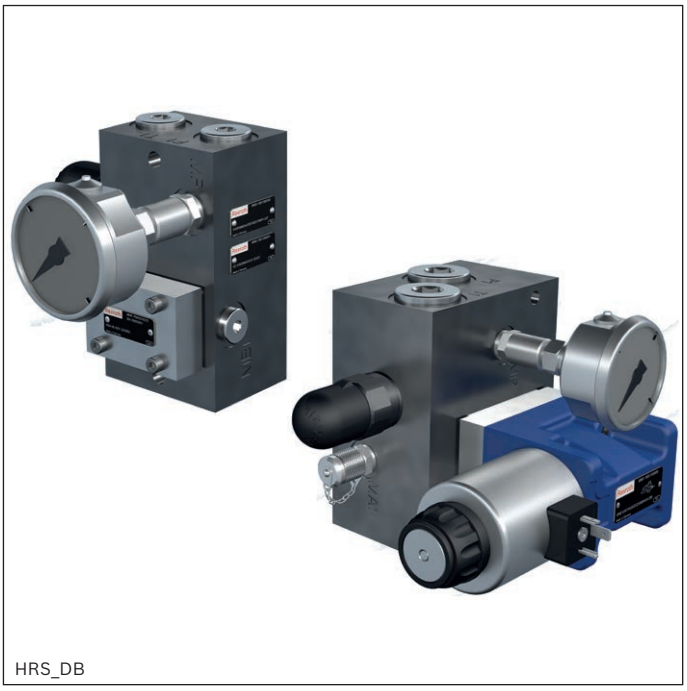
RE 48120
Edition: 2024-06

rexroth
A Bosch Company

Manifold with integrated pressure limitation

Type HSR DB



HRS_DB

- Size 6, 10
- Component series 4X
- Maximum operating pressure 315 bar
- Rated flow up to 120 l/min
- Pressure relief valve DBD6 and DBD10

Features

- Intended to be used for pressure limitation in hydraulic power units and systems
- Suitable for direct set-up on a power unit
- Integrated pressure gauge for setting the pressure relief valve and for pressure monitoring
- Pressure gauge can be disassembled due to mounting on a Minimess connection
- Two pressure and tank ports led through the block
- Phosphated surface coating

Contents

Ordering code

	01	02	03	04		05	06	07		08	09	10		11	12		13
1HSR		**M**	**D**	**4X**	**/**			**S**	**–**			**P**	**/**	**M**	**PH**	**–**	**227**

01	Size 06	**06**
	Size 10	**10**

02	Measuring ports in A and B	**M**

Position of actuator ports

03	Bottom	**D**

04	Component series 40 ... 49 (60 ... 69: unchanged installation and connection dimensions)	**4X**

Functional variant

05	Pressure relief valve DBD, valve station closed with cover plate "HSA"	**DB**
	Pressure relief valve DBD, with depressurized circulation	**DBW**
	Pressure relief valve DBD, with depressurized circulation, double flow	**DBWD**

Maximum pressure relief valve set pressure

06	100 bar	**100**
	315 bar	**315**

Adjustment type for pressure adjustment

07	Bushing with hexagon and protective cap	**S**

Directional control valve function

08	Cover plate (P-A-B-T closed)	**no code**
	Basic position (P-A-B-T connected), switching position "B" (P→B, A→T)	**H73A** [1]

Electrical voltages

09	Cover plate (P-A-B-T closed)	**no code**
	Direct voltage 24 VDC, high-power solenoid with detachable coil	**G24**

Measuring device on MP1

10	Minimess coupling with fitted pressure gauge DN63 (bar/MPa)	**P** [2]

Seal material

11	NBR	**M**

Coating of the drilled plate

12	Phosphate coating according to DIN EN 12476 (manganese or zinc phosphated)	**PH**

Design of the drilled plate

13	Special version 227 (second tank port, based on HSR06M 4X, see data sheet 48113)	**227**

[1] Smooth switching behavior

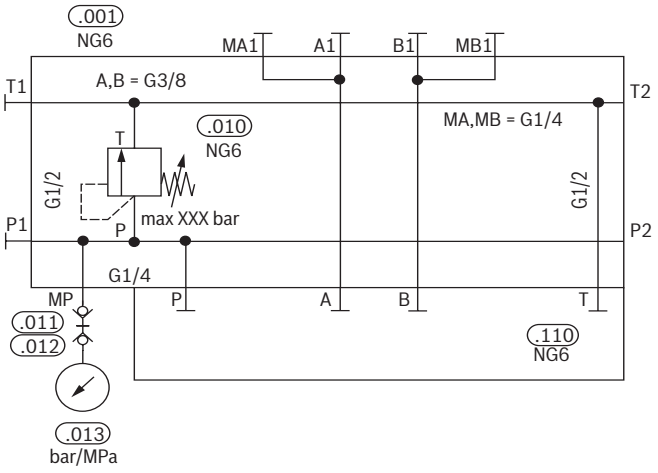
[2] Gauge pressure range corresponding to the maximum set pressure of the pressure relief valve
100 bar pressure limitation → 160 bar pressure gauge display range
315 bar pressure limitation → 400 bar pressure gauge display range

