

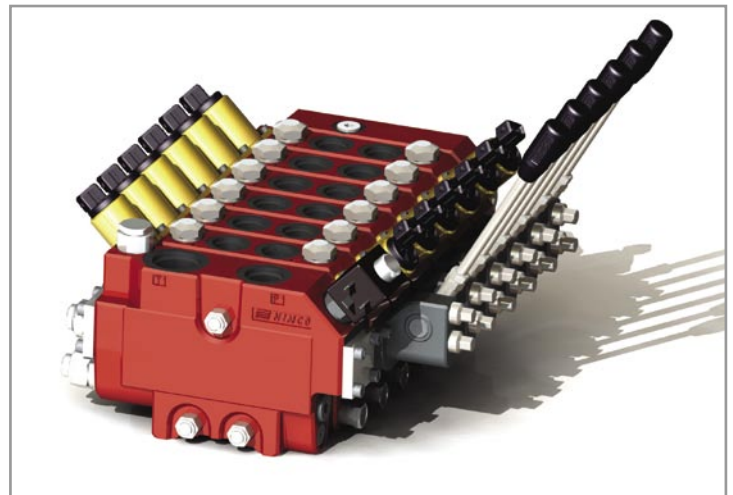
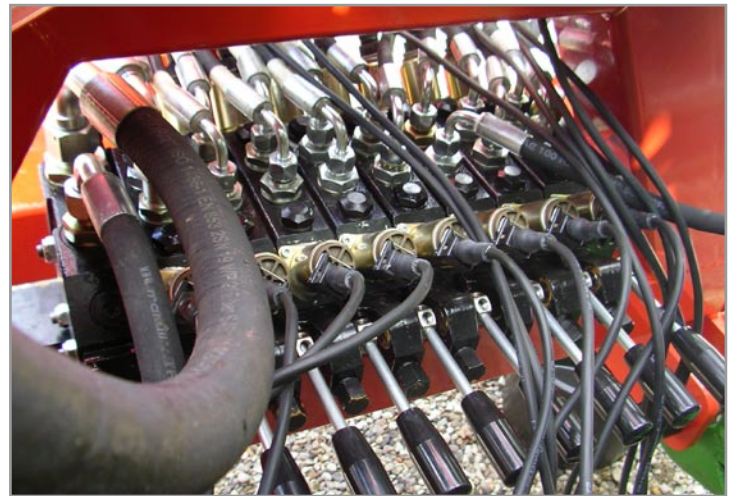
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POST-COMPENSATED PROPORTIONAL VALVE CV2000LS

Smart Solutions...
for the Future



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The CV2000LS is a stackable load sensing and pressure compensated directional control valve for the mobile market. It is designed for working pressures up to 320 bar [4640 psi], inlet pump flows up to 250 l/min [66 USgpm] and compensated output flow on work ports up to 125l/min [33 USgpm]. It can be used for both fixed and variable displacement pumps.

The CV2000LS is post compensated which allows all functions to operate even if the pump is saturated and no single function will take the whole flow deterioration in its function. It has been designed for use in a wide range of applications, such as cranes, sky lifts, drilling rigs, work platforms, forestry machines, construction equipment, fork lifts etc.

The modular design makes it possible to adapt the valve to specific customer requirements and build a compact and flexible system solution with 1 to 10 work sections per valve unit and the possibility for a large number of integrated features in different combinations.

Key user advantages :

- Load independent flow to each work port
- No hydraulic function will cease to operate if the pump is saturated
- Possibility to unload the inlet pressure as emergency stop or energy saving feature
- Port specific pressure compensators in each section module
- Port specific shock/anticavitation valves for each section module
- Port specific LS pressure limiting valve possibility in each section module
- Possibility to remotely unload the flow to each work port
- Possibility to integrate electro hydraulic proportional controls in the section body and have a mechanical override in each section module
- Possibility for integrated pressure reducer for internal pilot supply
- Possibility to adjust the maximum output flow for each work port with spool stroke limiters

Pressure Ratings

Maximum Inlet Pressure	320 bar	4640 psi
Maximum work Port Pressure	350 bar	5000 psi
Maximum Return Line Pressure	25 bar	363 psi

Flow Rates

Maximum inlet flow	250*/140** l/min	66*/37** USgpm
Maximum output flow A/B	125 l/min	33 USgpm

Temperature Range

Oil Temperature	-30 to +90°C	-22 to +194°F
Ambient Temperature	-30 to +60°C	-22 to +140°F

Spool Leakage

Maximum at 100 bar (1450 psi) 32 mm ² /s (cSt)	20 cm ³ /min	1.24 in ³ /min
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Filtration

Contamination Level equal to or better than 18/16/13 according to ISO 4406

Oil Viscosity

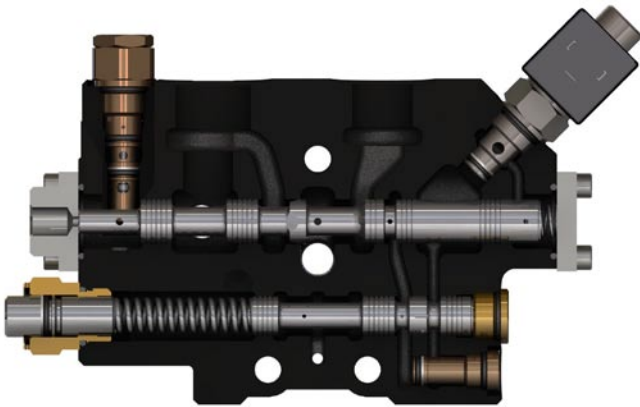
Recommended Operating Range	12-380 mm ² /s	65-2128 SSU
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Maximum number of Work Sections

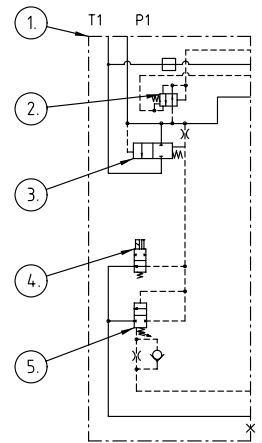
Inlet Modules IAF, IAV, IV	≤10
Mid Inlet Module IVM	≤9

* Inlet Module IVM

** Inlet Modules IAF, IAV, IV



POS.	DESCRIPTION	Code
1	Inlet Body	IAF
2	Press. Reducer for Pilot Supply	PRRV
3	Bypass Spool	-
4	Electrical Unloading Valve	UCV
5	LS Signal Spool	-



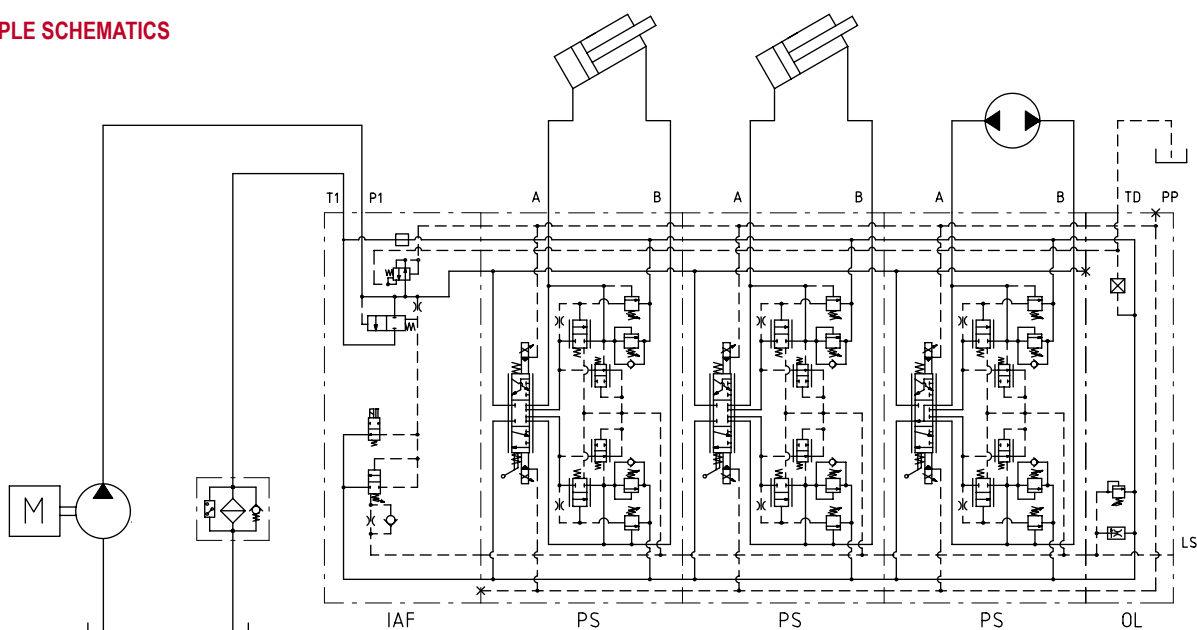
TECHNICAL DATA

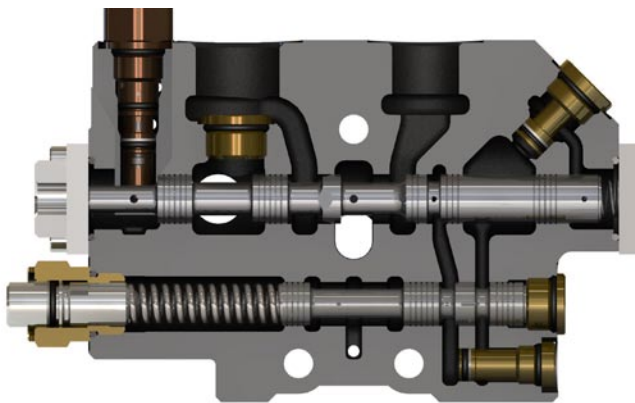
Maximum Inlet flow	140 l/min	37 USGpm
Maximum Working Pressure	320 bar	4640 psi
Port Size P1	BSP G3/4"	SAE #12 M27x2
Port Size T1	BSP G1"	SAE #16 M33x2
Port Size PM	BSP G1/4"	SAE #6 M14x1,5
Module Weight	6.4 kg	14.1 lbs

MODULE DESCRIPTION

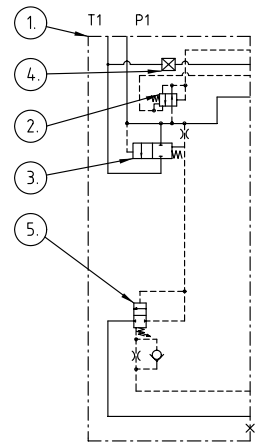
Open center inlet module for fixed pump systems. The bypass spool (3) regulates the excess oil to tank. The bypass pressure is set by the LS signal spool (5) and is adjustable from 4-19 bar [58-276 psi]. It can be unloaded with the optional electrical unloading valve (4) for emergency stop or to save energy and prevent unnecessary heating of the oil when no hydraulic functions are needed. The IAF inlet module can be equipped with a pressure reducing valve (2) for internal pilot pressure supply when using electrical control of the section modules.

SAMPLE SCHEMATICS





POS.	DESCRIPTION	Code
1	Inlet Body	IAF-S
2	Press. Reducer for Pilot Supply	PRRV
3	Bypass Spool	-
4	HPCO Plug	S
5	LS Signal Spool	-



TECHNICAL DATA

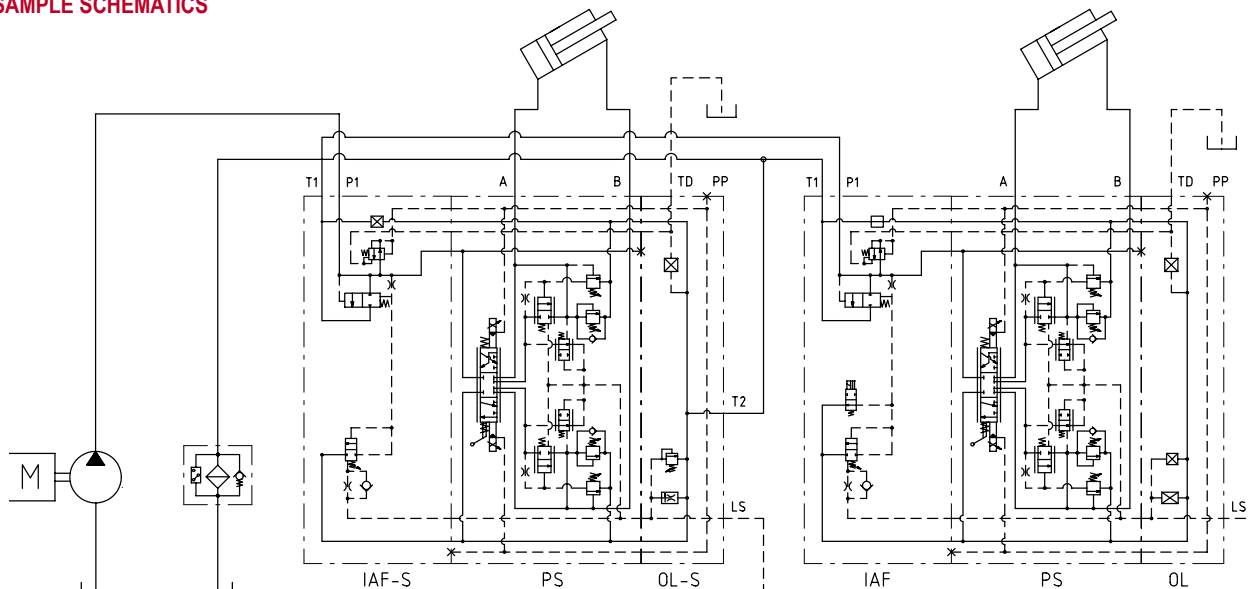
Maximum Inlet Flow	140 l/min	37 USGpm
Maximum Working Pressure	320 bar	4640 psi
Port Size P1	BSP G3/4"	SAE #12 M27x2
Port Size T1	BSP G1"	SAE #16 M33x2
Port Size PM	BSP G1/4"	SAE #6 M14x1,5
Module Weight	7.3 kg	16.1 lbs

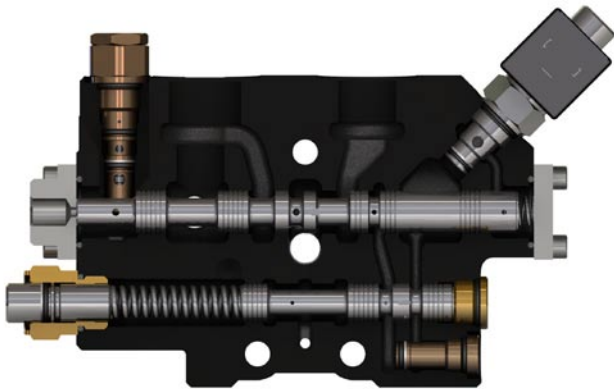
MODULE DESCRIPTION

High-pressure-carry-over (HPCO) open center inlet module for fixed pumps in serially connected systems. The bypass spool (3) regulates the excess oil to the T1 port which is used as the High Pressure Carry Over (HPCO) port. The bypass pressure is set by the LS signal spool (5) and is adjustable from 4-19 bar [58-276 psi]. The IAF-S inlet module can be equipped with a pressure reducing valve (2) for internal pilot pressure supply when using electrical control of the section modules.

