

Directional Control Valve HDM18



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1 General information

1.1 Directional valve installation

For the installation of the directional control valve on the equipment frame it is important to consider the following recommendations:

- the valve can be assembled in any position but, in order to avoid deformations and spool sticking, the surface on which the product is mounted has to be flat;
- before connecting pipelines, make sure that the pipeline hollows as well as fittings and seals are thoroughly clean; check also that the work ports are protected until the connection of the pipelines
- during assembly and servicing operations, it is

necessary to adopt clean procedures and work in an environment free of chips, swarf, dust and other possible source of pollution;

- if the spools are connected to the equipment controls through linkages, make sure that they do not affect their operations;
- before painting the valve, check that the work port plastic plugs are tightly in place;
- do not use high pressure jet washer directly on the valve to prevent water infiltration inside lever and spool caps.

1.2 Fittings

In the interest of safety, only fittings with STRAIGHT THREAD ENDS should be used.

Fittings with TAPERED THREAD ENDS should never be used, as they can cause deformation and cracks in the valve body.

Warranty conditions will not be valid in case tapered fittings are used.

The work port adaptors have to be fastened respecting the tightening torque values indicated in the following table (for different port types contact our Sales Dept.):

Cavity	Recommended tightening torque for work port fittings - Nm / lbf				
BSP - ISO 228-1	1/8" BSP	1/4" BSP	3/8" BSP	1/2" BSP	3/4" BSP
With copper washer (ISO 1179-1)	15 / 11.1	30 / 22.1	40 / 29.5	60 / 44.3	90 / 66.4
With rubber washer or steel (ISO 1179-1)	15 / 11.1	25 / 18.4	35 / 25.8	60 / 44.3	70 / 51.7
UN-UNF - ISO 263	SAE4 7/16-20 UNF	SAE6 9/16-18 UNF	SAE8 3/4-16 UNF	SAE10 7/8-14UNF	SAE12 1-1/16-12UNF
With O-Ring seal (ISO 11926-1)	10 / 7.4	30 / 22.1	40 / 29.5	60 / 44.3	90 / 66.4



IMPORTANT!: Tightening torques depends on several different factors including lubrication, coating and surfaces finish. The fitting manufacturer shall be consulted.

1.3 Hydraulic fluid

The main function of the fluid used in hydraulic systems is to transfer energy but it performs also other important functions: protect the components from corrosion, lubricate the directional valve moving parts, remove particles and heat from the system.

In order to ensure proper operation and long life of the system it is important to choose the correct hydraulic fluid with proper additives.

Bucher Hydraulics recommends to use a mineral based oil

according to type HM (ISO 6743/4) or type HLP (DIN 51524) only.

The system should be operated only with hydraulic oil containing anti-foaming and antioxidant additives. Before using other types of fluid, please contact our Sales Dept, since they can cause serious damage to the directional valve components and jeopardize the correct function of the system.

1.4 Filtration

In order to ensure proper operation and long life of the directional valve components it is extremely important to provide a proper and effective filtration of the hydraulic fluid. It is advisable to follow filter manufacturers instructions and recommendations.

The fineness of the filter should be selected in order to maintain the fluid contamination level according to the values listed at section 1.6.1 (Technical specification)

Particular attention has to be paid to the cleaning of the machine hydraulic circuit and its components before the first run-in, since the presence of foreign materials could cause damages to the directional valve components even if a proper filtration is provided.

1.5 Directives and standards

- PED (97/23/EC)

The pressure relief valves assembled into the directional control valve cannot be considered and/or confused with the safety valve when the PED Directive is applied to the hydraulic system.

- Atex



Attention: The equipment and protective systems of this catalogue ARE NOT intended for use in potentially explosive atmospheres. Ref: Directive 99/92/EC and Directive 2014/34/UE

- ISO 9001:2015 / ISO 14001:2015

Bucher Hydraulics S.p.A. is certified for research, development and production of directional control valves, power units, gear pumps and motors, electro pumps, cartridge valves and integrated manifolds for hydraulic applications.

1.6 Hydraulic system

1.6.1 Technical specification



IMPORTANT!: Parameter values and diagrams shown in this catalogue have been measured with mineral oil having a viscosity of 23 mm²/s at 50° C