Additional configurations available on request

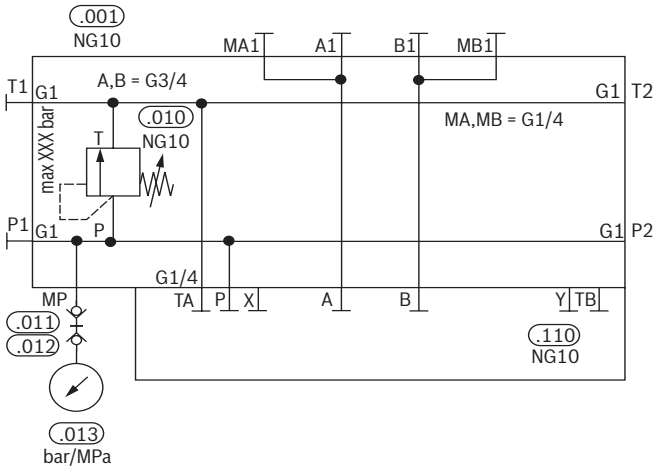
Function

Function variant "DB"

NG06

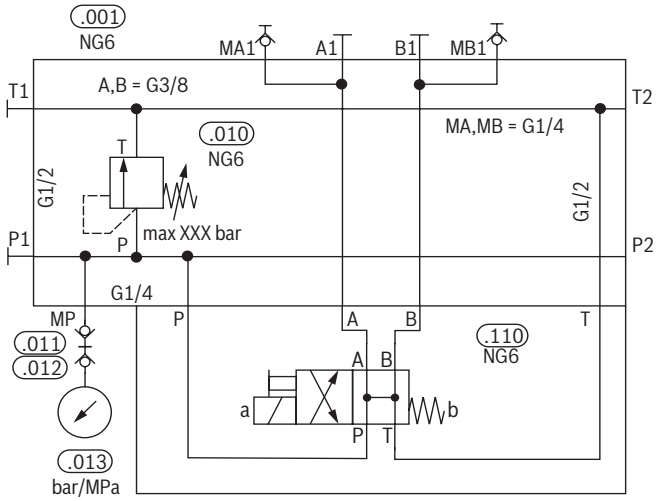


NG10

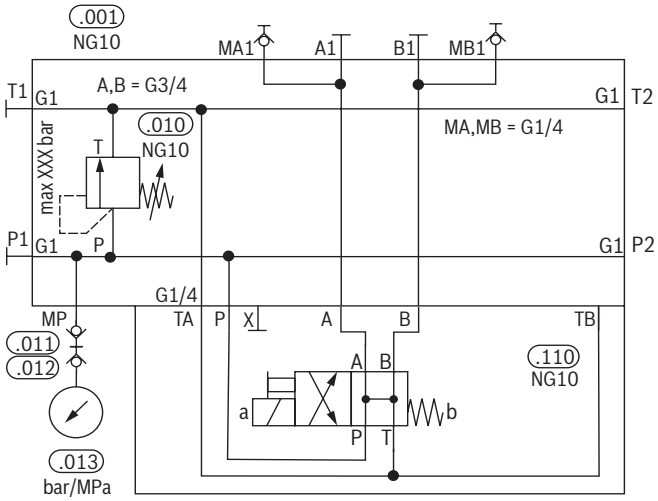


Function variant "DBW"

