

Proportional flow control valves type SE, SEH

Product documentation



Operating pressure p_{\max} :

315 bar

Flow rate Q_{\max} :

120 l/min



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Overview of proportional flow control valves type SE, SEH

Proportional flow control valves are a type of flow valve. They generate a constant flow rate independent of the load which can be controlled in an electro-proportional and remote way.

The flow control valve type SE has a directly actuated metering orifice, which is advantageous for control operations when Q_{\min} is almost zero. The flow control valve type SEH has a pilot-controlled metering orifice which is shown to be beneficial in dynamic systems with short reaction times. The flow control valve type SE and SEH is available as a single valve for pipe connection or as a manifold mounting valve.

Pressure-limiting valves and randomly switchable idle circulation valves are additional options. The flow control valve type SE and SEH controls the operating speed of hydraulic consumers.

Features and advantages

- Electric control of consumer working speeds
- Automation of operating cycles
- Optionally also available with additional valves (bypass check valve, pressure-limiting valve, idle circulation valve)

Intended applications

- Construction machines
- Machine tools
- General hydraulic systems
- Mining machinery

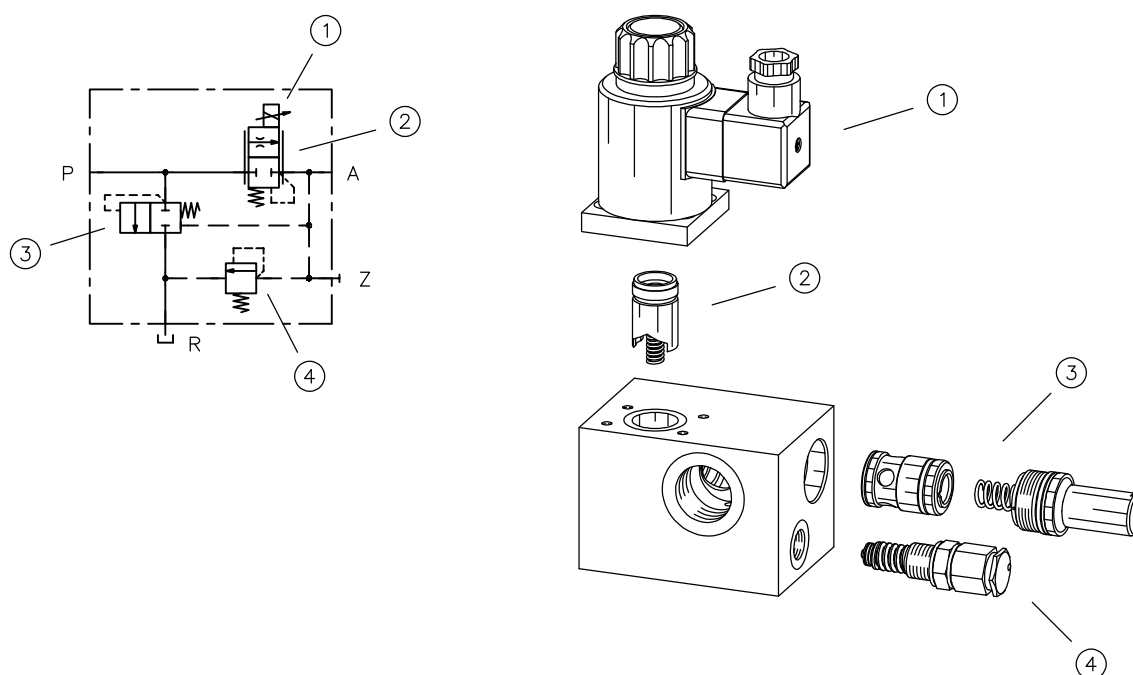


Proportional flow control valve type SEH

1.1.1 Overview of directly actuated flow control valve type SE

see Chapter 2.1, "Directly actuated flow control valve type SE"

Configuration example: SE 3-4/70 S-G 24

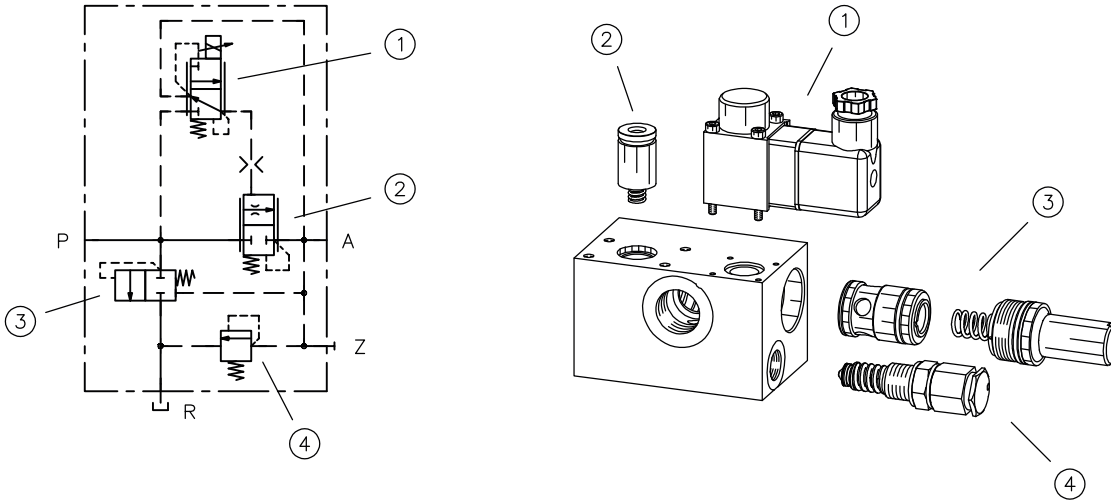


- 1 Proportional solenoid for directly actuating the metering orifice: Advantageous for controlling flow rates of close to 0, [see Chapter 2.1.5, "Solenoid voltage and connector"](#)
- 2 Metering orifice: directly actuated, responsible for the consumer flow in port A; generates a slight pressure drop (measuring pressure) that is required for the control function of the pressure compensator, [see Chapter 2.1.3, "Flow rate range"](#)
- 3 Pressure compensator: consists of a piston and a sleeve with bores; opens at 8 bar to reduce pressure at port P, [see Chapter 3.4, "Characteristic lines"](#)
- 4 Optional pressure-limiting valve as an additional valve to restrict the consumer pressure.
other additional valves [see Chapter 2.1.4, "Model and additional functions"](#)

1.1.2 Overview of pilot-controlled flow control valve type SEH

see Chapter 2.2, "Pilot-controlled flow control valve type SEH"

Configuration example: **SEH 3-3/50F S-G 24**



- 1 Proportional pilot valve type PM according to D 7625 (with solenoid for pressure setting): reduces the pressure at P in proportion to the electrical current signal at the solenoid see Chapter 2.2.5, "Solenoid voltage and connector "
- 2 Pilot-controlled control orifice (metering orifice): responsible for the consumer flow in port A; its flow cross section is adjusted by the proportional solenoid and it generates a slight pressure drop (measuring pressure) that is required for the control function of the pressure compensator, see Chapter 2.2.3, "Flow rate range"
- 3 Pressure compensator: consists of a piston and a sleeve with bores; opens at 8 bar to reduce pressure at port P, see Chapter 3.4, "Characteristic lines"
- 4 Optional pressure-limiting valve as an additional valve to restrict the consumer pressure.
other additional valves see Chapter 2.2.4, "Model and additional functions"

2 Available versions

2.1 Directly actuated flow control valve type SE

Ordering example

SE 2	-3	/15	B	-G 24
				2.1.5 "Solenoid voltage and connector"
				2.1.4 "Model and additional functions"
				2.1.3 "Flow rate range"
				2.1.2 "Size"
				2.1.1 "Basic type"

2.1.1 Basic type

Type	Description	Circuit symbol
SE 2	2-way flow control valve	
SE 3	3-way flow control valve	

2.1.2 Size

Type	Size	Flow rate Q_{max} (l/min)	Pressure p_{max} (bar)		Ports (ISO 228-1) P, R, A	
			Pipe connection	Manifold mounting	Pipe connections	Manifold mounting
SE 2 SE 3	3	60	315	200	G 1/2	*
SE 2 SE 3	4	90	315	200	G 3/4	*

* For the ports for the flow valve for manifold mounting see Chapter 4, "Dimensions"

2.1.3 Flow rate range

Metering orifice, open when de-energised

Type	Coding	Flow rate Q (l/min)
SE 2-3	3	0.1 to 3
SE 3-3	6	0.1 to 6
	15	0.1 to 15
	30	0.2 to 30
	36	0.3 to 36
	50	0.3 to 50
	60	0.3 to 60
SE 2-4	70	0.6 to 70
SE 3-4	90	0.6 to 90

Metering orifice, closed when de-energised

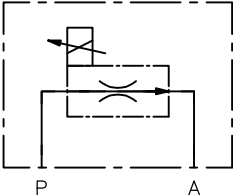
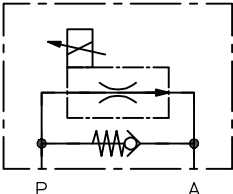
Type	Coding	Flow rate Q (l/min)
SE 2-3	6 F	0.1 to 6
SE 3-3	15 F	0.1 to 15
	30 F	0.2 to 30
	36 F	0.3 to 36
	50 F	0.3 to 50

2.1.4 Model and additional functions

For pipe connection

Type	Coding	Description	Circuit symbol
SE 2-3 SE 3-3 SE 2-4 SE 3-4	without coding	Standard version without additional function Ordering example: SE 2-3/6 F-G 24	
SE 2-3 SE 2-4	R	Version with bypass check valve for free return flow A → P Ordering example: SE 2-3/6 FR-G 24	
SE 2-3	B	Version with check valve bridge rectifier Flow rate control in both flow directions Ordering example: SE 2-3/6 FB-G 24	
SE 3-3 SE 3-4	S	Version with pressure-limiting valve Pressure setting in bar. Adjustment range depending on spring see Chapter 4, "Dimensions" <ul style="list-style-type: none"> 10 to 200 bar 200 to 315 bar Ordering example: SE 3-3/6 FS-G 24-230	
SE 3-3 SE 3-4	S-WN 1 F S-WN 1 D	Version with pressure-limiting valve and idle circulation valve (directional seated valve according to D 7470 A/1) <ul style="list-style-type: none"> WN 1 F: open when de-energised (see circuit symbol) WN 1 D: closed when de-energised <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;"> <p>i INFORMATION Idle circulation valve $p_{min} = 6$ to 10 bar</p> </div> Pressure setting of pressure-limiting valve in bar. Adjustment range depending on spring see Chapter 4, "Dimensions" <ul style="list-style-type: none"> 10 to 200 bar 200 to 315 bar Ordering example: SE 3-3/6 FS-WN 1 F-G 24/WG 110-230 – G 24: voltage for the SE flow control valve – WG 110: voltage for the WN directional seated valve	

For manifold mounting

Type	Coding	Description	Circuit symbol
SE 2-3 SE 3-3 SE 2-4 SE 3-4	P	Standard version without additional function Ordering example: SE 2-3/6 FP-G 24	
SE 2-3 SE 2-4	PR	Version with bypass check valve for free return flow A → P Ordering example: SE 2-3/6 FPR-G 24	

2.1.5 Solenoid voltage and connector

For solenoid voltage of idle circulation valve see [D 7470 A/1](#)

Coding	Electrical connection	Nominal voltage	Protection class (IEC 60529)	Description		
G 12 G 24	EN 175 301-803 A	12 V DC 24 V DC	IP 65	3-pin, connector position on side		
X 12 X 24	<ul style="list-style-type: none"> ▪ G: with male connector (MSD 3-309 acc. to D 7163) ▪ X: without male connector 	12 V DC 24 V DC				
DT 12 DT 24	DEUTSCH (DT 04-2P)	12 V DC 24 V DC			IP 67	2-pin, connector position on side

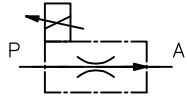
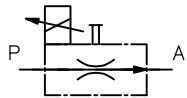
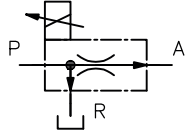
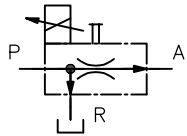
The specifications regarding the IP protection class apply for versions featuring a properly assembled male connector.

