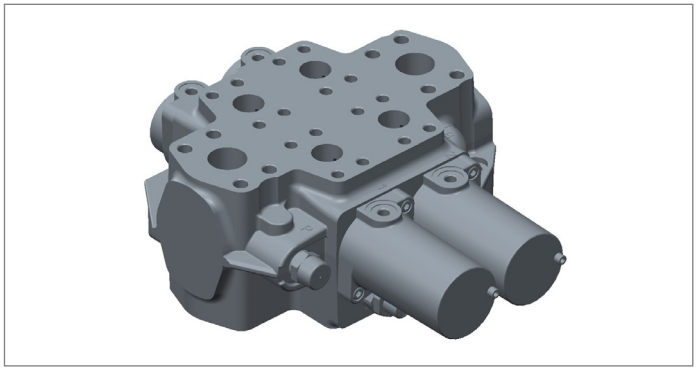
RE 64263/2021-03-10
Replaces: 10.2017

rexroth
A Bosch Company

Open center control block in mono block design M1-32



- Size 32
- Series 1X
- Maximum working pressure
  - on the pump side 250 bar
  - on the consumer side 300 bar
- Maximum flow 400 l/min

Features

- Valve control in accordance with the 6/3-way principle
- Pump pressure carry-over feature for downstream consumers when using **C** port (separation of by-pass line from tank line)
- Large fine control range for flow control with progressive flow characteristics
- Parallel or tandem connection
- Large-size line system
- Low internal leakage
- Parallel-connection load-sensing-system possible

Design

- Mono block with 2 or 3 consumer axes
- Type of actuation
  - hydraulic
  - electrohydraulic (on request)
- Pressure limitation
  - Primary pressure relief valve in the **P** supply line
  - Fitted secondary pressure relief valves and/or feed valves

Fields of application

- Wheeled loaders
- Underground loaders
- Bulldozers
- Tracked loaders

Contents

Ordering details

Short type | Spool axis | Additional information

01	02	03	04	05	06	07	08	09	10	11	12	13
	M1	**–**	**32**	**–**	**1X**	**/**						

1st Spool axis

2nd Spool axis

3rd Spool axis

Short type

01	Number of spool axes **2** or **3**	
02	Series control block M1	**M1**
03	Size 32	**32**
04	Series 10 to 19 (unchanged installation and connection dimensions)	**1X**

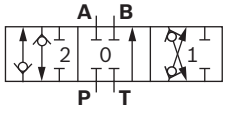
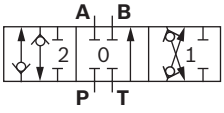
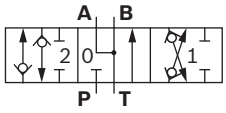
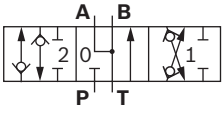
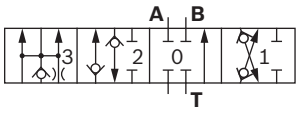
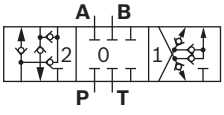
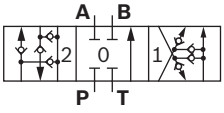
Primary pressure limitation[1)]

05	Without primary pressure relief valve (retrofittable)	**Q 000–000**
	Pressure relief valve, pilot operated (MHDBV, see data sheet 64642)	**V ... – 000**
	Pressure limitation/feed valve with pressure sequencing stage (MHDBH, see data sheet 64642)	**B ... – ...**
	Pressure limitation/feed valve with pressure cut-off stage (MHDBM, see data sheet 64642)	**L ... – ...**

Circuit type

06	Parallel connection (only possible with 2-way control block)	**P**
	Tandem connection	**T**

Spool type

07	**Control spool for tandem connection**		**Control spool for parallel connection**	
	Standard 	**001**	Standard 	**001**
	A, B → T 	**011**	**A, B → T** 	**011**
	4-position spool (floating position) 	**041**	For load-sensing version (axis 1) 	**162**
			For load-sensing version (axis 2) 	**209**

1) Specified pressure for pressure limitation and pressure sequencing/cut-off stage in bar, 3-digit

Type of actuation

08	Hydraulic		**H**
	Hydraulic, 4-position spool (3rd switching position with hydraulic unloading)		**K**
	Electrohydraulic (on request)	proportional	**W2**
		switchable	**W4**

Supply voltage (parameter only required with electrohydraulic actuation)

09	12 V	**G12**
	24 V	**G24**

Electrical connection (parameter only required with electrohydraulic actuation)[2)]