NG06

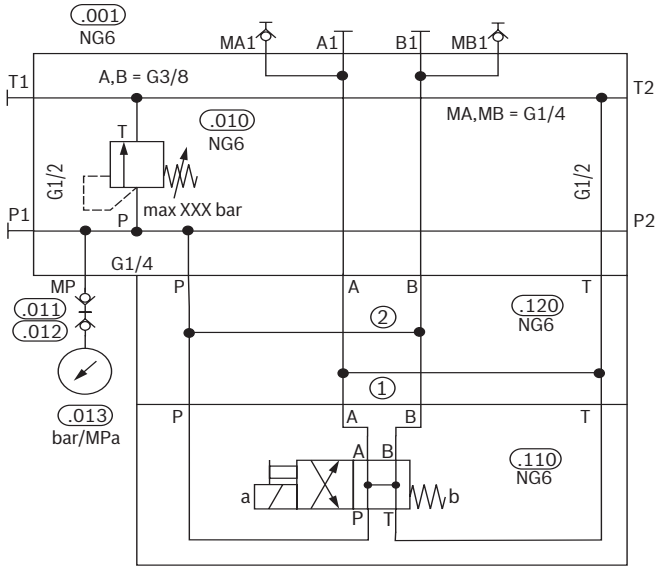


NG10

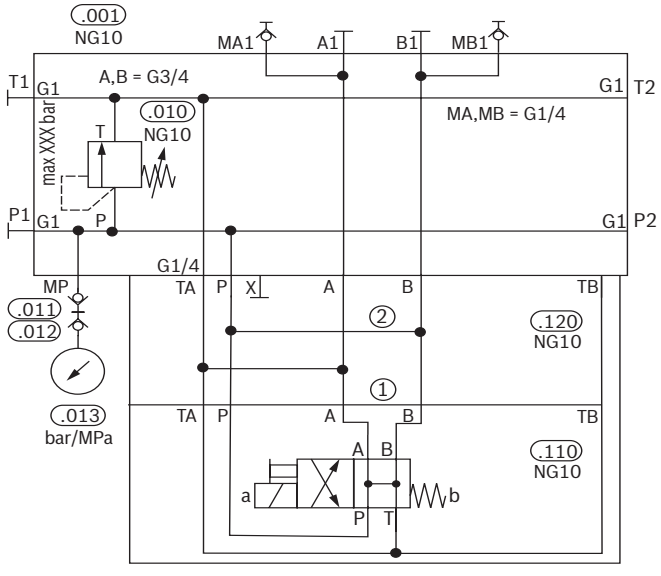


Function variant "DBWD"

NG06



NG10



Functional description

General information:

The HSR manifold (based on data sheet 48113) is used for the pressure limitation of hydraulic systems and power units. The manifold is generally equipped with a pressure relief valve (data sheet 25402), which safeguards the maximum system pressure corresponding to the selected pressure rating. Pressure adjustment can be effected via the internal hexagon when the protective cap is removed. The pressure can be read on the integrated pressure gauge (data sheet 50205) on measuring port MP. A different measuring device can be optionally installed on measuring port MP by unscrewing the pressure gauge and mounting a different measuring device. The installation of the pressure gauge on a Minimess coupling makes a leakage-free exchange of the measuring device possible.

In addition, the manifold offers the possibility of constructing a directional control valve or a valve chain. In the function variant "DB", the valve bores are closed with a cover plate, so that the block functions only as a pressure relief function. In the function variants "DBW" and "DBWD", a smoothly switching directional control valve (data sheet 23178 / data sheet 23340) is constructed, which is connected from P to T in the basic position. The variant "DBWD" also offers the possibility of double flow-through depressurized circulation, resulting in a higher admissible volume flow or a significantly reduced pressure loss in depressurized circulation.
In the switched state, pressure build-up is possible up to the set pressure of the pressure relief valve. The soft switching behavior reduces pressure peaks when switching off. On the power unit side, the block is generally piped at ports P2 and T2. On the system side, piping can be continued directly via ports P1 and T1. In the function variants "DBW" and "DBWD", ports A1 and B1 can additionally be used for the further piping or a downstream function. Mounting threads are provided on the P2 and T2 side for front-side mounting (e.g. on a console). Two through holes on the valve side also permit mounting from the valve side.

Function:

If the system pressure at port P exceeds the set value of the pressure relief valve (.010), it is opened. The system pressure is maintained at the set value and the excessive oil is conducted, depressurized, to the tank at port T2. During operation, the directional control valve (.110) is switched and blocks the connection from P to T. In the event of switching off or power failure of the system, the directional control valve (.110) opens and relieves the pressure applied to port P to the tank via port T2.

Technical data
(Please consult us for applications outside these values!)

General			
Size		6	10
Mass		See page 8	See page 8
Ambient temperature range	°C	–10 ... +50	
Storage temperature range	°C	+5 ... +40	
Plate coating		Phosphate coating according to DIN EN 12476 with after-treatment (greases, oils, lubricants) (FE//ZNPH/R/5/T4 or FE//MNPH/R/5/T4)	

Hydraulic			
Maximum operating pressure	▶ Port A, B, P, MA, MB, MP	bar	315
	▶ Port T	bar	210
Hydraulic fluid			See table below
Hydraulic fluid temperature range		°C	–10 ... +60
Viscosity range		mm^2/s	21 ... 230
Maximum admissible degree of contamination of the hydraulic fluid; cleanliness class according to ISO 4406 (c)			Class 20/18/15 [1]
Maximum flow		l/min	See characteristic curve on page 7
Minimum set pressure		bar	See characteristic curve on page 7

[1] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.

