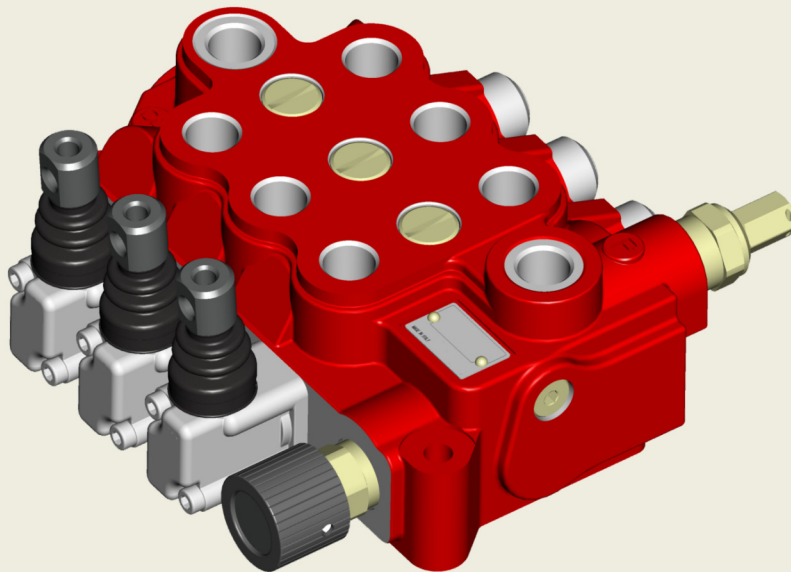


Monoblock Directional Control Valve HDM11S/3PQ

Adjustable priority flow to the first section (for agricultural applications)



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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 cabling 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 hoses.

1.2 Fittings

In the interest of safety, only fittings with STRAIGHT THREAD ENDS should be used (e.g. DIN3852).

Fittings with TAPERED THREAD ENDS (e.g. DIN 3852 form C) should never be used, as they can cause deformation and cracks in the valve body.

Recommended tightening torque for work port fittings - Nm (lbf)	
Metric - ISO 261	M18X1.5
With O-Ring seal (ISO 6149-1)	40/29.5
With copper washer (ISO 9974-1)	40/29.5
With rubber washer or steel (ISO 9974-1)	35/25.8
BSP - ISO 228-1	3/8" BSP
With copper washer (ISO 1179-1)	40/29.5
With rubber washer or steel (ISO 1179-1)	35/25.8
UN-UNF - ISO 263	SAE8 - 3/4-16 UNF
With O-Ring seal (ISO 11926-1)	40/29.5



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.

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.

- 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.

Our warranty conditions will be not 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.):



Distributors information:

HDM11S/3 PQ shares the following components with HDS/HDM11S:

- Spools
- Positioners
- Adjustable service port valves (Anti-shock and anti-cavitation)
- Single-double effect valve
- Mechanical check valve (with HDM11S only)

The fineness of the filter should be selected in order to guarantee that a contamination level of 21/19/16 ISO 4406:1999 (NAS 1638 class 10) is not exceeded.

When the high reliability of the system is an important requirement a 10 µm nominal pressure filter must be used. In these cases it is also advisable to use a pressure filter with by-pass and indicator.

For mechanical operated directional valves a <30 µm nominal return filter is adequate.

The size of the return filters must suit the maximum return flow whereas the size of the pressure filters must suit the maximum pump flow.

It is advisable to fit filters with pressure gauge or dirt indicator in order to make it possible to verify the filter condition.

In order to obtain the best performance of the system we recommend to strictly follow the conditions advised here above, failing which warranty shall be void.

1.5 Directives and standards

- Atex:



Attention: The equipment and protective systems of these catalogue ARE NOT intended for use in potentially explosive atmospheres that is to say where there is an explosive atmosphere referred to in Article 2 of the Directive 99/92/EC and referred to Article 1.3 of the Directive 94/9/EC

- Machinery safety

Hydraulic directional control valves are excluded by Directive 2006/42/EC

- ISO 9001: 2000

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.

- ISO 14000

BHRE is certified in Environmental Management System.

1.6 Technical specification:



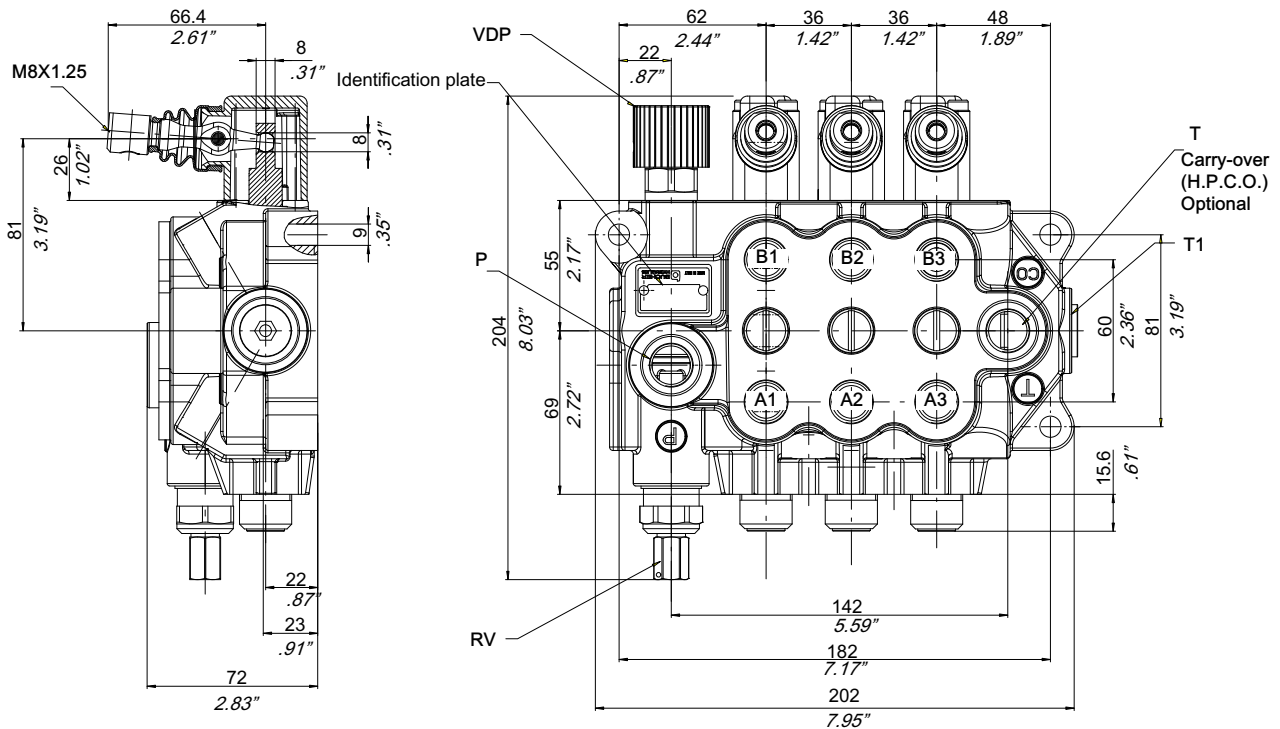
IMPORTANT!: Specification and diagrams shown in this catalogue are measured with mineral oil having a viscosity of 23 mm²/s at 50° C

Features	
Max inlet flow	50 l/min (14 US gpm)
Max regulated flow	45 l/min (12 US gpm)
Max continuous operating pressure supply port P Parallel circuit	300 bar (4300 PSI)
Max intermittent peak pressure work port A/B Parallel circuit	350 bar (5000 PSI)
Max back pressure tank port T	30 bar (430 PSI)
Fluid temperature (with NBR seals)	-20°C / +80 °C (70°F / 180°F)
Oil viscosity	from 15 to 75 mm ² /s
Port threads size	3/8" BSP - M18x1.5 - SAE8
Max Spool leakage at 100 bar (1450 PSI) temp 50°C (120°F) viscosity 23 mm ² /s*	12 cm ³ /min (0.7321 Cu.In./min)
	14 cm ³ /min (0.854 Cu.In./min) (with UC Valves)
Max Spool leakage at 125 bar (1800 PSI) temp 50°C (120°F) viscosity 23 mm ² /s*	max 3 cm ³ /min (0.183 Cu.In./min) (with RSM3 Valves)
Number of spools	3
Adjustable direct operated relief valve (tamper-proof seal available on request)	RV
Load hold check valve in each section	LC
Antishock, anti-cavitation and combined valves	OA-UC-C
Mechanical operated check valve	RSM3

