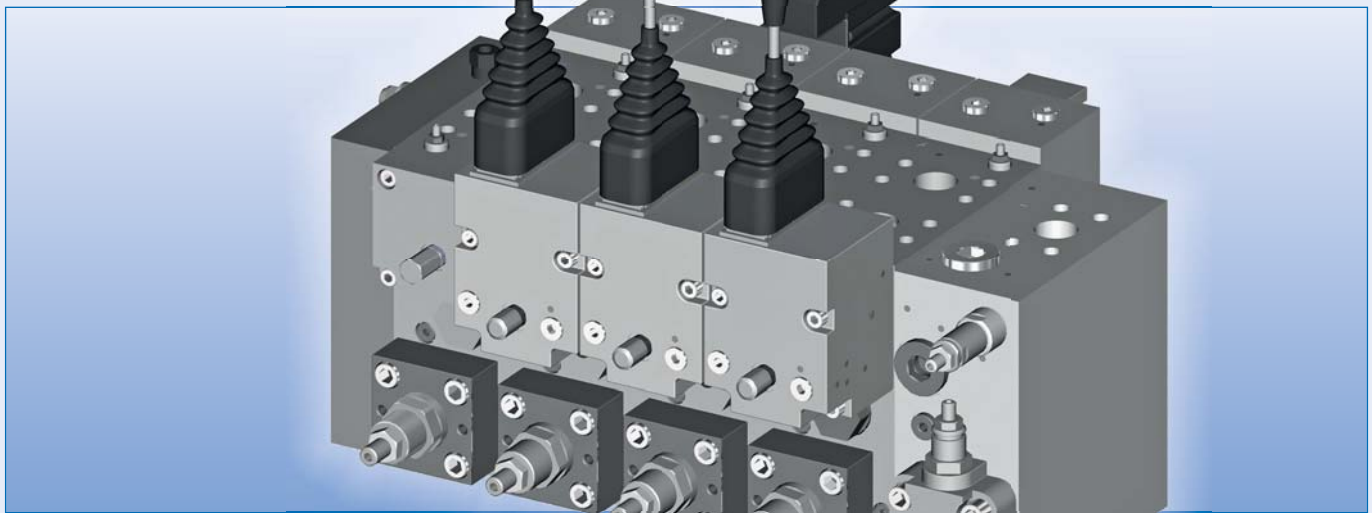


## HPV310 PROPORTIONAL DIRECTIONAL VALVES

Technical Catalogue

December  
2014





## The company

Brevini Fluid Power was established in 2003 in Reggio Emilia where it has its head office.

Brevini Fluid Power manufactures hydraulic components and application packages: a very large range suited to several operational requirements and applications thanks to a strict interaction between mechanical, hydraulic and electronic components.

Brevini Fluid Power is among the top manufacturers in Italy and a major player in Europe and in the world.

## International presence

Brevini Fluid Power operates internationally with 15 branches all over the world placed in major industrialized countries: Italy, France, Germany, English, Romania, Holland, Finland, China, India, Singapore and the United States. The network is constantly expanding by opening new branches in just a few years.

The branches are guided by managers that have an excellent knowledge of their own country.

The advantages this brings are evident:

- Reduced delivery times thanks to the branches warehouses;
- Easy customization of products and systems basing on the customer's needs, thanks to the competence and professional skills of the branches' own technical and servicing departments;
- Quick servicing;
- A ready sales staff at hand and closer to the customers, which ensures high flexibility plus experience.

The production facilities are located throughout Reggio Emilia, Ozzano Emilia (BO), Noceto (PR), Novellara (RE), Yancheng (province of Jiangsu, China) which was inaugurated in 2009 and became operative since 2010.

## Competitive Strategy

Innovation combined with the focus on customers is the strength of the Brevini Fluid Power "brand", born from the forty-year-long experiences of Aron, Hydr-App, SAM Hydraulik, Oleodinamica Reggiana, VPS Brevini and Brevini Hydraulics.

Brevini Fluid Power proposes itself as a "local hub", as it happened to BPE Electronics in 2008 and OT Oiltechnology in 2009, in order to create a new Made in Italy global player in the world of hydraulics, increasingly more integrated with electronics.

The purpose is still the development of a very large range of products forming together integrated packages able to meet various application needs. Our ten-year-long partnership relations with hundreds of customers all over the world are the best synthesis of Brevini Fluid Power's operational philosophy.

Sharing of know-how and several experiences have made Brevini Fluid Power a more global company, more incisive in international markets and closer to its customers.

## Product lines

The product lines are numerous and well-structured aimed to cover every needs: a strong basis on which to develop the engineering of application packages and complete systems. The offer is improving in the direction of a solution supplier often developed in co-design with the customer, both for the mobile and industrial sector.

**Hydr-App Product Line:** Hydraulic power packs and mini hydraulic packs (whether standard or customised), cartridge valves and solenoid valves, gear boxes and transmission components.

**S.A.M. Hydraulik Product Line:** Axial piston pumps and motors for medium and high pressure, orbital motors.

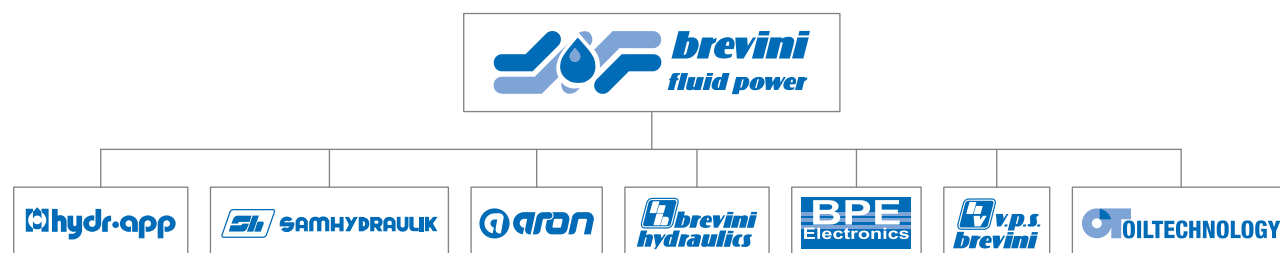
**Aron Product Line:** Directional, flow, on-off and proportional pressure control valves. Modular and cartridge valves, subplates and blocks.

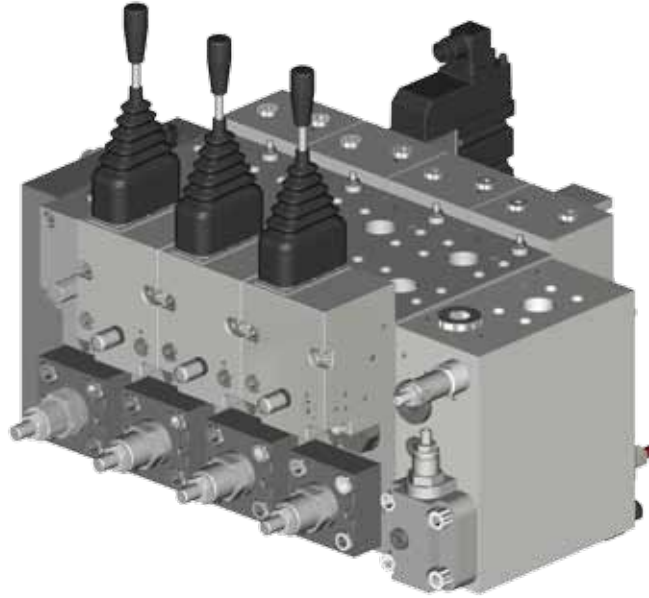
**Brevini Hydraulics Product Line:** Proportional directional valves, joysticks and electronic modules.

**BPE Electronics Product Line:** Sensors, load cells, boards and electronic controls via CAN, display units, planarity indicators.

**VPS Brevini Product Line:** Mono-block and modular mobile valves.

**OT Oiltechnology Product Line:** Gear pumps and motors, flow dividers.





## General

Optimised performances and integration of the greatest number of functions are the objectives planned and achieved through the development of the HPV valves, a range of the latest generation of proportional directional valves that perform two simultaneous functions: directional control and flow control that is unaffected by load variations. Their operation is based on the proportional hydraulic principle, e.g. keeping pressure loss constant through a variable section.

The HPV spool can assume an infinite number of positions making the crossing areas infinitely variable, thus regulating the flow in relation to the pressure difference ( $\Delta p$ ) throughout the entire operating range. By means of logical selection, an LS signal (feedback) is taken from the highest pressure ports and sent to the pump flow regulator through the LS port so that when a main spool is activated the pump regulator will adjust the displacement, so that, the set different pressure between P and LS is maintained.

The pressure compensation provided by the two-way pressure compensators installed on each element, allows multiple operations to be performed at the same time without reciprocal effects.

With HPV proportional directional valves program Brevini Fluid Power is committed to supplying products that meet the ever increasing demands to suit different market applications.

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The use of the products shown on this catalogue must be carried out according to operating limits as reported in technical specifications, estimating the type of application, the conditions of operation even in case of damage, in order to not compromise the safety of people and /or things.

General terms and conditions of sale: see website [www.brevinifluidpower.com](http://www.brevinifluidpower.com).

## **Mineral oil hydraulic fluids**

All mineral oil fluids are more or less suitable for use.

The properties required for such fluid include:

- high viscosity index
- low yield point
- high thermal stability
- high hydrolytic stability (minimum formation of corrosive phenomena in the presence of water)
- excellent anti-wear, anti-corrosion and demulsification properties.

The requirements described above are generally met by the normal mineral oil fluids designated as HPL and HVLP according to DIN 51524.

## **Ecological hydraulic fluids**

Considering the minimum requirements according to DIN 51524, the HPV can also be used with vegetal oil hydraulic fluids HGT (cole or rape oil) without particular precautions. Vegetal-based fluids can be mixed with mineral oils; however, it should be recalled that if the oil is changed, only the part consisting of the vegetal oil is biodegradable.

The polyglycol biodegradable oils HPG or synthetic phosphoric ester biodegradable fluids HPDR can be used with the HPV, replacing the usual gaskets with those made with FPM (Viton).

Therefore, when ordering, we recommend to indicate the use of the HPV with these types of synthetic fluids. It should also be pointed out that the synthetic fluids cannot be mixed with mineral oils.

## **Hydraulic fluid filtering**

It has been widely demonstrated that efficient hydraulic equipment operation depends to a great extent on the degree of contamination of the circulating oil.

Today, users require hydraulic plants to have:

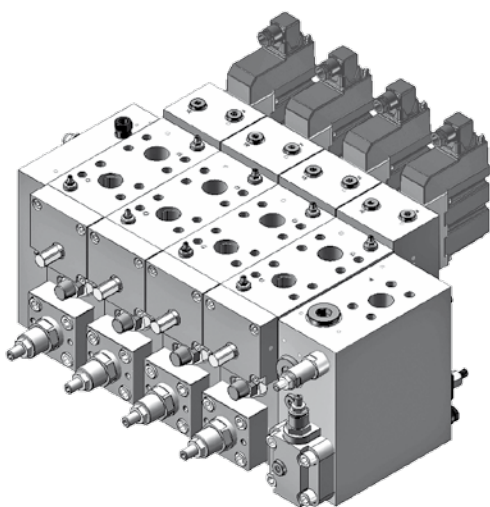
- high performances
- operation precision
- sensitive controls
- reduced maintenance expenses without giving up extended plant service life.

Carefully considering these requirements, it can be understood that specific filtering measures are needed with high-quality filtering elements to satisfy such conditions.

The maximum degree of contaminations for particles tolerated in HPV proportional directional valves cannot be greater than contamination class 9 according to NAS 1638 (20/18/15 according to ISO 4406). This required contamination class is generally achieved using filters with a retention capacity of  $\beta_{20} \geq 100$ .

Our experience suggests that a pressurised filter with a nominal rating of nominal 20  $\mu\text{m}$  [787  $\mu\text{in}$ ] or absolute 10  $\mu\text{m}$  [394  $\mu\text{in}$ ] is suitable to maintain the required oil cleaning parameters. In addition, it is always recommended to use pressurised filters with a clogging indicator.

The HPV are equipped with some built-in filters which are not suitable to filter the oil of the entire hydraulic circuit, but only some pilot lines order to protect some important components of the HPV against large-sized contaminating particles. The internal filters of the load sensing line and the low-pressure line are easy to replace and are available as spare parts.



### HPV310 General characteristics

- Pressure compensated flow control;
- Excellent flow control;
- High repeatability accuracy;
- Low hysteresis;
- Built in general pilot oil supply;
- Energy saving
- Built in pump overflow system (working in progress, not available yet);
- Different spool interchangeable variants;
- Open loop PWM electrical activation;
- Closed loop electrical actuation (0÷10 V - 0÷20 mA - 0.5 Udc signal , working in progress, not available yet);
- Manual / hydraulic spool control;
- Flow control spool;
- Motion control spool (working in progress, not available yet);
- Up to 5 working sections;
- Hybrid composition with HPV group valves.

