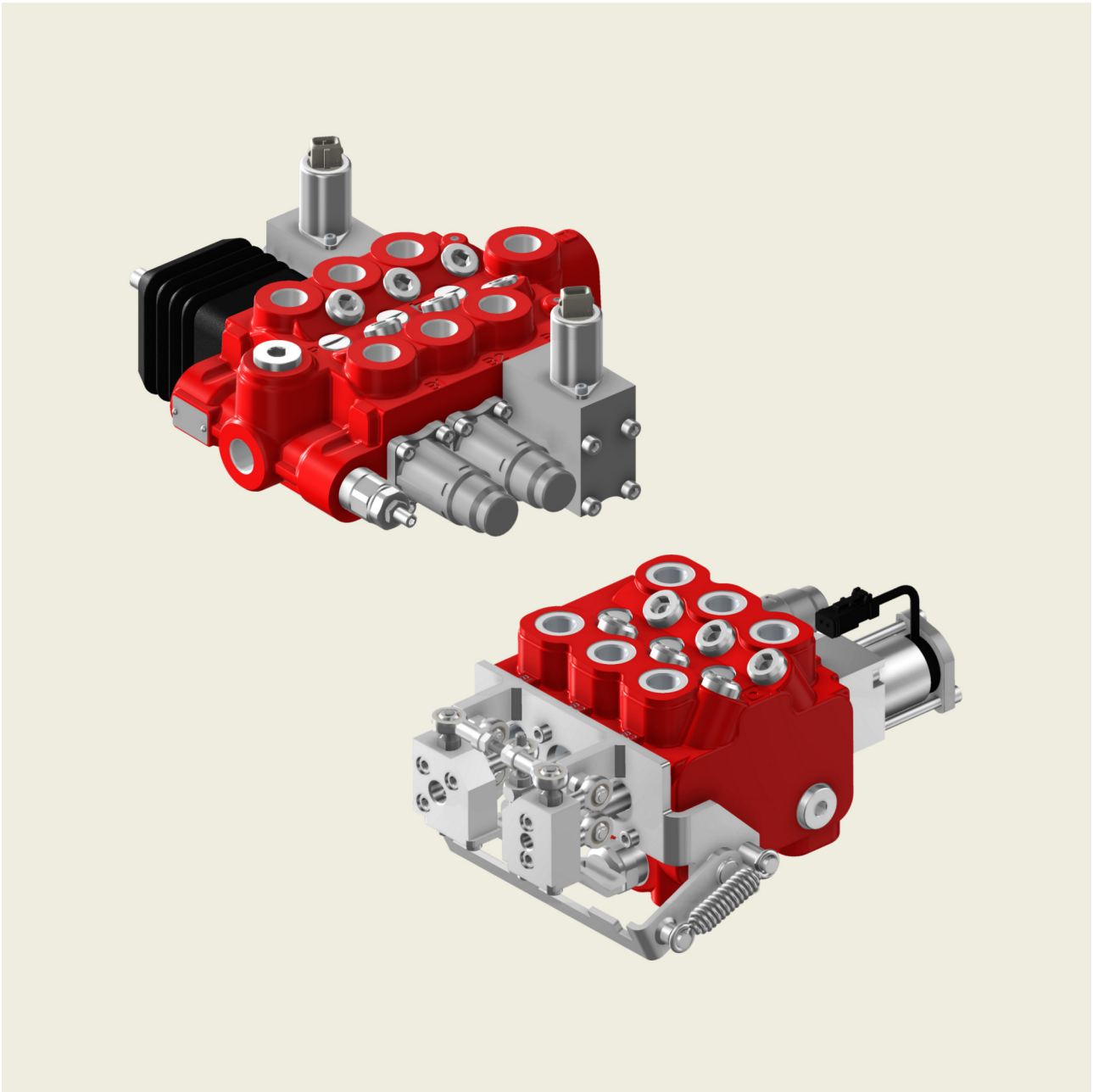
BUCHER hydraulics

Directional Control Valve HDM19



BUCHER
hydraulics

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1 Installation and maintanance - 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 have to be used.

Fittings with TAPERED THREAD ENDS shall 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.):

Recommended tightening torque for work port fittings - Nm / *lbft*				
Metric - ISO 261	**M14X1.5**	**M18X1.5**	**M22X1.5**	
With O-Ring seal (ISO 6149-1)	30 / *22.1*	40 / *29.5*	60 / *44.3*	
With copper washer (ISO 9974-1)	30 / *22.1*	40 / *29.5*	60 / *44.3*	
With rubber washer or steel (ISO 9974-1)	25 / *18.4*	35 / *25.8*	60 / *44.3*	
BSP - ISO 228-1	**1/4" BSP**	**3/8" BSP**	**1/2" BSP**	**3/4" BSP**
With copper washer (ISO 1179-1)	30 / *22.1*	40 / *29.5*	60 / *44.3*	90 / *66.4*
With rubber washer or steel (ISO 1179-1)	25 / *18.4*	35 / *25.8*	60 / *44.3*	70 / *51.7*
UN-UNF - ISO 263	**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)	30 / *22.1*	40 / *29.5*	60 / *44.3*	90 / *66.4*

IMPORTANT!: Tightening torques depend 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 2.3 (Technical specification).

It is advisable to use a pressure filter with by-pass and indicator.

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.

2 Hydraulic system

2.1 Typical applications

The monoblock directional control valve HDM19 has been specifically designed to fulfil the typical requirements of compact wheeled and telescopic loaders.

The modular construction and wide range of controls as well as integrated valves allows an high degree of freedom in terms of assembly position and hydraulic circuit configuration.

2.2 Advantages

High metering spools combined with extremely low operating forces for a fine control of the load.

Optional circuit to eliminate “no reaction time” after fast boom lowering, to increase productivity.

Very fine control during boom lowering to avoid vibrations and machine instability with full load

- Wide availability of integrated flow restrictors for maximum dumping speed setting
- Regenerative circuit for fast dumping speed as alternative

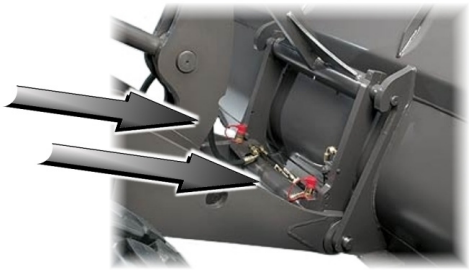
Manual or hydraulic operated joysticks which allow a simultaneous control of two functions:

- boom/bucket (main handle)
- aux/bucket (auxiliary handle).

The manual version can be equipped with handles locking system, to avoid unwanted movement of boom/bucket, for safe travelling on roads

Up to seven stackable on-off, manual, hydraulic or electro-hydraulic proportional elements to control telescopic and auxiliary functions

The monoblock construction guarantees very low spool leakage.



Optional integrated manifold to unload auxiliary function work ports for an easy connection/disconnection of quick couplings.

2.3 Technical specification:

IMPORTANT!: Parameter values and diagrams shown in this catalogue have been measured with mineral oil having a viscosity of 23 mm^2/s at 50° C

Features			
Features		WL	EH
Nominal flow range		80 l/min *(21 US gpm)*	
Max inlet pressure (P) 1)		280 bar *(4060 PSI)*	290 bar *(4200 PSI)*
Max work port pressure (A/B) 2)		300 bar *(4200 PSI)*	320 bar *(4640 PSI)*
Max back pressure (T)	standard	30 bar *(430 PSI)*	
	with ON-OFF control	20 bar *(290 PSI)*	
	with electro-hydraulic positioner (EHO)	10 bar *(145PSI)*	
Max internal leakage A/B→T (at 100 bar/1450 PSI, 23 mm^2/s)3)	without port valves standard	15 cc/min 4) *(0.730 Cu In/min)*	
	with port valves standard	20 cc/min 4) *(0.973 Cu In/min)*	
	without port valves ON-OFF	35 cc/min *(2.492 Cu In/min)*	
	with port valves ON-OFF	40 cc/min *(2.634 Cu In/min)*	
Fluid		mineral based oil (see 1.3)	
Fluid temperature (with NBR seals)		-20°C / +80°C *(-4° to 176° F)*	
Max contamination level		21/19/16 ISO 4406 *(NAS 1638 class10)*	
Max contamination level for electro-hydraulic and direct ON-OFF applications		20/18/15 ISO 4406 *(NAS 1638 class 9)*	
Viscosity operating range	recommended	from 15 to 75 mm^2/s	
	admissible	from 12 to 400 mm^2/s	
Ambient temperature in operating conditions:	with mechanical/hydraulic/ pneumatic controls	from -30 to +60 °C	
	with electric/ electrohydraulic devices	from -30 to +50 °C	
Tie-rods tightening torque	standard	18^{+2} Nm	-

1) Fatigue tested according to internal procedure at 1,1x rated pressure on 6 sample for 1.000.000 cycles

2) Fatigue tested according to internal procedure at 1,1x rated pressure on 6 sample for 500.000 cycles (HDM19WL) and 1.000.000 cycles (HDM19EH)

3) 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.

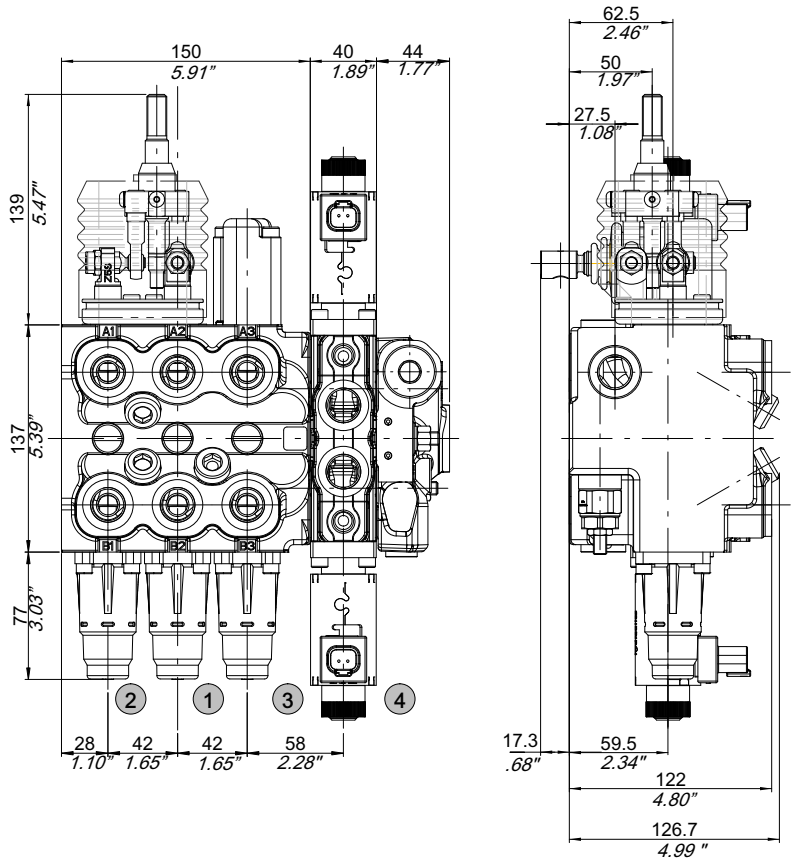
4) Lower values for specific functions (BOOM/BUCKET) can be provided on demand

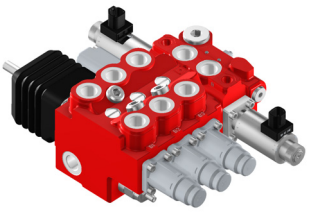
For different operating conditions, please contact our Sales Dept.

2.4 Examples

2.4.1 HDM19WL + HDS16

Manual operated with ON-OFF stackable additional section to control telescopic or auxiliary function.
Optional tank port in the back cover

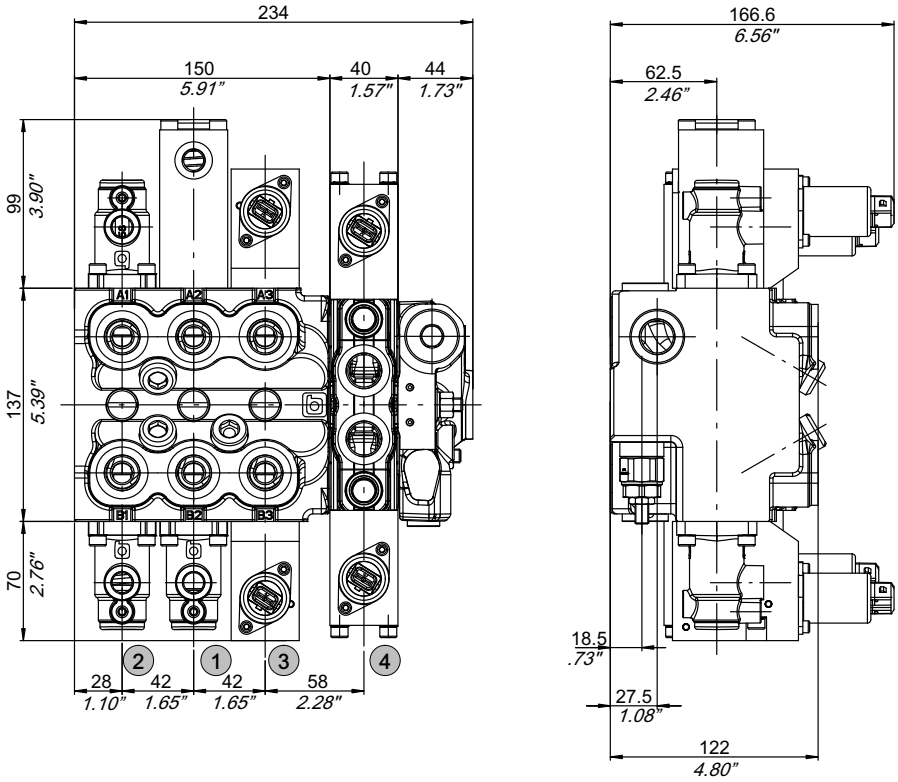


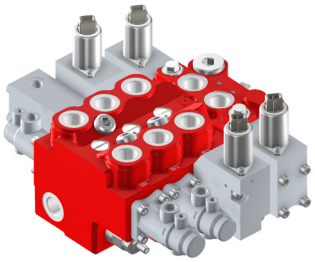


1 BOOM
2 BUCKET
3 AUXILIARY
4 TELESCOPIC/AUXILIARY

2.4.2 HDM19WL + HDS16

Hydraulic proportional operated with stackable additional section to control telescopic or auxiliary function.