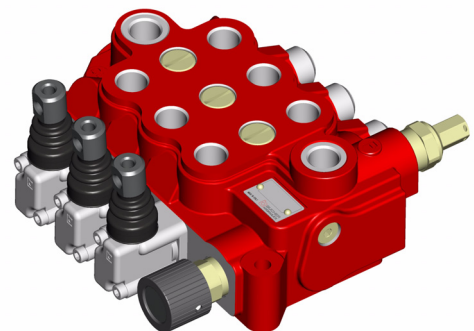
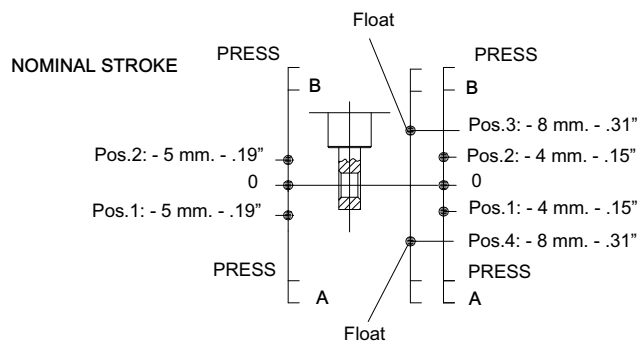
For different operating conditions, please contact our Sales Dept.

(*) lower values on demand (to be agreed with our Sales Dept.)

2 Dimensional data



Approximate weight: 8.2 Kg



RV = Relief valve

P = Inlet port

T / H.P.C.O. = Outlet port / Carry-over port (optional)

A/B= work ports

T1 = outlet side port

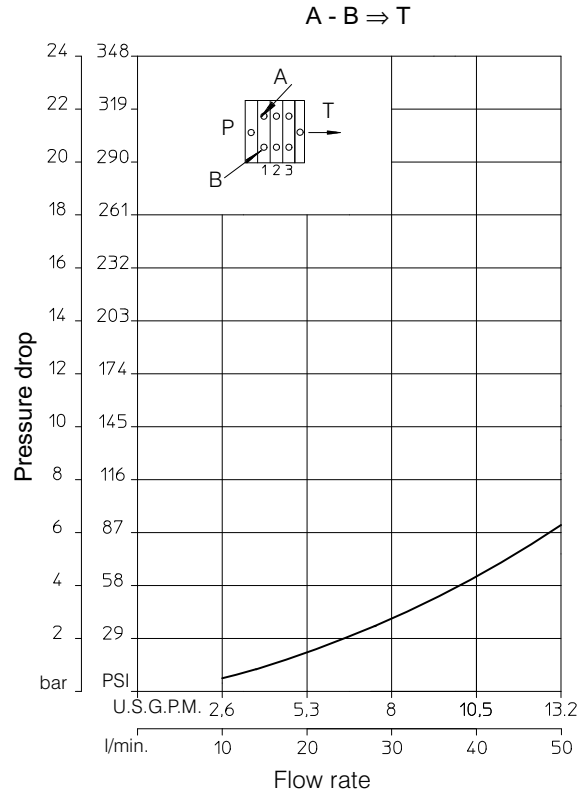
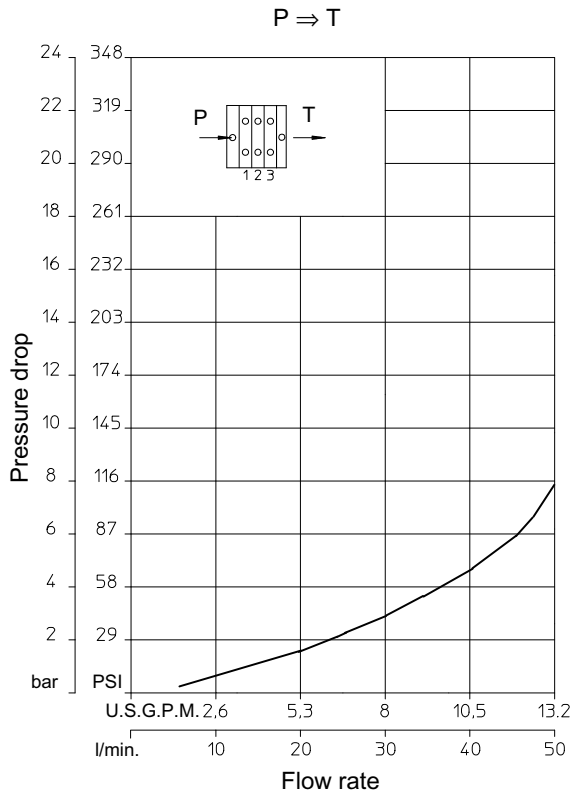
VDP = adjustable flow control valve

2.1 Ports Size

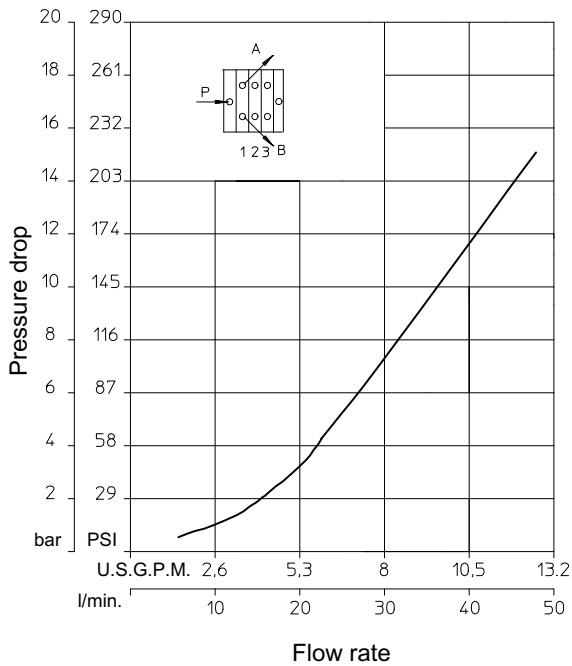
Threads	P	T	T1	A/B	H.P.C.O. (Optional)
BSP	3/8"	3/8"	3/8"	3/8"	3/8"
Metric	M18x1.5	M18x1.5	M18x1.5	M18x1.5	M18x1.5
UNF	SAE8	SAE8	SAE8	SAE8	SAE8