2.2 Pilot-controlled flow control valve type SEH

Ordering example

SEH 3	-2	/15F	PS	-G 24	-230
2.2.1 "Basic type"					
2.2.2 "Size"					
2.2.3 "Flow rate range"					
2.2.4 "Model and additional functions"					
2.2.5 "Solenoid voltage and connector "					
Pressure setting for pressure-limiting valve					

2.2.1 Basic type

Type	Description	Circuit symbol
SEH 2 SEHF 2	<p>2-way flow control valve</p> <p>SEHF</p> <ul style="list-style-type: none"> With mechanical minimum-flow limiter in the form of a counter screw see Chapter 4.2.1.1, "Mechanical minimum-flow limiter SEH" Only available for size 3, see Chapter 2.2.2, "Size" 	<p>SEH</p>  <p>SEHF</p> 
SEH 3 SEHF 3 SEHD 3	<p>3-way flow control valve</p> <p>SEHF</p> <ul style="list-style-type: none"> With mechanical minimum-flow limiter in the form of a counter screw see Chapter 4.2.1.1, "Mechanical minimum-flow limiter SEH" Only available for size 3, 4, 5, see Chapter 2.2.2, "Size" <p>SEHD</p> <ul style="list-style-type: none"> With mechanical minimum-flow limiter in the form of a control knob see Chapter 4.2.1.1, "Mechanical minimum-flow limiter SEH" Only available for size 3, 4, 5, see Chapter 2.2.2, "Size" 	<p>SEH</p>  <p>SEHF, SEHD</p> 

2.2.2 Size

Type	Size	Flow rate Q _{max} (l/min)	Pressure p _{max} (bar)		Ports (ISO 228-1) P, R, A	
			Pipe connection	Manifold mounting	Pipe connections	Manifold mounting
SEH 2 SEH 3	2	36	315	315	G 3/8	*
SEH 2 SEHF 2	3	50	315	315	--	*
SEH 3 SEHF 3 SEHD 3					G 1/2	*
SEH 3 SEHF 3 SEHD 3					G 3/4	*
SEH 3 SEHF 3 SEHD 3	5	120	315	315	G 1	--

* For the ports for the flow valve for manifold mounting see Chapter 4.1.2, "For manifold mounting"

2.2.3 Flow rate range

Metering orifice, open when de-energised

Type	Coding	Flow rate Q (l/min)
SEH 2-2	3	0.1 to 3
SEH 3-2	6	0.1 to 6
	10	0.1 to 10
	15	0.2 to 15
	22	0.2 to 22
	30	0.2 to 30

! NOTICE

In the case of 2-way flow control valves type SEH 2-.., a minimum input-side flow rate at port P of approx. 2/3 of the nominal flow is necessary to achieve the internal pressure drop which is required to move the pilot-controlled control orifice (metering orifice) into the control position.

Coding	3	6	10	15	22	30	36	50
Q _{Pu min} (l/min)	2	4	6	10	15	20	24	33

Metering orifice, closed when de-energised

Type	Coding	Flow rate Q (l/min)
SEH 2-2	3 F	0.1 to 3
SEH 3-2	6 F	0.1 to 6
	10 F	0.1 to 10
	15 F	0.2 to 15
	22 F	0.2 to 22
	30 F	0.2 to 30
	36 F	0.3 to 36
SEH 2-3	6 F	0.1 to 6
SEHF 2-3	15 F	0.2 to 15
SEH 3-3	30 F	0.2 to 30
SEHF 3-3	36 F	0.3 to 36
SEHD 3-3	50 F	0.3 to 50
SEH 3-4	70 F	0.6 to 70
SEHF 3-4	90 F	0.6 to 90
SEHD 3-4		
SEH 3-5	120 F	1 to 120
SEHF 3-5		
SEHD 3-5		

Metering orifice, closed when de-energised with compulsory lock-out circuit for the pressure compensator

see Chapter 6.1, "Version with orifice with coding F0"

Type	Coding	Flow rate Q (l/min)
SEH 3-2	3 F0	0.1 to 3
	6 F0	0.1 to 6
	10 F0	0.1 to 10
	15 F0	0.2 to 15
	22 F0	0.2 to 22
	30 F0	0.2 to 30
	36 F0	0.3 to 36

Metering orifice, closed when de-energised with precision control range

see Chapter 3.4, "Characteristic lines"

Type	Coding	Flow rate Q (l/min)
SEH 2-2	3/7 F	0.1 to 7
SEH 3-2	4/18 F	0.1 to 18
	3/26 F	0.1 to 26

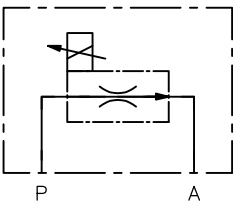
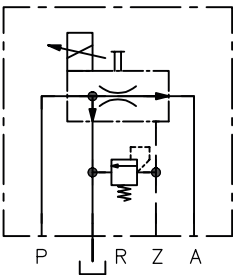
2.2.4 Model and additional functions

For pipe connection

Type	Coding	Description	Circuit symbol
SEH 2-2 SEH 3-2 SEH 3-3 SEHF 3-3 SEHD 3-3 SEH 3-4 SEHF 3-4 SEHD 3-4 SEH 3-5 SEHF 3-5 SEHD 3-5	without coding	Standard version without additional function Ordering example: SEH 3-3/6 F -G 24	
SEH 2-2	P-3/8 B	Version with check valve bridge rectifier. Flow rate control in both flow directions Ordering example: SEH 2-2/6 FP-3/8 B-G 24	
SEH 3-2 SEH 3-3 SEHF 3-3 SEHD 3-3 SEH 3-4 SEHF 3-4 SEHD 3-4 SEH 3-5 SEHF 3-5 SEHD 3-5	S	Version with pressure-limiting valve Pressure setting in bar. Adjustment range depending on spring see Chapter 4, "Dimensions" <ul style="list-style-type: none"> ▪ 10 to 200 bar ▪ 200 to 315 bar Ordering example: SE 2-3/6 FB-G 24 Also available in combination with an additional proportional pressure-limiting valve type PMV, PMVP according to D 7485/1 see Chapter 6.4, "Version with additional proportional pressure-limiting valve"	
SEH 3-4 SEHF 3-4 SEHD 3-4 SEH 3-5 SEHF 3-5 SEHD 3-5	ST	Version with pressure-limiting valve, where the outflow oil from the pressure-limiting valve is discharged via a drain port T that must be connected separately. see Chapter 6.3, "Version with a pressure-limiting valve with coding ST" Pressure setting is independent of the current pressure at port R Pressure setting in bar. Adjustment range depending on spring see Chapter 4, "Dimensions" <ul style="list-style-type: none"> ▪ 10 to 200 bar ▪ 200 to 315 bar Ordering example: SEH 3-4/70 FST-G 24-230	

Type	Coding	Description	Circuit symbol
SEH 3-2 SEH 3-3 SEHF 3-3 SEHD 3-3 SEH 3-4 SEHF 3-4 SEHD 3-4 SEH 3-5 SEHF 3-5 SEHD 3-5	S-WN 1 F S-WN 1 D	<p>Version with pressure-limiting valve and idle circulation valve (directional seated valve according to D 7470 A/1)</p> <ul style="list-style-type: none"> WN 1 F: open when de-energised (see circuit symbol) WN 1 D: closed when de-energised <p>i INFORMATION Idle circulation valve $p_{min} = 6$ to 10 bar</p> <p>Pressure setting in bar. Adjustment range depending on spring see Chapter 4, "Dimensions"</p> <ul style="list-style-type: none"> 10 to 200 bar 200 to 315 bar <p>Ordering example: SE 3-3/6 FS-WN 1 F-G 24/WG 110-230</p> <ul style="list-style-type: none"> G 24: voltage for the SE flow control valve WG 110: voltage for the WN directional seated valve 	
SEH 3-4 SEHF 3-4 SEHD 3-4 SEH 3-5 SEHF 3-5 SEHD 3-5	B 0.6 S-B 0.6 ST-B 0.6 S-WN 1 F-B 0.6 S-WN 1 D-B 0.6	<p>Version with bypass orifice of $\varnothing 0.6$ between A and R for quickly reducing the pressure in the pressure compensator when the metering orifice is closed (proportional solenoid de-energised) see Chapter 6.2, "Version with bypass orifice with coding B 0.6"</p> <p>i INFORMATION Idle circulation valve $p_{min} = 6$ to 10 bar</p> <p>Ordering example: SEH 3-4/70 FB 0.6-G 24</p> <p>Also available in combination with just a pressure-limiting valve or a pressure-limiting valve and idle circulation valve.</p> <p>For the version with a pressure-limiting valve: Pressure setting in bar. Adjustment range depending on spring see Chapter 4, "Dimensions"</p> <ul style="list-style-type: none"> 10 to 200 bar 200 to 315 bar <p>Ordering example: SEH 3-4/70 FST-B 0.6-G 24-230</p>	

For manifold mounting

Type	Coding	Description	Circuit symbol
SEH 2-2 SEH 2-3 SEHF 2-3 SEH 3-2 SEH 3-3 SEHF 3-3 SEHD 3-3 SEH 3-4 SEHF 3-4 SEHD 3-4	P	Standard version without additional function Ordering example: SEH 2-3/6 FP-G 24	
SEH 3-3 SEHF 3-3 SEHD 3-3 SEH 3-4 SEHF 3-4 SEHD 3-4	PS	Version with pressure-limiting valve Pressure setting in bar. Adjustment range depending on spring see Chapter 4, "Dimensions" <ul style="list-style-type: none"> ▪ 10 to 200 bar ▪ 200 to 315 bar Ordering example: SE 2-3/6 FR-G 24 Also available in combination with an additional proportional pressure-limiting valve type PMV, PMVP according to D 7485/1 see Chapter 6.4, "Version with additional proportional pressure-limiting valve"	

2.2.5 Solenoid voltage and connector

For solenoid voltage of idle circulation valve see [D 7470 A/1](#)

Coding	Electrical connection	Nominal voltage	Protection class (IEC 60529)	Description
G 12 G 24	EN 175 301-803 B	12 V DC 24 V DC	IP 65	2-pin, connector position on side
X 12 X 24	<ul style="list-style-type: none"> ▪ G: with male connector (MSD 6-209 acc. to D 7163) ▪ X: without male connector 	12 V DC 24 V DC		
G 12 DIN X 12 DIN G 24 DIN X 24 DIN	EN 175 301-803 A	12 V DC 12 V DC 24 V DC 24 V DC		
	<ul style="list-style-type: none"> ▪ G: with male connector (MSD 3-309 acc. to D 7163) ▪ X: without male connector 			
DT 12 DT 24	DEUTSCH (DT 04-2P)	12 V DC 24 V DC	IP 65	2-pin, connector position on side
S 12 S 24	Bayonet PA 6 Schlemmer	12 V DC 24 V DC	IP 67	3-pin, connector position at top
AMP 12 AMP 24	AMP Junior Power Timer	12 V DC 24 V DC	IP 65	2-pin, connector position at top

The specifications regarding the IP protection class apply for versions featuring a properly assembled male connector.

3 Parameters

3.1 General data

Designation	Proportional flow control valve
Design	Flow control valve
Model	<ul style="list-style-type: none"> ▪ Single valve for pipe connection ▪ Manifold mounting valve
Material	<p>SE, SEH: valve block made of steel, nitrided or galvanised surface SE: solenoid surface electro-galvanised SEH: pilot valve block made of steel, nitrided surface</p>
Attachment	Mounting thread or tapped holes, see Chapter 4, "Dimensions"
Installation position	any
Ports/connections	<ul style="list-style-type: none"> ▪ P = Pump ▪ R = Reflux ▪ A = Consumer outlet ▪ Z = Control port ▪ T = Tank connection: only for the version with a pressure-limiting valve with coding ST, see Chapter 6.3 <p>Connecting thread: SE: see Chapter 2.1.2, "Size" SEH: see Chapter 2.2.2, "Size"</p>
Flow direction	<p>Operating direction:</p> <ul style="list-style-type: none"> ▪ P → A / P → R ▪ A → B or B → A for the version with a bridge rectifier <p>Free return flow A → P only with bypass check valve</p>
Hydraulic fluid	<p>Hydraulic fluid, according to DIN 51 524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 4 - 1500 mm²/s Optimal operating range: approx. 10 - 500 mm²/s Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.</p>
Cleanliness level	<p>ISO 4406</p> <hr style="width: 20%; margin-left: 0;"/> <p>20/17/14</p>
Temperatures	<p>Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -50 °C is permissible (take account of the start viscosities!), as long as the steady-state temperature is at least 20 K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.</p>

3.2 Pressure and volumetric flow

Operating pressure

Ports P, A, Z, R: $p_{\max} = 315$ bar
 Port T: $p_{\max} = 20$ bar

! NOTICE

In the case of a 3-way flow control valve, the permissible counter-pressure at port R must always be lower than the prevailing consumer pressure at port A (minimum difference: 8 bar).