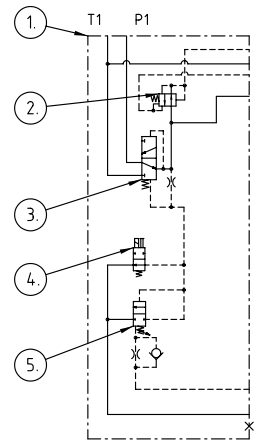
The IAF-S outlet must be used in combination with the OL-S outlet module with the T2 tank port, which should be connected to tank. The LS-signal should be parallel connected between all valves in the system.

SAMPLE SCHEMATICS





Pos.	Description	Code
1	Inlet Body	IAV
2	Press. Reducer for Pilot Supply	PRRV
3	Compensator Spool	-
4	Electrical Unloading Valve	UCV
5	LS Signal Spool	-



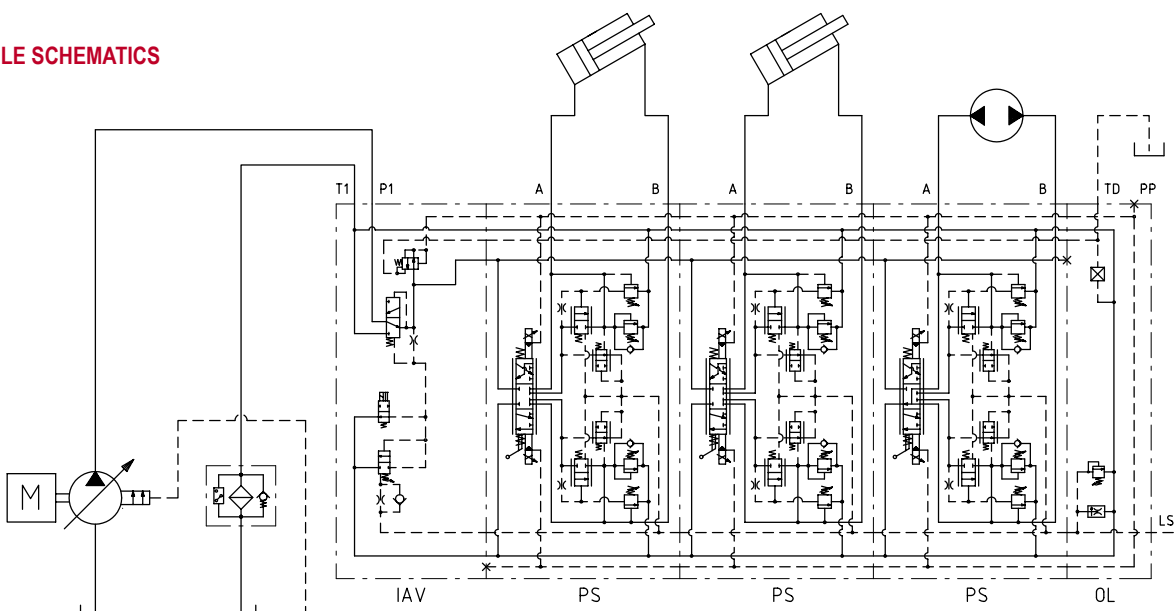
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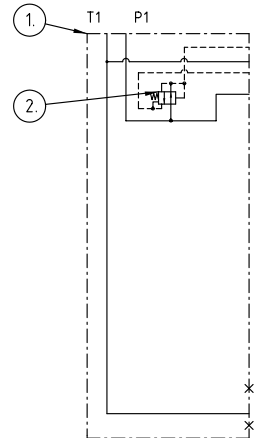
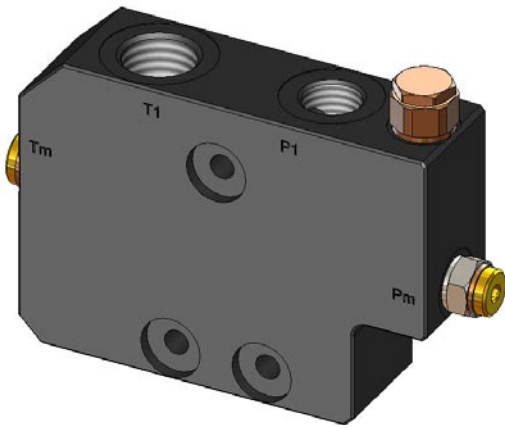
Maximum Inlet Flow	140 l/min	37 USGpm
Maximum Working Pressure	320 bar	4640 psi
Port Size P1	BSP G3/4"	SAE #12 M27x2
Port Size T1	BSP G1"	SAE #16 M33x2
Port Size PM	BSP G1/4"	SAE #6 M14x1,5
Module Weight	6.4 kg	14.1 lbs

MODULE DESCRIPTION

Closed center inlet module for variable displacement pumps. The compensator spool (3) in the IAV reduces the pump pressure differential to the pressure differential set by the LS signal spool (5) which is adjustable between 4-19 bar [58-276 psi]. This means that the system can work with a pressure drop between pump and valve up to the difference $\Delta p_{\text{pump}} - \Delta p_{\text{valve}}$ without decreasing flow to the work sections modules. The IAV inlet module can be equipped with a pressure reducing valve (2) for internal pilot pressure supply when using electrical control of the section modules. It can also be equipped with an electrical unloading valve (4) for use as an emergency stop.

SAMPLE SCHEMATICS





POS.	DESCRIPTION	Code
1	Inlet Body	IV
2	Press. Reducer for Pilot Supply	PRRV

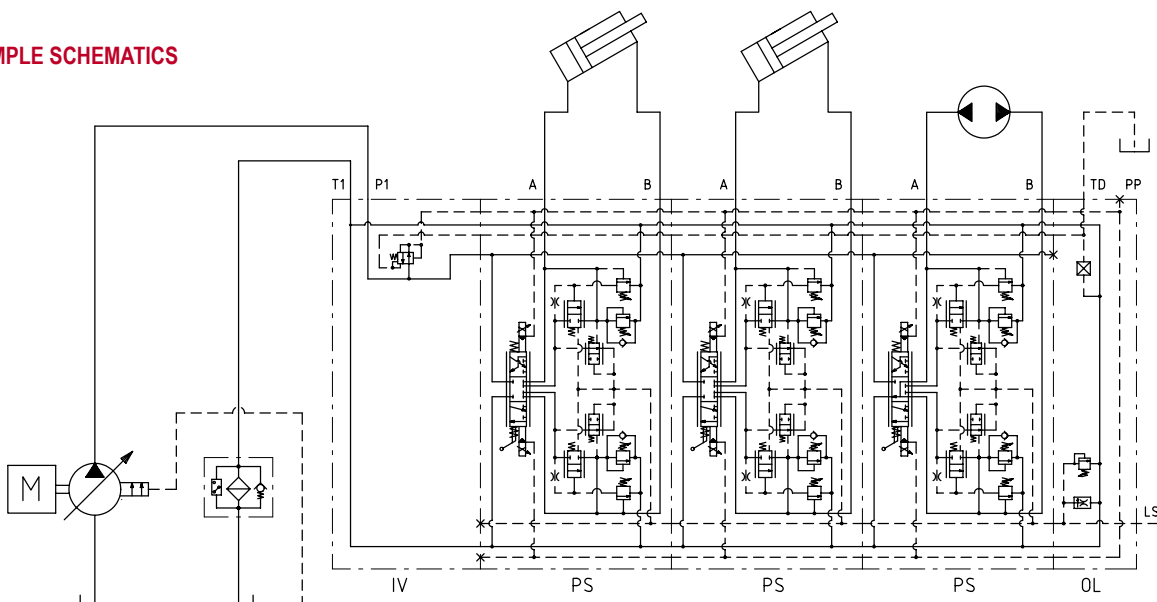
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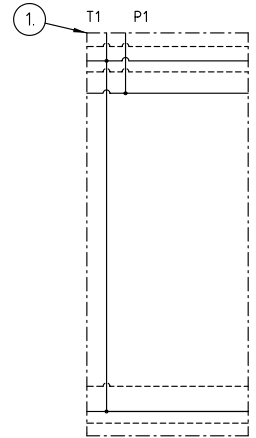
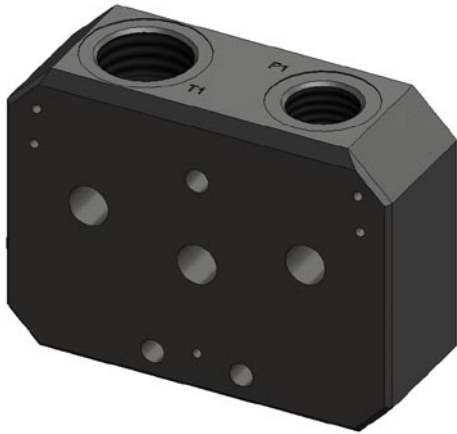
Maximum Inlet Flow	140 l/min	37 USGpm	
Maximum Working Pressure	320 bar	4640 psi	
Port Size P1	BSP G3/4"	SAE #12	M27x2
Port Size T1	BSP G1"	SAE #16	M33x2
Port Size PM	BSP G1/4"	SAE #6	M14x1,5
Module Weight	7.3 kg	16.1 lbs	

MODULE DESCRIPTION

Closed center inlet module for variable displacement pumps. The IV module can be equipped with a pressure reducing valve (2) for internal pilot pressure supply when using electrical control of the section modules.

SAMPLE SCHEMATICS





Pos.	Description	Code
1	Inlet Body	IVM

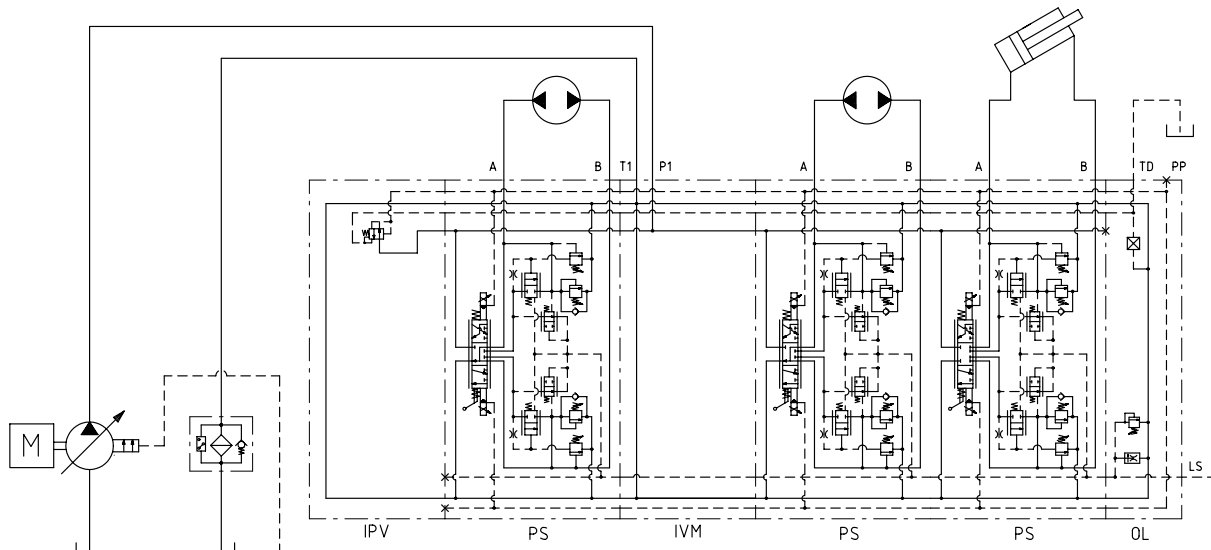
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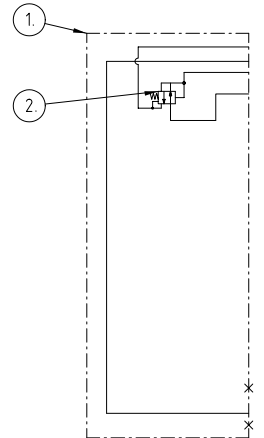
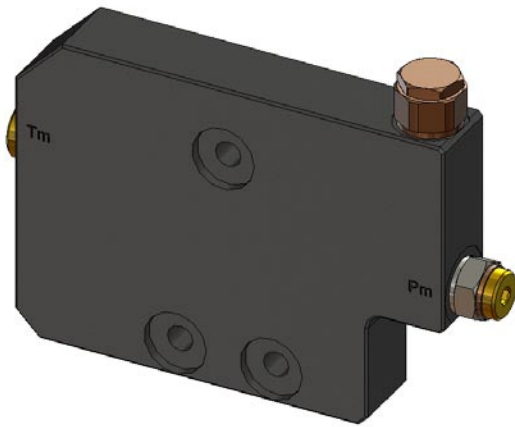
Maximum Inlet Flow	250 l/min	66 USGpm	
Maximum Working Pressure	320 bar	4640 psi	
Port Size P1	BSP G1"	SAE #16	M33x2
Port Size T1	BSP G1-1/4"	SAE #20	M42x2
Module Weight	7.9 kg	17.4 lbs	

MODULE DESCRIPTION

Closed center mid inlet module for variable displacement pumps. The IVM module is used for large inlet pump flows and distributes the flow to section modules on both sides of the inlet module. The IVM module must be used together with the IPV end cover plate.