3 Performance curves

Oil: Shell Tellus T32
 Temperature: 50° C (120° F)
 Viscosity: 23 mm²/s

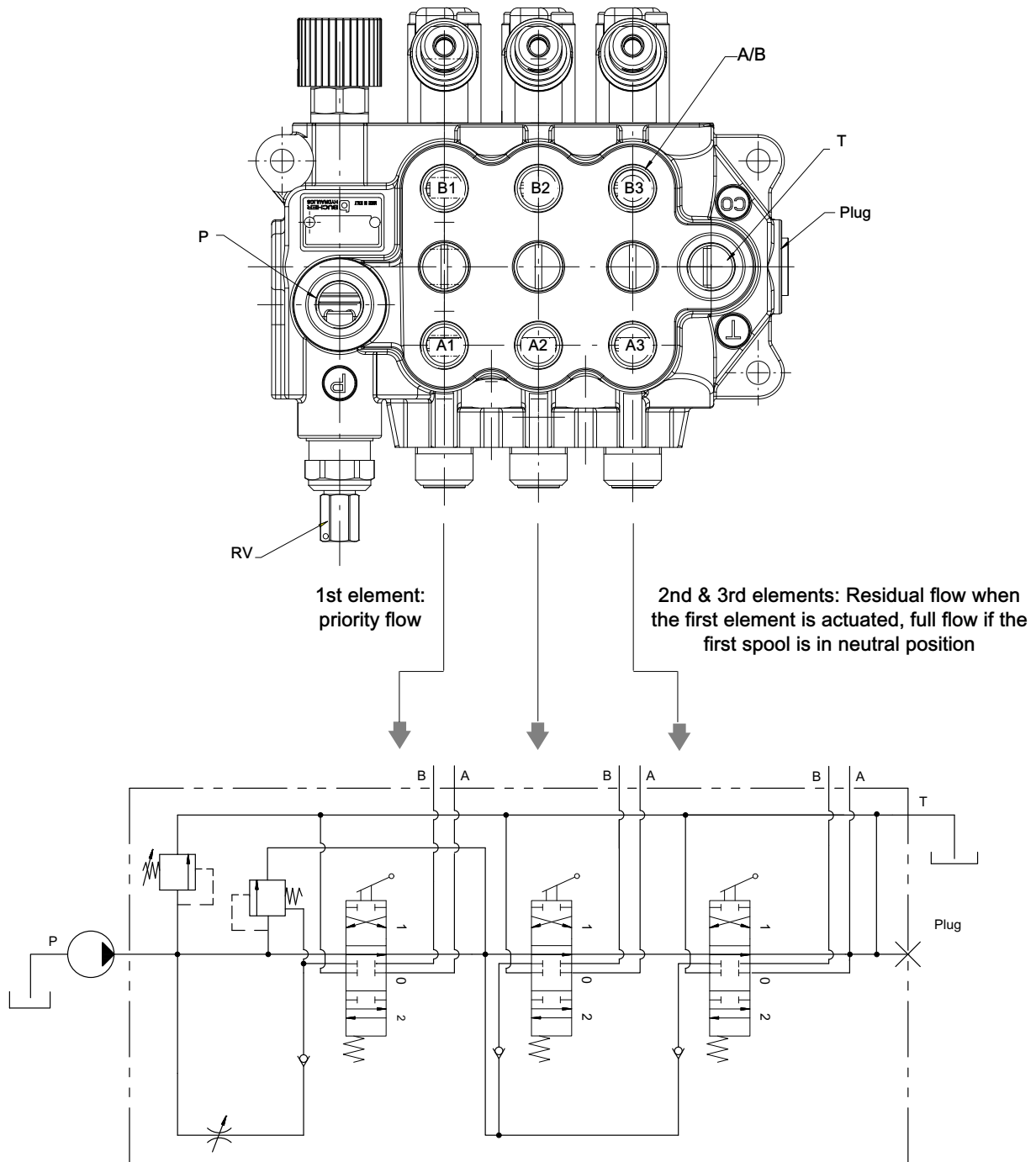


P ⇒ A - B (Flow regulator - completely opened to priority line)