Flow rate

SE: Q_{\max} see Chapter 2.1.1, "Basic type"
SEH: Q_{\max} see Chapter 2.2.1, "Basic type"

Pressure setting

100 bar if no other value is specified in the order.
 The pressure setting is the operating pressure at which the set flow rate is set see Chapter 3.4, "Characteristic lines"

3.3 Weight

Directly actuated flow control valve type SE

SE	Type	Size	
		3	4
	SE 2-.., SE 3-.. SE 2-..R, SE 3-..S	2.2 kg	2.8 kg
	SE 2-..B	2.4 kg	--
	SE 2-..P SE 2-..PR	2.4 kg	3.1 kg
	SE 3-..S-WN 1 F SE 3-..S-WN 1 D	2.4 kg	3.1 kg

Pilot-controlled flow control valve type SEH

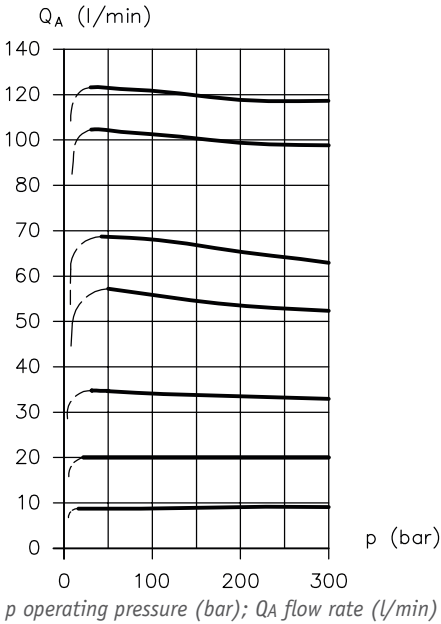
SEH	Type	Size			
		2	3	4	5
	SEH 2-..	1.0 kg	--	--	--
	SEH 3-.. SEHF 3-.. SEHD 3-..	1.0 kg	1.6 kg	2.2 kg	3.3 kg
	SEH 2-2/..-P SEHF 2-2/..-P	1.1 kg	--	--	--
	SEH 2-2/..-P-3/8 B	1.8 kg	--	--	--
	SEH 3-..S, SEH 3-..ST SEHF 3-..S, SEHF 3-..ST SEHD 3-..S, SEHD 3-..ST	1.0 kg	1.6 kg	2.2 kg	3.3 kg
	SEH 3-..S-WN 1 F SEH 3-..S-WN 1 D	--	2.0 kg	2.6 kg	3.7 kg
	SEHF 3-..S-WN 1 F SEHD 3-..S-WN 1 D	--	2.0 kg	2.6 kg	3.7 kg
	SEHD 3-..S-WN 1 F SEHD 3-..S-WN 1 D	--	2.0 kg	2.6 kg	3.7 kg
	SEH 3-..P SEHF 3-..P SEHD 3-..P	1.1 kg	1.9 kg	2.5 kg	--

3.4 Characteristic lines

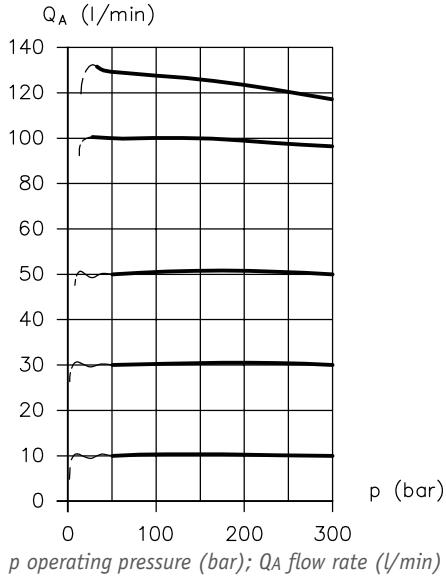
p-Q characteristic lines for 2-way and 3-way flow control valve

Viscosity of the hydraulic fluid approx. 35 mm²/s

2-way flow control valve



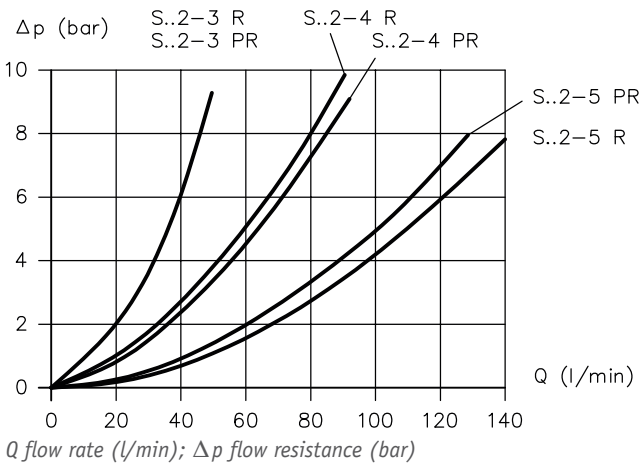
3-way flow control valve



Δp -Q characteristic line for 2-way flow control valve with bypass check valve

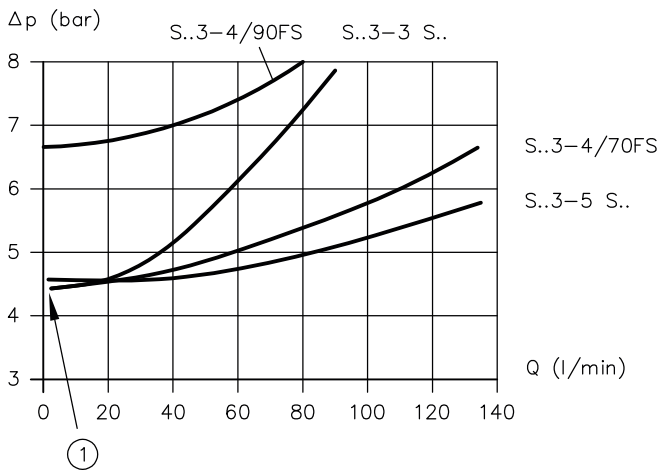
Viscosity of the hydraulic fluid approx. 35 mm²/s

Flow direction A → P



Circulation resistance when load on pressure compensator has been relieved

Viscosity of the hydraulic fluid approx. 35 mm²/s



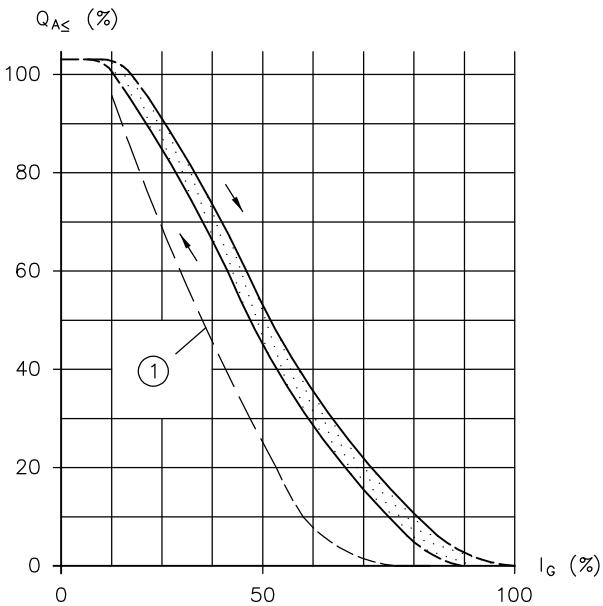
Q flow rate (l/min); Δp flow resistance (bar)

1 Opening pressure

Q-I characteristic line for 2-way and 3-way flow control valve

Viscosity of the hydraulic fluid approx. 50 mm²/s

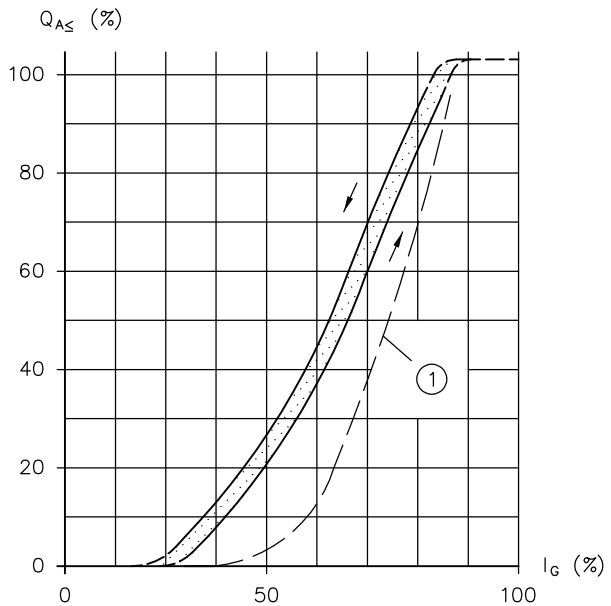
Version with open metering orifice



I_G control current (%); Q_A usable consumer flow in % of $Q_{A\ max}$

1 Version with precision control range

Version with closed metering orifice



I_G control current (%); Q_A usable consumer flow in % of $Q_{A\ max}$

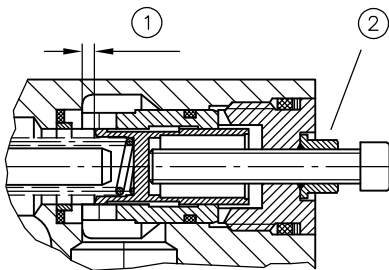
1 Version with precision control range

Precision control range:

The precision control range ends at approx. 0.5 x control current I. The flow rate achieved at that point can be identified from the coding for the metering orifice, see Chapter 2.2.3, "Flow rate range".

Example: SEH 3-2/4/18 F-G 24 (precision control range up to approx. 4 l/min, flow rate $Q_{\max} = 18$ l/min)

Note for the 2-way flow control valve:



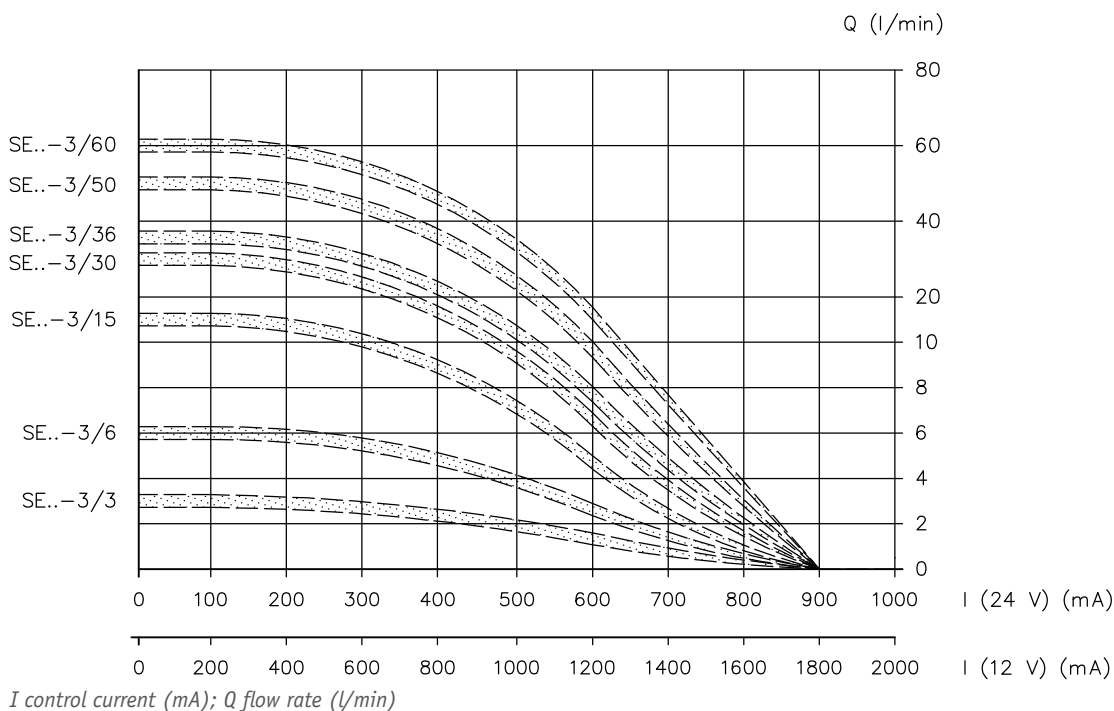
- 1 The initial idle stroke can be shortened using a screw if $Q_{\text{pump}} < Q_{A\ \text{max}}$. This enables the reaction time and the start-up jump to be reduced. The initial idle stroke is set ex works to Q_{max} in line with the coding for the nominal flow rate.
- 2 Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.

