgpm for SVM320)*
Max. feeding pressure	on P inlet port	from 30 to 100 bar - *from 435 to 1450 psi*
Max. backpressure	on T outlet port	3 bar - *43.5 psi*
Max. hysteresis		0.5 bar - *7.25 psi*
Internal leakage (all ports)	at 30 bar - *435 psi*, P⇒T	from 2.5 to 4.5 cm³/min - *from 0.15 to 0.27 in3/min*
Fluid		Mineral oil
Fluid temperature	with NBR (BUNA-N) seals	from -10°C to 80°C - *from 14 °F to 176 °F*
Viscosity	operating range	from 15 to 75 mm²/s - *from 15 to 75 cSt*
	min.	12 mm²/s - *12 cSt*
	max.	400 mm²/s - *400 cSt*
Max. contamination level		-/15/12 - ISO 4406 - *NAS1638 class 6*
Ambient temperature	without electric devices	from -40°C to 60°C - *from 40 °F to 140 °F*
	with electric devices	from -20°C to 50°C - *from -4 °F to 122 °F*
Tie rod tightening torque (wrench 13)	only for SVM100-101	*24 Nm - 17.7 lbft*

NOTE - for different conditions please contact our Sales Dpt.

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

PORTS	Threads		Fitting tightening torque	
	UNI EN ISO 1179	UNI EN ISO 11926-2	Nm	*lbft*
P Inlet	G 1/4	7/16-20 (SAE 4)	30	*22.1*
Ports	G 1/4	7/16-20 (SAE 4)	30	*22.1*
T Outlet	G 1/4	7/16-20 (SAE 4)	30	*22.1*

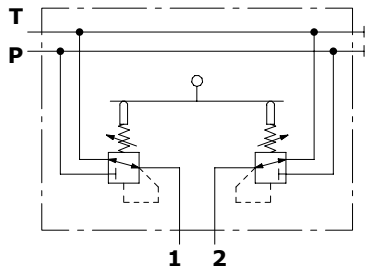
NOTE – These torques are recommended. Assembly tightening torque depends on many factors, including lubrification, coating and surface finishing. The manufacturer has to be consulted.

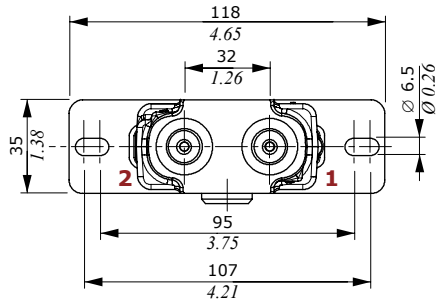
Dimensions and hydraulic circuit

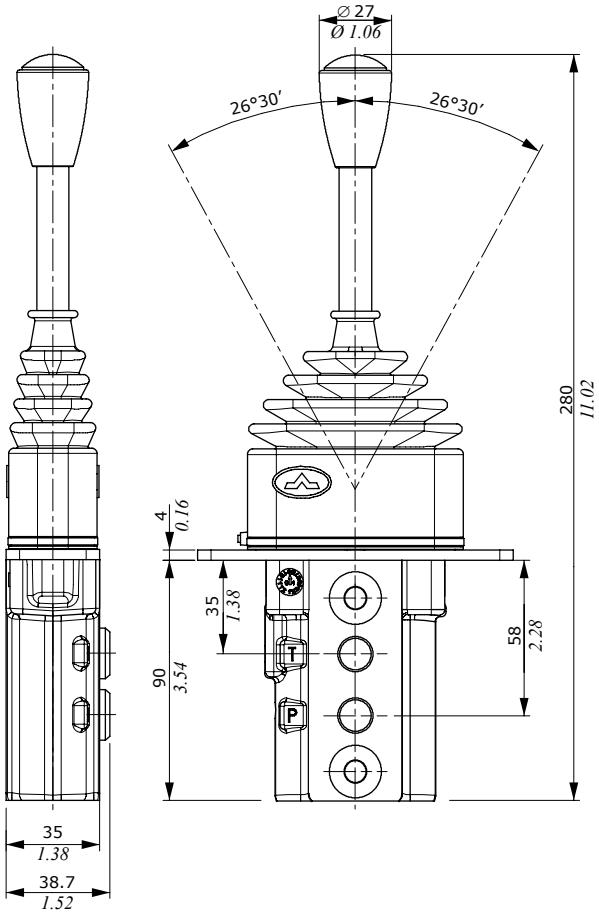
Single acting version

Single function configuration with side P and T ports.

Hydraulic circuit



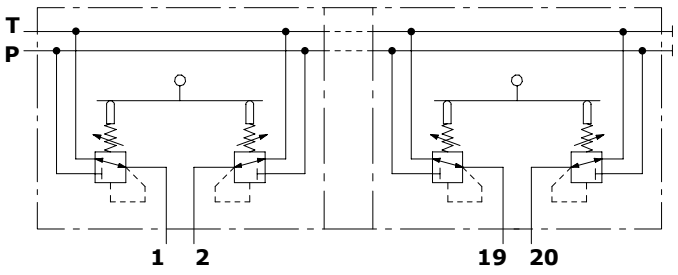




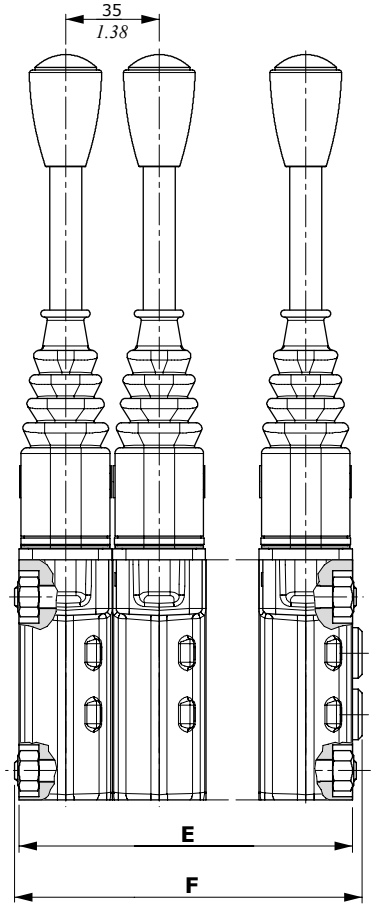
SVM100/n version

Multiple function configuration with side P and T ports.

Hydraulic circuit



TYPE	E		F		TYPE	E		F	
	mm	*in*	mm	*in*		mm	*in*	mm	*in*
SVM100/2	70	*2.76*	75.2	*2.96*	**SVM100/7**	245	*9.65*	250.2	*9.85*
SVM100/3	105	*4.13*	110.2	*4.34*	**SVM100/8**	280	*11.02*	285.2	*11.23*
SVM100/4	140	*5.51*	145.2	*5.72*	**SVM100/9**	315	*12.40*	320.2	*12.61*
SVM100/5	175	*6.89*	180.2	*7.09*	**SVM100/10**	350	*13.78*	355.2	*13.98*
SVM100/6	210	*8.27*	215.2	*8.27*					

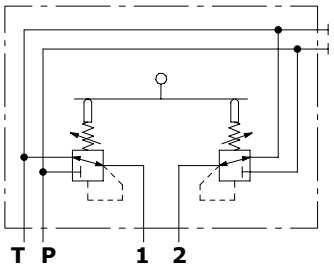


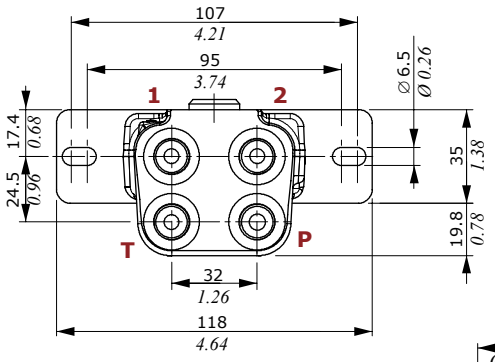
Dimensions and hydraulic circuit

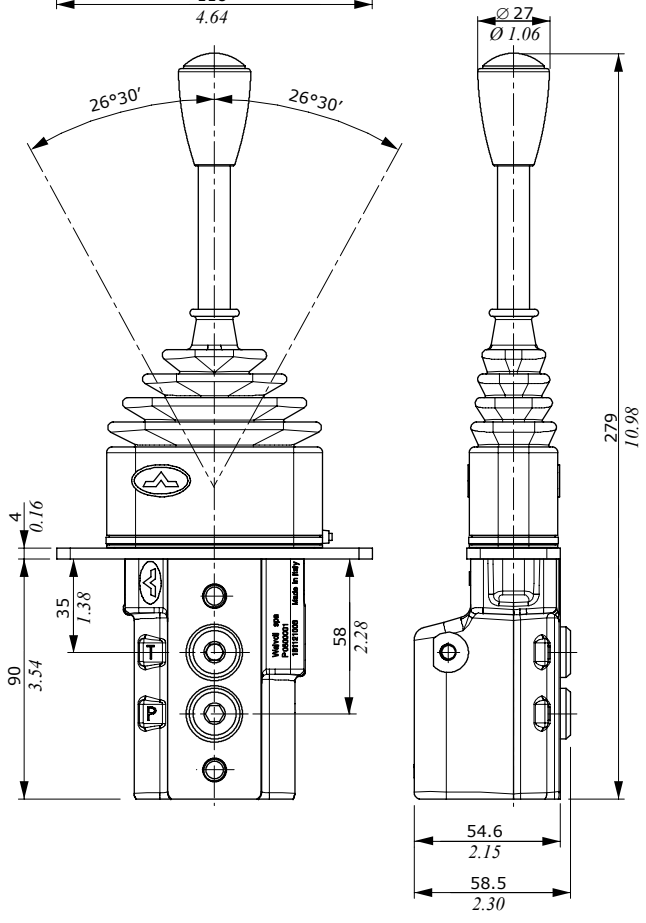
SVM101 version

Single function configuration with bottom P and T ports.

Hydraulic circuit



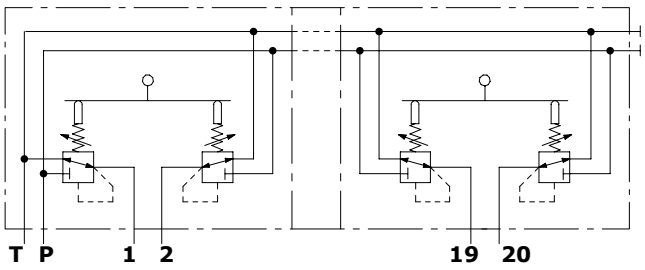




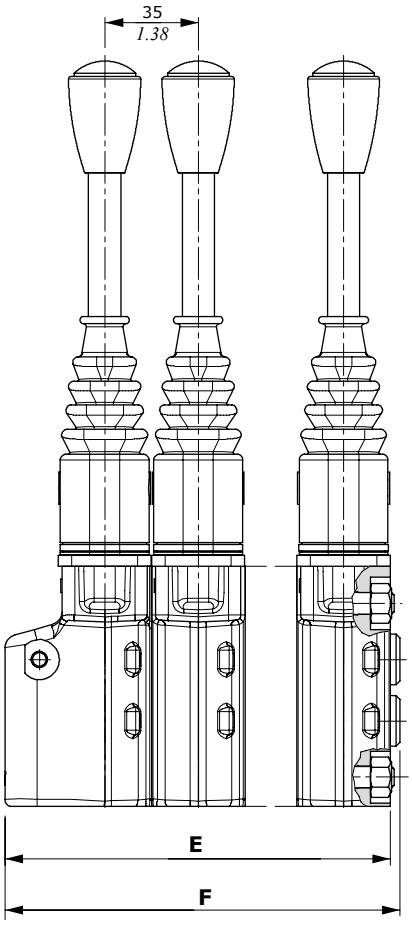
SVM101/n version

Multiple function configuration with bottom P and T ports.

Hydraulic circuit



TYPE	E		F		TYPE	E		F	
	mm	*in*	mm	*in*		mm	*in*	mm	*in*
SVM101/2	89.6	*3.53*	93.3	*3.67*	**SVM101/7**	264.6	*10.42*	268.3	*10.56*
SVM101/3	124.6	*4.91*	128.3	*5.05*	**SVM101/8**	299.6	*11.79*	303.3	*11.94*
SVM101/4	159.6	*6.28*	163.3	*6.43*	**SVM101/9**	334.6	*13.17*	338.3	*13.32*
SVM101/5	194.6	*7.66*	198.3	*7.81*	**SVM101/10**	369.6	*14.55*	373.3	*14.70*
SVM101/6	229.6	*9.04*	233.3	*9.18*					



Ordering codes

description for 1st section: repeat the choice for following sections — 2nd section — Last section (max.10)

SVM100 / N - B / 01 G3 (....) - 00001A - 0 0 001 A / ..... / .....