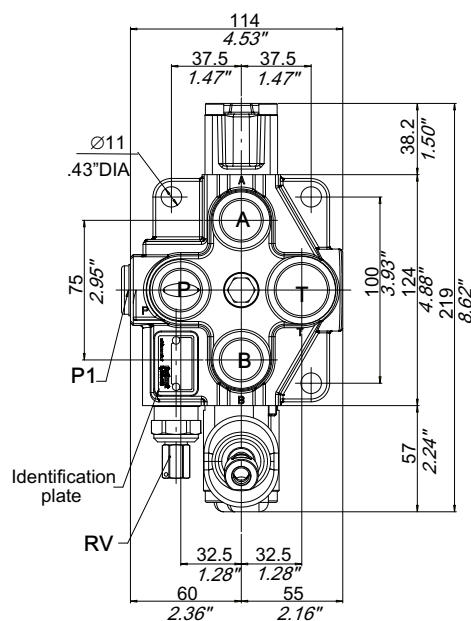
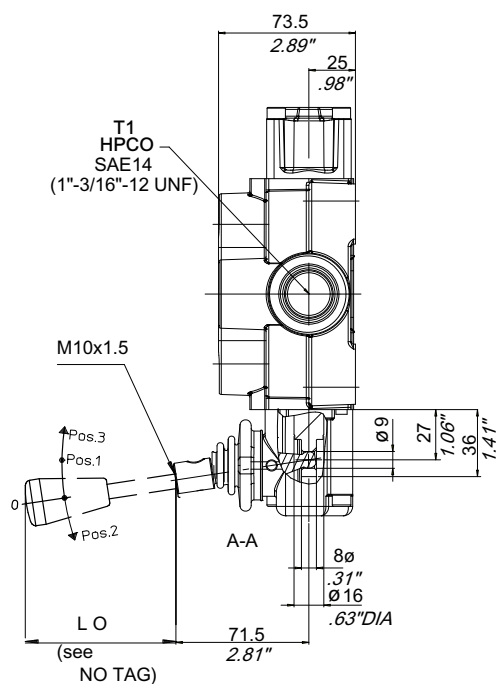
Features		
Nominal flow range		70 l/min (15 US gpm)
Max inlet pressure (P) ¹⁾		300 bar (4300 PSI)
Max work port pressure (A/B) ¹⁾		320 bar (4640 PSI)
Max back pressure (T)		30 bar (430 PSI)
Max internal leakage A/B→T (at 100 bar/1450 PSI, 23 mm ² /s) ¹⁾		14 cc/min (0.854 Cu In/min)
Fluid		mineral based oil (see 1.4)
Fluid temperature (with NBR seals)		-20°C / +80°C (-4° to 176° F)
Contamination class		21/19/16 ISO4406:1999 (NAS 1638 class10)
Viscosity operating range	recommended	from 15 to 75 mm ² /s
	admissible	from 12 to 400 mm ² /s
Number of spools		1 to 2
Ambient temperature in operating conditions:	with mechanical/hydraulic/ pneumatic controls	from -30 to +60 °C
	with electric/ electrohydraulic devices	from -30 to +50 °C

For different operating conditions, please contact our Sales Dept.

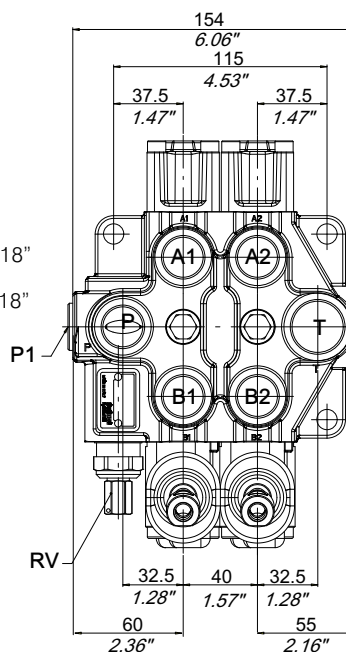
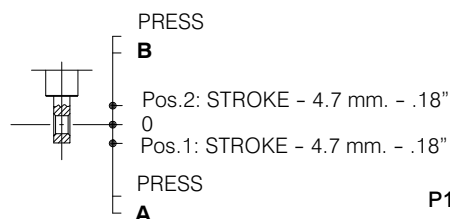
1) Spool leakage values are strongly influenced by fluid viscosity with a linear inversed relationship: 10 cc/min at 100 bar and 23 cSt become roughly 5 cc/min at 100 bar and 46 cSt.