### HPV310 Hydraulic features

The hydraulic features reported below were measured using a mineral based hydraulic oil according to DIN 51524 or ISO 6743/4 with a viscosity of 25 mm<sup>2</sup>/s [130 SUS] at a temperature of 50 °C [122 °F]

Rated flow	HSE inlet section, P port		600 l/min	159 US gal/1'
	Mid inlet section, HFLS			
	A, B ports		550 l/min	145 US gal/1'
Max. working pressure	P port	Pressure relief valve setting	400 bar	5800 psi
		Working pressure	370 bar	5370 psi
	A, B ports		370 bar	5370 psi
	Y port		to tank	
	T port	Static	25 bar	363 psi
Dynamic		35 bar	508 psi	
Max. pilot pressure oil supply			up to 30 bar	up to 428 bar
Oil temperature	Recommended		-30 ÷ 60 °C	-22 ÷ 140 °F
	Min.		-25 °C	-13 °F
	Max.		+80 °C	+176 °F
Ambient temperature			-30 ÷ 60 °C	-22 ÷ 140 °F
Viscosity	Recommended		12 ÷ 80 mm <sup>2</sup> /s	65 ÷ 366 SUS
	Min.		4 mm <sup>2</sup> /s	39 SUS
	Max.		460 mm <sup>2</sup> /s	2090 SUS
Filtering			class 9 according to NAS 1638 (20/18/15 according to ISO 4406)	
Stroke	Spool stroke		± 9 mm	± 0.354 in
	Proportional		± 7.5 mm	± 0.295 in
Dead band			± 1.5 mm	± 0.059 in
Nominal internal leakage	A, B → T	Without anti-shock valves	98 cm <sup>3</sup> /min	5.98 in <sup>3</sup> /min
		With anti-shock valves	115 cm <sup>3</sup> /min	7.02 in <sup>3</sup> /min

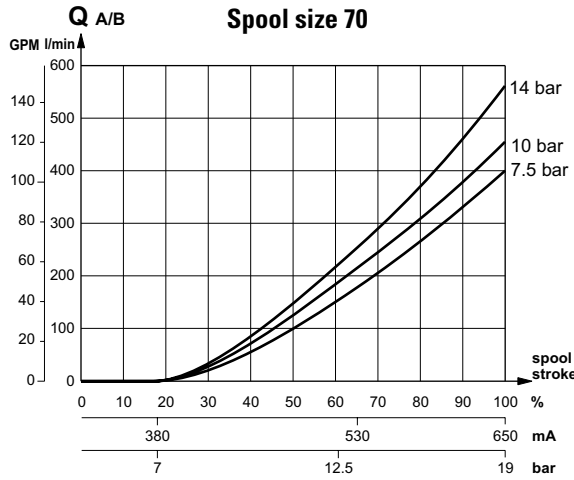
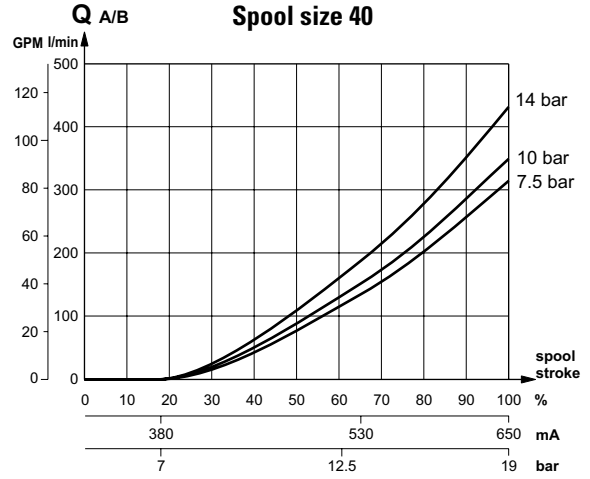
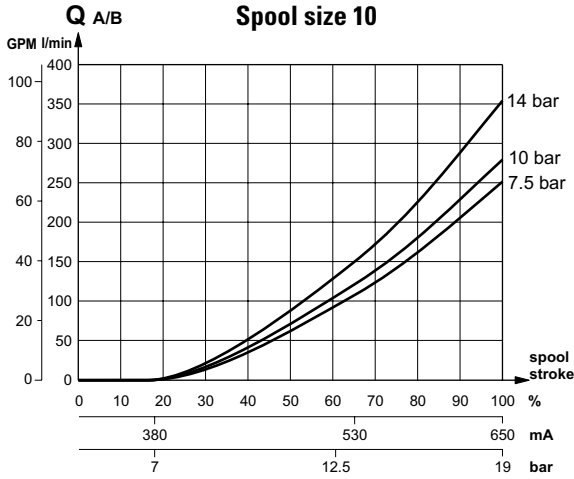
HPV 310 internal (easy replacement) filters, mesh 100 µm

Mineral oil hydraulic fluid: according to DIN 51524 and 51525 or ISO 6743/4

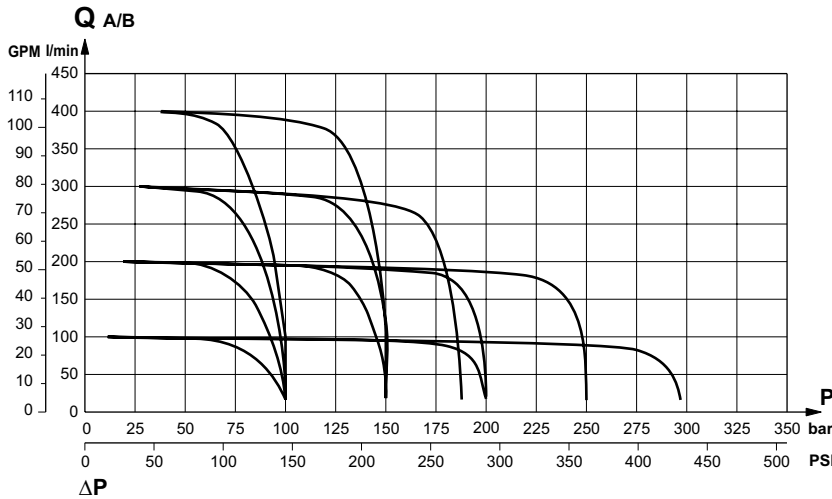
HPV 310 can also be used with phosphorous esters (HFDR), water-glycol /HFC) or water-oil (HFB) mixes, subject to our Technical Dept. approval.

Hydraulic operation			
Pilot pressure	Start	5 bar	72 psi
	End stroke	19 bar	275 psi
Max. pilot pressure		30 bar	436 psi

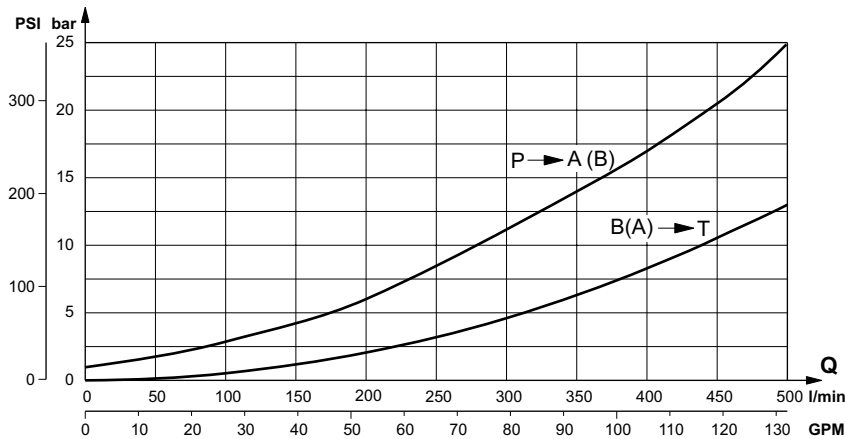
# HPV310, hydraulic features



**Spool flow characteristics**



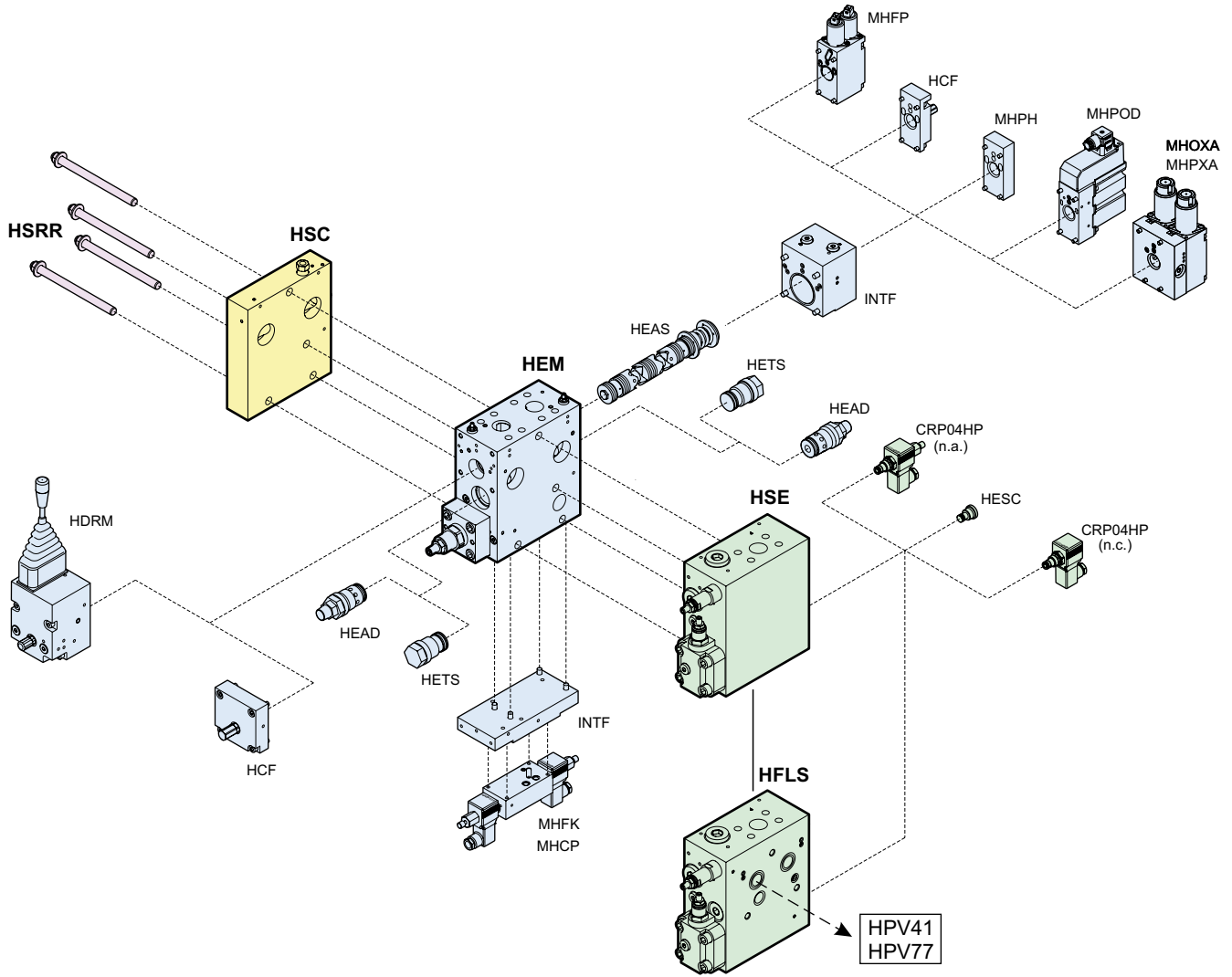
**HEM oil flow with LS A/B pilot relief valves (pressure compensated)**



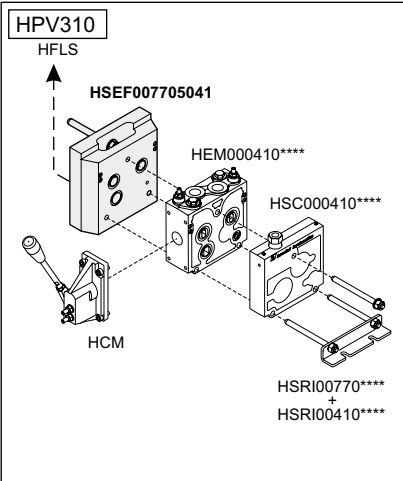
**HEM pressure drop**

# HPV310 configuration

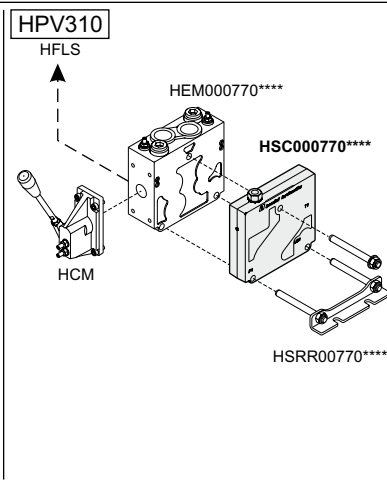
HPV310 module selection chart, basic and hybrid configuration (mit inlet plus HPV77 - HPV41)



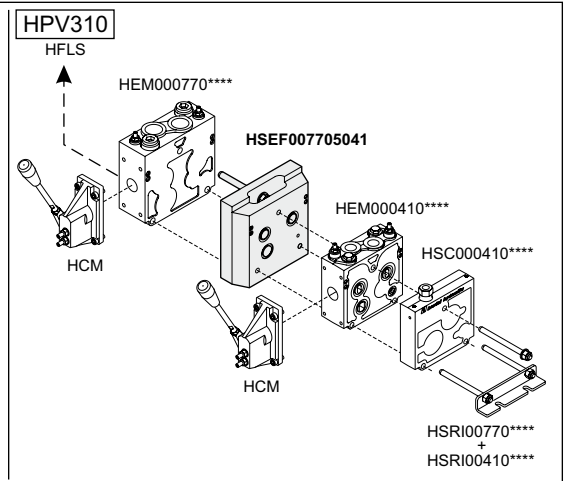
## HPV41



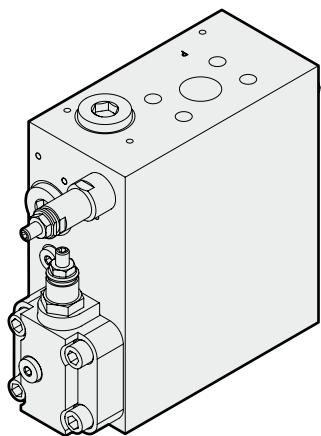
## HPV77



## HPV77+HPV41



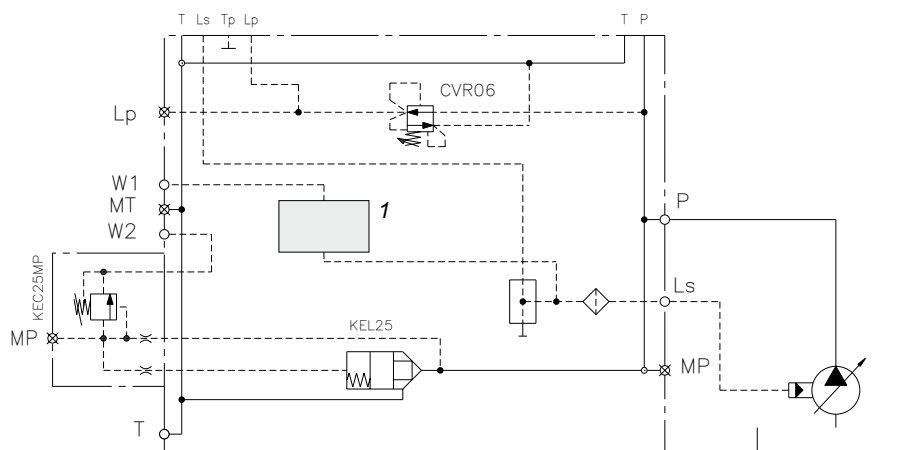
HPV41 and HPV77, see catalogue code P35200003



