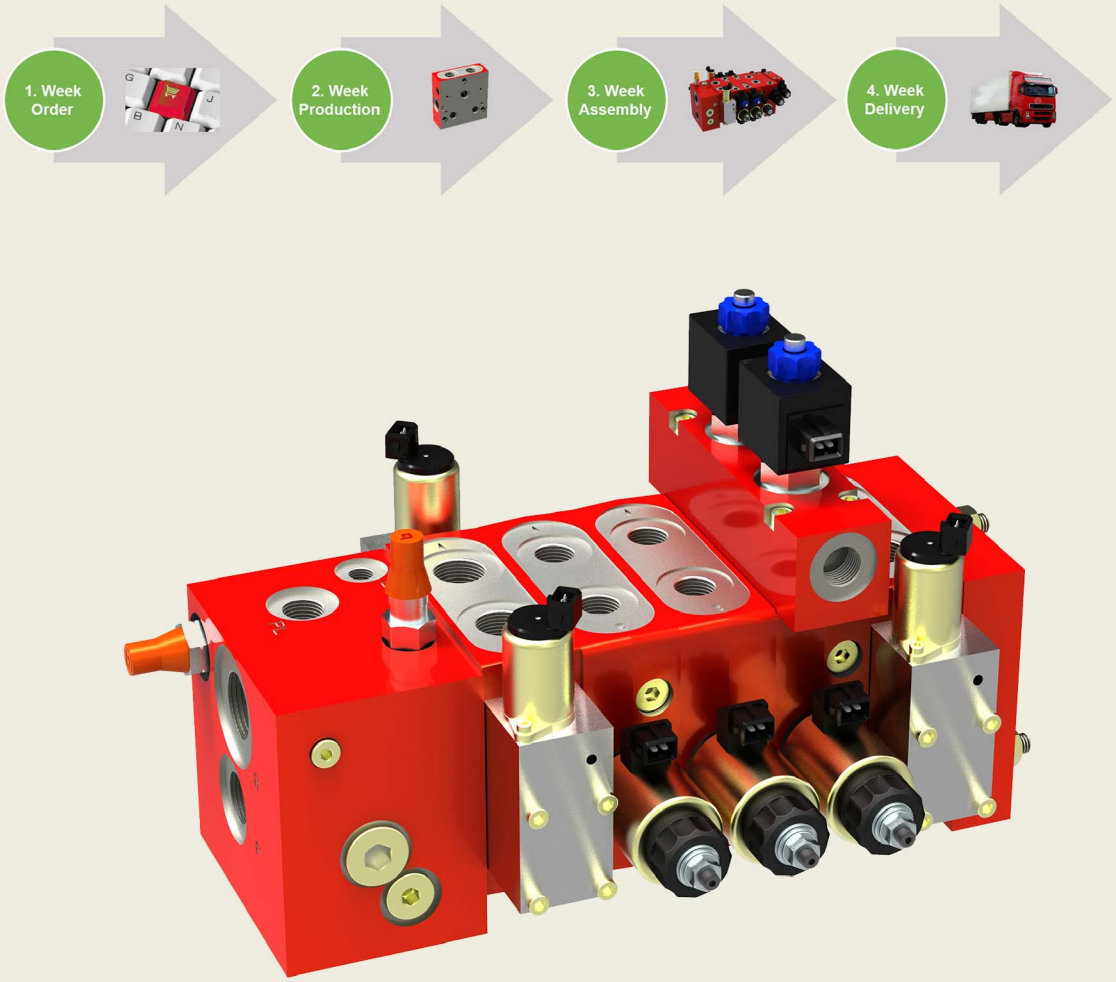
BUCHER hydraulics

Proportional Directional Valves

Series LVS08 and LVS12 – preferred products programme



BUCHER hydraulics

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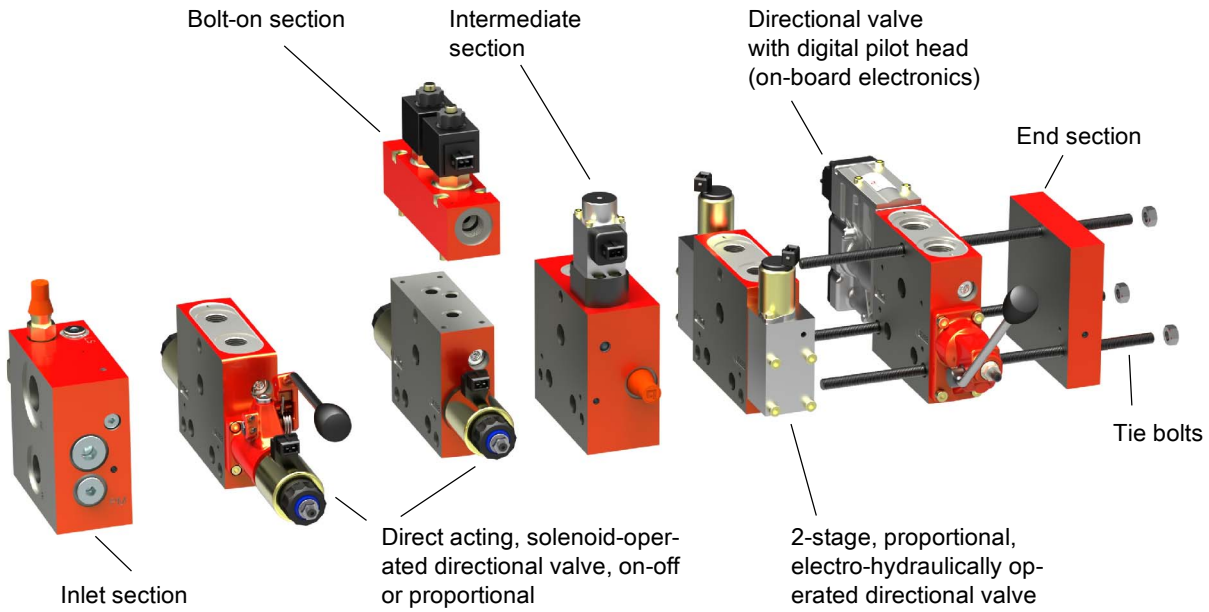
1 General description



Manufacturers of machinery and equipment depend on fast response times and the reliable supply of machine components. By using the preferred-products programme shown in this publication, you benefit from the straightforward ordering and on-time delivery of the fast-moving products from the LVS proportional directional valve modules.

The LVS preferred-products programme offers a targeted selection of valve segments with priority service.

Special-purpose valve sections and detailed information on the extensive range of LVS proportional directional valve modules can be found in our technical data sheet 100-P-000089.

1.1 Advantages

- Easy ordering via email, fax or post
- Short and reliable lead times
- Reduced inventories
- Very good availability of many products
- Flexible response to customer and market requirements
- Adaptable valve-block configuration
- Defined lead time

1.2 Application examples

- Agricultural equipment
- Forestry machines
- Construction equipment
- Transportation and materials handling
- Municipal vehicles and equipment

1.3 Pump systems

1.3.1 System with fixed-displacement pump

The valve block includes a 3-way pressure compensator, directional sections and block termination components. In the neutral position, the 3-way pressure compensator is unloaded to tank and the entire flow being supplied to the valve passes through the 3-way compensator to tank with minimal off-load pressure drop.

When a directional section is operated, the actuator pressure is signalled to the 3-way pressure compensator. The 3-way compensator maintains the Δp at a constant level, so the flow rate is independent of the load and proportional to the open flow area of the metering orifice in the directional valve.

1.3.2 System with variable-displacement pump

In systems with a variable-displacement pump (load-sensing control), as well as the normal P line, the control line is also connected to the pump control. When all directional valves are in the neutral position, the control line is connected to tank and the pump de-strokes. When a directional section is operated, the actuator pressure is signalled to the pump control and the pump goes on-stroke until the defined control Δp is reached.

1.4 Spool types for the directional valve sections

A spool	Actuator shut off from tank in the middle position
D + J spools	Actuator connected to tank in the middle position
4A + 4D spools	For double-acting actuators
3A + 3J spools	For single-acting actuators

1.4.1 Downstream compensator (proportional flow-sharing principle)

When a valve system that is designed on the proportional flow-sharing principle is receiving sufficient pump flow and has adequately-sized inlet lines, it operates functionally just like a system with upstream compensators. But two fundamentally different characteristics distinguish a system with a proportional flow-sharing circuit:

The pressure drop across the spool metering orifice is controlled not by the individual compensator (IDW), but by the most highly loaded actuator via by the system pressure control (pump control or system pressure compensator).

On the individual compensators of the other actuators, the highest system load is reproduced behind the spool metering orifice and thus the system pressure control also applies to these actuators, and the pressure compensators counteract the effects of the different load pressures on each section.

When a system with upstream compensators demands more total flow than the pump can supply, the system only reduces the flow to the actuator with the highest load (until it stops, if necessary).

In the case of downstream compensators, with the supply provided by LS pumps and no inlet compensator, the available LSΔp is used to generate the flow. In contrast to upstream compensators, this can alter the flow rate to all the actuator ports.

In this case, the LSΔp for the pump is split into the Δp loss in the supply line from the pump to the valve block and the effective Δp at the control spool.

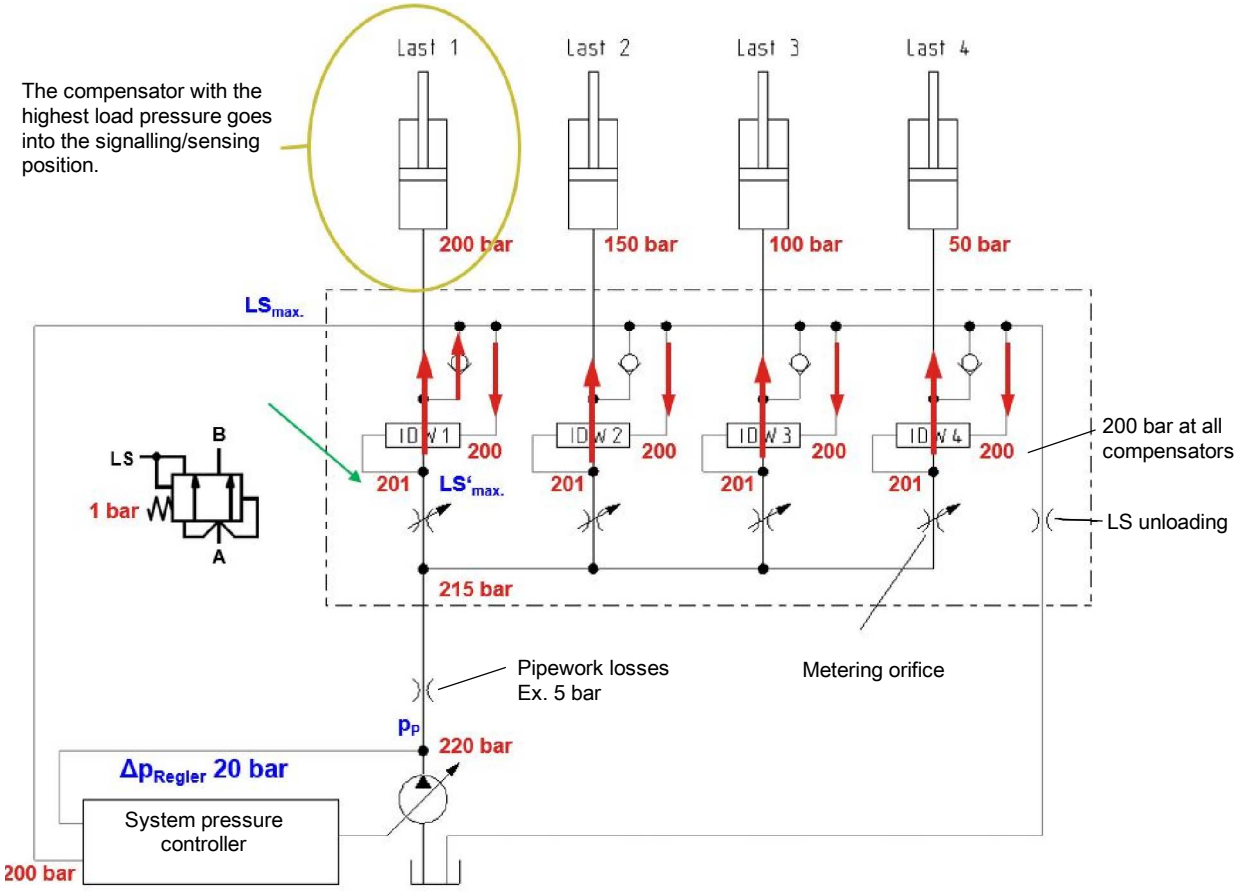
It is important to note that, as the flow rate increases, the Δp split ratio changes.

After the downstream compensators that jointly are supplied by one pump, it must always be the highest load pressure in the system that is signalled i.e. sensed.

Also in the case of several valve blocks, it is always the highest actuator load pressure in the system after all downstream compensators that must be signalled i.e. sensed.

By using an inlet compensator, a constant Δp is maintained, as long as the pump can supply the flow that is required. If the actuator flow demands are higher than the maximum pump delivery, the compensator Δp is no longer reached and the compensator opens completely. The Δp now sets itself automatically, at a level below the compensator Δp.

1.4.2 Example showing a downstream pressure compensator



1.5 General technical data

General characteristics	Unit	Description,value
Fluid temperature	°C	-25 … +80
Viscosity range	mm^2/s	For reliable operation 380 … 10 For rated performance 80 … 20
Minimum fluid cleanliness level		NAS 1638, class 9 or ISO 4406, code 20/18/15
Pressure	bar	**LVS08**: pump port max. 250, actuator port max. 280, tank port max. 200 static **LVS12**: pump port max. 350, actuator port max. 400, tank port max. 50 static (optionally 200)
Flow rate	l/min	Maximum flow at the P inlet = 300 Maximum flow at the actuator ports = 180 with control Δp of 12 bar
Current and voltage		**LVS08:** ON/OFF solenoid 30 W, proportional solenoid 12 V DC / 2.5 A, 24 V DC / 1.25 A at maximum stroke. **LVS12** electrohydraulic: 12 V DC / 1.5 A, 24 V DC / 0.75 A at maximum stroke. Digital pilot head: 12 V DC / 0.6 A, 24 V DC / 0.3 A
Onboard voltage	V DC	Minimum required for ON/OFF solenoids: 10.8 / 21.6 at the coil plug contacts.
Hydraulic fluid		Recommendation: high-quality fluids with a mineral-oil base, such as HLP oils to DIN 51524 part 2. For other fluids (e.g. phosphate esters) please contact Bucher Hydraulics.
Valve block size		Max. 10 directional sections per valve block

2 Inlet sections



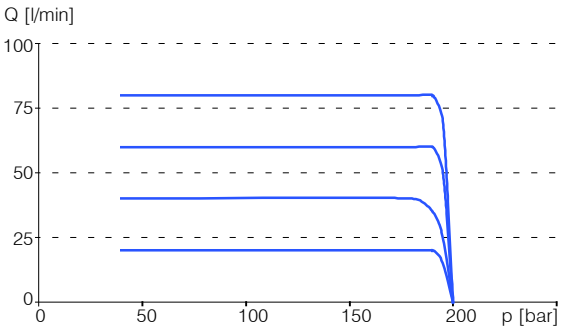
2.1 General technical data

General characteristics	Unit	Description, value
Inlet pressure	bar	max. 350
Nominal flow rate / open-centre systems	l/min	max. 200
Nominal flow rate / closed-centre systems	l/min	max. 260
Nominal flow rate, A and B to T	l/min	max. 300

2.2 Performance graphs

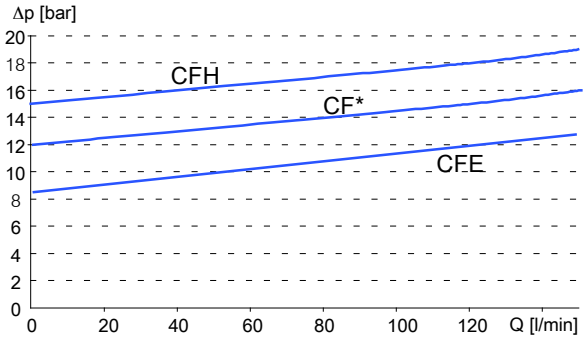
2.2.1 Priority valve

With no flow to downstream actuators
Q [l/min] = priority flow
p [bar} = load pressure at priority actuator



2.2.2 Control curve for the 3-way compensator in the inlet plate

Q [l/min] = flow rate through the block
Δp [bar] = pressure drop from P to LS



2.3 Functions

2.3.1 LS Unloading

The most highly loaded directional valve signals its load pressure to the LS gallery when it is in a working position. In the neutral position, no load is signalled. In the proportional flow-sharing system, all control valves are connected to the same load-sensing pressure. This means that pressure unloading in the neutral position is ensured by a controlled connection to tank (Q_{LSmax} approx. 0.7 l/min).

2.3.2 LS_{max} pressure relief

The LS_{max} pressure relief setting at the valve block must be set below the pressure cut-off setting of the pump. Without this pressure-relief function, all activated actuators stop when any actuator reaches its end-stop. If this is not a disadvantage in a system, the LS_{max} pressure-relief function in the valve block is not required.

IMPORTANT: the pressure setting at the LS pump must be higher than the LS_{max} pressure relief by at least the LS-Δp of the pump (see also 6.4.5)

2.3.3 3-way pressure compensator

The 3-way pressure compensator keeps the pressure difference between the pressure and control galleries inside the block at a constant level. The surplus flow passes to tank or to the surplus-flow port.

2.3.4 2-way pressure compensator

The 2-way compensator is a differential-pressure valve. It is situated inside the block, before the pressure gallery. By reducing the inlet pressure to this valve, the control pressure between the pressure and control galleries inside the block is kept at a constant level. If the pressure in the control line reaches the setting of an upstream pressure-relief valve, the valve shuts off the supply to the block.

2.3.5 Pressure control in P

Direct-acting pressure-relief function in the inlet flow in P.

2.3.6 2-stage pressure relief (only in conjunction with 3-way pressure compensator)

If the pressure in the control line reaches the setting of an upstream pressure-relief valve, the 3-way compensator opens to tank, thus limiting the pressure in the pressure gallery inside the block.

2.3.7 External priority function, with “Dynamic Flow” in the LS line

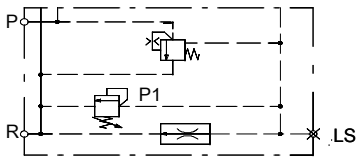
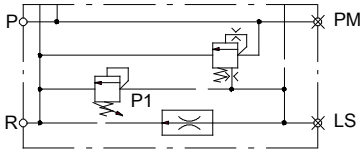
An external actuator always has priority when receiving supply. Only when the external actuator is already being supplied with the required flow is any surplus flow then fed to the valve block. A defined oil flow runs through the LS line to the priority actuator. This has the effect of shortening the priority function's reaction time.

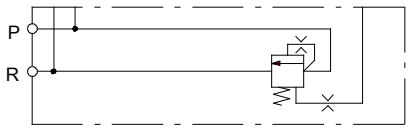
2.3.8 LS pressure relief in the priority flow

If the pressure in the control line reaches the LS pressure-relief setting, the flow to the priority actuator is reduced until the pressure in the LS line equals the setting of the pressure-relief valve. The flow that is no longer required is now available to other actuators.

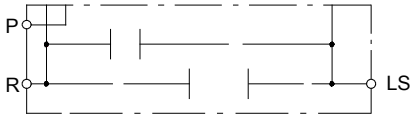
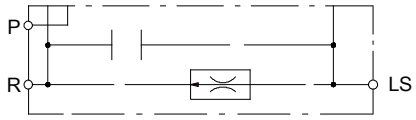
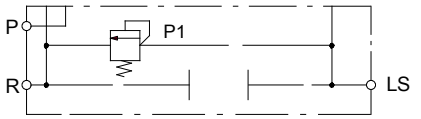
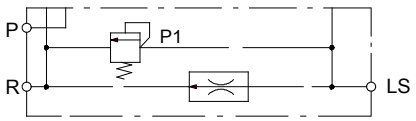
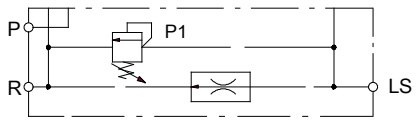
2.4 Overview of sections

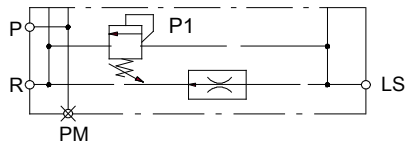
2.4.1 Inlet sections for systems with fixed-displacement pump (open centre)

Symbol	Description	Part number
	**LVS-E-CF*-G110A00/P1=** • 3-way compensator • LS unloading • Two-stage pressure relief, P1 = … • Control Δp = 12 bar • Q_{In} up to 200 l/min • Port threads: P and R = G 1” ⇒ Give the pressure setting P1 in bar with the ordering information This results in P = P1 (LS_{max}) + Δp	100030365
 **Note:** • Ports P and R at top • Test port for P inlet	**LVS-E-CF*-G100A20/P1=** • 3-way compensator • LS unloading • Two-stage pressure relief, P1 = … • Control Δp = 12 bar • Q_{In} = up to 200 l/min • Port threads: P = G ¾”, R = G 1” ⇒ Give the pressure setting P1 in bar with the ordering information This results in P = P1 (LS_{max}) + Δp	100029289

	**LVS-E-CF*-G3/4A79**	**100036392**
Note: • Ports P and R at top • Smaller dimensions	• 3-way compensator • Only use in combination with LVS-A-CE*-G1/4A28/P1=, which has the necessary function: - LS unloading / pressure relief LS_{max}, P1 = • Control Δp = 12 bar • Q_{In} = up to 120 l/min • Port threads: P and R = G ¾”	

2.4.2 Inlet sections for systems with load-sensing pump (closed center)

Symbol	Description	Part number
	**LVS-E-CAP-G110A00**	**100027317**
	• Q_{In} = up to 260 l/min • Port threads: P and R = G1”, LS = G¼”	
	**LVS-E-CB*-G110A00**	**100030496**
	• LS unloading • Q_{In} = up to 260 l/min • Port threads: P and R = G1”, LS = G¼”	
	**LVS-E-CC*-G110A00/P1=**	Ordering code see 2.5.2
	• LS_{max} pressure relief, fixed setting, P1 = e.g. 210 bar • Choice of LS_{max} pressures P1 [bar]: 100, 125, 140, 160, 175, 190, 210, 230, 250 280, 300, 330 • Q_{In} = up to 260 l/min • Port threads: P and R = G1”, LS = G¼” ⇒ Give the pressure setting P1 in bar with the ordering information This results in P = P1 (LS_{max}) + Δp	
	**LVS-E-CE*-G110A00/P1=**	Ordering code see 2.5.2
	• LS unloading • LS_{max} pressure relief, fixed setting, P1 = e.g. 210 bar • Choice of LS_{max} pressures P1 [bar]: 100, 125, 140, 160, 175, 190, 210, 230, 250 280, 300, 330 • Q_{In} = up to 260 l/min • Port threads: P and R = G1”, LS = G¼” ⇒ Give the pressure setting P1 in bar with the ordering information This results in P = P1 (LS_{max}) + Δp	
	**LVS-E-CE*-G110A01/P1=**	**100029646**
	• LS unloading • LS_{max} pressure relief adjustable, P1 = ⇒ • Q_{In} = up to 260 l/min • Port threads: P and R = G1”,LS = G¼” ⇒ Give the pressure setting P1 in bar with the ordering information This results in P = P1 (LS_{max}) + Δp	

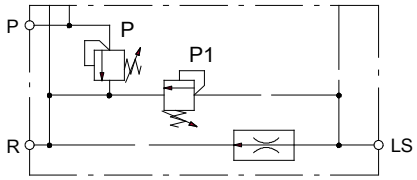


Note:
- Ports P and R at top
- Test port for P inlet

LVS-E-CE*-G100A36/P1=	100031797

- LS unloading
- LS_{max} pressure relief adjustable, P1 = ⇒
- P and T ports positioned on top
- Q_{ln} = up to 200 l/min
- Port threads: P and R = G 1”, PM and LS = G ¼”
- Ordering code, see section 2.5

