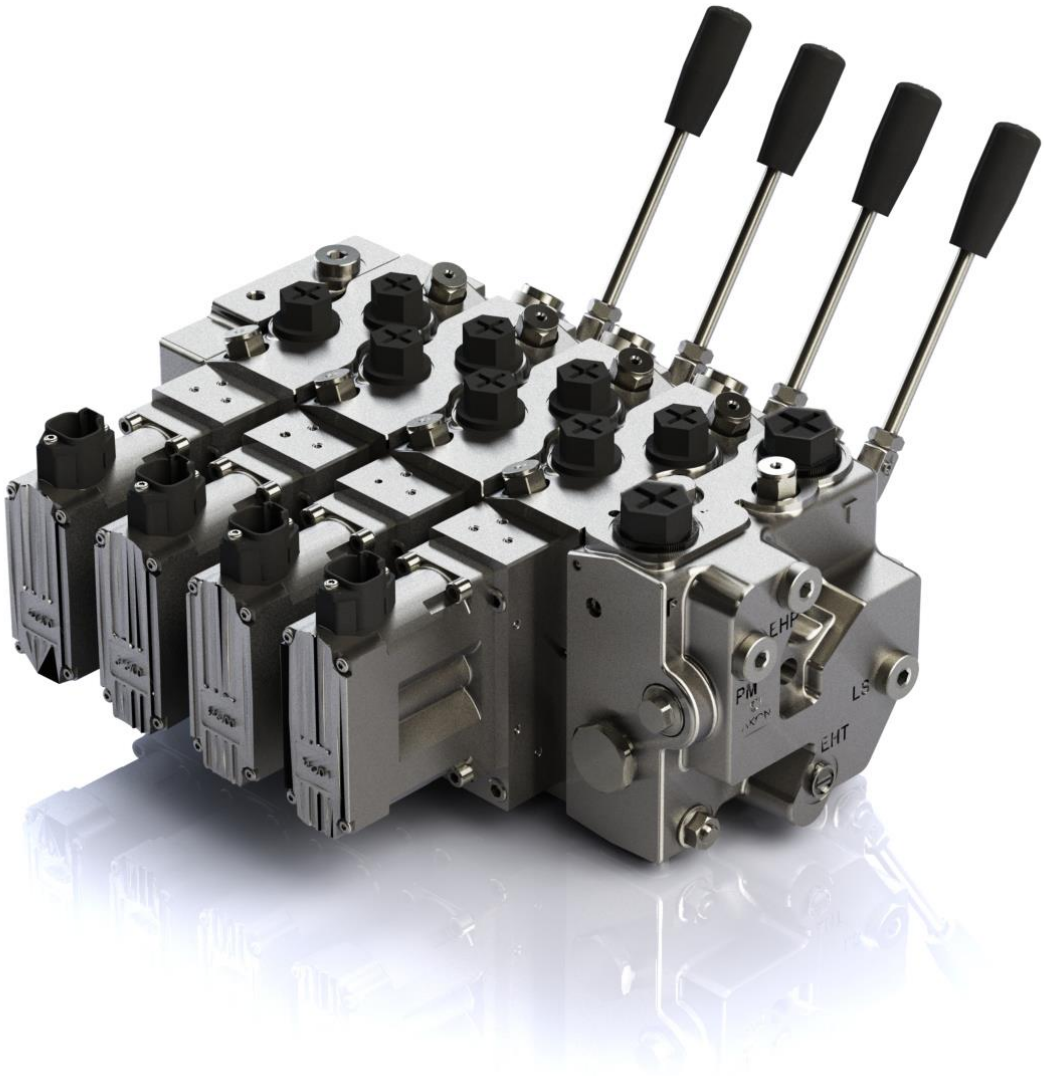
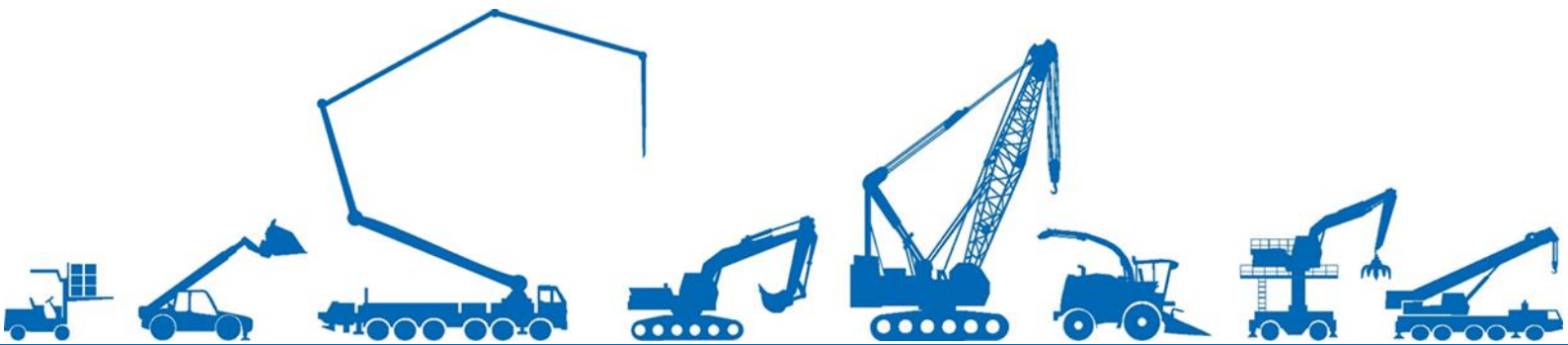
WESSEL HYDRAULIK

SPV-120

Load-Sensing-Proportional-Valve

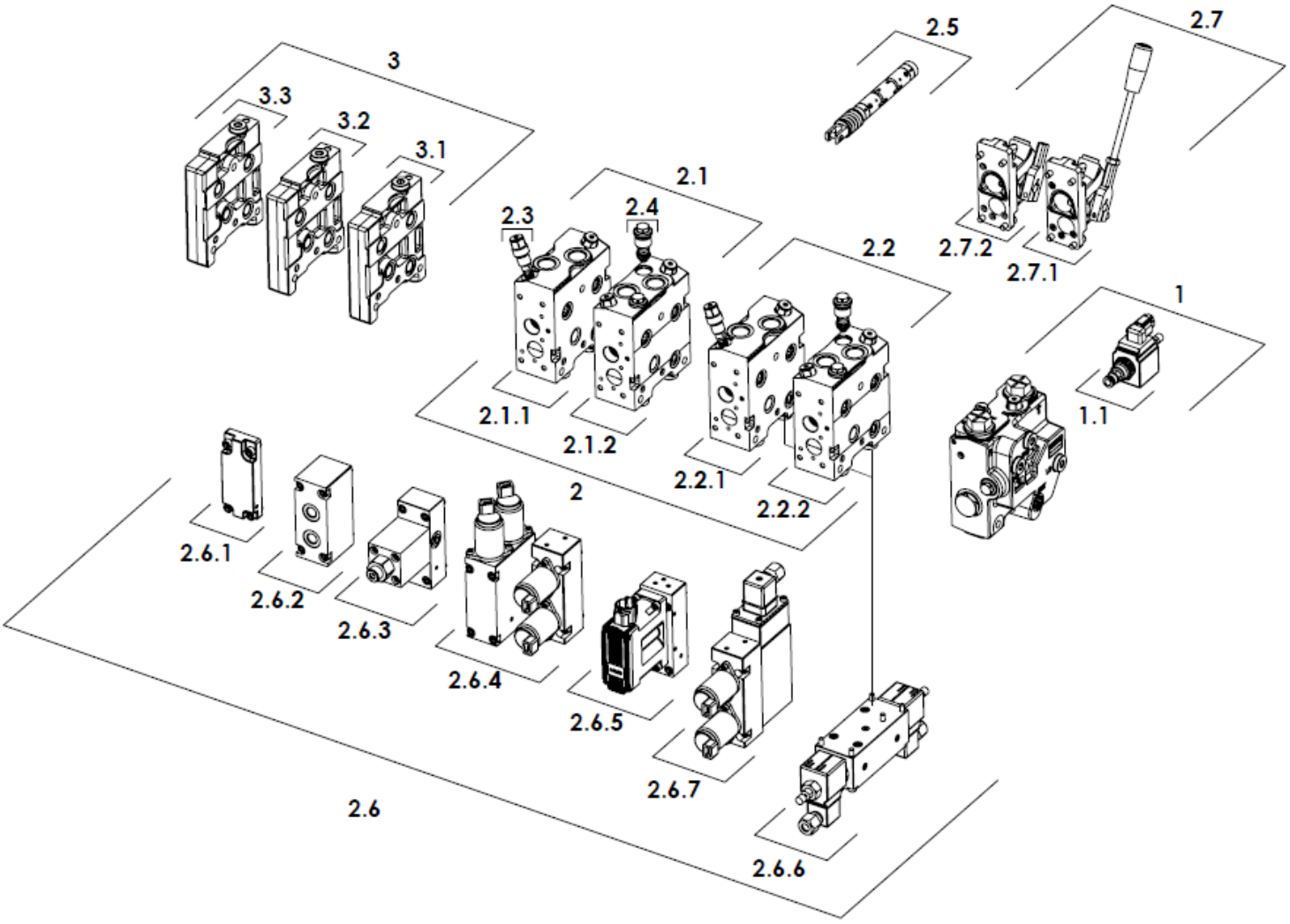




DATE	CHANGE	REVISION
OCTOBER 2017 (26.10.2017)	NEW EDITION	17A
JANUARY 2018 (04.01.2018)	UPDATE ON HYDRAULIC SCHEMES	18A
MARCH 2018 (16.03.2018)	UPDATE ON OPEN LOOP PWM CONTROL COILS NEW THREAD OPTIONS FOR END COVERS	18B

CONTENT

MODULES & ACCESSORIES



MODULES & ACCESSORIES

SPV120S	/	B	-	F	350	/	260	–	NC12	H
1		2		3	4		5		6	7

1 APPLICATION

SPV12(1-12)S	Standard Application
SPV12(1-12)M	Marine Application

2 PORT THREADS

B	BSP
A	UNF
M	Metric

3 INLET TYPE

F	Fixed Displacement Pump
V	Variable Discplacement Pump

4 SECONDARY RV

350	350 Bar Non-Adjustable

5 MAIN RV

260	30 - 380 Bar Adjustable

6 UNLOADING VALVE

Omit	N/A
NO12	Normally Open 12 VDC
NO24	Normally Open 24 VDC
NC12	Normally Closed 12 VDC
NC24	Normally Closed 24 VDC

7 CONNECTOR TYPE

H	DIN
A	AMP
D	Deutsch

		A Side	B Side		A Side	B Side										
2	C	-	LRV	(100 / 180) –	ASV	(300 / 300) –	F	65 / 65	T –	COAB	12	/	CP	/	MC	/ A
1			2			3	4	5	6	7	8		9		10	11

1 SECTION TYPE

1	Section Without Shock Valve Cavity
2	Section With Shock Valve Cavity
C	Section for LS Signal Cut-Off Module

2 LS RELIEF VALVE

LRV	LS Relief Valve
MLRV	Marine Type LS Relief Valve
P	LS Relief Valve Cavity Plug

3 SHOCK VALVE

ASV	Antishock&Anticavitation Valve
ACV	Anticavitation Valve
P	Cavity Plug

4 SPOOL TYPE

F	A/B Closed in Neutral
FT	A/B Partially open to tank in Neutral
FO	A/B Open to tank in Neutral
FF	Float

5 SPOOL FLOW RATE

5	5 l/min	1,3 US gpm
10	10 l/min	2,6 US gpm
25	25 l/min	6,5 US gpm
40	40 l/min	11 US gpm
65	65 l/min	17 US gpm
80	80 l/min	21 US gpm
100	100 l/min	26 US gpm
125	125 l/min	33 US gpm

6 FLOW CHARACTERISTICS

Omit	Symmetric
A	Asymmetric
T	Throttled Tank

7 LS SIGNAL CUT-OFF MODULE

COAB	NO - LSA+LSB Active
COA	NO - LSA Active
COB	NO - LSB Active
CCAB	NC - LSA+LSB Active
CCA	NC - LSA Active
CCB	NC - LSB Active

8 CUT-OFF SUPPLY

12	12 VDC
24	24 VDC

9 ACTUATORS

	MANUAL CONTROLS
ME	Mechanical End Cap
MD	Mechanical Friction Detent
MF	Mechanical Float Position
HC	Hydraulic Control
	ELECTRIC ACTUATORS
D12	Open Loop PWM 12 VDC
D24	Open Loop PWM 24 VDC
CP	Closed Loop PWM
CV5	Closed Loop Voltage 0-5V, +5V ref.
CVF	Closed Loop Voltage 0-5V, Feedback Output
CR	Closed Loop Voltage Ratio Metric
CC	Closed Loop Voltage CAN bus Control

10 LEVER CAPS

MA	Aluminium Lever Cap w/ Spool Stroke Limiter
MC	Cast Iron Lever Cap w/ Spool Stroke Limiter

11 CONNECTOR TYPE

H	DIN
A	AMP
D	Deutsch

ES / PN

1 2

1 END COVER

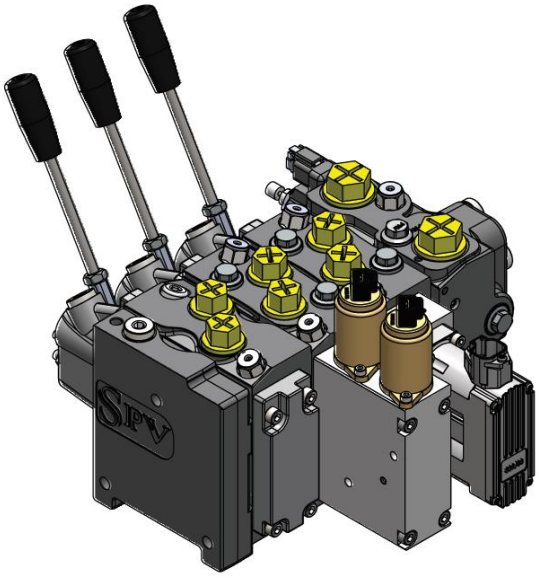
ES	End Cover w/o Connections
ED	End Cover w/ Internal Drain Line w/o Connections
EP	End Cover w/ P,T and LS Connections

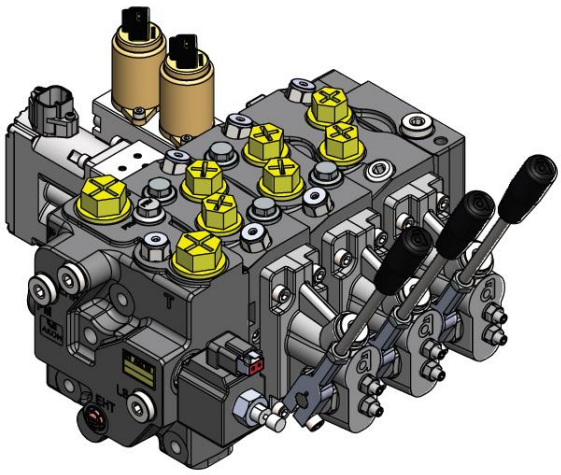
2 PAINT

Omit	No Painting or Coating
PN	Painting
CT	Coating

EXAMPLE CODING OF 3 SECTION VALVE

INLET SECTION	SPV123M/B-F350/240-NC12D
WORKING SECTION 1	2-LRV(180/200)-ASV(250/300)-F25/40-CV5-MA/D
WORKING SECTION 2	2-LRV(180/200)-ASV(250/300)-F25/40-D12-MA/D
WORKING SECTION 3	1-LRV(P/200)-FT40/40-ME-MA
END COVER	ES





Product Features & Benefits

SPV120 is a stackable, load sensing, pre-compensated proportional valve provides flow control independent of load pressure from 5 l/min to 125 l/min.

Precise Control & Efficiency

SPV120 offers precise control and efficiency for wide range of applications from mobile cranes, fire engines, agricultural machinery, aerial platforms & lifts, concrete pumps to mining and drilling machines.

Energy saving load sensing technology increase efficiency.

Time Saving Modular Structure

Modular structure enables unlimited configurations to the user with Add-on-Sections.

Advanced Customized Control

Thanks to the careful design engineering, SPV120 offers advanced customized control with shock valves, LSA/LSB pressure relief valves, spool stoke limiters, precise spool adjustents specific for the application requirements. The valve combines advanced abilities through various actutator options: manual, hydraulic, proportional, PWM, Voltage and CANBus proportional control for open and close loop Systems.

Pressure Compensator

With pressure compensators in each section, actuators are compensated and maintained a constant pressure drop against changes in load.

Installation

The valve can be installed either vertically or horizontally. It is however important to install it on a clean, flat and a vibration proof surface.

During assembly process, its necessary to work in a clean environment free of dirt, dust and other possible pollution.

Make sure that an authorized personnel carry-out the assembling.

Fittings

Always use standard fittings. When tightening, be sure that hey press the ports properly. Never use fittings which do not ensure this. This may cause malfunctions in the valve body.

