

HDM18 Series

Mono-Block Directional Control Valve



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Performance curves

Mono-block body

Adjustable direct acting Relief Valve RV

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Hydraulic controls

Electro-hydraulic controls

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Electro-hydraulic proportional controls

Electro-magnetic controls

HDM18 Series

Mono-Block Directional Control Valve



General Specifications

Technical specification	Metering unit system	
Max flow rate	l/min U.S.G.P.M.	70 18
Max operating pressure	bar PSI	400 5700
Max back pressure	bar PSI	30 420
Oil temperature	° C ° F	-10 to 80 14 to 180
Oil viscosity	° E cSt	2.4 to 10 16 to 75
Oil filtration	μ	≤ 30

Spool leakage at 100 bar (1450 PSI), Temp. 50° C (120° F), viscosity 27 cSt:		
Maximum	cm ³ /min Cu. In./min	14 0.854
Average	cm ³ /min Cu. In./min	7 0.427
Lower values on demand (to be agreed with our Sales Dpt.)		

Number of spools	1 to 4
Adjustable direct operated relief valve (tamper-proof seal available on request)	RV
Load hold check valve in each section	LC

Weight

Technical specification	Metering unit systems	
HDM18/1	kg LBS	4.3 9.60
HDM18/2	kg LBS	6.0 13.2

HDM18/3	kg LBS	9.0 19.8
HDM18/4	kg LBS	12.0 26.4

Material specification:

Body: High strength cast-iron.

Spool: Hardened steel and chrome plated

Seals: Buna "N".

Standard features:

- 1) Parallel circuit
- 2) Balanced interchangeable spools (provides minimum leakage, smooth operation)
- 3) Wide selection inlets, work ports, and outlets threaded ports.
- 4) Negative overlapping of the spool.

Optional features available:

- 1) Open or closed centre positions, 3 or 4 way operations, 3 or 4 position (float position), full open centre (motor spool) and other spool options.
- 2) Carry over.
- 3) Series circuit
- 4) Load sensing circuit closed centre for variable displacement pump
- 5) Complete lever assembly
- 6) Wide range of positioners

Symbols:

P: inlet port

T: outlet port

A/B: work ports

H.P.C.O.: carry-over

RV: relief valve

P₁T₁: side inlet and outlet ports

3.1.0.2: spool position

P: pressure line

T : exhaust line

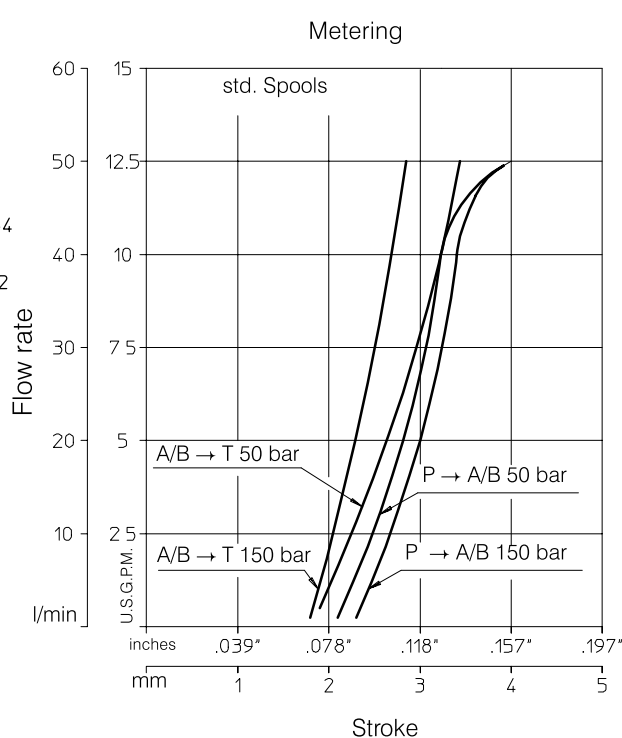
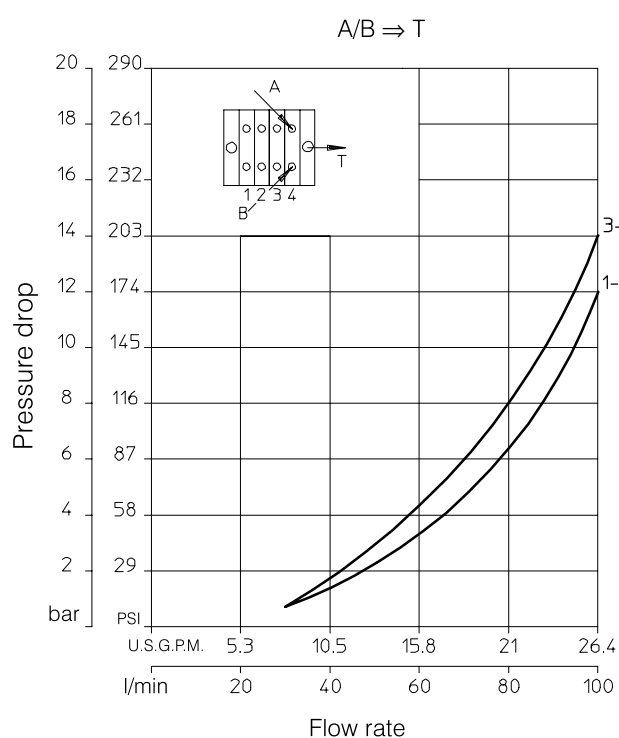
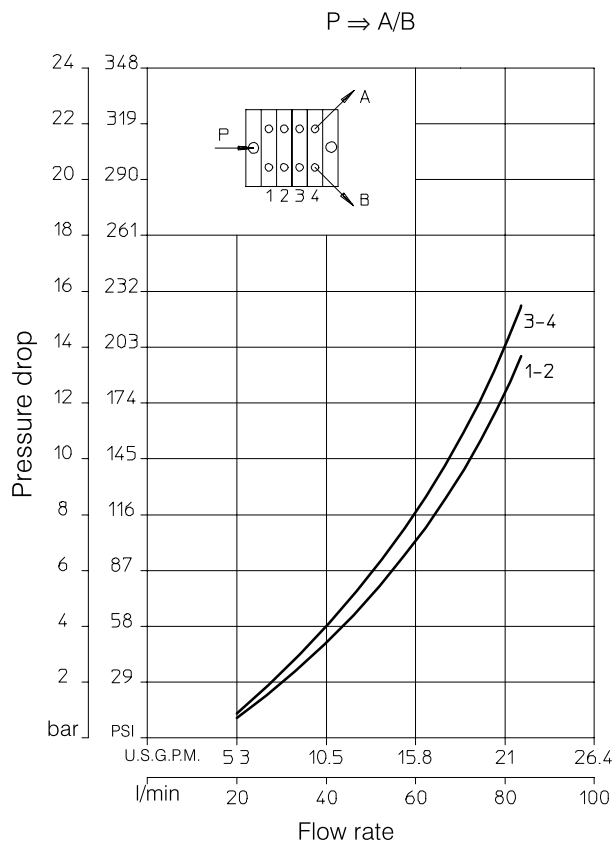
E: centre line (by pass).

N. of sections	HDM18/2	HDM18/3	HDM18/4
Dimension A	115	155	195
	4.53"	6.11"	7.69"
Dimension B	155	195	235
	6.11"	7.69"	9.25"