☞ **Notice:**
- ▶ Hydraulic counter pressures in port T add 1:1 to the response pressure of the valve set at the adjustment type.
  Example:
  - – Pressure adjustment of the valve through spring preload p_{spring} **= 200 bar**
  - – Hydraulic counter pressure in port T: $p_{hydraulic}$ **= 50 bar**
  - – ⇒ Response pressure = p_{spring} + $p_{hydraulic}$ **= 250 bar**

Hydraulic fluid	**Classification**	**Suitable sealing materials**	**Standards**	**Data sheet**
Mineral oils	HL, HLP, HLPD, HVLP, HVLPD	NBR, FKM	DIN 51524	90220

☞ **Important information on hydraulic fluids:**
- ▶ For further information and data on the use of other hydraulic fluids, please contact us.

Technical data
(Please consult us for applications outside these values!)

Electric			
Voltage type			Direct voltage
Supply voltage		V	24
Voltage tolerance (nominal voltage)		%	±10
Maximum power consumption according to VDE 0580		W	30
Relative duty cycle (ED) according to VDE 0580		%	100 (S1 continuous operation)
Switching time according to ISO 6403 [4)]	▶ ON	ms	25 ... 45
	▶ OFF	ms	10 ... 25
Maximum surface temperature on the coil		°C	120
Manual override			Concealed, type "N9"

When establishing the electrical connection, the protective grounding conductor (PE ⏚) must be connected correctly.

☞ **Notice:**
For information on ports and voltages, see data sheet 23178 (directional spool valves NG6) and data sheet 23440 (directional spool valves NG10).

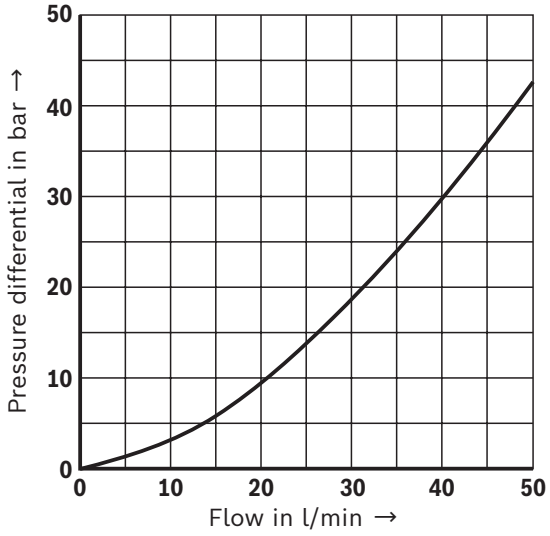
☞ **Notice:**
Solenoid valves induce voltage peaks during switch-off. In order to prevent electro-magnetic interference at the system and damage to the valve control, an interference protection circuit has to be provided on the system side. Alternatively, you can also select a connector with integrated interference protection circuit.

Characteristic curves

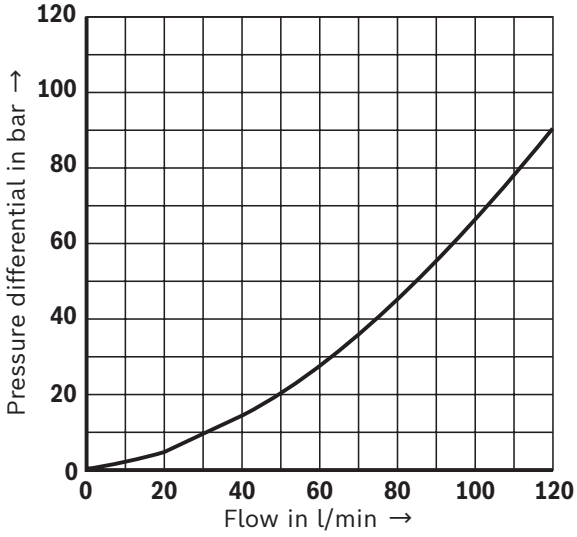
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Minimum set pressure on the pressure relief valve