SAMPLE SCHEMATICS





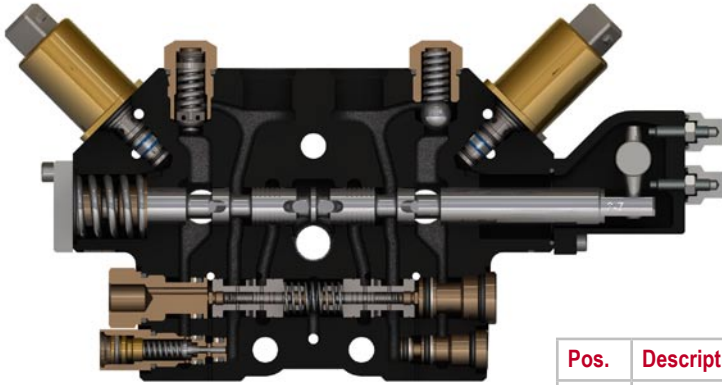
POS.	DESCRIPTION	Code
1	End Plate Body	IPV
2	Press. Reducer for Pilot Supply	PRRV

TECHNICAL DATA

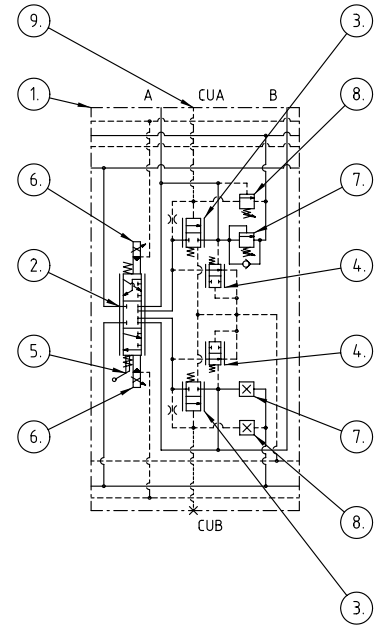
Maximum Working Pressure	320 bar	4640 psi	
Port Size PM	BSP G1/4"	SAE #6	M14x1,5
Module Weight	4.6 kg	10.1 lbs	

MODULE DESCRIPTION

End cover plate to be used together with the IVM mid inlet module. The IPV can be equipped with a pressure reducing valve (2) for internal pilot pressure supply.



Pos.	Description	
1	Section Body	PS
2	Main Spool	Page 13
3	Post Comp. Spool	-
4	LS Copy Spool	-
5	Spool Control	Page 14
6	Pilot Control	Page 15
7	Shock/Anticav. Valve	WPV
8	LS Pressure Limiter	PRL
9	CU-Port	CU

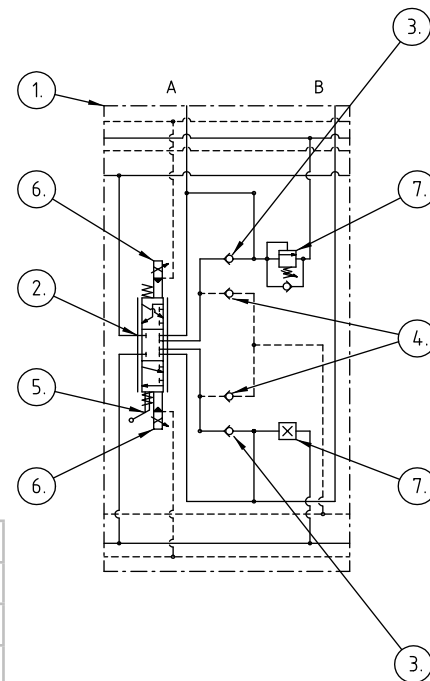
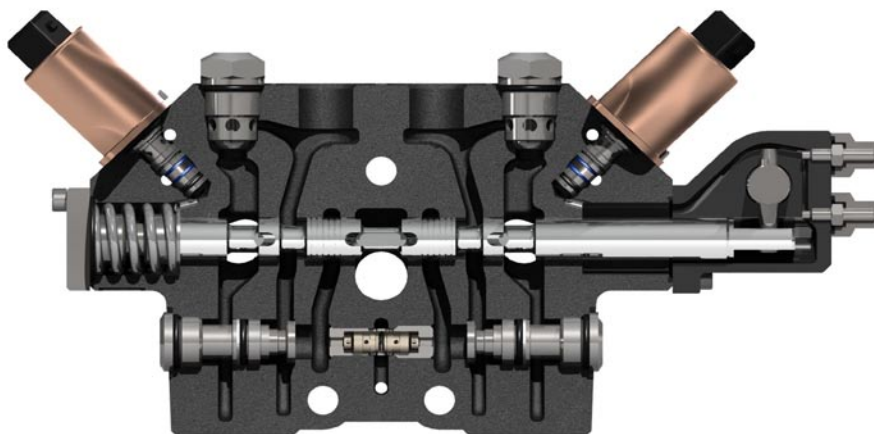


TECHNICAL DATA

Maximum compensated port flow	125 l/min	33 USGpm
Maximum Working Pressure	320 bar	4640 psi
Port size A	BSP G1/2"	SAE #10 M33x2
Port size B	BSP G1/2"	SAE #10 M14x1,5
Port size CU	BSP G1/4"	SAE #6 M14x1,5
Module Weight	6.0 kg	13.2 lbs

MODULE DESCRIPTION

Post compensated section module for use together with any of the inlet and outlet modules. Load independent flow on each work port maintained by the individual pressure compensators (3). Possibility to equip with port shock relief and anticavitation valves (7) for each work port as well as LS pressure limiting valves (8). The work port flow can be unloaded through the optional CU-port (9). The highest port load pressure in the valve is copied by the LS copy spool (4) to the LS channel. The sections can be equipped with a main spool control (5) in form of mechanical hand lever or wire control. It can also be equipped with a pilot control (6) in form of electro hydraulic proportional controls and hydraulic proportional controls in combination with the main spool control. The maximum spool stroke can be adjusted with spool stroke limiters to set the maximum flow for each work port.



Pos.	Description	
1	Section Body	US 60
2	Main Spool	Page 18
3	Load Holding Check Valve	-
4	Load Sense Copy Check Valve	-
5	Spool Control	Page 19
6	Pilot Control	Page 20
7	Shock/Anticav. Valve 60l/min	WPV 60

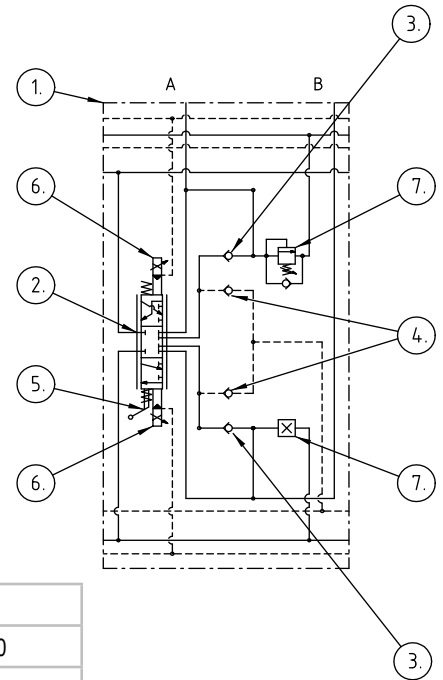
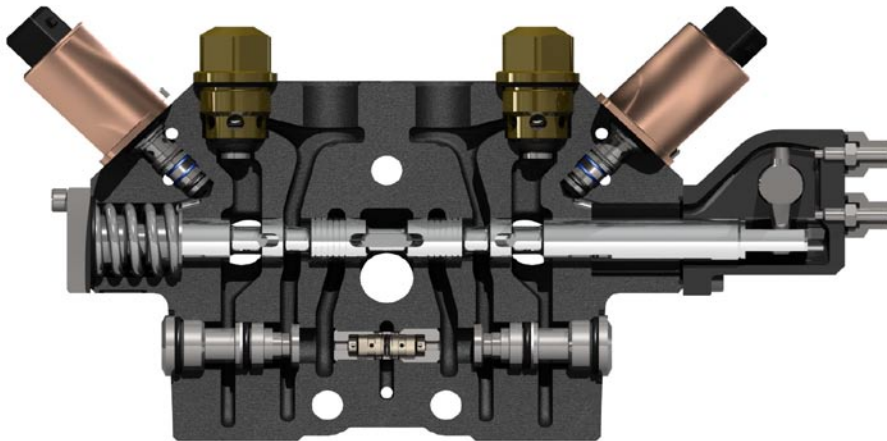
TECHNICAL DATA

Maximum port flow	125 l/min	33 USGpm
Maximum Shock Relief Flow	60l/min	16 USgpm
Maximum Working Pressure	320 bar	4640 psi
Port Size A	G1/2"	SAE#10 M22x1,5
Port Size B	G1/2"	SAE#10 M22x1,5
Module Weight	6.0 kg	13,2 lbs

MODULE DESCRIPTION

The US60 is an uncompensated section module for the CV2000LS valve with shock cavities allowing for shock/anti cavitation valves rated for up to 60 l/min (7). The section can be equipped with hand lever (5) and spool stroke limiters. It can also be equipped with pilot controls (6) such as electro hydraulic proportional or hydraulic proportional controls.

This module can be integrated together with post compensated sections, but if activated at the same time as a compensated section the flow sharing capabilities will cease to function.



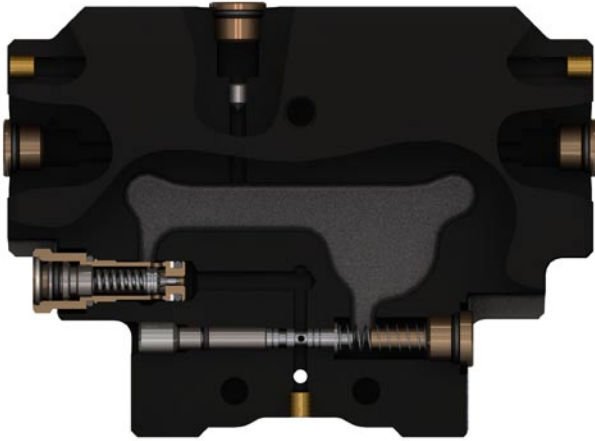
Pos.	Description	
1	Section Body	US 100
2	Main Spool	Page 18
3	Load Holding Check Valve	-
4	Load Sense Copy Check Valve	-
5	Spool Control	Page 19
6	Pilot Control	Page 20
7	Shock/Anticav. Valve 100l/min	WPV 100

TECHNICAL DATA

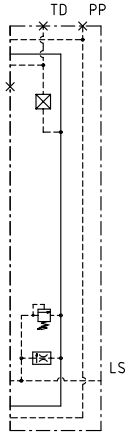
Maximum port flow	125 l/min	33 USGpm
Maximum Shock Relief Flow	100l/m	27 USgpm
Maximum Working Pressure	320 bar	4640 psi
Port Size A	G1/2"	SAE#10 M22x1,5
Port Size B	G1/2"	SAE#10 M22x1,5
Module Weight	6.0 kg	13,2 lbs

MODULE DESCRIPTION

The US100 is an uncompensated section module for the CV2000LS valve with shock cavities allowing for shock/anti cavitation valves rated for up to 100 l/min (7). The section can be equipped with hand lever (5) and spool stroke limiters. It can also be equipped with pilot controls (6) such as electro hydraulic proportional or hydraulic proportional controls. This module can be integrated together with post compensated sections, but if activated at the same time as a compensated section the flow sharing capabilities will cease to function.