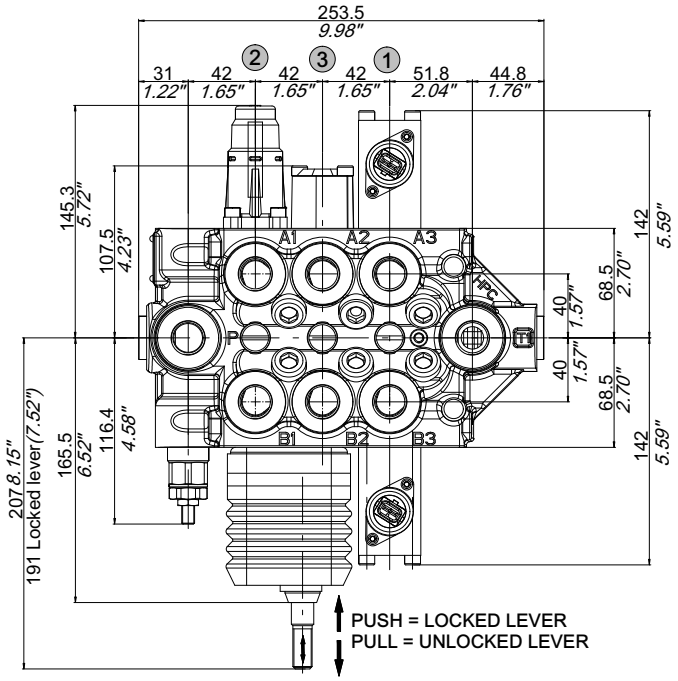


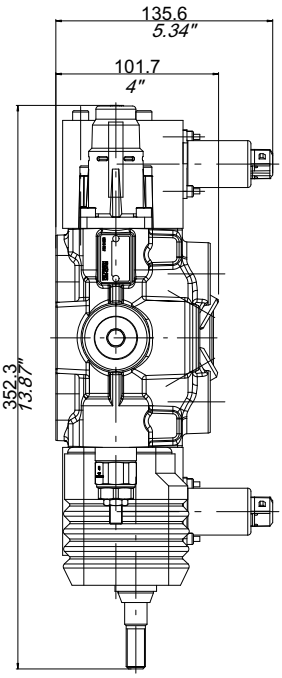


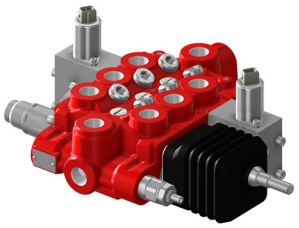
1 BOOM
2 BUCKET
3 TELESCOPIC/AUXILIARY
4 TELESCOPIC/AUXILIARY

2.4.3 HDM19EH

Manual and electro-hydraulic proportional operated







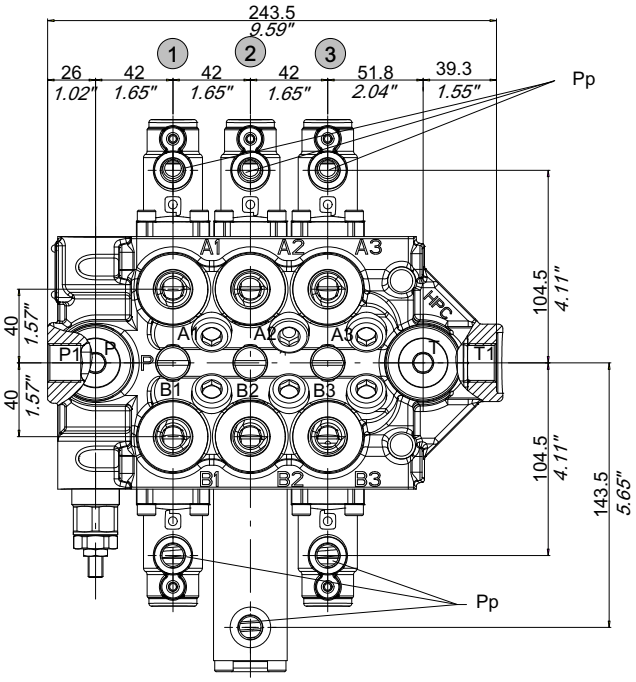
1 AUXILIARY

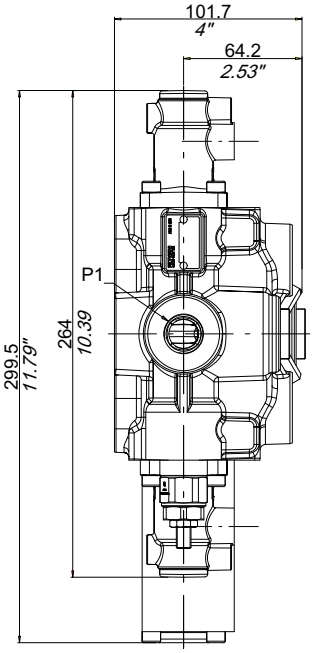
2 BOOM

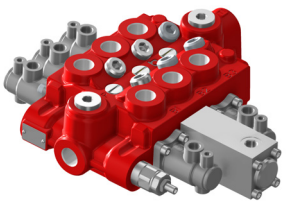
3 BUCKET

2.4.4 HDM19EH

Hydraulic operated







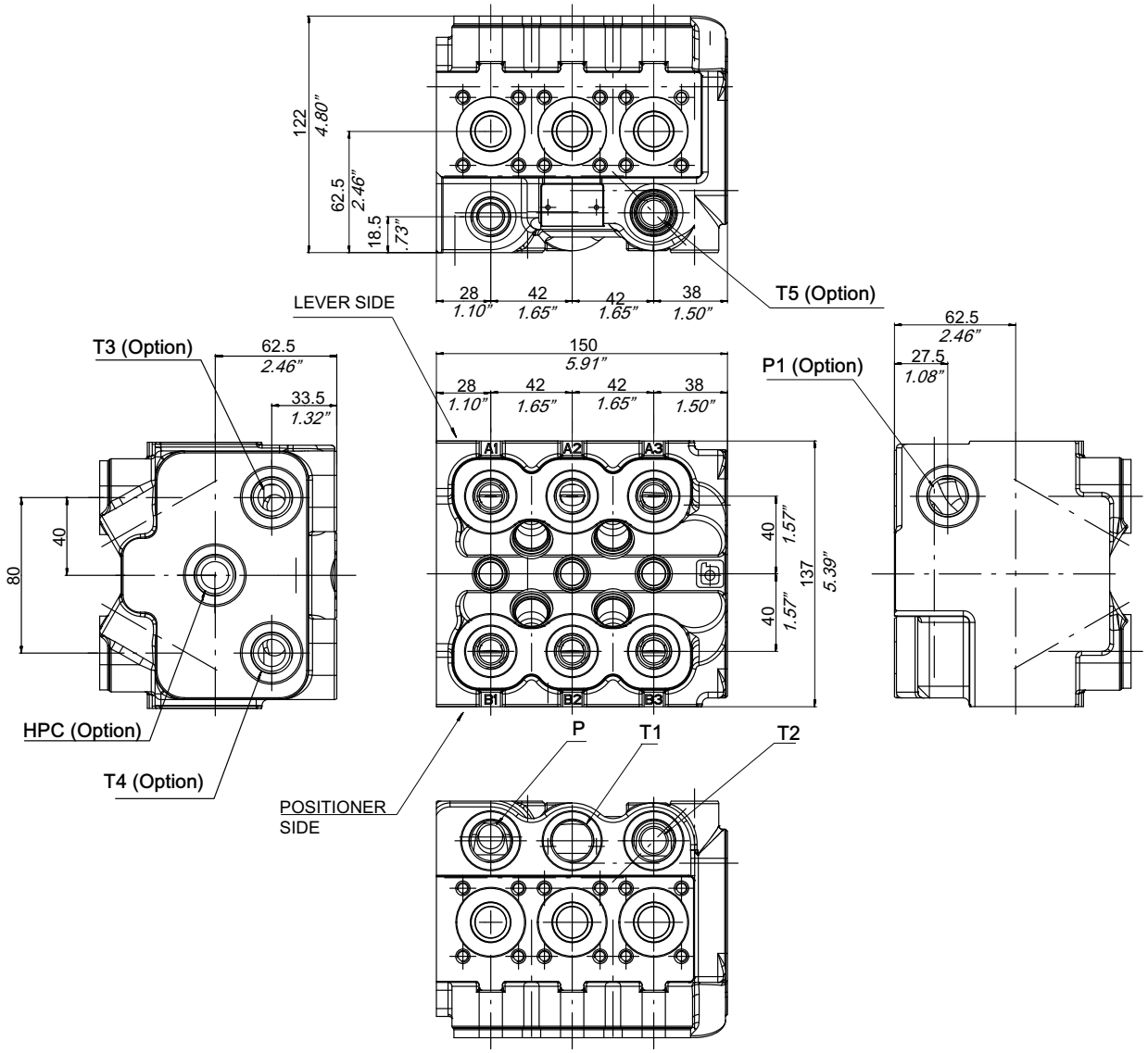
1 AUXILIARY

2 BOOM

3 BUCKET

3 Ports

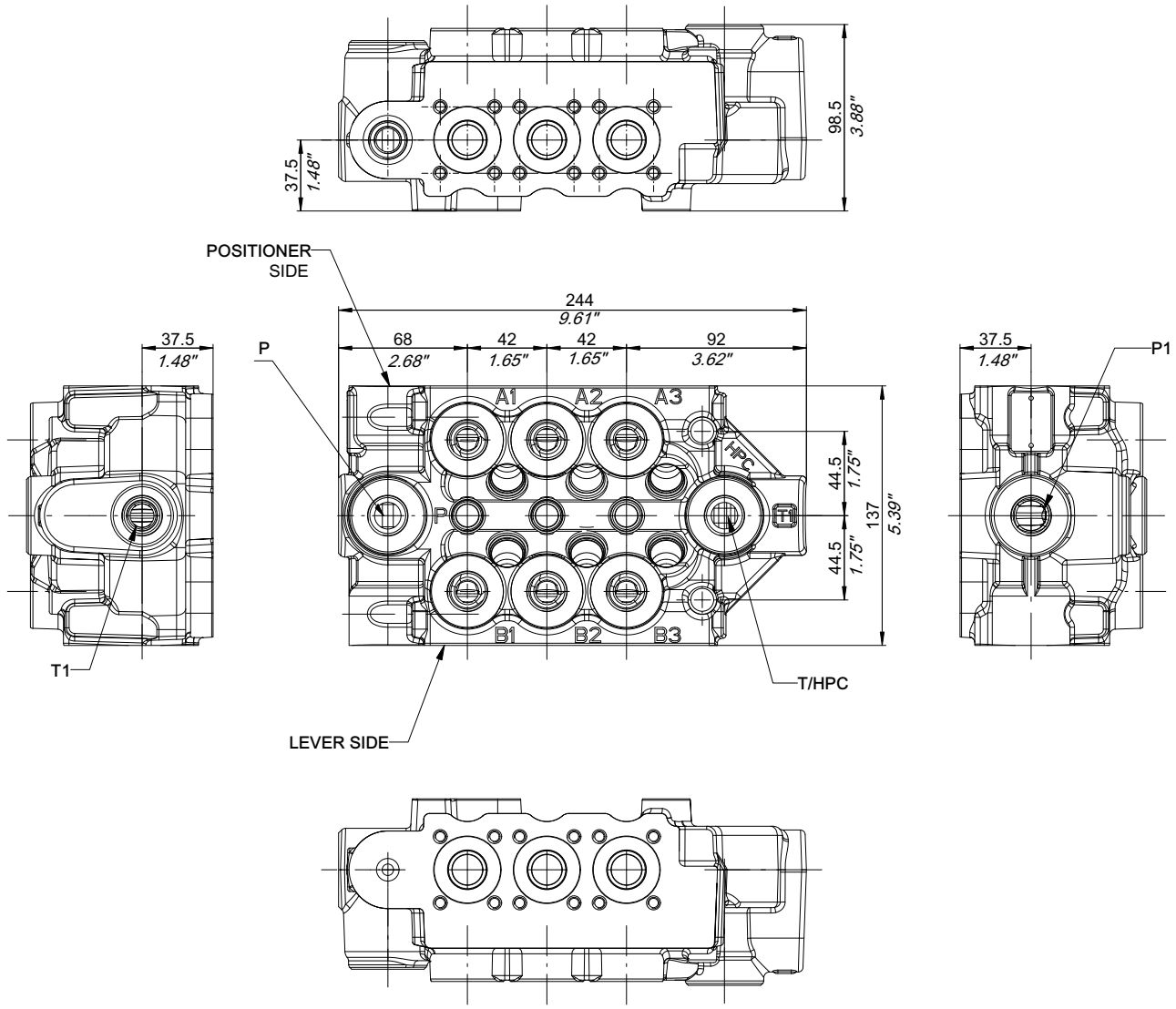
3.1 HDM19WL



PORT CAVITIES - STANDARDS			
	BSP parallel thread	Metric straight thread	UN-UNF straight thread
Thread	ISO228-1	ISO 261	ISO 263
			SAE J475
Cavity	ISO 1179-1	ISO 9974-1	ISO 11926-1
	DIN 3852-2	DIN 3852-1	SAE J1926-1
PORT SIZE			
Main ports	**BSP**	**Metric**	**UNF**
Inlet P, P1	1/2”	M22X1.5	7/8”-14 (SAE10)
Ports A/B	1/2”	M18X1.5	3/4”-16 (SAE8)
Outlet T1, T2, T3, T4, T5, HPC	1/2”	M22X1.5	7/8”-14 (SAE10)
Controls	**BSP**	**Metric**	**UNF**
Hydraulic (Pp)	1/4”		SAE6
Open loop proportional (Pp)	1/4”		

For different ports size please contact our Sales Department

3.2 HDM19EH



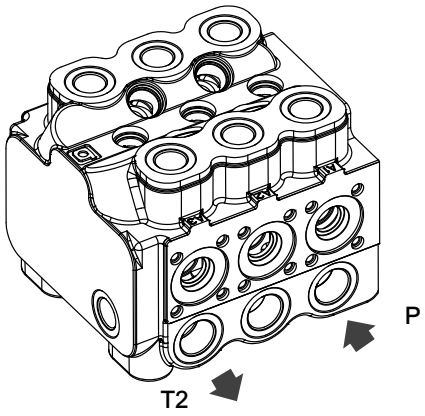
	BSP parallel thread	Metric straight thread	UN-UNF straight thread
Thread	ISO228-1	ISO 261	ISO 263
			SAE J475
Cavity	ISO 1179-1	ISO 9974-1	ISO 11926-1
	DIN 3852-2	DIN 3852-1	SAE J1926-1
PORT DIMENSIONS			
Main ports	BSP	Metric	UNF
Inlet P, P1	1/2”	M22X1.5	7/8”-14 (SAE10)
Ports A/B	1/2”	M18X1.5	3/4”-16 (SAE8)
Outlet T, T1, HPC	1/2”	M22X1.5	7/8”-14 (SAE10)
Controls	BSP	Metric	UNF
Hydraulic (Pp)	1/4”		9/16”-18 (SAE6)
Open loop proportional (Pp)	1/4”		9/16”-18 (SAE6)

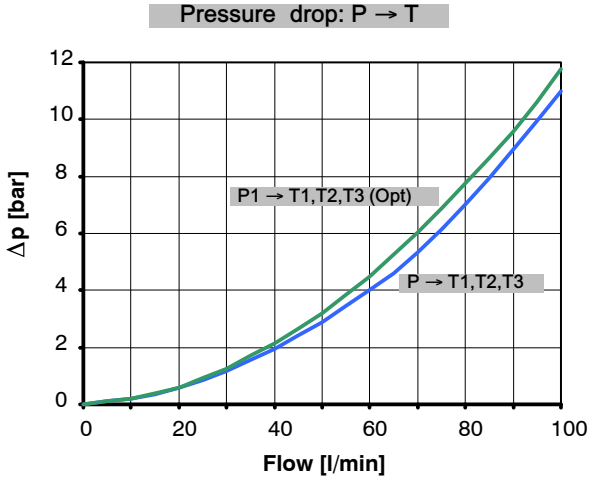
For different ports size please contact our Sales Department

4 Performance data

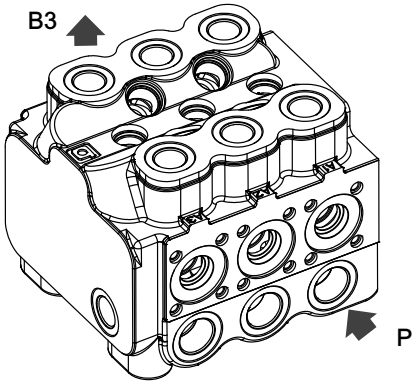
4.1 HDM19WL

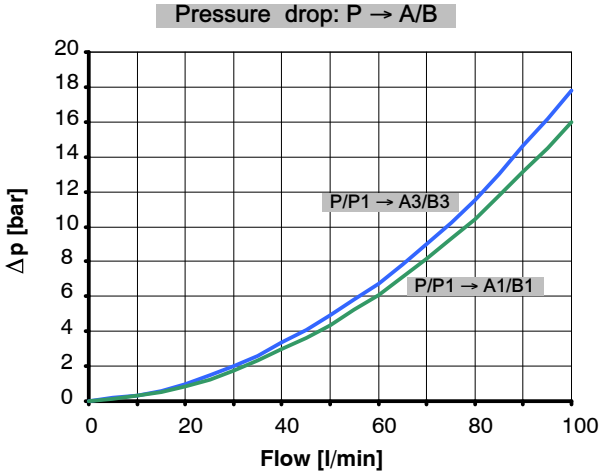
4.1.1 Neutral gallery



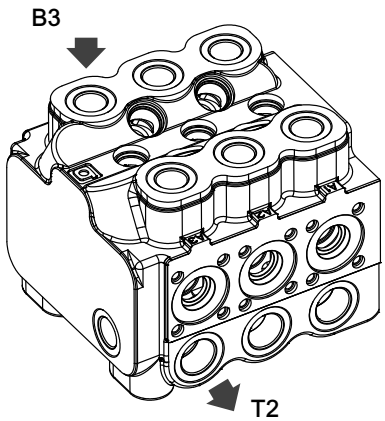


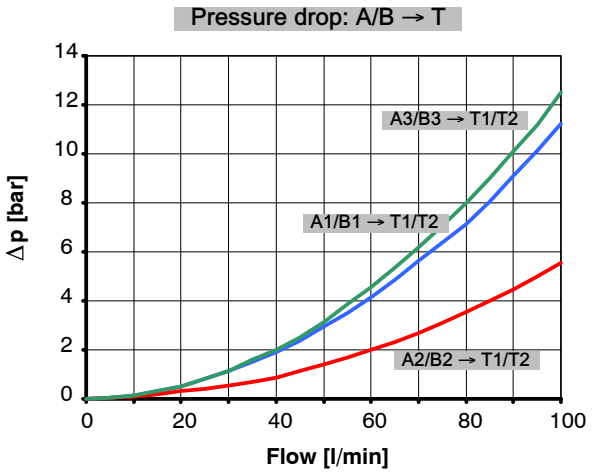
4.1.2 Inlet to work port





4.1.3 Work port to outlet

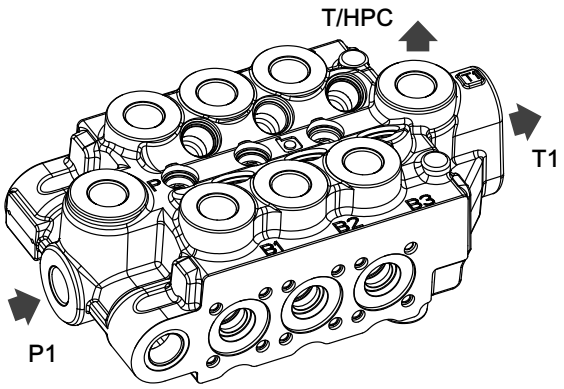


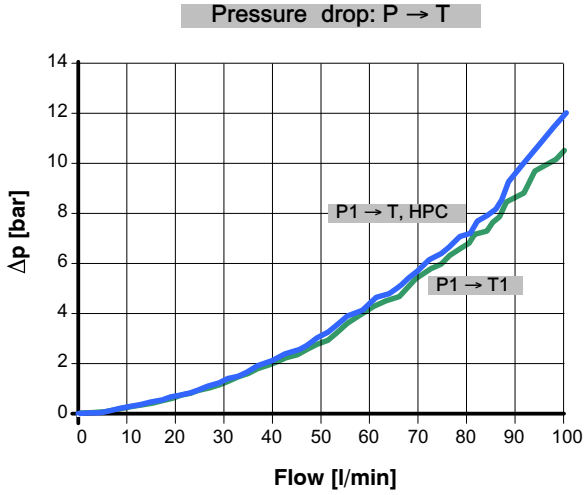


Note: the curves have been recorded with A5S spool

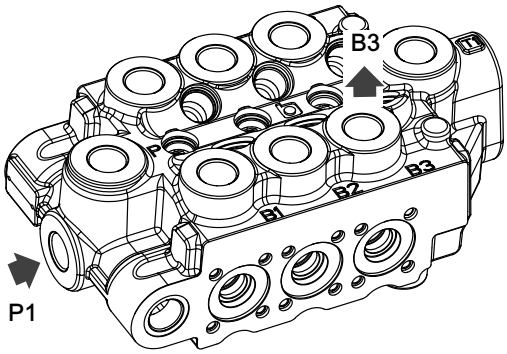
4.2 HDM19EH

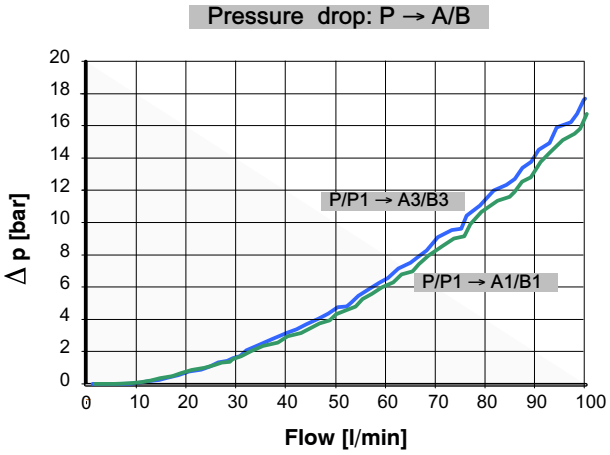
4.2.1 Neutral gallery



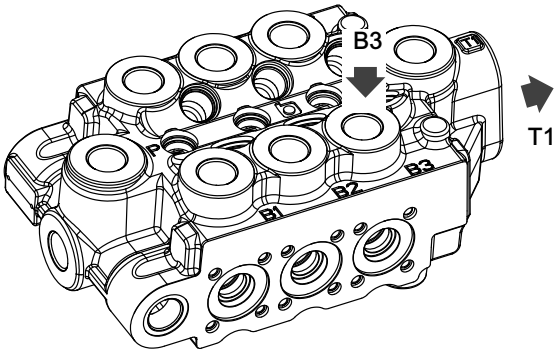


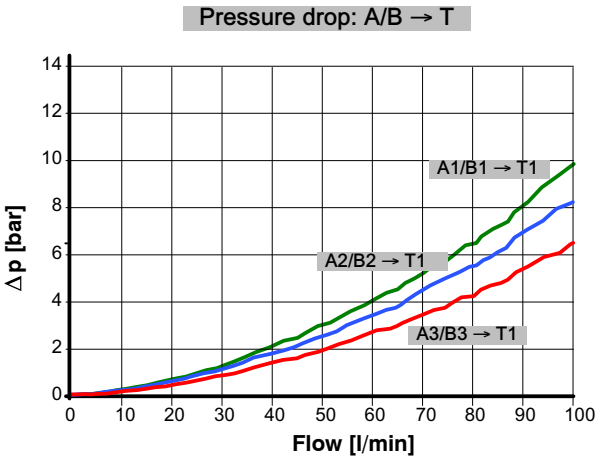
4.2.2 Inlet to work port





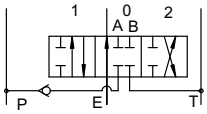
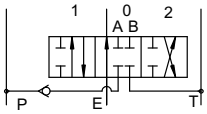
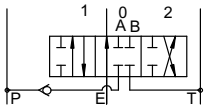
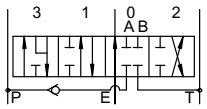
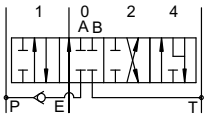
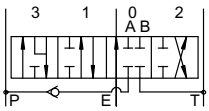
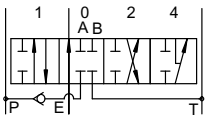
4.2.3 Work port to outlet



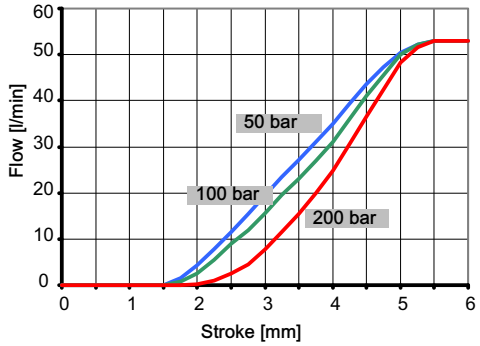


Note: the curves have been recorded with A5S spool

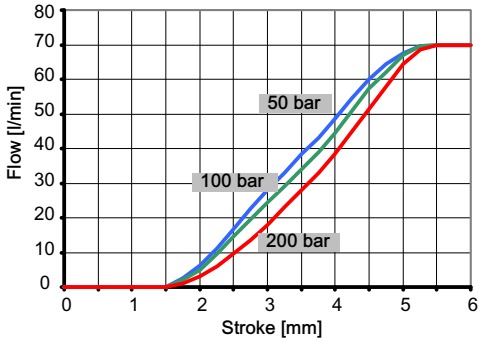
5 Spools

Spool Type	Hydraulic schematic	Features
A5S		Symmetric metering on port A/B (AUXILIARY FUNCTION)
A5A		High metering to tank on lever side (BUCKET FUNCTION)
A5B		High metering to tank on positioner side (BUCKET FUNCTION)
Z5S		Floating position pulling the spool (BOOM FUNCTION)
W5S		Floating position pushing the spool (BOOM FUNCTION)
Z5A		Symmetric floating spool to unload to tank the work ports for quick couplings easy engagement (AUXILIARY FUNCTION)
R5RB		Regenerative circuit at full stroke pushing the spool for high dumping speed (BUCKET FUNCTION)

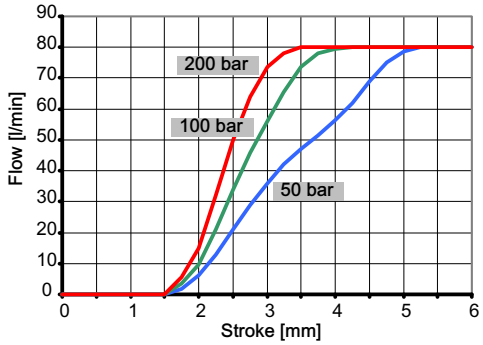
Spool metering: P → A/B (inlet flow 53 l/min)



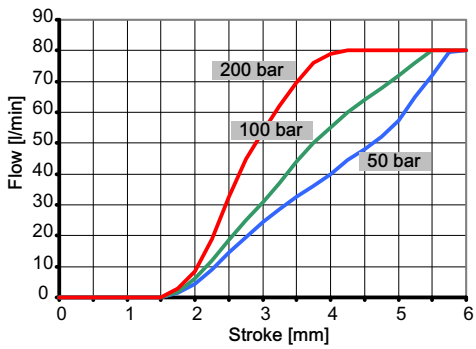
Spool metering: P → A/B (inlet flow 70 l/min)