Size 6



Size 10

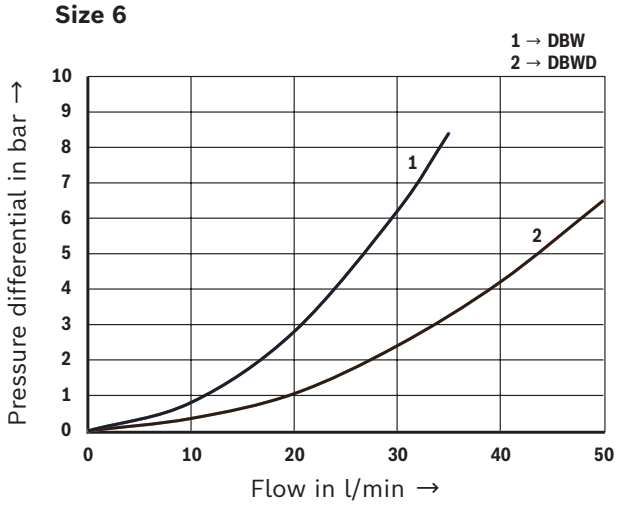


Pressure rating 25 ... 315 bar

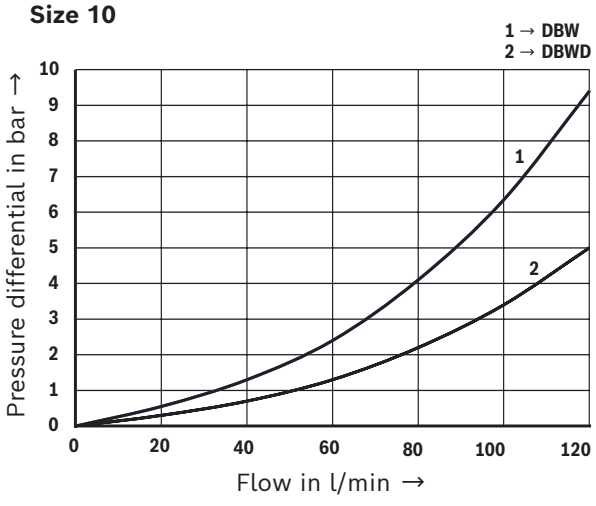
☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Pressure drop via directional control valve in the basic position (depressurized circulation)

Size 6



Size 10



☞ **Notice:**
Refer to the respective data sheets for performance characteristics for the installed valves.