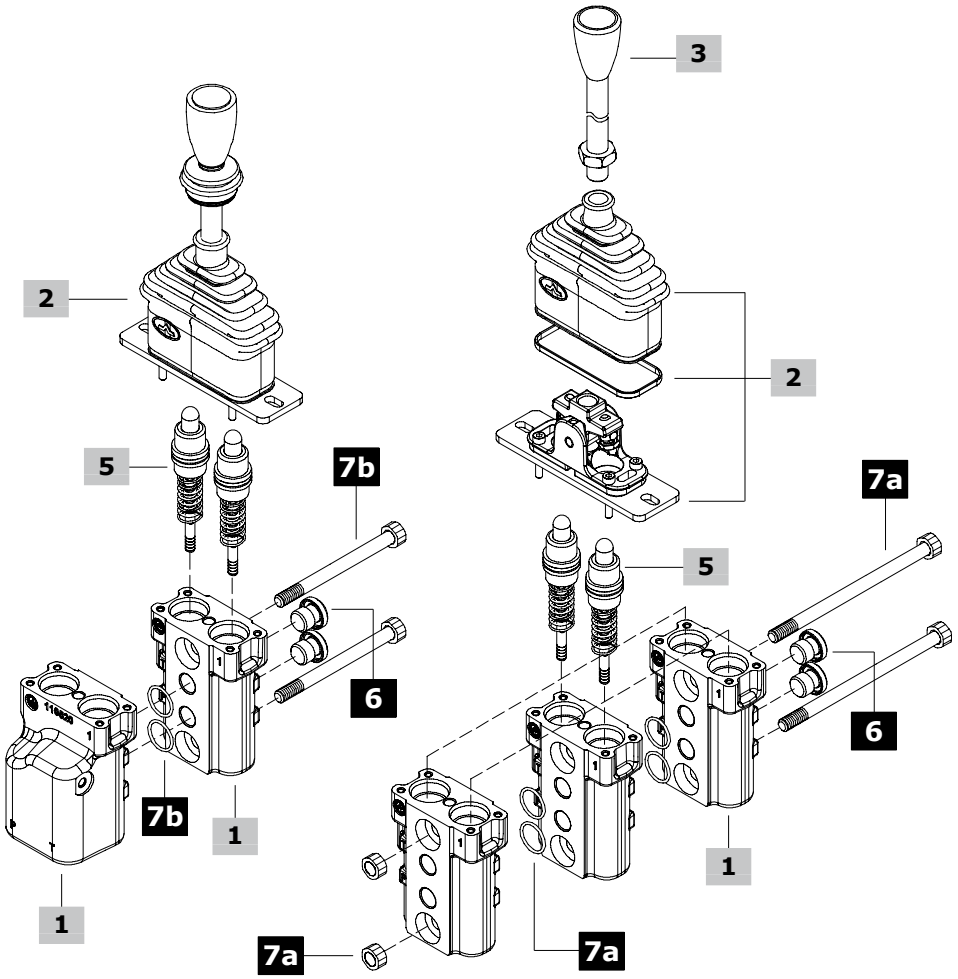
1 — 1 — 2 — 3 — 4 — 5 — 5.1 5.2 5.1 5.3

Substitute with number of sections

5

SVM101 / N - B / 02G3 - 00001A - 00001A / ..... / .....

1 — 1 — 2



Ordering codes

1 Body kit *

TYPE	CODE	DESCRIPTION
SVM100-B	3CO3122300	With side P and T ports
SVM101-B	3CO3122310	With bottom P and T ports

2 Control option

Complete with rubber bellow and fixing wrapper

Without handlever (for standard handlever see 3)

TYPE	CODE	DESCRIPTION
01	5CIN101000	Spring return to neutral position
03S	5CIN103008	With friction and neutral sensing, for 10, V, H, P and S series handles
05	5CIN105000	With detent in pos. 1 and spring return in neutral position
06	5CIN106000	With detent in pos. 2 and spring return in neutral position
07	5CIN107000	With detent in pos. 1 and 2; spring return in neutral position

Controls with handlevers

For assembling reasons, the under listed control kits must be supplied complete with handle. Please contact our Sales Department for use with different handles.

TYPE	CODE	DESCRIPTION
02G3	5CIN102000	With detent in neutral position, spring return in neutral position and type G knob; can not be used on two adjacent sections
03G3	5CIN103000	With friction and neutral sensing, G knob
03E3	5CIN103005	As previous one, E knob, 15° bending rod
03JL3	5CIN103004	As previous one, JL knob
10G3	5CIN110000	With friction and detent in neutral position, G knob; can not be used on two adjacent sections
11G3	5CIN111000	Detent in 3 positions, G knob; can not be used on two adjacent sections
16G3	5CIN116000	With (NO) microswitch operation in either directions, neutral sensing, spring return in neutral position, G knob
16TM3G3	5CIN116005	With (NC) microswitch operation in either directions, spring return in neutral position, G knob, Heavy Duty configuration
16TM1G3	5CIN116004	As 16TM3G3, microswitch operation with lever towards port 1
16TM2G3	5CIN116004	As 16TM3G3, microswitch operation with lever towards port 2
20G3	5CIN120000	Detent in position 1 and 2, friction, neutral sensing, G knob
22G3	5CIN122000	With (NO) microswitch operation in either directions, friction, G knob

3 Standard handlevers

Without microswitch:

TYPE	CODE	DESCRIPTION
G3	5AST271218G	Ogival with portlight, straight rod (STANDARD)
G3(15)	5AST371227G	Ogival with portlight, 15° sloping rod
G3(30)	5AST371228G	Ogival with portlight, 30° sloping rod
E	5AST371215E	Spherical with portlight, 15° sloping rod

With microswitch:Not available with control type 07-16-20-22

CAUTION: for assembly requirements these handlevers, if ordered as a spare parts, will be supplied complete with rubber bellow

TYPE	CODE	DESCRIPTION
JJ3	5AST271218J	With spring return
JM3	5AST271218M	With detent rocker switch

For J handle specifications see the “handles and handlevers” catalogue

4 Handle position

Only for sploping rod

TYPE	DESCRIPTION
(0)	Handlever oriented towards plugged P and T ports
(90)	Handlever oriented towards port 1
(180)	Handlever oriented towards open P and T ports
(270)	Handlever oriented towards port 2

5 Pressure control curves

For list available see from page 27

5.1 Curve type

TYPE	DESCRIPTION
0	Standard

5.2 Typology of curves

TYPE	DESCRIPTION
0	With step
1	Without step
2	Piecewise with step
3	Piecewise without step

5.3 Curve identification

Progressive number

5.4 Return springs

TYPE	DESCRIPTION
M	Operation range from 18 to 25.5 N - *from 4.04 to 5.73 lbf*
A	Operation range from 23 to 35.2 N - *from 5.17 to 7.91 lbf*
B	Operation range from 23 to 68.1 N - *from 5.17 to 15.31 lbf*
C	Operation range from 89 to 176 N - *from 20 to 39.56 lbf*
D	Operation range from 110 to 220 N - *from 24.73 to 49.46 lbf*
E	Operation range from 137.8 to 276.1 N - *from 31 to 62.07 lbf*

6 Closing plugs *

CODE	DESCRIPTION
3XTAP719150	G1/4 plug for rear ports (n. 2 plugs)

7b Assembling kit for SVM100

Only for SVM100/2 or higher: this kit contains tie rods, nuts and O-ring seal.

CODE	DESCRIPTION	CODE	DESCRIPTION
5TIR108073	For SVM100/2	5TIR108248	For SVM100/7
5TIR108108	For SVM100/3	5TIR108283	For SVM100/8
5TIR108143	For SVM100/4	5TIR108319	For SVM100/9
5TIR108178	For SVM100/5	5TIR108353	For SVM100/10
5TIR108213	For SVM100/6		

7b Assembling kit for SVM101

Only for SVM101/2 or higher: this kit contains tie rods, nuts and O-ring seal.

CODE	DESCRIPTION	CODE	DESCRIPTION
5TIR108050	For SVM101/2	5TIR108225	For SVM101/7
5TIR108085	For SVM101/3	5TIR108261	For SVM101/8
5TIR108122	For SVM101/4	5TIR108295	For SVM101/9
5TIR108156	For SVM101/5	5TIR108330	For SVM101/10
5TIR108190	For SVM101/6		

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

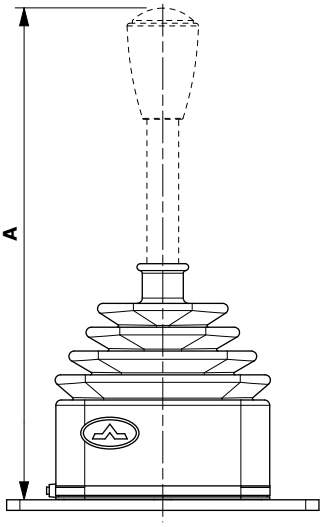
Configuration option

Controls without handlevers

Controls type

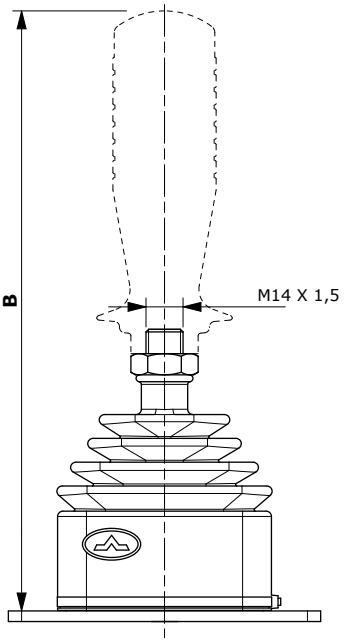
01: Spring return to neutral position
05: With detent in position 1 and spring return in neutral position
06: With detent in position 2 and spring return in neutral position
07: With detent in positions 1 and 2; spring return in neutral position
03S: With friction and neutral sensing, arranged for handles with M14x1.5 thread (see the "handles and handlevers" catalogue)

01-05-06-07 type



Handlever type	A mm	A *in*
G3 straight rod	186	*7.32*
G3 15° bending rod	184	*7.24*
G3 30° bending rod	176	*6.93*
E 15° bending rod	186	*7.32*
JJ3 straight rod	190	*7.48*

03S type



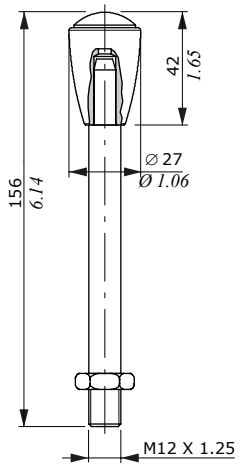
Handle type	B mm	B *in*
10 series	229	*9.02*
V type	243	*9.57*
H type	241	*9.49*
P type	259	*10.20*
AMH type	200	*7.87*

Handlevers

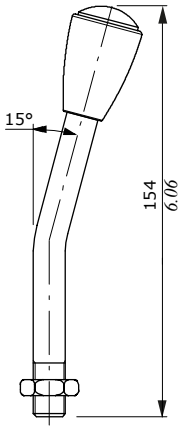
Without microswitch

G type: Ogival knob with customizable portlight. It's possible to insert labels with specific machine functions (for example: lifting function): please contact our Sales Department.
E type: Spherical handle customizable as G type.

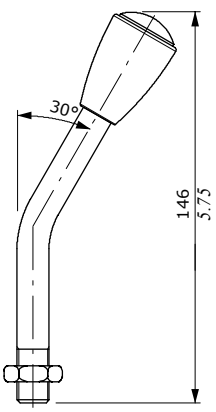
G type
straight rod



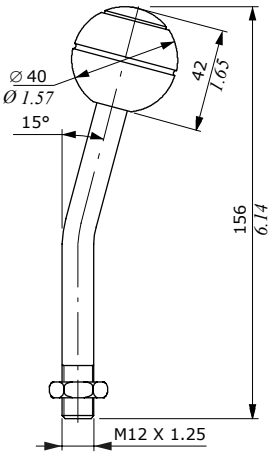
G(15) type
15° sloping rod



G(30) type
30° sloping rod



E type
15° sloping rod



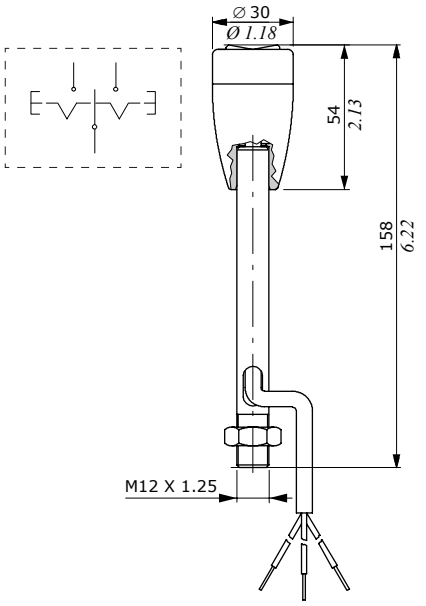
Configuration option

Handlevers

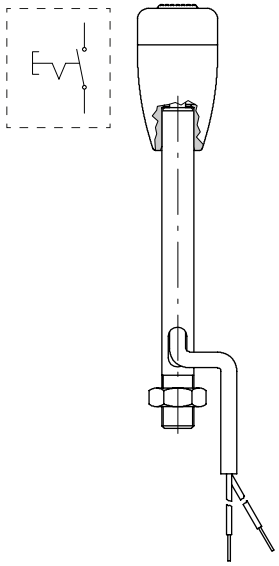
With microswitch

JM type: Ogival knob, small dimensions, available with detent rocker microswitch.
JJ type: As previous one, available with spring return push-button microswitch.
For technical features see catalogue D1WWEH01I.