Spool metering: A/B → T (port flow 80 l/min)
STANDARD spool

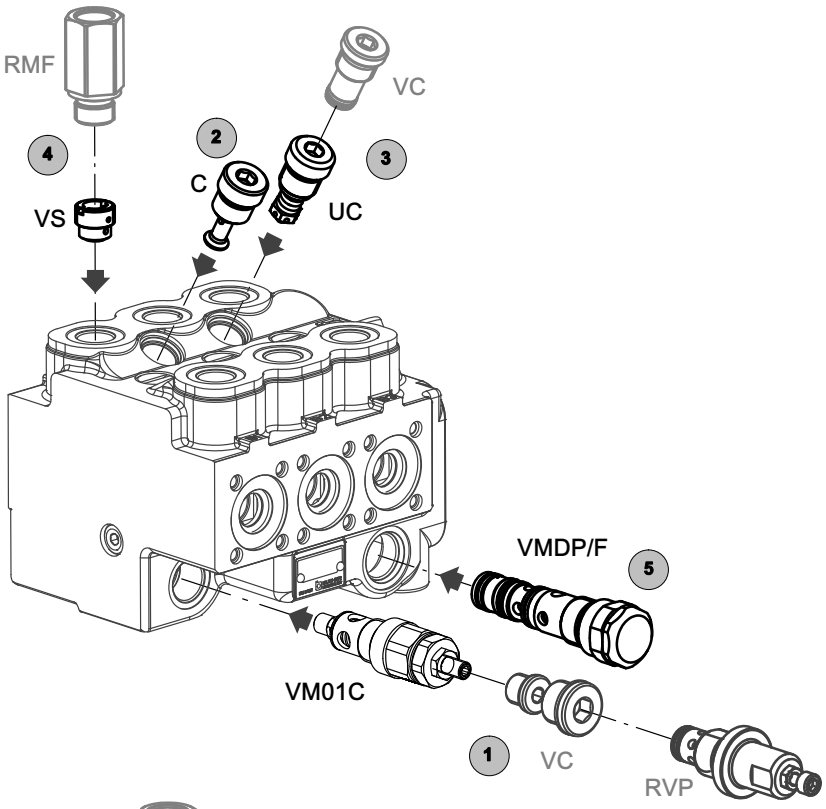


Spool metering: A/B → T (port flow 80 l/min)
BOOM and BUCKET spools

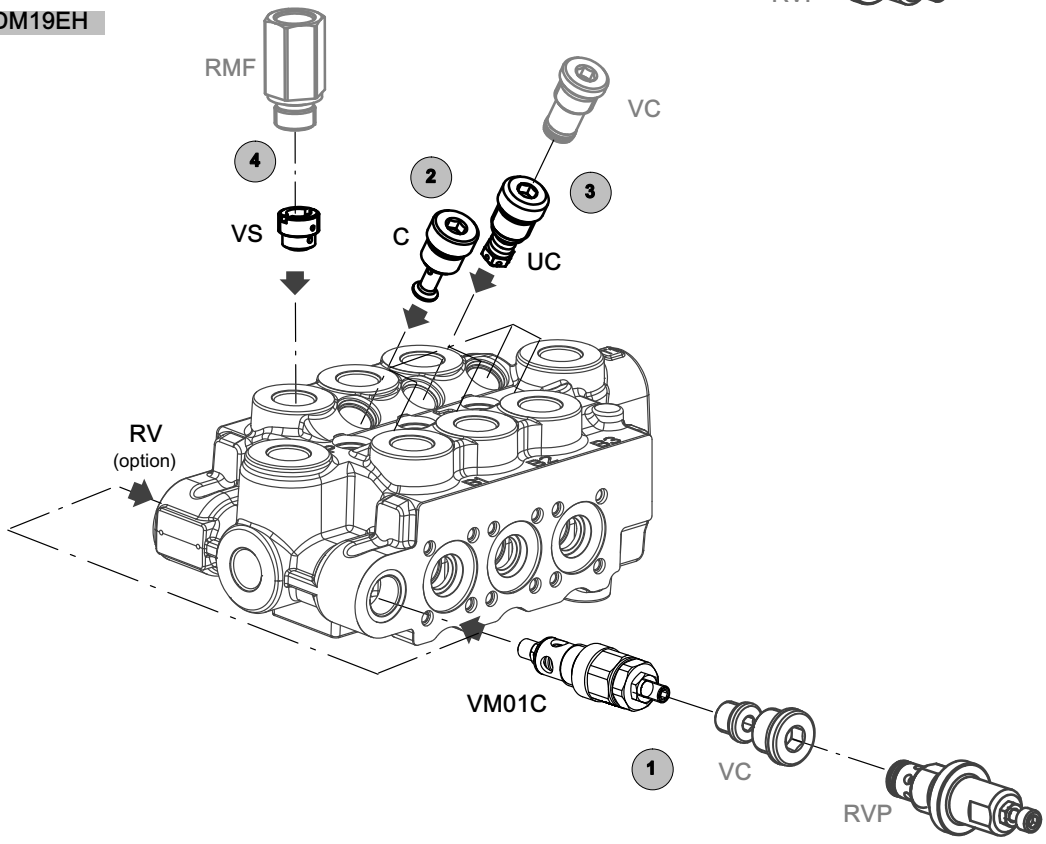


6 Valves

HDM19WL



HDM19EH

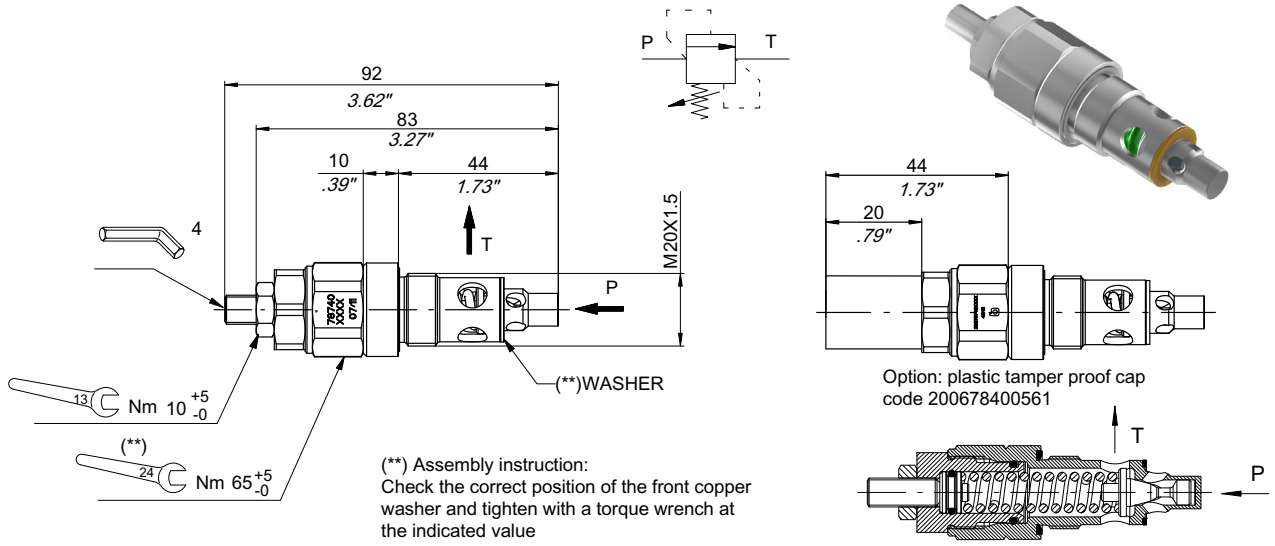


1. Main pressure relief valve : direct acting VM01C / piloted RVP / plug VC
2. Anti-cavitation valve: C
3. Anti-shock and anti-cavitation valves / plug: UC / VC
4. Check valve / flow restrictor: VS / RMF
5. Piloted pressure differential relief valve: VMDP/F

Note: VC is a functionless plug

6.1 Main pressure relief valves

6.1.1 Direct Acting VM01C

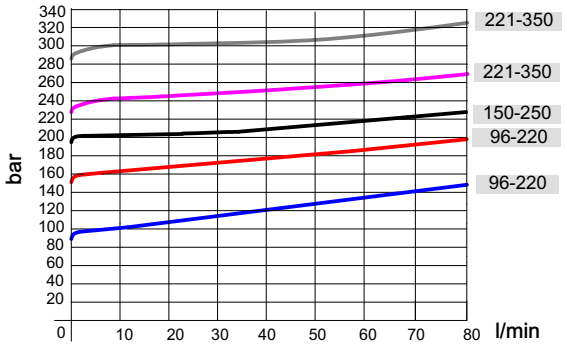


(**) Assembly instruction:
Check the correct position of the front copper washer and tighten with a torque wrench at the indicated value

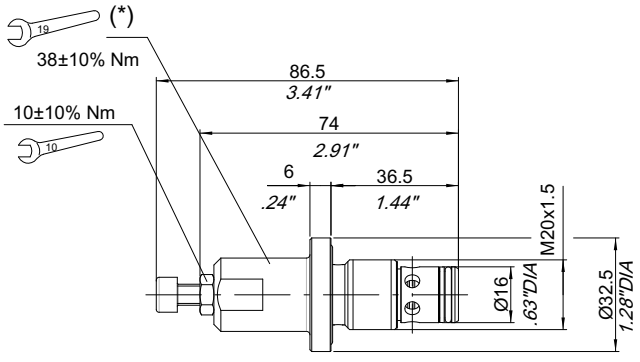
Pressure setting range bar (PSI)	Type	Relief valve code
96 - 220 (1390 - 3190)	12VM01C	200787403420
150 - 250 (2170 - 3620)	15VM01C	200787403470
221 - 350 (3200 - 5070)	23VM01C	200787403430
VC (plug)		200978400140

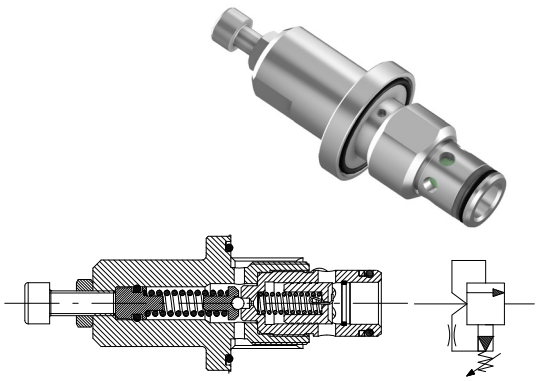
Unless otherwise specified standard pressure setting at 16 l/min

Pressure viscosity characteristic 46 cSt at 40°C



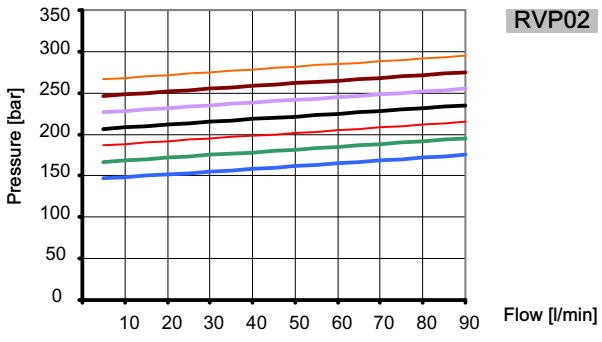
6.1.2 Piloted RVP



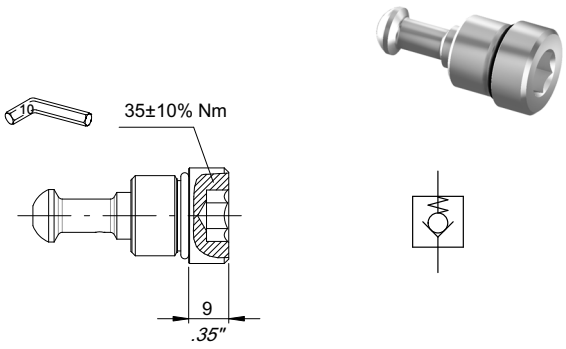


Pressure setting range bar (PSI)	Type	Code
100 - 270 (1450-3910)	RVP02 - 15	200787402871

NB: The body cavity is different compared to the direct acting version

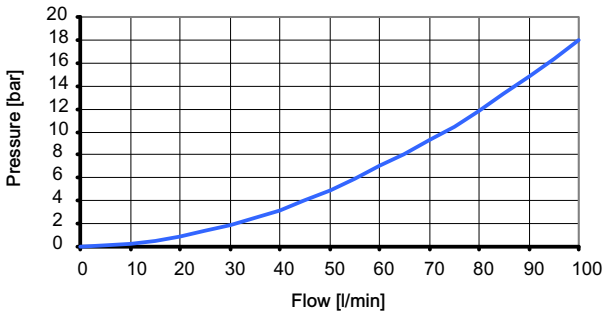


6.2 Anti-cavitation valves C

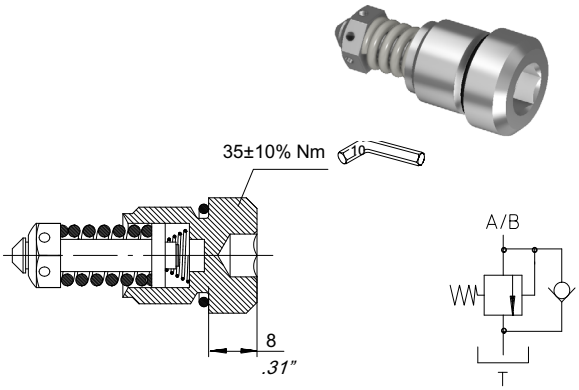


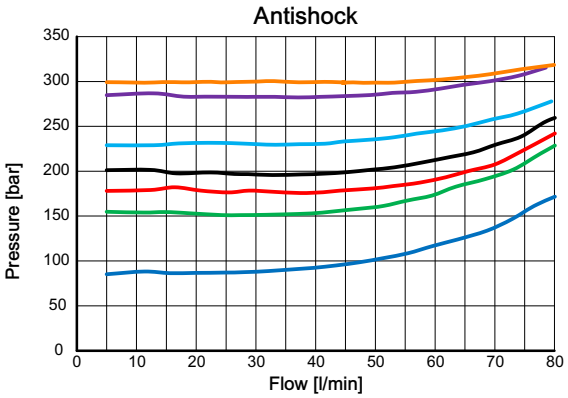
Note: the dedicated cavity is machined on request only

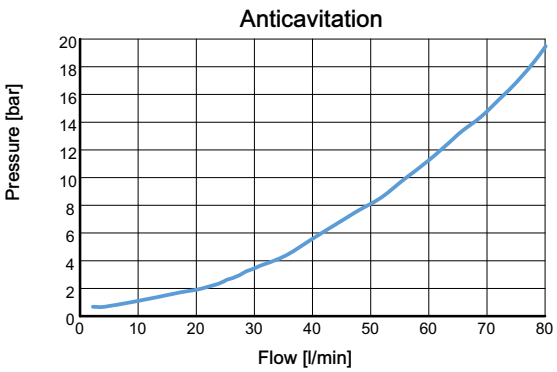
Type	Code
C	200787602560
VC (plug)	200778400310



6.3 Anti-shock and anti-cavitation valves UC



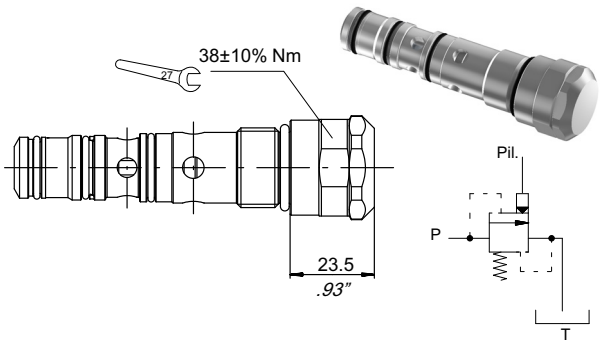


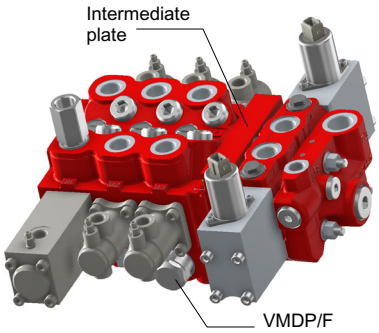


Pressure setting at 10 l/min (*) bar *(PSI)*	Code
40 *(580)*	200533930068
60 *(870)*	200533930077
70 *(1010)*	200533930050
80 *(1160)*	200533930050
90 *(1300)*	200533930084
100 *(1450)*	200533930100
110 *(1590)*	200533930110
120 *(1740)*	200533930085
130 *(1880)*	200533930057
140 *(2030)*	200533930059
150 *(2170)*	200533930051
160 *(2320)*	200533930067
170 *(2460)*	200533930071
180 *(2610)*	200533930056
190 *(2750)*	200533930113
200 *(2900)*	200533930060
210 *(3040)*	200533930080
220 *(3190)*	200533930064
230 *(3330)*	200533930058
240 *(3480)*	200533930081
250 *(3620)*	200533930052
260 *(3770)*	200533930065
270 *(3910)*	200533930066
280 *(4060)*	200533930053
290 *(4200)*	200533930069
300 *(4350)*	200533930079
320 *(4640)*	200533930054
VC (plug)	200778400310

(*) For different pressure settings please contact our Sales Department

6.4 Piloted differential relief valve VMDP/F HDM19WL only





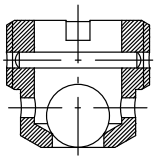
Type	Code	Settings
VMDP/F-30	200789000170	18 + 4 bar *(260 + 60 PSI)*

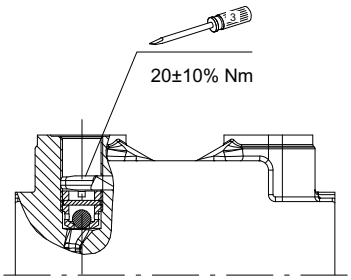
This valve is used to increase productivity avoiding cavitation during boom lowering and bucket dumping operations

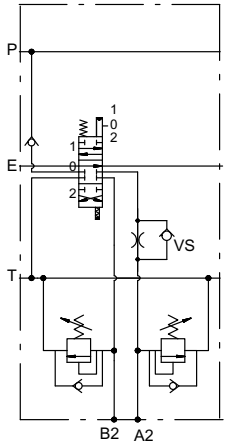
Note: the dedicated cavity is machined on request only

IMPORTANT!
To use this function for the monoblock spools in presence of additional HDS16 sections a special intermediate plate is needed.

6.5 VS check valve/flow restrictor



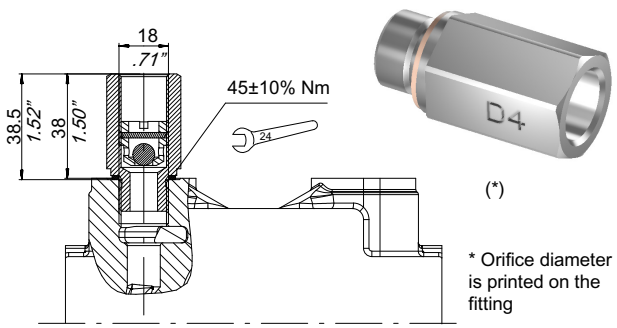




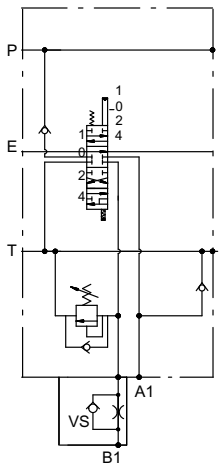
Type	Thread	Ø mm *(inch)*	Code
VS32	M18x1.5	3.5 *(.138)*	200787201580
VS40	1/2" BSP	3.5 *(.138)*	200787201680
VS42	M18x1.5	4.0 *(.157)*	200787201810
VS45	M18x1.5	4.2 *(.165)*	200787200610
VS46	M18x1.5	6.0 *(.236)*	200787201900

Note: the dedicated cavity is machined on request only

6.6 RMF check valve/flow restrictor



* Orifice diameter is printed on the fitting



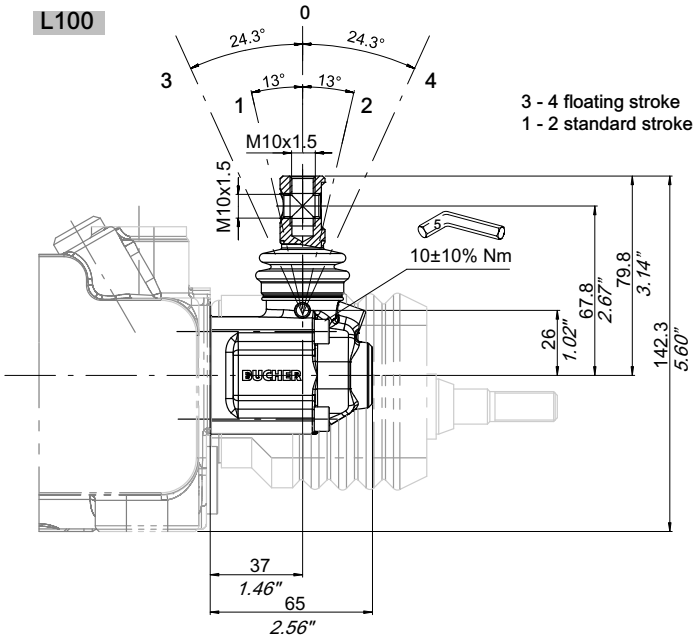
Type	Thread	Ø mm *(inch)*	Code
VS42	M18x1.5	4.0 *(.157)*	200787201800
VS46	M18x1.5	6.0 *(.236)*	200787201910