10	Device connector, 2-pin, Junior Timer (AMP)	**C4**
	Device connector, 2-pin, DT 04-2P (Deutsch)	**K40**

Secondary valves for A- and B-side

11, 12	Without secondary valves (cannot be retrofitted)	**Z**
	Without secondary valves (retrofittable), with threaded plug	**Q**
	Pressure limitation / feed valve (specified pressure in bar, 3-digit)	**H...**
	Feed valve	**E**

Option: floating position bar (only possible with parallel connection)

13	Electrically actuated unloading valve for floating position	**S**

Tank port

14	With tank port **T**	**R**
	With tank port **T** and pressure port **C** for downstream consumers (not possible in conjunction with spool type **162** and **209** or with tank port on the front side, ordering code **T** and **U**)	**C**

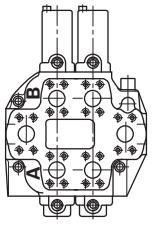
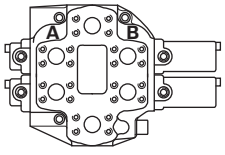
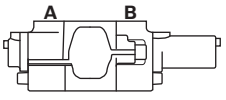
Line connections

15	SAE flange port according to ISO 6162, pressure stage 6000 PSI	**11**

Position of pump port and tank port

16	Pump port **P** and tank port **T** on the consumer side	**V**
	Pump port **P** and tank port **T** on the front side	**T**
	Double pump port **P** and double tank port **T** on consumer side and front side (only possible in conjunction with **R**)	**U**

Installation position (standard)

17	Characterization of installation position in relation to horizontal. This parameter fixes the position of the air bleed. 		**1**
		**2**	 **3**

Sealing material

18	NBR (nitrile rubber)	**M**

Option

19	Flushing grooves in the control spool	**S**

20	Further details in plain text	*

2) Plug-in connectors are not included in the scope of delivery and must be ordered separately, see data sheet 08006.

Functional description

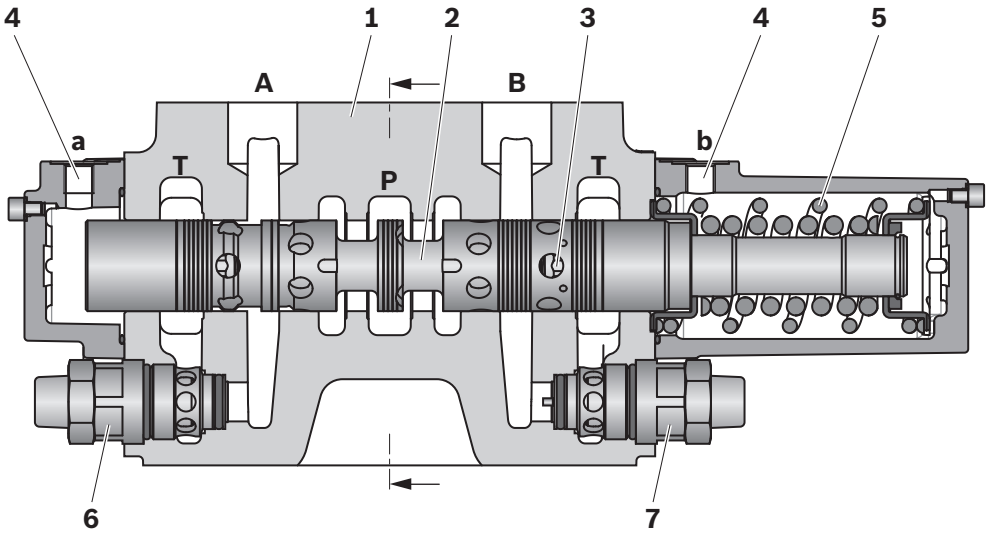
The type M1-32 medium pressure mobile control block is a directional valve of mono block design. It provides sensitive control of the speed and flow direction. The valves are actuated hydraulically or electrohydraulically as desired (upon request).
The control block consists mainly of the housing (**1**), the control spool (**2**) with installed load holding valves (**3**), the actuation element (**4**), the return springs (**5**), mounted feed valves (**6**) (optional), and/or mounted secondary pressure relief valves (**7**) (optional).
The 6/3-way valves combine the function of a 4/3- (4/4-) way directional valve and a 2/2-way directional valve. In the non-actuated state, the control spool (**2**) is kept in the initial position by the return springs (**5**). In this position, the connection from the pump to the consumer is closed, and the 2/2-way valve is open and allows the depressurized flow of fluid from **P** to **T** (free circulation).