Q-I characteristic line for directly actuated flow control valve type SE

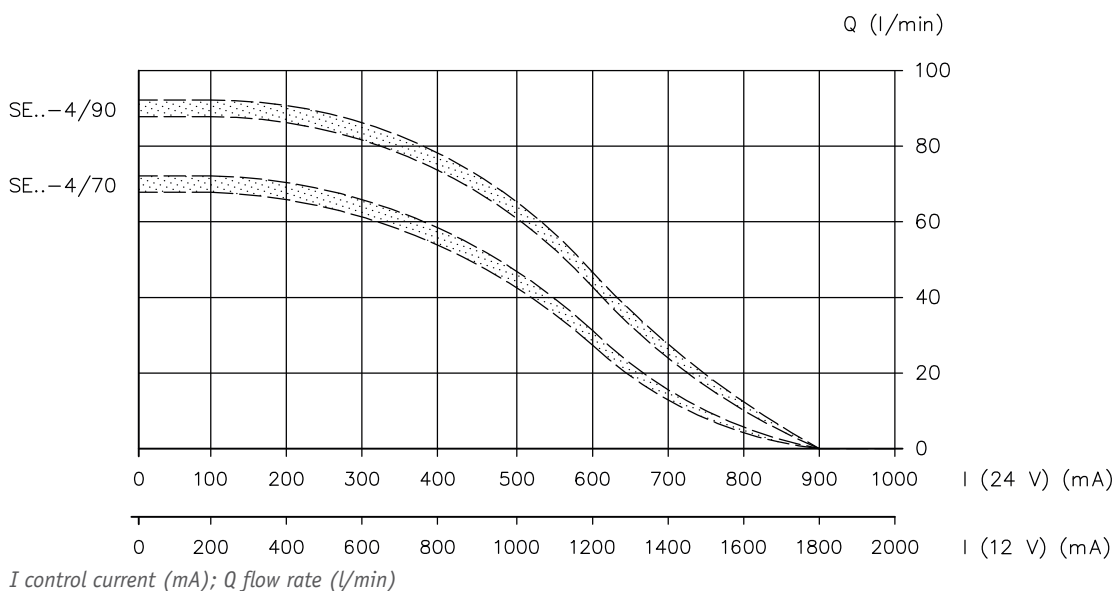
Viscosity of the hydraulic fluid approx. 50 mm²/s