7 Levers

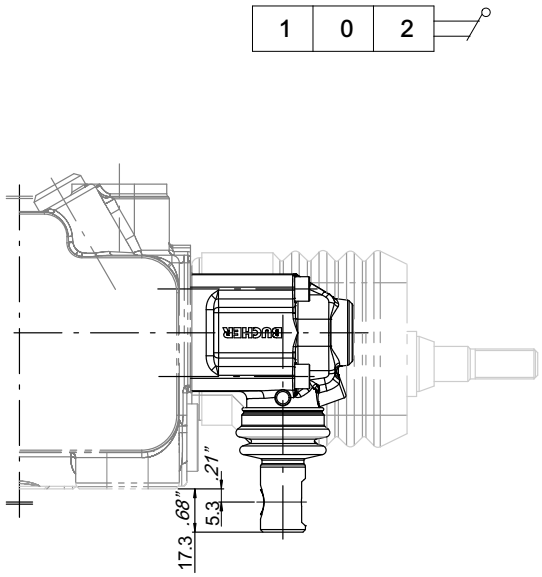
7.1 Standard lever group

Code: 200707120670

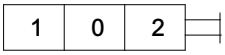
L100



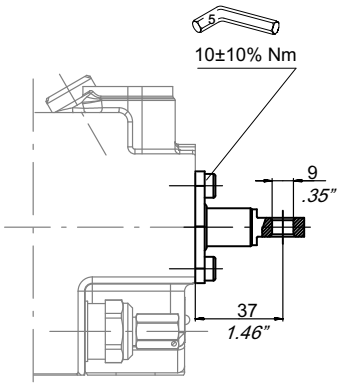
L300



7.2 Free end spool

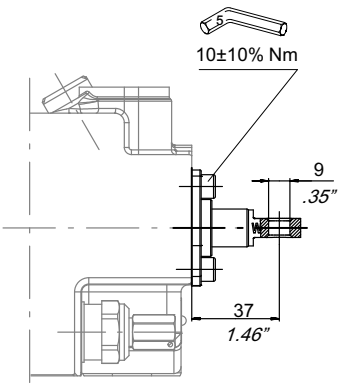


L55



Code: 200707190040

L56

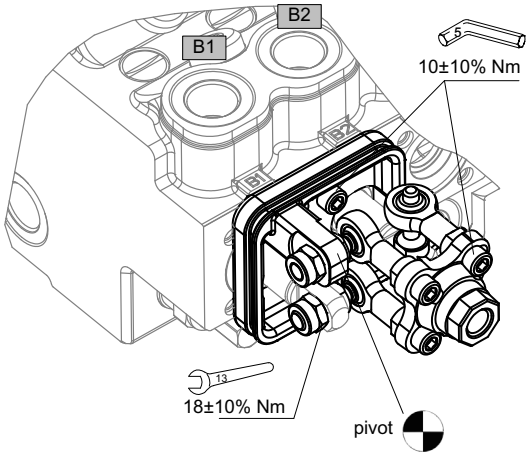


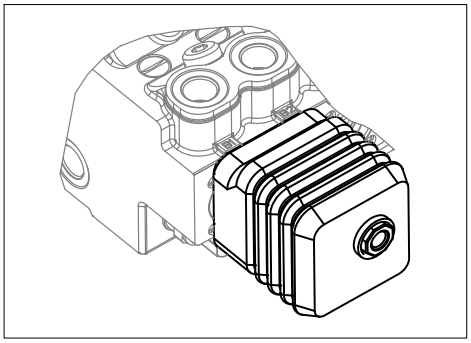
Code: 200707190250

For W** spools only

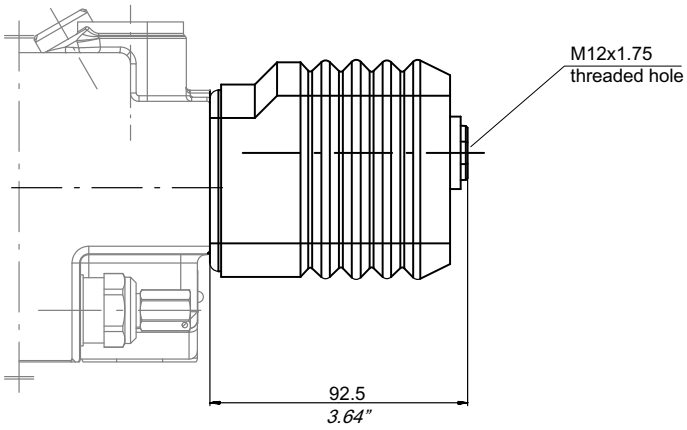
7.3 Joystick control L133-134

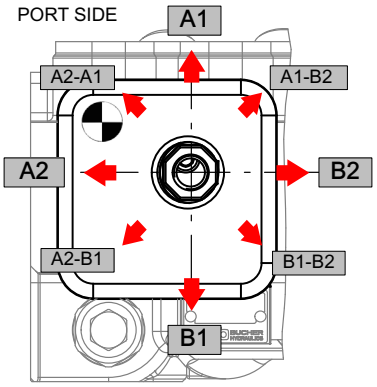
Code: 200775930320



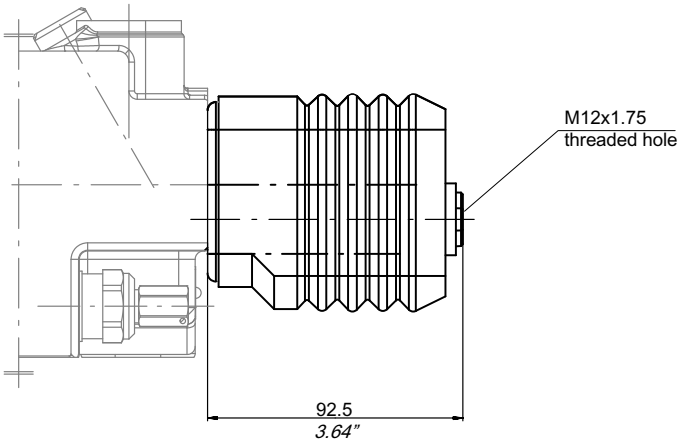


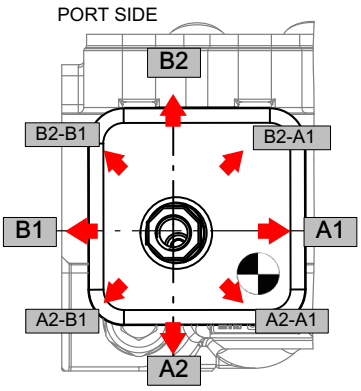
L133



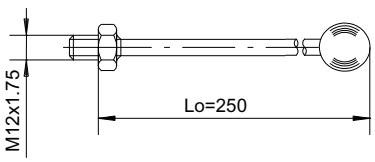


L134



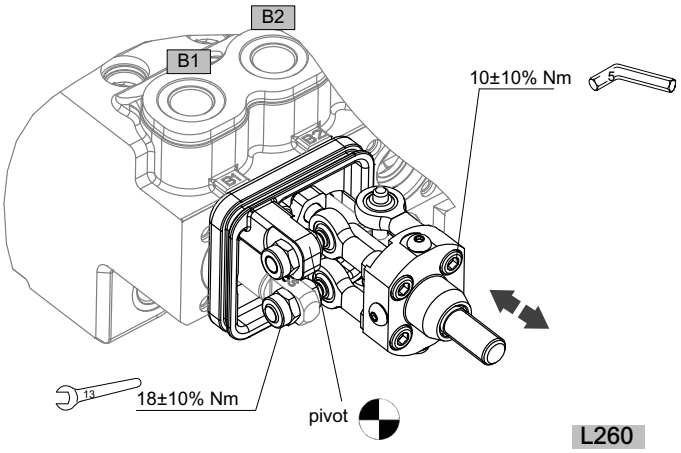


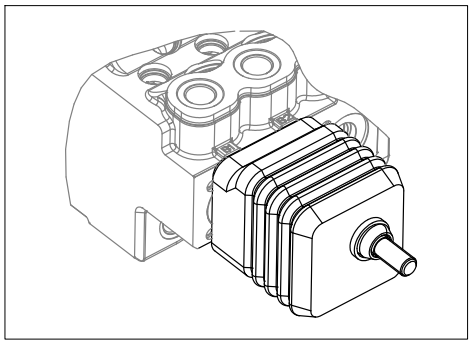
AL010
Code: 200702230040



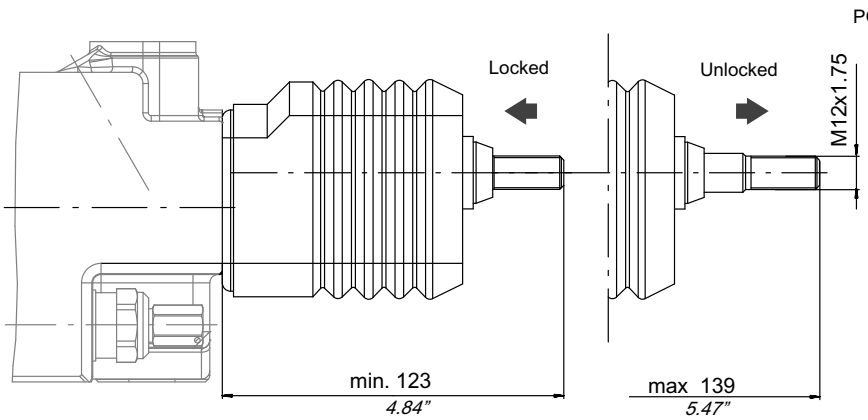
7.4 Joystick control L260 - L460 with integrated locking system

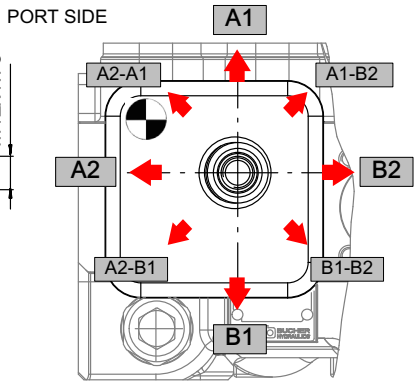
Code: 200775930410



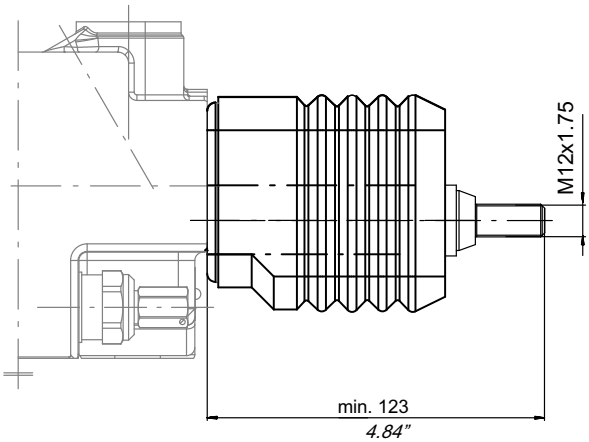


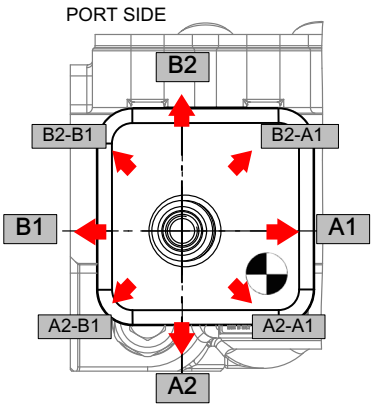
L260





L460



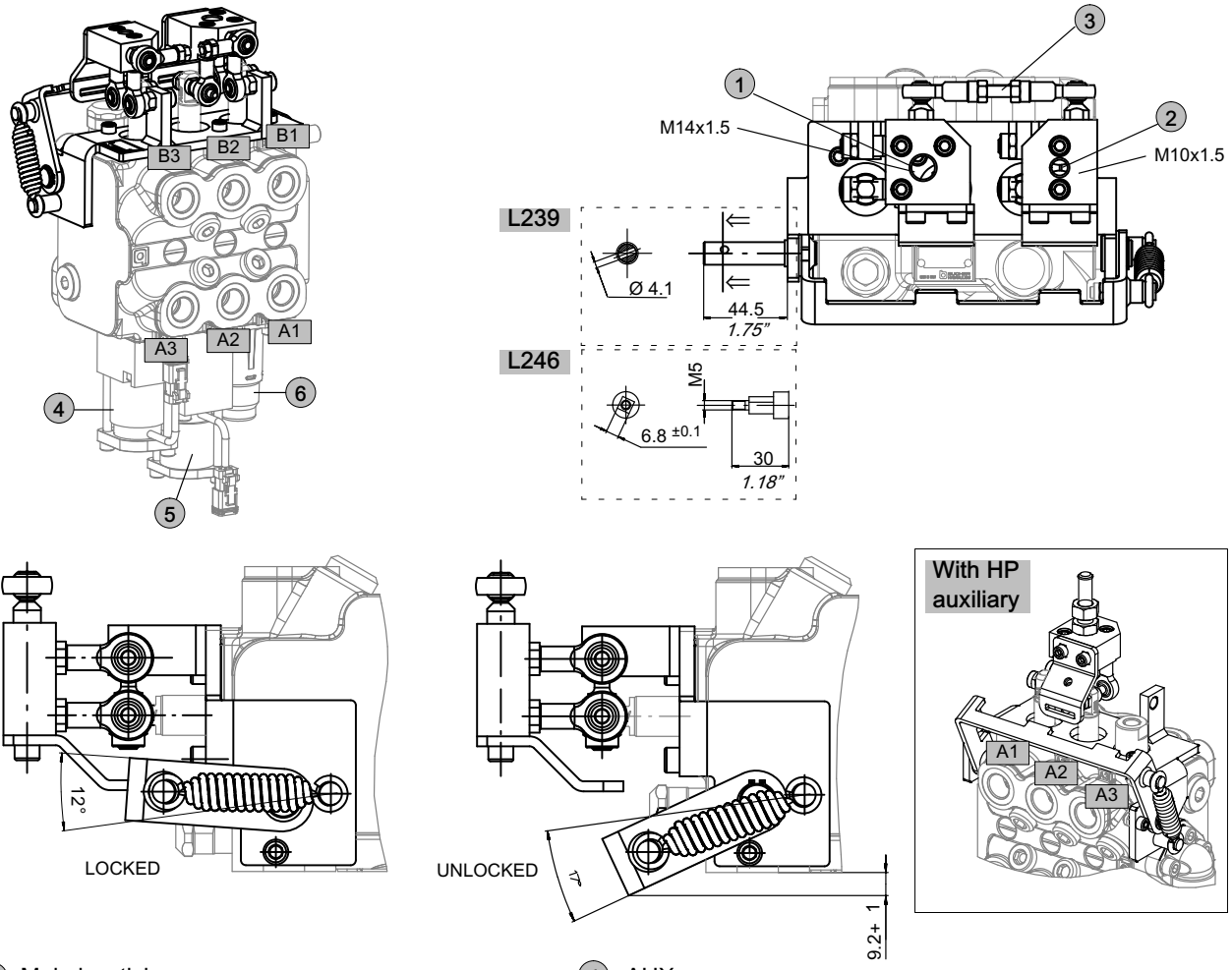


7.5 Joystick control for three spools HDM19WL only

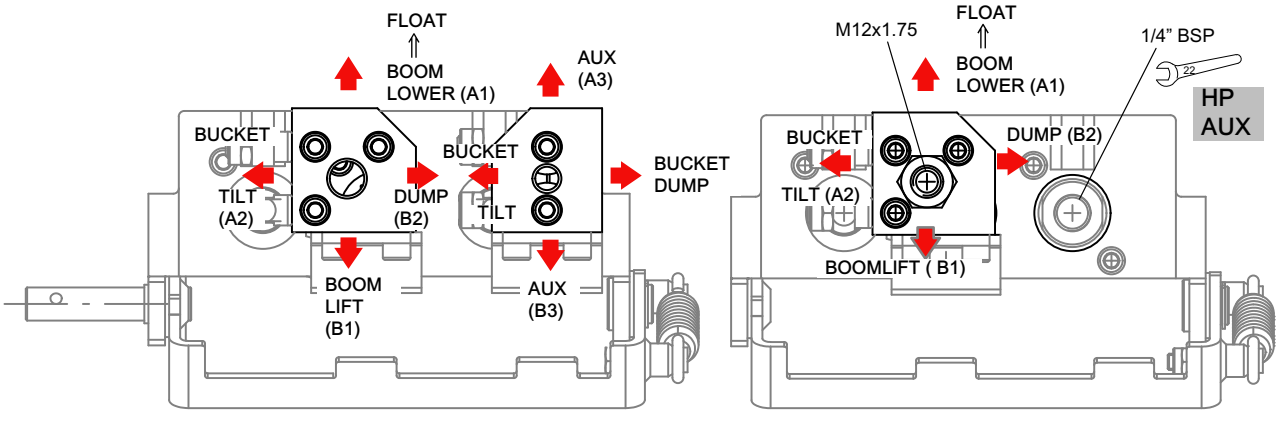
Manual joystick with integrated locking system to control simultaneously two functions with each handle.

Boom and bucket are operated by the main joystick (1).

The linkage (3) make it possible to control both bucket and auxiliary functions using the auxiliary handle (2).

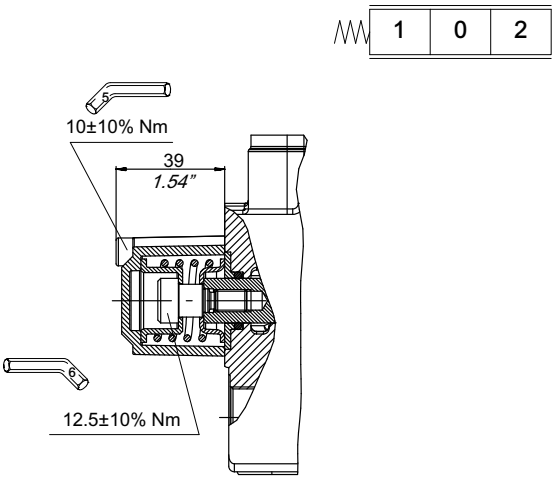


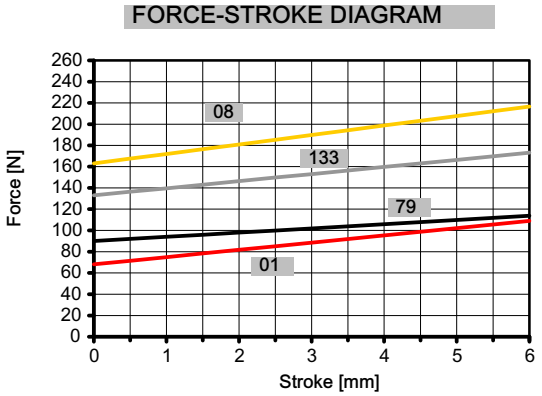
1. Main joystick
2. Auxiliary handle
3. Linkage
4. AUX
5. BUCKET
6. BOOM



8 Positioners

8.1 Spring return to neutral position

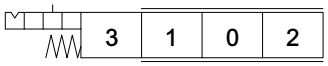


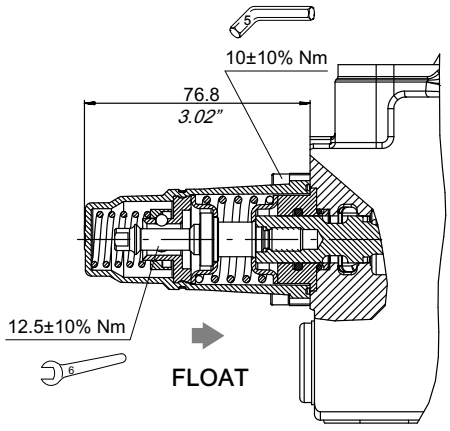


Type	Code	Colour
01	200768611722	RED
79	200768612070	BLACK
133	200768612050	WHITE
08	200768612060	YELLOW

8.2 Detent in floating position and spring return to neutral from position 1 and 2

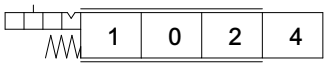
Floating position pulling the spool (Z type)

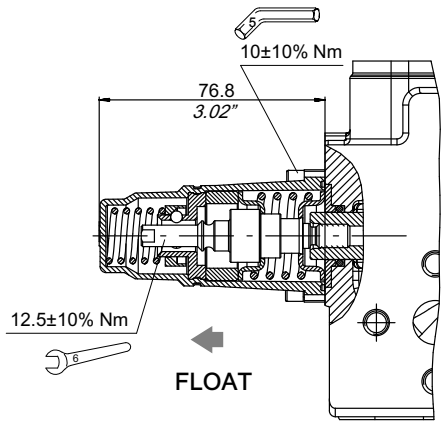




Type	Code	Main spring	Detent spring
04	200768640590	RED	BLACK
333	200768640640	BLACK	BLACK

Floating position pushing the spool (W type)

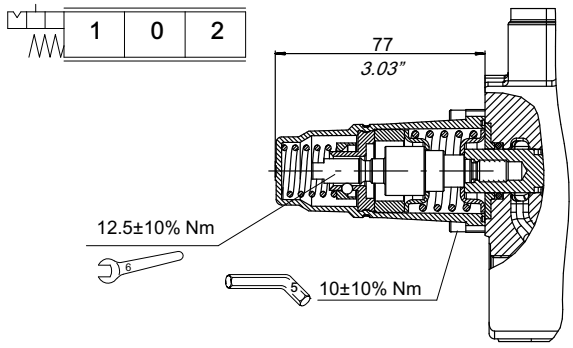




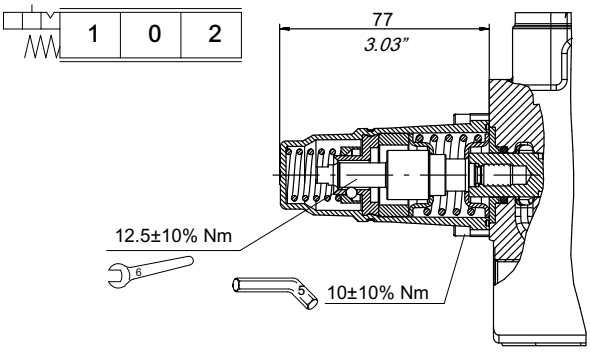
Type	Code	Main spring	Detent spring
06	200768640610	RED	BLACK
335	200768640910	WHITE	BLACK

8.3 Detent in position 1 or 2 and spring return to neutral in both directions

A pre-feeling (force increase) signals the operator that the detent position is going to be engaged

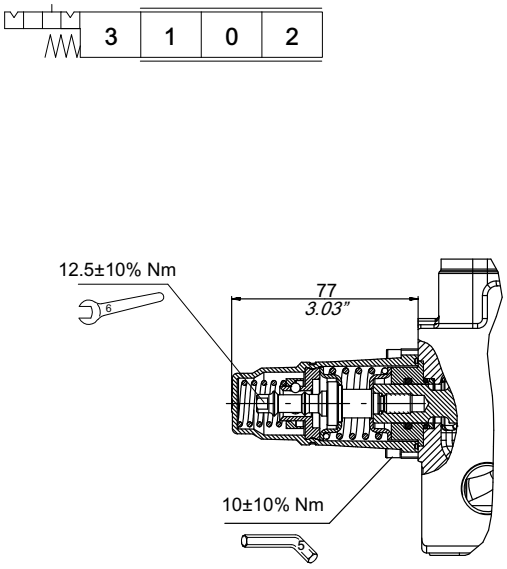


Type	Code	Main spring	Detent spring
359	200768630481	RED	BLACK



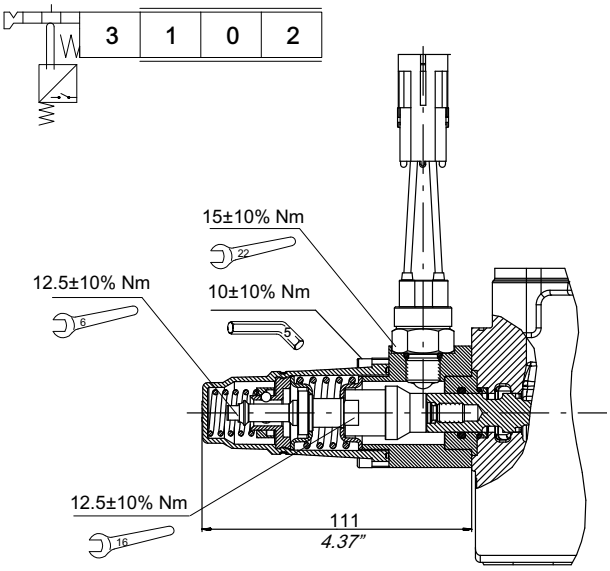
Type	Code	Main spring	Detent spring
340	200768640471	RED	BLACK

8.4 Detent in position 2 and 3 and spring return to neutral in both directions



Type	Code	Main spring	Detent spring
353	200768640700	RED	BLACK

8.5 With microswitch in floating position

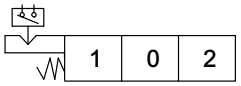


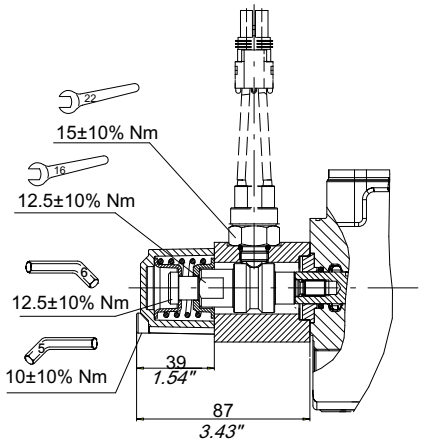
Type	Code	Main spring	Detent spring	Contact type
342	200768640670	RED	BLACK	NO

Microswitch specification	
Current rating	.01 - 5.0 DC Amp
Voltage rating	5.0 - 24.0 VDC
Connector	Packard Metri-pack Female
Electrical life max.	500.000 Cycles
Mechanical life max.	1.000.000 Cycles
Type	Normally Open, Encapsulated with Wire Leads

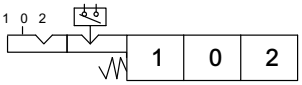
8.6 Microswitch positioners

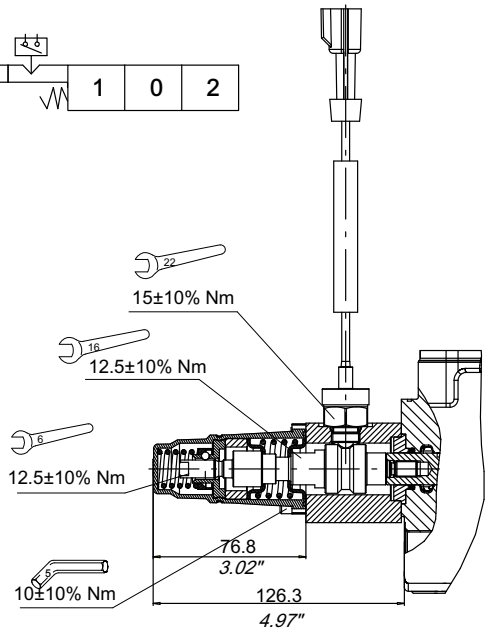
8.6.1 Spool movement detection



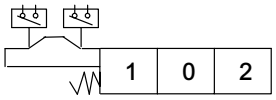


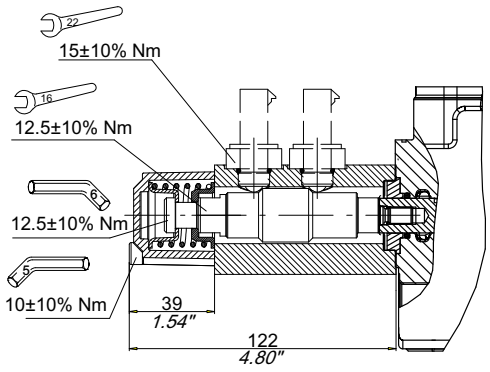
8.6.2 Spool movement detection with detent posit.