If the control spool (**2**) is moved from its initial position, the connection from the pump to the consumer is opened via precision grooves and the 2/2-way valve is throttled via precision grooves. The pump pressure increases. When the pressure at the consumer port is reached, the load holding valve (**3**) opens in the control spool and the hydraulic fluid begins to flow to the consumer. As the control spool (**2**) continues its movement, the opening to the tank is produced
by precision grooves for the hydraulic fluid coming from the consumer, and the flow is gradually diverted from the 2/2-way line to the consumer channel (fine control).

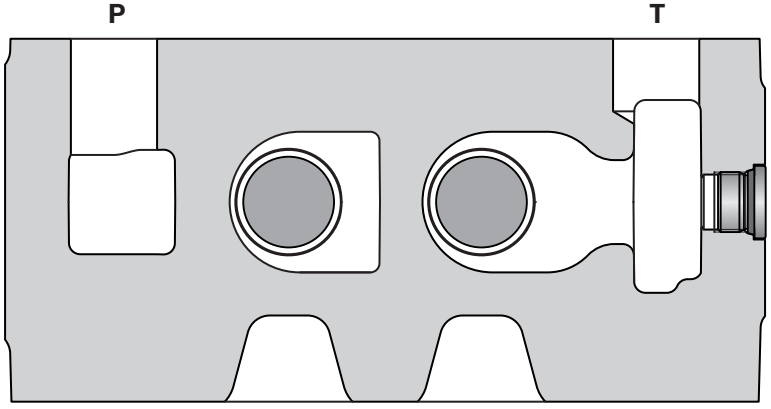
Spool travel
The spool travel is divided into approx. 30% control edge overlap and 50% fine control range, while the remaining stroke serves to create the full opening cross-section.
The overlap and a low spool tolerance reduce internal leakage. Due to the large fine control range, the consumers can be sensitively controlled.

▼ **Sectional view, example of a 2-spool block in tandem connection**

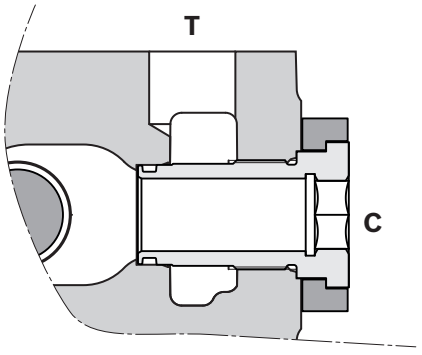
1 Housing
2 Control spool
3 Load holding valve
4 Actuation element
5 Return springs
6 Feed valve (optional)
7 Secondary pressure relief valve (optional)



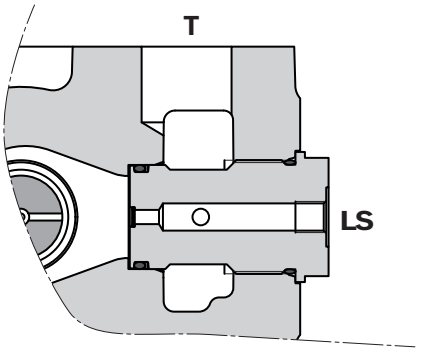
Version “R” with tank port



Version “C” with pressure port
By-pass channel is separated from the tank line, pressure transmission

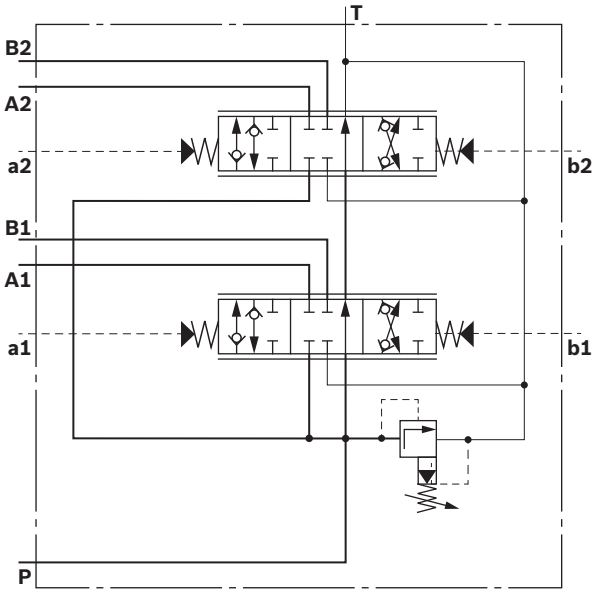


“Load-sensing” version with LS port
(only in conjunction with spool symbol **162** and **209**)
By-pass channel is converted into the LS channel and separated from the tank line, LS pressure transmission

