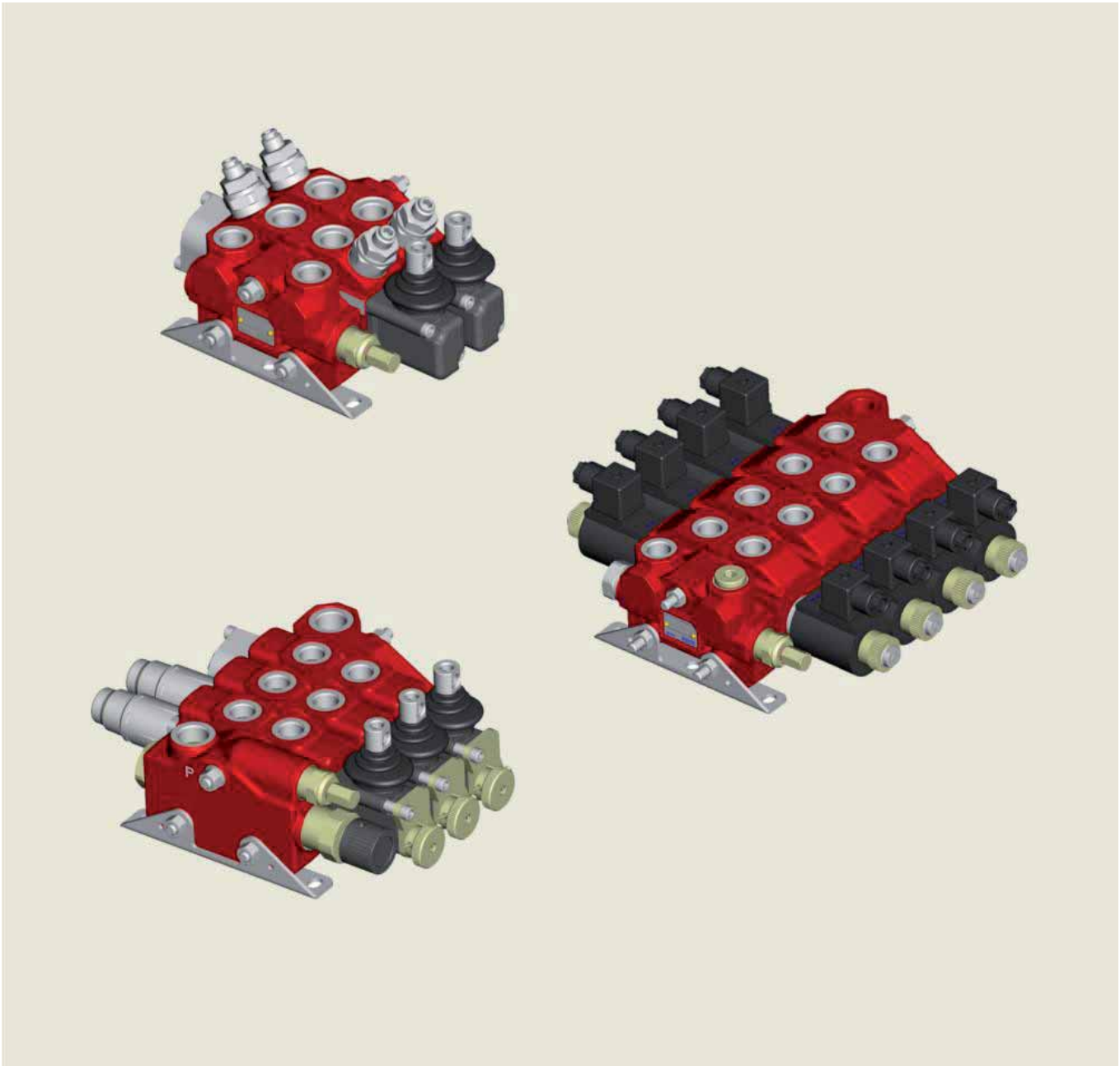
Heizmann

Schlauchtechnik - Hydraulik - Antriebstechnik

Directional Control Valve "HDM/HDS15"



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Directional Control Valve "HDM/HDS15"

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Directional Control Valve "HDM/HDS15"

1 Installation and maintenance - General information

1.1 Introduction

HDS/HDM15 directional control valve series is the result of several decades of successful experience in a wide range of different applications for agricultural, material handling and earth moving machine sectors.

The combination of monoblock and stackable construction with a wide range of inlet, outlet and intermediate covers as well as of controls, gives the designer a high degree of freedom in the definition of the hydraulic circuit that fits in the best way the machine requirements.

It is possible to combine direct ON-OFF, manual, hydraulic proportional and electro-hydraulic proportional sections in the same valve stack and to realise complex hydraulic circuits with the possibility to define priority and residual controlled flow to selected valve sections.

Specific options have been developed to best satisfy the requirements of different types of agricultural or industrial machines such as tractors, wheel and telescopic loaders, backhoes, fork lift trucks, forestry cranes, recovery trucks, etc.

As a result, the HDS/HDM15 is a very flexible series valve able to fulfil all the requirements of modern machines.

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1.2 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 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 operation;
- before painting the valve, check that the work port plastic plugs are tightly in place.

1.3 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) must never be used, as they can cause deformation and cracks in the valve body.

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.):

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 depends on several different factors including lubrication, coating and surfaces finish. The fitting manufacturer shall be consulted.

1.4 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 sliding 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 responding to ISO 6743/4 requirements, 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.

1.5 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 guarantee that a contamination level of 21/19/16 ISO4406: 1999 (NAS 1638-CLASS10) is not exceeded.

When solenoid operated valves, (eg: on direct acting electromagnetic or electro-hydraulic positioners) are

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integrated in the directional valve, 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.

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.

1.6 Directives and standards

Recommended conditions for obtaining the best performance of the system: we recommend to strictly follow the conditions advised here above, failing which warranty shall be void.

- 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/CE

- ISO 9001:2008 / ISO 14001:2004

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.

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1.7 Hydraulic system

1.7.1 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		Standard	ON-OFF
Nominal flow range		60 l/min *(15 US gpm)*	
Max inlet pressure (P)		250 bar *(3620PSI)***	
Max work port pressure (A/B)		320 bar *(4640 PSI)*	
Max back pressure (T)		30 bar *(430 PSI)*	20 bar *(290 PSI)*
Max back pressure (T) with electro-hydraulic positioner (EHO)		10 bar *(145PSI)*	
Max internal leakage A/B→T (at 100 bar/1450 PSI, 23 mm^2/s)	Without port valves	14 cc/min (*) *(0.854 Cu In/min)*	35 cc/min *(2.492 Cu In/min)*
	With port valves	19 cc/min (*) *(1.139 Cu In/min)*	40 cc/min *(2.634 Cu In^3min)*
Fluid		mineral based oil (see 1.4)	
Fluid temperature (with NBR seals)		from -20° to 80 °C *(from -4° to 176° F)*	
Max contamination level		21/19/16 ISO4406:1999 *(NAS 1638 class10)*	
Max contamination level for electro-hydraulic and direct ON-OFF applications		20/18/15 -ISO 4406:1999 *(NAS 1638 class 9)*	
Viscosity operating range		recommended	from 15 to 75 mm^2/s
		admissible	from 12 to 400 mm^2/s
Max number of elements		10	
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		18^{+2} Nm	
With ON-OFF sections		16^{+2} Nm	

For different operating conditions, please contact our Sales Dept.

(*) Lower values can be provided on demand

(**) For direct on-off version see operating limits diagrams at section 2.2

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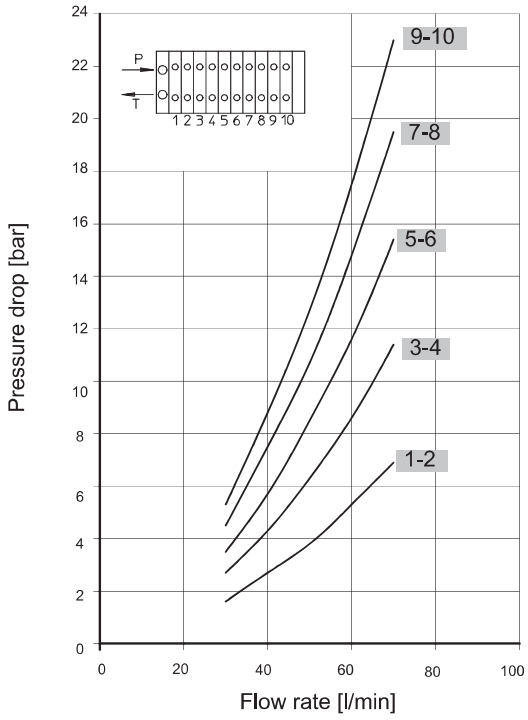
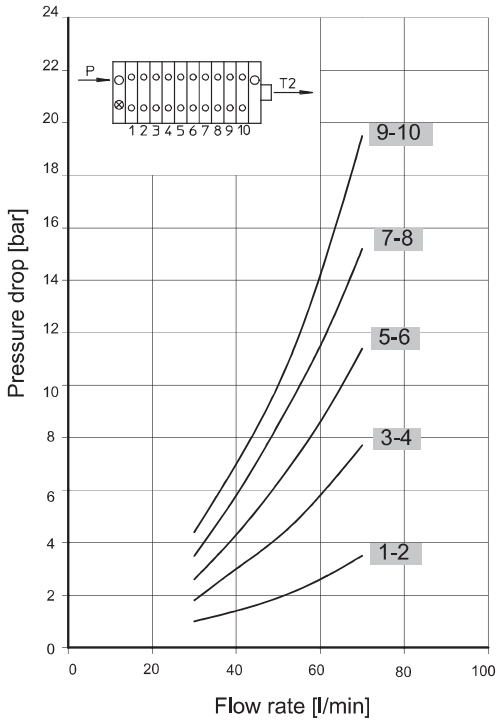
2 Performance curves

2.1 HDS version parallel circuit

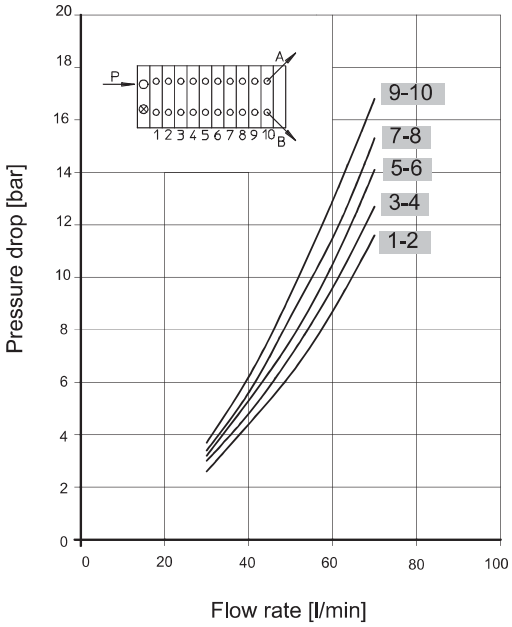
P ⇒ T



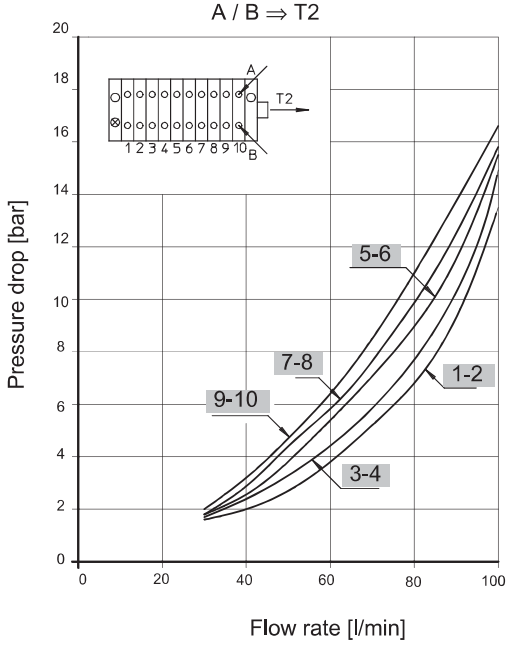
P ⇒ T2



P ⇒ A / B



A / B ⇒ T2



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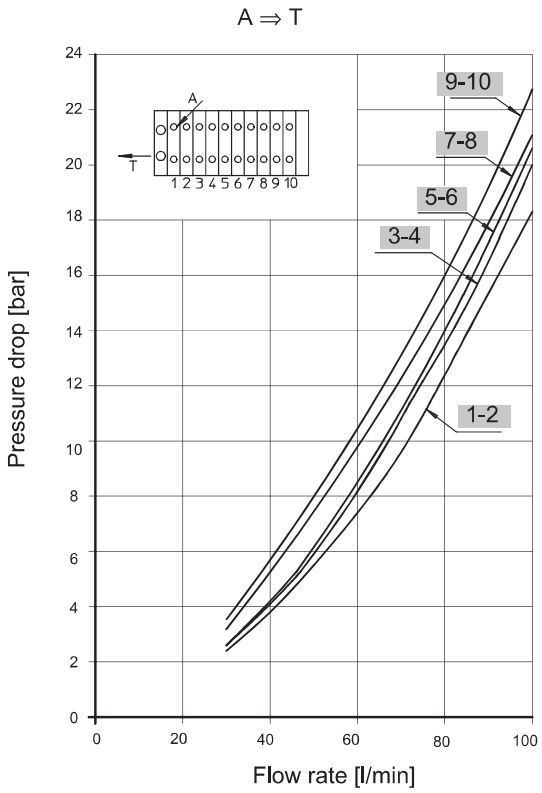

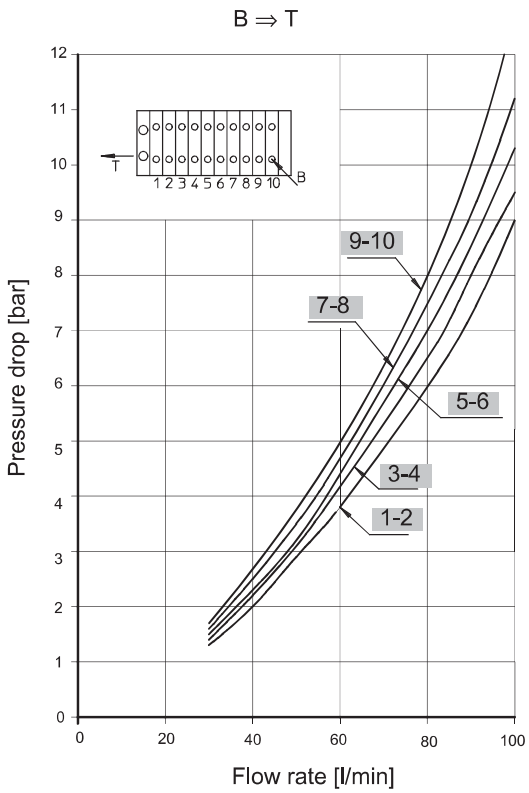

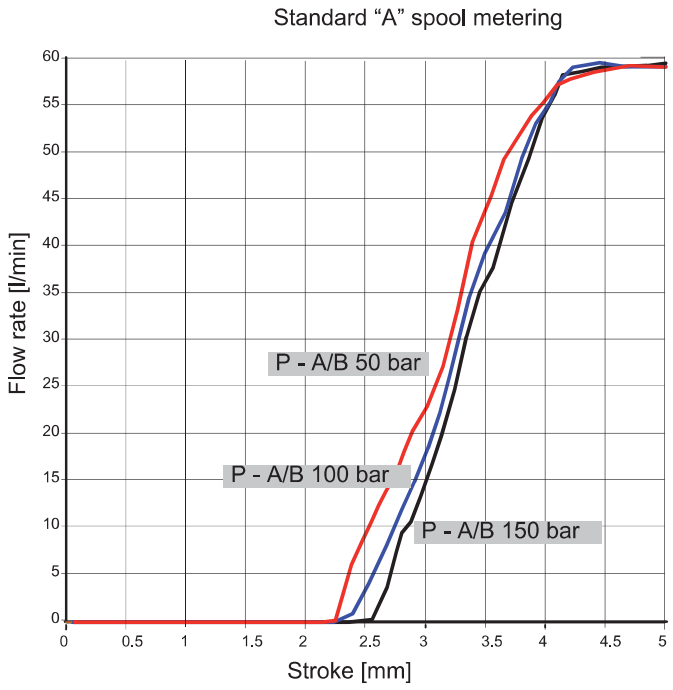

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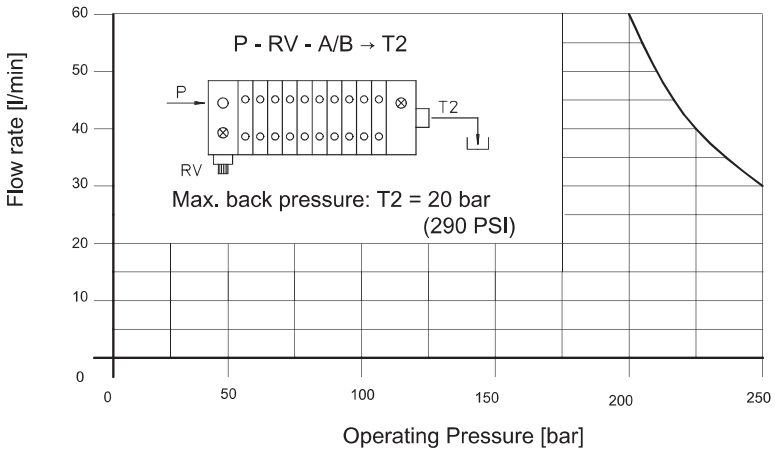
Directional Control Valve "HDM/HDS15"

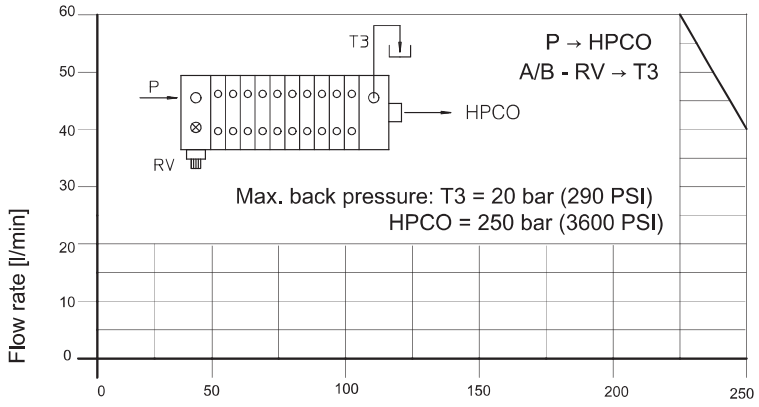
2.2 Operating limits for ON-OFF version

Tested with voltage V = -10% and
solenoids at ambient temperature

Standard Circuit



Carry–over circuit



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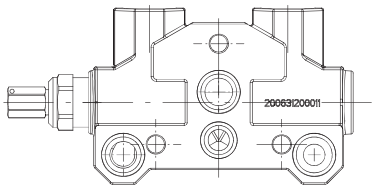
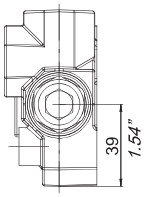
Directional Control Valve "HDM/HDS15"

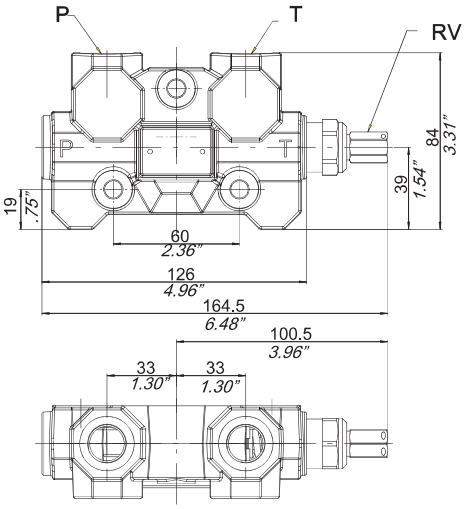
3 Inlet cover

3.1 Std inlet cover with relief valve RV dimension

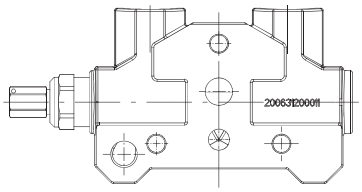
Parallel circuit



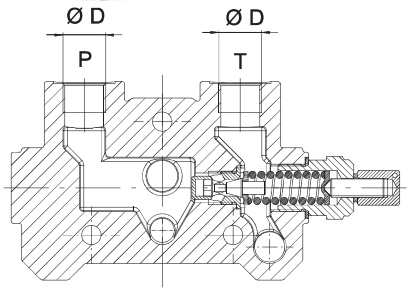


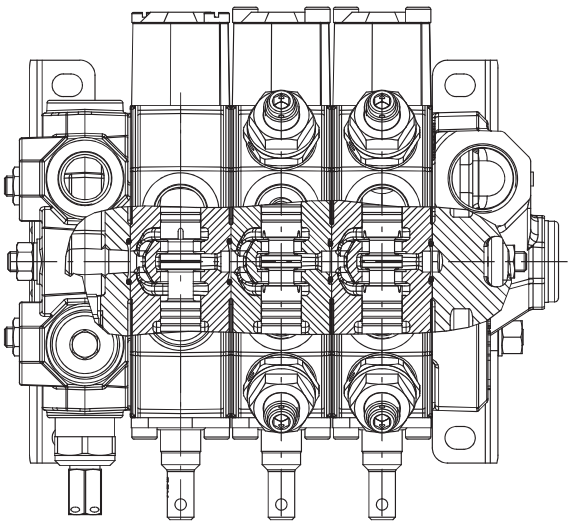


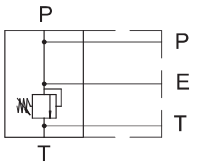
Series and tandem circuit



3.1.1 Std inlet cover for parallel circuit with relief valve RV + o-ring seals







Ø D	Type/Code*
M18X1.5	T01 200931210070
3/8" BSP	T02 200931220060
1/2" BSP Standard	T03 200931230110
SAE10	T05 200931280020

* Group code with RV set at standard pressure 150 bar (210 PSI)

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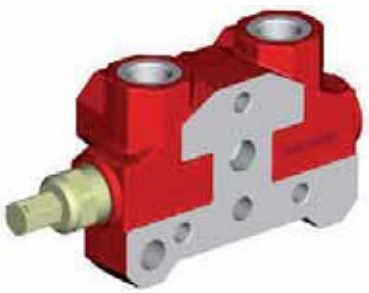
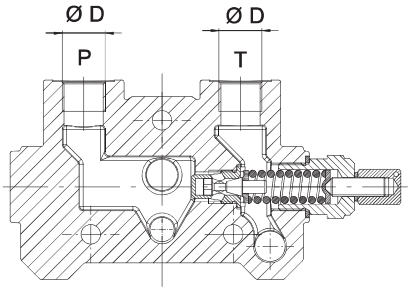
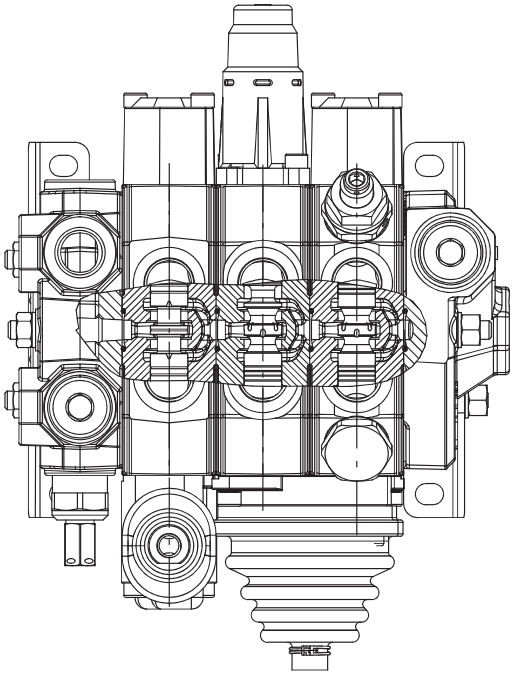
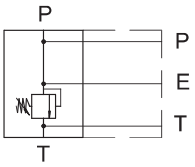
3.1.2 Std inlet cover for series and tandem circuit with relief valve RV









Ø D	Type/Code*
M18X1.5	T41 200931210050
3/8" BSP	T42 200931220050
1/2" BSP Standard	T43 200931230080
SAE10	T45 200931280010

* Group code with RV set at standard pressure 150 bar (210 PSI)

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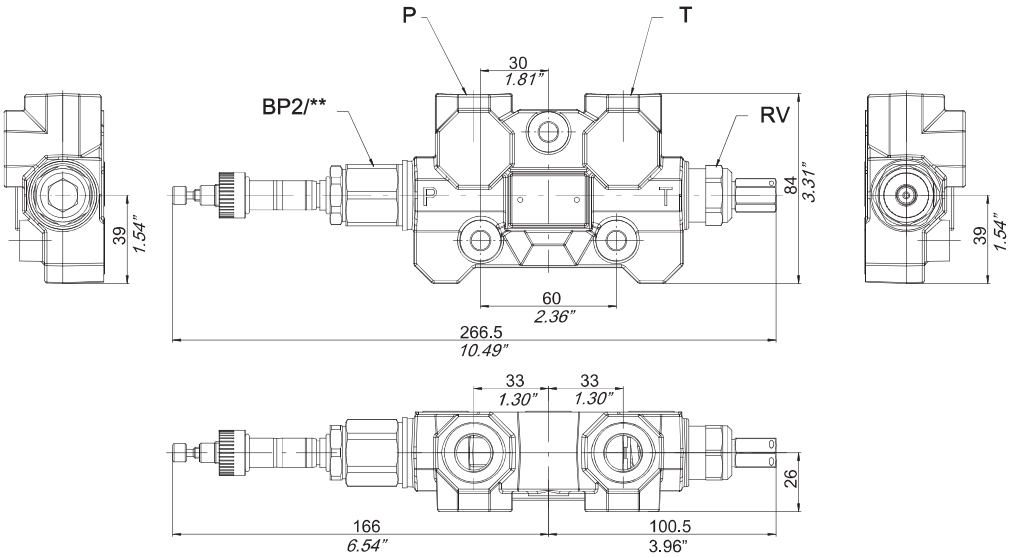
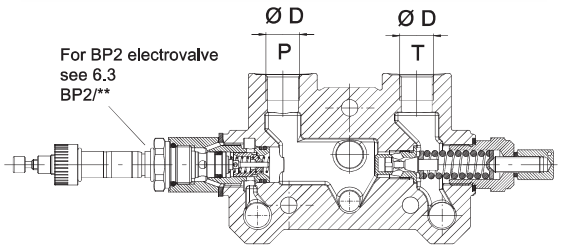
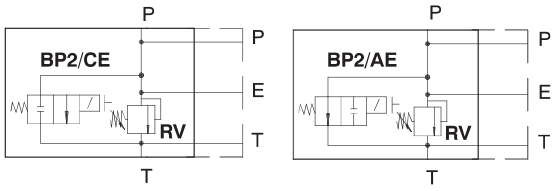
3.2 Unloading solenoid valve BP2/CE -BP2/AE for parallel circuit





Ø D	By-pass solenoid valve circuit	Type	Type code (*)
M18X1.5	BP2/AE BP2/CE	T21	200931210150 200931210160
3/8" BSP	BP2/AE BP2/CE	T22	200931220180 200931220190
1/2" BSP Standard	BP2/AE BP2/CE	T23	200931230220 200931230230
SAE10	BP2/AE BP2/CE	T25	200931280070 200931280080



* Mechanical part only (without coil)

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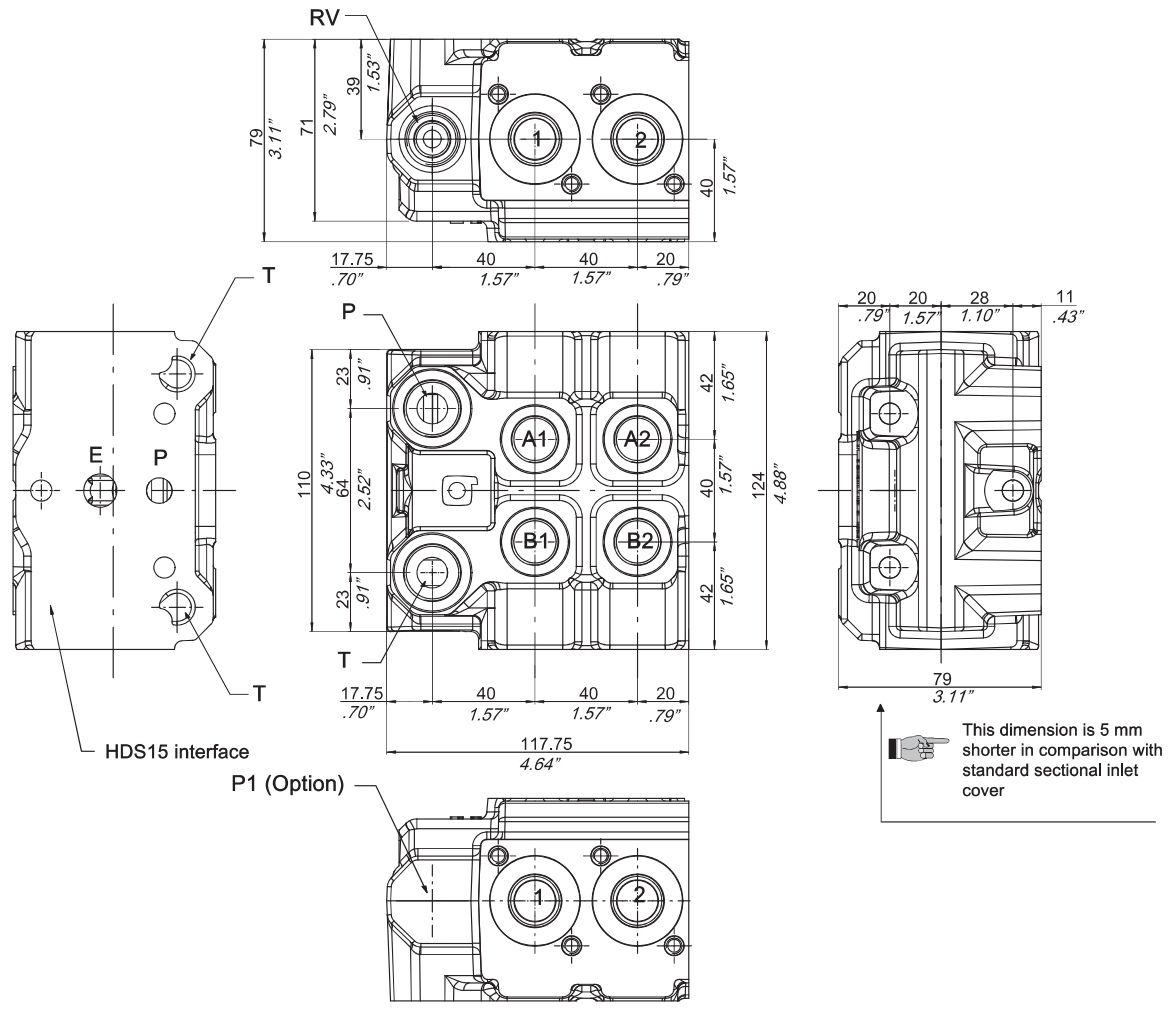
Directional Control Valve "HDM/HDS15"