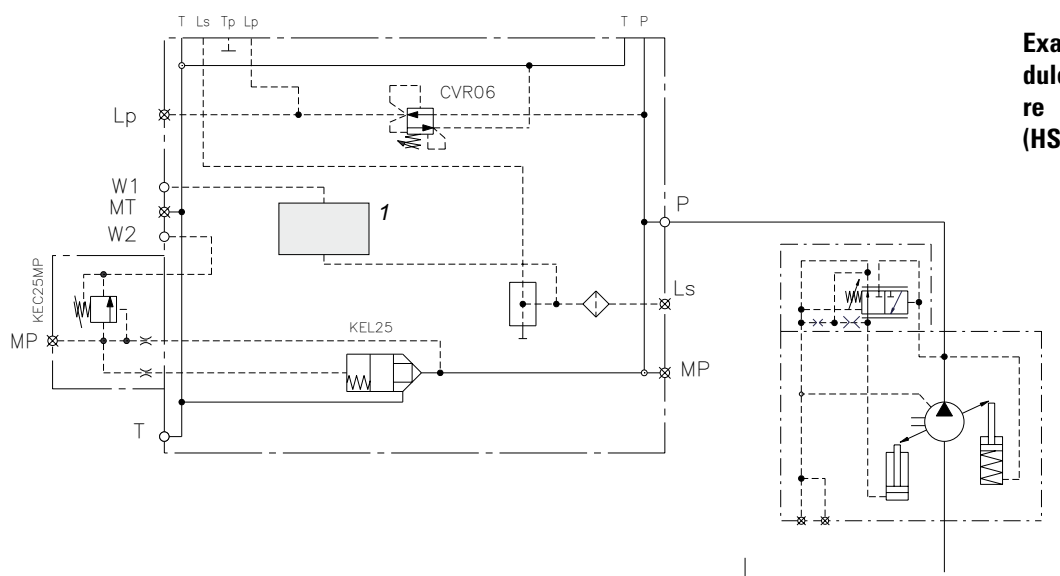
## Inlet section

- Built in pilot pressure relief valve;
- System with **LS** variable displacement pumps;
- System with constant pressure variable displacement pumps;
- Built in central pilot oil supply;
- Solenoid **LS** unloading valve;
- Built in pump overflow system (working in progress, not available yet);
- **P** port gauge connection;
- **T** port gauge connection.

Code	Description
<b>HSE0003101010</b>	Inlet module



**Example with HSE inlet module for LS variable displacement pumps with LS open not plugged**



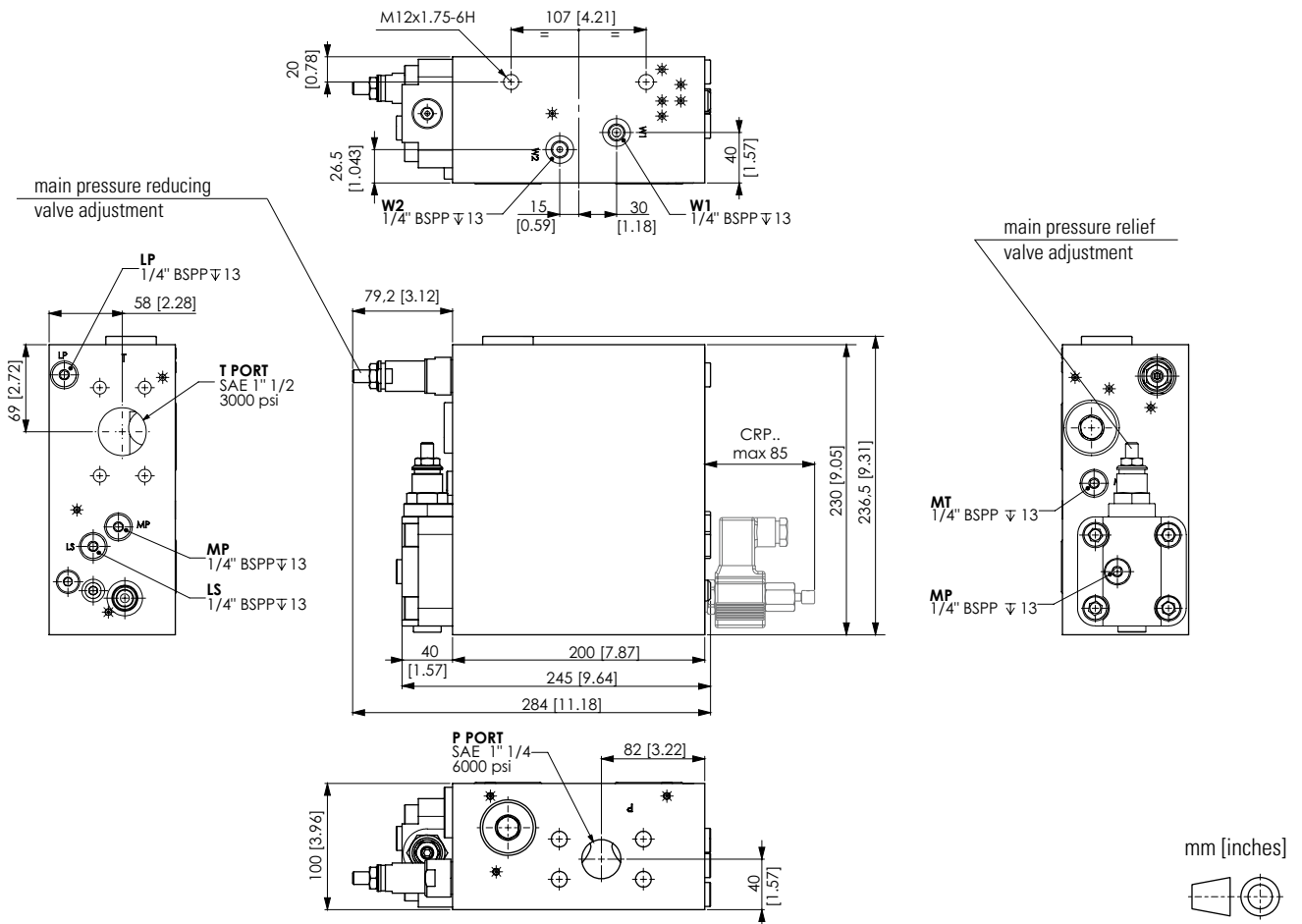
**Example with HSE inlet module for constant pressure systems with LS plugged (HSE0003101010)**

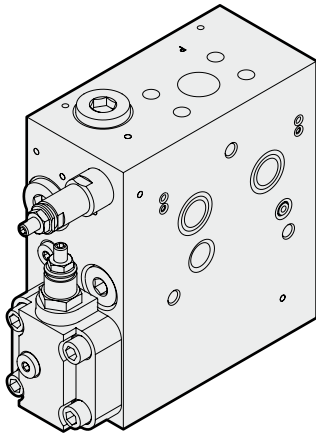


## Plug or solenoid valves for HSE module position 1

Pos.	Code	Description	Symbol
1	<b>HESC003103015</b>	Kit with closing cover for CRP04 and V1 threaded holes	
	<b>CRP04HPNAAELP31</b>	High pressure piloted operated solenoid valve <b>normally open 14VDC</b>	
	<b>CRP04HPNAAEMP31</b>	High pressure piloted operated solenoid valve <b>normally open 28VDC</b>	
	<b>CRP04HPNCAEL001</b>	High pressure piloted operated solenoid valve <b>normally closed 14VDC</b>	
	<b>CRP04HPNCAEM001</b>	High pressure piloted operated solenoid valve <b>closed closed 28VDC</b>	

For CRP04HP with different voltages see catalogue "Cartridge valves / In-line valves" code DOC00044

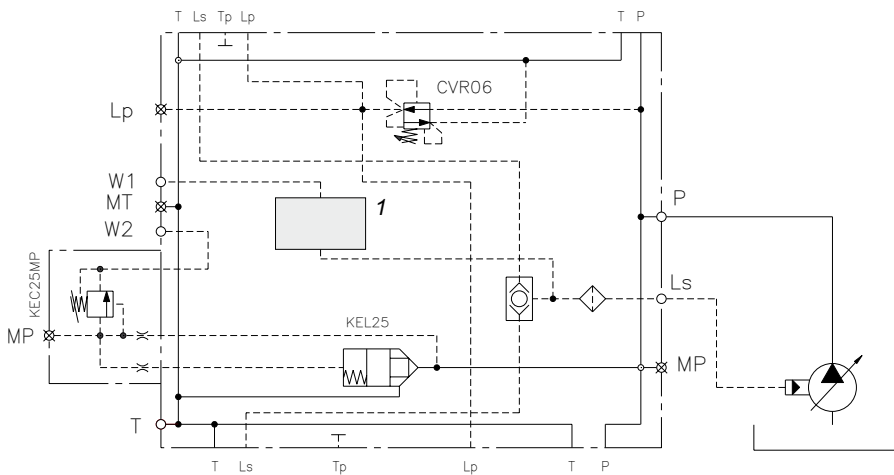




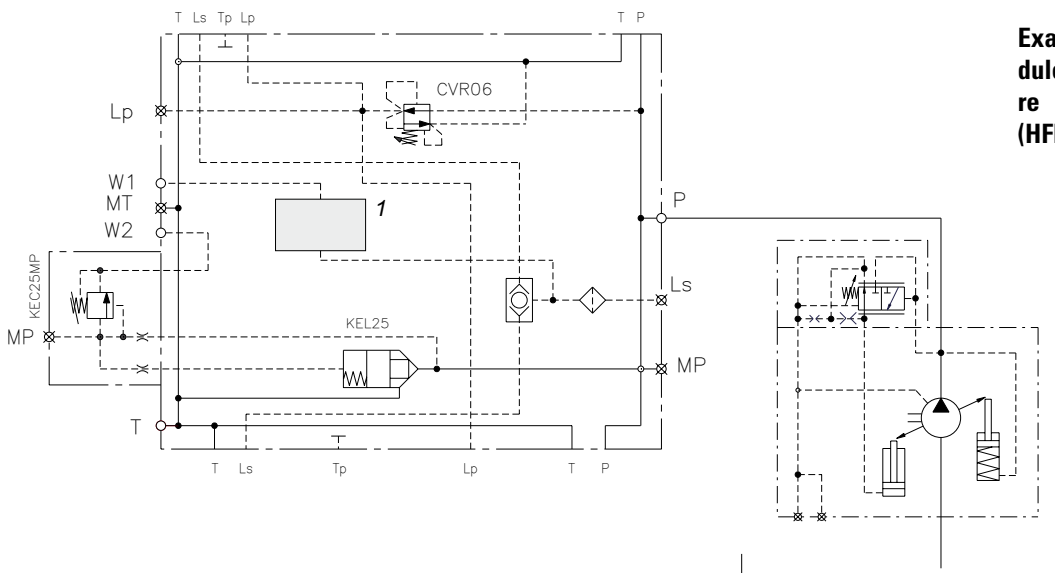
## Mid inlet section

- For hybrid assembling with HPV 77 and /or HPV 41
- Built-in pilot pressure relief valve
- System with LS variable displacement pump
- System with constant pressure variable displacement pump
- Built-in central pilot oil supply
- Built-in pump overflow system (work in progress, not available yet)
- Solenoid LS unloading valve
- P port, gauge connection
- T port, gauge connection

Code	Description
<b>HFLS003101210</b>	Inlet module



**Example with HFLS inlet module for LS variable displacement pumps with LS open not plugged**

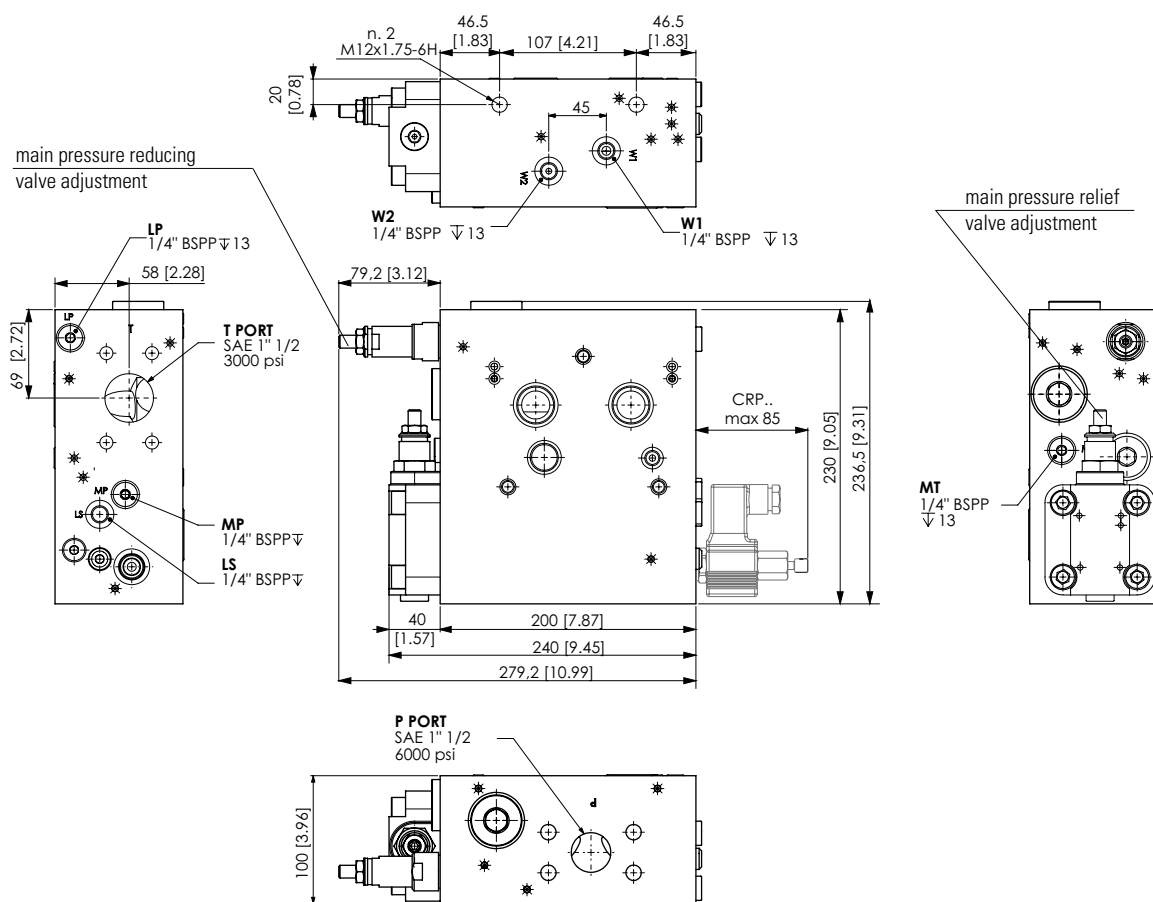


**Example with HFLS inlet module for constant pressure systems with LS plugged (HFLS003101210)**

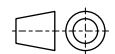
## Plug or solenoid valves for HSE module position 1