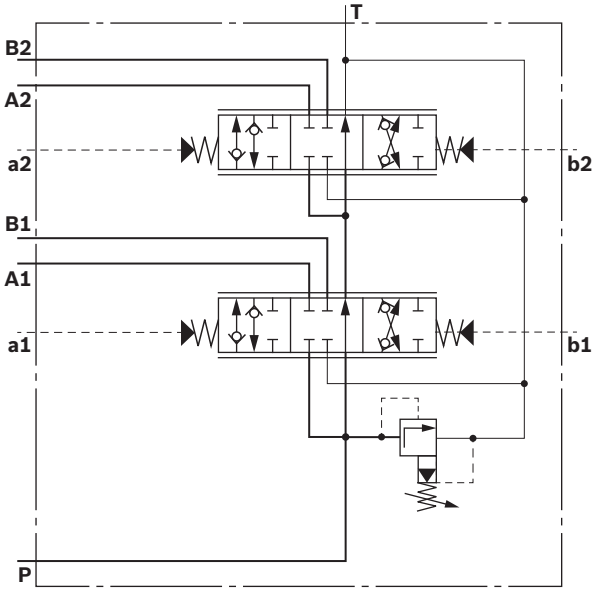


Symbols

▼ **Example of a 2-spool block, hydraulically operated, parallel connection**

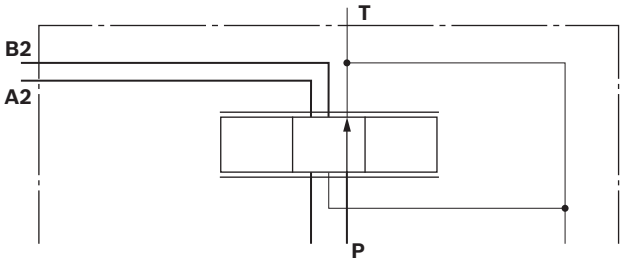


▼ **Example of a 2-spool block, hydraulically operated, tandem connection**

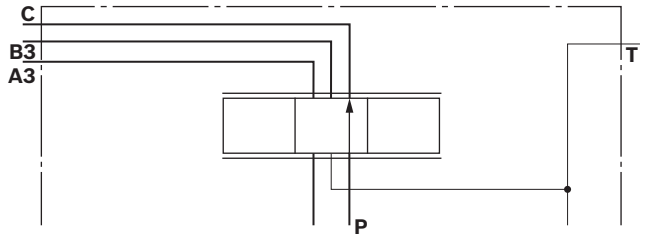


On versions with a tandem connection, the pump line is blocked up to the next spool axis if the free circulation is closed when an upstream control spool is actuated.

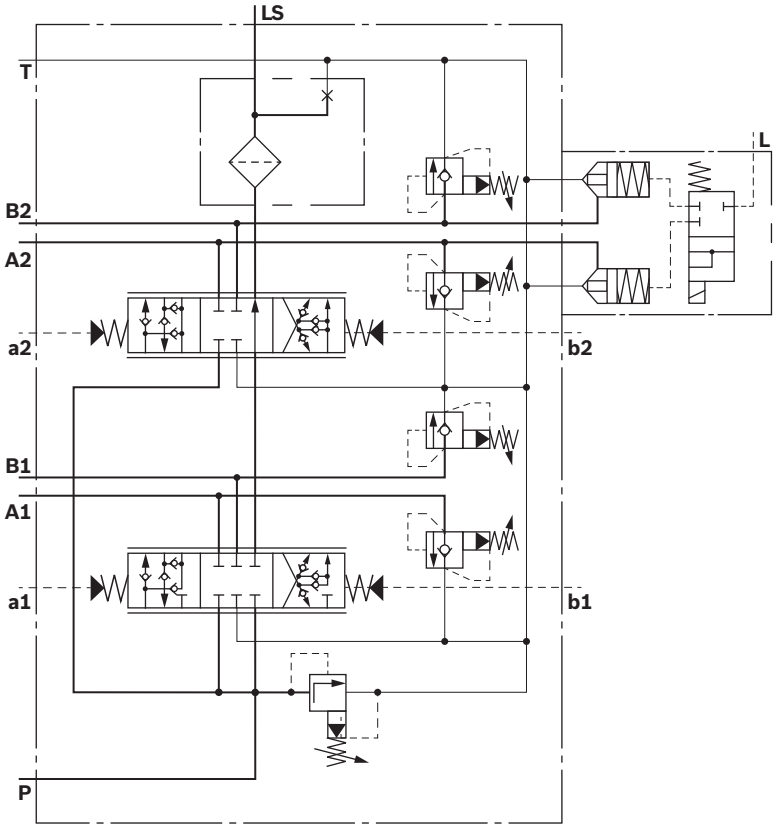
▼ **In the case of tank port with ordering code R, the circulation and return flow go into a tank**