Version with open metering orifice

SE 2-3, SE 3-3

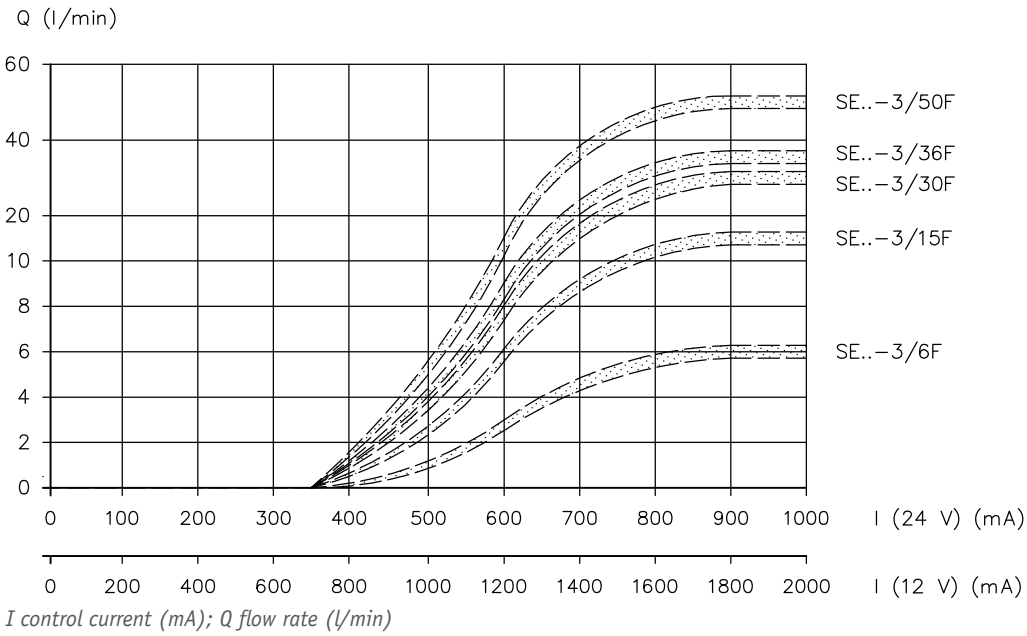


SE 2-4, SE 3-4



Version with closed metering orifice

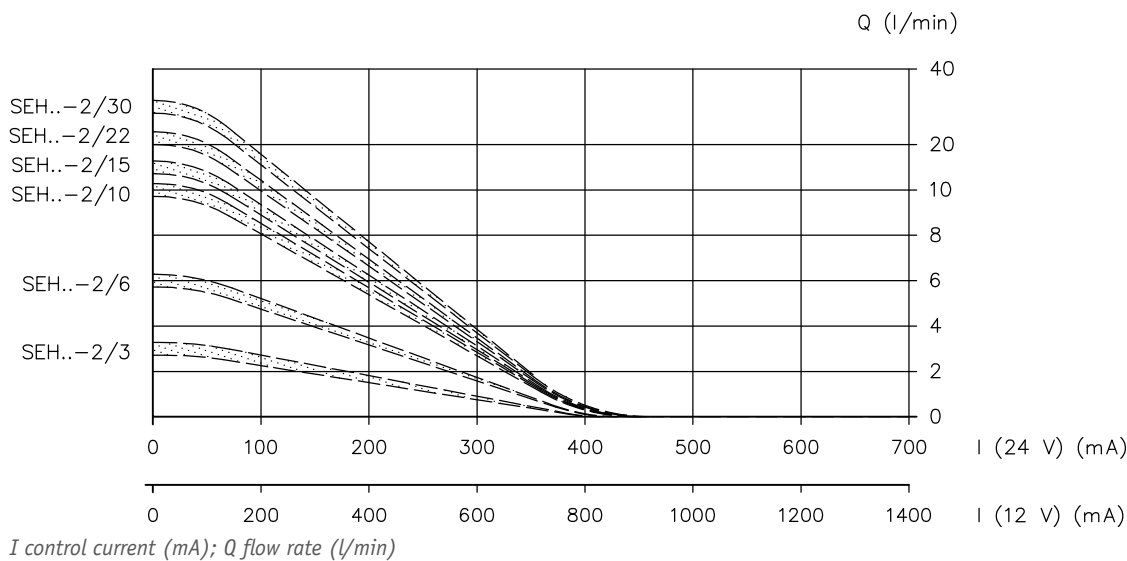
SE 2-3, SE 3-3



Q-I characteristic line for pilot-controlled flow control valve type SEH

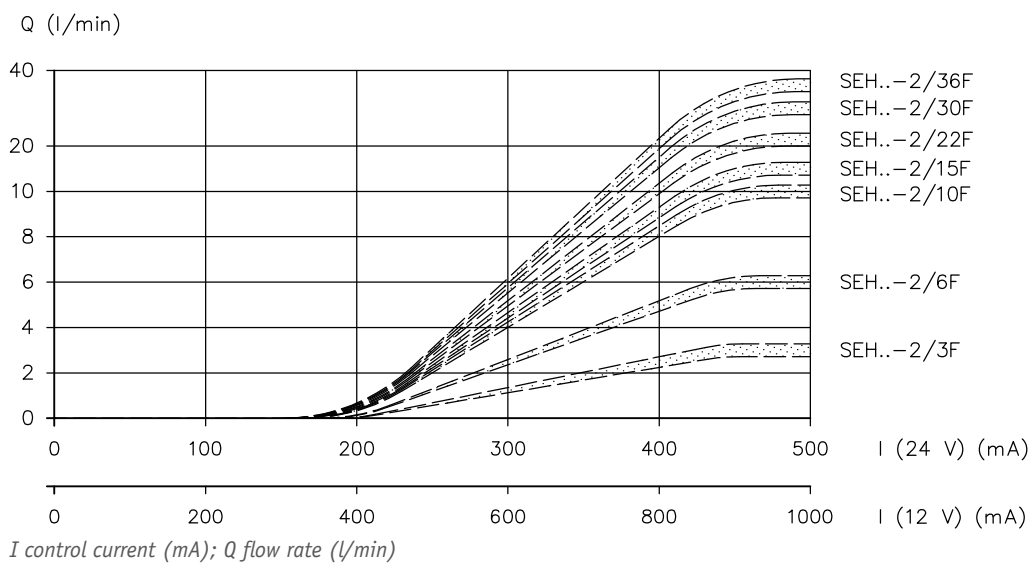
Version with open metering orifice

SEH 2-2, SEH 3-2

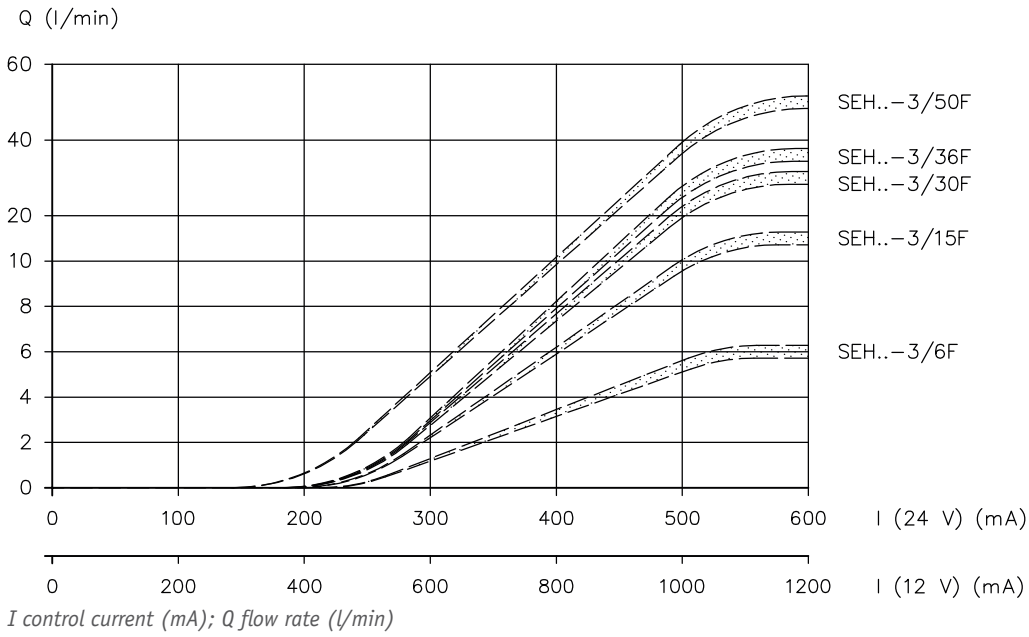


Version with closed metering orifice

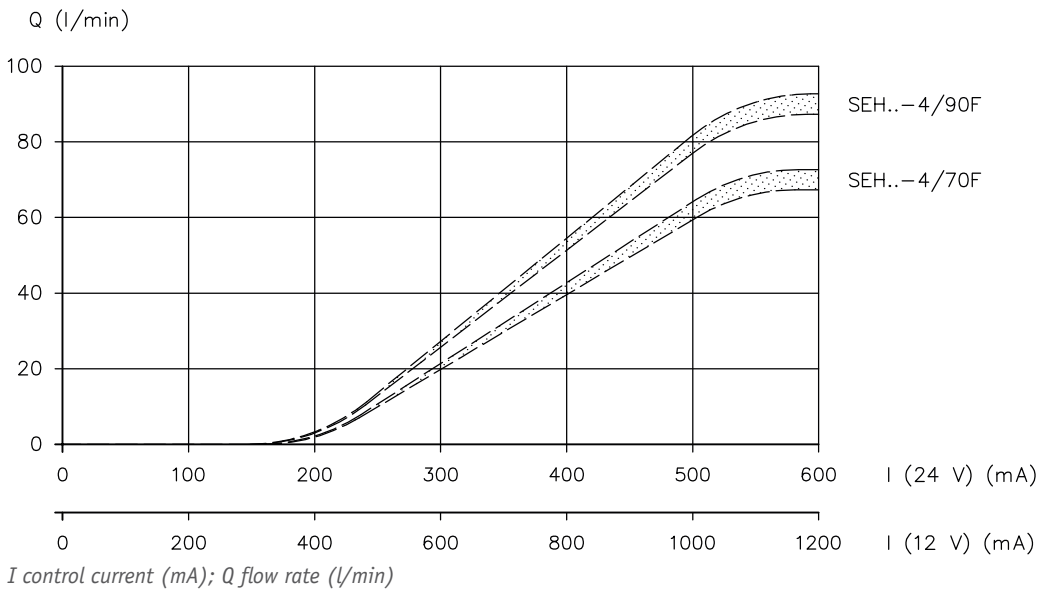
SEH 2-2, SEH 3-2



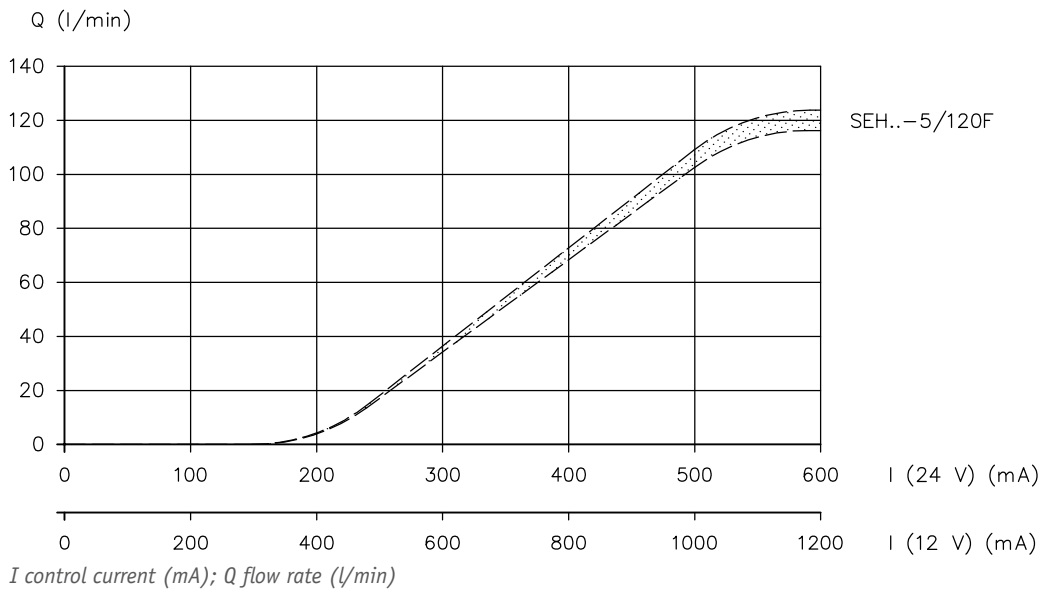
**SEH 2-3, SEHF 2-3
SEH 3-3, SEHF 3-3, SEHD 3-3**



SEH 3-4, SEHF 3-4, SEHD 3-4



SEH 3-5, SEHF 3-5, SEHD 3-5



3.5 Electrical data

Type	SE		SEH	
Nominal voltage U_N	12 V DC	24 V DC	12 V DC	24 V DC
Resistance $R_{20} \pm 5\%$	4.1 Ω	17.6 Ω	6 Ω	24 Ω
Current, cold I_{20}	2.8 A	1.4 A	2 A	1 A
Limit current I_G	21.9 A	0.95 A	1.26 A	0.63 A
Cooling power P_{20}	37 W	37 W	24 W	24 W
Limit power P_G	24.7 W	24.7 W	9.5 W	9.5 W
Relative duty cycle	100%			
Insulation material class	F			
Required dither frequency	60 to 150 Hz			
Dither amplitude $A_D(\%) = \frac{I_{Spitze-Spitze}}{I_G} \times 100$	$20\% \leq A_D \leq 50\%$			

Electrical connection

Type SE

Coding	Specification	Port	Plug
G 12, G 24 X 12, X 24	EN 175 301-803 A 3-pin IP 65 (IEC 60529)		
DT 12, DT 24	DEUTSCH (DT 04-2P) 2-pin IP 67		

Type SEH

Coding	Specification	Port	Plug
G 12, G 24 X 12, X 24	EN 175 301-803 B 2-pin IP 65 (IEC 60529)		
G 12 DIN, G 24 DIN X 12 DIN, X 24 DIN	EN 175 301-803 A 3-pin IP 65 (IEC 60529)		
DT 12, DT 24	DEUTSCH (DT 04-2P) 2-pin IP 67		
S 12, S 24	Bayonet PA 6, Schlemmer 3-pin IP 67		
AMP 12, AMP 24	AMP Junior Power Timer 2-pin IP 65		

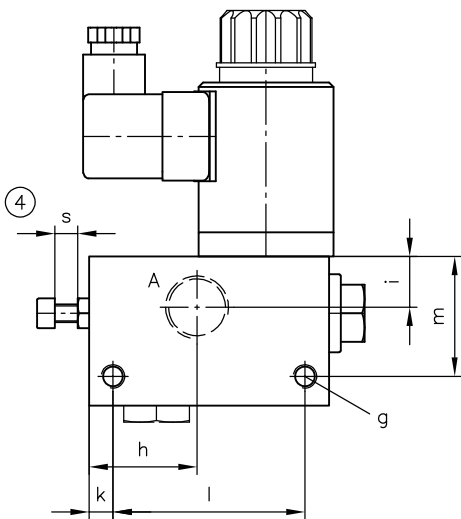
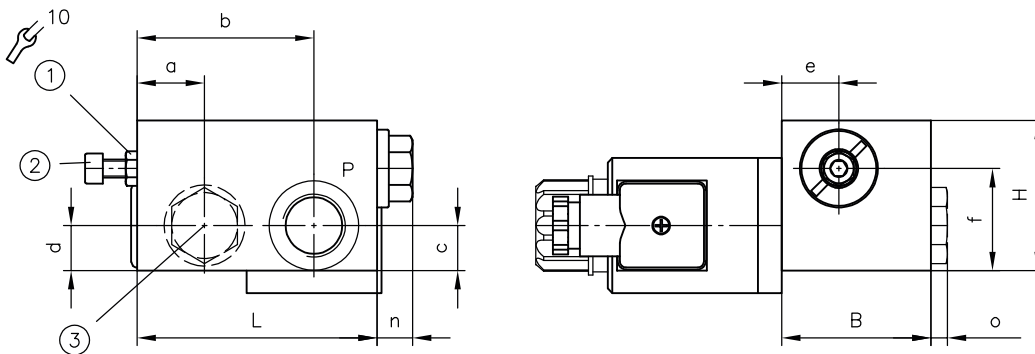
4 Dimensions

All dimensions in mm, subject to change.

4.1 Directly actuated flow control valve type SE

4.1.1 For pipe installation

SE 2-3/.., SE 2-4/..
SE 2-3/..R, SE 2-4/..R

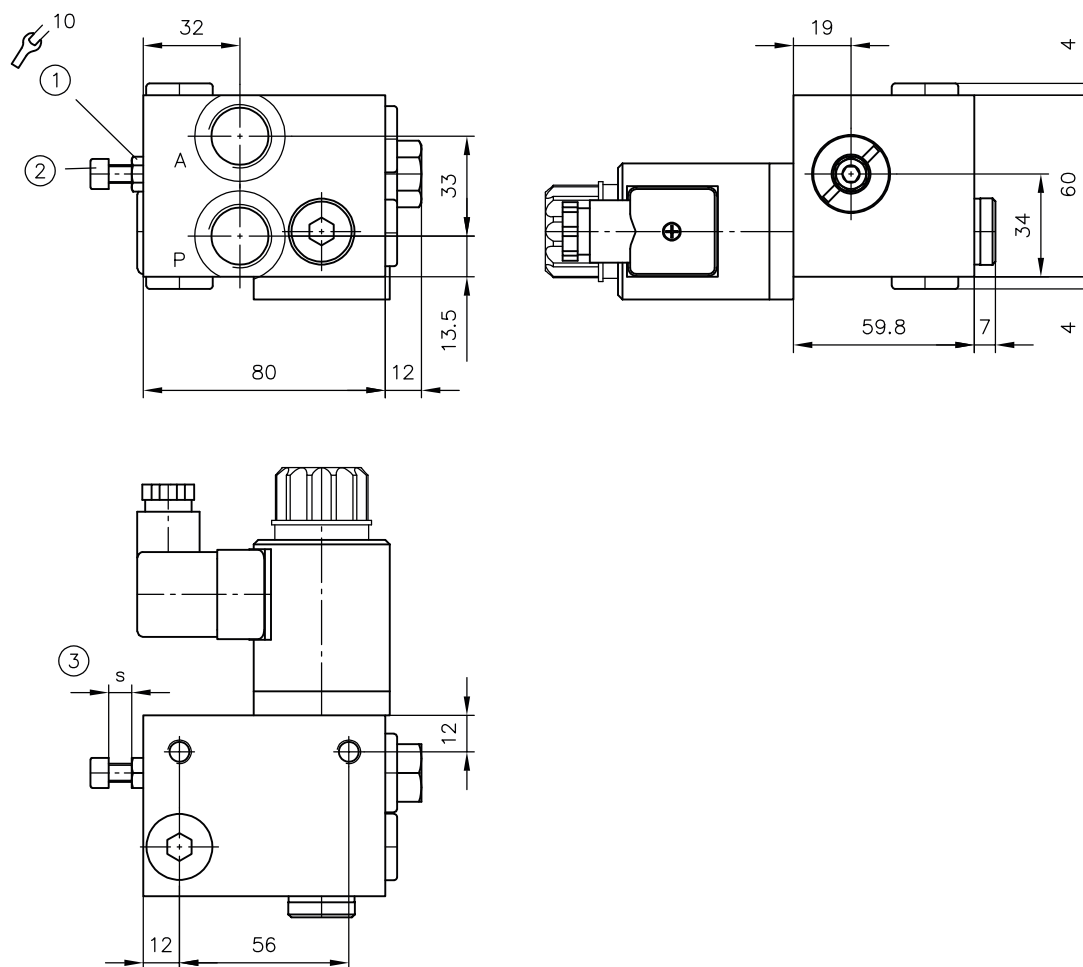


- 1 Lock nut
Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.
- 2 Set screw
- 3 Tapped plug for version with bypass check valve with coding R
- 4 s = setting for the maximum flow volume of the respective control orifice. The dimension depends on the control orifice.

