Pump safety block

Type DBA; DBAW

RE 25880
Edition: 2019-04
Replaces: 2013-01

H5961+5962

- Sizes 32 and 40
- Component series 1X
- Maximum operating pressure 350 bar
- Maximum flow 650 l/min

Features

- Depressurized start-up and circulation of the pump
- To be mounted directly onto the SAE pressure port of the pump
- Quick pressure build-up
- 4 adjustment types for pressure adjustment, optionally
  - Rotary knob
  - Sleeve with hexagon and protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- 5 pressure ratings, optional
- Solenoid-actuated unloading via a built-on directional valve
- Integrated check valve, optional
- Switching shock damping, optional (DBAW type only)

Contents

Ordering code

01	02	03	04	05	06	07	08	09		10	11	12	13	14	15	16	17	18	19	20	21	22
DBA								**1X**	**/**								**K4**					*****

01	Pump safety block	**DBA**
02	**Without** directional valve	**no code**
	With built-on directional valve	**W**
03	**Without** check valve	**no code**
	With check valve	**R** [1]
04	Size 32	**30**
	Size 40	**40**
05	Normally closed	**A** [2]
	Normally open	**B** [2]

Connection / SAE flange [3]

06	Standard flange (200 ... 250 bar)	**F**
	High-pressure flange (350 bar)	**H**

Adjustment type for pressure adjustment

07	Rotary knob	**1**
	Sleeve with hexagon and protective cap	**2**
	Lockable rotary knob with scale	**3** [4]
	Rotary knob with scale	**7**
08	**With** main spool Ø24 mm	**–**
	With main spool Ø28 mm	**N**
09	Component series 10 ... 19 (10 ... 19: unchanged installation and connection dimensions)	**1X**

Pressure rating

10	Set pressure ... 50 bar	**50**
	Set pressure ... 100 bar	**100**
	Set pressure ... 200 bar	**200**
	Set pressure ... 250 bar	**250**
	Set pressure ... 315 bar (only version "H")	**315**
	Set pressure ... 350 bar (only version "H")	**350**

Pilot flow

11	Pilot oil supply and pilot oil return internal (standard)	**–** [5]
	Internal pilot oil supply, external pilot oil return	**Y**
12	Standard version	**no code**
	Valve for minimum cracking pressure (not suitable for mutual relief)	**U**

[1] Only ... 315 bar

[2] Ordering code only required if 02 = **"W"**

[3] Please observe pressure ratings and connection dimensions (see page 13)

[4] H-key with material no. **R900008158** is included in the scope of delivery.

[5] Dash "–" only required if 02 = **"W"** and 12 and 13 = **"no code"**

[6] Mating connectors, separate order, see page 19

[7] Ordering code only required if 02 = **"W"** and 13 = **"S"**

☞ **Notice:** Preferred types and standard units are contained in the EPS (standard price list).

Ordering code

01	02	03	04	05	06	07	08	09		10	11	12	13	14	15	16	17	18	19	20	21	22
DBA								**1X**	**/**								**K4**					*****

13	**Without** switching shock damping	**no code**
	With switching shock damping (version "W" only)	**S**

14	**Without** directional valve	**no code**
	With directional spool valve (data sheet 23178)	**6E** [2)]
	With directional seat valve (data sheet 22058)	**6SM** [2)]

15	Direct voltage 24 V	**G24** [2)]
	DC voltage 205 V	**G205** [2)]
	Alternating voltage 230 V 50/60 Hz (version "6E" only)	**W230** [2)]

16	**Without** manual override	**no code**
	With manual override (version "6E" only)	**N** [2)]
	With concealed manual override (standard)	**N9** [2)]

Electrical connection

17	**Without** mating connector with connector DIN EN 175301-803	**K4** [2; 6)]

18	Nozzles – Ø1.2 mm in channel B of the directional spool valve	**R12** [7)]
	Nozzles – Ø1.2 mm in channel P of the directional seat valve	**B12** [7)]

Seal material (observe compatibility of seals with hydraulic fluid used, see page 8)

19	NBR seals	**no code**
	FKM seals	**V**

Type-examination procedure

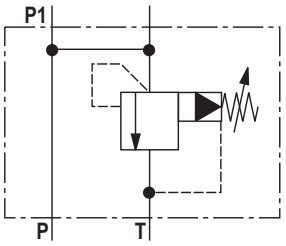
20	**Without** type-examination procedure	**no code**
	Type-examination tested safety valve according to Pressure Equipment Directive 2014/68/EU	**E**

21	Standard version	**no code**
	Solenoid coil is an approved component with UR-marking according to UL 906	**=UR**

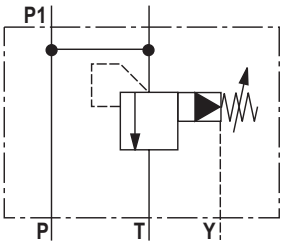
22	Further details in the plain text	

Symbols

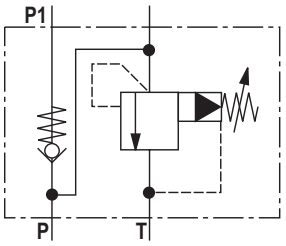
Type DBA ...**–**..



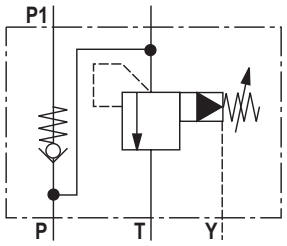
Type DBA ...**Y**..



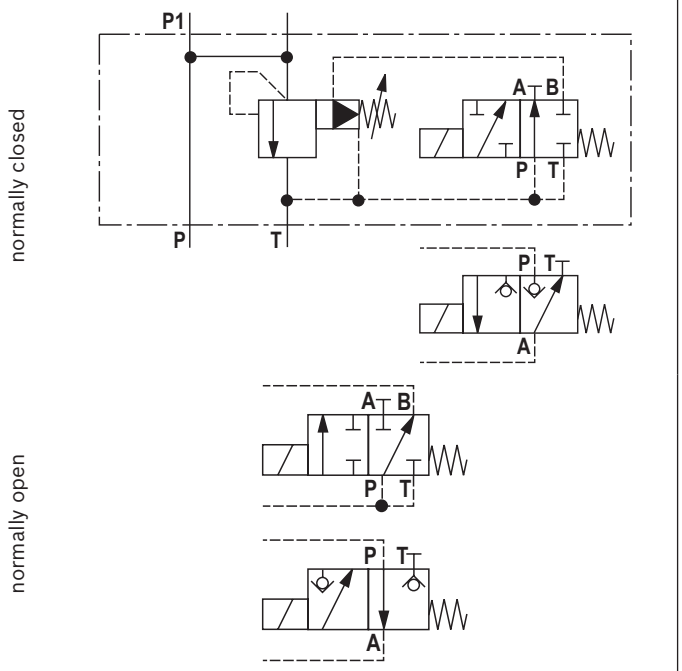
Type DBAR ...**–**..