8.6.3 Spool direction detection





DE: microswitch operated in both directions

SE1: microswitch operated in POS.1

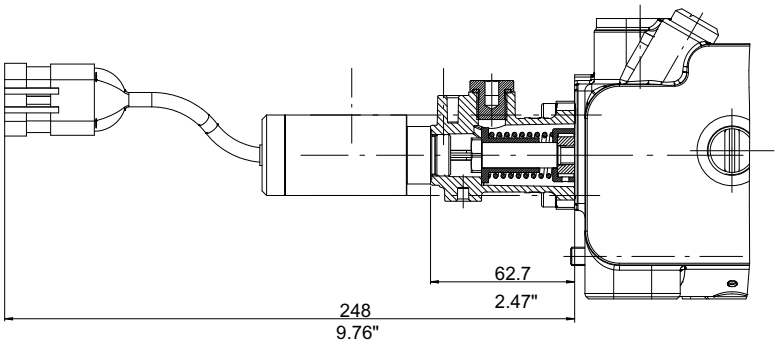
SE2: microswitch operated in POS.2

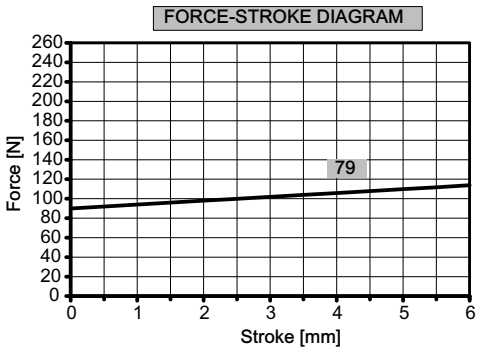
Microswitch control	
Current rating	.01 - 5.0 DC Amp
Voltage rating	5.0 - 24.0 VD C
Mechanical life	500.000 cycles
Temperature range	-30 to 120° C

The normally closed version is available too.

Type	Code	Hydraulic scheme	Description	Connector type	
SAE6 C21-478	200544124021		Normally Closed, Encapsu-lated with Wire Leads	Packard Weather Pack	
SAE6 O21-477	200544124022		Normally Open, Encapsulated with Wire Leads	Packard Weather Pack	
SAE6 O21-467	200544124023		Normally Open, Encapsulated with Wire Leads, Convoluted nylon wire shield	Packard Metri-pack	
SAE6 C21-462	200544124027		Normally Closed, Sealed Terminals	Packard Weather Pack	

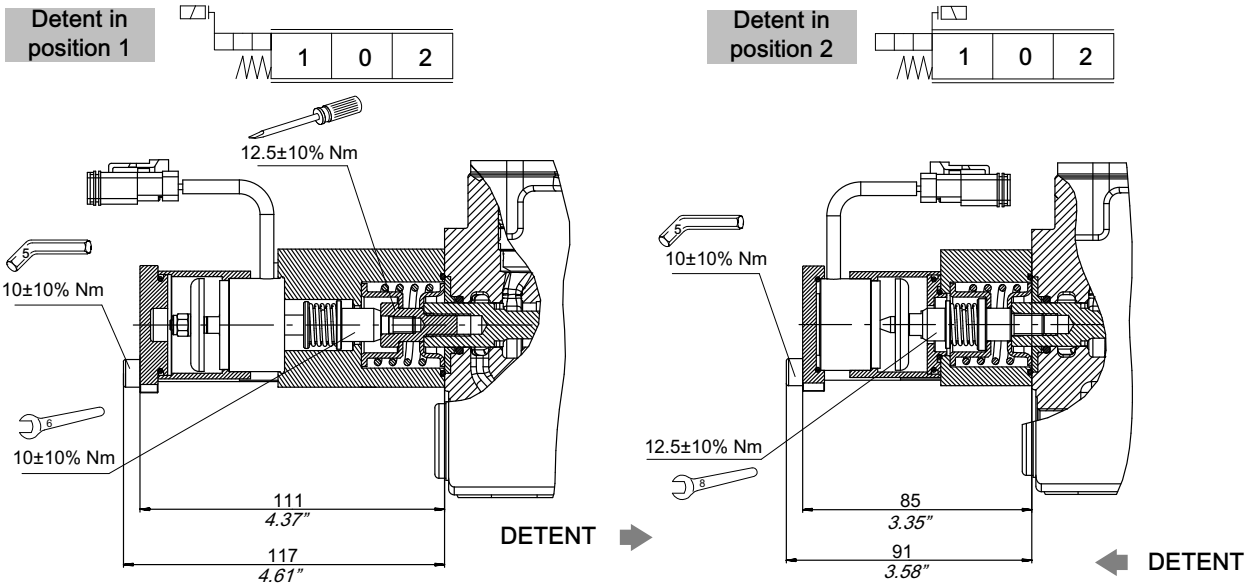
8.7 Manual positioner with spool sensor





8.8 Electro-magnetic detent positioners (EMD)

A pre-feeling (force increase) signals the operator that the detent position is going to be engaged



8.8.1 Operating features

COIL

Nominal voltage: 12 VDC ± 10%

Power rating: 7 W

Electrical resistance when holding (20°C): 21 ± 1.5 Ohm:

Min. solenoid axial hold force: 260 N

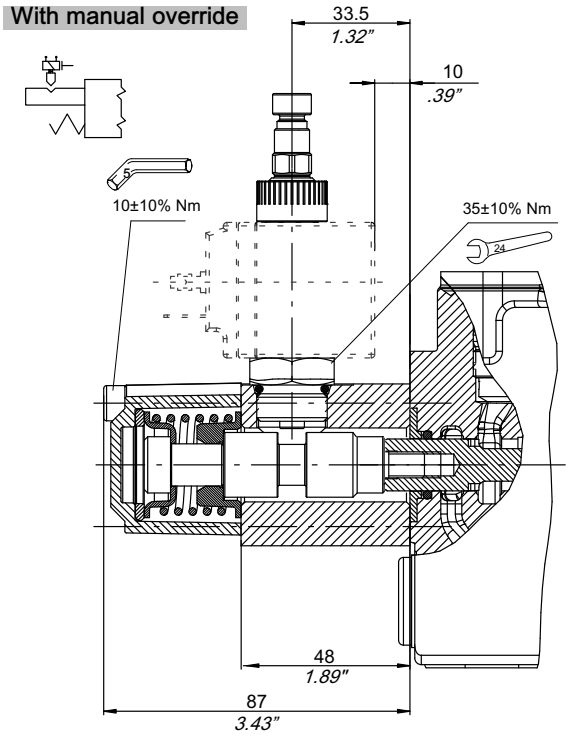
Duty cycle: 100%

Standard cable length: 500 mm

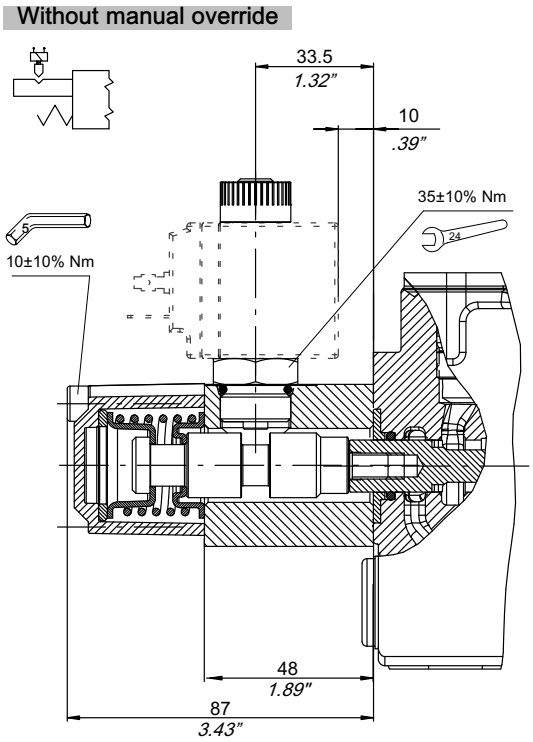
Type	Code	Spring	Voltage	Min. holding force	Connector	Detent position
336	200768670100	RED	12 VDC	137 N	DEUTSCH DT06-2S	2
363	200768670110	RED	12 VDC	137 N	DEUTSCH DT06-2S	1

8.9 Electro-mechanic locking system

With manual override



Without manual override



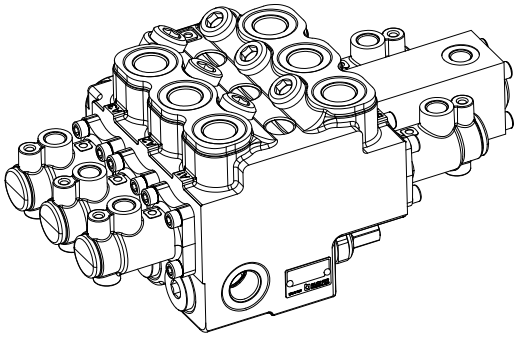
Type	Code	Colour	Manual override
178	200768690260	YELLOW	Y
179	200768690270	YELLOW	N

For types of coils see 5.9 and contact our Sales Department

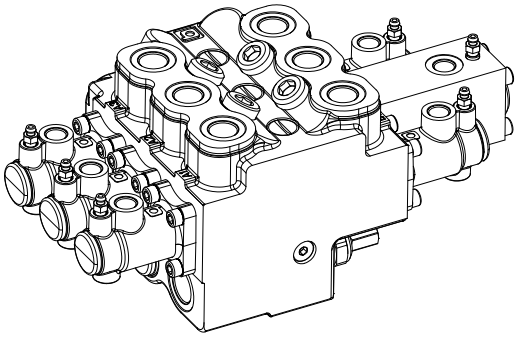
For other types of springs see section 8.1

8.10 Hydraulic controls (HP)

Standard

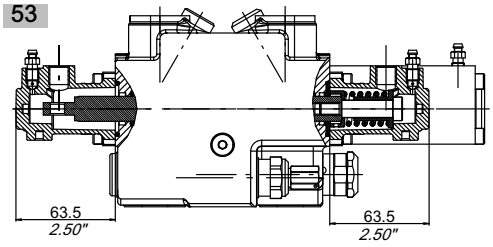


With de-aeration fittings to eliminate air from the piloting circuit

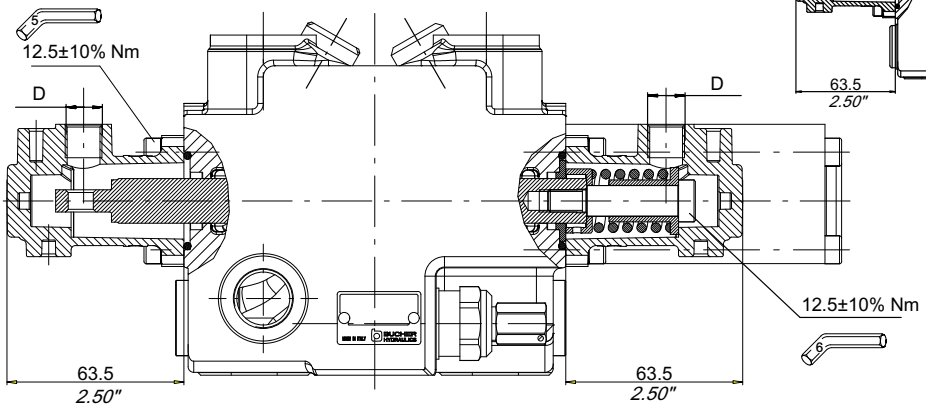


8.10.1 Positioner 50 - 53 - 55

53



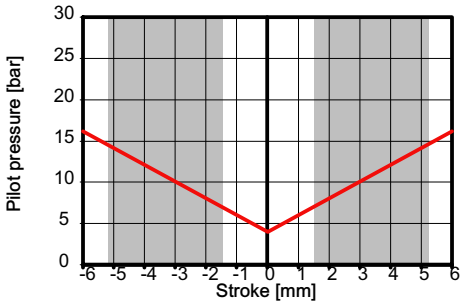
50 - 55



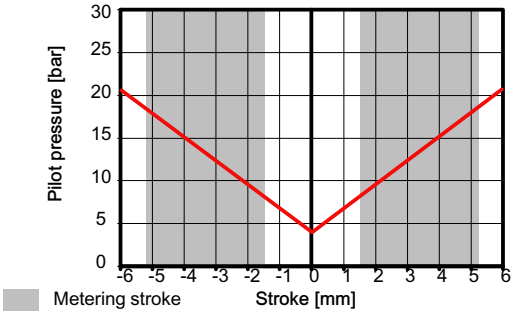
Type	D	Code
50	1/4" BSP	200768650512
53	1/4" BSP	200768650552
55	1/4" BSP	200768650671
57	SAE6	200768650880

Pmax= 40 bar *(580 PSI)*

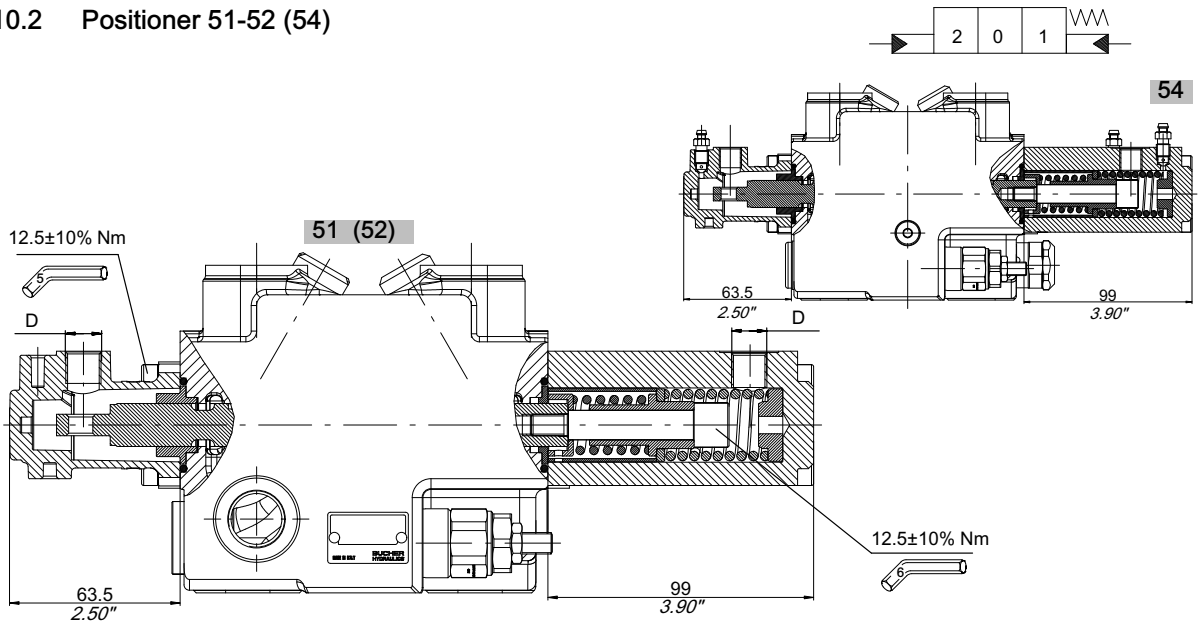
Spring characteristic curve 50-53



Spring characteristic curve 55



8.10.2 Positioner 51-52 (54)

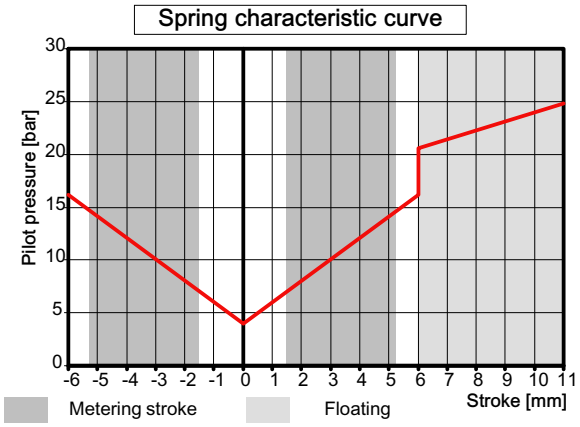


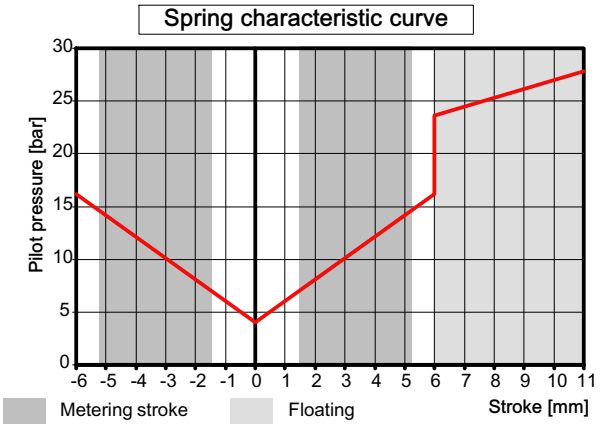
Type	D	Code
51	1/4" BSP	200768650522
54	1/4" BSP	200768650562
68	SAE6	200768650800

Pmax= 40 bar *(580 PSI)*

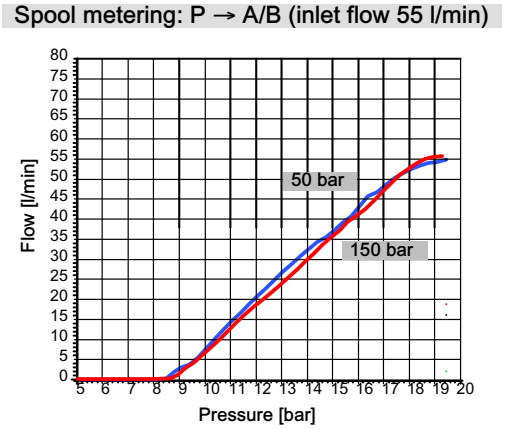
Type	D	Code
52	1/4" BSP	200768650532

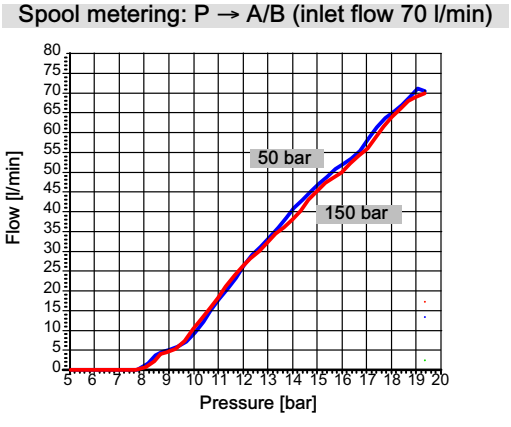
Pmax= 40 bar *(580 PSI)*





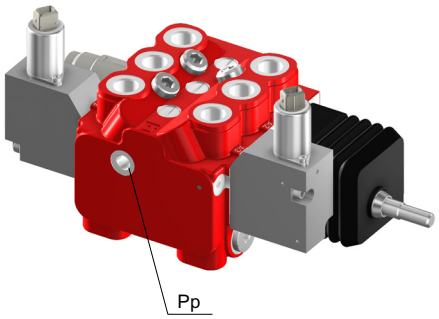
8.10.3 Spool metering curves positioner 50





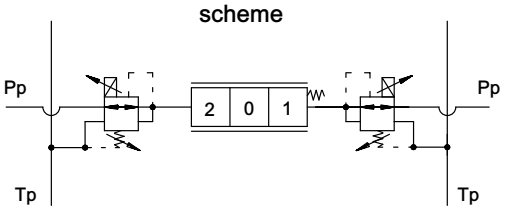
8.11 Electro-hydraulic open loop proportional / ON-OFF control (EHO) internal piloted