Work port adapters has to be fastened according to the following tightening torque table.

Recommended Tightening Torque for Work Ports (Nm / lbft)

BSP (ISO 228/1)	***G1/4"***	***G1/2"***	***G3/4"***
WITH O-RING	*25 / 18,4*	*50 / 36,9*	*90 / 66,4*
WITH COPPER WASHER (ISO 1179-1)	*30 / 22,1*	*60 / 44,3*	*90 / 66,4*
WITH BOUNDED SEAL (ISO 1179-1)	*16 / 11,8*	*60 / 44,3*	*90 / 51,6*
UN-UNF (ISO 263)	***9/16-18 UNF (SAE6)***	***7/8-10 UNF (SAE10)***	***1 1/16-12 UNF (SAE12)***
WITH O-RING (ISO 11926-1)	*30 / 22,1*	*50 / 36,9*	*95 / 70*

For metric threads please contact to our Sales Department.

Hydraulic Fluid

For best performance recommends to use mineral based oil of high quality and cleanness in the Hydraulic system. Mineral based oil responding to DIN51524 HLP requirements can be used.

For viscosity range allowed, please see table «Working Conditions».

Safety in Application

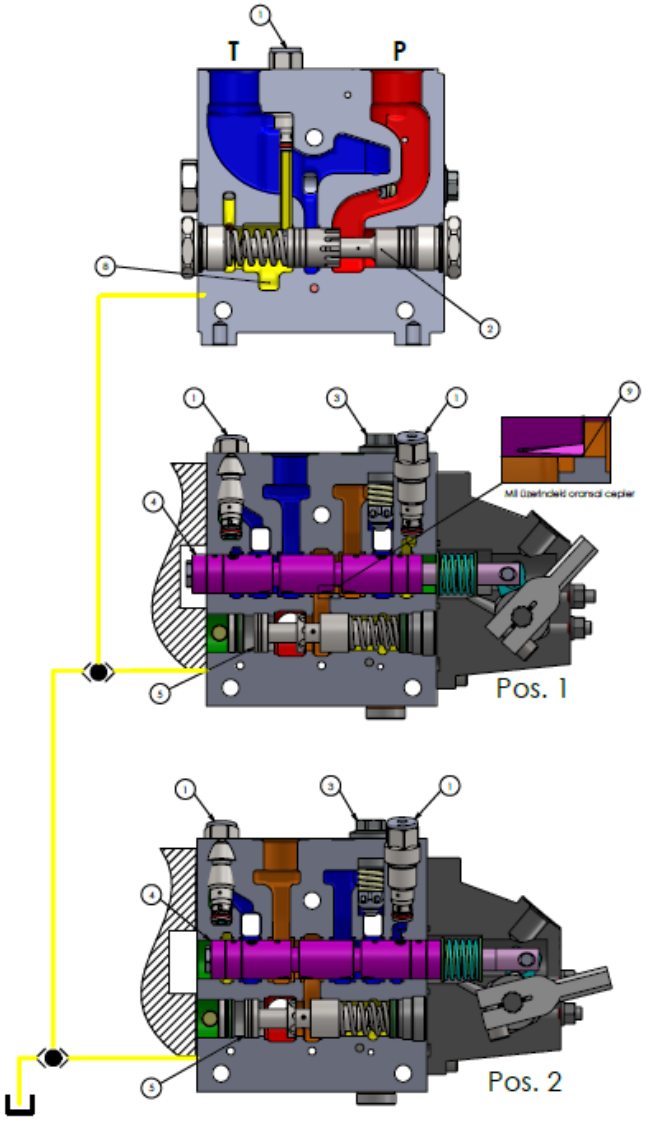
An assessment of possible failures in the application like pressure failures, blocked movements need to be analyzed and necessary protection against possible failures should be integrated to the system to ensure safety in application. SPV120 can provide standard or on demand safety functions integrated to the directional control valve.

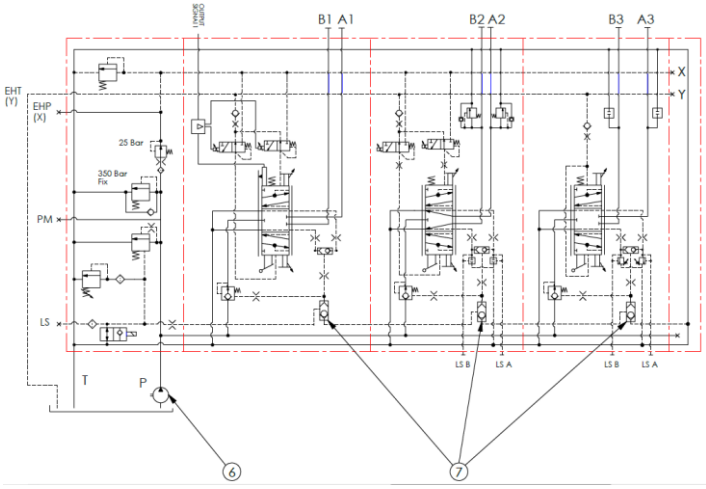
Please remember that, as proportional valves are used in wide range of applications, the manufacturer of the application is the only responsible for the final selection of the product and ensuring the performance, safety and warning equirements in the application. For choosing the control system EN 13849 (Safety related requirements for control Systems) provides safety requirements and guidance on the principles for the design and integration of satefy-related parts of control Systems.

Filtration

Its important to provide effective filtration to the hydraulic fluid in order to ensure proper operation and long life for the directional control valve and its components. The system must be filtered to avoid the possible damaged caused by the excess contamination level of the fluid.

Filtration must be arranged not to exceed Target Contamination Class 20/18/15 according to ISO 4406 and 18/16/13 for pilot circuit.





Hydraulic systems with pressure compensator enable efficiency in terms of energy consumption. Pressure compensated systems are divided into two groups as “Open Center” and “Closed Center” systems. In open center systems 3-way compensator spool (2) in inlet section enable system to work with fixed displacement pump. Unlike open center systems, in closed center systems the pressure in the LS line is led directly to the load-sensing line and pump provides pressure compensation.

When spool (4) is in neutral position, oil will come from P line in inlet section of the valve to tank through 3 way compensator. Pressure in P line, the bypass pressure, equals to the spring force in LS line which is approximately 14 bar. This pressure equals to the tank pressure in neutral position.

When spools (4) are in position, highest load will lead to LS line (8) in inlet through shuttle valves (7). In same position, oil will pass through P line and 2 way compensator consequently and reach to the spool (4).

Notches (9) on spool determines the necessary flow rate for the cylinder. When the pressure beats the load, the movement starts.

Oil is determined according to 3 way compensator, 2 way compensator (5) and notches on spool. Proportional control ensured by these notches on spool and notch rate on 3 way compensator (2). 2 way compensator maintaines a constant pressure drop against changes in load and the valve operates proportionally indepedent of load changes.

Shock valves (3) on service port A and B enable oil flow to tank when pressure shocks arise. This prevents the valve from possible damages.

LSA and LSB relief valves (1) are used to limit the pressure on the port if pressure exceeds the valve setting. LS relief valves use low flow in LS line and can reach necessary pressure even in high flow rates. This enable less heating and efficiency.

Working Conditions

Recommended Oil Viscosity Operating Range		12 cSt to 75 cSt	
Minimum / Maximum Viscosity		10 cSt / 400 cSt	
Recommended Fluid Temperature Range (°C)		-20 to +90	
Ambient Temperature in Operating Condition (°C)		w/ mechanical controls -30 to +60	w/ electric actuators -30 to +50
Maximum Contamination Level		Class 9 (NAS 1638)	20/18/15 (ISO 4406)

Technical Specifications

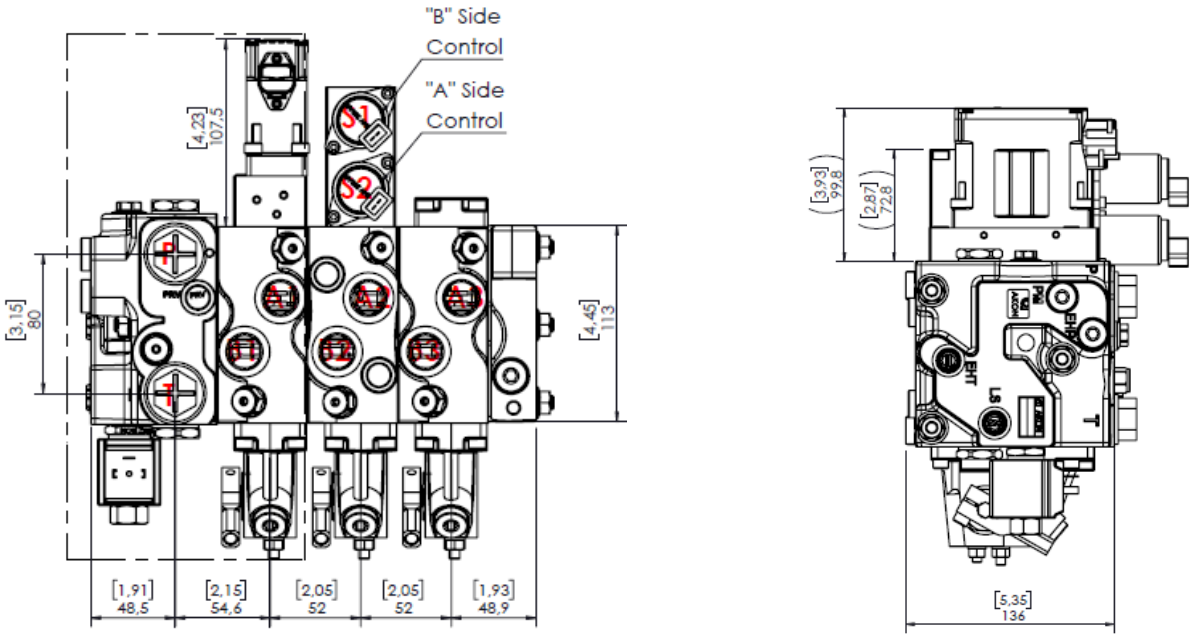
Number of Spools		1-12	
Nominal Flow on Inlet		150 l/min	40 US gpm
Nominal Flow on Ports	Compensated	125 l/min	33 US gpm
	Not Compensated	140 l/min	37 US gpm
Maximum Working Pressure	Port P, A/B Continous	350 bar	5000 psi
	Port A/B	420 bar	6100 psi
	Port LS	350 bar	5000 psi
Maximum Back Pressure on T Port		10 bar	150 psi
Maximum Internal Leakage (100 Bar; 32 cSt, 40˚C)	Without Shock Valves	12cc (100 Bar; 32 cSt, 40˚C)	0,73 in3/m (1450 psi; 32 cSt, 104°F)
	With Shock Valves	15cc (100 Bar; 32 cSt, 40˚C)	0,92 in3/m (1450 psi; 32 cSt, 104°F)
Spool Travel	Spool Travel	±7,0 mm	
	Dead Band	±1,5 mm	
	Proportional Range	±5,5 mm	

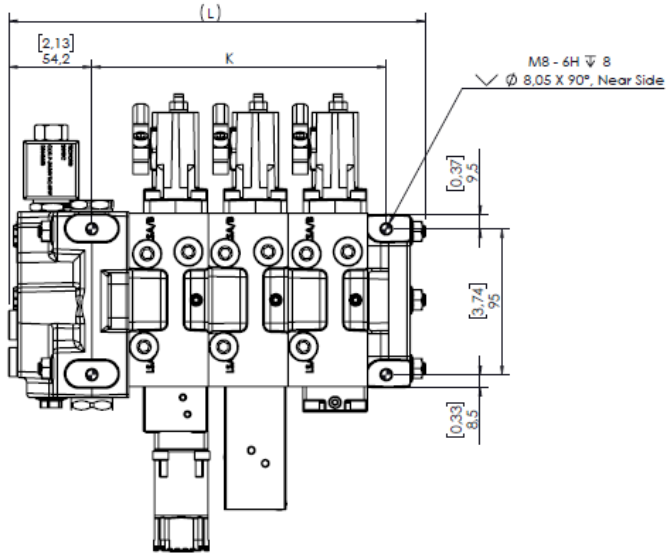
For other operating conditions please contact to our Sales Department.

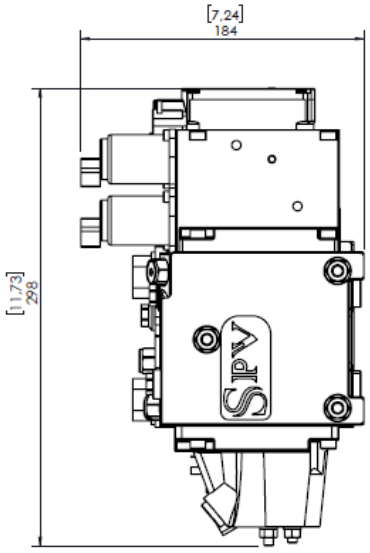
Standard & Optional Threads

Thread	Code	P	A/B	T	LSA/LSB	PM / EHP / EHT
BSP	B	G ¾"	G ½"	G ¾"	G ¼"	G ¼"
UN - UNF	A	1 1/16-12 UNF (SAE 12)	7/8 – 14 UNF (SAE 10)	1 1/16-12 UNF (SAE 12)	9/16-18 UNF (SAE 6)	9/16-18 UNF (SAE 6)

BSP thread is standard. For other demands please contact our Sales Department.