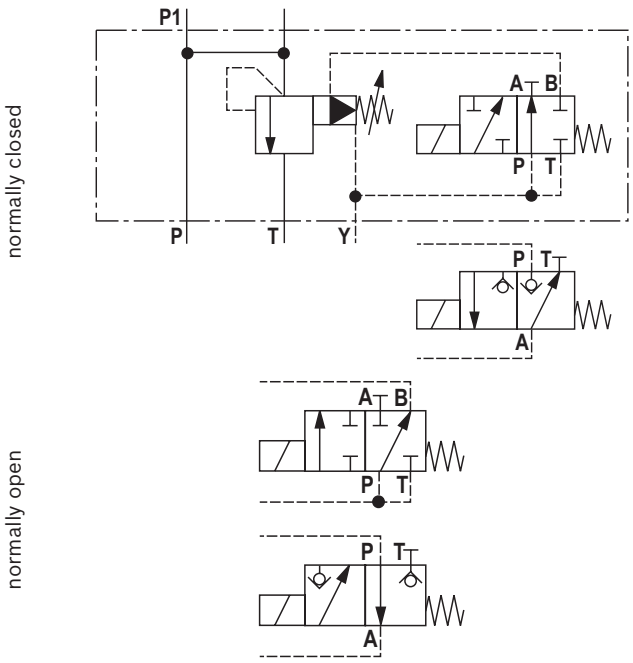
Type DBAR ...**Y**..



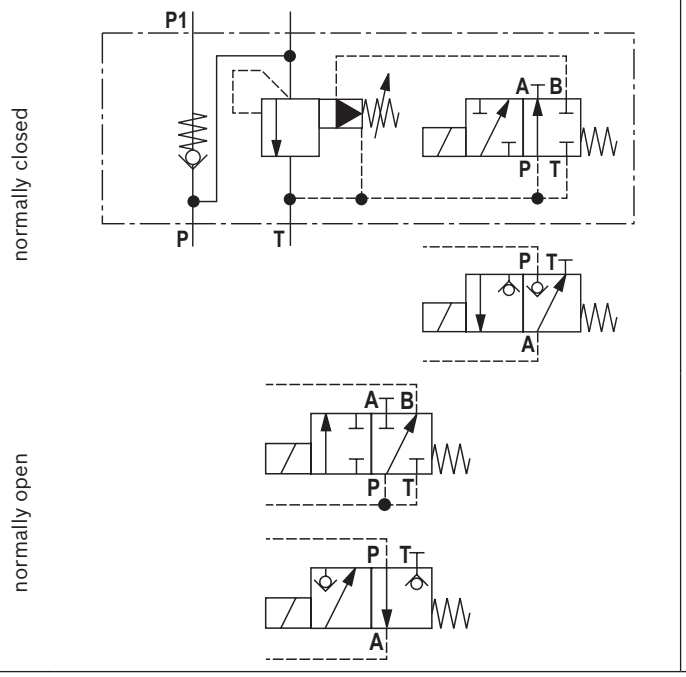
Type DBAW ...**–**...



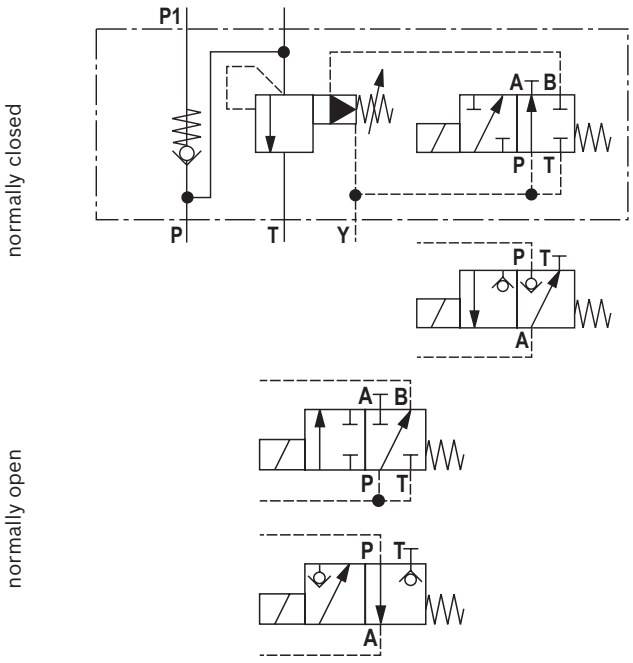
Type DBAW ...**Y**...



Type DBAWR ...**–**...



Type DBAWR ...**Y**...



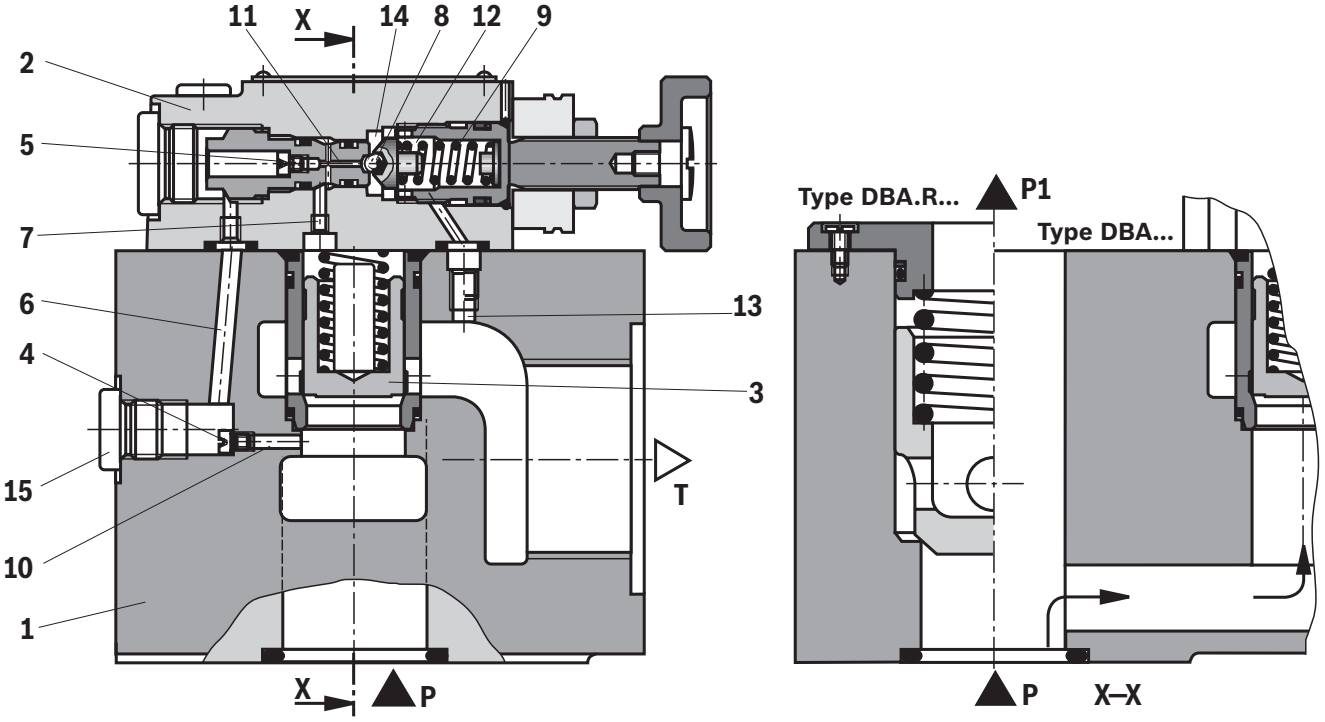
Function, sections

Pump safety blocks of types DBA/DBAW are pilot-operated pressure relief valves which are integrated into a block and intended to be mounted directly onto the SAE pressure port of pumps.
They are used for limiting (DBA) or limiting and magnetically unloading (DBAW) the operating pressure.
Pump safety blocks (DBA) basically consist of a valve block (1), main spool insert (3) and pilot control valve (2) with adjustment type for pressure adjustment. The valve housing has a port P for the hydraulic fluid input and port P1 for the output. In a branch of the through-bore between these two ports there is the main spool insert. When this is open there is a connection to port T (tank line).