▼ **In the case of tank port with ordering code C, the tank line is separated from the by-pass channel**



▼ **Example of load-sensing version with floating position bar, ordering code S**



Technical data

General					
Weight (without secondary valves), hydraulically operated	Number of consumer axes			**2**	**3**
	Parallel block		kg	78	–
	Tandem block		kg	70	93
Installation position				See ordering details on page 3	
Line connections				SAE flange according to ISO 6162 (6000 PSI)	
Ambient temperature range		ϑ	°C	–20 ... +80	
Standard paint				One-coat paint RAL 5010	

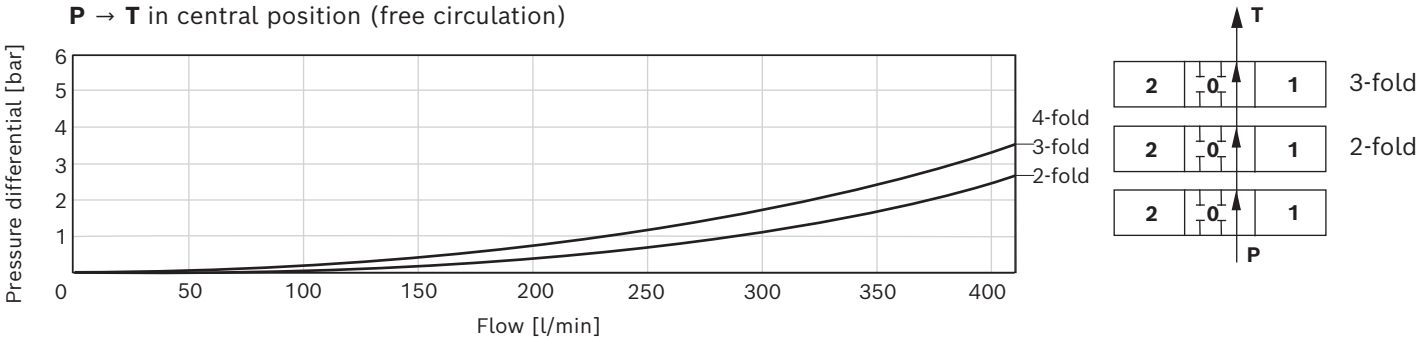
Hydraulic				
Maximum working pressure at port	**P**, **C**	p	bar	250
	A, **B**	p	bar	300
	T	p	bar	30
	L	p	bar	0.5 (depressurized routing to tank is necessary)
Maximum pilot pressure at port	**a**, **b**, **X**	p	bar	30 (higher pressures on request)
Maximum flow			l/min	400
Hydraulic fluid				Mineral oil (HL, HLP) according to DIN 51524, other hydraulic fluids, e.g. HEES (synthetic esters) according to ISO 1530 and hydraulic fluids as specified in data sheet 90221, on request
Hydraulic fluid temperature range		ϑ	°C	–20 ... +80
Viscosity range		v	mm^2/s	10 ... 380
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness level as per ISO 4406 (c)				Level 20/18/15, we recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$
Recommended hydraulic pilot control devices				2TH6 see data sheet 64552 4TH5/6 see data sheet 64555 TH7 see data sheet 64558 } Control curve no. 06

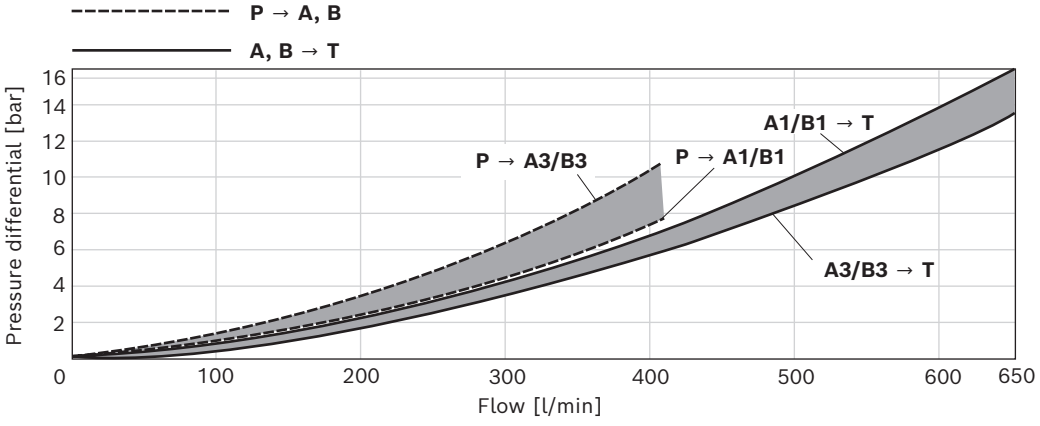
Notice

- Please contact us if the unit is to be used outside the specified range of values.
- The technical data was determined with a viscosity range of v = 41 mm^2/s and a temperature of ϑ = 50 °C.