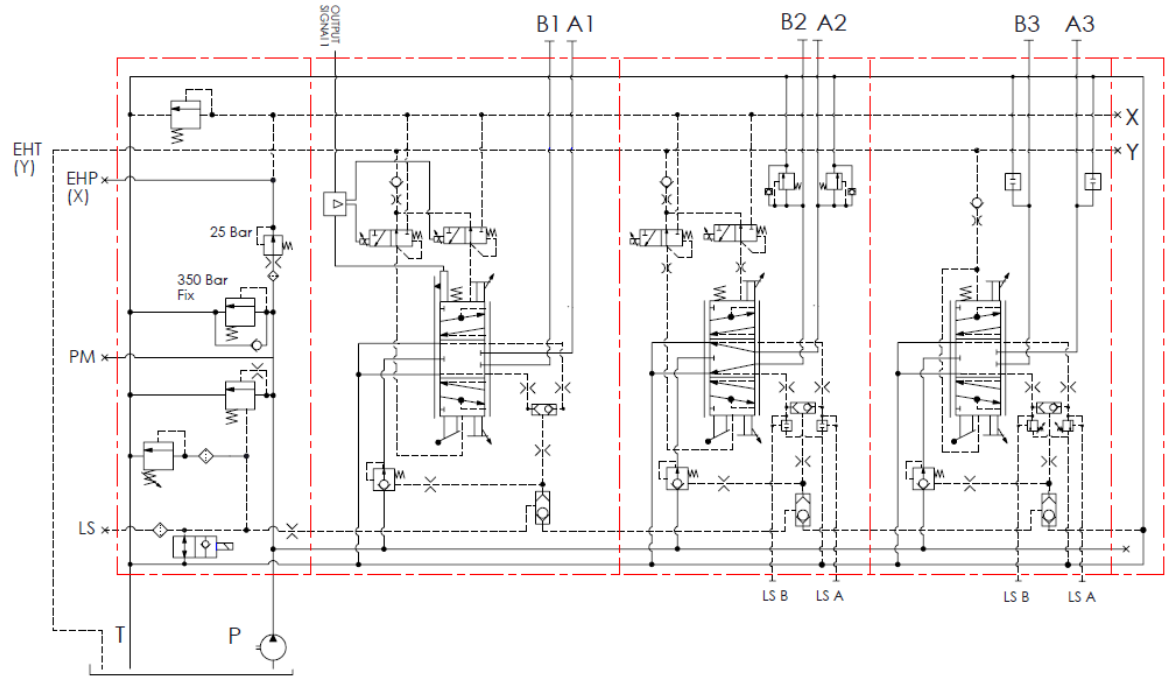




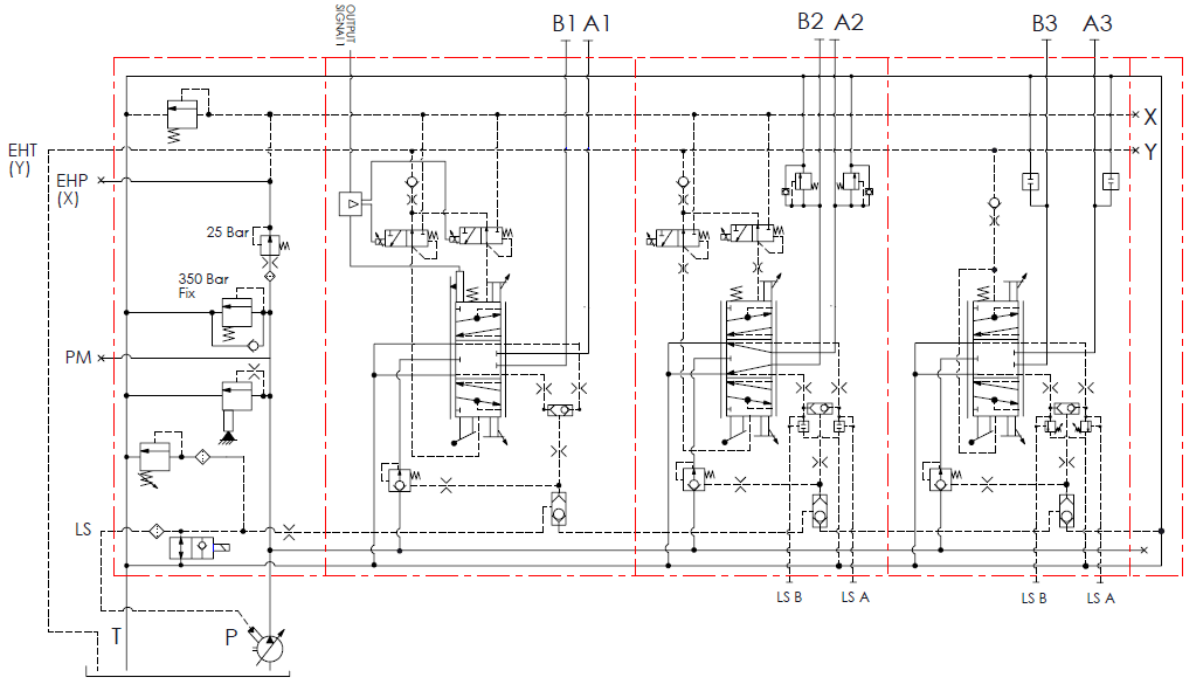


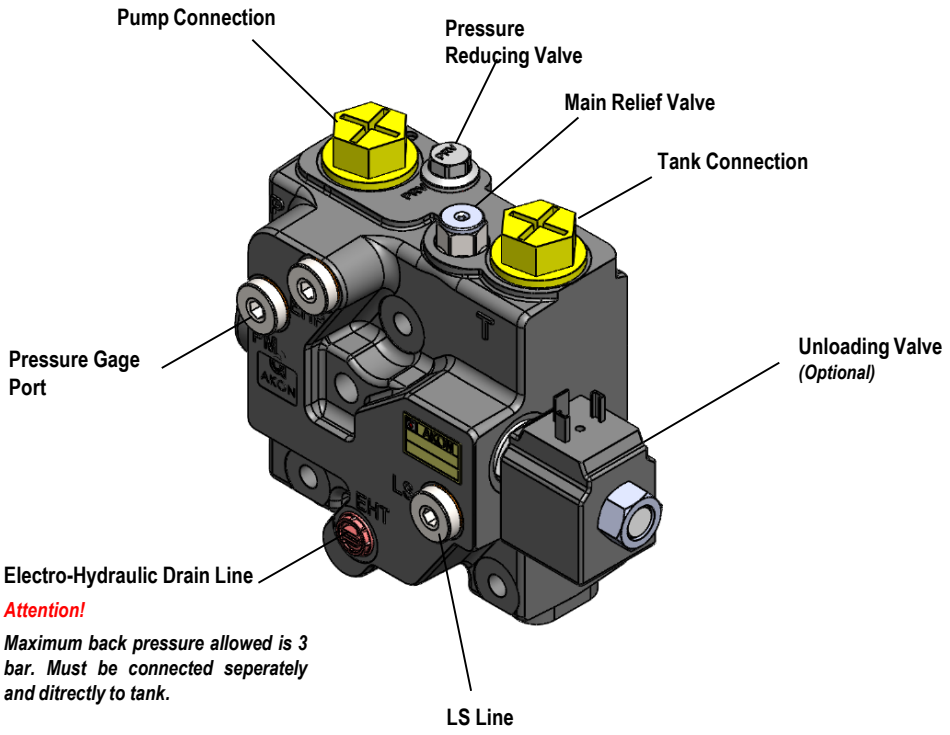
Type	K		L	
	mm	inch	mm	inch
SPV121	88	3,46	167,7	6,60
SPV122	140	5,51	219,7	8,64
SPV123	192	7,55	271,7	10,69
SPV124	244	9,60	323,7	12,74
SPV125	296	11,65	375,7	14,79
SPV126	348	13,70	427,7	16,83
SPV127	400	15,74	479,7	18,88
SVP128	452	17,79	531,7	20,93
SPV129	504	19,84	583,7	22,98
SPV1210	556	21,88	635,7	25,02

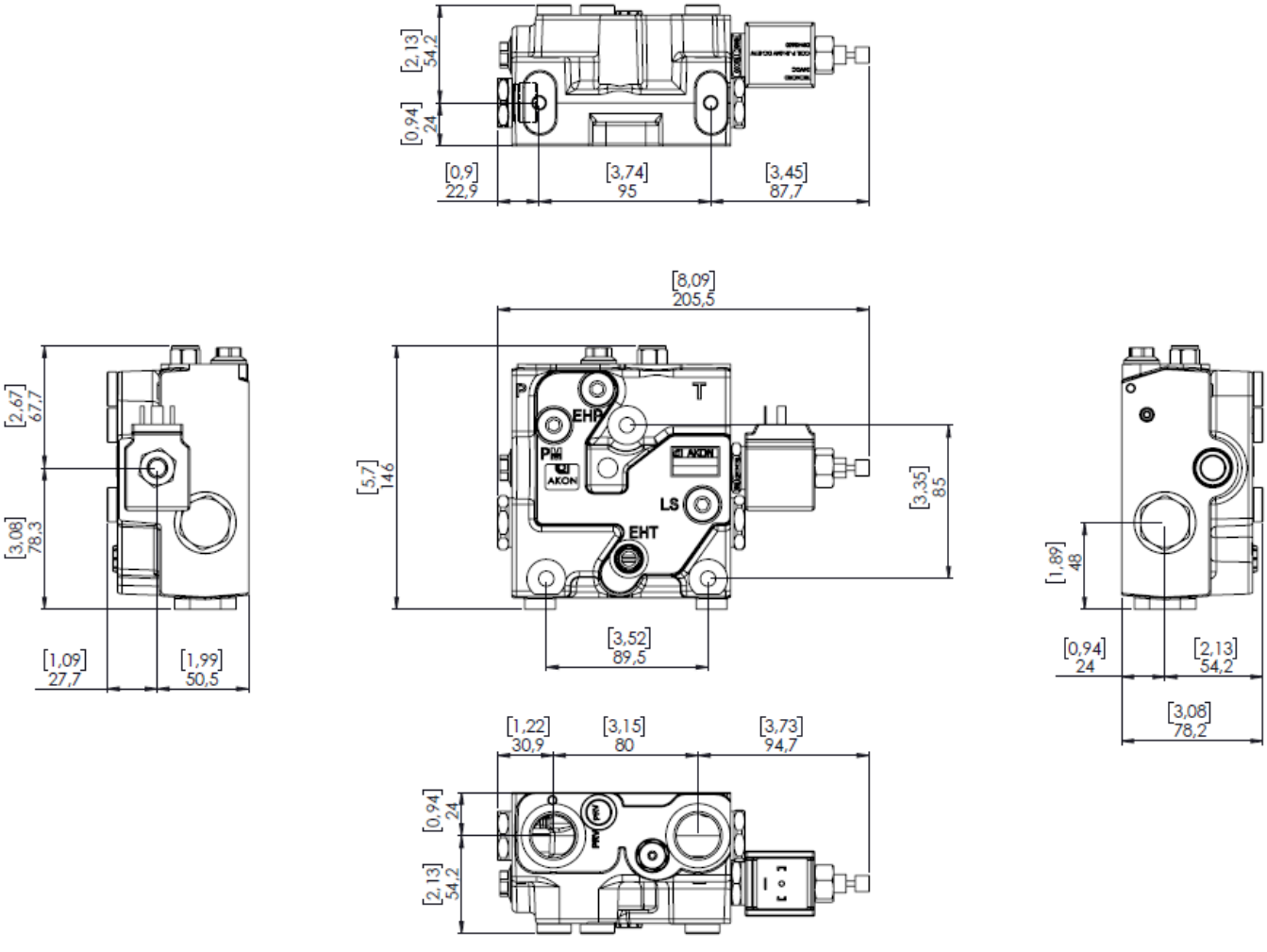
Systems fed by fixed displacement pumps



Systems fed by variable displacement pumps




Pump Connection
Pressure
Reducing Valve
Main Relief Valve
Tank Connection
Pressure Gage
Port
Unloading Valve
(Optional)
Electro-Hydraulic Drain Line
Attention!
Maximum back pressure allowed is 3 bar. Must be connected seperately and ditrectly to tank.
LS Line

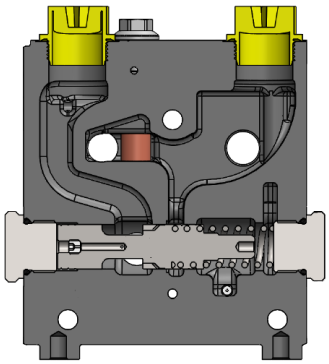

[2,13] 54,2
[0,94] 24
[0,9] 22,9
[3,74] 95
[3,45] 87,7
[8,09] 205,5
[2,67] 67,7
[3,08] 78,3
[1,09] 27,7
[1,99] 50,5
[5,7] 146
[3,35] 85
[3,52] 89,5
[1,89] 48
[0,94] 24
[2,13] 54,2
[3,08] 78,2
[1,22] 30,9
[3,15] 80
[3,73] 94,7
[0,94] 24
[2,13] 54,2

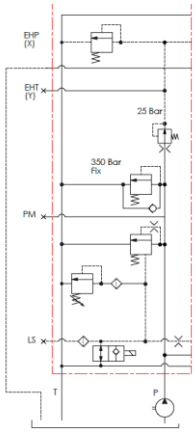
All SPV120 inlet section configurations include, P and T connections, PM pressure gage port for measuring the pump and load signal pressures, pressure reducing valve, adjustable main relief valve, non-adjustable secondary relief valve set to 350 bar for safety purpose. Unloading cavity is prearranged and plugged for unloading valve.

Unloading valve is not included in the inlet configurations, please see «*Unloading Valves*» for details.

Inlet can be easily switched from fixed to variable pump configuration by changing compensator spool and spring with dummy spool.

Inlet Section For Systems With Fixed Pump

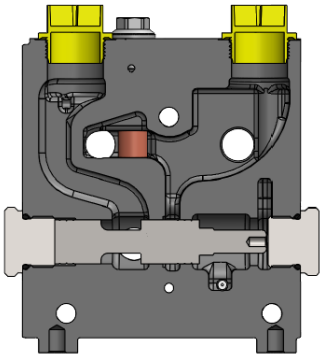


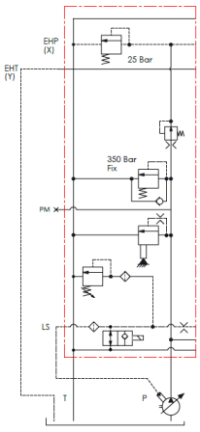


Weight

5,8 kgs / 18,20lbs

Inlet Section For Systems With Variable Pump





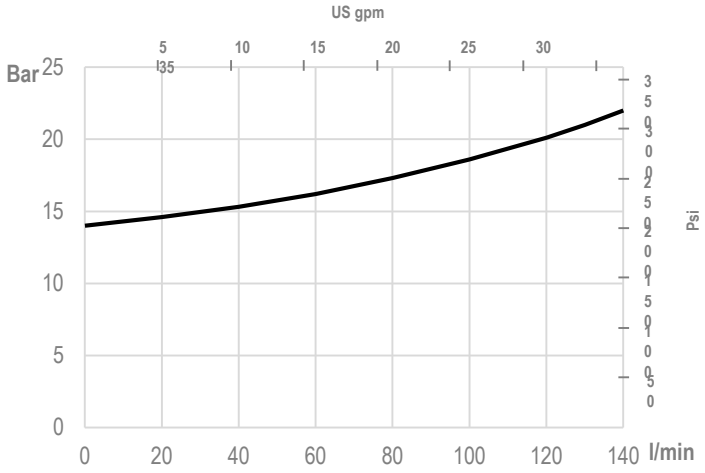
Weight

5,80 kgs / 18,20lbs

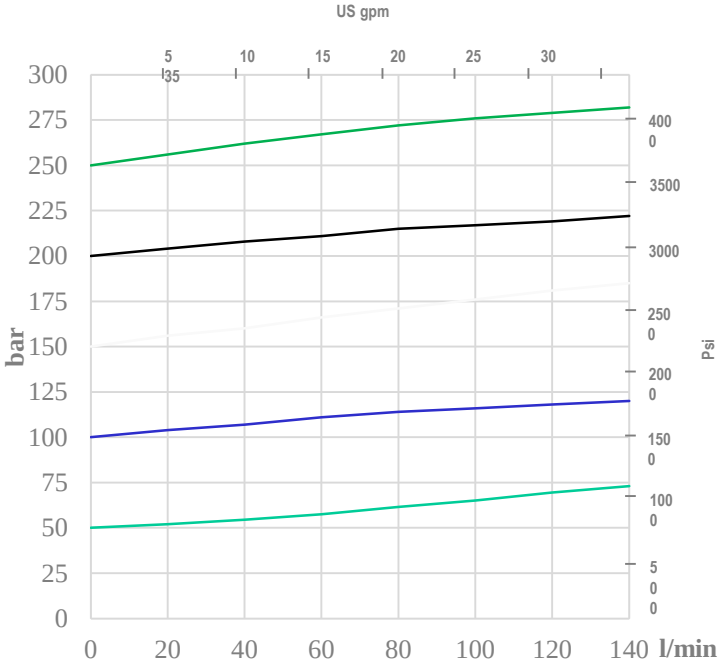
ORDER CODE	DESCRIPTION
120POHN1600	G 3/4 INLET FOR FIXED PUMP
120POHN1640	SAE 12 INLET FOR FIXED PUMP
120PCHN1700	G 3/4 INLET FOR VARIABLE PUMP
120PCHN1740	SAE 12 INLET FOR VARIABLE PUMP
120MPOHN1600	MARINE TYPE; G 3/4 INLET FOR FIXED PUMP
120MPOHN1640	MARINE TYPE; SAE 12 INLET FOR FIXED PUMP
120MPCHN1700	MARINE TYPE; G 3/4 INLET FOR VARIABLE PUMP
120MPCHN1740	MARINE TYPE; SAE 12 INLET FOR VARIABLE PUMP

ORDER CODE	INLET CONVERSION KITS
15010417000	CONVERSION KIT FROM VARIABLE TO FIXED DISPLACEMENT
1010322000	CONVERSION KIT FROM FIXED TO VARIABLE DISPLACEMENT

P – T Pressure Drop Inlet Compensator

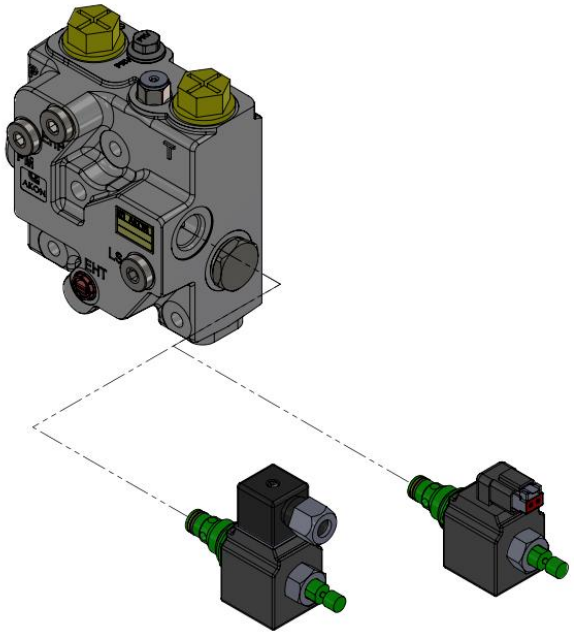


Main Relief Valve Characteristics

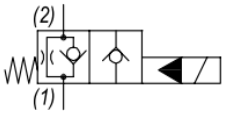


Please see page 24 for main relief valve order code and details.

UNLOADING VALVES

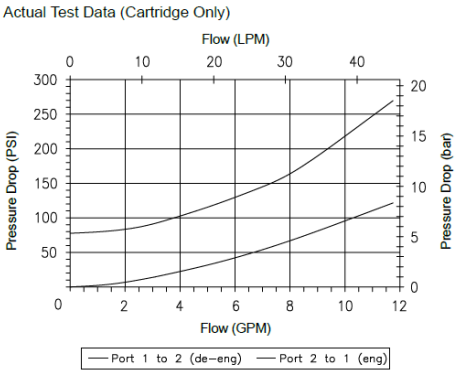


Normally Open w/ Manual Override



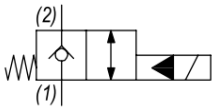
When de-energized the unloading valve allows flow from 1 to 2 and blocks flow from 2 to 1.

When energized the the unloading valve blocks flow from 1 to 2 and allows flow from 2 to 1.