Mono-Block Directional Control Valve



Oil: Shell Tellus T37
Temperature: 50° C (120° F)
Viscosity: 27 cSt



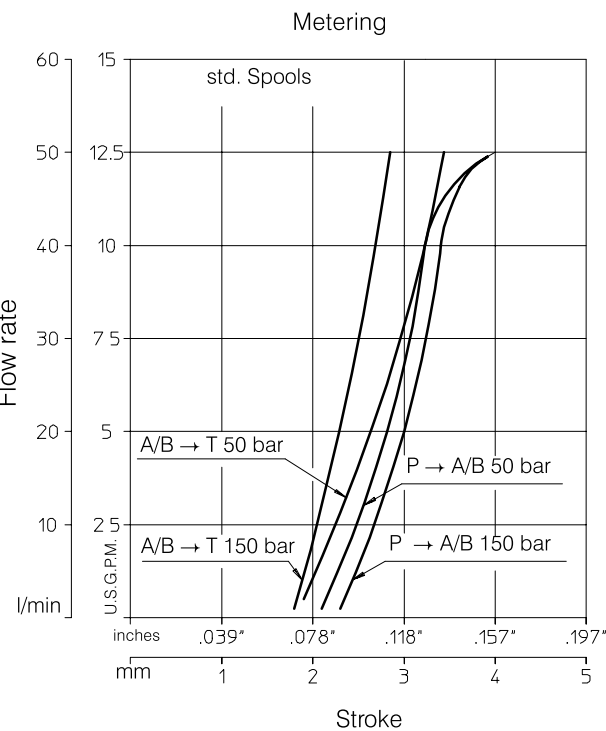
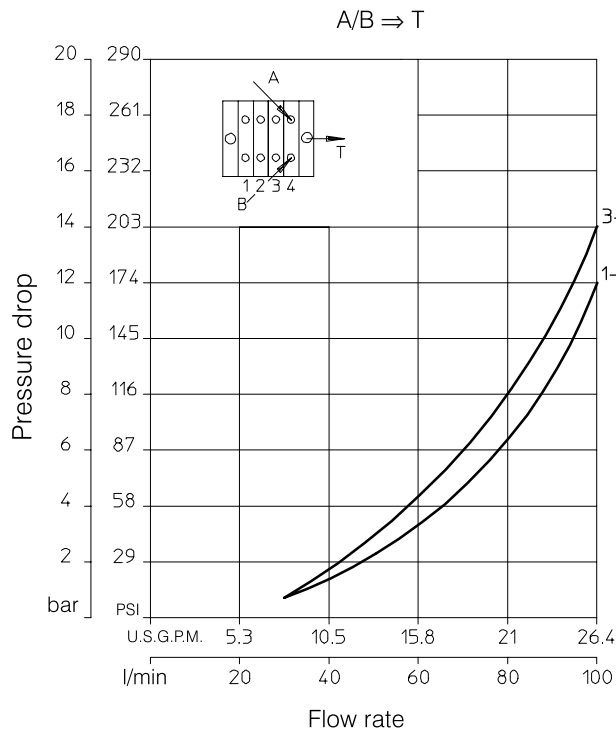
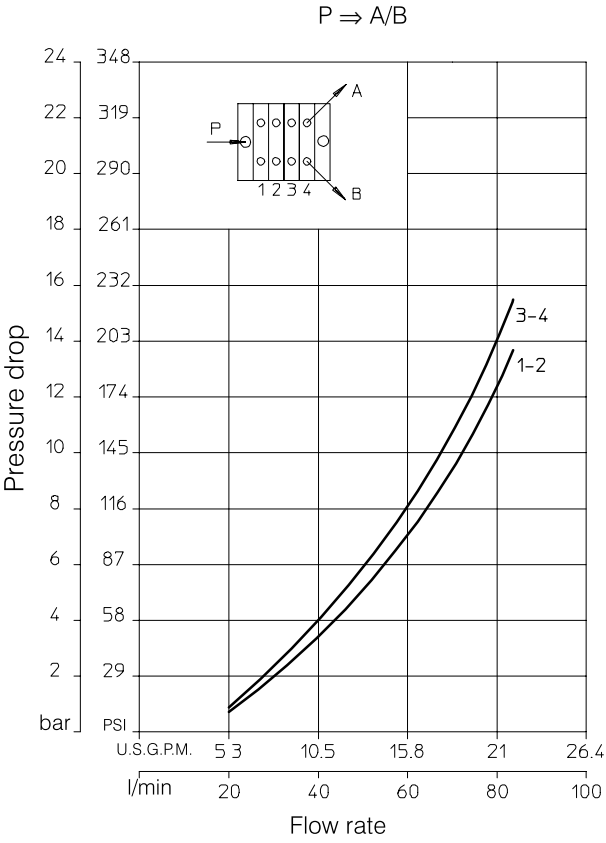
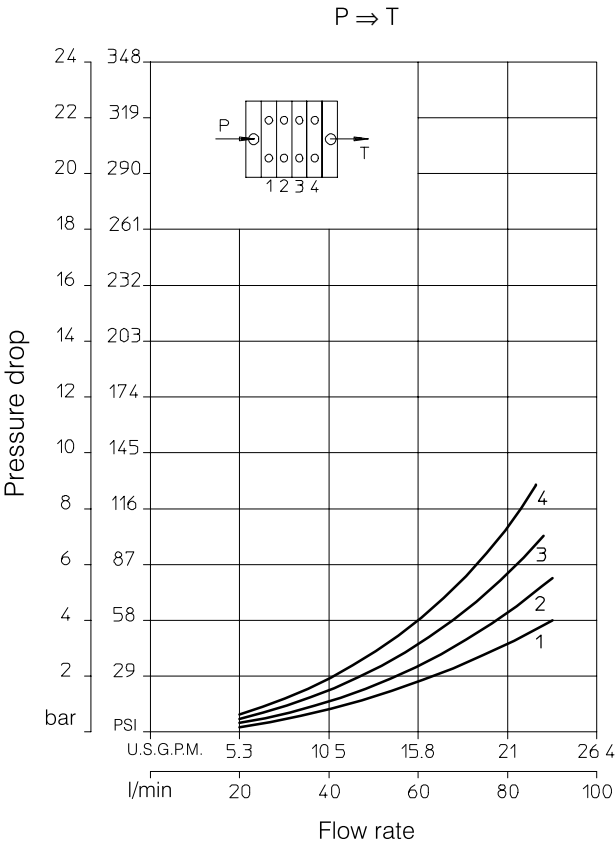
HDM18 Series

Mono-Block Directional Control Valve



Performance curves

Oil: Shell Tellus T37
Temperature: 50° C (120° F)
Viscosity: 27 cSt



HDM18 Series

Mono-Block Directional Control Valve

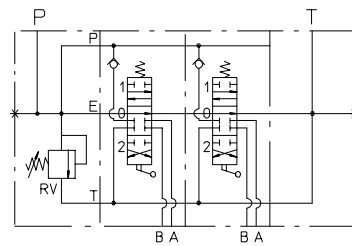
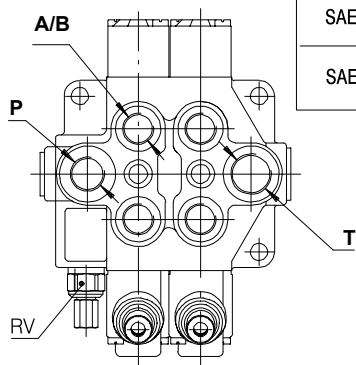


Monobloc body

Standard circuits: parallel

Open centre with P – T – RV

P	A/B	T	Code			
			HDM18/1	HDM18/2	HDM18/3	HDM18/4
M18X1.5	M18X1.5	M18X1.5	K01 200.9441.1001.0	K01 200.9442.1001.0	K01 200.9443.1001.0	K01 200.9444.1001.0
M18X1.5	M18X1.5	M22X1.5	K03 200.9441.1002.0	K03 200.9442.1002.0	K03 200.9443.1002.0	K03 200.9444.1002.0
1/2" BSP	1/2" BSP	1/2" BSP	K02 200.9441.3006.0	K02 200.9442.3004.0	K02 200.9443.3006.0	K02 200.9444.3002.0
1/2" BSP	1/2" BSP	3/4" BSP	K05 200.9441.3007.0	K05 200.9442.3005.0	K05 200.9443.3007.0	K05 200.9444.3003.0
SAE10	SAE10	SAE10	K04 200.9441.8004.0	K04 200.9442.8003.0	K04 200.9443.8003.0	K04 200.9444.8003.0
SAE10	SAE10	SAE12	K06 200.9441.8005.0	K06 200.9442.8004.0	K06 200.9443.8004.0	K06 200.9444.8004.0

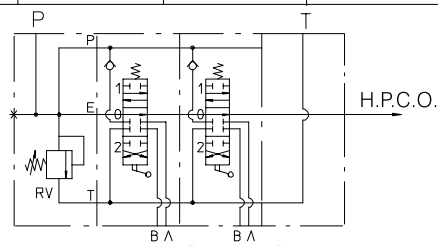
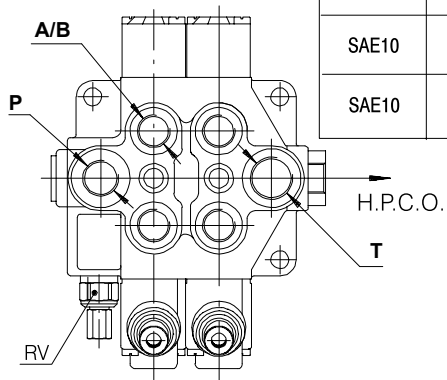


Standard circuits: parallel

Open centre and carry-over with P – T – RV

H.P.C.O

P	A/B	T - HPCO	Code			
			HDM18/1	HDM18/2	HDM18/3	HDM18/4
M18X1.5	M18X1.5	M18X1.5	K21 200.9441.1003.0	K21 200.9442.1003.0	K21 200.9443.1003.0	K21 200.9444.1003.0
M18X1.5	M18X1.5	M22X1.5	K23 200.9441.1004.0	K23 200.9442.1004.0	K23 200.9443.1004.0	K23 200.9444.1004.0
1/2" BSP	1/2" BSP	1/2" BSP	K22 200.9441.3008.0	K22 200.9442.3006.0	K22 200.9443.3008.0	K22 200.9444.3004.0
1/2" BSP	1/2" BSP	3/4" BSP	K25 200.9441.3009.0	K25 200.9442.3007.0	K25 200.9443.3009.0	K25 200.9444.3005.0
SAE10	SAE10	SAE10	K24 200.9441.8006.0	K24 200.9442.8005.0	K24 200.9443.8005.0	K24 200.9444.8005.0
SAE10	SAE10	SAE12	K26 200.9441.8007.0	K26 200.9442.8006.0	K26 200.9443.8006.0	K26 200.9444.8006.0



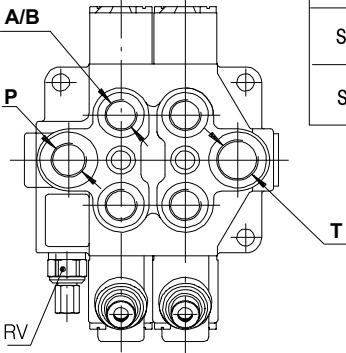
Note: Body codes consist of seals, plugs, check valve, but relief valve -RV- is not included.