Pos.	Code	Description	Symbol
1	<b>HESC003103015</b>	Kit with closing cover for CRP04 and V1 threaded holes	
	<b>CRP04HPNAAELP31</b>	High pressure piloted operated solenoid valve <b>normally open 14VDC</b>	
	<b>CRP04HPNAAEMP31</b>	High pressure piloted operated solenoid valve <b>normally open 28VDC</b>	
	<b>CRP04HPNCAEL001</b>	High pressure piloted operated solenoid valve <b>normally closed 14VDC</b>	
	<b>CRP04HPNCAEM001</b>	High pressure piloted operated solenoid valve <b>closed closed 28VDC</b>	

For CRP04HP with different voltages see catalogue "Cartridge valves / In-line valves" code DOC00044

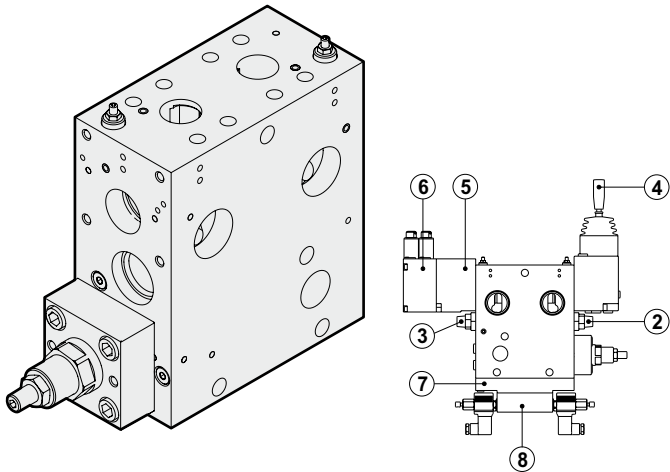


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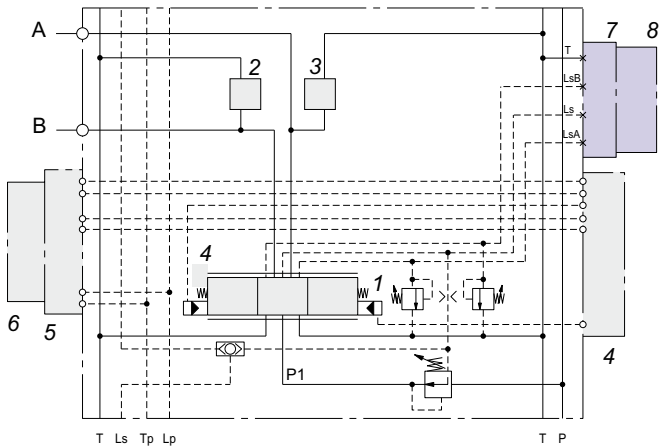


## Working section

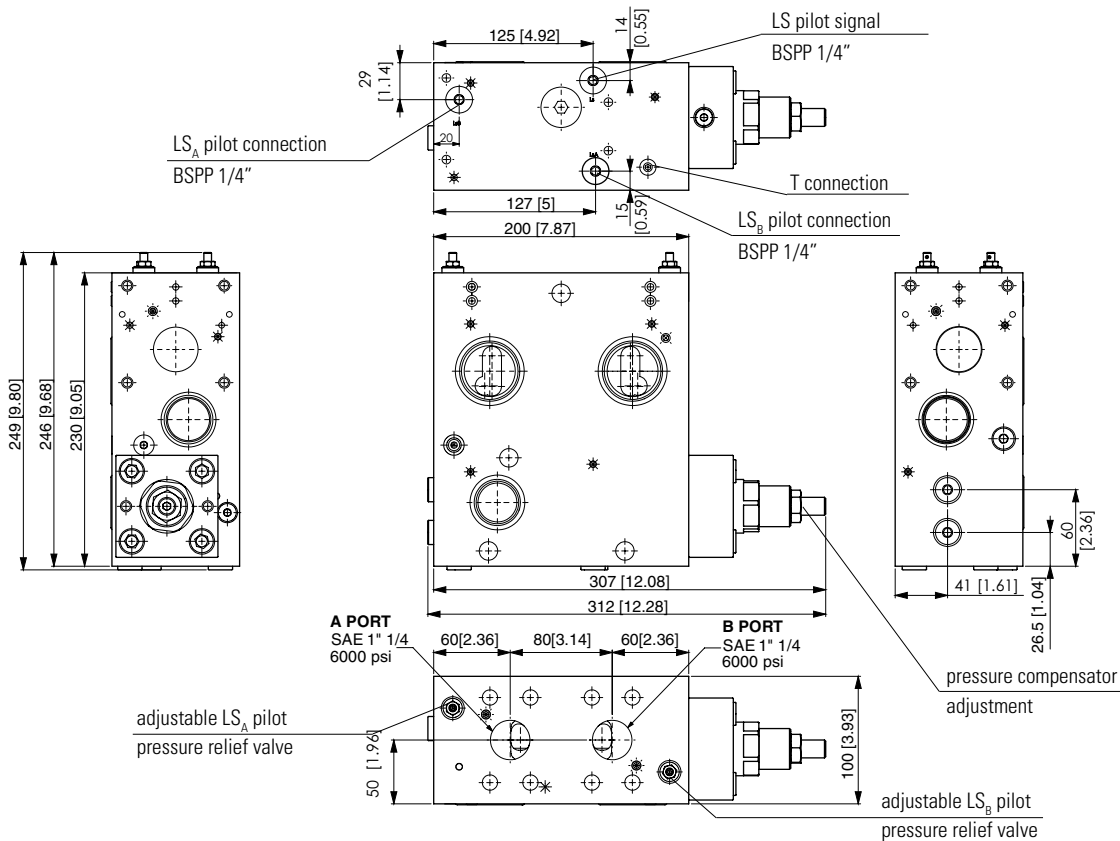
- Built-in adjustable pressure compensator
- Symmetrical distribution that allows the manual activation position to be reversed with all servocontrols
- Built-in adjustable pilot operated shock-suction valves
- Interchangeable spools
- LS and LSA/B pilot connections
- LSA/B pilot relief valves
- LS and LSA/B electrical unloading (work in progress, not available yet)
- Electrical actuation
  - MHPF, PWM signal, open loop control
  - MHPOD, 0-10 V, 0-20 mA, 0,5 UDC signal, open loop control
  - MHPED, 0-10 V, 0-20 mA, 0,5 UDC signal, closed loop control (work in progress, not available yet)
- Mechanical flow adjustment



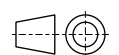
Code	Description
<b>HEM0003103010</b>	Working section with holes LsA-B for electrical unloading plugged



Pos.	Description	Type	Page
1	Spool	Complements	11
2	Shock valve or plug	Complements	12
3	Shock valve or plug	Complements	12
4	Manual actuation or flange	Complements	13
5	Adapter interface	Complements	16
6	Control	Complements	17
7	Adapter interface (bottom side)	Accessory	22
8	LSA / LSB / LS electrical unloading signal (bottom side)	Accessory	23

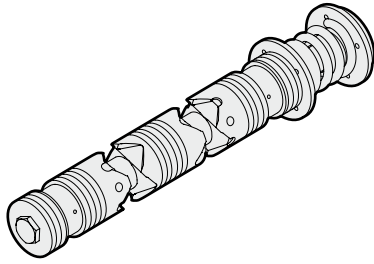


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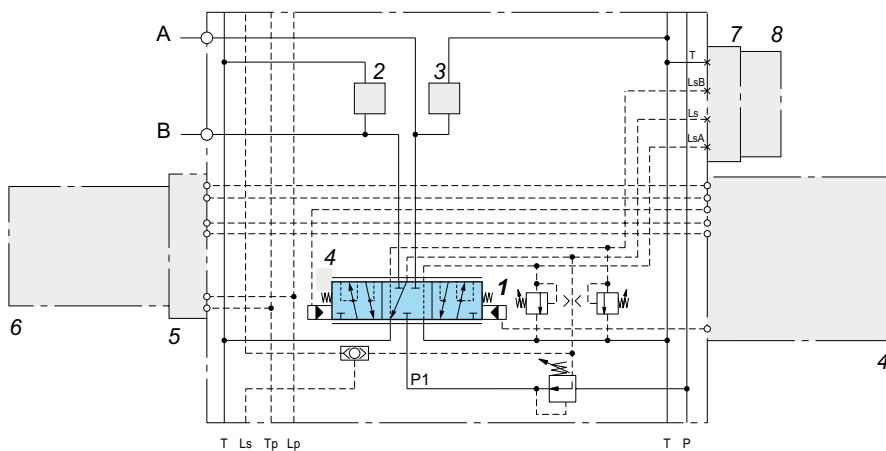


## HEAS - Main spool for flow control, double acting (position 1)

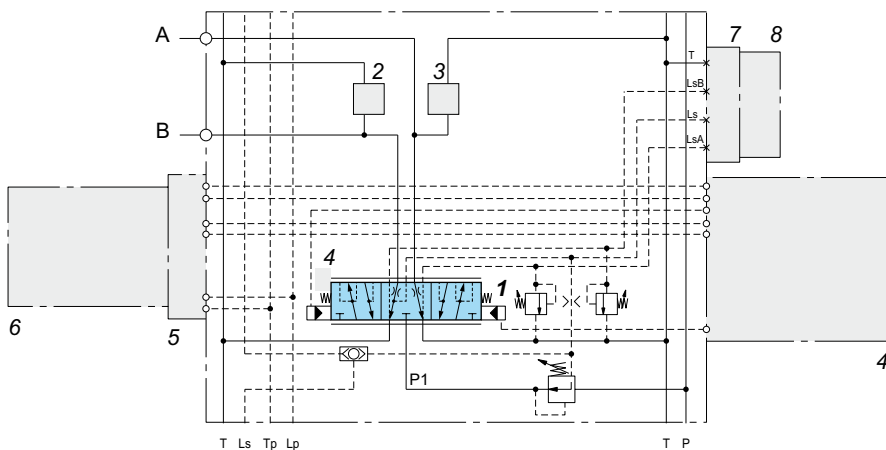
Symmetrical distribution that allows the manual activation position to be reversed with all servocontrols



Spool type		Code	Size	$\Delta p$ [bar]	Flow range [l/min]	Symbol
01N	4-way, 3-position A, B closed	HEAS003104200	05	8 ÷ 14	180 ÷ 270	
		HEAS003104225	10	8 ÷ 14	250 ÷ 320	
		HEAS003104240	40	8 ÷ 14	310 ÷ 410	
		HEAS003104265	70	8 ÷ 14	410 ÷ 500	
03N	4-way, 3-position A, B → T	HEAS003104300	05	8 ÷ 14	180 ÷ 270	
		HEAS003104325	10	8 ÷ 14	250 ÷ 320	
		HEAS003104340	40	8 ÷ 14	310 ÷ 410	
		HEAS003104365	70	8 ÷ 14	410 ÷ 500	



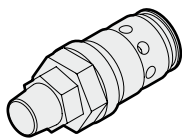
Example with HEAS0031042.. spool



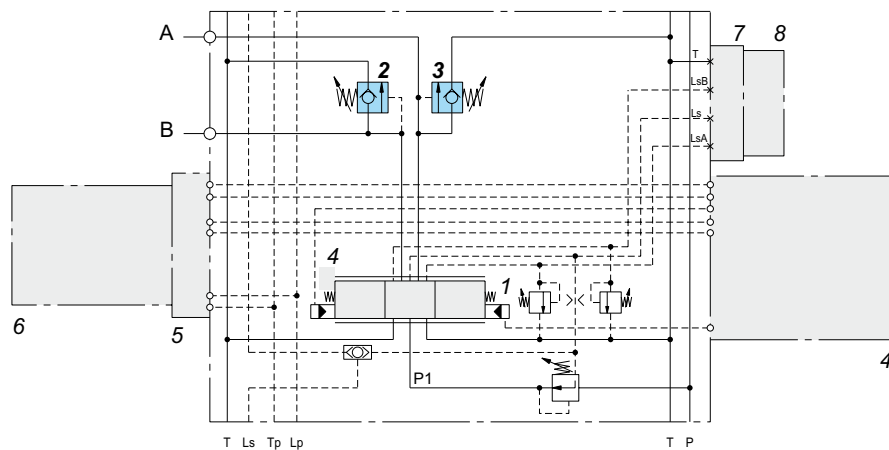
Example with HEAS0031043.. spool

## HEAD - Shock and suction valve for A – B ports (position 2-3)

HEAD is designed to absorb shock effects only. Don't use it as a pressure relief valve.