Type	L	B	H	a	b	c	d	e	f	g	h	i	k
SE 2-3/..(R)	80	49.75	50	22.5	59	15	15	19	34	M8, 8 deep	36	17	8
SE 2-4/..(R)	85	59.8	60	16	60	19	19	21	41	M8, 10 deep	32	21	10

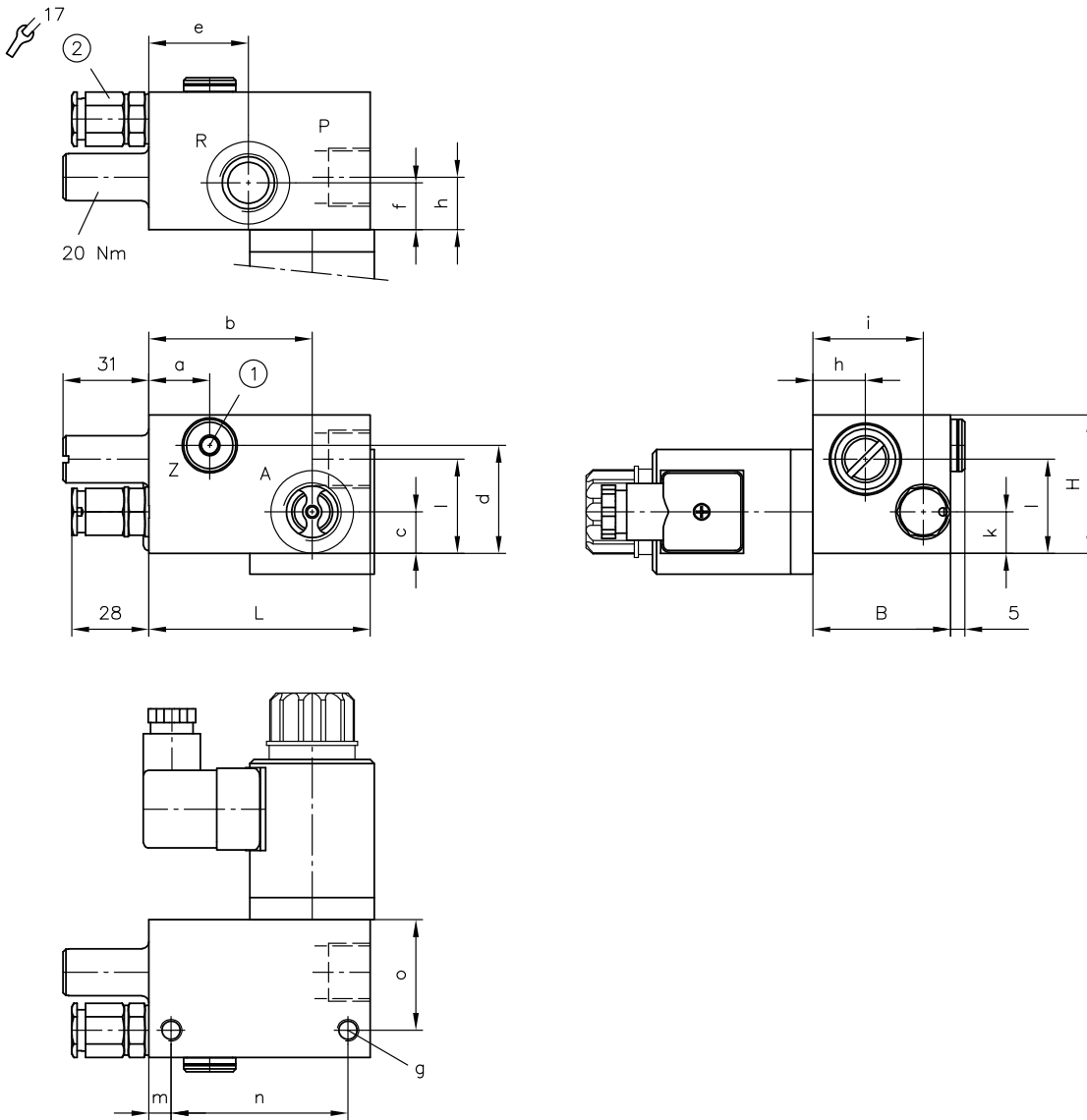
Type	l	m	n	o	Ports (ISO 228-1) A, P
SE 2-3/..(R)	64	40	12	5.5	G 1/2
SE 2-4/..(R)	65	148	14	8.2	G 3/4

SE 2-3/..B



- 1 Lock nut
Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.
- 2 Set screw
- 3 s = setting for the maximum flow volume of the respective control orifice. The dimension depends on the control orifice

SE 3-3/..., SE 3-3/..S
SE 3-4/..., SE 3-4/..S



- 1 Pilot control port Z: only in conjunction with a pressure-limiting valve
- 2 Pressure-limiting valve for the version with coding S

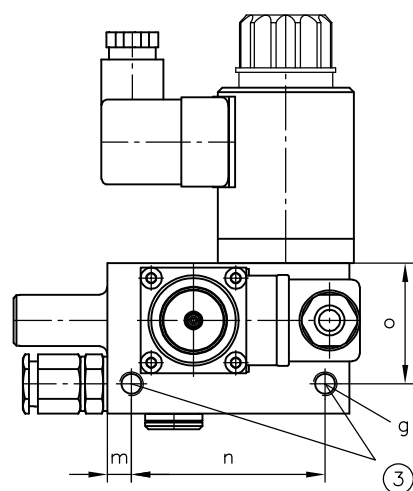
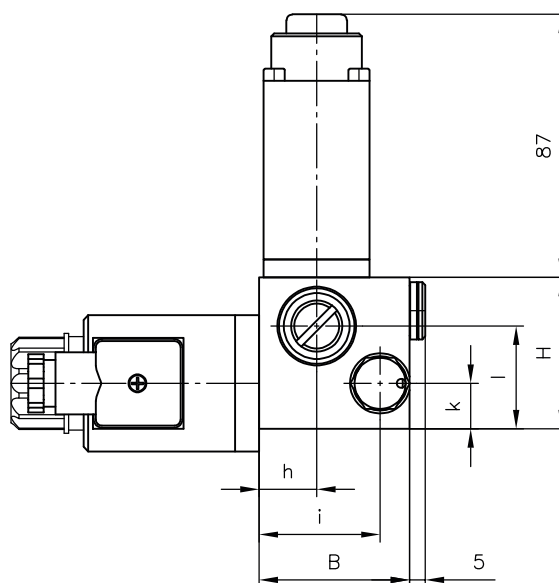
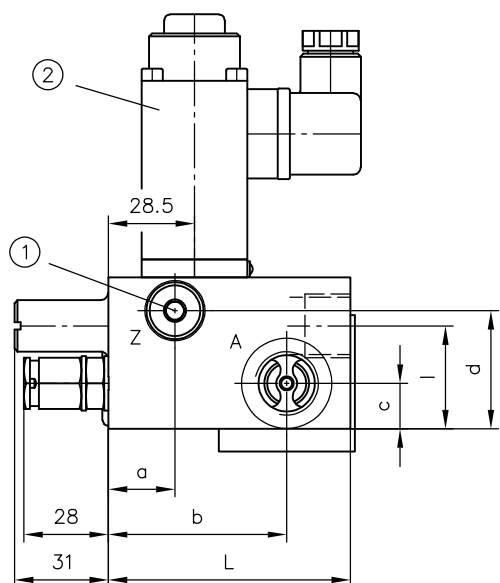
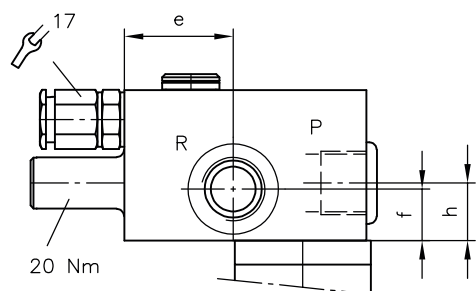
Type	L	B	H	a	b	c	d	e	f	g	h	i	k
SE 3-3/..(S)	80	49.75	50	22	59	15	39	36	17	M8, 8 deep	19	40	15
SE 3-4/..(S)	85	59.80	60	30	60	19	41	32	21	M8, 10 deep	21	46	23

Type	l	m	n	o	Ports (ISO 228-1)	
					A, P, R	Z
SE 3-3/..(S)	34	8	64	40	G 1/2	G 1/4
SE 3-4/..(S)	41	10	65	48	G 3/4	G 1/4

Pressure adjustment for the version with a pressure-limiting valve

Pressure setting range (bar)	Travel f_{max} (mm)	Δp (bar) per revolution
10 to 200	4	90
200 to 315	4	150

SE 3-3/..S-WN 1 F, SE 3-4/..S-WN 1 F, SE 3-3/..S-WN 1 D, SE 3-4/..S-WN 1 D



- 1 Pilot control port Z: only in conjunction with a pressure-limiting valve
- 2 Directional seated valve, see [D 7470 A/1](#)
- 3 Fastening holes (only the right-hand hole can be used as the left-hand hole is covered by the solenoid)

NOTICE

Only one fastening hole can be used.

Type	L	B	H	a	b	c	d	e	f	g	h	i
SE 3-3/..S-WN 1 F(D)	80	49.75	50	22	59	15	39	36	17	M8, 8 deep	19	40
SE 3-4/..S-WN 1 F(D)	85	59.80	60	30	60	19	41	32	21	M8, 10 deep	21	46

Type	k	l	m	n	o	Ports (ISO 228-1)	
						A, P, R	Z
SE 3-3/..S-WN 1 F(D)	15	34	8	64	40	G 1/2	G 1/4
SE 3-4/..S-WN 1 F(D)	23	41	10	65	48	G 3/4	G 1/4

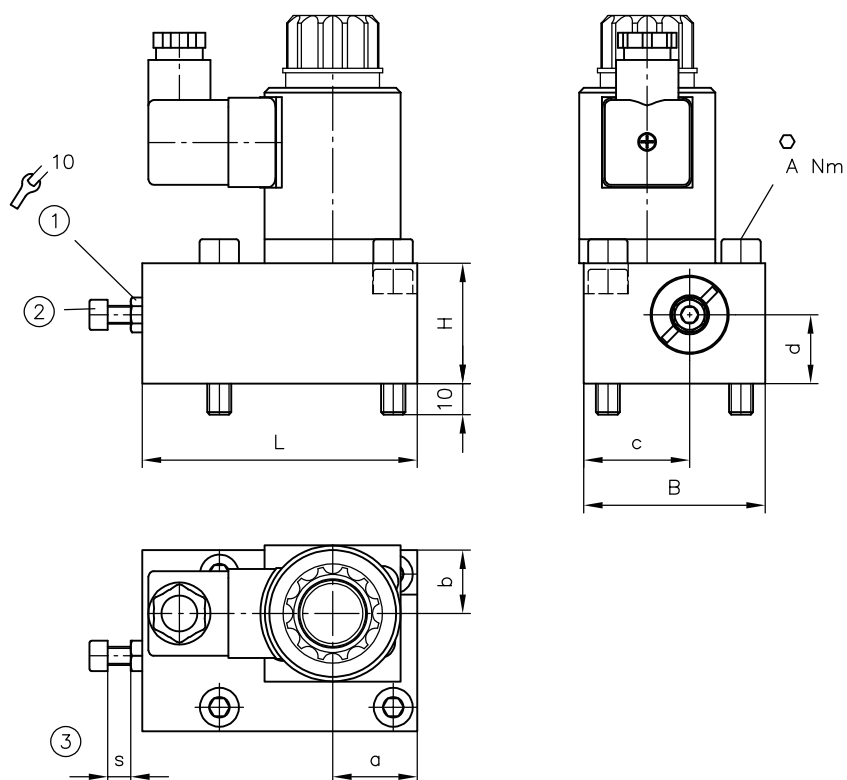
Pressure adjustment for the version with a pressure-limiting valve

Pressure setting range (bar)	Travel f_{\max} (mm)	Δp (bar) per revolution
10 to 200	4	90
200 to 315	4	150

4.1.2 For manifold mounting

SE 2-3/..P, SE 2-4/..P

SE 2-3/..PR, SE 2-4/..PR



1 Lock nut

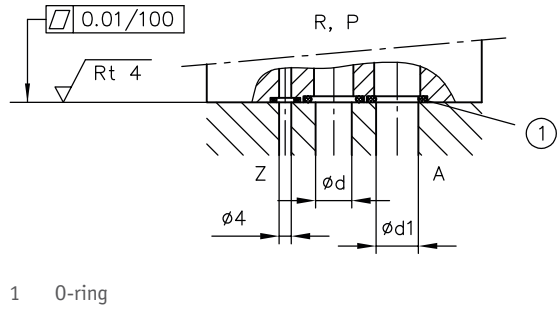
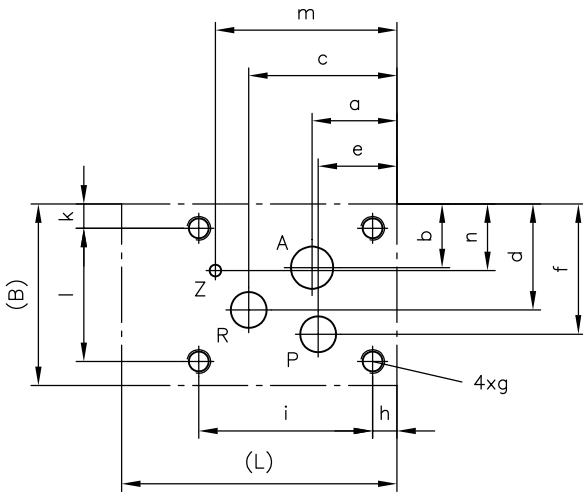
Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.