JM type

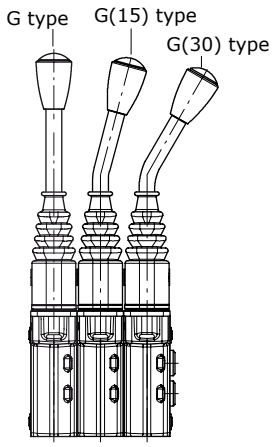


JJ type

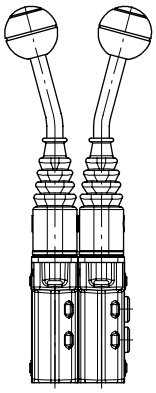


Mounting and orientation examples

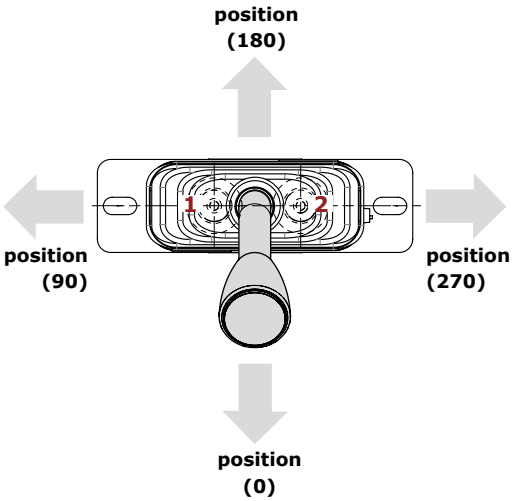
G type
on 3 sections
pilot control valve



E type
on 2 sections
pilot control valve



Sloping rod position



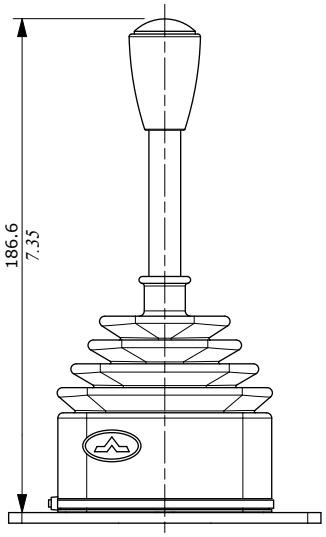
Configuration option

Controls with handlevers

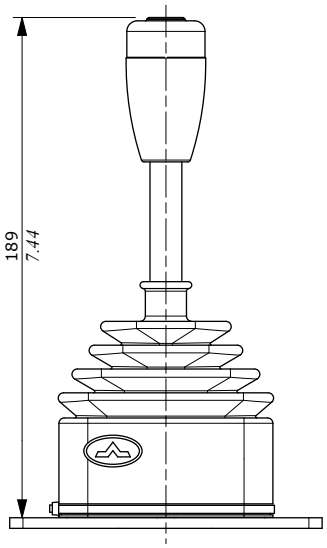
Without microswitch

02G3: With detent in neutral position; it can not be used on two adjacent sections.
03G3: With friction: stop in any positions and neutral sensing. Ogival with portlight G type knob.
03E3: As type 03G3 control, E knob and 15° bending rod.
03JL3: As type 03G3 control, JL knob with spring return microswitch push-button.
10G3: With friction and detent in neutral position; it can not be used on two adjacent sections.
11G3: Detent in neutral position, 1 and 2; it can not be use in adjacent sections.
20G3: With friction, stop in any positions and neutral sensing, with detent in positions 1 and 2.

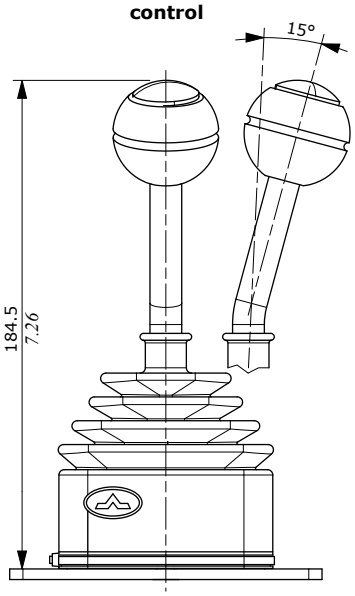
03G3-20G3 control



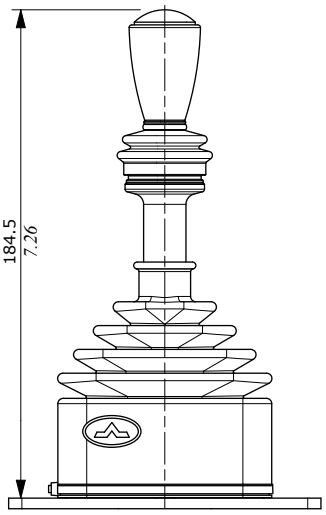
03JL3 control



03E3 control



02G3-10G3-11G3 control



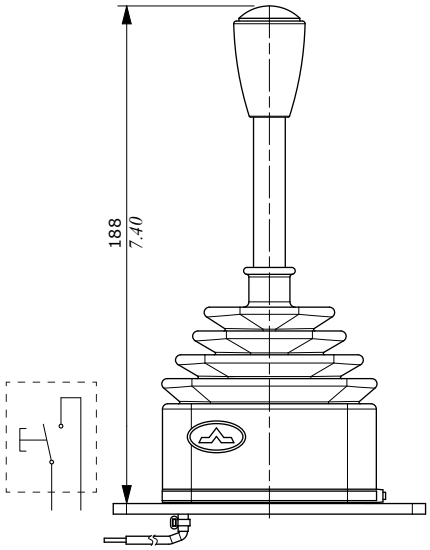
Configuration option

Controls with handlevers

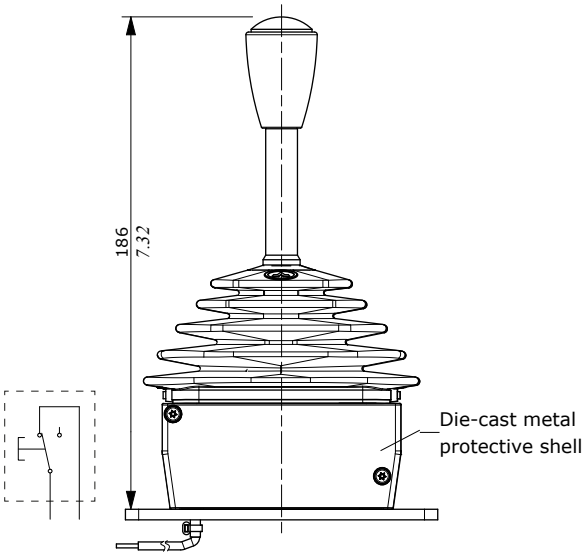
Controls with microswitch

16G3(NO): With (NO) microswitch operation in either directions, neutral sensing, spring return in neutral position.
16TM3G3(NC):With (NC) microswitch operation in either directions, protective shell and dust-proof seals
16TM1G3(NC):With NC) microswitch operation towards port 1, protective shell and dust-proof seals
16TM2G3(NC):With (NC) microswitch operation towards port 2, protective shell and dust-proof seals
22G3(NO): With (NO) microswitch operation in either directions and friction (stop in any position)

16G3(NO)-22G3(NO)
control

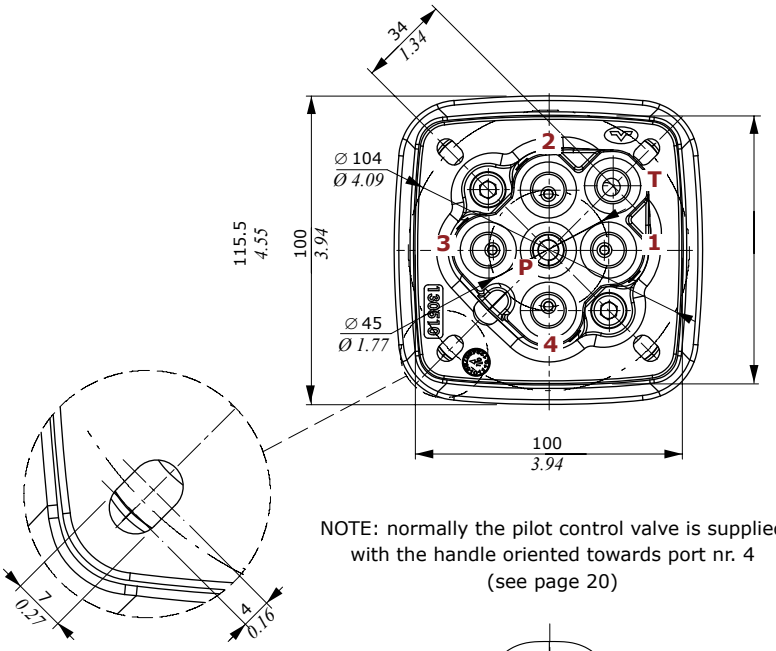


16TM3G3(NC)-16TM1G3(NC)-16TM2G3(NC)
control

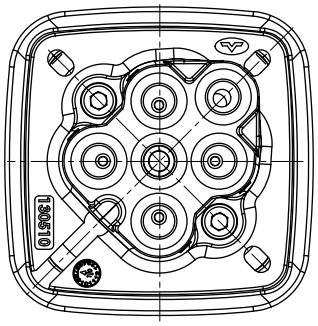


Dimensions and hydraulic circuit

SVM400

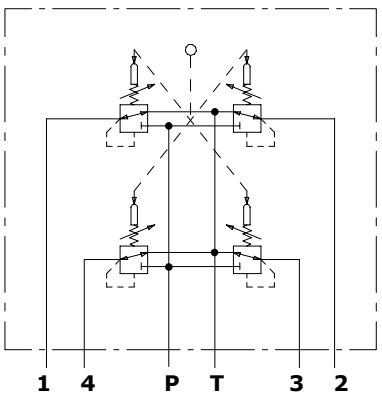


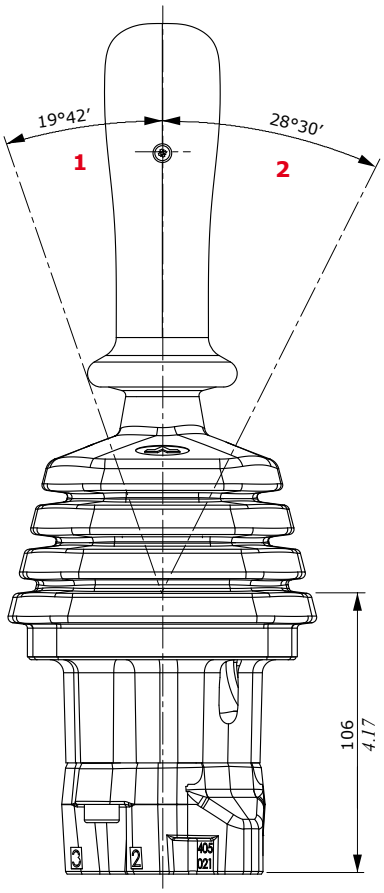
Configuration with one open ring

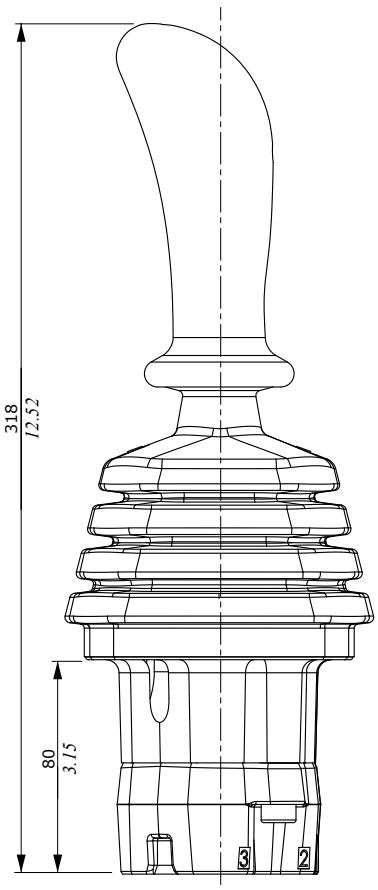


NOTE: normally the pilot control valve is supplied with the handle oriented towards port nr. 4 (see page 20)