POS.	DESCRIPTION	Code
1	Outlet	OL
2	LS Pressure Relief Valve	LSRV
3	Load Signal Drain	FC
4	External Pilot Drain Plug	TD



TECHNICAL DATA

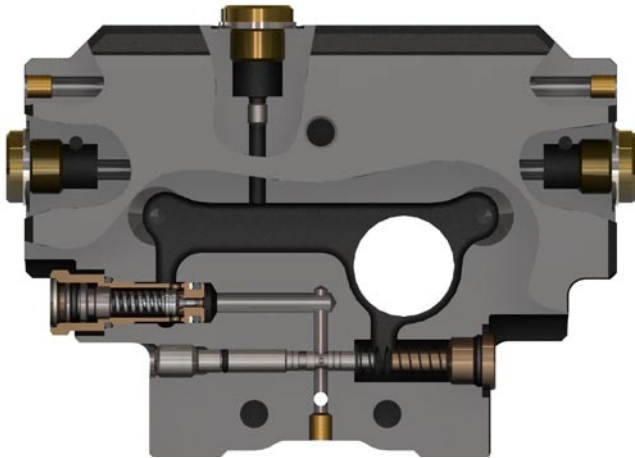
Load signal drain flow	0.8 l/min	0.21 USgpm	
Maximum Working Pressure	320 bar	4640 psi	
Port size PP	BSP G3/8"	SAE #6	M14x1,5
Port size TD	BSP G3/8"	SAE #6	M14x1,5
Module Weight	4.8 kg	10.6 lbs	

MODULE DESCRIPTION

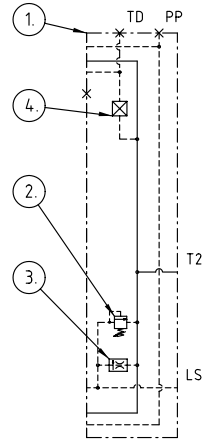
The OL outlet module is used as end plate for the valve unit and can be equipped with an LS pressure relief valve (2) to limit the maximum LS pressure in the system. When used together with the IAF inlet module this pressure relief valve is used to pilot the bypass spool in the inlet module to form a pilot operated pressure relief valve for the entire pump flow.

The OL module contains a constant flow LS signal drain valve (3) that drains the LS signal to tank when the section modules are inactivated, allowing the inlet pressure to return to standby pressure. When parallel connecting several valve units, only one of the OL modules should be equipped with this valve, and the rest should have plugs.

When electro hydraulic proportional actuation of the main spool is used, the pilot valves can be drained externally to tank from the outlet section, to protect against varying return line pressures acting on the pilot valves, which could cause unwanted movement of the main spools. This is made by connecting the external drain port (TD) and blocking the internal drain channel with a plug (4).



POS.	DESCRIPTION	Code
1	Outlet	OL-S
2	LS Pressure Relief Valve	LSRV
3	Load Signal Drain	FC
4	External Pilot Drain Plug	TD



TECHNICAL DATA

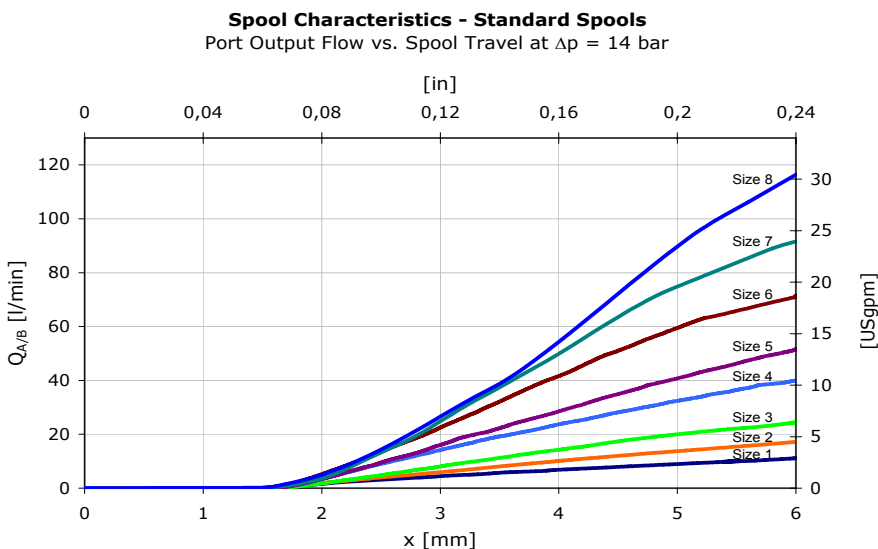
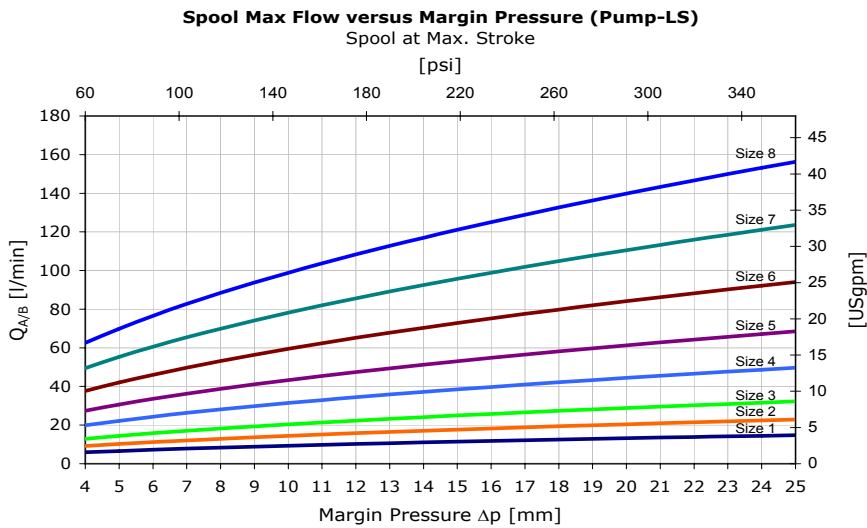
Load signal drain flow	0.8 l/min	0.21 USgpm	
Maximum Working Pressure	320 bar	4640 psi	
Port size T2	BSP G1"	SAE #16	M33x2
Port size PP	BSP G3/8"	SAE #6	M14x1,5
Port size TD	BSP G3/8"	SAE #6	M14x1,5
Module Weight	4.8 kg	10.6 lbs	

MODULE DESCRIPTION

The OL-S inlet has the same features as the OL outlet module, but with a tank connection T2 port machined on the side. It is for use together with the IAF-S inlet module in serial connected systems, or if a tank connection is desired in the end plate of the valve unit.

Spool Type	Symbol	Spool Code							
		Max. Pressure Compensated Flow at $\Delta P=14$ bar l/min [USgpm] $\Delta P=14$ bar l/min [USgpm]							
		11 [2.9]	17 [4.5]	24 [6.3]	37 [9.8]	51 [13]	70 [18]	92 [24]	115 [30]
Double Acting		1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8
Single Acting A-port		2A-1	2A-2	2A-3	2A-4	2A-5	2A-6	2A-7	2A-8
Single Acting B-port		2B-1	2B-2	2B-3	2B-4	2B-5	2B-6	2B-7	2B-8
Motor		4-1	4-2	4-3	4-4	4-5	4-6	4-7	4-8
Double Acting Drained		5-1	5-2	5-3	5-4	5-5	5-6	5-7	5-8

The maximum output flows in the table above is based on a pressure drop of 14 bar over the valve. By changing the pressure drop over the valve the output flow will change according to the following diagram:



Code	Type	A-Side	B-Side	Type	Code
9	Spring Centered			Enclosed Hand Lever	HLB
EFL	Electrically Activated Float Position			Enclosed Hand Lever with Stroke Limiters	HLB-Q
				Cable Controls	WB

Code	Type	A-Side	B-Side	Type	Code																
P	Plug			Plug	P																
HP	Hydraulic Proportional	<table border="1" data-bbox="475 1196 711 1357"> <thead> <tr> <th colspan="2">D</th> </tr> </thead> <tbody> <tr> <td>BSP</td> <td>G1/4"</td> </tr> <tr> <td>SAE</td> <td>SAE#6</td> </tr> <tr> <td>Metric</td> <td>M14x1.5</td> </tr> </tbody> </table>	D		BSP	G1/4"	SAE	SAE#6	Metric	M14x1.5	<table border="1" data-bbox="810 1196 1046 1357"> <thead> <tr> <th colspan="2">D</th> </tr> </thead> <tbody> <tr> <td>BSP</td> <td>G1/4"</td> </tr> <tr> <td>SAE</td> <td>SAE#6</td> </tr> <tr> <td>Metric</td> <td>M14x1.5</td> </tr> </tbody> </table>	D		BSP	G1/4"	SAE	SAE#6	Metric	M14x1.5	Hydraulic Proportional	HP
D																					
BSP	G1/4"																				
SAE	SAE#6																				
Metric	M14x1.5																				
D																					
BSP	G1/4"																				
SAE	SAE#6																				
Metric	M14x1.5																				
SPV	Electro Hydraulic Proportional			Electro Hydraulic Proportional	SPV																

UCV - UNLOAD CONTROL VALVE

The UCV valve is used in the IF and IVA inlet modules as an emergency stop feature. In the IF inlet it can also be used to unload the standby pressure for energy saving and lower heat generation when no hydraulic functions are used.



Hydraulic Data

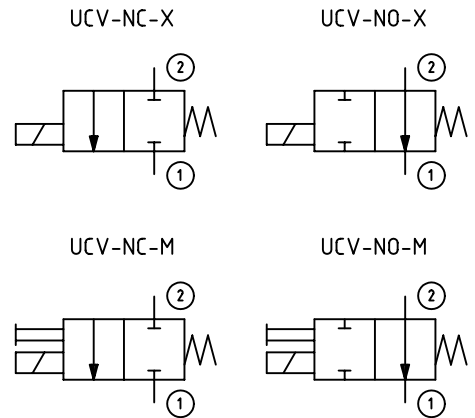
Maximum Operating Pressure	345 bar [50000 psi]	
Rated Flow	25 l/min	
Internal Leakage Max.	0.15 ccm/min at 345 bar [5000 psi]	
Contamination Level	20/18/15 acc. ISO 4406	
Temperature Range	-40 to +120°C	

Electrical Data

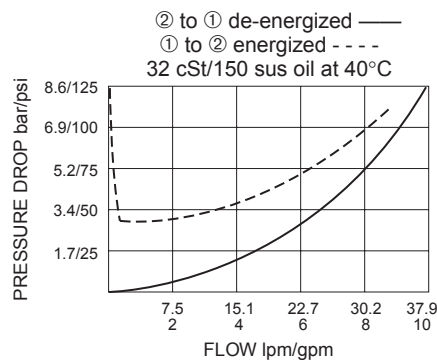
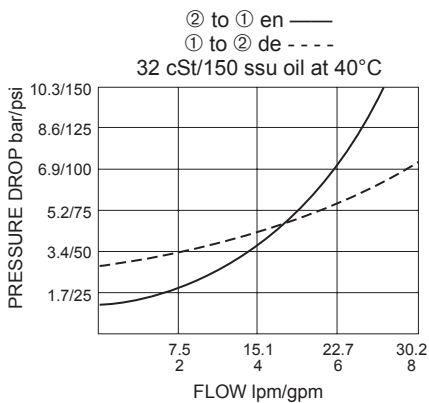
Power	345 bar [5000psi]	
Voltage	12 V	24 V
Current	1.22 A	0.61 A
Resistance	9.8 Ω ±5%	39.3 Ω ±5%
Connector Type	DIN 43650	
Protection Class	IP65	

Ordering Code

	UCV-	12-	NC-	X
12 V	12			
24 V	24			
Normally Open	NO			
Normally Closed	NC			
Manual Override	M			
None	X			

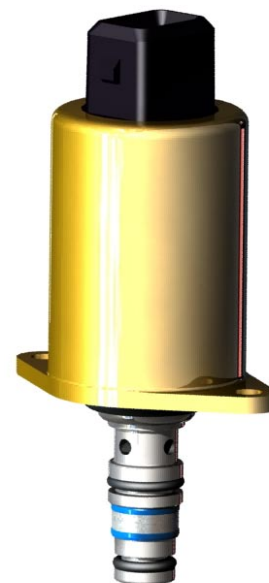


PERFORMANCE



SPV PROPORTIONAL PRESSURE REDUCING VALVE

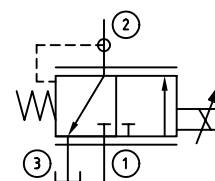
The SPV is a 3/2 way electrically operated proportional pressure reducing valve used to operate the main spool of the sections when electro hydraulic actuation is used. It is available for both 12 and 24 V systems and operates on a PWM signal.