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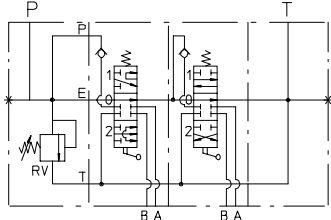


Mono-Block Directional Control Valve

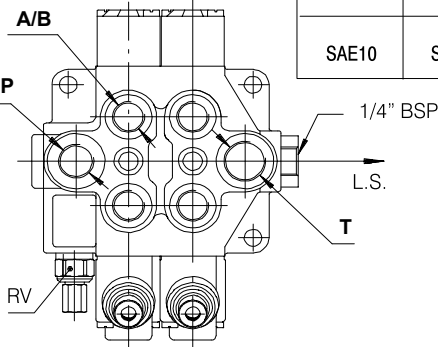
Optional circuits: series and tandem
Open centre with P – T – RV



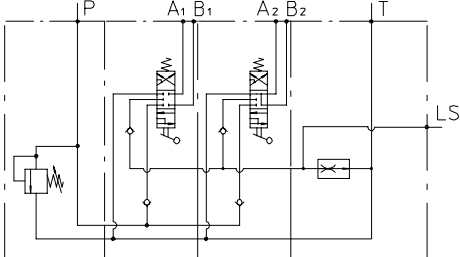
P	A/B	T	Code			
			HDM18/1	HDM18/2	HDM18/3	HDM18/4
M18X1.5	M18X1.5	M18X1.5	K31	K31	K31	K31
M18X1.5	M18X1.5	M22X1.5	K33	K33	K33	K33
1/2" BSP	1/2" BSP	1/2" BSP	K32	K32	K32	K32 200.9444.3006.0
1/2" BSP	1/2" BSP	3/4" BSP	K35	K35 200.9442.3008.0	K35	K35
SAE10	SAE10	SAE10	K34	K34	K34	K34
SAE10	SAE10	SAE12	K36	K36	K36	K36



Optional circuit: load sensing
Closed centre for variable-displacement pump
with P – T – RV and L.S.



P	A/B	T	Code			
			HDM18/1	HDM18/2	HDM18/3	HDM18/4
M18X1.5	M18X1.5	M18X1.5	K61	K61	K61	K61
M18X1.5	M18X1.5	M22X1.5	K63	K63	K63	K63
1/2" BSP	1/2" BSP	1/2" BSP	K62	K62	K62	K62 200.9444.3007.0
1/2" BSP	1/2" BSP	3/4" BSP	K65	K65 200.9442.3009.0	K65	K65
SAE10	SAE10	SAE10	K64	K64	K64	K64
SAE10	SAE10	SAE12	K66	K66	K66	K66



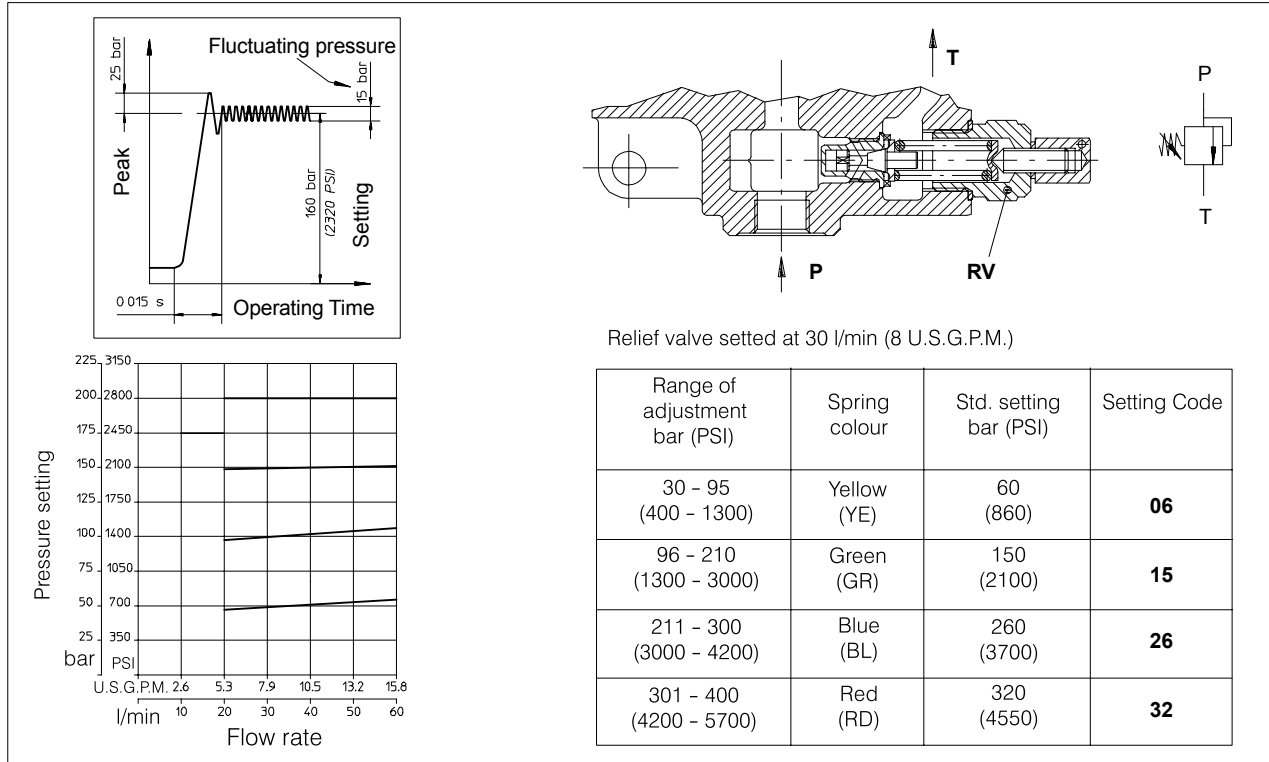
Note: Body codes consist of seals, plugs, check valve, but relief valve -RV- is not included.
For availability of -K- bodies without ordering code please contact our Sales Department.

HDM18 Series

Mono-Block Directional Control Valve



Adjustable direct acting Relief Valve RV



Spool chart

Type	Spool scheme	Spool features
A As*		4 way - 3 position A/B: blocked E: open by pass
B		4 way - 3 position A/B: blocked E: closed
C Cs*		4 way - 3 position A/B: to tank in neutral E: open by pass
D		4 way - 3 position A: blocked B: to tank in neutral
G Gs*		3 way - 3 position B: blocked E: open by pass
L		4 way - 3 position B: blocked A: to tank in neutral
R**		4 way - 3 position with differential spool in 2 nd position
S Ss*		3 way - 3 position A: blocked E: open by pass

X Xs*		4 way - 3 position series connection
Xc		4 way - 3 position A: to tank in neutral
Z Zs*		4 way - 4 position 4 th float position
** LsA		4 way - 3 position A/B: blocked Load Sensing
** LsC		4 way - 3 position A/B: to tank in neutral Load Sensing
** LsG		3 way - 3 position B: blocked Load Sensing
** LsS		3 way - 3 position A: blocked Load Sensing

** : special body required

* : High metering spool (max. flow suggested 40 l/min)

Note: For availability of L/S versions please contact our Sales Department

HDM18 Series



Mono-Block Directional Control Valve

Load sensing

Load-sensing control and working principle

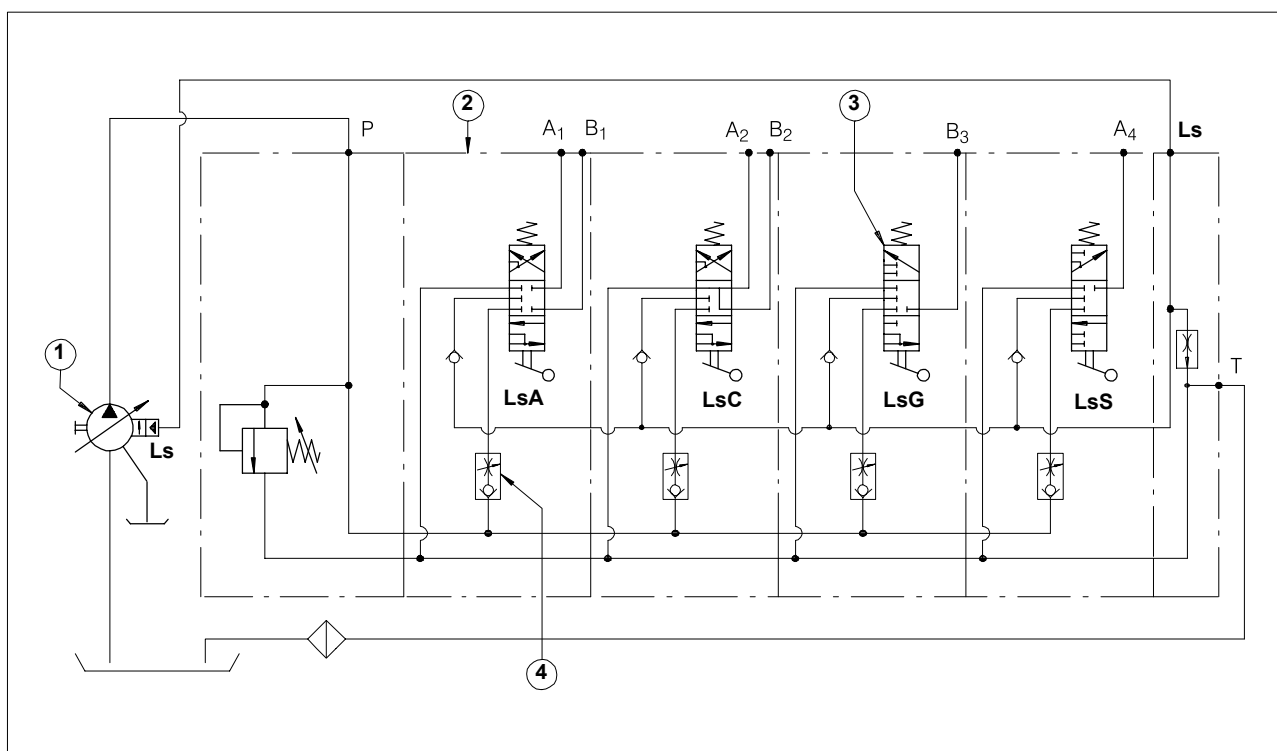
Through the use of variable flow pumps provided with a pressure and flow compensator the pressure and flow parameters can be adapted according to the different and real working conditions.

These pumps require the use of special valves provided with Load Sensing control which "feels" the hydraulic components (cylinder and motor) requirements and through a special pilot line (L.S.) controls the pump compensator conforming capacity and pressure to such requirements which can be variable in time within the limits of the pump perform-

ance.