Hydraulic circuit





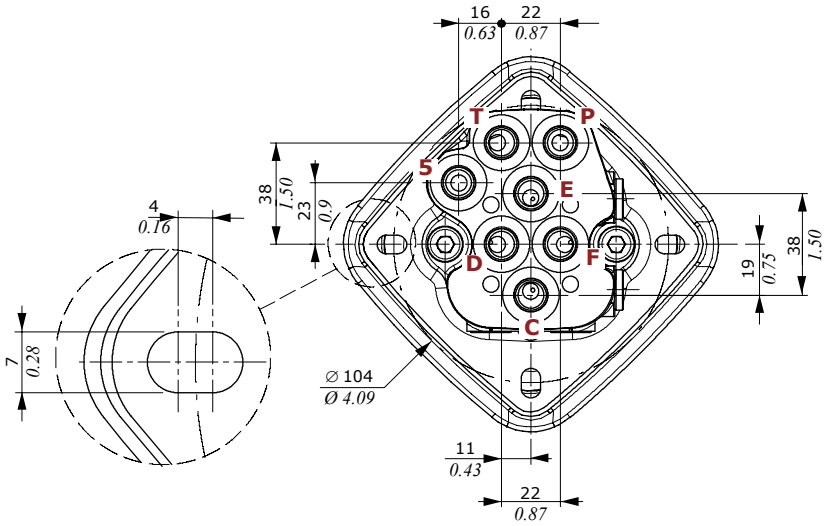


1 : Single work port
2 : Two simultaneous work ports

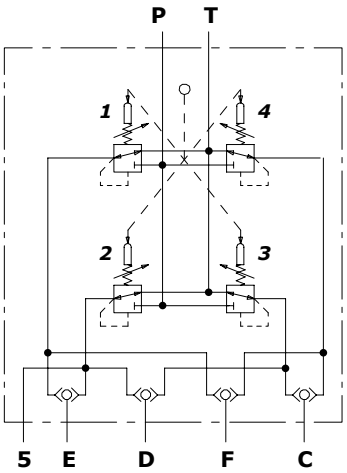
Dimensions and hydraulic circuit

SVM430

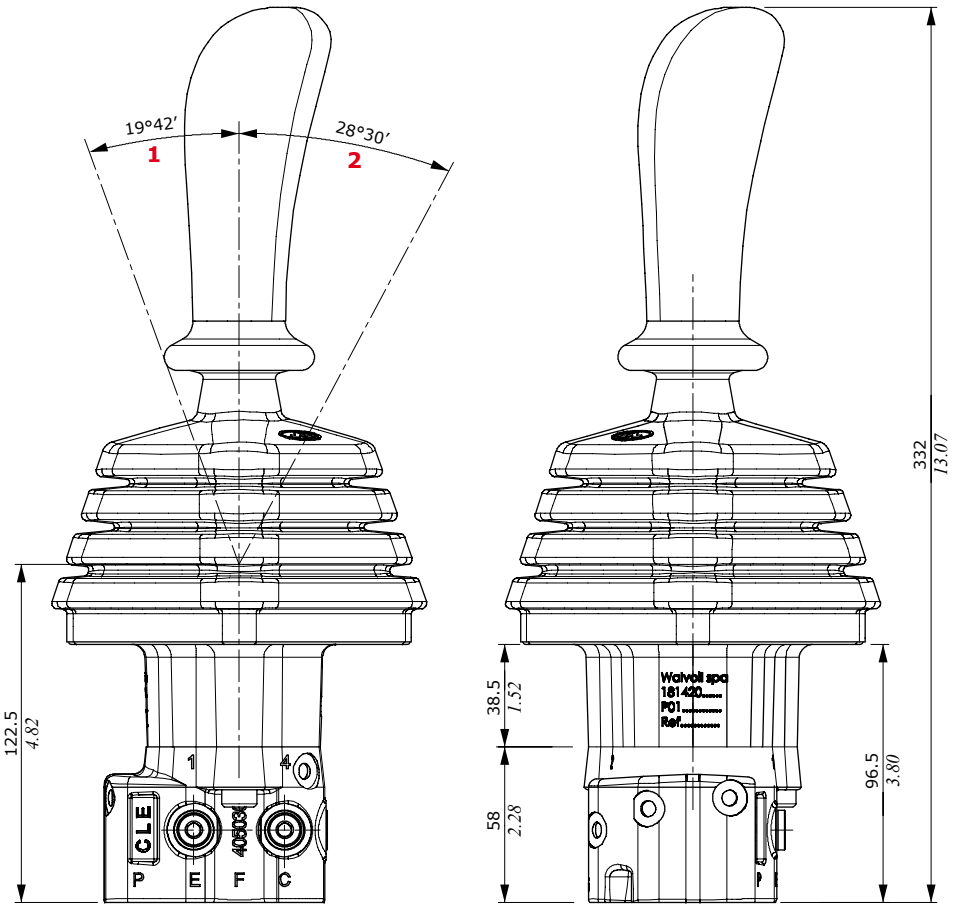
It's configured with pressure gauges (5) to get an additional output signal (ex. back-up alarm).



Hydraulic circuit



Work port **1** ⇒ **EF** port ⇒ **right**
Work port **2** ⇒ **ED** port ⇒ **back**
Work port **3** ⇒ **CD** port ⇒ **left**
Work port **4** ⇒ **CF** port ⇒ **forward**

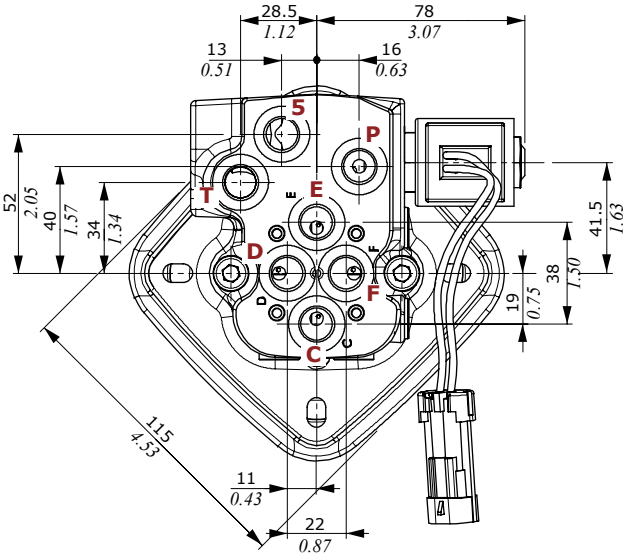


1 : Single work port
2 : Two simultaneous work ports

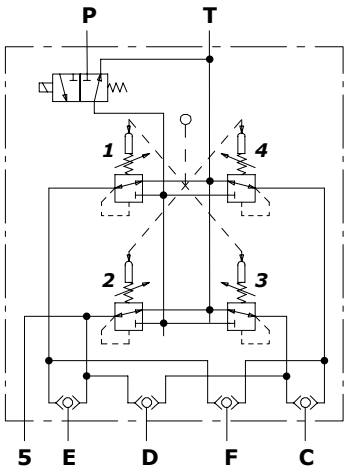
Dimensions and hydraulic circuit

SVM431

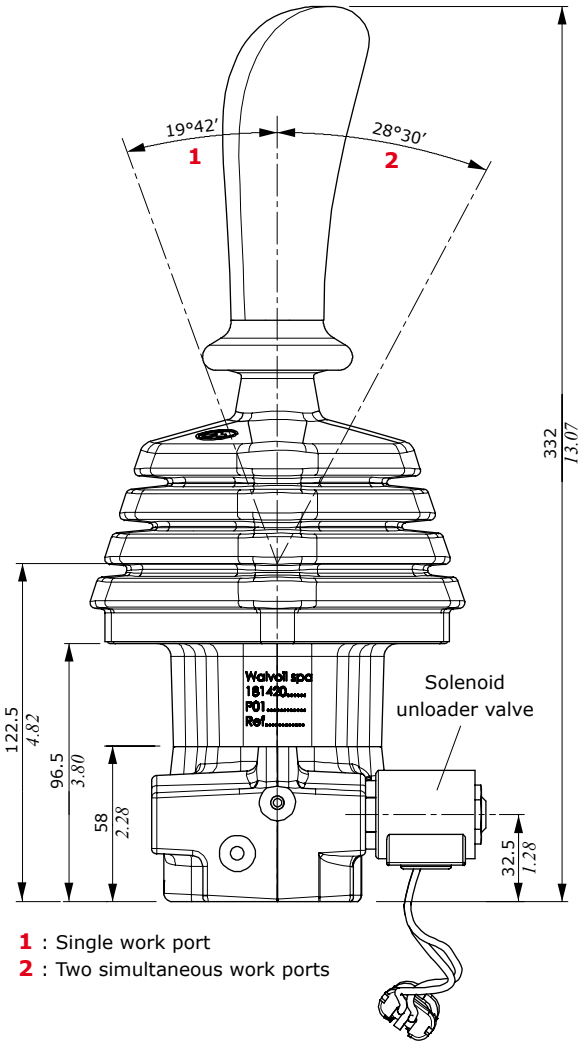
SVM431 it's configured with pressure gauges (5) to get an additional output signal with safety solenoid valve.



Hydraulic circuit



Work port **1** ⇒ **EF** port ⇒ **right**
Work port **2** ⇒ **ED** port ⇒ **back**
Work port **3** ⇒ **CD** port ⇒ **left**
Work port **4** ⇒ **CF** port ⇒ **forward**

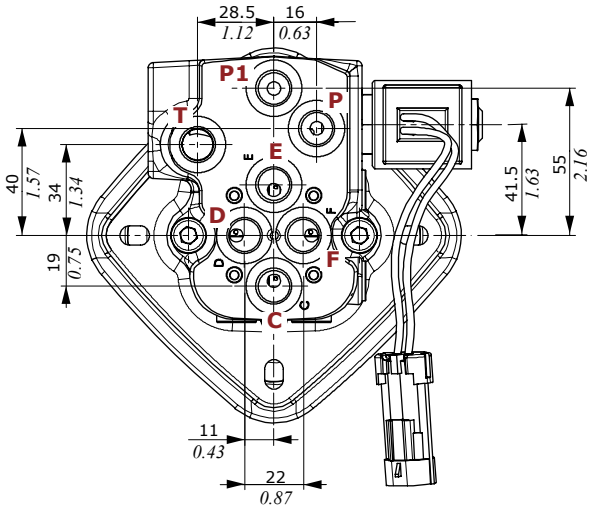


1 : Single work port
2 : Two simultaneous work ports

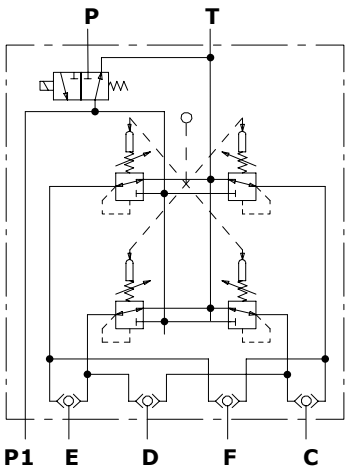
Dimensions and hydraulic circuit

SVM432

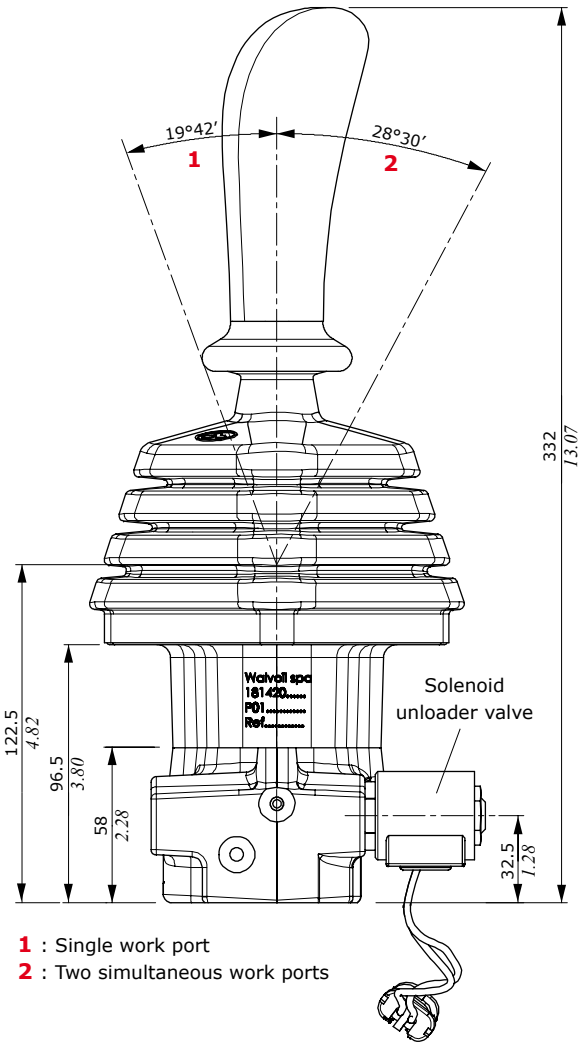
SVM432 it's configured with solenoid unloader valve and auxiliary under safety pressure gauge port (P1).



Hydraulic circuit



Work port **1** ⇒ **EF** port ⇒ **right**
Work port **2** ⇒ **ED** port ⇒ **back**
Work port **3** ⇒ **CD** port ⇒ **left**
Work port **4** ⇒ **CF** port ⇒ **forward**



