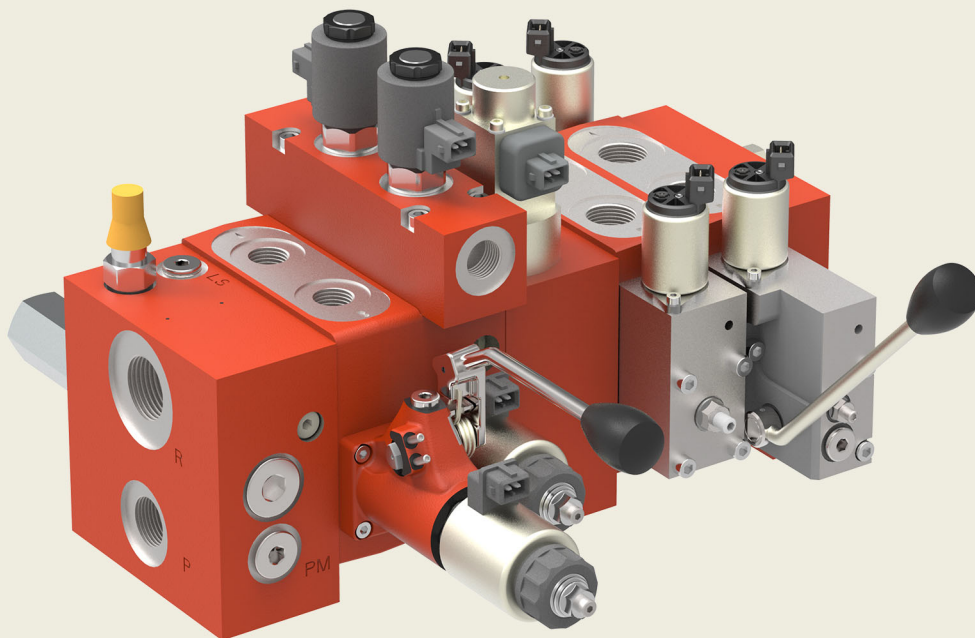
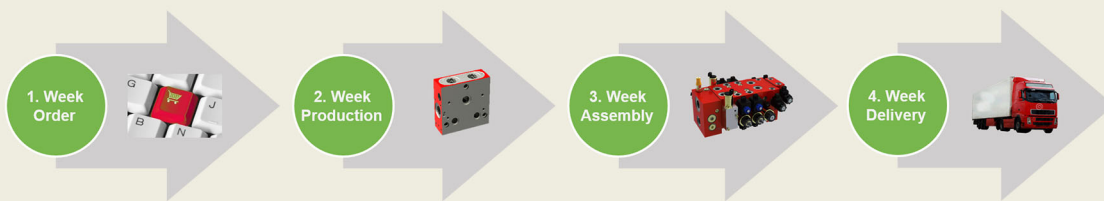


Proportional Directional Valves

Series LVS08 and LVS12 – Preference program



Contents

Page

1	General description	5
	1.1 Advantages	5
	1.2 Application examples	5
	1.3 Pump systems	5
	1.4 General technical data	7
2	Inlet sections	8
	2.1 General technical data	8
	2.2 Characteristic curves	8
	2.3 Functions	8
	2.4 Overview inlet sections	9
	2.5 Dimensions	13
3	Intermediate sections	16
	3.1 Characteristic curves	16
	3.2 Overview of items, with part number	16
	3.3 Overview of intermediate sections	16
	3.4 Dimensions	18
4	Directional valve sections	19
	4.1 General technical data	19
	4.2 Technical data for pressure relief / make-up valve	19
	4.3 Characteristic curves	19
	4.4 Functions	20
5	Directional sections LVS08 – with ON/OFF or proportional solenoids	21
	5.1 General technical data	21
	5.2 Characteristic curve	21
	5.3 LVS08 Standard	22
	5.4 LVS08 Standard with pressure relief / make-up valve	24
	5.5 LVS08 Standard, surface for bolt-on valve	26
	5.6 LVS Standard, surface for bolt-on valves, with pressure relief / make up valve	28
	5.7 LVS08 with integrated double seat valve	30
	5.8 LVS08 with additional manual handlever	32
	5.9 LVS08 with additional manual handlever and pressure relief / make-up valve	34
6	Bolt-on sections LVS08	36
	6.1 Function	36
	6.2 Overview of items, with part number	36
	6.3 Overview bolt-on sections	36
	6.4 Dimensions	38

7	Directional valve sections LVS12 – electrohydraulic, two-stage	39
7.1	General technical data	39
7.2	Characteristic curve	40
7.3	LVS12 Standard	41
7.4	LVS12 with pressure relief /make-up valves	43
7.5	LVS12 with additional manual handlever	45
7.6	LVS12 with additional manual operation, pressure relief / make-up valve	47

8	End sections	49
8.1	Overview of items, with part number	49
8.2	Overview of end sections	49
8.3	Dimensions	49

9	Configuration of control blocks	50
9.1	Ordering example	50
9.2	Assembly kit	50

10	Fluid	51
----	-------------	----

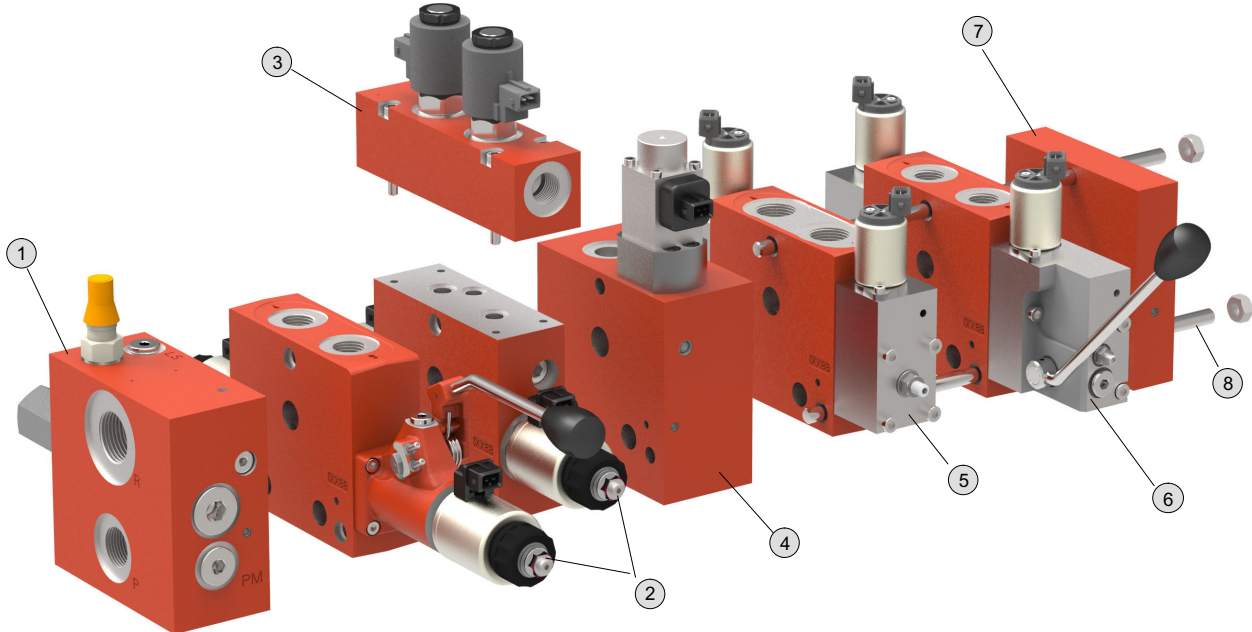
11	Liability	51
----	-----------------	----

12	Note	51
----	------------	----

1 General description

Manufacturers of machinery and equipment depend on fast response times and the reliable supply of machine components. By using the preference 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.



Item	Description
1	Inlet section
2	Direct acting, solenoid-operated directional valve, on/off or proportional solenoid
3	Bolt-on section
4	Intermediate section
5	2-stage, proportional, electrohydraulically operated directional valve
6	2-stage, proportional, electrohydraulically operated directional valve with additional manual handlever
7	End section
8	Threaded tie rods

1.1 Advantages

- Short and reliable lead times (we maintain an inventory of preferred products)
- Reduced customer inventories
- Rapid reaction time to changes in customer- and market-requirements
- Adaptable valve-block configuration

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 system), 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.

1.3.3 Post-compensated system (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, but by the most highly loaded actuator via the system pressure control (pump controller with load-sensing systems, or system pressure compensator with fixed-displacement pump supply).

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).

In a post-compensated system, with LS pump supply without inlet compensator, the available $LS\Delta p$ 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 $LS\Delta p$ 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.

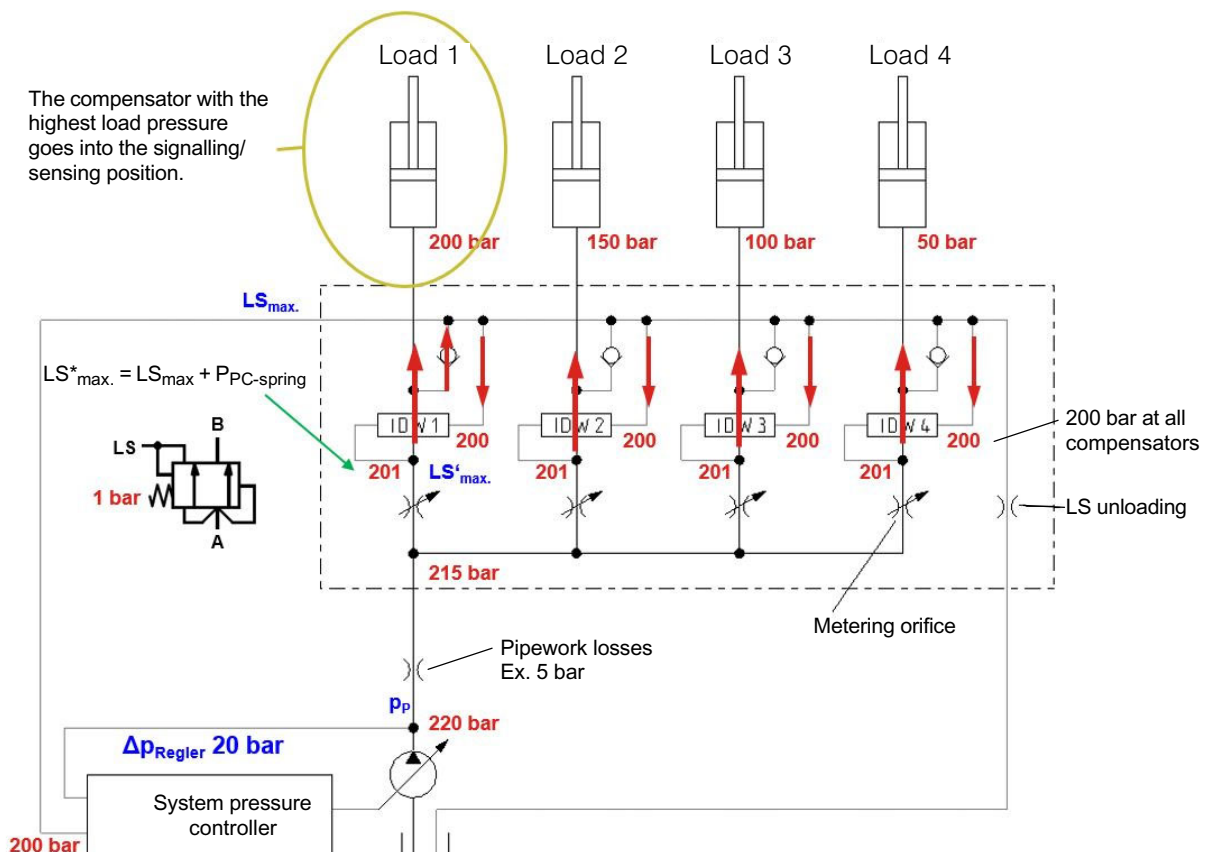
It is important to note that, as the flow rate increases, the Δp split ratio changes.

After the post-compensated systems that jointly are supplied by one pump, it always have to 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 post-compensated systems 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 demanded is 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 .

1.3.4 Example showing a downstream pressure compensator

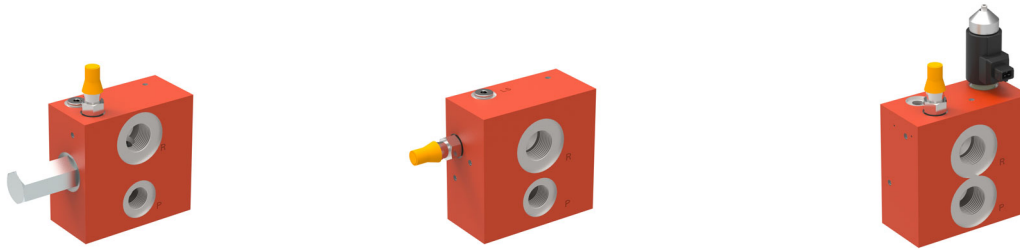


1.4 General technical data

General characteristics	Unit	Description, value
Recommended mounting orientation		With spool axis horizontal
Fluid temperature	°C	-20 ... +80
Viscosity range	mm ² /s	For reliable operation 380 ... 10 For rated performance 80 ... 20
Minimum fluid cleanliness level		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. 300 ¹⁾ actuator port max. 320 ¹⁾ tank port max. 50 static
Flow rate	l/min	Maximum flow rate at the P inlet = 260 ¹⁾ Maximum flow rate at the actuator ports = 180 with control Δp of 12 bar
Hydraulic fluid		Recommendation: high-quality fluids with a mineral-oil base, such as HLP oils to DIN 51524 part 2. Biodegradable oils in groups HEES and HEPG can be used if the manufacturer's instructions are followed. For other fluids please contact Bucher Hydraulics.
Valve block size		Max. 10 directional sections per valve block

1) For higher pressures and flow rates, please enquire.

2 Inlet sections



2.1 General technical data

General characteristics	Unit	Description, value
Inlet pressure	bar	max. 300 ¹⁾
Nominal flow rate Open-Center systems	l/min	max. 200
Nominal flow rate Closed-Center systems	l/min	max. 260
Nominal flow rate, A and B to T	l/min	max. 300

1) For higher pressures, please enquire.

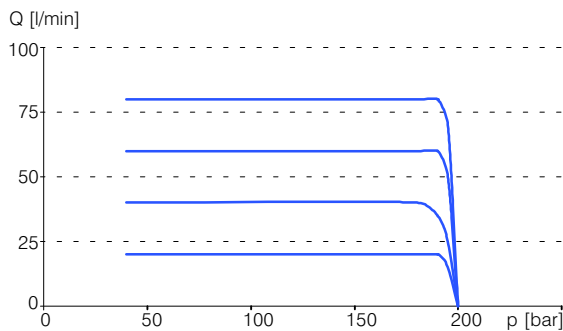
2.2 Characteristic curves

2.2.1 Priority valve

With no flow to downstream actuators

Q [l/min] = priority flow

p [bar] = load pressure at priority actuator

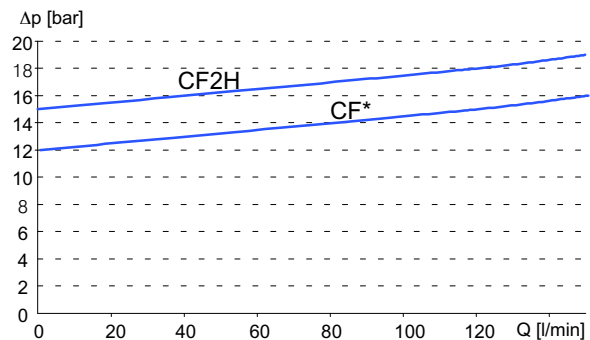


This characteristic curve is valid in conjunction with inlet sections that have an additional priority function.

2.2.2 Bypass pressure with 3-way pressure compensator in neutral position

Q [l/min] = flow rate through the block

Δp [bar] = pressure drop from P to T



Definition of the inlet sections see section 2.4.2.

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_{LS} approx. 0.7 l/min).

2.3.2 LS_{max} pressure relief

The LS_{max} pressure relief setting at the valve block have to 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-position. 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 have to be higher than the LS_{max} pressure relief by at least the $LS-\Delta p$ of the pump (see also section 4.4.4)

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 rest flow passes to tank or to the rest-flow port.

2.3.4 2-way pressure compensator

In the inlet section, the 2-way pressure compensator is needed to convert a higher inlet pressure into a lower, controlled working pressure.

This circuit is needed when several control blocks, each with a different working pressure, are incorporated in the overall system and one of these hydraulic circuits has to be regulated to a lower pressure level.

If the pressure in the control line reaches the setting of a pressure relief valve, the pressure compensator shuts off the supply to the hydraulic circuit. In this way, a constant pressure level is achieved in the respective hydraulic circuit.

2.3.5 Pressure control in P line

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

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 flow is supplied by pump. Only when the external priority is completely supplied, rest flow will feed the block functions. 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.

2.3.9 LS shut-off

In the type LVS-E-CCL... inlet sections for closed-center operation (LS pump), an additional LS shut-off is implemented using a seat-type directional cartridge valve.

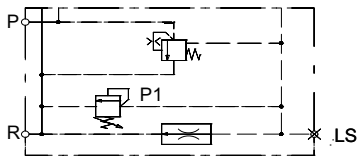
This safety shut-off is used to interrupt the LS signal from the control block to the pump (by connecting the LS signal inside the block directly to tank).

