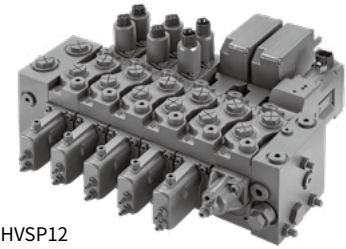
1.4.1

HVSP SERIES

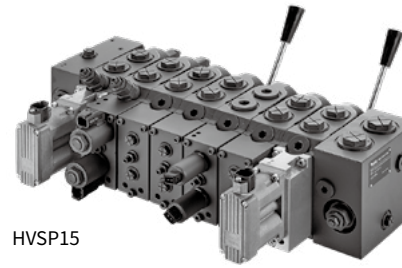
LOAD SENSING PROPORTIONAL CONTROL VALVE

HVSP:

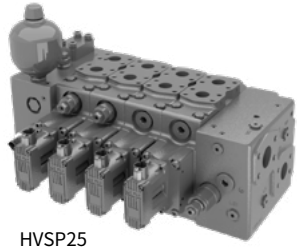
Nominal size:	12	15	25
Rated pressure(bar)pump side:	350	350	350
actuator side	420	420	350
Rated flow(L/min):	120	150	400



HVSP12



HVSP15



HVSP25

Contents

Features

1. System

Load pressure independent flow distribution

- Open center, for fixed displacement pump system
- Closed center, for load sensing variable pump system
- ·Priority function
- ·Various pilot control methods

2. Structure

- ·Sandwich plate of design
- ·Max. 12 middle section (HVSP12)
  Max. 9 middle section (HVSP15)
  Max. 8 middle section(HVSP25)

3. Pressure

- ·Primary and secondary pressure relief valve
- ·LS relief valve （With LS pressure relief valve in each section）

4. Flow

- ·Load pressure compensated
- ·Quick response
- ·Low hysteresis

5. Applications

Aerial work platform

Forestry machine

Drilling rigs

Mining truck

Concrete pump truck

Crane

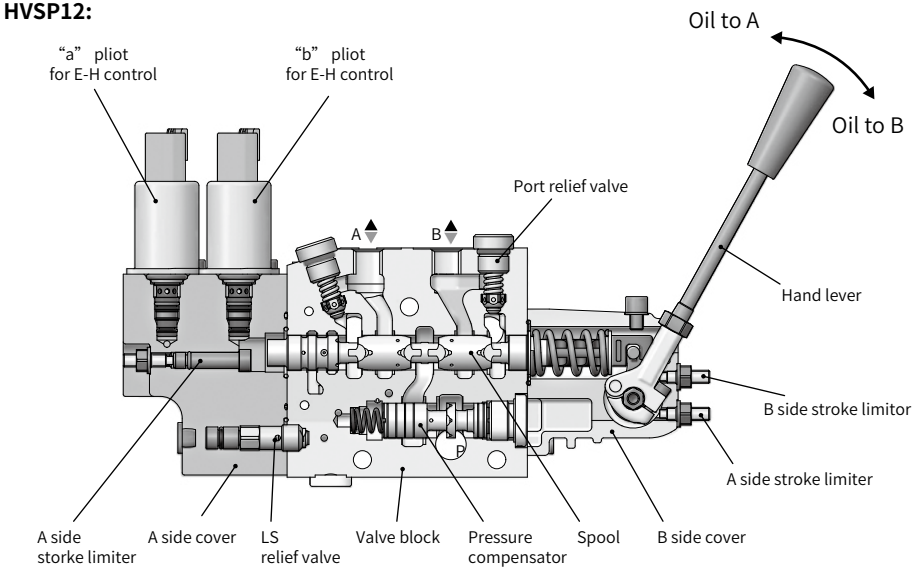
Telehandler

Stone Crusher

01

Section view

HVSP12:



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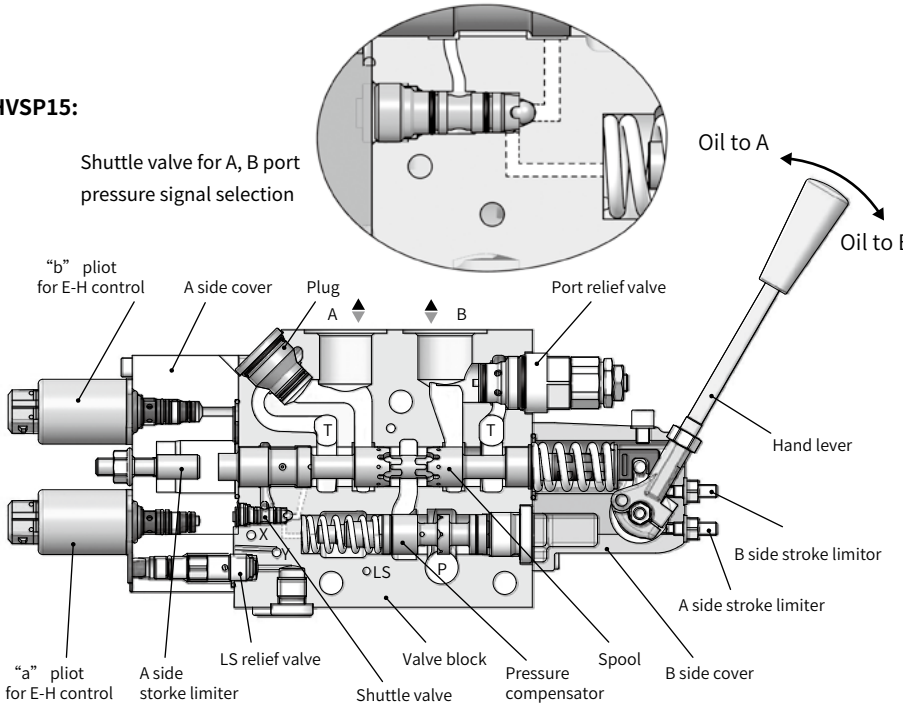
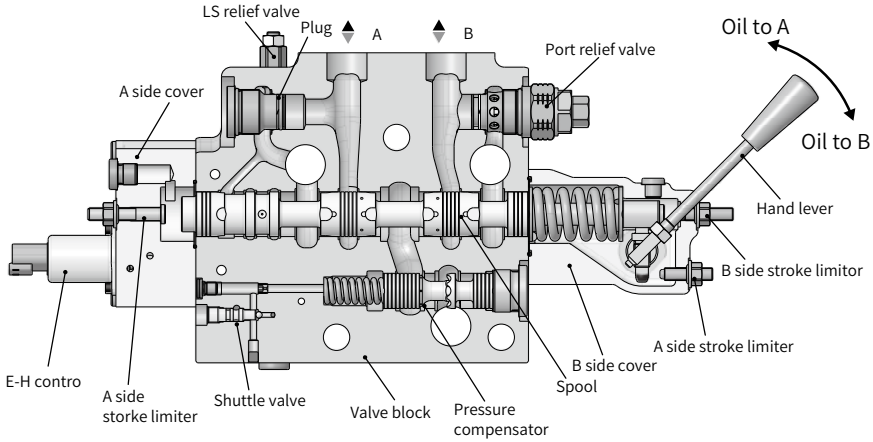


Section view

HVSP25:



Technical data

General

Nominal Size			12	15	25
Structure	Stackable, proportional, load sensing, pre-compensated				
Type of connection	ISO BSP thread, metric thread,ISO 6162 flange interface (Please contact our company for other connection methods)				
Mass (kg)	Inlet element	Open center	5.53/5.29	9.8	26.2
		Closed center	4.34	6.5	25.3
	Middle section	Hydraulic operation	4.25	5.4	21.3
		Normal E-H operation	4.65	6.5	22
		Super E-H operation	4.95	7.5	24.4
	End element		3.09	4.5	14.5

01

Hydraulic

Nominal Size		12	15	25
Rated flow Q(L/min)	With load-holding function, without pressure compensator.	140	200	500
	Without load-holding function, with pressure compensator.	120	190	400
	With load-holding function, with pressure compensator.	120	150	400
Max. operating pressure at port (bar)	P	350		
	LS	330		
	A/B	420		350
	T	30		
	Y	Less than 2		
Pilot pressure (bar)	a/b	Less than 35		
	X	30		
Pilot pressure control range	For Hydraulic control	7~22bar(102~319psi)	8.5 ~22.5 bar(123 ~ 330 psi)	
Required control Δp at the control block		Compensator-S; C; T: 15bar (218psi) Recommended variable pump set pressure difference: 18~20bar (261~290psi)	Compensator-S; C: 18bar (260psi) Compensator-T: 25bar (360psi)	Compensator-T: 25bar (360psi)
Recommended hydraulic pilot control units		See H-2TH6 characteristic curve 97		
LS pressure relief function (adjustment ranges)		50 ~ 149 bar (725 ~ 2160psi); 150 ~ 350bar (2175 ~ 4800psi))		

Electric

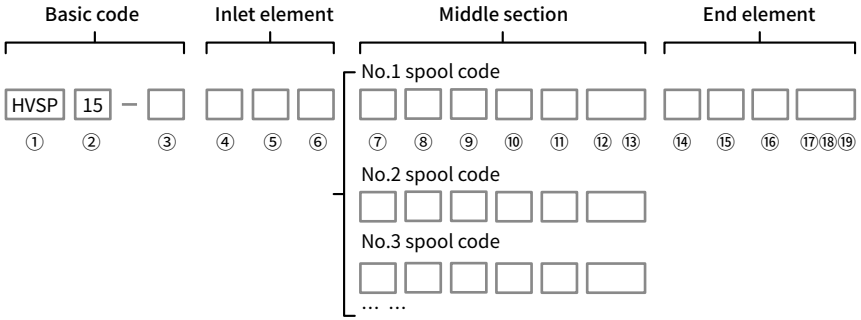
Normal E-H operation	· Electrical on/off valve: Installed on the 'A'side cover · Connection: Deutsch DT04-2P or AMP Junior-Timer · Protection class: IP67 · Supply voltage: 12 or 24VDC	· Electrical proportional valve: Installed on the 'A' side cover · Dither frequency required: 150Hz · Hysteresis: Less than 3%(at valid range) · Connection: Deutsch DT04-2P or AMP Junior-Timer · Protection class: IP67 · Reducing pressure range: 0~30 bar · Control current@24VDC: 0~750mA, @12VDC: 0~1500mA

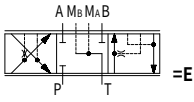
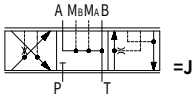
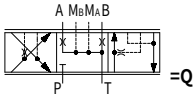
Using environment

Hydraulic fluid	Mineral oil (HL, HLP) according to DIN 51524. Other hydraulic fluids, such as HEES (Synthetic Ester) according to VDMA 24568.
Hydraulic fluid temperature range(°C)	-20 to + 80
Viscosity range v (mm^2/s)	10 to 380
Maximum permissible degree of contamination of the pressure fluid cleanliness class to ISO 4406 (C)	Class 20/18/15, we therefore recommend a filter with a minimum retention rate of β10 ⩾ 75

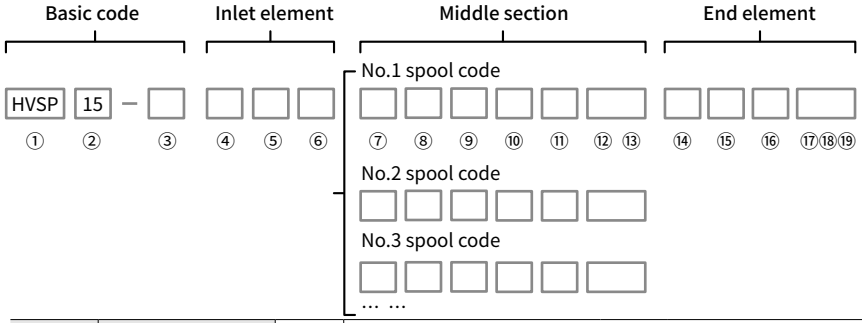
(For applications outside above mentioned parameters, please consult our sales dept.)