Pump safety block type DBA
The pressure applied in the through-bore acts on the main spool (3). At the same time, pressure is applied to the spring-loaded side of the main spool (3) and to the ball (8) in the pilot control valve (2) via the control lines (6) and (7) which are equipped with nozzles (4) and (5). If the pressure in the through-bore exceeds the value set at spring (9), ball (8) opens against spring (9). The signal for this is provided internally from the through-bore via control lines (10) and (6).

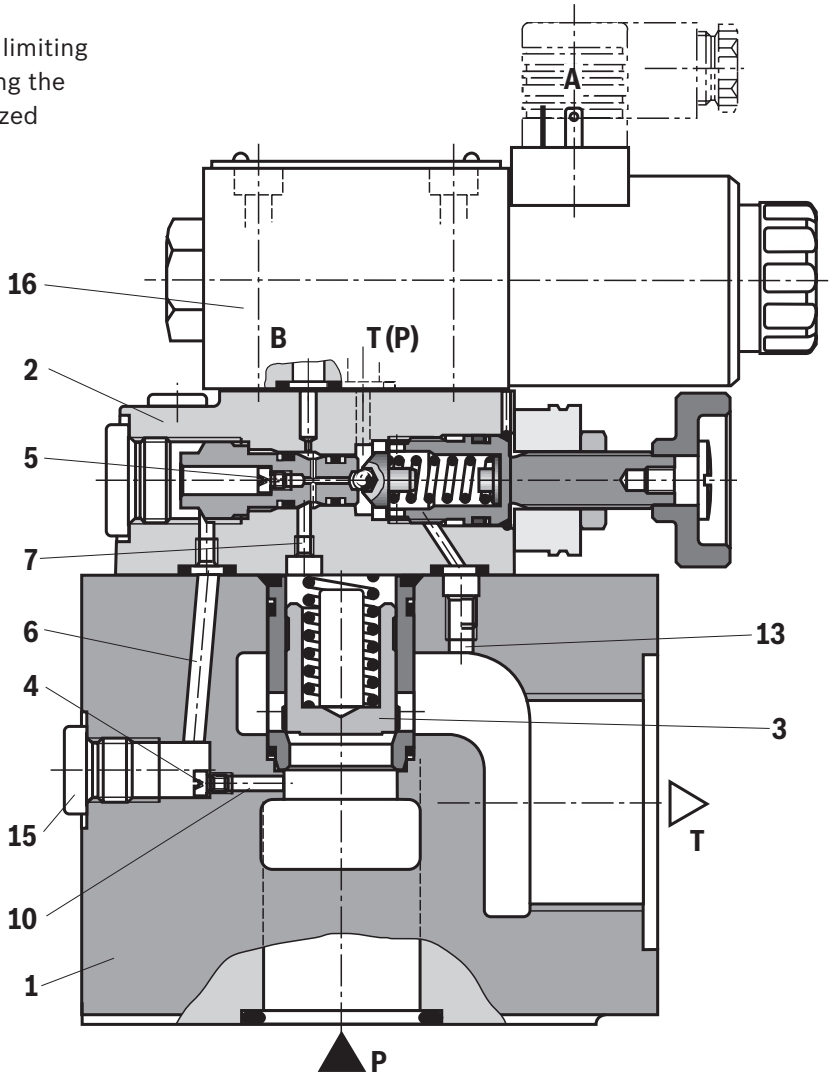
The hydraulic fluid on the spring-loaded side of main spool (3) now flows via the control line (7), nozzle bore (11) and ball (8) into the spring chamber (12). From here, it is fed into the tank, either internally for type DBA ...– via control line (13), or externally for type DBA ...Y via control line (14). Nozzles (4) and (5) cause a pressure drop to occur at the main spool (3), hence the connection from channel P to channel T opens. The hydraulic fluid now flows from channel P to channel T, whilst the set operating pressure is maintained.
Port (15) can be used for remote control purposes.
If a pressure load cell or a pressure gauge shut-off valve is to be connected here, then version SO616 – without nozzle (4) – must be ordered. This prevents delays in the pressure build-up or brief pressure drops when the pressure gauge shut-off valve is operated.

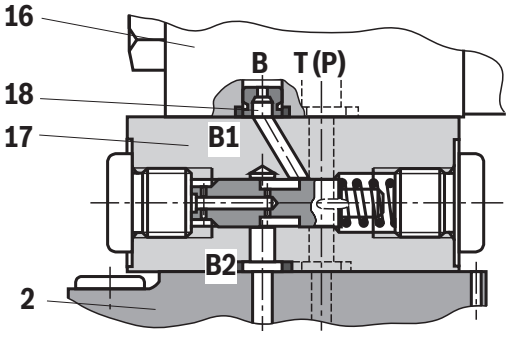
Pump safety block type DBAR
(with check valve)
The integrated check valve maintains the system pressure when the pump is disconnected and prevents the hydraulic fluid from returning to the pump.
If this valve is selected, no separate check valve is needed.



Function, sections, symbols

Pump safety block type DBAW...
In addition, it can be switched from the pressure limiting function to depressurized circulation by controlling the built-on directional valve (16). Thus, a depressurized start-up of the pump is possible.

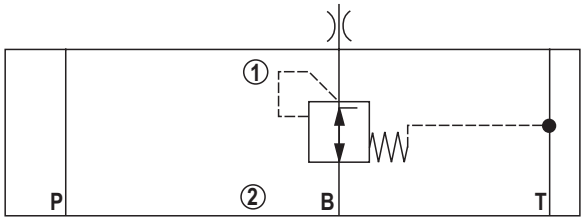




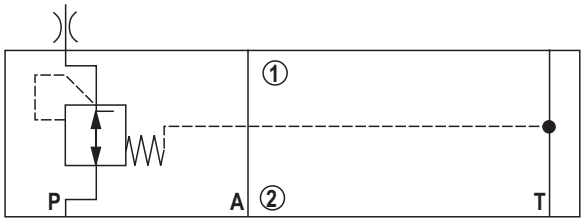
Representation: Directional valve open

Pump safety block with switching shock damping (sandwich plate), **type DBAW...S6E...R12** and **type DBAW...S6SM...B12**
The opening of the connection from B2 to B1 or P2 to P1 is delayed by means of the switching shock damping valve (17). Pressure peaks and acoustic decompression shocks in the return line can thus be avoided. It is installed between the pilot control valve (2) and the directional valve (16).
The degree of damping (decompression shock) is determined by the size of the nozzle (18). By default, a nozzle Ø1.2 mm is installed (ordering code..**R12**.. or ..**B12**..).

Type DBAW...S6E...R12



Type DBAW...S6SM...B12



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

General					
Size			NG	32	40
Weight	▶ Type DBA...		kg	8	11.4
	▶ Type DBAW...		kg	9.2	12.6
	▶ Check valve "R"		kg	+0.3	+0.4
	▶ Switching shock damping "S"		kg	+0.6	+0.6
Installation position				any	
Ambient temperature range	▶ Type DBA...			–30 ... +80 (NBR seals) –15 ... +80 (FKM seals)	
	▶ Type DBAW...			–30 ... +50 (NBR seals) –15 ... +50 (FKM seals)	
Minimum stability of the housing materials				Housing materials are to be selected so that there is sufficient safety for all imaginable operating conditions (e.g. with reference to pressure resistance, thread stripping strengths and tightening torques).	