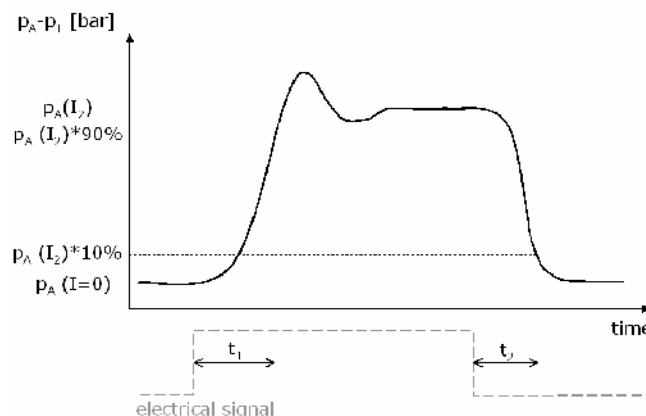
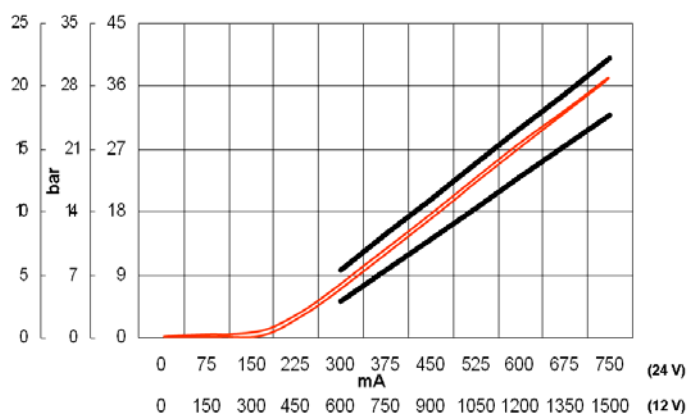
Hydraulic Data	
Maximum Operating Pressure P_p	50 bar
Maximum Operating Pressure P_T	30 bar
Pressure Drop 2-1	<9.5 bar at 4 l/min
Pressure Drop 2-3	<6.0 bar at 4 l/min
Hysteresis	< 1.0
Contamination Level	20/18/15 acc. ISO 4406
Temperature Range	-30 to +105°C

Electrical Data		
Voltage	12 V	24 V
Current	1500 mA	750 mA
Resistance	4.72 Ω \pm 5%	20.8 Ω \pm 5%
Recommended PWM Freq.	120 Hz	
Connector Type	AMP Junior Timer or Deutsch connector DT04-2P	
Protection Class	Up to IP6K6/IPX9K	

Ordering Code		
	SPV-	12
12 V	12	
24 V	24	
Deutsch connector DT04-2P		
AMP Junior Timer		



PERFORMANCE



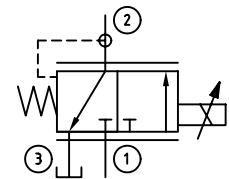
t_1, t_2 50 ms (50 °C Oil Temperature)

SPV-EX PROPORTIONAL PRESSURE REDUCING VALVE

The SPV-EX is a explosion proof classified 3/2 way electrically operated proportional pressure reducing valve used to operate the main spool of the sections when electro hydraulic actuation is used. It is available for both 12 and 24 V systems and operates on a PWM signal. A diode for protection against switch-off overvoltage must be connected parallel to each proportional solenoid. A fuse corresponding to its rating current has to be connected in series to each solenoid.

Test Certificate: TÜV 07 ATEX 7425 X

Marking:	CE0035		II 2G Ex mb II T4
	CE0035		II 2D Ex mbD 21 T130 °C
	CE0035		I M2 Ex mb I



Hydraulic Data

Maximum Operating Pressure P_p	50 bar
Maximum Operating Pressure P_T	30 bar
Pressure Drop 2-1	<17 bar at 4 l/min
Pressure Drop 2-3	<6.0 bar at 4 l/min
Hysteresis	< 3,5% P
Contamination Level	20/18/15 acc. ISO 4406
Temperature Range Fluid	-20 to +80 °C
Ambient temperature	-20 to +60 °C

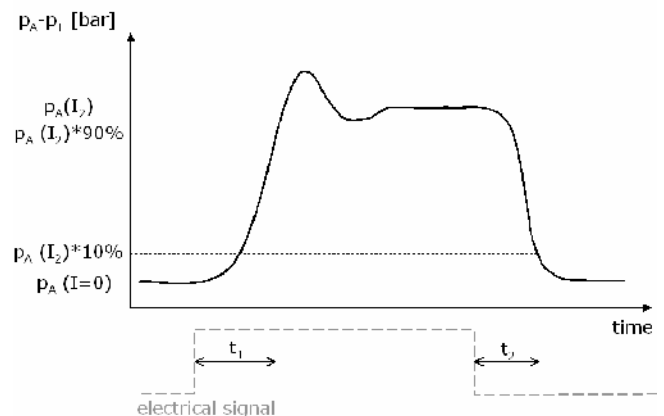
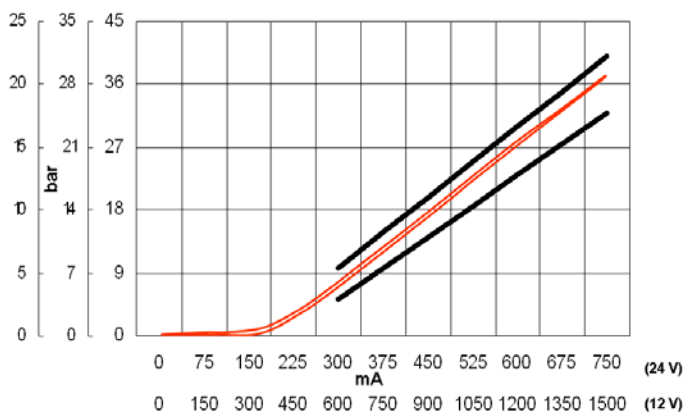
Electrical Data

Voltage	12 V	24 V
Current	1500 mA	750 mA
Resistance	5,3 Ω \pm 5%	21,2 Ω \pm 5%
Recommended PWM Freq.	120 Hz	
Protection Class	Up to IP65 / IPX7	
Cable	2*1,5 mm ²	

Ordering Code

	SPV-EX	12
12 V	12	
24 V	24	
Cable length (1-20m)		

PERFORMANCE

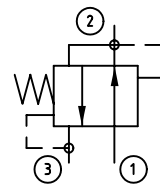


t_1, t_2 100 ms (50 °C Oil Temperature)

PRRV - PRESSURE REDUCING VALVE

Pressure reducing valve used in the inlet modules to provide internal pilot pressure for electro hydraulic operation.

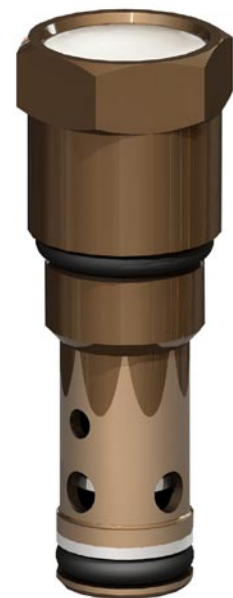
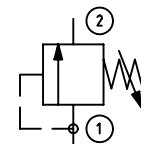
Hydraulic Data	
Maximum Operating Pressure Port 1	320 bar [4640 psi]
Reduced Pressure Port 2	24 bar [348 psi]



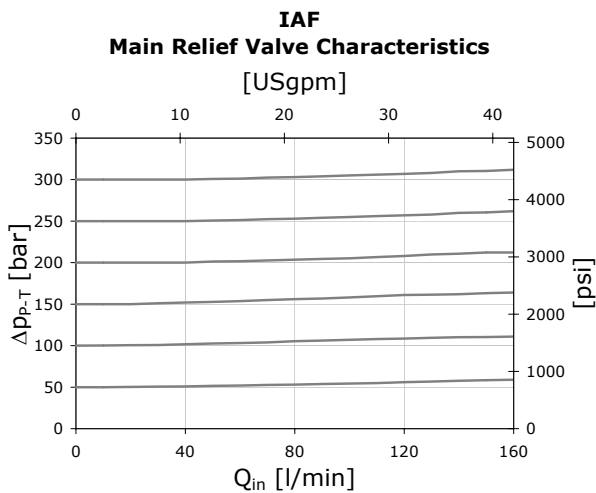
LSRV - PRESSURE RELIEF VALVE

LS pressure relief valve used in outlet module to limit the maximum LS pressure in the system. When used with the fixed pump inlet IAF it pilots the bypass spool to form a pilot operated relief valve, see below flow characteristics.

Hydraulic Data	
Maximum Operating Pressure port 1	320 bar [4640 psi]
Pressure Range	30-320 bar



PERFORMANCE WITH IAF

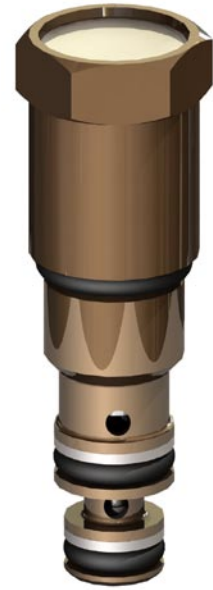


Ordering Code	
Pressure Setting bar	LSRV-

PRL – LS PRESSURE LIMITER

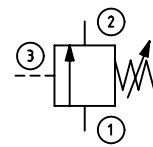
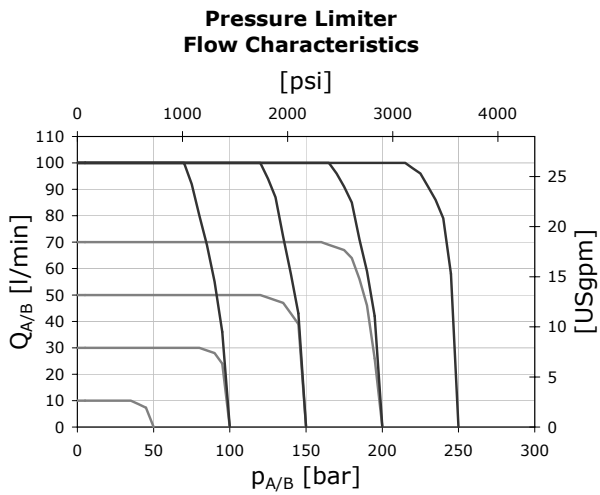
LS pressure limiting valve used in the section modules to limit the work port pressure by piloting the post compensator spool, see below characteristics.

Hydraulic Data	
Maximum Operating Pressure Port 1	320 bar [4640 psi]
Pressure Range	30-320 bar



PERFORMANCE

PRL in section module piloting the post compensator spool



Ordering Code	
Pressure Setting bar	PRL-

WPV 60 – SECONDARY VALVES

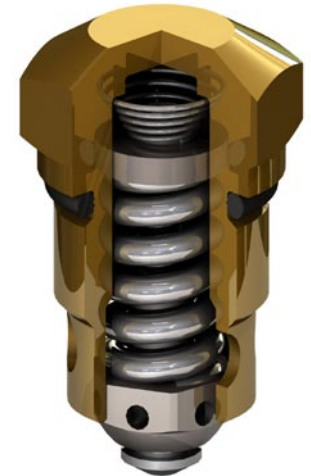
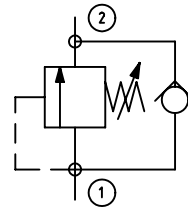
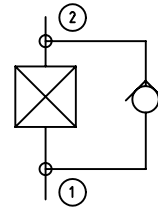
WPV valves are used as secondary valves in the PS section module for work port shock relief and anticavitation or just anticavitation. The direct action and specific design allow a very fast opening and closing.

Hydraulic Data

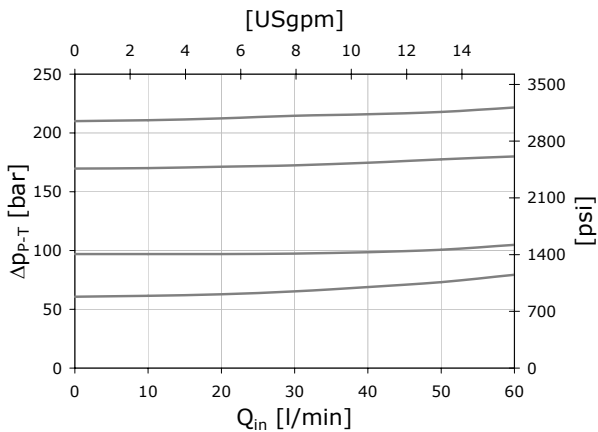
Maximum Operating Pressure Port 1	350 bar [5075 psi]
Pressure Range	10-350 bar [150-5075 psi]
Maximum Flow	60 l/min [16 USgpm]
Weight	0.048 kg [0.106 lbs]

Ordering Code

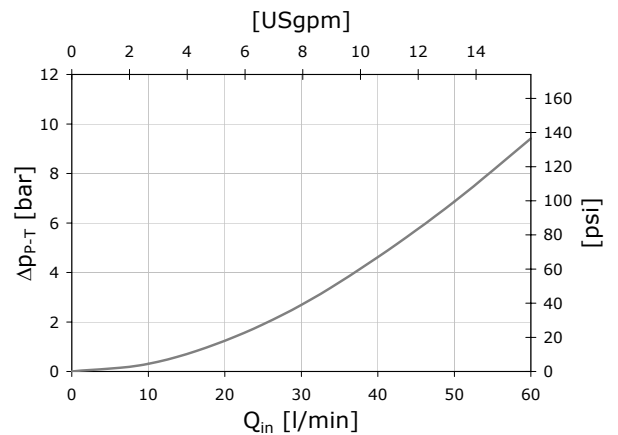
	WPV-60	CA
Shock/Anticav.	CA	
Anticav	A	
Pressure Setting CA [bar]		
For A-version, leave blank		



Port Relief Valve Characteristics

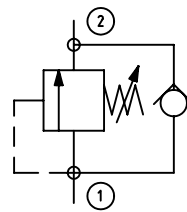
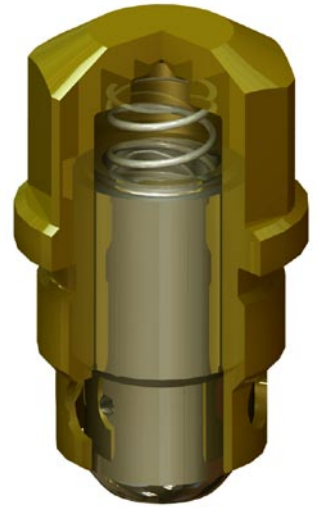
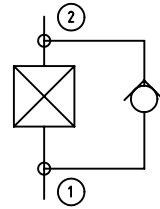


Anticavitation Valve Characteristics



WPV 100 – SECONDARY VALVES

WPV 100 is used as an option for work port shock relief and anticavitation or just anticavitation, on uncompensated sections, it can take the whole pump flow up to 100l/min. The direct action and specific design allow a very fast opening and closing.