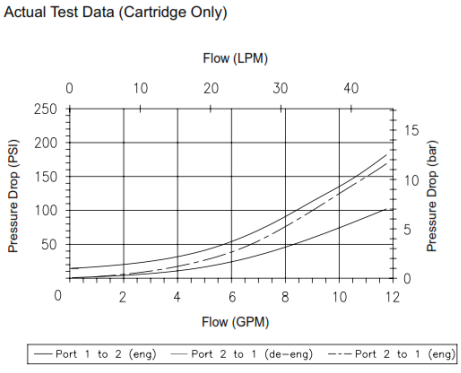
ORDER CODE	DESCRIPTION
120UN5040	NO & MANUAL OVERRIDE - 12VDC - DIN
120UN5041	NO & MANUAL OVERRIDE - 12VDC - AMP
120UN5042	NO & MANUAL OVERRIDE - 12VDC - DEUT.
120UN5050	NO & MANUAL OVERRIDE - 24VDC - DIN
120UN5051	NO & MANUAL OVERRIDE - 24VDC - AMP
120UN5052	NO & MANUAL OVERRIDE - 24VDC - DEUT.

Normally Closed w/ Manual Override



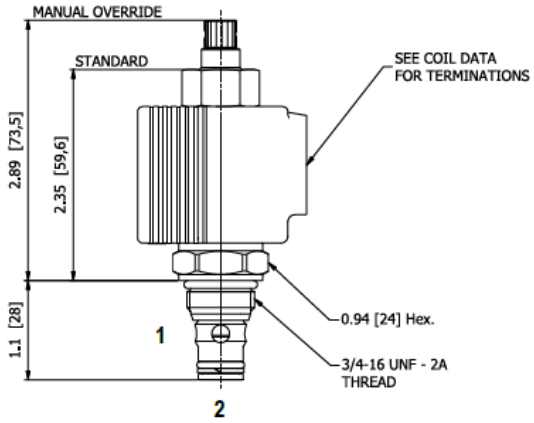
When de-energized the unloading valve blocks flow from 1 to 2 and allows reverse flow from 2 to 1.

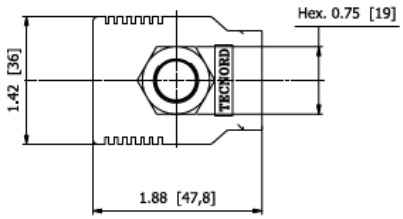
When energized the valve allows flow from 1 to 2 and from 2 to 1.



ORDER CODE	DESCRIPTION
120UN5060	NC & MANUAL OVERRIDE - 12VDC - DIN
120UN5061	NC & MANUAL OVERRIDE - 12VDC - AMP
120UN5062	NC & MANUAL OVERRIDE - 12VDC - DEUT.
120UN5070	NC & MANUAL OVERRIDE - 24VDC - DIN
120UN5071	NC & MANUAL OVERRIDE - 24VDC - AMP
120UN5072	NC & MANUAL OVERRIDE - 24VDC - DEUT.

UNLOADING VALVES





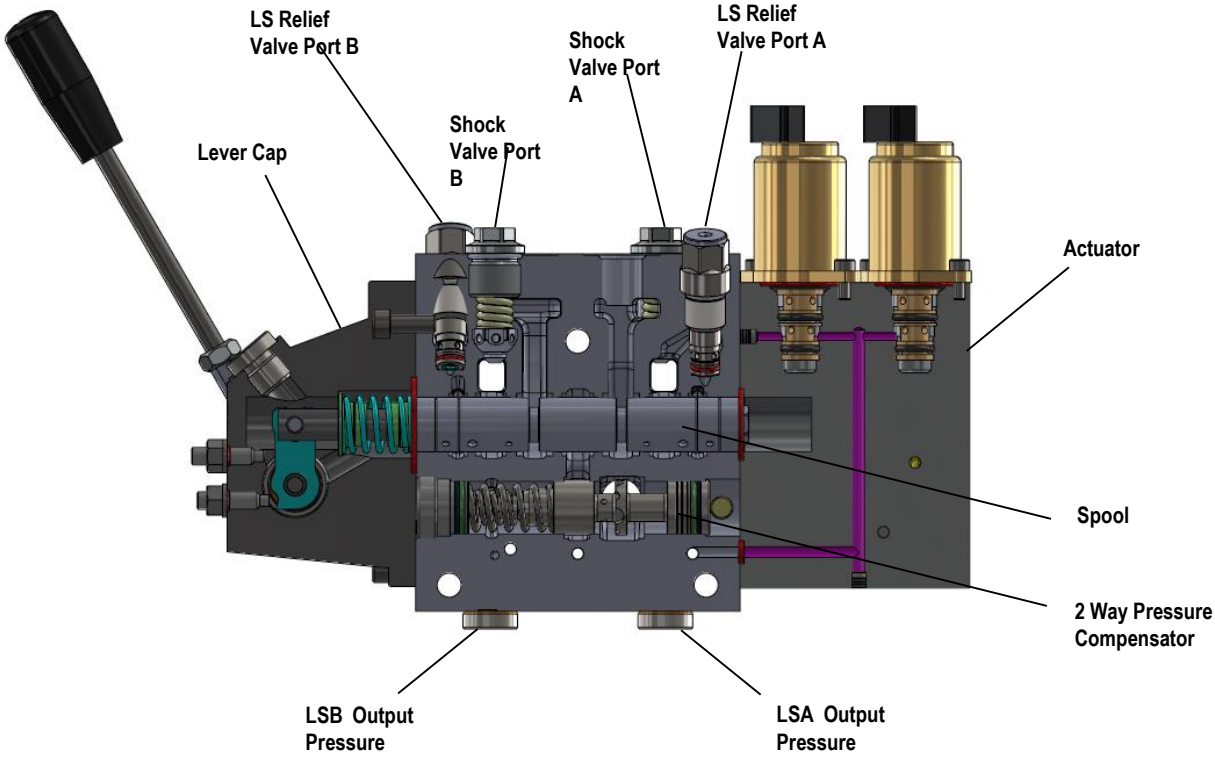
Weight

0,35 kgs / 0,77 lbs

Coil Specifications

Wattage	21 Watts Nominal
Rated Current Range	Continous Duty ±10% rated voltage @ 49°C (120°F) ambient
Min. Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H
Heat Insulation Class	F
Ambient Temperature Range	-30°C to 60°C
Emcapsulation Material	Thermo-Plastic, resistant to moisture, caustic solutions, fungus and vibrations

WORKING SECTION

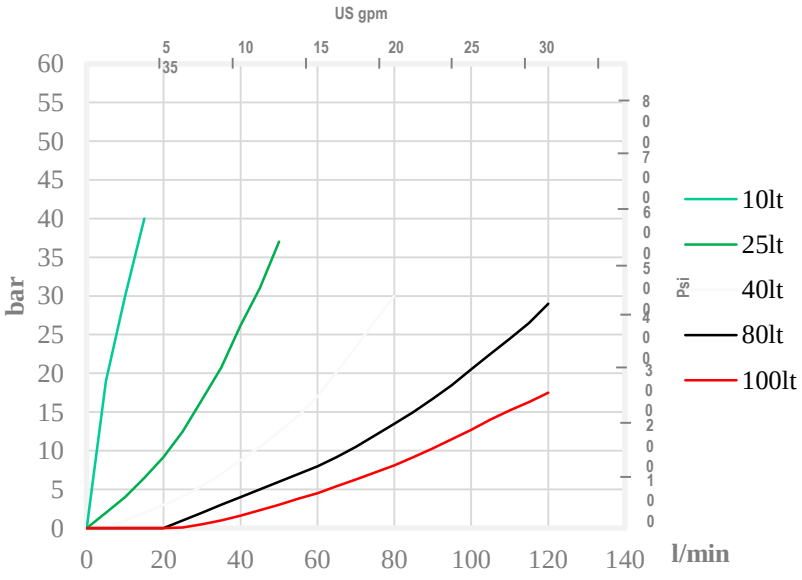


SPV120 is stackable valve 1 to 12 sections with a wide range of configuration options for the application requirements.

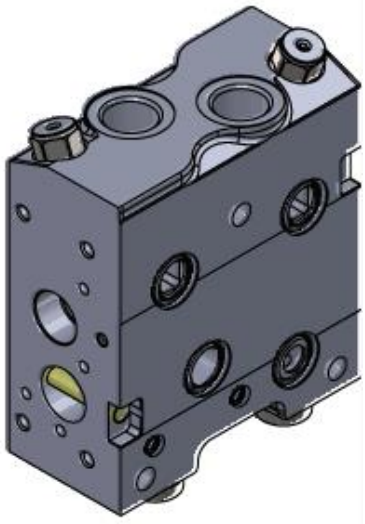
Each section is equipped with 2 way pressure compensator, LSA / LSB relief valve cavities, optionally with or without shock valve cavities on servie ports A and B. Additionally cut-off option for moment control which actively maintains the dynamic stability of the application.

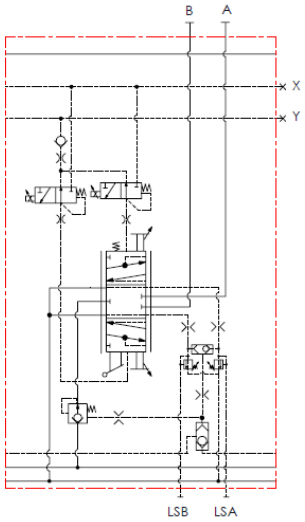
In SPV120 all working section accessories except standard equipment need to be ordered seperately. Please see related pages for spool options, relief valve options, actuator and lever cap options.

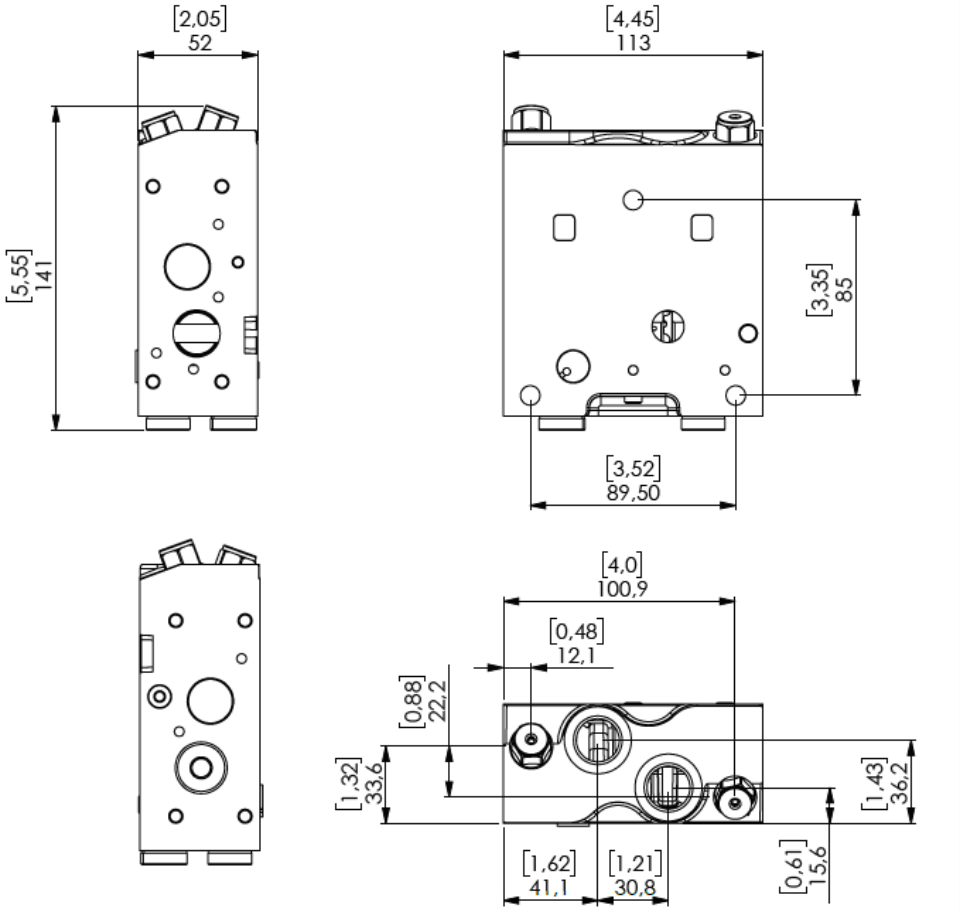
A/B – T Pressure Drop



WORKING SECTION





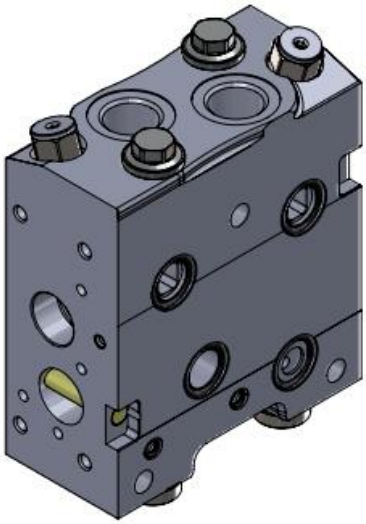


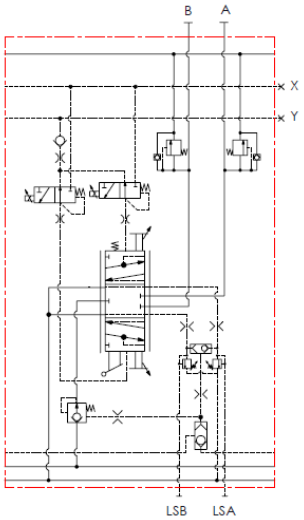
Weight

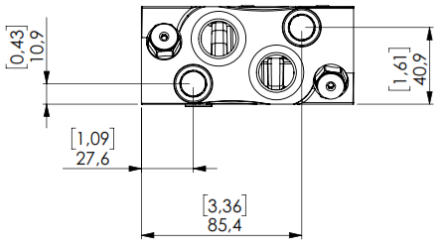
4,1kgs / 9,03 lbs

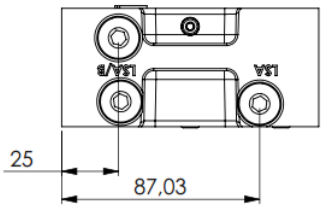
ORDER CODE	DESCRIPTION
120DL3410	G1/2 - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - WO/ ANTISHOCK CAVITY
120DL3420	SAE 7/8-14 - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - W/O ANTISHOCK CAVITY

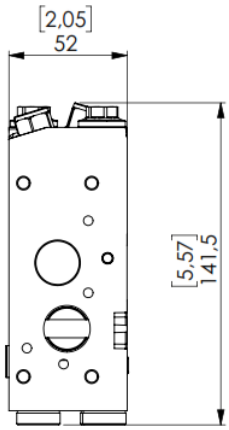
WORKING SECTION *W/ SHOCK VALVE CAVITY*

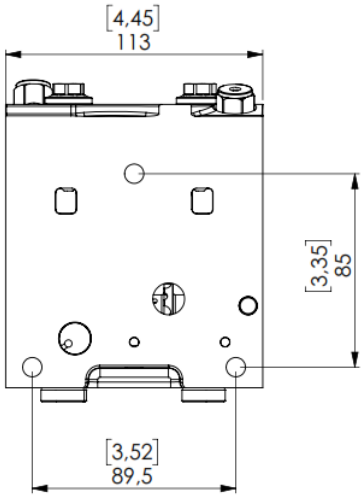










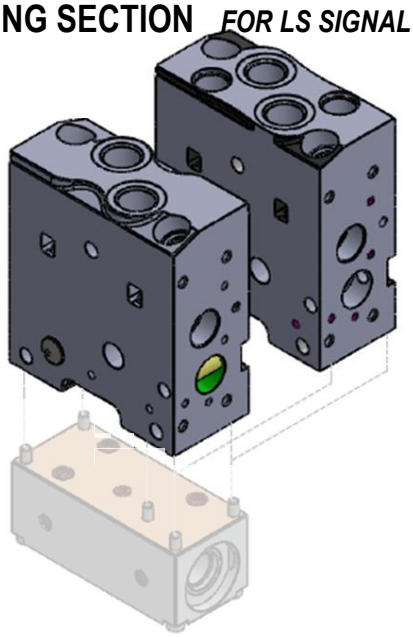


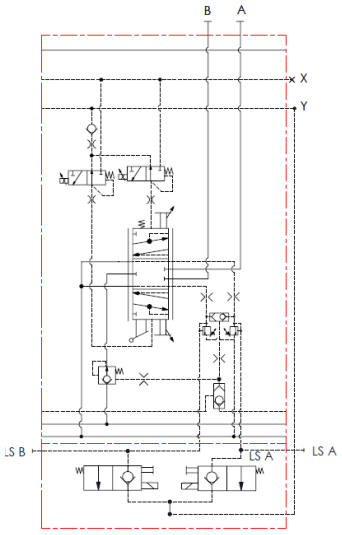
Weight

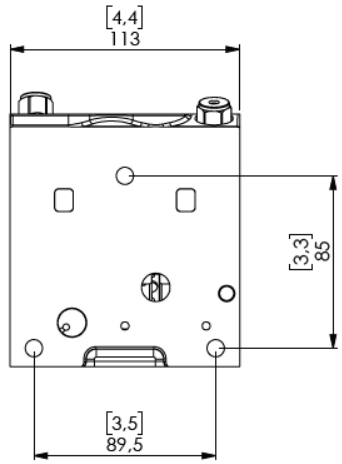
4,2 kgs / 9,25 lbs

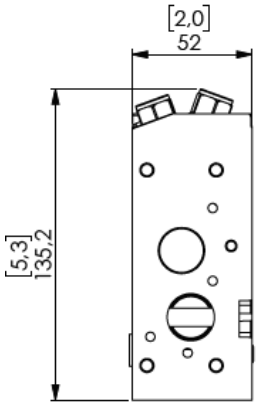
ORDER CODE	DESCRIPTION
120DL3411	G1/2 - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - W/ ANTISHOCK CAVITY
120DL3422	SAE 7/8-14 - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - W/ ANTISHOCK CAVITY

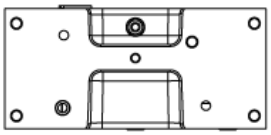
WORKING SECTION *FOR LS SIGNAL CUT-OFF MODULE*











Type	Weight
w/o Shock Valve Cavity	5,30 kgs / 11,68 lbs
w/ Shock Valve Cavity	5,40 kgs / 11,90 lbs

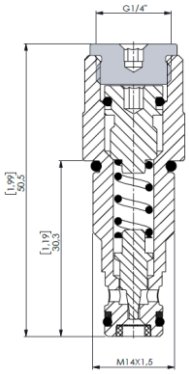
Cut-off module is not included in iven weights.