The Load Sensing brings following advantages:

- Energy saving.
- Smaller heat exchangers can be used due to a smaller heat energy dissipation.
- Longer life of the pump and driving motor, due to reduced heavy working cycles.
- Excellent control of the load by using 100% of the spool metering.



- 1) Variable flow pump provided with pressure and flow compensator.
- 2) Load Sensing valve.

- 3) Special spools: LsA – LsC – LsG – LsS
- 4) Check valve provided with max flow control

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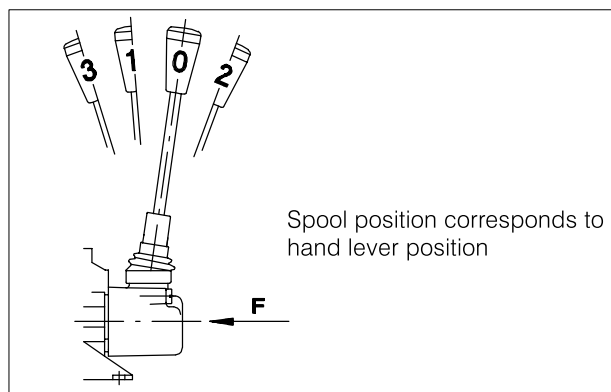
Mono-Block Directional Control Valve



Spool action

Type	Spool position				Stroke mm	Code
	3	1	0	2		
08		○	*	○	5	200.9686.1008.0
10		●	●	○	5	200.9686.3004.0
17		●	●	●	5	200.9686.2014.0
20		○	●	●	5	200.9686.3009.0
25			●	●	5	200.9686.2015.0
27		*		○	10	200.9686.1044.0
29			*	○	5	200.9686.3025.0
30		○	*	○	5	200.9686.1048.0
32		○	*	○	5	200.9686.1061.0
34		○	*	○	5	200.9686.1065.0
36		●		●	10	200.9686.2017.0
37		○		*	10	200.9686.1066.0
38		○	*		5	200.9686.1069.0
79		○	*	○	5	200.9686.1091.0
84		○	*	○	5	200.9686.1098.0
133		○	*	○	5	200.9686.1031.0
136	●	○	*	○	4- 5- 5	200.9686.4012.0

- * Initial hand lever position
- Hand lever in detent position
- Spring return position of hand lever

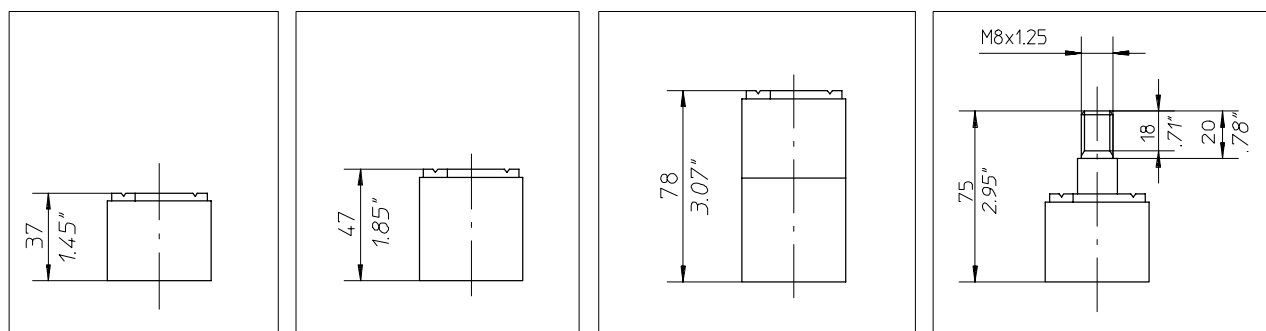


Force (F) for spool movement

Spool position control	F (N)
08	260
79	130
133 (standard)	190

Note: consult factory for other configurations.

Spool positioners dimensions



Spool positioners 08 – 38 – 79 – 133	Spool positioners 10 – 17 – 20 – 25 – 27 29 – 36 – 37	Spool positioners (Z spool type) 136	Spool positioners 84
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Microswitch control

30 Microswitch operated with spool in pos.1

32 Microswitch operated with spool in pos.2

34 Microswitch operated with spool in pos.1 and 2

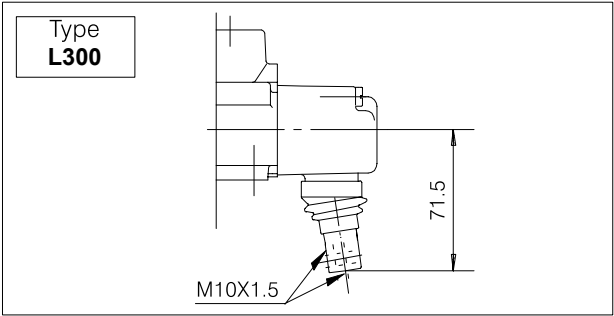
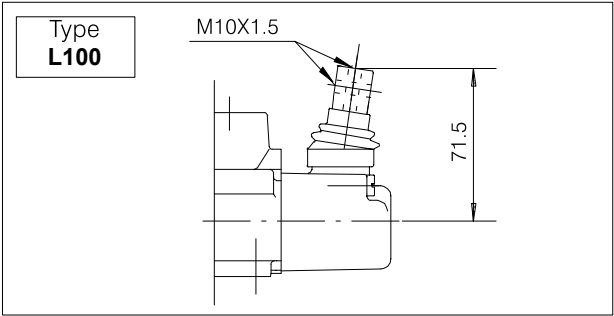
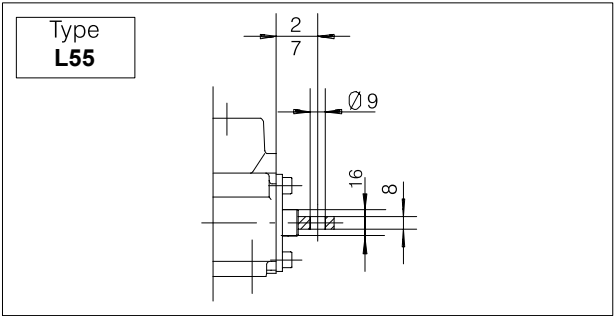
The microswitch code 200.9625.0001.0 is supplied only on customer's request.

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Mono-Block Directional Control Valve

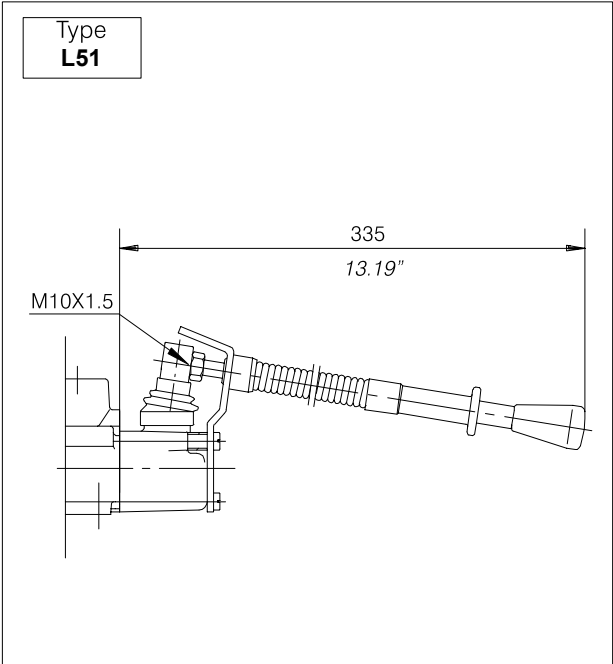
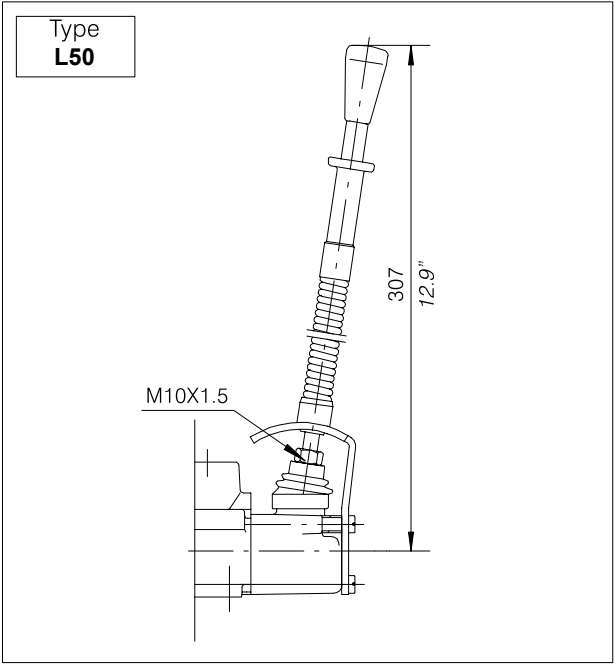


Lever styles



Type	Lo		Code
	mm	inches	
AL001	185	7.28	200.7022.2001.0
AL002	250	9.84	200.7022.2003.0
AL003	300	11.81	200.7022.2004.0
AL004	350	13.78	200.7022.2005.0