2.4 Overview inlet sections

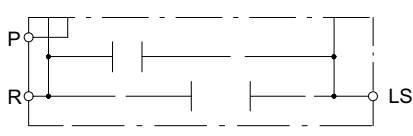
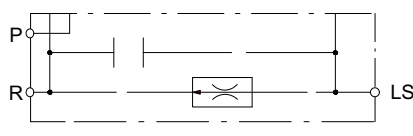
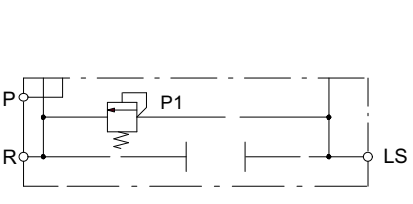
2.4.1 Overview of items, with part number

Model code	Part number	Model code	Part number
LVS-E-CF*-G110A00/P1=	100030365	LVS-E-CCL-G110J24A53/P1=	100033188
LVS-E-CAP-G110A00	100027317	LVS-E-CCL-G110J12A48/P=/P1=	100036604
LVS-E-CB*-G110A00	100030496	LVS-E-CCL-G110J24A48/P=/P1=	100033704
LVS-E-CE*-G110A01/P1=	100029646	LVS-E-CF2-G110A00/P1=	100031115
LVS-E-CE*-G110A48/P=P1=	100032849	LVS-E-CF2H-G110A00/P1=	100036559
LVS-E-CE*-B110A42/P=P1=	100032566	LVS-E-CME-G101A54/P2=	100032775
LVS-E-CCL-G110J12A53/P1=	100036603	LVS-E-CGE-G100A00/P2=/P3	100027273

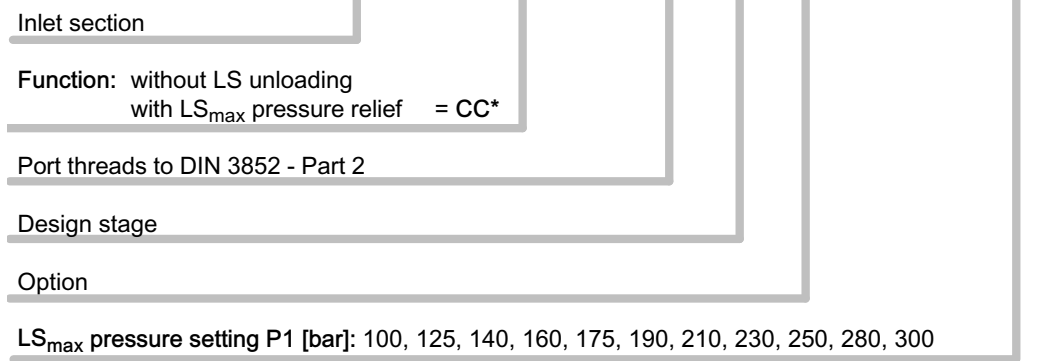
2.4.2 Inlet sections for systems with fixed-displacement pump (Open Center)

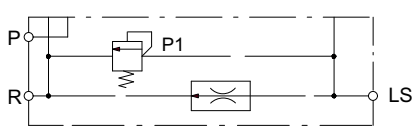
Symbol	Description	Part number
	<p>LVS-E-CF*-G110A00/P1=</p> <ul style="list-style-type: none"> • 3-way compensator • LS_{max} pressure relief adjustable, $P1 =$ • Two-stage pressure relief, $P1 =$ • Control $\Delta p = 12 \text{ bar}$ • Q_{In} up to 200 l/min • Port threads: P and R = G1" <p>⇒ Give the pressure setting P1 in bar with the ordering information This results in $P = P1 (LS_{max}) + \Delta p$</p>	100030365

2.4.3 Inlet sections for systems with load-sensing pump (Closed Center)

Symbol	Description	Part number
	LVS-E-CAP-G110A00 <ul style="list-style-type: none"> • Q_{In} = up to 260 l/min • Port threads: P and R = G 1", LS = G 1/4" 	100027317
	LVS-E-CB*-G110A00 <ul style="list-style-type: none"> • LS-unloading • Q_{In} = up to 260 l/min • Port threads: P and R = G 1", LS = G 1/4" 	100030496
	LVS-E-CC*-G110A00/P1= <ul style="list-style-type: none"> • 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 • Q_{In} = up to 260 l/min • Port threads: P and R = G 1", LS = G 1/4" ⇒ Give the pressure setting P1 in bar with the ordering information This results in $P = P1 (LS_{max}) + \Delta p$	see ordering code

L V S - E - C C * - G 1 1 0 A 0 0 / P 1 =



	LVS-E-CE*-G110A00/P1= <ul style="list-style-type: none"> • LS-unloading • LS_{max} pressure relief, fixed setting, P1 = e.g. 210 bar • Selection of LS_{max} pressures P1 [bar]: 100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300 • Q_{In} = up to 260 l/min • Port threads: P and R = G 1", LS = G 1/4" ⇒ Give the pressure setting P1 in bar with the ordering information This results in $P = P1 (LS_{max}) + \Delta p$	see ordering code
---	---	-------------------

L V S - E - C E * - G 1 1 0 A 0 0 / P 1 =

Inlet section

Function:

with LS unloading with LS_{max} pressure relief = CE*

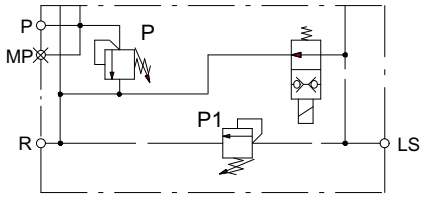
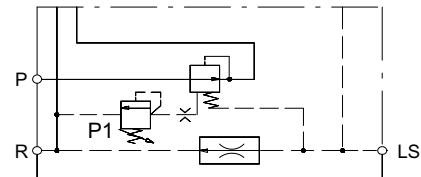
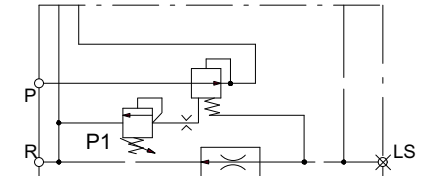
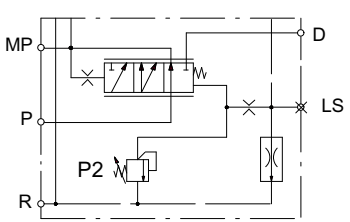
Port threads to DIN 3852 - Part 2

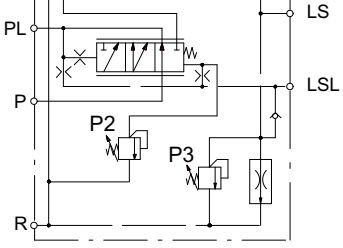
Design stage

Option

LS_{max} pressure setting P1 [bar]: 100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300

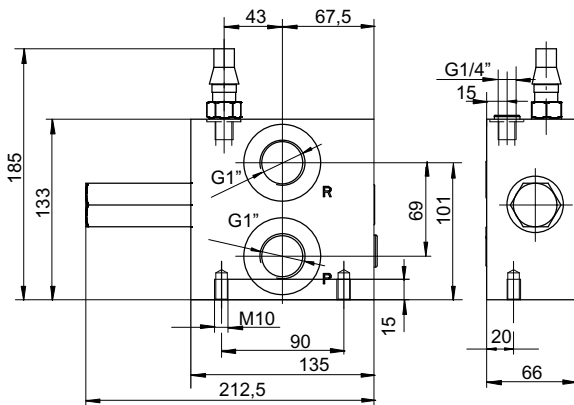
	<p>LVS-E-CE*-G110A01/P1=</p>	<p>100029646</p>
	<p>LVS-E-CE*-G110A48/P=/P1=</p>	<p>100032849</p>
	<p>LVS-E-CE*-G110A42/P=/P1=</p>	<p>100032566</p>
	<p>LVS-E-CCL-G110J12A53/P1= (12 V DC) LVS-E-CCL-G110J24A53/P1= (24 V DC)</p>	<p>100036603 100033188</p>

 <p>Note:</p> <ul style="list-style-type: none"> • Test port for P inlet 	<p>LVS-E-CCL-G110J12A48/P=/P1= (12 V DC) LVS-E-CCL-G110J24A48/P=/P1= (24 V DC)</p> <ul style="list-style-type: none"> • Electrical LS-disable via 2/2 seat valve, de-energised open • LS_{max} pressure relief adjustable, P1= • Q_{In} up to 260 l/min • Pressure relief can be set in the P inlet, Q = 140 l/min • Port threads: P and R = G1", LS = G1/4" <p>⇒ Give the pressure setting P and P1 in bar with the ordering information This results in $P = P1 (LS_{max}) + \Delta p$</p>	<p>100036604 100033704</p>
	<p>LVS-E-CF2-G110A00/P1=</p> <ul style="list-style-type: none"> • 2-way compensator • LS-unloading • Flow cut-off, adjustable P1 = • Control $\Delta p = 12$ bar • Q_{In} up to 150 l/min • Port threads: P and R = G1", LS = G1/4" <p>⇒ Give the pressure setting P1 in bar with the ordering information This results in $P = P1 (LS_{max}) + \Delta p$</p>	<p>100031115</p>
	<p>LVS-E-CF2H-G110A00/P1=</p> <ul style="list-style-type: none"> • 2-way compensator • LS-unloading • Flow cut-off, adjustable P1 = • Control $\Delta p = 15$ bar • Q_{In} up to 180 l/min • Port threads: P and R = G1", LS = G1/4" <p>⇒ Give the pressure setting P1 in bar with the ordering information This results in $P = P1 (LS_{max}) + \Delta p$</p>	<p>100036559</p>
 <p>Note:</p> <ul style="list-style-type: none"> • Test port for P inlet 	<p>LVS-E-CME-G101A54/P2=</p> <ul style="list-style-type: none"> • Internal priority function • Control $\Delta p = 9$ bar • LS-unloading • LS_{max} pressure relief, priority flow, adjustable P2= • Q_{In} up to 200 l/min • Rest flow at port D = 200 l/min • Port threads: P and R = G1", MP and LS = G1/4" <p>⇒ Give the pressure setting P2 in bar with the ordering information This results in $P = P2 (LS_{max}) + \Delta p$</p> <p>Description: The LVS valve sections mounted after the inlet section are given priority supply. The maximum pressure for priority- and surplus-flow is set using P2. The rest flow is available at port D.</p>	<p>100032775</p>

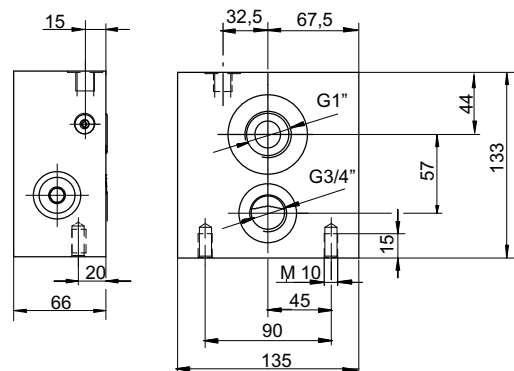
	LVS-E-CGE-G100A00/P2=/P3=	100027273
	<ul style="list-style-type: none"> • LS-unloading • LS_{max} pressure relief, priority flow, adjustable $P2 = / P3 =$ • Control $\Delta p = 9$ bar • Q_{In} up to 200 l/min • Q_D up to 80 l/min • Priority flow at port PL • Port threads: P and R = G1", PL = G½", LS and LSL = G¼" <p>⇒ Give the pressure settings P2 and P3 in bar with the ordering information This results in $P = P2/3 (LS_{max}) + \Delta p$</p> <p>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 rest 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 P2).</p> <p>Dynamic LS: - Application with Orbitrol</p> <p>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 (please discuss with Bucher Hydraulics).</p>	

2.5 Dimensions

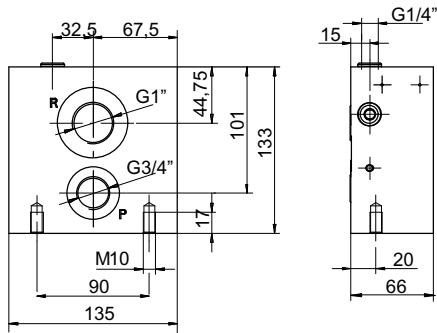
2.5.1 LVS-E-CF*-G110A00 (100030365)



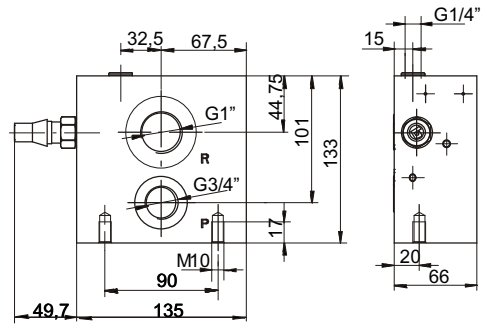
2.5.2 LVS-E-CAP-G110A00 (100027317)



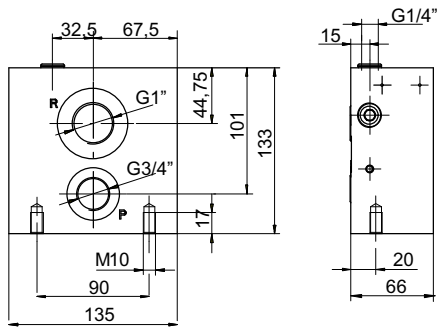
2.5.3 LVS-E-CB*-G110A00 (100030496)



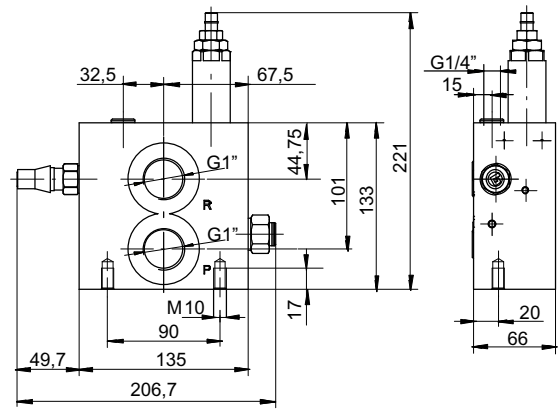
2.5.6 LVS-E-CE*-G110A01 (100029646)



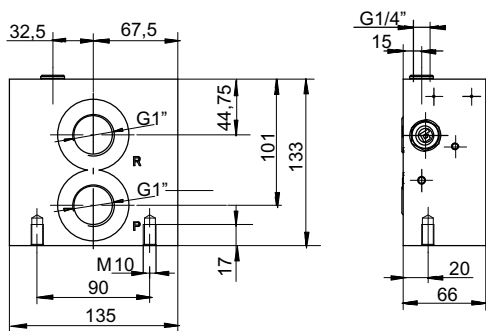
2.5.4 LVS-E-CC*-G110A00/P1=



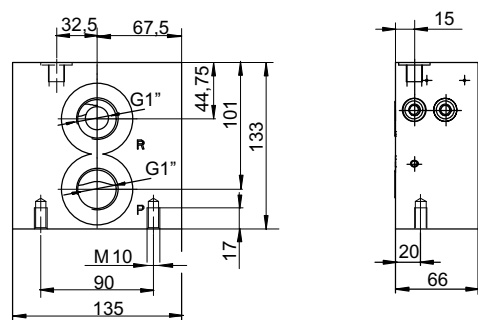
2.5.7 LVS-E-CE*-G110A48 (100032849)



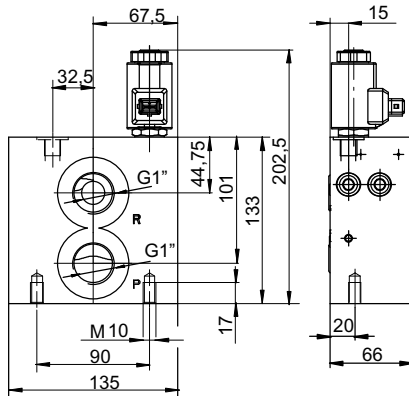
2.5.5 LVS-E-CE*-G110A00/P1=



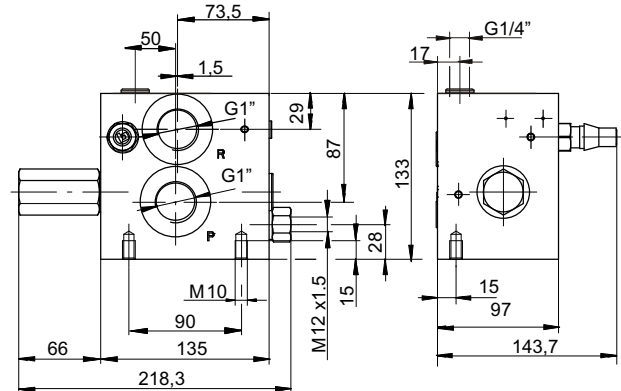
2.5.8 LVS-E-CE*-G110A42 (100032566)



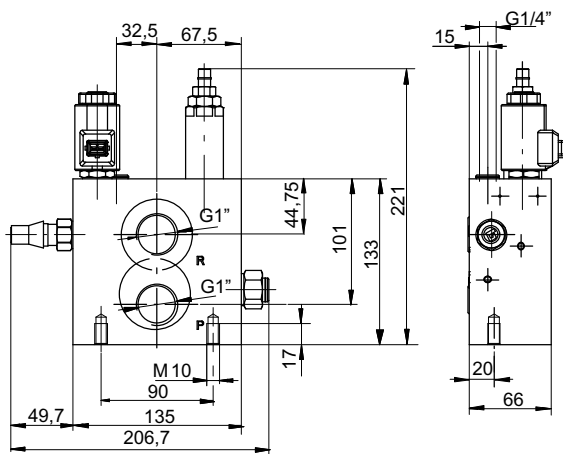
2.5.9 LVS-E-CCL-G110J12A53 (100036603)
LVS-E-CCL-G110J24A53 (100033188)