Ordering code



Basic code	① Structure	HVSP	Stackable, proportional control, load sensing, pressure compensated
	② Nominal size		12/15/25
	③ Number of blocks	..	01~09
Inlet element	④ Solenoid valve	Blank	Without solenoid valve
		G12	With 12V solenoid valve
		G24	With 24V solenoid valve
		G28	With 28V solenoid valve
	⑤ Circuit types	J	Closed center, for variable piston pump system
		p	Open center, for fixed displacement pump system
	⑥ Main relief valve	Q	Without main pressure relief valve(not for open center)
		…	With main pressure relief valve,(pressure in bar, 3-digits)
Middle section	⑦ Spool function	S	With load-holding function, with pressure compensator
		T	Without load-holding function, with pressure compensator
		C	With load-holding function, without pressure compensator
	⑧ LS relief valve	QMQ	With LS pressure relief plug, with LS measuring port
		...M...	With LS pressure relief valve, with LS measuring port (pressure in bar, 3-digits)
		...MQ	Only with A port LS pressure relief valve, with LS measuring port (pressure in bar, 3-digits)
		QM...	Only with B port LS pressure relief valve, with LS measuring port (pressure in bar, 3-digits)
		...R...	With remote LS pressure relief valve, decreasing characteristic curve, with LS measuring port (pressure in bar, 3-digits)
		...L...	With remote LS pressure relief valve, increasing characteristic curve, with LS measuring port (pressure in bar, 3-digits)
	⑨ Spool symbol	E	 =E
		J	 =J
		Q	 =Q
	⑩ A/B flow	...—...	Flow in l/min, 3-digits, e.g. 50-50

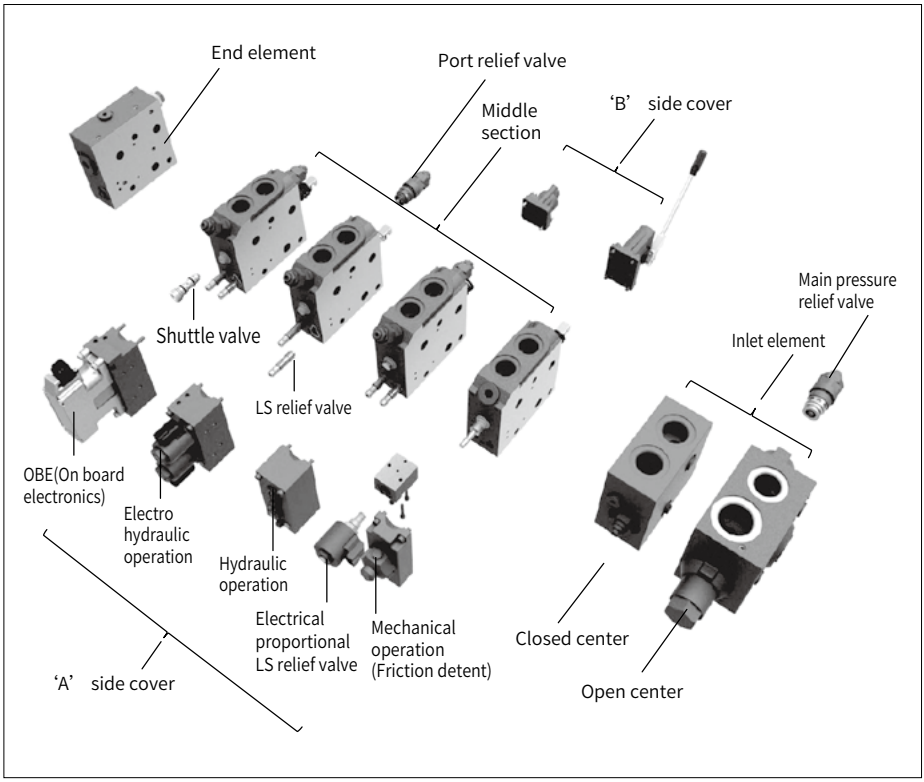
Ordering code



Middle section	⑪ 'A' side cover	M0	Mechanical, standard spring centered (M1: Mechanical, friction detent)		
		H	Hydraulic		
		W21	E-H operation, proportional control, 24V		
		W23	E-H operation, proportional control, 12V		
		W41	E-H operation, on/off control, 24V		
		W43	E-H operation, on/off control, 12V		
		OBE	Super high performance E-H control		
	⑫ 'B' side cover	Blank	Standard cover		
		1(K/L)	Hand lever		
			Hand lever position		
			K	L —**	
			Hand lever position 60°	Others（L—45°）	
		2	Without hand lever (can be added if any demand)		
	⑬ A/B port relief valve	QQ	Plug, without relief valve (port relief valve can be added)		
		GG	Check valve, for anti-cavitation function		
		H...H...	H320H320, pressure in bar, pressure details of port relief valve in 3 digits		
End element	⑭ LS unload	LZ	Without LS unload function		
		LA	With LS unload function		
	⑮ Additional P port	Blank	Without additional P port		
		PT	With additional P port		
	⑯ Pilot pressure control	X	Internal pilot pressure supply		
		Y	External pilot pressure supply		
Others	⑰ Sealing type	V	FKM		
		N	NBR		
	⑱ Design code	001			
	⑲ Special application	Blank	Without special requirement	-450	Without aluminum material
*	Other request	Further requirement in the clear text			

Ordering code

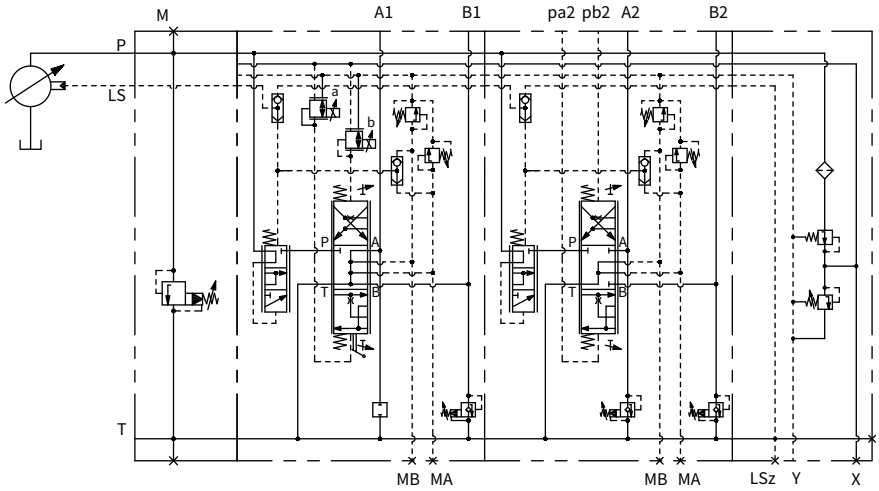
Basic code	HVSP12,HVSP15,HVSP25		
1- Inlet element	P		Open center, for fixed displacement pump system
	J		Closed center, for variable displacement pump system
2- Middle section	'A' side cover	M0	Mechanical, standard spring centered
		M1	Mechanical, friction detent
		H	Hydraulic
		W21	E-H operation, proportional control, 24V
	'B'side cover	1K	Hand lever
		Blank	Standard cover
3- End element	LS unload	LZ	Without LS unload function
		LA	With LS unload function
	Pilot pressure control	X	Internal pilot pressure supply
		Y	External pilot pressure supply



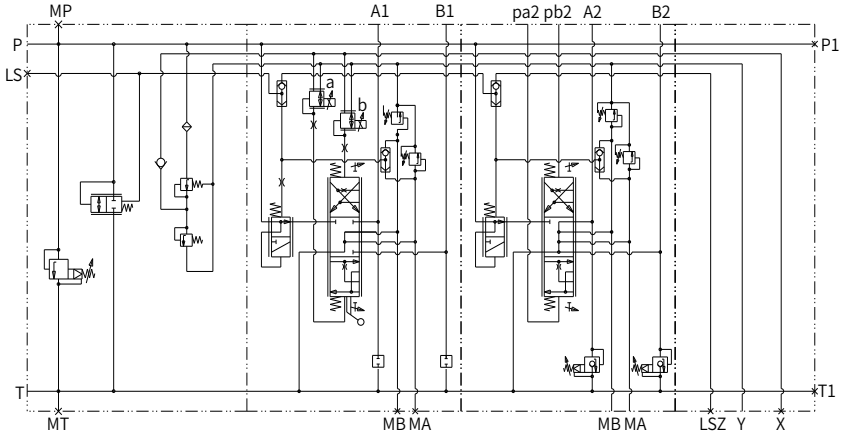
Exploded view (example: HVSP15)