1.7 Dimensional data

HDM18/1



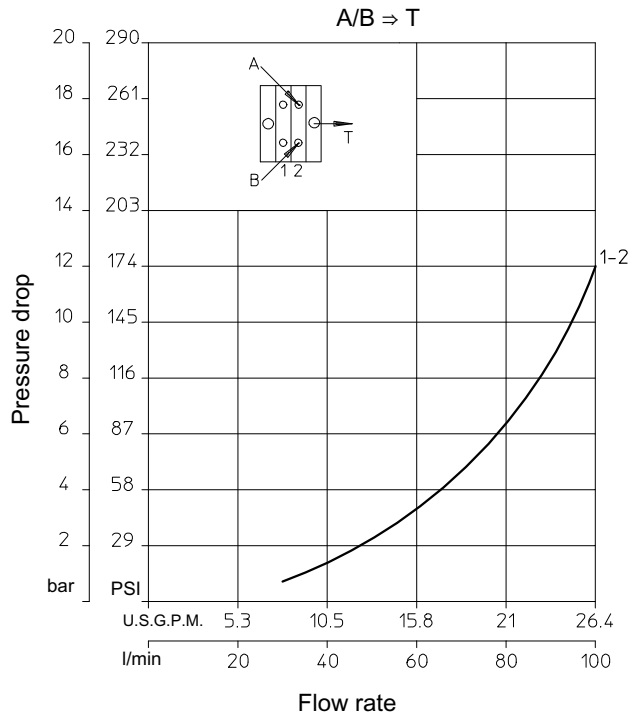
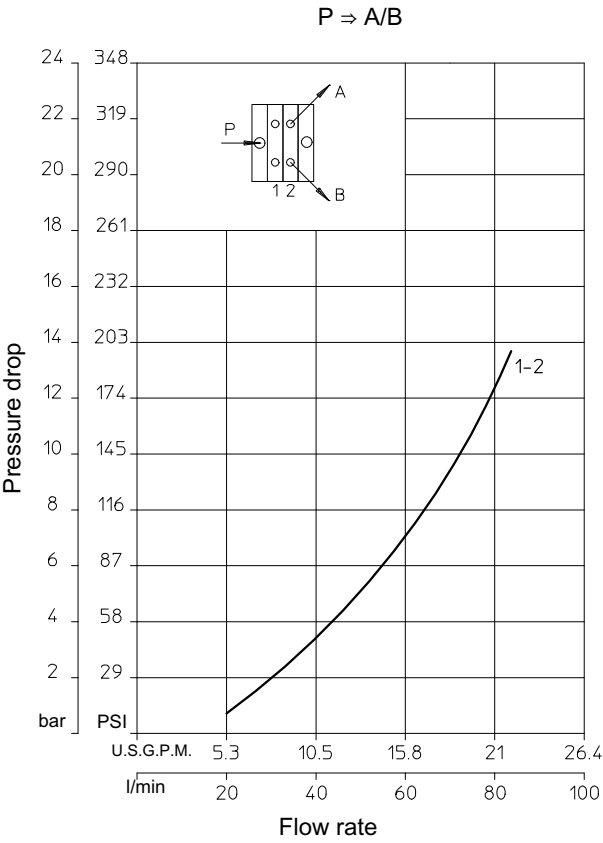
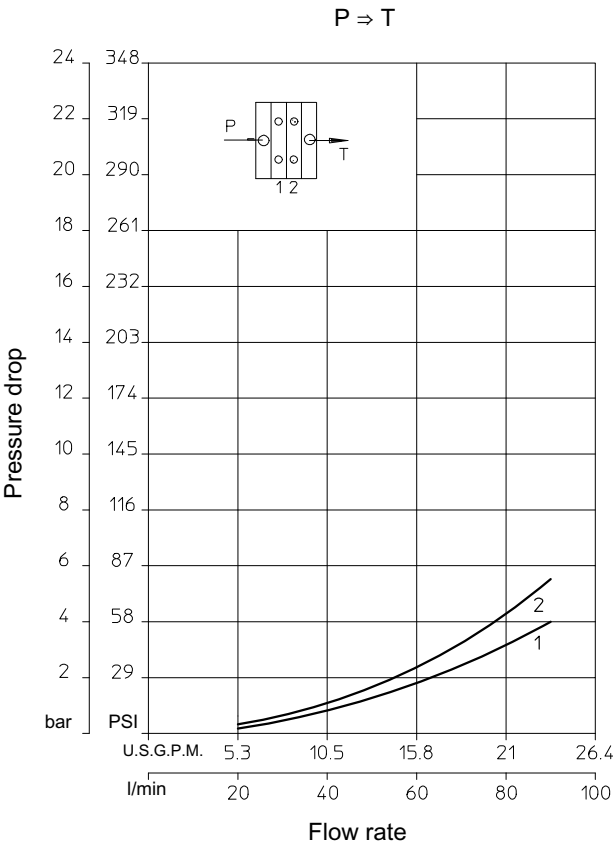
HDM18/2



Dimensional data shown in mm and inches Ex.: 115 = mm
4.53" = inches

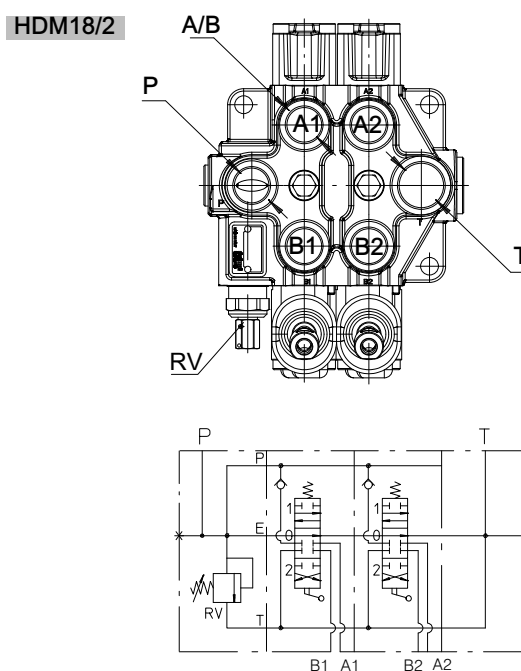
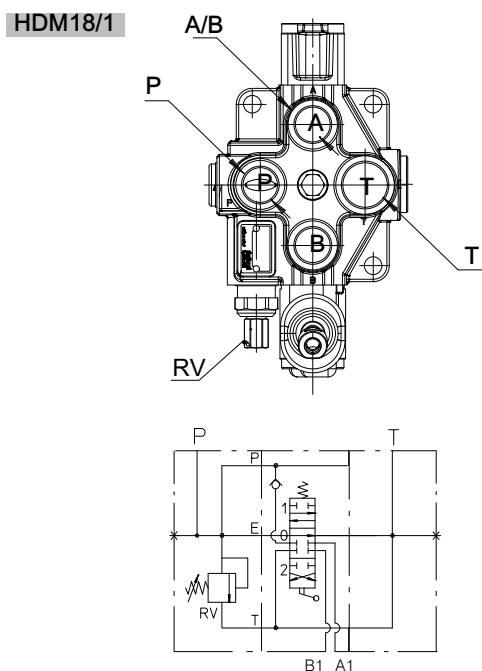
1.8 Performance curves