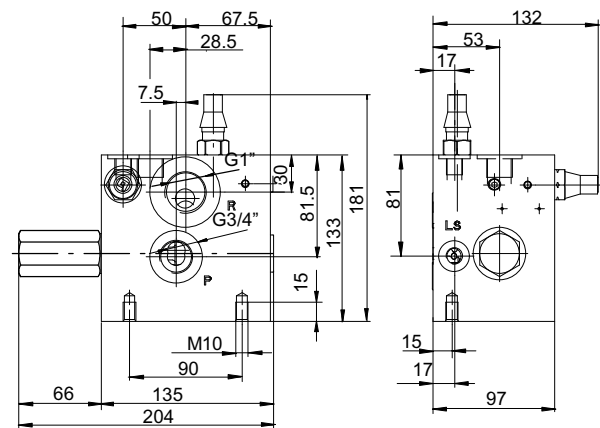
2.5.12 LVS-E-CME-G101A54 (100032775)



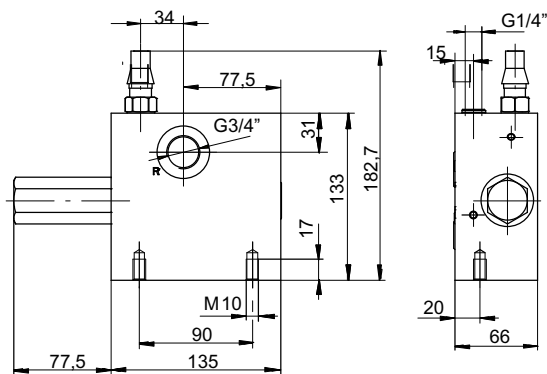
2.5.10 LVS-E-CCL-G110J12A48 (100036604)
LVS-E-CCL-G110J24A48 (100033704)



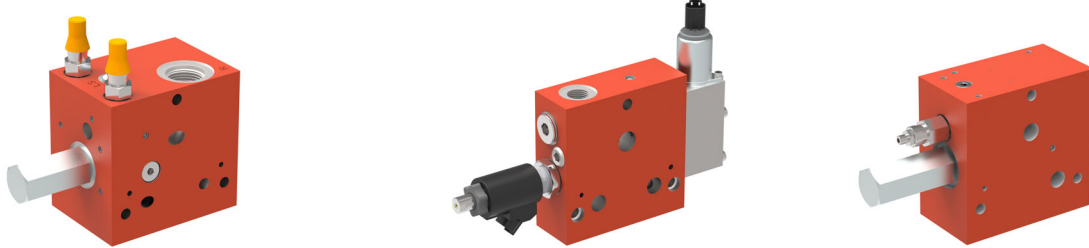
2.5.13 LVS-E-CGE-G100A00 (100027273)



2.5.11 LVS-E-CF2-G110A00 (100031115)
LVS-E-CF2H-G110A00 (100036559)



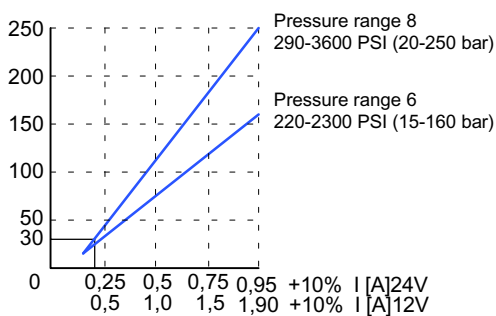
3 Intermediate sections



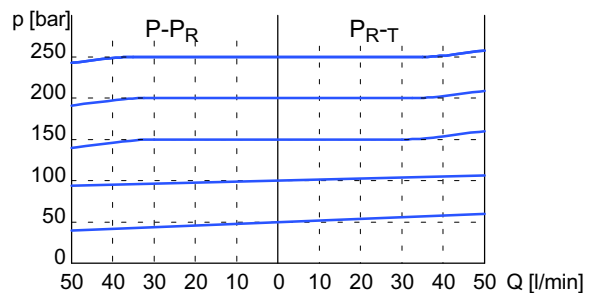
3.1 Characteristic curves

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

I [A] = solenoid current



3.1.2 Control characteristic as a function of flow rate



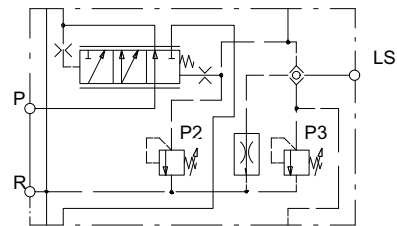
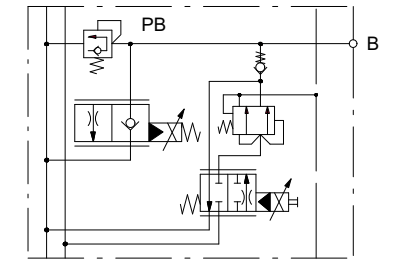
This characteristic curve is valid in conjunction with intermediate sections that have a 3-way pressure control (LVS-Z-PDR...).

3.2 Overview of items, with part number

Model code	Part number	Model code	Part number
LVS-Z-CF2-****A00/P1=	100031656	LVS-Z-PDR6FJ-G1/2A00	100031117
LVS-Z-CME-G3/4A10/P2=/P3=	100035201	LVS-Z-PDRA8FJ-G1/2A00	100029118

3.3 Overview of intermediate sections

Symbol	Description	Part number
	<p>LVS-Z-CF2-****A00/P1=</p> <p>2-way compensator for a lower p_{max} in the downstream part of the block, pressure is adjustable</p> <ul style="list-style-type: none"> • LS-unloading • Control Δp 12 bar • Flow cut-off adjustable P1= • Q_{Nom} up to 180 l/min <p>⇒ Give the pressure setting P1 in bar with the ordering information This results in $P = P1 + 12$ bar</p>	100031656

	LVS-Z-CME-G3/4A10/P2=/P3=	100035201
	LVS-Z-BHR...-G1/2...B1000/P=...	see ordering code

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

⇒ Give the pressure setting P2 and P3 in bar with the ordering information

Description: Priority function – the parts of the block downstream of this intermediate section are given priority supply. The rest flow supplies the part of the block upstream of the intermediate section. The maximum pressure of the rest 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 rest 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.

- Hitch control valve
- Selection of actuator flow rates [l/min]: 16, 25, 32, 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

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 - BHR - G 1/2 - B 1000 / P B =

Intermediate section

Function

Actuator flow rate [l/min]:

16, 25, 32, 40, 50, 63, 80, 100

= 016 - 100

Port threads to DIN 3852 - Part 2 B

= G $\frac{1}{2}$ "

Plug type AMP Junior Timer = J

Deutsch plug DT04-2P-EP04 = T

Supply voltage

12V DC = 12

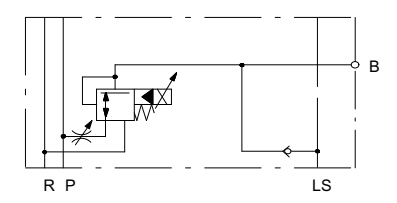
24V DC = 24

Design stage

Option

Pressure range PB [bar]:

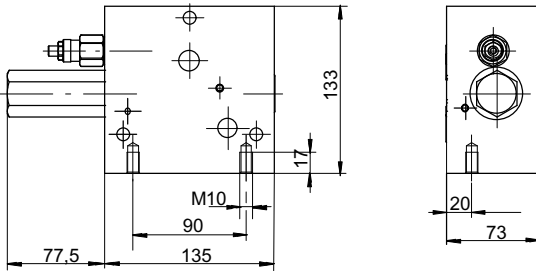
50, 63, 80, 100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300

	LVS-Z-PDRC6FJ-G1/2A00 (12 V DC)	100031117
<p>3-way proportional pressure control of actuators; preferred in applications that require a supporting or counterbalancing pressure. E.g. ground-guided equipment such as snow ploughs, mowers, harvesting systems,</p>		
<ul style="list-style-type: none"> • 3-way pressure reducing valve • Controllable pressure range 15-160 bar • $Q_{Actuator}$ = 40 l/min <p style="text-align: right;">Port thread B = G$\frac{1}{2}$"</p>		

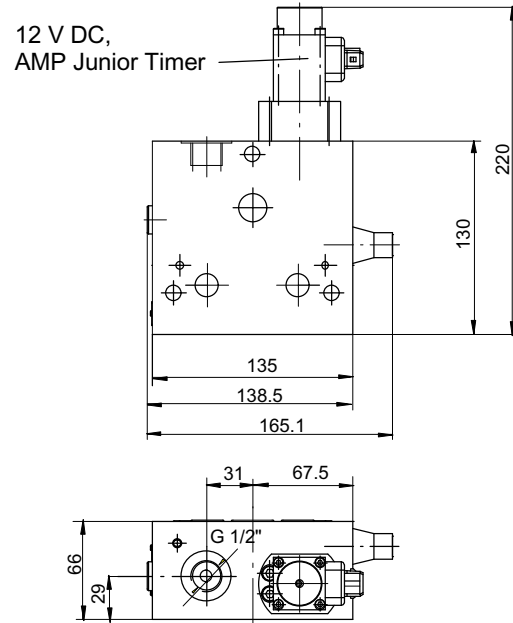
	LVS-Z-PDRA8FJ-G1/2A00	(12 V DC)	100029118
	<p>3-way proportional pressure control of actuators; preferred in applications that require a supporting or counterbalancing pressure. E.g. ground-guided equipment such as snow ploughs, mowers, harvesting systems,</p> <ul style="list-style-type: none"> • 3-way pressure reducing valve • Controllable pressure range 20-250 bar • $Q_{\text{Actuator}} = 40 \text{ l/min}$ <p style="text-align: right;">Port thread B = G$\frac{1}{2}$</p>		

3.4 Dimensions

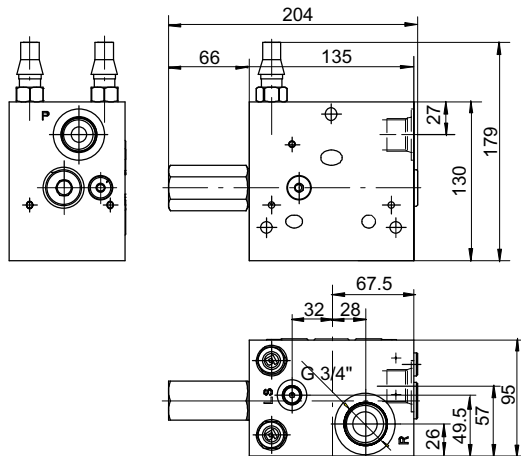
3.4.1 LVS-Z-CF2-****A00 (100031656)



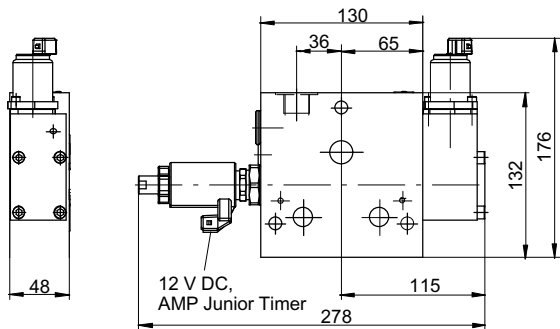
3.4.4 LVS-Z-PDRC6FJ-G1/2A00 (100031117 / 100029118)



3.4.2 LVS-Z-CME-G3/4A10 (100035201)



3.4.3 LVS-Z-BHR100-G1/2J12A..



4 Directional valve sections

Directional valve series LVS08 and LVS12 can be freely combined. Ideally, the LVS12 sections are the first ones after the inlet section, followed by the LVS08 sections.

4.1 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
Nominal flow rate [l/min]	50	180
Maximum inlet pressure [bar]	250	300 ¹⁾
Maximum pressure at the actuator ports A and B [bar]	280	320 ¹⁾
Possible additional functions:		
- separate, proportional flow rates for A and B per valve section		X
- pressure relief and make-up function		X
- electrically operated seat valves (integral)	X	-
- manual override by pin	X	X
- manual override by hand lever	X	X
- spool-stroke limiter	-	X
- bolt-on plate with seat valves	X	-
- bolt-on plate with load-control valves	X	-

1) For higher pressures and flow rates, please enquire.

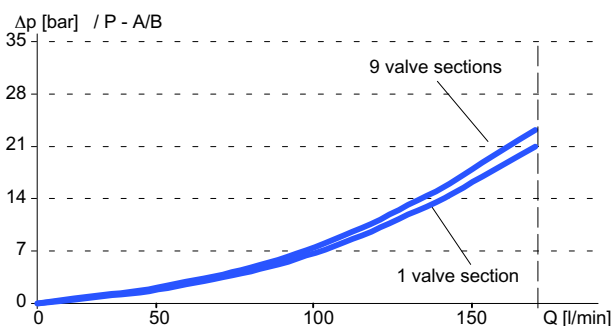
4.2 Technical data for pressure relief / make-up valve

General characteristics	Unit	Description, value
Nominal flow rate	l/min	60 permissible tolerance = +/- 10% at $Q_{In} = 3$ l/min

4.3 Characteristic curves

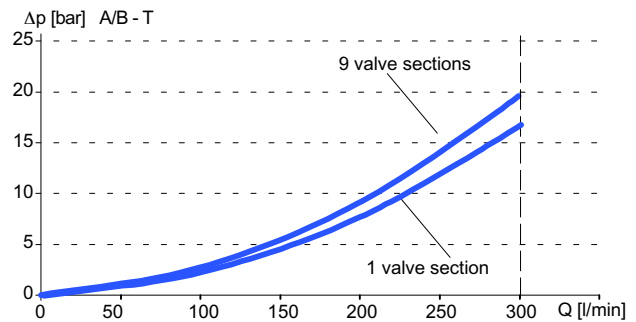
4.3.1 Spool in maximum operating position

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



4.3.2 Pressure drop with individual operation

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



4.4 Functions

4.4.1 Directional function

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

4.4.2 Two independent 3/2 prop. directional valves

Spool types 6A and 6D are designed to supply 2 motor drives.

By dividing the control spool 6A, 2 motor drives can be implemented in parallel, and independently of one another, in one valve body.

4.4.3 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.

4.4.4 LS-max pressure relief

If no oil flows out from an actuator port although the valve is in an operated position (e.g. 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.

4.4.5 Pressure compensator function

With the LVS08 valve series, there are two versions of the pressure compensator. The standard pressure compensator can be used in all applications and functions.

There is also a pressure compensator that can be configured for improved fine control. To increase the functional stability, this variant is the preferred choice for oscillation-critical functions (usually motor functions).

4.4.6 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.

4.4.7 Load sensing

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

4.4.8 Conversion factors

Without changing the 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 following table. Actuator flow rate for each spool is defined at 12 bar.

LS Δp	Conversion factor
6 bar	0.7
8 bar	0.8
9 bar	0.86
12 bar (standard)	1.0
15 bar	1.12
16 bar	1.15
18 bar	1.25
20 bar	1.30

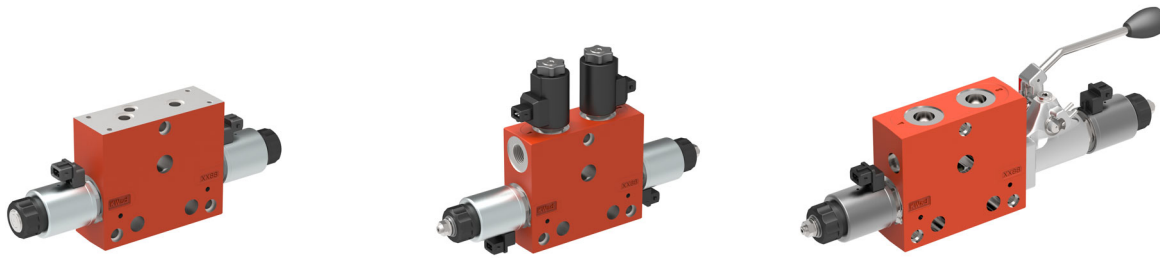
4.4.8.1 Example

LS Δp 18 bar
 spool 120 l/min
 $120 \times 1,25 = 150$ l/min
 = max. flow rate achieved at 18 bar control Δp

4.4.9 Spool types for the directional valve sections

A spool	Actuator flow closed to tank in 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
6A + 6D spools	Split spool, for two single-acting actuators in one section.

5 Directional sections LVS08 – with ON/OFF or proportional solenoids



5.1 General technical data

Description	Unit	ON/OFF solenoid	Proportional solenoid
Maximum flow rate	l/min	50	
Maximum inlet pressure	bar	250	
Maximum inlet pressure with manual operation	bar	250	
Maximum pressure at the actuator ports	bar	280	
Maximum pressure at the actuator ports with manual operation	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 and voltage tolerance $\pm 10\%$	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 for 12 V 0.4 - 1.25 for 24 V
Duty cycle	%	100% (2.5 A / 12 V or 1.25 A / 24 V)	
Protection class		AMP Junior Timer: Deutsch plug DT04:	IP65 IP67 (DIN EN 60529)
Override pin Φ		6	2

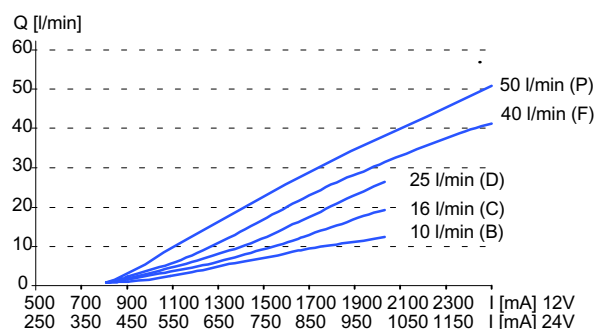
Main characteristics of the seat valves	Unit	Description, Value	
Maximum flow rate	l/min	50	
Power consumption	W	20	
Voltage tolerance	%	+/- 10	
Coil resistance	Ω	7.4 for 12 V	28.4 for 24 V
Switching time: opening	msec	50	
closing		100	

5.2 Characteristic curve

5.2.1 Control characteristic

Valve with proportional solenoid and 12 bar pressure drop at the orifice.