3.3 Two spools monoblock with inlet and outlet ports inlet cover HDM15/2

3.3.1 Ports dimensions



3.3.2 Port threads

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
Inlet P, P1	1/2"	M22X1.5	7/8"-14 (SAE10)
Ports A/B	1/2"	M18X1.5	3/4"-16 (SAE8)
Outlet T_1, T2, T3, T4, T5, HPC	1/2"	M22X1.5	7/8"-14 (SAE10)
Hydraulic control	1/4"		
Open loop proportional control	1/4"		

For different ports size please contact our Sales Department

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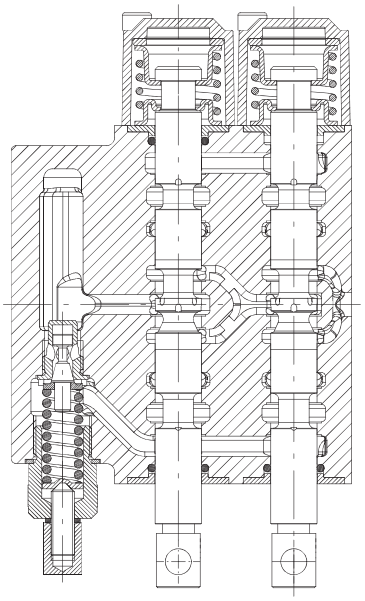
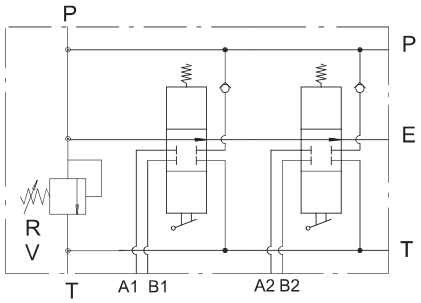
Directional Control Valve "HDM/HDS15"

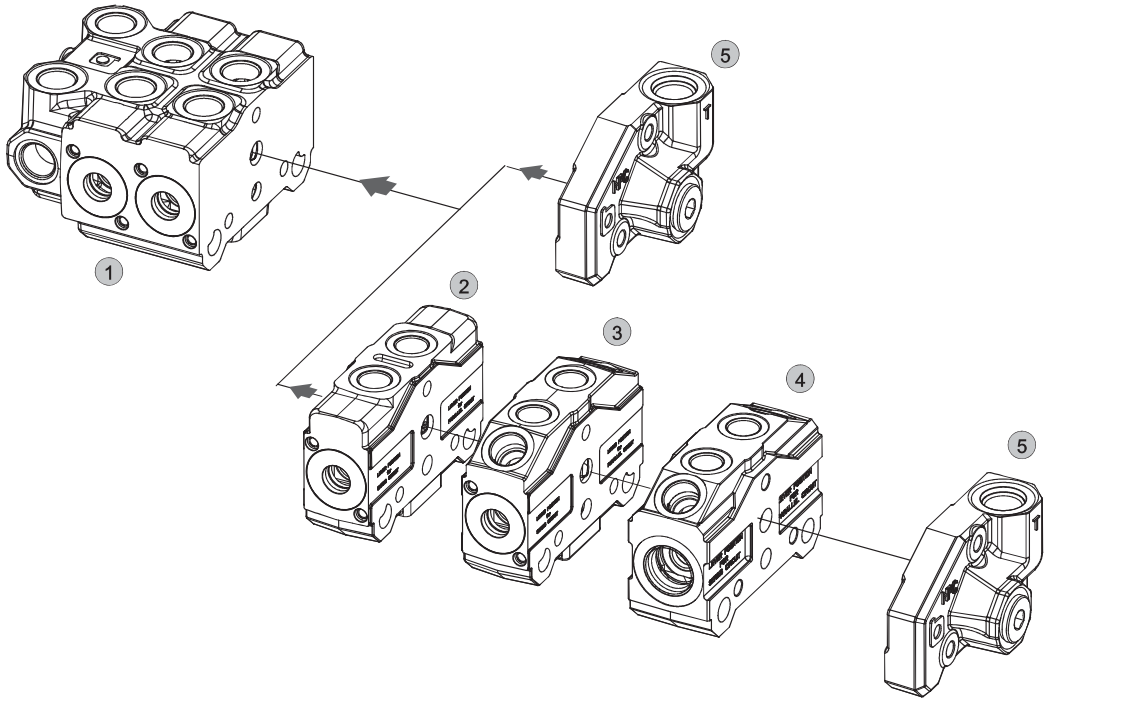
3.3.3 Monobloc body



ØD	Type/Code Standard	Type/Code Section with valve OA-UC-C
M18X1.5		
3/8"BSP		
1/2" BSP	K03 200741331230	K13 200741331240
SAE10		



IMPORTANT!: Body codes consist of machined casting, seals and load hold check valve only. Not to be used for complete valve orders.



1 HDM15 body 2 HDS15 body 79 mm dedicated 3 HDS15 valve body 4 HDS15 ON-OFF valve body 5 HDS15 end cover

For inlet covers see chapter 3
For bodies see chapter 4

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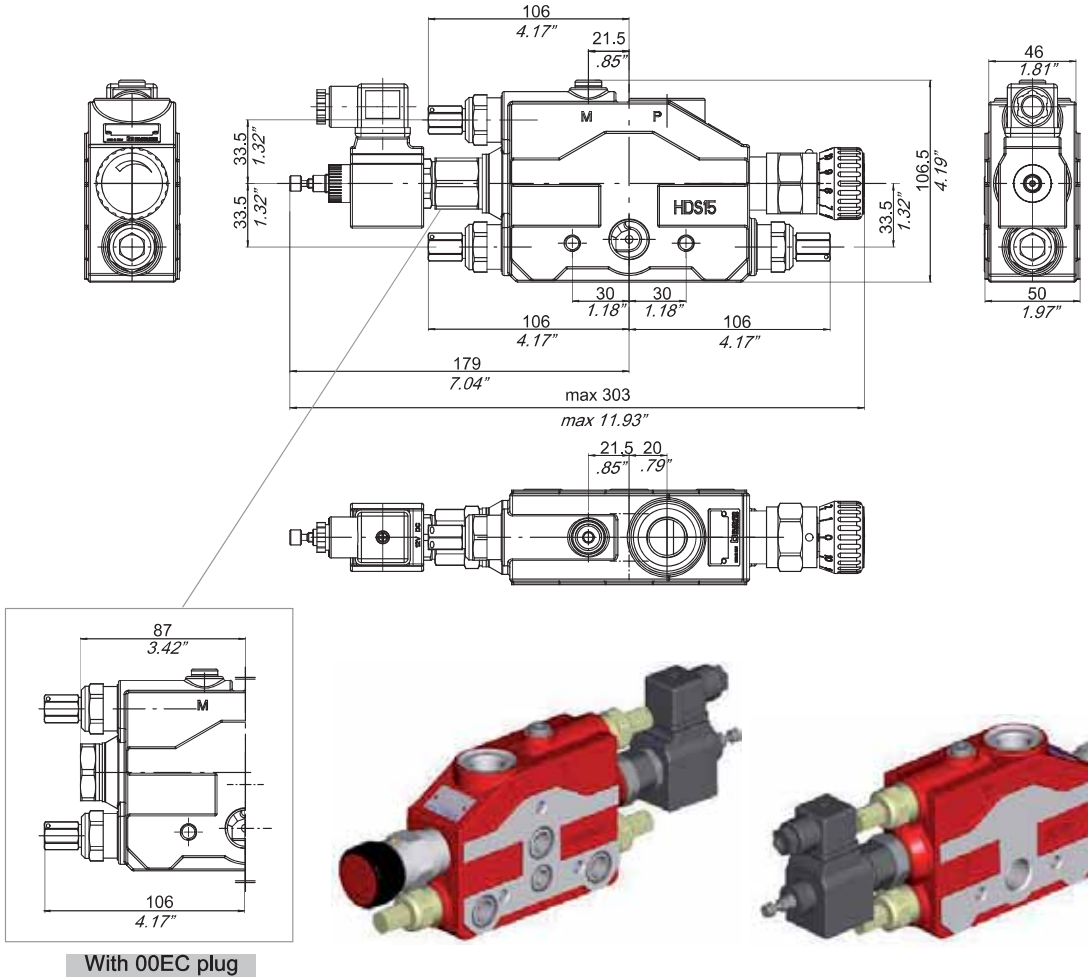
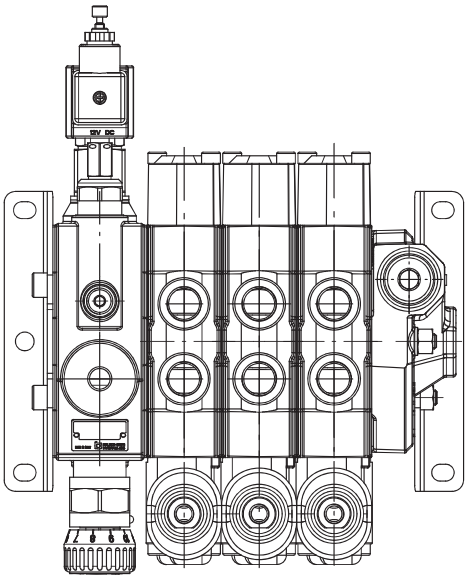
Directional Control Valve "HDM/HDS15"

3.4 Pressure and flow control inlet covers PQ

3.4.1 Inlet cover T100: dimensions



With 00EC plug



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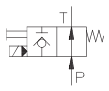
Directional Control Valve "HDM/HDS15"

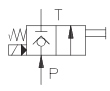
3.4.2 Inlet cover T100

Inlet cover with priority flow regulator, pressure relief valves and by-pass valve.
H.P.C.O. port can be pressurized

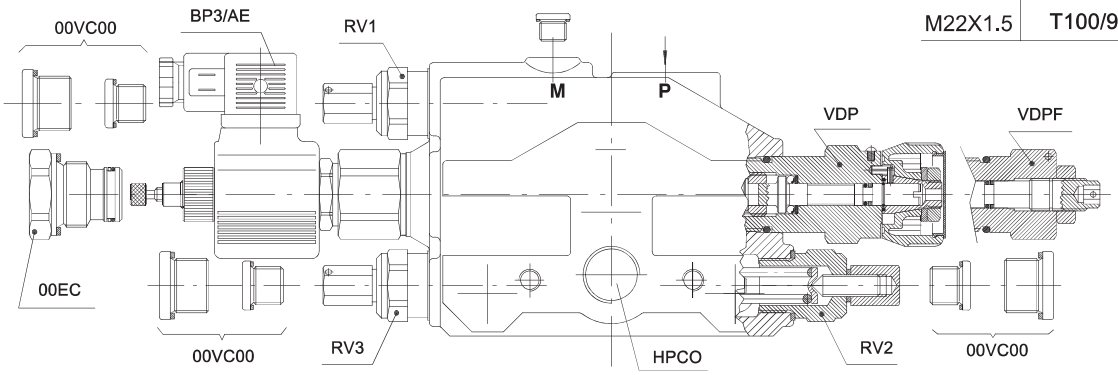
BP3/AE 13HC (12 VDC)
BP3/AE 23HC (24 VDC)



BP3/CE 13HC (12 VDC)
BP3/CE 23HC (24 VDC)



Ø D (P)	Type
M18X1.5	T100/1
1/2" BSP	T100/3
M22X1.5	T100/9

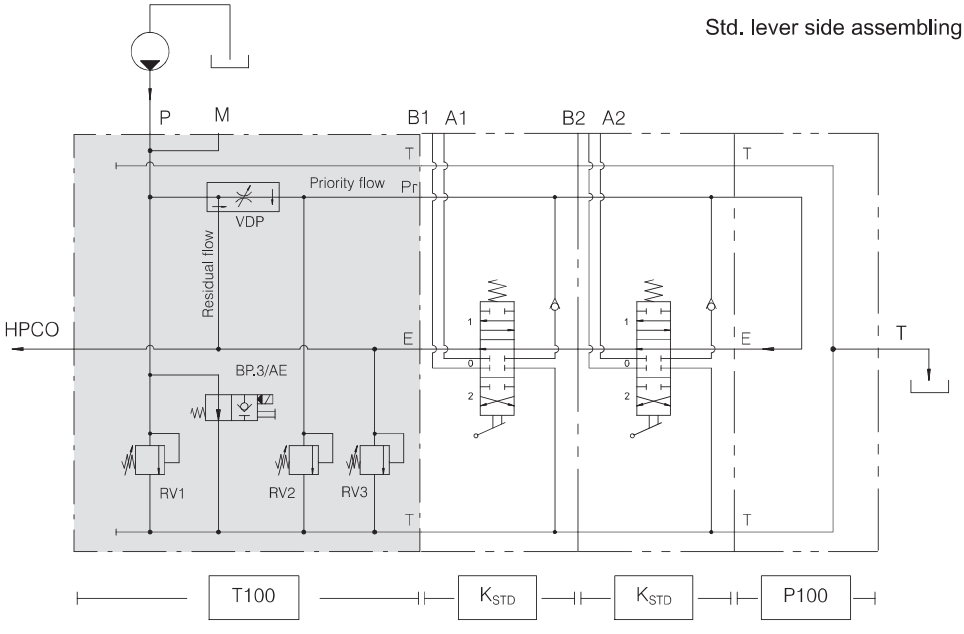


VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV1 / RV2 / RV3 –06**
96 ÷ 210	150	**RV1 / RV2 / RV3 –15**
150 ÷ 250	200	**RV1 / RV2 / RV3 –20**
211 ÷ 320	250	**RV1 / RV2 / RV3 –25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VD 06**
0.5 ÷ 12	12	**VD 12**
0.5 ÷ 25	25	**VD 25**
0.5÷ 50	50	**VD 50**

Std. lever side assembling position



HPCO= can be pressurized

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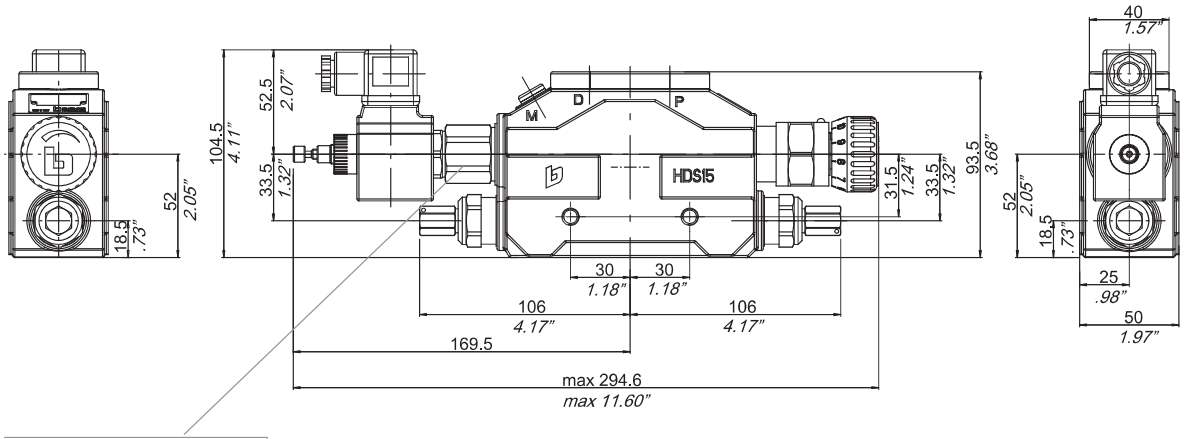
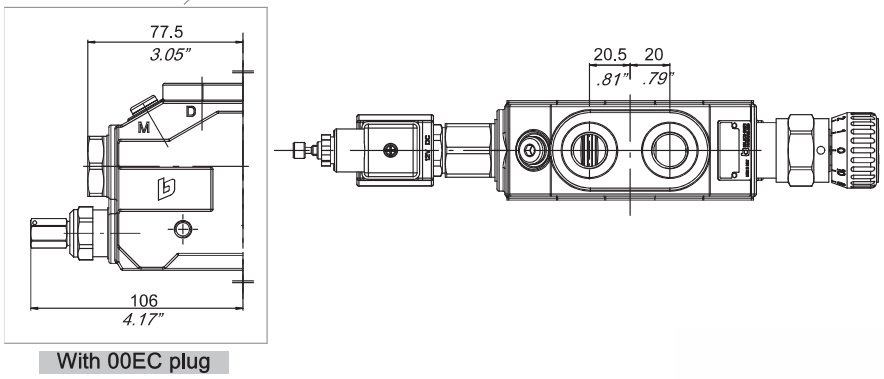
Directional Control Valve "HDM/HDS15"

3.4.3 Inlet covers T88-T90: dimensions





With 00EC plug

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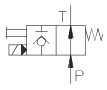
Directional Control Valve "HDM/HDS15"

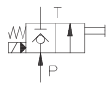
3.4.4 Inlet cover T88

Inlet cover with priority flow regulator, pressure relief valves and by-pass valve.
D = residual flow can be pressurized

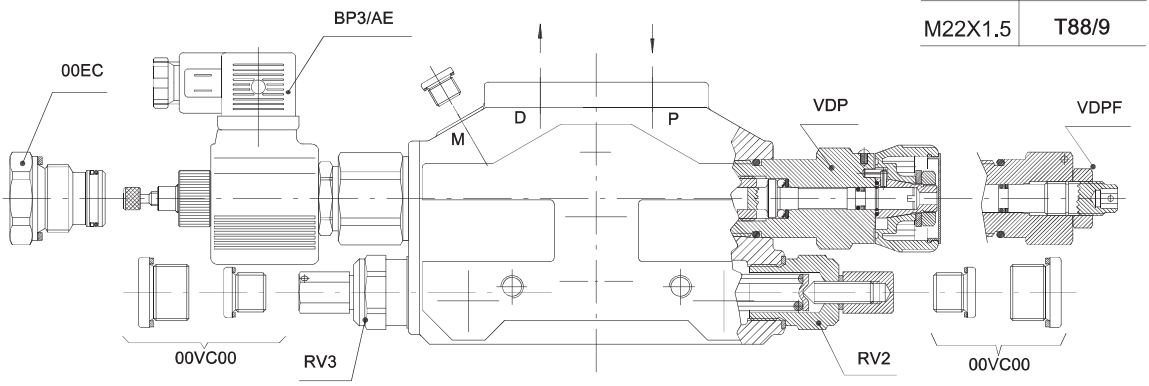
BP3/AE 13HC (12 VDC)
BP3/AE 23HC (24 VDC)



BP3/CE 13HC (12 VDC)
BP3/CE 23HC (24 VDC)



Ø D (P)	Type
M18X1.5	T88/1
1/2" BSP	T88/3
M22X1.5	T88/9

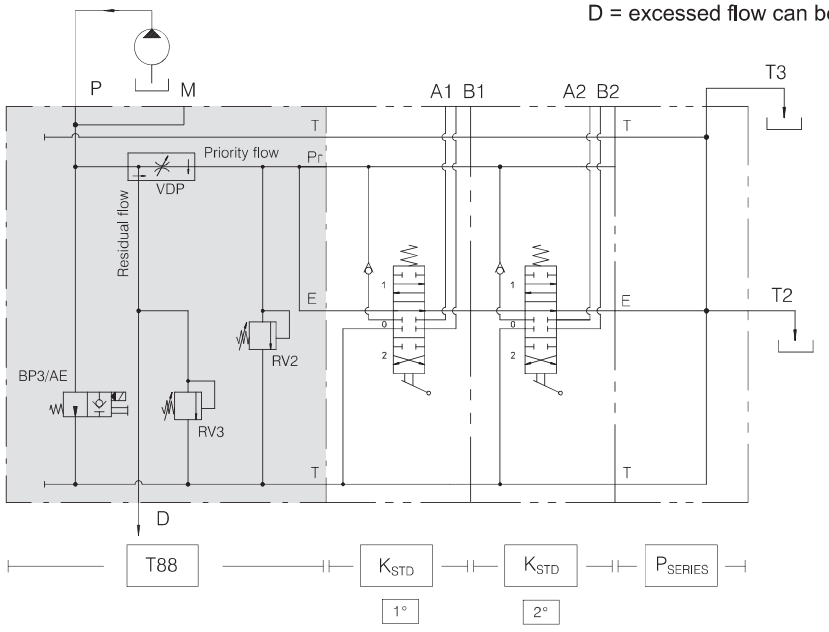


VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV2 / RV3 –06**
96 ÷ 210	150	**RV2 / RV3 –15**
150 ÷ 250	200	**RV2 / RV3 –20**
211 ÷ 320	250	**RV2 / RV3 –25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VDP 06**
0.5 ÷ 12	12	**VDP 12**
0.5 ÷ 25	25	**VDP 25**
0.5÷ 50	50	**VDP 50**

D = excessed flow can be pressurized



Spool reversed to have the lever at the same side of the regulator knob

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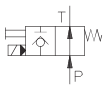
Directional Control Valve "HDM/HDS15"

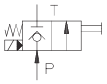
3.4.5 Inlet cover T90

Inlet cover with priority flow regulator, pressure relief valves and by-pass valve.
Residual flow directly to tank (cannot be pressurized).

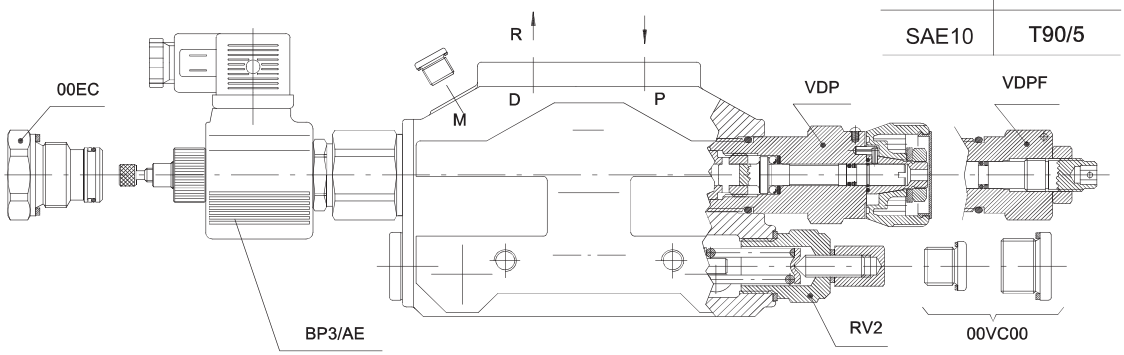
BP3/AE 13HC (12 VDC)
BP3/AE 23HC (24 VDC)



BP3/CE 13HC (12 VDC)
BP3/CE 23HC (24 VDC)



Ø D (R-P)	Type
M18X1.5	T90/1
1/2" BSP	T90/3
M22X1.5	T90/9
SAE10	T90/5

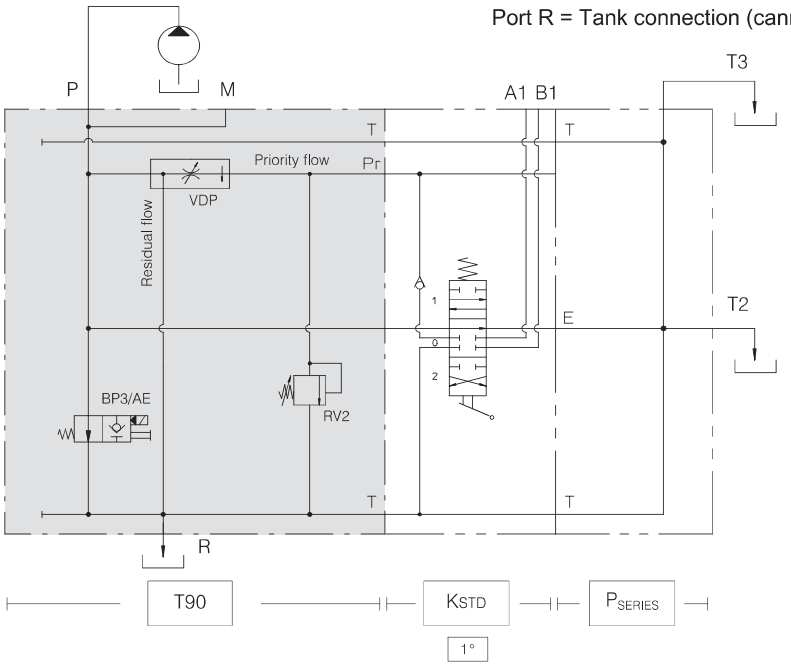


VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV2 –06**
96 ÷ 210	150	**RV2 –15**
150÷ 250	200	**RV2 –20**
211 ÷ 320	250	**RV2 –25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VDP 06**
0.5 ÷ 12	12	**VDP 12**
0.5 ÷ 25	25	**VDP 25**
0.5÷ 50	50	**VDP 50**

Port R = Tank connection (cannot be pressurized)



Spool reversed to have the lever on the same side of the regulator knob

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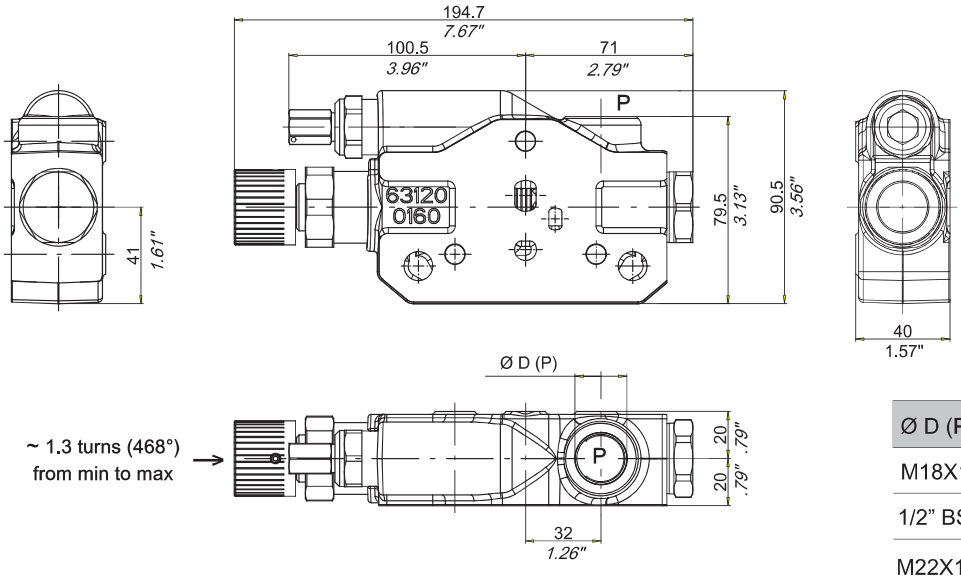
Directional Control Valve "HDM/HDS15"

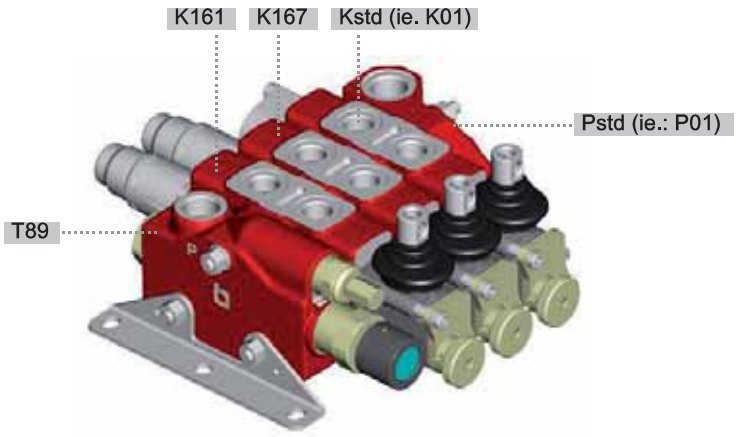
3.4.6 Inlet cover T89

3.4.6.1 Dimension



Ø D (P)	Type
M18X1.5	Please consult our Sales Centre
1/2" BSP	
M22X1.5	T89/9

Example of a typical circuit



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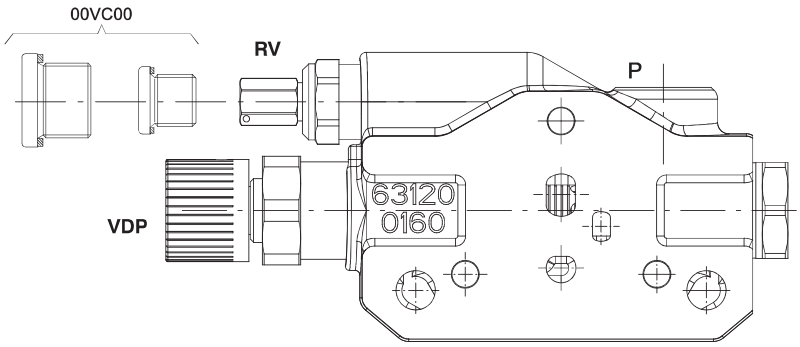
Directional Control Valve "HDM/HDS15"

3.4.6.2 Scheme

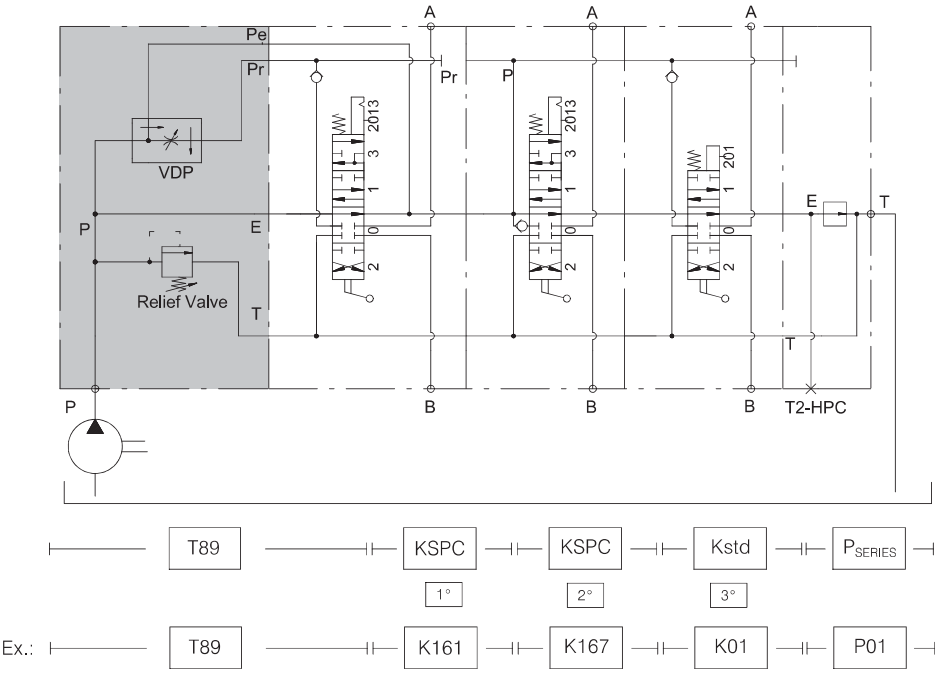
Inlet cover with priority flow regulator and inlet pressure relief valves.
Priority flow to the first element and residual flow to downstream elements. Requires dedicated first and second downstream elements.