8.11.1 HDM19WL

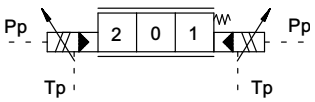


Pp= External connections
Tp= Internal connections

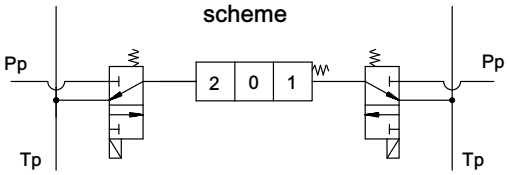
Complete PROPORTIONAL scheme



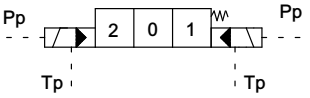
Simplified PROPORTIONAL scheme

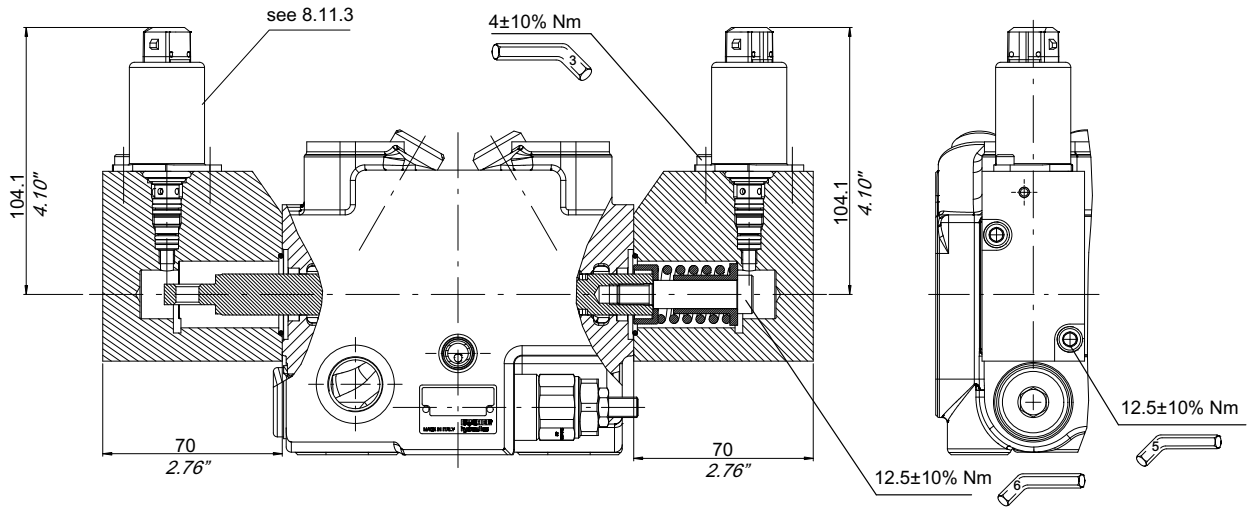


Complete ON-OFF scheme



Simplified ON-OFF scheme



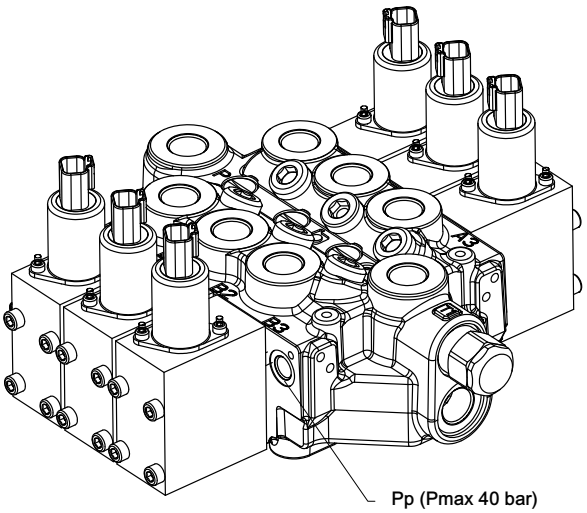


Pmax= 30 bar *(430 PSI)*

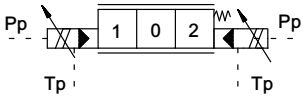
Type	Code	Voltage	Connector
412	200768661450	12 VDC	AMP
413	200768661530	12 VDC	Deutsch

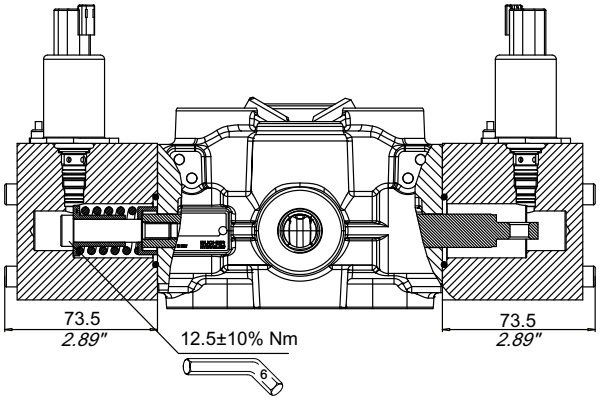
IMPORTANT!:
It is possible to assemble the “single” version in the 3rd section only and without service port valves. If service port valves are need the version with external oil supply ports has to be used.
A dedicated body is requested

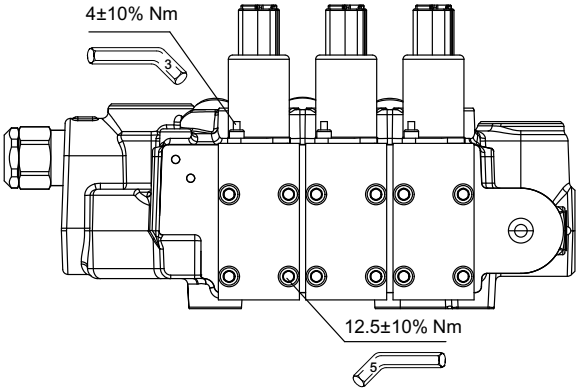
8.11.2 HDM19EH

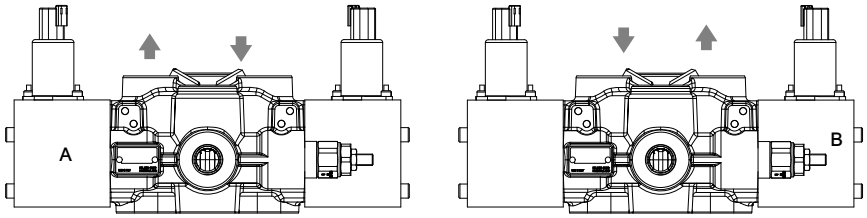


Simplified scheme





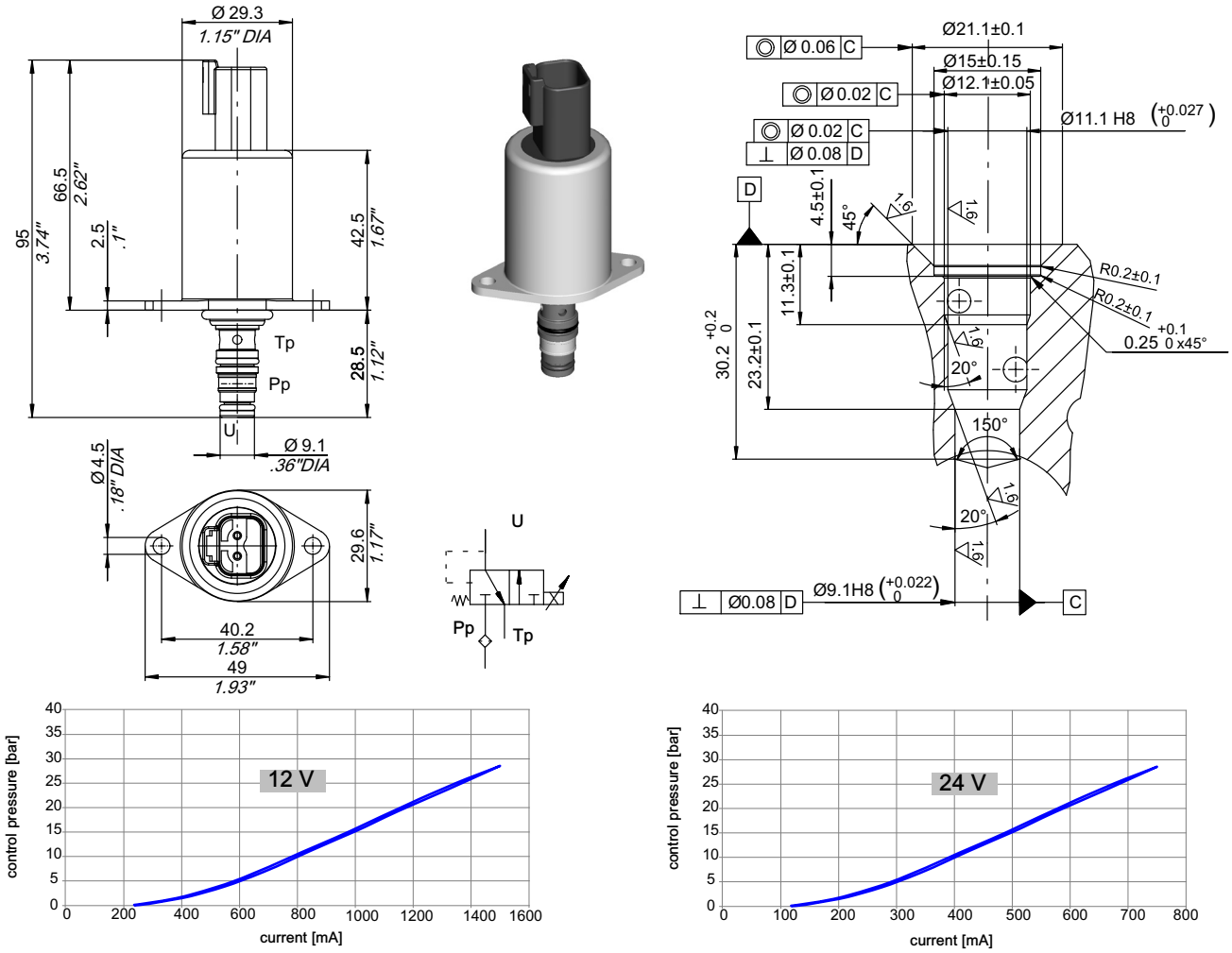




Type*	Code	Voltage	Connector
POS 400	200768661070	12 VDC	AMP
		24 VDC	AMP
		12 VDC	Deutsch
		24 VDC	Deutsch

The pressure differential between pilot lines Pp and Tp should be > 25 bar in order to be sure to switch the spool to full stroke in all operating conditions.

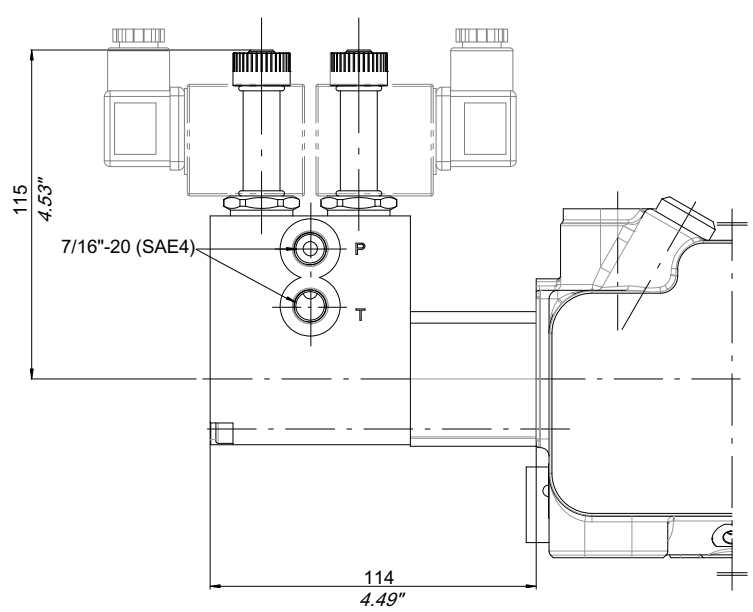
8.11.3 Proportional pressure reducing valve

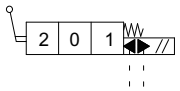


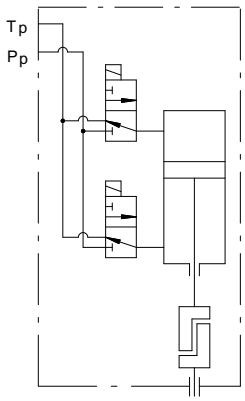
Ectro-hydraulic specifications	12 V	24 V
Nominal flow rate	4 l/min *(1 GPM)*	
Max inlet pressure	50 bar *(725 psi)*	
Rated supply voltage	12 VDC	24 VDC
Current supply characteristic	PWM (Pulse width modul.)	
Maximal current	1500±10 mA	750±10 mA
Superimposed dither frequency	100	
Degree of protection	AMP IP65	Deutsch IP69K
Pp filter screen	125 µm	
Coil resistance	4.7 Ohm ±5%	20.8 Ohm ±5%
Response time	< 50 ms	
Leakage from Pp to Tp	< 30 cc/min. at 35 bar and 50°C *(< 0.9 cu:in./min. at 500 psi and 176 °F)*	
Duty cycle	ED 100%	
Connector Type	AMP Junior timer (AMP84-9419) / DEUTSCH DT04-2P	
Connector colour	MOSSY-GREY	BLACK
Code (*)	200533960015 (DEUTSCH) 200533960016 (AMP)	200533960013 (DEUTSCH) 200533960014 (AMP)

(*) nr. 2 screws M4x12 are not included

8.12 Electro-hydraulic ON-OFF control EHE



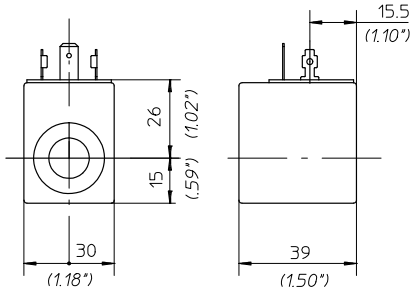




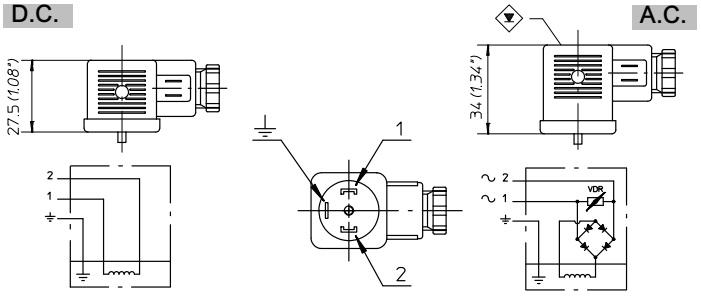
Type	Code (Solenoid and connector not included)
301	200768661500

Features	
Min. pilot pressure	10 bar
Max pilot Pressure	30 bar

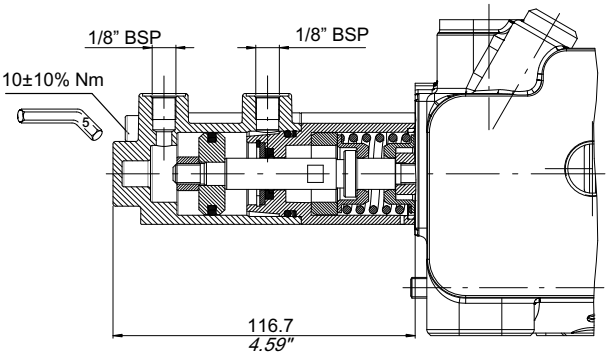
Solenoid EHI-EHE

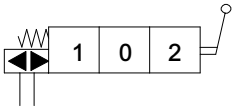
Supply voltage	Nominal voltage	Power (Watt)	Resistance (Ohm)		Current (Ohm)		Coil code	
			Ambient temp.	Stabilized temp.	Ambient temp.	Stabilized temp.		
12 V.DC	12 V.DC.	18.7	7.7	10.8	1.56	1.11	200674910030	
24 V.DC	24 V.DC.	18.6	31	41.4	0.77	0.58	200674920030	

Connector

Supply voltage	Code	Connector type	
AC	200544110009	DIN43650	
DC	200544110012		

8.13 Pneumatic control





Type	Code
24	-

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)

8.14 Spool position transducer

8.14.1 Features

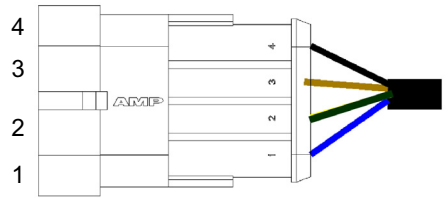
Code : 200544124029
Position transducer.
± 7,5 mm linear stroke.
Hall effect sensor

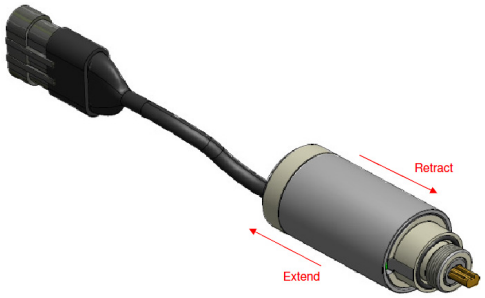
Mechanical specifications	
Maximum mechanical stroke	≥±8,5mm
External diameter	35 mm
Body lenght	91 ± 8,5mm
Cable lenght (including connector)	350mm
Maximum operating pressure	5 MPa (50bar)
Operating temperature range	-25°C / +105°C
Protection class	IP 67
Connector	Amp seal, 4 male pins
Mechanical life	5 Million cycles

Electrical specifications - Linear, Hall-effect sensor	
Power Supply Voltage	7 ÷ 32 Vdc
Current Consumption	< 20 mA
Output signal in Neutral	2,5V
Output signal range	1 V ÷ 4 V
Tolerance on output signal	± 0,1 V
Maximum linearity error (-25 ÷ 105°C)	± 2%
Max. Electrical stroke linearity range	± 7,5mm (adjustable)
Electrical life	10 Million cycles

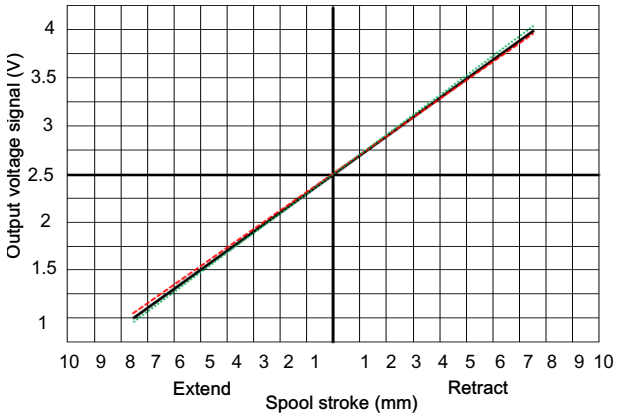
Electrical Connections (proportional version)

1. Vcc - Blue
2. Gnd - Green/Yellow
3. Proportional Output - Brown
4. n.u. - Black

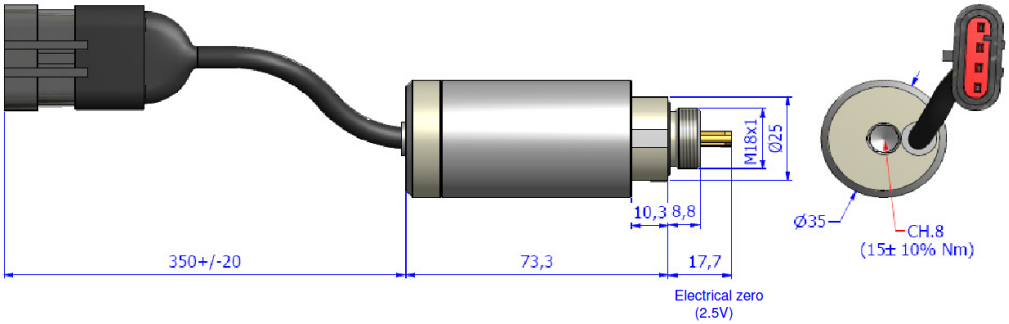




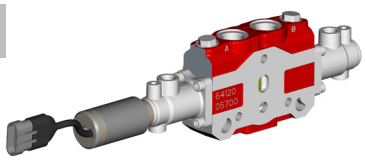
Output signal control characteristic (proportional version)



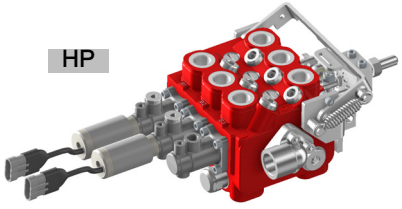
Red lines: -25 / +85 °C Green lines: 85 / 105 °C



HP
HDS16



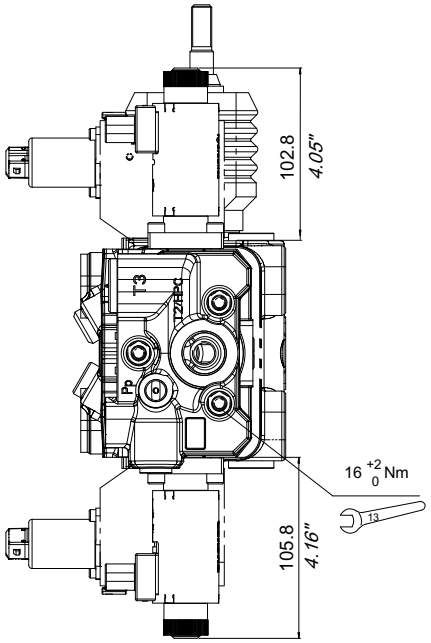
HP

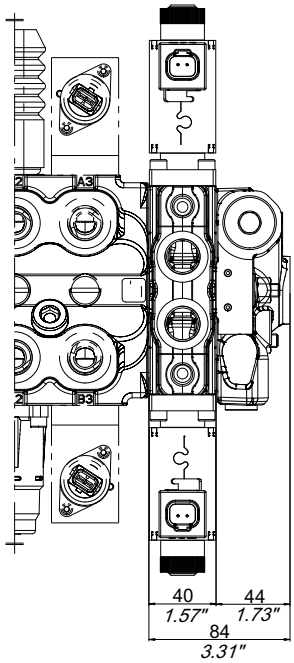


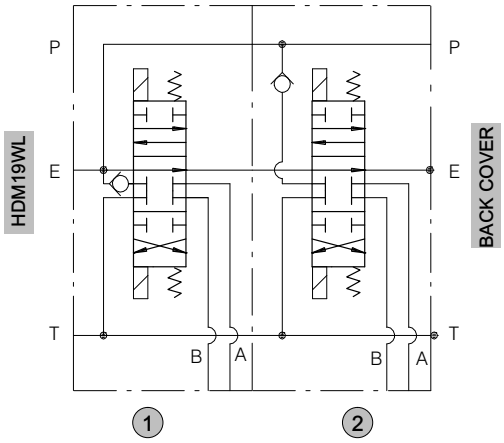
9 Stackable elements - HDM19WL only

It is possible to flange up to seven HDS16 elements on the tank port side or manifolds with specific functions on the inlet port side.