Temperature: 50° C (120° F)
Viscosity: 27 mm²/s



2 Monobloc bodies

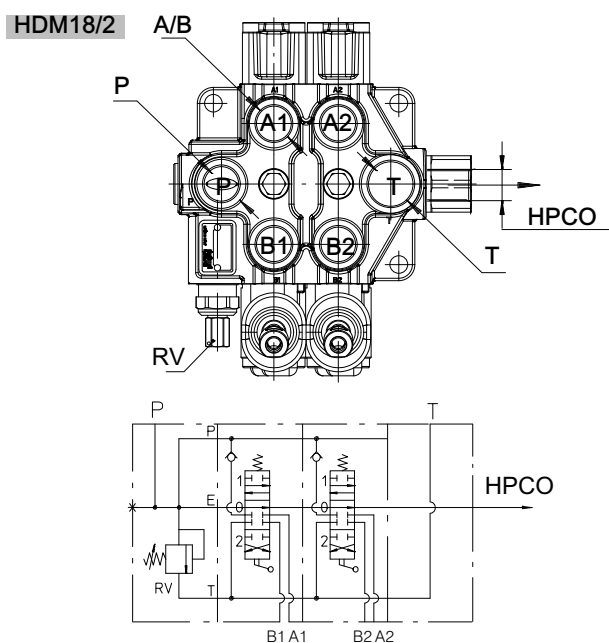
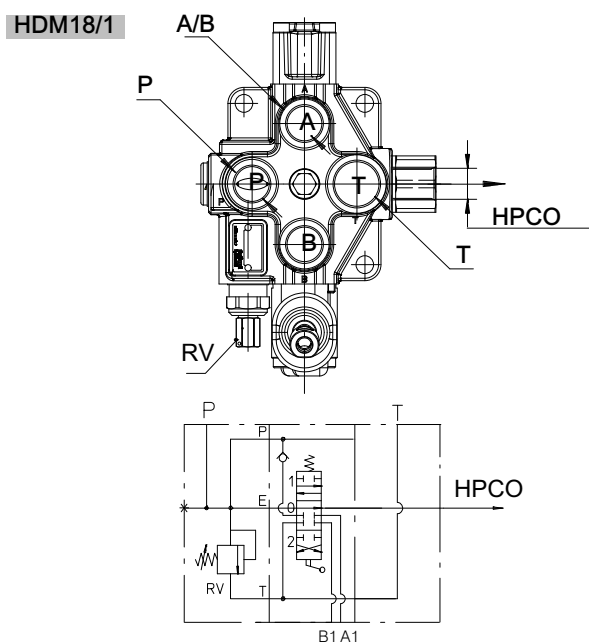
2.1 Standard circuits: parallel - Open centre with P - T - RV



HDM18/1 - Type	P	A/B	T
K05	1/2" BSP	1/2" BSP	3/4" BSP
K04	SAE10	SAE10	SAE10

HDM18/2 - Type	P	A/B	T
K05	1/2" BSP	1/2" BSP	3/4" BSP
K04	SAE10	SAE10	SAE10

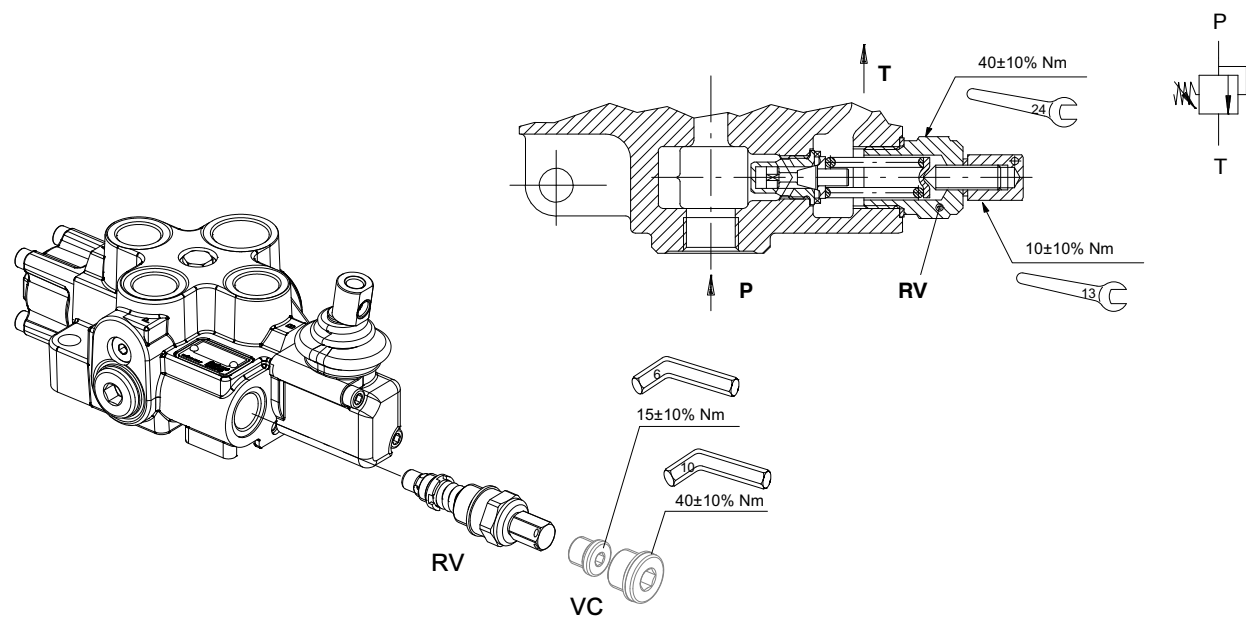
2.2 Standard circuits: parallel - Open centre and carry-over with P - T - RV - HPCO