Hydraulic diagram

·HVSP12/15

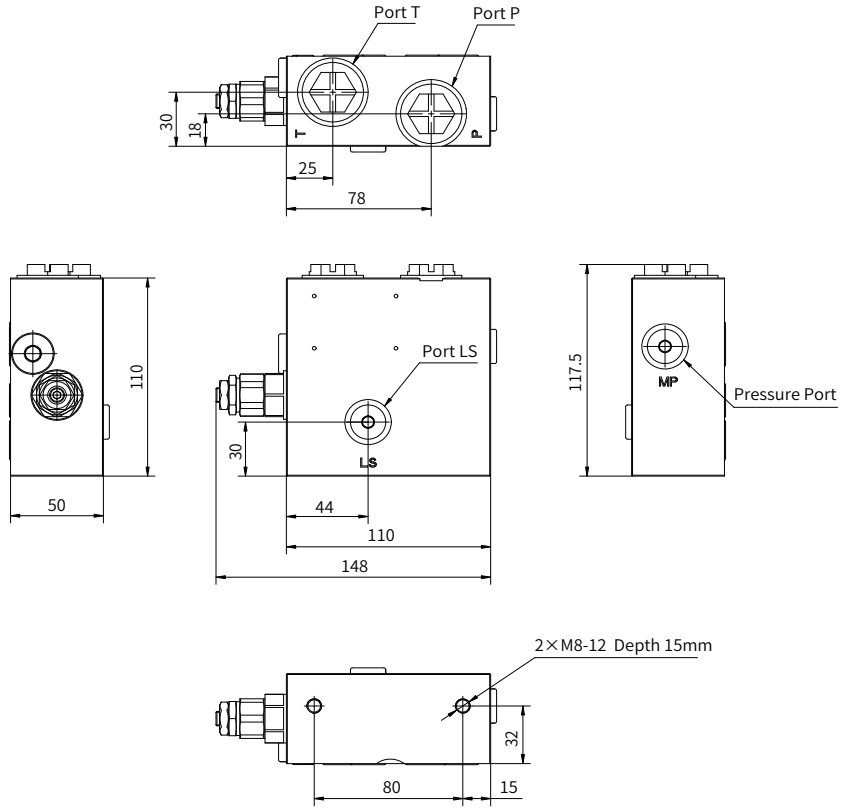


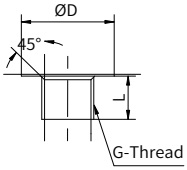
·HVSP25



Inlet section — closed center

·HVSP12





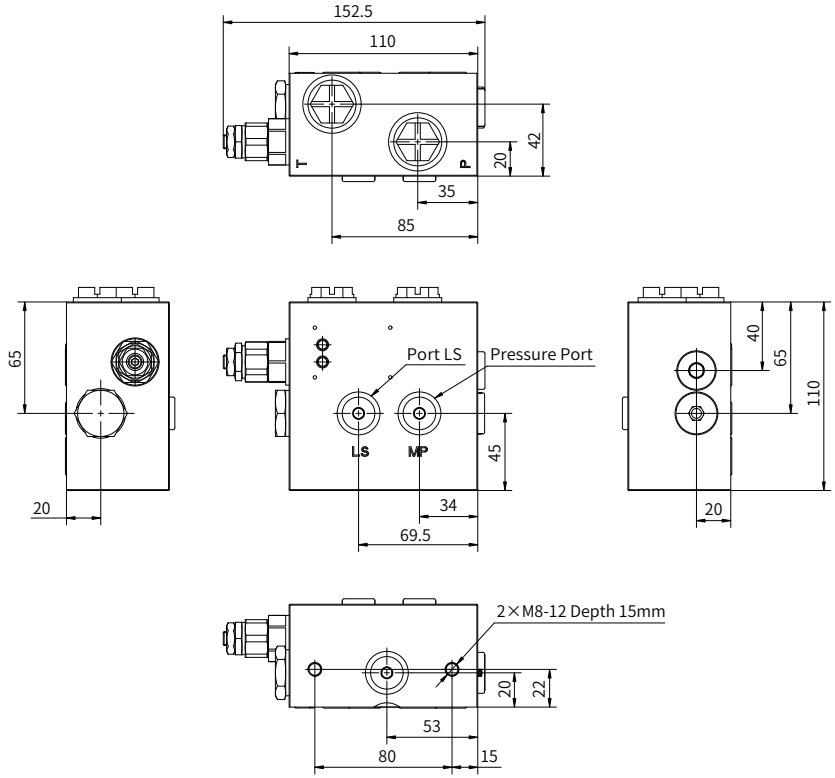
Port dimension	
P port:	G3/4
T port:	G3/4
LS port:	G1/4
Measuring port:	G1/4

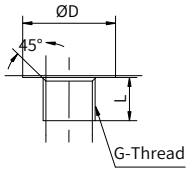
Thread dimensions		
G3/4:	ΦD 38	L 16
G1/4:	ΦD 24	L 12

01

Inlet section — open center

·HVSP12

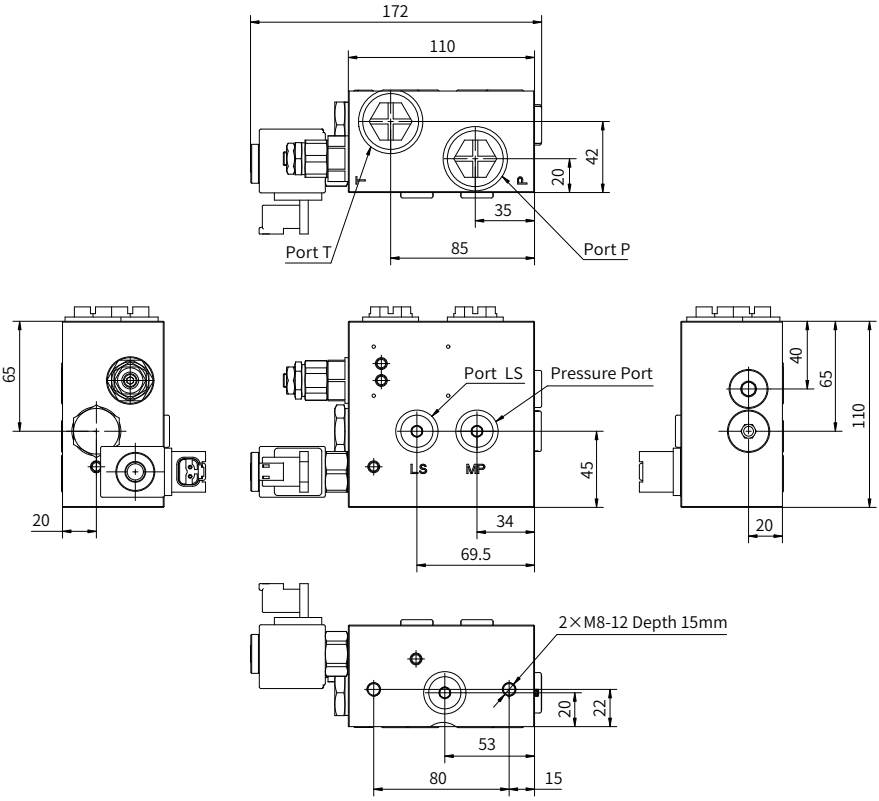


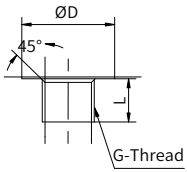


Port dimension		Thread dimensions		
P port:	G1/2	G1/2:	ΦD 30	L 15
T port:	G1/2	G1/4:	ΦD 24	L 12
LS port:	G1/4			
：	G1/4			

Inlet section — open center (With LS solenoid unloading valve)

·HVSP12

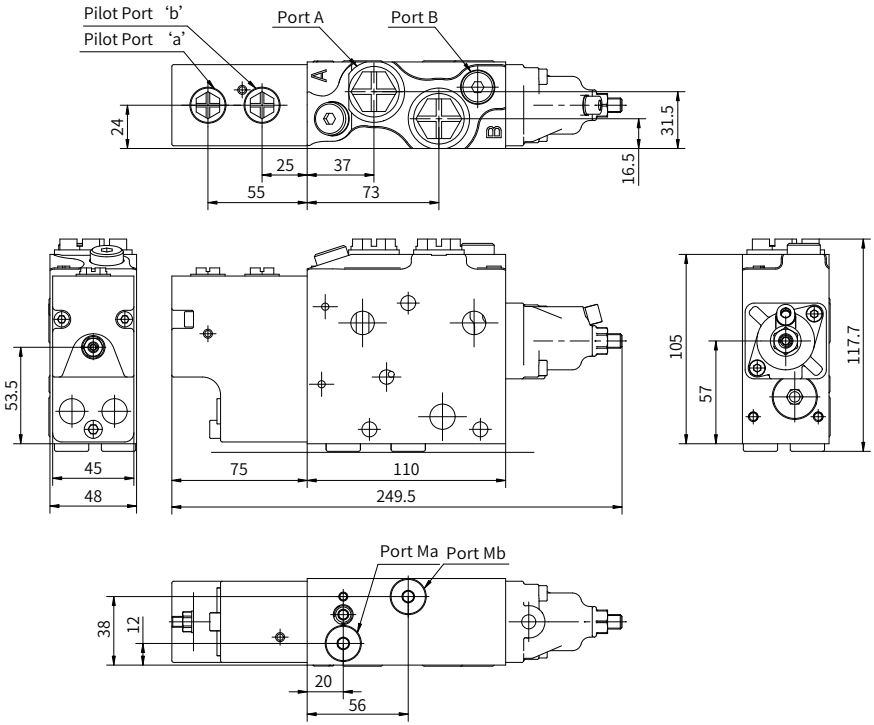


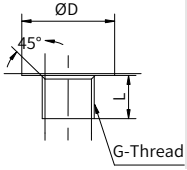


Port dimension		Thread dimensions		
P port:	G3/4	G3/4:	ΦD 38	L 16
T port:	G3/4	G1/4:	ΦD 24	L 12
LS port:	G1/4			
Measuring port:	G1/4			

Middle section—hydraulic

·HVSP12

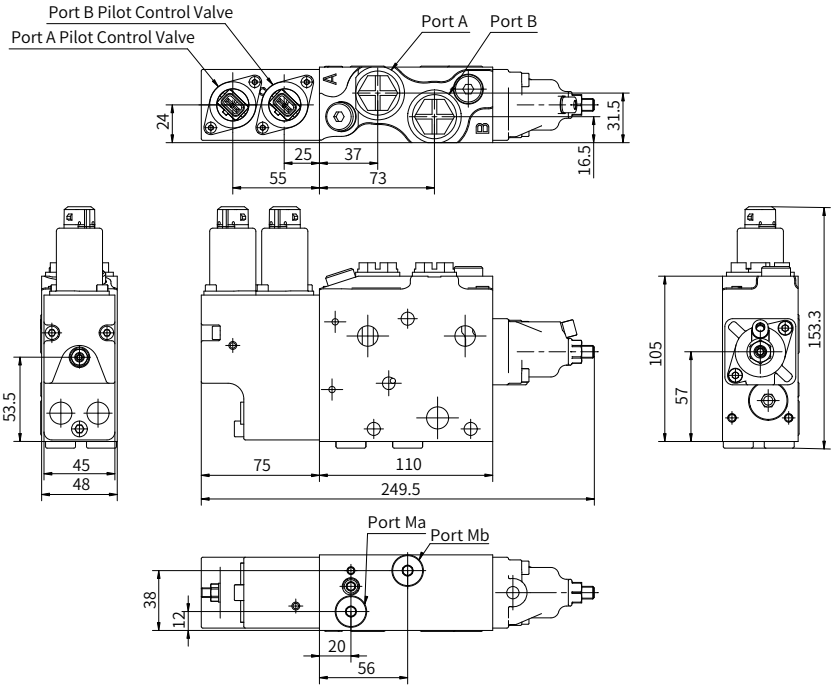


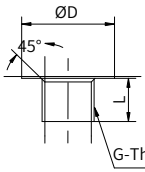


Port dimension		Thread dimensions		
A/B port:	G1/2 or G3/8	G1/4:	ΦD 24	L 12
MA/MB/ Pilot port:	G1/4	G3/8:	ΦD 28	L 12.5
		G1/2:	ΦD 30	L 15