Safety levers

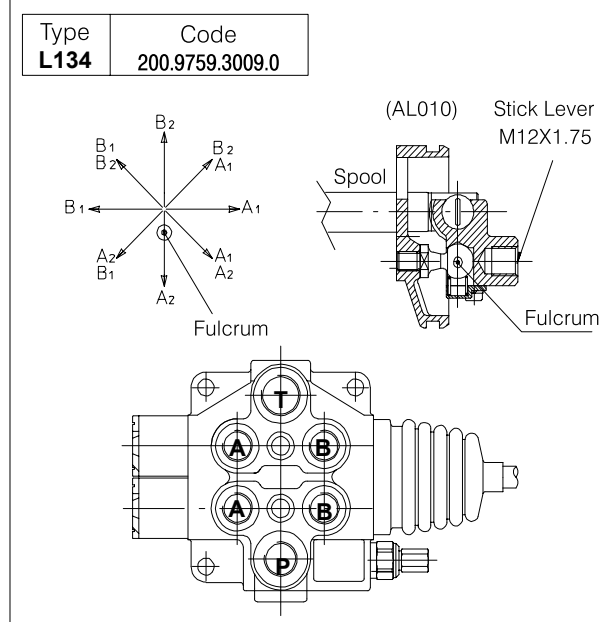
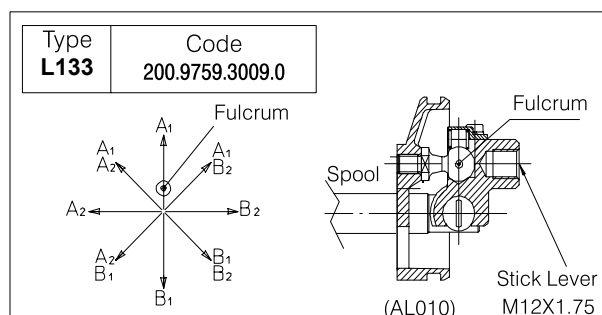
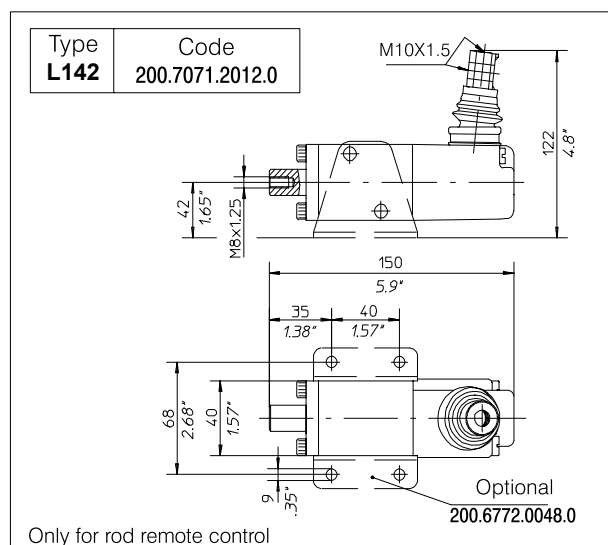
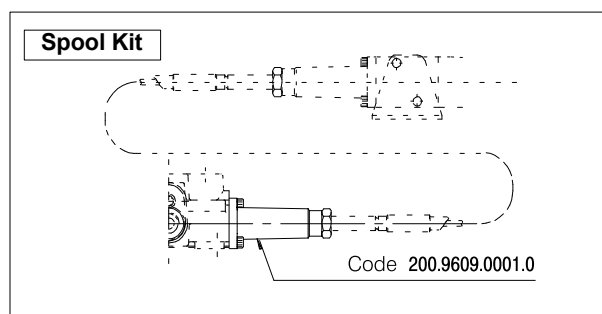
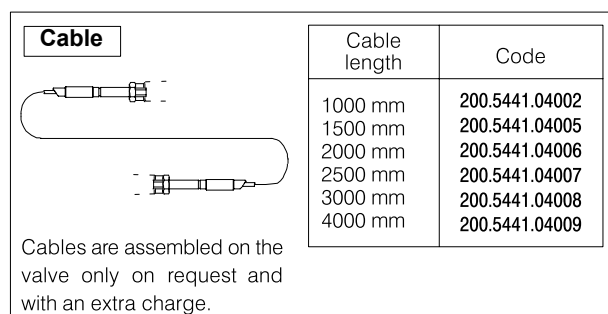
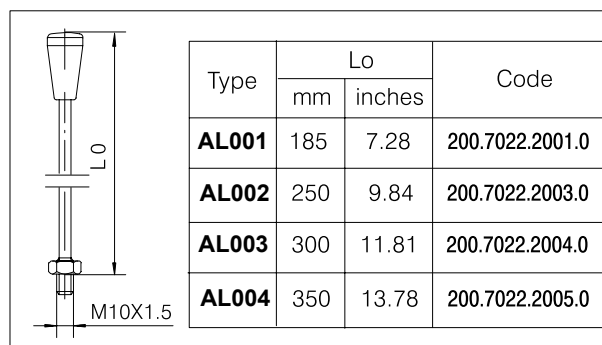
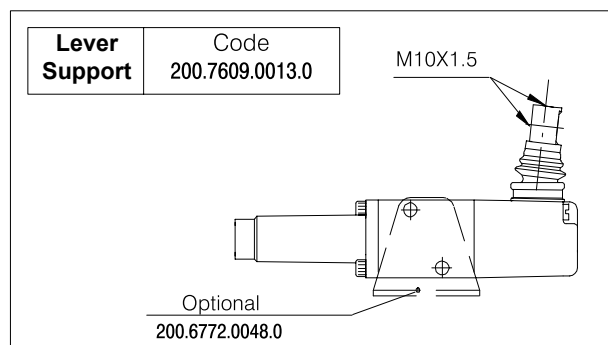


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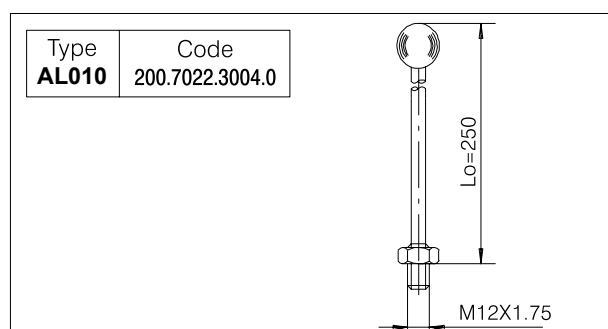
Mono-Block Directional Control Valve



Remote cable control



Cross joystick for dual axis control



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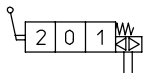


Mono-Block Directional Control Valve

Pneumatic controls

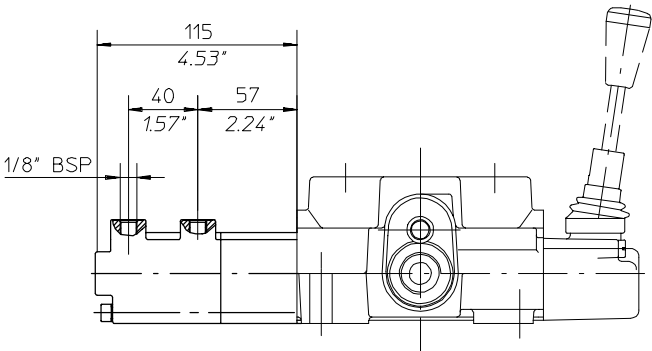
Pneumatic control ON-OFF

Type	Code
P 24	200.9686.5011.0



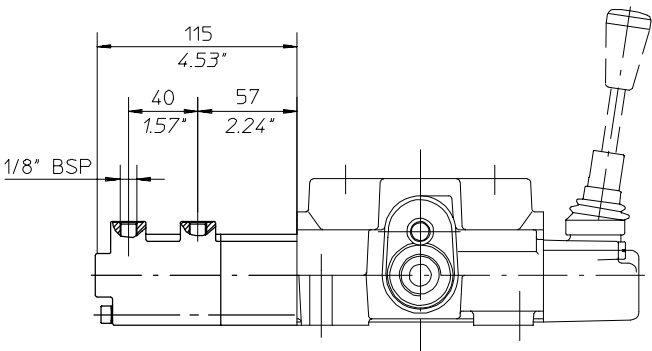
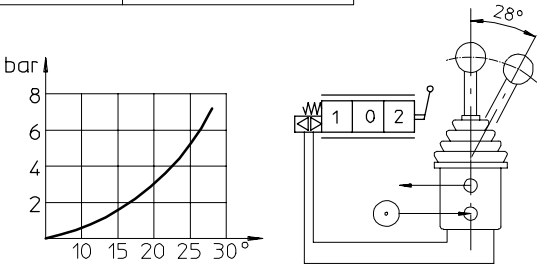
Operating conditions

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



Pneumatic proportional control

Type	Code
PP 150	200.9686.5009.0



Electro-pneumatic control ON-OFF

Type	Voltage	Code
EP 77	12 VDC	200.9686.6023.0
EP 78	24 VDC	200.9686.6026.0

Electrical data

Insulation class H - 180° C (356° F)

Encapsulation material: nylon

Temperature range:

-10° C to 80° C (14° F to 170° F)

Duty cycle: 100% at 68° 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

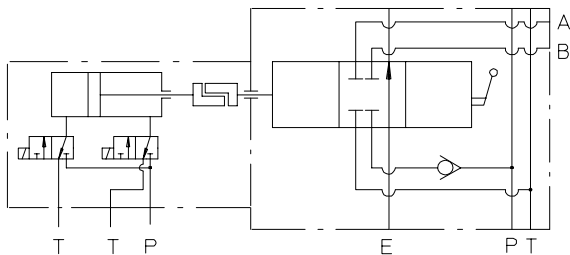
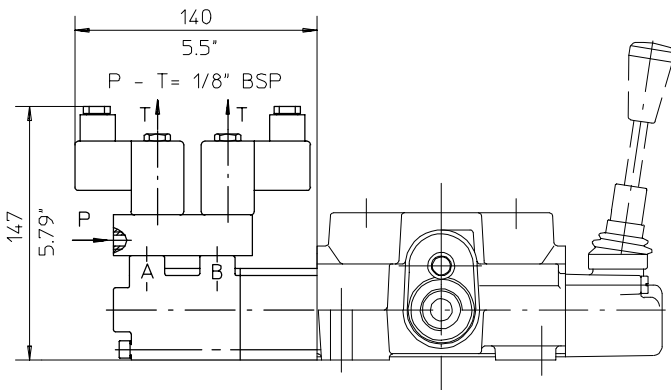
Pressure range: (bar): Min. 6 - Max. 10