HDM18/1 - Type	P	A/B	T - HPCO
K25	1/2" BSP	1/2" BSP	3/4" BSP
K24	SAE10	SAE10	SAE10

HDM18/2 - Type	P	A/B	T - HPCO
K25	1/2" BSP	1/2" BSP	3/4" BSP
K24	SAE10	SAE10	SAE10

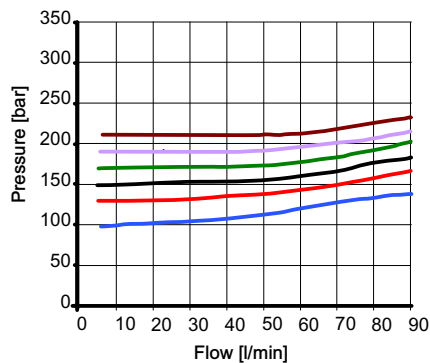
3 Direct acting Relief Valve RV



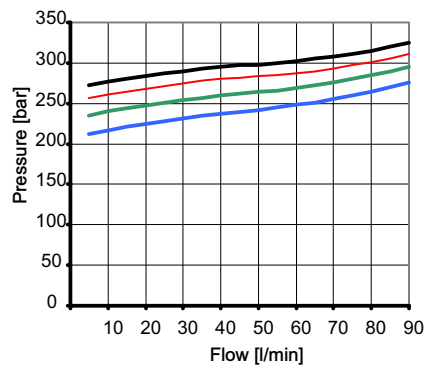
Pressure set range bar (PSI)	Type	Code	Standard setting bar (PSI)	Setting Code	Spring colour
96 - 210 (1370 - 3040)	RV01-15	200787400740	150 (2100)	15	Green (GR)
211 - 300 (3040 - 4350)	RV01-26	200787400710	260 (3700)	26	Blue (BL)
VC (plugged valve)		200778400140	-	-	-

 **IMPORTANT!** Example: RV01-15*= 150 bar standard setting value. Different setting values have to be specified at the order. Please pay attention that the minimum setting step has to be fixed in 10 bar.

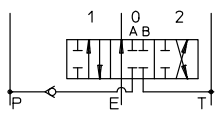
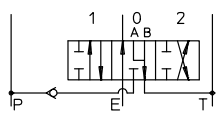
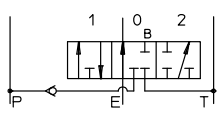
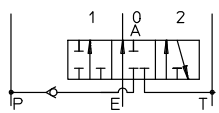
RV01 (96-210 bar)



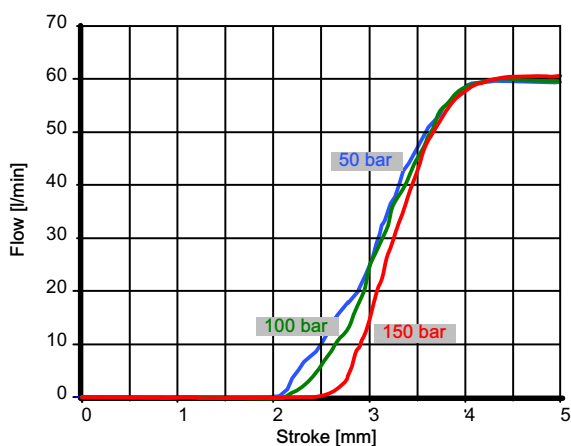
RV01 (211-300 bar)



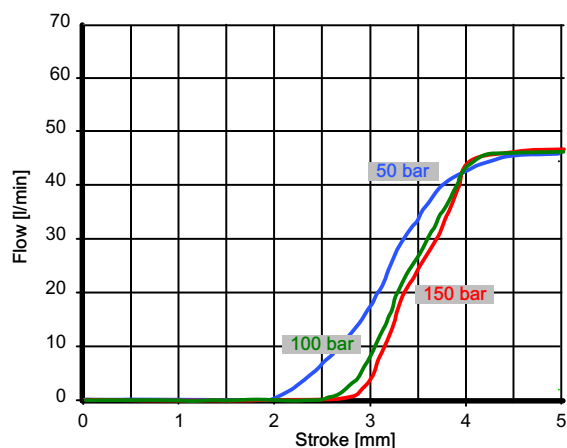
4 Standard spools

Spool Type	HDS15 equivalent	Hydraulic schematic	Circuit	Features	Application examples
AF6S	A		Double acting A/B closed	Symmetric	
CF6S	C		Double acting A/B to tank	Motor Spool	
GF6S	G		Single acting B closed		FORK LIFT LIFTING FUNCTION
SF6S	S		Single acting A closed		FORK LIFT LIFTING FUNCTION

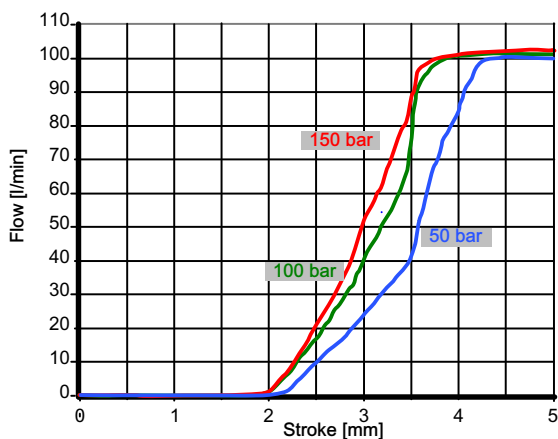
Spool size 6 metering: P → A/B (inlet flow 60 l/min)



Spool size 6 metering: P → A/B (inlet flow 45 l/min)



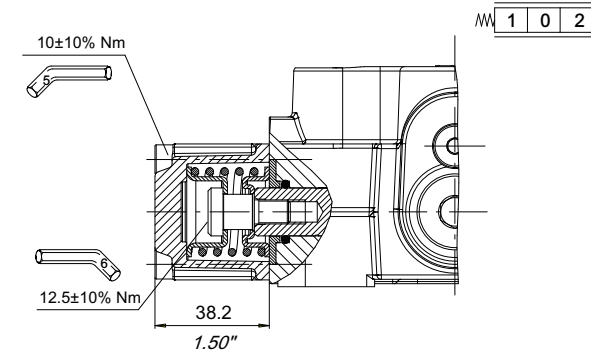
Spool size 6 metering: A/B → T (port flow 100 l/min)
metering configuration S