Middle section—electro-hydraulic

·HVSP12





Port dimension

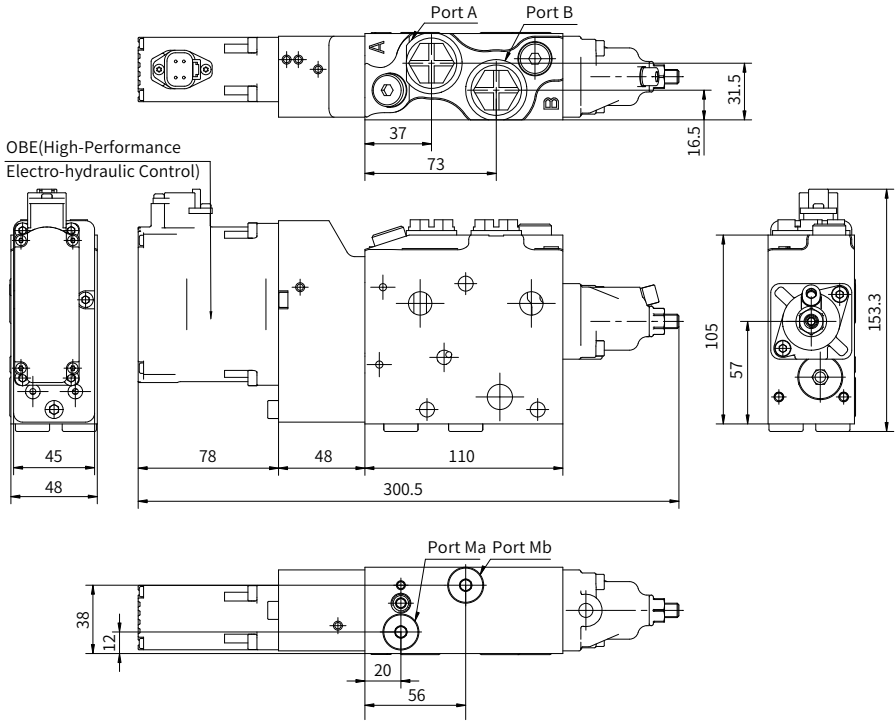
A/B port:	G1/2 or G3/8
MA/MB port:	G1/4

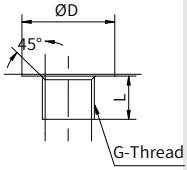
Thread dimensions

G1/4：	ΦD 24	L 12
G3/8：	ΦD 28	L 12.5
G1/2：	ΦD 30	L 15

Middle section—OBE (Super high performance E-H control)

·HVSP12





Port dimension

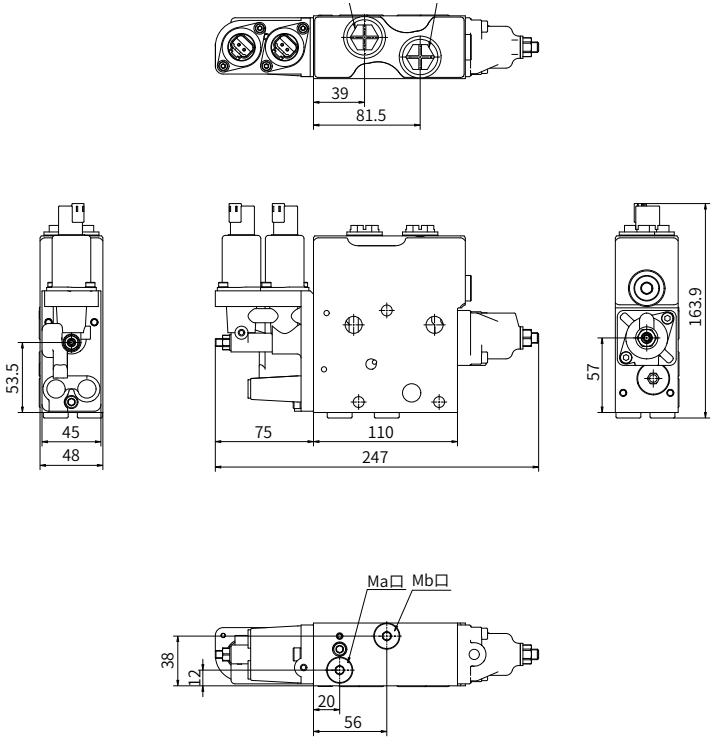
A/B port:	G1/2 or G3/8
MA/MB port:	G1/4

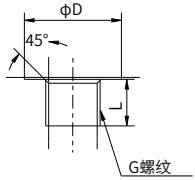
Thread dimensions

G1/4 :	ΦD 24	L 12
G3/8:	ΦD 28	L 12.5
G1/2:	ΦD 30	L 15

Middle section——Integrated with hydraulic lock

·HVSP12





Port dimension

A/B port: G1/2 或 G3/8

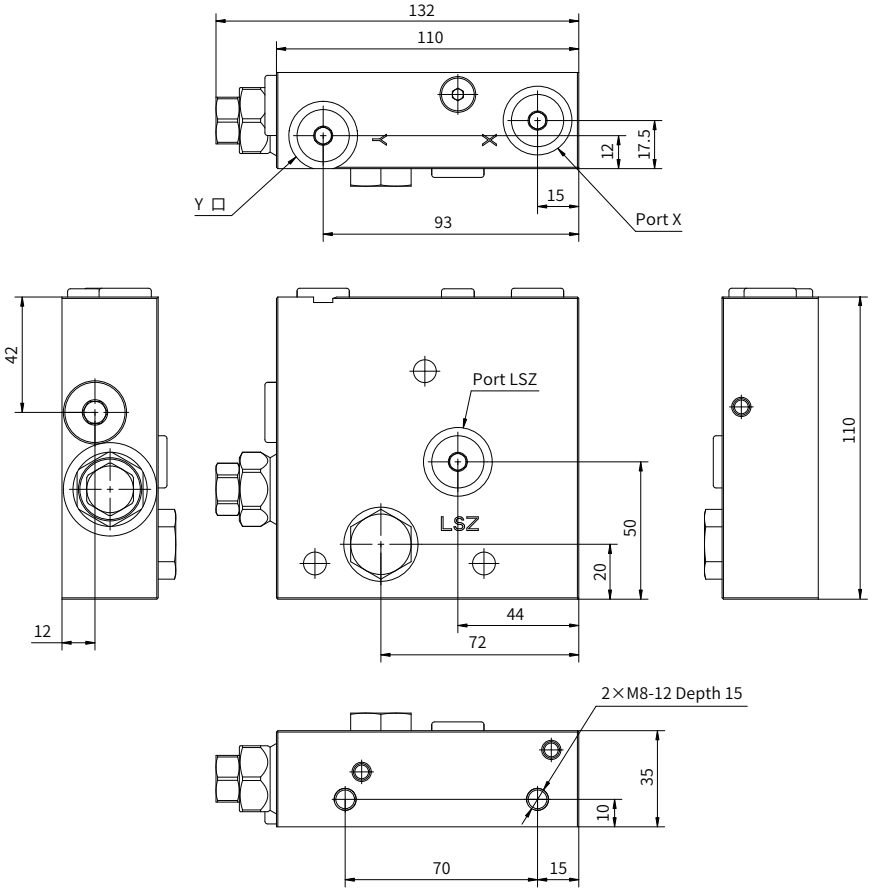
MA/MB port: G1/4

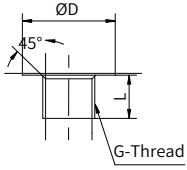
Thread dimensions

G1/4：	ΦD 24	L 12
G3/8：	ΦD 28	L 12.5
G1/2：	ΦD 30	L 15

Endlet section assembly (without additional P port)

·HVSP12

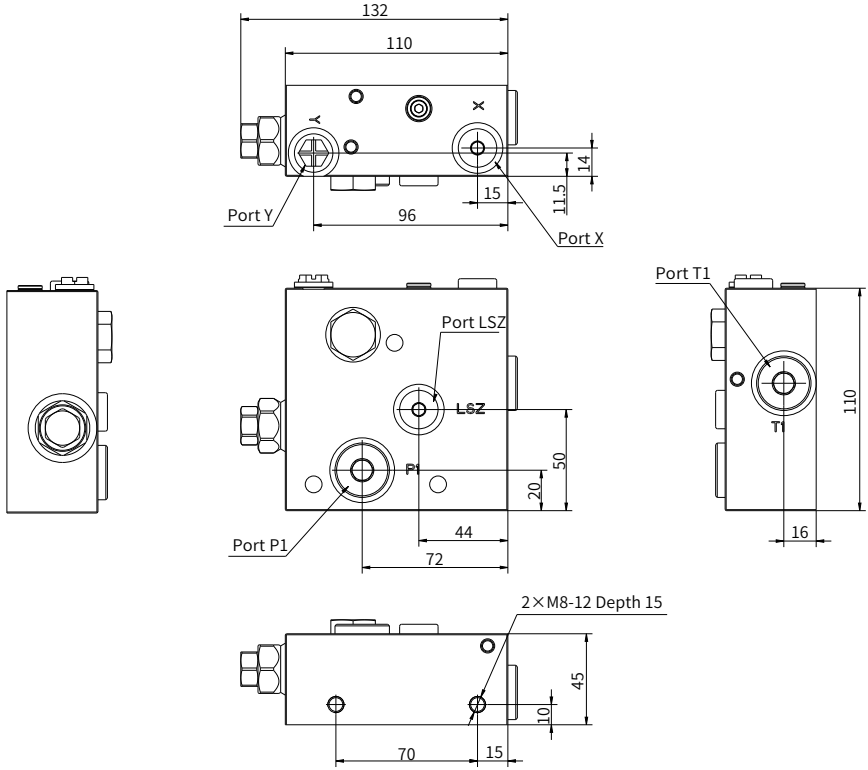


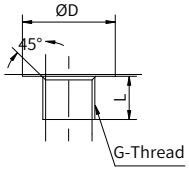


Port dimension		Thread dimensions		
Y port:	G1/4	G1/4:	ΦD 24	L 12
X port:	G1/4			
LSZ port:	G1/4			

Endlet section assembly (with additional P port)

·HVSP12





Port dimension		Thread dimensions		
Y port:	G1/4	G1/4:	ΦD 24	L 12
X port:	G1/4	G1/2:	ΦD 30	L 15
LSZ port:	G1/4			
P1 port:	G1/2			
T1 □:	G1/2			

Preferred spool flow

·HVSP12

·Symmetry spool

Pressure compensator	Flow(L/min)						
S	100-100	76-76	54-54	33-33	22-22	14-14	07-07
	90-90	68-68	47-47	29-29	19-19	12-12	06-06
	80-80	60-60	40-40	25-25	15-15	10-10	05-05
C	120-120	90-90	60-60	40-40	25-25	15-15	10-10
T	100-100	76-76	54-54	33-33	22-22	14-14	07-07

· Asymmetry spool

Please consult the company's technology sales.