Hydraulic					
Maximum operating pressure	▶ Port P		bar	350	
	▶ Port T		bar	315	
Cracking pressure (for DBAR...)			bar	0.5	
Maximum counter pressure	▶ Type DBA	Port Y	bar	315	
	▶ Type DBAW	Port Y, T	bar	210 (DC solenoid) 160 (AC solenoid) 180 (DC solenoid with version "=UR")	
Minimum set pressure			bar	flow-dependent (see characteristic curves page 9 and 10)	
Maximum set pressure			bar	50; 100; 200; 315; 350	
Maximum flow	▶ Type DBA/DBAW		l/min	600	650
	▶ Type DBAR/DBAWR		l/min	350	450
Hydraulic fluid				see table page 8	
Hydraulic fluid temperature range			°C	–30 ... +80 (NBR seals) –15 ... +80 (FKM seals)	
Viscosity range			mm^2/s	10 ... 800	
Maximum admissible degree of contamination of the hydraulic fluid cleanliness class according to ISO 4406 (c)				class 20/18/15 [1)]	

[1)] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.
For the selection of the filters see www.boschrexroth.com/filter.

Technical data for directional seat valves see data sheet 22058, directional spool valves data sheet 23178.
Deviating technical data for type-examination tested safety valves can be found on page 16.

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

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP, HLPD, HVLP, HVLPD	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	FKM	ISO 15380	90221
		HEES	FKM		
	▶ Soluble in water	HEPG	FKM	ISO 15380	
Flame-resistant	▶ Water-free	HFDU (glycol base)	FKM	ISO 12922	90222
		HFDU (ester base)	FKM		
		HFDR	FKM		
	▶ Containing water	HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	NBR	ISO 12922	90223

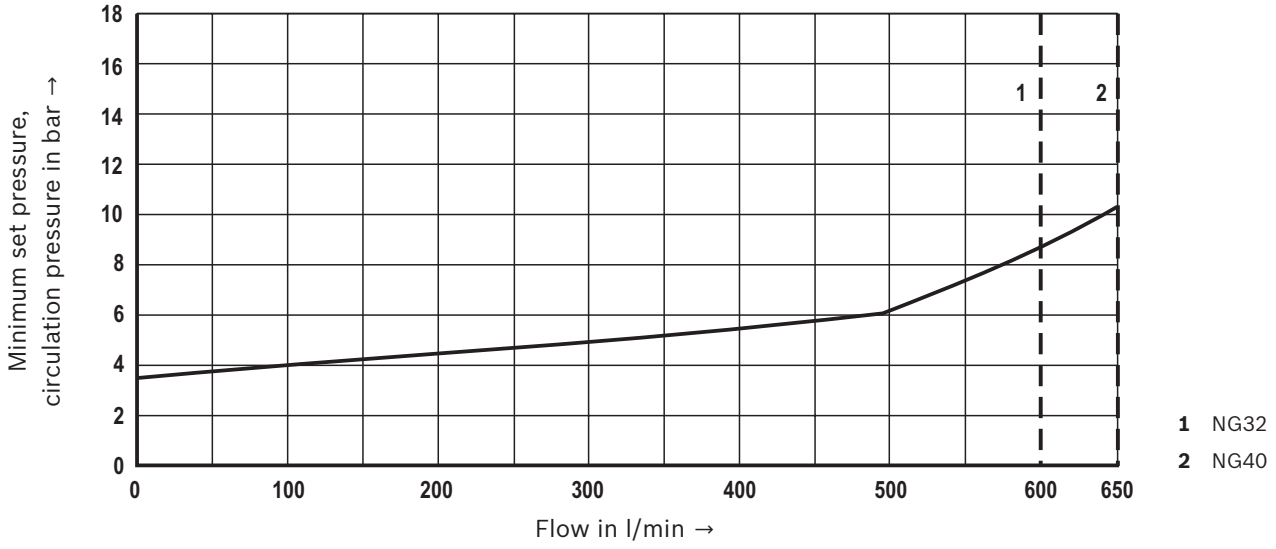
☞ **Important information on hydraulic fluids:**

- For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.
- **Bio-degradable and flame-resistant – containing water:**
  If components with galvanic zinc coating (e.g. version "J3" or "J5") or parts containing zinc are used, small amounts of dissolved zinc may get into the hydraulic system and cause accelerated aging of the hydraulic fluid. Zinc soap may form as a chemical reaction product, which may clog filters, nozzles and solenoid valves - particularly in connection with local heat input.
- **Flame-resistant – containing water:**
  Due to increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP. In order to reduce the cavitation effect, it is recommended - if possible specific to the installation - to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

Characteristic curves

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

Minimum set pressure and circulation pressure dependent on the flow
Standard version



1 NG32
2 NG40

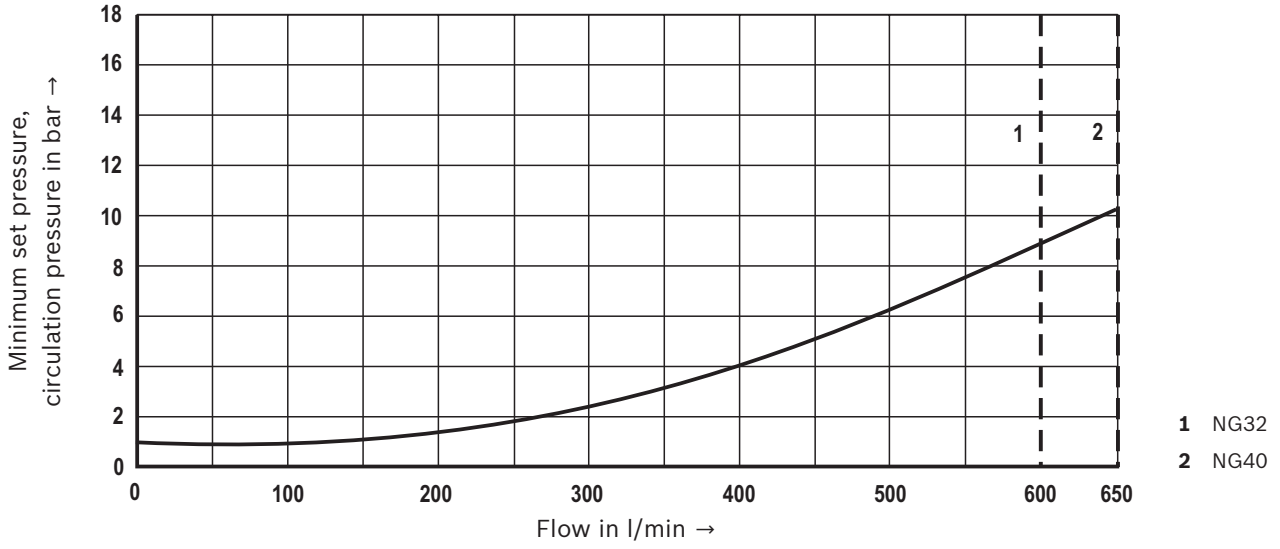
☞ **Notice:**

- The characteristic curves were measured with **external, depressurized pilot oil return**.
  With internal pilot oil return, the inlet pressure increases by the output pressure present in port T.
- The characteristic curves apply to the pressure at the valve output p_T = 0 bar across the entire flow range.