Ø D (P)	Type
M18X1.5	Please consult our Sales Centre
1/2" BSP	
M22X1.5	T89/9

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV01 –06**
96 ÷ 210	150	**RV01 –15**
150 ÷ 250	200	**RV14 –20**
211 ÷ 320	250	**RV01 –26**

Flow range (l/min)	Flow regulator Type
0.5÷ 50	**VDP 50**



Spool reversed to have the lever at the same side of the regulator knob

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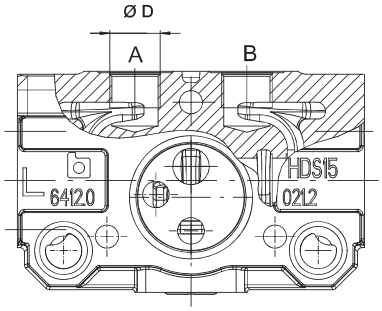
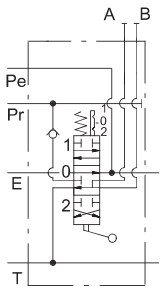
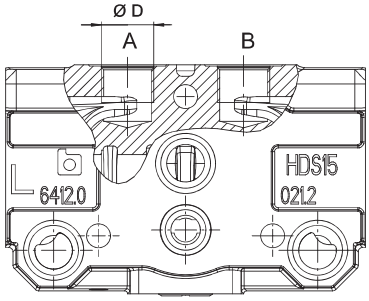
Directional Control Valve "HDM/HDS15"

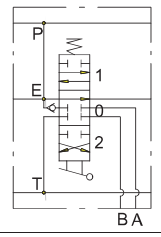
3.4.6.3 Special element (Pr: priority flow) to be used only with T89 inlet cover. See circuit example



ØD	Type/Code Standard	Hydraulic scheme
M18X1.5	K161 200941313100	
3/8"BSP	Please consult our Sales Centre	
1/2" BSP		
SAE10		

3.4.6.4 Special element (Pe: residual flow) to be used only with T89 inlet cover. See circuit example



ØD	Type/Code Standard	Hydraulic scheme
M18X1.5	K167 200941313170	
3/8"BSP	Please consult our Sales Centre	
1/2" BSP		
SAE10		

IMPORTANT!: In this kind of bodies the cavities for service port valves cannot be machined.
It is not possible to use "VS" restrictor valves

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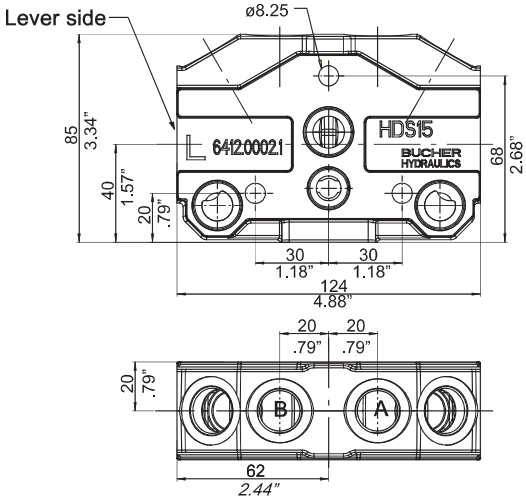
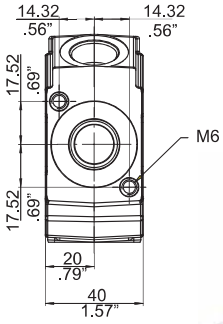
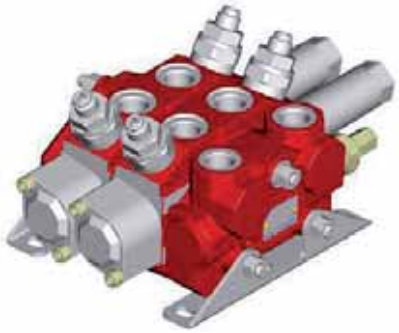
Directional Control Valve "HDM/HDS15"

4 Elements

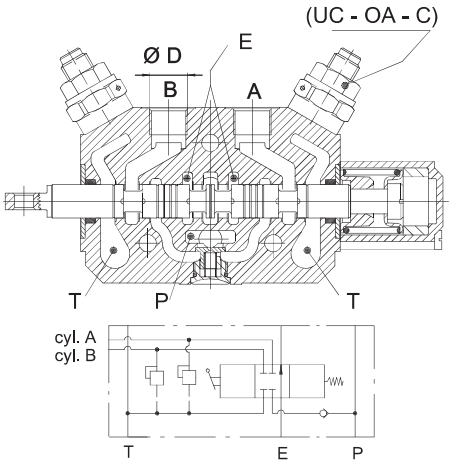
4.1 HDS15 valve body: dimensions





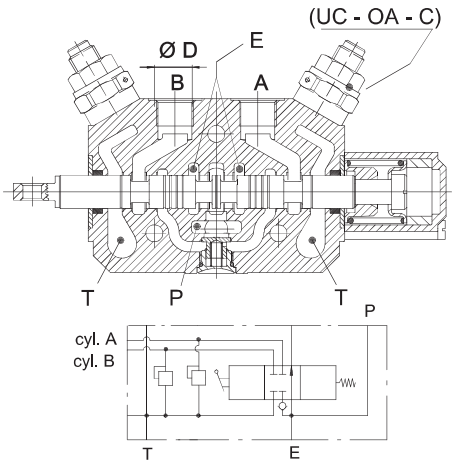


4.1.1 Standard circuit: parallel



ØD	Type/Code Standard	Type/Code Section with valve UC-OA-C
M18X1.5	K01 200941312420	K11 200941312430
3/8"BSP	K02 200941325770	K12 200941325780
1/2" BSP	K03 200941330740	K13 200941330750
SAE10	K05 200941380010	K15 200941380020

4.1.2 Optional circuits: series and tandem



ØD	Type/Code Standard	Type/Code Section with valve UC-OA-C
M18X1.5	K41 200941312440	K51 200941312450
3/8"BSP	K42 200941325790	K52 200941325800
1/2" BSP	K43 200941330760	K53 200941330770
SAE10	K45 200941380030	K55 200941380040

IMPORTANT!: Body codes consist of machined casting, seals and load hold check valve only. Not to be used for complete valve order.

Attention: In case of series, tandem, parallel/series circuits, it is necessary to reverse the positioner and the lever group, even for standard parallel sections (see the indications on the side of the valve body): Lever position for parallel circuit, lever position for series circuit

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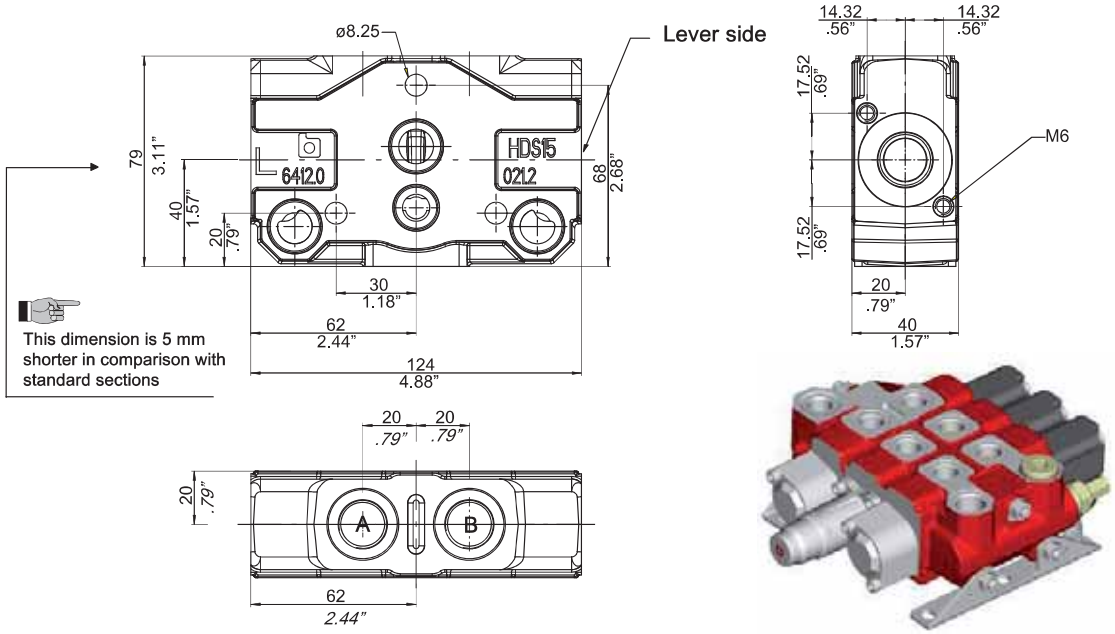
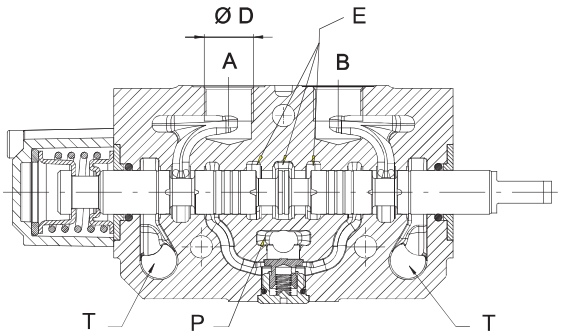
Directional Control Valve "HDM/HDS15"

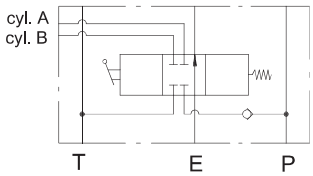
4.2 HDS15 valve body dimensions: 79 mm dedicated for HDM15

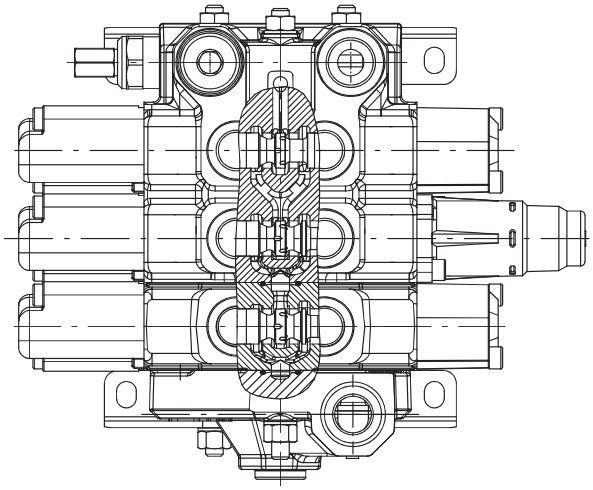




ØD	Type/Code Standard
M18X1.5	K145 200741313050
3/8"BSP	Please consult our Sales Centre
1/2" BSP	
SAE10	

IMPORTANT!: In this kind of bodies the cavities for service port valves cannot be machined.





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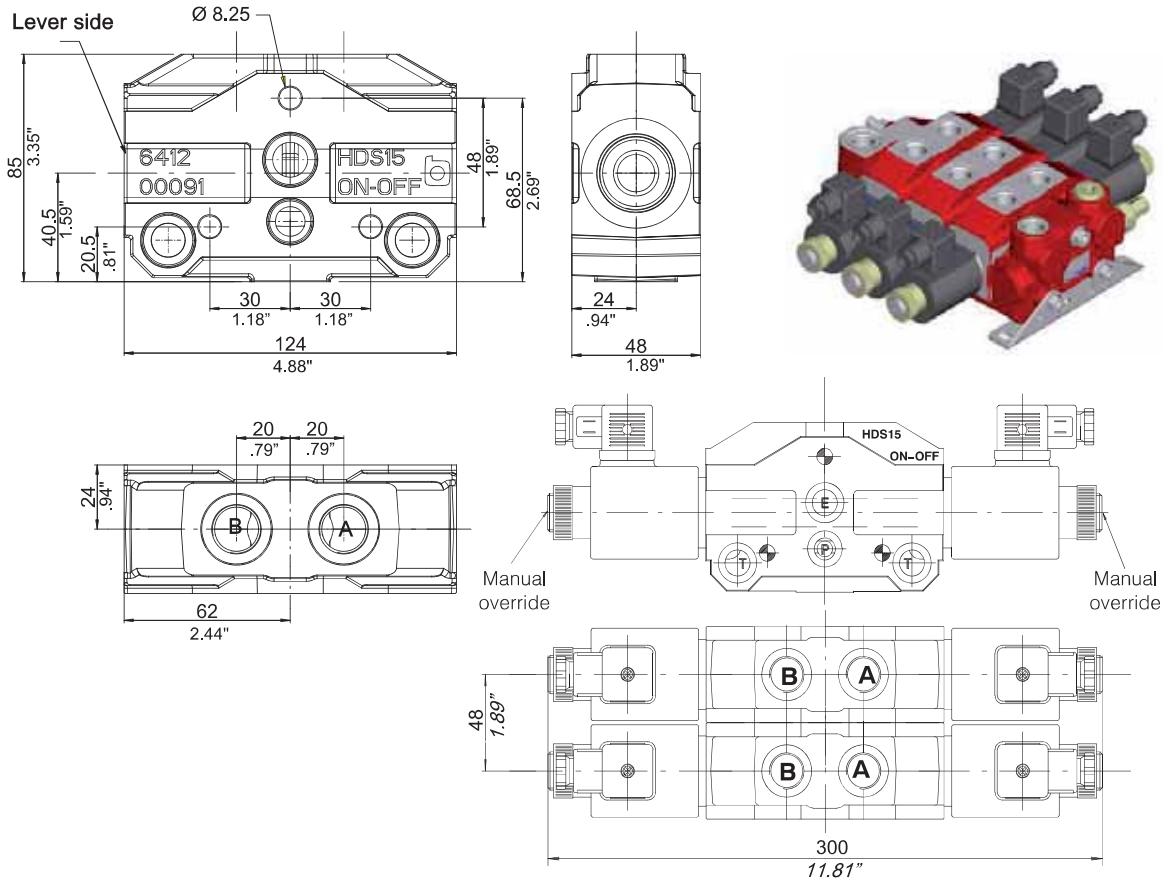
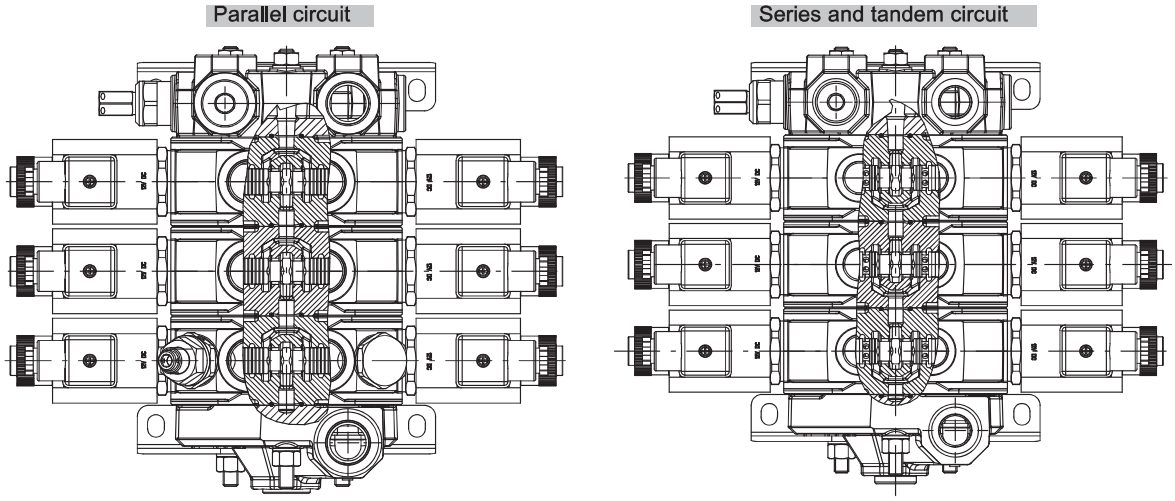
Directional Control Valve "HDM/HDS15"

4.3 HDS15 ON-OFF valve body: dimensions





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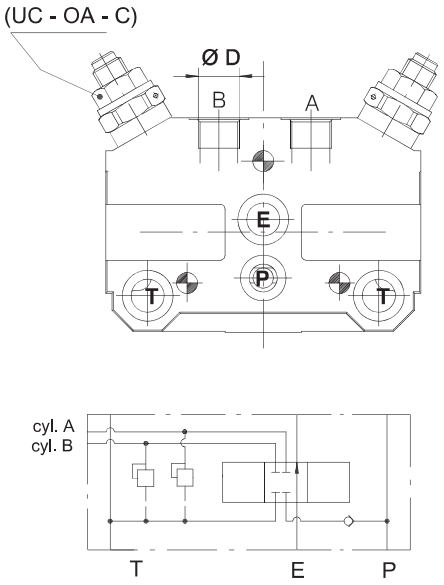
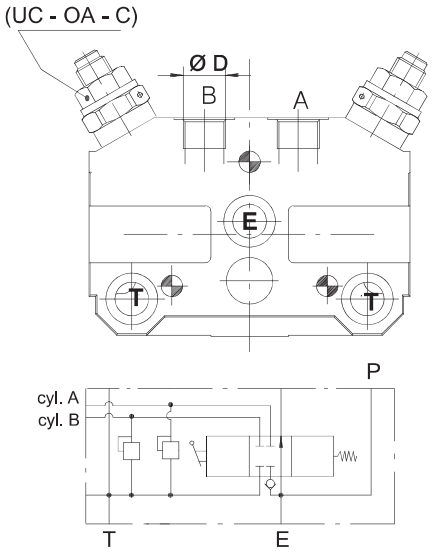
Directional Control Valve "HDM/HDS15"

4.3.1 Standard circuit: parallel



ØD	Type/Code Standard	Type/Code Section with valve UC-OA-C
M18X1.5	K201 200941312700	K211 200941312710
3/8"BSP	K202 200941326220	K212 200941326230
1/2" BSP	K203 2009413310600	K213 200941331070
SAE10	K205 200941380120	K215 200941380150

4.3.2 Optional circuit: series and tandem



ØD	Type/Code Standard	Type/Code Section with valve UC-OA-C
M18X1.5	K241 200941310290	K251 200941310360
3/8"BSP	K242	K252
1/2" BSP	K243 200941331010	K253 200941331090
SAE10	K245 200941380130	K255 200941380160

IMPORTANT!: For availability of -K- bodies without code please contact our Sales Department.
Body codes consist of machined casting, seals and load hold check valve only.
Not to be used for complete valve orders.

Attention: in case of series and tandem circuits use always inlet and outlet covers for series circuits (ex. - T41, T42, etc. - P32, P41, etc.).

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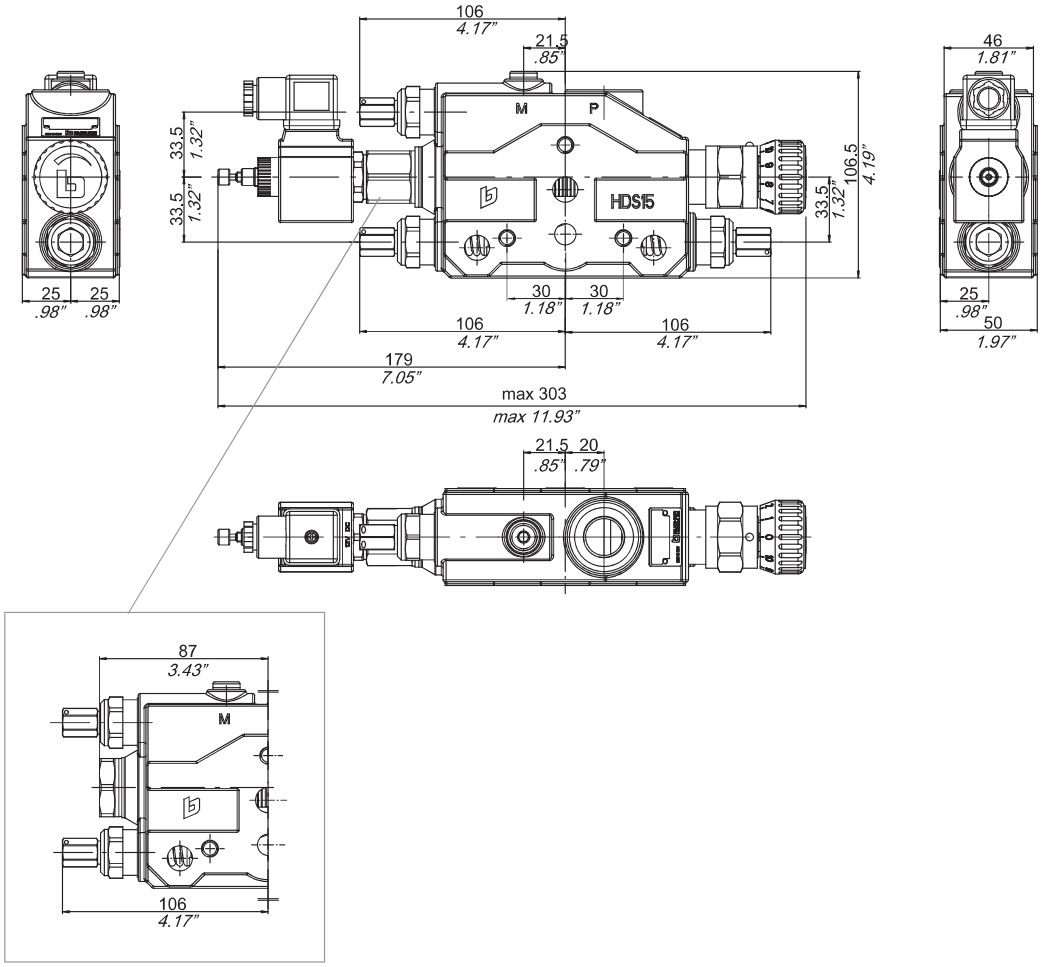
Directional Control Valve "HDM/HDS15"

4.4 Pressure and flow controls elements PQ

4.4.1 Sectional body K100: dimensions



With 00EC plug

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Directional Control Valve "HDM/HDS15"

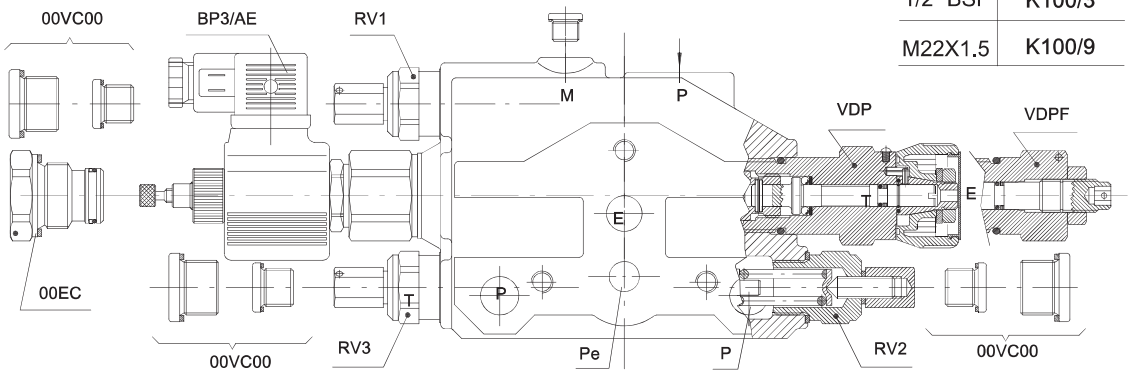
4.4.2 Sectional body K100

Intermediate section with priority flow regulator, pressure relief valves and by-pass valve.
H.P.C.O. port can be pressurized

BP3/AE 13HC (12 VDC)
BP3/AE 23HC (24 VDC)

BP3/CE 13HC (12 VDC)
BP3/CE 23HC (24 VDC)

Ø D (P)	Type
M18X1.5	K100/1
1/2" BSP	K100/3
M22X1.5	K100/9

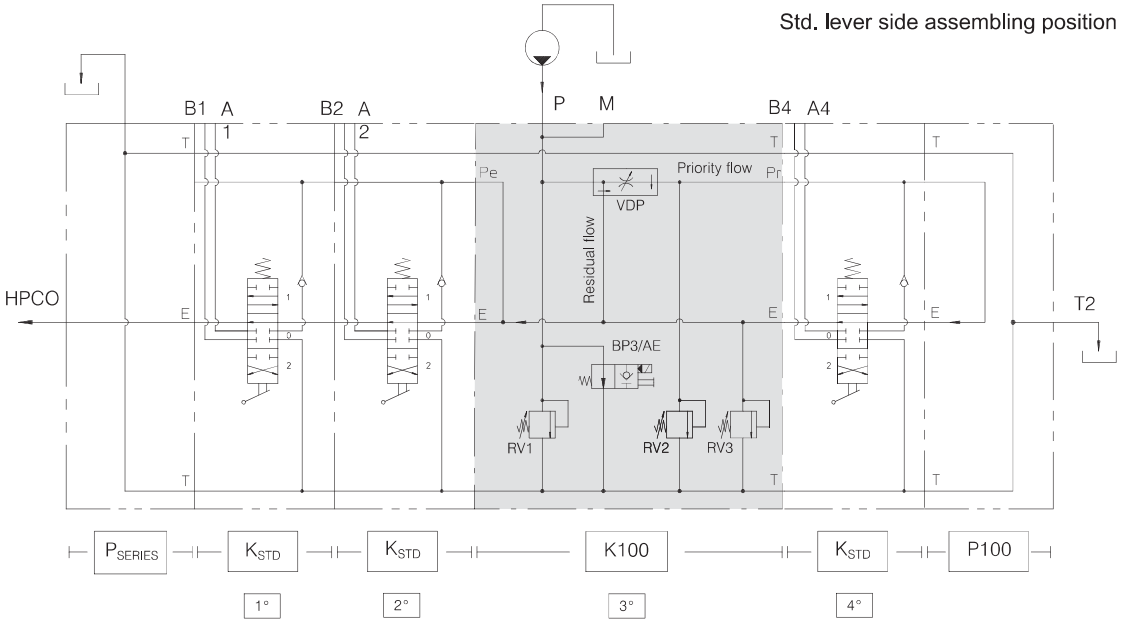


VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV1 / RV2 / RV3 –06**
96 ÷ 210	150	**RV1 / RV2 / RV3 –15**
150 ÷ 250	200	**RV1 / RV2 / RV3 –20**
211 ÷ 320	250	**RV1 / RV2 / RV3 –25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VDP 06**
0.5 ÷ 12	12	**VDP 12**
0.5 ÷ 25	25	**VDP 25**
0.5÷ 50	50	**VDP 50**