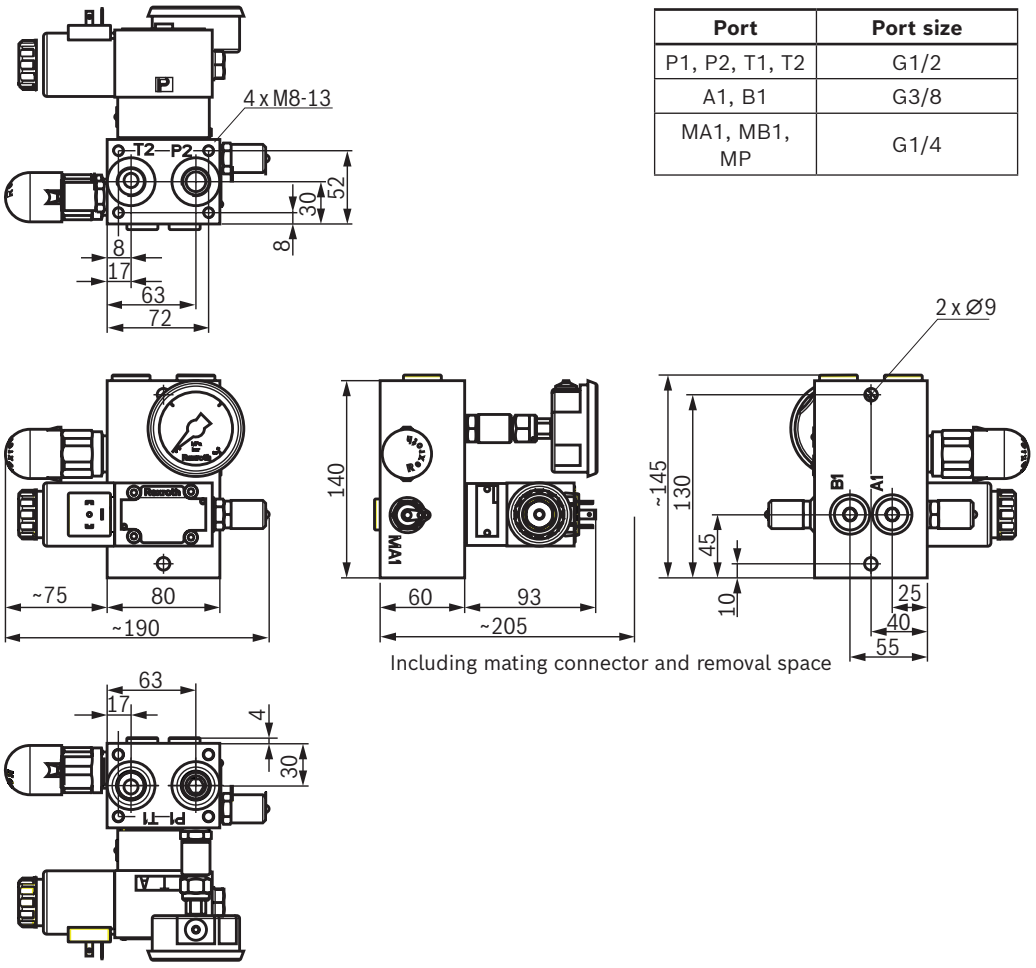
Preferred program

Size	Function	Maximum set pressure DB	Designation	Material number	Weight in kg
06	DB	100	1HSR06MD4X/DB100S-P/MPH-227	R901586383	5.5
		315	1HSR06MD4X/DB315S-P/MPH-227	R901586384	5.5
	DBW	100	1HSR06MD4X/DBW100S-H73AG24P/MPH-227	R901586385	6.6
		315	1HSR06MD4X/DBW315S-H73AG24P/MPH-227	R901586386	6.6
	DBWD	100	1HSR06MD4X/DBWD100S-H73AG24P/MPH-227	R901586387	7.2
		315	1HSR06MD4X/DBWD315S-H73AG24P/MPH-227	R901586388	7.2
10	DB	100	1HSR10MD4X/DB100S-P/MPH-227	R901586389	11.8
		315	1HSR10MD4X/DB315S-P/MPH-227	R901586390	11.8
	DBW	100	1HSR10MD4X/DBW100S-H73AG24P/MPH-227	R901586391	15
		315	1HSR10MD4X/DBW315S-H73AG24P/MPH-227	R901586392	15
	DBWD	100	1HSR10MD4X/DBWD100S-H73AG24P/MPH-227	R901586393	15.8
		315	1HSR10MD4X/DBWD315S-H73AG24P/MPH-227	R901586394	15.8

Other configurations and fitting variants available on request

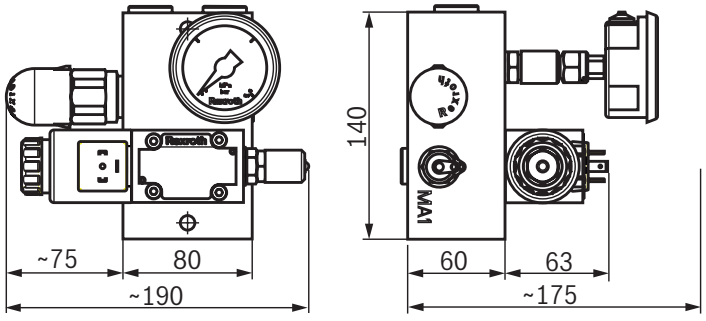
Dimensions: Size 6
(dimensions in mm)

Function variant
"DBWD"

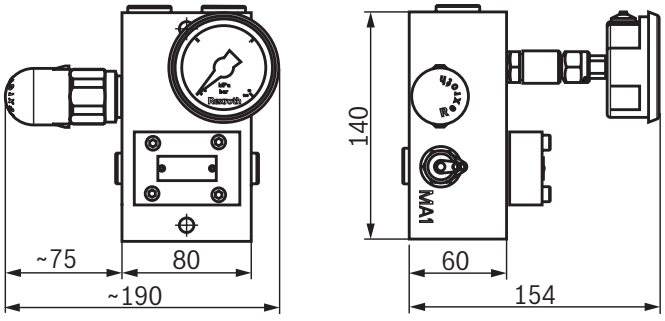


Port	Port size
P1, P2, T1, T2	G1/2
A1, B1	G3/8
MA1, MB1, MP	G1/4

Function variant
"DBW"



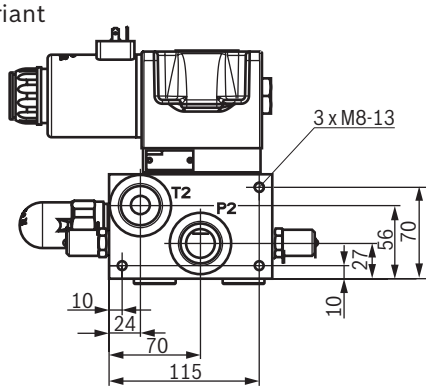
Function variant
"DB"