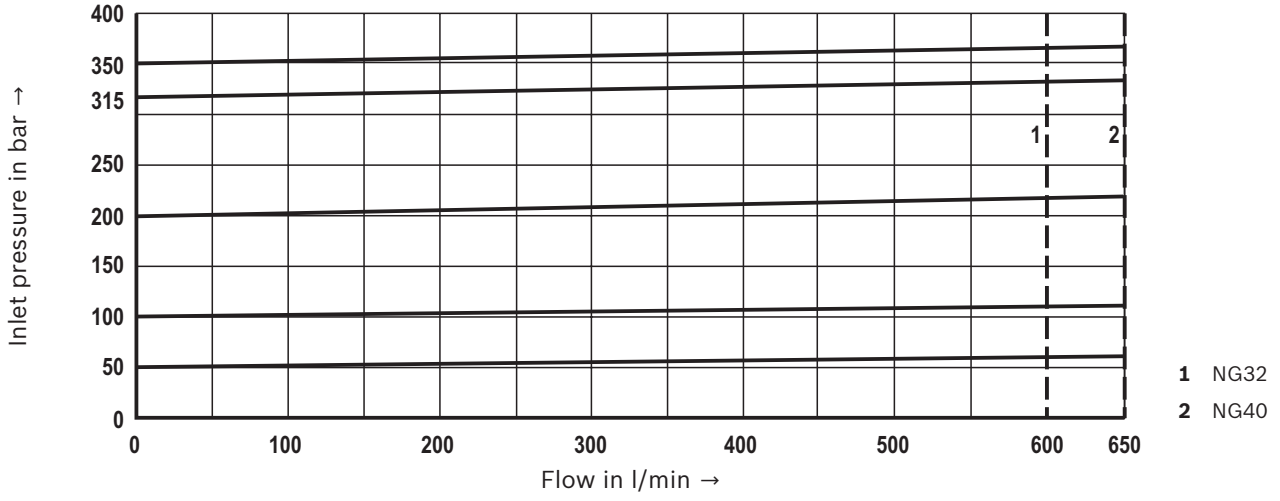
Characteristic curves

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

Minimum set pressure and circulation pressure dependent on the flow
Version "U"



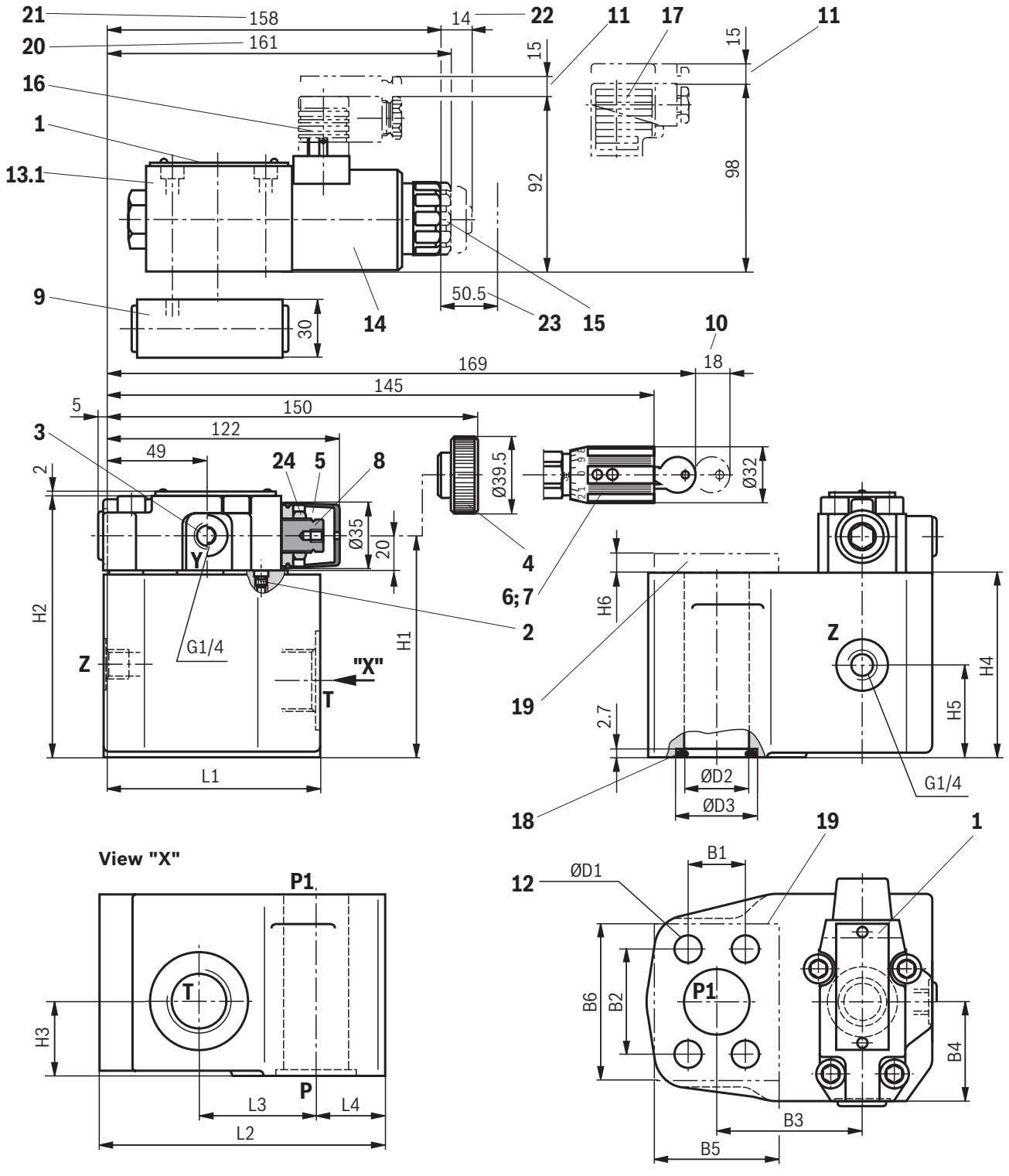
Inlet pressure dependent on the flow

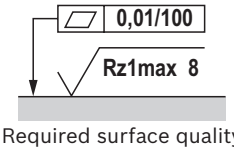


☞ **Notice:**

- The characteristic curves were measured with **external, depressurized pilot oil return**.
  With internal pilot oil return, the inlet pressure increases by the output pressure present in port T.
- The characteristic curves apply to the pressure at the valve output p_T = 0 bar across the entire flow range.

Dimensions: With directional spool valve
(dimensions in mm)