ORDER CODE	DESCRIPTION
120DL3511	G1/2 - W/ LS SIGNAL CUT-OFF MODULE - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - W/ ANTISHOCK CAVITY
120DL3510	G1/2 - W/ LS SIGNAL CUT-OFF MODULE - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - WO/ ANTISHOCK CAVITY
120DL3522	SAE 7/8-14 - W/ LS SIGNAL CUT-OFF MODULE - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - W/ ANTISHOCK CAVITY
120DL3520	SAE 7/8-14 - W/ LS SIGNAL CUT-OFF MODULE - INDIVIDUAL LSA/LSB PILOT LINE - LSA/B RELIEF VALVE CAVITY - WO/ ANTISHOCK CAVITY

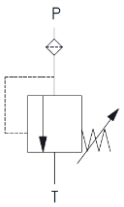
Please see page 37 for cut-off options.

LS RELIEF VALVES

Standard Type LS Relief Valve



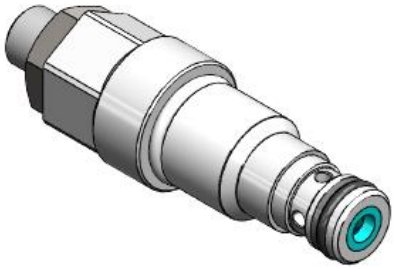
Symbol

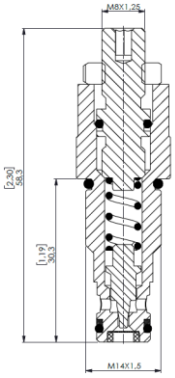


Weight

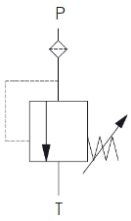
0,05 kgs / 0,11 lbs

Marine Type LS Relief Valve





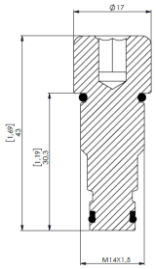
Symbol



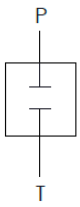
Weight

0,05 kgs / 0,11 lbs

LS Relief Valve Cavity Plug



Symbol



Weight

0,04 kgs / 0,08 lbs

ORDER CODE	DESCRIPTION
120LRV6030	30 bar / 435 psi
120LRV6040	40 bar / 580 psi
120LRV6050	50 bar / 725 psi
120LRV6060	60 bar / 870 psi
120LRV6070	70 bar / 1015 psi
120LRV6080	80 bar / 1160 psi
120LRV6090	90 bar / 1305 psi
120LRV6100	100 bar / 1450 psi
120LRV6110	110 bar / 1595 psi
120LRV6120	120 bar / 1740 psi

ORDER CODE	DESCRIPTION
120LRV6130	130 bar / 1885 psi
120LRV6140	140 bar / 2030 psi
120LRV6150	150 bar / 2175 psi
120LRV6160	160 bar / 2320 psi
120LRV6170	170 bar / 2465 psi
120LRV6180	180 bar / 2610 psi
120LRV6190	190 bar / 2755 psi
120LRV6200	200 bar / 2900 psi
120LRV6210	210 bar / 3045 psi
120LRV6220	220 bar / 3190 psi

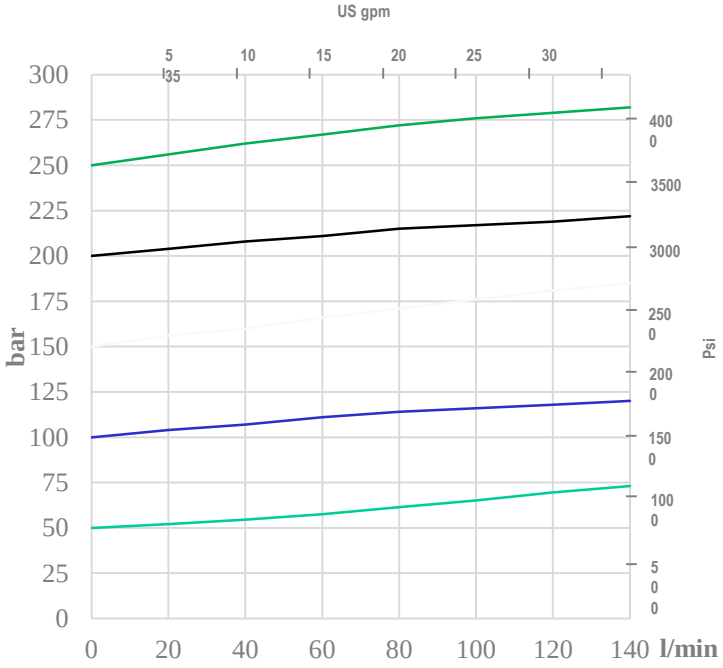
ORDER CODE	DESCRIPTION
120LRV6230	230 bar / 3335 psi
120LRV6240	240 bar / 3480 psi
120LRV6250	250 bar / 3625 psi
120LRV6260	260 bar / 3770 psi
120LRV6270	270 bar / 3915 psi
120LRV6280	280 bar / 4060 psi
120LRV6290	290 bar / 4205 psi
120LRV6300	300 bar / 4350 psi
120LRV6310	310 bar / 4495 psi
120LRV6320	320 bar / 4640 psi

ORDER CODE	DESCRIPTION
120LRV6330	330 bar / 4785 psi
120LRV6340	340 bar / 4930 psi
120LRV6350	350 bar / 5075 psi
120LRV6360	360 bar / 5220 psi
120LRV6370	370 bar / 5365 psi
120LRV6380	380 bar / 5510 psi
120LRV-P6002	Cavity Plug

Marine type LS relief valves are coded with «M».
Example coding for 100 bar pressure setting 120MLRV6100.

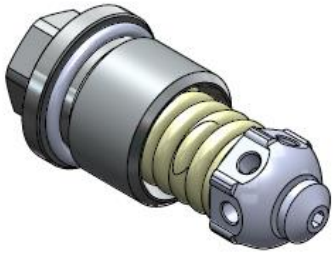
LS RELIEF VALVES *PERFORMANCE DATA*

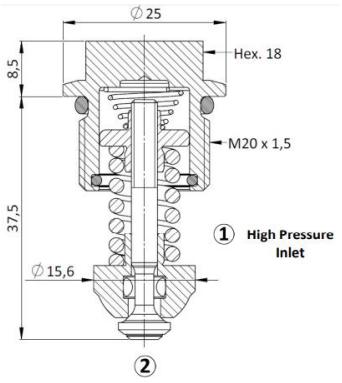
Curves



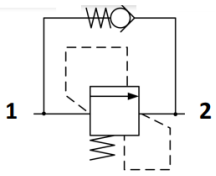
SHOCK VALVES

Antishock & Anticavitation Valve





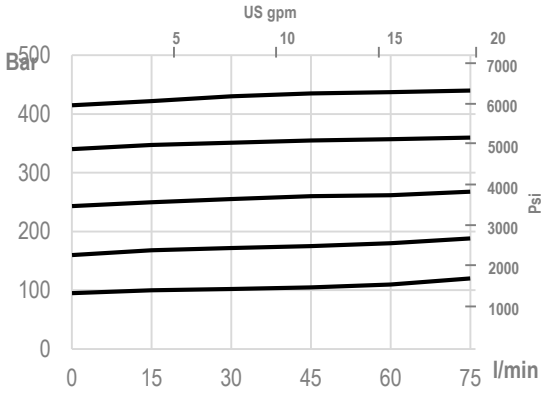
Symbol



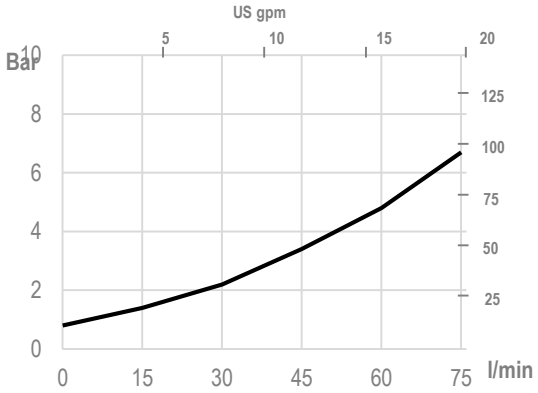
Weight

0,05 kgs / 0,11 lbs

Relief Valve Function

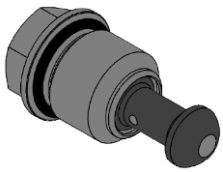


Anticavitation Function



Anticavitation Valve

Symbol



Weight

0,05 kgs / 0,11 lbs

Shock Valve Cavity Plug

Weight

0,04 kgs / 0,08 lbs

Symbol

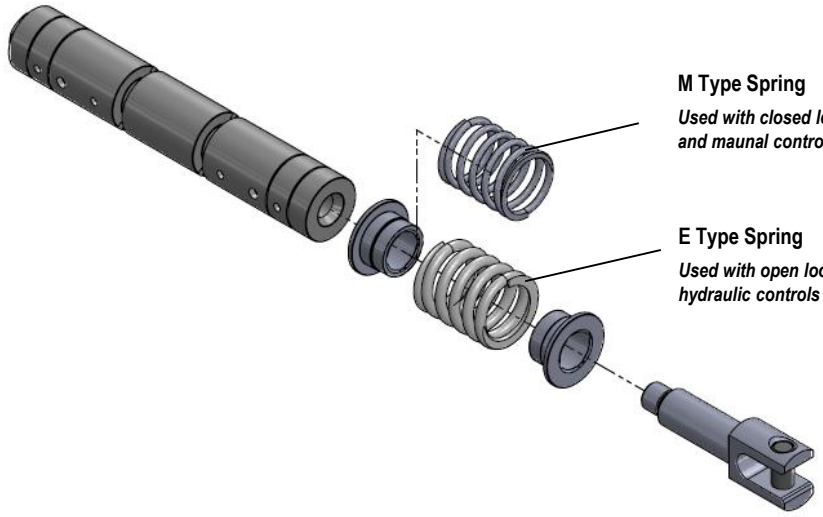
ORDER CODE	DESCRIPTION
120ASV6030	30 bar / 435 psi
120ASV6040	40 bar / 580 psi
120ASV6050	50 bar / 725 psi
120ASV6060	60 bar / 870 psi
120ASV6070	70 bar / 1015 psi
120ASV6080	80 bar / 1160 psi
120ASV6090	90 bar / 1305 psi
120ASV6100	100 bar / 1450 psi
120ASV6110	110 bar / 1595 psi
120ASV6120	120 bar / 1740 psi

ORDER CODE	DESCRIPTION
120ASV6130	130 bar / 1885 psi
120ASV6140	140 bar / 2030 psi
120ASV6150	150 bar / 2175 psi
120ASV6160	160 bar / 2320 psi
120ASV6170	170 bar / 2465 psi
120ASV6180	180 bar / 2610 psi
120ASV6190	190 bar / 2755 psi
120ASV6200	200 bar / 2900 psi
120ASV6210	210 bar / 3045 psi
120ASV6220	220 bar / 3190 psi

ORDER CODE	DESCRIPTION
120ASV6230	230 bar / 3335 psi
120ASV6240	240 bar / 3480 psi
120ASV6250	250 bar / 3625 psi
120ASV6260	260 bar / 3770 psi
120ASV6270	270 bar / 3915 psi
120ASV6280	280 bar / 4060 psi
120ASV6290	290 bar / 4205 psi
120ASV6300	300 bar / 4350 psi
120ASV6310	310 bar / 4495 psi
120ASV6320	320 bar / 4640 psi

ORDER CODE	DESCRIPTION
120ASV6330	330 bar / 4785 psi
120ASV6340	340 bar / 4930 psi
120ASV6350	350 bar / 5075 psi
120ASV6360	360 bar / 5220 psi
120ASV6370	370 bar / 5365 psi
120ASV6380	380 bar / 5510 psi
120SV6003	Anticavitation Valve
120ASV-P6001	Cavity Plug

SPOOLS

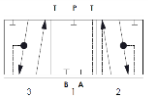
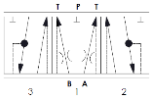
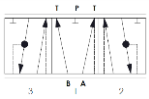
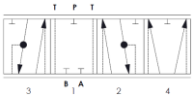


M Type Spring

Used with closed loop electrical actuators and maunal controls

E Type Spring

Used with open loop electrical actuators and hydraulic controls

Code	*Hydraulic Scheme*	*Function*
F		*3 Position, Double Acting Spool, A & B Closed in Neutral*
FT		*3 Position, Double Acting Spool, A & B Partially Open to Tank in Neutral*
FO		*3 Position, Double Acting Spool, A & B Open to Tank in Neutral*
FF		*4 Position, Double Acting, Float Spool*

Flow Requirements

Choice of spool is important to meet the requirements of the application in terms of control ability and performance. SPV120 has many spool options regarding the function and flow requirements.

Flow options in SPV120 between 5l/min / 1,3 US Gpm up to 130l/min / 34,0 US Gpm.

SPV120 spools are highly customizable in terms of flow and characteristics. Pelase contact our Sales Department for asymmetric, throttled tank or other special spool demands.

Weight

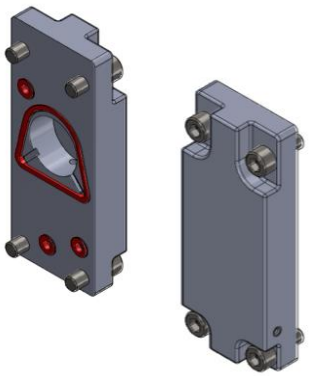
0,30 kgs / 0,66 lbs

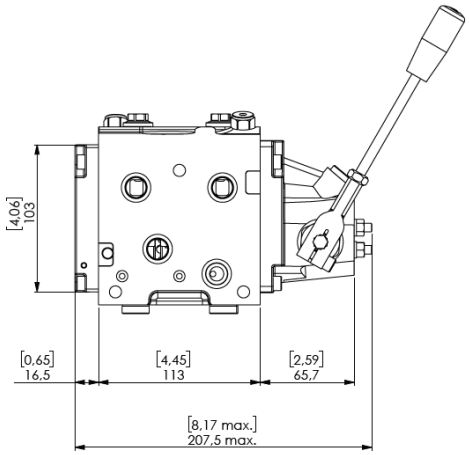
FLOW RATE		*ORDER CODE*							
		F TYPE SPOOL		*FT TYPE SPOOL*		*FO TYPE SPOOL*		*FF TYPE SPOOL*	
		E SPRING	*M SPRING*	*E SPRING*	*M SPRING*	*E SPRING*	*M SPRING*	*E SPRING*	*M SPRING*
5 l/min	***1,3 US gpm***	*120EF0505L*	*120MF0505L*	*120EFT0505L*	*120MFT0505L*	*120EFO0505L*	*120MFO0505L*	*120EFF0505L*	*120MFF0505L*
10 l/min	***2,6 US gpm***	*120EF1010L*	*120MF1010L*	*120EFT1010L*	*120MFT1010L*	*120EFO1010L*	*120MFO1010L*	*120EFF1010L*	*120MFF1010L*
25 l/min	***6,5 US gpm***	*120EF2525L*	*120MF2525L*	*120EFT2525L*	*120MFT2525L*	*120EFO2525L*	*120MFO2525L*	*120EFF2525L*	*120MFF2525L*
40 l/min	***11 US gpm***	*120EF4040L*	*120MF4040L*	*120EFT4040L*	*120MFT4040L*	*120EFO4040L*	*120MFO4040L*	*120EFF4040L*	*120MFF4040L*
65 l/min	***17 US gpm***	*120EF6565L*	*120MF6565L*	*120EFT6565L*	*120MFT6565L*	*120EFO6565L*	*120MFO6565L*	*120EFF6565L*	*120MFF6565L*
80 l/min	***21 US gpm***	*120EF8080L*	*120MF8080L*	*120EFT8080L*	*120MFT8080L*	*120EFO8080L*	*120MFO8080L*	*120EFF8080L*	*120MFF8080L*
100 l/min	***26 US gpm***	*120EF100100L*	*120MF100100L*	*120EFT100100L*	*120MFT100100L*	*120EFO100100L*	*120MFO100100L*	*120EFF100100L*	*120MFF100100L*
125 l/min	***33 US gpm***	*120EF125125L*	*120MF125125L*	*120EFT125125L*	*120MFT125125L*	*120EFO125125L*	*120MFO125125L*	*120EFF125125L*	*120MFF125125L*

For asymmetric and other spool demands, please contact our Sales Department.