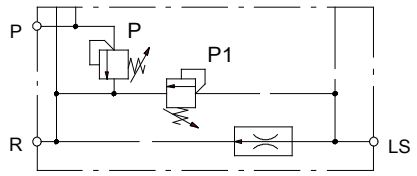
⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 (LS_{max}) + Δp



LVS-E-CE*-G110A48/P=/P1=	100032849

- LS unloading
- LS_{max} pressure relief adjustable, P1= ⇒
- Pressure relief can be set in the P inlet, Q = 140 l/min, P = ⇒
- Q_{ln} = up to 260 l/min
- Port threads: P and R = G1”, LS = G¼”

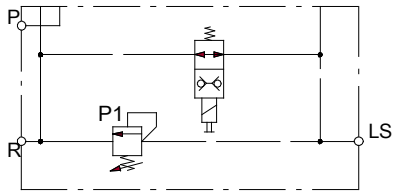
⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 (LS_{max}) + Δp



LVS-E-CE*-G110A42/P=/P1=	100032566

- LS unloading
- LS_{max} pressure relief adjustable, P1= ⇒
- Pressure relief can be set in the P inlet, Q = 60 l/min, P = ⇒
- Q_{ln} = up to 260 l/min
- Port threads: P and R = G1”, LS = G¼”

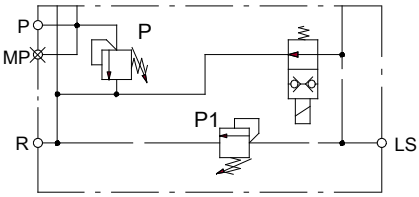
⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 (LS_{max}) + Δp



LVS-E-CCL-G110J12A53/P1= (12 V DC) LVS-E-CCL-G110J24A53/P1= (24 V DC)	100036603 100033188

- Electrical LS-disable via 2/2 seat valve, de-energised open
- LS_{max} pressure relief adjustable, P1= ⇒
- Q_{ln} up to 260 l/min
- Port threads: P and R = G1”, LS = G¼”

⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 (LS_{max}) + Δp

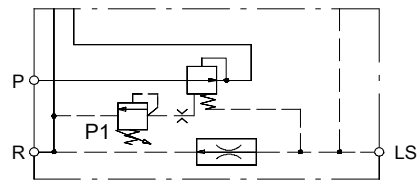


Note:
- Test port for P inlet

LVS-E-CCL-G110J12A48/P=/P1= (12 V DC) LVS-E-CCL-G110J24A48/P=/P1= (24 V DC)	100036604 100033704

- Electrical LS-disable via 2/2 seat valve, de-energised open
- LS_{max} pressure relief adjustable, P1= ⇒
- Q_{ln} up to 260 l/min
- Pressure relief can be set in the P inlet, Q= 140 l/min, P= ⇒
- Port threads: P and R = G1”, LS = G¼”

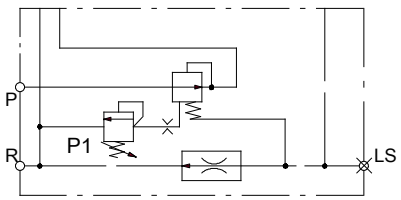
⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 (LS_{max}) + Δp



LVS-E-CF2-G110A00/P1=	100031115

- 2-way compensator
- LS unloading
- Flow cut-off P1 = ⇒
- Control Δp = 12 bar
- Q_{ln} up to 180 l/min
- Port threads: P and R = G1”, LS = G¼”

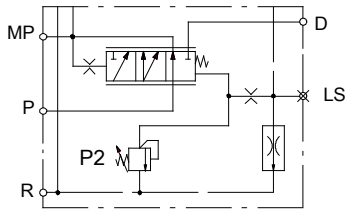
⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 (LS_{max}) + Δp



LVS-E-CF2H-G110A00/P1=	100036559

- LS unloading
- 2-way compensator
- flow cut-off P1 = ⇒
- Control Δp = 15 bar
- Q_{In} up to 260 l/min
- Port threads: P and R = G1”, LS = G¼”

⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 (LS_{max}) + Δp



Note:

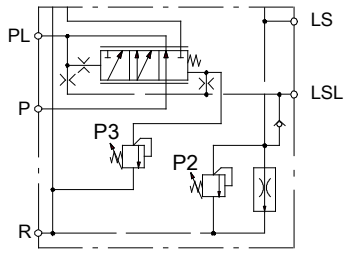
- Test port for P inlet

LVS-E-CME-G101A54/P2=	100032775

- Internal priority function
- Control Δp = 9 bar
- LS unloading
- LS_{max} pressure relief, priority flow, P2= ⇒
- Q_{In} up to 200 l/min, Q_D up to 80 l/min
- Port threads: P and R = G1”, MP and LS=G¼“

⇒ Give the pressure setting P2 in bar with the ordering information
This results in P = P2 (LS_{max}) + Δp

Priority function:
The LVS valve sections mounted after the inlet section are given priority supply. The maximum pressure of the prioritised flow can be set. The surplus flow is available at port D.



LVS-E-CGE-G100A00/P2=/P3=	100027273

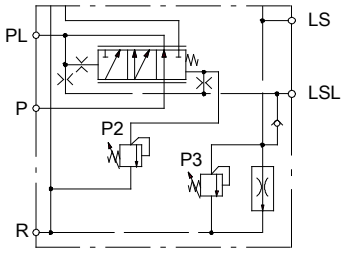
- LS unloading
- LS_{max} pressure relief, priority flow, P2 = … adjustable
- LS_{max} pressure relief, surplus flow, P3 = … adjustable
- Control Δp = 9 bar
- Q_{In} up to 200 l/min, Q_D up to 80 l/min
- Port threads: P and R = G1”, PL = G1/2”, LS and LSL = G1/4”

⇒ Give the pressure settings P2 and P3 in bar with the ordering information
This results in P = P2/3 (LS_{max}) + Δp

Description:
The priority function is routed via port PL to a prioritised external actuator and is load-independent, thanks to the pressure compensator. The maximum pressure of the prioritised flow can be limited with the P2 pressure relief function. The surplus flow is available to the LVS directional valves downstream of the inlet section. The maximum pressure can be set with P3 (must be higher than the priority pressure).

Dynamic LS:
- Application with Orbitrol

At port LSL there is a permanent flow of control oil of about 0.8 l/min. This is mostly used in systems with a steering function.
If another valve block is connected to PL, there must be no dynamic LS (= specify assembly variant when ordering).



LVS-E-CGH-G110A00/P2=/P3=	100036560

- LS unloading
- With/without dynamic LS
- LS_{max} pressure relief, priority flow, P2 = ⇒
- LS_{max} pressure relief, surplus flow, P3 = ⇒
- Control Δp = 15 bar
- Q_{In} up to 260 l/min, Q_D up to 160 l/min
- Port threads: P and R = G1",PL= G½", LS and LSL=G¼"

⇒ Give the pressure settings P2 and P3 in bar with the ordering information
This results in P = P2/3 (LS_{max}) + Δp

Description:
The priority function is routed via port PL to a prioritised external actuator and is load-independent, thanks to the pressure compensator. The maximum pressure of the prioritised flow can be limited with the P2 pressure relief function. The surplus flow is available to the LVS directional valves downstream of the inlet section. The maximum pressure can be set with the P3 pressure relief function (must be higher than the priority pressure).

Dynamic LS:

- Application with Orbitrol

At port LSL there is a permanent flow of control oil of about 0.8 l/min. This is mostly used in systems with a steering function.
If another valve block is connected to PL, there must be no dynamic LS (= specify assembly variant when ordering).

2.5 Ordering information

2.5.1 Overview of products, with part number

Model code	Part number	Model code	Part number
LVS-E-CF*-G110A00/P1=	100030365	LVS-E-CCL-G110J12A53/P1=	100036603
LVS-E-CF*-G100A20/P1=	100029289	LVS-E-CCL-G110J24A53/P1=	100033188
LVS-E-CF*-G3/4A79	100036392	LVS-E-CCL-G110J12A48/P=/P1=	100036604
LVS-E-CAP-G110A00	100027317	LVS-E-CCL-G110J24A48/P=/P1=	100033704
LVS-E-CB*-G110A00	100030496	LVS-E-CF2-G110A00/P1=	100031115
LVS-E-CE*-G110A01/P1=	100029646	LVS-E-CF2H-G110A00/P1=	100036559
LVS-E-CE*-G100A36/P1=	100031797	LVS-E-CME-G101A54/P2=	100032775
LVS-E-CE*-G110A48/P=P1=	100032849	LVS-E-CGE-G100A00/P2=/P3	100027273
LVS-E-CE*-G110A42/P=P1=	100032566	LVS-E-CGH-G110A00/P2=/P3=	100036560

2.5.2 Accessories

Deliverable accessories see paragraph 12

2.5.3 Ordering code for LVS-E-CC*-G110A00/P1=… and LVS-E-CE*-G110A00/P1=…

White fields = data specified by Bucher Hydraulics
Grey fields = data from the overview of sections

LVS	-	E	-	*	-	G110	A	00	/	P1=

Inlet section

Function:
with LS unloading, with LS_{max} pressure relief = **CE***
without LS unloading, with LS_{max} pressure relief = **CC***

Port threads to DIN 3852 - Part 2

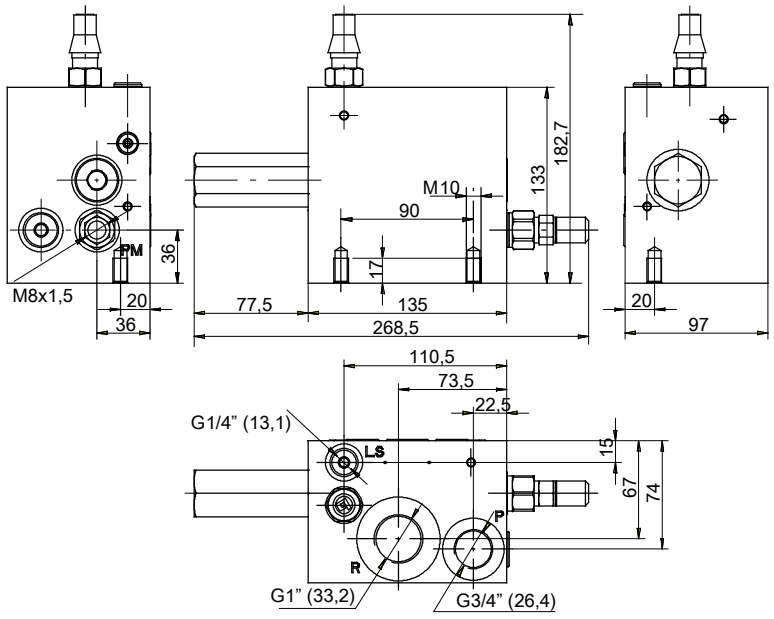
Design stage

Option

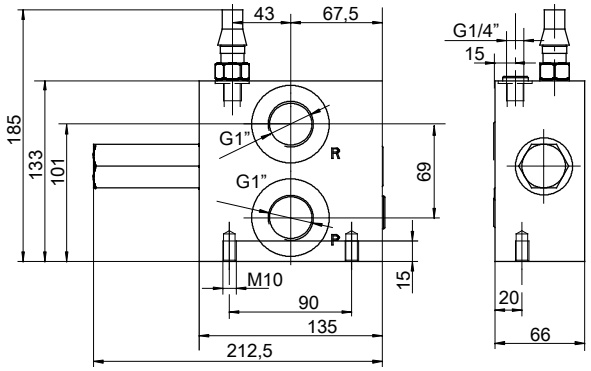
LS_{max} pressure setting P1 (in bar):
100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300, 330

2.6 Dimensions

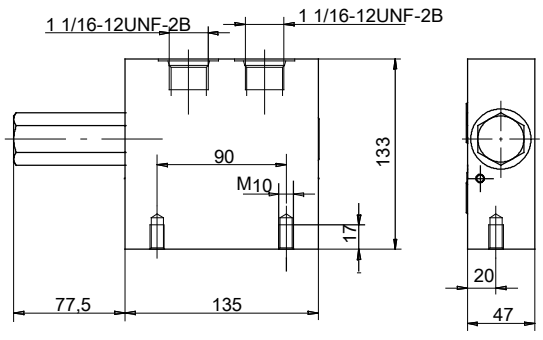
2.6.1 LVS-E-CF*-G100A20



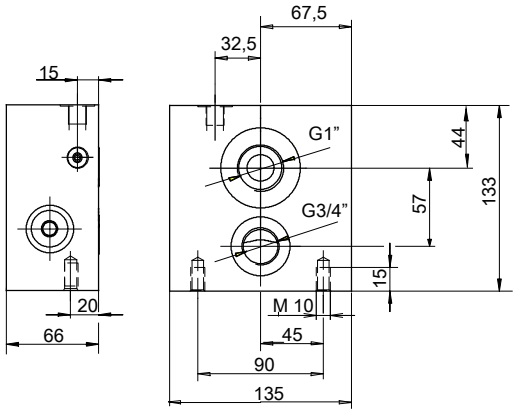
2.6.2 LVS-E-CF*-G110A00



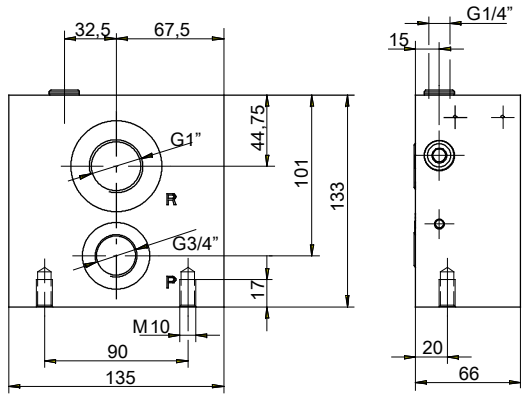
2.6.3 LVS-E-CF*-G3/4A79



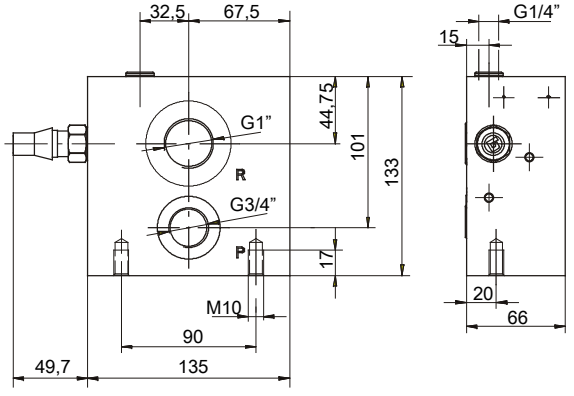
2.6.4 LVS-E-CAP-G110A00



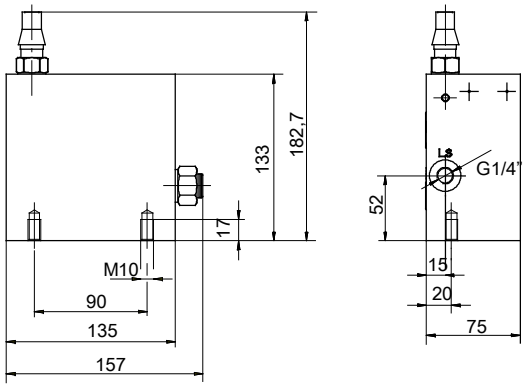
2.6.5 LVS-E-CB*-G110A00



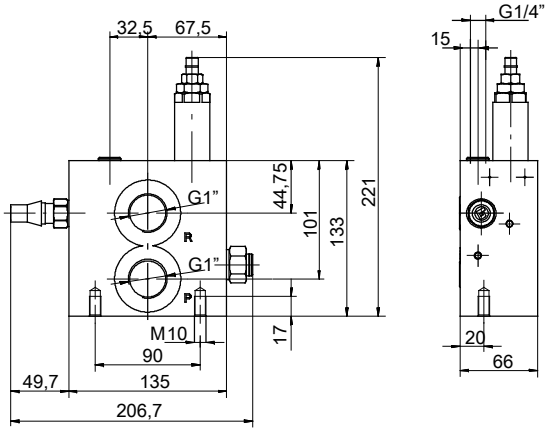
2.6.6 LVS-E-CE*-G110A01



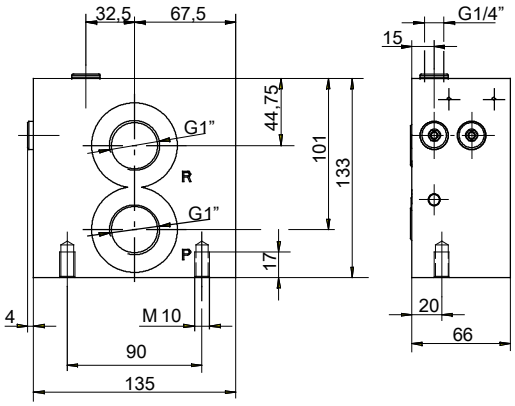
2.6.7 LVS-E-CE*-G100A36



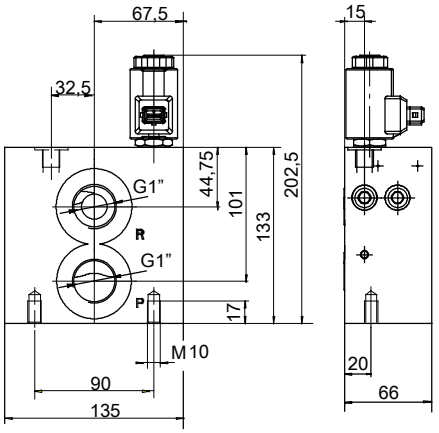
2.6.8 LVS-E-CE*-G110A48



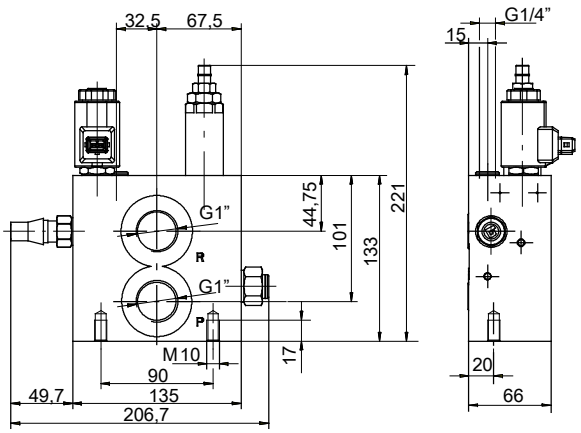
2.6.9 LVS-E-CE*-G110A42



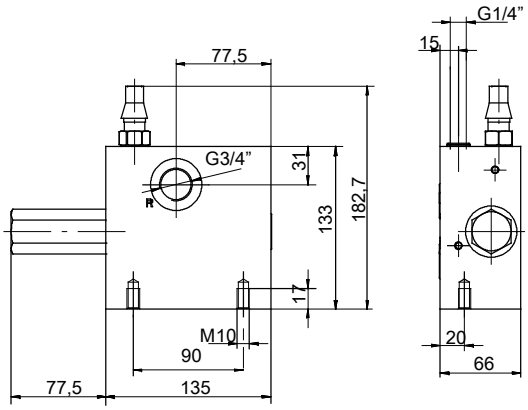
2.6.10 LVS-E-CCL-G110J12A53
LVS-E-CCL-G110J24A53



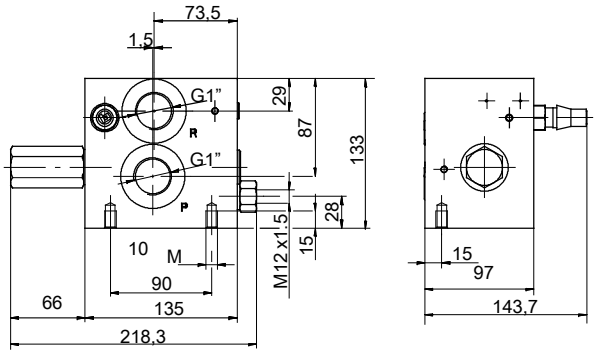
2.6.11 LVS-E-CCL-G110J12A48
LVS-E-CCL-G110J24A48



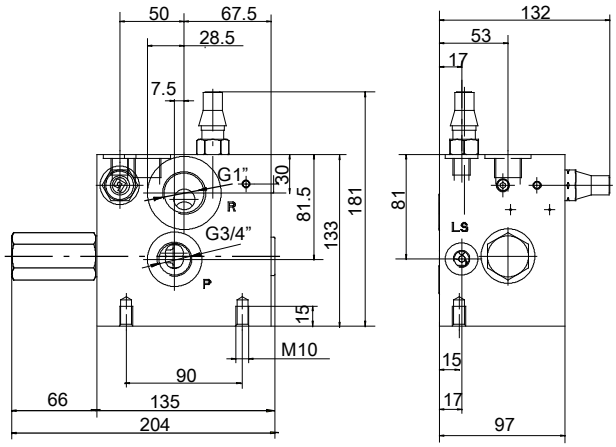
2.6.12 LVS-E-CF2-G110A00
LVS-E-CF2H-G110A00



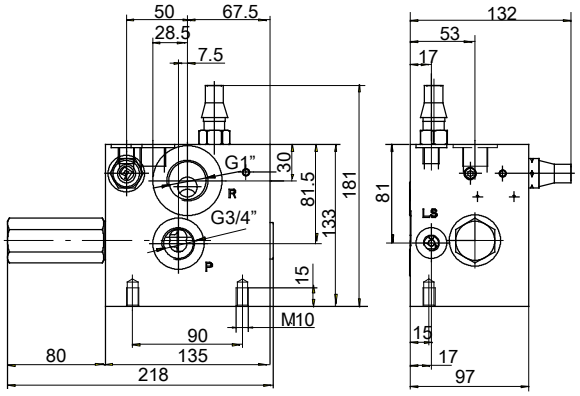
2.6.13 LVS-E-CME-G101A54



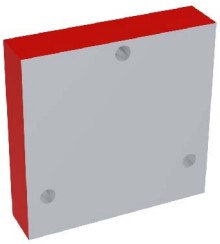
2.6.14 LVS-E-CGE-G100A00



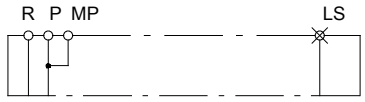
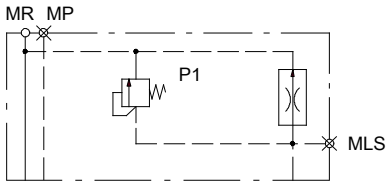
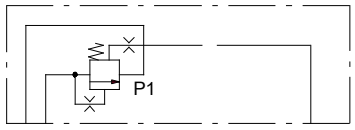
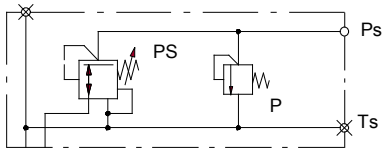
2.6.15 LVS-E-CGH-G110A00