1 : Single work port
2 : Two simultaneous work ports

Ordering codes

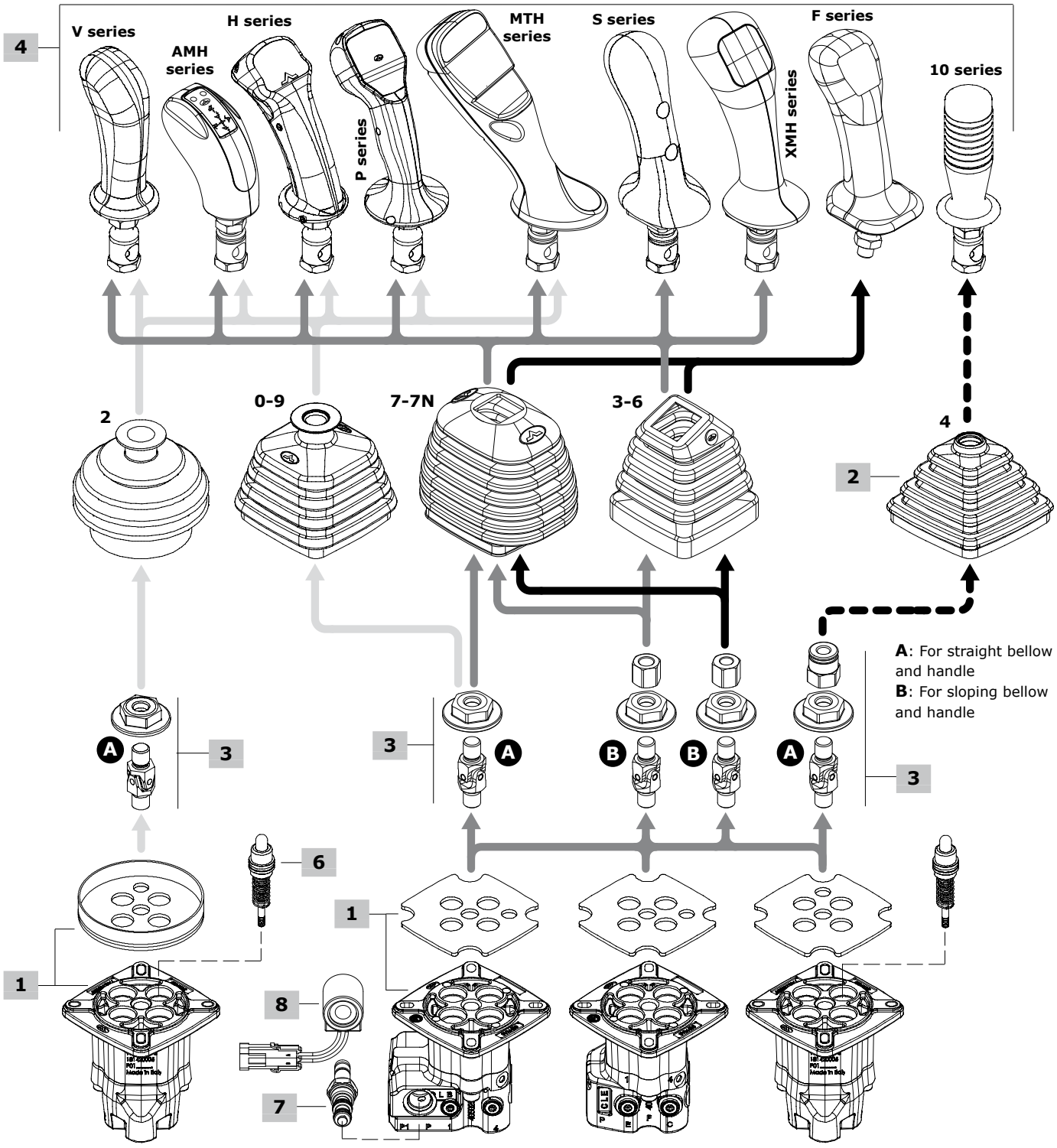
SVM400 / 0 1 - B / 01 V009 (90) - 0 0 001 A X 4 - <CRVN>

1 2 1 3 4 5 6

Body is painted as standard, with one coat of primer black antirust paint

SVM431 / 0 1 - B / 01 V009 (90) - 0 0 001 A - ELN (W1F02)-12VDC - <CRVN>

6.1 6.2 6.3 6.4 7 8



Ordering codes

1 Body kit *

TYPE	CODE	DESCRIPTION
With arrangement for circular base rubber bellow		
SVM400/3-B	5CO3422300C	For circular base rubber bellow
With arrangement for square base rubber bellow		
SVM400/1-B	5CO3422300	For square base rubber bellow
SVM400/1-B	5CO3422301	As previous one, arranged for control type 16
SVM400/1A-B	5CO3422305	For square base rubber bellow, with one open ring
SVM430/1-B	5CO3432302	With auxiliary pressure gauge port
SVM431/1-B	5CO3432310	With auxiliary pressure gauge port and solenoid unloader valve
SVM432/1-B	5CO3432320	With auxiliary under-safety pressure gauge port and solenoid unloader valve

2 Rubber bellow

TYPE	CODE	DESCRIPTION
Circular base type		
2	3SOF110100	Straight type; it can be used with sloping handles
Square base type		
0	3SOF111130	Straight type with logo
3	3SOF111113	Sloping type with logo, only for 19° sloping handles. Not available for type 16 control
6	3SOF111114	As type 3, without logo. Not available for type 16 control
7	3SOF111135	General purpose type with logo; it can be used straight or up to 30° sloping in all directions
7N	3SOF111137	As type 7 without logo.
9	3SOF111131	As type 0 without logo.
4	3SOF111100	Straight type

3 Control option

TYPE	CODE	DESCRIPTION
With spring return in neutral position		
01	5CIN4003	For handles with straight rubber bellow (not for Series 10 and F handles)
	5CIN4001	For handles with sloping rubber bellow (not for Series 10 and F handles)
01GP	5CIN4002	For series 10 handles
01	5CIN401F00	For series F handles
With microswitches for movement detection on each port: It needs type 7/7N rubber bellow and dedicated body kit (see ch.1)		
16	5CIN4023	For handles with straight rubber bellow (not for Series 10 and F handles)
	5CIN4021	For handles with sloping rubber bellow (not for Series 10 and F handles

4 Handles

Some handles as examples are listed below: for technical specifications and full range of handles and other types of joint see the "Handles and handlevers" catalogue.

V series handle
TYPE: **V007-(Q)** CODE:5IMP030071
DESCRIPTION Without switches, with sloping 19° left joint and square seat bellow adapter

AMH series handle
TYPE: **AMH0400A9-6R2035(T)-7R2035(T)-8R2035(T)-9R2035(T)-(E2)** CODE: 2IM3000004
DESCRIPTION: 4 spring return push-buttons, protection diode, flying leads, straight joint and square seat bellow adapter

H series handle
TYPE: **HA029-0RD040-2RD040-4RD040** CODE: 2IM4100109
DESCRIPTION: 2 microswitch push-buttons on the operator side, "dead man" switch, flying leads, straight joint, for circular seat bellow

P series handle
TYPE: **PZTA4100D9-0RD035-3R1D035-4R1D035-5R1D035-6R1D035-WN130035** CODE: 2IM8600007
DESCRIZIONE: 1 proportional roller and 4 spring return push-buttons on operator side,"dead man" switch, flying leads, straight joint for circular seat bellow

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

4(bis) Handles

MTH series handle
TYPE: **MTH-R00-ZTM31009-00-3N2035-5R2035-6N2035-7N2035-8N2035-DY2035-WG130035-(D2F12)**
CODE: 2IM2000012
DESCRIPTION: 1 proportional roller and 3 spring return push-buttons on the operator side, 3 push buttons on the opposite side, straight joint, for circular seat bellow, Deutsch connector

XMH series handle
TYPE: **XMHZTA21008-2G2035-4G2035-7G2035-VG171035**
CODE: 2IM1000004
DESCRIPTION: 1 proportional roller and 2 spring return push-buttons on the opetrator side, 1 push button with spring return on the opposite side, Deutsch connector, 19° sloping right joint, for square seat bellow

S series handle
TYPE: **SZTA8-0G4045-XG122045** CODE: 2IM5310003
DESCRIPTION: With prop. roller on the operator side and spring return push-button on the opposite side, 19° sloping right joint, for square seat bellow

F series handle
TYPE: **F02F-02R(1=8)** CODE: 320000251
DESCRIPTION: 2 microswitch push-buttons on the operator side and 2 on the opposite side, flying leads, 15° sloping joint, square seat bellow adapter, requires dedicated control

5 Handle position

TYPE	DESCRIPTION
(-)	STANDARD configuration, forward operation to port 4: **omitted in description**
(90)	Mounted with 90° rotation step: forward operation towards port 1
(180)	Mounted with 180° rotation step: forward operation towards port 2
(270)	Mounted with 270° rotation step: forward operation towards port 3

6 Pressure control curves

For list available see from page 27

6.1 Curve type

TYPE	DESCRIPTION
0	Standard

6.2 Typology of curves

TYPE	DESCRIPTION	TYPE	DESCRIPTION
0	With step	**2**	Piecewise with step
1	Without stepp	**3**	Piecewise without step

6.3 Curve identification

Progressive number

6.4 Return springs

TYPE	DESCRIPTION
M	Operation range from 18 to 25.5 N - *from 4.04 to 5.73 lbf*
A	Operation range from 23 to 35.2 N - *from 5.17 to 7.91 lbf*
B	Operation range from 23 to 68.1 N - *from 5.17 to 15.31 lbf*
C	Operation range from 89 to 176 N - *from 20 to 39.56 lbf*
D	Operation range from 110 to 220 N - *from 24.73 to 49.46 lbf*
E	Operation range from 137.8 to 276.1 N - *from 31 to 62.07 lbf*

7 Solenoid unloader valve

TYPE	CODE	DESCRIPTION
ELN	2X4800100	Without emergency operation
ELT	2X4800200	With emergency operation

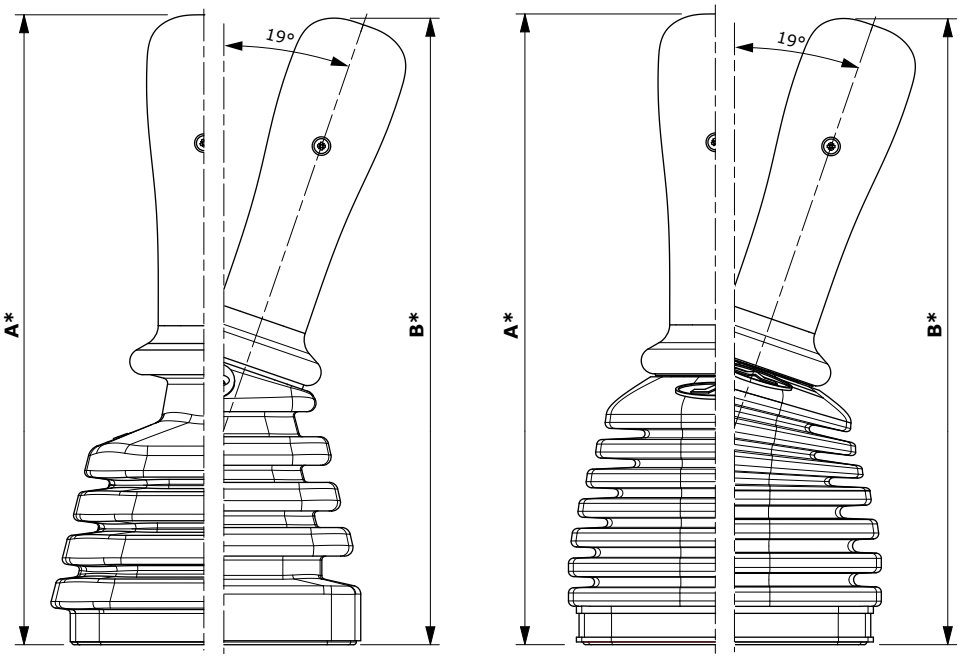
8 Coil

TYPE	CODE	DESCRIPTION
(D1F02)-12VDC	4SL6001200	12VDC, integrated Deutsch connector
(D1F02)-24VDC	4SL6002400	As previous one, 24VDC
(W1F02)-12VDC	4SL6001204	12VDC, WP Packard connector with flying leads (L= 210 mm - *8.27 in*)

Configuration option

Control and handle options

01 type: Spring return in neutral position.
16 type: With microswitches for movement detection on each port. It needs type 7 rubber bellow and special body: please contact our Sales Department.

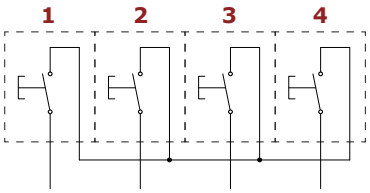


Straight control 01 | Sloping control 01 | Straight control 16 | Sloping control 16

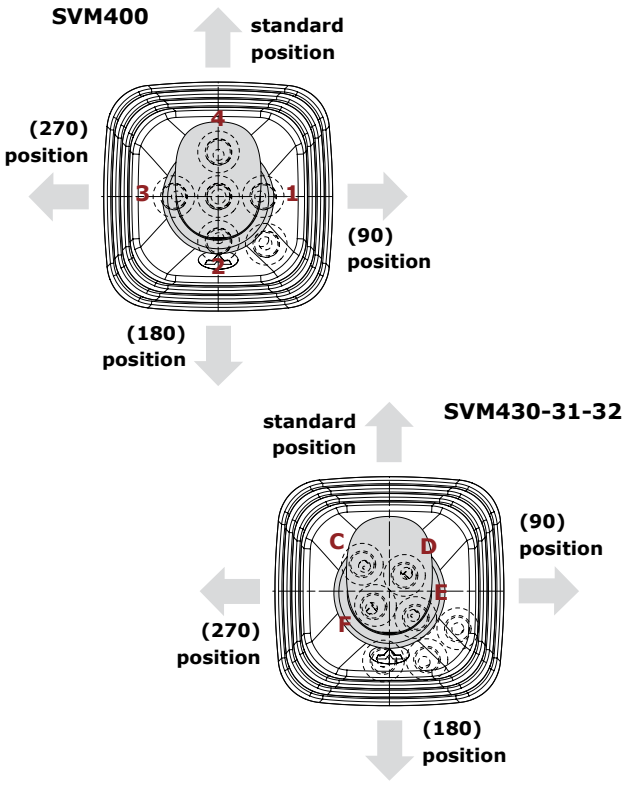
Type	A*		B*	
	mm	*in*	mm	*in*
V series	238	*9.71*	236	*9.29*
AMH series	194	*7.64*	194	*7.64*
H series	236	*9.29*	234	*9.21*
P series	255	*10.04*	253	*9.96*
MTH series	262	*10.31*	250	*9.84*
S series	251	*9.88*	248	*9.76*
XMH series	260	*10.24*	256	*10.08*
F series	242	*9.52*	238	*9.37*
10 series	222	*8.74*	/	/