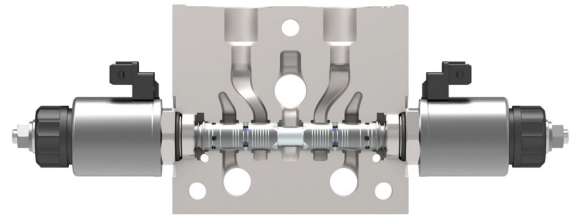
Q [l/min] = flow rate at the actuator outlet port
I [mA] = current at the proportional solenoids



5.3 LVS08 Standard

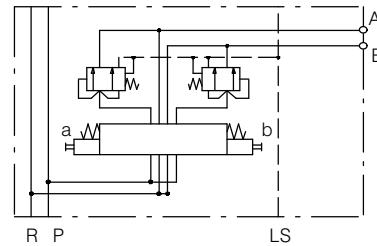
5.3.1 Standard version

- Port threads for actuator A + B = G $\frac{1}{2}$ "
- Pressure compensator in A and B
- Override pin



5.3.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Compensator function
- Control type (proportional solenoid or ON/OFF)
- Plug type



5.3.3 Options menu

Spool type	3A	3J	4A	4D
06 l/min at B (A closed)	=	*A3J	06 l/min at A and B =	AA4A
10 l/min at B (A closed)	=	*B3J	10 l/min at A and B =	BB4A
16 l/min at B (A closed)	=	*C3A	16 l/min at A and B =	CC4A
25 l/min at B (A closed)	=	*D3A	25 l/min at A and B =	DD4A
32 l/min at B (A closed)	=	*E3J	32 l/min at A and B =	EE4A
40 l/min at B (A closed)	=	*F3J	40 l/min at A and B =	FF4A
50 l/min at B (A closed)	=	*P3A	50 l/min at A and B =	PP4A

Pressure compensator function	standard	fine control ¹⁾
for actuator B	= 4	B
for actuator A	= 8	A
for actuator A + B	= 5	C

Control type	
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 plug DT04-2P-EP04	= T

1) Fine controlled compensator function for increased stability in the hydraulics systems (see section 4.4.5).

5.3.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-

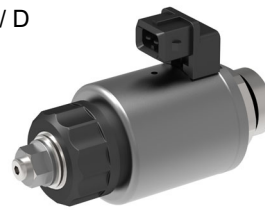
5.3.5 Control type

A / B



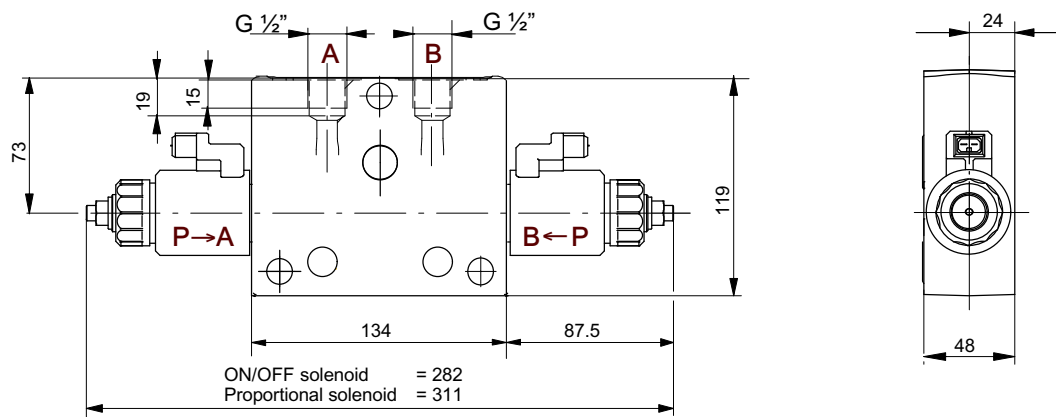
ON/OFF solenoid with override pin

C / D



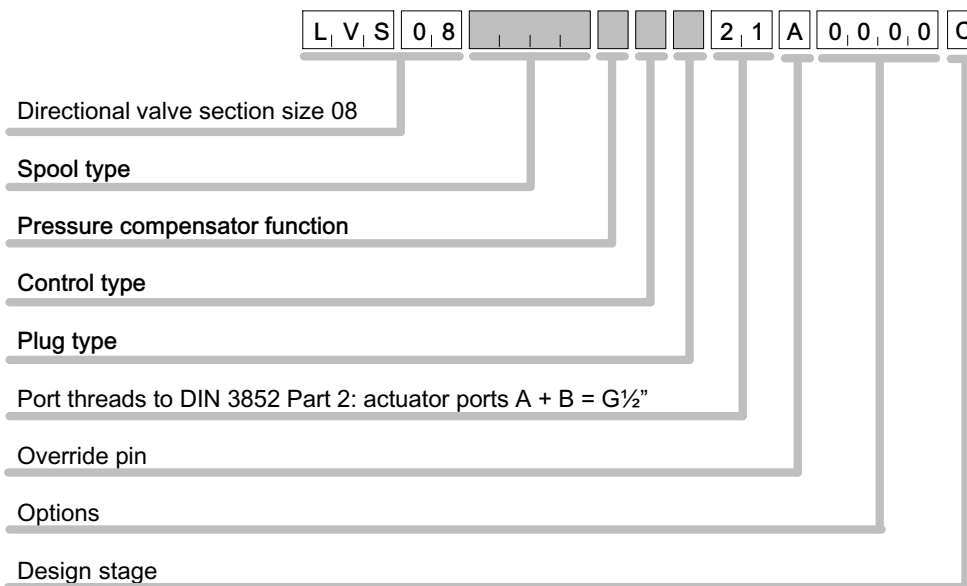
Proportional solenoid with override pin and starting point adjustment (starting point is set by the factory)

5.3.6 Dimensions



5.3.7 Ordering code

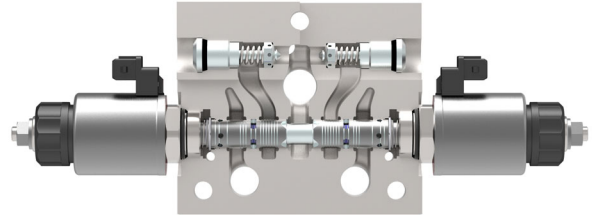
- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 5.3.3



5.4 LVS08 Standard with pressure relief / make-up valve

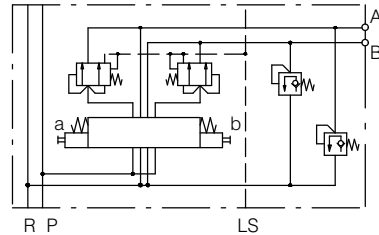
5.4.1 Standard version

- Port threads for actuator A + B = G $\frac{1}{2}$ "
- Pressure compensator in actuator A + B
- Override pin
- Pressure relief and make-up function (pressure setting selectable)



5.4.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Pressure compensator function
- Control type (proportional solenoid or ON/OFF)
- Plug type



5.4.3 Options menu

Spool type	3A	3J		4A	4D
06 l/min at B (A closed)	=	*A3J	06 l/min at A and B =	AA4A	AA4D
10 l/min at B (A closed)	=	*B3J	10 l/min at A and B =	BB4A	BB4D
16 l/min at B (A closed)	=	*C3A	16 l/min at A and B =	CC4A	CC4D
25 l/min at B (A closed)	=	*D3A	25 l/min at A and B =	DD4A	DD4D
32 l/min at B (A closed)	=	*E3J	32 l/min at A and B =	EE4A	EE4D
40 l/min at B (A closed)	=	*F3J	40 l/min at A and B =	FF4A	FF4D
50 l/min at B (A closed)	=	*P3A	50 l/min at A and B =	PP4A	PP4D

Pressure compensator function	standard	fine control ¹⁾
for actuator B	= 4	B
for actuator A	= 8	A
for actuator A + B	= 5	C

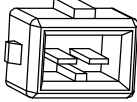
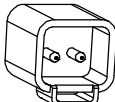
Control type	
ON/OFF solenoid 12 V	= A
ON/OFF solenoid 24 V	= B
Proportional solenoid 12V	= C
Proportional solenoid 24V	= D

Plug type	
AMP Junior Timer	= J
Deutsch plug 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 (closed, no function, prepared for retrofitting anti-shock valves, with plug) = #		

1) = Fine controlled compensator function for increased stability in the hydraulics systems (see section 4.4.5).

5.4.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

5.4.5 Control type

A / B



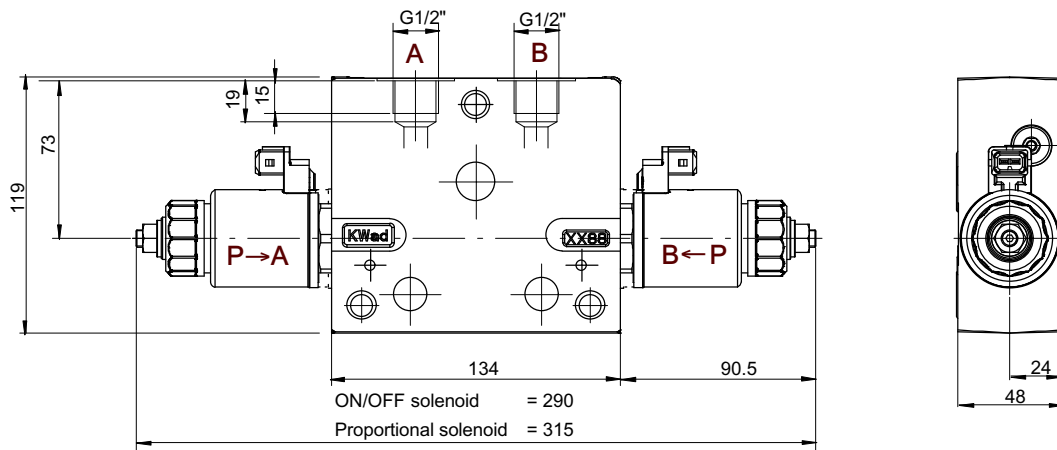
ON/OFF solenoid
with override pin

C / D



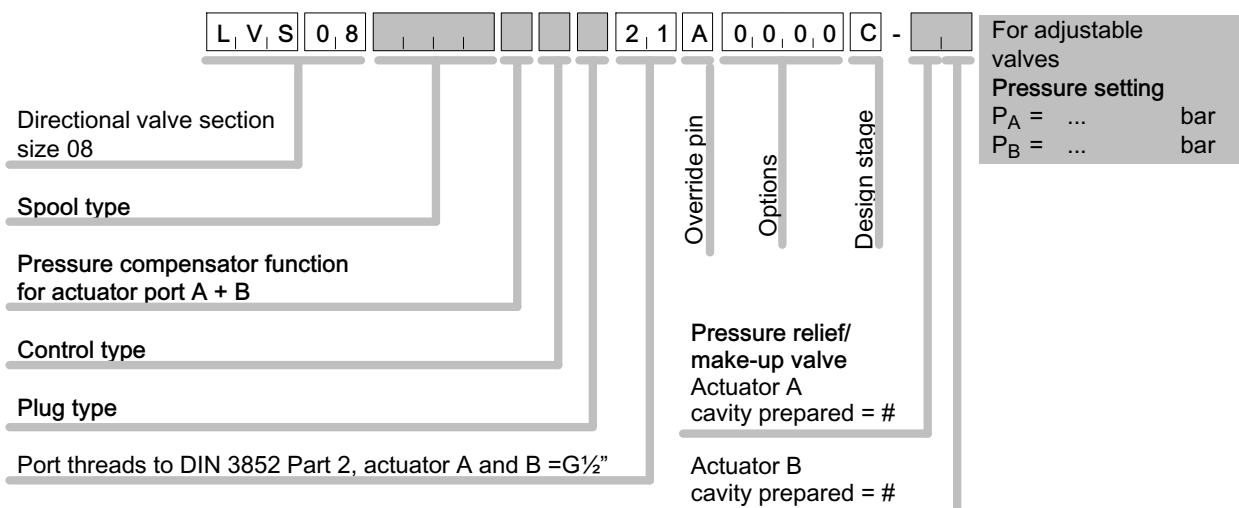
Proportional solenoid
with override pin and
starting point adjustment
(starting point is set by the
factory)

5.4.6 Dimensions



5.4.7 Ordering code

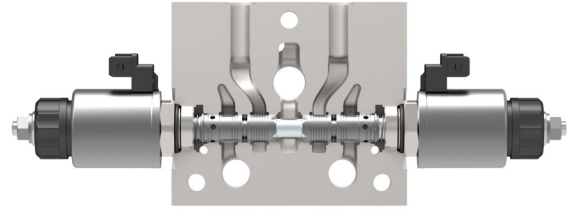
- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 5.4.3



5.5 LVS08 Standard, surface for bolt-on valve

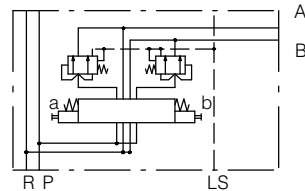
5.5.1 Standard version

- Prepared for bolt-on plate
- Pressure compensator in actuator A + B
- Override pin



5.5.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Pressure compensator function
- Control type (proportional solenoid or ON/OFF)
- Plug type



5.5.3 Options menu

Spool type	3A	3J		4A	4D
06 l/min at B (A closed) =					
10 l/min at B (A closed) =		*A3J	06 l/min at A and B =	AA4A	AA4D
16 l/min at B (A closed) =	*C3A	*B3J	10 l/min at A and B =	BB4A	BB4D
25 l/min at B (A closed) =	*D3A	*C3J	16 l/min at A and B =	CC4A	CC4D
32 l/min at B (A closed) =		*D3J	25 l/min at A and B =	DD4A	DD4D
40 l/min at B (A closed) =		*E3J	32 l/min at A and B =	EE4A	EE4D
50 l/min at B (A closed) =	*P3A	*F3J	40 l/min at A and B =	FF4A	FF4D
		*P3J	50 l/min at A and B =	PP4A	PP4D

Pressure compensator function	standard	fine control ¹⁾
for actuator B =	4	B
for actuator A =	8	A
for actuator A + B =	5	C

Control type	
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 plug DT04-2P-EP04	= T

1) Fine controlled compensator function for increased stability in the hydraulics systems (see section 4.4.5).

5.5.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-

5.5.5 Control types

A / B



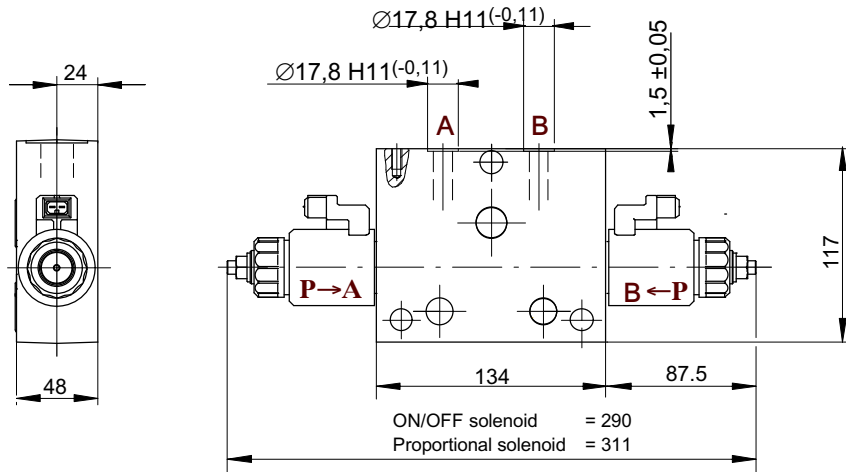
ON/OFF solenoid with override pin

C / D



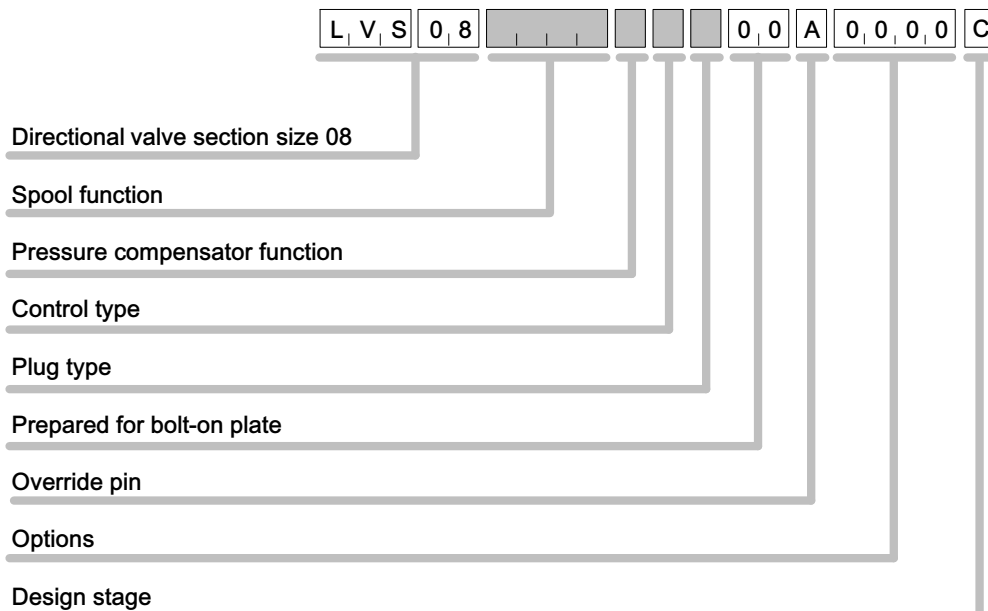
Proportional solenoid with override pin and starting point adjustment (starting point is set by the factory)