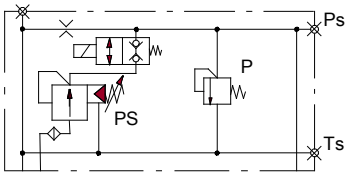


3 End sections



3.1 Overview of sections

Symbol	Description	Part number
	**LVS-A-CA*-****A00**	**100027983**
	• No control function	
	**LVS-A-CA*-G110A10**	**100030024**
	• No control function • Ports: P = G 1“ R = G 1” LS = G ¼“ MP = G ¼“	
	**LVS-A-CA*-G1/2A07**	**100026845**
	• No control function • Test ports MP = G¼” MR = G ½” MLS = G ¼“	
	**LVS-A-CE*-G1/2A07/P1=**	**Ordering code see 3.2.2**
	• Choice of LS_{max} pressures [bar]: 100, 125, 140, 160, 175, 190, 210, 230, 250 280, 300, 330 • LS_{max} pressure relief, P1= ⇒ • LS unloading • Test ports: MR = G ½“ MP = G ¼“ MLS = G ¼“ ⇒ Give the pressure settings P1 in bar with the ordering information This results in P = P1 (LS_{max}) + Δp	
	**LVS-A-CF*-****A12**	**100032468**
	• 3-way compensator • Q = 120 l/min • Control Δp 12 bar	
	**LVS-A-CS*-G3/4A00/P=100/P1=**	**100027293**
	• 3-way pressure reducing function for external use • Safety pressure relief P = 100 bar • Adjustment range of the pressure reducing valve PS = 20 to 90 bar (specify required setting in plain text on the order)	



LVS-A-CSA-G3/4J12A30/P=50/P1= LVS-A-CSA-G3/4J24A30/P=50/P1=	100036605 100036522

- Preferably in combination with LVS OBE (Onboard Electronics)
- 2-way pressure reducing valve
- 2/2 seat valve in the reduced pressure zone for switch-off of control oil
- Filter insert in control-oil region
- Safety pressure relief P = 50 bar
- Adjustment range of the pressure reducing valve PS = 15 to 30 bar (specify required setting in plain text on the order)

3.2 Ordering information

3.2.1 Overview of products, with part number

Model code	Part number	Model code	Part number
LVS-A-CA*-****A00	100027983	LVS-A-CS*-G3/4A00/P=100/P1=	100027293
LVS-A-CA*-G110A10	100030024	LVS-A-CSA-G3/4J12A30/P=50/P1=	100036605
LVS-A-CA*-G1/2A07	100026845	LVS-A-CSA-G3/4J24A30/P=50/P1=	100036522
LVS-A-CF*-****A12	100032468		

3.2.2 Ordering code for LVS-A-CE*-G1/2A07/P1=

☐ White fields = data specified by Bucher Hydraulics
▩ Grey fields = information on LS_{max} pressure in bar

LVS - A - CE* - G1/2 A 07 / P1= ___

End section

Function

Port threads to DIN 3852 - Part2

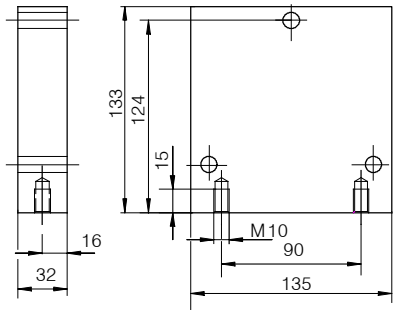
Design stage

Option

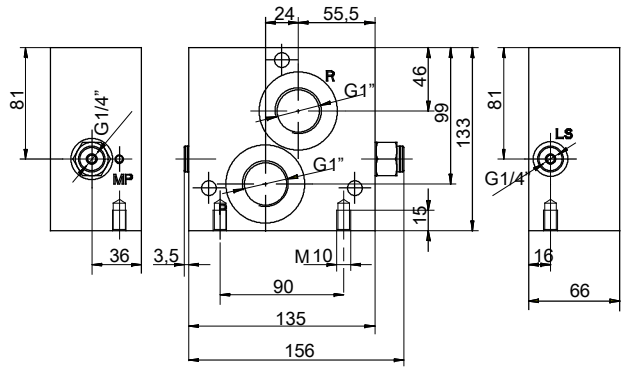
LS_{max} pressure setting P1 (in bar):
100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300, 330

3.3 Dimensions

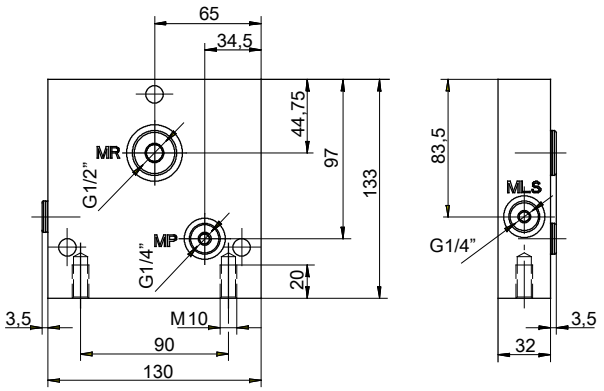
3.3.1 LVS-A-CA*-****A00



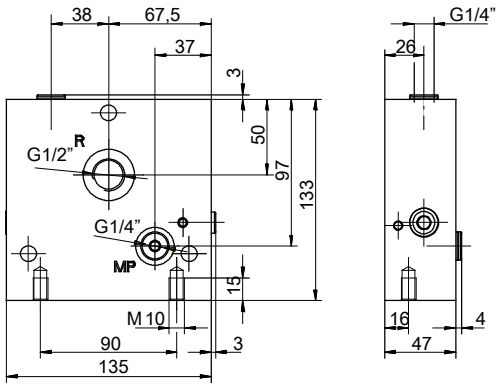
3.3.2 LVS-A-CA*-G110A10



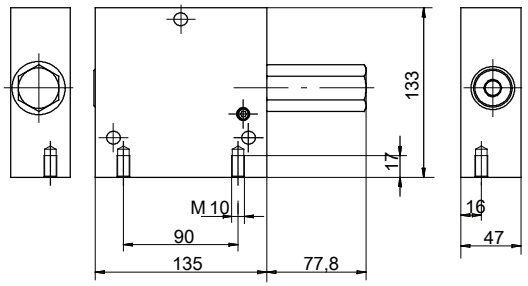
3.3.3 LVS-A-CA*-G1/2A07



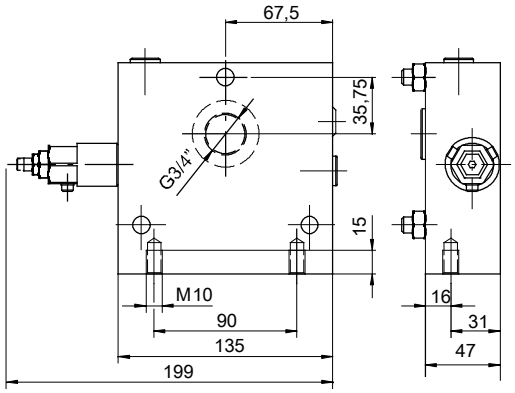
3.3.4 LVS-A-CE*-G1/2A07



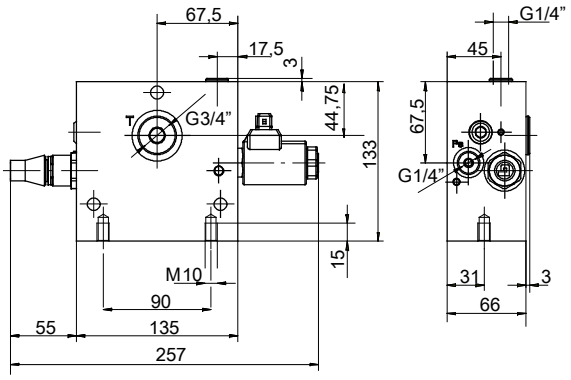
3.3.5 LVS-A-CF*-****A12



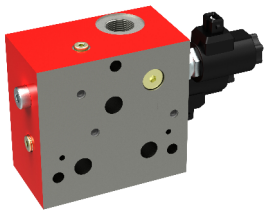
3.3.6 LVS-A-CS*-G3/4A00

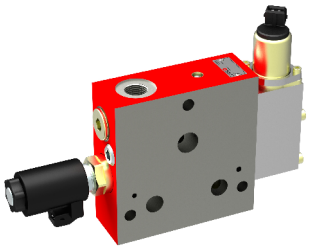


3.3.7 LVS-A-CSA-G3/4J12A30
LVS-A-CSA-G3/4J24A30



4 Intermediate sections

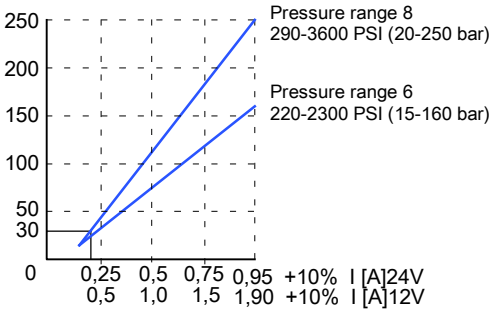




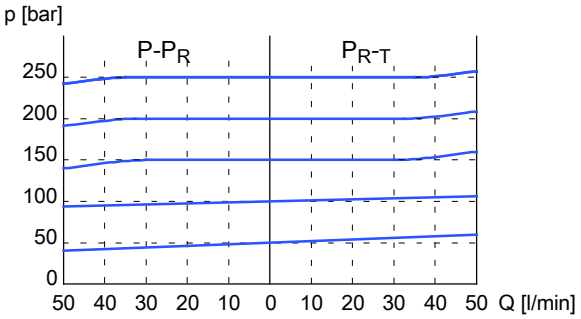
4.1 Performance graphs

4.1.1 Adjustment range of 3-way proportional pressure-control valve

I [A] = solenoid current



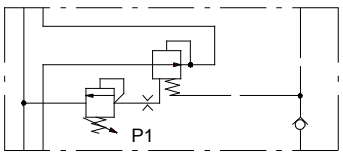
4.1.2 Control characteristic as a function of flow rate



4.1.3 Leakage in working position, incl. pilot flow

Primary pressure	[bar]	50	100	200	300
Q_{Lv}	[cm^3/min]	235	245	250	260

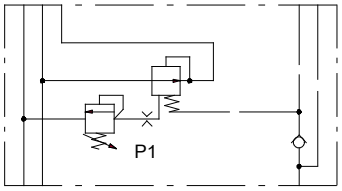
4.2 Overview of sections

Symbol	Description	Part number
	LVS-Z-CF2-****A00/P1=	100031656

Description:
2-way compensator for a lower p_{max} in the downstream part of the block, pressure is adjustable

- 2-way pressure compensator
- LS unloading
- Control Δp 12 bar
- Flow cut-off adjustable P1= ⇒
- Q_{Nom} up to 180 l/min

⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 + 12 bar

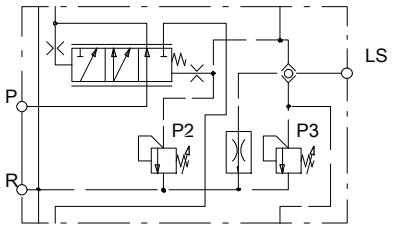


LVS-Z-CF2-****A08/P1=	100032467

Description:
2-way compensator for a lower p_{max} in the downstream part of the block, but only for actuator port B. The A actuator ports are not affected.

- 2-way pressure compensator / LS unloading / control Δp 12 bar
- Flow cut-off adjustable, P1= ⇒
- Q_{Nom} up to 180 l/min

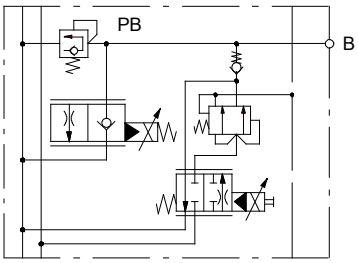
⇒ Give the pressure setting P1 in bar with the ordering information
This results in P = P1 + 12 bar



LVS-Z-CME-G3/4A10/P2=/P3=	100035201

Description:
Priority function – the parts of the block downstream of this intermediate section are given priority supply. The surplus flow supplies the part of the block upstream of the intermediate section. The maximum pressure of the surplus flow is set with an LS_{max} pressure relief function. The maximum pressure of the prioritised flow can be limited with the P2 pressure relief function. The surplus flow is available to the LVS directional valves downstream of the inlet section. The maximum pressure can be set with the P3 pressure relief function.

- Internal priority function / LS unloading / control Δp 9 bar
- LS_{max} pressure relief, priority flow, P2 =… / surplus flow, P3 = …
- Q_{In} up to 180 l/min



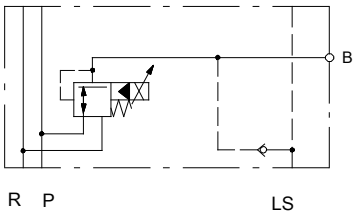
LVS-Z-BHR…-G1/2…A00/P=…	Ordering code see 4.3.2

- Hitch control valve
- Choice of actuator flow rates [l/min]: 16, 25, 40, 50, 63, 80, 100
- Choice of pressure ranges PB [bar]:
  50, 63, 80, 100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300 330

Description:
Two-stage, proportional, electrohydraulic 3/3 directional valve for single-acting, leak-free functions. The actuator flow rate is set by the proportional, electrohydraulic pilot valve. A throttle valve in the return line enables a practically load-independent lowering speed. The pressure relief PB protects the actuators from undue pressure peaks.

LVS-Z-SA10-****A00	100032554

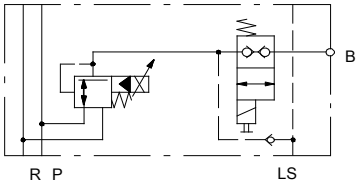
Description:
This spacer plate (10 mm) is recommended for use in combination with directional valve sections when 30S fittings are used.



LVS-Z-PDRA8FJ-G1/2A00 (12 V DC)	100029118

Description:
3-way proportional pressure control of actuators; preferred in applications that require a supporting or counterbalancing pressure. Ex. ground-guided equipment such as snow ploughs, mowers, harvesting systems, ...

- 3-way pressure reducing valve
- Controllable pressure range 20-250 bar
- $Q_{Actuator}$ = 40 l/min
- Port thread B = G =½”



LVS-Z-PDRC6FJ-G1/2A00 (12 V DC)	100031117

Description:
3-way proportional pressure control of actuators; preferred in applications that require a supporting or counterbalancing pressure. Ex. ground-guided equipment such as snow ploughs, mowers, harvesting systems, ...

- 3-way pressure reducing valve with seat valves on the actuator side
- Controllable pressure range 15-160 bar
- $Q_{Actuator}$ = 40 l/min
- Port thread B = G ½“

4.3 Ordering information

4.3.1 Overview of products, with part number

Model code	Part number	Model code	Part number
LVS-Z-CF2-****A00/P1=	100031656	LVS-Z-SA10-****A00	100032554
LVS-Z-CF2-****A08/P1=	100032467	LVS-Z-PDRA8FJ-G1/2A00	100029118
LVS-Z-CME-G3/4A10/P2=/P3=	100035201	LVS-Z-PDRC6FJ-G1/2A00	100031117

4.3.2 Accessories

Deliverable accessories see paragraph 12

4.3.3 Ordering code for LVS--Z-BHR…-G1/2…A00/P=…

☐ White fields = data specified by Bucher Hydraulics
▩ Grey fields = data from the overview of sections

LVS - Z - BHR ☐☐ - G1/2 - ☐☐ A00 / PB= ☐☐☐

Intermediate section

Function

Actuator flow rate
16, 25, 40, 63, 80 and 100 l/min = **016 - 100**

Port threads to DIN 3852 - Part 2 B = G1/2“

Plug type AMP Junior Timer = **J** Deutsch plug = **T**

Supply voltage 12V DC = **12** 24V DC = **24**

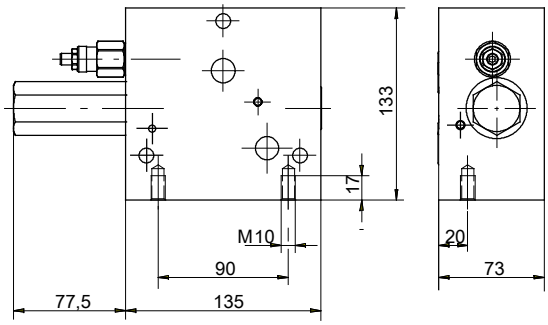
Design stage

Option

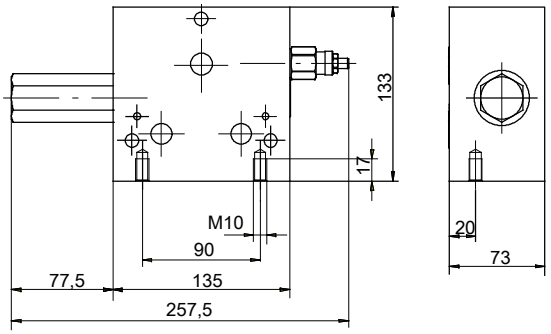
Pressure range PB (in bar): 50, 63, 80, 100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300 and 330

4.4 Dimensions

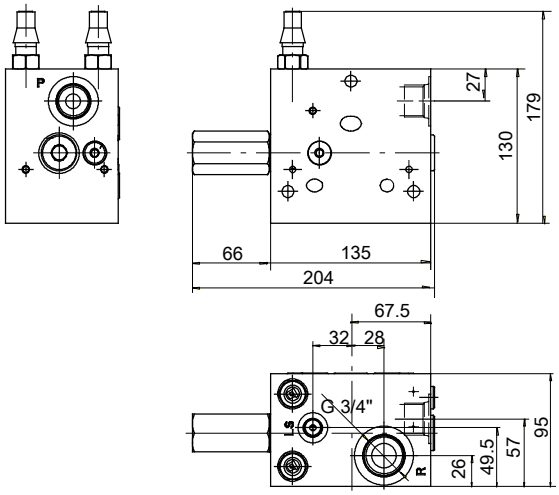
4.4.1 LVS-Z-CF2-****A00



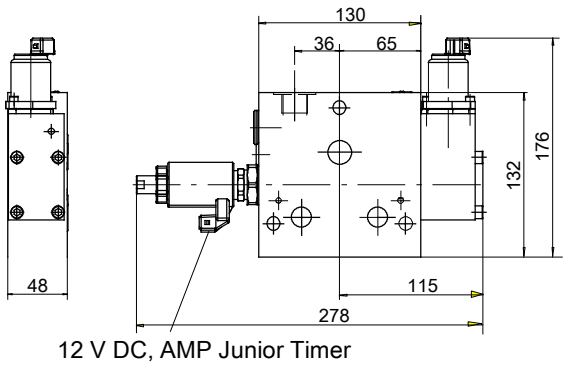
4.4.2 LVS-Z-CF2-****A08



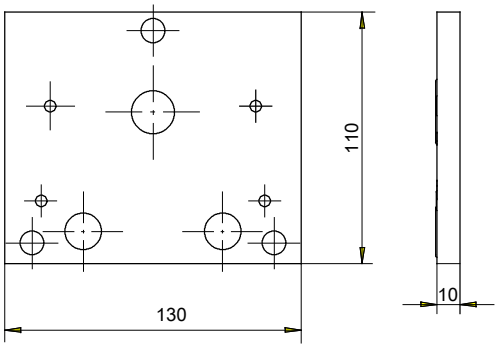
4.4.3 LVS-Z-CME-G3/4A10



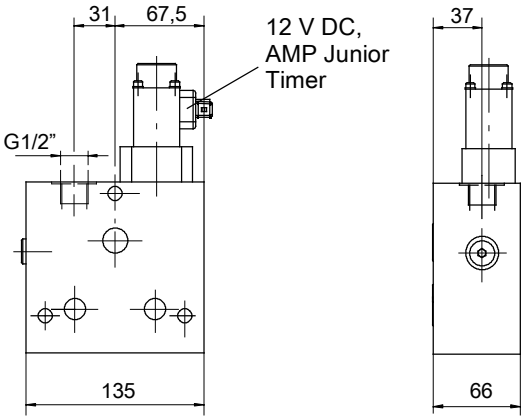
4.4.4 LVS-Z-BHR100-G1/2J12A15



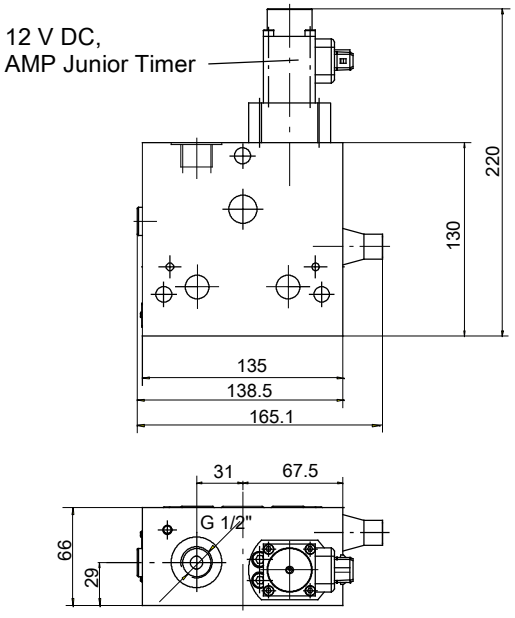
4.4.5 LVS-Z-SA10-****A00



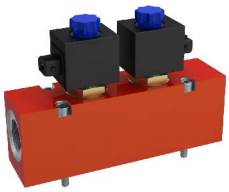
4.4.6 LVS-Z-PDRA8FJ-G1/2A00



4.4.7 LVS-Z-PDRC6FJ-G1/2A00



5 Bolt-on plates sections (only with LVS08)



5.1 Function

5.1.1 Load-control valve

These bolt-on load control valves, with integral anti-shock function, ensure load-independent lowering motion at speeds determined by the inlet flow, with leak-free shut-off when the directional valve is in its neutral position. The anti-shock valve setting should preferably be between 100% and 200% of the highest load pressure. Turning the adjusting screw in the clockwise direction reduces the setting, and this can also be used for emergency lowering of the load.

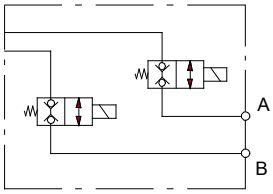
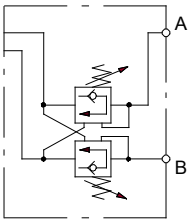
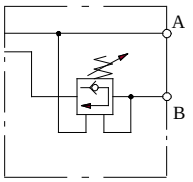
5.1.2 Seat valves

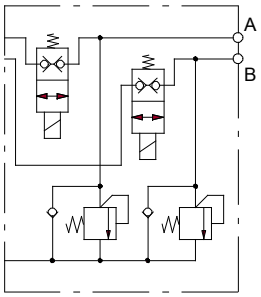
These solenoid-opened seat valves shut off the actuator lines with zero leakage.

5.1.3 Seat valves with pressure relief and make-up valve

These solenoid-opened seat valves with service line pressure relief and make-up valves shut off the actuator lines with zero leakage and protect the actuator from unacceptably large pressure peaks.

5.2 Overview of sections

Symbol	Description	Part number
	**LVSPRE-ZVAZVB-21-J12-A00** **LVSPRE-ZVAZVB-21-J24-A00**	**100033813** **100026981**
	Description: Bolt-on plate with double seat valve. These solenoid-opened seat valves shut off the actuator lines with zero leakage. • Q_{max} = 50 l/min • Port threads G½”	
	**LVSPBH-S30-S30-21-A00/P=**	**100031107**
	Description: These bolt-on load control valves, with integral anti-shock function, ensure load-independent lowering motion at speeds determined by the inlet flow, with leak-free shut-off when the directional valve is in its neutral position. • Load-holding valve in actuator ports A and B • Pressure setting of anti-shock valves PA and PB is adjustable • Q_{max} = 50 l/min • Pilot ratio of the load-holding valves = 3:1 • Port threads G½”	
	**LVSPBH-***-S30-21-A00/P=**	**100029653**
	Description: These bolt-on load control valves, with integral anti-shock function, ensure load-independent lowering motion at speeds determined by the inlet flow, with leak-free shut-off when the directional valve is in its neutral position. • Load-holding valve in actuator port B, adjustable pressure • Q_{max} = 50 l/min • Port threads G½”	



LVSPEC-230-230-21-J24-B02	Ordering code see 5.3.2

Description:
These solenoid-opened seat valves with service line pressure relief and make-up valves shut off the actuator lines with zero leakage and protect the actuator from unacceptably large pressure peaks.