(*) The overall dimensions are indicative

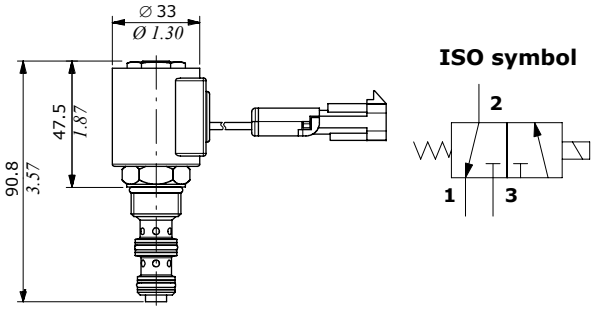
Control type 16 electrical diagram



Handles positions



Solenoid unloader valve



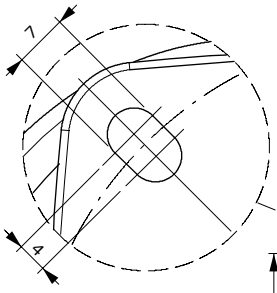
Features

SOLENOID VALVE
Nominal pressure . . . . . : 207 bar - *14.27 psi*
maximum internal leakage
on port 3 (de-energized coil) . . . . : 82 cm³/min a 207 bar
5 in3/min at 14.27 psi
on port 1 (energized coil) . . . . . : 164 cm³/min a 207 bar
10 in3/min at 14.27 psi

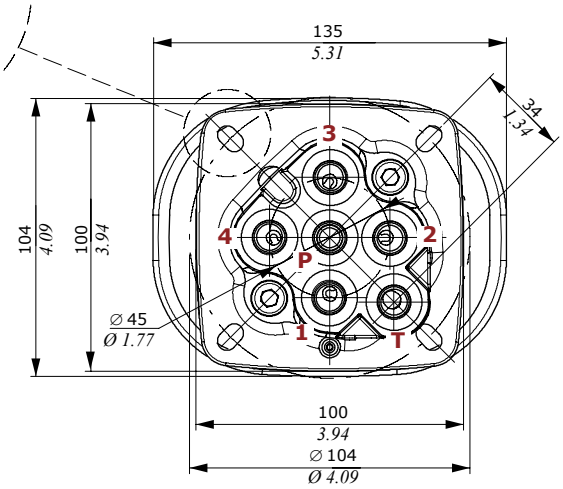
COIL
Nominal voltage tolerance . . . . . : ±15%
Power rating . . . . . : 14.7 W
Max. operating current . . . . . : 1.22 A a 12 VDC
0.61 A a 24 VDC
Coil insulance . . . . . : Class H
Weather protection (EN 60529) . . . : IP65 *
Insertion . . . . . : 100%
(*) with connector correctly fitted and O-ring protection

Dimensions and hydraulic circuit

Configuration with electromagnetic detent



NOTE: normally the pilot control valve is supplied with the handle oriented towards port nr. 4 (see page 24)



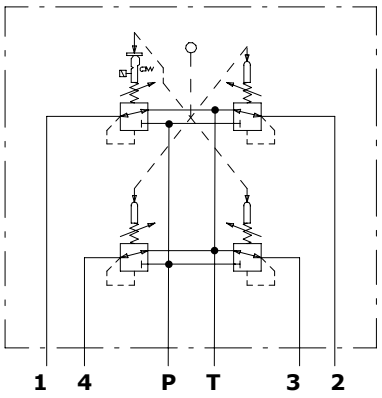
Features

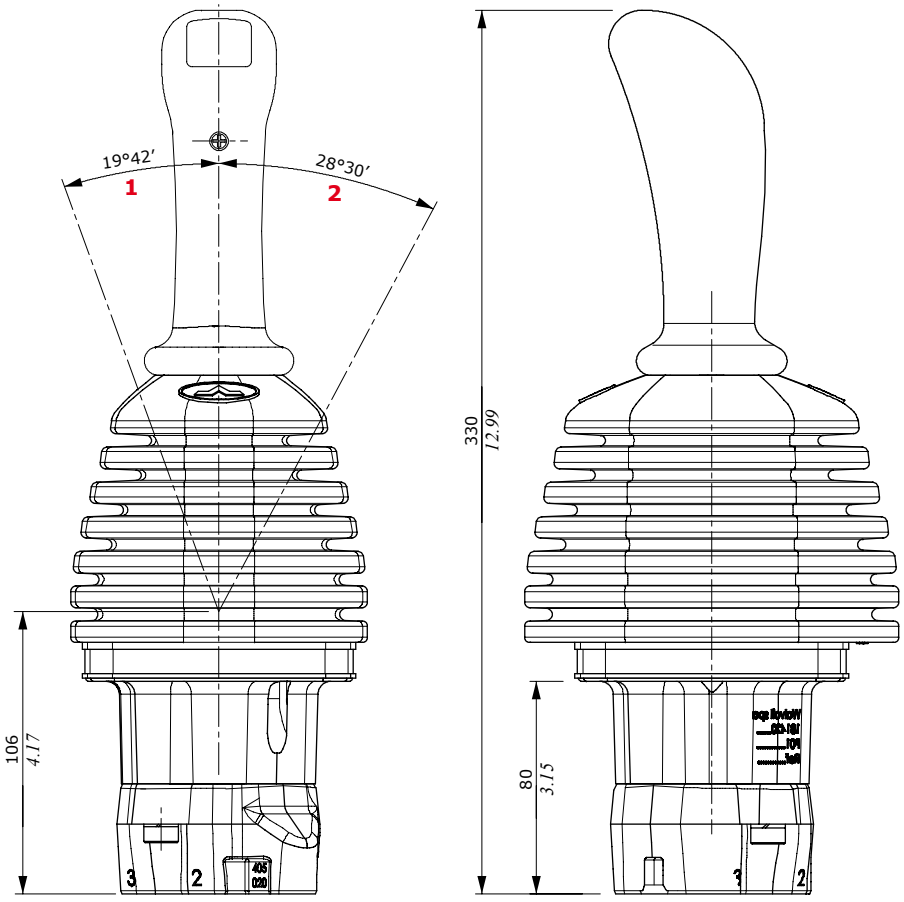
ELECTROMAGNET

Nominal voltage tolerance	: ±10%
Power rating	: 8 W - 12 VDC
	: 7.4 W - 24 VDC
Nominal current	: 0.66 A - 12 VDC
	: 0.3 A - 24VDC
Coil insulance	: Class H
Weather protection	: IP65
Insertion	: 100%

Hydraulic circuit

Example detent on working port 1





1 : Single work port
2 : Two simultaneous work ports

Ordering codes

Pressure control curve for electromagnetic detent

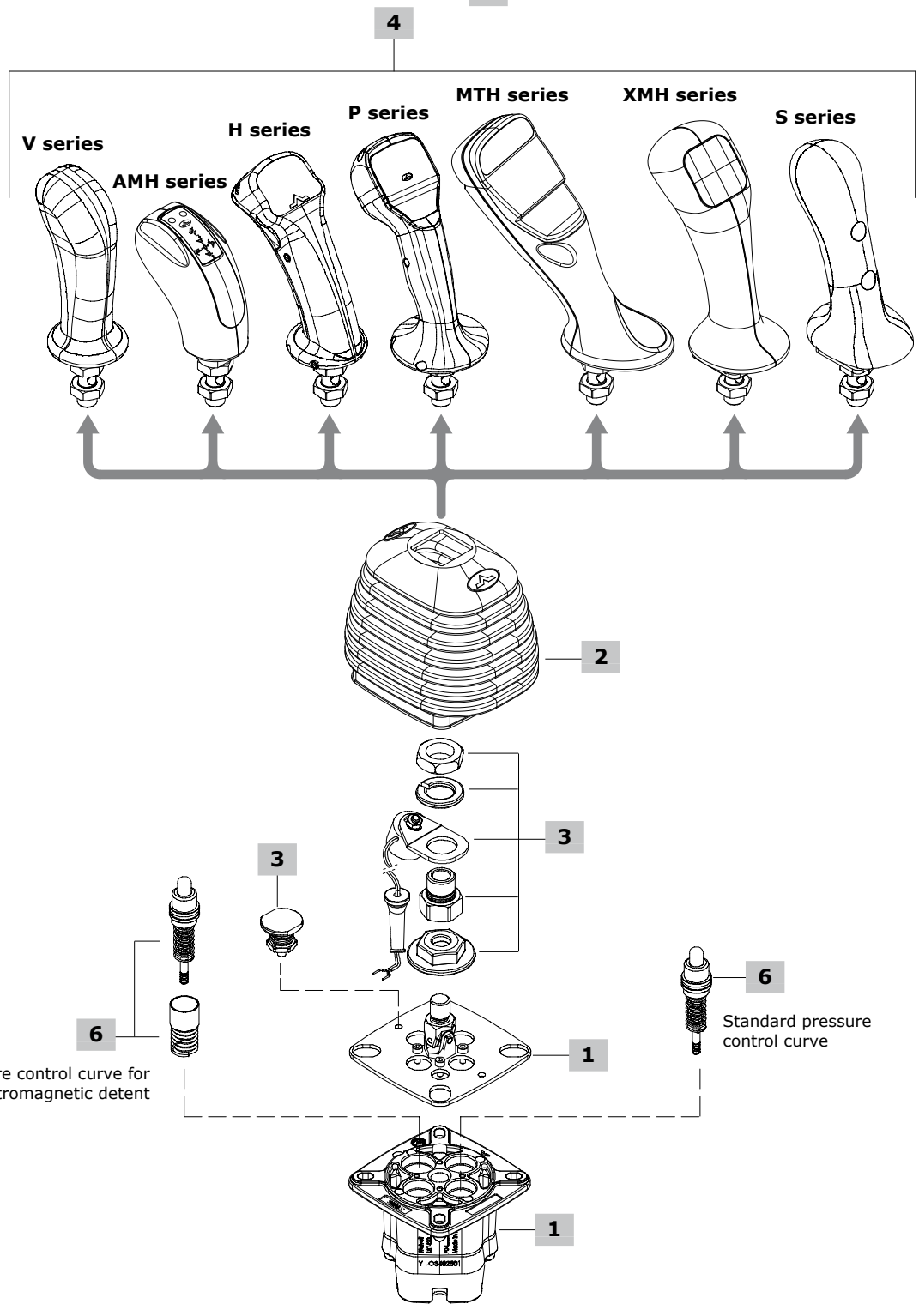
Standard pressure control curve

SVM400-EMD1 / 7 1 - B / 01E15 (....) V00G (90) (....) - E 0 001 M - 00001M X 3 - 12VDC - <CRVN>

1	2	1	3	7	4	5	7	6.1	6.2	6.3	6.4	6	3

6

Body is painted as standard, with one coat of primer black antirust paint



Ordering codes

1 Body kit *

TYPE: **SVM400-EMD0/1-B** CODE: 5CO3422300
DESCRIPTION: Without detent arrangement
TYPE: **SVM400-EMD1/1-B** CODE: 5CO3402301
DESCRIPTION: With detent arrangement on port 1
TYPE: **SVM400-EMD6/1-B** CODE: 5CO3402306
DESCRIPTION: With detent arrangement on ports 2 and 4

2 Rubber bellow

7	3SOF111135	Universal type, rectangular base. With logo and it can be used straight and 30° sloping in all directions
7N	3SOF111137	As type 7 without logo

3 Detent configuration

Cables are supplied with wires with tin-plate terminals

TYPE	CODE	DESCRIPTION
01E0	5CIN401E00	Spring return, without detent
Detent on port 1		
01E15	5CIN401E12	12 VDC - Spring return
01E15	5CIN4E401100	24 VDC - Spring return
Detent on ports 1, 3 or 2, 4		
01E25	5CIN401E22	12 VDC - Spring return
01E25	5CIN4E401200	24 VDC - Spring return

NOTE: For detent on different ports please contact our Sales Department.

6 Pressure control curves

For list available see from page 27

6.1 Curve type

TYPE	DESCRIPTION
0	Standard, without electromagnetic detent
E	For electromagnetic detent, with pre-feeling

6.2 Typology of curves

TYPE	DESCRIPTION
0	With step
1	Without step
2	Piecewise with step
3	Piecewise without step

6.3 Curve identification

Progressive number

6.4 Return springs

TYPE	DESCRIPTION
M	Operation range from 18 to 25.5 N - *from 4.04 to 5.73 lbf*
A	Operation range from 23 to 35.2 N - *from 5.17 to 7.91 lbf*
B	Operation range from 23 to 68.1 N - *from 5.17 to 15.31 lbf*

7 Connector

Configurations with detent or microswitch are provided with wires with tin-plate terminals. For connectors please contact our Sales Department

4 Handles

Some handles as examples are listed below: for technical specifications and full range of handles and other types of joint see the "Handles and handlevers" catalogue.