Code	Description
HEAD003101450	Shock and suction valve. Setting up to 400 bar

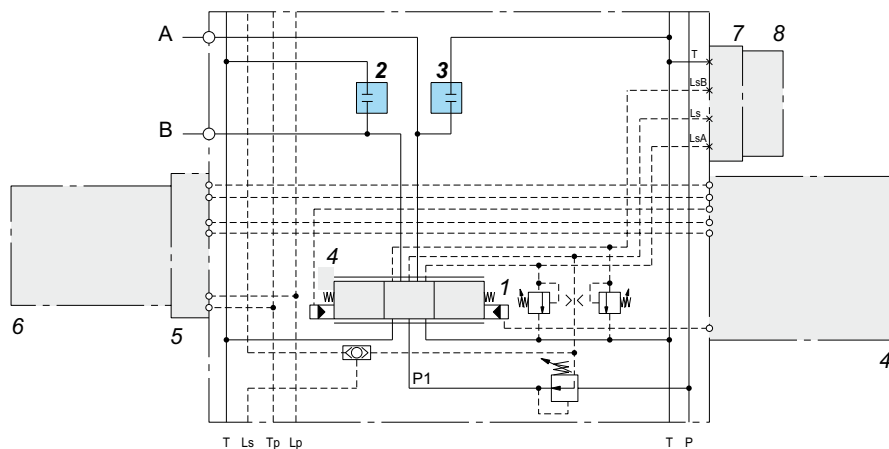


Example with HEAD.. valve

## HETS - Plug for position 2 and 3

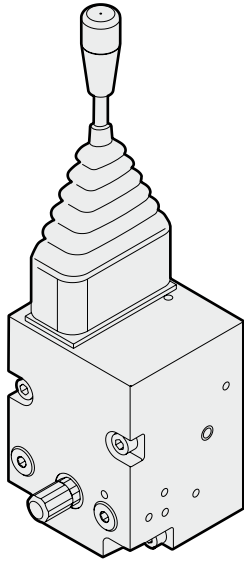


Code	Description
HETS003103000	Plug



Example with HETS.. plug

## HDRM - Manual activation (position 4)

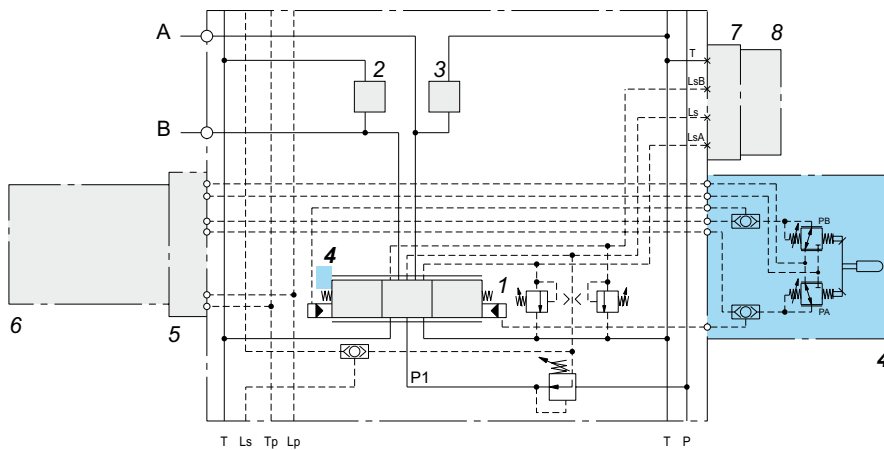


HDRM manual actuations operate on the basis of direct operated pressure reducing valves.

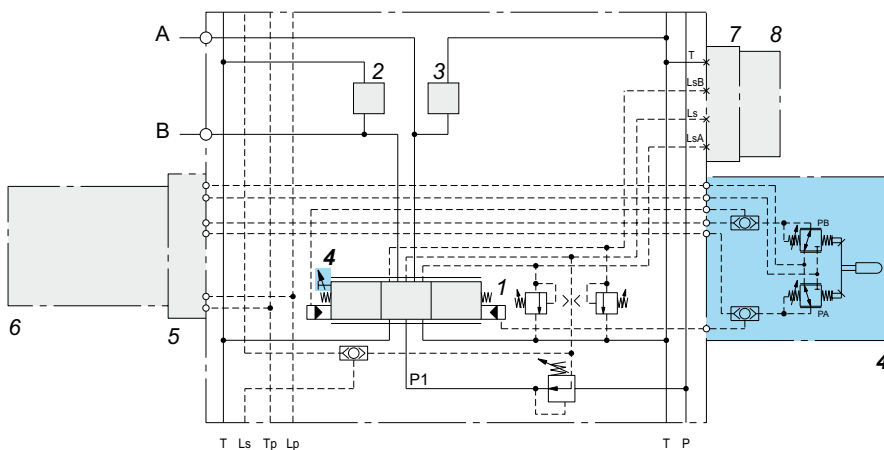
HDRM control devices basically comprise a control lever, two pressure reducing valves and a housing.

When the control lever is deflected, as a result of the interaction with the two pressure reducing valves the relevant pilot pressure is a function of the control lever position, enabling a highest metering spool control

Code	Description
<b>HDRM003107001</b>	Manual actuator for electric control without spool stroke limiter
<b>HDRM003107002</b>	Manual actuator for electric control with spool stroke limiter
<b>HDRM003107003</b>	Manual actuator for manual control without spool stroke limiter
<b>HDRM003107004</b>	Manual actuator for manual control with spool stroke limiter

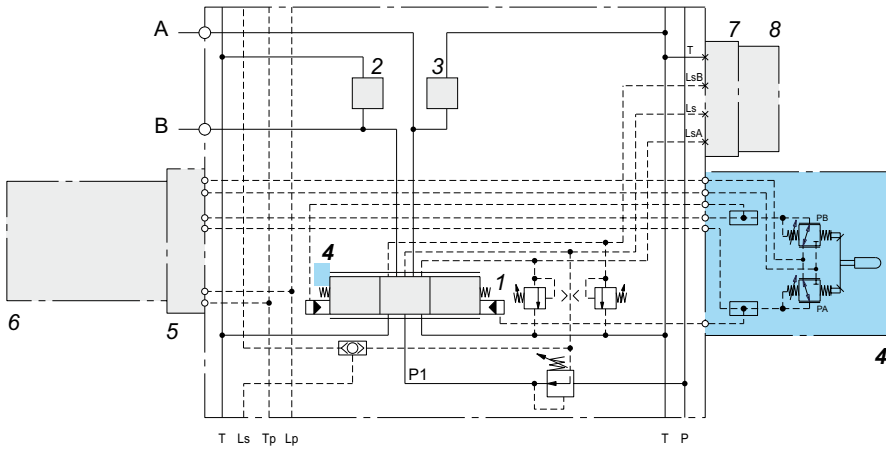


**Example with HDRM003107001 for electric control (on position 6) without spool stroke limiter**

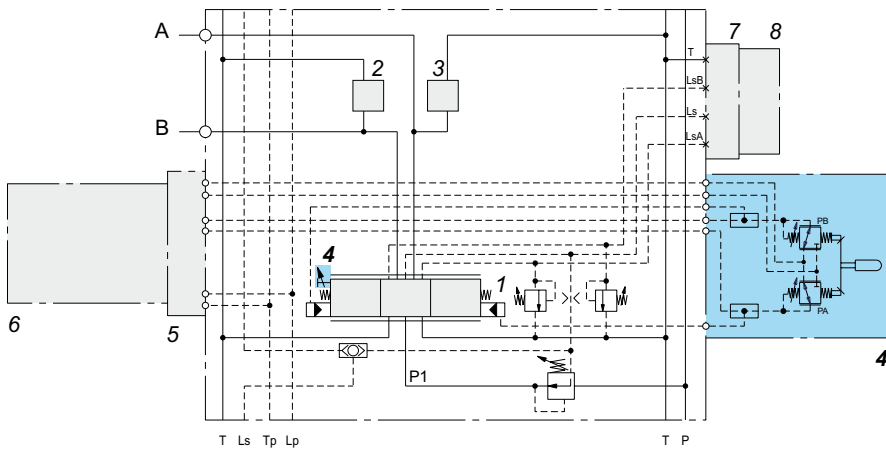


**Example with HDRM003107002 for electric control (on position 6) with spool stroke limiter**

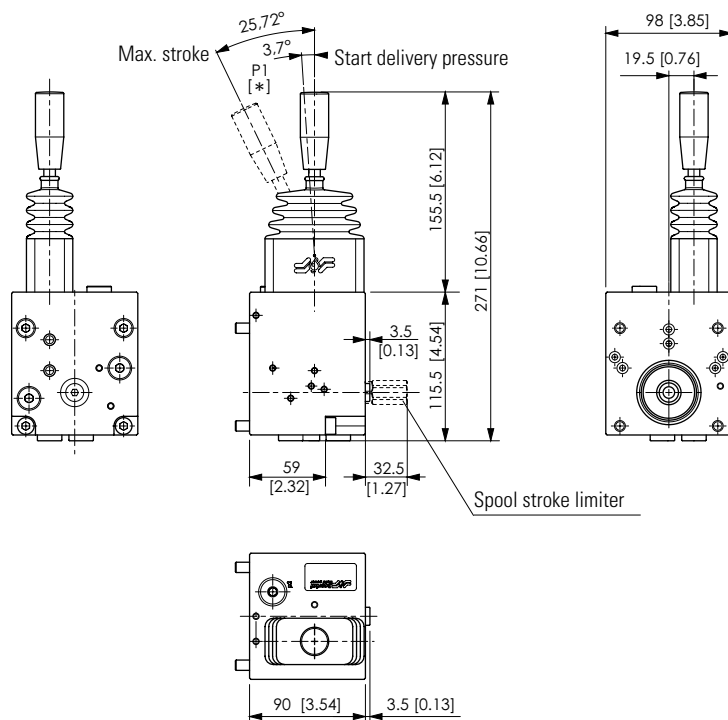
## HDRM - Manual actuation (position 4)



Example with HDRM003107003 for manual (on position 6) without spool stroke limiter

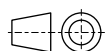


Example with HDRM003107004 for manual control (on position 6) with spool stroke limiter



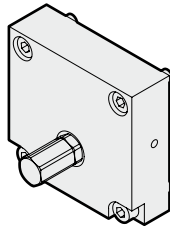
\* = PB with standard right HPV feed  
PA for left HPV feed

mm [inches]

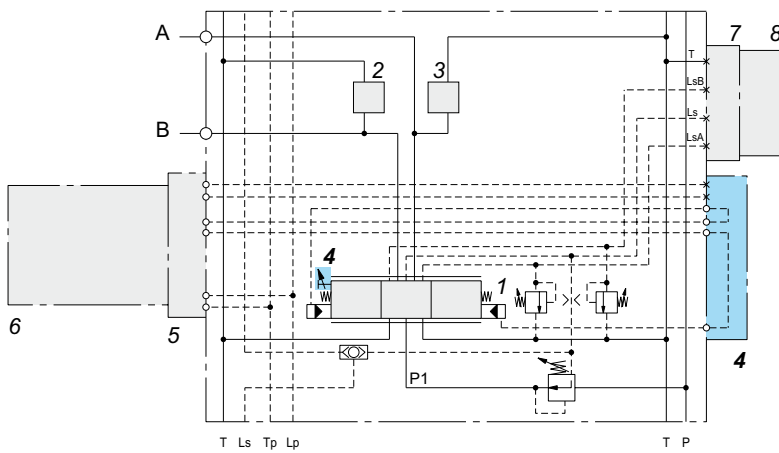




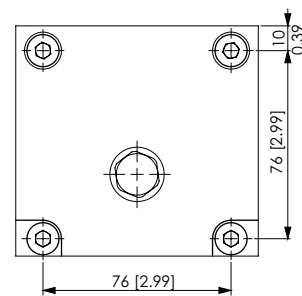
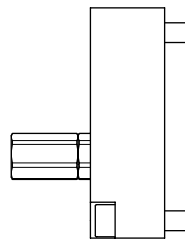
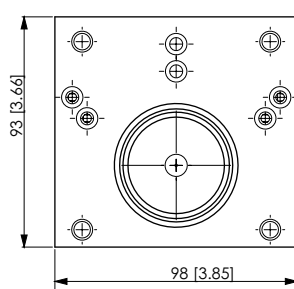
## HCF - Flange with stroke limiter (position 4)



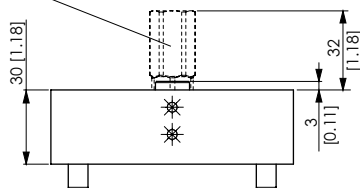
Code	Description
<b>HCF0003104010</b>	Flange with stroke limiter
<b>HCF0003104011</b>	Flange without stroke limiter



**Example with HCF.. (on position 4) with spool stroke limiter**



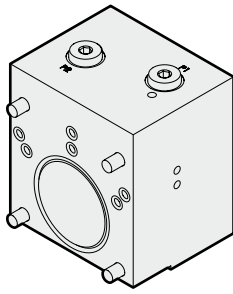
Spool stroke limiter



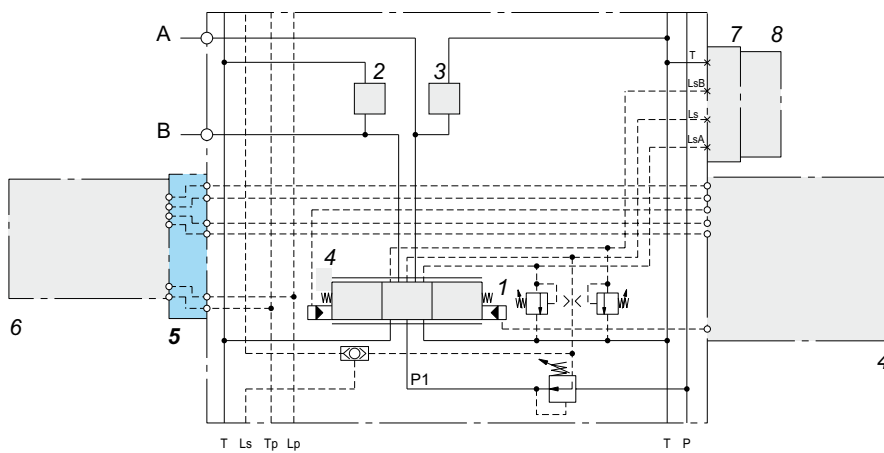
mm [inches]