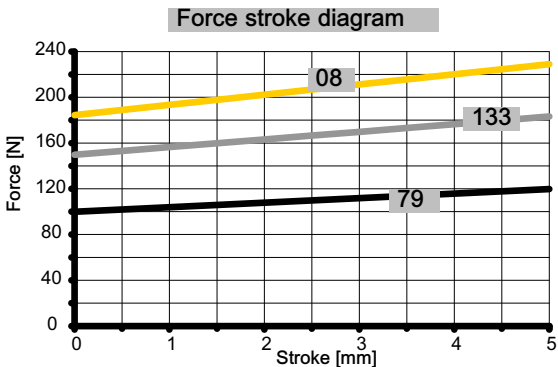
5 Manual positioners

The standard position of the spring kit is always located on A port side.

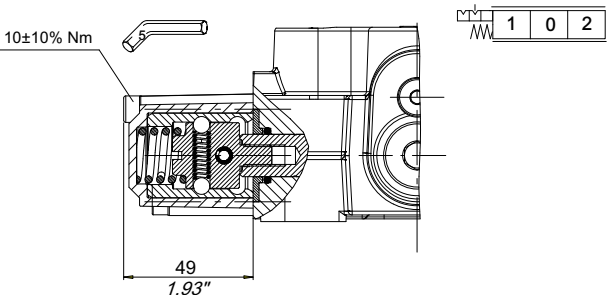
5.1 Spring return to neutral position



Type	Code	Spring colour
08	200768612610	YELLOW
79	200768612620	BLACK
133	200768612600	WHITE

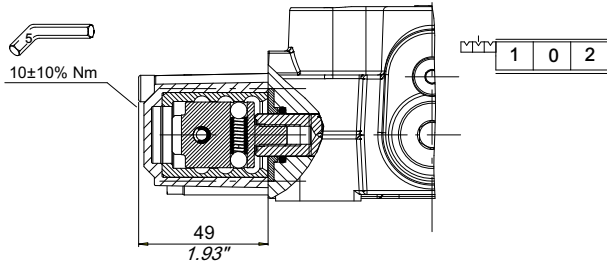


5.2 Spring return to neutral position and detent position in 1 or 2

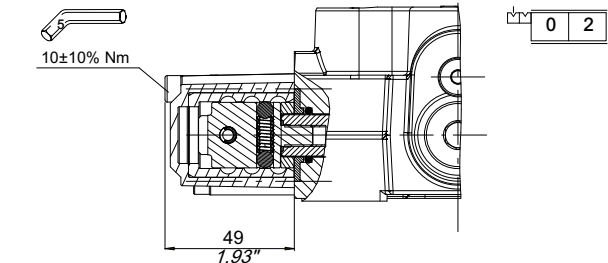


Type	Code
10	200768630040

5.3 Detent in all positions



Type	Code
17	200768620140

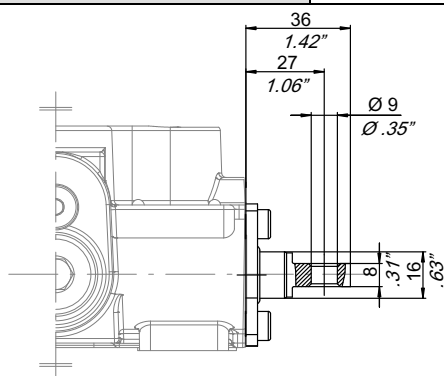
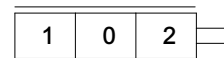


Type	Code
25	200768620150

6 Levers

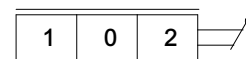
6.1 Free end spool with dust proof seal

Type	Code
L55	200707190040

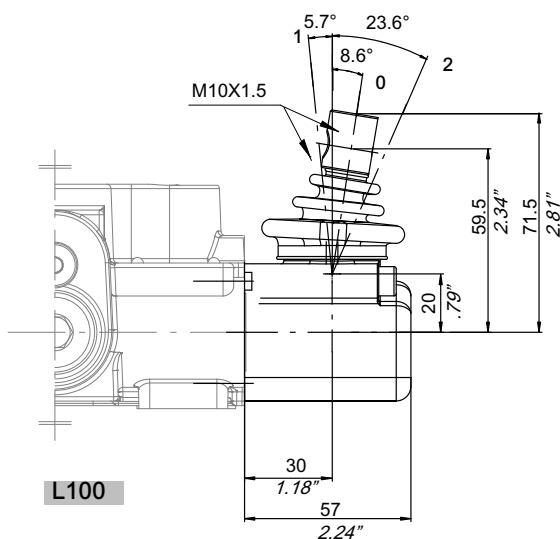


6.2 Standard lever group

Type	Code
L100 L300	200707120340

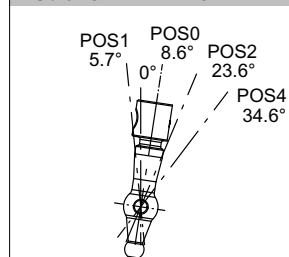


1 - 2 standard stroke 5-5
0 neutral position

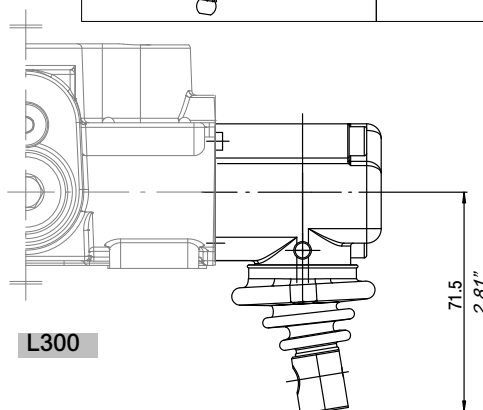
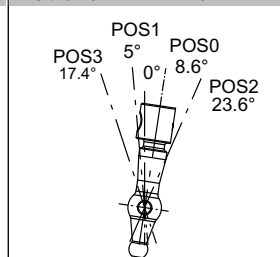