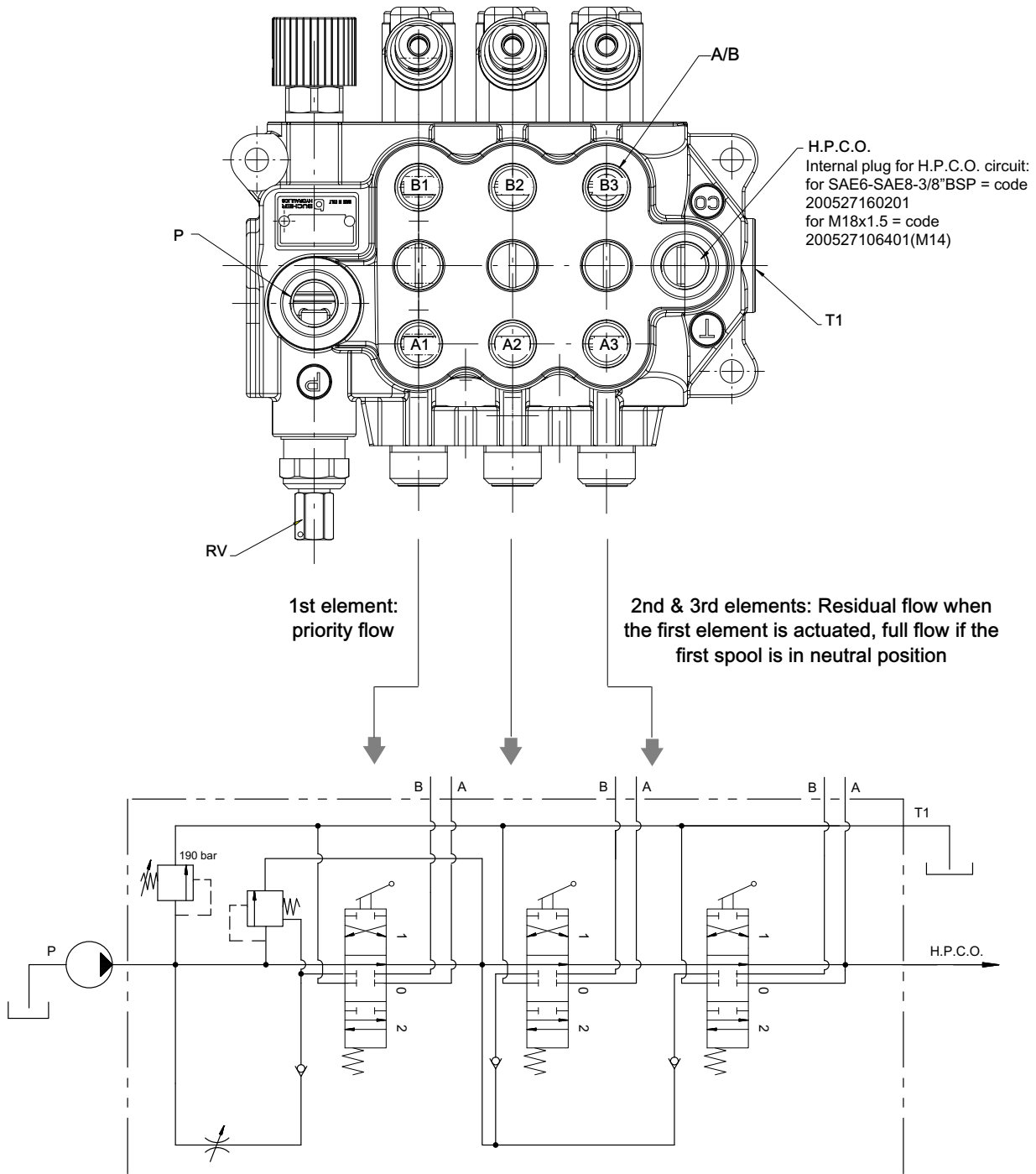


4 Monobloc bodies

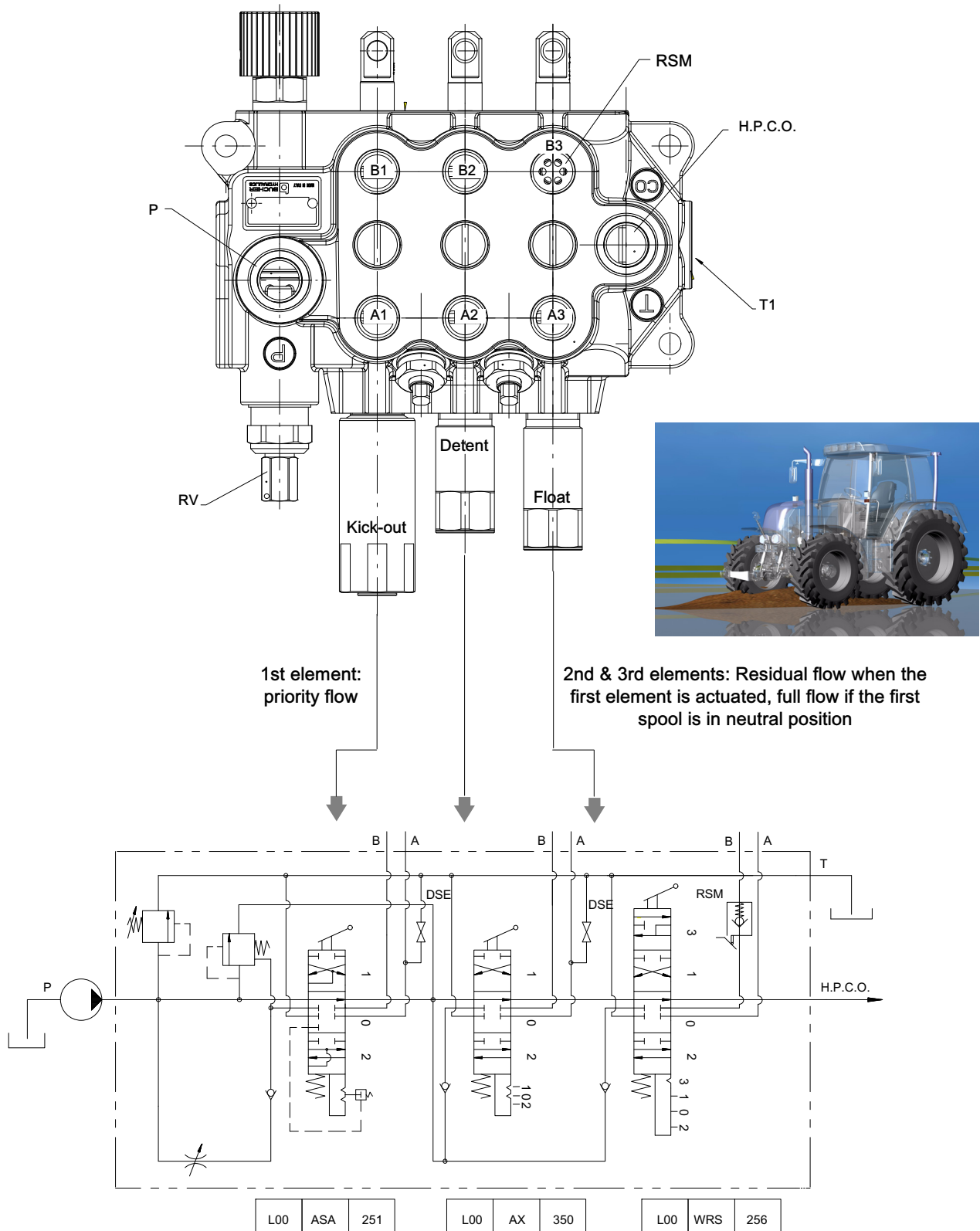
4.1 Standard circuit



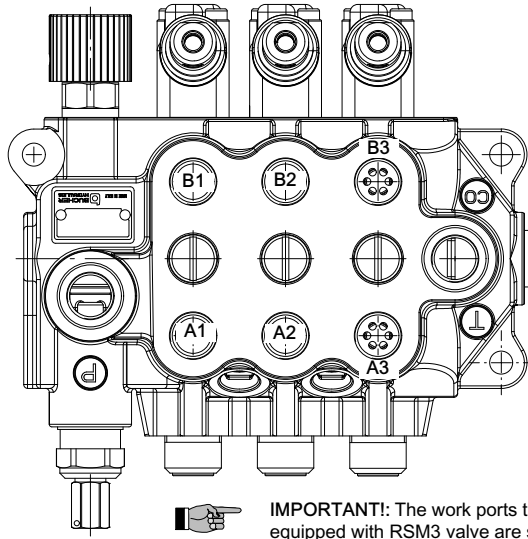
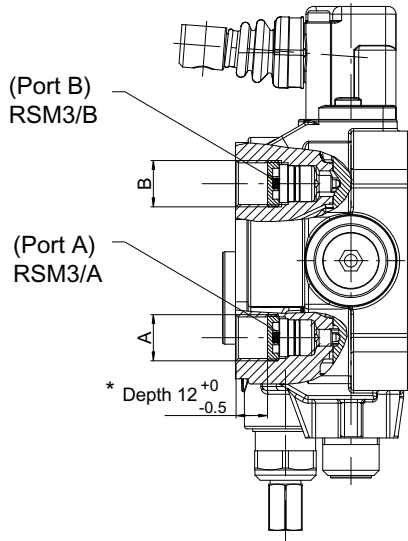
4.2 Standard circuit with HPCO



4.3 Special circuit with low leakage mechanical operated check valve



4.4 Mechanical operated check valve arrangement

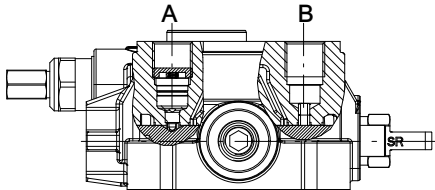
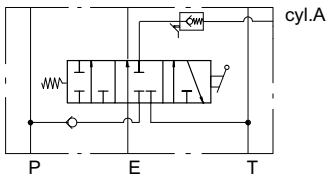


IMPORTANT! The work ports that have to be equipped with RSM3 valve are specifically machined on demand. Dedicated body and spools are requested.

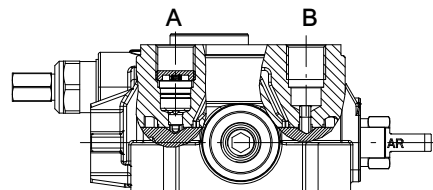
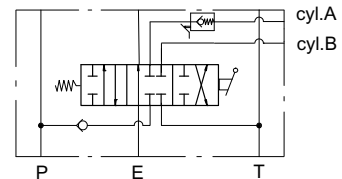
Port A (RSM3/A)

Spool SR

N.B.: port B plugged with SR spool



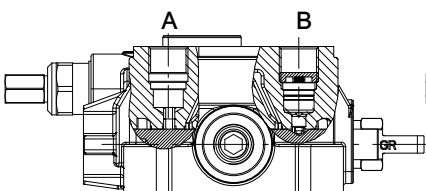
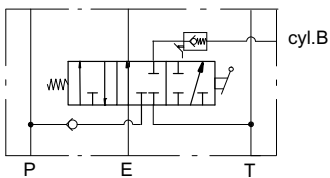
Spool AR



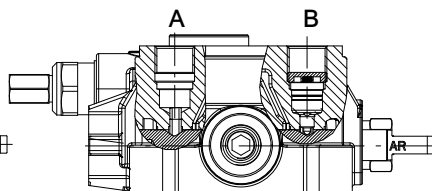
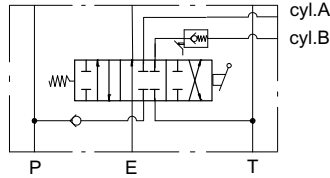
Port B (RSM3/B)

Spool GR

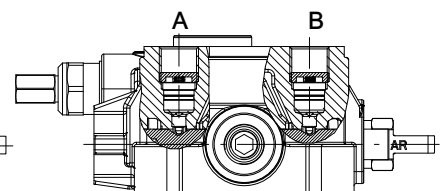
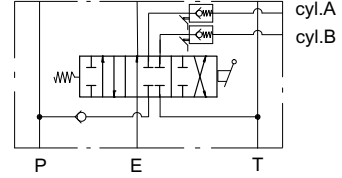
N.B.: port A plugged with GR spool