- Actuator ports A and B virtually leak-free
- Pressure relief in actuator ports A and B
- Choice of pressure relief settings for A + B:
  100, 125, 140, 160, 175, 190, 210, 230, 250
  280, 300, 330 bar
- Q_{max} up to 50 l/min
- Port threads G½"

5.3 Ordering information

5.3.1 Overview of products, with part number

Model code	Part number	Model code	Part number
LVSPRE-ZVAZVB-21-J12-A00	100033813	LVSPBH-S30-S30-21-A00/P=	100031107
LVSPRE-ZVAZVB-21-J24-A00	100026981	LVSPBH-***-S30-21-A00/P=	100029653

5.3.2 Accessories

Deliverable accessories see paragraph 12

5.3.3 Ordering code for LVSPEC-…-…-21-…-B02

□ White fields = data specified by Bucher Hydraulics
▒ Grey fields = data from the ordering code

L V S P E C - [ ] - [ ] - 2 1 - J [ ] - B 0 2

Bolt-on valve with pressure-relief

Actuator port A:
Pressure-relief - pressure setting [bar]
100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300, 330

Actuator port B:
Pressure-relief - pressure setting [bar]
100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300, 330

Port threads to DIN 3852 - Part 2
Actuator A+B = G = ½"

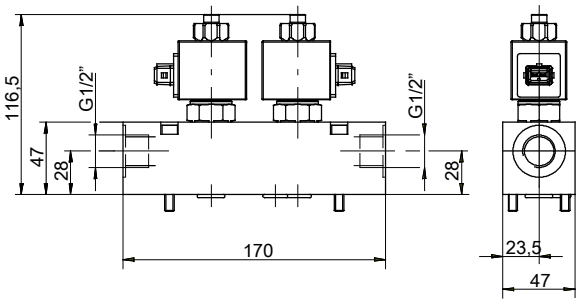
Plug type and nominal voltage:
AMP Junior Timer 12 V DC = **J12**
24 V DC = **J24**

Design stage

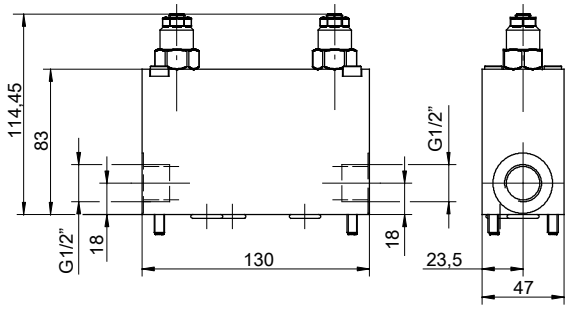
Seat valves, solenoid opened:
Double seat valves in actuator ports A + B

5.4 Dimensions

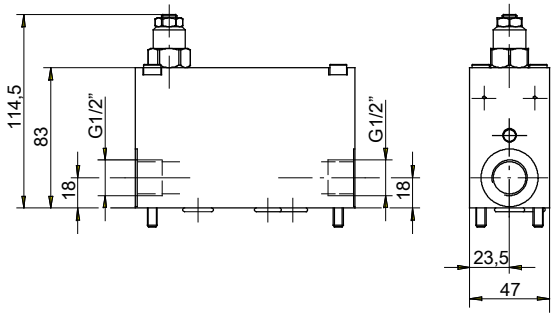
5.4.1 LVSPRE-ZVAZVB-21-J12-A00
LVSPRE-ZVAZVB-21-J24-A00



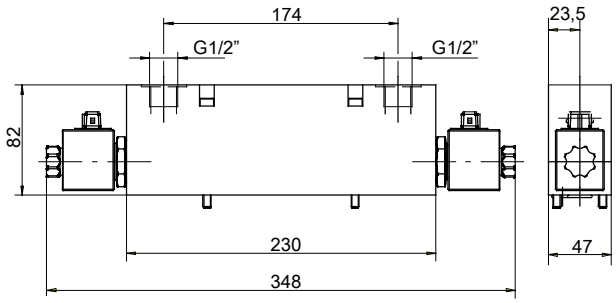
5.4.2 LVSPBH-S30-S30-21-A00



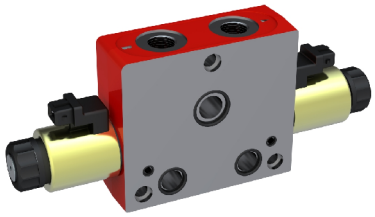
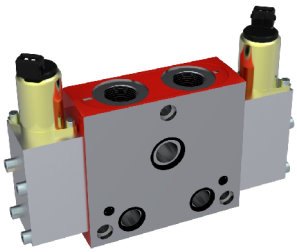
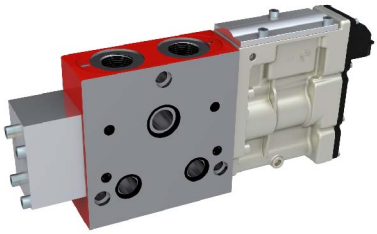
5.4.3 LVSPBH-***-S30-21-A00



5.4.4 LVSPEC-230-230-21-J24-B02



6 Directional valve sections

6.1 Combination opportunities

Series LVS08 and LVS12 directional valve sections can normally be combined. If directional valve sections with on-board electronics are incorporated in the valve block, these must always be fitted at the end of the block, immediately before the end section.

6.2 General technical data

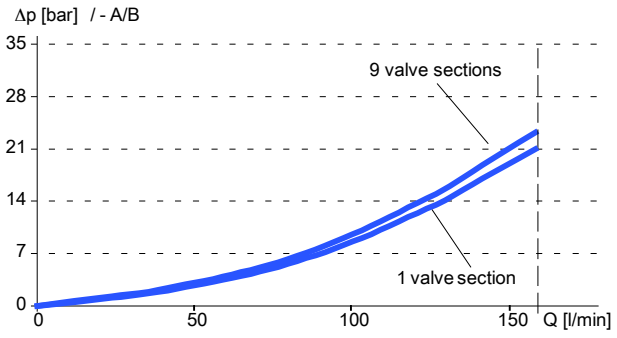
Description	LVS08	LVS12
Control types:		
- direct acting On/Off solenoid	X	-
- direct acting proportional solenoid	X	-
- two-stage, proportional, electrohydraulically operated	-	X
- digital pilot head with onboard electronics	-	X
Nominal flow rate [l/min]	50	180
Maximum inlet pressure [bar]	250	350 *
Maximum pressure at the actuator ports A and B [bar]	280	400 *
Options:		
- separate, proportional flow rates for A and B per valve section	-	X
- downstream compensator	X	X
- pressure relief and make-up function	X	X
- electrically operated seat valves (integral)	X	-
- manual override by pin	X	X
- manual override by hand lever	X	X
- spool-stroke limiter	X	X
- bolt-on plate with seat valves	-	X
- bolt-on plate with load-control valves	X	-
	X	-

* For inlet pressure > 300 bar and actuator pressure > 320 bar contact Bucher Hydraulics

6.3 Performance graphs

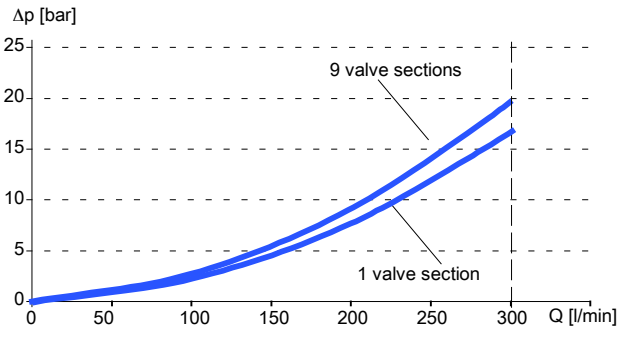
6.3.1 Pressure drop with individual operation

Measured with spool type O = 180 l/min
Q [l/min] = flow rate **P → A/B** and **A/B → T**
Δp [bar] = pressure drop **P → A/B** and **A/B → T**



6.3.2 Pressure drop with individual operation

Measured with spool type O = 180 l/min
Q [l/min] = flow rate **A/B → T**
Δp [bar] = pressure drop **A/B → T**



6.4 Functions

6.4.1 Directional function

3-way valves have only one actuator port. 4-way valves are designed for double-acting actuators.

6.4.2 Two independent 3/2 prop. directional valves

Spool types 6A(5) and 6D(5) are designed to supply 2 motor drives.
By dividing the control spool 6A(5), 2 motor drives can be implemented in parallel, and independently of one another, in one valve body.

6.4.3 Load-independent operation

When several valves are operated simultaneously, the highest actuator pressure is signalled to the 3-way pressure compensator or to the pump control. The control pressure-difference of the system pressure control (3-way pressure compensator, variable-delivery pump) acts directly on the most highly loaded actuator and ensures load-independent control. The lower loaded actuators can be made load-independent by using individual section compensators.

6.4.4 LS-max pressure relief

If no oil flows out from an actuator port although the valve is in an operated position (ex. cylinder at end-stop), the P pressure is signalled in the LS ring circuit behind all compensators. The compensators in the individual functions would now also close due to their spring forces, and all actuators would remain stationary.
To prevent this from happening, the LS_{max} pressure is limited by a pressure-relief function. The discharge of LS flow reduces the pressure before the LS ring circuit, which results in the planned Δp being kept constant. The actuators in the system now operate without any malfunction.

6.4.5 Downstream compensator

When a valve system that is designed to the proportional flow-sharing principle is receiving sufficient pump flow and has adequately-sized supply lines, it functions like a system with upstream compensators.

For the most highly loaded actuator, the pressure drop across the spool orifice is determined by the system pressure control (pump controller or system pressure compensator). On the individual compensators of the other actuators, the highest system load is reproduced behind the spool metering orifice and thus the system pressure control also applies to these actuators, and the pressure compensators counteract the effects of the different load pressures on each section.

If the flow demand is more than the pump can supply, the pump pressure simply falls. With the principle of proportional flow-sharing, the flow rate to all actuators is reduced.

6.4.6 Pressure relief and make-up function

The pressure relief valves protect actuators from unacceptably large pressure peaks when the actuator is operated or when external forces act on the actuator. The make-up (anti-cavitation) function supplies oil to the actuator when the tank pressure is higher than the actuator pressure.

6.4.7 Load sensing

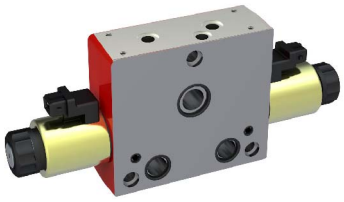
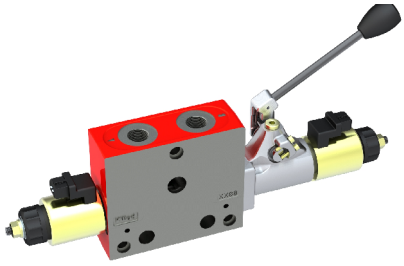
By means of the load sensing system, the highest prevailing actuator pressure is signalled to all proportional flow-sharing valves.

6.4.8 Conversion factors

For a given spool position, the flow rate at the actuator ports can be changed by altering the LS Δp setting at the compensator or pump controller. The corresponding conversion factors are shown in the table below.

LS Δp	Conversion factor
6 bar	0.7
8 bar	0.8
10 bar	0.9
12 bar	1.0
14 bar	1.05
16 bar	1.15
18 bar	1.25
20 bar	1.30

7 Directional sections LVS08 – with on/off or proportional solenoids

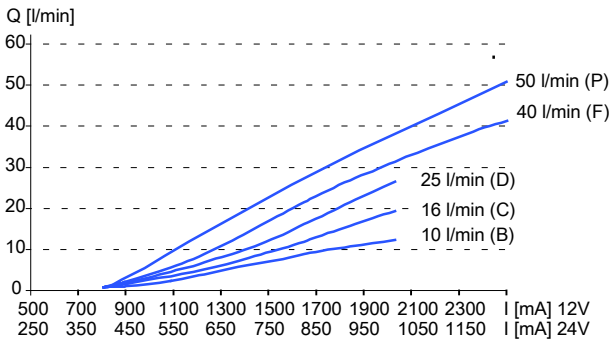
7.1 General technical data

Description	Unit	On-off solenoid	Proportional solenoid
Maximum flow rate	l/min	50	
Maximum inlet pressure	bar	250	
Maximum pressure at the actuator ports	bar	280	
Spool increments by actuator flow rates at 12 bar Δp	l/min	6 (A), 10 (B), 16 (C), 25 (D), 32 (E), 40 (F), 50 (P)	
Power consumption	W	30	max. 30 at 2.5 A / 12 V max. 30 at 1.25 A / 24 V
Energising current	A		0.8 - 2.5 at 12 V 0.4 - 1.25 at 24 V
Duty cycle	%	100% (2.5 A / 12 V or 1.25 A / 24 V)	
Protection class		IP65 (DIN 40050)	
Override pin Φ		6	2

7.2 Performance graphs

7.2.1 Control characteristics

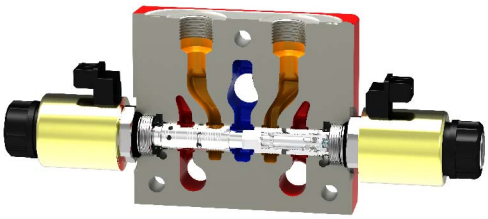
Valve with proportional solenoid and 12 bar pressure drop at the orifice.
Q [l/min] = flow rate at the actuator outlet port
I [mA] = current at the proportional solenoids

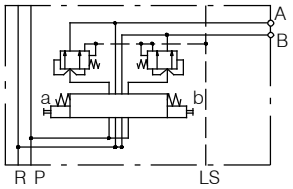


7.3 With compensator and G½" port threads

7.3.1 Standard version

- Port threads for actuator A + B = G½"
- Compensator function
- Override pin





7.3.2 Selectable functions

- Flow rate
- Spool type
- Pilot head
- Plug type

7.3.3 Options menu

Spool type

3A	16 l/min for B (A closed)	=	*C3A
	25 l/min for B (A closed)	=	*D3A
	50 l/min for B (A closed)	=	*P3A
3J	6 l/min for B (A closed)	=	*A3J
	10 l/min for B (A closed)	=	*B3J
	16 l/min for B (A closed)	=	*C3J
	25 l/min for B (A closed)	=	*D3J
	32 l/min for B (A closed)	=	*E3J
	40 l/min for B (A closed)	=	*F3J
	50 l/min for B (A closed)	=	*P3J
4A	6 l/min for A and B	=	AA4A
	10 l/min for A and B	=	BB4A
	16 l/min an A and B	=	CC4A
	25 l/min for A and B	=	DD4A
	32 l/min for A and B	=	EE4A
	40 l/min for A and B	=	FF4A
	50 l/min for A and B	=	PP4A
4D	6 l/min for A and B	=	AA4D
	10 l/min for A and B	=	BB4D
	16 l/min for A and B	=	CC4D
	25 l/min for A and B	=	DD4D
	32 l/min for A and B	=	EE4D
	40 l/min for A and B	=	FF4D
	50 l/min for A and B	=	PP4D

Compensator function	Standard	Fine control *
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Pilot head

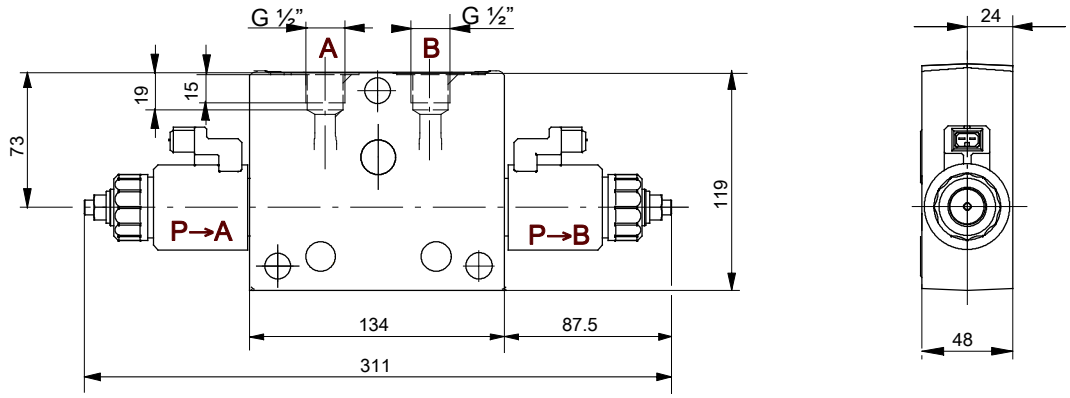
ON-OFF solenoid 12 V	=	A
ON-OFF solenoid 24 V	=	B
Proportional solenoid 12V	=	C
Proportional solenoid 24V	=	D

Plug type

AMP-Junior Timer	=	J
Deutsch DT04-2P-EP04	=	T

* = Fine controlled compensator function for increased stability in the hydraulics systems

7.3.4 Dimensions



7.3.5 Pilot heads

A / B

On/off solenoid
with override pin

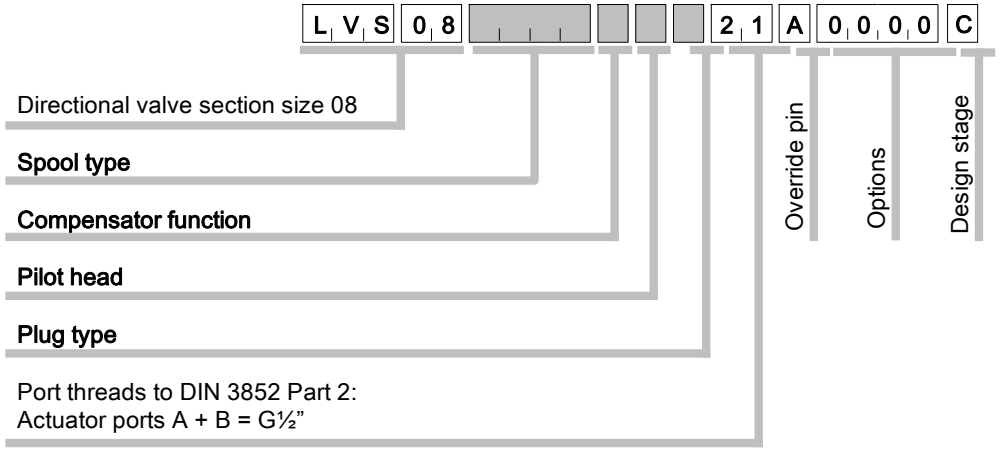
C / D

Proportional solenoid
with override pin and
starting point adjustment
(starting point is set by the
factory)

7.3.6 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▩ Grey fields = data from the overview of sections 7.3.3



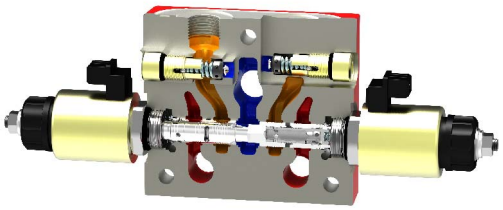
7.3.7 Accessories

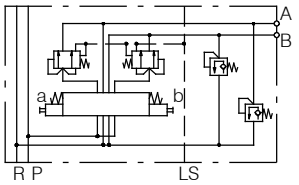
Deliverable accessories see paragraph 12

7.4 With compensator, pressure relief / make-up valve, and G½" port threads

7.4.1 Standard version

- Port threads for actuator A + B = G½"
- Compensator function
- Override pin
- Pressure relief and make-up function (pressure setting selectable)



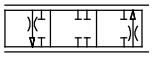
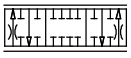
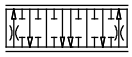


7.4.2 Selectable functions

- Flow rate
- Spool function
- Pilot head
- Plug type

7.4.3 Options menu

Spool type

3A 	16 l/min for B (A closed)	= ***C3A**
	25 l/min for B (A closed)	= ***D3A**
	50 l/min for B (A closed)	= ***P3A**
3J 	6 l/min for B (A closed)	= ***A3J**
	10 l/min for B (A closed)	= ***B3J**
	16 l/min for B (A closed)	= ***C3J**
	25 l/min for B (A closed)	= ***D3J**
	32 l/min for B (A closed)	= ***E3J**
	40 l/min for B (A closed)	= ***F3J**
	50 l/min for B (A closed)	= ***P3J**
4A 	6 l/min for A and B	= **AA4A**
	10 l/min for A and B	= **BB4A**
	16 l/min for A and B	= **CC4A**
	25 l/min for A and B	= **DD4A**
	32 l/min for A and B	= **EE4A**
	40 l/min for A and B	= **FF4A**
	50 l/min for A and B	= **PP4A**
4D 	6 l/min for A and B	= **AA4D**
	10 l/min for A and B	= **BB4D**
	16 l/min for A and B	= **CC4D**
	25 l/min for A and B	= **DD4D**
	32 l/min for A and B	= **EE4D**
	40 l/min for A and B	= **FF4D**
	50 l/min for A and B	= **PP4D**

Compensator function	**Standard**	**Fine control ***
for actuator B =	**4**	**B**
for actuator A =	**8**	**A**
for actuator A + B =	**5**	**C**

Pilot head

ON-OFF solenoid 12 V	=	**A**
ON-OFF solenoid 24 V	=	**B**
Proportional solenoid 12V	=	**C**
Proportional solenoid 24V	=	**D**

Plug type

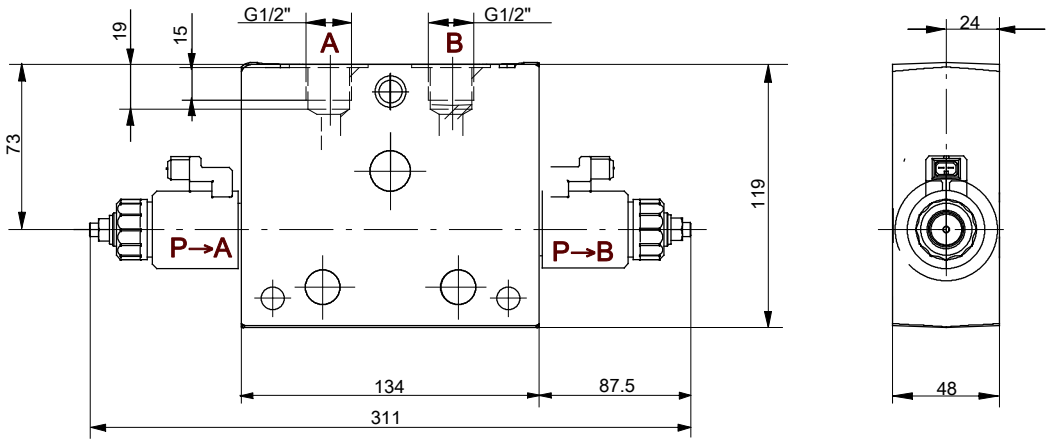
AMP-Junior Timer	=	**J**
Deutsch DT04-2P-EP04	=	**T**

Pressure relief and make-up function

adjustable 70 - 230 bar = **A**
adjustable 150 - 380 bar = **B**
fixed setting (values in bar):
25 = **D**, 32 = **E**, 40 = **F**, 63 = **H**, 80 = **I**, 100 = **K**, 125 = **L**, 140 = **M**,
160 = **N**, 175 = **O**, 190 = **P**, 210 = **Q**, 230 = **R**, 250 = **S**, 280 = **T**
Cavity prepared = **#**

* = Fine controlled compensator function for increased stability in the hydraulics systems

7.4.4 Dimensions



7.4.5 Pilot heads

A / B

On/Off solenoid
with override pin

C / D

Proportional solenoid
with override pin and
starting point adjustment
(starting point is set by the
factory)

7.4.6 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▒ Grey fields = data from the overview of sections 7.4.3

L	V	S	0	8						2	1	A	0	0	0	0	C	-	

Directional valve section
size 08

Spool type

Compensator function for actuator port A + B

Pilot head

Plug type

Port threads to DIN 3852 Part 2
Actuator A and B =G ½”