Characteristic curves

Flow curves (Δp – q_V characteristic curve)





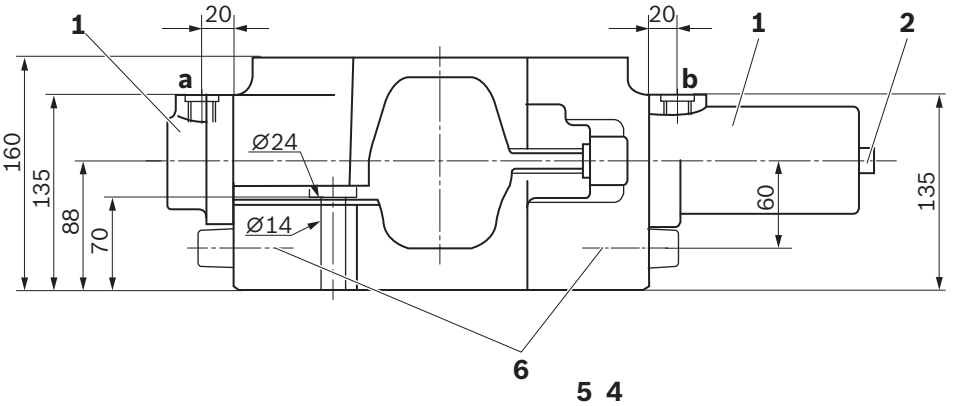
Notice
Characteristic curves measured at ν = 41 mm²/s and ϑ = 50 °C.