Spool AR



Spool AR



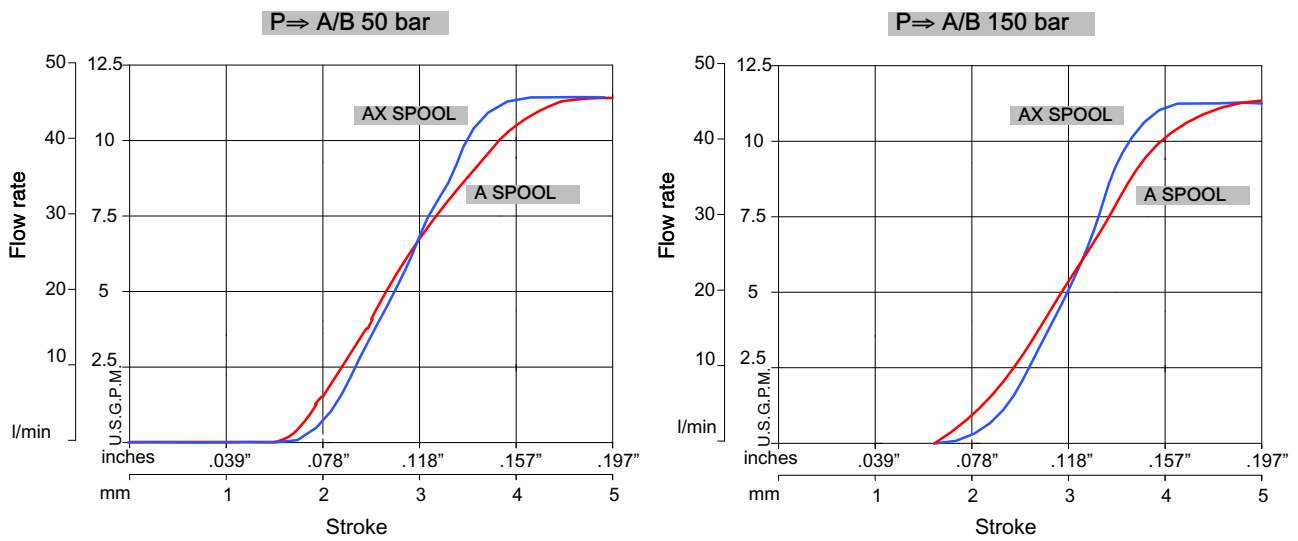
ATTENTION!* For RSM3 valve see 6.8 section, pay attention to the fitting depth, it must not exceed the available space (see 6.8 section)

5 Spools

Spool Type	Hydraulic schematic	Features	Body / lever / positioner notes
A		4 way - 3 position A/B closed E open by-pass	Standard
AR		4 way - 3 position A/B closed E open by-pass RSM3 arrangement	Special body required (please contact our Sales Dept.)
AX		4 way - 3 position A/B closed E open by-pass	Standard
ASA		4 way - 3 position A/B closed E open by-pass For Kick-out function	Standard
B		4 way - 3 position A/B - E closed	Standard
C		4 way - 3 position A/B to tank in neutral E open by-pass	Standard
D		4 way - 3 position A closed B to tank in neutral E open by pass	Standard
G		3 way - 3 position B closed E open by-pass	Standard
GR		3 way - 3 position B closed E open by-pass RSM3 arrangement	Special body required (please contact our Sales Dept.)
L		4 way - 3 position B closed A to tank in neutral E open by-pass	Standard
R		4 way - 3 position with regenerative spool in 2nd position A/B closed E open by-pass	Special body required (please contact our Sales Dept.)
S		3 way - 3 position A closed E open by-pass	Standard
SR		3 way - 3 position A closed E open by-pass RSM3 arrangement	Special body required (please contact our Sales Dept.)
X		4 way - 3 position series connection A/B closed E open by-pass	Standard

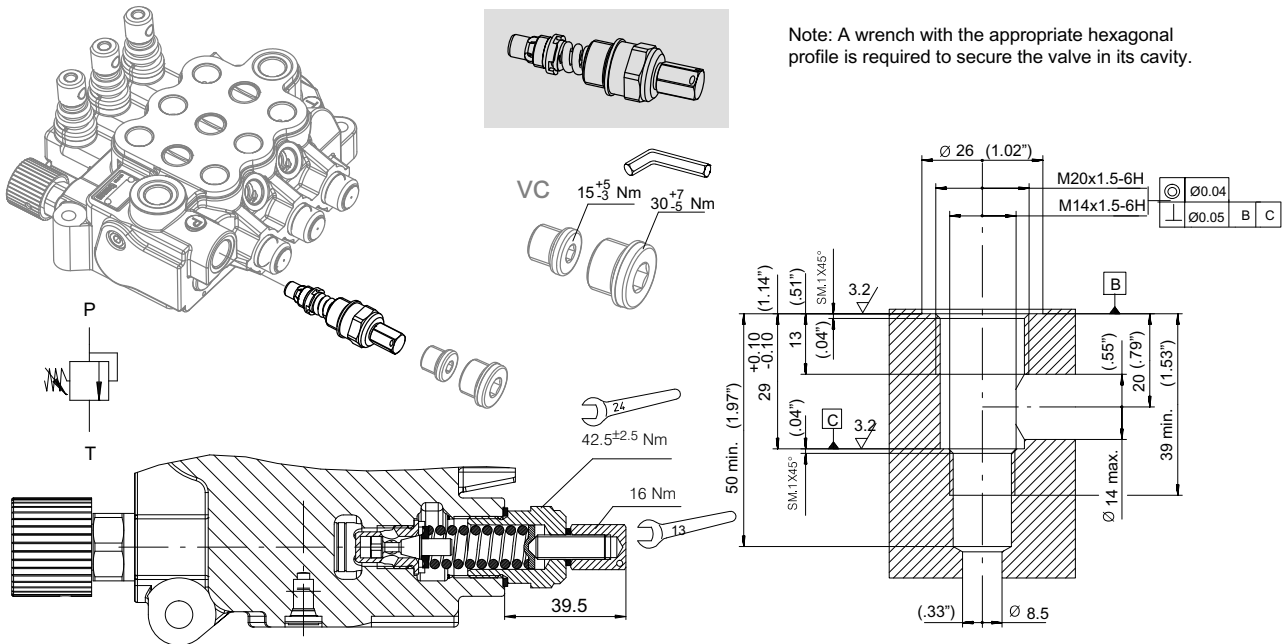
Spool Type	Hydraulic schematic	Features	Body / lever / positioner notes
XC		4 way - 3 position A/B to tank in neutral series connection E open by-pass	Standard
Z		4 way - 4 position 4th floating position E open by-pass	Special lever required (L175)
WRS		4 way - 4 position 4th floating position A/B closed E open by-pass RSM3 on B port	Special body required (K...), positioner (240) and lever (L192)
WW		4 way - 4 position 4th floating position A/B closed E open by-pass	Special body required (K...), positioner (240) and lever (L192)

5.1 Spools metering examples



6 Valves

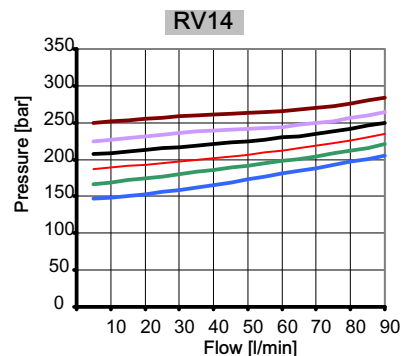
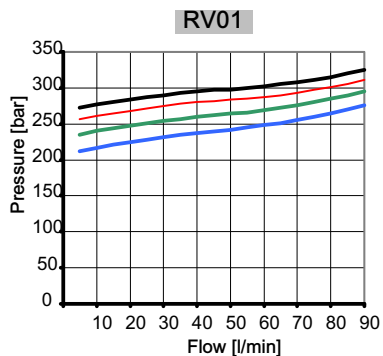
6.1 Direct acting relief valve



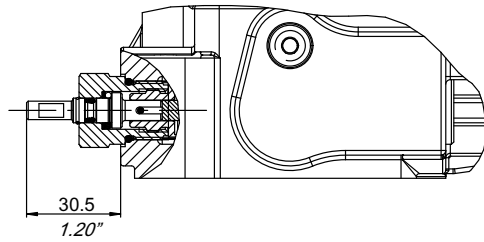
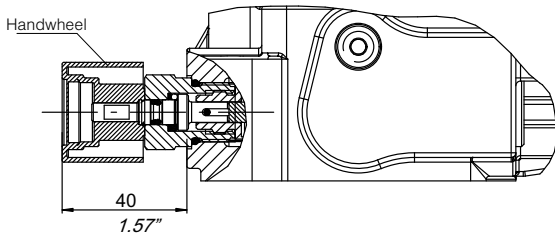
Pressure set range bar (PSI)	RV Type	Code	Spring code	Std. setting bar (PSI)	Setting code	Spring colour
30-95 (400-1300)	06 VM01 RV01-06	200787400720	200662401450	60 (860)	06	Yellow (YE)
96-210 (1300-300)	15 VM01 RV01-15	200787400740	200662401480	150 (2100)	15	Green (GR)
150-250 (2170-3620)	20 VM14 RV14	200787402970	200662402400	200 (2900)	20	-
211-300 (3000-4200)	26 VM01 RV01-26	200787400710	200662401460	260 (3700)	26	Blue (BL)
VC (Plugged valve)		200778400140	-	-	-	-



IMPORTANT!: Example: RV1 - 06* = 60 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.