(PSI): Min. 85 - Max. 145

Ambient temperature: -10° C to 50° C (14° F to 122° F)

Response time: 6 - 8 milliseconds

Mounting in any position



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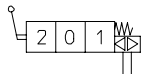
Mono-Block Directional Control Valve



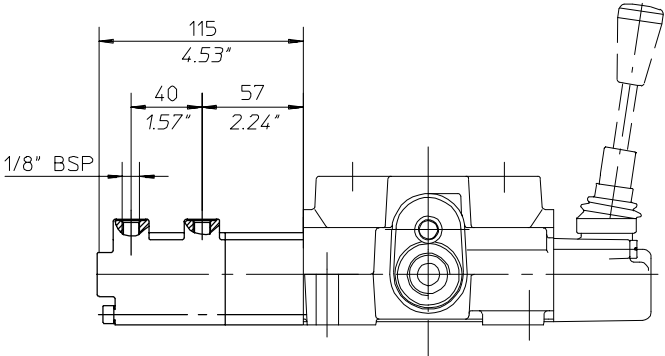
Hydraulic controls

Hydraulic control ON-OFF

Type	Code
H 24	200.9686.5011.0

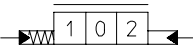


Operating conditions
Pressure range: (bar): Min. 6 - Max. 15
(PSI): Min. 85 - Max. 215

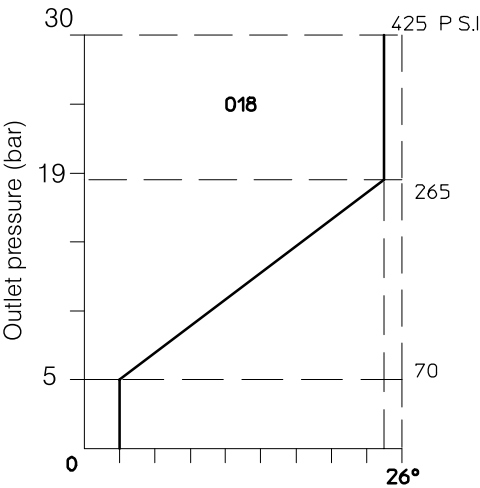


Hydraulic proportional control

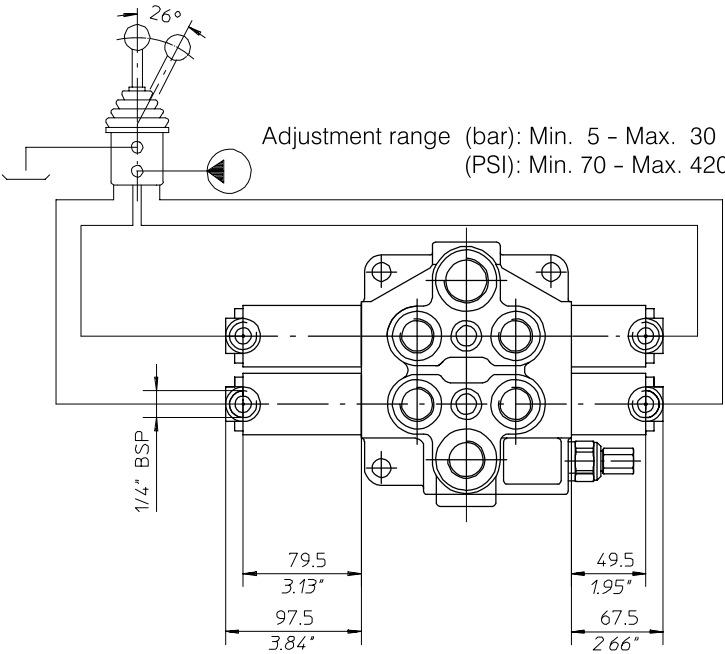
Type	Code
HP 50	200.9686.5019.0



Joystick adjustment diagram



Adjustment range (bar): Min. 5 - Max. 30
(PSI): Min. 70 - Max. 420



HDM18 Series

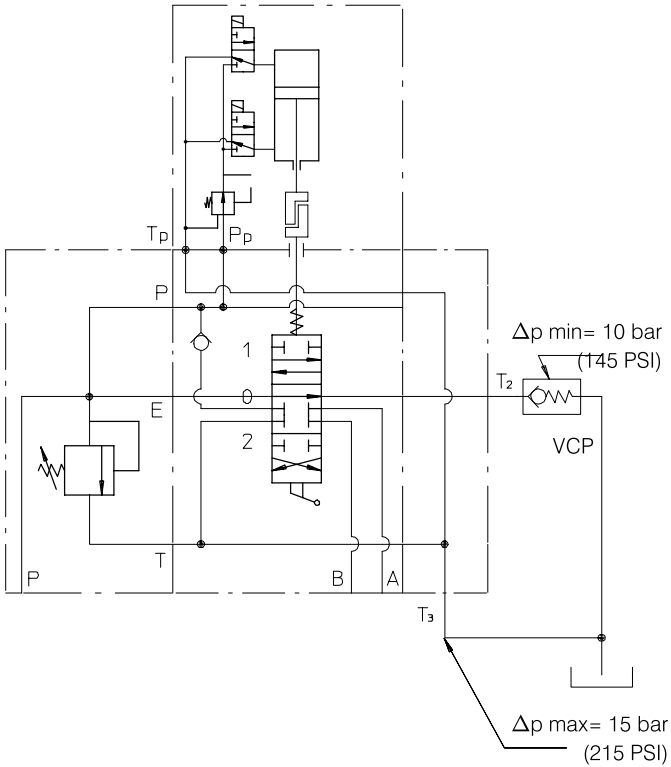
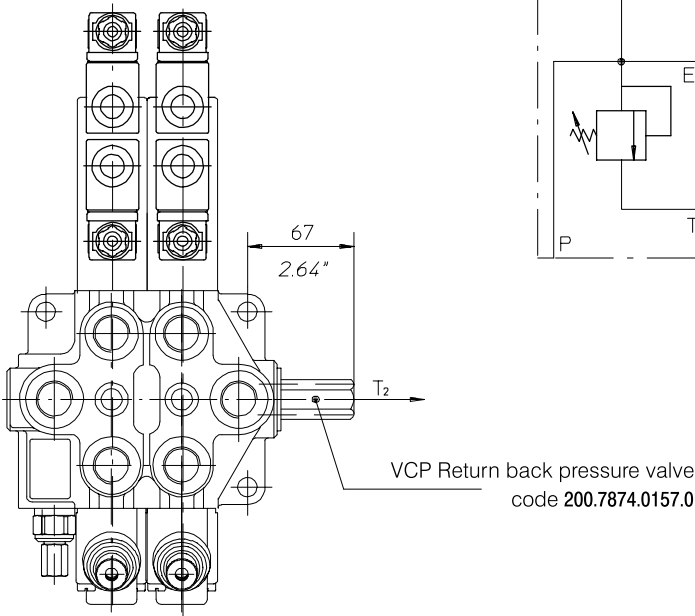
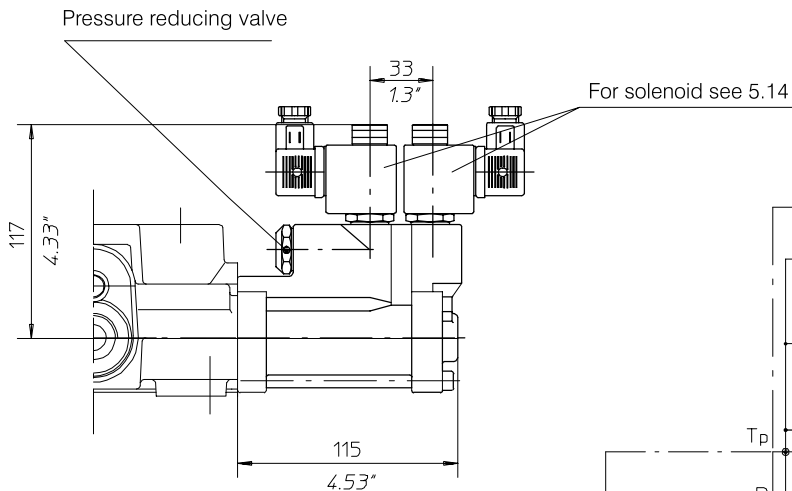
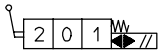


Mono-Block Directional Control Valve

Electro-hydraulic controls

Electro-hydraulic control internal pilot version
ON-OFF with pressure reducing valve

Type	Code
EHI 263	200.9686.6038.0



Mechanical and hydraulic features

Max pressure on P_p port 300 bar (4200 PSI)
Reduced pressure after
pressure reducing valve 10 bar (145 PSI)
Fixed delivery on P_p
pilot line 1 l/min (0.26 U.S.G.P.M.)