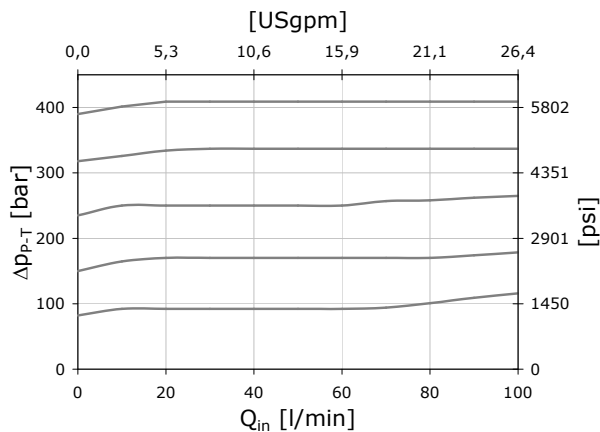
Hydraulic Data

Maximum Operating Pressure	350 bar
Pressure Range	10-350 bar [150-5075 psi]
Maximum Flow	100 l/min [16 USgpm]
Weight	0.100 kg

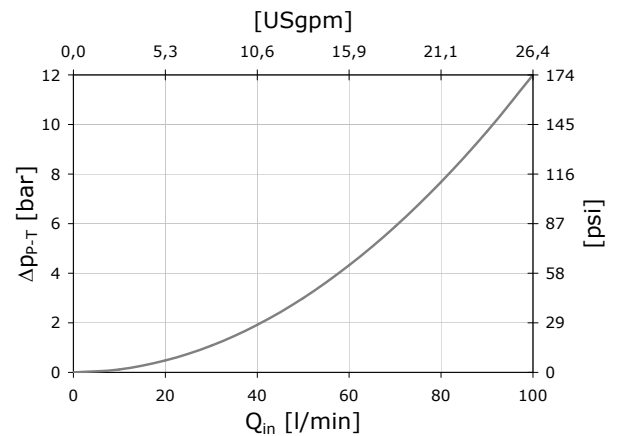
Ordering Code

	WPV-100	CA	
Shock/Anticav.	CA		
Anticav	A		
Pressure Setting CA [bar]			
For A-version, leave blank			

Port Relief Valve Characteristics

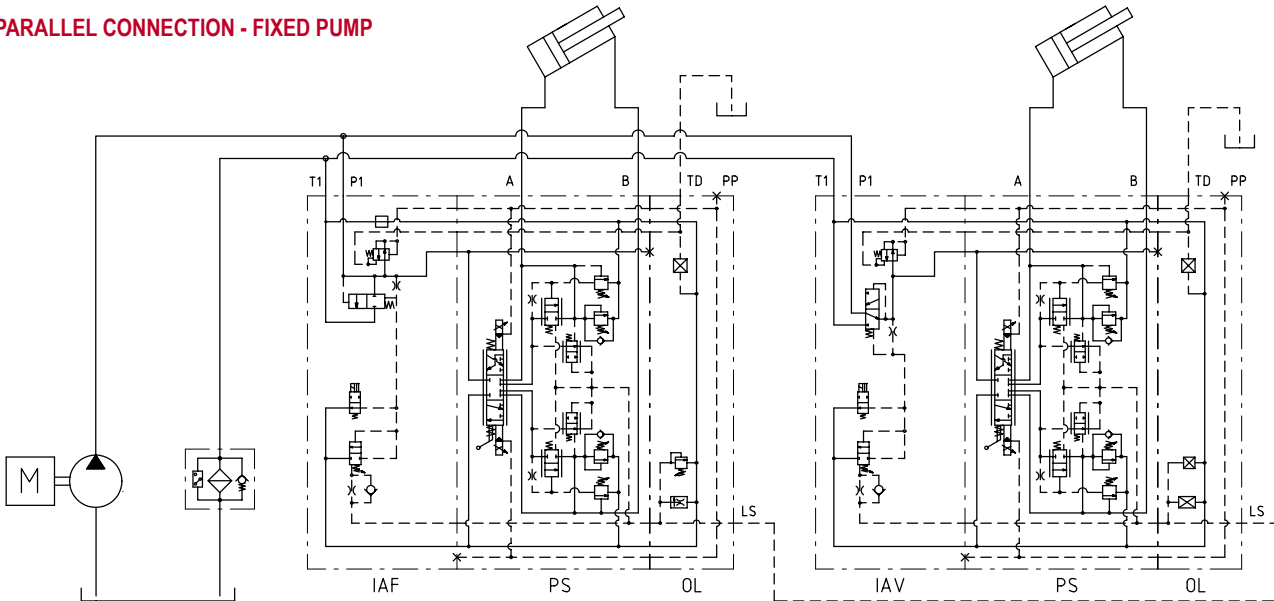


Anticavitation Valve Characteristics

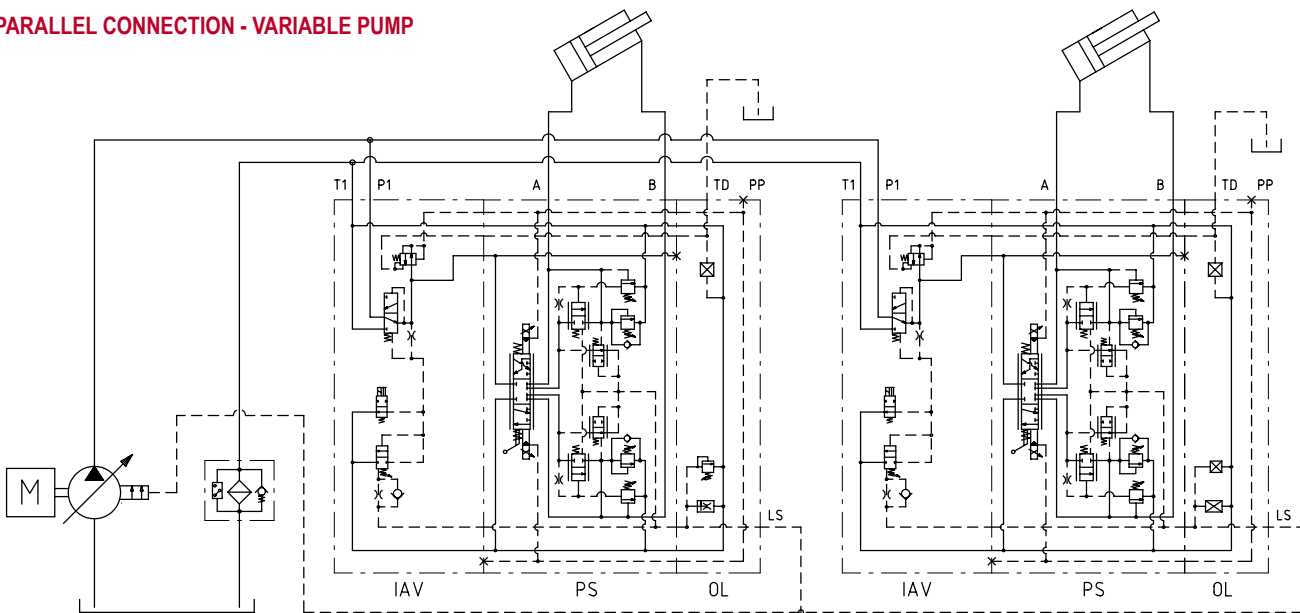


When parallel connecting several CV2000LS valve units to the same pump, only one of the outlet modules can be equipped with the Load Signal Drain Valve (FC) and the Load Signal Relief Valve (LSRV). All other outlet modules have to have these functions plugged. The LS-signal should be parallel connected between the valves, but no shuttle valves should be used in the LS-line. See the schematics for an example of parallel connection.

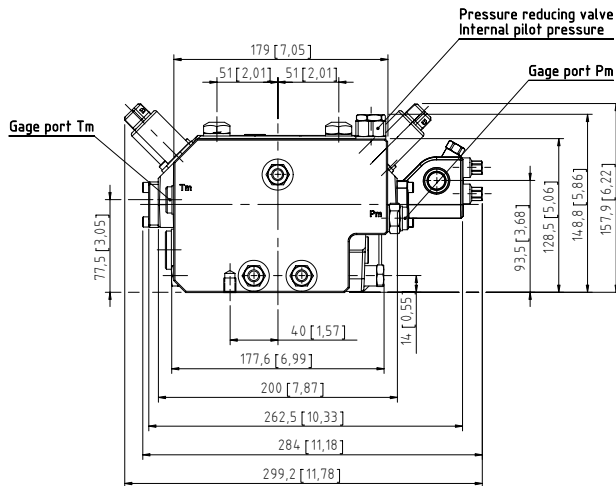
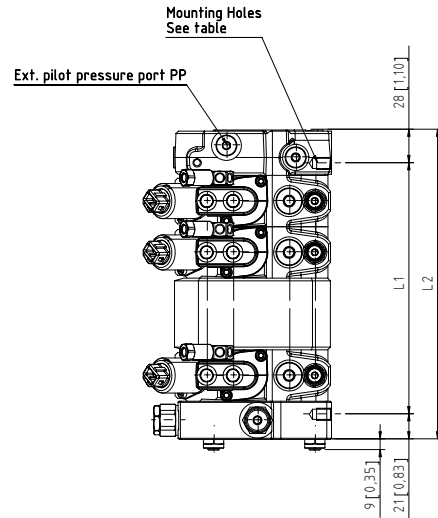
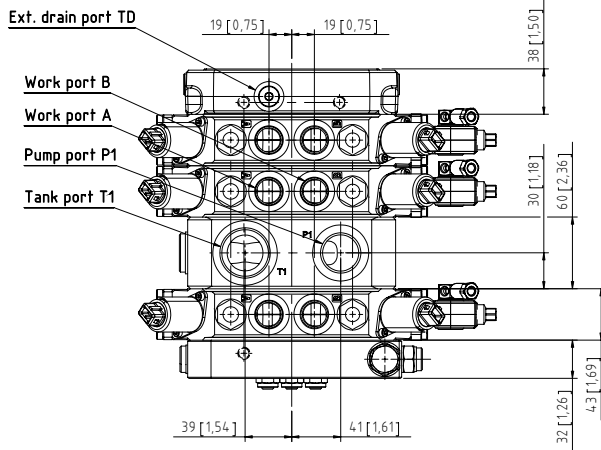
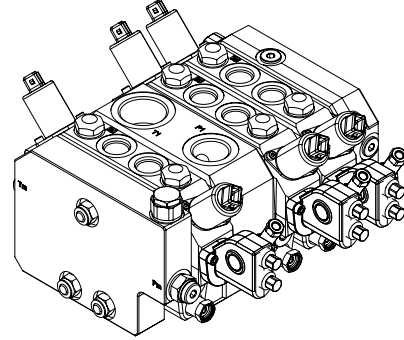
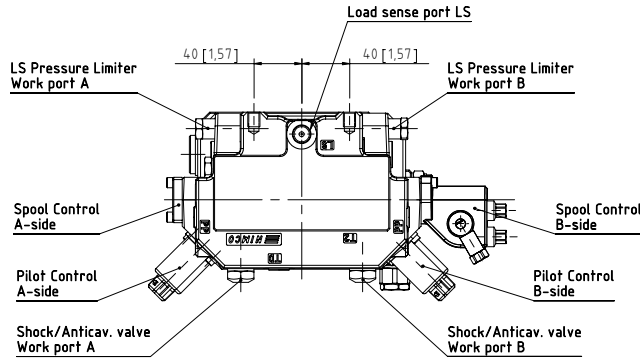
PARALLEL CONNECTION - FIXED PUMP



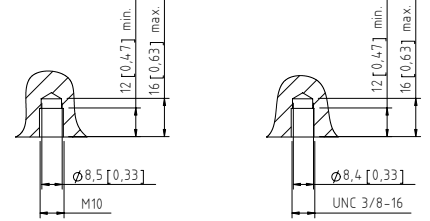
PARALLEL CONNECTION - VARIABLE PUMP



L1	mm	2	3	4	5	6	7	8	9
	[in]	[6.57]	[8.27]	[9.96]	[11.65]	[13.35]	[15.04]	[16.73]	[18.43]
L2	mm	216	259	302	345	388	431	474	517
	[in]	[8.50]	[10.20]	[11.89]	[13.58]	[15.28]	[16.97]	[18.66]	[20.35]



Mounting Holes



Standard for housings machined with BSP and Metric ports

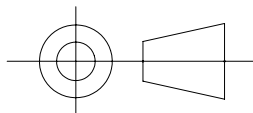
Standard for housings machined with SAE ports