Std. lever side assembling position



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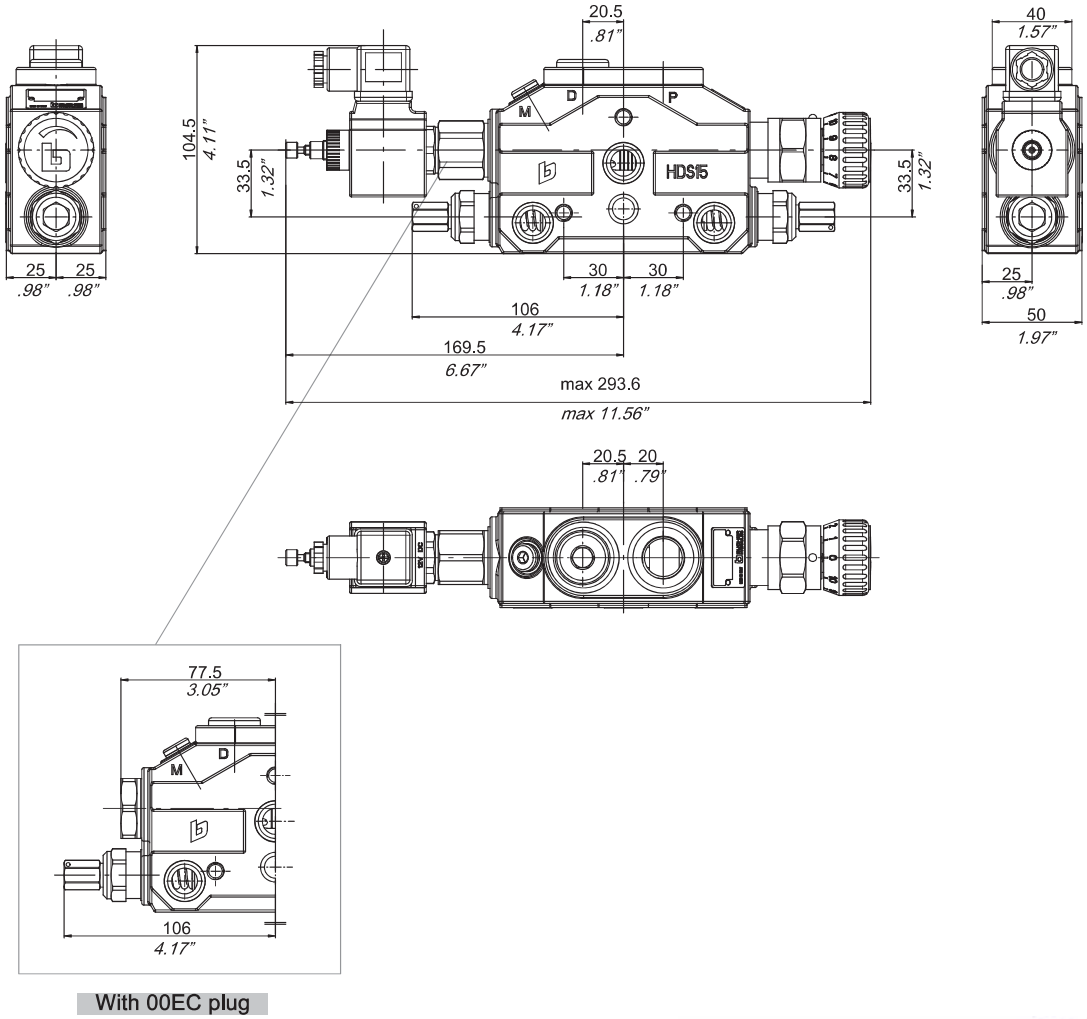
Directional Control Valve "HDM/HDS15"

4.4.3 Sectional body K88-K90: dimensions



With 00EC plug

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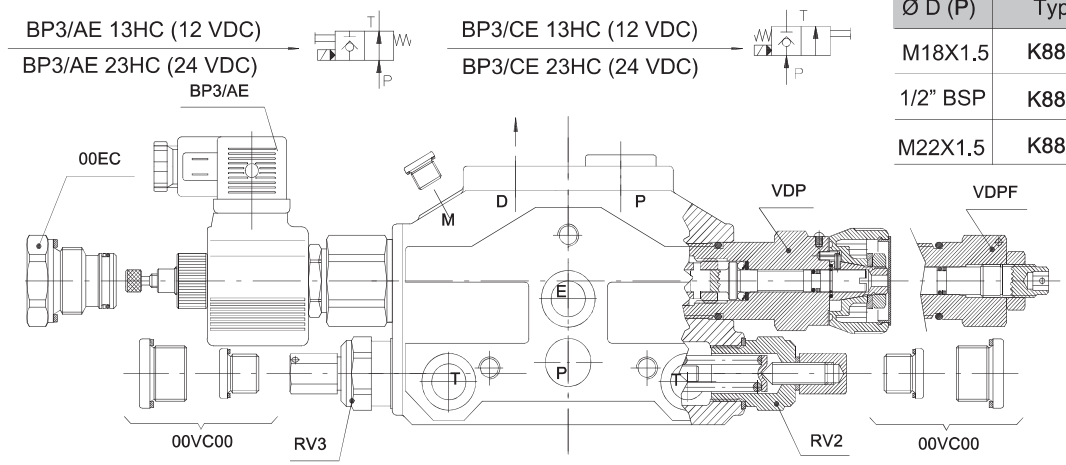
Directional Control Valve "HDM/HDS15"

4.4.4 Sectional body K88

Intermediate section with priority flow regulator, pressure relief valves and by-pass valve.
D = residual flow can be pressurized



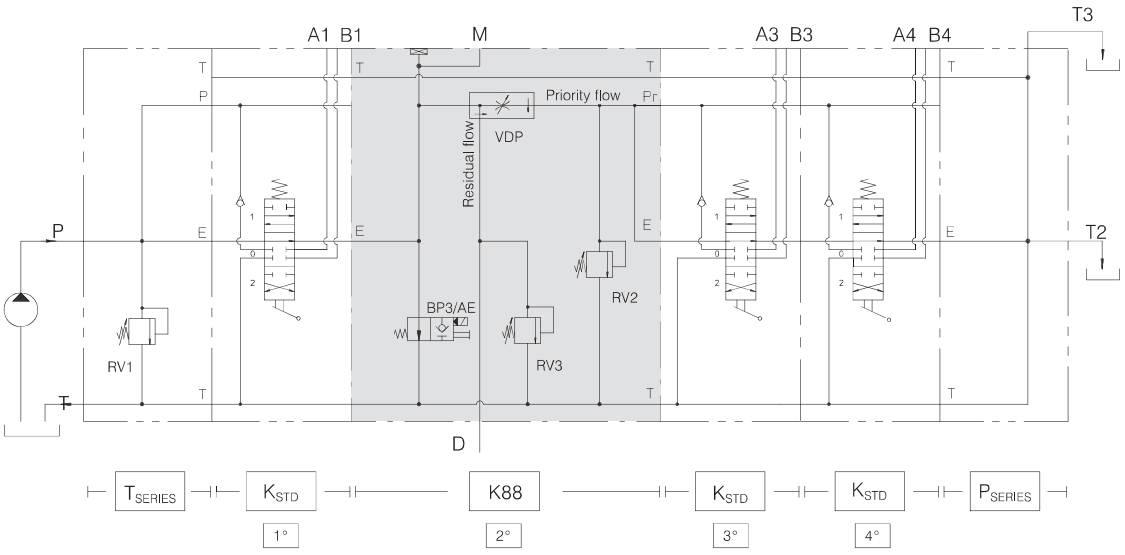
Ø D (P)	Type
M18X1.5	K88/1
1/2" BSP	K88/3
M22X1.5	K88/9

VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV2 or RV3 –06**
96 ÷ 210	150	**RV2 or RV3 –15**
150 ÷ 250	200	**RV2 or RV3 –20**
211 ÷ 320	250	**RV2 or RV3 –25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VDP 06**
0.5 ÷ 12	12	**VDP 12**
0.5 ÷ 25	25	**VDP 25**
0.5÷ 50	50	**VDP 50**

D = excessed flow can be pressurized



Spool reversed to have the lever at the same side of the regulator knob.

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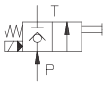
Directional Control Valve "HDM/HDS15"

4.4.5 Sectional body K90

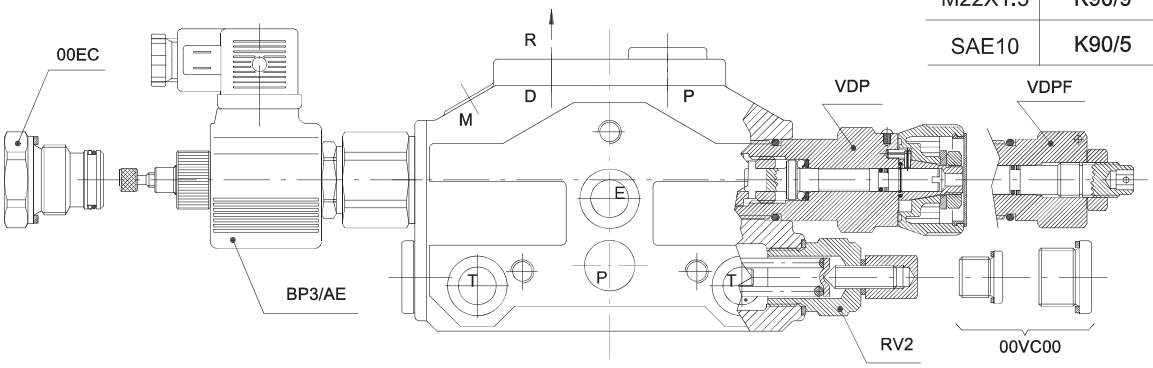
Intermediate section with priority flow regulator, pressure relief valves and by-pass valve.
Residual flow directly to tank (cannot be pressurised)

BP3/AE 13HC (12 VDC)
BP3/AE 23HC (24 VDC)

BP3/CE 13HC (12 VDC)
BP3/CE 23HC (24 VDC)



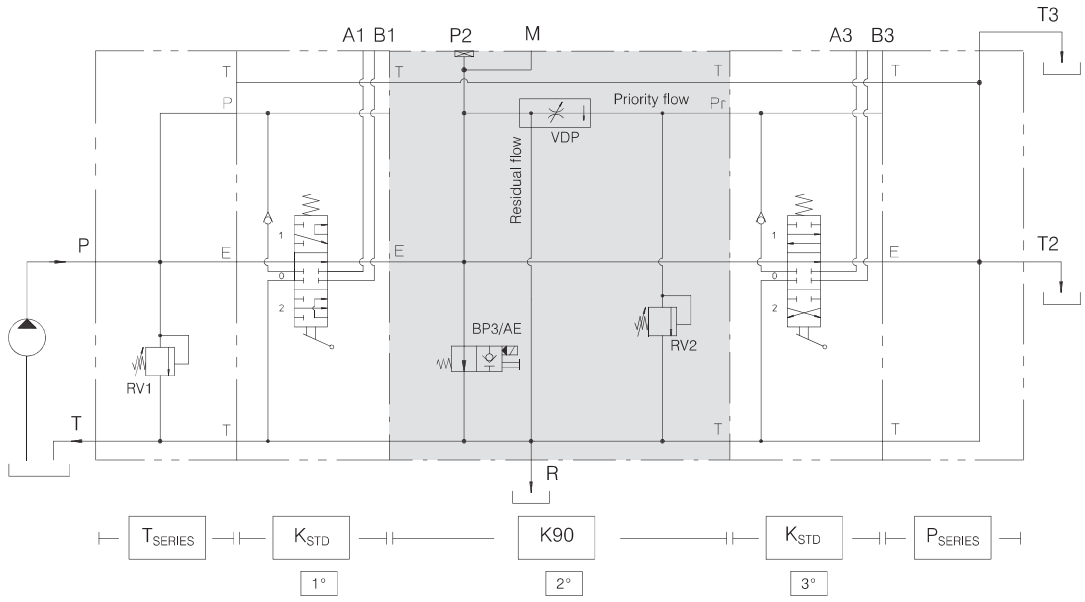
Ø D (R-P)	Type
M18X1.5	K90/1
1/2" BSP	K90/3
M22X1.5	K90/9
SAE10	K90/5



VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV2 –06**
96 ÷ 210	150	**RV2 –15**
150 ÷ 250	200	**RV2 –20**
211 ÷ 320	250	**RV2 –25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VDP 06**
0.5 ÷ 12	12	**VDP 12**
0.5 ÷ 25	25	**VDP 25**
0.5÷ 50	50	**VDP 50**



Spool reversed to have the lever at the same side of the regulator knob.

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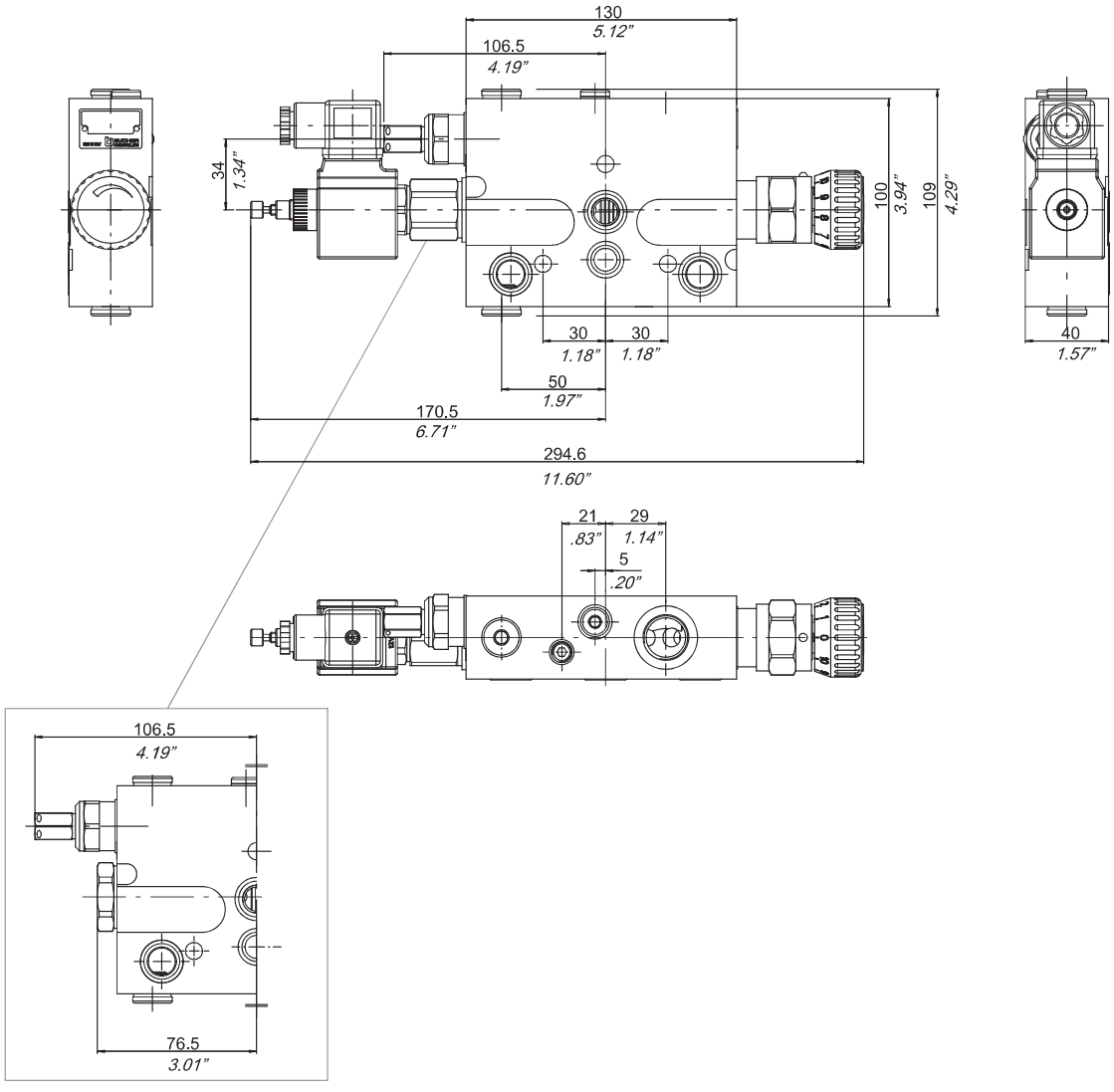
Directional Control Valve "HDM/HDS15"

4.4.6 Sectional body K91-K92: dimensions



With 00EC plug

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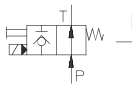
Directional Control Valve "HDM/HDS15"

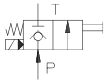
4.4.7 Sectional body K91

Intermediate section with priority flow regulator, pressure relief valves and by-pass valve.
Residual flow (port D) can be pressurized. Suitable for circuits where there are several priority sections
(Tie rods crossing holes instead of blind holes like in the standard priority sections)

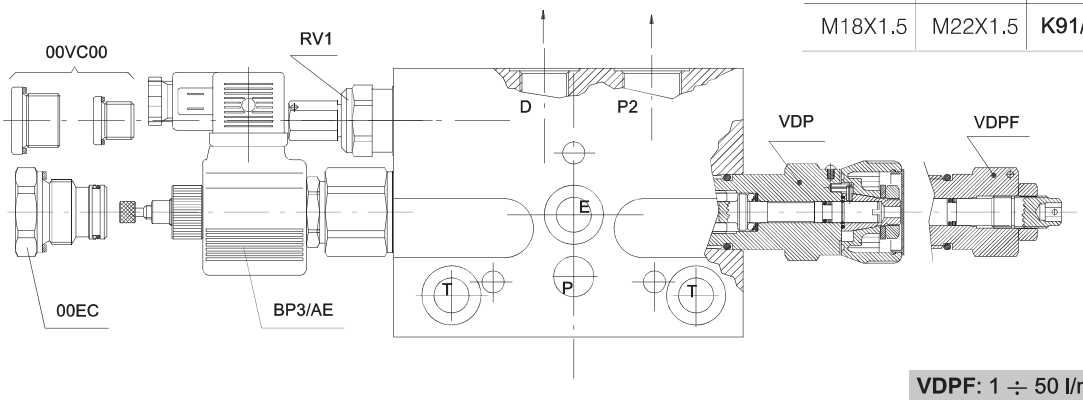
BP3/AE 13HC (12 VDC)
BP3/AE 23HC (24 VDC)



BP3/CE 13HC (12 VDC)
BP3/CE 23HC (24 VDC)



Ø D (D)	Ø D (P2)	Type
M18X1.5	M18X1.5	K91/1
3/8" BSP	1/2" BSP	K91/3
M18X1.5	M22X1.5	K91/9

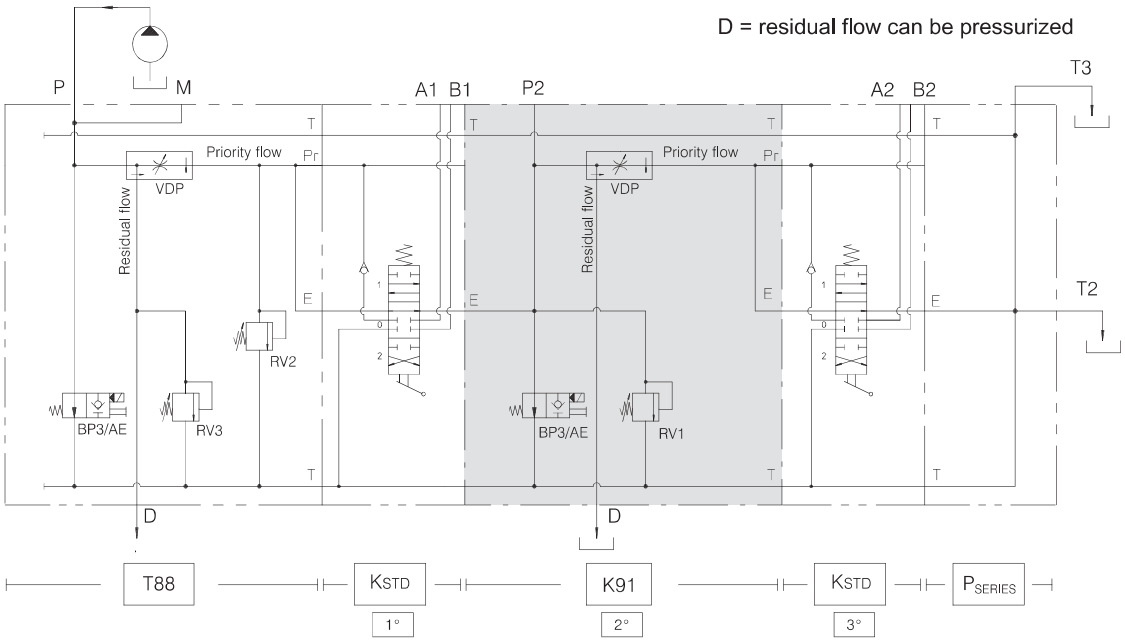


VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV1 – 06**
96 ÷ 210	150	**RV1 – 15**
150 ÷ 250	200	**RV1 – 20**
211 ÷ 320	250	**RV1 – 25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VDP 06**
0.5 ÷ 12	12	**VDP 12**
0.5 ÷ 25	25	**VDP 25**
0.5÷ 50	50	**VDP 50**

D = residual flow can be pressurized



Spool reversed to have the lever at the same side of the regulator knob.

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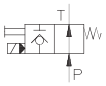
Directional Control Valve "HDM/HDS15"

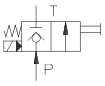
4.4.8 Sectional body K92

Intermediate section with priority flow regulator, pressure relief valves and by-pass valve. Residual flow directly to tank (cannot be pressurised). Suitable for circuits where there are several priority sections (Tie rods crossing holes instead of blind holes like in the standard priority sections)

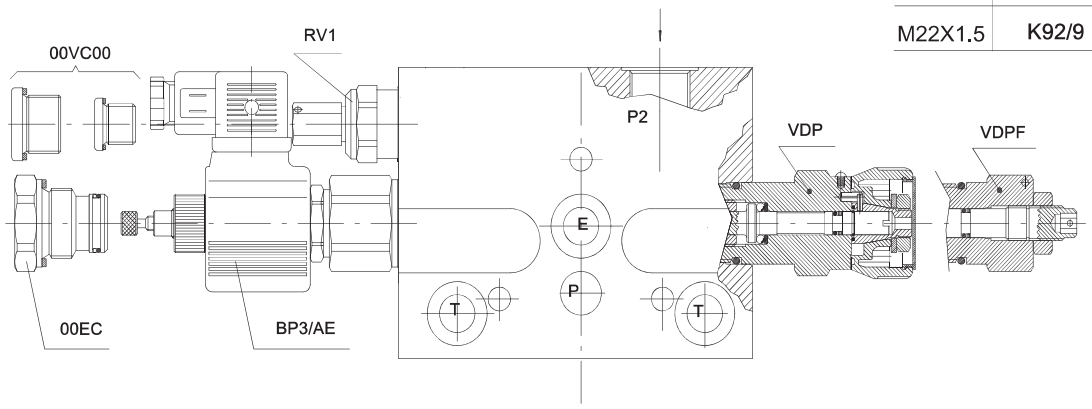
BP3/AE 13HC (12 VDC)
BP3/AE 23HC (24 VDC)



BP3/CE 13HC (12 VDC)
BP3/CE 23HC (24 VDC)



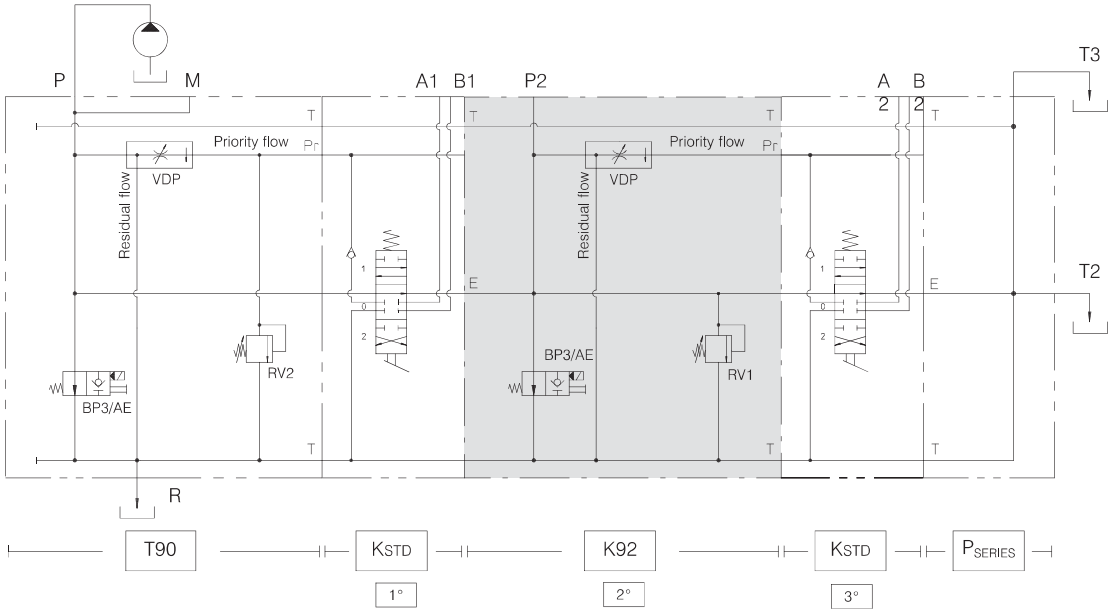
Ø D (P)	Type
M18X1.5	K92/1
1/2" BSP	K92/3
M22X1.5	K92/9



VDPF: 1 ÷ 50 l/min

Pressure set range (bar)	Standard Setting (bar)	Relief valves Type
30 ÷ 95	60	**RV1 –06**
96 ÷ 210	150	**RV1 –15**
150 ÷ 250	200	**RV1 –20**
211 ÷ 320	250	**RV1 –25**

Flow set range (l/min)	Standard Setting (l/min)	Flow regulator Type
0.5 ÷ 6	06	**VDP 06**
0.5 ÷ 12	12	**VDP 12**
0.5 ÷ 25	25	**VDP 25**
0.5÷ 50	50	**VDP 50**



Spool reversed to have the lever at the same side of the regulator knob.

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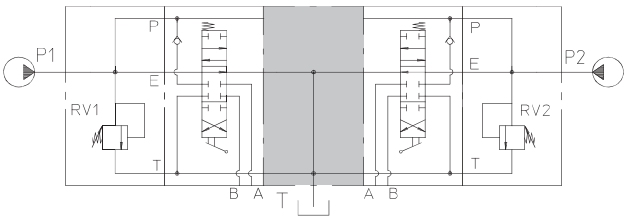
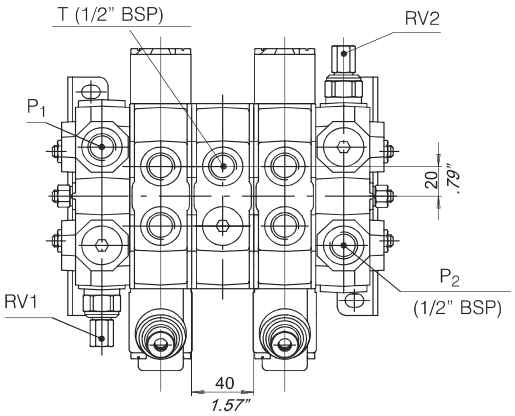
Directional Control Valve "HDM/HDS15"

4.5 Intermediate sections

4.5.1 Intermediate outlet section

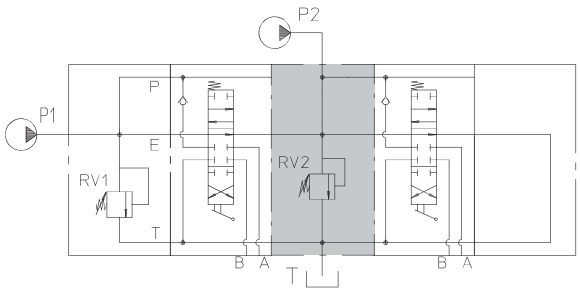
Type	Code
K83	200756200200

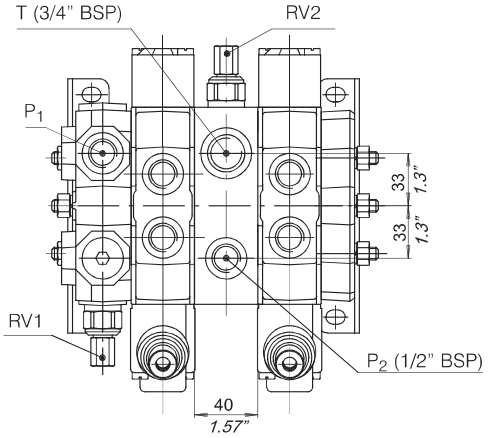




4.5.2 Intermediate inlet section with pressure relief valve (suitable for circuits with two pumps)

Type	Code
K84	200756200210





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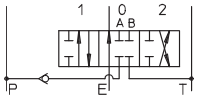
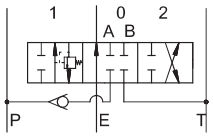
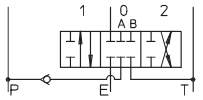
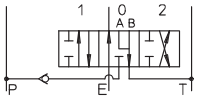
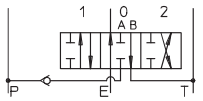
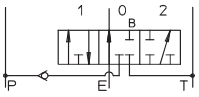
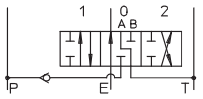
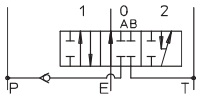
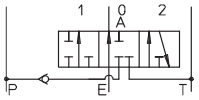
Directional Control Valve "HDM/HDS15"

5 Spools

5.1 Spool charts for HDS15 standard body (79 and 85 mm)

Spool Type	Hydraulic schematic	Features	Body / lever / positioner notes
A		4 way - 3 position A/B blocked - E open by-pass	Standard
AS		4 way - 3 position A/B blocked - E open by-pass High metering low flow spools	Standard
AXB		4 way - 3 position A/B blocked - E open by-pass High metering to tank positioner side (Specific for wheel loader)	Standard
APD		4 way - 3 position A/B blocked - E open by-pass Electromagnetic ON-OFF control	For push-pull ON-OFF section
AVM		4 way - 3 position Piloted differential pressure relief valve on B port (Fork Lift application)	Special body required
B		4 way - 3 position A/B blocked - E closed	Standard
C		4 way - 3 position A/B to tank in neutral - E open by-pass	Standard
CS		4 way - 3 position A/B to tank in neutral - E open by-pass High metering low flow spools	Standard
CPD		4 way - 3 position A/B to tank in neutral - E open by-pass Electromagnetic ON-OFF control	For push pull ON-OFF section
D		4 way - 3 position A blocked - B to tank in neutral	Standard
G		3 way - 3 position B blocked - E open by-pass	Standard
GS		3 way - 3 position B blocked - E open by-pass High metering low flow spools	Standard
L		4 way - 3 position B blocked - A to tank in neutral	Standard
R		4 way - 3 position with regenerative spool in 2nd pos.	Special body required
S		3 way - 3 position A blocked - E open by pass	Standard
SS		3 way - 3 position A blocked - E open by pass High metering low flow spools	Standard