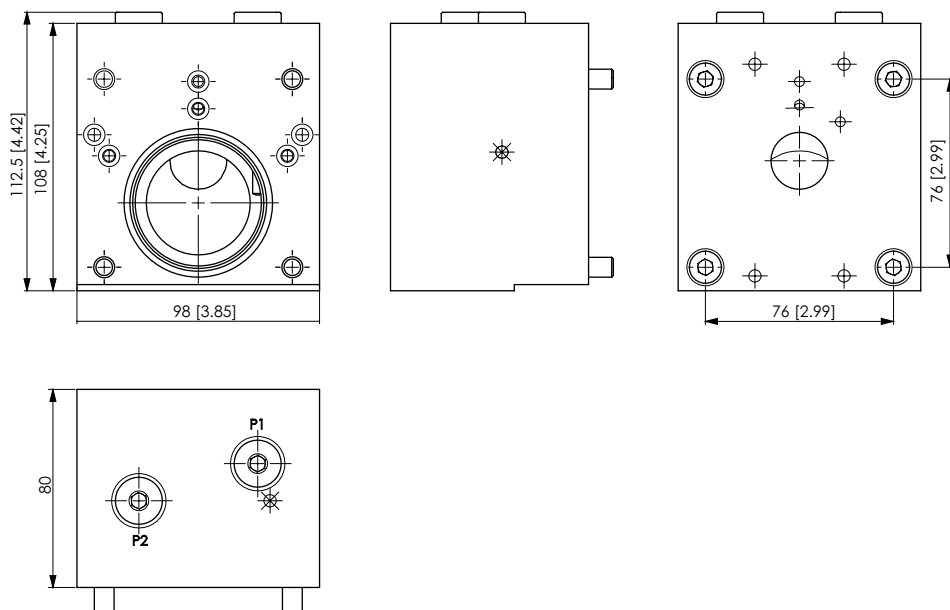
## INTF - Adapter for controls (position 5)



Code	Description
INTF003105015	Adapter for controls



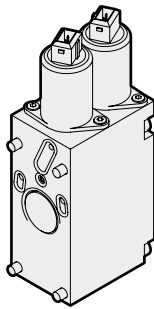
Example with INTF (on position 5)



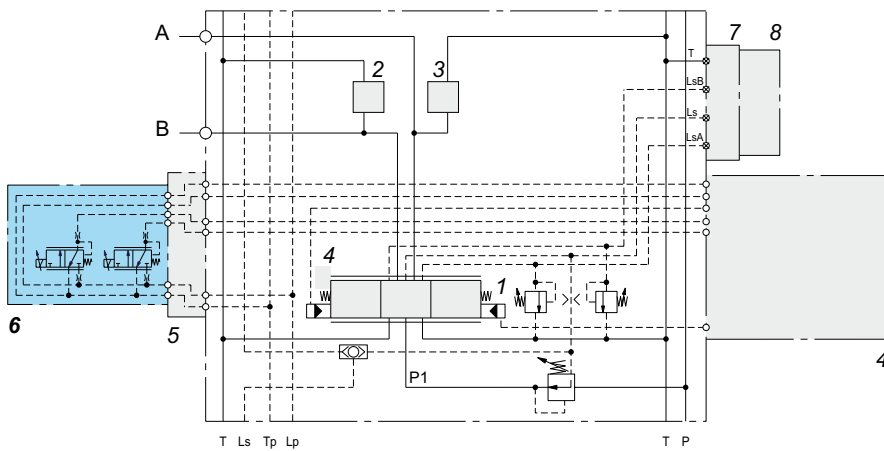
mm [inches]



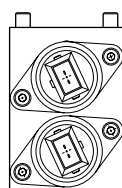
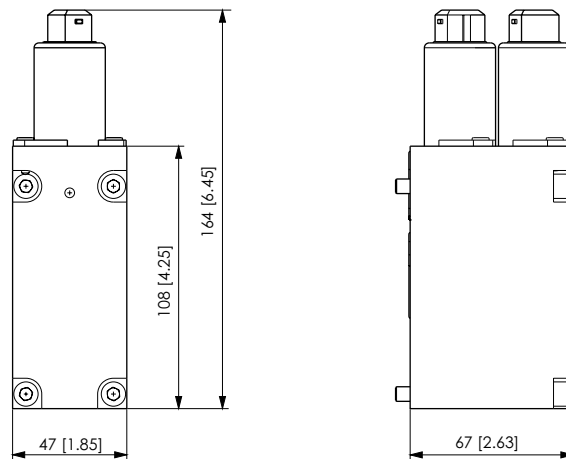
## MHPF - Control (position 6)



Code	Description
<b>MHPF003107050</b>	12 VDC control
<b>MHPF003107051</b>	24 VDC control



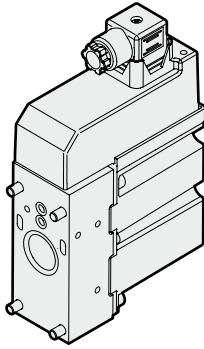
Example with MHPF. control (on position 6)



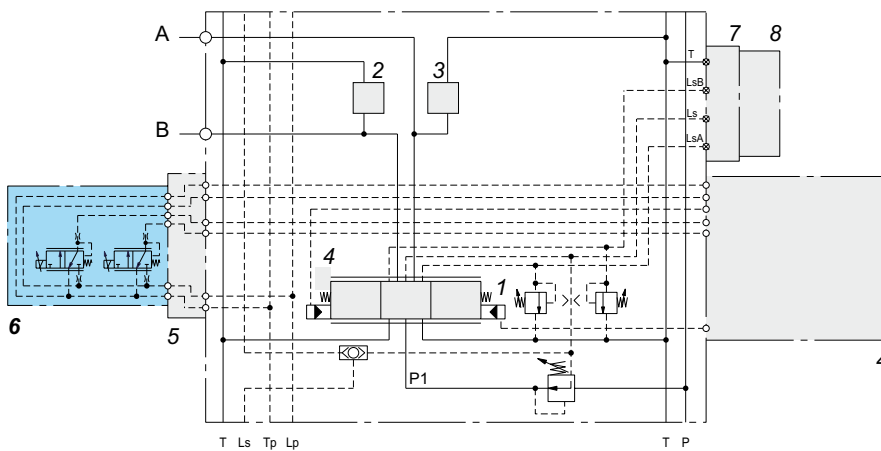
mm [inches]



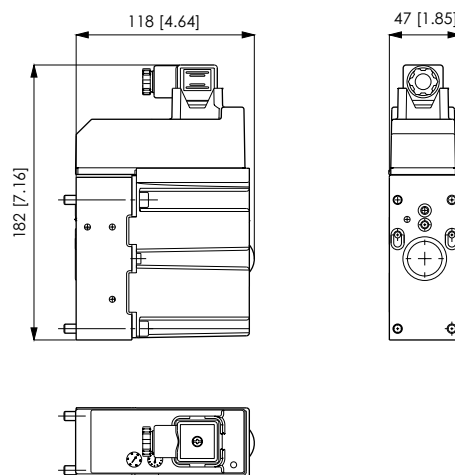
## MHPOD - Control (position 6)



Code	Voltage	Description
<b>MHPOD07708077</b>	12 VDC	Input signal control 0.5 x UDC
<b>MHPOD07708075</b>	24 VDC	
<b>MHPOD07708082</b>	12 VDC	Input signal control 0 ÷ 10 VDC
<b>MHPOD07708084</b>	24 VDC	
<b>MHPOD07708086</b>	12 VDC	Input signal control 0 ÷ 20 mA
<b>MHPOD07708088</b>	24 VDC	



Example with MHPOD.. control (on position 6)

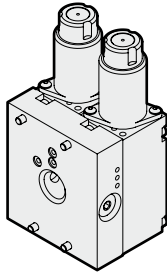


mm [inches]

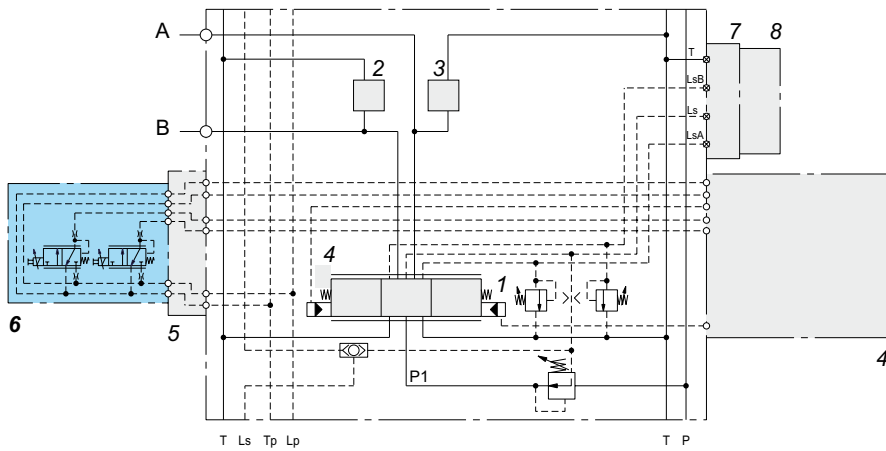


**ATEX**

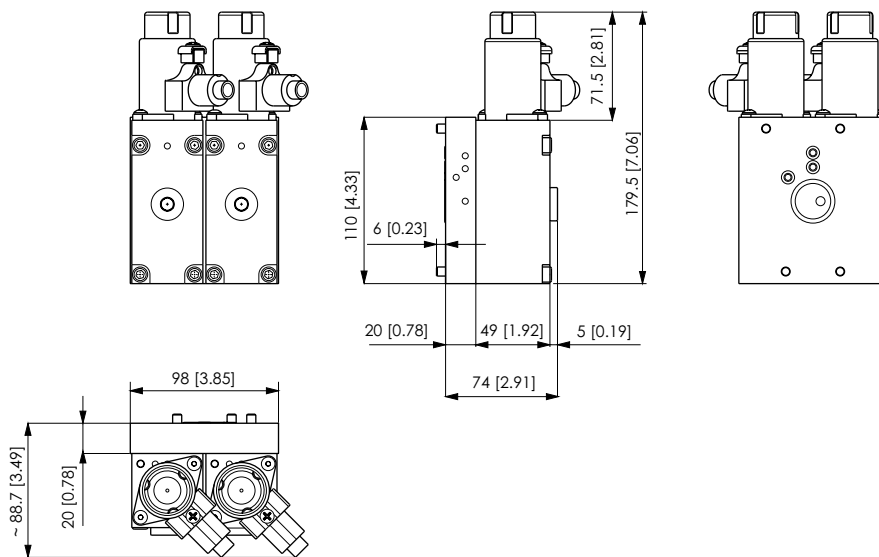
**ATEX - Control (position 6)**



Code	Voltage	Description
<b>MHOXAB3107381</b>	12 VDC	ATEX Electro-hydraulic On/Off module
<b>MHOXAB3107380</b>	24 VDC	ATEX Electro-hydraulic On/Off module double acting
<b>MHPXAB3107181</b>	12 VDC	ATEX Electro-hydraulic proportional module double acting
<b>MHPXAB3107180</b>	24 VDC	ATEX Electro-hydraulic proportional module double acting



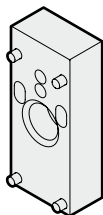
**Example with ATEX control (on position 6)**



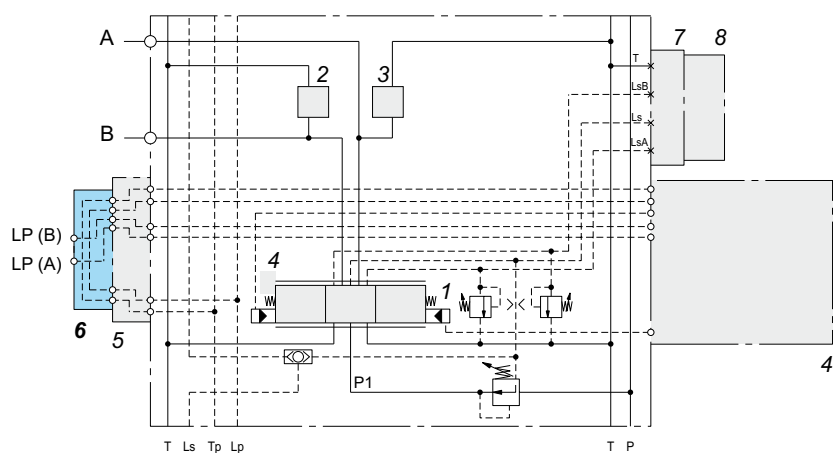
mm [inches]



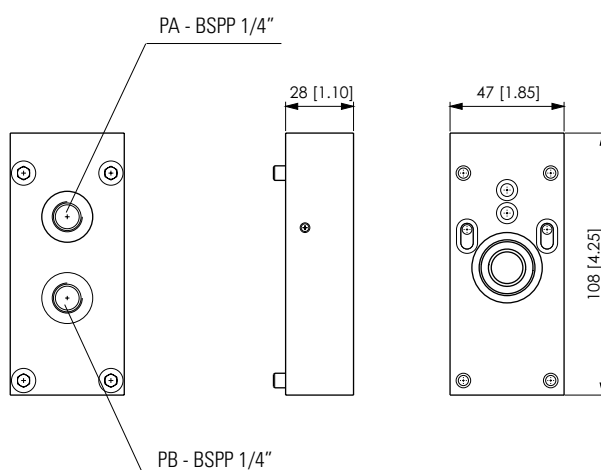
## MHPH - Control (position 6)



Code	Description	Thread	Made
<b>MHPH007704601</b>	Hydraulic activation	BSPP	Aluminium
<b>MHPH007704602</b>	Hydraulic activation	UN - UNF	
<b>MHPH007704621</b>	Hydraulic activation	BSPP	Cast iron
<b>MHPH007704622</b>	Hydraulic activation	UN - UNF	

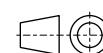


Example with MHPH.. control (on position 6)

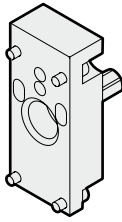


**PB** with standard right HPV feed  
**PA** for left HPV feed

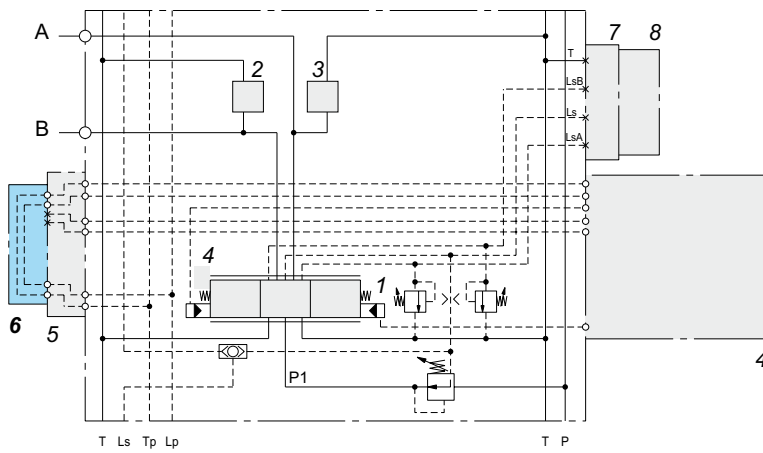
mm [inches]