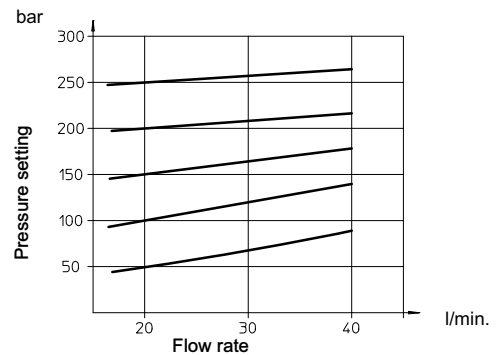
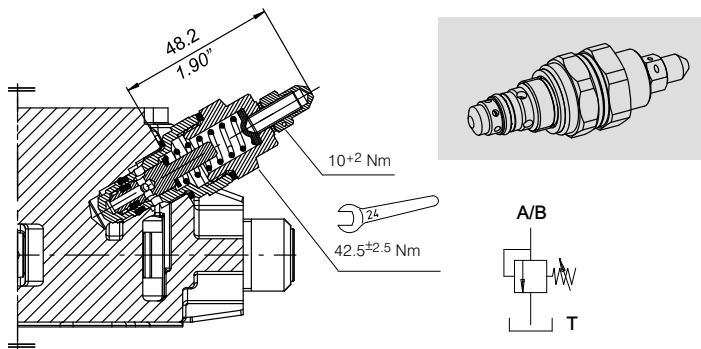


6.2 Priority flow divider pressure compensated valve



Valve code: 200787201540 (code without handwheel, handwheel code: 200661890040)

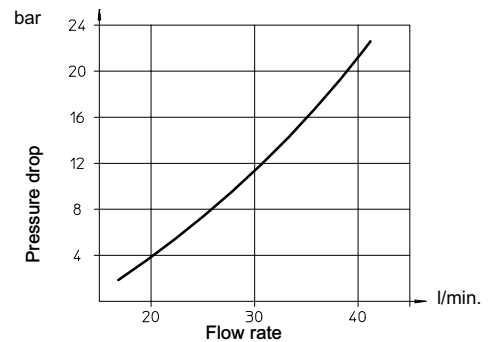
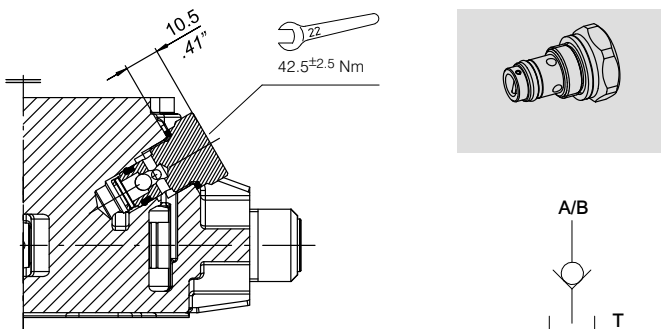
6.3 Port relief valve OA (antishock)



Pressure set range bar (PSI)	Type	Code	Spring code
0-30 (0-400)	OA/A02 OA/B02	200787400920	200662401130
31-130 (400-1900)	OA/A06 OA/B06	200787400940	200662400700
131-300 (1900-4300)	OA/A15* OA/B15	200787400930	200662400770
VC (Plugged valve)		200778400040	-

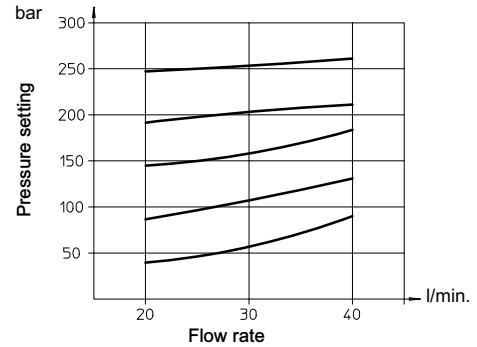
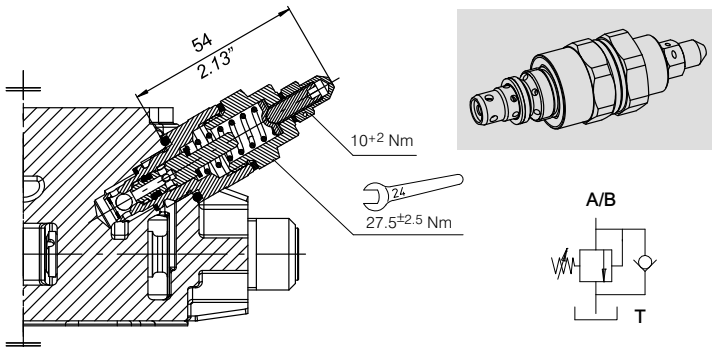
Setting is made, at required pressure, with flow Q = 16 l/min

6.4 Anti-cavitation valve C



Type	Code
C/A or C/B	200787600930
VC (Plugged valve)	200778400040

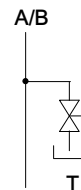
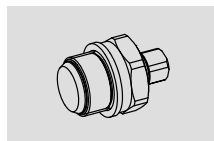
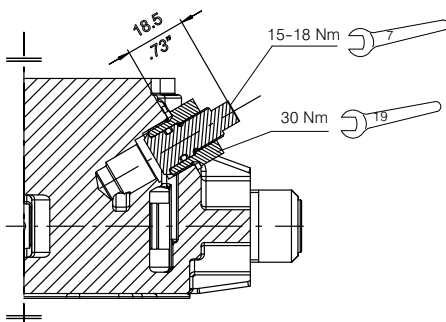
6.5 Combined port relief and anticavitation valve UC (antishock/anti-cavitation)



Pressure set range bar (PSI)	Type	Code	Spring Code
0-30 (0-400)	UC/A02 UC/B02	200787401260	200662401130
31-130 (400-1900)	UC/A06 UC/B06	200787401290	200662400700
131-300 (1900-4300)	UC/A15* UC/B15	200787401270	200662400770
VC (Plugged valve)		200778400040	-

Setting is made, at required pressure, with flow Q = 16 l/min

6.6 Valve D.S.E.



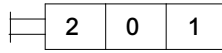
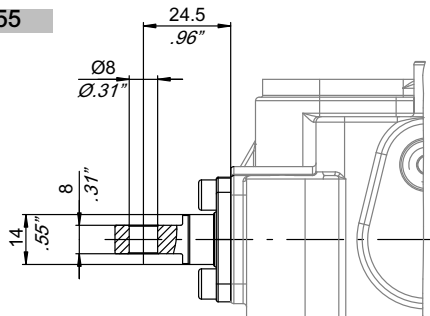
To easily switch from a double to a single acting application

Type	Code
D.S.E.	200787602280

7 Levers

7.1 Free end spool with dust proof seal

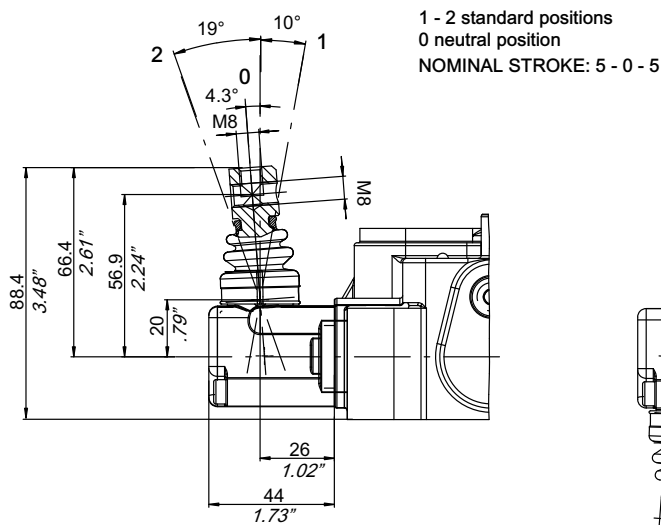
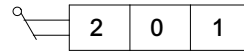
L55