Example:

* Pressure compensator: S

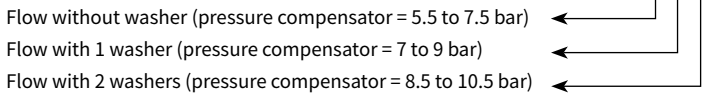
* Command flow value: Qac= 72 L/min

Solution:

→ 60 L/min spool + 2 washers = 76 L/min

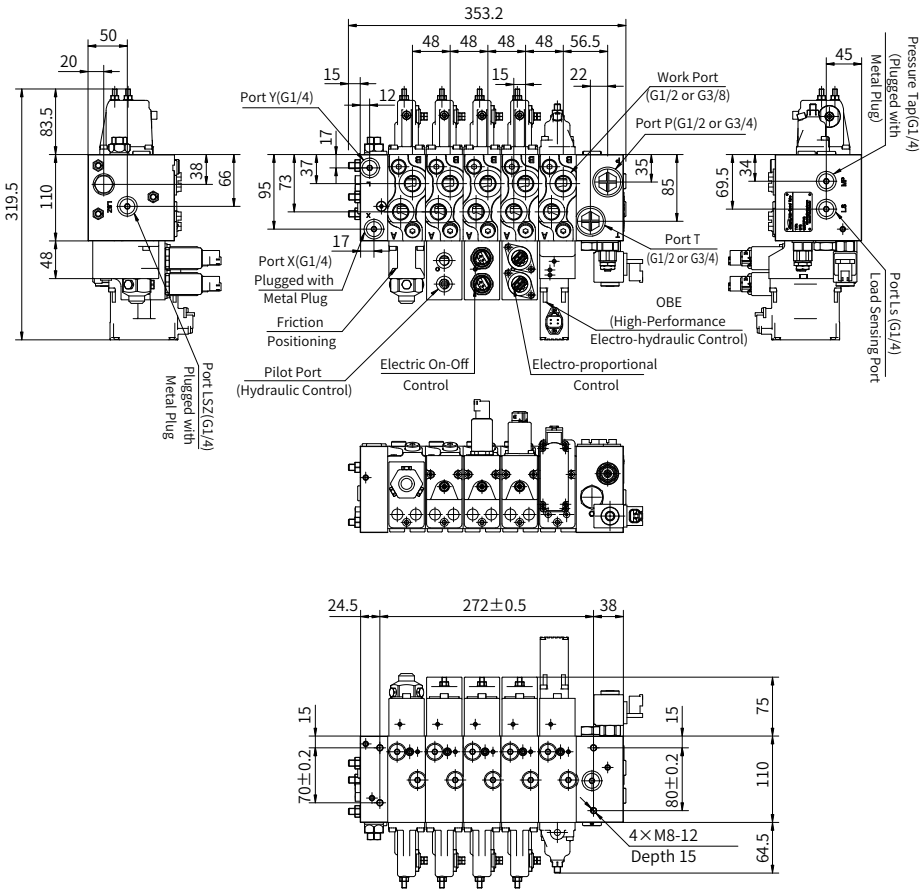
→ Set 72 L/min via stroke limitation

Pressure compensator	Flow (L/min)
S	76-76
	68-68
	60-60



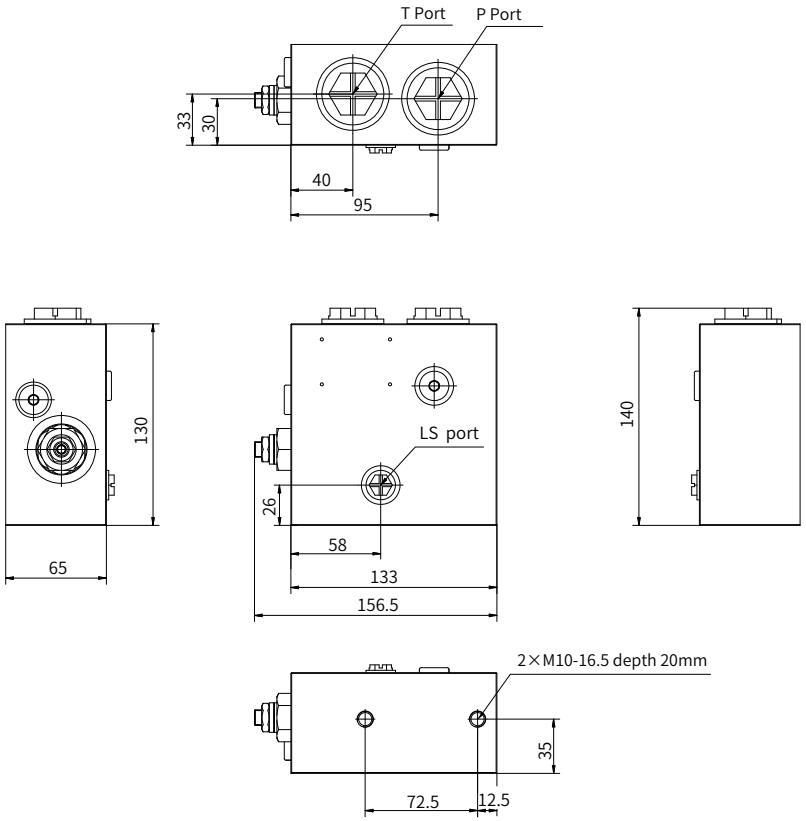
Unit dimensions

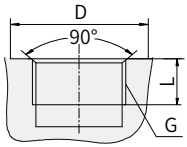
·HVSP12



Inlet section — closed center

·HVSP15

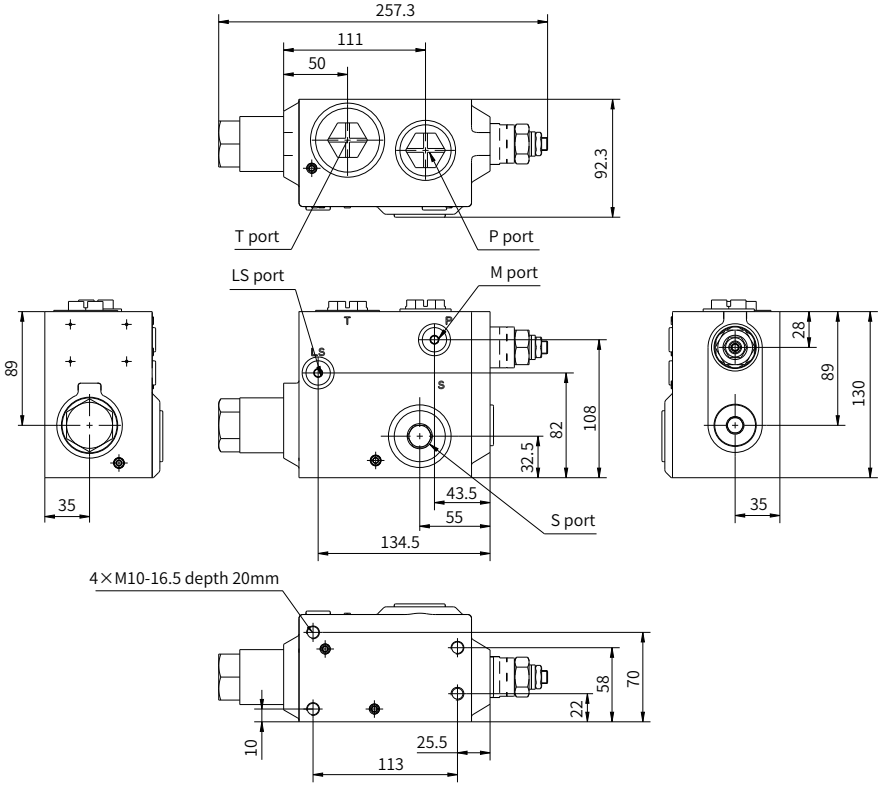


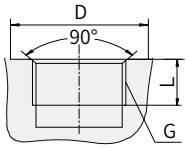


Port dimension		Thread dimensions		
P port:	G1	G1:	ΦD 47	L 19
T port:	G1	G1/4:	ΦD 24	L 12
LS port:	G1/4			

Inlet section — open center

·HVSP15

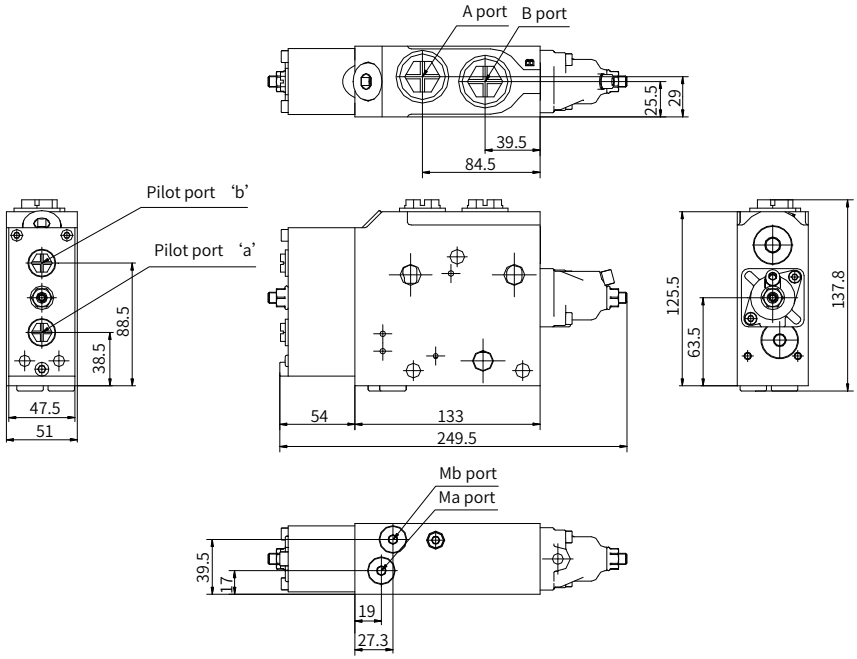


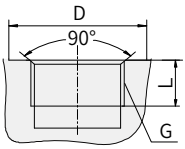


Port dimension		Thread dimensions		
P port:	G1	G1 1/4 :	ΦD 58	L 21.5
T port:	G1 1/4	G1:	ΦD 47	L 19
LS port:	G1/4	G1/4:	ΦD 24	L 12
S port:	G1			

Middle section—hydraulic

·HVSP15

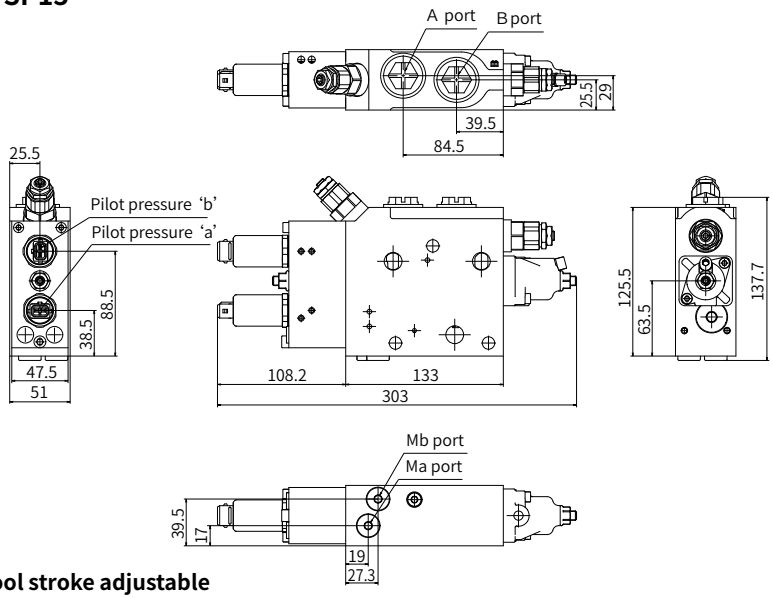




Port dimension	Thread dimensions		
A/B port: G3/4	G3/4:	ΦD 38	L 16
Pilot port/Ma/Mb port: G1/4	G1/4:	ΦD 24	L 12