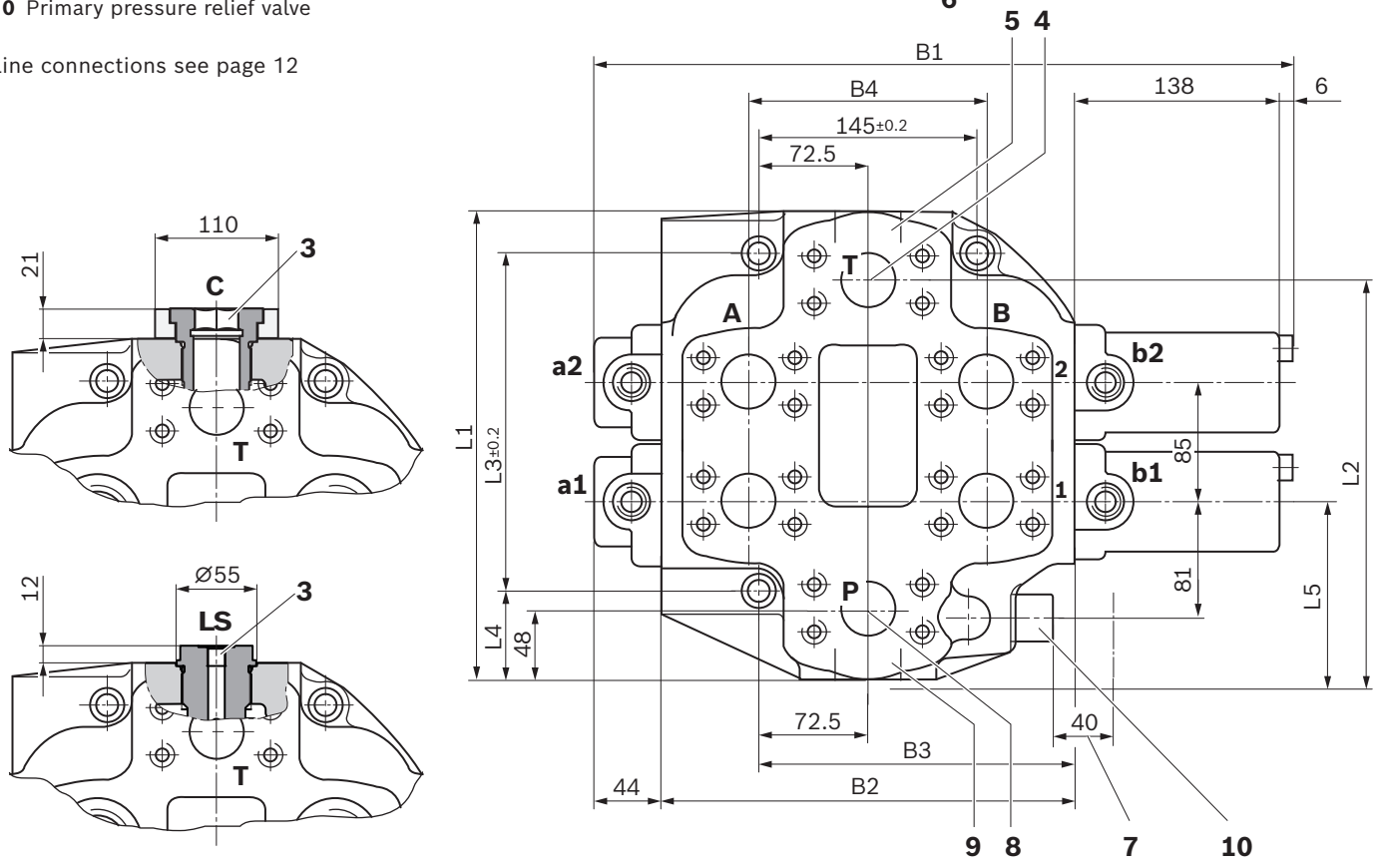
Dimensions

▼ **M1-32 with hydraulic actuation**

1 Hydraulic actuation **H**
2 Air bleed screw, attachment depends on the installation position of the control block relative to the horizontal
3 Pressure port **C** for downstream consumers and/or port **LS**
4 Tank port **T** on consumer side
5 Tank port **T** on front side
6 Installation option for secondary valves
7 Dismounting dimension for primary pressure relief valve
8 Pump port **P** on the consumer side
9 Pump port **P** on the front side
10 Primary pressure relief valve