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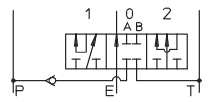
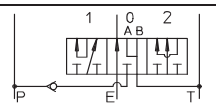
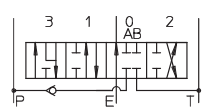
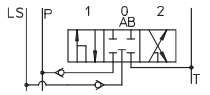
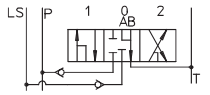
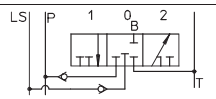
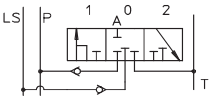
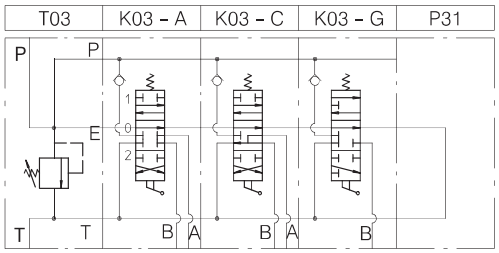
Directional Control Valve "HDM/HDS15"

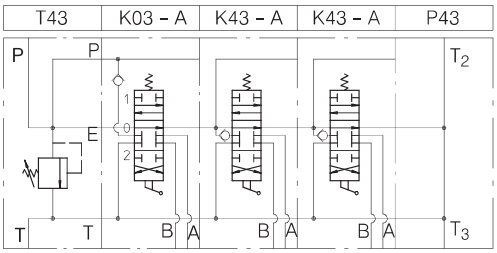
Spool Type	Hydraulic schematic	Features	Body / lever / positioner notes
X		4 way - 3 position A/B: blocked - series connection	Series body required
XS		4 way - 3 position A/B: blocked - series connection High metering low flow spools	Series body required
XC		4 way - 3 position A/B: to tank in neutral - series connection	Series body required
Z		4 way - 4 position 4th float position	Standard For version with UC valve on B port special lever L228 required
ZSS		4 way - 4 position 4th float position High metering low flow spools	Special body required
LSA		4 way - 3 position A/B: blocked - Load Sensing	For LS version - For the availability contact our Sales Dept. Special body required
LSC		4 way - 3 position A/B: to tank in neutral - Load Sensing	For LS version - For the availability contact our Sales Dept. Special body required
LSG		3 way - 3 position B: blocked - Load Sensing	For LS version - For the availability contact our Sales Dept. Special body required
LSS		3 way - 3 position A: blocked Load Sensing	For LS version - For the availability contact our Sales Dept. Special body required

5.1.1 Hydraulic circuit for HDS15 standard bodies

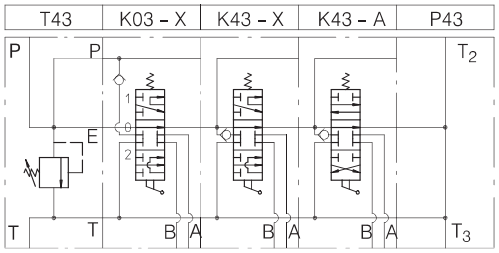
Standard parallel circuit



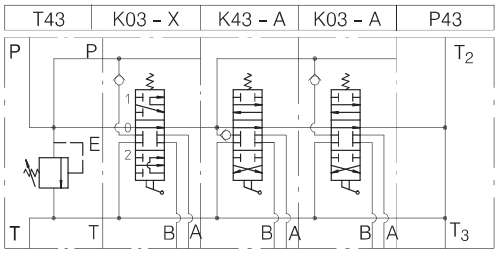
Optional tandem circuit



Optional series circuit



Combined parallel/series circuit



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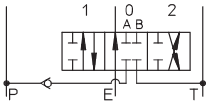
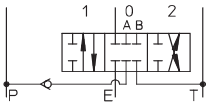
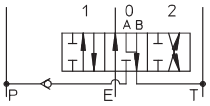
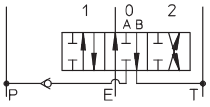
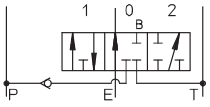
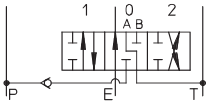
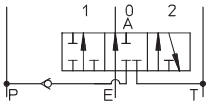
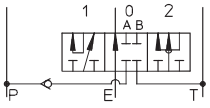
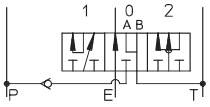
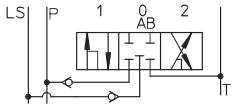
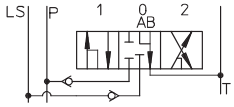
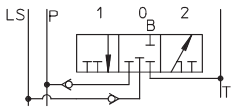
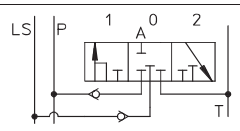
Directional Control Valve "HDM/HDS15"

5.2 Spool charts for HDS15 ON-OFF body

Spool Type	Hydraulic schematic	Features	Body notes
AE		4 way - 3 position A/B: blocked E: open by pass	Standard ON-OFF body
BE		4 way - 3 position A/B: blocked E: closed	Standard ON-OFF body
CE		4 way - 3 position A/B to tank in neutral E: open by pass	Standard ON-OFF body
DE		4 way - 3 position A: blocked B: to tank in neutral	Standard ON-OFF body
GE		3 way - 3 position B: blocked E:open by pass	Standard ON-OFF body
LE		4 way - 3 position B: blocked A: to tank in neutral	Standard ON-OFF body
SE		3 way - 3 position A: blocked E: open by pass	Standard ON-OFF body
XE		4 way - 3 position A/B: blocked series connection	Series body required
XCE		4 way - 3 position A/B: to tank in neutral series connection	Series body required
LAE		4 way - 3 position A/B: blocked Load Sensing	For LS version - For the availability contact our Sales Dept.
LCE		4 way - 3 position A/B to tank in neutral Load Sensing	For LS version - For the availability contact our Sales Dept.
LGE		3 way -3 position B: blocked Load Sensing	For LS version - For the availability contact our Sales Dept.
LSE		3 way - 3 position A: blocked Load Sensing	For LS version - For the availability contact our Sales Dept.

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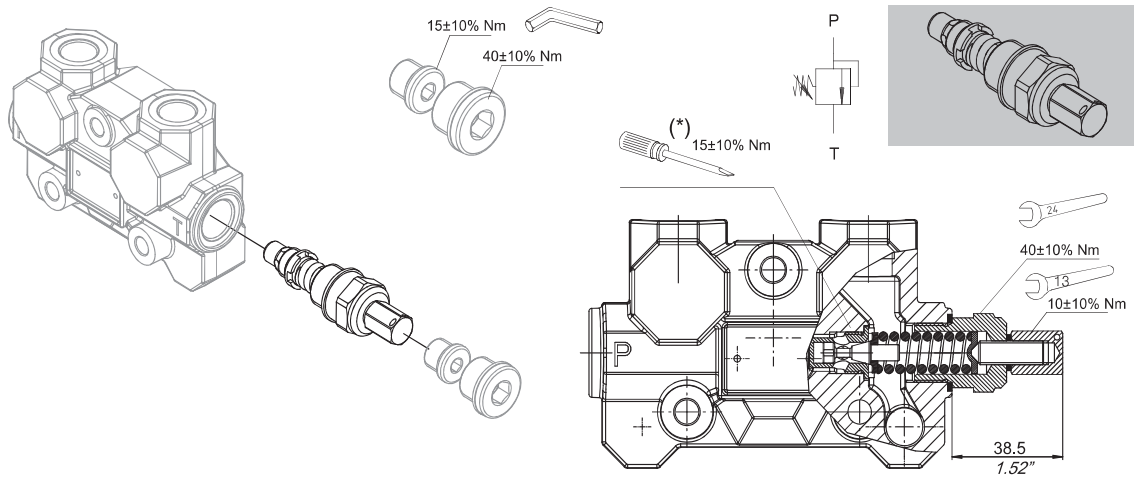
Directional Control Valve "HDM/HDS15"

6 Valves

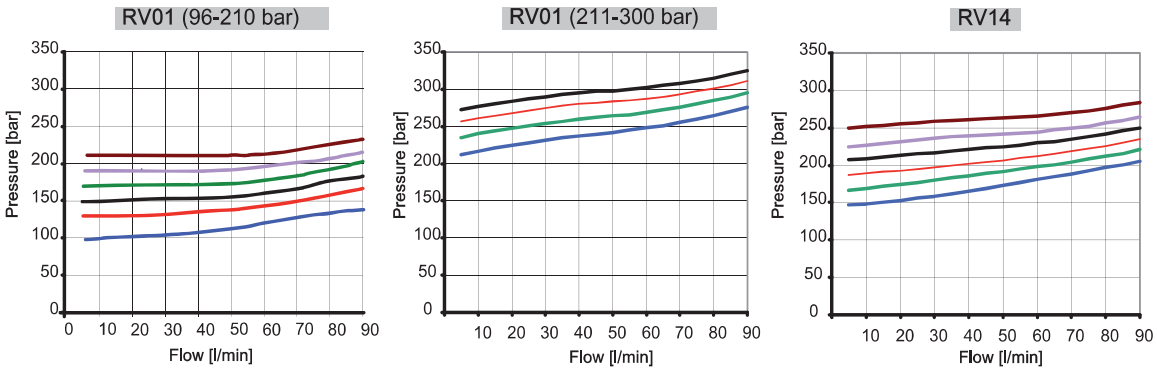
6.1 Direct acting relief valve



A tamper proof shrinkable-sheat can be supplied if requested

Pressure set range bar *(PSI)*	Type	Code	Spring code	Std. setting bar *(PSI)*	Setting code	Spring colour
15-30 *(215-430)*	RV01-02	200787400700	200662401470	-	-	-
30-95 *(430-1370)*	RV01-06	200787400720	200662401450	60 *(870)*	06	Yellow (YE)
96-210 *(1370-3040)*	RV01-15	200787400740	200662401480	150 *(2170)*	15	Green (GR)
150-250 *(2170-3620)*	RV14-20	200787402970	200662402400	200 *(2900)*	20	-
211-300 *(3040-4350)*	RV01-26	200787400710	200662401460	260 *(3770)*	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.



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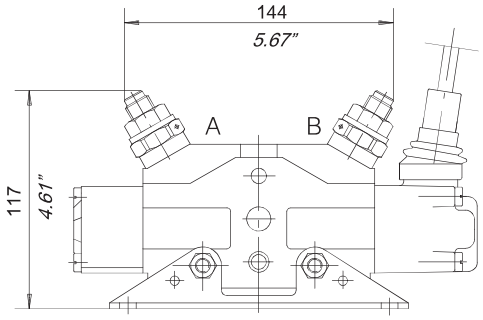
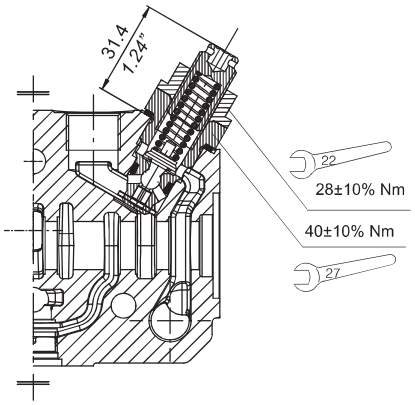
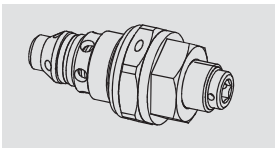
Directional Control Valve "HDM/HDS15"

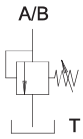
6.2 Anti shock and anti-cavitation valves

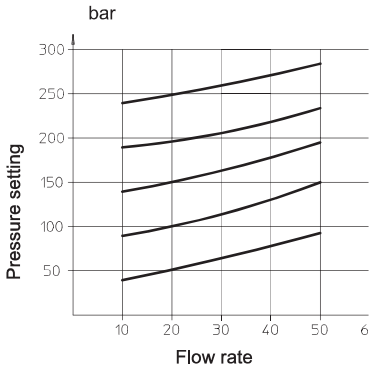


6.2.1 Port relief valve OA





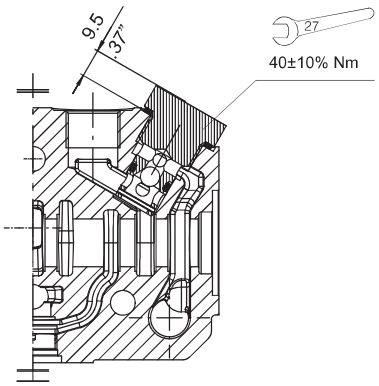


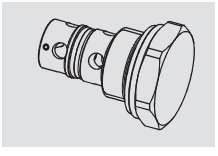


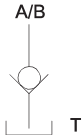
Pressure set range bar *(PSI)*	Type	Code	Spring code	Std. setting bar *(PSI)*	Setting code	S c
30 - 80 (430-1160)	OA/A05 OA/B05	200787403090	200662402570	50 (720)	05	V (
81 - 130 (1160-1880)	OA/A10 OA/B10	200787400950	200662401150	100 (1450)	10	Y
131-350 (1880-5070)	OA/A15 OA/B15	200787400960	200662401160	150 (2170)	15	C (
VC (Plugged valve)		200778400050	-			

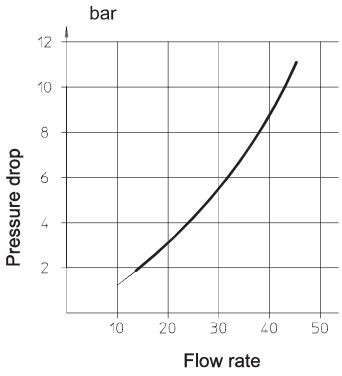
Setting is made, at required pressure, with flow Q = 16 l/min

6.2.2 Anti-cavitation valve C









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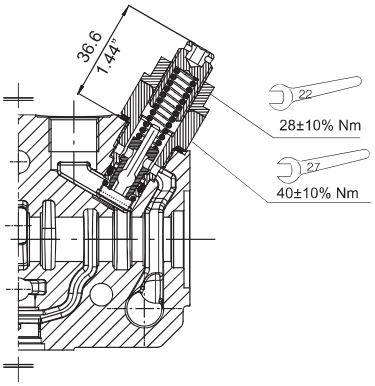
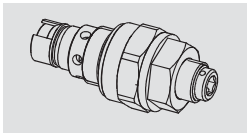
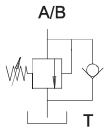
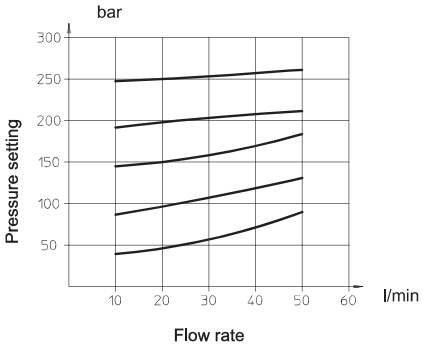
Directional Control Valve "HDM/HDS15"

6.2.3 Combined port relief and anti-cavitation valve UC





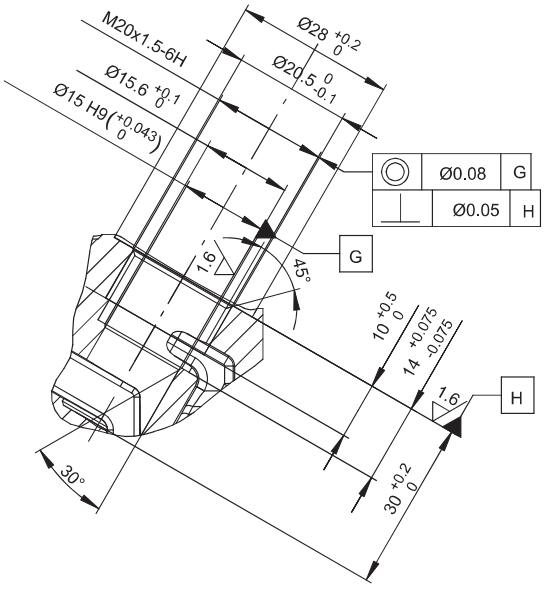


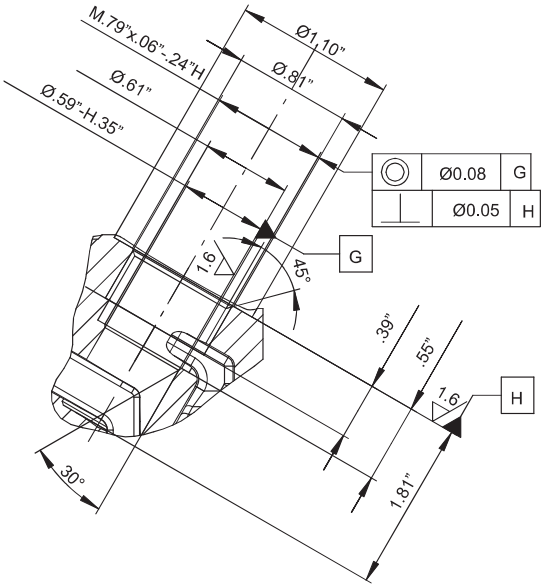


Pressure set range bar *(PSI)*	Type	Code	Spring code	Std. setting bar *(PSI)*	Setting code	Spring colour
0-130 (0-1880)	UC/A06 UC/B06	200787401310	200662401150	60 (870)	05	Yellow (YE)
131-350 (1880-5070)	UC/A15 UC/B15	200787401320	200662401160	150 (2170)	15	Green (GR)
VC (Plugged valve)		200778400050	-			

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

6.2.4 Service port valves cavity





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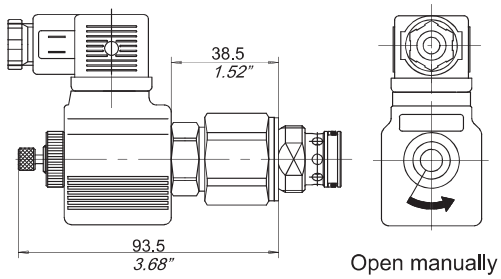
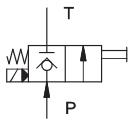
Directional Control Valve "HDM/HDS15"

6.3 By-Pass solenoid valve - BP2 -

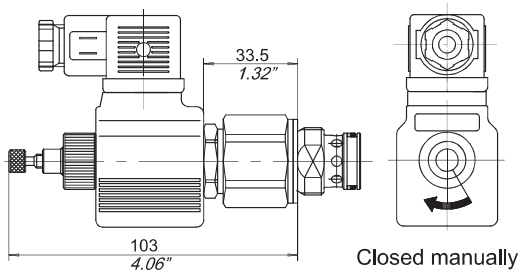
6.3.1 Normally closed with manual override



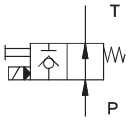
Voltage	Type	Code
Without coil	BP2/CE HDS15 p.m.	200757200440
12 V.D.C.	BP2/CE 13-HC27 HDS15	200757010062
24 V.D.C.	BP2/CE 23-HC27 HDS15	200757020069



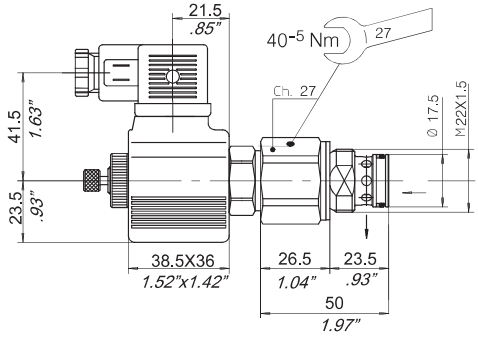
6.3.2 Normally open with manual override



Voltage	Type	Code
Without coil	BP2/AE HDS15 p.m.	200757200450
12 V.D.C.	BP2/AE 13-HC27 HDS15	200757010063
24 V.D.C.	BP2/AE 23-HC27 HDS15	200757020070



6.3.3 Dimension



BP2 Solenoid valve performance	
Max pressure	315 bar
Max flow	60 l/min
Power	27 Watt
Intermittence	ED 100%
Voltage tolerance	±10%
Temperature range	-20/+80 °C
Oil filtration	≤25 micron
Pressure drop Q= 30 l/min	7.5 bar
Pressure drop Q= 50 l/min	12.7 bar

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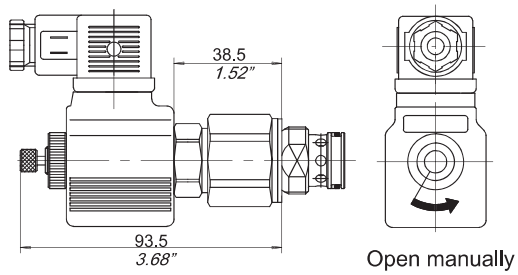
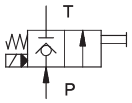
Directional Control Valve "HDM/HDS15"

6.4 By-Pass solenoid valve - BP3 - for PQ elements

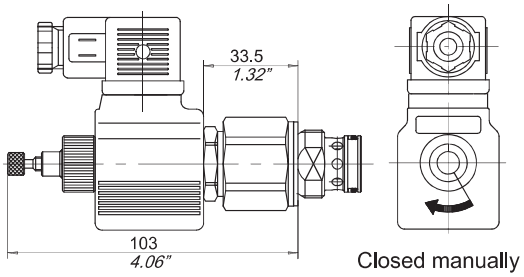
6.4.1 Normally closed with manual override



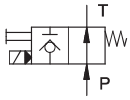
Voltage	Type	Code
Without coil	BP3/CE HDS15 p.m.	200757200480
12 V.D.C.	BP3/CE 13-HC27 HDS15	200757010064
24 V.D.C.	BP3/CE 23-HC27 HDS15	200757020071



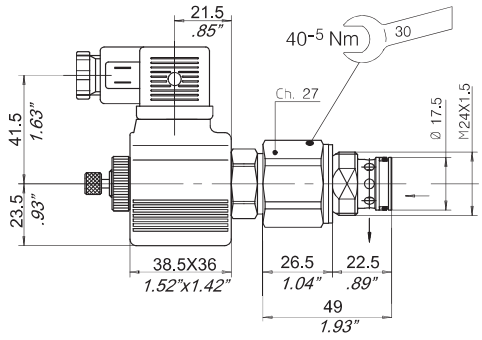
6.4.2 Normally open with manual override



Voltage	Type	Code
Without coil	BP3/AE HDS15 p.m.	200757200490
12 V.D.C.	BP3/AE 13-HC27 HDS15	200757010065
24 V.D.C.	BP3/AE 23-HC27 HDS15	200757020072



6.4.3 Dimension



BP2 Solenoid valve performance	
Max pressure	315 bar
Max flow	60 l/min
Power	27 Watt
Intermittence	ED 100%
Voltage tolerance	±10%
Temperature range	-20/+80 °C
Oil filtration	≤25 micron
Pressure drop Q= 30 l/min	7.5 bar
Pressure drop Q= 50 l/min	12.7 bar

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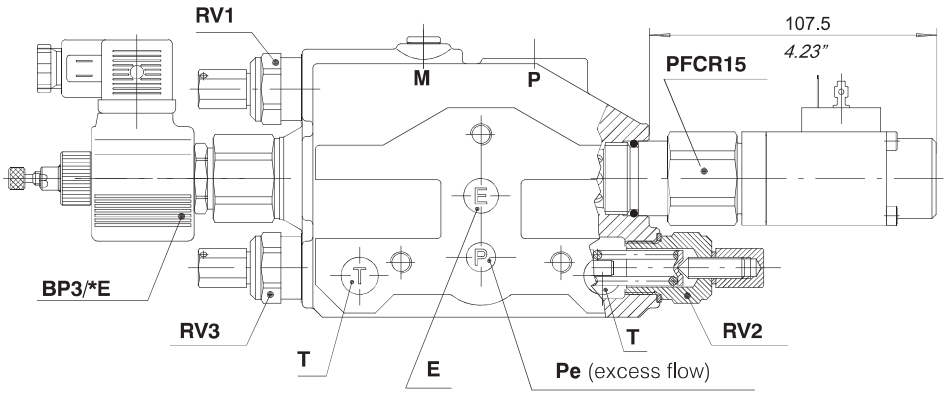
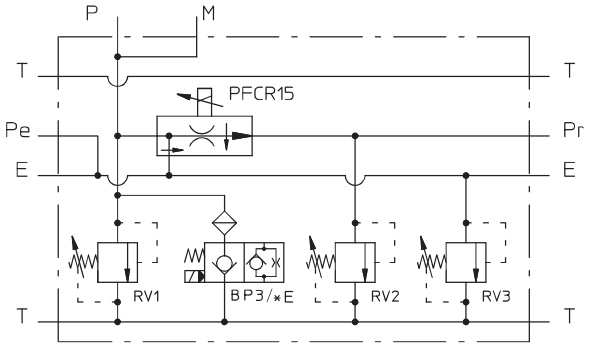
Directional Control Valve "HDM/HDS15"

6.5 Proportional Flow Control PFCR15

6.5.1 Example of application on K100 body



6.5.2 Example of hydraulic scheme K100



6.5.3 Electric performances

Coil according to	VDE 0580
Connector type	DIN 43650
Max. current	0.75 A (24 V. DC)
Duty rating	ED= 100%
Suggested dither	110 Hz
Insulation class with std. plug	IP54 (DIN 40050)

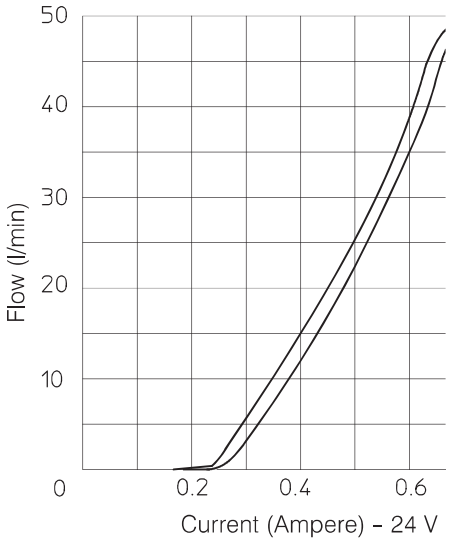
Voltage ±5%	12	24	V (DC)
Nominal current	1.25	0.68	Ampere
Resistance at 20°C	7.2	24.6	Ohm
Nominal power	17.2	17.4	watt

6.5.4 Code

6.5.5 Hydraulic performances

Max. pressure	270
Max. recommended pressure	230
Regulated flow range	0.5 - 4
Temperature range	-5/+7

6.5.6 Current/flow regulated diagram



Performance recorded with:
24 VDC Proportional Coil
Pressure on priority flow channel: 100 bar
No pressure on the residual flow channel:
Minimum current: 0 Ampere
Maximum current: 1.05 Ampere
Ramp UP: 30 sec - Ramp DOWN: 30 sec
Oil temp.: 50° C - Oil viscosity: 23 cSt

(* code without connector)

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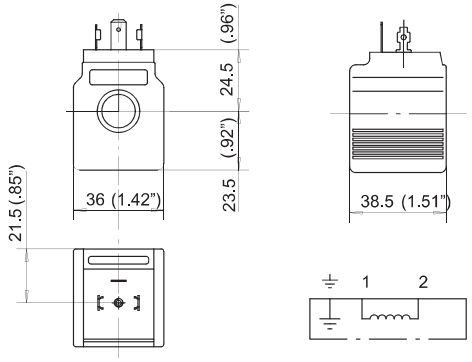
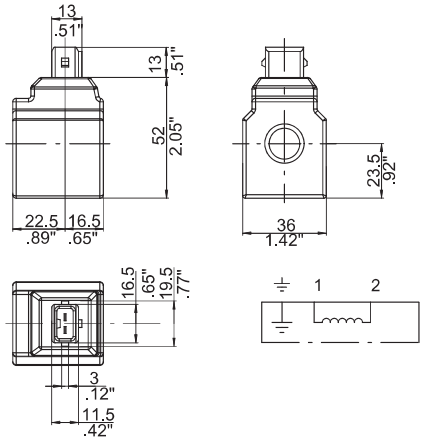
Directional Control Valve "HDM/HDS15"

6.6 Coils for solenoid valves

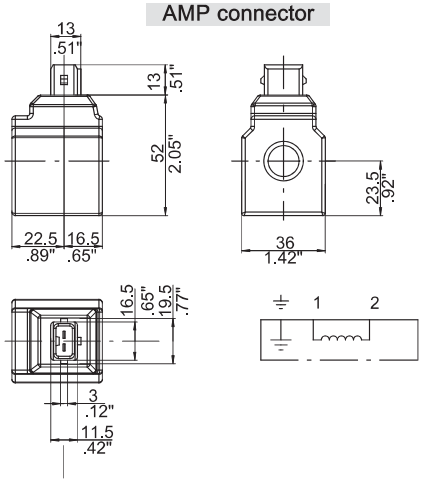
DIN connector



AMP connector



AMP connector



Diode

For solenoid valve series	
Wire class	H (VDE0580)
Protection	IP65 (DIN40050)
Coil insulation	F
Duty rating	ED 100%
Voltage tolerance	± 10%

Connector style	Nominal Coil voltage	Power (Watt)	Resistance (Ohm) **Ambient temp.**	Current (Ampere) **Ambient temp.**	Coil code
DIN	12 V. DC.	27.2	5.3	2.2	200674910100
	24 V. DC.	27	21.3	1.12	200674920080
AMP	12 V. DC.	27.2	5.3	2.2	200674910250
	24 V. DC.	27	21.3	1.12	200674920200
AMP + DIODE	12 V. DC.	21	6.85	1.75	200541210032
	24 V. DC.	21	27	0.78	200541210033