L100

Floating position W spool
- Stroke: 4.7-4.7-9.2

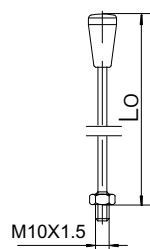


Floating position Z spool
- Stroke: 4.7-4.7-9.2



L300

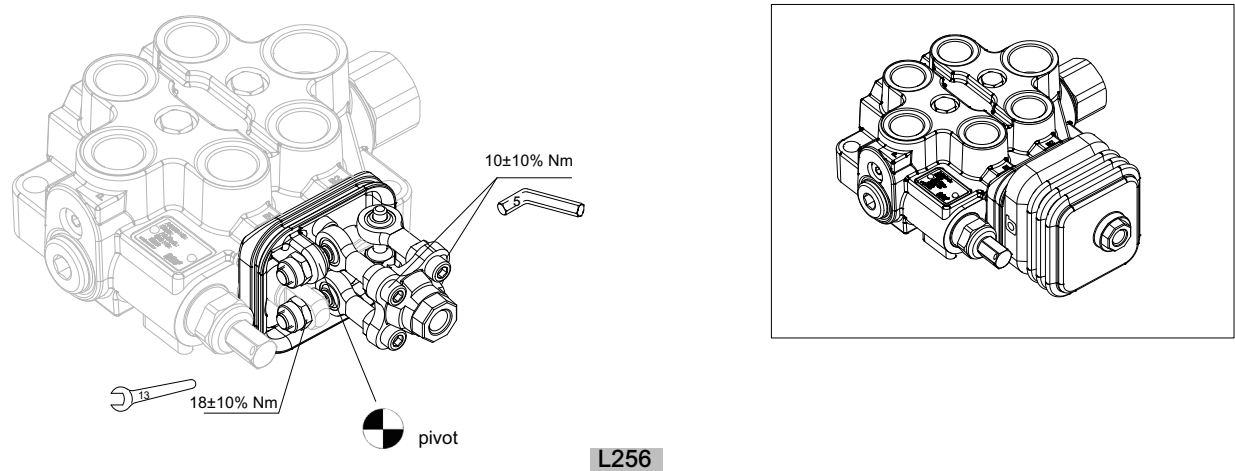
Lever stick
AL00*



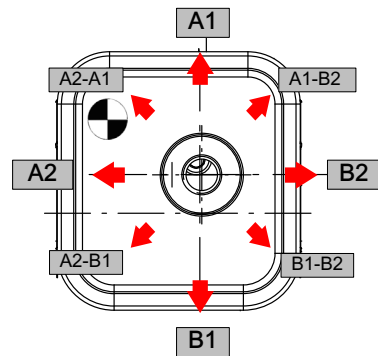
Lo		Type	Code
mm	inches		
190	7.48	AL001	200702220010
255	10.04	AL002	200702220030
300	11.81	AL003	200702220040
350	13.78	AL004	200702220050

6.3 Joystick control L256 - 456

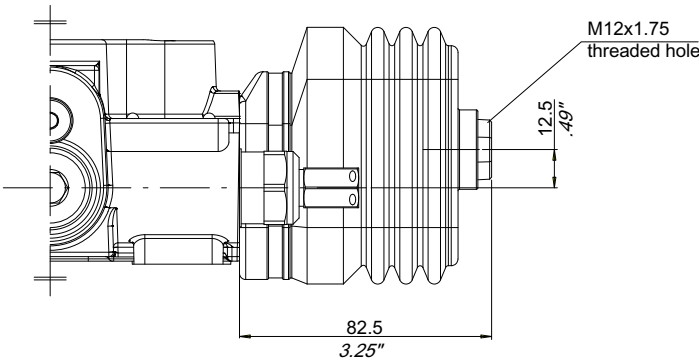
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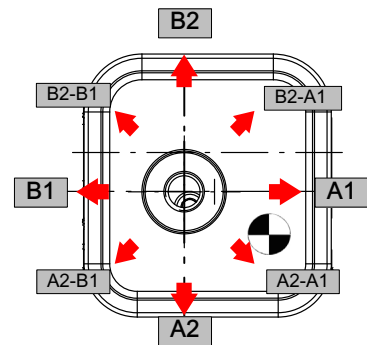
PORT SIDE