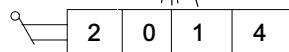
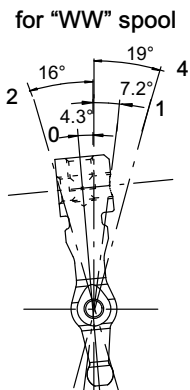
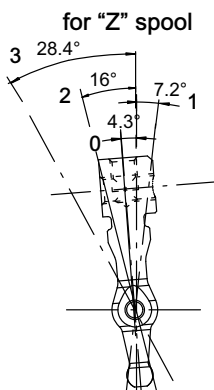
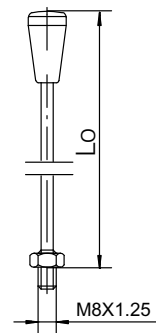
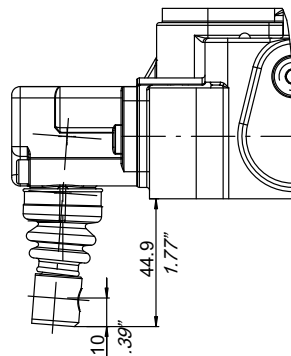
Code: 200707190010

7.2 Standard lever group

L100: code 200707120330 (Standard)
L175: code 200707110280 (for "Z" only)
L192: code 200707010231 (for "WW" only)



L300
L375
L392

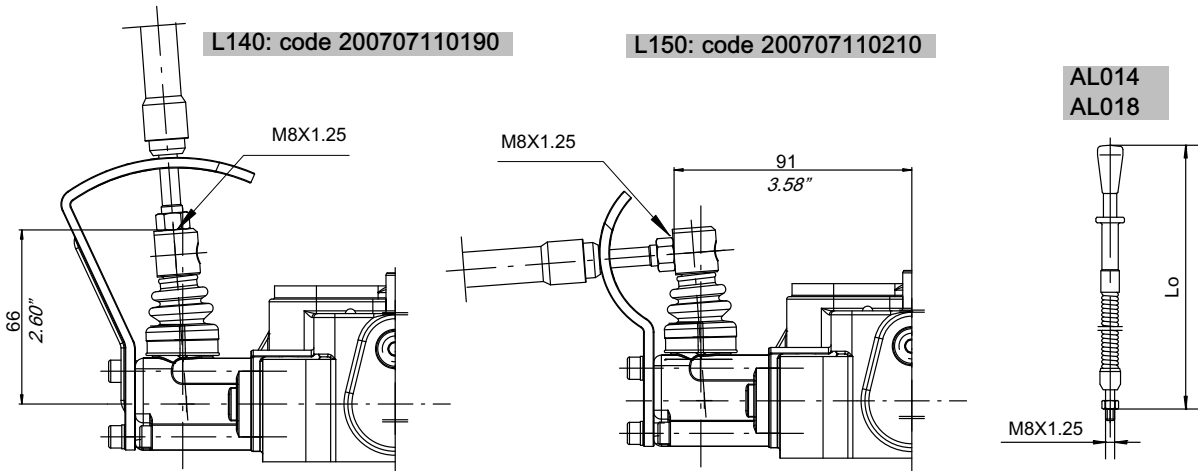


NOMINAL
STROKE: 4+4 - 4 - 0 - 4

NOMINAL
STROKE: 4 - 0 - 4 - 4+4

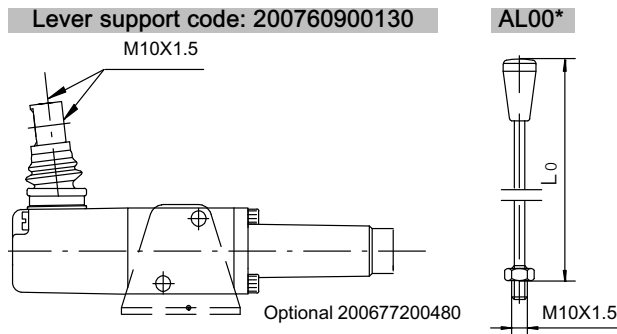
Lo		Type	Code
mm	inches		
150	5.90	AL001	200702210190
200	7.87	AL002	200702210030
250	9.84	AL003	200702210050
300	11.81	AL004	200702210060

7.3 Safety levers



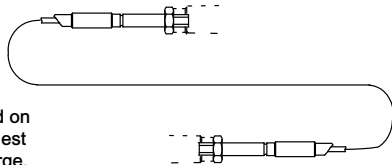
Lo		Type	Code
mm	inches		
160	6.30	AL014	200702210090
180	7.08	AL018	200702210110

7.4 Remote cable control



Lo		Type	Code
mm	inches		
185	7.28	AL001	200702220010
250	9.84	AL002	200702220030
300	11.81	AL003	200702220040
350	13.78	AL004	200702220050

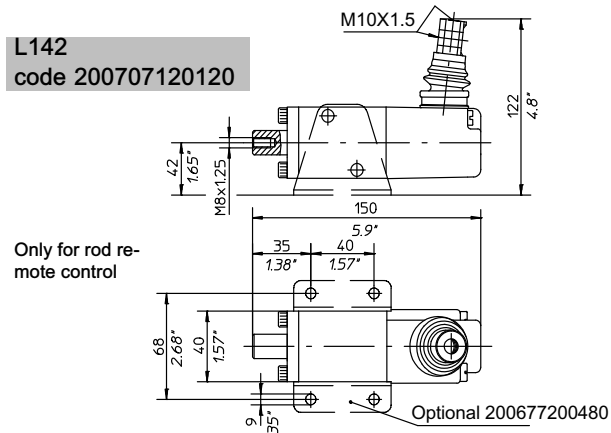
Cable



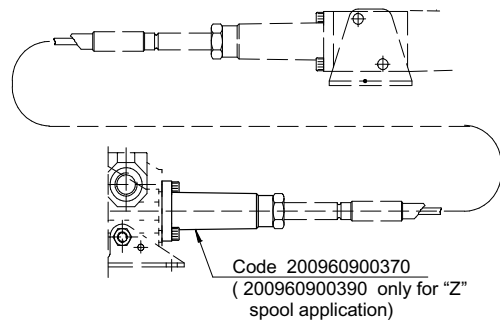
Cables are assembled on the valve only on request and with an extra charge.

Cable length	Code	Cable length	Code
1000 mm	200544104002	2500 mm	200544104007
1500 mm	200544104005	3000 mm	200544104008
2000 mm	200544104006	4000 mm	200544104009

L142 code 200707120120



Spool kit

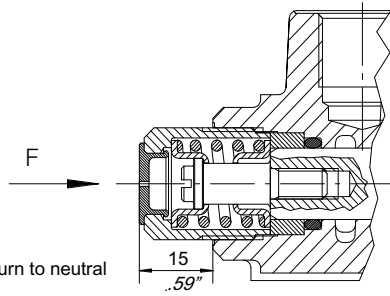


Code 200960900370
(200960900390 only for "Z" spool application)



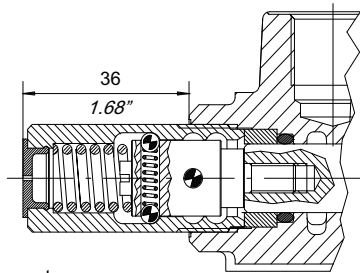
IMPORTANT!: For other levers versions, please consult the HDM11S general catalogue

8 Positioners



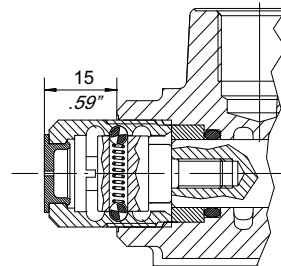
3 positions spring return to neutral

Type	F (N)**	Code*	Spring code	Scheme
01	200	200768510010	200662400501	
79	140	200768510920	200662400470	