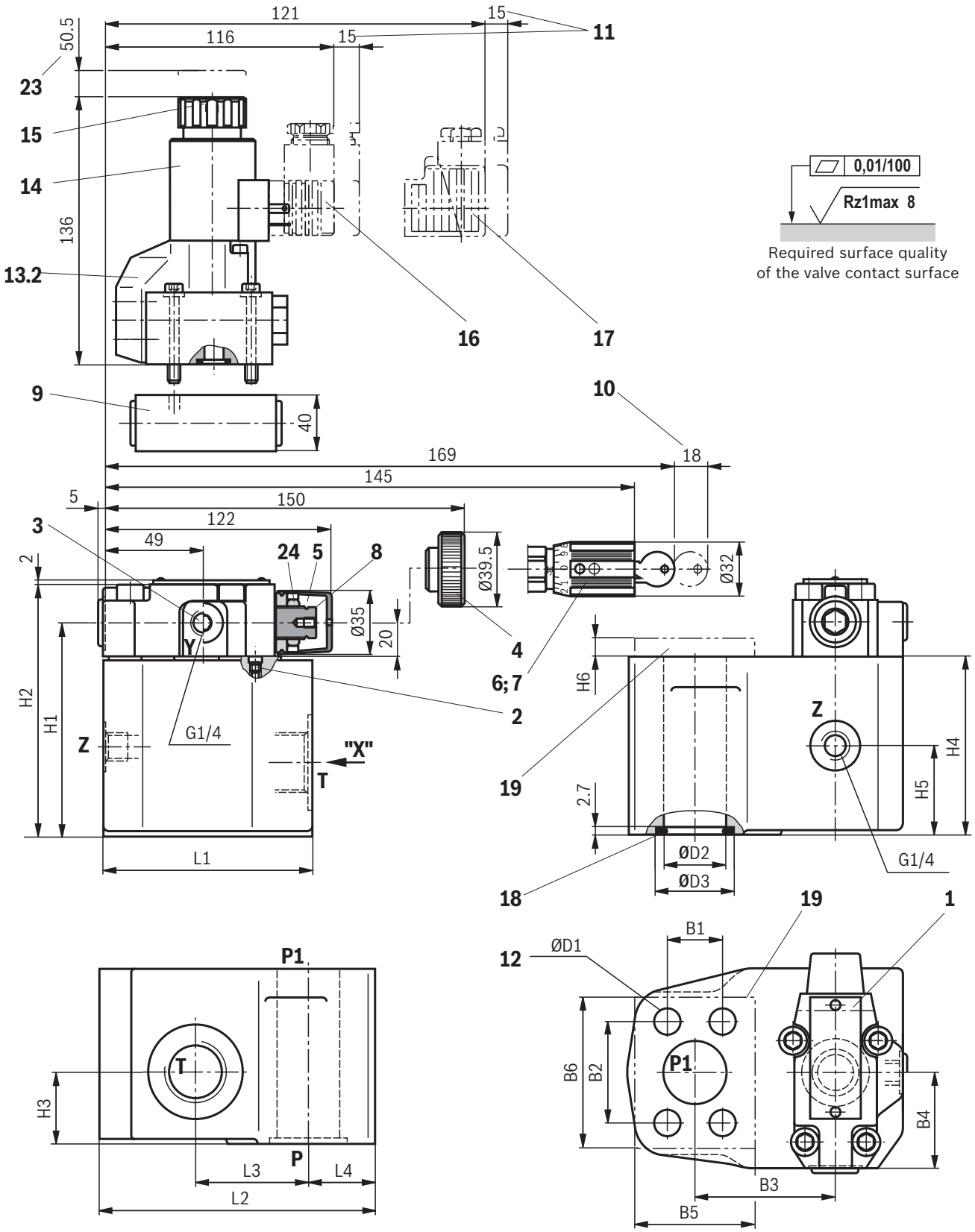




Required surface quality
of the valve contact surface

Item explanations can be found on page 14.
Dimensional tables see page 13.

Dimensions: With directional seat valve
(dimensions in mm)



Required surface quality
of the valve contact surface

Item explanations can be found on page 14.
Dimensional tables see page 13.

Dimensions
(dimensions in mm)

Standard flanges, version "DBA...**F**"

NG	L1	L2	L3	L4	B1	B2	B3	B4	B5 [1]	B6 [1]	H1	H2	H3	H4	H5	H6 [1]	ØD1	ØD2	ØD3
32	121	138	55	38.5	30.2	58.7	65	48.3	60	80	105	125	43	85	43	9	11	32	45
40	138	156	54.5	49.5	35.8	69.9	74.5	54.7	60	100	118	138	50	98	56	8	13	40	54

Standard flanges, version "DBA**R..F**"

NG	L1	L2	L3	L4	B1	B2	B3	B4	B5 [1]	B6 [1]	H1	H2	H3	H4	H5	H6 [1]	ØD1	ØD2	ØD3
32	121	138	55	38.5	30.2	58.7	65	48.3	60	80	105	125	43	85	43	9	11	25	40
40	138	156	54.5	49.5	35.8	69.9	74.5	54.7	60	100	118	138	50	98	56	8	13	30	54

NG	Type	Connections		4 valve mounting screws ISO 4762 - 10.9 [2]		Tightening torque
		P and P1	T		Material no.	M_A in Nm [3]
32	"DBA"	SAE 1 1/4"	G1 1/4	M10 x 120	R913015560	52
	"DBAR"			M10 x 125	R913015561	
40	"DBA"	SAE 1 1/2"	G1 1/2	M12 x 135	R913015592	77
	"DBAR"			M12 x 140	R913015593	

Admissible pressures (flange connections according to ISO 6162-1) in bar	
SAE 1 1/4"	250
SAE 1 1/2"	200

High-pressure flanges, version "DBA...**H**"

NG	L1	L2	L3	L4	B1	B2	B3	B4	B5 [1]	B6 [1]	H1	H2	H3	H4	H5	H6 [1]	ØD1	ØD2	ØD3
32	121	138	55	38.5	31.8	66.7	65	48.3	60	90	105	125	43	85	43	8	15	32	45
40	138	156	54.5	49.5	36.6	79.4	74.5	54.7	65	110	118	138	50	98	56	8	17	40	54

High-pressure flanges, version "DBA**R..H**"

NG	L1	L2	L3	L4	B1	B2	B3	B4	B5 [1]	B6 [1]	H1	H2	H3	H4	H5	H6 [1]	ØD1	ØD2	ØD3
32	121	138	55	38.5	31.8	66.7	65	48.3	60	90	105	125	43	85	43	8	15	25	40
40	138	156	54.5	49.5	36.6	79.4	74.5	54.7	65	110	118	138	50	98	56	8	17	30	54

NG	Type	Connections		4 valve mounting screws ISO 4762 - 10.9 [2]		Tightening torque
		P and P1	T		Material no.	M_A in Nm [3]
32	"DBA"	SAE 1 1/4"	G1 1/4	M14 x 135	R913024230	113
	"DBAR"			M14 x 145	R913024233	
40	"DBA"	SAE 1 1/2"	G1 1/2	M16 x 155	R913024234	184
	"DBAR"			M16 x 160	R913015647	

Admissible pressures (flange connections according to ISO 6162-2) in bar	
SAE 1 1/4"	350
SAE 1 1/2"	350

[1] Only for version with check valve "R"

[2] **For reasons of stability, exclusively the following valve mounting screws may be used** (separate order):
4 hexagon socket head cap screws ISO 4762 - 10.9
(with friction coefficient μ_{total} = 0.09 ... 0.14)

[3] The specified tightening torques stated are guidelines when using screws with the specified friction coefficients and when using a manual torque wrench
(tolerance ±10%).

Dimensions

1 Name plate
2 Omitted with internal pilot oil return
3 Port Y for external pilot oil return
4 Adjustment type "1"
5 Adjustment type "2"
6 Adjustment type "3"
7 Adjustment type "7"
8 Hexagon wrench size 10
9 Switching shock damping sandwich plate, optional
10 Space required to remove the key
11 Space required to remove the mating connector
12 Valve mounting bore
13.1 Directional spool valve NG6 (data sheet 23178)
13.2 Directional seat valve NG6 (data sheet 22058)
14 Solenoid "a"
15 Manual override, optional
16 Mating connector without circuitry, separate order, see page 19
17 Mating connector with circuitry, separate order, see page 19
18 Seal ring
19 Integrated check valve, version "R"
20 Dimension for valve without manual override
21 Dimension for valve with concealed manual override "N9"
22 Dimension for valve with manual override "N"
23 Space required to remove the coil
24 Lock nut, wrench size 17, tightening torque $\boldsymbol{M}_A = 10^{+5}$ Nm

Possible pumps (selection)

Pump	Type	Component series/series	Data sheet
Internal gear pump	PGH	3X	10227
	PGH	2X	10223
Displacement pump	A2FO	Series 6	91401
Industrial-type variable displacement pump	A4VSO	Series 3	92050
	A4VG	Series 3	92003
Variable displacement pump	A7VO	Series 63	92203
	A7VO	Series 63	92202
	A10VSO	Series 31	92711
	A10VSO	Series 32	92714

☞ **Notice:**
Ensure that the connection dimensions are appropriate when selecting the pump, see page 11 ... 13.