Standard Threads

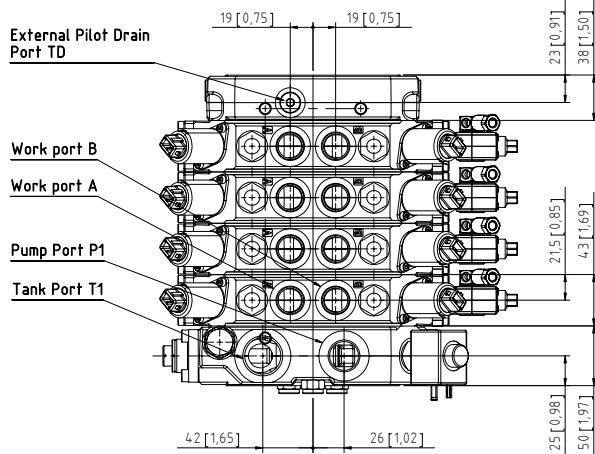
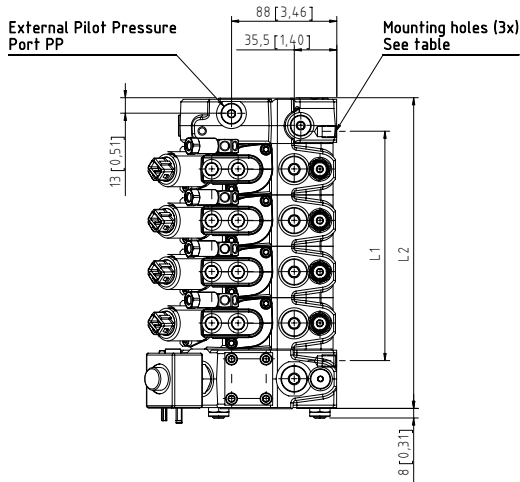
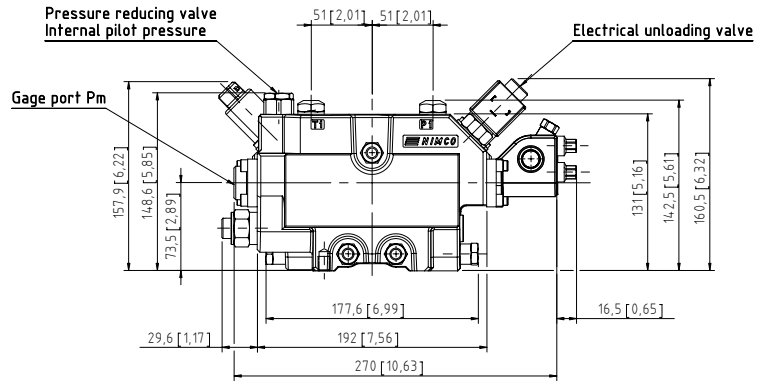
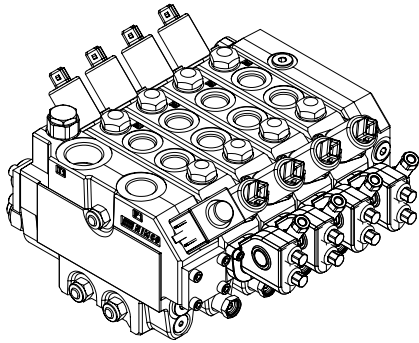
BSP (ISO 228/1) SAE (ISO 11926) METRIC (ISO 6149)

PORT	BSP	SAE	METRIC
P1	G1"	SAE #16	M33x2
T1	G1-1/4"	SAE #20	M42x2
A	G1/2"	SAE #10	M22x1.5
B	G1/2"	SAE #10	M22x1.5
LS	G1/4"	SAE #6	M14x1.5
PM	G1/4"	SAE #6	M14x1.5
TM	G3/8"	SAE #6	M14x1.5
PP	G3/8"	SAE #6	M14x1.5
TD	G3/8"	SAE #6	M14x1.5

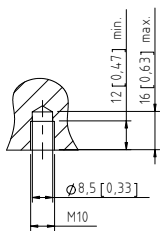
US VIEW SETTING



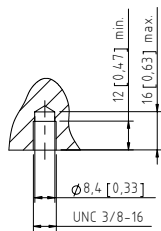
L1	mm	63	106	149	192	235	278	321	364	407	450
	[in]	[2.48]	[4.17]	[5.87]	[7.56]	[9.25]	[10.94]	[12.64]	[14.33]	[16.02]	[17.72]
L2	mm	131	174	217	260	303	346	389	432	475	518
	[in]	[5.16]	[6.85]	[8.54]	[10.24]	[11.93]	[13.62]	[15.31]	[17.01]	[18.70]	[20.39]



Mounting Holes



Standard for housings machined with BSP and Metric ports

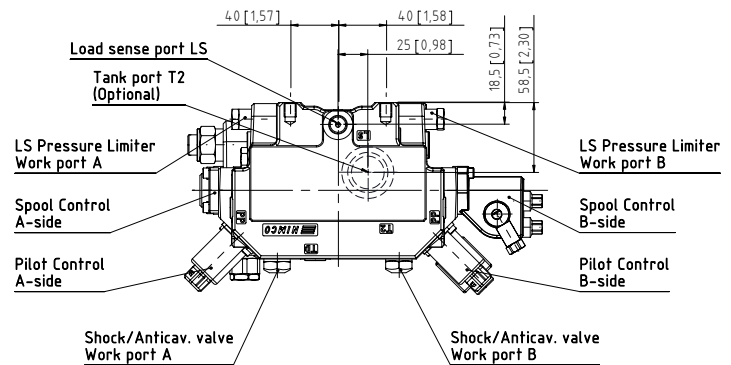


Standard for housings machined with SAE ports

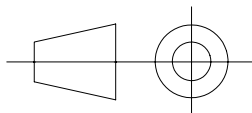
Standard Threads

BSP (ISO 228/1) SAE (ISO 11926) METRIC (ISO 6149)

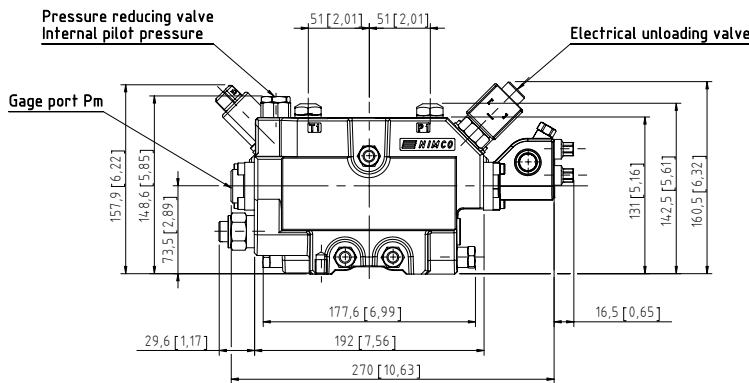
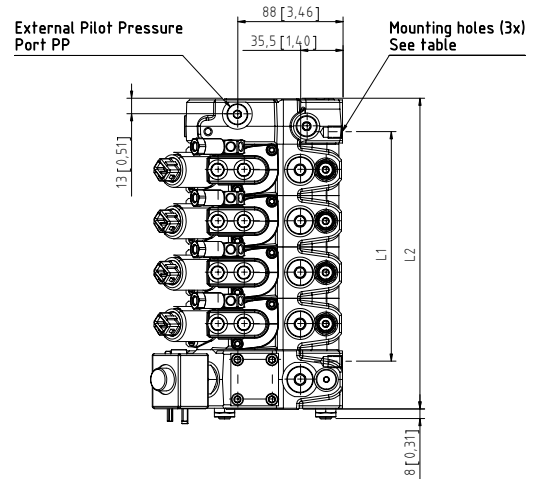
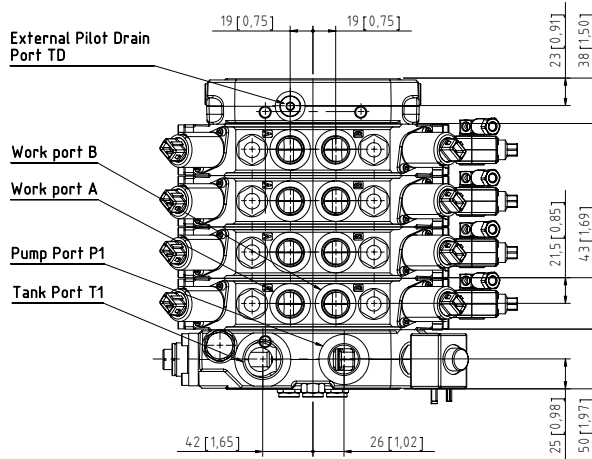
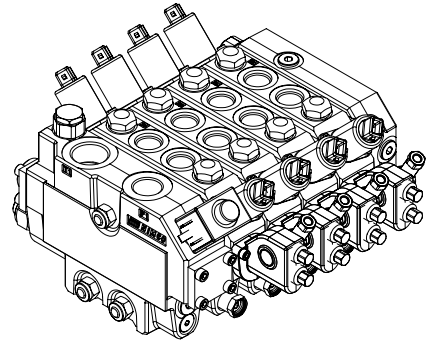
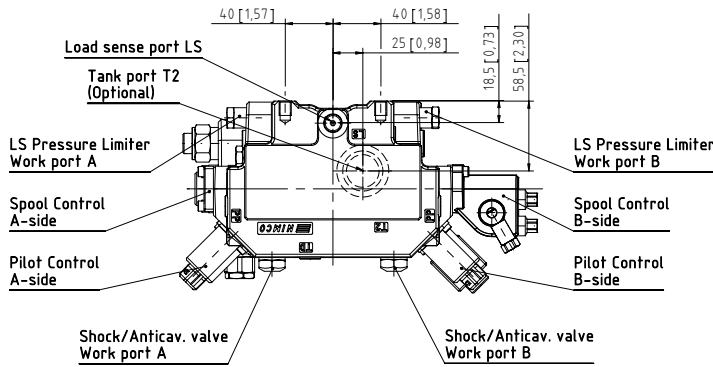
PORT	BSP	SAE	METRIC
P1	G3/4"	SAE #12	M27x2
T1	G1"	SAE #16	M33x2
T2	G1"	SAE #16	M33x2
A	G1/2"	SAE #10	M22x1.5
B	G1/2"	SAE #10	M22x1.5
LS	G1/4"	SAE #6	M14x1.5
PM	G1/4"	SAE #6	M14x1.5
PP	G3/8"	SAE #6	M14x1.5
TD	G3/8"	SAE #6	M14x1.5



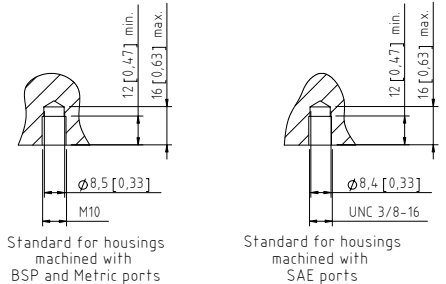
EUROPEAN VIEW SETTING



L1	mm	63	106	149	192	235	278	321	264	407	450
	[in]	[2.48]	[4.17]	[5.87]	[7.56]	[9.25]	[10.94]	[12.64]	[14.33]	[16.02]	[17.72]
L2	mm	131	174	217	260	303	346	389	432	475	518
	[in]	[5.16]	[6.85]	[8.54]	[10.24]	[11.93]	[13.62]	[15.31]	[17.01]	[18.70]	[20.39]



Mounting Holes

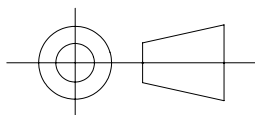


Standard Threads

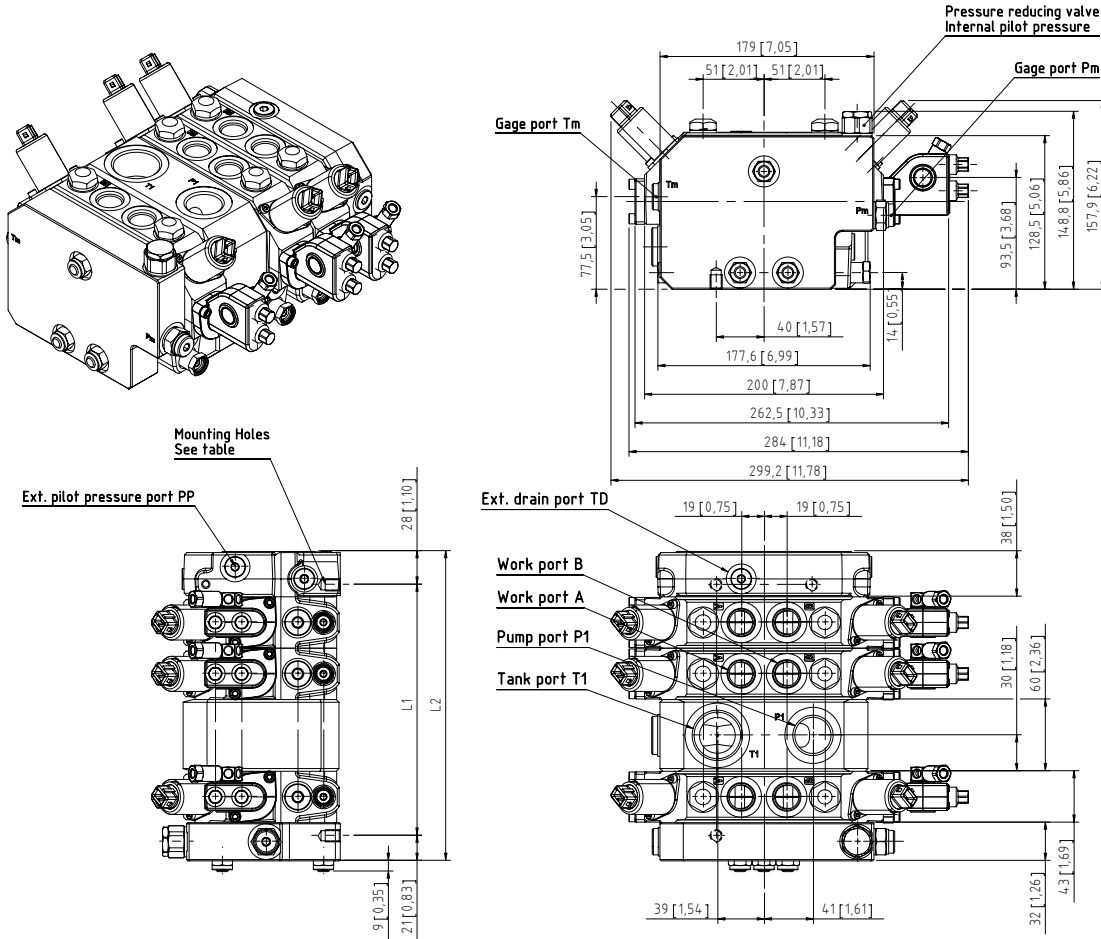
BSP (ISO 228/1) SAE (ISO 11926) METRIC (ISO 6149)