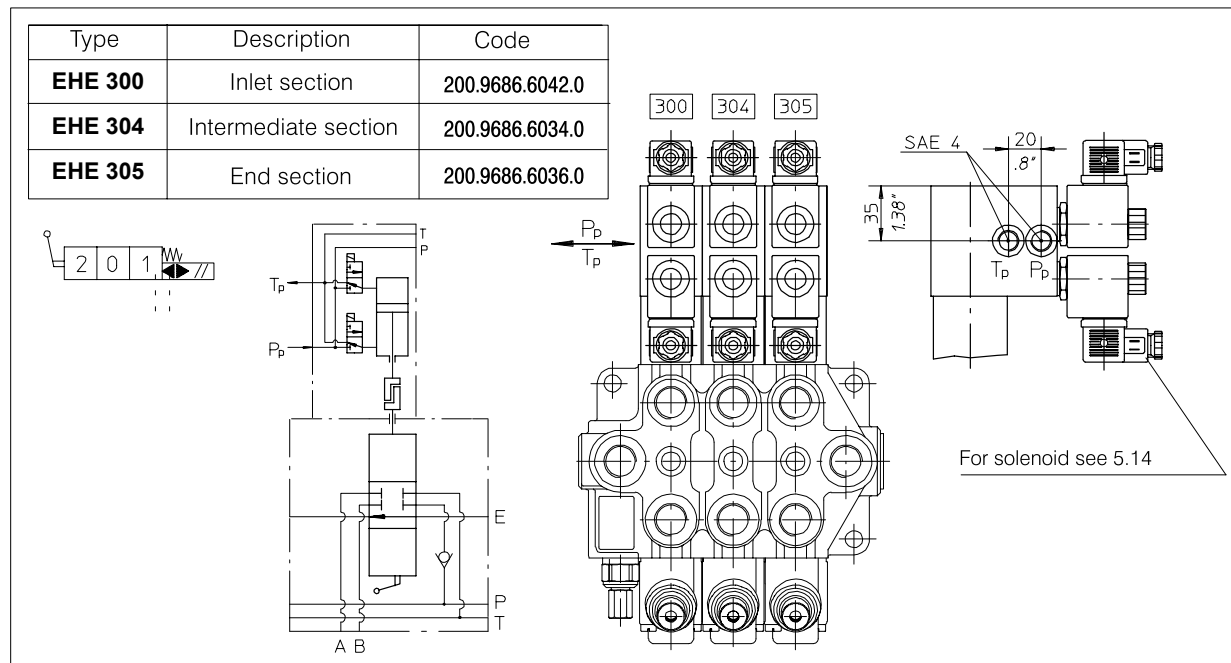
Leakage of pressure reducing
valve (in neutral pos.) 100 ml/min (6.1 in³/min)
Min. suggested filtration 25 micron
Operating oil temperature min. -30°C- max. 90°C
..... min. -22°F - max 194°F

HDM18 Series

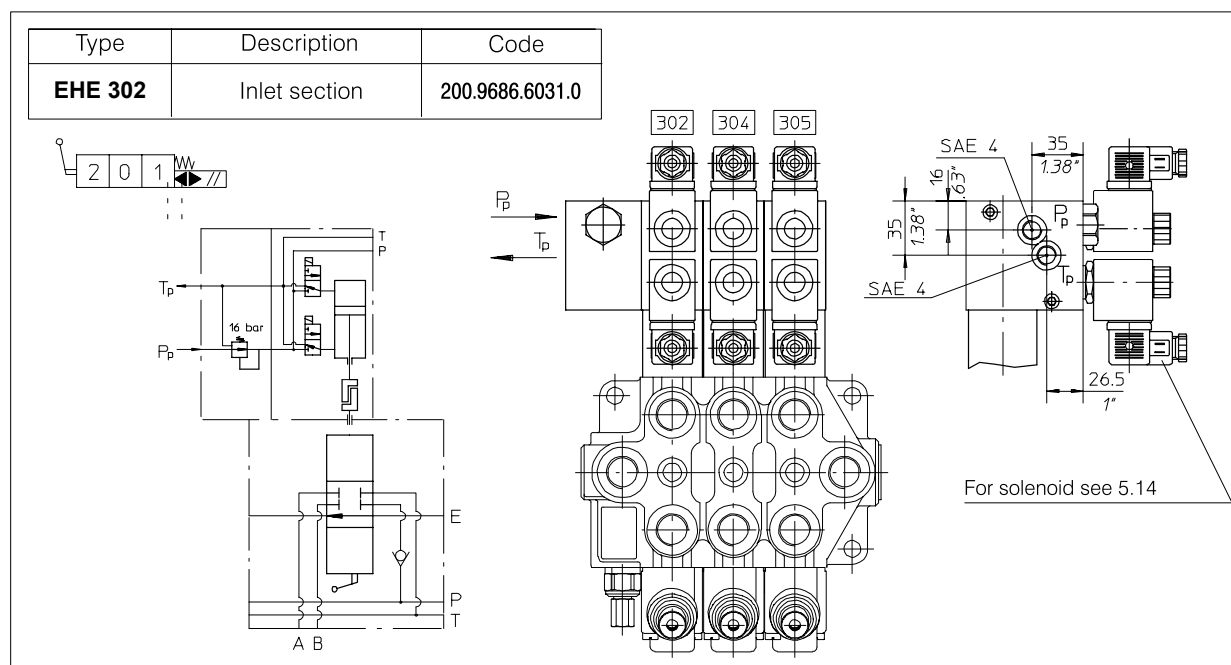
Mono-Block Directional Control Valve



Electro-hydraulic control external pilot version
ON-OFF



Electro-hydraulic control external pilot version
ON-OFF with pressure reducing valve on inlet
manifold



Mechanical and hydraulic features

Pilot pressure min. 10 bar (140 PSI)
Pilot pressure max. 30 bar (420 PSI)
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.)

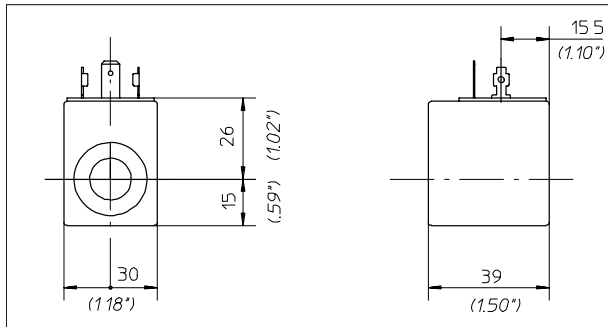
Operating oil temperature min.-30°C- max. 90°C
..... min.-22°F - max 194°F
Leakage of pressure reducing
valve (in neutral pos.) 100 ml/min (6.1 in³/min)
Min. suggested filtration 25 micron

HDM18 Series

Mono-Block Directional Control Valve

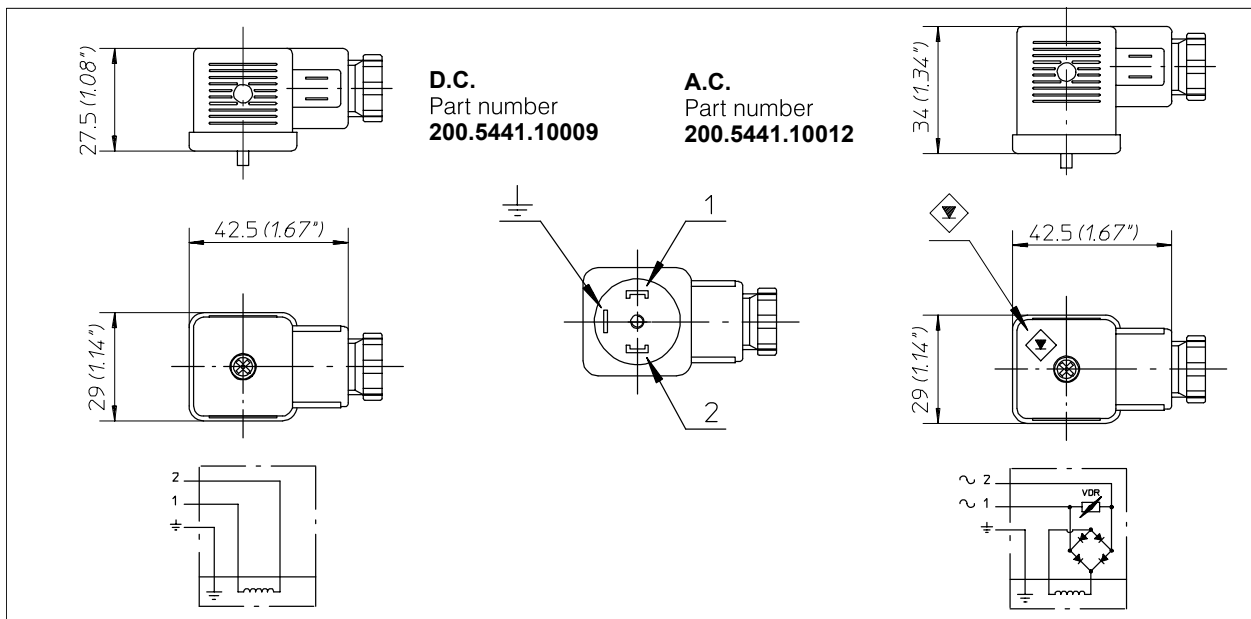


Solenoids for pilot electrovalves EHI-EHE



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

Coil code	Voltage	Nominal voltage	Power (Watt)	Resistance (Ohm)		Current (Ampere)	
				Ambient temp.	Stabilized temp.	Ambient temp.	Stabilized temp.
200.6749.1003.0	12 V. DC	12 V. DC	18.7	7.7	10.8	1.56	1.11
200.6749.2003.0	24 V. DC	24 V. DC	18.6	31	41.4	0.77	0.58
200.6748.2003.0	24 V. AC	21.6 V. DC	17.3	27	36	0.80	0.60
200.6748.4003.0	110 V. AC.	98 V. DC	15.6	630	825	0.157	0.120
200.6748.6003.0	220 V. DC	198 V. DC	15.7	2500	3300	0.08	0.06



Armour clamp	Pg 9
Ø cable	6 – 8 mm
Diodes	1N 4007 GP
Overvoltage protection	VDR
Connector type	DIN 43650
Number of poles	2 + $\frac{1}{2}$
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