5.5.6 Dimensions



5.5.7 Ordering code

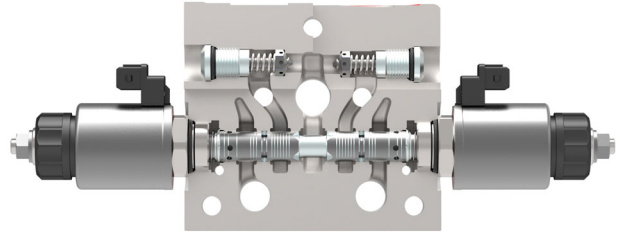
- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 5.5.3



5.6 LVS Standard, surface for bolt-on valves, with pressure relief / make up valve

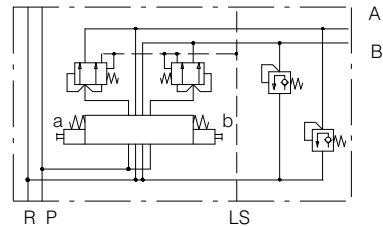
5.6.1 Standard version

- Prepared for bolt-on section
- Pressure compensator in actuator A and B
- Override pin
- Pressure relief and make-up function (pressure setting selectable)



5.6.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Pressure compensator function
- Control type (proportional solenoid or ON/OFF)
- Plug type



5.6.3 Selection menu

Spool type	3A	3J	4A	4D
06 l/min at B (A closed)	=	*A3J	06 l/min at A and B = AA4A	AA4D
10 l/min at B (A closed)	=	*B3J	10 l/min at A and B = BB4A	BB4D
16 l/min at B (A closed)	= *C3A	*C3J	16 l/min at A and B = CC4A	CC4D
25 l/min at B (A closed)	= *D3A	*D3J	25 l/min at A and B = DD4A	DD4D
32 l/min at B (A closed)	=	*E3J	32 l/min at A and B = EE4A	EE4D
40 l/min at B (A closed)	=	*F3J	40 l/min at A and B = FF4A	FF4D
50 l/min at B (A closed)	= *P3A	*P3J	50 l/min at A and B = PP4A	PP4D



Pressure compensator function	standard	fine control ¹⁾
for actuator B	= 4	B
for actuator A	= 8	A
for actuator A + B	= 5	C

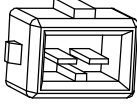
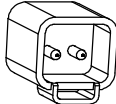
Control type	
ON/OFF solenoid 12 V	= A
ON/OFF solenoid 24 V	= B
Proportional solenoid 12V	= C
Proportional solenoid 24V	= D

Plug type	
AMP Junior Timer	= J
Deutsch plug 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 (closed, no function, prepared for retrofitting anti-shock valves, with plug) = #		

1) Fine controlled compensator function for increased stability in the hydraulics systems (see section 4.4.5).

5.6.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

5.6.5 Control type

A / B



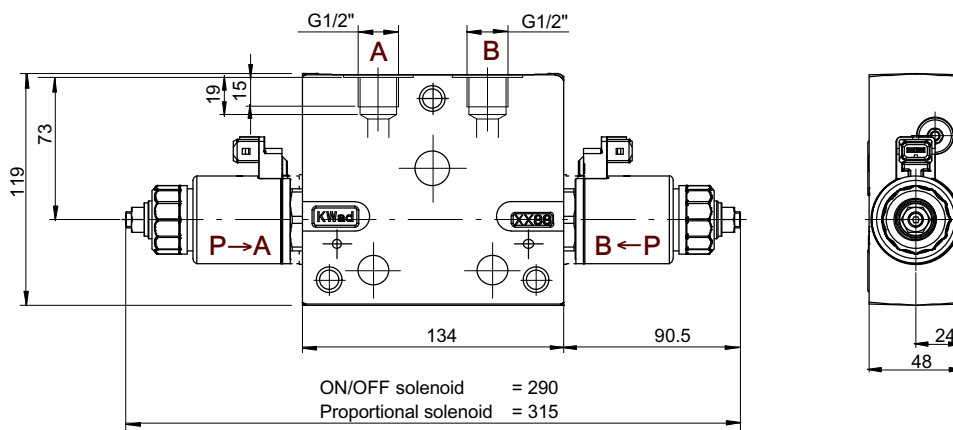
ON/OFF solenoid
with override pin

C / D



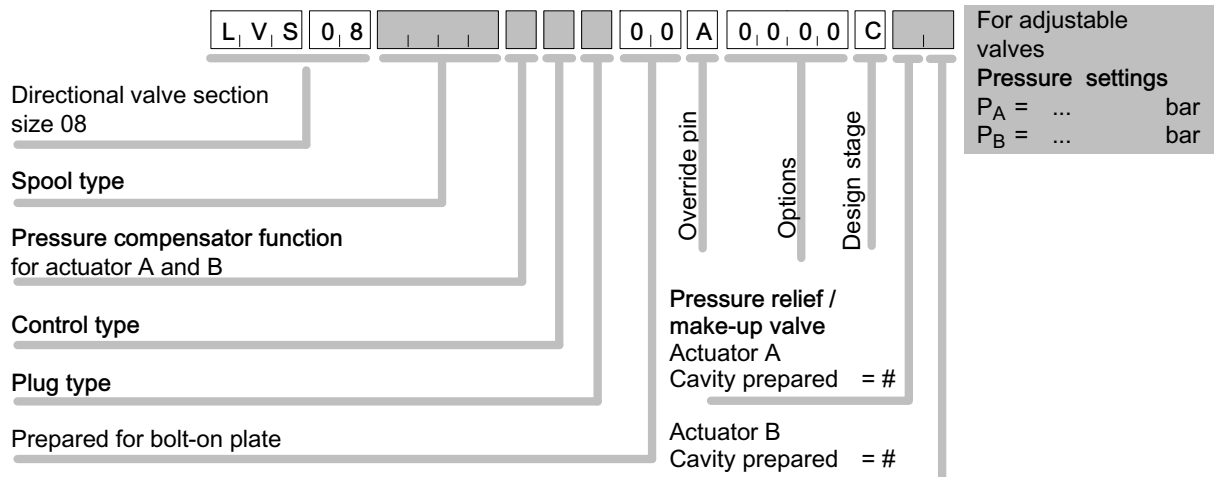
Proportional solenoid
with override pin and
starting point adjustment
(starting point is set by the
factory)

5.6.6 Dimensions



5.6.7 Ordering code

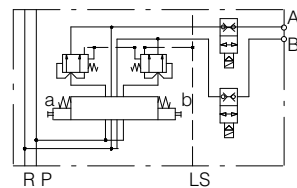
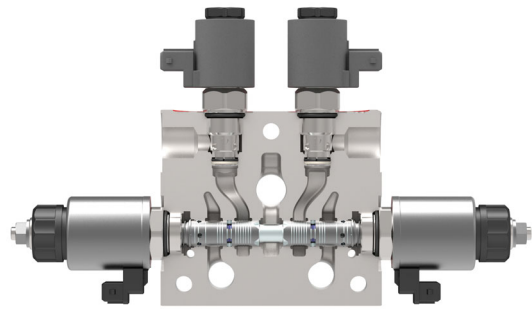
- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 5.6.3



5.7 LVS08 with integrated double seat valve

5.7.1 Standard version

- Port thread for actuator A + B = G $\frac{1}{2}$ "
- Pressure compensator in actuator A + B
- Double seat valve, solenoid operated



5.7.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Pressure compensator function
- Control type (proportional solenoid or ON/OFF)
- Plug type

5.7.3 Selection menu

Spool type	3A	3J	4A	4D
06 l/min at B (A closed)	=	*A3J	06 l/min at A and B = AA4A	AA4D
10 l/min at B (A closed)	=	*B3J	10 l/min at A and B = BB4A	BB4D
16 l/min at B (A closed)	= *C3A	*C3J	16 l/min at A and B = CC4A	CC4D
25 l/min at B (A closed)	= *D3A	*D3J	25 l/min at A and B = DD4A	DD4D
32 l/min at B (A closed)	=	*E3J	32 l/min at A and B = EE4A	EE4D
40 l/min at B (A closed)	=	*F3J	40 l/min at A and B = FF4A	FF4D
50 l/min at B (A closed)	= *P3A	*P3J	50 l/min at A and B = PP4A	PP4D

Pressure compensator function	standard	fine control ¹⁾
for actuator B	= 4	B
for actuator A	= 8	A
for actuator A + B	= 5	C

Control type	
ON/OFF solenoid 12 V	= A
ON/OFF solenoid 24 V	= B
Proportional solenoid 12V	= C
Proportional solenoid 24V	= D

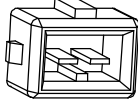
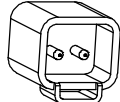
Plug type	
AMP Junior Timer	= J
Deutsch plug DT04-2P-EP04	= T

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 manual override, 'Knob-Style', push-and-turn	= J8D
Double seat valve, solenoid operated, in B	= J7 ²⁾
Double seat valve, solenoid operated, in B with manual override, 'Knob-Style', push-and-turn	= J7D ²⁾

1) Fine controlled compensator function for increased stability in the hydraulics systems (see section 4.4.5).

2) Can only be used with spool types 3A and 3J.

5.7.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

5.7.5 Control type

A / B



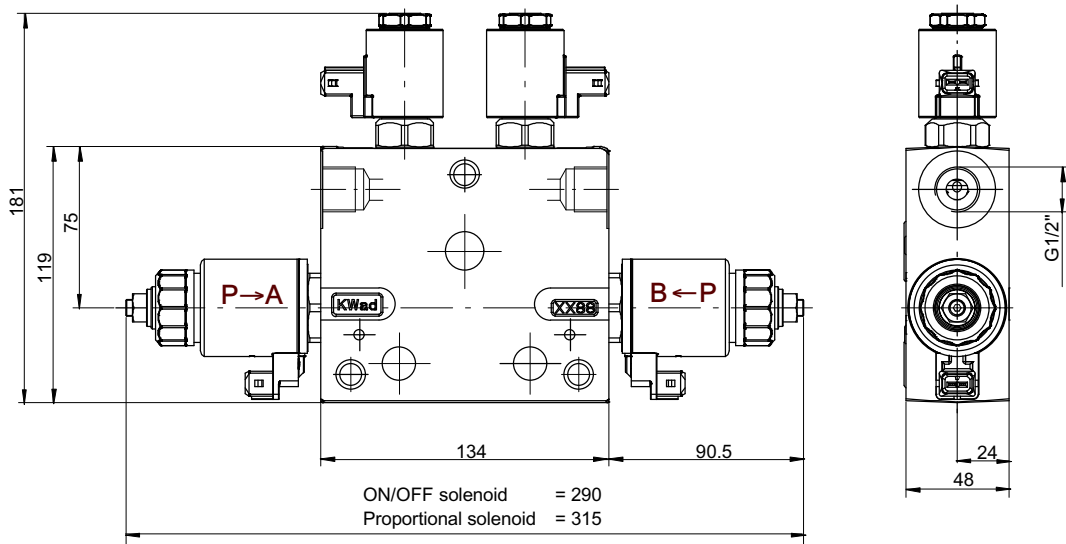
ON/OFF solenoid
with override pin

C / D



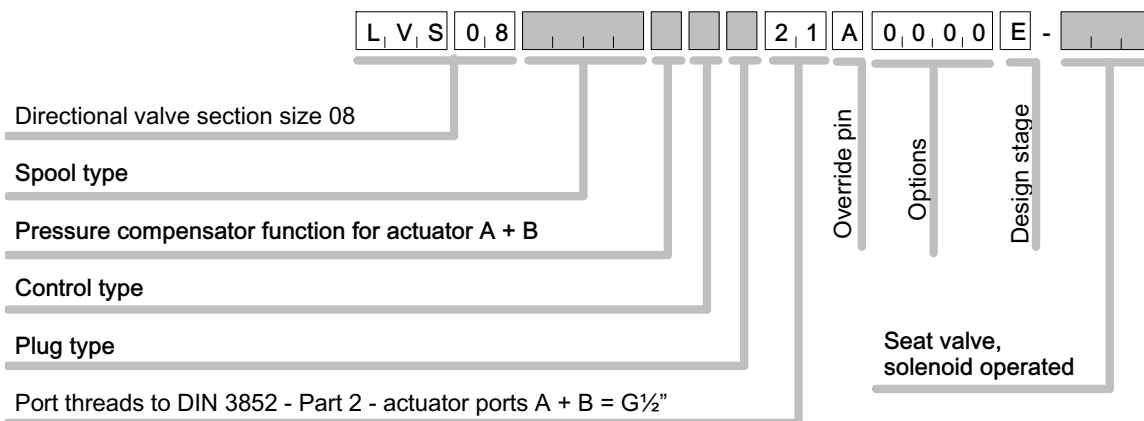
Proportional solenoid
with override pin and
starting point adjustment
(starting point is set by the
factory)

5.7.6 Dimensions



5.7.7 Ordering code

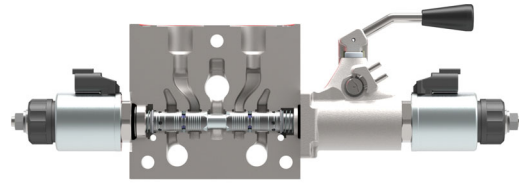
- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 5.7.3



5.8 LVS08 with additional manual handlever

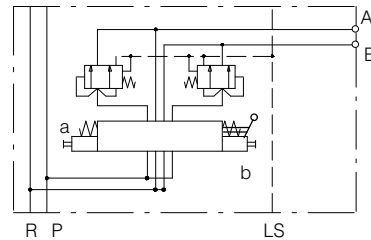
5.8.1 Standard version

- Port threads for actuator A + B = G $\frac{1}{2}$ "
- Pressure compensator in actuator A + B
- Additional manual handlever with override pin P_{max} 250 bar. With electrical operation, the hand lever remains in the 0 position (hand lever does not move with the spool).



5.8.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Pressure compensator function
- Control type (proportional solenoid or ON/OFF)
- Plug type



5.8.3 Options menu

Spool type	3A	3J	4A	4D
06 l/min at B (A closed)	=	*A3J	06 l/min at A and B =	AA4A
10 l/min at B (A closed)	=	*B3J	10 l/min at A and B =	BB4A
16 l/min at B (A closed)	=	*C3A	16 l/min at A and B =	CC4A
25 l/min at B (A closed)	=	*D3A	25 l/min at A and B =	DD4A
32 l/min at B (A closed)	=	*E3J	32 l/min at A and B =	EE4A
40 l/min at B (A closed)	=	*F3J	40 l/min at A and B =	FF4A
50 l/min at B (A closed)	=	*P3A	50 l/min at A and B =	PP4A



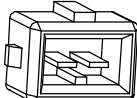
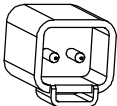
Pressure compensator function	standard	fine control ¹⁾
for actuator B	= 4	B
for actuator A	= 8	A
for actuator A + B	= 5	C

Control type	
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 plug DT04-2P-EP04	= T

1) Fine controlled compensator function for increased stability in the hydraulics systems (see section 4.4.5).