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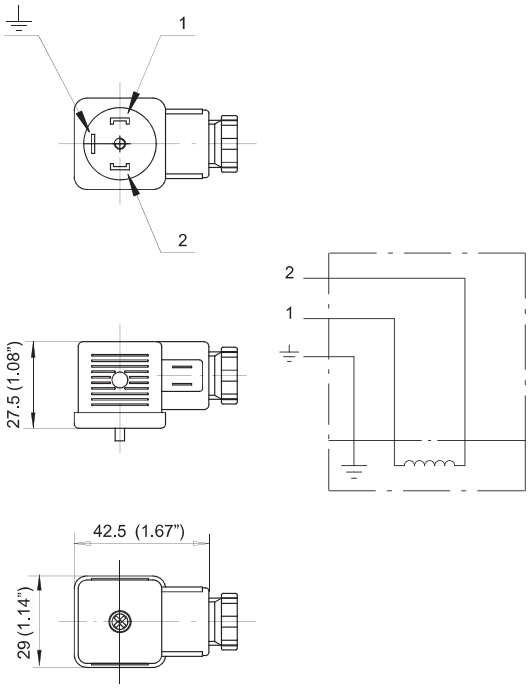
Directional Control Valve "HDM/HDS15"

6.6.1 Connector for DIN type solenoids

Code 200544110009



For power input	D.C.
Connector type	DIN 43650
Number of poles	2 + ⏚
Supply voltage	max. 220 V.
Nom. capacity at contacts	10 A.
Max capacity at contacts	16 A.
Resistance at contacts	≥ 4 mOhm
Max section of cable	1.5 mm^2
Outer material	Glass fibre reinforced Nylon
Contact mount material	
Color	Black
Armour clamp	Pg 9
Ø cable	6-8 mm.
Protection factor	IP65 (DIN40050)
Insulation class	C (VDE0110)
Temperature range	-40 / +90 °C

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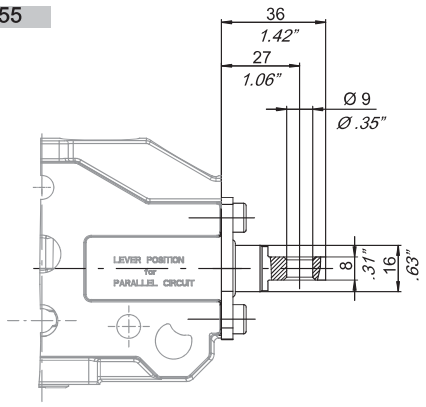
Directional Control Valve "HDM/HDS15"

7 Levers

7.1 Free end spool with dust proof seal

L55



1	0	2

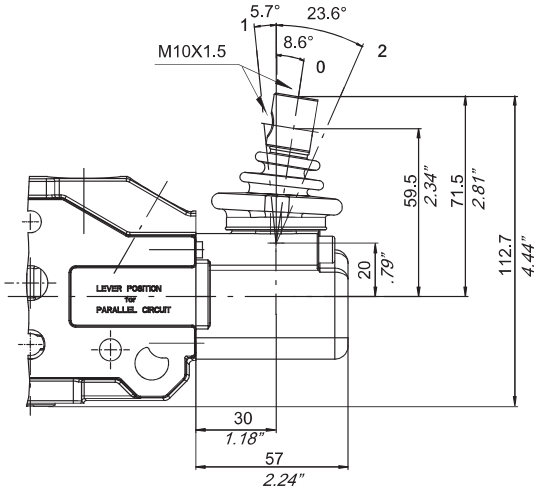
Code: 200707190040

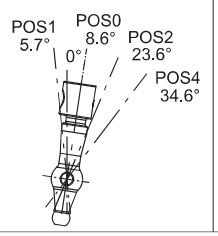
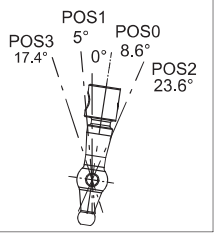
7.2 Standard lever group

2	0	1

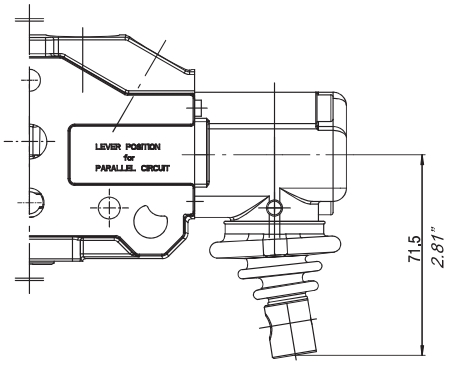
L100: code 200707120340

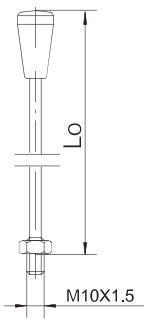
1 - 2 standard stroke 5-5
0 neutral position



Floating position W spool - Stroke: 5-5-9	Floating position Z spool - Stroke: 5-5-9
	

L300





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

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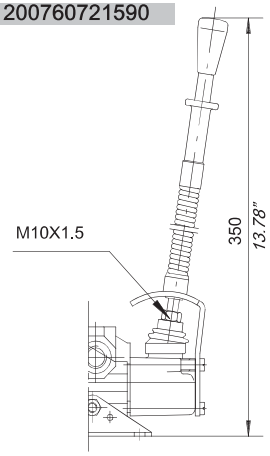
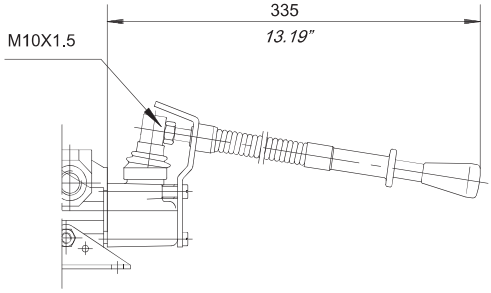
Directional Control Valve "HDM/HDS15"

7.3 Safety levers

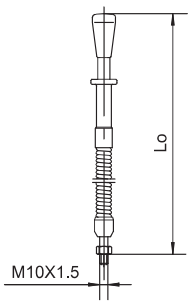
L50: code 200760721590



L51: code 200760721600



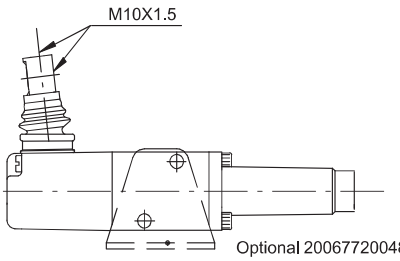
AL056



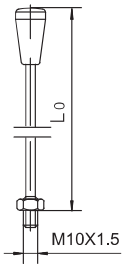
Lo		Type	Code
mm	inches		
279	10.98	AL056	200760721590

7.4 Remote cable control

Lever support code: 200760900130

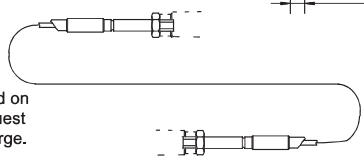


AL00*



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

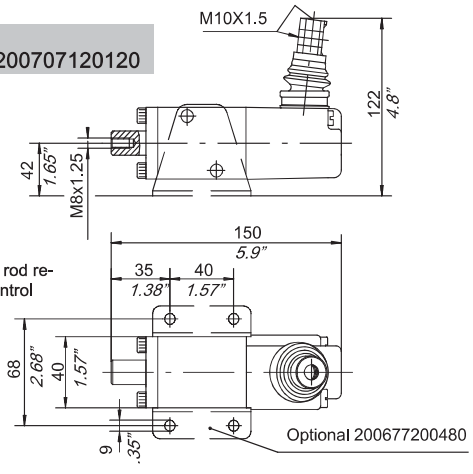
Cable



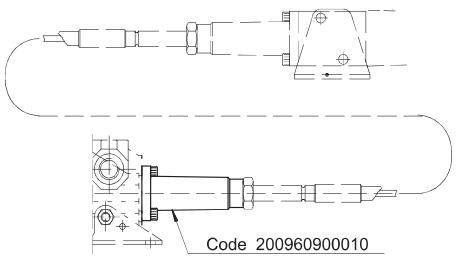
Cables are assembled on the valve only on request and with an extra charge.

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



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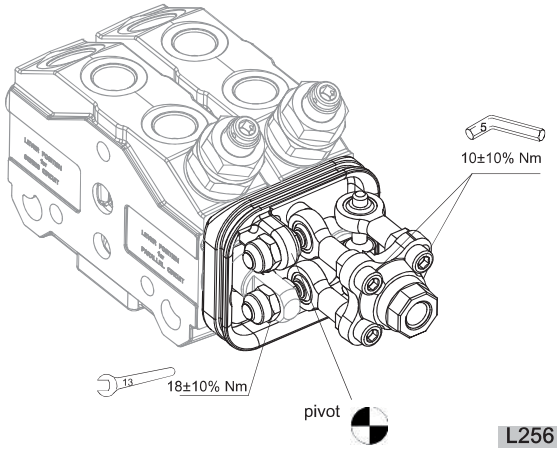
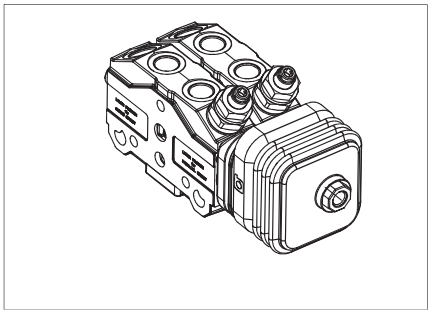
Directional Control Valve "HDM/HDS15"

7.5 Joystick control L256 - 456

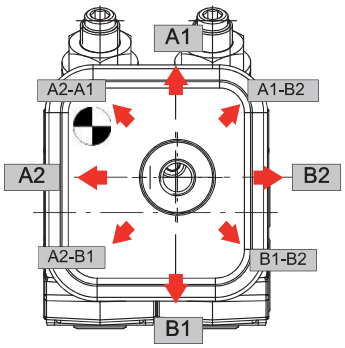
Code: 200775930370

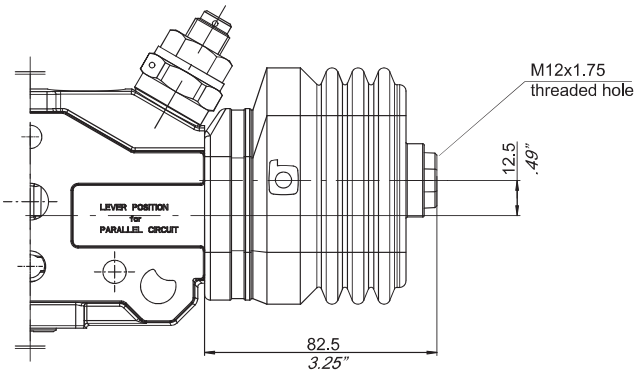




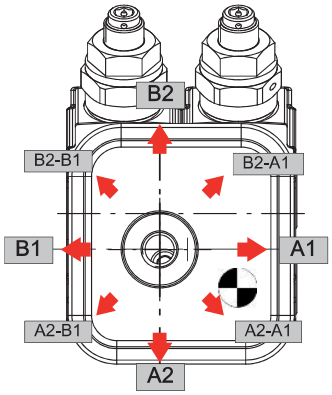
L256

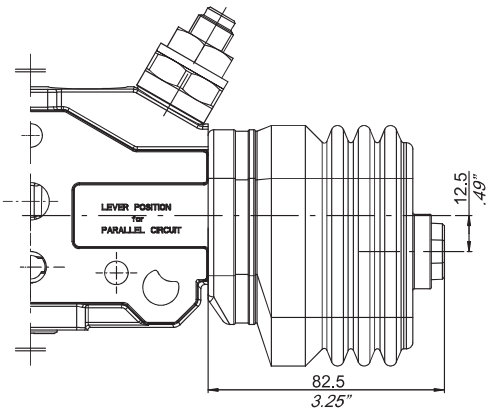
PORT SIDE



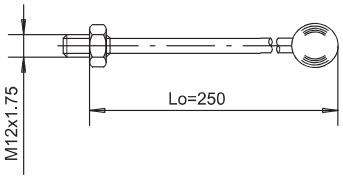


L456





AL010
Code: 200702230040



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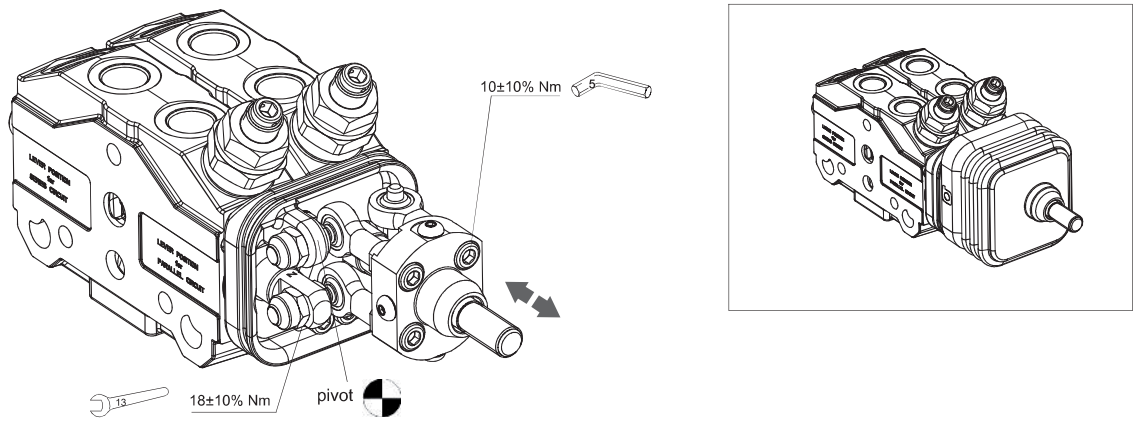
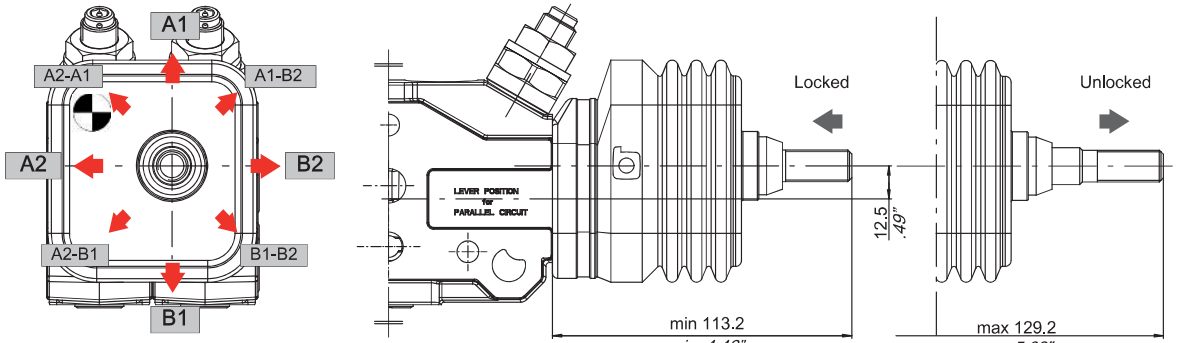
Directional Control Valve "HDM/HDS15"

7.6 Joystick control L263 - 463 with integrated locking system

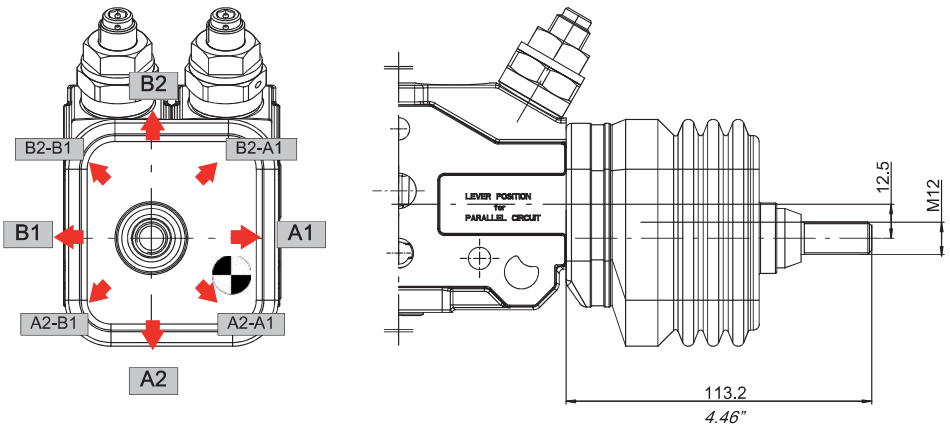
Code: 200775930390



L263



L463



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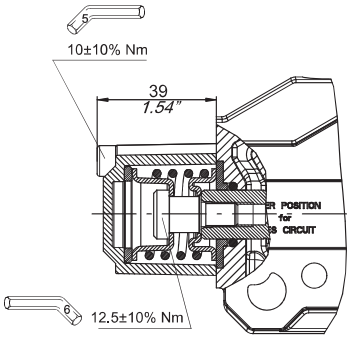
Directional Control Valve "HDM/HDS15"

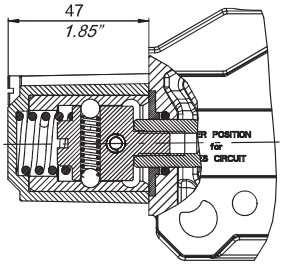
8 Positioners

8.1 Spring return to neutral position



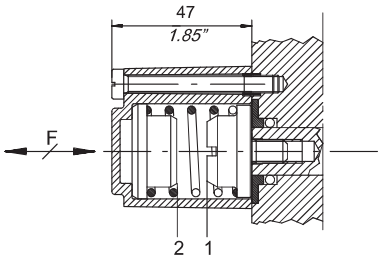
Type	Code	Spring code	Colour	Scheme
08	200968610080	200662402410	YELLOW	1 0 2
38	200968610690	200662401521	YELLOW	1 0
79	200968610910	200662402430	BLACK	1 0 2
133	200968610310	200662402450	WHITE	1 0 2

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



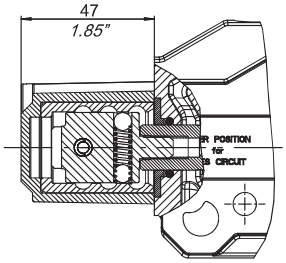
Type	Code	Main spring code	Scheme
10	200968630040	200662401240	1 0 2
20	200968630090	200662400860	1 0 2
29	200968630250	200662401240	0 2

8.3 Spring return to position 1 or 2



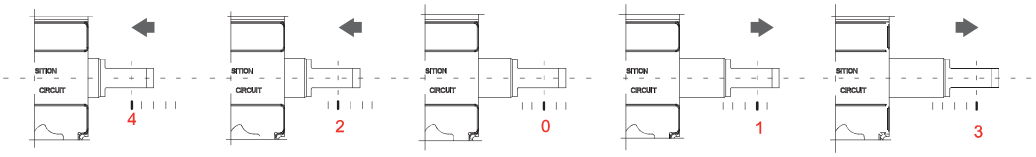
Type	Code	Spring code	Scheme
27	200968610440	200662401521	1→2 1 0 2
37	200968610660	200662401521	1←2 1 0 2

8.4 Hand lever in detent position



Type	Code	Spring code	Scheme
17	200968620140	-	1 0 2
25	200968620150	-	0 2
36	200968620170	-	1 0 2

Spool positions



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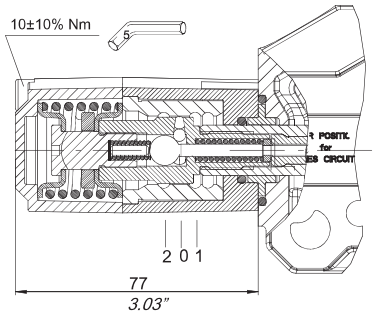
Directional Control Valve "HDM/HDS15"

8.5 KicK-out

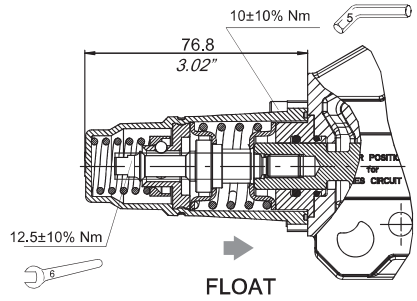


Type	Code	Main spring code	Scheme
358	200968630471	200662401521	

Standard kick-out setting: 150 bar

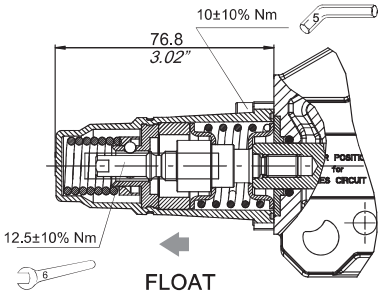
8.6 Detent in floating position and spring return to neutral from position 1 and 2

Floating position pulling the spool (Z type)



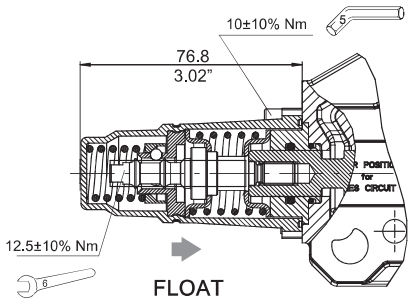
Type	Code	Main spring	Detent spring
341	200968640660	BLACK	WHITE
355	200968640720	BLACK	BLACK

Floating position pushing the spool (W type)



Type	Code	Main spring	Detent spring
354	200968640710	YELLOW	WHITE

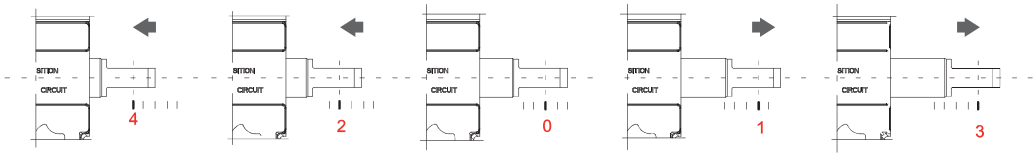
Floating position pulling the spool (Z type)



Type	Code	Main spring	Detent spring
366	200968640760	WHITE	BLACK

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

Spool positions



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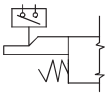
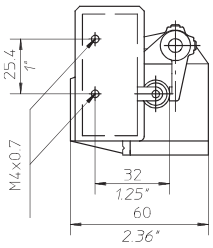
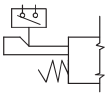
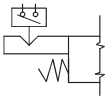
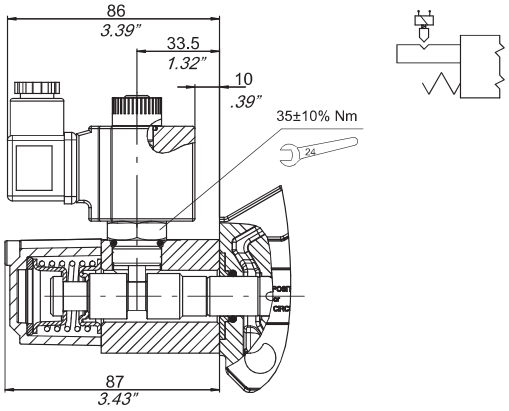
Directional Control Valve "HDM/HDS15"

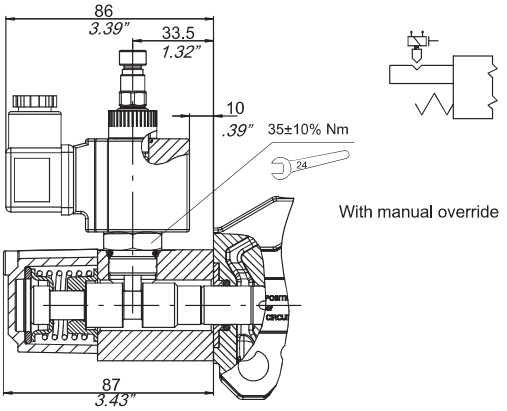
8.7 Microswitch control for multisectional directional valve

Type	Code	Feature	Hydraulic scheme	
30	200968610480	Microswitch is operated when the spool is switch to pos. 1		
32	200968610610	Microswitch is operated when the spool is in pos. 2		
34	200968610650	Microswitch is operated when the spool is in pos. 1 and 2		

The microswitch is supplied only on customer's request.

8.8 Electro-mechanical locking system (normally locked)





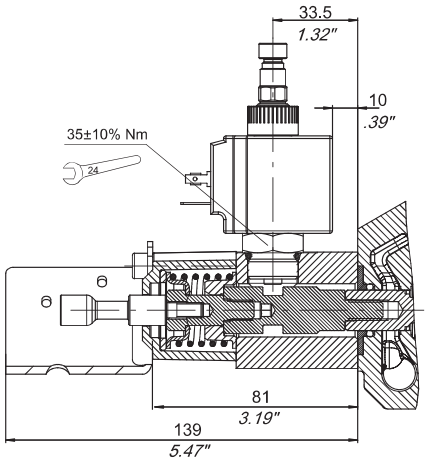
With manual override

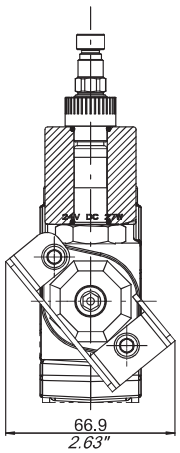
Type	Code
379	200768690080

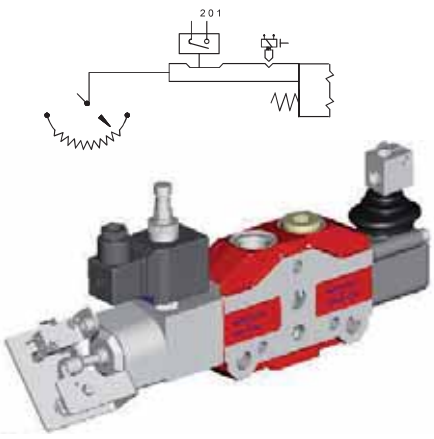
Type	Code
380	200768690130

For solenoids features see chapter 6.6

8.9 Electro-mechanical locking system (normally locked) with micro and potentiometer predisposal







Type	Code (Without micro and potentiometer)
381	200768611960

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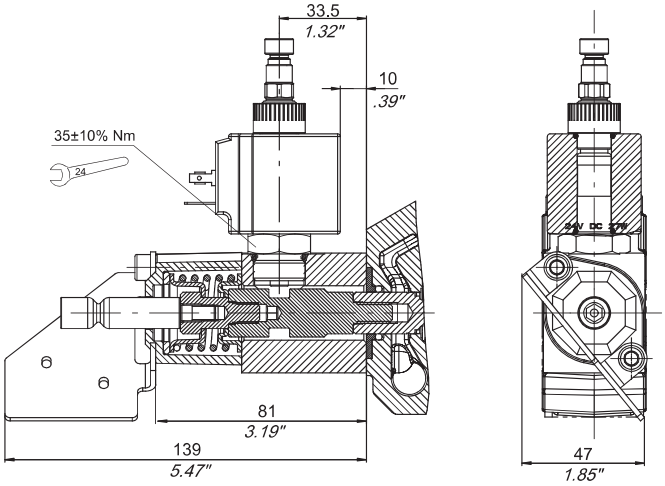
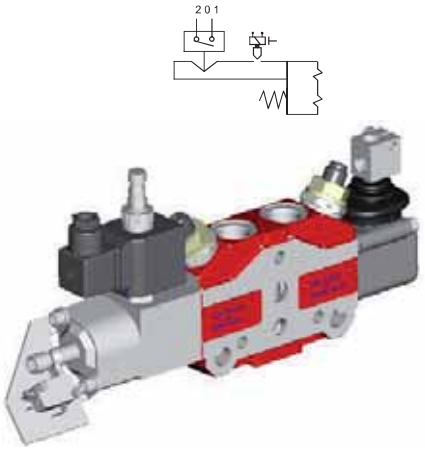
Directional Control Valve "HDM/HDS15"

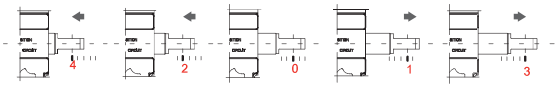
8.10 Electro-mechanical locking system (normally locked) with micro predisposal



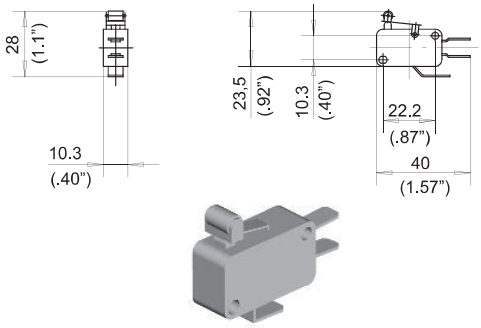


Type	Code (Without micro)
382	200768611970

Spool positions

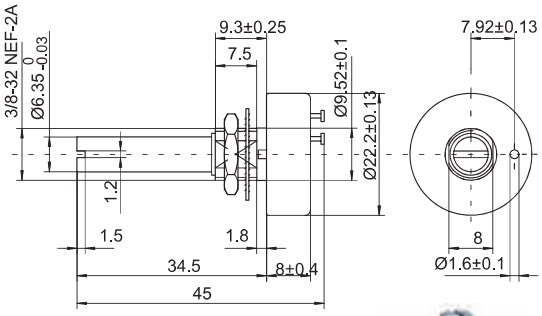


8.11 Microswitch



Code (micro only)	200544124017
Complete code (micro + fixing kit)	200962500080
Voltage	250 V
Max current	26 A.
Index protection	IP40
Mechanical life	2.5x10^5 cycles

8.12 Potentiometer



Code	200587344012
Independent linearity	A ≤ ± 2%
Actual electrical angle (AEA)	340° ± 5°
Ohmic values (RT)	5 KΩ
Ohmic value tolerances at 20°C	±20%
Maximum power rating at 70°C	0.3Ω
Insulation resistance	≥ 1000 MΩ, 500 VDC
Dielectric strength	≥ 500VRMS, 50Hz
Life (10^6 cycles)	5 to 10
Temperature range	-55°C, +125°C