Override pin

Options

Design stage

Pressure relief / make-up valve
actuator A
actuator B
without = *

For adjustable valves
Pressure setting
P_A = ... bar
P_B = ... bar

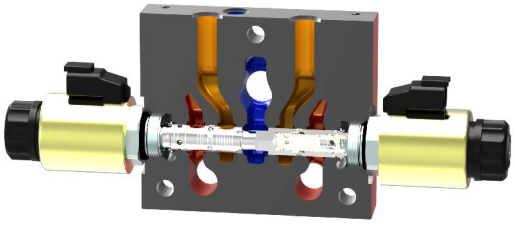
7.4.7 Accessories

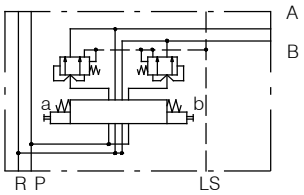
Deliverable accessories see paragraph 12

7.5 With compensator and mounting surface for bolt-on valve

7.5.1 Standard version

- Prepared for bolt-on plate
- Compensator function
- Override pin





7.5.2 Selectable functions

- Flow rate
- Spool function
- Pilot head
- Plug type

7.5.3 Options menu

Spool type

3A	16 l/min for B (A closed)	= *C3A
	25 l/min for B (A closed)	= *D3A
	50 l/min an B (A closed)	= *P3A
3J	6 l/min for B (A closed))	= *A3J
	10 l/min for B (A closed)	= *B3J
	16 l/min for B (A closed)	= *C3J
	25 l/min for B (A closed)	= *D3J
	32 l/min for B (A closed)	= *E3J
	40 l/min for B (A closed)	= *F3J
	50 l/min for B (A closed)	= *P3J
4A	6 l/min for A and B	= AA4A
	10 l/min for A and B	= BB4A
	16 l/min for A and B	= CC4A
	25 l/min for A and B	= DD4A
	32 l/min for A and B	= EE4A
	40 l/min for A and B	= FF4A
	50 l/min for A and B	= PP4A
4D	6 l/min for A and B	= AA4D
	10 l/min for A and B	= BB4D
	16 l/min for A and B	= CC4D
	25 l/min for A and B	= DD4D
	32 l/min for A and B	= EE4D
	40 l/min for A and B	= FF4D
	50 l/min for A and B	= PP4D

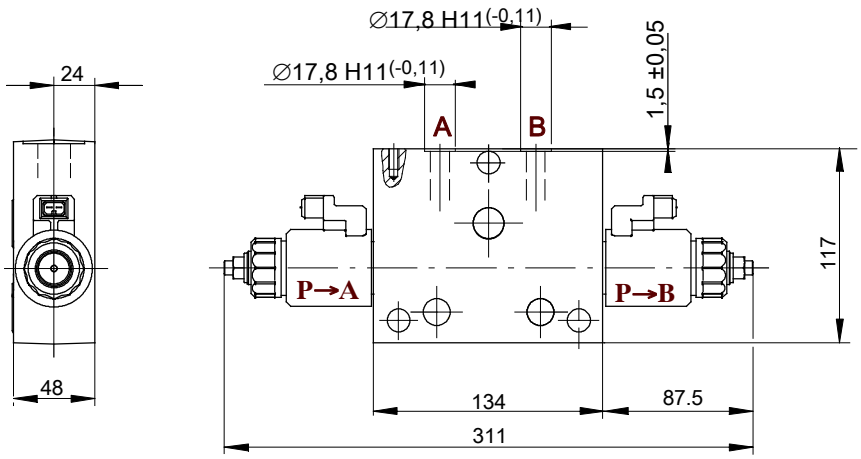
Compensator function			Standard	Fine control *
for actuator	B	=	4	B
for actuator	A	=	8	A
actuator	A + B	=	5	C

Pilot head		
ON/OFF solenoid 12 V	=	A
ON/OFF solenoid 24 V	=	B
Proportional solenoid12V	=	C
Proportional solenoid 24V	=	D

Plug type		
AMP-Junior Timer	=	J
Deutsch DT04-2P-EP04	=	T

* = Fine controlled compensator function for increased stability in the hydraulics systems

7.5.4 Dimensions



7.5.5 Pilot heads

A / B

On/off solenoid with override pin

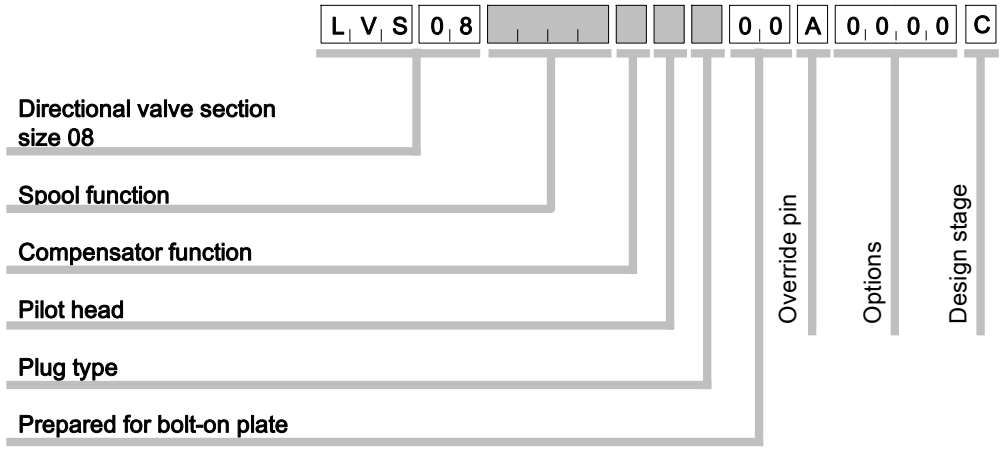
C / D

Proportional solenoid with override pin and starting point adjustment (starting point is set by the factory)

7.5.6 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▩ Grey fields = data from the overview of sections 7.5.3



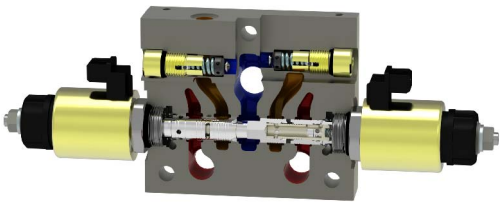
7.5.7 Accessories

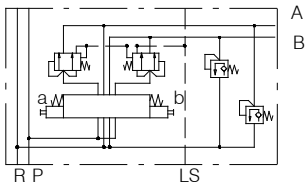
Deliverable accessories see paragraph 12

7.6 With compensator, press. relief / make-up valve, and mtg. surface for bolt-on valves

7.6.1 Standard version

- Prepared for bolt-on plate
- Compensator function
- Override pin
- Pressure relief and make-up function (pressure setting selectable)



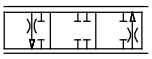
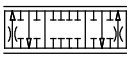
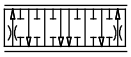


7.6.2 Selectable functions

- Flow rate
- Spool function
- Pilot head
- Plug type

7.6.3 Options menu

Spool type

3A 	16 l/min for B (A closed)	= ***C3A**
	25 l/min for B (A closed)	= ***D3A**
	50 l/min for B (A closed)	= ***P3A**
3J 	6 l/min for B (A closed)	= ***A3J**
	10 l/min for B (A closed)	= ***B3J**
	16 l/min for B (A closed)	= ***C3J**
	25 l/min for B (A closed)	= ***D3J**
	32 l/min for B (A closed)	= ***E3J**
	40 l/min for B (A closed)	= ***F3J**
	50 l/min for B (A closed)	= ***P3J**
4A 	6 l/min for A and B	= **AA4A**
	10 l/min for A and B	= **BB4A**
	16 l/min for A and B	= **CC4A**
	25 l/min for A and B	= **DD4A**
	32 l/min for A and B	= **EE4A**
	40 l/min for A and B	= **FF4A**
	50 l/min for A and B	= **PP4A**
4D 	6 l/min for A and B	= **AA4D**
	10 l/min for A and B	= **BB4D**
	16 l/min for A and B	= **CC4D**
	25 l/min for A and B	= **DD4D**
	32 l/min for A and B	= **EE4D**
	40 l/min for A and B	= **FF4D**
	50 l/min for A and B	= **PP4D**

Compensator function			**Standard**	**Fine control ***
for actuator	B	=	**4**	**B**
for actuator	A	=	**8**	**A**
actuator	A + B	=	**5**	**C**

Pilot head

ON/OFF solenoid 12 V	=	**A**
ON/OFF solenoid 24 V	=	**B**
Proportional solenoid12V	=	**C**
Proportional solenoid 24V	=	**D**

Plug type

AMP-Junior Timer	=	**J**
Deutsch DT04-2P-EP04	=	**T**

Pressure relief and make-up function

adjustable 70 - 230 bar = **A** adjustable 150 - 380 bar = **B**

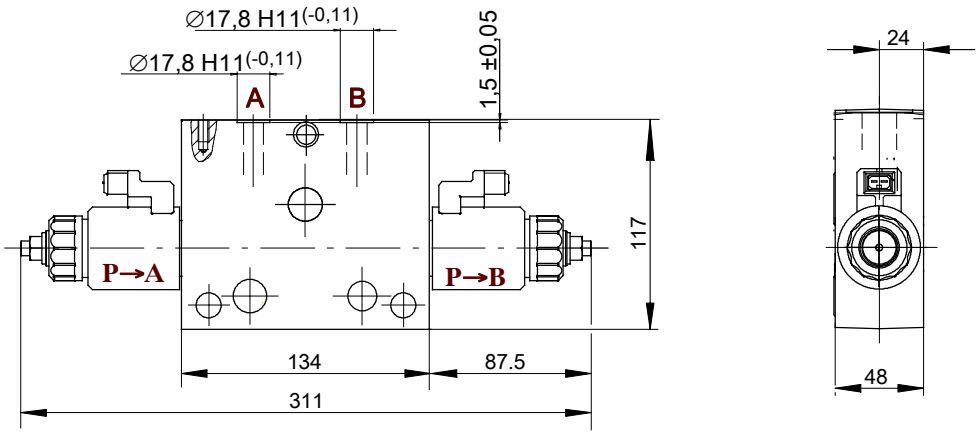
fixed setting (values in bar):

25 = **D**, 32 = **E**, 40 = **F**, 63 = **H**, 80 = **I**, 100 = **K**, 125 = **L**, 140 = **M**,
160 = **N**, 175 = **O**, 190 = **P**, 210 = **Q**, 230 = **R**, 250 = **S**, 280 = **T**

Cavity prepared = **#**

* = Fine controlled compensator function for increased stability in the hydraulics systems

7.6.4 Dimensions



7.6.5 Pilot heads

A / B

On/OFF solenoid with override pin

C / D

Proportional solenoid with override pin and starting point adjustment (Starting point is set by the factory)

7.6.6 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▩ Grey fields = data from the overview of sections 7.6.3

L	V	S	0	8						0	0	A	0	0	0	0	C	

Directional valve section size 08

Spool type

Compensator function for actuator A and B

Pilot head

Plug type

Prepared for bolt-on plate

Override pin

Options

Design stage

Pressure relief / make-up valve
actuator A
actuator B
without = *

For adjustable valves
Pressure settings
P_A = ... bar
P_B = ... bar

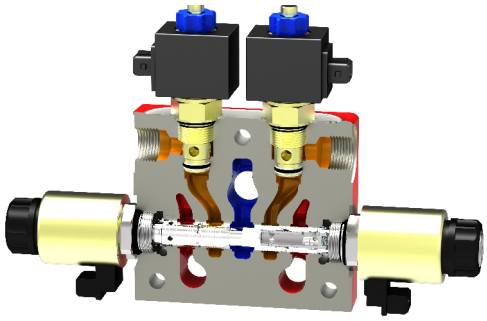
7.6.7 Accessories

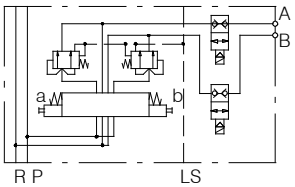
Deliverable accessories see paragraph 12

7.7 With compensator, double seat valve and G ½" port threads

7.7.1 Standard version

- Compensator function
- Double seat valve, solenoid operated
- Port threads for actuator A + B = G½"





7.7.2 Selectable functions

- Flow rate
- Spool function
- Pilot head
- Plug type

7.7.3 Options menu

Spool type

3A

16 l/min for B (A closed)	= ***C3A**
25 l/min for B (A closed)	= ***D3A**
50 l/min for B (A closed)	= ***P3A**

3J

6 l/min for B (A closed)	= ***A3J**
10 l/min for B (A closed)	= ***B3J**
16 l/min for B (A closed)	= ***C3J**
25 l/min for B (A closed)	= ***D3J**
32 l/min for B (A closed)	= ***E3J**
40 l/min for B (A closed)	= ***F3J**
50 l/min for B (A closed)	= ***P3J**

4A

6 l/min for A and B	= **AA4A**
10 l/min for A and B	= **BB4A**
16 l/min for A and B	= **CC4A**
25 l/min for A and B	= **DD4A**
32 l/min for A and B	= **EE4A**
40 l/min for A and B	= **FF4A**
50 l/min for A and B	= **PP4A**

4D

6 l/min for A and B	= **AA4D**
10 l/min for A and B	= **BB4D**
16 l/min for A and B	= **CC4D**
25 l/min for A and B	= **DD4D**
32 l/min for A and B	= **EE4D**
40 l/min for A and B	= **FF4D**
50 l/min for A and B	= **PP4D**

Compensator function	**Standard**	**Fine control ***
for actuator B =	**4**	**B**
for actuator A =	**8**	**A**
for actuator A + B =	**5**	**C**

Pilot head

ON-OFF solenoid 12 V	=	**A**
ON-OFF solenoid 24 V	=	**B**
Proportional solenoid 12V	=	**C**
Proportional solenoid 24V	=	**D**

Plug type

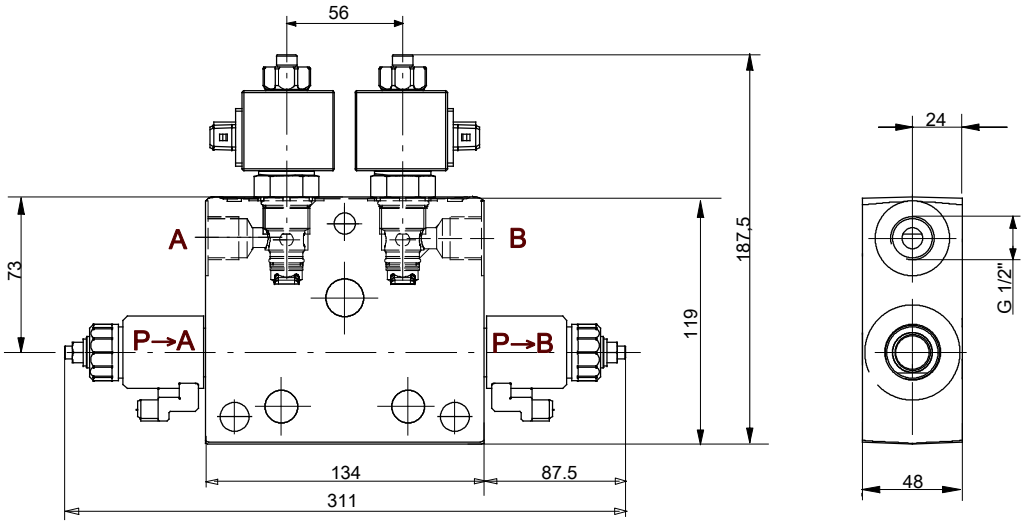
AMP-Junior Timer	=	**J**
Deutsch DT04-2P-EP04	=	**T**

Seat valves, solenoid operated, Q_{max} 70 l/min, de-energised closed

Double seat valve, solenoid operated, in A + B	=	**J8**
Double seat valve, solenoid operated, in A + B with man. o/ride, 'Knob-Style', push-and-turn	=	**J8D**
Double seat valve, solenoid operated, in B	=	**J7**
Double seat valve, solenoid operated, in B with manual o/ride, 'Knob-Style', push-and-turn	=	**J7D**

* = Fine controlled compensator function for increased stability in the hydraulics systems

7.7.4 Dimensions



7.7.5 Pilot heads

A / B

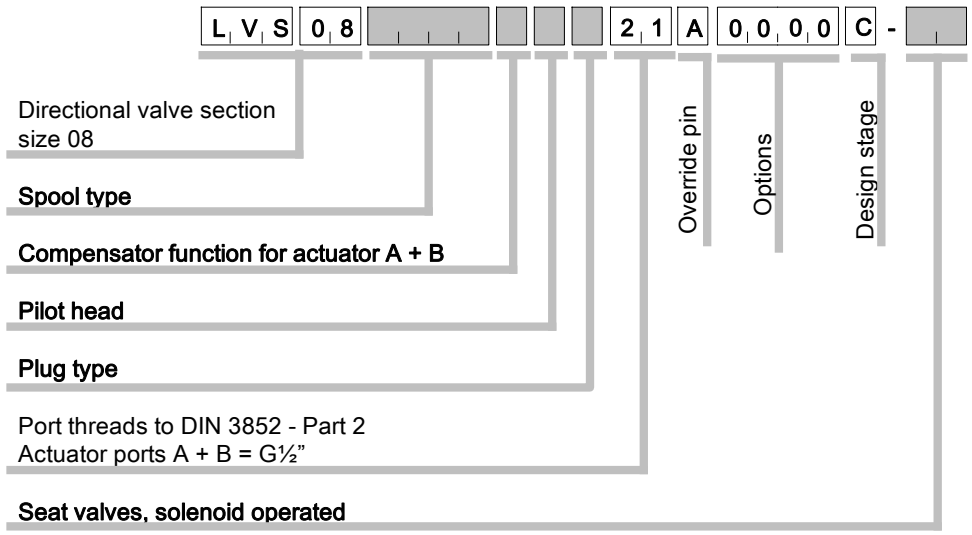
On/off solenoid with override pin

C / D

Proportional solenoid with override pin and starting point adjustment (starting point is set by the factory)

7.7.6 Ordering code

☐ White fields	=	data specified by Bucher Hydraulics
▒ Grey fields	=	data from the overview of sections 7.7 3



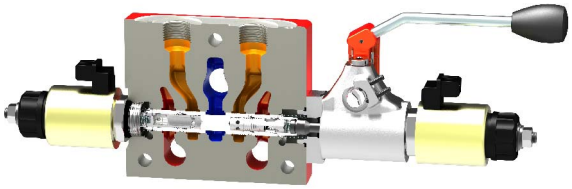
7.7.7 Accessories

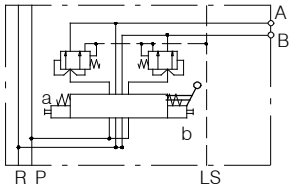
Deliverable accessories see paragraph 12

7.8 With compensator, additional manual operator and G½" port threads

7.8.1 Standard version

- Compensator function
- Port threads for actuator A + B = G½"
- Override pin with add'l manual operator P_{max} 250 bar
  With electrical operation, the hand lever remains in the 0 position



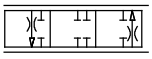
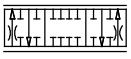
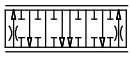


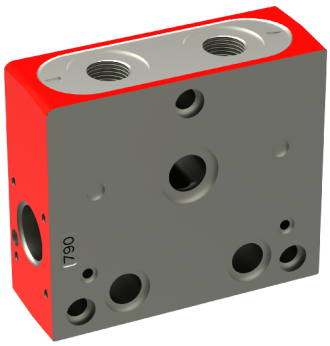
7.8.2 Selectable functions

- Flow rate
- Spool function
- Pilot head
- Plug type

7.8.3 Options menu

Spool type

3A 	16 l/min for B (A closed)	= *C3A
	25 l/min for B (A closed)	= *D3A
	50 l/min an B (A closed)	= *P3A
3J 	6 l/min for B (A closed)	= *A3J
	10 l/min for B (A closed)	= *B3J
	16 l/min for B (A closed)	= *C3J
	25 l/min for B (A closed)	= *D3J
	32 l/min for B (A closed)	= *E3J
	40 l/min for B (A closed)	= *F3J
	50 l/min for B (A closed)	= *P3J
4A 	6 l/min for A and B	= AA4A
	10 l/min for A and B	= BB4A
	16 l/min for A and B	= CC4A
	25 l/min for A and B	= DD4A
	32 l/min for A and B	= EE4A
	40 l/min for A and B	= FF4A
	50 l/min for A and B	= PP4A
4D 	6 l/min for A and B	= AA4D
	10 l/min for A and B	= BB4D
	16 l/min for A and B	= CC4D
	25 l/min for A and B	= DD4D
	32 l/min for A and B	= EE4D
	40 l/min for A and B	= FF4D
	50 l/min for A and B	= PP4D



Compensator function	Standard	Fine control *
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Pilot head

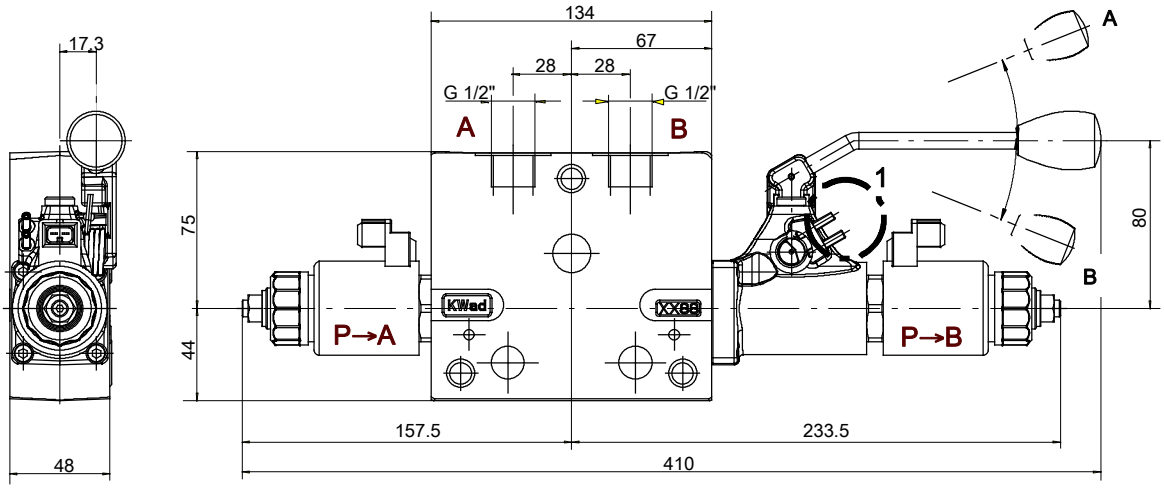
ON-OFF solenoid 12 V	=	A
ON-OFF solenoid 24 V	=	B
Proportional solenoid 12V	=	C
Proportional solenoid 24V	=	D

Plug type

AMP-Junior Timer	=	J
Deutsch DT04-2P-EP04	=	T

* = Fine controlled compensator function for increased stability in the hydraulics systems

7.8.4 Dimensions



1 = Set screws for spool stroke limiting (flow limiting only works with manual operation)

7.8.5 Pilot heads

A / B

On/off solenoid with override pin

C / D

Proportional solenoid with override pin and starting point adjustment (starting point is set by the factory)

7.8.6 Ordering code

☐ White fields	=	data specified by Bucher Hydraulics
▒ Grey fields	=	data from the overview of sections 7.8.3

L	V	S	0	8						2	1	N	0	0	0	0	C

- Directional valve section size 08
- **Spool type**
- **Compensator function**
- **Pilot head**
- **Plug type**
- Port threads to DIN 3852 - Part 2
Actuator ports A + B = G½”
- Override pin with additional manual operator
- Options
- Design stage