2 Set screw

3 s = setting for the maximum flow volume of the respective control orifice. The dimension depends on the control orifice

Type	L	B	H	a	b	c	d	A
SE 2-3/..P(R)	91	60	40	28	21	35	22.75	20
SE 2-4/..P(R)	97	70	50	35	26	42	28.75	41

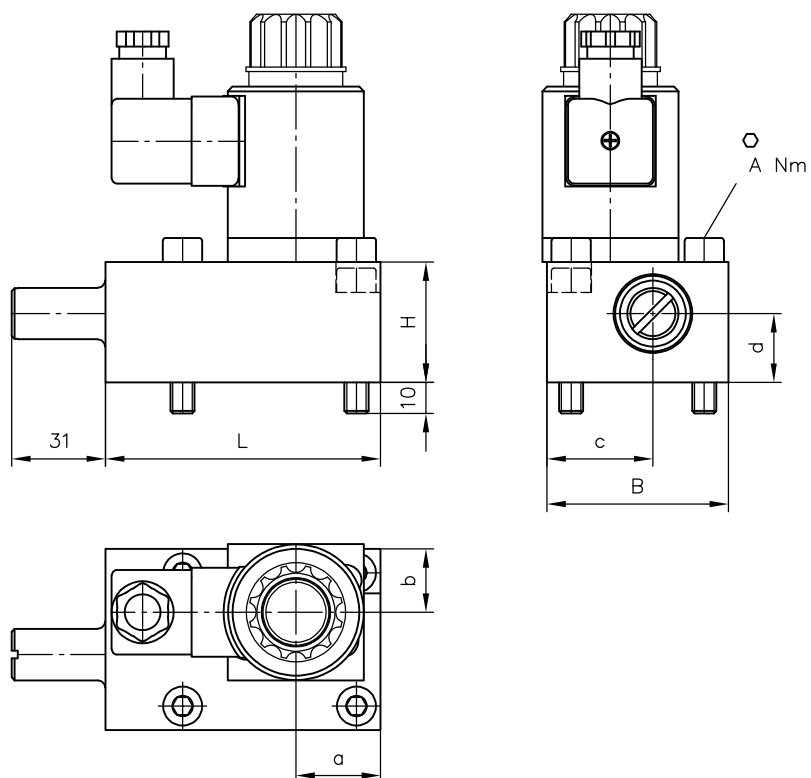
Hole pattern of the base plate



Type	L	B	a	b	c	d	h	i	k	l	g	$\varnothing d$	$\varnothing d1$
SE 2-3/..P(R)	91	60	28	21	49	35	8	57.5	8	44	M8, 12 deep	12	14
SE 2-4/..P(R)	97	70	35	26	57	42	16	57	9	52	M10, 12 deep	17	17

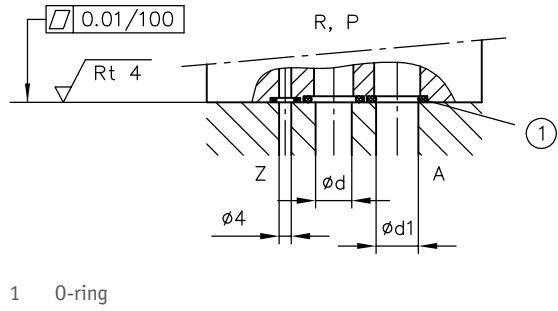
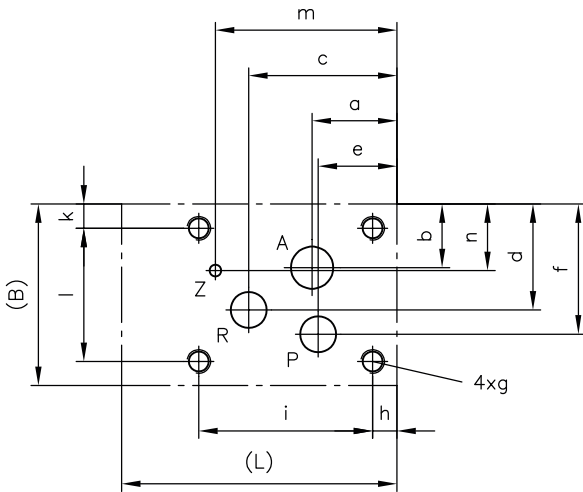
Type	O-ring NBR 90 Sh	
	P, R, A	Z
SE 2-3/..P(R)	15x2.5	6x2
SE 2-4/..P(R)	18.75x2.62	6x2

SE 3-3/..P, SE 3-4/..P



Type	L	B	H	a	b	c	d	A
SE 3-3/..P	91	60	40	28	21	35	22.75	20
SE 3-4/..P	97	70	50	35	26	42	28.75	41

Hole pattern of the base plate

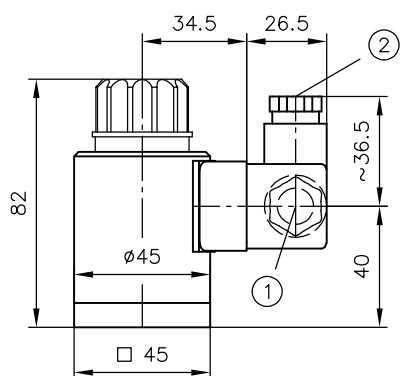


Type	L	B	a	b	c	d	h	i	k	l	g	Ød	Ød1
SE 3-3/..P	91	60	28	21	49	35	8	57.5	8	44	M8, 12 deep	12	14
SE 3-4/..P	97	70	35	26	57	42	16	57	9	52	M10, 12 deep	17	17

Type	O-ring NBR 90 Sh	
	P, R, A	Z
SE 3-3/..P	15x2.5	6x2
SE 3-4/..P	18.75x2.62	6x2

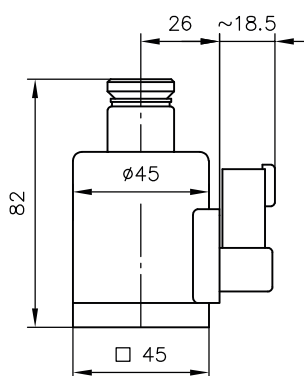
4.1.3 Solenoid version

G., X..



- 1 Connector can be mounted offset 3x 90°
- 2 Cable fitting

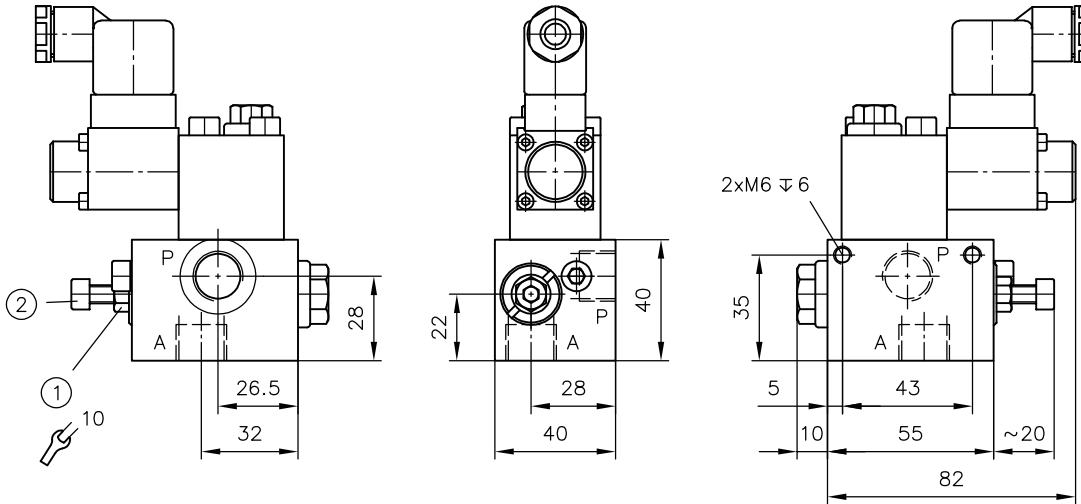
DT..



4.2 Pilot-controlled flow control valve type SEH

4.2.1 For pipe installation

SEH 2-2/..

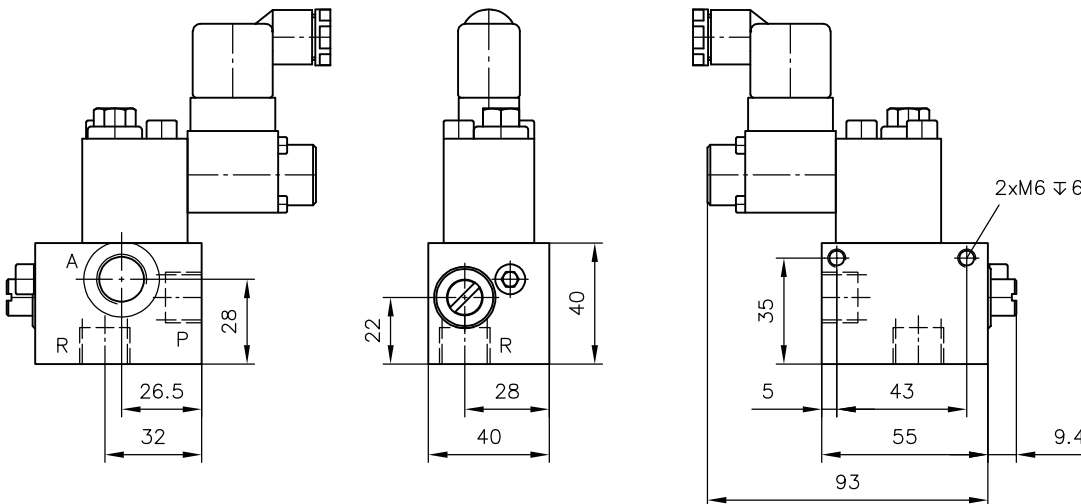


1 Lock nut

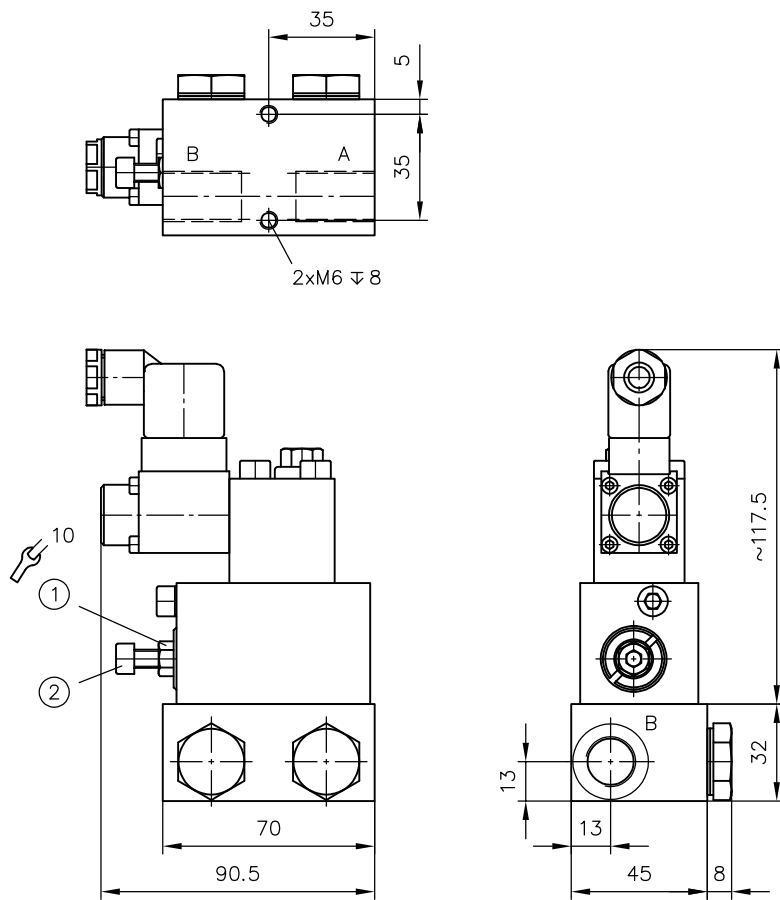
Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.

2 Set screw

SEH 3-2/..