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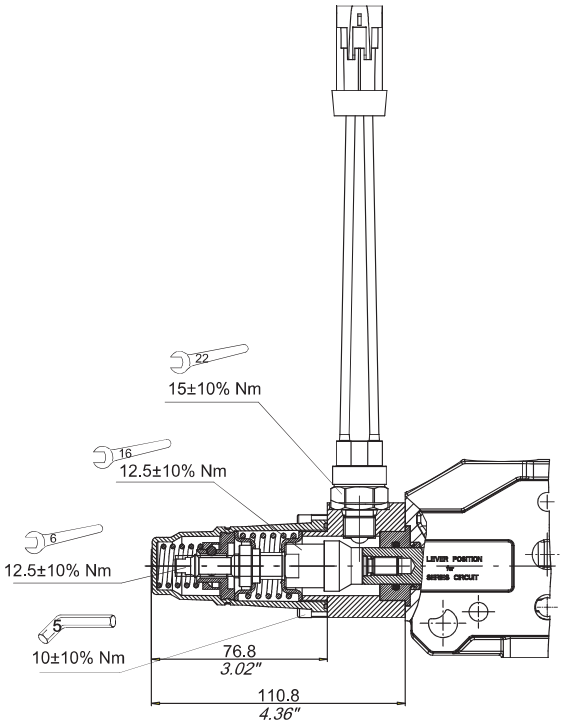
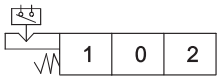
Directional Control Valve "HDM/HDS15"

8.13 Microswitch positioners

8.13.1 Spool movement 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	

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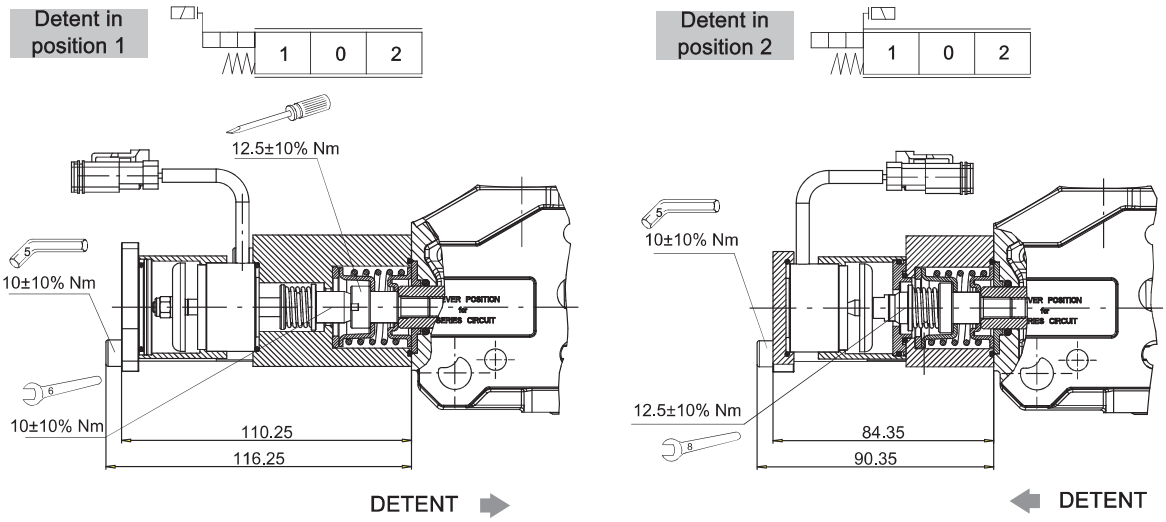
Directional Control Valve "HDM/HDS15"

8.14 Electro-magnetic detent positioners (EMD)

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



8.14.1 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	200768670160	RED	12 VDC	137 N	DEUTSCH DT06-2S	2
363	200768670150	RED	12 VDC	137 N	DEUTSCH DT06-2S	1

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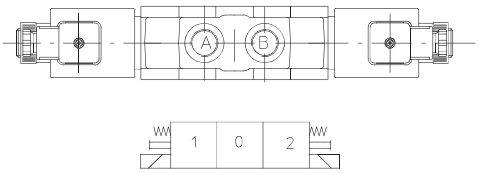
Directional Control Valve "HDM/HDS15"

8.15 Spool actions for ON-OFF control

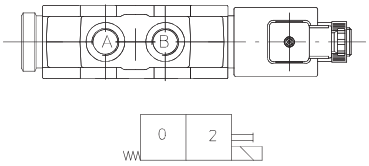
Double acting

Type 01E



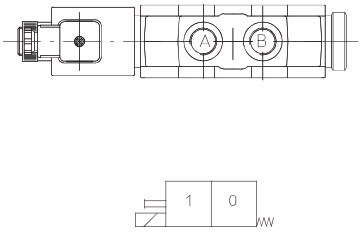
Single acting port "B"

Type 02E



Single acting port "A"

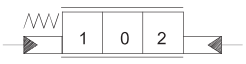
Type 03E

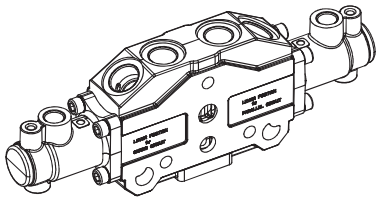


Solenoid specificastions			
Voltage	V.D.C	12±10%	24±10%
Power consumption	Watts (W)	34	
Intensity of current	Ampere (A)	2.8	1.4
Temperature range	Ohms (Ω)	4.2	17.1
Duty cycle (continuous)	ED	100%	
Ambient temperature	°C	-20 to 50	
Protection class	DIN40050	IP65	
Connection		DIN43650	
Manual override		Push type	

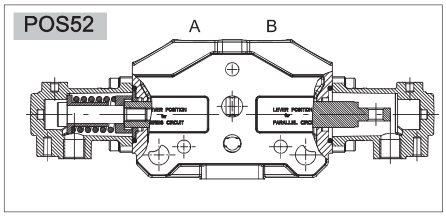
8.16 Hydraulic control (HP)

Type	Code
50-52	200768650632

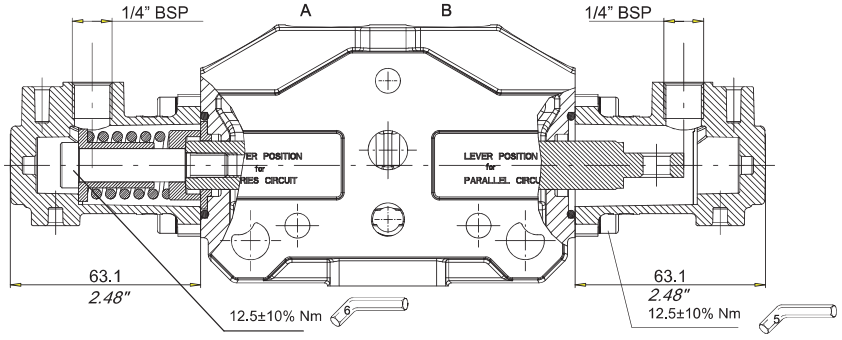




POS52

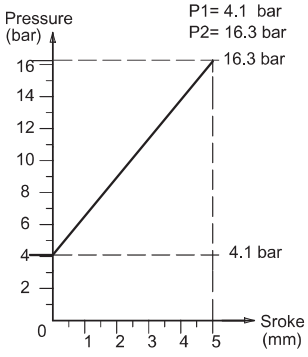


POS50



A special body with four lever/positioner fixing holes is requested.

Spring characteristic curve



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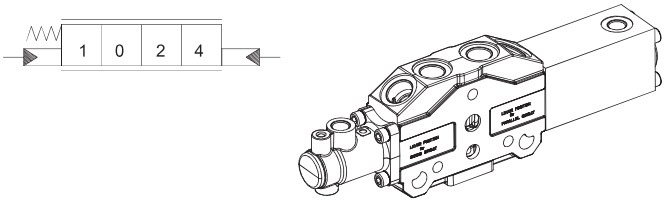
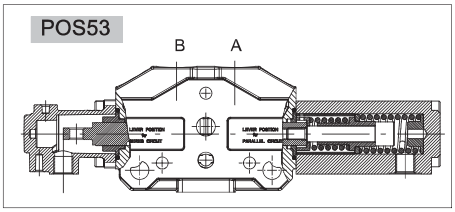
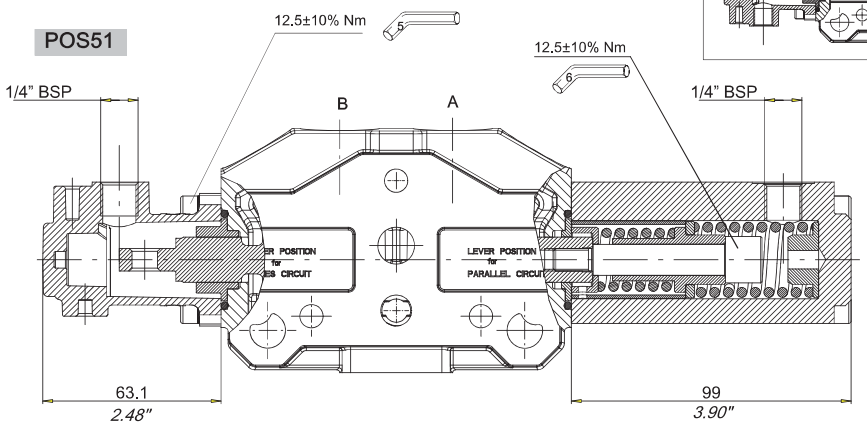
Directional Control Valve "HDM/HDS15"

8.17 Hydraulic control (HP) + floating position

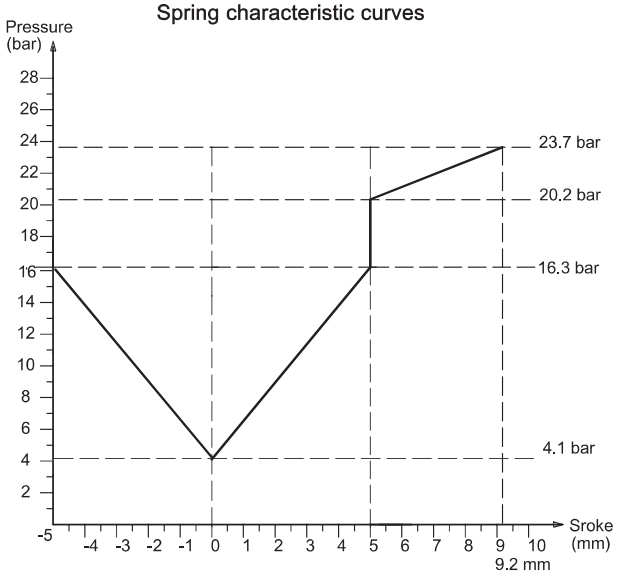
Type	Code
51-53	200968650641





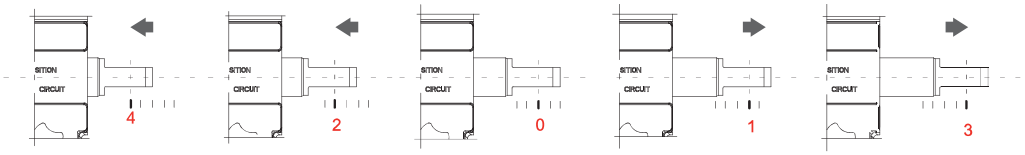


Spring characteristic curves



A special body with four lever/positioner fixing holes is requested.

Spool positions



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Directional Control Valve "HDM/HDS15"

8.18 Spool position transducer

8.18.1 Features

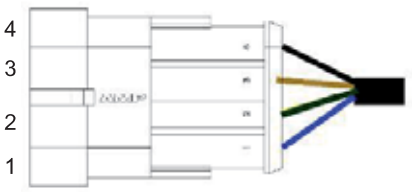
Code : 200544124026
Position transducer.
± 7,5 mm linear stroke.
Hall effect sensor

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

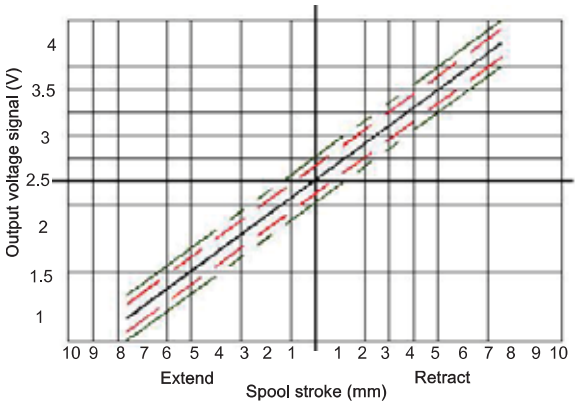
Electrical specifications - Linear, Hall-effect sensor	
Power Supply Voltage	6 ÷ 32 Vdc
Current Consumption	< 15 mA
Output signal in Neutral	2,5V
Output signal range	1 V ÷ 4 V
Tolerance on output signal	± 0,1 V
Maximum linearity error (-25 ÷ 85°C)	3%
Maximum linearity error (85 ÷ 105°C)	5%
Electrical stroke linearity range	± 7,5mm
Electrical life	10 Million cycles

Electrical Connections (proportional version)

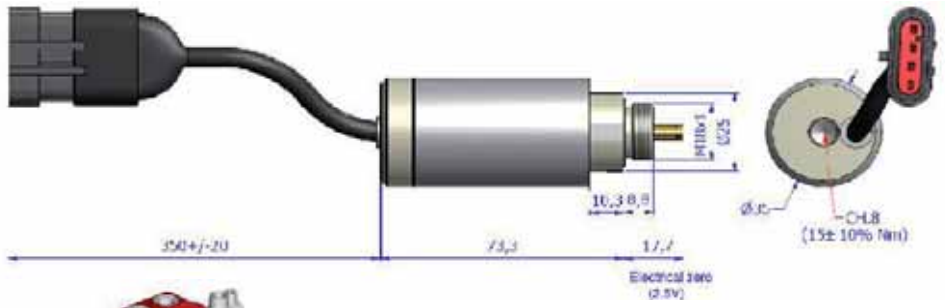
1. Vcc - Blue
2. Gnd - Green/Yellow
3. Proportional Output - Brown
4. n.u. - Black



Output signal control characteristic (proportional version)



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



HP

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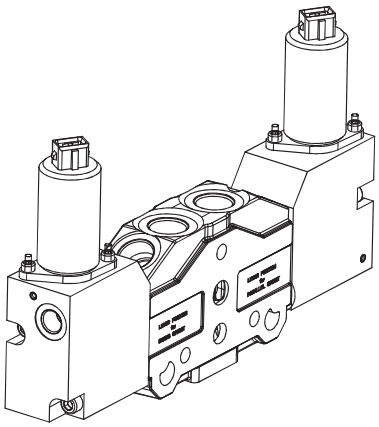
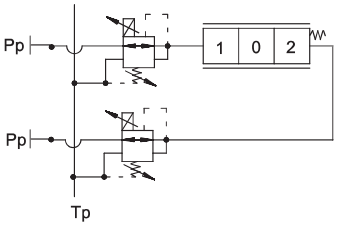
Directional Control Valve "HDM/HDS15"

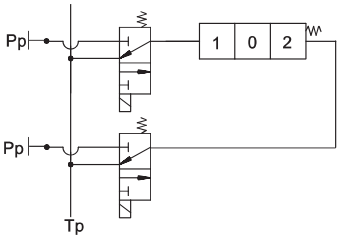
8.19 Electro-hydraulic open loop proportional / ON-OFF control (EHO)



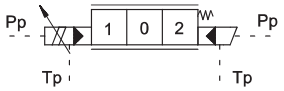
Complete PROPORTIONAL scheme



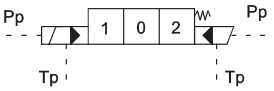
Complete ON-OFF scheme

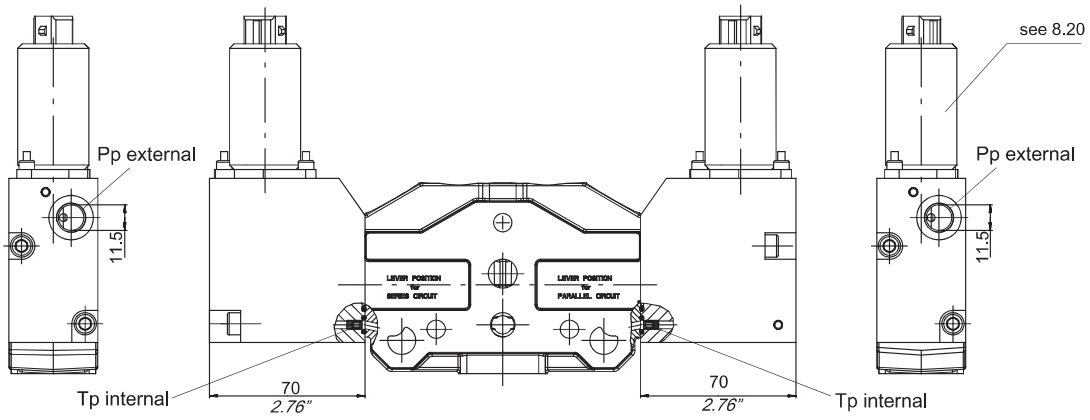


Simplified PROPORTIONAL scheme



Simplified ON-OFF scheme



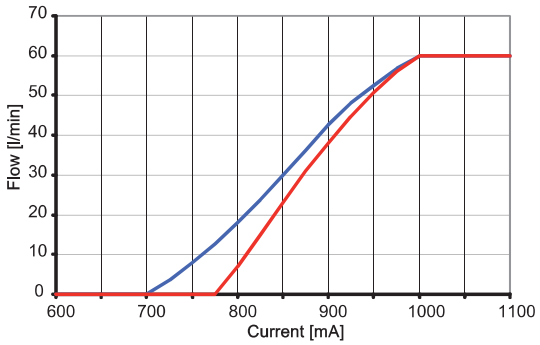


Control	Type	Code	Voltage	Connector
Proportional	420	200768660680	12 VDC	AMP 84-9419
ON-OFF	425	200768660740	12 VDC	AMP 84-9419

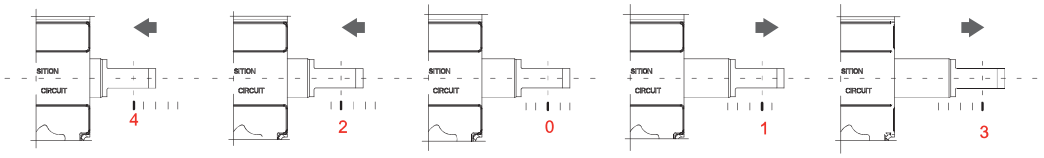
The pressure differential between pilot lines Pp and Tp should be > 25 bar in order to be sure to switch the spool to full stroke in all operating conditions

"AEH" spool metering curve

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



Spool positions



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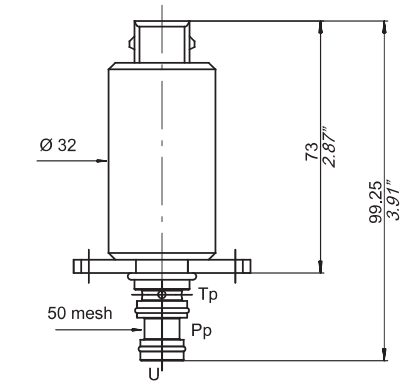
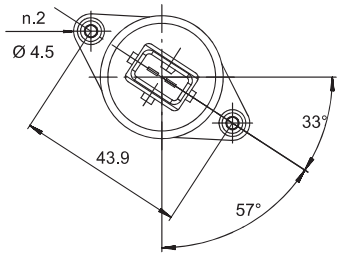
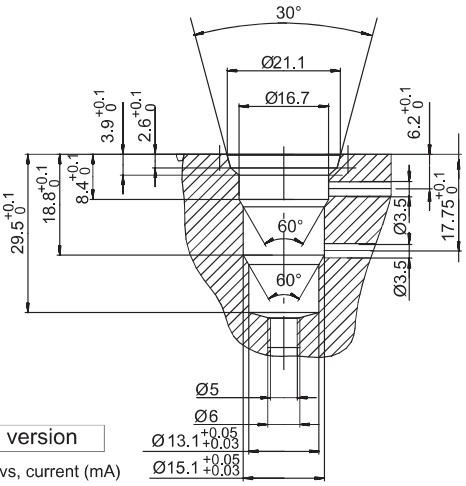
Directional Control Valve "HDM/HDS15"

8.20 Direct acting proportional pressure reducing valve / ON-OFF directional valve

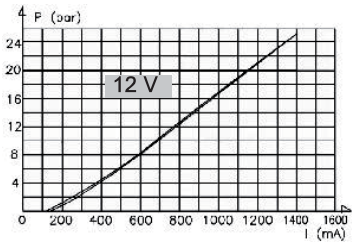


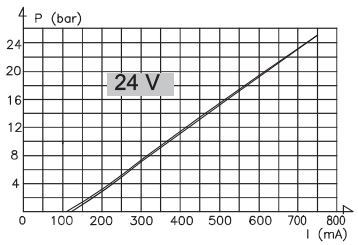


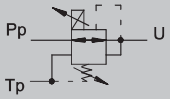
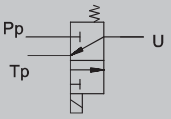


Proportional EHO version

Reduced pressure (bar) vs. current (mA)





Electro-hydraulic specifications			
	Proportional 		ON-OFF 
Nominal flow rate	4 l/min *(1 GPM)*		6 l/min *(1.5 GPM)*
Max inlet pressure	35 bar *(500 PSI)*		50 bar *(750 PSI)*
Reduced pressure tolerance	±5%		-
Rated supply voltage	12 VDC	24 VDC	12 VDC ±10%
Current supply characteristic	PWM (Pulse width modul.)		ON-OFF
Superimposed dither frequency	100 to 150 Hz		-
Degree of protection	IP65		
Max power consumption	11 W	14 W	20 W
Coil resistance (at 20°C)	5.4 Ohm	22 Ohm	7.2 Ohm
Response time	< 80 ms		from 30 to 45 ms
Leakage	< 15 cc/min. at 35 bar and 80°C *(< 0.9 cu:in./min. at 500 psi and 176 °F)*		
Duty cycle	ED 100%		
Connector Type	AMP Junior timer (AMP84-9419)		
Connector colour	BLUE	RED	BLACK
Code (*)	200533960004	200533960007	200533940075

(*) nr. 2 screws M4x12 are not included

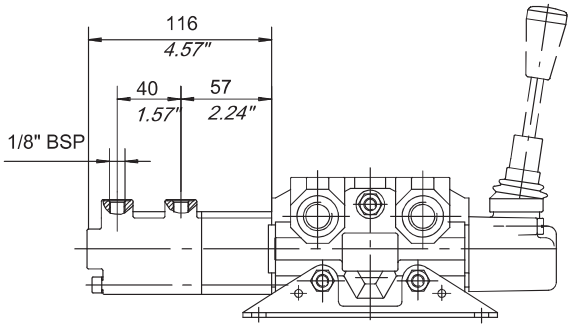
For proportional versions, ED100% not guaranteed for current values higher than the maximum shown in the correspondent diagram.

For ED100% without current limitation the ON-OFF version must be used

Directional Control Valve "HDM/HDS15"

8.21 Hydraulic-Pneumatic control ON-OFF

Type	Code
HP 24	200968650110

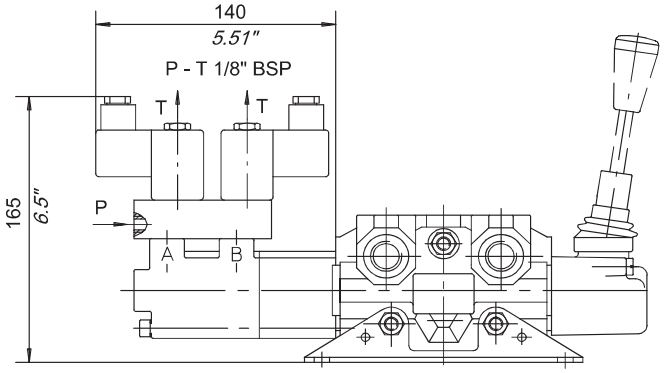


Operating conditions:
Hydraulic controls
Pressure range: (bar): Min. 6 - Max. 15
(PSI): Min. 85 - Max. 215

Pneumatic controls:
Pressure range: (bar): Min. 6 - Max. 10
(PSI): Min. 85 - Max. 145

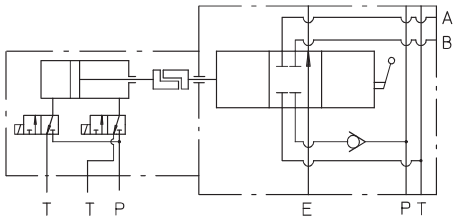
8.22 Electro-pneumatic control ON-OFF

Type	Voltage	Code
EP 77	12 VDC	200968660230
EP 78	24 VDC	200968660260



Electrical data
Insulation class H - 1805 C (3565 F)
Encapsulation material: nylon
Temperature range:
-105 C to 805 C (145 F to 1705 F)
Duty cycle: 100% at 685 F ambient
Voltage variation: -10% to + 15% of nominal voltage
Power consumption DC - 10 W
Electrical connection: DIN43650/A (2P + E)
Cable connection PG9
Protection class: IP65 (with connector)

Operating conditions
Pressure range: (bar): Min. 6 - Max. 10
(PSI): Min. 85 - Max. 145
Ambient temperature: -105 C to 505 C (145 F to 1225 F)
Response time: 6 - 8 milliseconds
Mounting in any position



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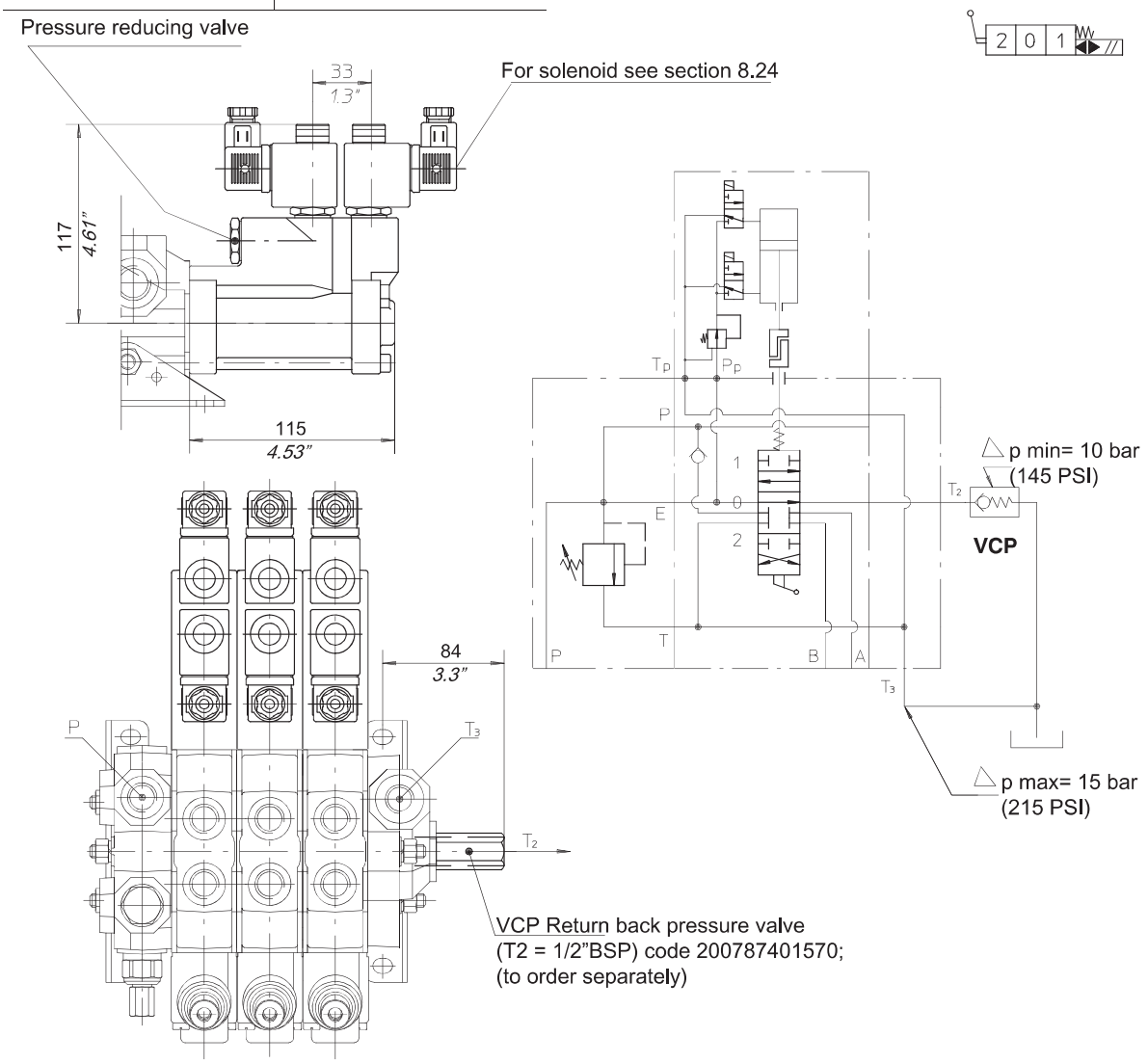
Directional Control Valve "HDM/HDS15"

8.23 Electro-Hydraulic ON-OFF controls

8.23.1 Electro-hydraulic ON-OFF control internal piloted with integrated pressure reducing valve

Type	Code
EHI 263*	200968660380 (without coils)



Dedicated body is required.