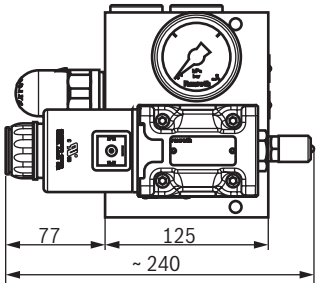


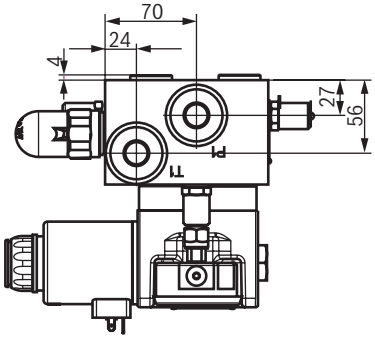
Dimensions: Size 10
(dimensions in mm)

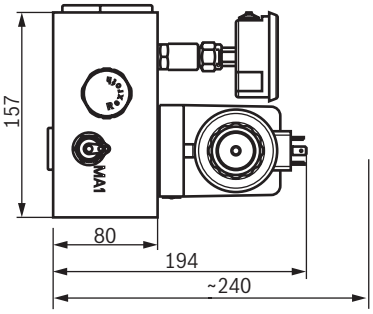
Function variant
"DBWD"

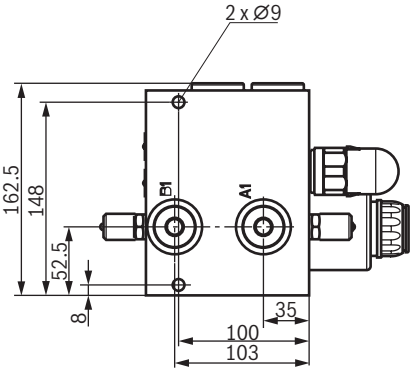
Port	Port size
P1, P2, T1, T2	G1
A1, B1	G3/4
MA1, MB1, MP	G1/4





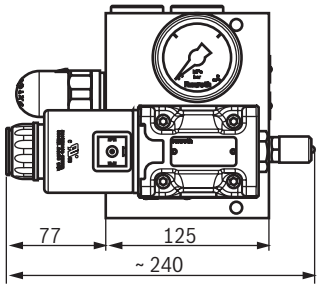


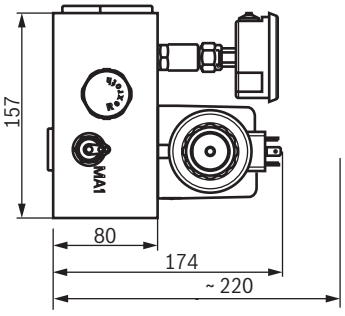




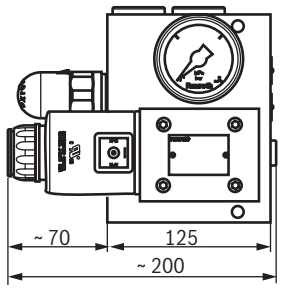
Including mating connector and removal space

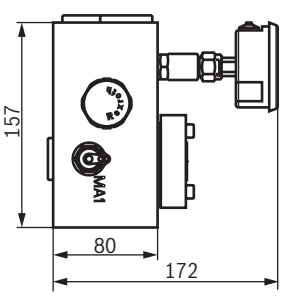
Function variant
"DBW"





Function variant
"DB"





Accessories (separate order)

Pressure gauge

Designation	Type designation	Material number	Data sheet
Pressure gauge with fluid filling, indication range up to 160 bar	ABZMM 63- 160BAR/MPA-R/B-G	**R900022457**	50205
Pressure gauge with fluid filling, indication range up to 250 bar	ABZMM 63- 250BAR/MPA-R/B-G	**R900072028**	
Pressure gauge with fluid filling, indication range up to 400 bar	ABZMM 63- 400BAR/MPA-R/B-G	**R900022459**	

Pressure sensors

Designation	Type designation	Material number	Data sheet
Pressure transducer for hydraulic applications up to 160 bar, current output 4 ... 20 mA	HM 20-2X/160-C-K35-N	**R901381345**	30272
Pressure transducer for hydraulic applications up to 160 bar, voltage output 0.1 ... 10 V	HM 20-2X/160-H-K35-N	**R901381347**	
Pressure transducer for hydraulic applications up to 400 bar, current output 4 ... 20 mA	HM 20-2X/400-C-K35-N	**R901456334**	
Pressure transducer for hydraulic applications up to 400 bar, voltage output 0.1 ... 10 V	HM 20-2X/400-H-K35-N	**R901466598**	
Electronic pressure switch up to max. 100 bar, internal thread	HEDE10-3X/100/1/-GI-K35-0	**R901425473**	30277
Electronic pressure switch up to max. 250 bar, internal thread	HEDE10-3X/250/1/-GI-K35-0	**R901425474**	
Electronic pressure switch up to max. 400 bar, internal thread	HEDE10-3X/400/1/-GI-K35-0	**R901425475**	
Electronic pressure switch up to max. 100 bar, 2 switching outputs	HEDE12-1X/100-2-K35-V	**R901507473**	30340
Electronic pressure switch up to max. 250 bar, 2 switching outputs	HEDE12-1X/250-2-K35-V	**R901507474**	
Electronic pressure switch up to max. 400 bar, 2 switching outputs	HEDE12-1X/400-2-K35-V	**R901507475**	