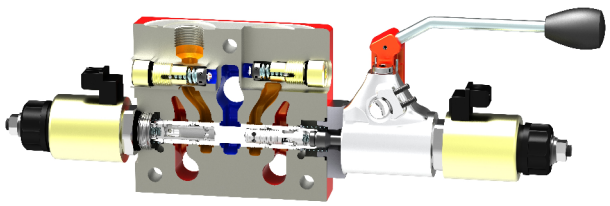
7.8.7 Accessories

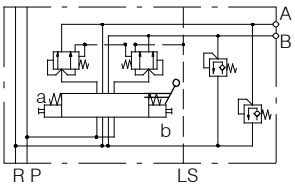
Deliverable accessories see paragraph 12

7.9 With compensator, pressure relief / make-up valve, additional manual operator and G½" port threads

7.9.1 Standard version

- Compensator function
- Override pin with add'l manual operator P_{max} 250 bar
  With electrical operation, the hand lever remains in the 0 position



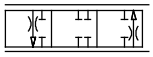
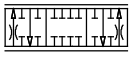
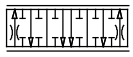


7.9.2 Selectable functions

- Flow rate
- Spool function
- Pilot head
- Plug type

7.9.3 Options menu

Spool type

3A 	16 l/min for B (A closed)	= ***C3A**
	25 l/min for B (A closed)	= ***D3A**
	50 l/min for B (A closed)	= ***P3A**
3J 	6 l/min for B (A closed)	= ***A3J**
	10 l/min for B (A closed)	= ***B3J**
	16 l/min for B (A closed)	= ***C3J**
	25 l/min for B (A closed)	= ***D3J**
	32 l/min for B (A closed)	= ***E3J**
	40 l/min for B (A closed)	= ***F3J**
	50 l/min for B (A closed)	= ***P3J**
4A 	6 l/min for A and B	= **AA4A**
	10 l/min for A and B	= **BB4A**
	16 l/min for A and B	= **CC4A**
	25 l/min for A and B	= **DD4A**
	32 l/min for A and B	= **EE4A**
	40 l/min for A and B	= **FF4A**
	50 l/min for A and B	= **PP4A**
4D 	6 l/min for A and B	= **AA4D**
	10 l/min for A and B	= **BB4D**
	16 l/min for A and B	= **CC4D**
	25 l/min for A and B	= **DD4D**
	32 l/min for A and B	= **EE4D**
	40 l/min for A and B	= **FF4D**
	50 l/min for A and B	= **PP4D**

Compensator function	**Standard**	**Fine control ***
for actuator B =	**4**	**B**
for actuator A =	**8**	**A**
for actuator A + B =	**5**	**C**

Pilot head

ON-OFF solenoid 12 V	=	**A**
ON-OFF solenoid 24 V	=	**B**
Proportional solenoid 12V	=	**C**
Proportional solenoid 24V	=	**D**

Plug type

AMP-Junior Timer	=	**J**
Deutsch DT04-2P-EP04	=	**T**

Pressure relief and make-up valve

adjustable 70 - 230 bar = **A** adjustable 150 - 380 bar = **B**

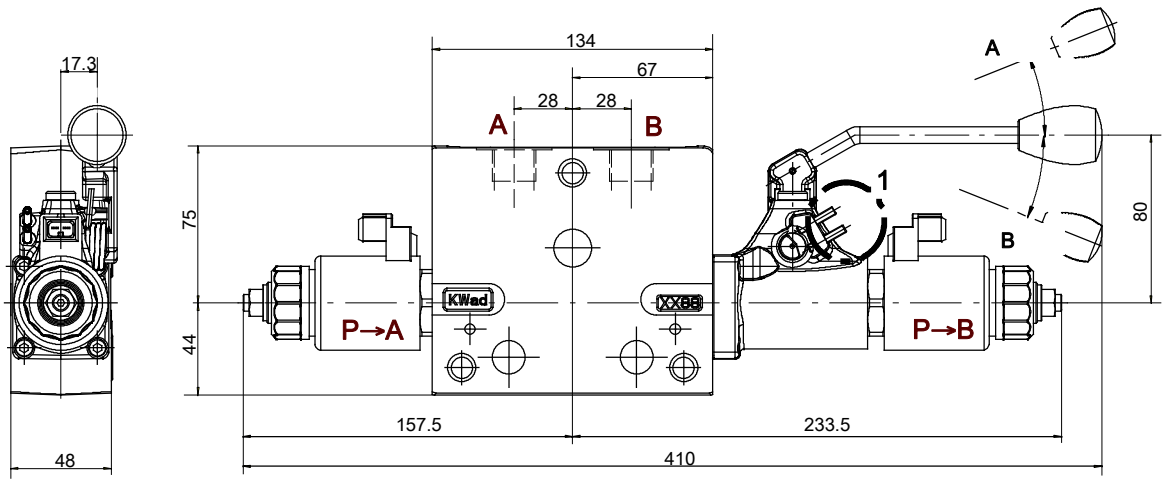
fixed setting (values in bar):

25 = **D**, 32 = **E**, 40 = **F**, 63 = **H**, 80 = **I**, 100 = **K**, 125 = **L**, 140 = **M**,
160 = **N**, 175 = **O**, 190 = **P**, 210 = **Q**, 230 = **R**, 250 = **S**, 280 = **T**

Cavity prepared = **#**

* = Fine controlled compensator function for increased stability in the hydraulics systems

7.9.4 Dimensions



1 = Set screws for spool stroke limiting (flow limiting only works with manual operation)

7.9.5 Pilot heads

A / B

On/off solenoid
with override pin

C / D

Proportional solenoid
with override pin and
starting point adjustment
(starting point is set by the
factory)

7.9.6 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▩ Grey fields = data from the overview of sections 7.9.3

L	V	S	0	8						2	1	A	0	0	0	0	C	-	

For adjustable valves:
Pressure setting
P_A = ... bar
P_B = ... bar

Directional valve section, size 08

Spool type

Compensator function for actuator A and B

Pilot head

Plug type

Port threads to DIN 3852 Part 2
Actuator ports A + B = G ½”

Override pin with additional manual operator

Options

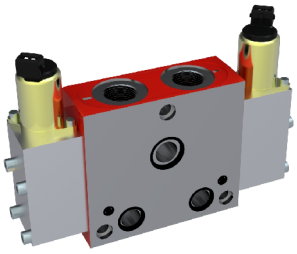
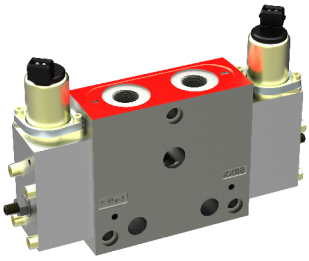
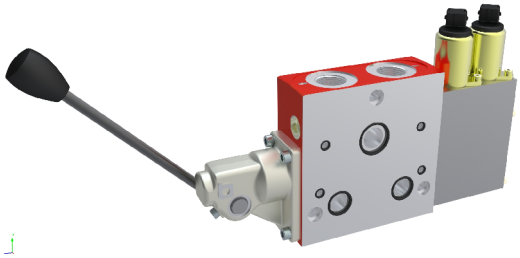
Design stage

Pressure relief / make-up valve
actuator A
actuator B
without = *

7.9.7 Accessories

Deliverable accessories see paragraph 12

8 Directional sections LVS12 – electrohydraulic, two stage

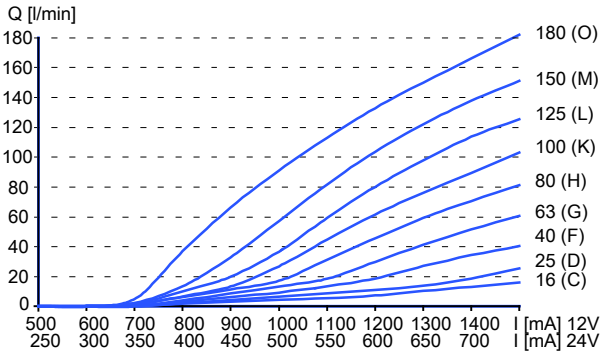
8.1 General technical data

General characteristics	Unit	Value
Maximum flow rate	l/min	180
Maximum inlet pressure	bar	350 *
Maximum pressure at the actuator ports	bar	400 *
Spool increments by actuator flow rates at 12 bar Δp	l/min	16(C), 25(D), 40(F), 50(P), 63(G), 80(H), 100(K), 125(L), 150(M), 180(O)
Nominal voltage	V DC	12 or 24
Power consumption	W	max. 18 (at 1.5 A + 12 V or 0.75 A + 24 V)
Energising current	A	0.6 … 1.5 at 12 V 0.3 … 0.75 at 24 V
Duty cycle	%	100
Protection class		IP65 (DIN 40050)

* For inlet pressure > 300 bar and actuator pressure > 320 bar contact Bucher Hydraulics

8.2 Control characteristics

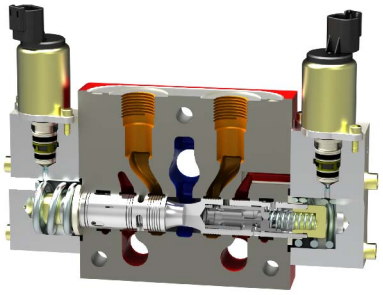
Proportional, electrohydraulically operated valve with
12 bar pressure drop at the orifice
Q [l/min] = flow rate at the actuator outlet port
I [mA] = current at the solenoids



8.3 With compensator and G¾" port threads

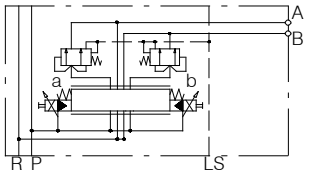
8.3.1 Standard version

- Port threads for actuator A + B = G¾"
- Compensator function



8.3.2 Selectable functions

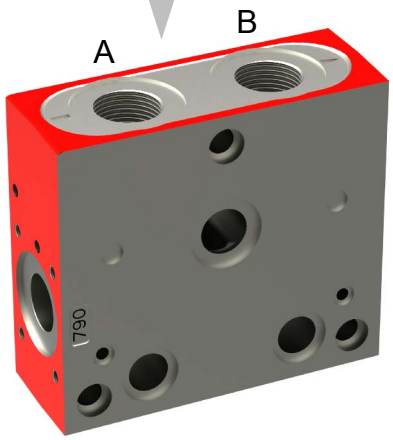
- Flow rate
- Spool function
- Pilot head
- Plug type
- Manual override



8.3.3 Options menu

Spool type (spool type 6A and 6D for different actuator flow rates available)

	3A (B). A closed	3J (A). B closed	4A (A+B)	4D (A+B)	6A (DW - A+B)	6D (DW - A+B)	4R (REG)
16 l/min	= *C3J			= CC4D		= CC6D	
25 l/min	= *D3J	= DD4A	= DD4D	= DD6A	= DD6D		
40 l/min	= *F3J	= FF4A	= FF4D	= FF6A	= FF6D		
50 l/min	= *P3J	= PP4A	= PP4D	= PP6A	= PP6D		
63 l/min	= *G3J	= GG4A	= GG4D	= GG6A	= GG6D		
80 l/min	= *H3J	= HH4A	= HH4D	= HH6A	= HH6D		
100 l/min	= *K3J	= KK4A	= KK4D	= KK6A	= KK6D		
125 l/min	= *L3J	= LL4A	= LL4D		= LL6D		
150 l/min	= *M3J	= MM4A	= MM4D		= MM6D		
180 l/min	= O*3A = *O3J	= OO4A	= OO4D		= OO6D		
A = 50 l/min, B= 25 l/min							= PD4R



Compensator function	Standard	Fine control *
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Pilot head

Electrohydraulic, two stage, 12 V	=	F
Electrohydraulic, two stage, 24 V	=	G

Plug type

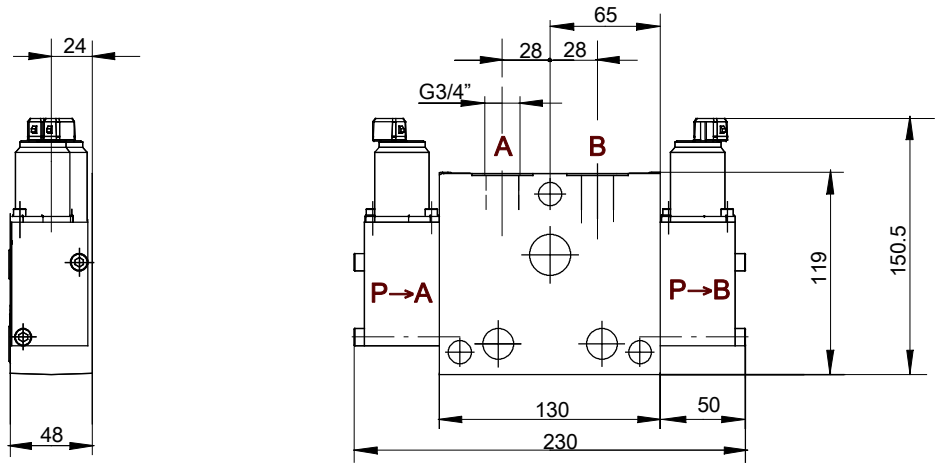
AMP-Junior Timer	=	J
Deutsch DT04-2P-EP04	=	T

Manual override by pin / spool-stroke limiter

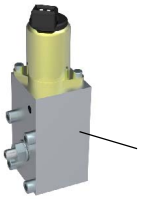
Manual override	=	A
Manual override and spool-stroke limiter	=	C
without	=	*

* = Fine controlled compensator function for increased stability in the hydraulics systems

8.3.4 Dimensions



8.3.5 Functional expansion



Spool-stroke limiter

8.3.6 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▩ Grey fields = data from the overview of sections 8.3.3

L	V	S	1	2					2	2		0	0	0	0	B

Directional valve section, size12

Spool type

Compensator function

Pilot head

Spool type

Port threads for actuators A+B = G ¾"

Override pin and spool-stroke limiter

Option

Design stage

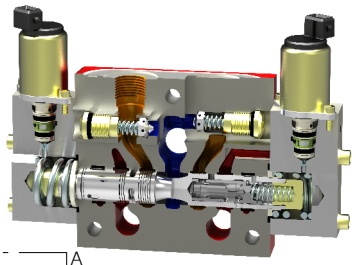
8.3.7 Accessories

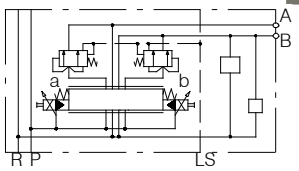
Deliverable accessories see paragraph 12

8.4 With compensator, pressure relief / make-up valves and G¾" port threads

8.4.1 Standard version

- Compensator function
- Port threads for actuator A + B = G¾""
- Pressure relief /make-up valve (selectable pressure setting)





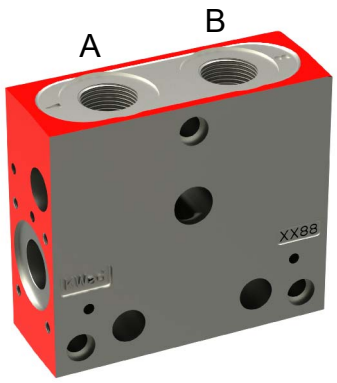
8.4.2 Selectable functions

- Flow rate
- Pilot head
- Manual override
- Plug type

8.4.3 Options menu

Spool type (spool type 6A and 6D for different actuator flow rates available)

	3A (B). A closed	3J (A). B closed	4A (A+B)	4D (A+B)	6A (DW - A+B)	6D (DW - A+B)	4R (REG)
16 l/min	= *C3J		= CC4D			= CC6D	
25 l/min	= *D3J	= DD4A	= DD4D	= DD6A		= DD6D	
40 l/min	= *F3J	= FF4A	= FF4D	= FF6A		= FF6D	
50 l/min	= *P3J	= PP4A	= PP4D	= PP6A		= PP6D	
63 l/min	= *G3J	= GG4A	= GG4D	= GG6A		= GG6D	
80 l/min	= *H3J	= HH4A	= HH4D	= HH6A		= HH6D	
100 l/min	= *K3J	= KK4A	= KK4D	= KK6A		= KK6D	
125 l/min	= *L3J	= LL4A	= LL4D			= LL6D	
150 l/min	= *M3J	= MM4A	= MM4D			= MM6D	
180 l/min = O*3A	= *O3J	= OO4A	= OO4D			= OO6D	
A = 50 l/min, B= 25 l/min							= PD4R



Compensator function	Standard	Fine control *
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Pilot head

Electrohydraulic, two stage 12 V	= F
Electrohydraulic, two stage 24 V	= G

Plug type

AMP-Junior Timer =	J
Deutsch DT04-2P-EP04 =	T

Manual override by pin / spool-stroke limiter

Manual override	= A
Manual override and spool-stroke limiter	= C
without	= *

Pressure relief and make-up function

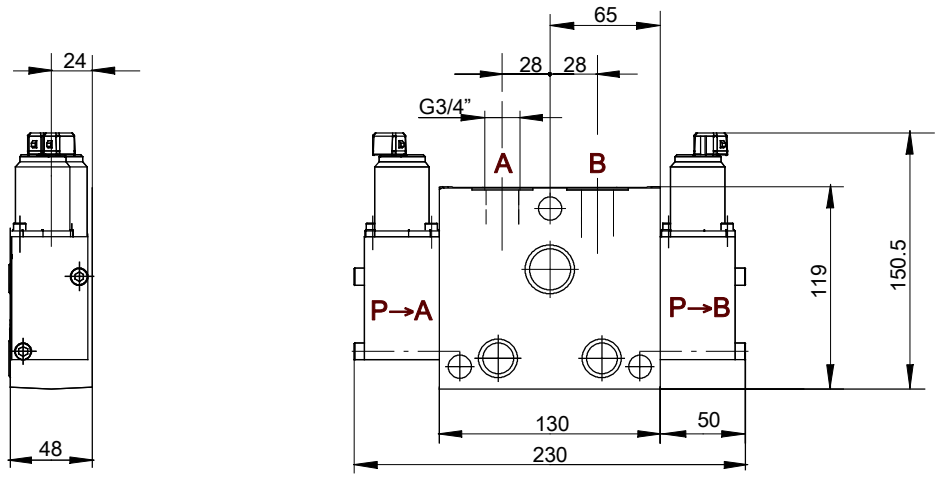
adjustable 70 - 230 bar = **A** adjustable 150 - 380 bar = **B**

fixed setting (values in bar): 25 = **D**, 32 = **E**, 40 = **F**, 63 = **H**, 80 = **I**, 100 = **K**, 125 = **L**, 140 = **M**, 160 = **N**, 175 = **O**, 190 = **P**, 210 = **Q**, 230 = **R**, 250 = **S**, 280 = **T**

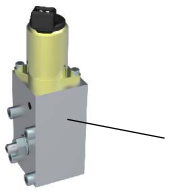
Cavity prepared = **#**

* = Fine controlled compensator function for increased stability in the hydraulics systems

8.4.4 Dimensions



8.4.5 Functional expansion



Spool-stroke limiter

8.4.6 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▩ Grey fields = data from the overview of sections 8.4.3

L	V	S	1	2						2	2		0	0	0	0	B	–	

For adjustable valves:
Pressure setting
P_A = ... bar
P_B = ... bar

Directional valve section size 12

Spool type

Compensator

Pilot head

Plug type

Port thread for actuator A+B = G ¾"

Override pin and spool-stroke limiter

Options

Design stage

Pressure relief / make-up valve
actuator A
actuator B
without = *

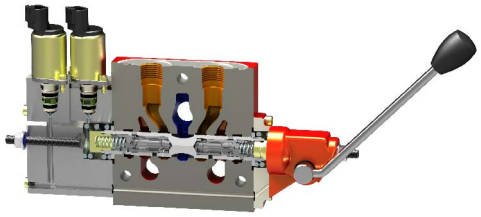
8.4.7 Accessories

Deliverable accessories see paragraph 12

8.5 With compensator, duo head, additional manual operator and G¾" port threads

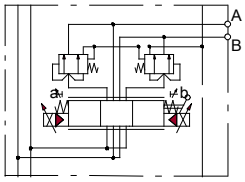
8.5.1 Standard version

- Compensator function
- Port thread
- Additional manual operator
- Spool stroke limiter



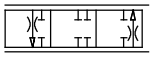
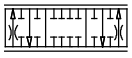
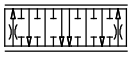
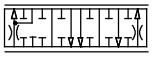
8.5.2 Selectable functions

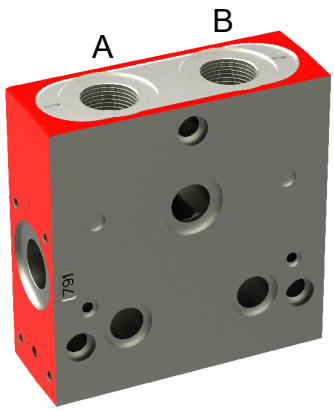
- Flow rate
- Pilot head
- Plug type



8.5.3 Options menu

Spool type

	 3A (B). A closed	 3J (A). B closed	 4A (A+B)	 4D (A+B)	 4R (REG)
16 l/min		= *C3J		= CC4D	
25 l/min		= *D3J	= DD4A	= DD4D	
40 l/min		= *F3J	= FF4A	= FF4D	
50 l/min		= *P3J	= PP4A	= PP4D	
63 l/min		= *G3J	= GG4A	= GG4D	
80 l/min		= *H3J	= HH4A	= HH4D	
100 l/min		= *K3J	= KK4A	= KK4D	
125 l/min		= *L3J	= LL4A	= LL4D	
150 l/min		= *M3J	= MM4A	= MM4D	
180 l/min	= O*3A	= *O3J	= OO4A	= OO4D	
A = 50 l/min, B= 25 l/min					= PD4R



Compensator function		Standard	Fine control *
for actuator B	=	4	B
for actuator A	=	8	A
for actuator A + B	=	5	C

Pilot head

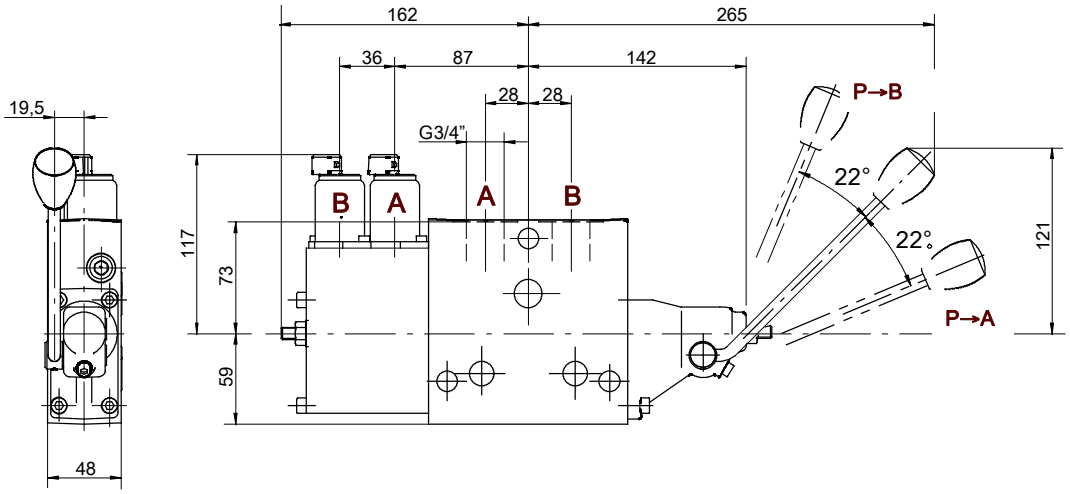
Electrohydraulic, two stage 12 V Duo head and add'l manual operator	=	Y
Electrohydraulic, two stage 24 V Duo head and add'l manual operator	=	Z