Middle section—electro-hydraulic

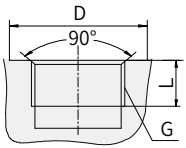
·HVSP15



·Spool stroke adjustable

☐ E-H proportional control
W21 24V; W23 12V

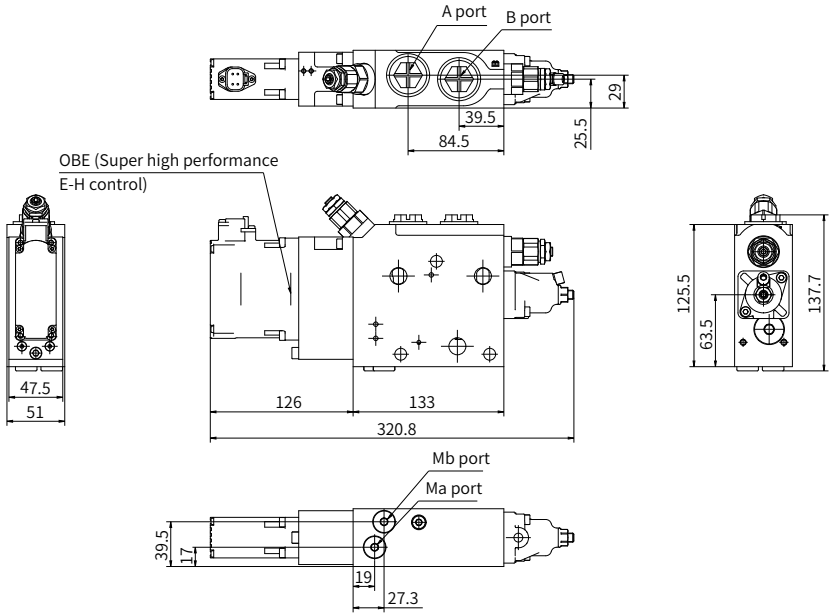
☐ E-H on/off control
W41 24V; W43 12V

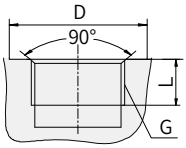


Port dimension	Thread dimensions		
A/B port: G3/4	G3/4:	ΦD 38	L 16
Ma/Mb port: G1/4	G1/4:	ΦD 24	L 12

Middle section—OBE (Super high performance E-H control)

·HVSP15

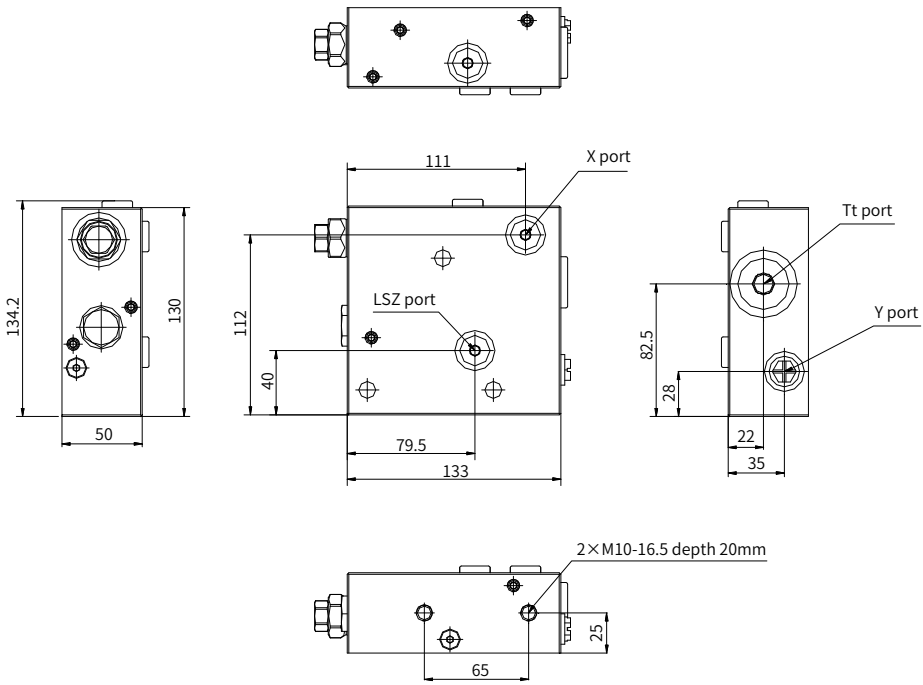


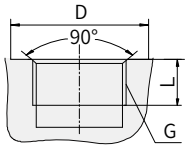


Port dimension	Thread dimensions		
A/B port: G3/4	G3/4:	ΦD 38	L 16
Ma/Mb port: G1/4	G1/4:	ΦD 24	L 12

Endlet section assembly (without additional P port)

·HVSP15

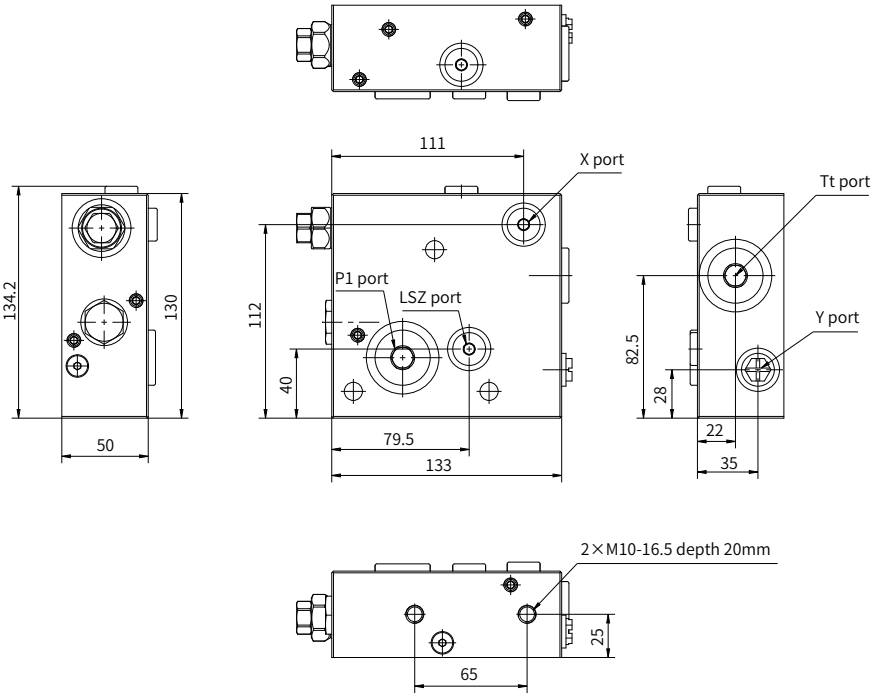


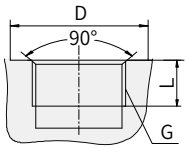


Port dimension		Thread dimensions		
Tt port:	G3/4	G3/4:	ΦD 38	L 16
Y port:	G1/4	G1/4:	ΦD 24	L 12
X port:	G1/4			
LSZ port:	G1/4			

Endlet section assembly (with additional P port)

· HVSP15





Port dimension		Thread dimensions		
P1 port:	G3/4	G3/4:	ΦD 38	L 16
Tt Port:	G3/4	G1/4:	ΦD 24	L 12
Y Port:	G1/4			
X Port:	G1/4			
LSZ Port:	G1/4			

Preferred spool flow

·HVSP15

·Symmetry spool

Pressure compensator	Flow(L/min)						
S	150-150	120-120	080-080	050-050	032-032	023-023	
	140-140	130-130	100-100	070-070	045-045	028-028	020-020
	120-120	110-110	085-085	060-060	040-040	025-025	017-017
C	200-200	175-175	145-145	110-110	080-080	045-045	028-028
T	190-190	160-160	100-100	065-065	040-040		

01

· Asymmetry spool

Pressure compensator	Flow(L/min)				
S	150-120	120-180	080-050	050-032	023-014
	130-110	100-070	070-045	045-028	020-012
	110-085	085-060	060-040	040-025	017-010
C	175-145	145-110	110-080	080-045	
T	190-160	160-100	100-065	065-040	028-017

Example:

* Pressure compensator: S
* Command flow value: Qac= 145 L/min

Solution:

→ 110 L/min spool + 2 washers = 150 L/min

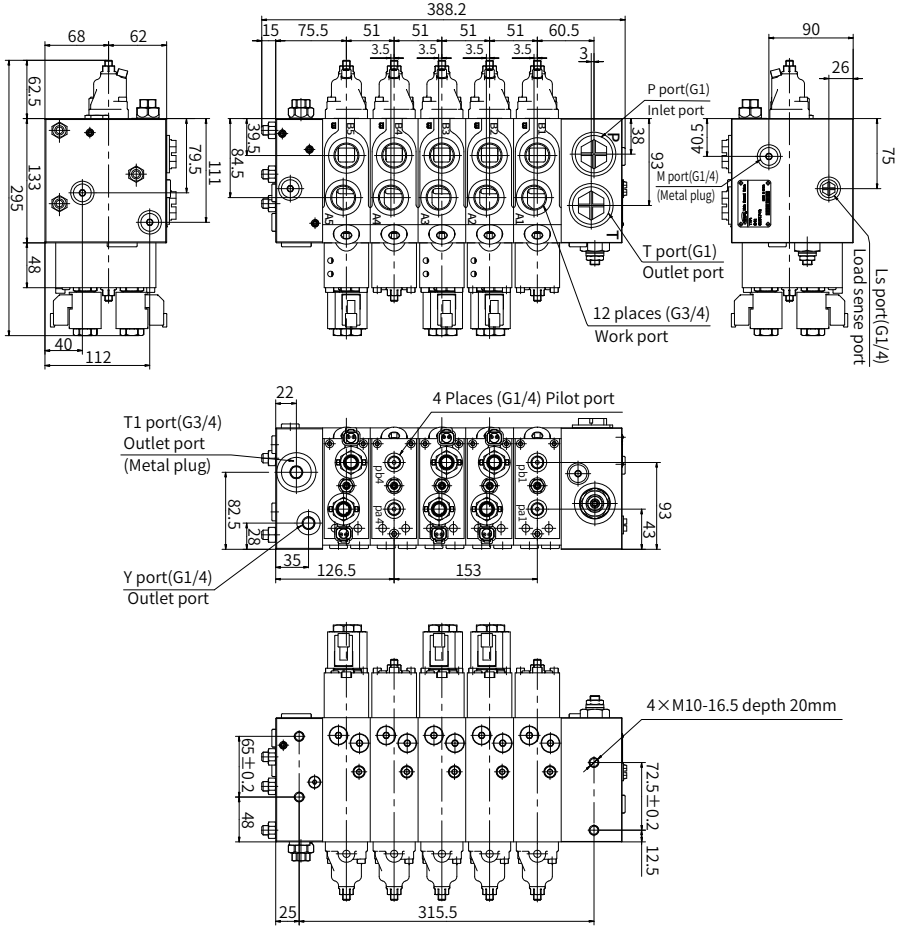
→ Set 145 L/min via stroke limitation

Pressure compensator	Flow in L/min
S	150-150
	130-130
	110-110

Flow without washer (pressure compensator = 6 to 9 bar)
Flow with 1 washer (pressure compensator = 7.5 to 10 bar)
Flow with 2 washers (pressure compensator = 9 to 12 bar)