Ordering code: Type-examination tested safety valves type DBA...E, component series 1X according to Pressure Equipment Directive 2014/68/EU

NG	Type designation	Component marking	Maximum flow q_{Vmax} in l/min with pilot oil return		Pre-set response overpressure p in bar
			external "Y"	internal "–"	
32	DBA 30 2 3 [ ][ ] N1X/ 4 5 6 [ ][ ][ ] E	TÜV.SV.[ ]–1150.22.F.G.p	200	175	30 ... 60
	DBAR 30 2 3 [ ][ ] N1X/ 4 5 6 [ ][ ][ ] E [1)]		400	260	61 ... 110
	DBAW 30 1 2 3 [ ][ ][ ] N1X/ 4 5 6 [ ][ ] 6 * [ ] E		600	360	111 ... 210
	DBAWR 30 1 2 3 [ ][ ][ ] N1X/ 4 5 6 [ ][ ] 6 * [ ] E [1)]		700	520	211 ... 350
40	DBA 40 2 3 [ ][ ] N1X/ 4 5 6 [ ][ ][ ] E	TÜV.SV.[ ]–1150.22.F.G.p	350	300	30 ... 60
	DBAR 40 2 3 [ ][ ] N1X/ 4 5 6 [ ][ ][ ] E [1)]		450	350	61 ... 110
	DBAW 40 1 2 3 [ ][ ][ ] N1X/ 4 5 6 [ ][ ] 6 * [ ] E		550	500	111 ... 210
	DBAWR 40 1 2 3 [ ][ ][ ] N1X/ 4 5 6 [ ][ ] 6 * [ ] E [1)]		700	600	211 ... 350

1	Directional valve, normally closed	**A**
	Directional valve, normally open	**B**

2	Standard flange	**F**
	High-pressure flange	**H**

Adjustment type

3	Hand wheel (pressure adjustment sealed, unloading or setting of a lower response pressure possible.)	**1**
	With sealed protective cap (no adjustment/unloading possible)	**2**

4	Pressure in the designation is to be entered by the customer, pressure adjustment ≥30 bar and possible in 5-bar steps.	**e. g. 150**

Pilot oil flow

5	Internal	**–** [2)]
	Recommendation: Internal pilot oil supply, external pilot oil return (ordering code according to symbols page 4)	**Y**

*	Ordering code of the electric data (see page 3)	**e.g. EG24N9K4**

6	NBR seals	**no code**
	FKM seals	**V**

[ ]	Information is entered at the factory	

1) Only version "315"

2) Hyphen "–" required only if 02 = **"W"** and 12 and 13 = **"no code"** (see pages 2 and 3)

Deviating technical data: Type-examination tested safety valve type DBA...E

Hydraulic			
Maximum counter pressures	– Port Y	bar	0
	– Port T	bar	10
Maximum flow			see table page 15 and characteristic curves page 17 and 18
Hydraulic fluid			Mineral oil (HL, HLP) according to DIN 51524
Hydraulic fluid temperature range		°C	–10 ... +60
Viscosity range		mm^2/s	12 ... 230

Safety instructions: Type-examination tested safety valve type DBA...E [1)]

- Before ordering a type-examination tested safety valve, it must be ensured that at the desired **response pressure *p***, the maximum admissible **flow $q_{V\,max}$** (= numerical value at the position of letter "G" in the component marking) of the safety valve is higher than the maximum possible flow of the system/accumulator to be secured.
  In this respect, the applicable regulations must be observed.
- According to the Pressure Equipment Directive **2014/68/EU,** the increase in the system pressure due to the flow must not exceed 10% of the set response pressure (see component marking page 15).
- The maximum flow $q_{V\,max}$ stated in the component marking must not be exceeded.
- Discharge lines of safety valves must end in a risk-free manner. The accumulation of fluids in the discharge lines must **not** be possible (see AD2000 - data sheet A2).

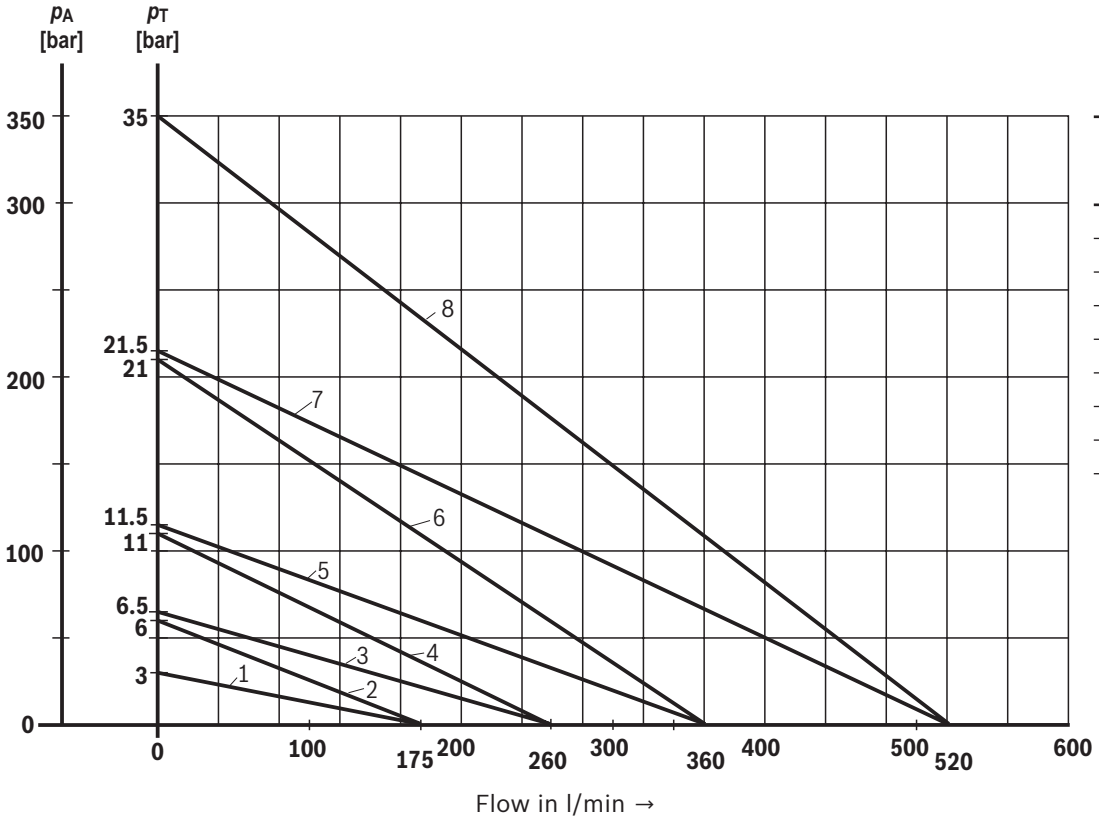
☞ **Always observe application notes!**

- In the plant, the response pressure specified in the component marking is set with a flow of 2 l/min.
- The maximum flow specified in the component marking applies to:
  - External pilot oil return **"Y"** without counter pressure in the pilot oil return line, admissible counter pressure in the discharge line (port T) < 15 bar
  - Internal pilot oil return **"–"** without counter pressure in the discharge line (port T)
    With internal pilot oil return, the system pressure increases by the counter pressure in the discharge line (port T) with increasing flow (observe AD2000 - data sheet A2 - item 6.3).
    To ensure that this increase in system pressure caused by the volume flow does not exceed the value of 10% of the set response pressure, the admissible volume flow has to be reduced dependent on the counter pressure in the discharge line (port T), see characteristic curves pages17 and 18).
- By removing a lead seal at the safety valve, the approval according to the Pressure Equipment Directive becomes void.
- The requirements of the Pressure Equipment Directives and of data sheet AD2000 A2 must be observed.