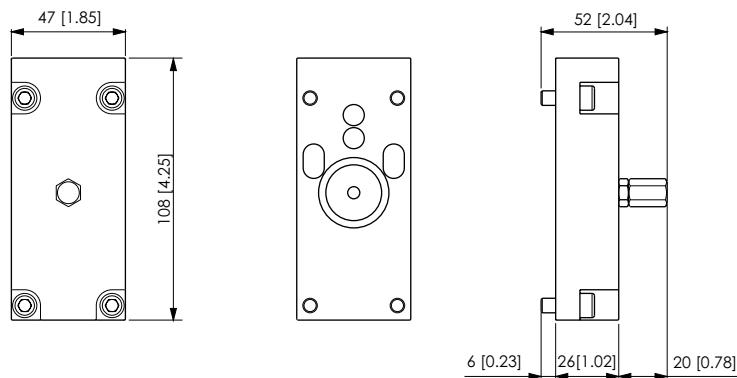
## HCF - Flange (position 6)



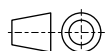
Code	Description	Made
HCF0007704587	Rear cover flow adjustement	Aluminium
HCF0007704584		Cast iron



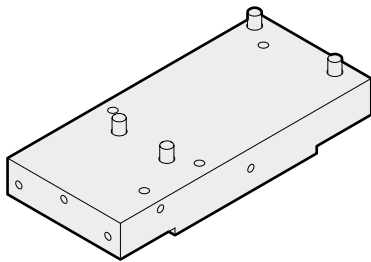
**Example with HCF.  
(on position 6)**



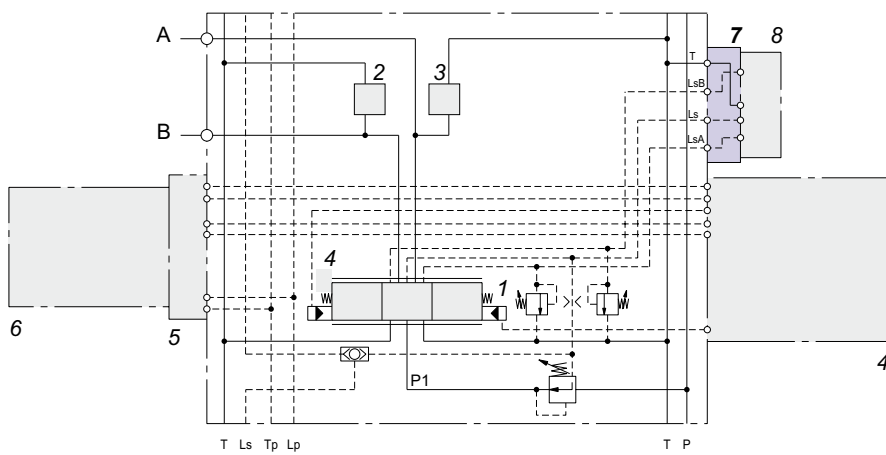
mm [inches]



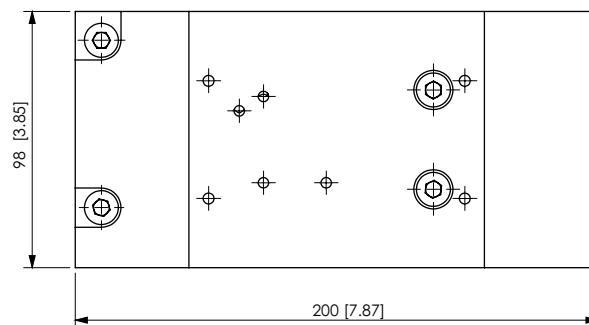
## INTF - Adapter (position 7)



Code	Description
INTF003104005	Adapter



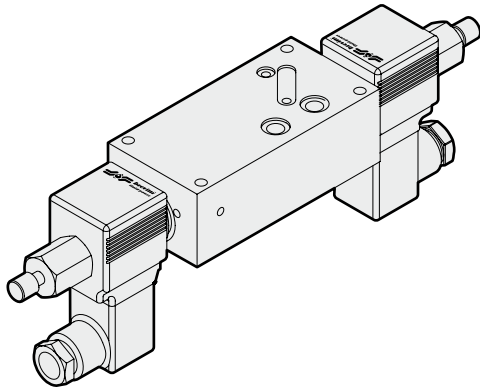
**Example with INTF.. control  
(on position 7)**



mm [inches]







## MHFO - Unloading electrical modules LS<sub>A/B</sub> signal (position 8)

LS<sub>A</sub> / LS<sub>B</sub> pilot signal unloading solenoid valve.

- **Normally open:** the on/off solenoids **are not energized**, there is no flow on A/B work ports;

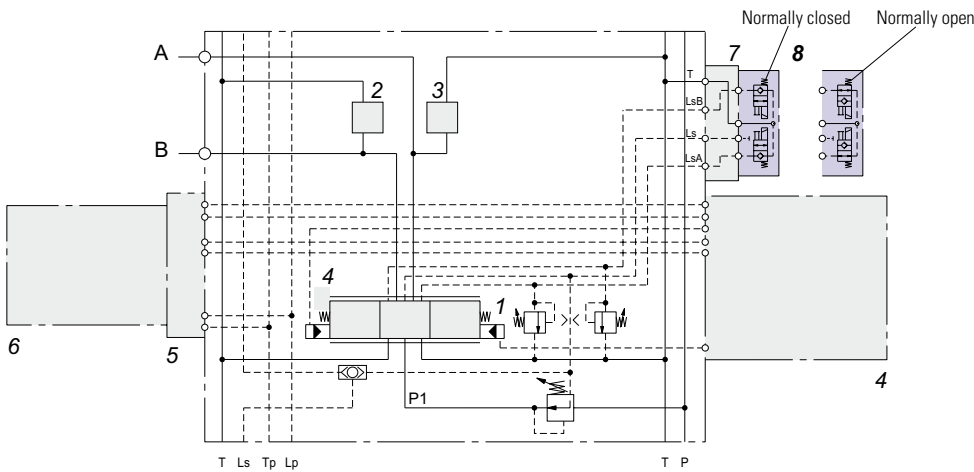
- **Normally closed:** the on/off solenoids **are energized**, there is no flow on A/B work ports;

while the pressure in the open will be equal to the P → T unloading pressure value on the inlet section, plus the counterpressure acting on T line.

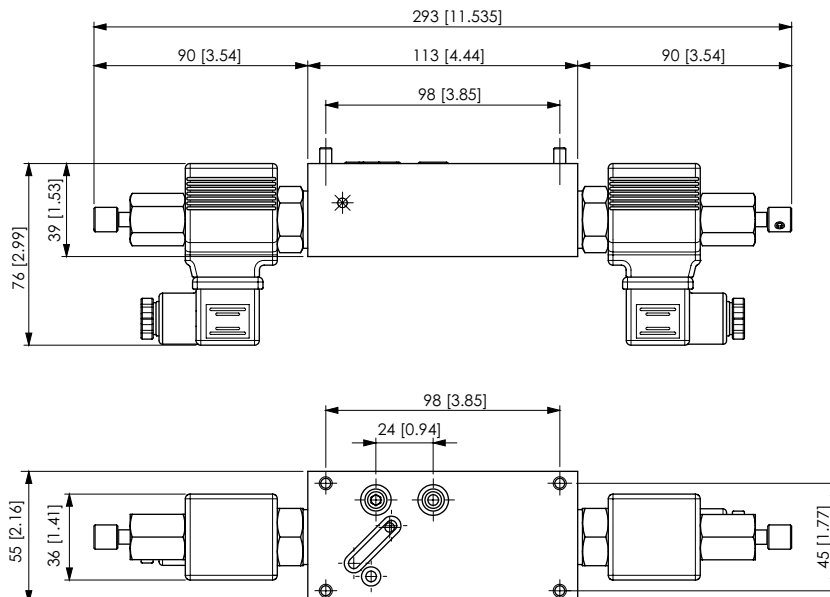
In closed centre circuits (under the same operating conditions) the pressure will be equal to the stand-by pump pressure.

Code 12VDC	Code 24VDC	Description
<b>MHF0007706205</b>	<b>MHF0007706210</b>	Active on LS <sub>A</sub> - Normally open
<b>MHF0007706215</b>	<b>MHF0007706220</b>	Active on LS <sub>B</sub> - Normally open
<b>MHF0007706225</b>	<b>MHF0007706230</b>	Active on LS <sub>A</sub> + LS <sub>B</sub> - Normally open
<b>MHF0007706300</b>	<b>MHF0007706305</b>	Active on LS - Normally open
<b>MHF0007706235</b>	<b>MHF0007706240</b>	Active on LS <sub>A</sub> - Normally closed
<b>MHF0007706245</b>	<b>MHF0007706250</b>	Active on LS <sub>B</sub> - Normally closed
<b>MHF0007706255</b>	<b>MHF0007706260</b>	Active on LS <sub>A</sub> + LS <sub>B</sub> - Normally closed
<b>MHF0007706310</b>	<b>MHF0007706315</b>	Active on LS - Normally closed

CRP04HP, see catalogue "Cartridge valves / In-line valves" code DOC00044



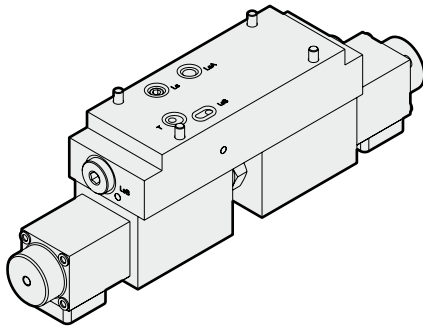
**Example with MHFO..  
(on position 8)**



mm [inches]

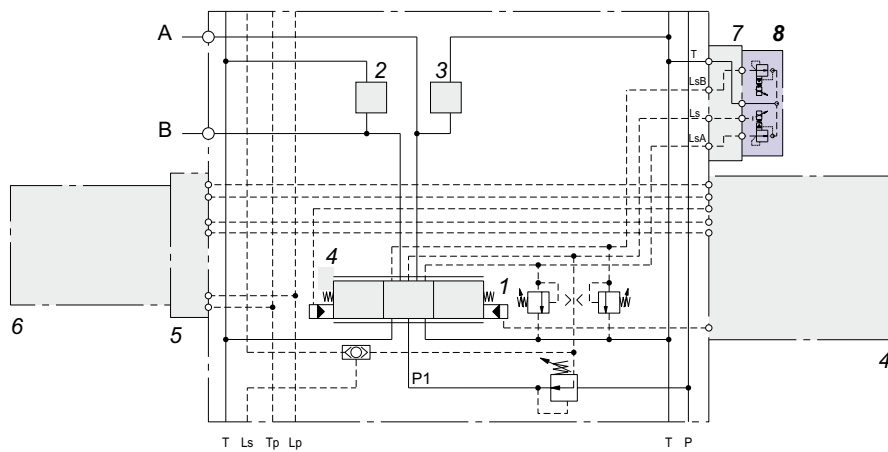


## MHCP - Unloading electrical modules LS signal (position 8)

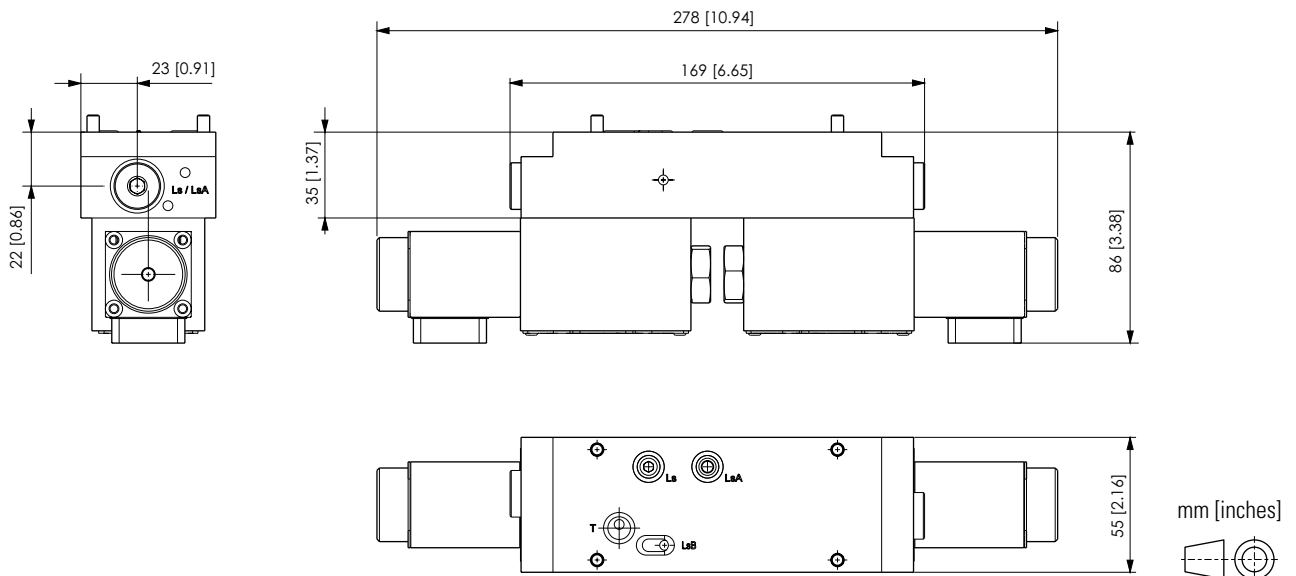


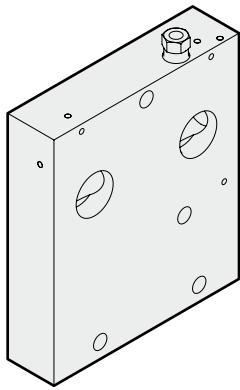
Code	Description
<b>MHCP007706210</b>	Active on LSA - 24VDC
<b>MHCP007706220</b>	Active on LSB - 24VDC
<b>MHCP007706230</b>	Active on LSA + LSB - 24VDC
<b>MHCP007706305</b>	Active on LS - 24VDC