9.1 HDS16 ON-OFF





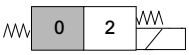


Double acting

Type 01E

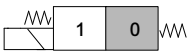
Single acting port “B”

Type 02E

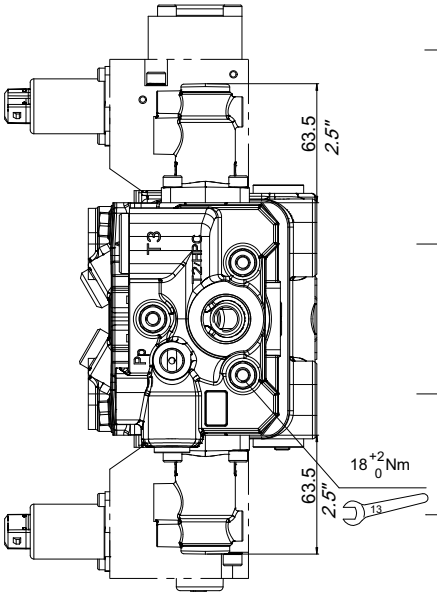


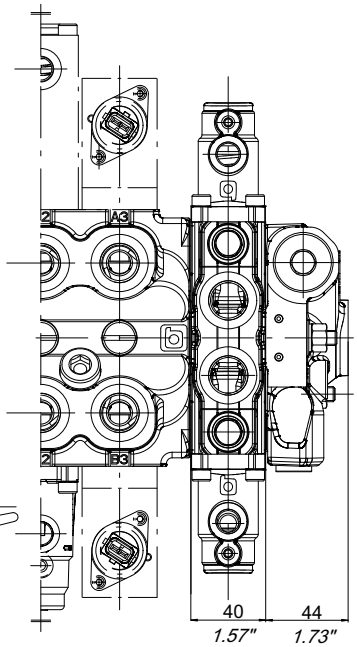
Single acting port “A”

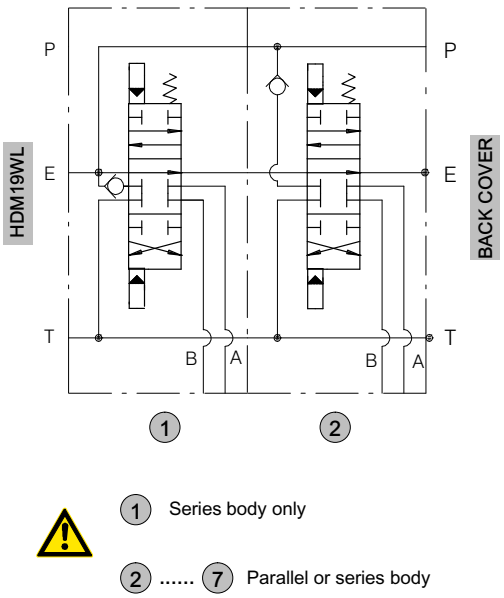
Type 03E



9.2 HDS16 hydraulic control (HP)

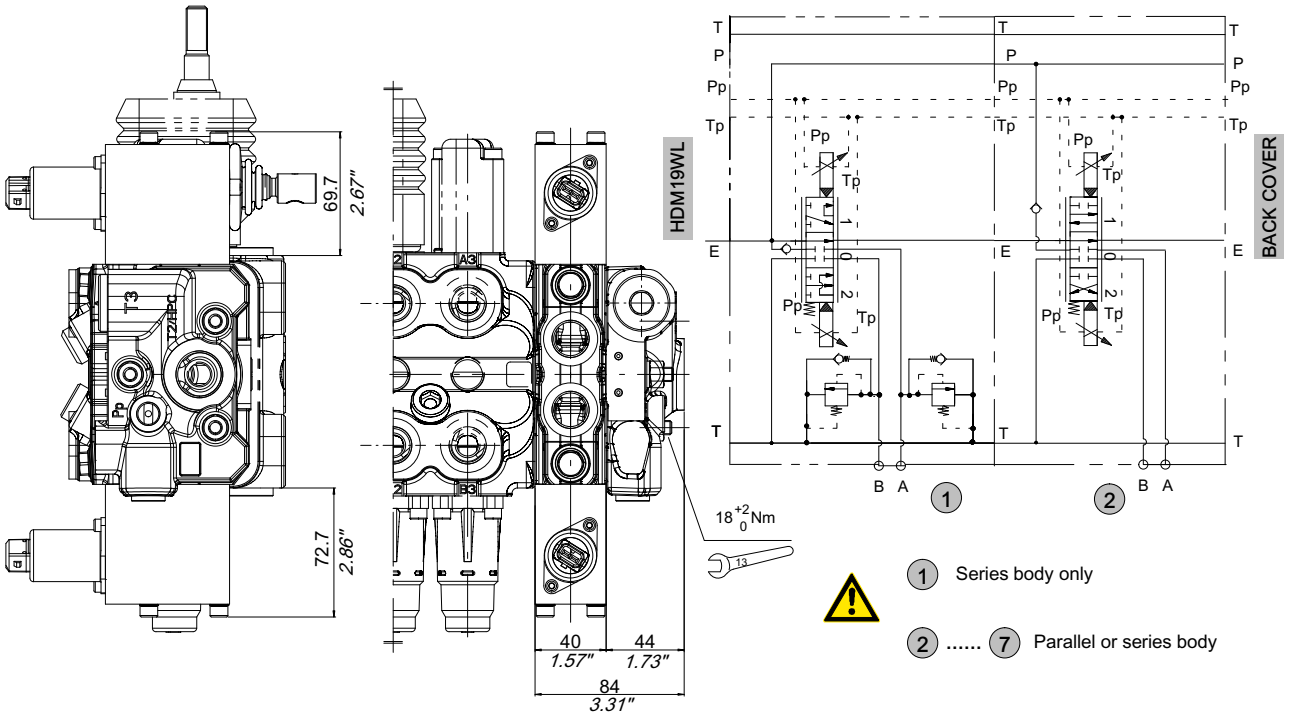






IMPORTANT!: For bodies, outlet covers, spools, controls and service port valves see the HDS16 catalogue

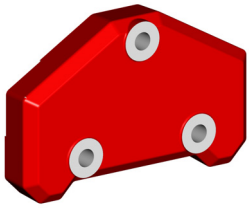
9.3 HDS16 proportional controls (EHO)

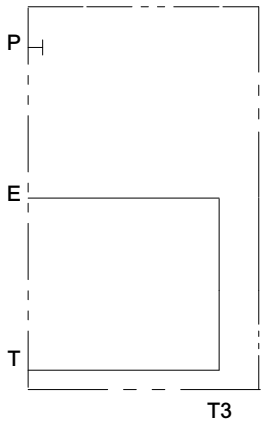


IMPORTANT!: For bodies, outlet covers, spools, controls and service port valves see the HDS16 catalogue

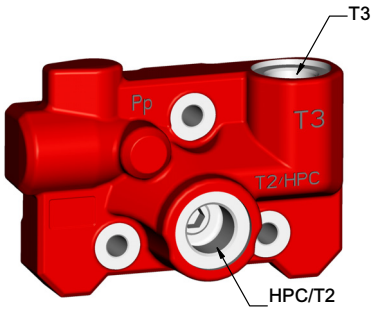
9.4 Back covers

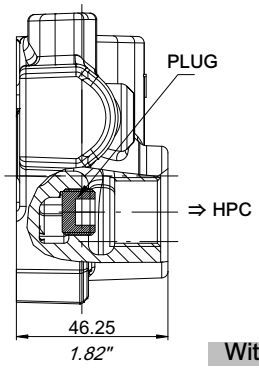
9.4.1 Standard end cover (P)



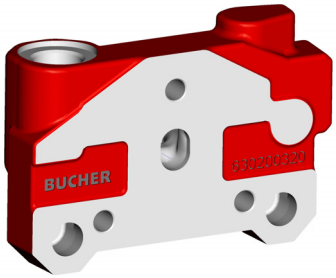


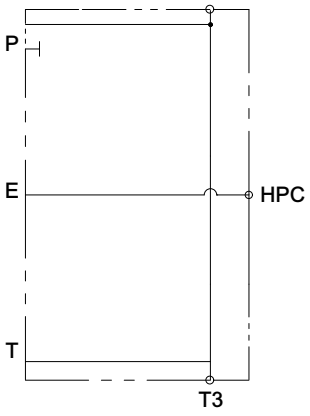
9.5 Standard outlet cover (PM)

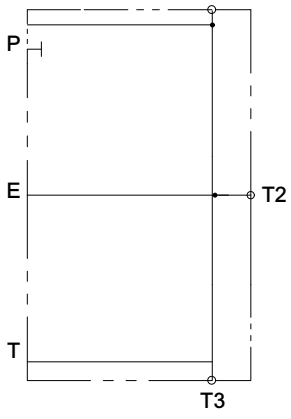




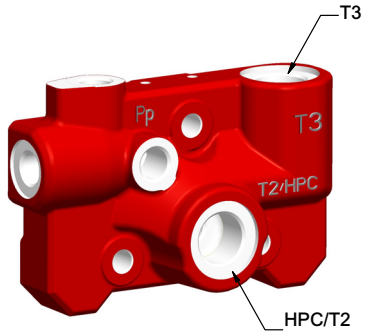
With pilot line for EH positioners

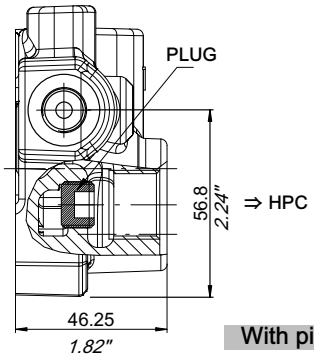


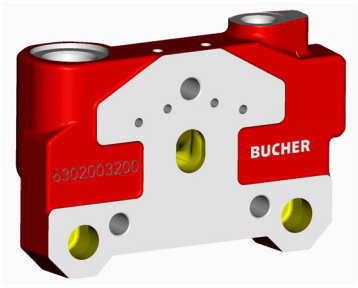




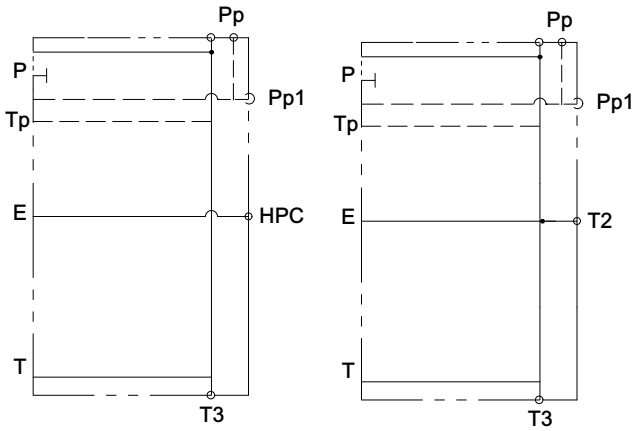
9.6 End cover with pilot pressure port Pp for EH version (PH)





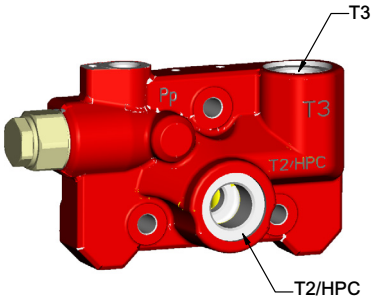


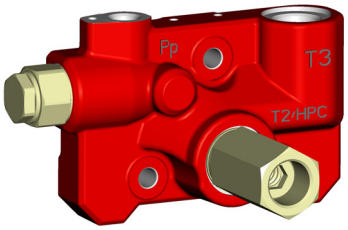
With pilot line for EH positioners

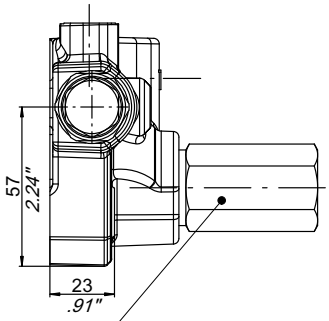


Pp ports max supply pressure: 40 bar

9.7 End cover with pilot lines and pressure reducing valve for EHO positioners (PH)



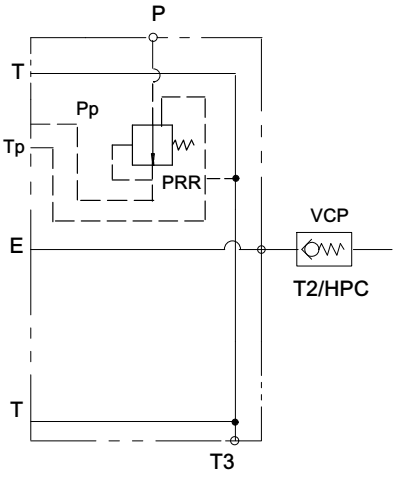




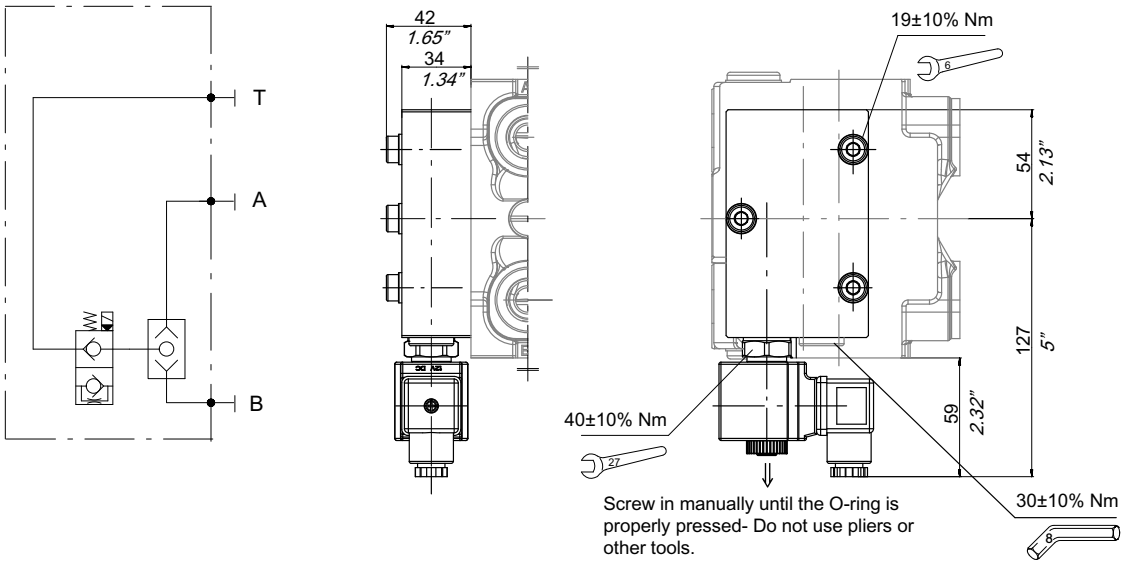
Optional
VCP return back pressure valve (T2 = 1/2"BSP) code 200787401570;
(to order separately)

VCP is fixed set and create an additional back pressure to the neutral gallery free flow according to the diagram.

With pilot line for EHO positioners



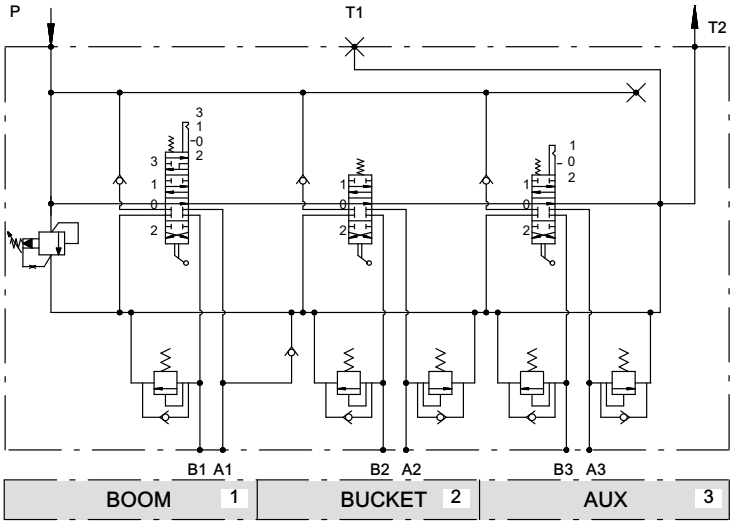
9.8 Ports A1 / B1 unloading valve - (A1-B1-T internal connections) HDM19WL only

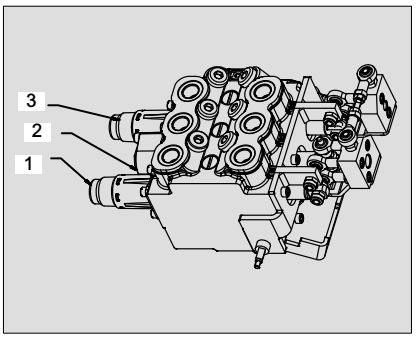


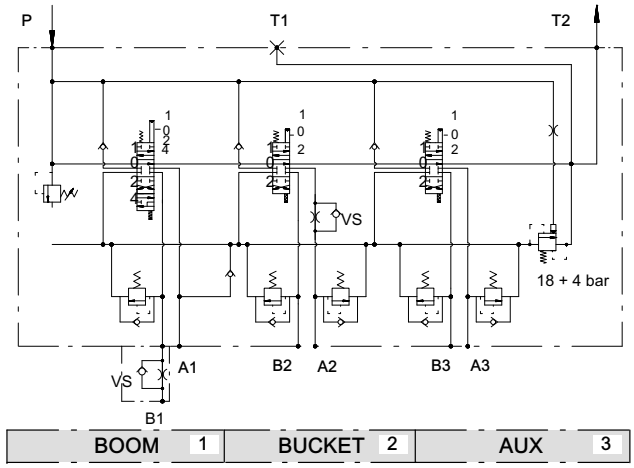
IMPORTANT!: Max operating pressure 250 bar
Dedicated HDM19WL main body required