Mechanical and hydraulic features	
Max pressure on Pp port	250 bar *(3620 PSI)*
Reduced pressure after pressure reducing valve	10 bar */ (145 PSI)*
Fixed delivery on Pp pilot line	1 l/min / *(0.26 U.S.G.P.M)*
Leakage of pressure reducing valve (in neutral pos.)	100 ml/min / *(6.1 in^3/min)*
Min. suggested filtration	25 micron
Operating oil temperature	min. -30°C- max. 90°C / *min.-22°F - max 194°F*

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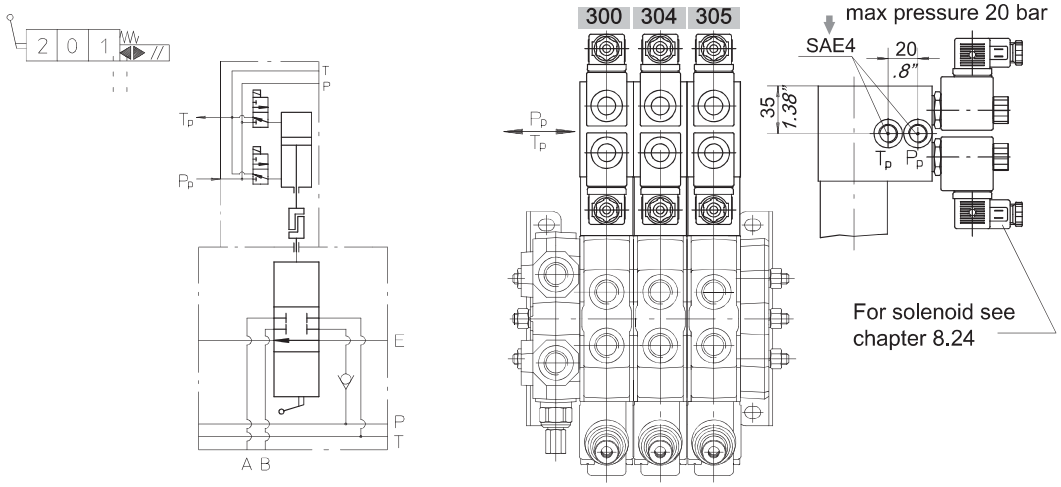
Directional Control Valve "HDM/HDS15"

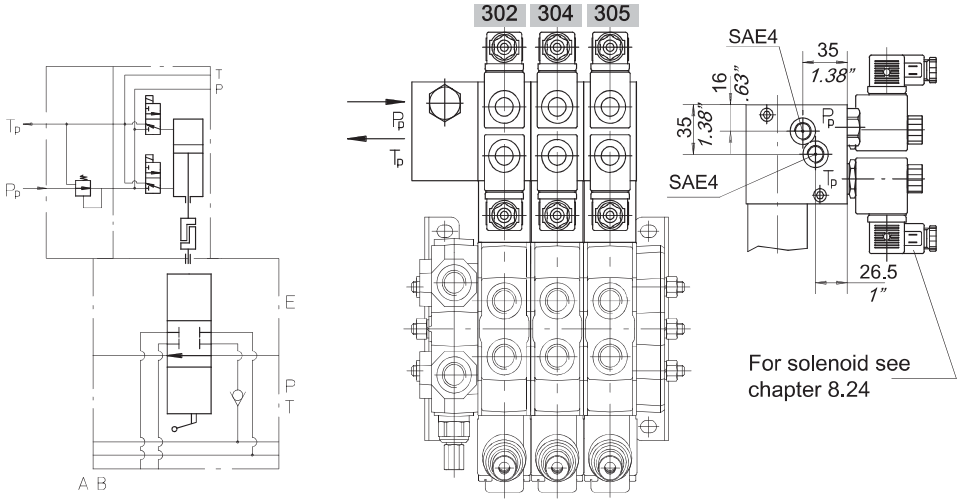
8.23.2 Electro-hydraulic ON-OFF control external piloted

Description	Type	Code
Inlet section	EHE 300	200968660420 (without coils)
Intermediate section	EHE 304	200968660340 (without coils)
End section	EHE 305	200968660360 (without coils)



8.23.3 Electro-hydraulic ON-OFF control external piloted with integrated pressure reducing valve

Description	Type	Code
Inlet section	EHE 302	200968660310 (without coils)



Mechanical and hydraulic features	
Pilot pressure with pressure reducing valve	12 bar / *(175 PSI)*
Pilot flow to each working section	1 l/min/(*0.26 U.S.G.P.M.)*
Operating oil temperature	min.-30°C- max. 90° C / min. - 22°F - max 194°F
Leakage of pressure reducing valve (in neutral pos.)	100 ml/min / *(6.1 in3/min)*
Min. suggested filtration	25 micron

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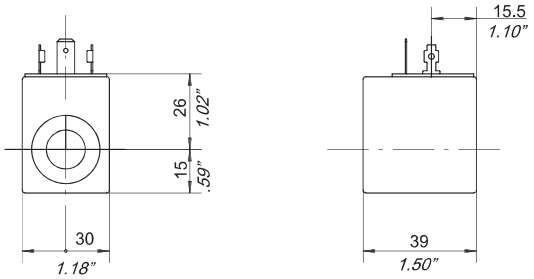
Directional Control Valve "HDM/HDS15"

8.24 Coils for EHI-EHE solenoid valves

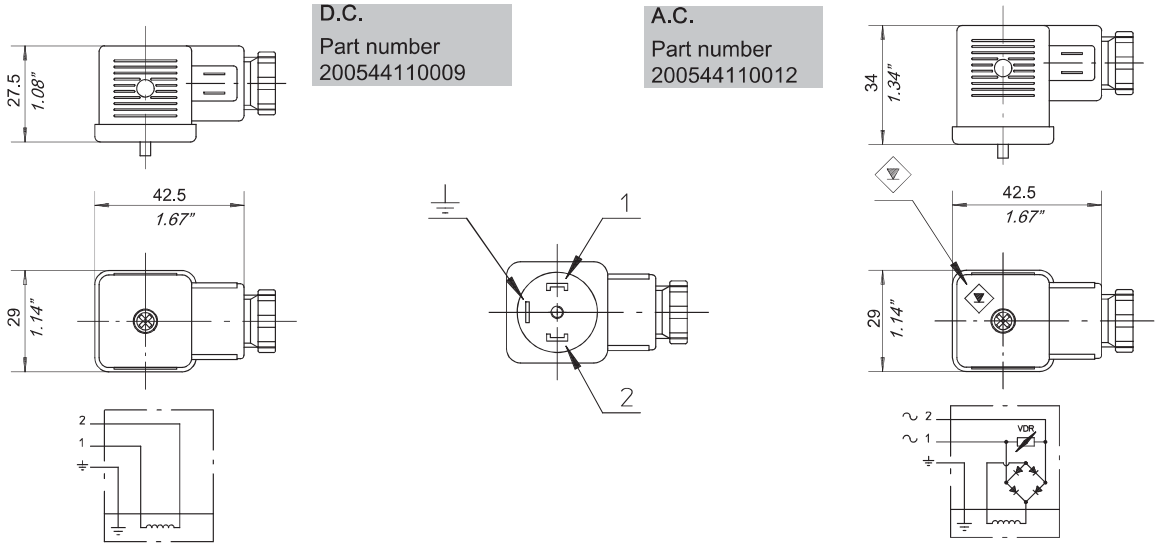


Wire class	F (VDE 0580)
Coil insulation	IP65 (DIN 40050)
Duty rating	ED 100%
Stabilized temperature	70° C
Voltage tolerance	± 10%

Supply voltage	Nominal coil voltage	Power (Watt)	Resistance (Ohm)		Current (Ampere)		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	41.1	0.77	0.58	200674920030
24 V.AC	21.6 V.DC	17.3	27	36	0.80	0.60	200674820030
110 V.AC	98 V.DC	15.6	630	825	0.157	0.120	200674840030
220 V.AC	198 V.DC	15.7	2500	330	0.08	0.06	200674860030

D.C.
Part number
200544110009

A.C.
Part number
200544110012



Armour clamp	Pg 9
Ø cable	6-8 mm
Diodes	1N 4007 GP
Overvoltage protection	VDR
Connector type	DIN 43650
Number of poles	2 + ⏚
Supply voltage	max. 220 V
Nom. capacity at contacts	10 Ampere

Max capacity at contacts	16 Ampere
Resistance at contacts	≥ 4 mOhm
Max section of cable	1.5 mm²
Outer material	Glass fibre reinforced nylon
Protection factor	IP65 (DIN 40050)
Insulation class	C (VDE 0110)
Temperature range	-40° +90° C

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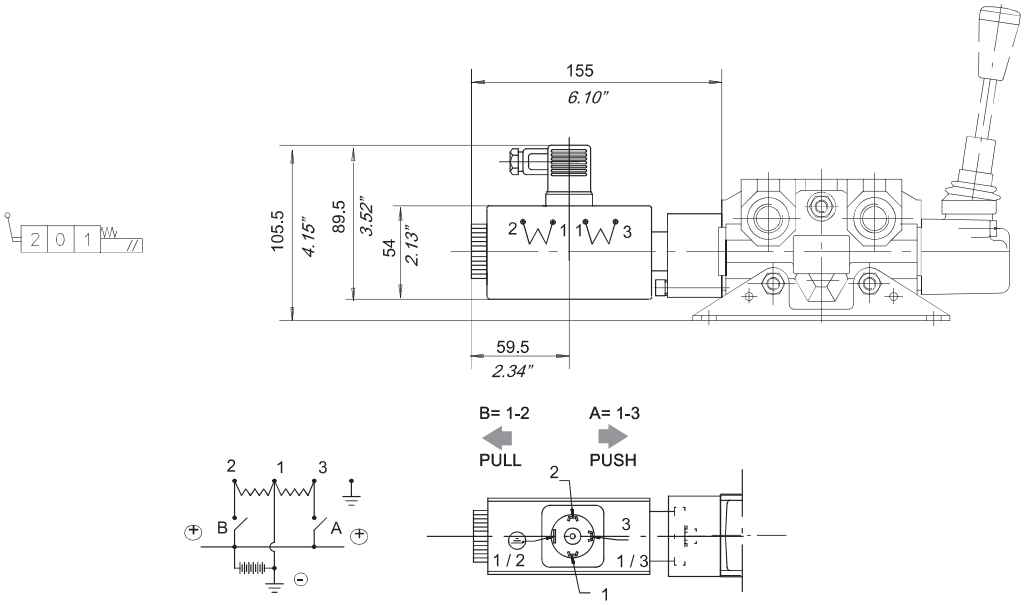
Directional Control Valve "HDM/HDS15"

8.25 Electromagnetic ON-OFF control - Push/Pull type

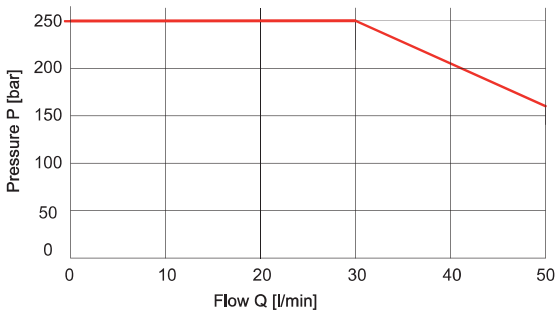
Voltage	Type	Code
12 V.DC	EPP 344*	200968611790
24 V.DC	EPP 343*	200968611800



* To be used with special spools only: the spool definition is different from the standard one because of the extention "PD". For example A spool become APD.

Ex.: (A spool + 24 VDC positioner)= APD343

Mechanical and hydraulic features	
Max flow vs pressure	see diagram
Max back pressure	5 bar *(70 PSI)*
Operating oil temperature	80° C *(180° F)*



Electromagnetic specification	
Input tension	12 V DC [24 V DC] + 10%
Power consumption	60 W
ED	100%
Ohms resistance (cold T°)	2.4 Ω [9.6 Ω]
Ohms resistance (stabilized T°)	3.1 Ω [12.5 Ω]
Intensity of current (cold T°)	5 A (2.5 A)
Intensity of current (stabilized T°)	3.8 A (1.9 A)
Ambient operating temperature range	-25° C/+50°C

Insulation class:

According to VDE 0580 standard: H

Electrical connection: DIN 43650: IP 65

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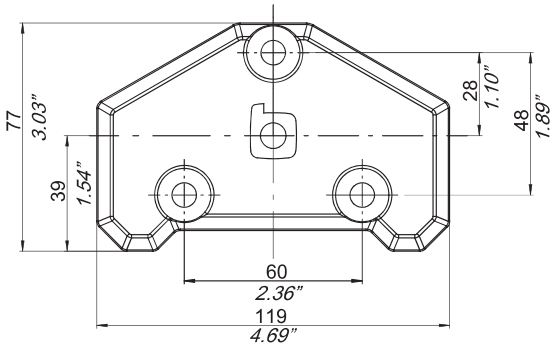
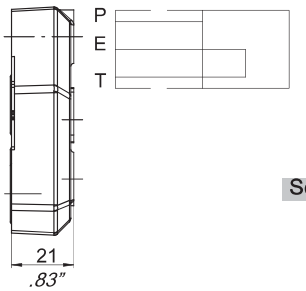
Directional Control Valve "HDM/HDS15"

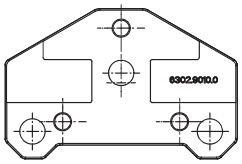
9 End covers

9.1 Standard end cover

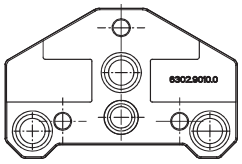




Parallel circuit

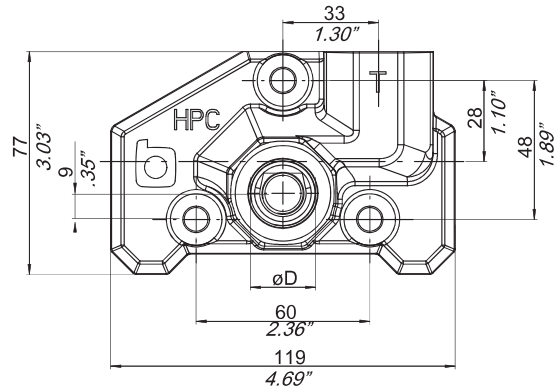


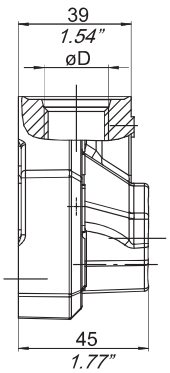
Series and tandem circuit



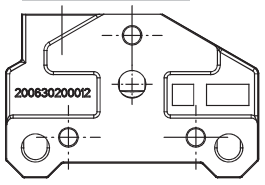
Type/code	
Standard circuit parallel	Optional circuit series and tandem
P31 200630290100	P32 200930290110

9.1.1 End cover with outlet ports T_2 and T_3

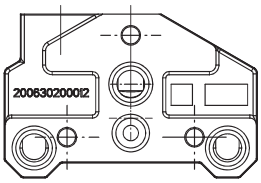


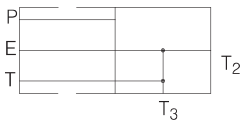


Parallel circuit



Series and tandem circuit





ØD	Type/code	
	Standard circuit parallel	Optional circuit series and tandem
M18X1.5	P01 200930210060	P41 200930210040
3/8" BSP	P02 200930220070	P42 200930220050
1/2"BSP	P03 200930230070	P43 200930230050
SAE10	P05 200930280030	P45 200930280060
3/4" BSP	P09 200930240010	P49 200930240030

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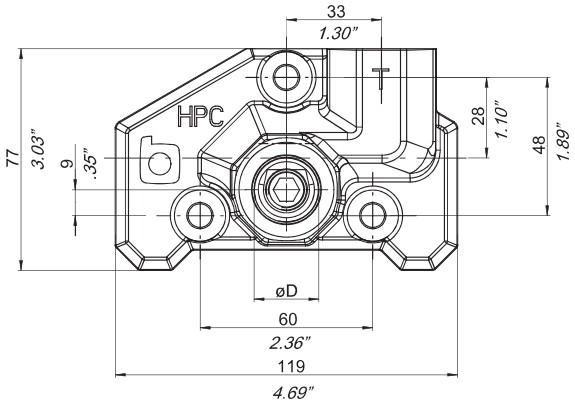
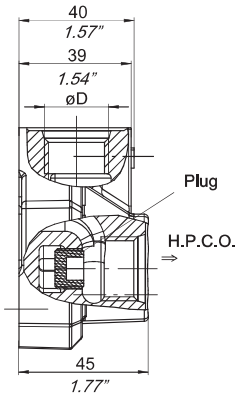
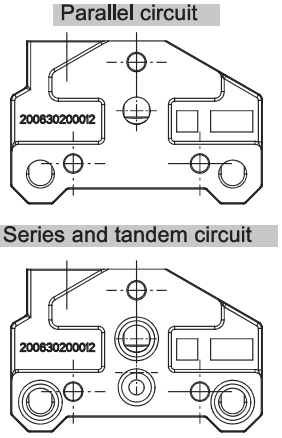
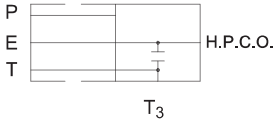
Directional Control Valve "HDM/HDS15"

9.1.2 End cover with outlet port T_3 and H.P.C.O.



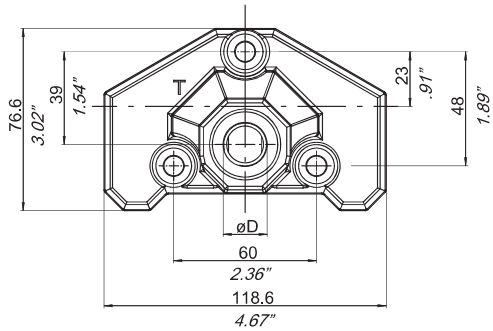


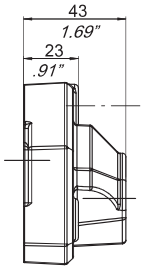


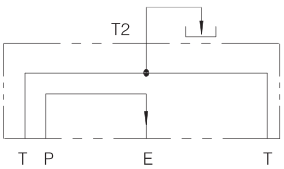


ØD	Type/code	
	Standard circuit parallel	Optional circuit series and tandem
M18X1.5	P11 200930210030	P51 200930210050
3/8" BSP	P12 200930220040	P52 200930220060
1/2"BSP	P13 200930230040	P53 200930230060
SAE10	P15 200930280020	P55 200930280040
3/4" BSP	P19 200930240020	P59 200930240040

9.1.3 Right end cover for K100 and T100







ØD	Type	Code
M18X1.5	P100/1	200630210050
1/2" BSP	P100/3	200630230090

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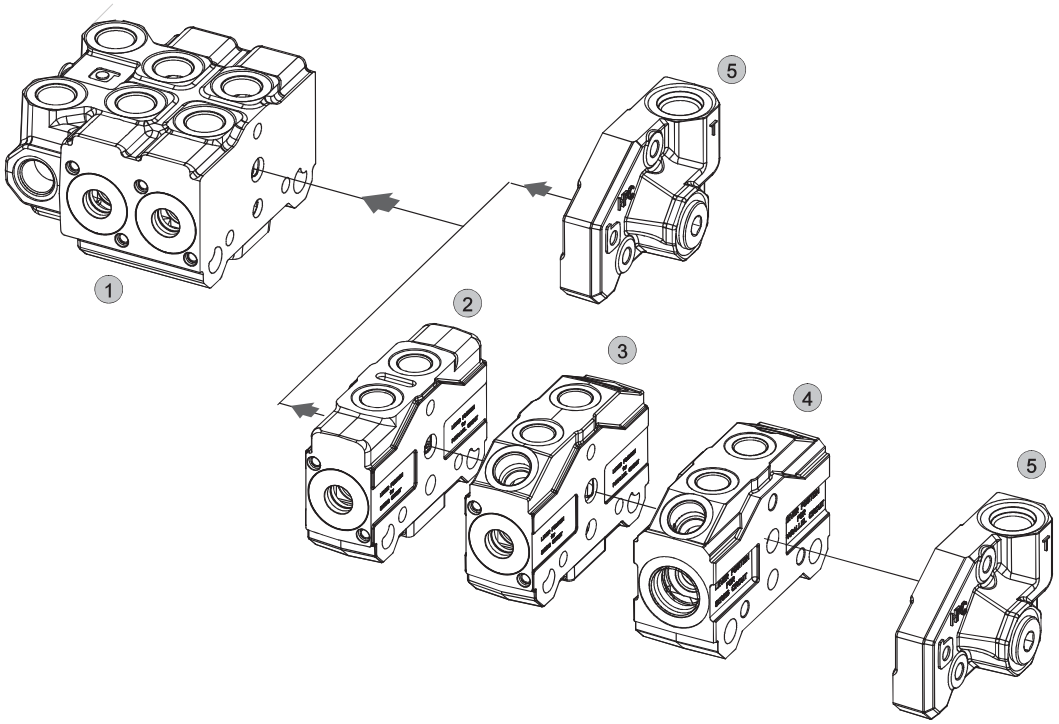
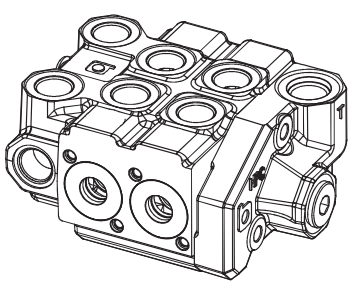
Directional Control Valve "HDM/HDS15"

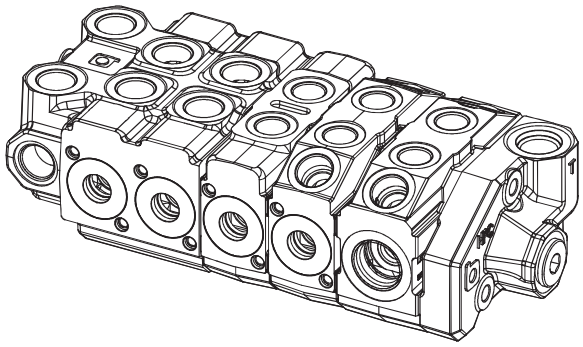
10 Combination

10.1 Example

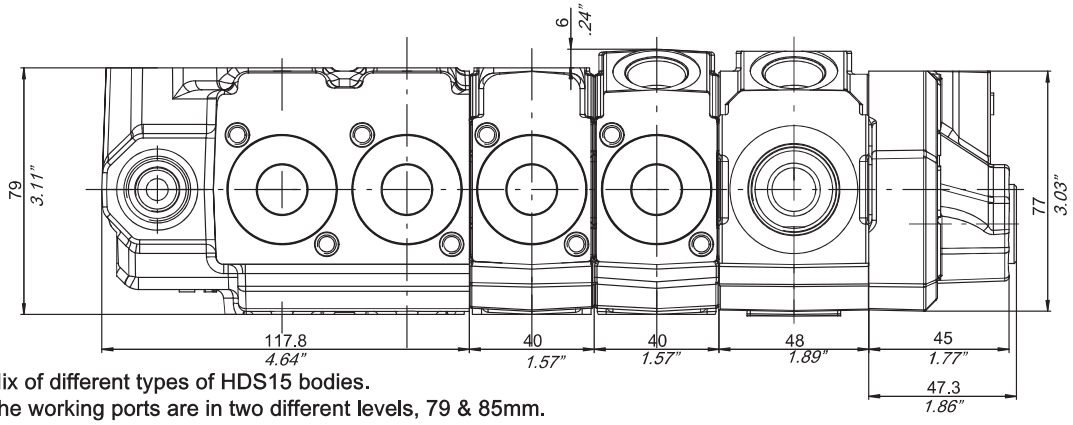


1 HDM15 body 2 HDS15 body 3 HDS15 valve body 4 HDS15 ON-OFF valve body 5 HDS15 end cover





10.1.1 Example of some HDM15 / HDS15 body dimensions



Mix of different types of HDS15 bodies.
The working ports are in two different levels, 79 & 85mm.

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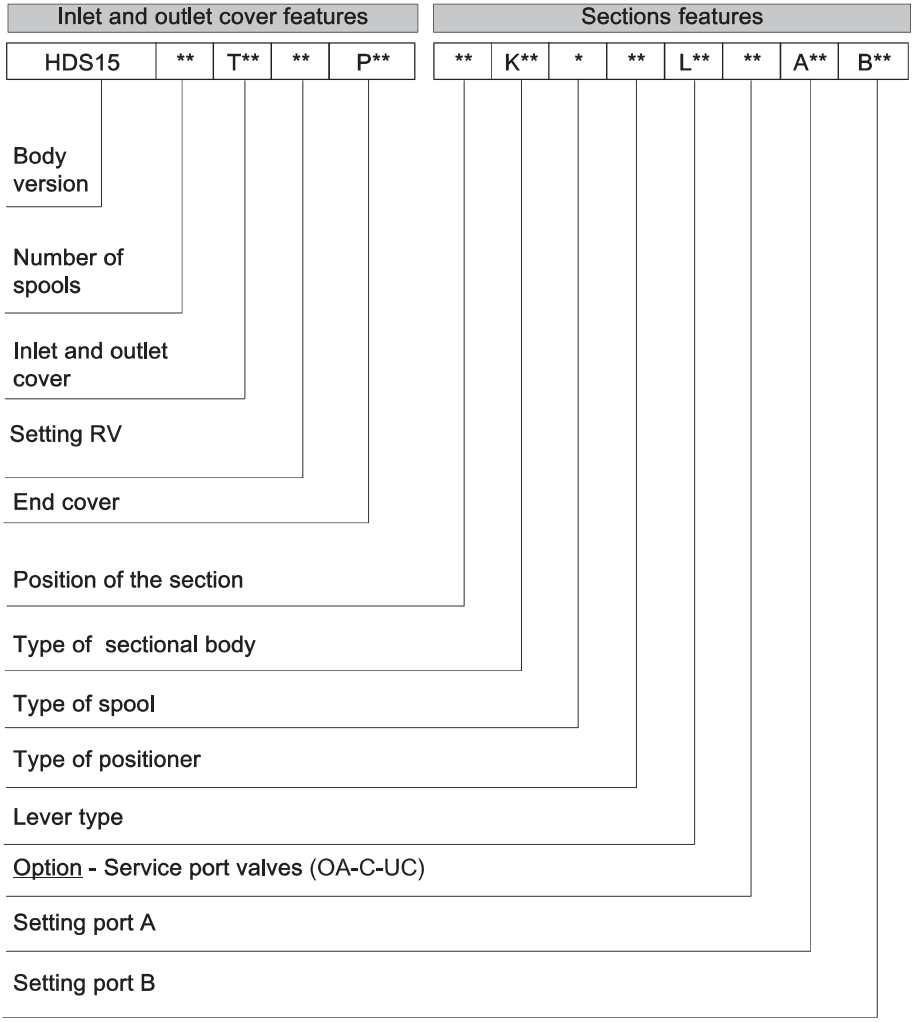
Directional Control Valve "HDM/HDS15"

11 Composition of ordering code

11.1 Example for manual valves



How to order

HDS15	02	T01	15	P11	01	K11	A	08	L100	OA	A15	B26	1st section features
					02	K01	C	03	L100				2nd section features

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Directional Control Valve "HDM/HDS15"

11.2 Example for valves with electromagnetic control EMC

Inlet and outlet cover features					Sections features							
HDS15	**	T**	**	P**	**	K**	*	**	**	**	A**	B**

Body version

Number of spools

Inlet and outlet cover

Setting RV

End cover

Position of the section

Type of sectional body

Type of spool

Type of positioner

Voltage

Option - Service port valves (OA-C-UC)

Setting port A

Setting port B

How to order

HDS15	02	T05	15	P05	01	K215	AE	01E	13	OA	A15	B26	1st section features
					02	K205	CE	03E	13				2nd section features

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Directional Control Valve "HDM/HDS15"

11.3 Example for valves with and flow control PQ elements

HDS15	K**/* T**/*	RV1-** 00VC00	RV2-** 00VC00	RV3-** 00VC00	BP3-** 00EC	VDP-** VDPF

Type of valve: HDS15

Type of sectional body K: K100-K88-K90-K91-K92

Type of head T : T100-T88-T90

(/1=M18X1.5 - /3= 1/2" BSP - /9=M22X1.5 - /5= SAE10)

Std setting pressure relief valve RV1: 06-15-26

Valve closed : 00VC00

Std setting pressure relief valve RV2: 06-15-26

Valve closed : 00VC00

Std setting pressure relief valve RV3: 06-15-26

Valve closed : 00VC00

Solenoid valve By-pass: BP3/AE - BP3/CE
13 HC (12 V. DC)
23 HC (24 V. DC)

Solenoid valve seat closed : 00EC

Flow control valve adjustable setting VDP: 06-12-25-50

Flow control valve fixed: VDPF

How to order

HDS15	K100/1	RV1-15	RV2-26	00VC00	BP3/AE 13HC	VDP-06

IMPORTANT!: RV1.. - RV2.. -RV3: do not indicate the valves in the order code if the section is not preset for their assembly

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Directional Control Valve "HDM/HDS15"

11.4 Example for monobloc HDM15/2

Body features			1st Spool features				2nd Spool features			
HDM15/*	K	**	*	**	L**	*****	*	**	L**	*****
HDM15/2	K03	18VM01	A	133	L440	VS23/A	A	133	L440	VS23/B

Body version

N. of ele-ments: 2

Type of thread

Setting RV

1st SPOOL

Type of Spool

Type of Positioner

Lever style

Service port valves: OA-C-UC-VS

Setting of ports: A or B

2nd SPOOL

Type of Spool

Type of Positioner

Lever style

Service port valves: OA-C-UC-VS

Setting of ports: A or B

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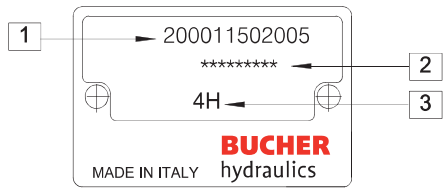
Directional Control Valve "HDM/HDS15"

11.5 Product identification plate



1 : Order Code

2 : Customer Code (on demand, only - if not request there will be the only the Manufacturing year and month*).

3 : Manufacturing Year and Month*

Approximate weights

Version	Kg	lb
Inlet with RV	1.8	*3.96*
1 spool section (standars, without options)	2.5	*5.5*
End cover standard	0.8	*1.76*
End cover with T3 and H.P.C.O.	1.25	*2.75*

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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