XP3, pressure relief valve, see catalogue "Valves and electronics" code P35030200



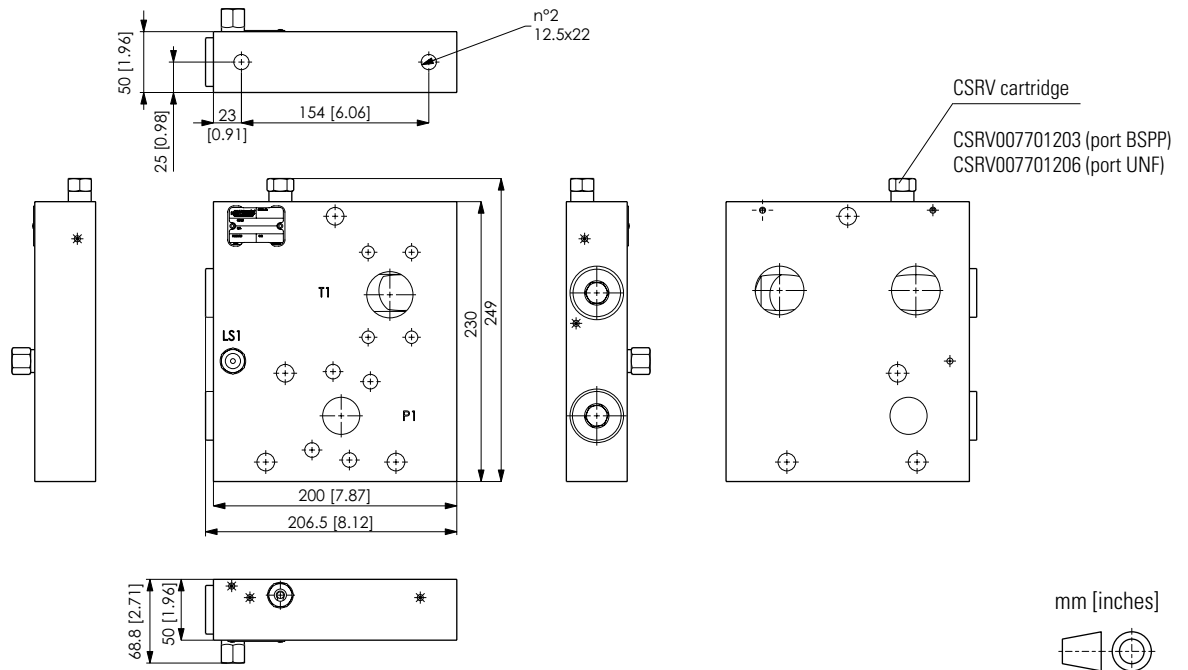
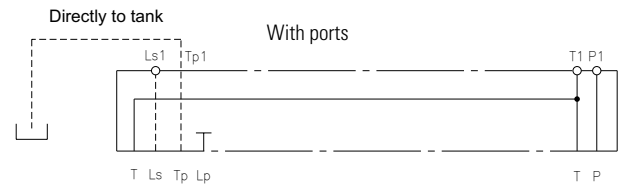
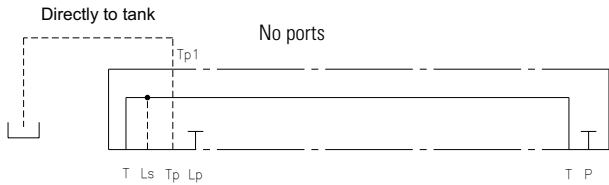
**Example with MHCP.  
(on position 8)**





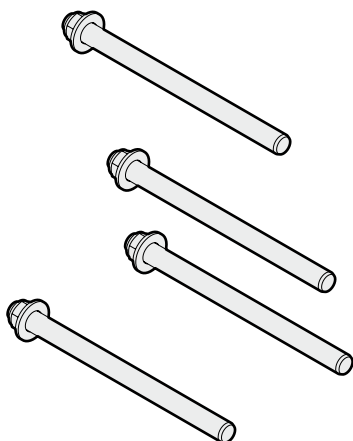
## End section

Code	Description
<b>HSC0003105005</b>	No ports
<b>HSC0003105010</b>	P <sub>1</sub> port - SAE 1" ¼ - 6000 psi
	T <sub>1</sub> port - SAE 1" ½ - 3000 psi
	Ls <sub>1</sub> port - BSPP ¼" - depth 13

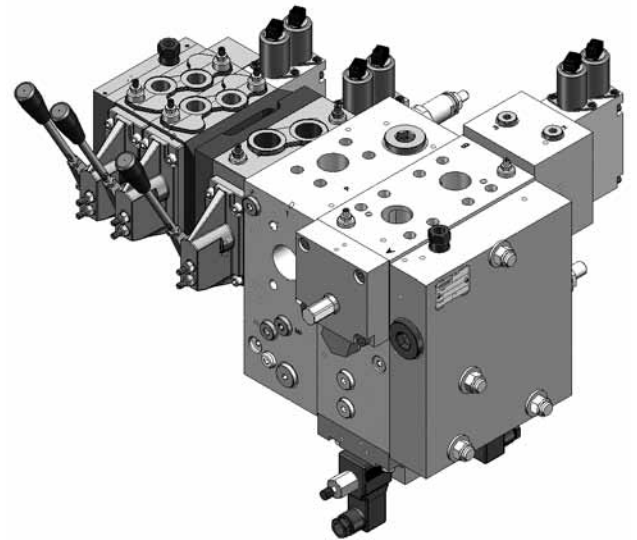
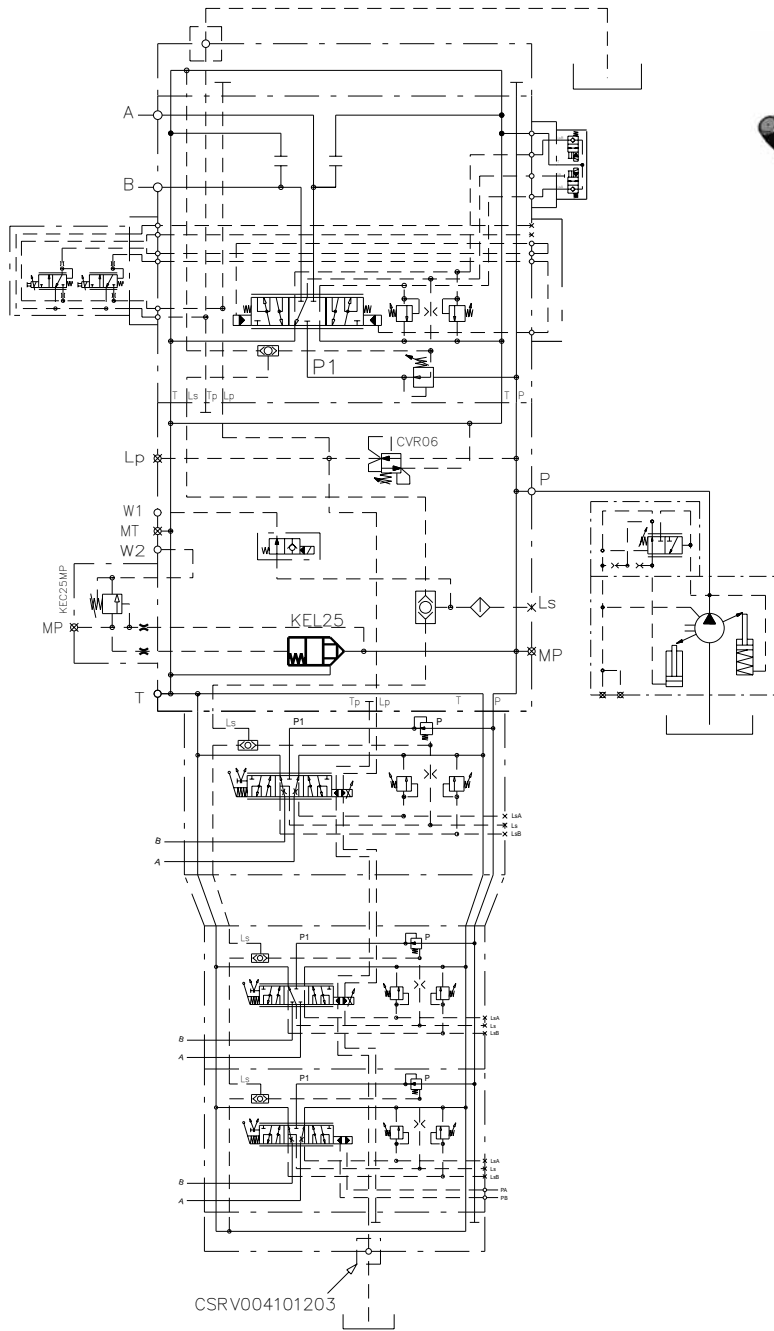


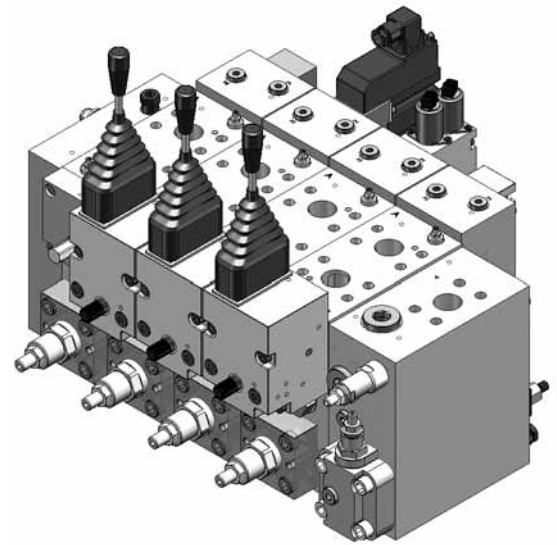
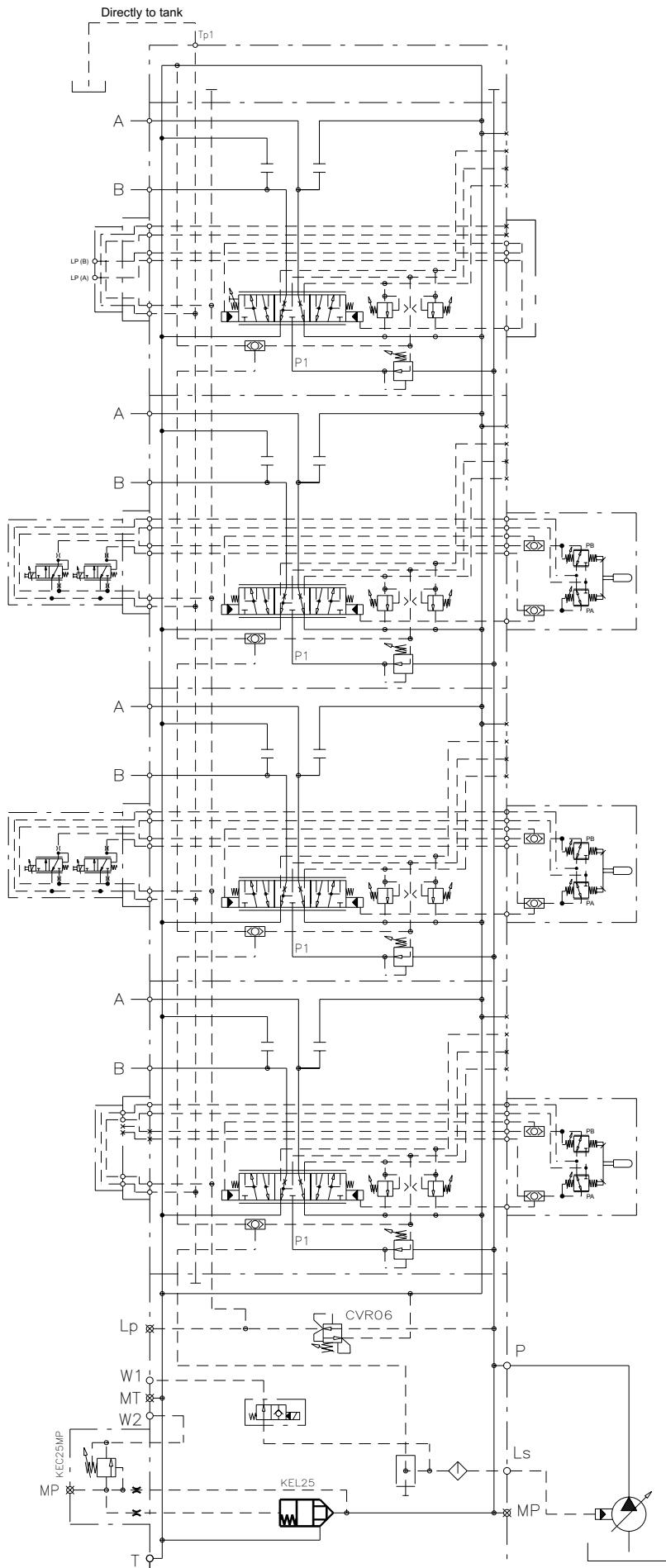
# HSRR stay bolts kit

## Stay bolts kit for HPV310 elements



Code	Elements	Description	Tightening torques
<b>HSRR003105551</b>	1	Stay bolts kit M14x1.5	140 ± 5 Nm
<b>HSRR003105552</b>	2		
<b>HSRR003105553</b>	3		
<b>HSRR003105554</b>	4		
<b>HSRR003105555</b>	5		
<b>HSRR003105556</b>	6		





# Note



Code DOC00061 - Rev.02



Brevini Fluid Power S.p.A.  
Via Moscova, 6  
42124 Reggio Emilia - Italy  
Tel. +39 0522 270711  
Fax +39 0522 270660  
[www.brevinifluidpower.com](http://www.brevinifluidpower.com)  
[info@brevinifluidpower.com](mailto:info@brevinifluidpower.com)