5.8.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

5.8.5 Control type

A / B



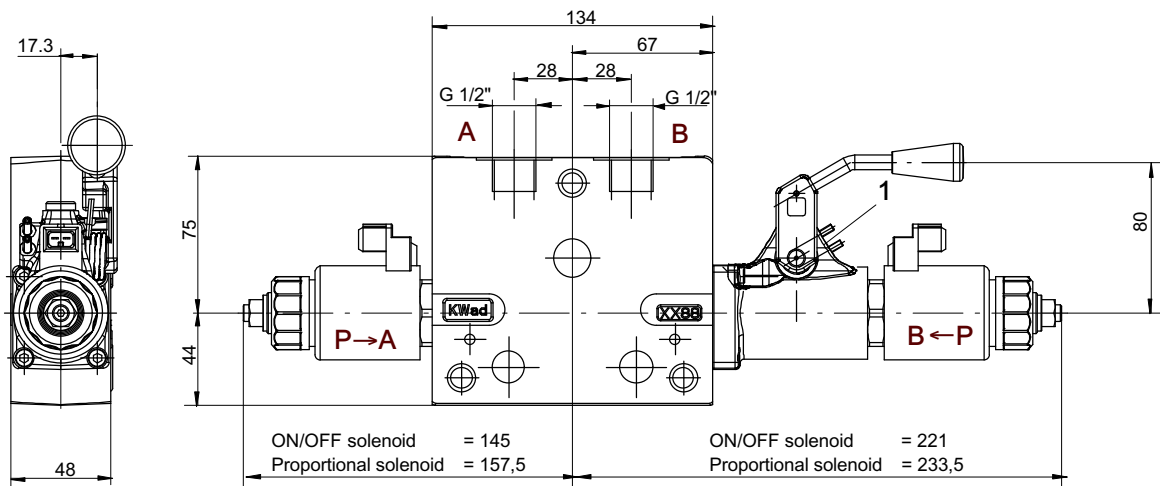
ON/OFF solenoid with override pin

C / D



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

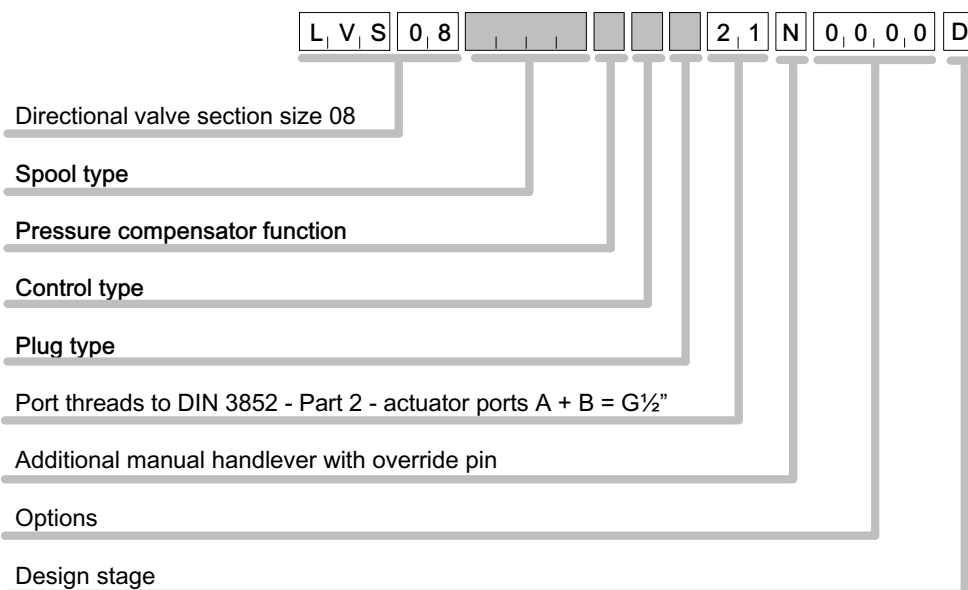
5.8.6 Dimensions



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

5.8.7 Ordering code

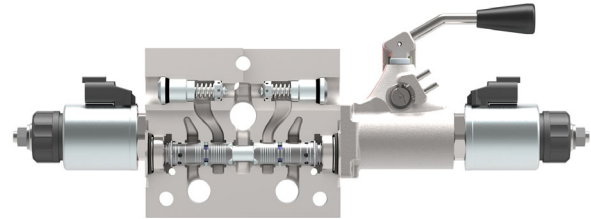
- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 5.8.3



5.9 LVS08 with additional manual handlever and pressure relief / make-up valve

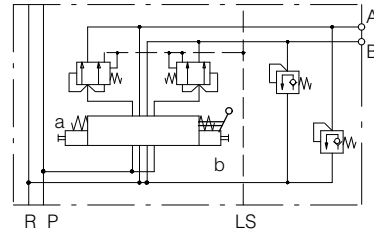
5.9.1 Standard version

- Pressure compensator in actuator A + B
- Override pin with manual handlever P_{max} 250 bar
With electrical operation, the hand lever remains in the 0 position (the hand lever does not move with the spool).
- Pressure relief – make-up valve / choice of pressure settings



5.9.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Pressure compensator function
- Control type (proportional solenoid or ON/OFF)
- Plug type



5.9.3 Selection menu

Spool type	3A	3J	4A	4D
06 l/min at B (A closed)	=	*A3J	06 l/min at A and B =	AA4A
10 l/min at B (A closed)	=	*B3J	10 l/min at A and B =	BB4A
16 l/min at B (A closed)	= *C3A	*C3J	16 l/min at A and B =	CC4A
25 l/min at B (A closed)	= *D3A	*D3J	25 l/min at A and B =	DD4A
32 l/min at B (A closed)	=	*E3J	32 l/min at A and B =	EE4A
40 l/min at B (A closed)	=	*F3J	40 l/min at A and B =	FF4A
50 l/min at B (A closed)	= *P3A	*P3J	50 l/min at A and B =	PP4A

Pressure compensator function	standard	fine control ¹⁾
for actuator B	= 4	B
for actuator A	= 8	A
for actuator A + B	= 5	C

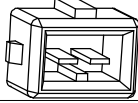
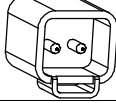
Control type	
ON/OFF solenoid 12 V	= A
ON/OFF solenoid 24 V	= B
Proportional solenoid 12V	= C
Proportional solenoid 24V	= D

Plug type	
AMP Junior Timer	= J
Deutsch plug 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 (closed, no function, prepared for retrofitting anti-shock valves, with plug) = #	

1) Fine controlled compensator function for increased stability in the hydraulics systems (see section 4.4.5).

5.9.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

5.9.5 Control type

A / B



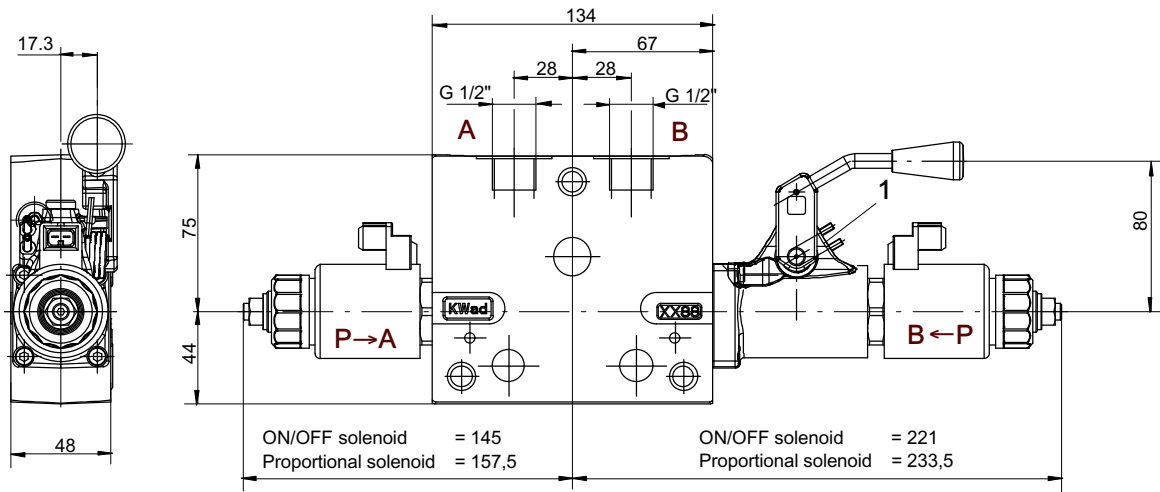
ON/OFF solenoid
with override pin

C / D



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

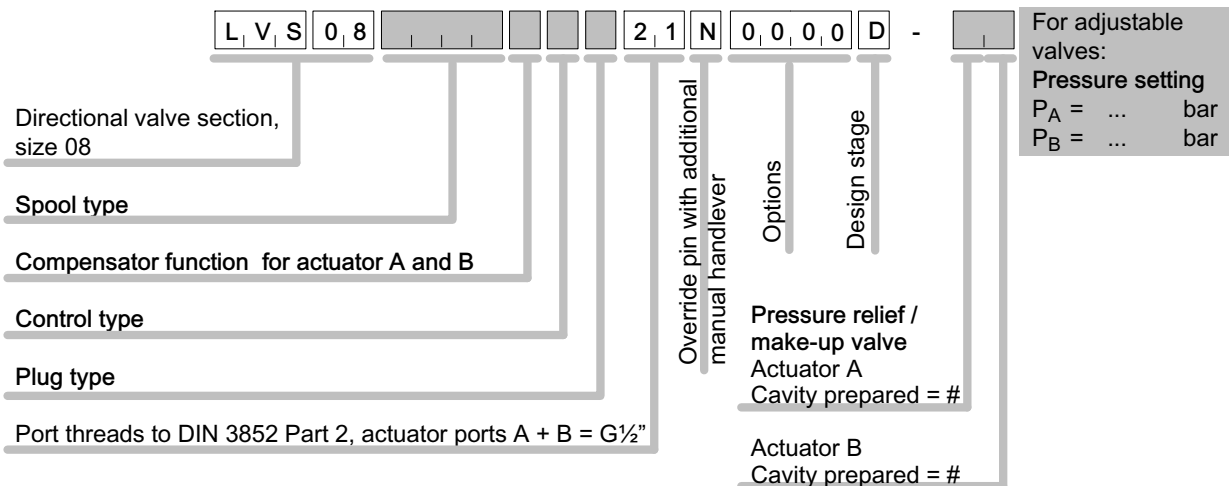
5.9.6 Dimensions



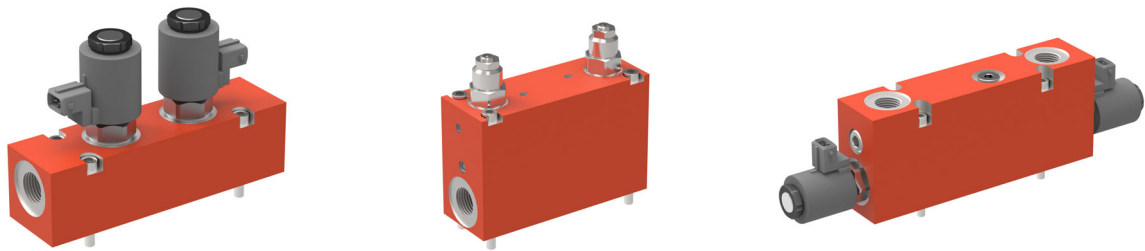
1 Set screws for spool stroke limiting (flow limiting only works with manual operation)

5.9.7 Ordering code

- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 5.9.3



6 Bolt-on sections LVS08



6.1 Function

6.1.1 Load-control valve

These bolt-on load control valves, with integrated 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 set higher than 1,5 times 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.

6.1.2 Seat valves

These seat valves, which can be opened by solenoid or by hydraulic pressure, shut off the actuator lines with zero leakage.

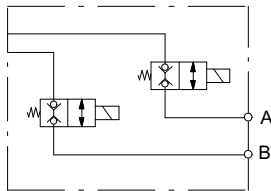
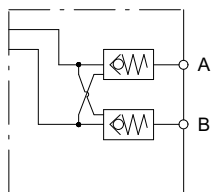
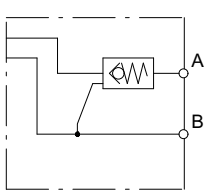
6.1.3 Seat valves with pressure relief and make-up valve

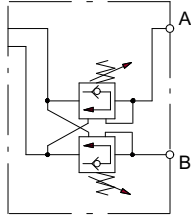
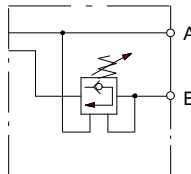
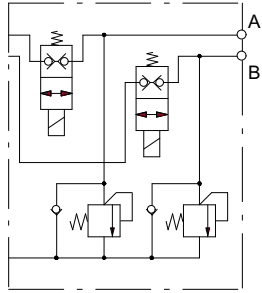
These solenoid-opened seat valves with service line pressure relief and make-up valves shut off the actuator lines with zero leakage and protect the actuator from unacceptable large pressure peaks.

6.2 Overview of items, with part number

Model code	Part number	Model code	Part number
LVSPRE-ZVAZVB-21-J12-C2000	100040196	LVSPBH-***-S30-21-A00/P=	100029653
LVSPRE-ZVAZVB-21-J24-C2000	100040200	LVSPRH-DVADVB-21-***-A00	100037249
LVSPBH-S30-S30-21-A00/P=	100031107	LVSPRH-DVA***-21-***-A00	100037896

6.3 Overview bolt-on sections

Symbol	Description	Part number
	LVSPRE-ZVAZVB-21-J12-C2000 LVSPRE-ZVAZVB-21-J24-C2000 Bolt-on section with double seat valve. These solenoid-opened seat valves shut off the actuator lines with zero leakage. <ul style="list-style-type: none"> • $Q_{max} = 50 \text{ l/min}$ • Port threads $G\frac{1}{2}$" 	100040196 100040200
	LVSPRH-DVADVB-21-***-A00 Bolt-on section with double seat valve. These solenoid-opened seat valves shut off the actuator lines with zero leakage. <ul style="list-style-type: none"> • $Q_{max} = 50 \text{ l/min}$ • Port threads $G\frac{1}{2}$" 	100037249
	LVSPRH-DVA***-21-***-A00 Bolt-on section with double seat valve. These solenoid-opened seat valves shut off the actuator lines with zero leakage. <ul style="list-style-type: none"> • $Q_{max} = 50 \text{ l/min}$ • Port threads $G\frac{1}{2}$" 	100037896

	LVSPBH-S30-S30-21-A00/P=	100031107
	LVSPBH-***-S30-21-A00/P=	100029653
	LVSPEC-230-230-21-J24-C02	see ordering code

L V S P E C -
 -
 -
 2 1 -
 J 2 4 -
 C 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

Actuator port B:

Pressure-relief - pressure setting [bar]

100, 125, 140, 160, 175, 190, 210, 230, 250, 280, 300

Port threads to DIN 3852 - Part 2 / actuator A+B = G $\frac{1}{2}$ "

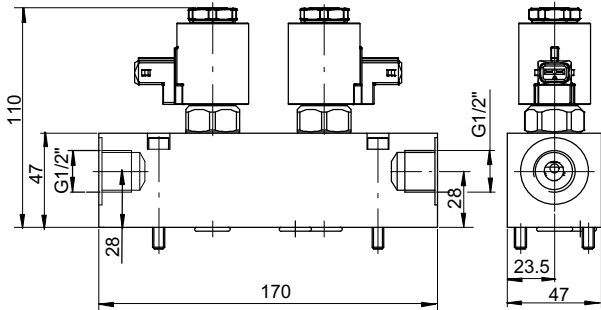
Plug type and nominal voltage: AMP Junior Timer 24 V DC = J24

Design stage

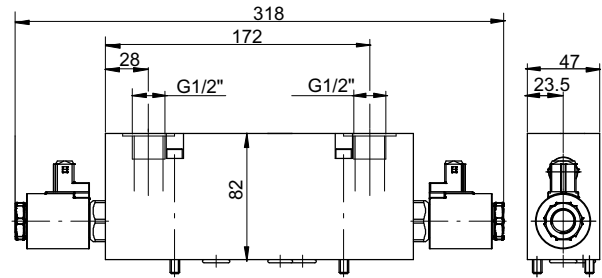
Seat valves, solenoid opened: Double seat valves in actuator ports A + B

6.4 Dimensions

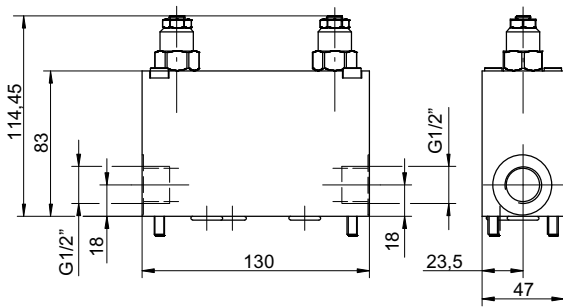
6.4.1 LVSPRE-ZVAZVB-21-J12-C00 (100040196)
LVSPRE-ZVAZVB-21-J24-C00 (100040200)



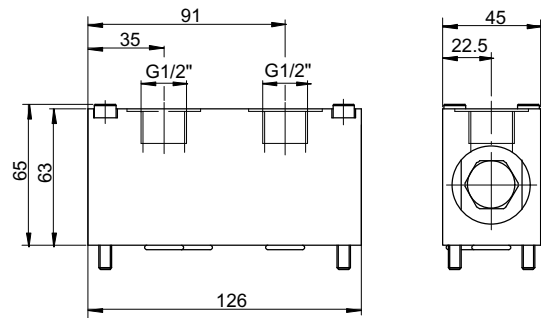
6.4.4 LVSPEC-230-230-21-J24-C02



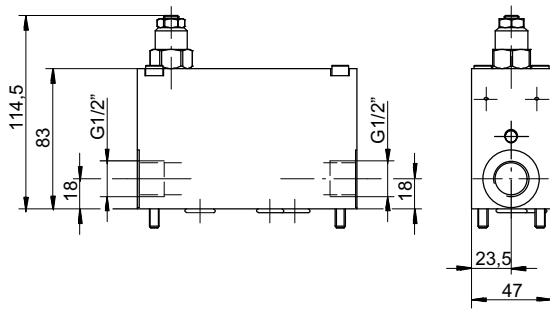
6.4.2 LVSPBH-S30-S30-21-A00 (100031107)



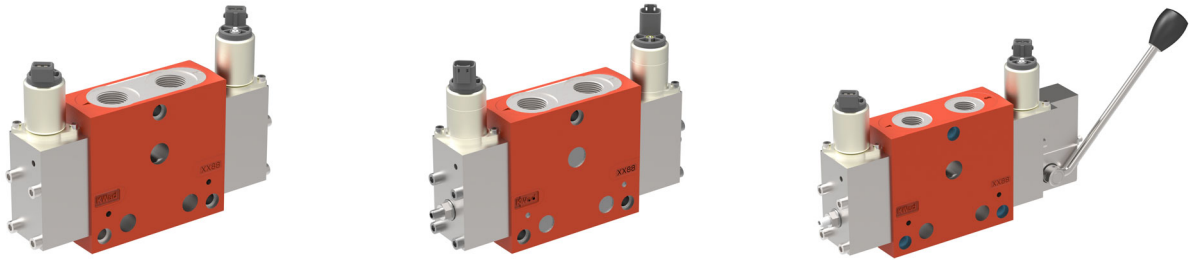
6.4.5 LVSPRH-DVADVB-21-***-A00 (100037249)
LVSPRH-DVA***-21-***-A00 (100037896)



6.4.3 LVSPBH-***-S30-21-A00 (100029653)



7 Directional valve sections LVS12 – electrohydraulic, two-stage



7.1 General technical data

General characteristics	Unit	Value
Maximum flow rate	l/min	180
Maximum inlet pressure	bar	300 ¹⁾
Maximum pressure at the actuator ports	bar	320 ¹⁾
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 with 12 V 0.3 ... 0.75 with 24 V
Duty cycle	%	100
Protection class		AMP: IP65 Deutsch plug DT04-2P-EP04: IP67 (DIN EN 60529)

1) For higher pressures and flow rates, please enquire.