Plug type

AMP-Junior Timer	=	J
Deutsch DT04-2P-EP04	=	T

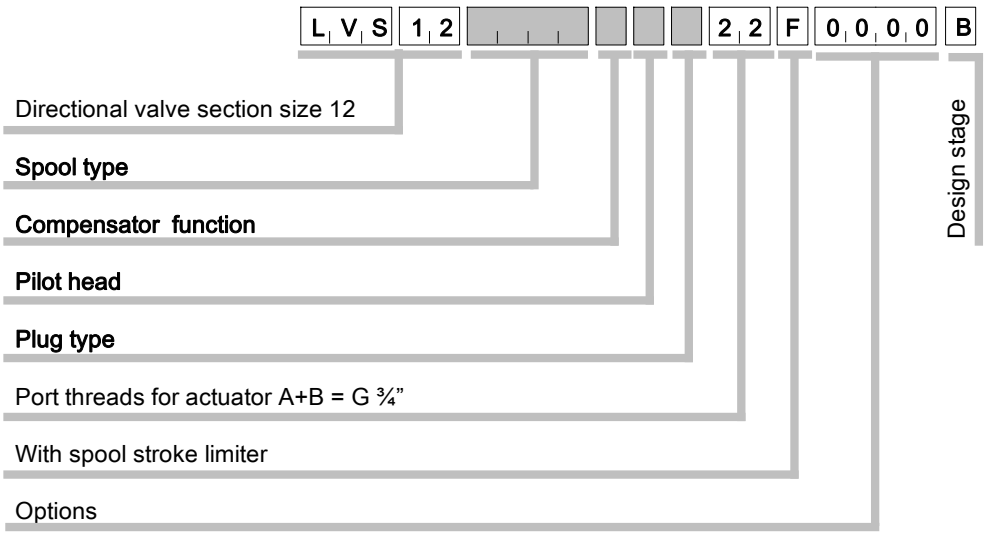
* = Fine controlled compensator function for increased stability in the hydraulics systems

8.5.4 Dimensions



8.5.5 Ordering code

☐ White fields	=	data specified by Bucher Hydraulics
▒ Grey fields	=	data from the overview of sections 8.5.3



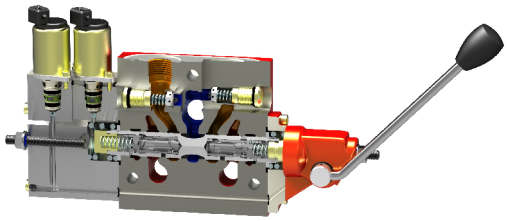
8.5.6 Accessories

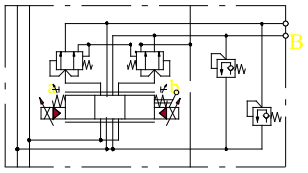
Deliverable accessories see paragraph 12

8.6 With compensator, pressure relief / make-up valves, duo head, additional manual operator and G¾" port threads

8.6.1 Standard functions

- Compensator function
- Port threads
- Pressure relief / make-up function (pressure settings are selectable)
- Additional manual operator and spool-stroke limiter



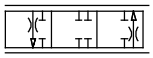
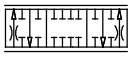
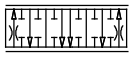
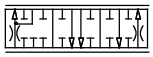


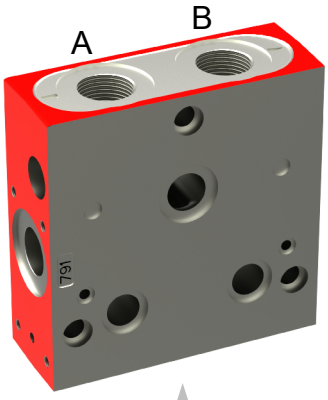
8.6.2 Selectable functions

- Flow rate and spool function
- Pilot head and plug type

8.6.3 Options menu

Spool type

	 3A (B). A closed	 3J (A). B closed	 4A (A+B)	 4D (A+B)	 4R (REG)
16 l/min		= *C3J		= CC4D	
25 l/min		= *D3J	= DD4A	= DD4D	
40 l/min		= *F3J	= FF4A	= FF4D	
50 l/min		= *P3J	= PP4A	= PP4D	
63 l/min		= *G3J	= GG4A	= GG4D	
80 l/min		= *H3J	= HH4A	= HH4D	
100 l/min		= *K3J	= KK4A	= KK4D	
125 l/min		= *L3J	= LL4A	= LL4D	
150 l/min		= *M3J	= MM4A	= MM4D	
180 l/min	= O*3A	= *O3J	= OO4A	= OO4D	
A = 50 l/min, B= 25 l/min					= PD4R



Compensator function	Standard	Fine control *
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Pilot head

Electrohydraulic, two stage 12 V Duo head and add'l manual operator	= Y
Electrohydraulic, two stage 24 V Duo head and add'l manual operator	= Z

Plug type

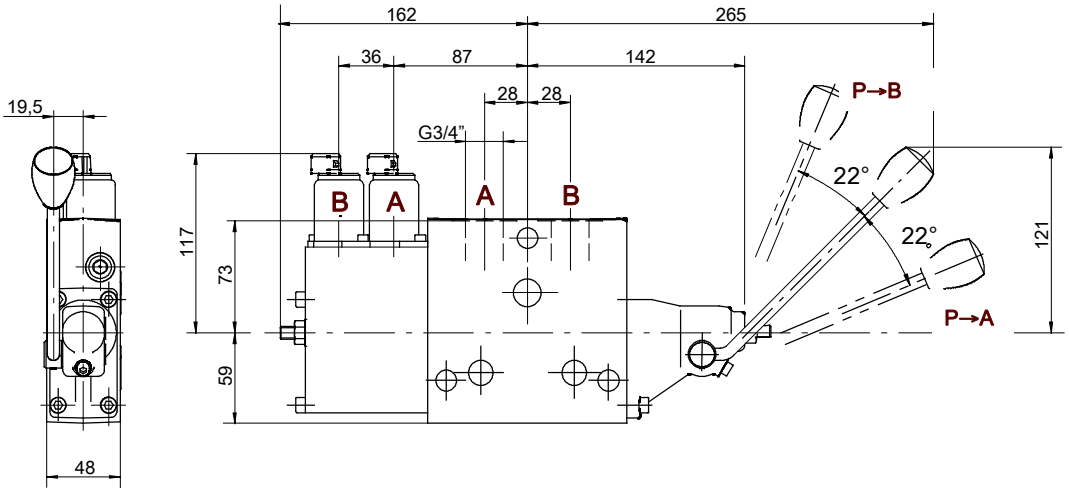
AMP-Junior Timer	= J
Deutsch DT04-2P-EP04	= T

Pressure relief / make-up function

adjustable 70-230 bar = **A**
adjustable, 150 - 380 bar = **B**
fixed setting (values in bar):
25 = **D**, 32 = **E**, 40 = **F**, 63 = **H**, 80 = **I**, 100 = **K**, 125 = **L**, 140 = **M**,
160 = **N**, 175 = **O**, 190 = **P**, 210 = **Q**, 230 = **R**, 250 = **S**, 280 = **T**
Cavity prepared = **#**

* = Fine controlled compensator function for increased stability in the hydraulics systems

8.6.4 Dimensions



8.6.5 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▢ Grey fields = data from the overview of sections 8.6.3

L	V	S	1	2					2	2	F	0	0	0	0	B	–	

For adjustable valves:
Pressure setting
P_A = ... bar
P_B = ... bar

Directional valve section size 12

Spool type

Compensator function

Pilot head

Spool type

Port thread for actuator A + B = G¾"

With spool-stroke limiter

Options

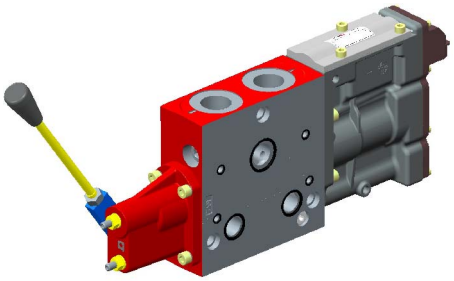
Design stage

Pressure relief / make-up function:
actuator A
actuator B
without = *

8.6.6 Accessories

Deliverable accessories see paragraph 12

9 Directional sections LVS12 – onboard electronics (digital pilot head)



9.1 Description

In the digital pilot head (electro-proportional operation), an electrical signal (demand signal) is amplified by using a pilot oil flow that, in turn, moves the control spool in the directional valve section. The position of the spool is detected by integral position transducers and this actual value is compared with the demand signal by the onboard electronics. By varying the pilot flow, the position of the spool is adjusted to correspond to the demand signal. The hydraulic supply to the on-board electronics is preferably done through the end section.

9.1.1 Advantages

Flexible
- Simple parameter changes
- Machine-specific configuration
- Easily extended

Cost-effective
- No adjustments during start-up
- Reduced cabling costs
- Simple, time-saving diagnostics

Coordinated system
- Integral sensors
- Proven, high-performance software
- Supported by application know-how

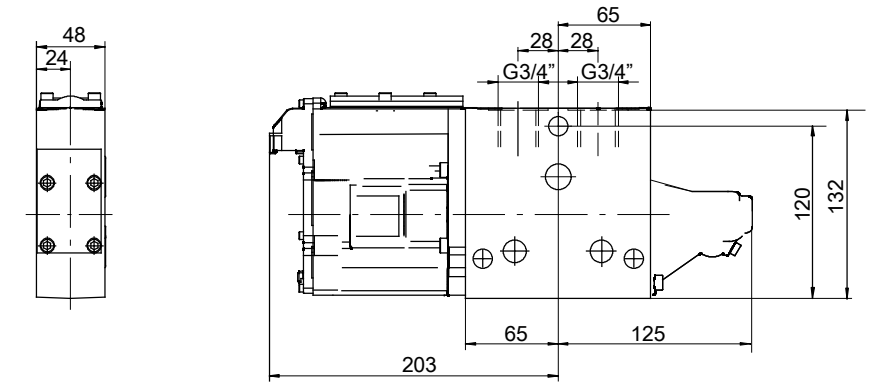
Safe
- Protection class IP67
- Sensors monitor the functionality
- Integral pilot pressure shut-off (end section)

9.2 General technical data

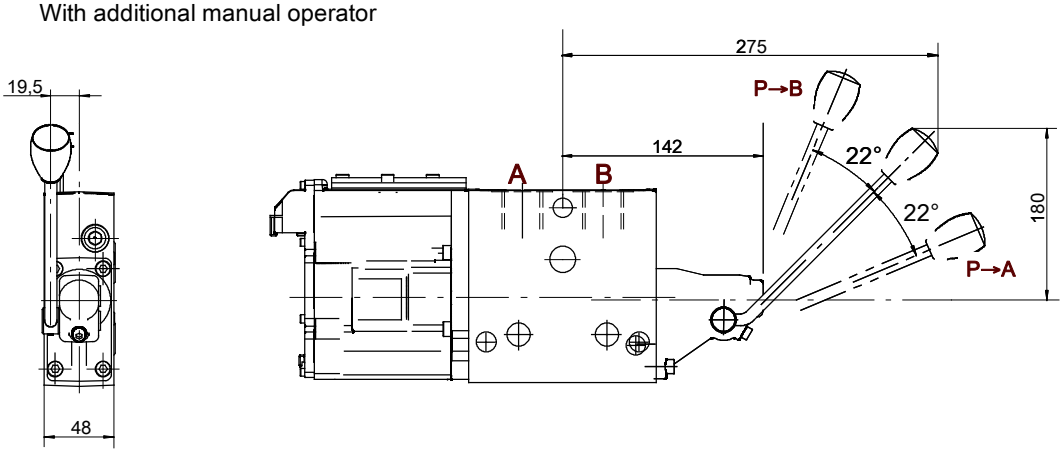
General characteristics	Unit	LVS12 with digital pilot head
Maximum flow rate	l/min	180
Maximum inlet pressure	bar	350 *
Maximum pressure at the actuator ports	bar	400 *
Spool increments by actuator flow rates at 12 bar Δp	l/min	16(C), 25(D), 40(F), 50(P), 63(G), 80(H), 100(K), 125(L), 150(M), 180(O)
Nominal voltage	V DC	24
Power consumption	W	7.2
Energising current	A	0.6 at 12 V / 0.3 at 24 V
Duty cycle	%	100
Plug type		DT16-6SA-K002
Protection class		IP67 (DIN 40050)
Configuration options		- flow limiting - flow characteristic - ramps (rate of rise/fall can be adjusted) - diagnostics via CAN bus

* Inlet pressures above 300 bar and actuator pressures above 320 bar only after discussion with the factory

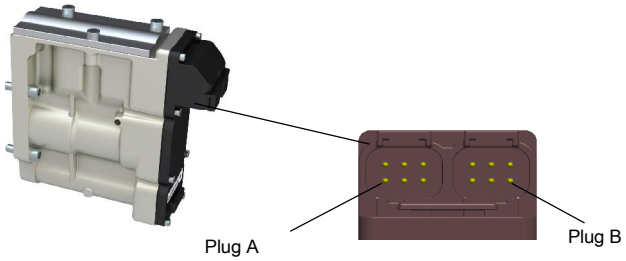
9.3 Dimensions



With additional manual operator



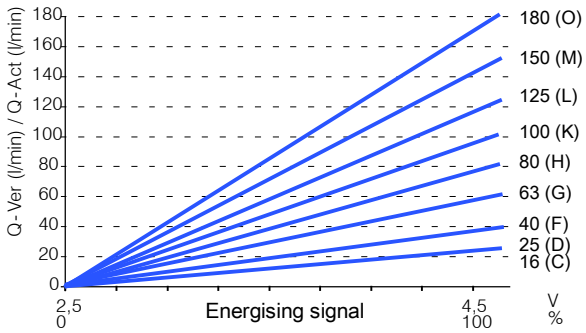
9.4 Onboard electronics



Components of the digital pilot head:
2 x Deutsch plugs, 6-pole
Fast-switch valves
Electronics card
Software (control system)
Spool-position sensor
Pressure sensor (optional)

9.4.1 Control characteristic

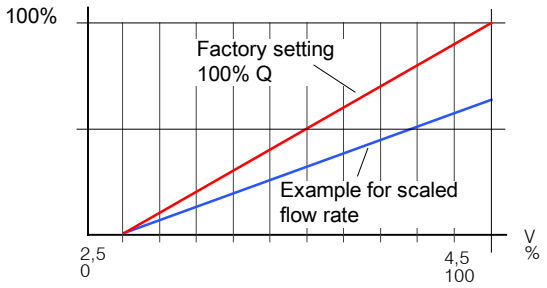
Operated by a digital pilot head with 12 bar pressure drop at the orifice.
Characteristics are linearised on the test stand:
10% control signal = 10% Q
20% control signal = 20% Q



9.4.2 Setting options

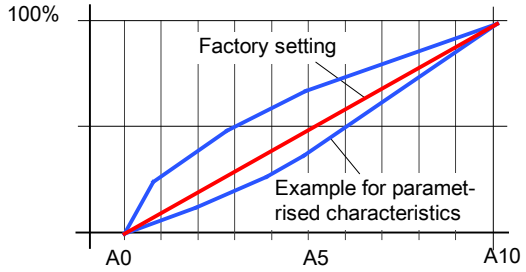
9.4.2.1 Scaling

Scaling of the flow rate with a constant input signal. The adjustment range is from 100% to 0%, and is adjustable in 1% steps.



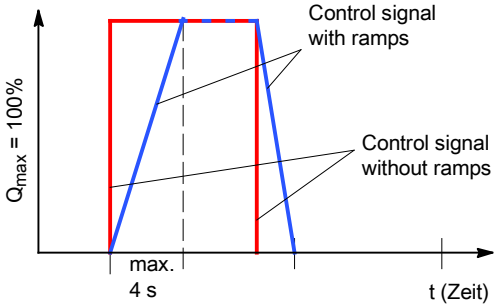
9.4.2.2 Actuator characteristic

The characteristics for actuator ports A and B are set with parameters A0 to A10.

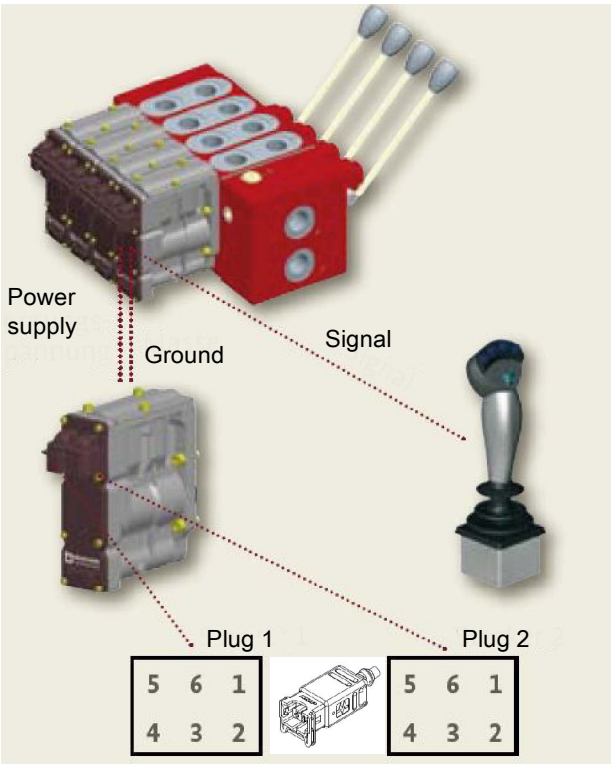


9.4.2.3 Ramp function

A and B, as well as the start and stop ramp, can be set differently.



9.5 Analogue systems



9.5.1 Functionality

- Analogue communication
- Each onboard electronic unit supplied by a separate control cable
- Power supply can be connected serially from pilot head to pilot head
- No interdependency between the individual valves
- Signal from spool-position sensor is available externally if required
- Control signal 2.5 ±2V

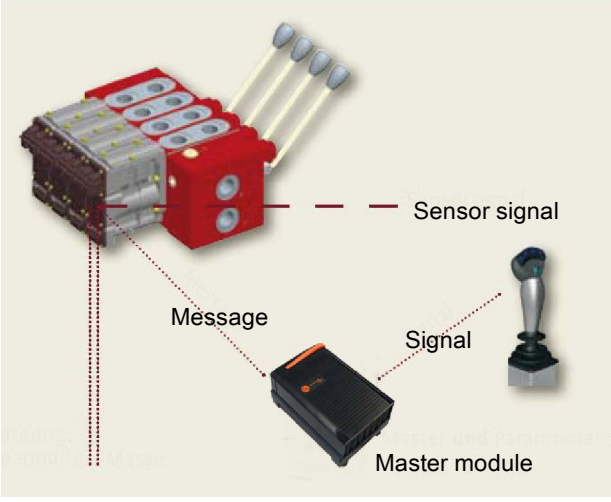
9.5.2 Configuration via CAN bus interface

- Flow limiting
- Flow characteristic
- Ramps (rate of rise/fall can be adjusted)
- Diagnostics via CAN bus

9.5.3 Plug pin layout

Plug 1, left (grey)	**Plug 2, right** (black)
1 = Control signal	1 = Signal from spool-position sensor
2 = Ground	2 = $V_{Reference}$, 5V (20 mA)
3 = Ground $_{Reference}$	3 = Ground
4 = CAN low	4 = CAN low
5 = CAN high	5 = CAN high
6 = $U_{Battery}$	6 = $U_{Battery}$

9.6 CAN bus systems



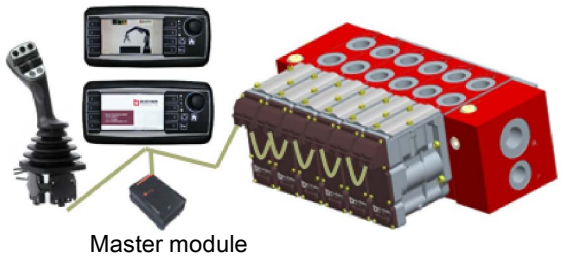
9.6.1 Functionality

- Communication via CAN bus interface and master board
- CAN bus and power supply are looped from pilot head to pilot head
- Intelligent system control
- Signal from spool-position sensor (available externally if required) is analogue or CAN protocol
- Analogue sensor can be added

9.6.2 Communication via CAN bus

- Flow limiting
- Flow characteristic
- Ramps (rate of rise/fall can be adjusted)
- Diagnostics via CAN bus
- System intelligence
- Master board (parametrisation and service terminal)

Operating, service and parametrisation terminal

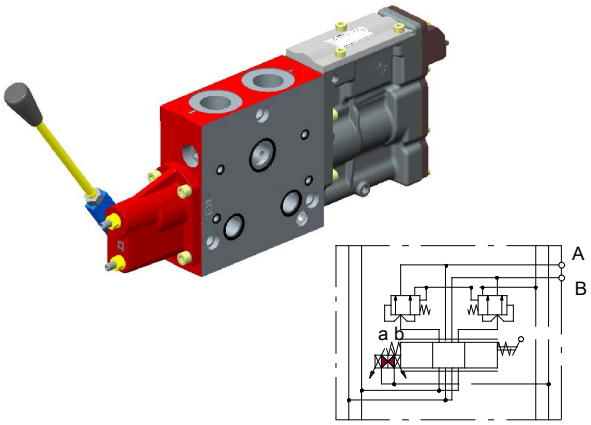


Master module

9.7 With compensator, additional manual operator and G¾" port threads

9.7.1 Standard functions

- Compensator function
- Pilot head: digital pilot head 12/24 Volt (external pilot pressure supply)
- Port threads for actuator A + B = G¾"
- Plug type: Deutsch DT16-6SA-K002

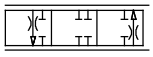
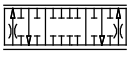
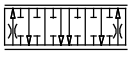
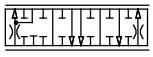


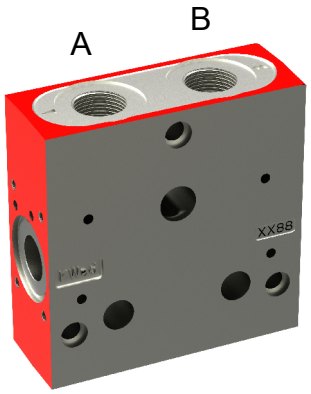
9.7.2 Selectable functions

- Flow rate
- Spool function
- Additional manual operator

9.7.3 Options menu

Spool type

	 3A (B). A closed	 3J (A). B closed	 4A (A+B)	 4D (A+B)	 4R (REG)
16 l/min		= *C3J		= CC4D	
25 l/min		= *D3J	= DD4A	= DD4D	
40 l/min		= *F3J	= FF4A	= FF4D	
50 l/min		= *P3J	= PP4A	= PP4D	
63 l/min		= *G3J	= GG4A	= GG4D	
80 l/min		= *H3J	= HH4A	= HH4D	
100 l/min		= *K3J	= KK4A	= KK4D	
125 l/min		= *L3J	= LL4A	= LL4D	
150 l/min		= *M3J	= MM4A	= MM4D	
180 l/min	= O*3A	= *O3J	= OO4A	= OO4D	
A = 50 l/min, B= 25 l/min					= PD4R



Compensator function	Standard	Fine control *
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Pilot head			
12 V DC	(CAN bus systems)	=	N
24 V DC	(CAN bus systems)	=	H
12 V DC	(analogue systems)	=	O
24 V DC	(analogue systems)	=	P