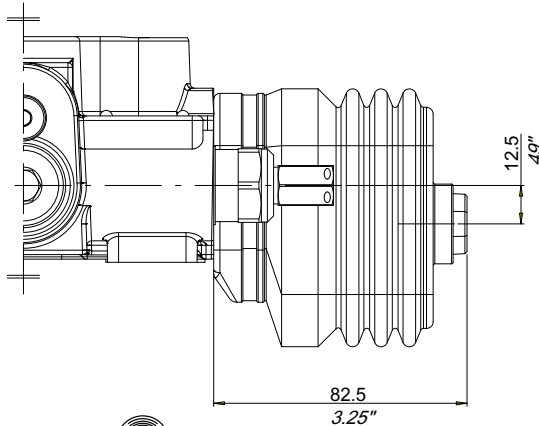
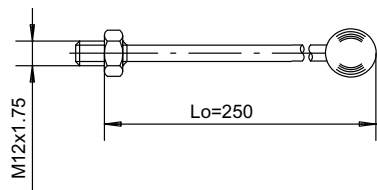
L256



L456



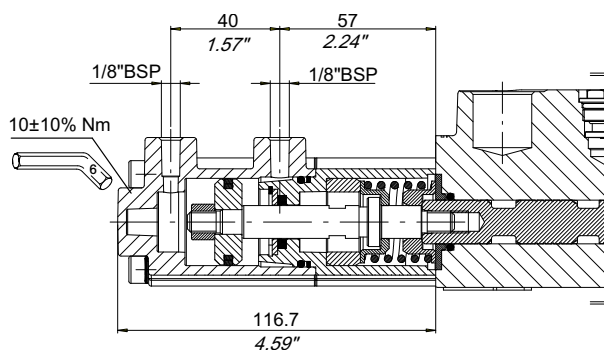
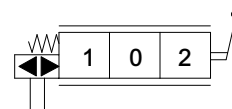
AL010
Code: 200702230040



7 Hydraulic-Pneumatic control ON-OFF

The standard position of positioner kits is on A port side

Type	Code
24	200768650111



Operating conditions

Hydraulic control:

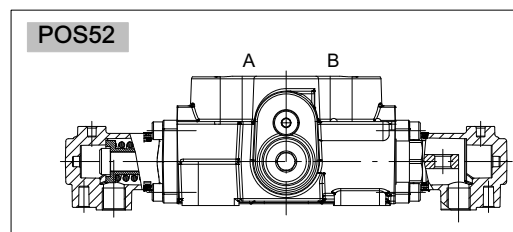
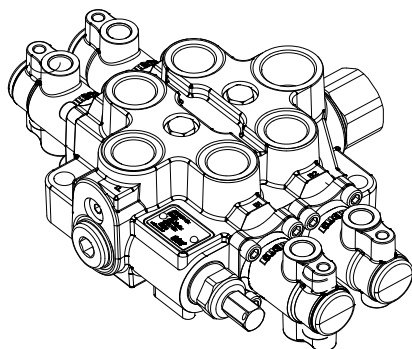
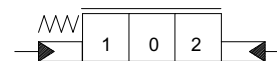
Pressure range: min. 6 bar (87 psi) - max. 15 bar (217 psi)

Pneumatic control:

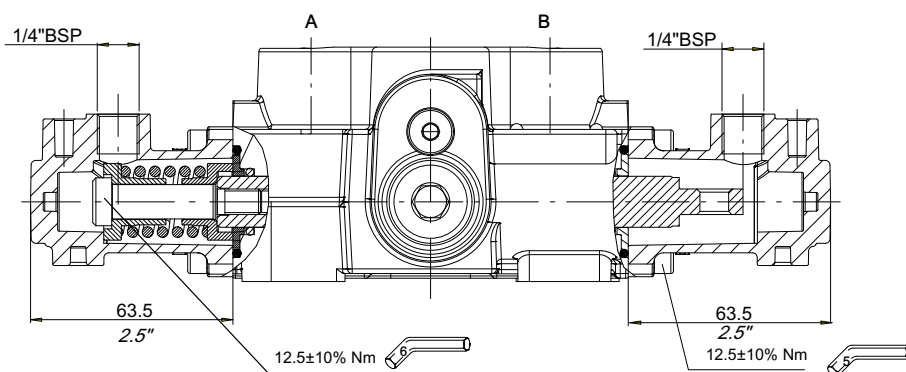
Pressure range: min. 6 bar (87 psi) - max. 10 bar (145 psi)

8 Hydraulic control (HP)

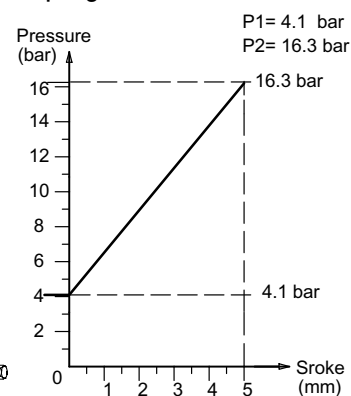
Type	Code
50 - 52	200768650632



POS50



Spring characteristic curve



9 Product identification plate

Article Code ↳

Description ↳

Order No. / Serial No. ↳

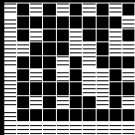
Article Customer Code ↳
(only if available)

DATA MATRIX ↳

2000718*****

HDM18/**** *****

*****/****



BUCHER
hydraulics

↳ Manufacturing Date (yyyymm)

↳ BUCHER Logo

DATA MATRIX:

Size: 8.5mm x 8.5mm

Internal data:

*	*	*	*	*	*	*	*	/	*	*	*	*	:	*	*	*	*	*	:	2	0	0	0	7	1	8	*	*	*	*	*	:	*	*	*	*	*	*	*
Order No. / Serial No.																																							
Semicolon																																							
Date (yyyymm)																																							
Semicolon																																							
Article code																																							
Semicolon																																							
Article customer code (only if available)																																							

Notes:

info.it@bucherhydraulics.com

www.bucherhydraulics.com

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Classification: 430.300.000