V series handle
TYPE: **V007-(Q)**
CODE: 5IMP030071
DESCRIPTION: Without switches, with 19° sloping left joint and square seat bellow adapter

AMH series handle
TYPE: **AMHT0300A8-(Q)-6N2D035-7R2D035-8N2D035-(E1)**
CODE: 2IM3000007
DESCRIPTION: 3 spring return push-buttons on the operator side, flying wires, 19° sloping right joint, square seat bellow adapter

H series handle
TYPE: **HMB03G-(Q)-1R4040-4R3040-5R2040-(12VDC)**
CODE: 2IM4600051
DESCRIPTION:3 spring return push-buttons on the operator side, flying wires, straight joint, square seat bellow adapter

P series handle
TYPE: **PZMA1200B7-0R035-3Y2D035-WN130035-ZN130035-(SCHEDA 2PWM)-(TD2M)**
CODE: 2IM8700003
DESCRIPTION: 2 proportional rollers and 1 spring return push-button on the operator side, "dead man" switch, flying wires with Deutsch pins, 19° sloping left joint, square seat bellow adapter

MTH series handle
TYPE: **MTH-R00-ZTI4100(K)Y-00-1Y2035-2Y2035-3N2035-6N2035-ZN122035-MRZ035-(5VDC)-D2F12**
CODE: 2IM2000005
DESCRIPTION: 1 proportional roller and 4 spring return push-buttons on operator side, 1 FNR rocker on the opposite side, Deutsch connector, 9° sloping left joint, square seat bellow adapter

XMH series handle
TYPE: **XMHZTA21008-2G2035-4G2035-7G2035-VG171035**
CODE: 2IM000004
DESCRIPTION: 1 proportional roller and 2 spring return-push buttons on the operator side, 1 spring return push button on the opposite side, Deutsch connector, 19° sloping right joint, for square seat bellow

S series handle
TYPE: **SZTA8-0G4045-XG122045**
CODE: 2IM5310003
DESCRIPTION: With proportional roller on the operator side and spring return push-button on the opposite side, 19° sloping right joint, for square seat bellow

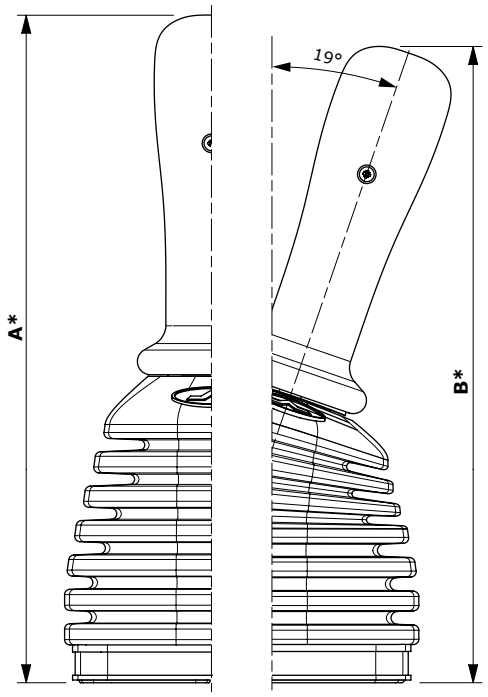
5 Handle position

TYPE	DESCRIPTION
(-)	STANDARD configuration, forwaed operation twards port 4: **omitted in description**
(90)	Mounted with 90° rotation step: forward operation towards port 1
(180)	Mounted with 180° rotation step: forward operation towards port 2
(270)	Mounted with 270° rotation step: forward operation towards port 3

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

Configuration option

Handle options

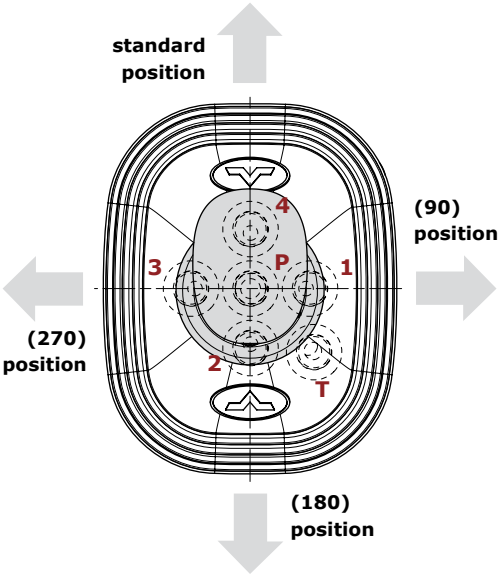


Type	A*		B*	
	mm	*in*	mm	*in*
V series	252	*9.92*	240	*9.45*
AMH series	209	*8.23*	201	*7.91*
H series	250	*9.84*	240	*9.45*
P series	268	*10.55*	266	*10.47*

Type	A*		B*	
	mm	*in*	mm	*in*
MTH series	275	*10.83*	271	*10.67*
S series	266	*10.47*	261	*10.27*
XMH series	275	*10.83*	264	*10.39*

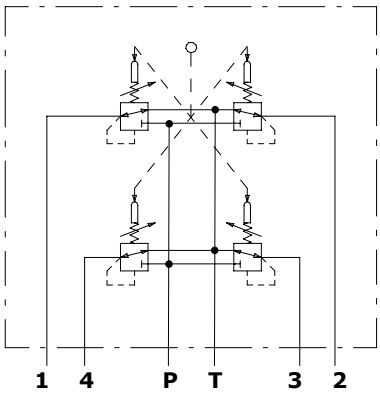
(*) The overall dimensions are indicative

Handle positions

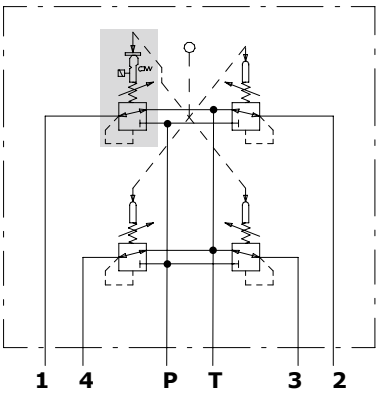


Detent configuration

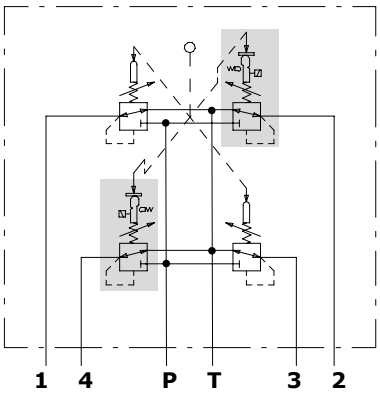
01E0 type
Spring return, without detent



01E15 type
Single detent on port 1
(detent on ports 2-3-4 on request),
spring return

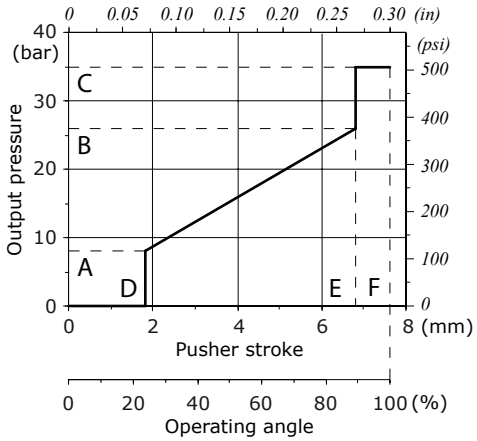


01E25 type
Detent on ports 2 and 4, spring return

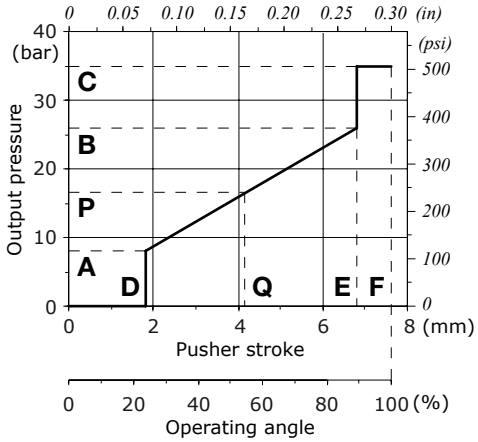


Control curves with step

00 type without pre-feeling



E0 type with pre-feeling for EM detent



Curve description		Pressure								Stroke								
		A		P		B		C		D		Q		E		F		
Type	Nr	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar	*psi*	mm	*in*	mm	*in*	mm	*in*	mm	*in*	CODE [1]
Without pre-feeling																		
00	**019**	0.5 (+1, -0.5)	*7.25 (+14.5, -7.25)*			11.4 (±1)	*165.3 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400019A
00	**022**	1 (±0.5)	*14.5 (±7.25)*			8 (±1)	*116.3 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40022A
00	**023**	2 (±0.5)	*29 (±7.25)*			11.5 (±1)	*166.7 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40023A
00	**047**	2 (+3/0)	*29 (+43.5/0)*			70 (±4.5)	*1015 (±65.2)*	75	*1088*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40047A 5CUR40047C
00	**065**	2 (±0.5)	*29 (±7.25)*			20.5 (±1.5)	*297.25 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40065A
00	**066**	2 (±0.5)	*29 (±7.25)*			23 (±1.5)	*333.5 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40066B 5CUR40066C
00	**110**	2 (±0.5)	*29 (±7.25)*			15 (±1)	*217.5 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400110A
00	**043**	3.2 (±0.5)	*46.4 (±7.25)*			11.7 (±0.5)	*169.6 (±7.25)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400043A
00	**010**	3.25 (±0.5)	*74.13 (±7.25)*			14.8 (±1)	*214.6 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40010A 5CUR40010M
00	**032**	3.4 (±0.5)	*49.3 (±7.25)*			29.4 (±1)	*426.3 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40032A 5CUR40032B 5CUR40032C
00	**086**	4 (±1)	*58 (±14.5)*			16.5 (±1)	*239.2 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40086A 5CUR40086C
00	**073**	4 (±0.5)	*58 (±7.25)*			18 (±1)	*261 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400073A 5CR400073M
00	**020**	4.3 (±0.5)	*63.3 (±7.25)*			15.2 (±1)	*220.4 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40020A 5CUR40020B 5CUR40020C
00	**004**	4.9 (±0.5)	*72.5 (± 7.25)*			18.9 (±1)	*274 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40004A 5CUR40004C 5CUR40004M
00	**017**	5 (±0.5)	*72.5 (± 7.25)*			12 (± 1)	*174 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40017A 5CUR40017C
00	**028**	5 (±1)	*72.5 (± 14.5)*			21 (±1.5)	*304.5 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40028A 5CUR40028B 5CUR40028C 5CUR40028M
00	**071**	5 (±1)	*72.5 (±14.5)*			17 (±1)	*246.5 (±14.5)*	35	*507.5*	1.35	*0.05*			6	*0.23*	7.3	*0.29*	5CUR40071A
00	**075**	5 (±0.5)	*72.5 (± 7.25)*			15 (±1.5)	*217.5 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40075A 5CUR40075B 5CUR40075C 5CUR40075E 5CUR40075M
00	**104**	5.5 (±1)	*79.75 (±14.5)*			17 (±1)	*246.5 (±14.5)*	35	*507.5*	0.85	*0.03*			3.1	*0.12*	3.5	*0.14*	5CR400104A
00	**115**	5.5				28.5				0.85	*0.03*			5.6	*0.22*	6.1	*0.24*	5CUR40115M
00	**001**	5.8 (±1)	*84.1 (±14.5)*			22 (±2)	*319 (±29)*	35	*507.5*	1.55	*0.06*			7	*0.27*	7.5	*0.29*	5CUR40001A