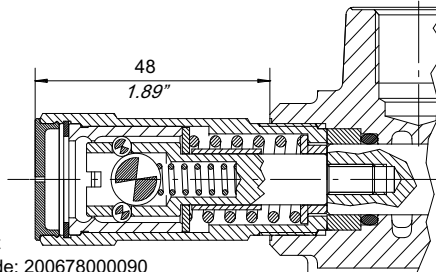
2 positions detent - spring center

Type	Code*	Main spring code	Scheme
02	200768530010	200662400430	



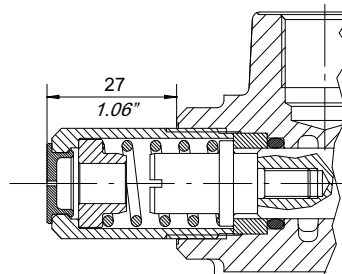
3 positions detent

Type	Code*	Spring code	Scheme
03	200768520010	200662400410	



4 positions float
Plastic plug code: 200678000090

Type	Code	Main spring code	Scheme
04	200768540030	200662400440	



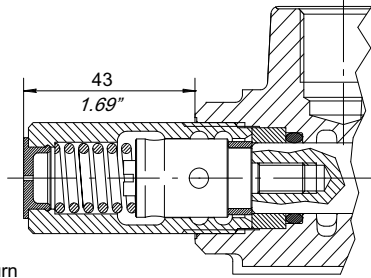
2 positions spring return

Type	Code*	Spring code	Scheme
12	200768510210	200662400440	

Note:

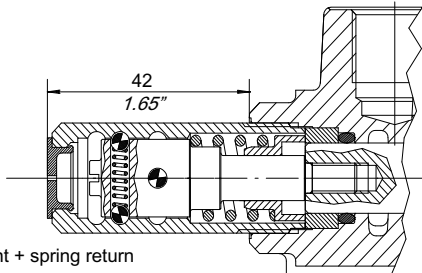
* = The positioners are supplied without the plastic plug code 200678000080

**= force in Newton needed to operate the spool



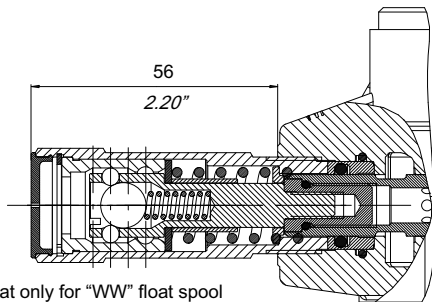
2 positions spring return

Type	Code*	Spring code	Scheme
16	200768511100	200662400450	



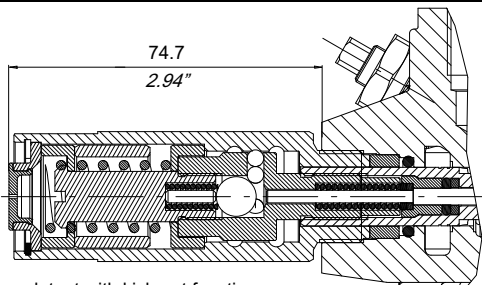
2 positions detent + spring return

Type	Code*	Main spring code	Scheme
20	200768530100	200662400550	



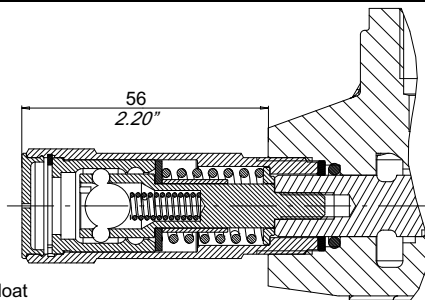
4 positions float only for "WW" float spool
Plastic plug code: 200678000090

Type	Code	Main spring code	Scheme
240	200768540310	200662400440	



2 positions detent with kick-out function

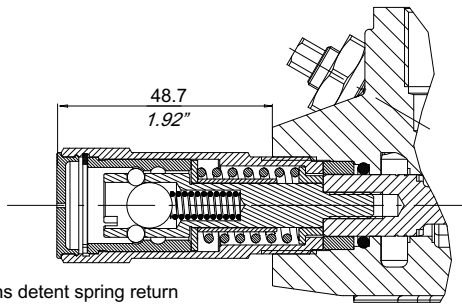
Type	Code	Main spring code	Scheme
251	200768620410	200662402080	



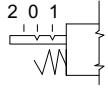
4 positions float
Plastic plug code: 200678000090

Type	Code	Main spring code	Scheme
256	200768540660	200662400460	

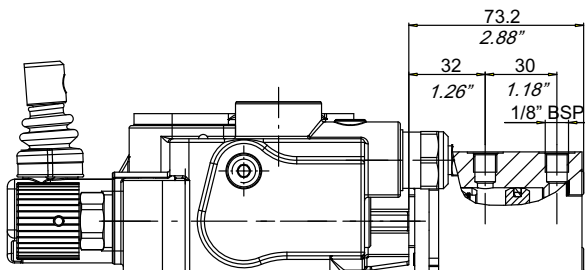
Note: *The positioners are supplied without the plastic plug code 200678000080

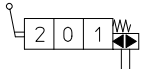


2 positions detent spring return
Plastic plug code: 200678000090

Type	Code	Main spring code	Scheme
350	200768630450	200662400460	


8.1 Hydraulic/pneumatic control ON-OFF



Type	Code	Scheme
HP24	200768650490	

Operating conditions

Hydraulic control		Pneumatic control	
Pressure range min	6 bar / 85 PSI	Pressure range min	6 bar / 85 PSI
Pressure range max	15 bar / 215 PSI	Pressure range max	10 bar / 145 PSI

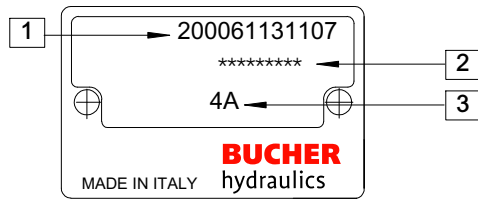
 **IMPORTANT!:** For different positioner configurations see HDM11S / HDS11 catalogue

9 Composition of ordering code

Body features			1st Spool features				2nd Spool features				3rd Spool features			
HDM11S / 3														
HDM11S / 3	K77	19VM01	ASA	251	L00	DSE/A	AX	350	L00	DSE/A	WRS	256	L00	RSM3/B *
Body version														
Number of spools: 3														
Type of thread (please consult our Sales Dept.)														
Relief valve setting														
1st SPOOL														
Type of Spool														
Type of Positioner														
Lever style														
Service port valves: OA-C-UC-DSE-RSM														
Setting of secondary valves: A or B														
2nd SPOOL														
Type of Spool														
Type of Positioner														
Lever style														
Service port valves: OA-C-UC-DSE-RSM														
Setting of secondary valves: A or B														
3rd SPOOL														
Type of Spool														
Type of Positioner														
Lever style														
Service port valves: OA-C-UC-DSE-RSM														
Setting of secondary valves: A or B														

* Example for chapter 4.3 configuration

9.1 Product identification plate



- 1 : Order Code
- 2 : Customer Code (only on request)
- 3 : Manufacturing Year and Month

Manufacturing month	Manufacturing year					
	2014	2015	2016	2017	2018	2019
January	4A	5A	6A	7A	8M	9M
February	4B	5B	6B	7B	8N	9N
March	4C	5C	6C	7C	8P	9P
April	4D	5D	6D	7D	8Q	9Q
May	4E	5E	6E	7E	8R	9R
June	4F	5F	6F	7F	8S	9S
July	4G	5G	6G	7G	8T	9T
August	4H	5H	6H	7H	8U	9U
September	4I	5I	6I	7I	8V	9V
October	4J	5J	6J	7J	8Z	9Z
November	4K	5K	6K	7K	8X	9X
December	4L	5L	6L	7L	8Y	9Y

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Classification: 430.300.000