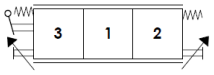
ACTUATORS *MANUAL CONTROLS*

End Cap





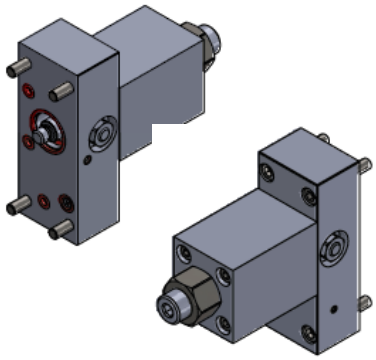
Symbol

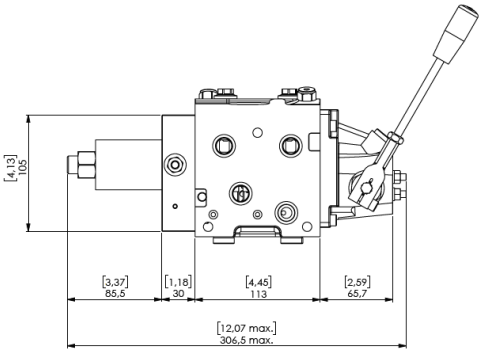


Weight

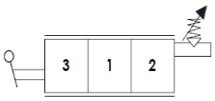
0,18 kgs / 0,40 lbs

Friction Detent





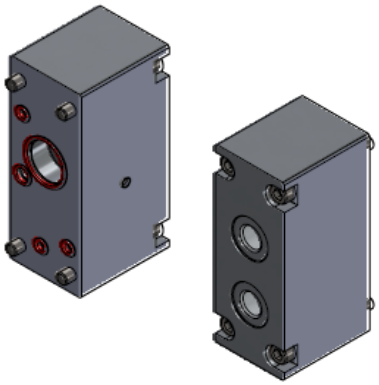
Symbol

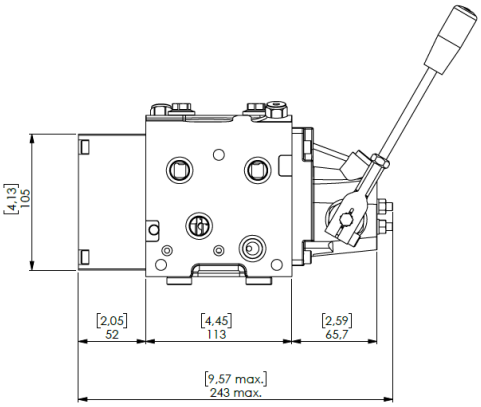


Weight

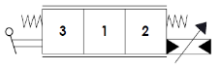
0,80 kgs / 1,76 lbs

Hydraulic Control





Symbol



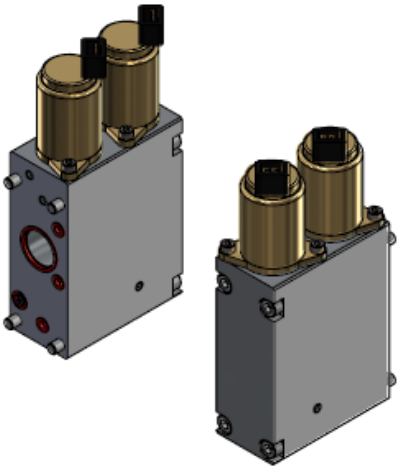
Working Pressure

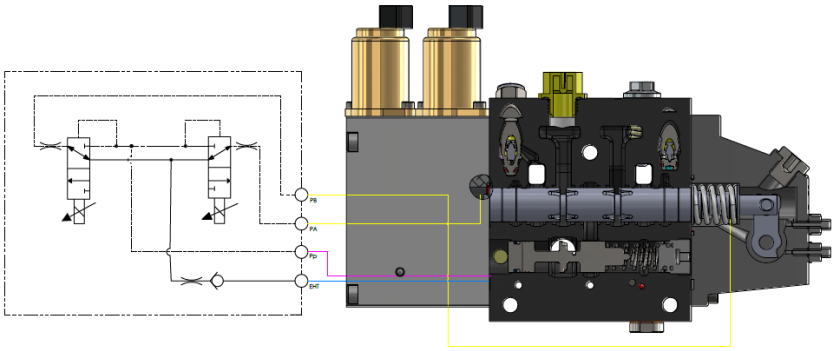
Min.	8 bar / 115 psi
Max.	17 bar / 250 psi

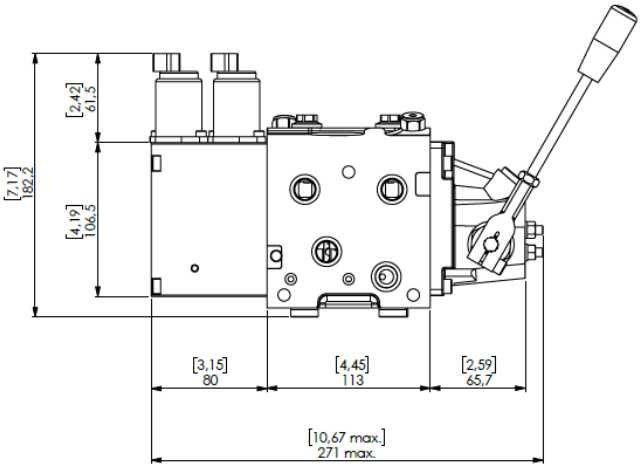
Weight

0,65 kgs / 1,43 lbs

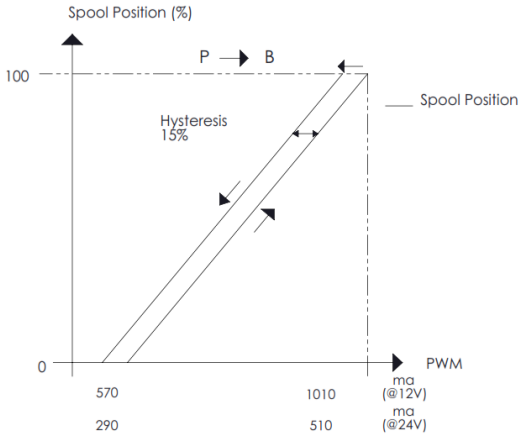
ORDER CODE	DESCRIPTION
MP8000	END CAP
MPS8010	FRICTION DETENT
MPH8030	HYDRAULIC CONTROL G1/4
MPH8031	HYDRAULIC CONTROL UNF 9/16-18

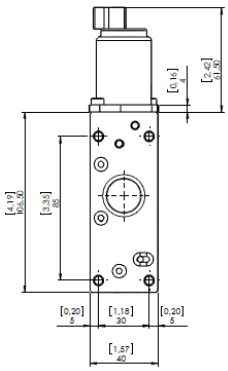


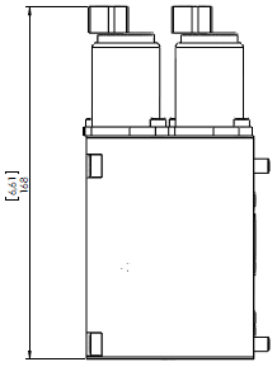


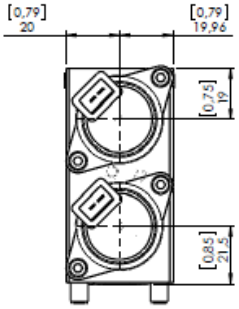


Hysteresis









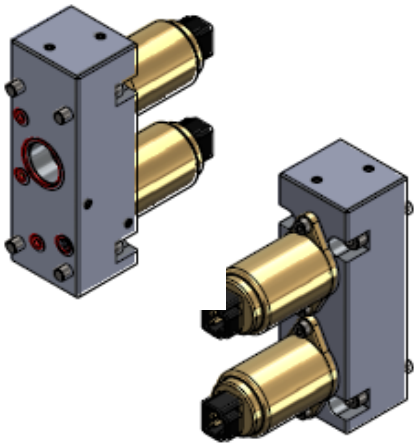
Weight

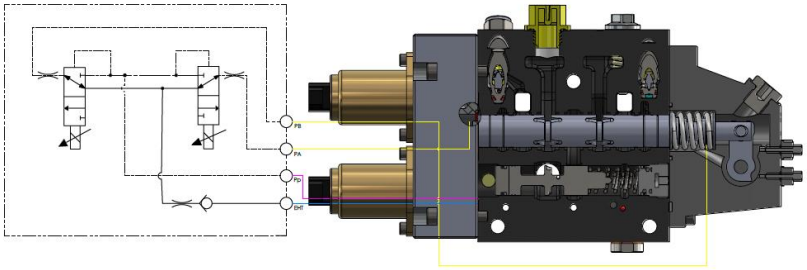
1,46 kgs / 3,22 lbs

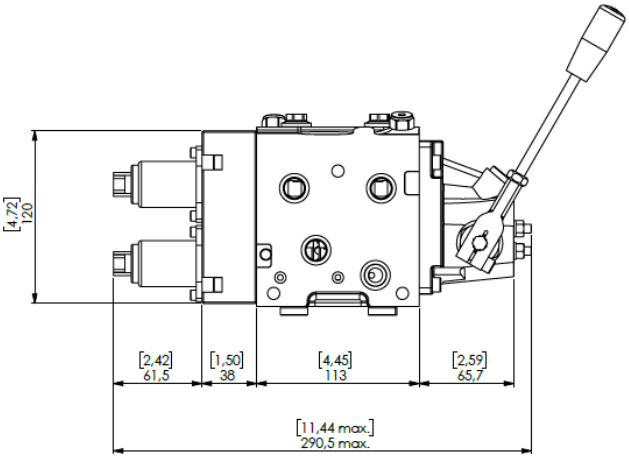
ORDER CODE	DESCRIPTION
120EHP5402	OPEN LOOP PWM - 12VDC - DEUT.
120EHP5412	OPEN LOOP PWM - 24VDC - DEUT.

Please contact to our Sales Department for different coil options.

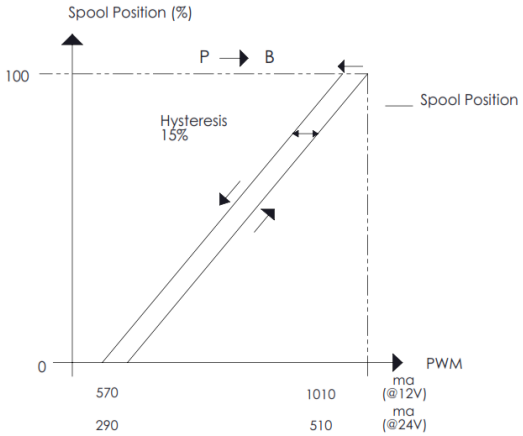
ACTUATORS *OPEN LOOP PWM CONTROL*

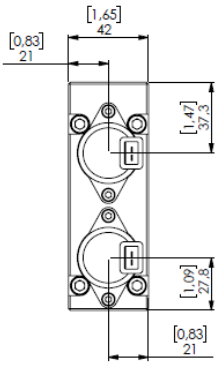


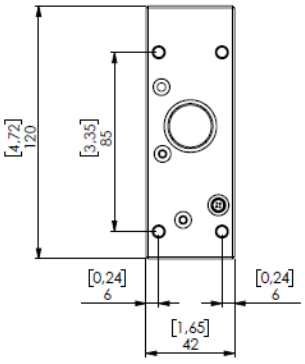


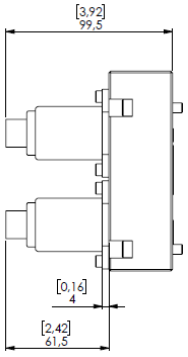


Hysteresis









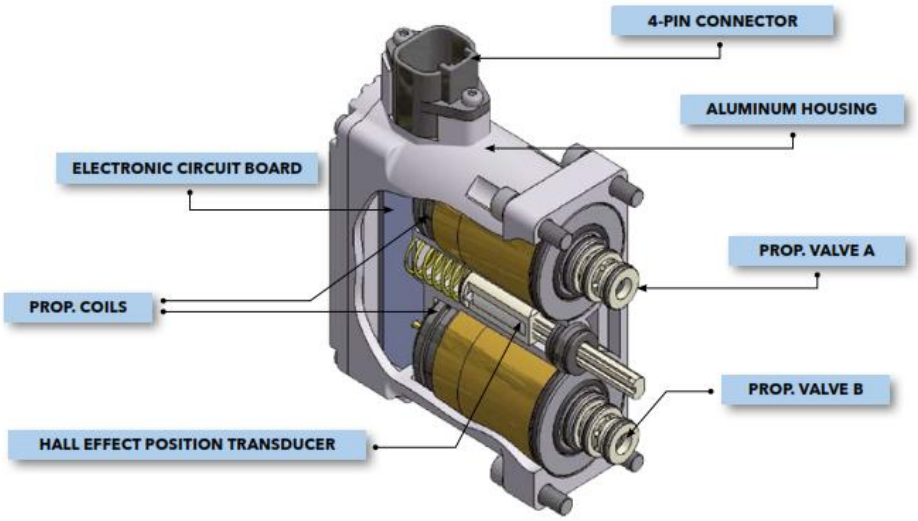
Weight

1,15 kgs / 2,55 lbs

ORDER CODE	DESCRIPTION
120EHP5432	REAR OPEN LOOP PWM - 12VDC - DEUT.
120EHP5422	REAR OPEN LOOP PWM - 24VDC - DEUT.

Please contact to our Sales Department for different coil options.

ACTUATORS *CLOSED LOOP CONTROLS*



Principle of Operation

Load Independent Proportional Control

The close loop electro-hydraulic proportional actuator designed to shift SPV120 valve spool either directly (FL version) or by means of a servo-piston mechanically connected to it (SP version).

The internal closed loop position control configuration of the makes spool achieve the desired position with accuracy levels approaching the performance of a servo-valve, by continuously comparing the set point of a remote control device (Potentiometer, Joystick, Machine Management System) with the feed-back signal generated by a high-precision hall effect position transducer.

Spool Stroke A

When the input voltage signal fed to the actuator is maintained within 2.25 and 2.75V, the valve spool is at rest (Neutral Dead Band). When Vin = 2.75V, the spool steps up from NEUTRAL to MINIMUM FLOW control position. A linear ramp from MIN. to MAX. spool stroke will follow by increasing Vin from 2.75 to 4.1V. At Vin = 4.50V, the spool is brought into its FLOAT POSITION, if present. By decreasing the input voltage from 4.1 to 2.75V, the spool stroke is linearly reduced and after the oil flow is fully shut-off, a step-down from MINIMUM FLOW to NEUTRAL position takes place.

Spool Stroke B

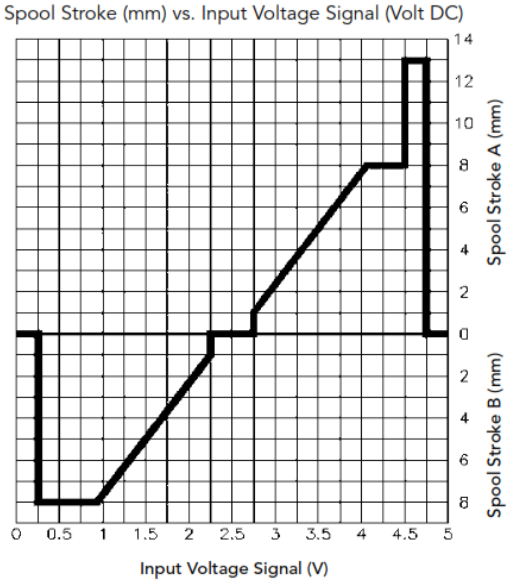
Same as for STROKE A, by varying Vin from 2.25 to 0.9V, the spool will go from NEUTRAL to MAX. STROKE in the opposite direction.