HDM18 Series

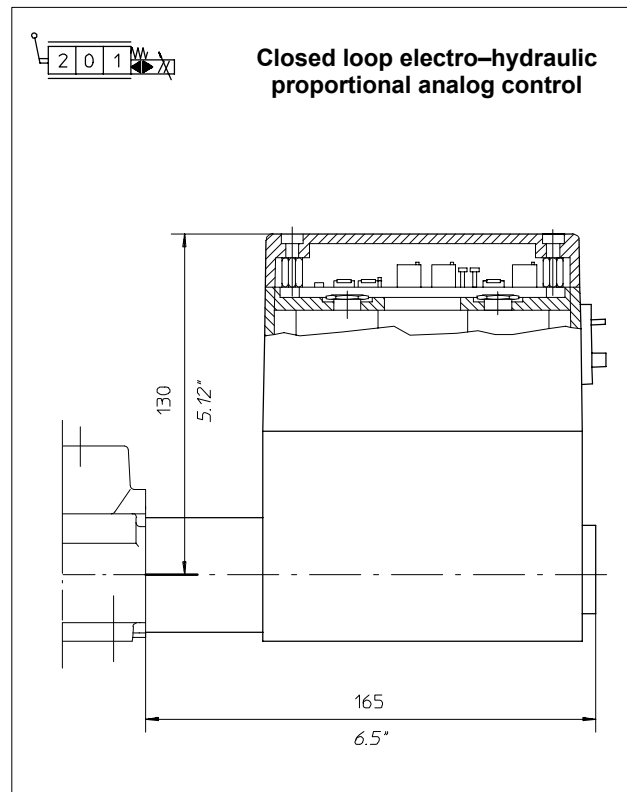
Mono-Block Directional Control Valve



Electro-hydraulic proportional control

Type	Description	Code
	Inlet cover with pressure reducing valve and electric by-pass	200.5333.20014
EHP 160	Inlet section	200.9686.6001.0
EHP 161	Intermediate section	200.9686.6003.0
EHP 162	End section	200.9686.6005.0

- High response accuracy, as a function of the input signal.
- Low hysteresis and high repeatability.
- The system is unaffected by disturbance forces, such as stiction of the driven sliding spool, changes in oil temperature or varying dynamic flow forces



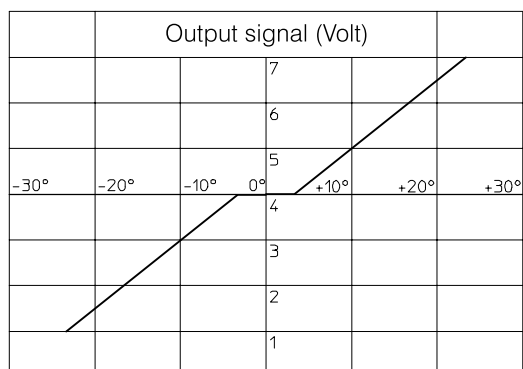
Mechanical and hydraulic features

Pilot pressure (reduced)	16 - 18 bar (220 PSI)
Pilot flow to each working section	0.1 l/min (0.26 GPM)
Max leakage	0.4 l/min (2.3 c.i./min)
Response time from neutral to max. stroke	180 ms
Response time from max stroke to neutral	80 ms
Min. suggested filtration	25 micron

Electric features

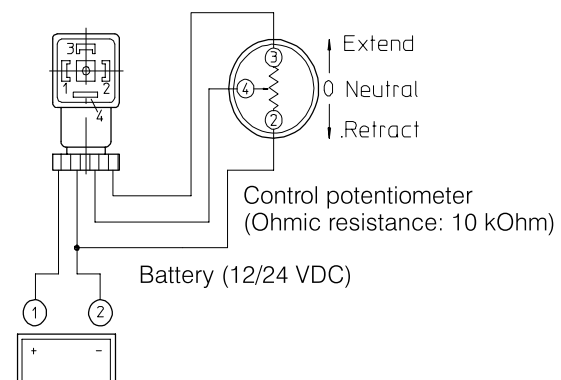
Supply voltage	12 - 24 VDC (12 - 24 VGS)
Control current range (PWM)	200 - 900 mA
Control potentiometer ohmic resistance	10 k Ω
Input voltage to the control potentiometer	8 V
Control voltage to the electronic circuit:	
neutral position	4 V
max. stroke A	6 V
max. stroke B	2 V

Joystick control characteristics



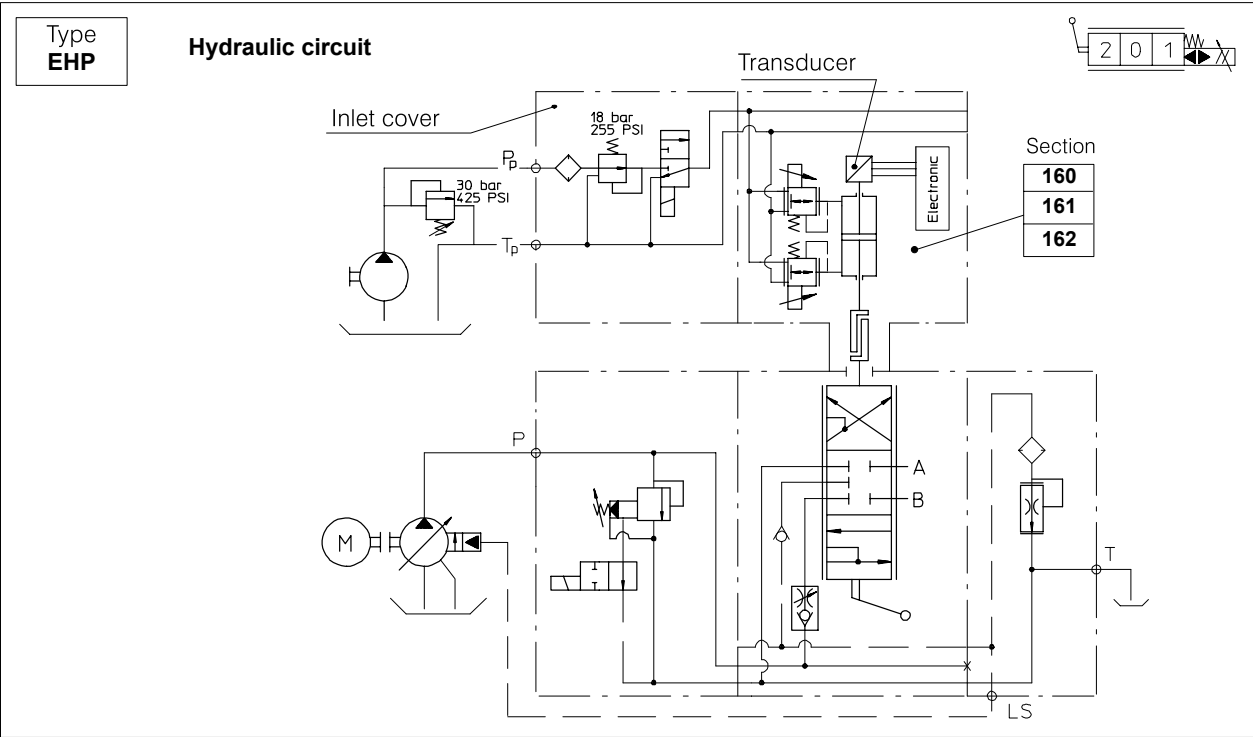
Electrical wiring

DIN 43650 connector

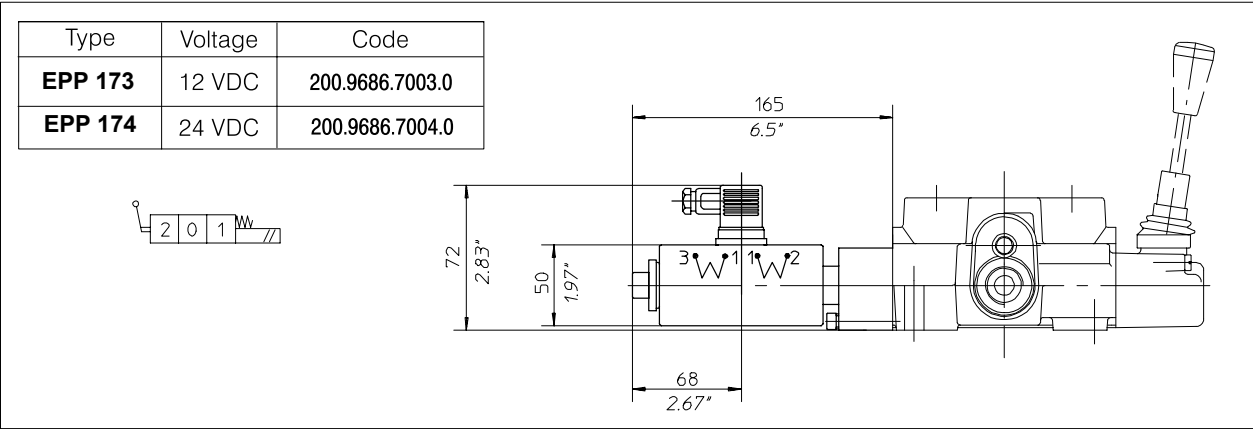


HDM18 Series

Mono-Block Directional Control Valve



Electromagnetic control



To be used with special spools only: the spool definition is different from the standard one because of the double "P", example A circuit = APP

173 **174**

Mechanical and hydraulic features

Max operating pressure 200 bar (2800 PSI)
Max flow 40 l/min (15 U.S.G.P.M.)
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 80 W

ED: 60 %
Ohms resistance: 1.25 Ω [5.8 Ω]
Intensity of current 8 A (3.7 A)
Ambient operating temperature range: ... -54°C/+60°C
Average stabilized coil temperature operated continuously +160°C
The a/m overage temperature is obtained with a nominal voltage of 12 V (24 V), with an ambient temperature of 25° C and with an electromagnet assembled on an hydraulic valve without oil circulation.
Insulation class: H
following to VDE 0580 standard
Electrical connection: with Hirschmann connector per DIN 43650 IP 65

HDM18 Series

Mono-Block Directional Control Valve



HOW TO ORDER