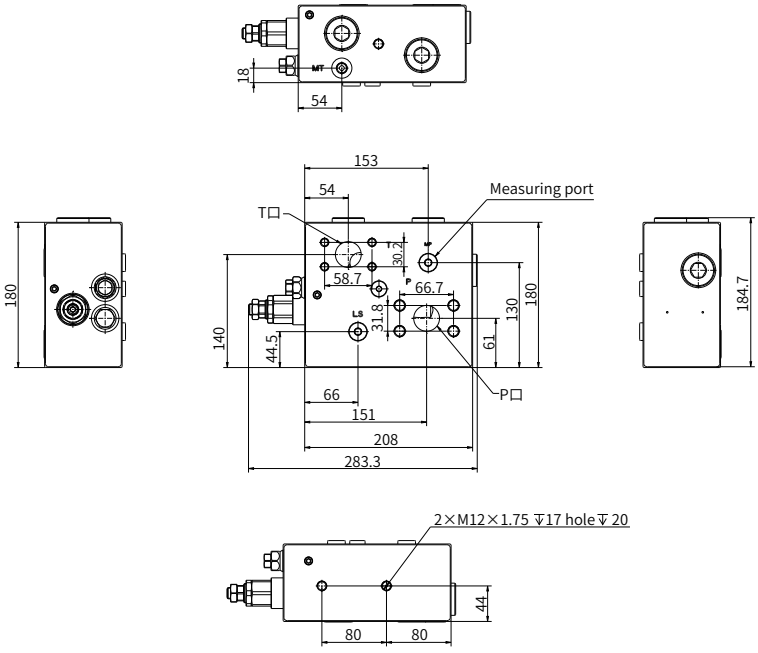
Unit dimensions

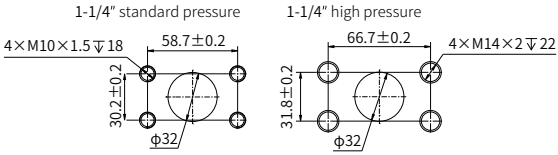
·HVSP15

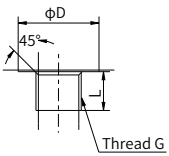


Inlet section — closed center

·HVSP25







Port dimension		Thread dimensions			
P port:	1 1/4	G3/8：	ΦD 30	L 15	
T port:	1 1/4				
LS port:	G3/8				
MB port:	G3/8				

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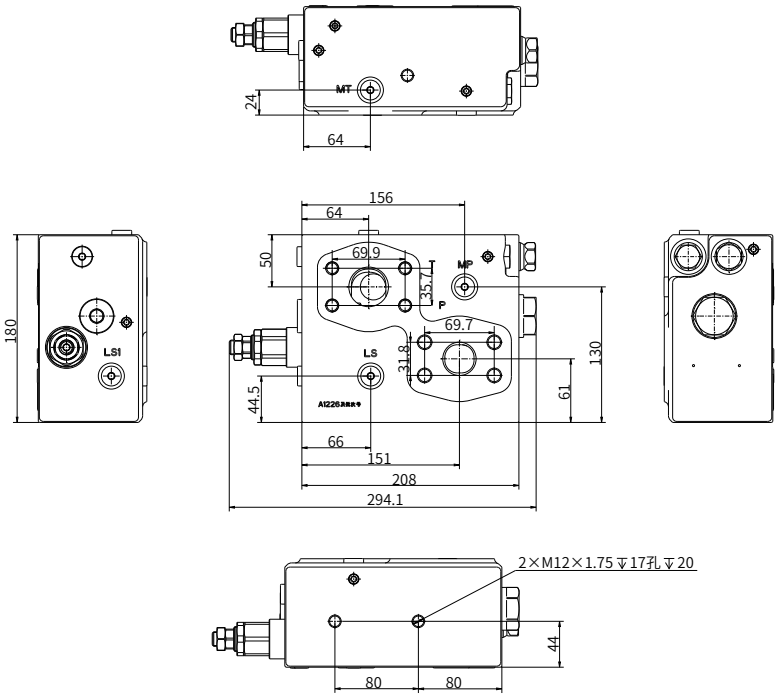
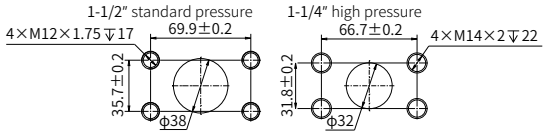
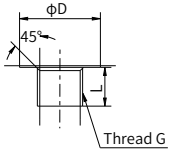
Inlet section — open center

·HVSP25



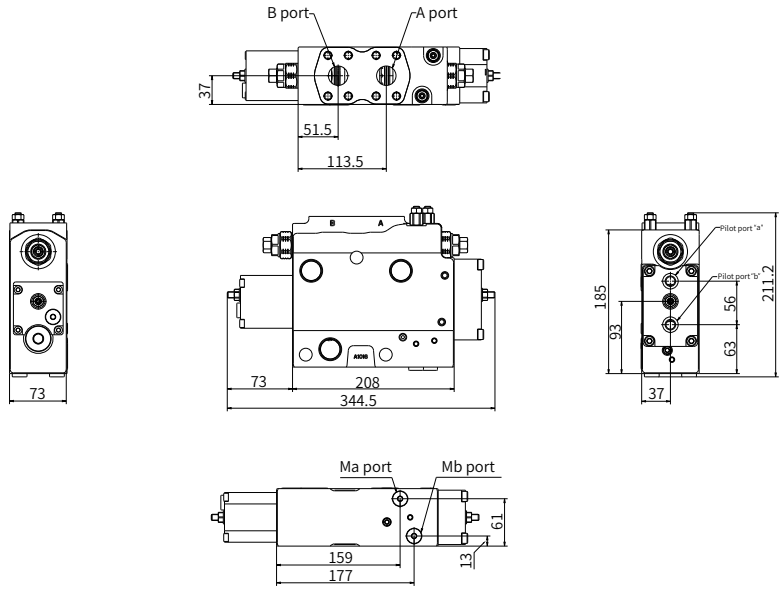


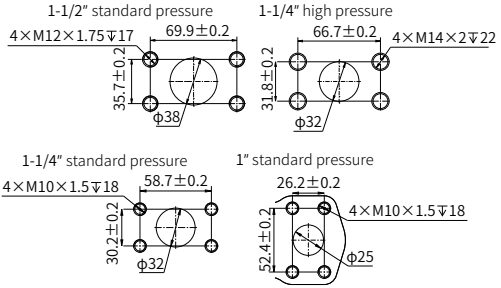


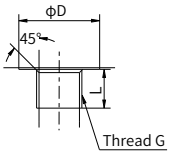
Port dimension		Thread dimensions		
P port:	1 1/4	G3/8 :	ΦD 30	L 15
T port:	1 1/2	G1/4 :	ΦD 24	L 12
LS port:	G3/8			
MP port:	G3/8			
MT port:	G1/4			