Alarm/Fail - Safe Mode

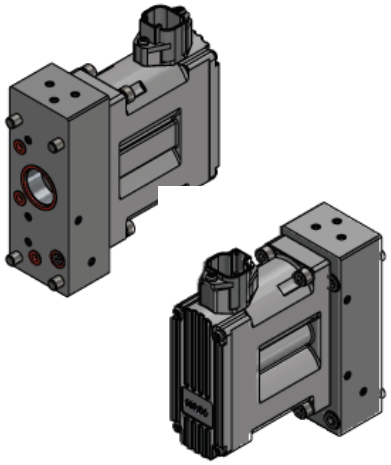
An input voltage variation beyond the calibration range (<0.25V or >4.75V) will bring the system into an ALARM mode, urging the spool to return to its NEUTRAL position until Vin is brought back to its nominal control range.

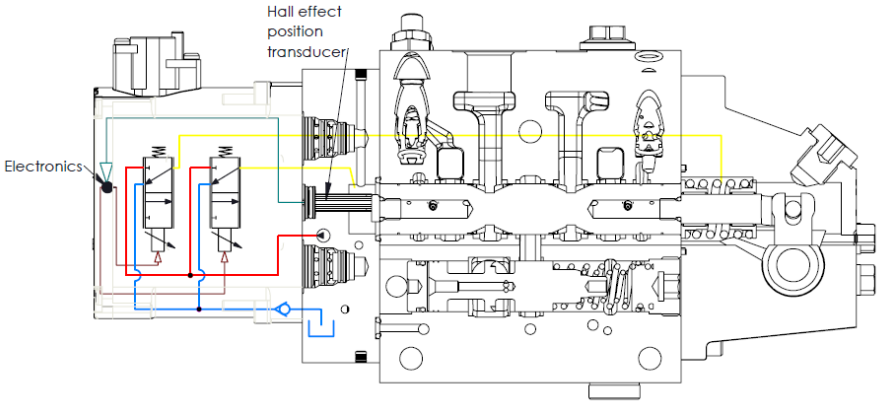
Hall Effect Position Sensor

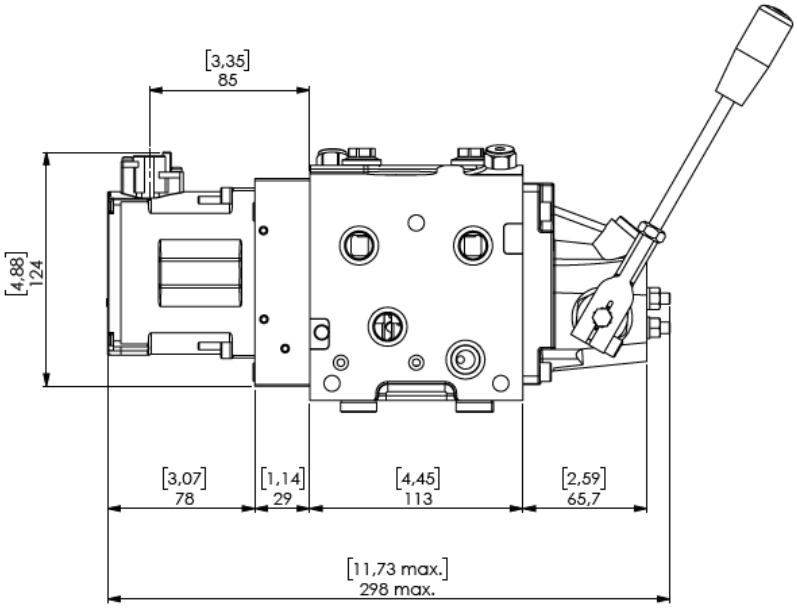
- Excellent linear control on 100% of spool travel.
- 8 mm standard control stroke from each side of NEUTRAL/13 mm for FLOAT position in one direction only.
- No “Cross Talking” between adjacent work sections.



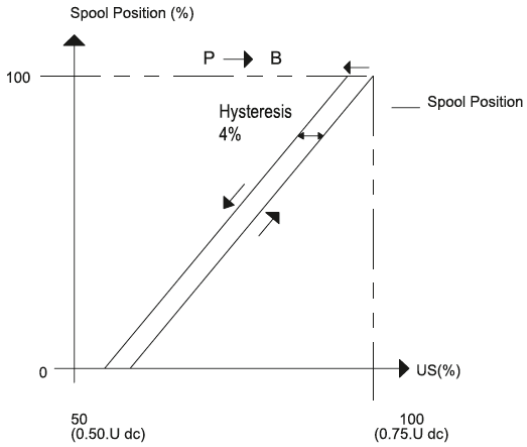
ACTUATORS *CLOSED LOOP CONTROLS*







Hysteresis



Weight

1,20 kgs / 2,65 lbs

Hydraulic Specifications

Max. Supply Pressure	35 bar / 500 psi
Min. Supply Pressure	12 bar / 175 psi
Max. Back Pressure	35 bar / 500 psi
Pilot Flow Requirement	0.2lt/section
Oil Temperature Range	-0/+95°C
Oil Viscosity Range	3-650 cSt
Filtration	18/15/10 (ISO 4406)

Flow Requirements

Operating Voltage	8-30 VDC
Min. Current Consumption	750mA / Section
Operating Temperature	-20/+105°C
Analogue Input Impedance	> 40 kOhm
Typical ctrl pot. Resistance	1-10 kOhm
Analog Input Signal	0-5 V
Degree of protection	IP68

ACTUATORS *CLOSED LOOP CONTROLS*

Configurations and Model Designations

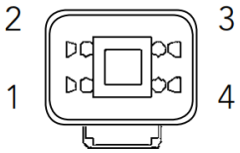
120EHP5442
Proportional Actuator
Digital Electronics
PWM Control

120EHP5462
Proportional Actuator
Digital Electronics
Analog Control Signal (Potentiometer)
5V auxiliary power supply for the control potentiometer

120EHP5482
Proportional Actuator
Digital Electronics
Analog Control Signal (Potentiometer)
Feedback Output

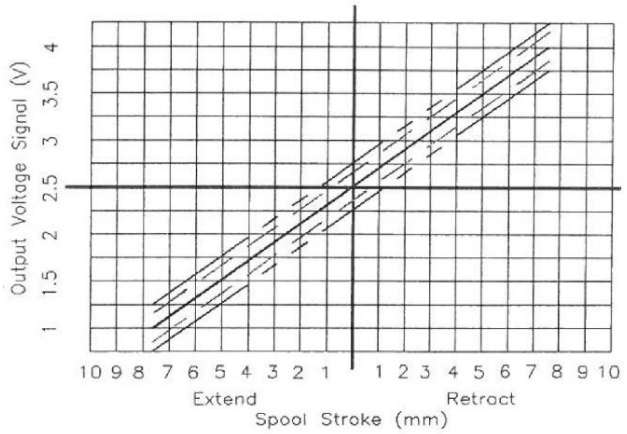
120EHP5472
Proportional Actuator
Digital Electronics
CANBus Control (31939 or CANopen Protocols)

Connector Pinout (Front View)



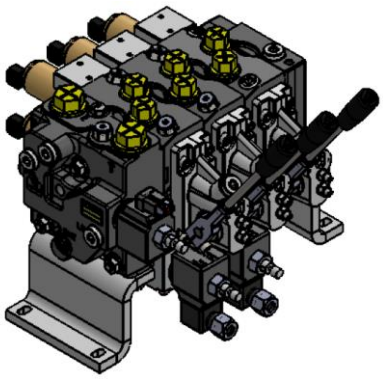
	120EHP5442	120EHP5462	120EHP5482	120EHP5472
1	+ V (Power Source)	+ Power Supply	+ Power Supply	+ Power Supply
2	PWM Signal Retract	+V5 Aux. Supply Voltage	Sensor Feedback Output	CANL
3	PWM Signal Extend	Control Signal	Control Signal	CANH
4	-V (Power Source) (GND)	Power Supply (GND)	Power Supply (GND)	Power Supply (GND)

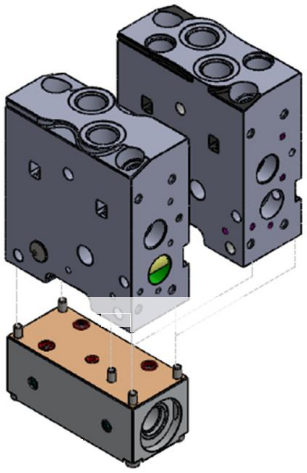
Spool Position Sensor Output Signal for 120EHP5482



ORDER CODE	DESCRIPTION
120EHP5442	*CLOSED LOOP PWM CONTROL W/ SPOOL POSITION FEEDBACK – DEUT.*
120EHP5482	*CLOSED LOOP VOLTAGE - W/ POSITION SENSOR - 0-5V FEEDBACK - DEUT.*
120EHP5462	*CLOSED LOOP VOLTAGE CONTROL - W/ POSITION SENSOR +5V AUX. POWER SUPPLY – DEUT.*
120EHP5472	*CLOSED LOOP CANbus CONTROL - DEUT.*

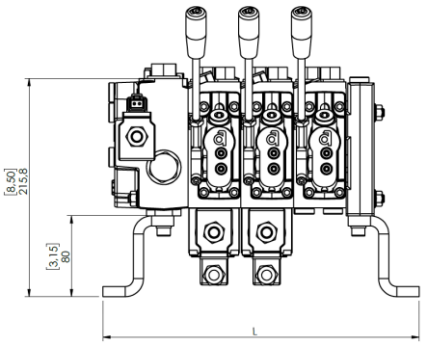
ACTUATORS *LS SIGNAL CUT-OFF MODULE*

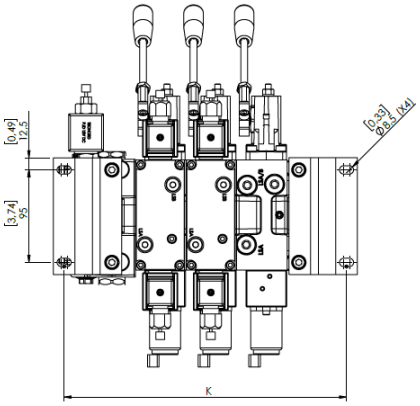




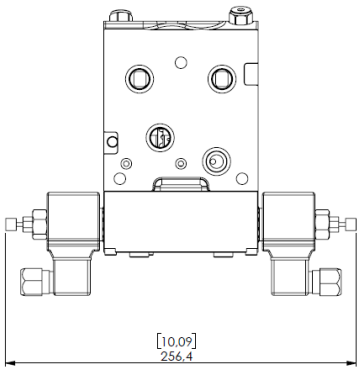
Weight

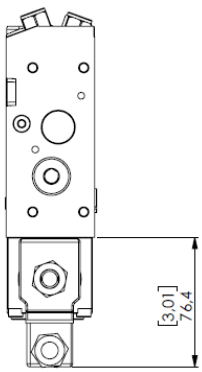
1,20 kgs / 2,65 lbs

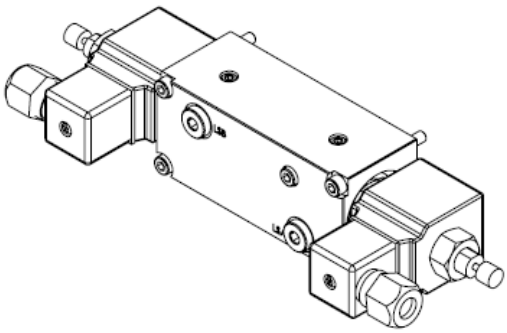




Type	*K*		*L*	
	mm	*inch*	*mm*	*inch*
SPV121	*186*	*7,33*	*208*	*8,2*
SPV122	*238*	*9,37*	*260*	*10,24*
SPV123	*290*	*11,41*	*312*	*12,28*
SPV124	*342*	*13,45*	*314*	*14,32*
SPV125	*394*	*15,49*	*416*	*16,36*
SPV126	*446*	*17,53*	*468*	*18,4*
SPV127	*498*	*19,57*	*520*	*20,44*
SVP128	*550*	*21,61*	*572*	*22,48*
SPV129	*602*	*23,65*	*624*	*24,52*
SPV1210	*654*	*25,69*	*676*	*26,56*







Technical Specifications

Rated Operating Pressure	350 bar / 5000 psi
Typical Internal Leakage	0-5 drops/min. at 350 bar / 5000 psi
Viscosity Range	36 – 3000 Ssu (3-647 cSt)
Cartridge Torque Requirement	41 – 47 Nm / 30 – 35 ft-lbs
Supply	12 VDC
	24 VDC

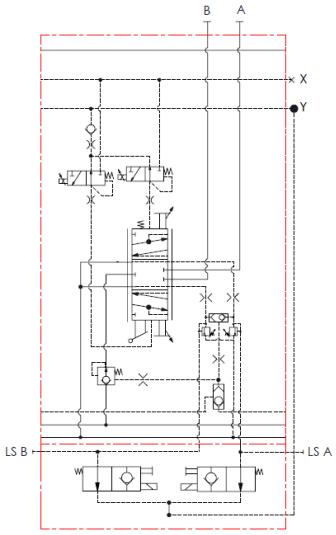
Coil Specifications

Wattage	21 Watts Nominal
Rated Current Range	Continous Duty ±10% rated voltage @ 49°C (120°F) ambient
Min. Current for Actuation	80% of rated current at room temperature
Magnet Wire Class	H
Heat Insulation Class	F
Ambient Temperature Range	-30°C to 60°C
Emcapsulation Material	Thermo-Plastic, resistant to moisture, caustic solutions, fungus and vibrations

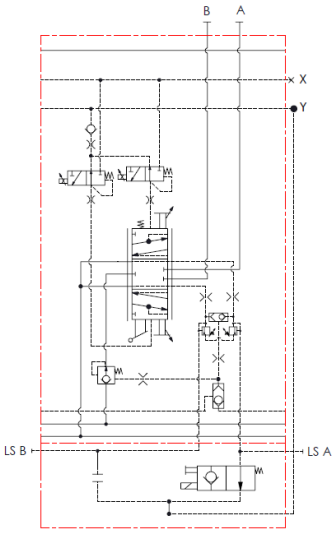
LS Signal Cut-off module is used with «Working Section for Cut-off» only.