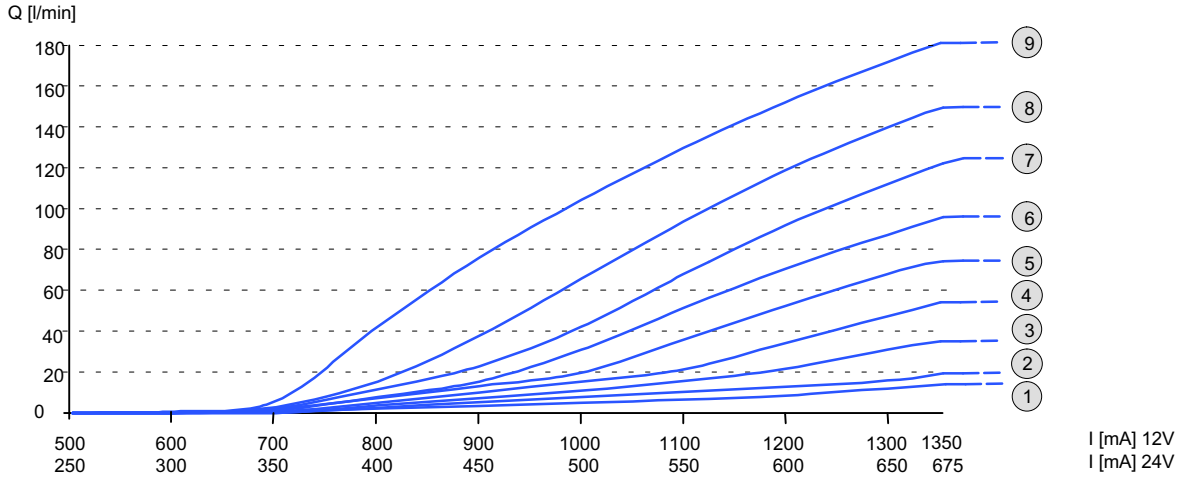
Technical data pressure relief valve	Unit	Value
Limit current	A	1.6 with 12 V 0.8 with 24 V
Coil resistance	Ω	5.3 with 12 V 21.2 with 24 V
PWM frequency (dither)	Hz	100

7.2 Characteristic curve

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



1	Spool type C	(16 l/min)
2	Spool type D	(25 l/min)
3	Spool type F	(40 l/min)
4	Spool type G	(63 l/min)
5	Spool type H	(80 l/min)

6	Spool type K	(100 l/min)
7	Spool type L	(125 l/min)
8	Spool type M	(150 l/min)
9	Spool type O	(180 l/min)

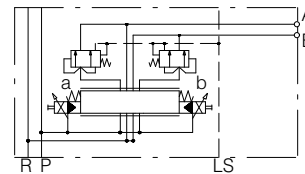
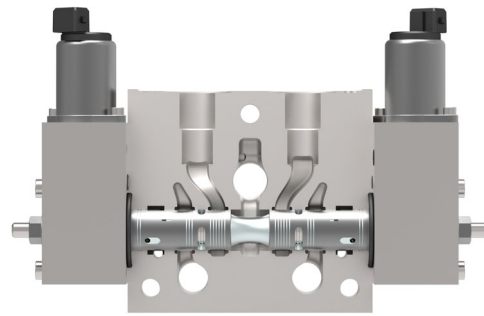
7.3 LVS12 Standard

7.3.1 Standard version

- Port threads for actuator A + B = G $\frac{3}{4}$ "
- Pressure compensator in A + B

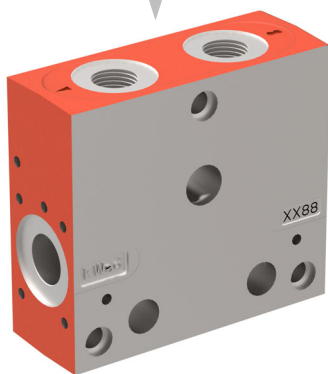
7.3.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Plug type
- Manual override
- Spool stroke-limiter feature (can be factory-setted)
Only with spool types 3A, 4A and 4D



7.3.3 Selection menu

Spool type		3A	3J	4A	4D	6A	6D
Compensator function for actuator		A	B.	A+B	A+B	A+B	A+B
		B closed	A closed				
16 l/min			= *C3JB	= CC4AC	= CC4DC		= CC6DC
25 l/min			= *D3JB	= DD4AC	= DD4DC	= DD6AC	= DD6DC
32 l/min			= *E3JB	= EE4AC	= EE4DC	= EE6AC	= EE6DC
40 l/min			= *F3JB	= FF4AC	= FF4DC	= FF6AC	= FF6DC
50 l/min			= *P3JB	= PP4AC	= PP4DC	= PP6AC	= PP6DC
63 l/min			= *G3JB	= GG4AC	= GG4DC	= GG6AC	= GG6DC
80 l/min			= *H3JB	= HH4AC	= HH4DC	= HH6AC	= HH6DC
100 l/min			= *K3JB	= KK4AC	= KK4DC	= KK6AC	= KK6DC
125 l/min			= *L3JB	= LL4AC	= LL4DC		= LL6DC
150 l/min			= *M3JB	= MM4AC	= MM4DC		= MM6DC
180 l/min	= O*3AA		= *O3JB	= OO4AC	= OO4DC		= OO6DC



Control type

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

Plug type

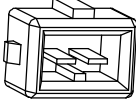
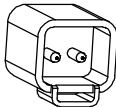
- AMP Junior Timer = J
- Deutsch plug DT04-2P-EP04 = T

Manual override by pin / spool-stroke limiter

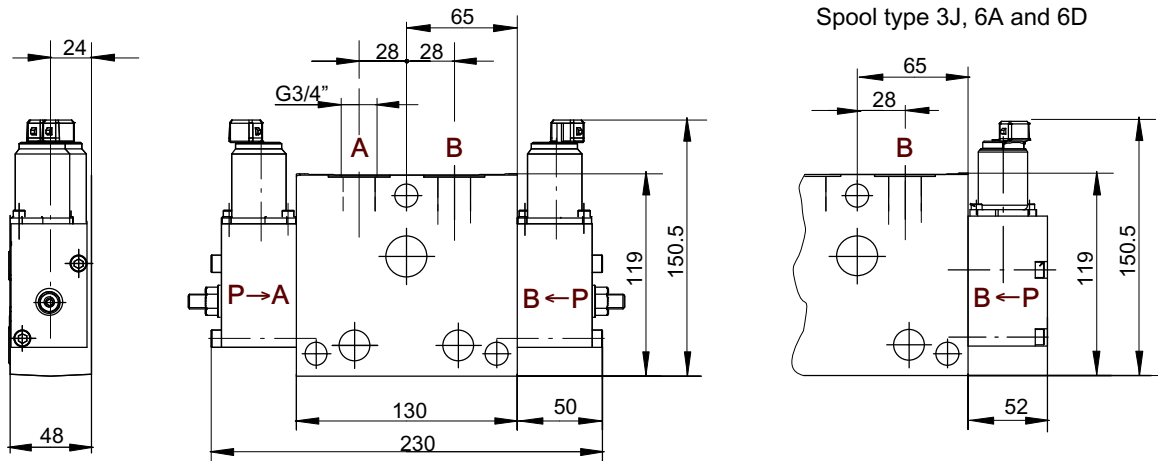
- Manual override = A
- Manual override and spool-stroke limiter = C 1)

1) Spool stroke limiting is not possible with split spools (spool selection 3J, 6A, 6D).

7.3.4 Plug type

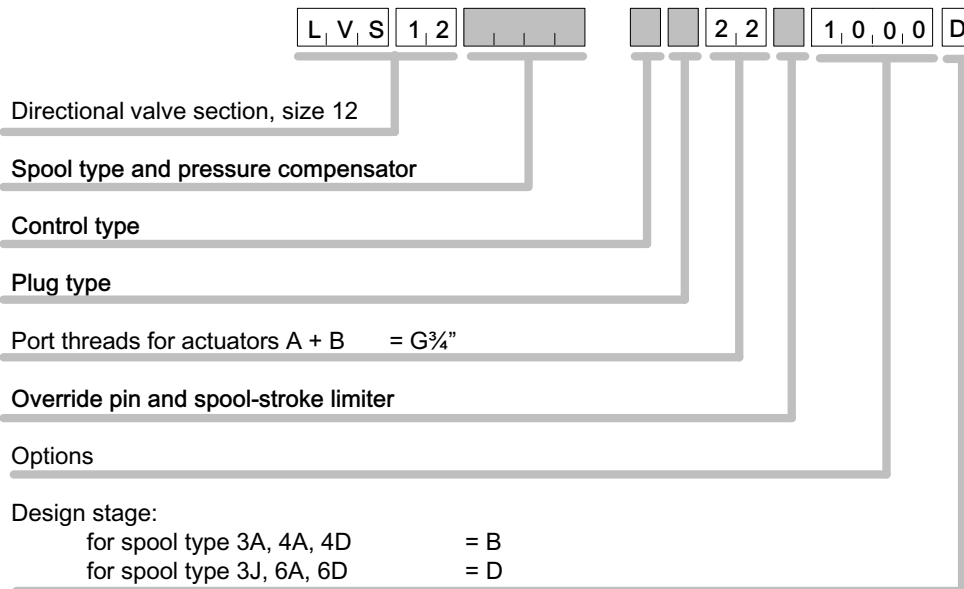
AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

7.3.5 Dimensions



7.3.6 Ordering code

- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 7.3.3



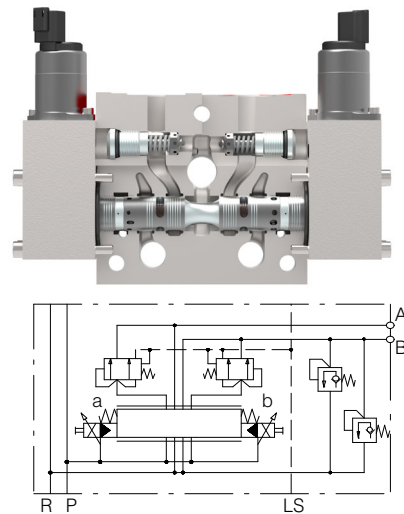
7.4 LVS12 with pressure relief /make-up valves

7.4.1 Standard functions

- Port thread for actuator A + B = G^{3/4}"
- Pressure compensator in A + B
- Pressure relief/make-up valve (selectable pressure setting)

7.4.2 Free configurable functions

- Flow rate
- Spool type in mid-position
- Plug type
- Manual override
- Spool stroke-limiter feature (can be factory-setted)
Only with spool types 3A, 4A and 4D



7.4.3 Selection menu

Spool type	3A	3J	4A	4D	6A	6D
Compensator function for actuator:	A B closed	B	A+B	A+B	A+B	A+B
16 l/min		= *C3JB	= CC4AC	= CC4DC		= CC6DC
25 l/min		= *D3JB	= DD4AC	= DD4DC	= DD6AC	= DD6DC
32 l/min		= *E3JB	= EE4AC	= EE4DC	= EE6AC	= EE6DC
40 l/min		= *F3JB	= FF4AC	= FF4DC	= FF6AC	= FF6DC
50 l/min		= *P3JB	= PP4AC	= PP4DC	= PP6AC	= PP6DC
63 l/min		= *G3JB	= GG4AC	= GG4DC	= GG6AC	= GG6DC
80 l/min		= *H3JB	= HH4AC	= HH4DC	= HH6AC	= HH6DC
100 l/min		= *K3JB	= KK4AC	= KK4DC	= KK6AC	= KK6DC
125 l/min		= *L3JB	= LL4AC	= LL4DC		= LL6DC
150 l/min		= *M3JB	= MM4AC	= MM4DC		= MM6DC
180 l/min	= O*3AA	= *O3JB	= OO4AC	= OO4DC		= OO6DC

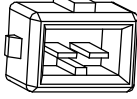
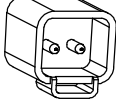
Control type	
Electrohydraulic, two stage 12 V	= F
Electrohydraulic, two stage 24 V	= G

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

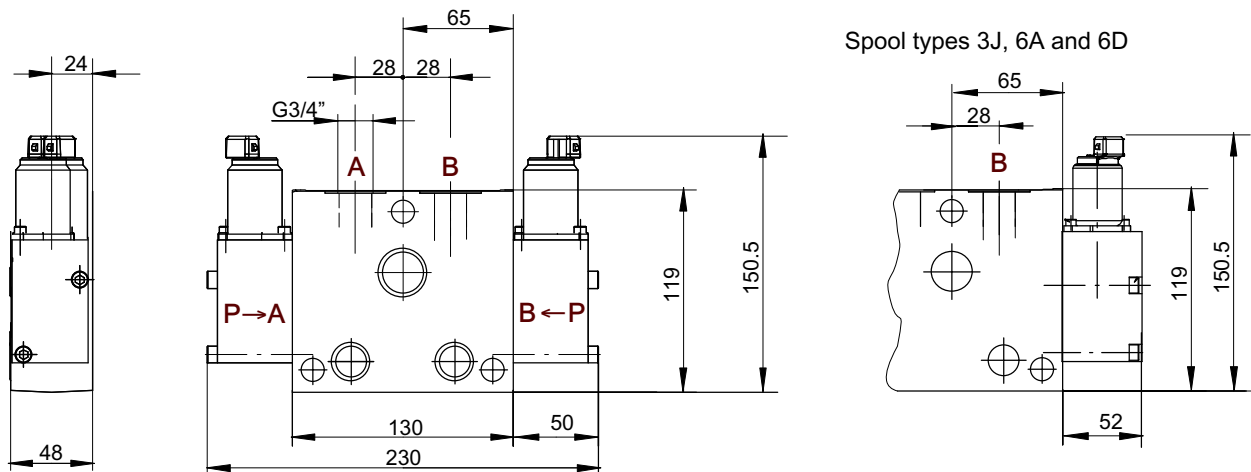
Manual override by pin / spool-stroke limiter	
Manual override	= A
Manual override and spool-stroke limiter	= C
Cavity prepared	= #

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, 300 = U, 330 = V	
Cavity prepared (closed, no function, prepared for retrofitting anti-shock valves, with plug)	= #

7.4.4 Plug type

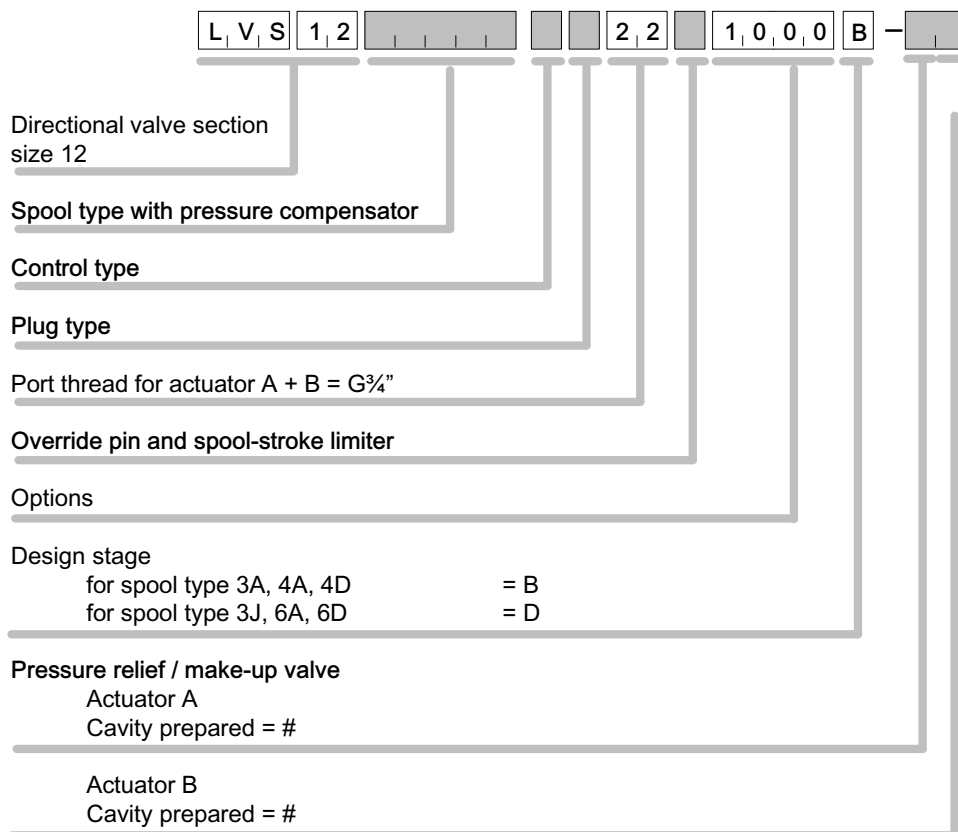
AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

7.4.5 Dimensions



7.4.6 Ordering code

- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 7.4.3

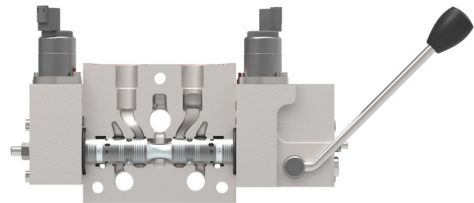


For adjustable valves:
Pressure setting
P_A = ... bar
P_B = ... bar

7.5 LVS12 with additional manual handlever

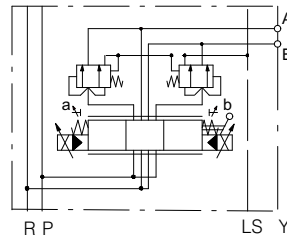
7.5.1 Standard version

- Pressure compensator in A + B
- Port thread actuator A and B = G $\frac{3}{4}$ "
- Additional manual handlever
- Spool-stroke limiter