Line connections see page 12

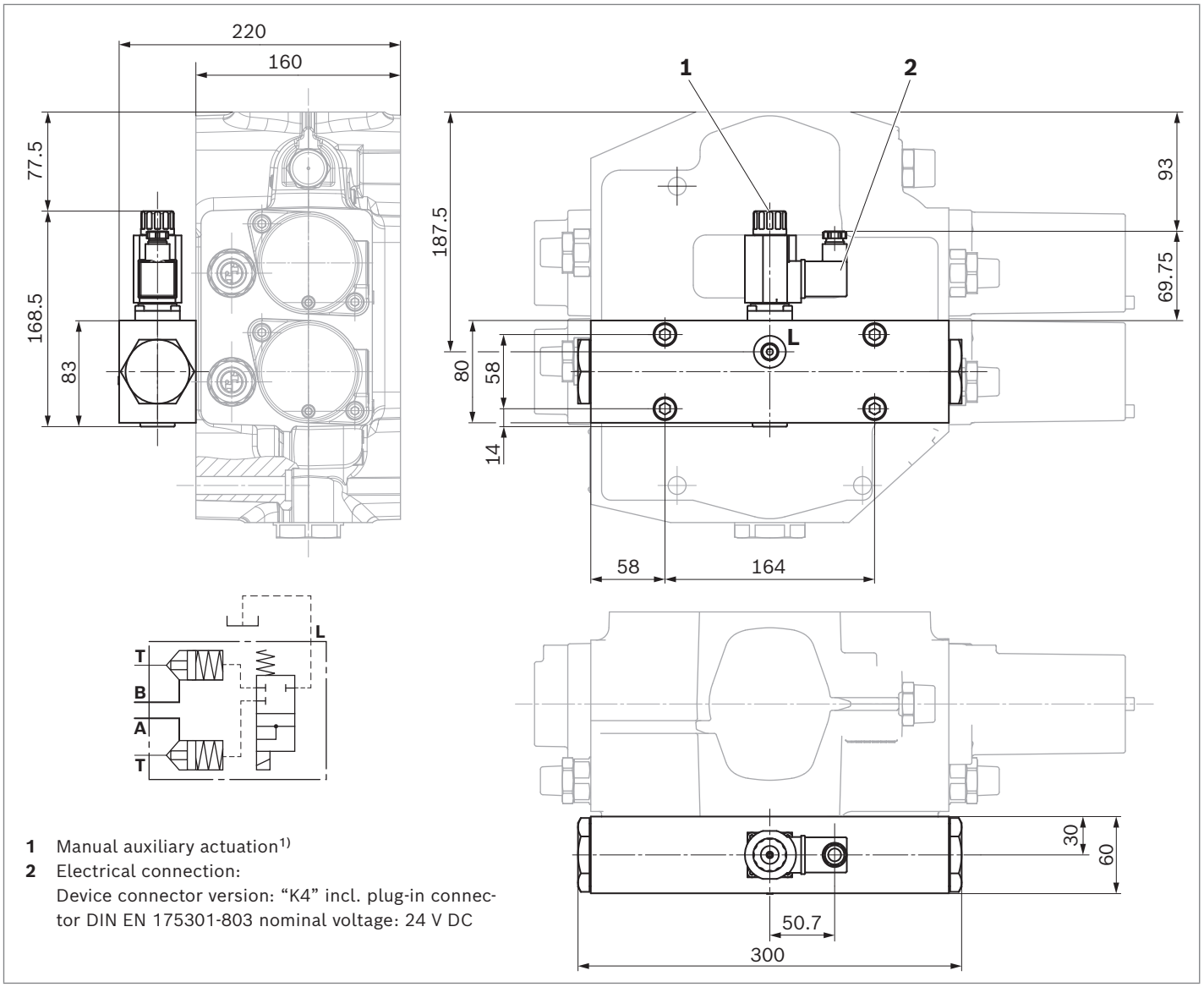




Number of spool axes	Parallel connection	Tandem connection	
	2	2	3
L1	321	335	420
L2	273	287	372
L3	234	234	319
L4	58	65	
L5	118	125	
B1	468	422	
B2	280	234	
B3	212.5	189.5	
B4	158	112	

Actuation (special cases)

▼ **Electrically actuated unloading valve for floating position, ordering code S**

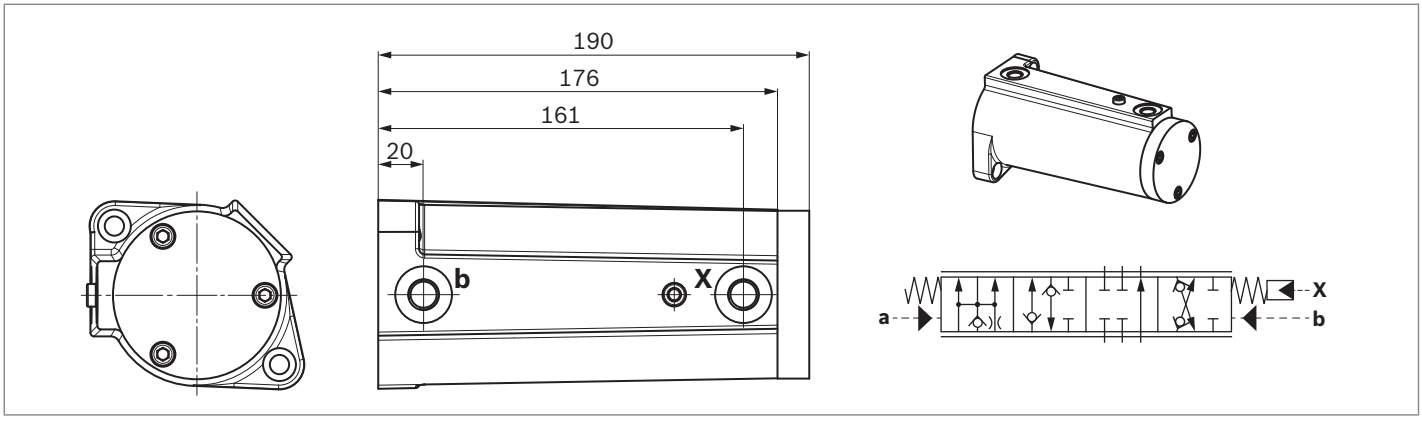


1 Manual auxiliary actuation[1)]

2 Electrical connection:
Device connector version: “K4” incl. plug-in connector DIN EN 175301-803 nominal voltage: 24 V DC

1) Actuation of the auxiliary activation device is only possible up to the permitted tank pressure. Avoid damaging the bore of the auxiliary activation device! (special tool for actuation, separate order, material no. R900024943).
The auxiliary activation device is not suitable for frequently recurring manual actuation!

▼ **Hydraulic actuation, cover for 4-position spool (3rd switching position hydraulically unloaded), ordering code K**



Line connections

SAE flange ports according to ISO 6162, pressure stage 6000 PSI

Port		
P	Pump port	SAE 1 1/2"
T	Tank port	SAE 1 1/2"
A, B	Consumer ports	SAE 1 1/4"
LS	Load sensing port	G 1/4
a, b, X	Pilot pressure port	G 1/4
C	Pump pressure transmission	SAE 1 1/2"
L	Drain port	G 1/4

Related documentation

Further information on installation, commissioning, and operation can be found in the instruction manual 64025-B: “Control blocks for mobile applications”.

Bosch Rexroth AG
Zum Eisengießer 1
97816 Lohr am Main
Germany
Tel. +49 9352 18-0
info.ma@boschrexroth.de
www.boschrexroth.com