Additional manual operator		
With additional manual operator	=	N
Without	=	*

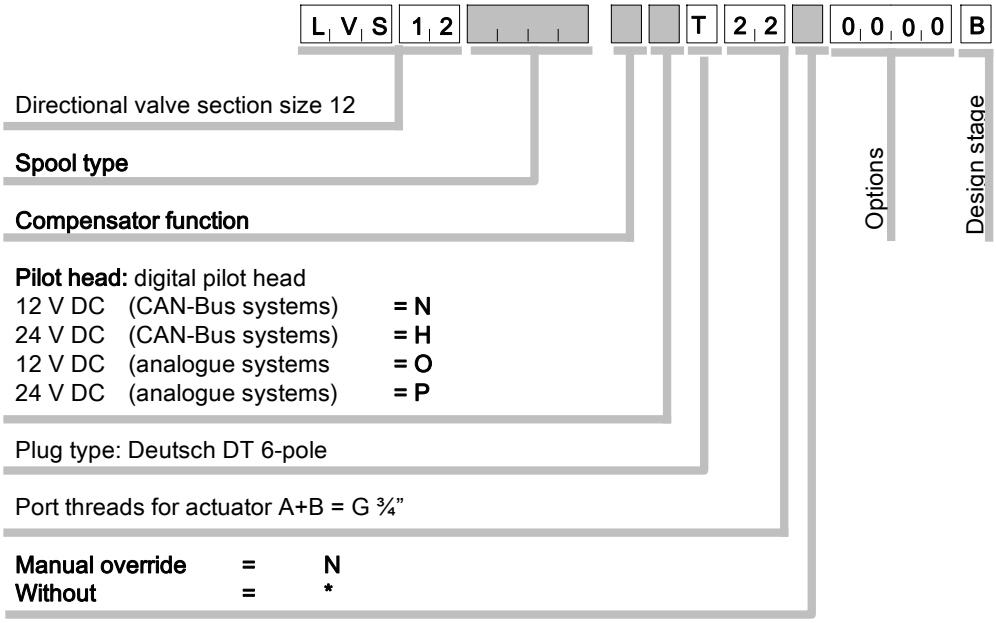
* = Fine controlled compensator function for increased stability in the hydraulics systems

9.7.4 Functional expansion

Additional manual operator

9.7.5 Ordering code

☐ White fields = data specified by Bucher Hydraulics
▨ Grey fields = data from the overview of sections 9.7.3



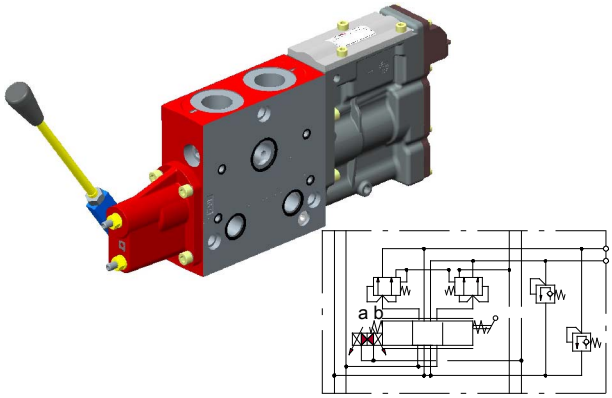
9.7.6 Accessories

Deliverable accessories see paragraph 12

9.8 With compensator, pressure relief / make-up function, additional manual operator and G¾" port threads

9.8.1 Standard functions

- Compensator function
- Pilot head: digital pilot head 12/24 Volt (external pilot pressure supply)
- Port threads for actuator A + B = G¾"
- Plug type: Deutsch DT16-6SA-K002
- Pressure relief / make-up valve (pressure settings are selectable)



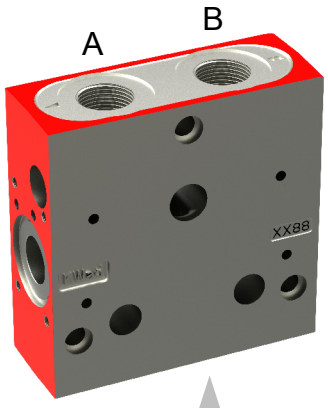
9.8.2 Selectable functions

- Flow rate
- Manual override
- Spool type

9.8.3 Options menu

Spool type

	3A (B). A closed	3J (A). B closed	4A (A+B)	4D (A+B)	4R (REG)
16 l/min		= *C3J		= CC4D	
25 l/min		= *D3J	= DD4A	= DD4D	
40 l/min		= *F3J	= FF4A	= FF4D	
50 l/min		= *P3J	= PP4A	= PP4D	
63 l/min		= *G3J	= GG4A	= GG4D	
80 l/min		= *H3J	= HH4A	= HH4D	
100 l/min		= *K3J	= KK4A	= KK4D	
125 l/min		= *L3J	= LL4A	= LL4D	
150 l/min		= *M3J	= MM4A	= MM4D	
180 l/min	= O*3A	= *O3J	= OO4A	= OO4D	
A = 50 l/min, B= 25 l/min					= PD4R



Compensator function	Standard	Fine control *
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Pilot head

12 V DC	(CAN bus systems)	=	N
24 V DC	(CAN bus systems)	=	H
12 V DC	(analogue systems)	=	O
24 V DC	(analogue systems)	=	P

Additional manual operator

with manual override	=	N
without	=	*

Pressure relief / make-up function

fixed setting (values in bar)

25 = **D**, 32 = **E**, 40 = **F**, 63 = **H**, 80 = **I**, 100 = **K**, 125 = **L**, 140 = **M**,
160 = **N**, 175 = **O**, 190 = **P**, 210 = **Q**, 230 = **R**, 250 = **S**, 280 = **T**

Cavity prepared = **#**

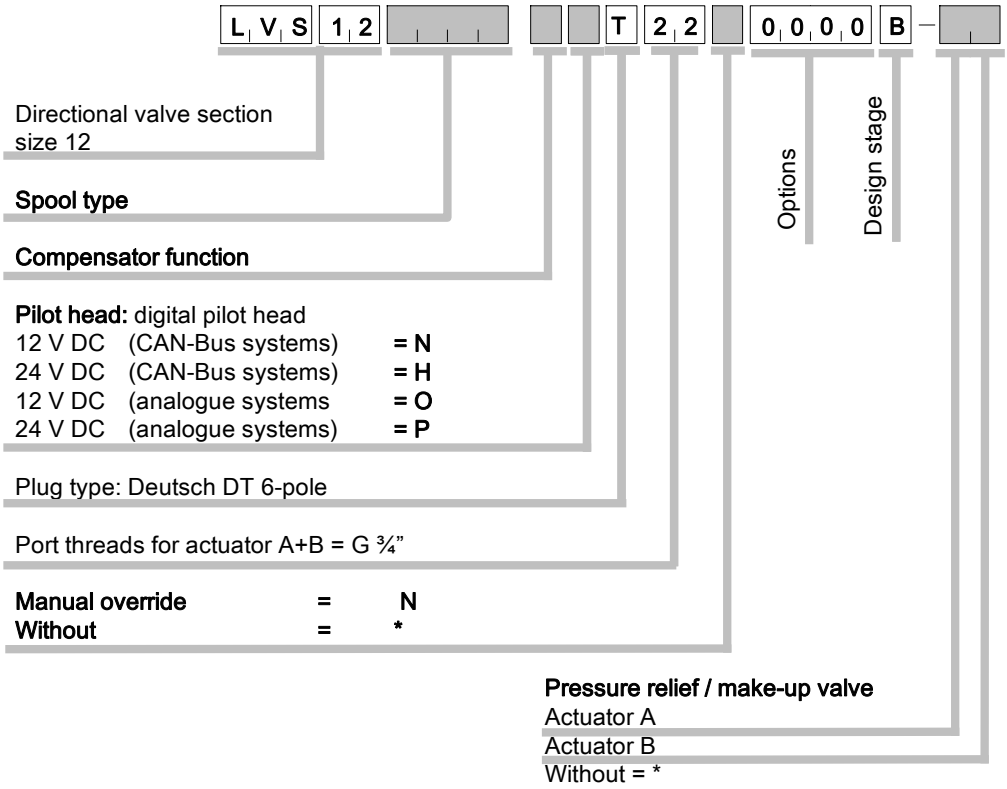
* = Fine controlled compensator function for increased stability in the hydraulics systems

9.8.4 Functional expansion

Additional manual operator

9.8.5 Ordering code

☐ White fields = data specified by Bucher Hydraulics
▩ Grey fields = data from the overview of sections 9.8.3



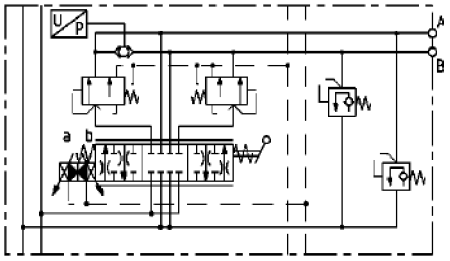
9.8.6 Accessories

Deliverable accessories see paragraph 12

9.9 With compensator, proportional pressure control, secondary pressure relief, additional manual operator and G¾" port threads

9.9.1 Proportional pressure control function

When the set maximum pressure (pressure sensor) is reached, the control spool reduces the flow sufficiently (to 0 l/min if necessary) to keep the pressure constant at the defined level. When the set pressure is reached, the control spool moves toward the mid-position until the set pressure is stable at the actuator port. If the actuator does not need any more flow to maintain the pressure, about 2 l/min flows through the now open tank metering notch.
Using a shuttle valve, the higher of the pressures at the actuator ports A and B is detected and signalled to the pressure sensor. To reduce pressure peaks, secondary pressure relief valves are fitted as standard equipment. Starting from this pressure level, the maximum control pressure set 10% lower.



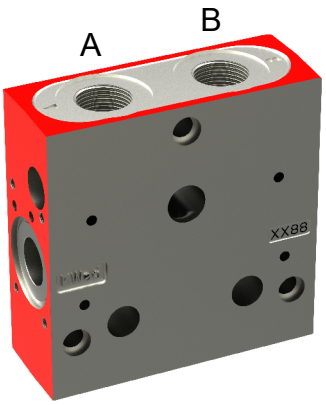
9.9.2 Optional variants

- Flow rate
- Spool function and spool type
- Additional manual operator

9.9.3 Standard configuration:

- Compensator function
- Pilot head:digital pilot head 12/24 V DC
- Proportional pressure control function
- Port threads for actuators ports A and B = G ¾"
- Plug type: Deutsch DT16-6SA-K002
- Pressure relief / make-up valve (choice of pressure settings)

9.9.4 Selection menu



Spool type

		4A		4D
A = 50 l/min	B = 50 l/min	**PP4A**	=	**PP4D**
A = 100 l/min	B = 100 l/min	**KK4A**	=	**KK4D**
A = 180 l/min	B = 180 l/min	**OO4A**	=	**OO4D**

Compensator function		**Standard**	**Fine control ***
for actuator B	=	**4**	**B**
for actuator A	=	**8**	**A**
actuator A + B	=	**5**	**C**

Pilot head

12 V DC	(CAN bus systems)	=	**N**
24 V DC	(CAN bus systems)	=	**H**
12 V DC	(analogue systems)	=	**O**
24 V DC	(analogue systems)	=	**P**

Additional manual operator

with additional manual operator	=	**N**
without	=	*****

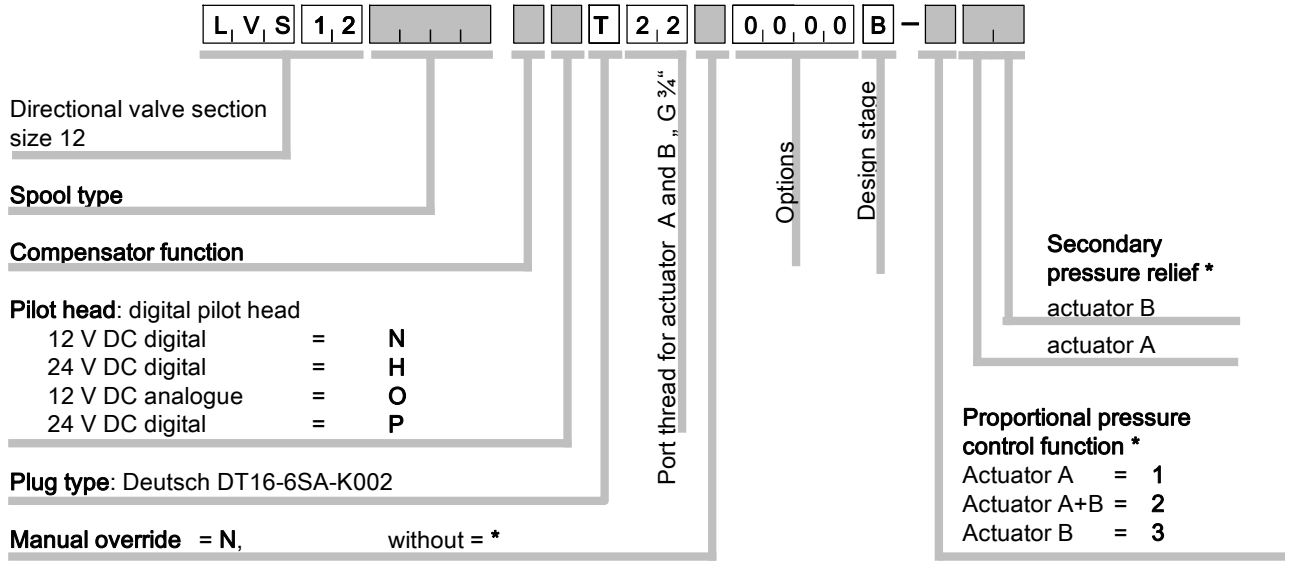
Secondary pressure relief valve
Fixed setting (values in bar, value = maximum control pressure + 10%):
25 = **D**, 32 = **E**, 40 = **F**, 63 = **H**, 80 = **I**, 100 = **K**, 125 = **L**, 140 = **M**, 160 = **N**, 175 = **O**,
190 = **P**, 210 = **Q**, 230 = **R**, 250 = **S**, 280 = **T** 300 = **U** 330 = **V**, 350 = **W** 380 = **X**

* = Fine controlled compensator function for increased stability in the hydraulics systems

9.9.5 Ordering code

☐ White fields = data specified by Bucher Hydraulics

▩ Grey fields = data from the overview of sections 9.9.4



* Secondary press. relief = control pressure + approx. 10%

10 Configuration of control blocks

10.1 Ordering example

Criteria	Model code and description	Part number
General: Power supply = 24 V DC Plug type = AMP-Junior Timer		
Inlet section: Pump type = fixed-displacement pump Inlet flow = 140 l/min P_{max} = 230 bar Three-way pressure compensator function	**LVS-E-CF*-G110A00/P1 = 230 bar** Port threads: P + R = 1“ Q_{In} up to 200 l/min, Δp = 12 bar, LS_{max} setting = 218 bar (P_{max} - Δp)	100030365
1st Directional valve section: Actuator: 1 motor drive, reversible Inlet flow = 100 l/min Compensator with fine control	**LVS12KK4DCGJ22A0000B** Port threads: P + R = 1“ Q_{In} up to 200 l/min, Δp = 12 bar, LS_{max} setting = 218 bar (P_{max} - Δp)	
2nd Directional valve section: Actuators: 2 motor drives, non-reversible Q motor 1 = 100 l/min, Q motor 2 = 40 l/min Compensator with fine control P_{max} at actuator B = 100 bar	**LVS12KF4DCGJ22A0000B-K**	
3rd Directional valve section: Actuator: double-acting cylinder Q at A and B = 25 l/min Q_{pmax} at A = 100 bar, at B = 160 bar Standard pressure compensator, ON-OFF operation	**LVS08DD4A5BJ22A0000C-KN**	
End section No control function	**LVS-A-CA*-****A00**	100027983
Tie bolts Screw-in depth 15 mm, plus 3 directional sections = 3 x 48 mm, plus thickness of end section 32 mm, plus projection of 15 mm = 206 mm, rounded up to the next x10 size = 210 mm	**3 pcs. tie bolts 210 mm**	

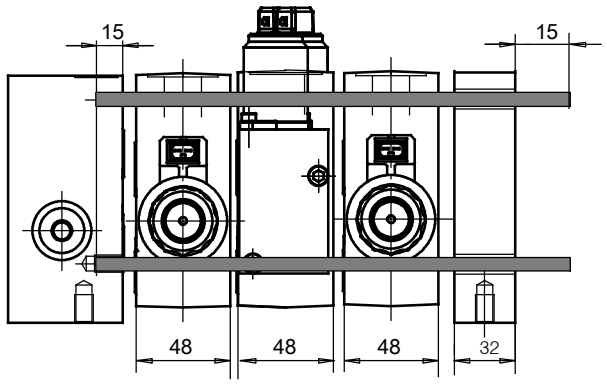
10.2 Assembly kit

To assemble the individual valve sections with assured functional reliability, 3 tie bolts and hex. nuts are necessary.

10.2.1 Ordering code

3 pcs. tie bolt M10 x ..... (required length in mm)

3 pcs. hex. nut M10, Part No.: 100243580



Calculating the tie bolt length:

15 mm + (48 mm x no. of directional valve sections) + width of the end section + 15 mm

Example:

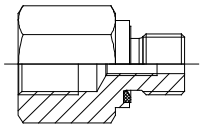
15 + (48x3) + 32 +15 = 206 mm

For ordering purposes, always round up the calculated tie bolt length to the next 10 mm.

In our example, we therefore need to order 3 pcs. tie bolt M10 x 210 mm.

IMPORTANT: maximum 10 directional sections in one valve block

10.2.2 Pipe fitting and orifices

Model code	Description
Part number: 100116329 	- Pipe fitting G1/4" with thread for inserting up to 2 x M5 orifices (TN3001, Form B) Application note: for fitting in the LS line to improve system stability - Orifice : Ø 0,5 = 100219282 Ø 0,6 = 100209791 Ø 0,8 = 100216052 Ø 1,0 = 100225419

11 Fluid

The control blocks require fluid with a minimum cleanliness level of NAS 1638, class 9 or ISO 4406, code 20/18/15.
We recommend the use of fluids that contains anti-wear additives for mixed-friction operating conditions.Fluids without appropriate additives can reduce the service life of valves.
The user is responsible for maintaining and regularly checking the fluid quality. Bucher Hydraulics recommends a load capacity of > 30 N/mm^2 to Brugger DIN 51347-2.

12 Fluid cleanliness class

Cleanliness class (RK) onto ISO 4406 and NAS 1638

Code ISO 4406	Dirt particle number / 100 ml			
	≤ 4 µm	≤ 6 µm	≤ 14 µm	NAS 1638
23/21/18	8000000	2000000	250000	12
22/20/18	4000000	1000000	250000	-
22/20/17	4000000	1000000	130000	11
22/20/16	4000000	1000000	64000	-
21/19/16	2000000	500000	64000	10
20/18/15	1000000	250000	32000	9
19/17/14	500000	130000	16000	8
18/16/13	250000	64000	8000	7
17/15/12	130000	32000	4000	6
16/14/12	64000	16000	4000	-
16/14/11	64000	16000	2000	5
15/13/10	32000	8000	1000	4

13 Note

This catalogue is intended for users with specialist knowledge. The user must check the suitability of the equipment described here in order to ensure that all of the conditions necessary for the safety and proper functioning of the system are fulfilled. If you have any doupts or questions concerning the use of these pumps, please consult Bucher Hydraulics.

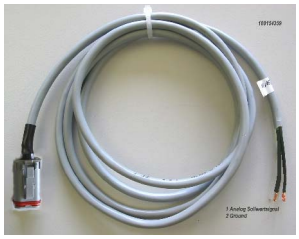
14 Accessories

14.1 Analogue systems

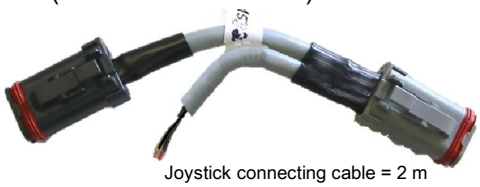
Description	Ordering code	Data sheet
Electrical joystick (demand-signal source)	FGE	100-P-700051
Plug kit, consisting of socket housing DT16-6SA-K002 right and left, including crimp contacts	100153228	

14.1.1 Connecting cable (2 m) EBT-400-CAB for the machine (Part No. 100035274)

14.1.2 Analogue connecting cable 2 m, connection resistance 120 Ω (Part No. 100154359)



14.1.3 Interconnecting cable 0.12 m, analogue connecting cable 2 m (Part No. 100154360)



Joystick connecting cable = 2 m

14.2 CAN bus systems

14.2.1 Interconnecting cable 0.12 m (Part No. 100153222)

14.2.2 Deutsch plug, 6-pole with LEDs

CAN bus terminator, 120 Ohm
(Part No. 100154185)

- **LED flashing** => CAN bus is working
- **LED ON** => supply voltage is present

14.2.3 CAN bus terminating resistor, 120 Ohm (Part No. 100153223)

14.2.4 Power supply (Part No. 100154290)

With blocks that have more than 6 valve sections, a second power supply is necessary from the 7th section.

14.2.5 Master module ELMR225

Description	Ordering code	Data sheet
Master module	ELMR225	100-P-700067

14.3 Analogue and CAN bus systems

14.3.1 Parametrisation terminal EBT-400

The EBT400 parametrisation terminal (process and dialog module) is a graphics display unit for parametrising LVS on-board electronics and analogue CAN bus models.

Function:
- Initial start-up
- Detecting and listing the address, serial number and version of all the pilot heads
- Change parameters, scale characteristic, define characteristic, define ramps
- Upload and download software with USB interface
- Change pilot head; software is downloaded to replacement pilot head (via USB) and corresponds to the original pilot head
- Change zero-point setting, change control parameters
- Display of actual values, spool displacements
- Supervision / monitoring bus traffic
- User level
- Addressing
- Troubleshooting – diagnostic information with error listing

Description	Ordering code	Data sheet
Parametrisation terminal EBT-400	100035273	100-B-000121

14.3.2 Parametrisation cable for workshop and machine
(Part No. 100035274)

14.3.3 Programming on the workbench
(Part No. 100035805)

14.3.4 Wiring harness for parametrisation and fault-finding on the machine
(Part No. 100035798)

Maximum tightening torque = 30 Nm.
Tighten in 3 steps of 6, 16 and 30 Nm.

15 Accessories

15.1 Pressure relierf valves

Model code	Ordering code	Description
DRUCKBEGRENZUNG LPA20/T-N-P	100232679	adyustable pressure relief valve
SICHERUNGSKAPPE GELB	100215172	Jellow savety cover for pressure relief valve

15.2 Pilod heads (solenoids)

Model code	Ordering code	Description
MAGNETSP SW D45 12V AMP 6KT	100234581	Pilod head, 12 V, ON/OFF solenoid, plug type AMP Junior Timer
MAGNETSP SW D45 24V AMP 6KT	100234582	Pilod head, 24 V, ON/OFF solenoid, plug type AMP Junior Timer
MAGNETSP SW D45 12V DT042P 6KT	100234583	Pilod head, 12 V, ON/OFF solenoid, plug type Deutsch DT04-2P-EP04
MAGNETSP SW D45 24V DT042P 6KT	100234584	Pilod head, 24 V, ON/OFF solenoid, plug type Deutsch DT04-2P-EP04
MAGNETSP PROP D45 12V AMP	100232669	Pilod head, 12 V, proportional solenoid, plug type AMP Junior Timer
MAGNETSP PROP D45 24V AMP	100232671	Pilod head, 24 V, proportional solenoid, plug type AMP Junior Timer
MAGNETSP PROP D45 12V DT04-2P	100233671	Pilod head, 12 V, proportional solenoid, plug type Deutsch DT04-2P-EP04
MAGNETSP PROP D45 24V DT04-2P	100233672	Pilod head, 24 V, proportional solenoid, plug type Deutsch DT04-2P-EP04
O.RING	100247890	O-ring seal for solenoid D45
MUTTER	100232493	Screw nut for fixing the solenoid D45

15.3 Pressure relierf valves for pilot head

Model code	Ordering code	Description
DRUCKREDUZIERVENTIL PROP	100235779	Pressure reducing valve for electrohydraulic pilot head, 12 V, plug type AMP Junior Timer, manual override
DRUCKREDUZIERVENTIL PROP	100234573	Pressure reducing valve for electrohydraulic pilot head, 24 V, plug type AMP Junior Timer, manual override
DRUCKREDUZIERVENTIL PROP	100236229	Pressure reducing valve for electrohydraulic pilot head, 12 V, plug type Deutsch DT04-2P-EP04, manual override
DRUCKREDUZIERVENTIL PROP	100236230	Pressure reducing valve for electrohydraulic pilot head, 12 V, plug type Deutsch DT04-2P-EP04, manual override

Classification: 430.300.330.