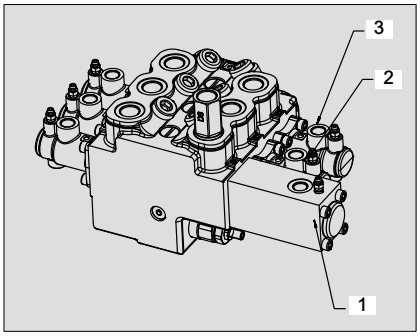
10 Hydraulic schematics examples

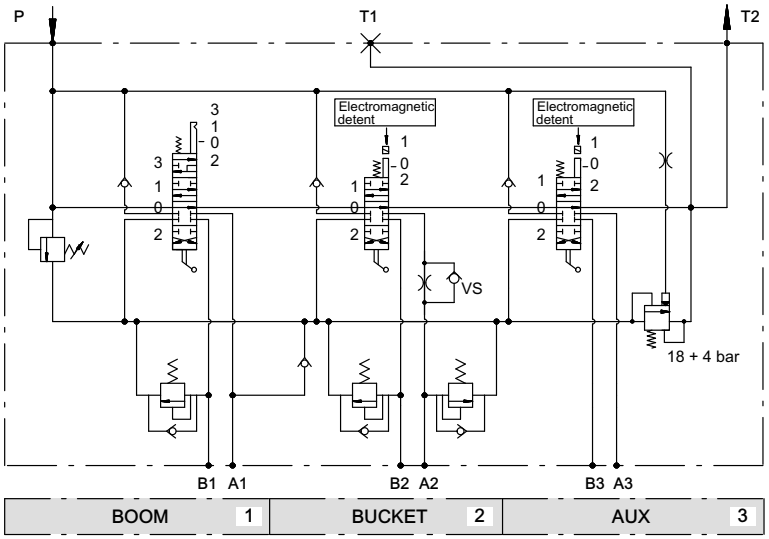
10.1 HDM19WL

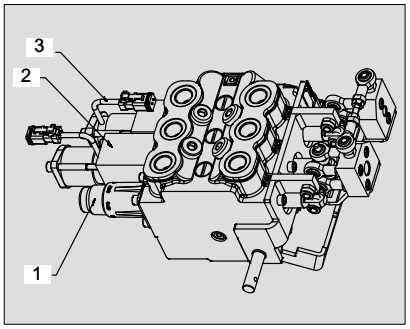


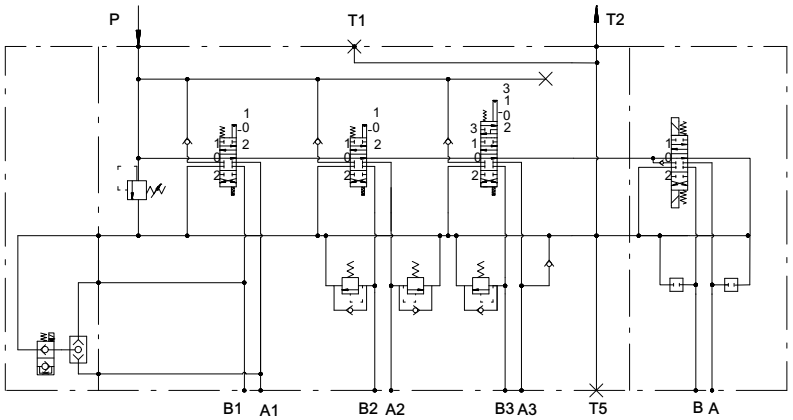


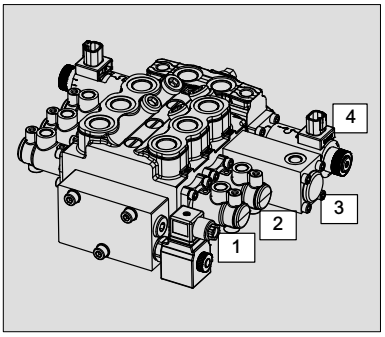




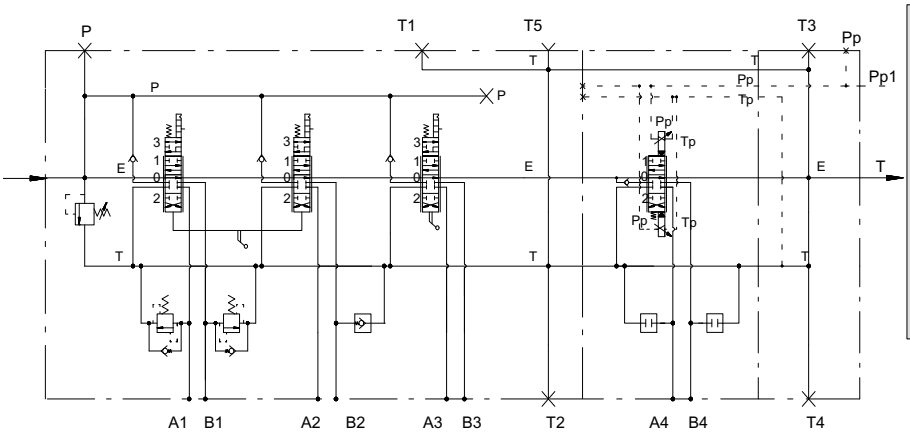


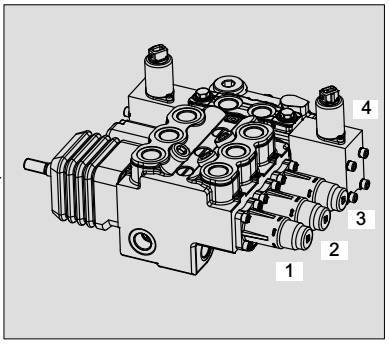






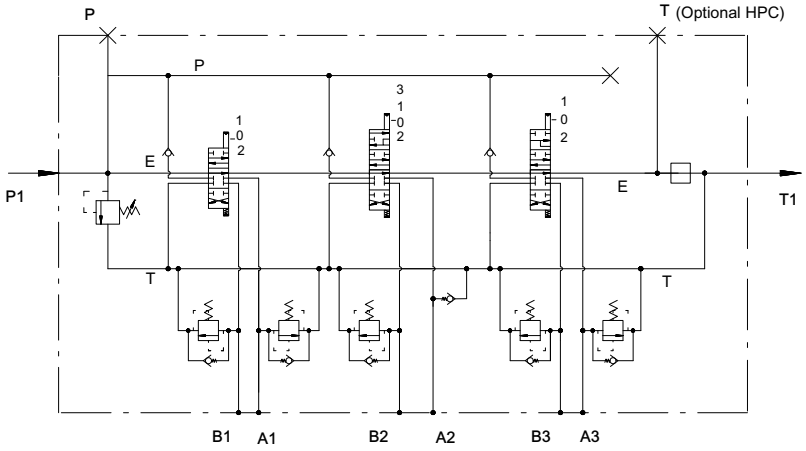
UNLOADING MANIFOLD	AUX 1	BUCKET 2	BOOM 3	TELESCOPIC 4	BACK COVER

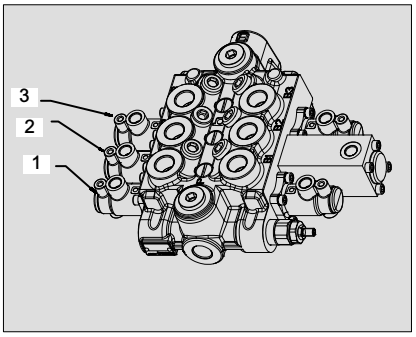




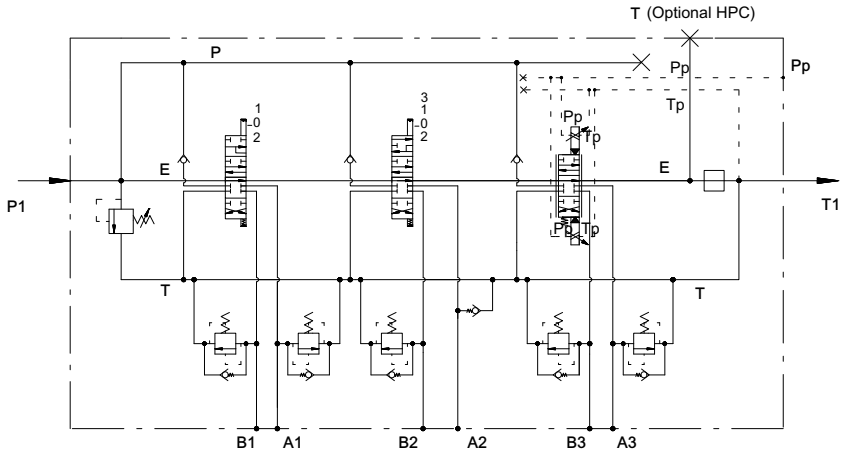
BUCKET 1	BOOM 2	AUX 3	TELESCOPIC 4	BACK-COVER

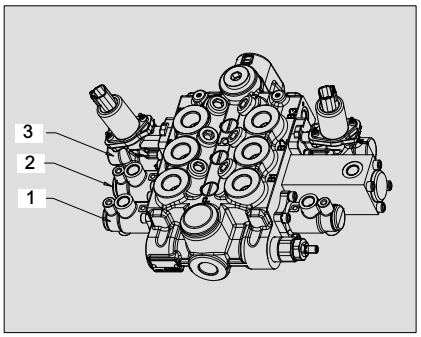
10.2 HDM19EH





AUX 1	BOOM 2	BUCKET 3
A5S -POS55 UC/A23-B23	W5P- POS52 C/A UC/B28	R5RB - POS55 UC/A13 -B28

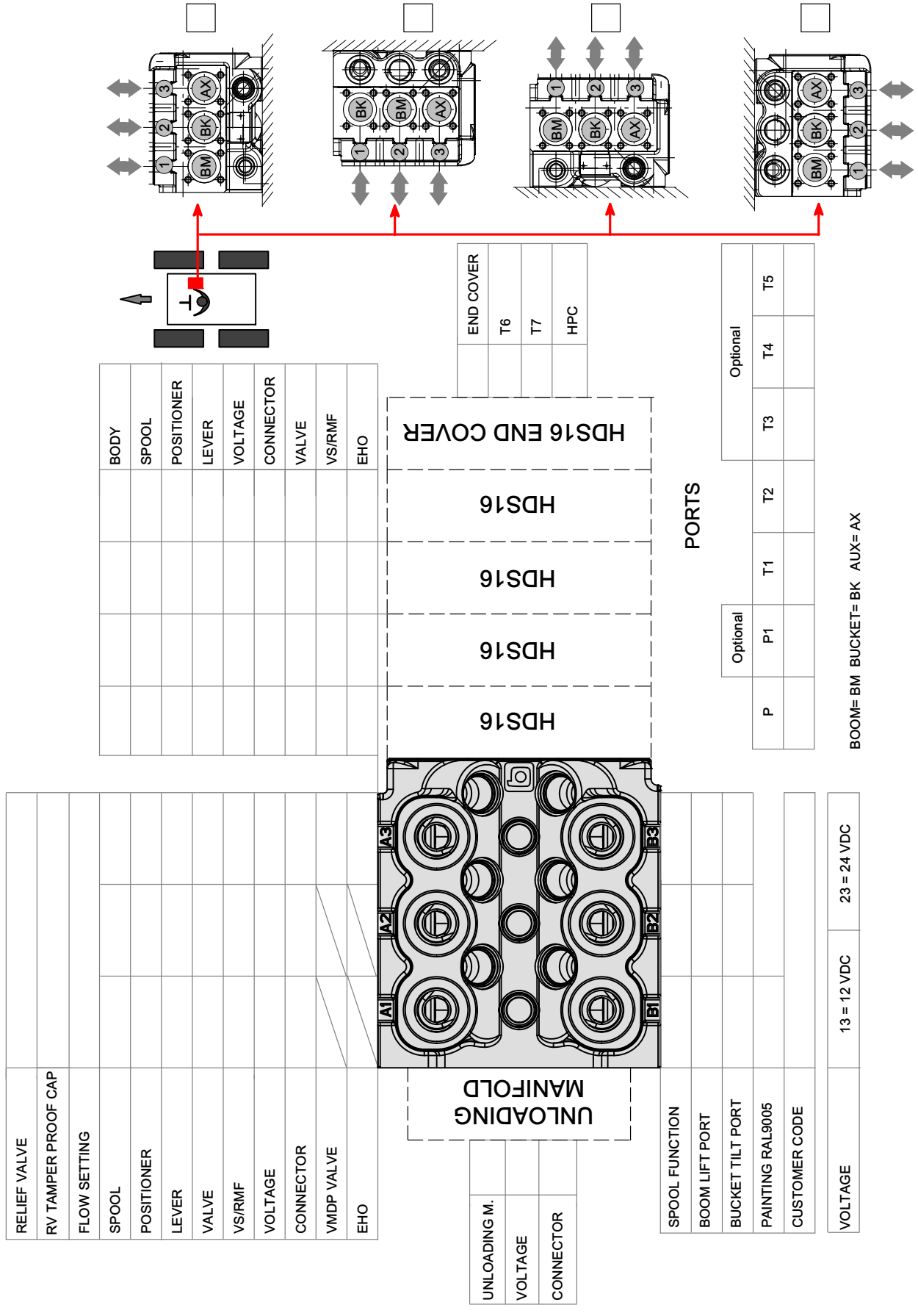




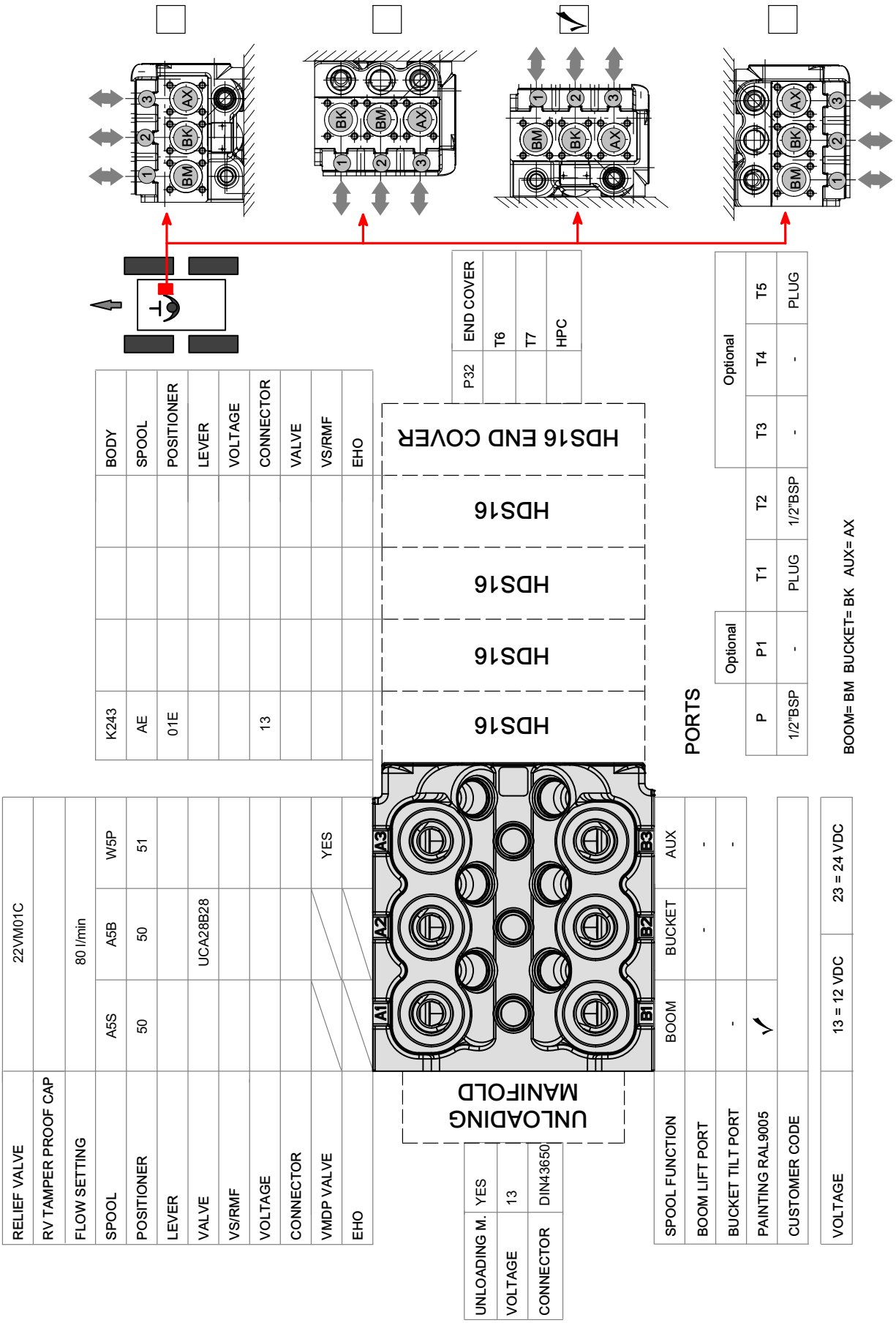
BUCKET 1	BOOM 2	AUX 3
R5RB - POS55 UC/A13-B28	W5P - POS52 C/A - UC/B28	A5S-POS400 UC/A23-B23

11 Composition of HDM19 ordering code

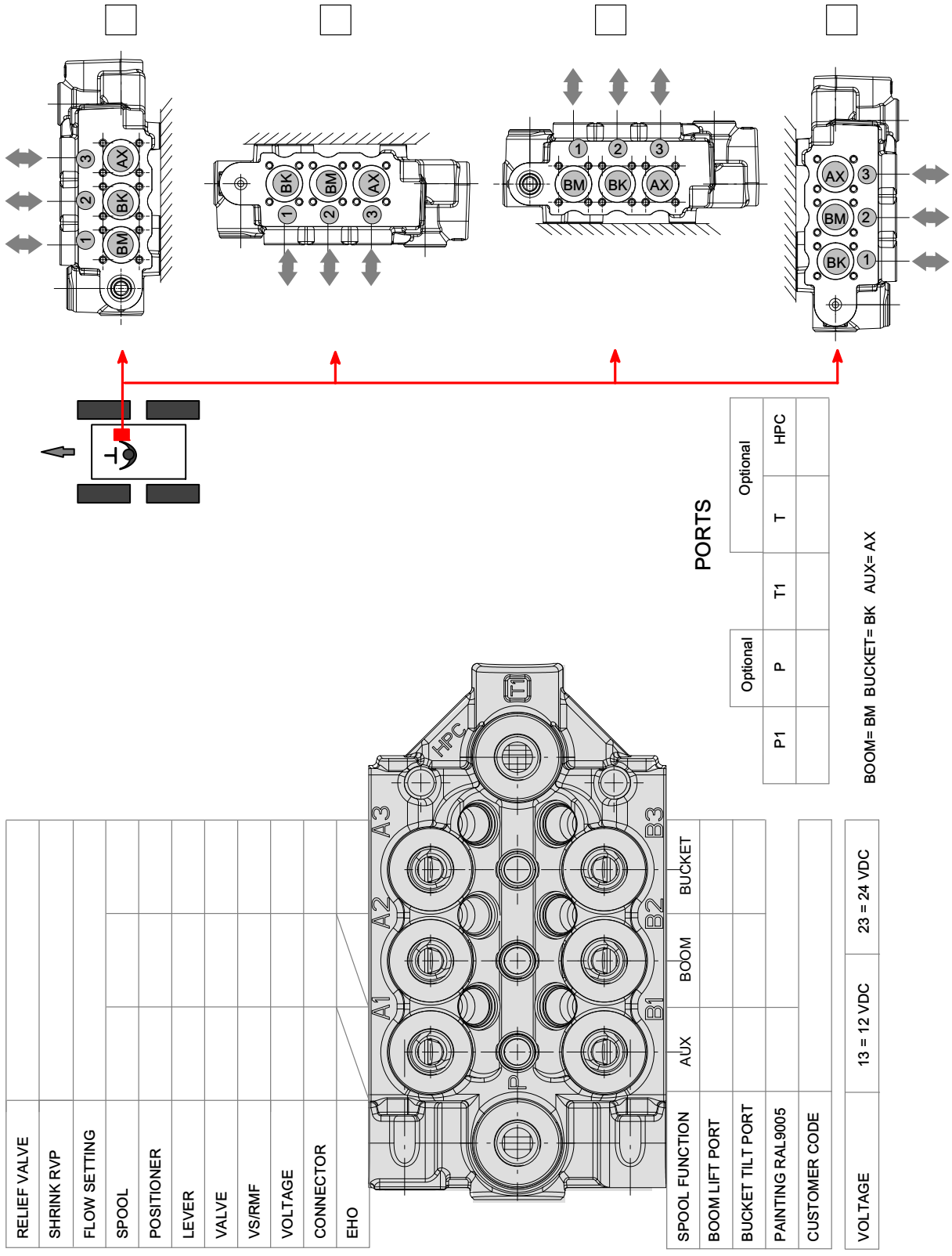
11.1 HDM19WL ordering code



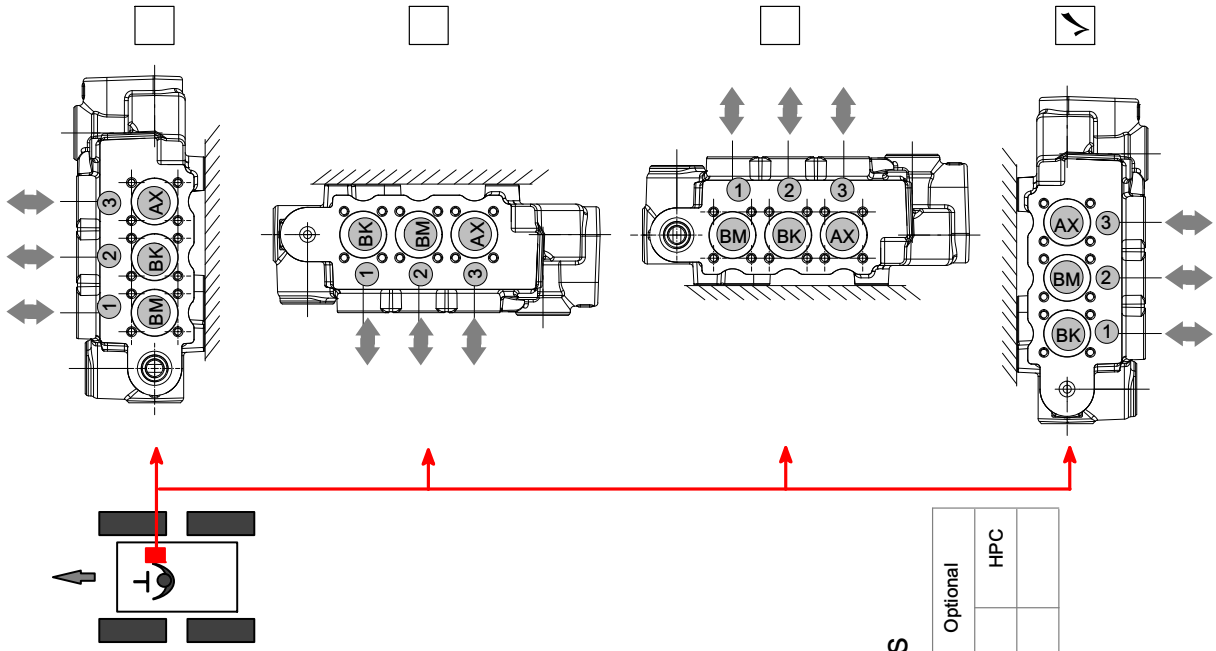
11.2 HDM19WL ordering code example



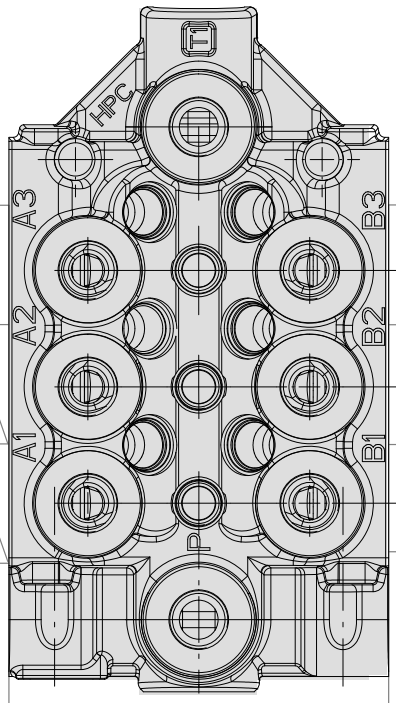
11.3 HDM19EH ordering code



11.4 HDM19EH ordering code example



RELIEF VALVE	22VM14										
SHRINK RVP											
FLOW SETTING	80 l/min										
SPOOL		A5S	W5P	R5RB							
POSITIONER		50	51	50							
LEVER											
VALVE		UC/A23-B23	C/A UC/B28	UC/A13-B28							
VS/RMF											
VOLTAGE											
CONNECTOR											
EHO											



SPOOL FUNCTION	AUX	BOOM	BUCKET
BOOM LIFT PORT		-	-
BUCKET TILT PORT	-		-
PAINTING RAL9005	✓		
CUSTOMER CODE			

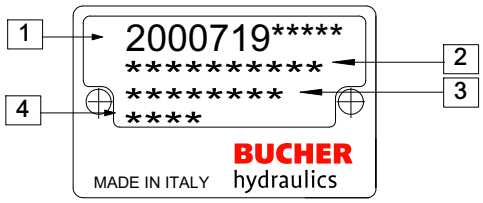
VOLTAGE	13 = 12 VDC	23 = 24 VDC

PORTS

P1	Optional	P	T1	Optional	T	HPC
		1/2"BSP	PLUG			

BOOM= BM BUCKET= BK AUX= AX

11.5 Product identification plate



1 : BHRE Product Order Code.

2 : Customer Code (on demand, only - if not requested manufacturing year and month are printed).

3 : WO : Production Work Order .

4 : WO progressive number.

Manufacturing month	Manufacturing year					
	2016	2017	2018	2019	2020	2021
January	6A	7A	8M	9M	0M	1M
February	6B	7B	8N	9N	0N	1N
March	6C	7C	8P	9P	0P	1P
April	6D	7D	8Q	9Q	0Q	1Q
May	6E	7E	8R	9R	0R	1R
June	6F	7F	8S	9S	0S	1S
July	6G	7G	8T	9T	0T	1T
August	6H	7H	8U	9U	0U	1U
September	6I	7I	8V	9V	0V	1V
October	6J	7J	8Z	9Z	0Z	1Z
November	6K	7K	8X	9X	0X	1X
December	6L	7L	8Y	9Y	0Y	1Y

BUCHER
hydraulics

info.it@bucherhydraulics.com www.bucherhydraulics.com

Classification: 430.300.000