Middle section—hydraulic

·HVSP25







Port dimension

A/B port： 1 1/4

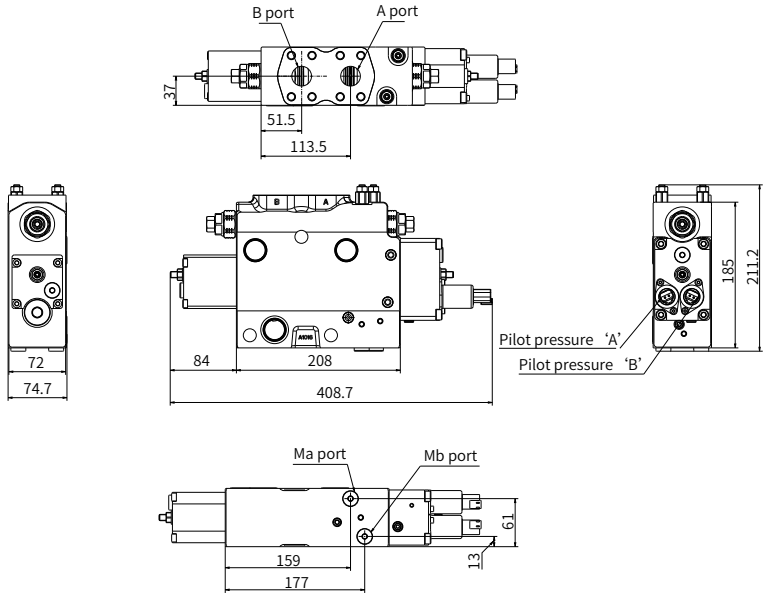
MA/MB/Pilot port：G1/4

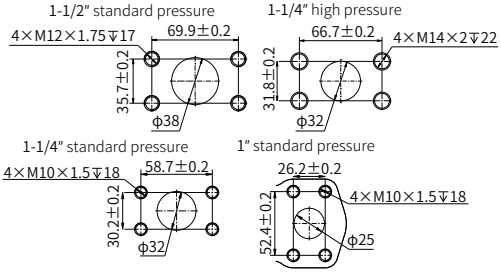
Thread dimensions

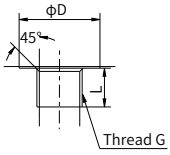
G1/4： ΦD 25 L 12

Middle section—electro-hydraulic

·HVSP25







Port dimension

A/B port： 1 ″

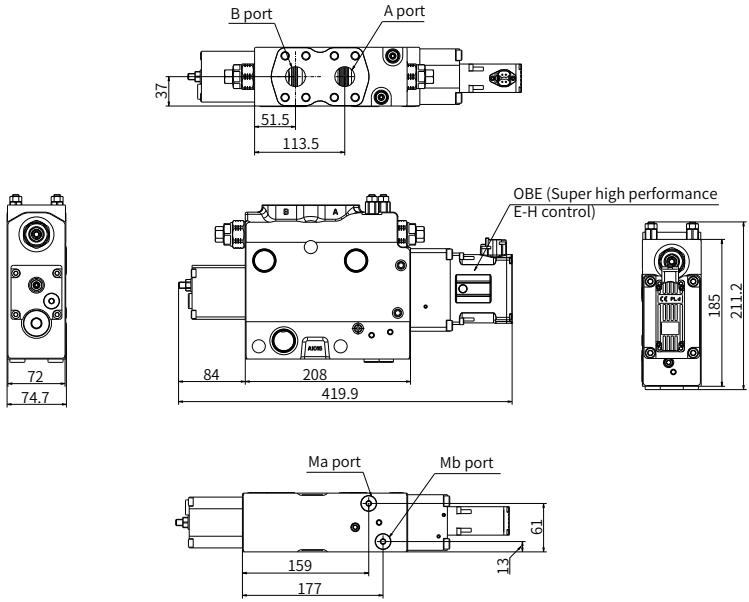
MA/MB/Pilot port：G1/4

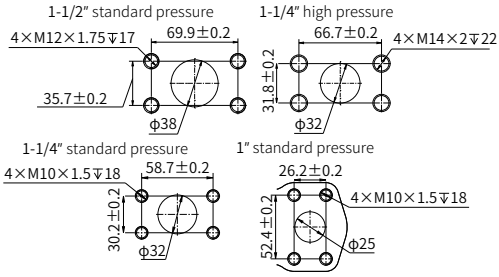
Thread dimensions

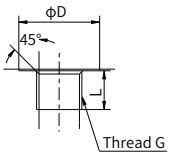
G1/4： ΦD 25 L 12

Middle section—OBE （Super high performance E-H control）

·HVSP25







Port dimension

A/B port： 1 ″

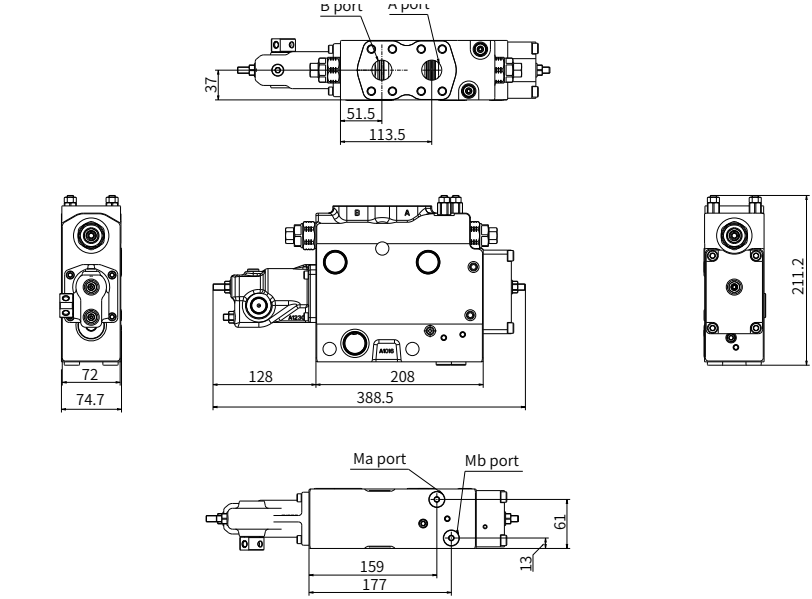
MA/MB/Pilot port：G1/4

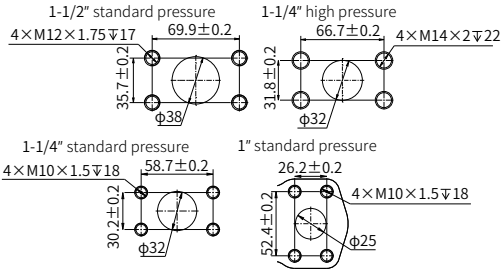
Thread dimensions

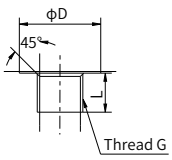
G1/4： ΦD 25 L 12

Middle section—manual control

·HVSP25







Port dimension

A/B port： 1 ″

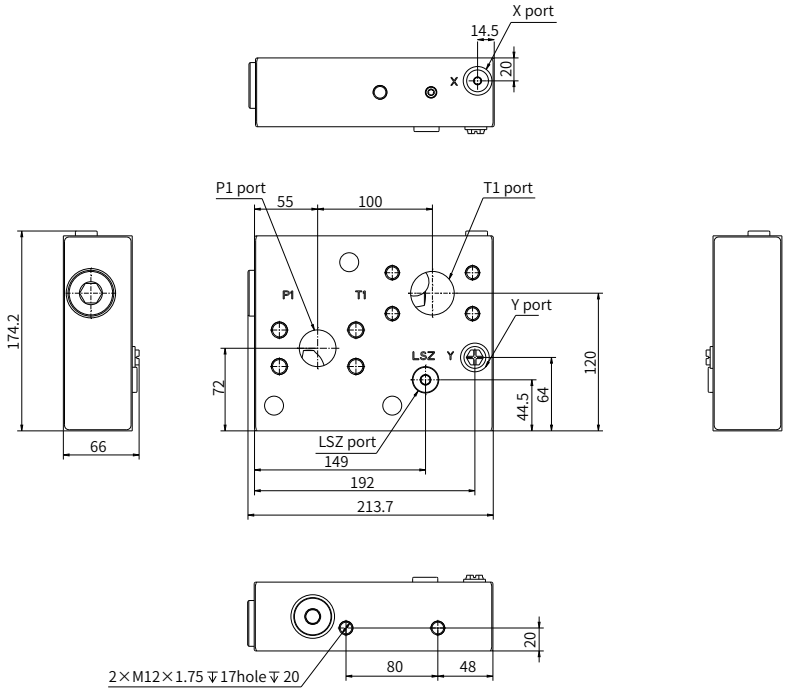
MA/MB/Pilot port：G1/4

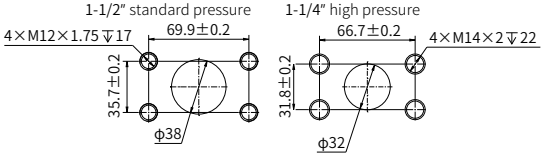
Thread dimensions

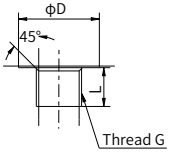
G1/4： ΦD 25 L 12

Endlet section assembly (with additional P port)

·HVSP25



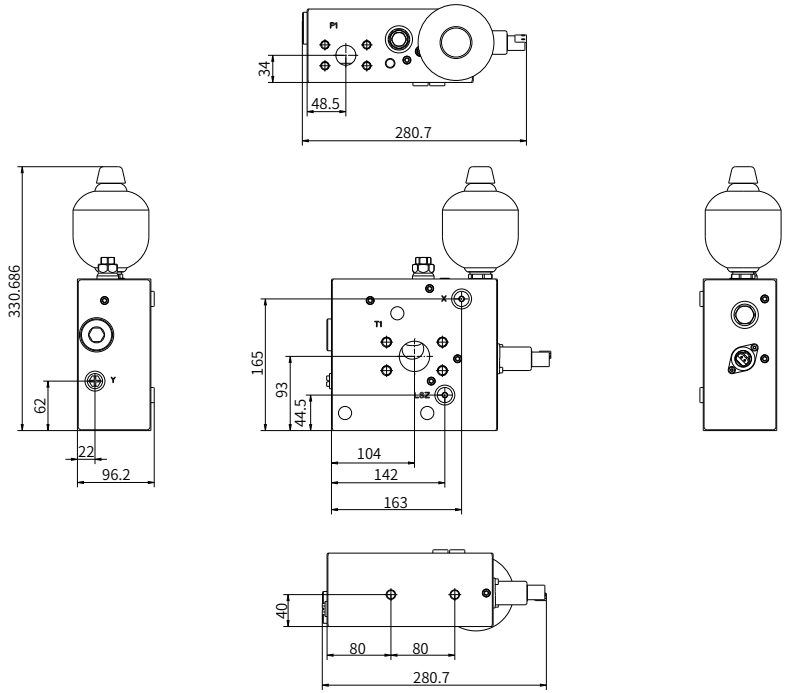


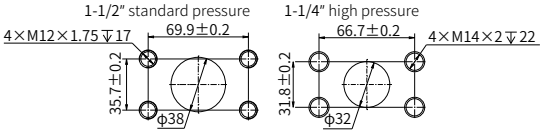


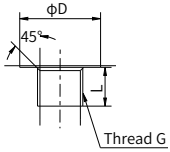
Port dimension		Thread dimensions		
P 1 port:	1 1/4	G3/8 :	ΦD 23	L 12.5
T1 port:	1 1/2	G1/4 :	ΦD 25	L 12
X/Y port:	G1/4			
LSZ port:	G3/8			

Endlet section assembly (with additional P port)

·HVSP25







Port dimension		Thread dimensions		
P 1 port:	1 1/4	G3/8:	ΦD 23	L 12.5
T1 port:	1 1/2	G1/4:	ΦD 25	L 12
X/Y port:	G1/4			
LSZ port:	G3/8			

Preferred spool flow

·HVSP25

·Symmetry spool

Pressure compensator	Flow(L/min)					
T	500	400	300	200	100	50

· Asymmetry spool

Pressure compensator	Flow(L/min)				
T	500-400	400-300	300-200	200-100	100-50

（*For other parameter requirements,please consult our company）

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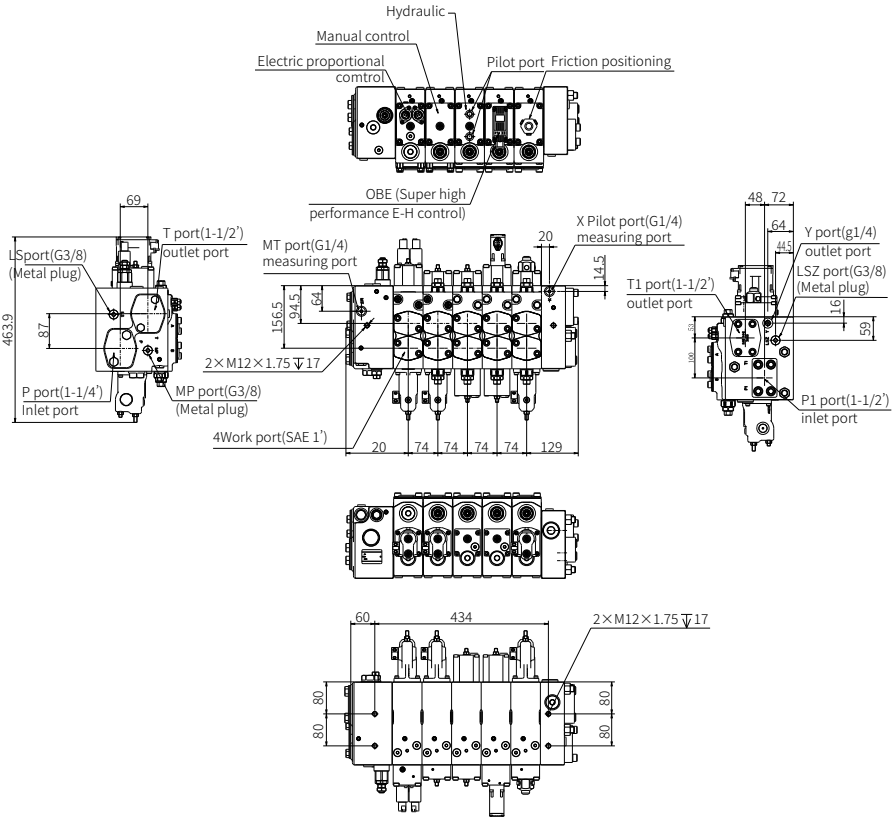
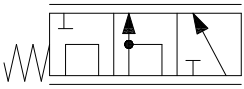
Unit dimensions

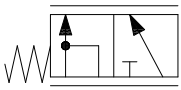
·HVSP25



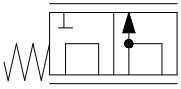
Pressure compensator type



Code 'S'
With pressure compensator
With load holding function

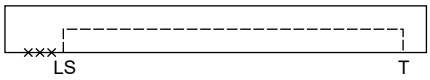


Code 'T'
With pressure compensator
Without load holding function

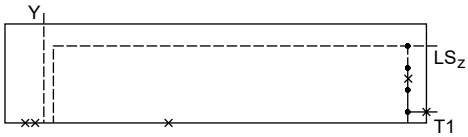


Code 'C'
Without pressure compensator
With load holding function

End elements option



End element with LS unloading
Ordering code: LA



End element without LS unloading
Ordering code: LZ
Short description
Supply of tandem switched LS signals

On-board electronics: OBE

By comparing the input value from the control element (potentiometer, operating handle, or host computer) with the feedback value from the built-in high-precision Hall effect position sensor, this closed-loop control system enables the spool displacement control accuracy to approach the performance level of a servo valve.

Technical Parameters

Hydraulic Parameters:

Maximum Pressure: 35 bar

Minimum Pressure: 12 bar

Maximum Back Pressure: 1.5 bar

Pilot Flow Rate: 0.2 L/min

Oil Filtration: 18/15 (ISO 4406)

Electrical Parameters:

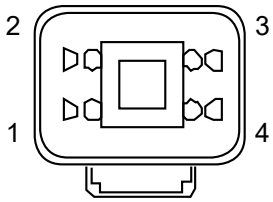
Supply Voltage: 10-30 VDC

Maximum Current: 750 mA

Protection Rating: IP67

Communication Protocol: CANopen or J1939

Terminal Definition (Front View)



D/C0

1. Power Supply Positive
2. CANL
3. CANH
4. Power Supply Negative

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