Plug screws

Designation	Type designation	Material number	Data sheet
Plug screw with internal hexagon and profile seal ring G1/4	PLUG SCREW DCCS10001-G1/4A-ST+E&	**R913011601**	
Plug screw with internal hexagon and profile seal ring G3/8	PLUG SCREW DCCS10001-G3/8A-ST+E&	**R913011602**	
Plug screw with internal hexagon and profile seal ring G1/2	PLUG SCREW DCCS10001-G1/2A-ST+E&	**R913011603**	
Plug screw with internal hexagon and profile seal ring G3/4	PLUG SCREW DCCS10001-G3/4A-ST+E&	**R913011604**	
Plug screw with internal hexagon and profile seal ring G1	PLUG SCREW DCCS10001-G1A-ST+EP-&	**R913011605**	

Measuring couplings

Designation	Type designation	Material number	Data sheet
Measuring port, straight, ribbed, without cap	MEASURING COUPLING MCS20-SDS-E-G1/4-ST3&	**R900011267**	
Measuring port, straight, ribbed, with cap	MEASURING COUPLING MCS20-SDS-E-G1/4-ST3N00Z-M	**R900009090**	

Mating connectors

Designation	Type designation	Material number	Data sheet
For valves with "K4" device connector, 2-pole + PE, design A (large cubic connector), with indicator light and Z-diode-suppressor	MATING CONNECTOR 3P Z5L1 M 24V SPEZ	**R901017026**	08006

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Accessories (separate order)

Pipe check valves (without nut and cutting ring)
Type "RZ", pipe connection on both sides
Type "RV", flow direction from the screw-in stud
Type "RZ", flow direction to the screw-in stud

Designation	Type designation	Material number	Data sheet
Type "RZ", light series, pipe outer diameter 18 mm, cracking pressure 1 bar	CHECK VALVE RZ L18 G 1/2 PE-1.0 &	**R901115547**	
Type "RZ", light series, pipe outer diameter 28 mm, cracking pressure 0.5 bar	CHECK VALVE RZ L28 G1 PE-0.5 &	**R901210868**	
Type "RV", light series, pipe outer diameter 18 mm, cracking pressure 0.5 bar	CHECK VALVE RV L18 G 1/2 PE-0.5 &	**R901115440**	
Type "RV", light series, pipe outer diameter 28 mm, cracking pressure 0.5 bar	CHECK VALVE RV L28 G1 PE-0.5 &	**R901115447**	
Type "RZ", heavy series, pipe outer diameter 16 mm, cracking pressure 1 bar	CHECK VALVE RZ S16 G 1/2 PE-1.0 &	**R901115555**	
Type "RZ", heavy series, pipe outer diameter 25 mm, cracking pressure 1 bar	CHECK VALVE RZ S25 G1 PE-1.0 &	**R901115557**	
Type "RV", heavy series, pipe outer diameter 16 mm, cracking pressure 0.5 bar	CHECK VALVE RV S16 G 1/2 PE-0.5 &	**R901115456**	
Type "RV", heavy series, pipe outer diameter 25 mm, cracking pressure 1.0 bar	CHECK VALVE RV S25 G1 PE-1.0 &	**R901115480**	

Further information

▶ Manifolds and modules	Operating instructions 07601-B
▶ Manifolds with installation bore for a pressure relief valve, type HSR	Data sheet 48113
▶ Pressure relief valve, direct operated, type DBD	Data sheet 25402
▶ Liquid-filled pressure gauge, Type ABZMM	Data sheet 50205
▶ Directional spool valves, direct operated, with solenoid actuation, NG06	Data sheet 23178
▶ Directional spool valves, direct operated, with solenoid actuation, NG10	Data sheet 23340
▶ Hydraulic fluids based on mineral oils	Data sheet 90220
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Mating connectors and cable sets for valves and sensors	Data sheet 08006
▶ Information on available spare parts	www.boschrexroth.com/spc

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