ACTUATORS *LS SIGNAL CUT-OFF MODULE*

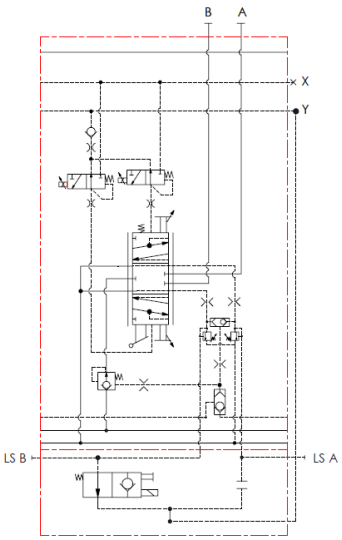
Normally Open LSA+LSB Active



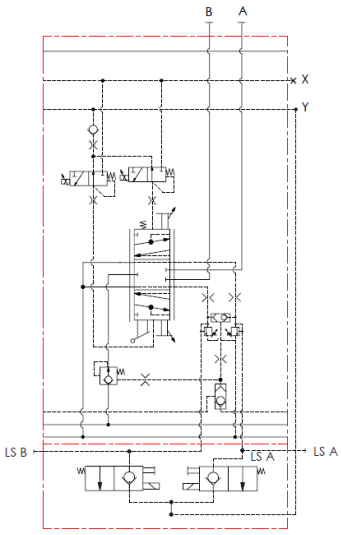
Normally Open LSA Active



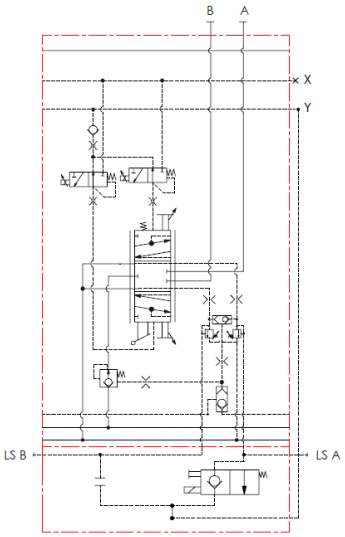
Normally Open LSB Active



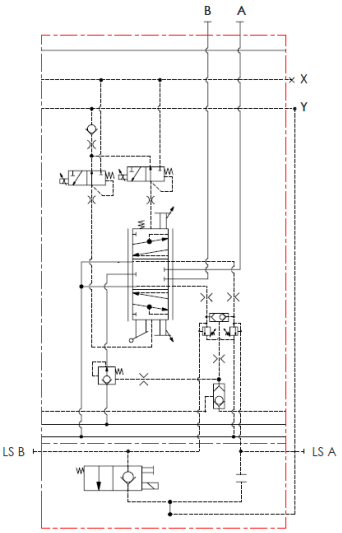
Normally Closed LSA+LSB Active



Normally Closed LSA Active

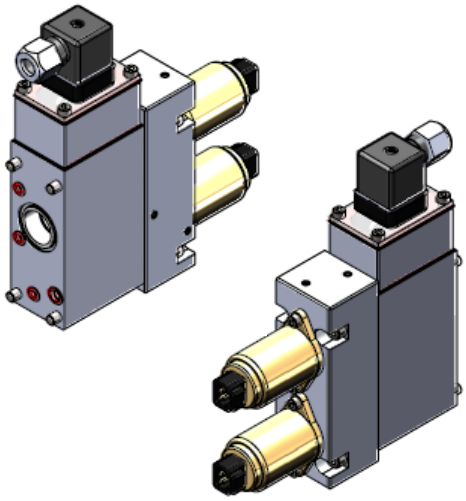


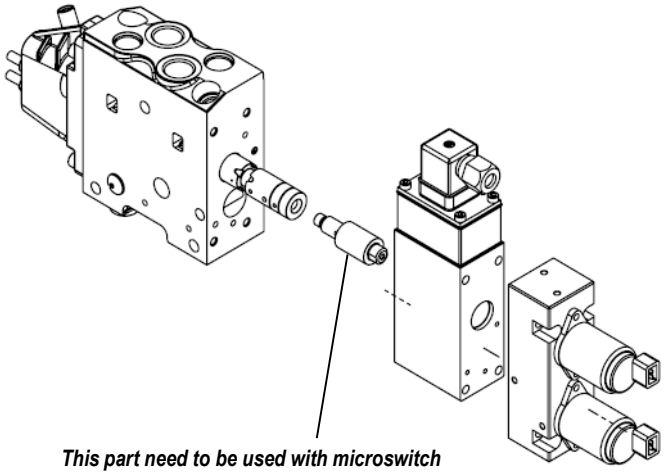
Normally Closed LSB Active



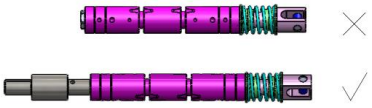
DESCRIPTION	*ORDER CODE*					
	HIRSCH		*AMP*		*DEUTSCH*	
	12VDC	*24VDC*	*12VDC*	*24VDC*	*12VDC*	*24VDC*
Normally Open LSA+LSB Active	*CTC5712*	*CTC5724*	*CTC6712*	*CTC6724*	*CTC7712*	*CTC7724*
Normally Open LSA Active	*CTA5712*	*CTA5724*	*CTA6712*	*CTA6724*	*CTA7712*	*CTA7724*
Normally Open LSB Active	*CTB5712*	*CTB5724*	*CTB6712*	*CTB6724*	*CTB7712*	*CTB7724*
Normally Closed LSA+LSB Active	*CTC5713*	*CTC5725*	*CTC6713*	*CTC6725*	*CTC7713*	*CTC7725*
Normally Closed LSA Active	*CTA5713*	*CTA5725*	*CTA6713*	*CTA6725*	*CTA7713*	*CTA7725*
Normally Closed LSB Active	*CTB5713*	*CTB5725*	*CTB6713*	*CTB6725*	*CTB7713*	*CTB7725*

ACTUATORS *MICROSWITCH CONTROL*





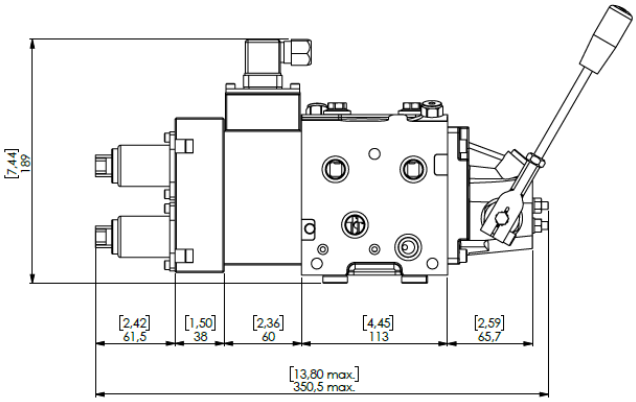
This part need to be used with microswitch control and included in **MSW5800 and MSW5810** *microswitch kits.*



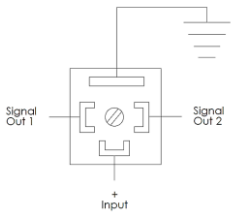
Microswitch control offers an independent electrical output signal for SPV120.

SPV microswitch control can be used with manual, Hydraulic and electrical controls.

Offers an independent monitoring on the spool position relative neutral and can be used for an extra feedback to the system controller.



Rated Operating Voltage (Ue)	24VDC
Load Current Capacity (Ie)	200 mA
Rated Insulation Voltage	250 AC
Electrical Type	DC
Switching Output	PNP
Switching Element Function	NC
Supply Voltage Max.	30 VDC
Supply Voltage Min.	10 VDC
Time Delay Before Availability	20 ms



Weight

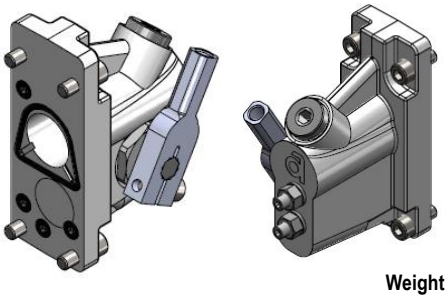
0,73 kgs / 1,60 lbs

ORDER CODE	DESCRIPTION
MSW5800	MICROSWTICH CONTROL - NO
MSW5810	MICROSWTICH CONTROL - NC

ACTUATORS *LEVER CAP*

SPV120 has two different types of pressurised lever cap options in terms of material. One is aluminium lever cap for standard applications, other is the cast iron lever cap for marine applications.

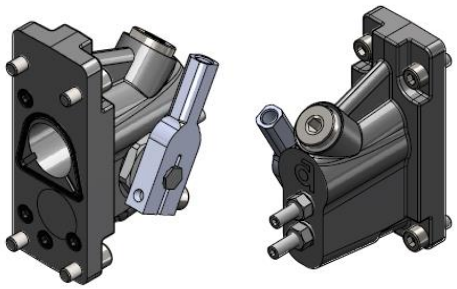
Aluminium Lever Cap



Weight

0,55 kgs / 1,21 lbs

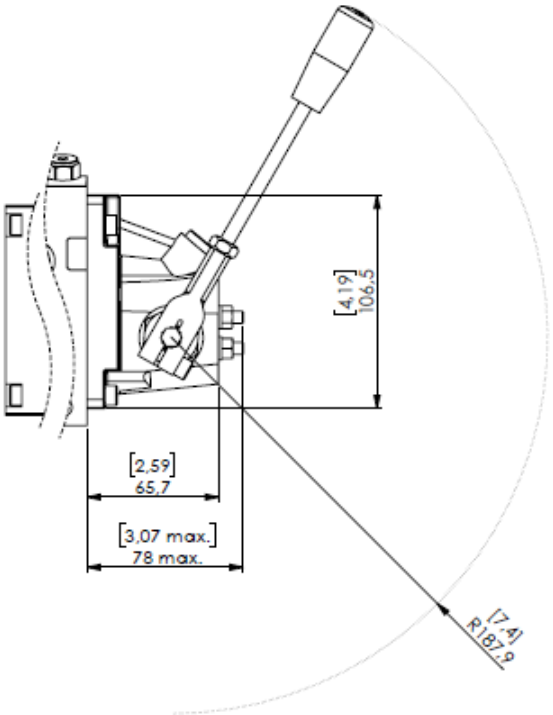
Cast Iron Lever Cap

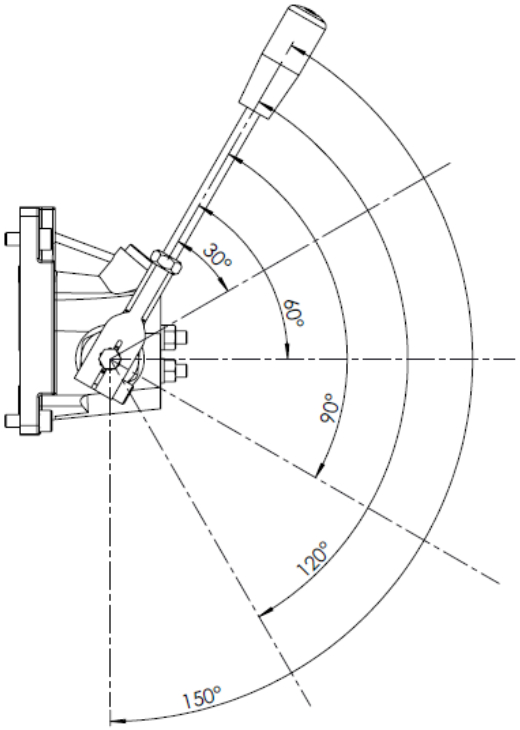


Weight

1,00 kgs / 2,20 lbs

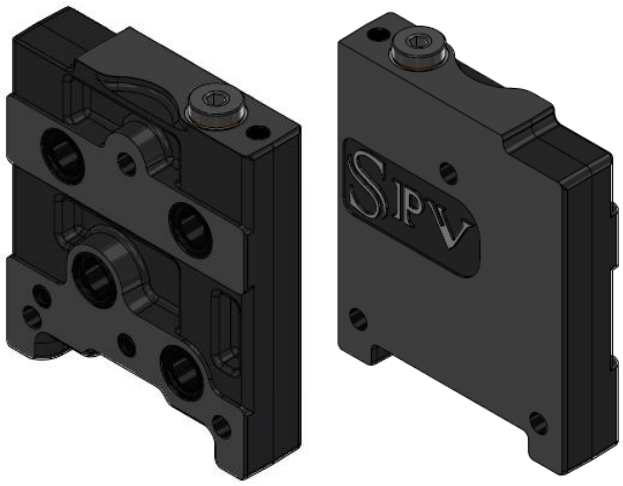
Lever Positions

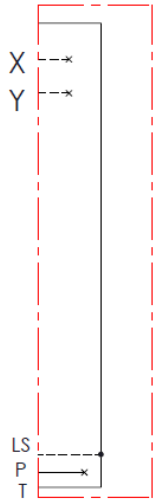




ORDER CODE	DESCRIPTION
SM8050	ALUMINIUM LEVER CAP W/ STROKE LIMITER
SM8060	CAST IRON LEVER CAP W/ STROKE LIMITER

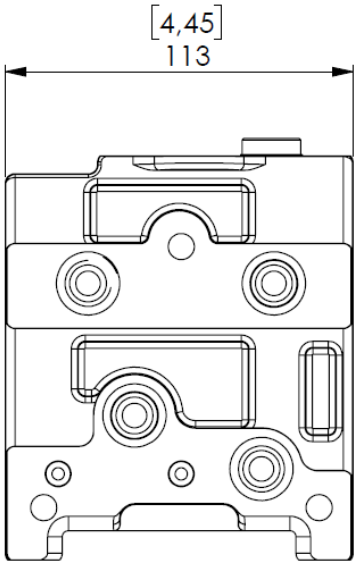
END COVER *W/O CONNECTIONS*

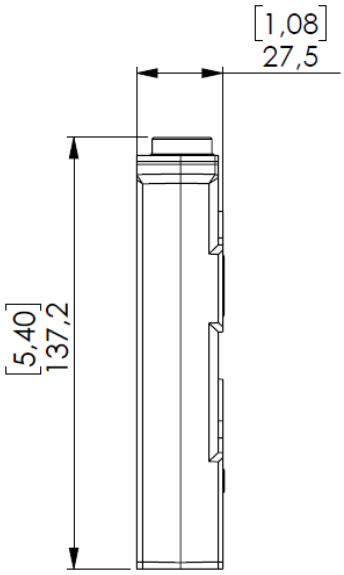




Weight

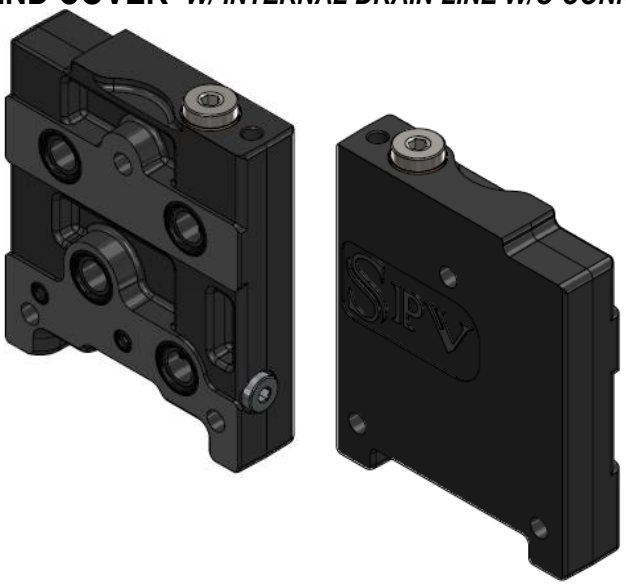
2,55 kgs / 5,60lbs

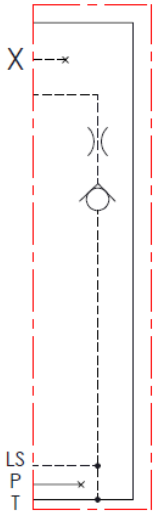


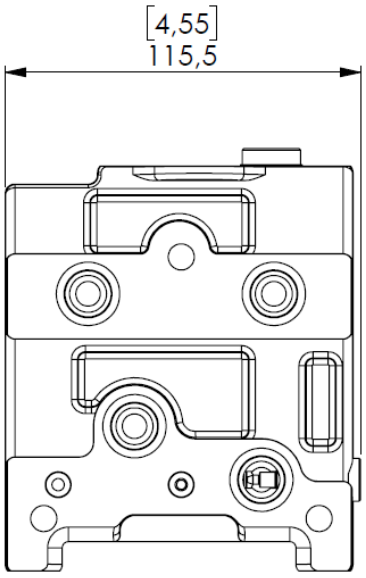


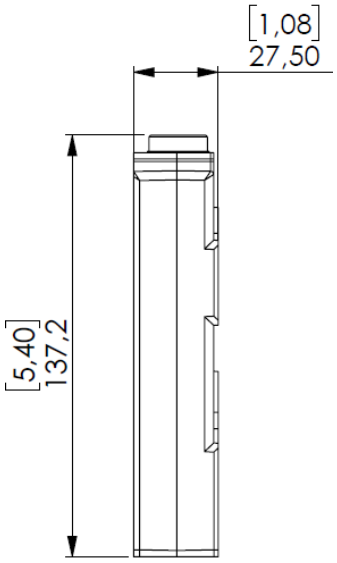
ORDER CODE	DESCRIPTION
120ES4010	END COVER W/O CONNECTIONS *(BSP)*
120ES5010	END COVER W/O CONNECTIONS *(UN-UNF)*

END COVER *W/ INTERNAL DRAIN LINE W/O CONNECTIONS*







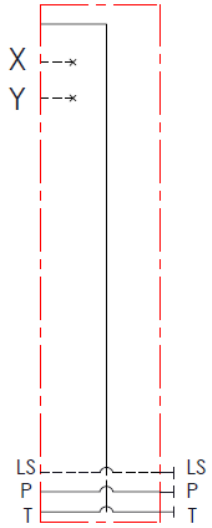


Weight

2,55 kgs / 5,60lbs

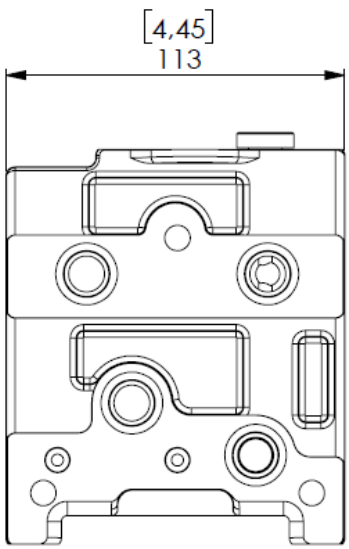
ORDER CODE	DESCRIPTION
120ES4011	END COVER W/ INTERNAL DRAIN LINE W/O CONNECTIONS *(BSP)*
120ES5011	END COVER W/ INTERNAL DRAIN LINE W/O CONNECTIONS *(UN-UNF)*

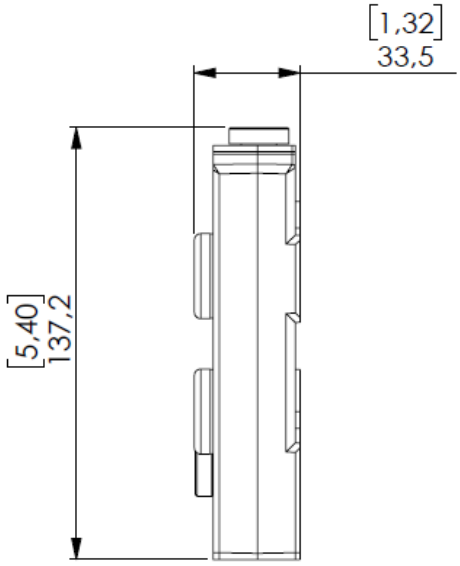
END COVER *W/ P,T AND LS CONNECTIONS*



Weight

2,55 kgs / 5,60lbs





ORDER CODE	DESCRIPTION
120ES4020	END COVER W/ P,T AND LS CONNECTIONS *(BSP)*
120ES5020	END COVER W/ P,T AND LS CONNECTIONS *(UN-UNF)*