[1)] Component series 1X, according to the Pressure Equipment Directive 2014/68/EU

Characteristic curves: Counter pressure in the discharge line – size 30

Diagram for determining the maximum counter pressure p_T in the discharge line at port T of the valve dependent on the flow q_{Vmax} for valves DBA...E with different response pressures p_A.

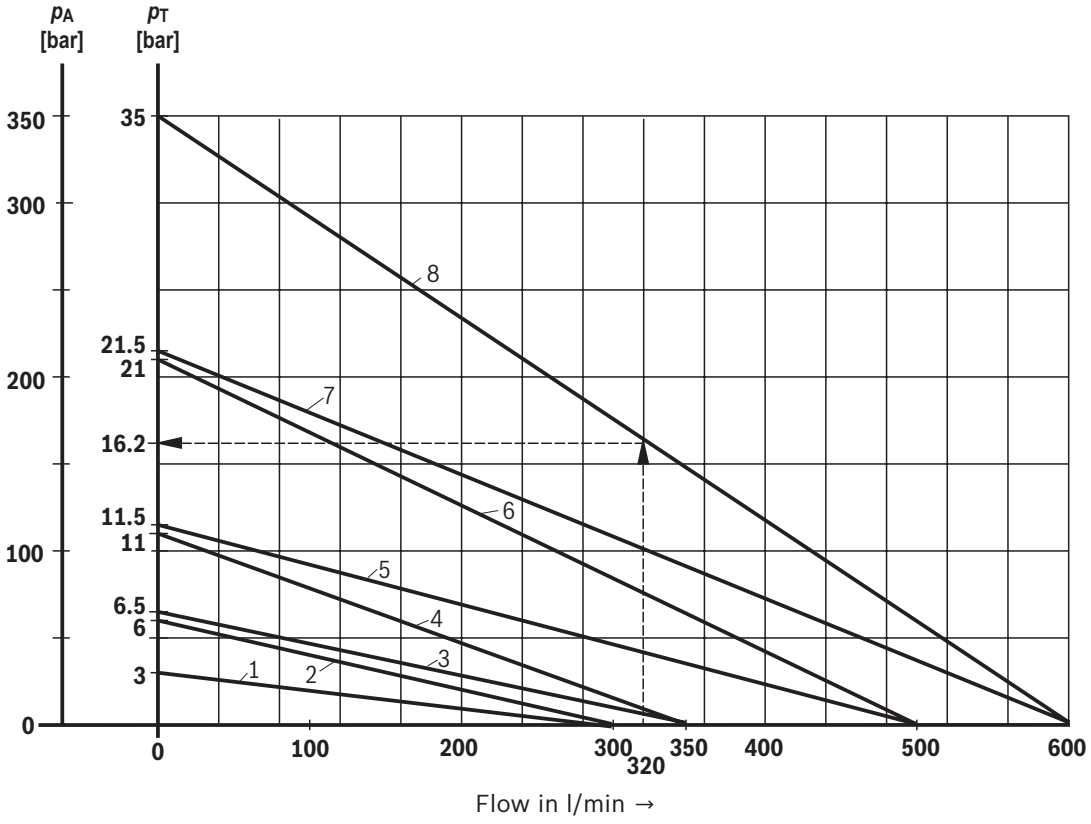


Characteristic curves	Response pressure p_A in bar
1	30
2	60
3	65
4	110
5	115
6	210
7	215
8	350

Characteristic curves for intermediate values can be generated by interpolation. Further explanations see page 18

Characteristic curves: Counter pressure in the discharge line – size 40

Diagram for determining the maximum counter pressure p_T in the discharge line at port T of the valve dependent on the flow q_{Vmax} for valves DBA...E with different response pressures p_A.



Characteristic curves	Response pressure p_A in bar
1	30
2	60
3	65
4	110
5	115
6	210
7	215
8	350

Characteristic curves for intermediate values can be generated by interpolation. Further explanations see below

p_A Response pressure in bar

p_T Maximum counter pressure in the discharge line (port T) in bar (sum of all possible counter pressures; also see AD2000 - data sheet - A2)

q_{Vmax} Maximum flow in l/min

p_{Tmax} 10% x p_A (at q_V = 0) according to PED 2014/68/EU

Determination of the maximum counter pressure

Flow of the system / accumulator to be secured: q_{Vmax} = 320 l/min
Safety valve set to: p_A = 350 bar
Read off the maximum counter pressure p_T of approx. 16.2 bar from the diagram (see arrows, characteristic curve 8).

Mating connectors according to DIN EN 175301-803

Mating connectors and cable sets

Item [1]	Designation	Type	Short designation	Material number	Data sheet
16, 17	Mating connector; for valves with "K4" connector, 2-pole + PE, design A	Without circuitry, M16 x 1.5, 12 ... 240 V, "a"	Z4	**R901017010**	08006
		Without circuitry, M16 x 1.5, 12 ... 240 V, "b"		**R901017011**	
		With indicator light, M16 x 1.5, 12 ... 240 V	Z5L	**R901017022**	
		With rectifier, M16 x 1.5, 80 ... 240 V	RZ5	**R901017025**	
		With indicator light and Z-diode-suppressor, M16 x 1.5, 24 V	Z5L1	**R901017026**	

[1] See dimensions on page 11 and 13.

General information

- The unloading function (directional valve function with version "W") must not be used for safety functions!
- With version **"B"**, the lowest adjustable pressure (circulation pressure) is set in case of power failure or cable break. With version **"A"**, the pressure limiting function is set in case of power failure or cable break.
- Hydraulic counter pressures in port T with internal pilot oil return and/or port Y with external pilot oil return add 1:1 to the response pressure of the valve set at the pilot control.

Example:
Pressure adjustment of the valve by spring preload (item 9 on page 5) in the pilot control valve/adjustment type $\boldsymbol{p}_{spring}$ **= 200 bar**

Hydraulic counter pressure in port T with internal pilot oil return $\boldsymbol{p}_{hydraulic}$ **= 50 bar**

=> Response pressure = $\boldsymbol{p}_{spring}$ **+** $\boldsymbol{p}_{hydraulic}$ **= 250 bar**

Further information

▶ Directional spool valve	Data sheet 23178
▶ Hydraulic fluids on mineral oil basis	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)	Data sheet 90223
▶ Mating connectors and cable sets for valves and sensors	Data sheet 08006
▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ Selection of filters	www.boschrexroth.com/filter
▶ Information on available spare parts	www.boschrexroth.com/spc

Notes

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