PORT	BSP	SAE	METRIC
P1	G3/4"	SAE #12	M27x2
T1	G1"	SAE #16	M33x2
T2	G1"	SAE #16	M33x2
A	G1/2"	SAE #10	M22x1.5
B	G1/2"	SAE #10	M22x1.5
LS	G1/4"	SAE #6	M14x1.5
PM	G1/4"	SAE #6	M14x1.5
PP	G3/8"	SAE #6	M14x1.5
TD	G3/8"	SAE #6	M14x1.5

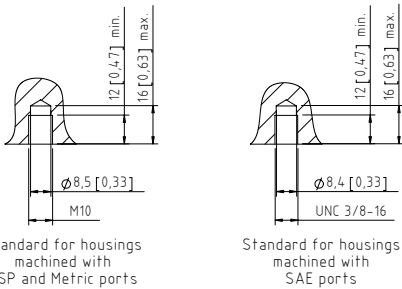
US VIEW SETTING



L1	mm	2	3	4	5	6	7	8	9
	[in]	[6.57]	[8.27]	[9.96]	[11.65]	[13.35]	[15.04]	[16.73]	[18.43]
L2	mm	216	259	302	345	388	431	474	517
	[in]	[8.50]	[10.20]	[11.89]	[13.58]	[15.28]	[16.97]	[18.66]	[20.35]



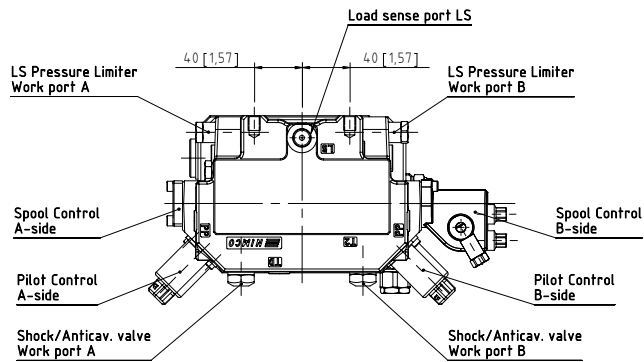
Mounting Holes



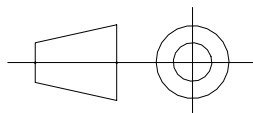
Standard Threads

BSP (ISO 228/1) SAE (ISO 11926) METRIC (ISO 6149)

PORT	BSP	SAE	METRIC
P1	G1"	SAE #16	M33x2
T1	G1-1/4"	SAE #20	M42x2
A	G1/2"	SAE #10	M22x1.5
B	G1/2"	SAE #10	M22x1.5
LS	G1/4"	SAE #6	M14x1.5
PM	G1/4"	SAE #6	M14x1.5
TM	G3/8"	SAE #6	M14x1.5
PP	G3/8"	SAE #6	M14x1.5
TD	G3/8"	SAE #6	M14x1.5



EUROPEAN VIEW SETTING



Enter option codes in the empty fields for desired inlet module, leave the rest blank

Inlet Module		IAF	IAF-S	IAV	IV	IVM
Internal Pilot Pressure Supply						
Pressure reducing valve	PRRV					
None	P					
Electrical Unloading Valve (UAV)						
* 12 VDC	12				•	•
* 24 VDC	24				•	•
** Unloading when no signal to UCV	NO					
** Unloading when no signal to UCV + Man. Override	NO-M					
** Unloading when signal to UCV	NC					
** Unloading when signal to UCV + Man. Override	NC-M					
None	P					
Threads						
BSP	G					
Metric	M					
SAE	S					

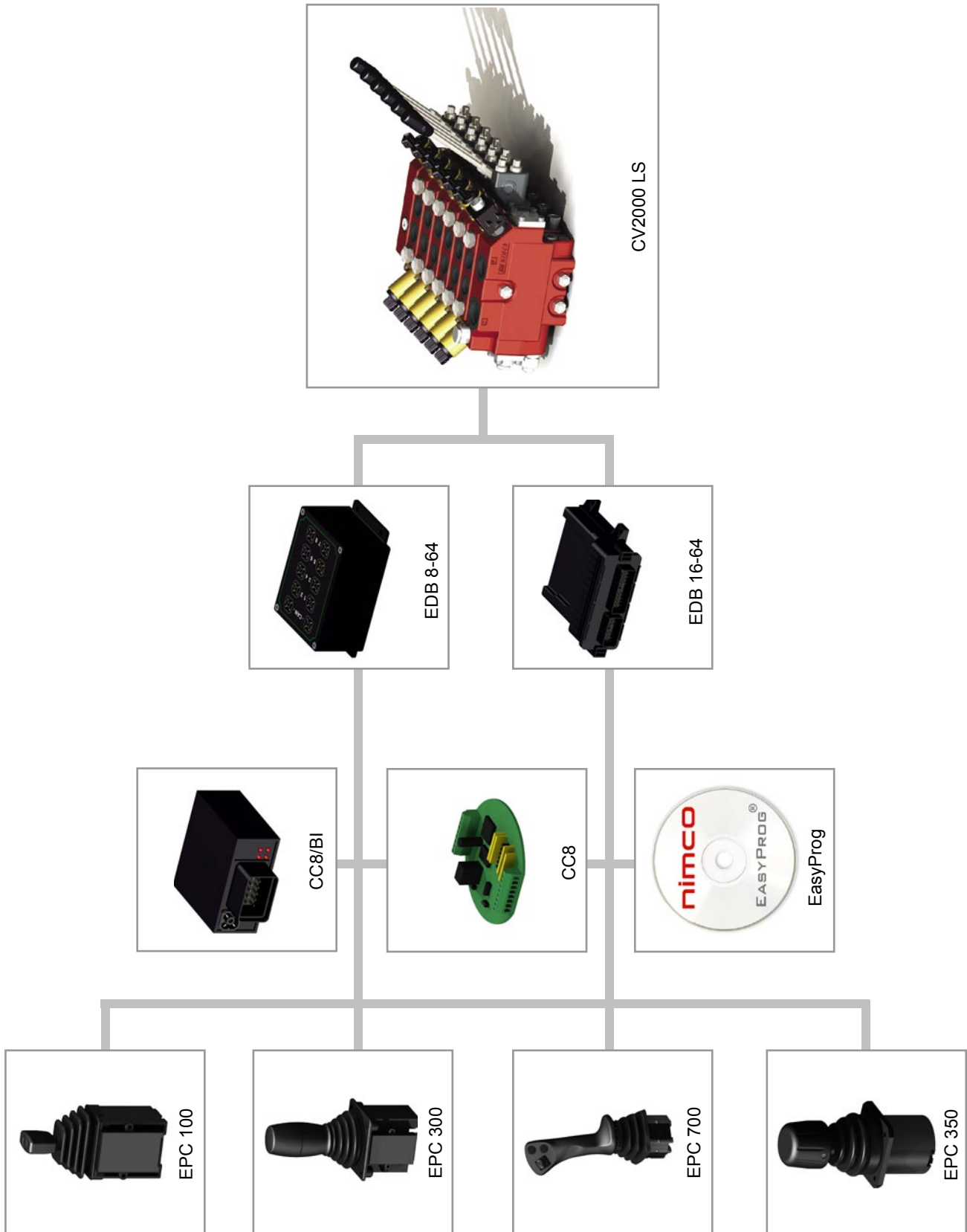
Enter option codes in the empty fields for each individual section of the valve up to the desired number of sections, leave the rest blank

Section Module		1	2	3	4	5	6	7	8	9	10
Section Module											
Post Compensated Section	PS										
Uncompensated Section 60 l/min	US60										
Uncompensated Section 100 l/min	US100										
Spool Code											
See page 15											
Spool Control											
Max Flow Setting (HLB-Q only) in l/min [Usqpm]											
Manual hand lever	HLB										
Manual hand lever with spool stroke limiters	HLB-Q + max. flow setting in l/min [Usqpm]										
Cable control	WB										
Hand Lever Pin											
Yes	S+length [mm]										
None	X										
Pilot Control A-side											
Electric Proportional Solenoid 12 V Junior Timer	SPV-12										
Electric Proportional Solenoid 24 V Junior Timer	SPV-24										
Electric Proportional Solenoid 12 V Deutsch	SPV-12										
Electric Proportional Solenoid 24 V Deutsch	SPV-24										
Explosion Proof El. prop. solenoid 12 V	SPV-EX-12 ■										
Explosion Proof El. prop. solenoid 24 V	SPV-EX-24 ■										
Hydraulic Proportional Control	HP										
None	P										
Pilot Control B-side											
Solenoid 12VDC	SPV-12										
Solenoid 24VDC	SPV-24										
Electric Proportional Solenoid 12 V Deutsch	SPV-12										
Electric Proportional Solenoid 24 V Deutsch	SPV-24										
Explosion Proof El. prop. solenoid 12 V	SPV-EX-12 ■										
Explosion Proof El. prop. solenoid 24 V	SPV-EX-24 ■										
Hydraulic Prop. Control	HP										
None	P										
Secondary Valves A-side (WPV)											
Shock/Anticav-valve	CA+pressure setting in bar [psi]										
Anticav. Valve	A										
None	P										
Secondary Valves B-side (WPV)											
Shock/Anticav-Valve	CA+pressure setting in bar [psi]										
Anticav. Valve	A										
None	P										
Pressure Limiter A-side											
Pressure limiter	PRL+pressure setting in bar [psi]										
None	P										
Pressure Limiter B-side											
Pressure limiter	PRL+pressure setting in bar [psi]										
None	P										
Compensator Unloading A-side											
Compensator unloading port	CU										
None	P										
Compensator Unloading B-side											
Compensator unloading port	CU										
None	P										
Threads											
BSP	G										
Metric	M										
SAE	S										

Enter options codes for desired outlet module in the empty fields, leave the rest blank

Outlet Module		OL	OL-S
LS Pressure Relief Valve			
LS Pressure Relief valve	LSRV+pressure setting in bar [psi]		
None	P		
Load Signal Drain			
Load Signal Drain Valve	FC		
None	P		
Pilot Drain			
External Drain	TD		
Internal Drain	P		
Pilot Pressure			
Internal pilot Pressure	P		
External Pilot Pressure	PP		
Threads			
BSP	G		
Metric	M		
SAE	S		

■ For valves equipped with explosion proof proportional electrical valves as per TÜV marking please add EX at the end of the ordering code stated here.



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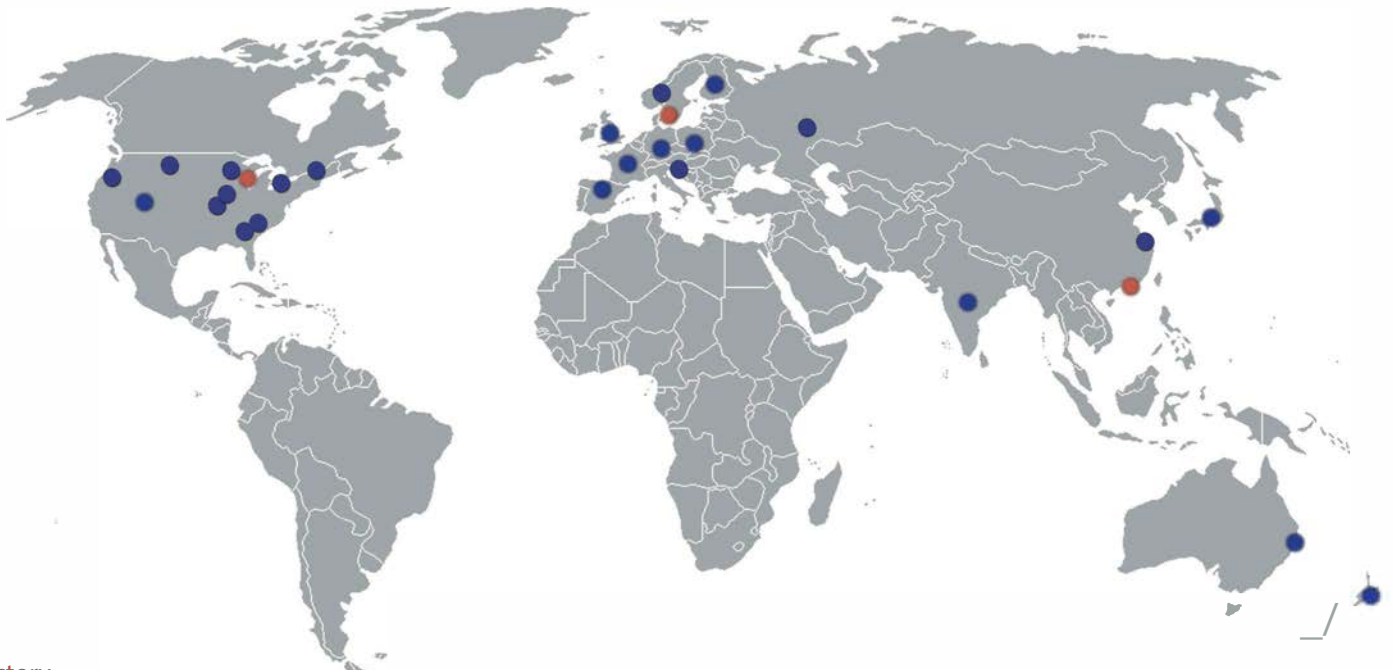
hydraulic systems

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- Factory
- Distributor