List continues in the next page

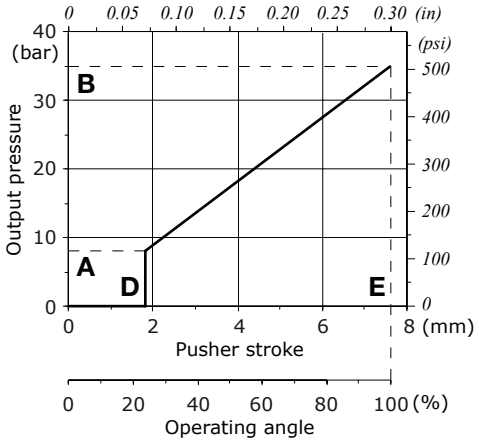
Control curves with step

Curve description		Pressure								Stroke								
		A		P		B		C		D		Q		E		F		
Type	Nr	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar	*psi*	mm	*in*	mm	*in*	mm	*in*	mm	*in*	CODE [1]
00	**024**	5.8 (±1)	*84.1 (±14.5)*			19 (±1.5)	*275.5 (±21.7)*	35	*507.5*	1.55	*0.06*			6.1	*0.24*	7.5	*0.29*	5CUR40024A 5CUR40024C
00	**033**	5.8 (±0.5)	*84.1 (± 7.25)*			19 (±1)	*275.5 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40033A 5CUR40033B 5CUR40033C 5CUR40033M
00	**070**	5.8 (±1)	*84.1 (±14.5)*			22.4 (±2)	*324.8 (±29)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40070A 5CUR40070B 5CUR40070D 5CUR40070M
00	**087**	5.8 (±0.5)	*84.1 (±7.25)*			17 (±1.5)	*246.5 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40087A
00	**021**	6 (±0.5)	*87 (±7.25)*			16.3 (±1)	*236.4 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400021A 5CR400021M
00	**105**	6 (±0.5)	*87 (±7.25)*			20 (±1)	*290 (±14.5)*	35	*507.5*	0.6	*0.02*			7.25	*0.28*	7.6	*0.30*	5CR400105B
00	**054**	6.2 (±1)	*89.9 (±14.5)*			24.5 (±2)	*355.25 (±29)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40054A
00	**007**	6.5 (±1)	*94.25 (±14.5)*			36 (±2)	*522 (±29)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400007A
00	**026**	6.5 (±0.5)	*94.25 (±7.25)*			14 (±1)	*203 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40026A 5CUR40026B 5CUR40026C
00	**053**	8 (±0.5)	*116 (±7.25)*			22.3 (±1)	*323.3 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40053A
00	**088**	8 (±0.5)	*116 (±7.25)*			27 (±1.5)	*391.5 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40088A 5CUR40088B 5CUR40088C 5CUR40088M
00	**089**	8 (±0.5)	*116 (±7.25)*			28 (±1)	*406 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40089A 5CUR40089C 5CUR40089D 5CUR40089M
00	**112**	8 (±1.5)	*116 (±21.7)*			54 (±3.5)	*783 (±50.75)*	60	*870*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400112A
00	**122**	10 (±1)	*145 (±14.5)*			27 (±2)	*391.5 (±29)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400122C
00	**124**	10 (±1)	*145 (±14.5)*			25 (±1.5)	*362.5 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400124A
00	**036**	12 (±0.5)	*174 (±7.25)*			25 (±1)	*362.5 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40036A
00	**107**	12 (±1)	*174 (±14.5)*			20 (±1)	*290 (±14.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400107A
00	**012**	14 (±1)	*203 (±14.5)*			28.5 (±1.5)	*413.25 (±21.7)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CR400012A
00	**038**	22 (±2)	*319 (±29)*			37 (±3)	*536.5 (±43.5)*	35	*507.5*	0.85	*0.03*			7.25	*0.28*	7.6	*0.30*	5CUR40038C 5CUR40038M
With Pre-feeling for electromagnetic detent																		
E0	**063**	1.4 (±0.5)	*20.3 (±7.25)*	11.5 (±1)	*166.75 (±14.5)*	12.8 (±1)	*185.6 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E063M
E0	**046**	2 (±0.5)	*29 (±7.25)*	13 (±1)	*188.5 (±14.5)*	14.5 (±1)	*210.2 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E046M
E0	**096**	3.5 (±0.5)	*50.7 (±7.25)*	15 (±0.5)	*217.5 (± 7.25)*	16.5 (±1)	*239.2 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CR4E0096B
E0	**B09**	3.5 (±0.5)	*50.7 (±7.25)*	13.7 (±1)	*198.65 (±14.5)*	15.1 (±1)	*219 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4EB09A 5CUR4EB09M
E0	**073**	4 (±0.5)	*58 (±7.25)*	18 (±1)	*261 (±14.5)*	19.9 (±1)	*288.55 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CR4E0073A
E0	**086**	4 (±0.5)	*58 (±7.25)*	16.5 (±0.8)	*239.3 (±11.6)*	18.2 (±1)	*263.9 (±14.5)*	30	*435*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E086A 5CUR4E086M
E0	**094**	4 (±0.5)	*58 (±7.25)*	12.7 (±0.5)	*184.1 (±7.25)*	13.8 (±1)	*200.1 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E094M 5CUR4E094B
E0	**075**	5 (±0.5)	*72.5 (±7.25)*	15 (±1)	*217.5 (±14.5)*	16.3 (±1.5)	*236.35 (±21.7)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E075A 5CUR4E075M
E0	**033**	5.8 (±0.5)	*84.1 (±7.25)*	19 (±1)	*275.5 (±14.5)*	20.8 (±1.5)	*301.6 (±21.7)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E033B 5CUR4E033M
E0	**087**	5.8 (±0.5)	*84.1 (±7.25)*	17.8 (±1)	*258.1 (±14.5)*	19.4 (±1)	*281.3 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E087M
E0	**085**	6 (±1)	*87 (±14.5)*	25 (±2)	*362.5 (±29)*	27.5 (±2)	*398.75 (±29)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CR4E0085M
E0	**088**	8 (±0.5)	*116 (±7.25)*	27 (±1)	*391.5 (±14.5)*	29.5 (±1)	*427.75 (±14.5)*	35	*507.5*	0.85	*0.03*	6.5	*0.25*	7.25	*0.28*	7.6	*0.30*	5CUR4E088M

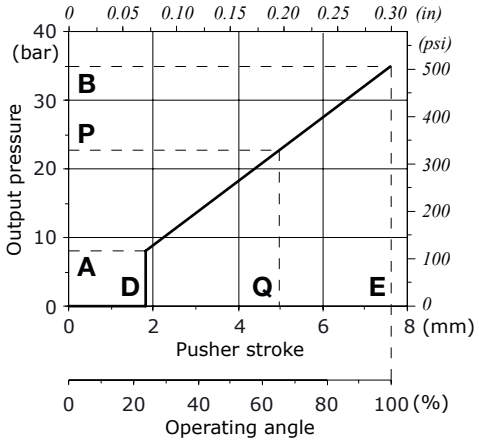
[1] Codes are referred to the curve with the specific return spring
For different curves please contact our Sales Department

Control curves without step

01 type without pre-feeling



E1 type with pre-feeling for EM detent



Curve description		Pressure						Stroke						
		A		P		B		D		Q		E		
Type	Nr	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	mm	*in*	mm	*in*	mm	*in*	CODE [1]
Without pre-feeling														
01	**148**	0 (+0.5)	*0 (±7.25)*			13 (±1)	*188.5 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40148B
01	**151**	0 (+1)	*0 (+14.5)*			41 (±2)	*594.5 (±29)*	1	*0.04*			5.4	*0.21*	5CR401151C
01	**099**	1 (±0.5)	*14.5 (±7.25)*			20 (±1.5)	*290 (±21.7)*	1.55	*0.06*			7.5	*0.29*	5CR401099A
01	**131**	1 (±1)	*14.5 (±14.5)*			15 (±1)	*217.5 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40131A 5CUR40131C
01	**100**	1.2 (±0.5)	*17.4 (±7.25)*			18.9 (±1)	*274 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40100B 5CUR40100M
01	**163**	1.4 (±0.5)	*20.3 (±7.25)*			11.5 (±1)	*166.8 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40163A 5CUR40163M
01	**105**	2 (±0.5)	*29 (±7.25)*			8 (±1)	*116 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40105A
01	**129**	2 (±0.5)	*29 (±7.25)*			66 (±4)	*957 (±58)*	0.85	*0.03*			6.8	*0.28*	5CUR40129A
01	**154**	2 (±0.5)	*29 (±7.25)*			15 (±1)	*217.5 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40154A 5CUR40154M
01	**138**	2.5 (±0.5)	*36.2 (±7.25)*			13 (±1)	*188.5 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40138A
01	**143**	3 (±0.5)	*43.5 (±7.25)*			25 (±1)	*362.5 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40143A
01	**127**	3.4 (±0.5)	*49.3 (±7.25)*			12 (±1)	*174 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40127A 5CUR40127B
01	**157**	3.4 (±1)	*49.3 (±14.5)*			17.2 (±1)	*249.4 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40157A 5CUR40157B
01	**114**	4 (±0.5)	*58 (±7.25)*			10 (±1)	*145 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40114A 5CUR40114B 5CUR40114M
01	**126**	4.5 (±0.7)	*65.2 (±10.1)*			30.7 (±1.5)	*445.1 (±21.7)*	0.85	*0.03*			7.6	*0.30*	5CUR40126A
01	**170**	5 (±0.5)	*72.5 (±7.25)*			20 (±1)	*290 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40170A 5CUR40170M
01	**175**	5 (±0.5)	*72.5 (±7.25)*			16 (±1.5)	*232 (±21.7)*	0.85	*0.03*			7.6	*0.30*	5CUR40175A 5CUR40175D
01	**111**	5.5 (±0.5)	*88 (±7.25)*			25.5 (±1)	*370 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40111A 5CUR40111B 5CUR40111C
01	**118**	5.8 (±1)	*84.1 (±14.5)*			19.5 (±1.5)	*282.7 (±21.7)*	1.55	*0.06*			7.5	*0.29*	5CUR40118A
01	**135**	5.8 (±0.5)	*84.1 (±7.25)*			23 (±1.5)	*333.5 (±21.7)*	0.85	*0.03*			7.6	*0.30*	5CUR40135A 5CUR40135M
01	**167**	6 (±0.5)	*87 (±7.25)*			18 (±1)	*261 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40167M
01	**103**	6 (±1)	*87 (±14.5)*			30 (±2.5)	*435 (±36.2)*	0.85	*0.03*			7.6	*0.30*	5CUR40103A 5CUR40103M
01	**106**	6 (±1)	*87 (±14.5)*			40 (±2)	*580 (±29)*	0.85	*0.03*			7.6	*0.30*	5CUR40106A 5CUR40106B 5CUR40106C
01	**095**	6.5 (±0.5)	*94.25 (±7.25)*			17.8 (±1)	*258.1 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CR401095A
01	**125**	8 (±0.5)	*116 (±7.25)*			22.5 (±1)	*326.25 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40125M

List continues in the next page

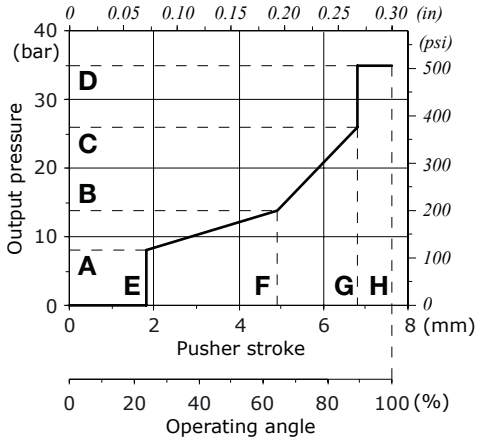
Control curves without step

Curve description		Pressure						Stroke						
		A		P		B		D		Q		E		
Type	Nr	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	mm	*in*	mm	*in*	mm	*in*	CODE [1]
01	**115**	8.3 (±0.7)	*120.3 (±10.1)*			22.5 (±1)	*326.2 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR40115M
01	**159**	10 (±0.5)	*145 (±7.25)*			28 (±1)	*406 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CUR401159A
01	**090**	12 (±1)	*174 (±14.5)*			18 (±1)	*261 (±14.5)*	0.85	*0.03*			7.6	*0.30*	5CR401090A
01	**195**	14 (±1)	*203 (±14.5)*			29.5 (±1.5)	*427.75 (±21.7)*	0.85	*0.03*			7.6	*0.30*	5CR401195A
01	**144**	35 (±2)	*507.5 (±29)*			70 (±3.5)	*1015 (±50.7)*	0.85	*0.03*			7.6	*0.30*	5CUR40144C
With Pre-feeling for electromagnetic detent														
E1	**103**	6 (±1)	*87 (±14.5)*	30 (± 1.5)	*435 (±21.7)*	34.7 (±2)	*503.1 (±29)*	0.85	*0.03*	6.5	*0.25*	7.6	*0.30*	5CUR4E103M
E1	**156**	3.4 (±0.5)	*46.3 (±7.25)*	14.5 (±1)	*210.25 (±14.5)*	16.7 (±1)	*242.15 (±14.5)*	0.85	*0.03*	6.5	*0.25*	7.6	*0.30*	5CUR4E156M

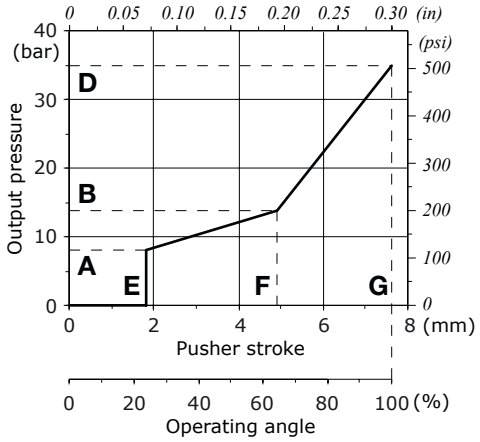
[1] Codes are referred to the curve with the specific return spring
For different curves please contact our Sales Department

Control curves piecewise with and without step

02 type with step



03 type without step



Control curve with step

Curve description		Pressure								Stroke								
		A		B		C		D		E		F		G		H		
Type	Nr	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar	*psi*	mm	*in*	mm	*in*	mm	*in*	mm	*in*	CODE [1]
02	**210**	1.5 (±1)	*21.7 (±14.5)*	7 (±1)	*101.5 (±14.5)*	15 (±1)	*217.5 (±14.5)*	35	*507.5*	0.85	*0.03*	5.7	*0.22*	7.25	*0.28*	7.6	*0.30*	5CUR40210C
02	**204**	4.3 (±0.5)	*62.3 (±7.25)*	12 (±0.8)	*174 (±11.6)*	20.5 (±1)	*297.2 (±14.5)*	35	*507.5*	0.85	*0.03*	5.7	*0.22*	7.25	*0.28*	7.6	*0.30*	5CUR40204C
02	**200**	7 (±1)	*101.5 (±14.5)*	13 (±1)	*188.5 (±14.5)*	22 (±1)	*319 (±14.5)*	30	*435*	0.85	*0.03*	5.7	*0.22*	7.25	*0.28*	7.6	*0.30*	5CUR40200A 5CUR40200M

Control curve without step

Curve description		Pressure						Stroke						
		A		B		D		E		F		G		
Type	Nr	bar (±toll)	*psi (±toll)*	bar (±toll)	*psi (±toll)*	bar	*psi*	mm	*in*	mm	*in*	mm	*in*	CODE [1]
03	**311**	1.2 (±0.5)	*17.4 (±7.25)*	14.7 (±2.5)	*213.15 (±36.25)*	22 (±2)	*319 (±29)*	0.85	*0.03*	6.6	*0.26*	7.6	*0.30*	5CUR40311B
03	**300**	5.1 (±0.5)	*73.95 (±7.25)*	16 (±1.5)	*232 (±21.75)*	20 (±2)	*290 (±29))*	0.85	*0.03*	6.6	*0.26*	7.6	*0.30*	5CUR40300A
03	**302**	6 (+0.5/-1.5)	*87 (+7.25/-21.75)*	12 (±1)	*175 (±14.5)*	22 (+2)	*320 (+29)*	0.85	*0.03*	6.6	*0.26*	7.6	*0.30*	5CUR40302A 5CUR40302C 5CUR40302D

[1] Codes are referred to the curve with the specific return spring
For different curves please contact our Sales Department