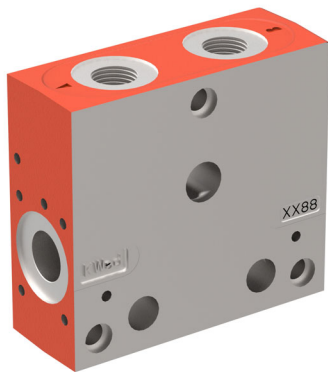


7.5.2 Freely configurable functions

- Flow rate
- Spool function
- Plug type
- Spool stroke-limiter feature (can be factory-setted)



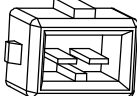
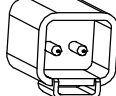
7.5.3 Selection menu



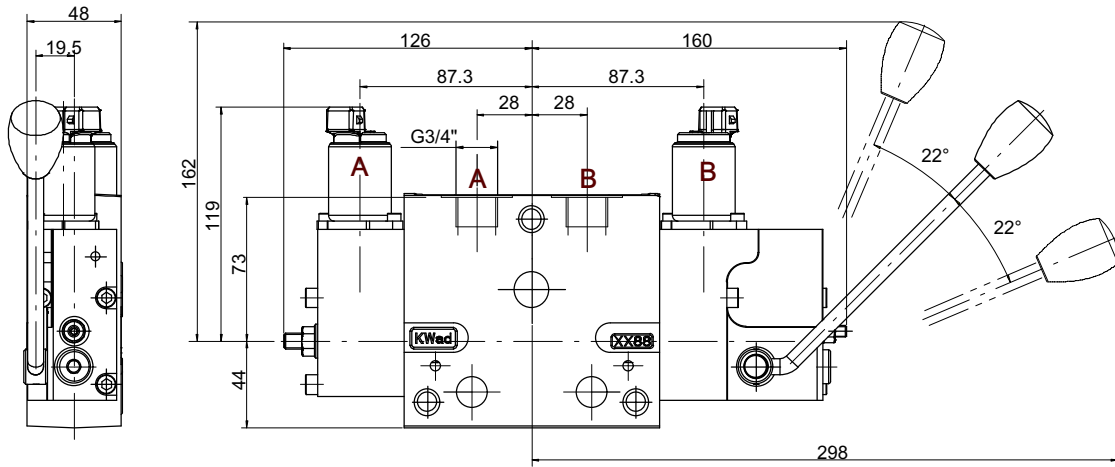
Spool type	4A	4D
Pressure compensator function for actuator:	A+B	A+B
16 l/min	= CC4AC	= CC4DC
25 l/min	= DD4AC	= DD4DC
40 l/min	= FF4AC	= FF4DC
50 l/min	= PP4AC	= PP4DC
63 l/min	= GG4AC	= GG4DC
80 l/min	= HH4AC	= HH4DC
100 l/min	= KK4AC	= KK4DC
125 l/min	= LL4AC	= LL4DC
150 l/min	= MM4AC	= MM4DC
180 l/min	= OO4AC	= OO4DC

Control type	
Electrohydraulic, two stage 12 V	= F
Electrohydraulic, two stage 24 V	= G
Additional function	
Additional manual handlever, Spool stroke limiter	= H
Plug type	
AMP Junior Timer	= J
Deutsch plug DT04-2P-EP04	= T

7.5.4 Plug type

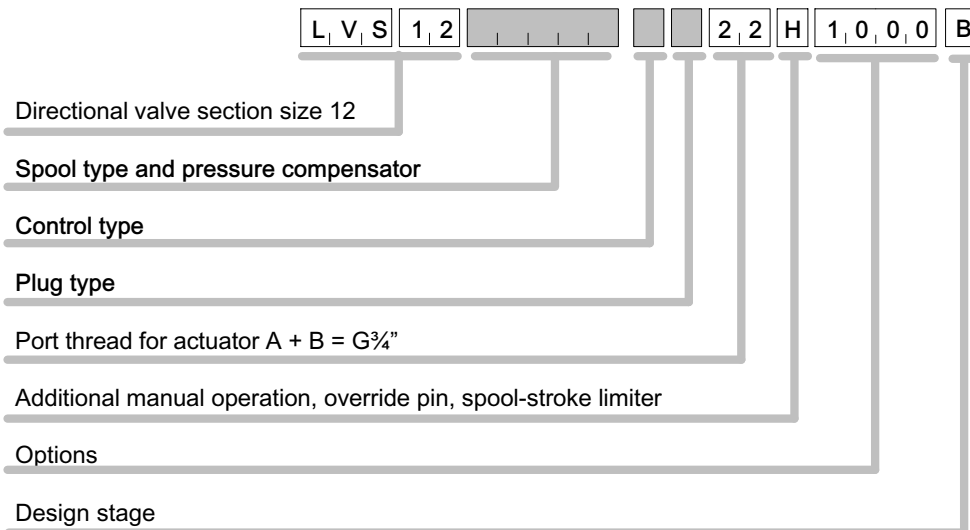
AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

7.5.5 Dimensions



7.5.6 Ordering code

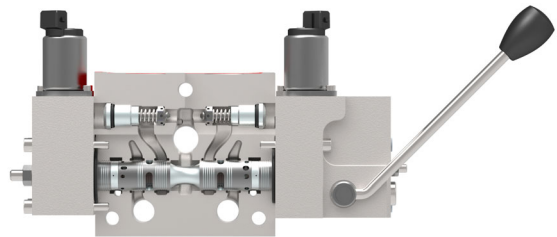
- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 7.5.3



7.6 LVS12 with additional manual operation, pressure relief / make-up valve

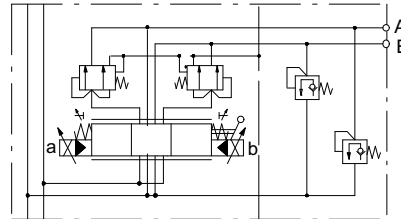
7.6.1 Standard functions

- Port threads G $\frac{3}{4}$ "
- Pressure compensator in A +B
- Pressure relief / make-up function (pressure settings are selectable)
- Additional manual handlever and spool-stroke limiter

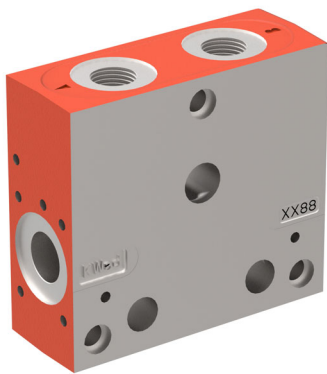


7.6.2 Freely configurable functions

- Flow rate
- Spool type in mid-position
- Plug type

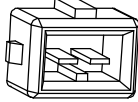
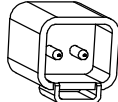


7.6.3 Selection menu

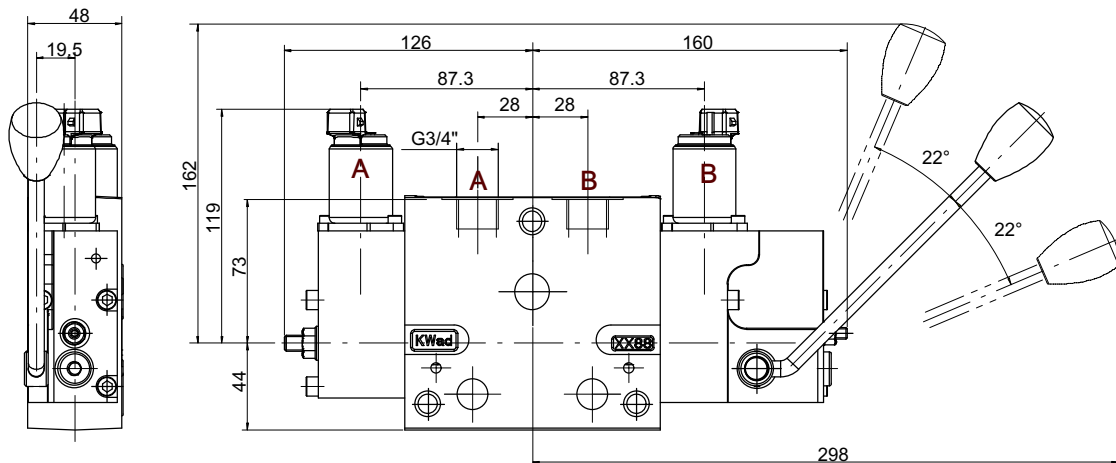


Spool type	
4A	4D
Pressure compensator function for actuator:	
A+B	A+B
16 l/min = CC4AC	= CC4DC
25 l/min = DD4AC	= DD4DC
40 l/min = FF4AC	= FF4DC
50 l/min = PP4AC	= PP4DC
63 l/min = GG4AC	= GG4DC
80 l/min = HH4AC	= HH4DC
100 l/min = KK4AC	= KK4DC
125 l/min = LL4AC	= LL4DC
150 l/min = MM4AC	= MM4DC
180 l/min = OO4AC	= OO4DC
Control type	
Electrohydraulic, two stage 12 V	= F
Electrohydraulic, two stage 24 V	= G
Plug type	
AMP Junior Timer	= J
Deutsch plug DT04-2P-EP04	= T
Additional function	
Additional manual handlever, Spool stroke limiter	= H
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, 300 = U	
Cavity prepared (closed, no function, prepared for retrofitting anti-shock valves, with plug) = #	

7.6.4 Plug type

AMP Junior Timer -J..-	Deutsch plug DT04-2P-EP04 -T..-
	

7.6.5 Dimensions

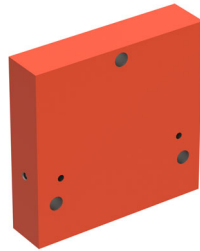


7.6.6 Ordering code

- White fields = data specified by Bucher Hydraulics
- Grey fields = data from the overview of sections 7.6.3

	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">L</td><td style="padding: 2px;">V</td><td style="padding: 2px;">S</td><td style="padding: 2px;">1</td><td style="padding: 2px;">2</td><td style="background-color: #cccccc; width: 20px;"></td><td style="background-color: #cccccc; width: 20px;"></td><td style="padding: 2px;">2</td><td style="padding: 2px;">2</td><td style="padding: 2px;">H</td><td style="padding: 2px;">1</td><td style="padding: 2px;">0</td><td style="padding: 2px;">0</td><td style="padding: 2px;">0</td><td style="padding: 2px;">B</td><td style="background-color: #cccccc; width: 20px;"></td> </tr> </table>	L	V	S	1	2			2	2	H	1	0	0	0	B		
L	V	S	1	2			2	2	H	1	0	0	0	B				
<p>Directional valve section size 12</p> <p>Spool type with pressure compensator function</p> <p>Control type</p> <p>Plug type</p> <p>Port thread for actuator A + B = G$\frac{3}{4}$"</p> <p>Additional manual operation, manual override by pin, spool-stroke limiter</p> <p>Options</p> <p>Design stage</p> <p>Pressure relief / make-up function: Actuator A Cavity prepared = #</p> <p>Actuator B Cavity prepared = #</p>	<p>For adjustable valves: Pressure setting P_A = ... bar P_B = ... bar</p>																	

8 End sections



8.1 Overview of items, with part number

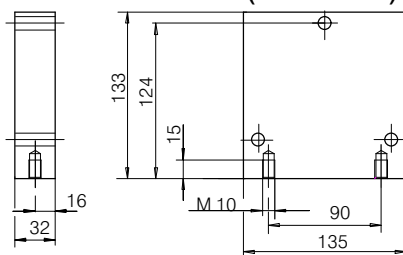
Model code	Part number	Model code	Part number
LVS-A-CA*-****A00	100027983	LVS-A-CA*-G1/2A07	100026845
LVS-A-CA*-G110A10	100030024		

8.2 Overview of end sections

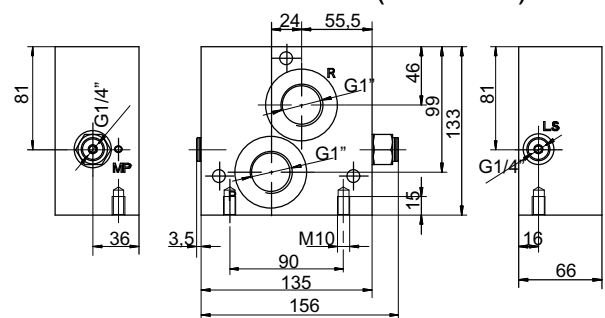
Symbol	Description	Part number
	LVS-A-CA*-****A00 • No function	100027983
	LVS-A-CA*-G110A10 • No function • Ports: P, R = G1" LS, MP = G1/4"	100030024
	LVS-A-CA*-G1/2A07 • No function • Test ports; MP, MLS = G1/4" MR = G1/2"	100026845

8.3 Dimensions

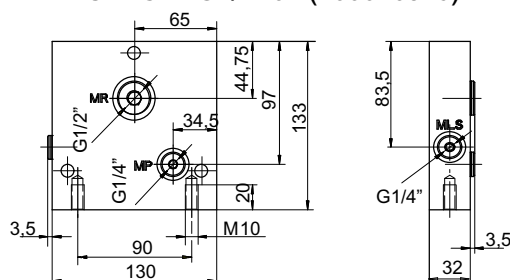
8.3.1 LVS-A-CA*-****A00 (100027983)



8.3.3 LVS-A-CA*-G110A10 (100030024)



8.3.2 LVS-A-CA*-G1/2A07 (100026845)



9 Configuration of control blocks

9.1 Ordering example

Criteria	Ordering code and data	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 3-way pressure compensator function	LVS-E-CF*-G110A00/P1 = 230 bar Port threads: A + B = 3/4" Q_{In} up to 200 l/min, Δp = 12 bar, LS_{max} setting = 218 bar ($P_{max} - \Delta p$)	100030365
1st. Directional valve section: Actuator = 1 motor drive, reversible Inlet flow = 100 l/min	LVS12KK4DCGJ22A1000B Port threads: P + R = 1" Q_{In} up to 200 l/min, Δp = 12 bar, LS_{max} setting = 218 bar ($P_{max} - \Delta p$)	Defined by factory
2nd. Directional valve section: Actuators: 2 motor drives, non-reversible Q motor 1 = 100 l/min, Q motor 2 = 40 l/min P_{max} at actuator B = 100 bar	LVS12KK4DCGJ22A1000B-#K	Defined by factory
3rd. Directional valve section: Actuator = double-acting cylinder Q at A and B = 25 l/min P_{max} at A = 100 bar, at B = 160 bar ON/OFF operation	LVS08DD4A5BJ21A1000C-KN	Defined by factory
End section No control function	LVS-A-CA*-****A00	100027983
Tie rods 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 10 mm size = 210 mm	3x tie rods 212 mm	

9.2 Assembly kit

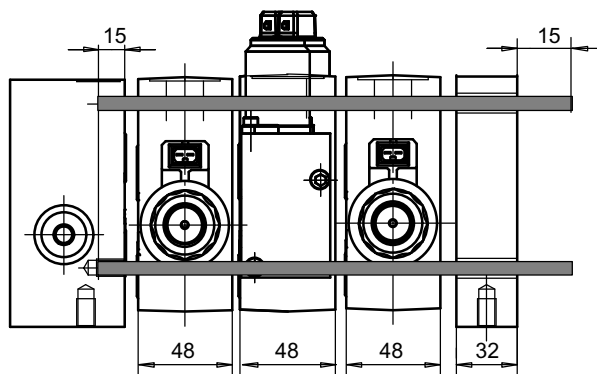
To assemble the individual valve sections with assured functional reliability, 3 tie rods and hex. nuts are necessary.

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

9.2.1 Ordering code

3x tie rod M10 x (required length in mm)

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



Calculating the tie rod length:

$15 \text{ mm} + (48 \text{ mm} \times \text{no. of directional valve sections}) + \text{width of the end section} + 15 \text{ mm}$

Example:

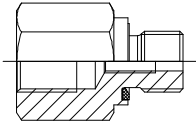
$15 + (48 \times 3) + 32 + 15 = 206 \text{ mm}$

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

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

IMPORTANT: maximum 10 directional sections in one valve block

9.2.2 Pipe fitting and orifices

Model code	Description
Part number: 100116329 	<ul style="list-style-type: none"> - Pipe fitting G$\frac{1}{4}$" with thread for inserting up to 2x M5 orifices (TN3001, Form B) Application note: for fitting in the LS-line to improve system stability - Orifice : <ul style="list-style-type: none"> \varnothing 0.5 = 100219282 \varnothing 0.6 = 100209791 \varnothing 0.8 = 100216052 \varnothing 1.0 = 100225419

10 Fluid

The control blocks require fluid with a minimum cleanliness level of 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.

11 Liability

In the design and operation of hydraulic systems, all aspects of the potential failure modes and all planned operational conditions and uses of the equipment have to take into consideration.

Concerning risk assessment, please refer to the relevant Standards. The use of components that are not Original Bucher Replacement Parts and Accessories nullifies all warranty.

12 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 doubts or questions concerning the use of these pumps, please consult Bucher Hydraulics.

info.kl@bucherhydraulics.com

www.bucherhydraulics.com

© 2020 by Bucher Hydraulics GmbH, D-79771 Klettgau

All rights reserved.

Data is provided for the purpose of product description only, and must not be construed as warranted characteristics in the legal sense. The information does not relieve users from the duty of conducting their own evaluations and tests. Because the products are subject to continual improvement, we reserve the right to amend the product specifications contained in this catalogue.

Classification: 430.300.330.