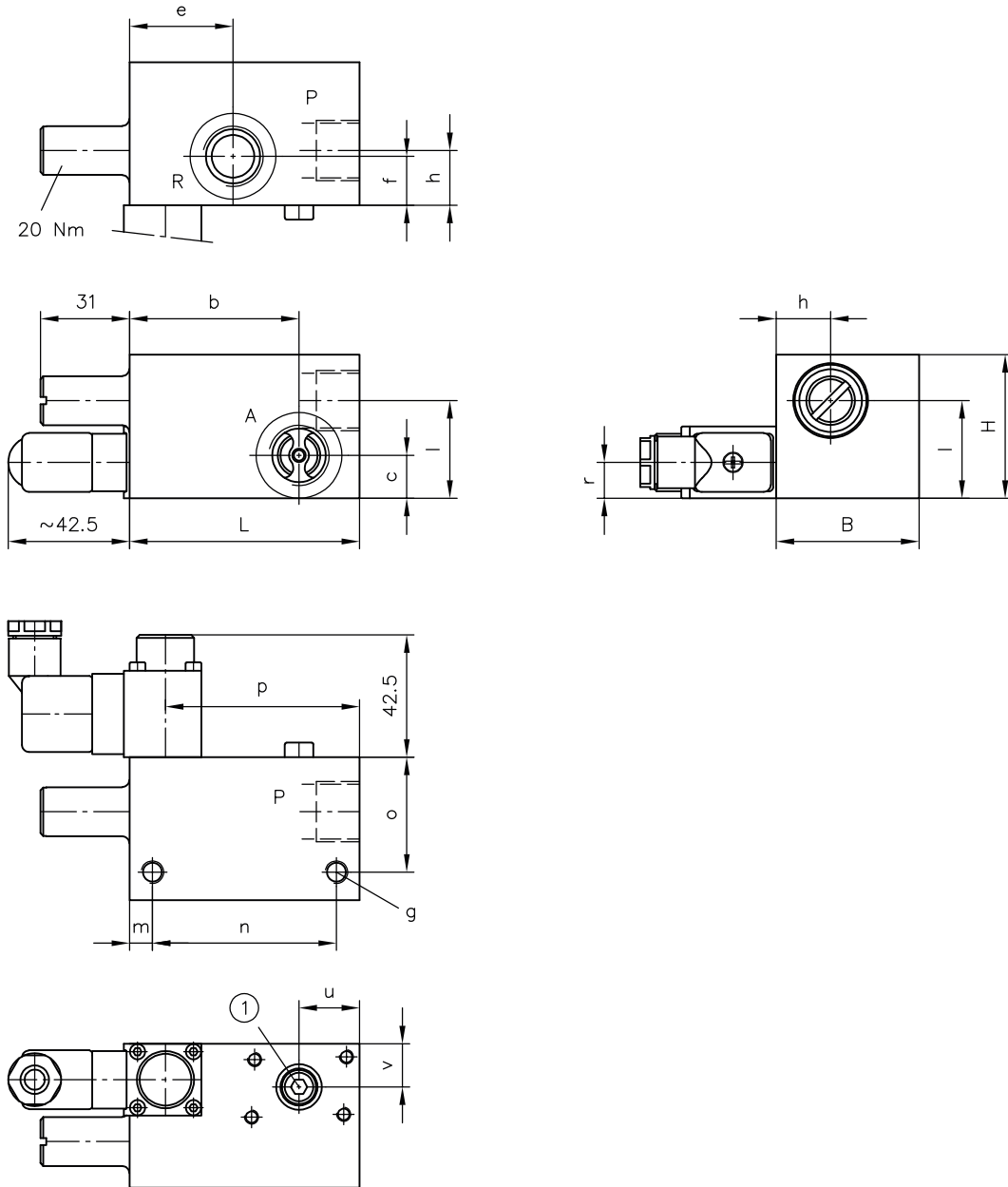


SEH 2-2/...-P-3/8 B-..



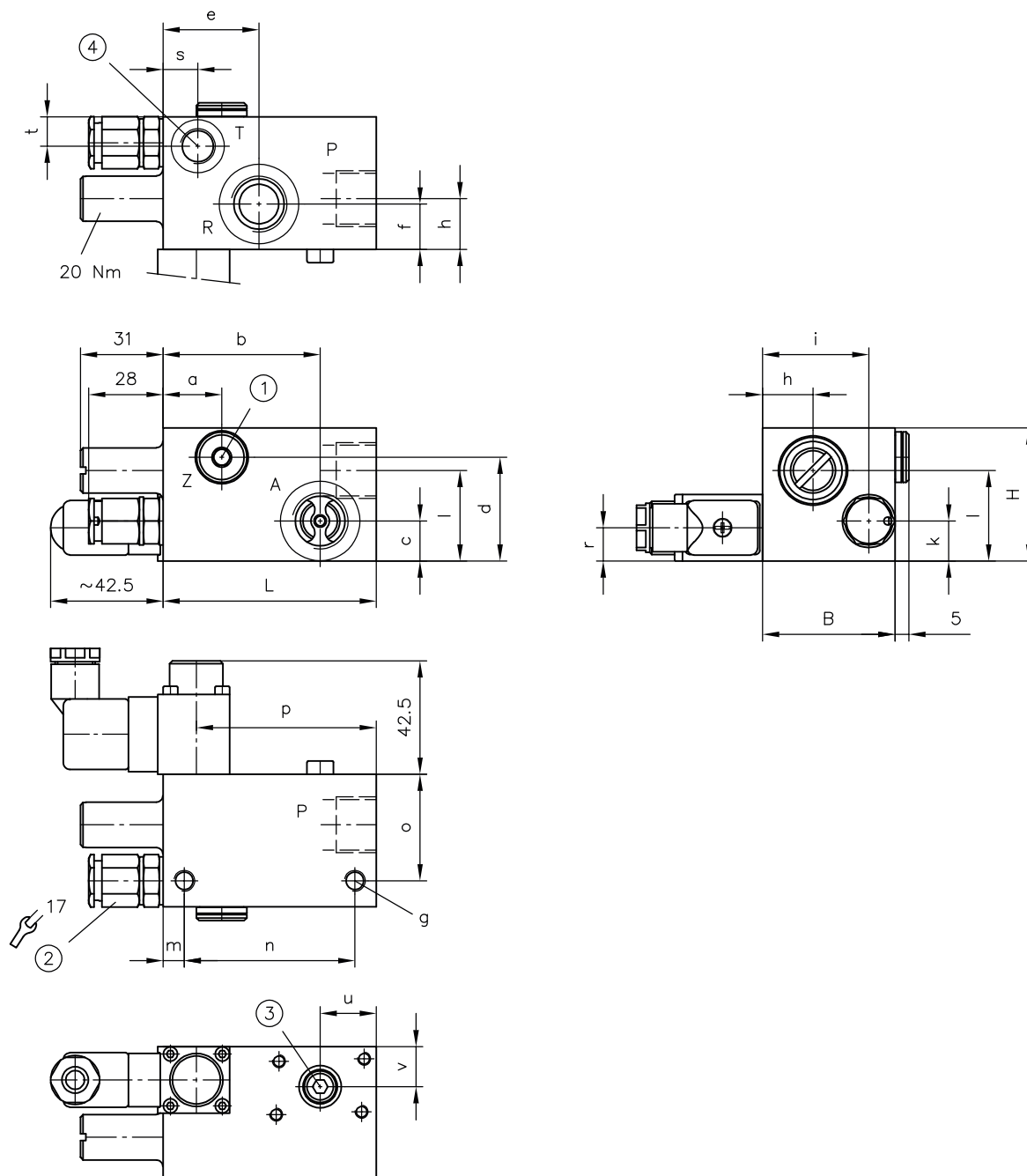
- 1 Lock nut
Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.
- 2 Set screw

SEH 3-3/..., SEHF 3-3/..., SEHD 3-3/...
 SEH 3-4/..., SEHF 3-4/..., SEHD 3-4/...
 SEH 3-5/..., SEHF 3-5/..., SEHD 3-5/...



1 see "Mechanical minimum-flow limiter"

SEH 3-3(4,5)/..S, SEH 3-3(4,5)/..ST
SEHF 3-3(4,5)/..S, SEHF 3-3(4,5)/..ST
SEHD 3-3(4,5)/..S, SEHD 3-3(4,5)/..ST



- 1 Pilot control port Z: only in conjunction with a pressure-limiting valve
- 2 Pressure-limiting valve in the case of coding S and ST
- 3 see "[Mechanical minimum-flow limiter](#)"
- 4 In the case of coding ST

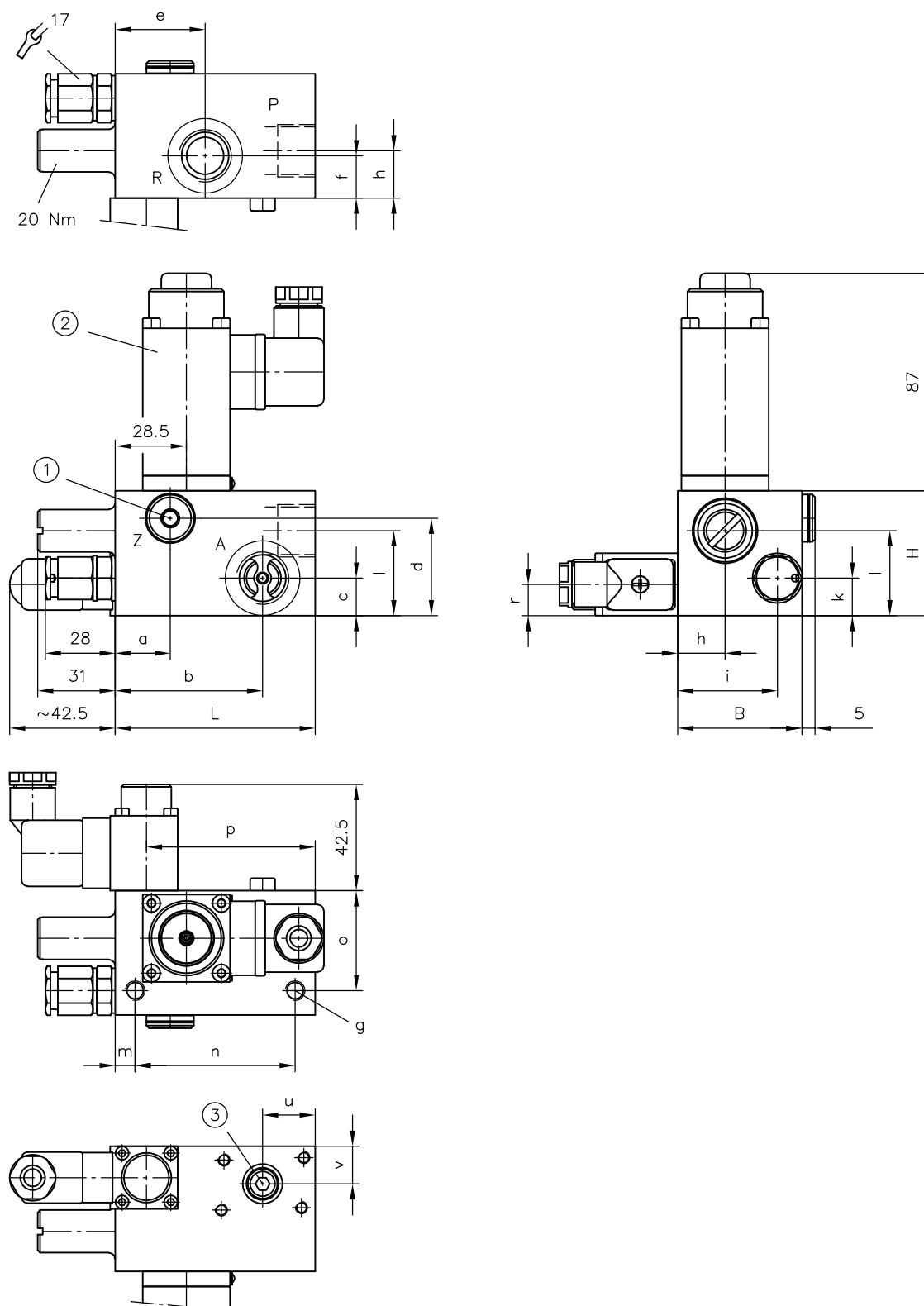
Type	L	B	H	a	b	c	d	e	f	g	h	i	k	l	m	n
SEH 3-3/..(S, ST) SEHF 3-3/..(S, ST) SEHD 3-3/..(S, ST)	80	49.75	50	22	59	15	39	36	17	M8, 8 deep	19	40	15	34	8	64
SEH 3-4/..(S, ST) SEHF 3-4/..(S, ST) SEHD 3-4/..(S, ST)	85	59.80	60	30	60	19	41	32	21	M8, 10 deep	21	46	23	41	10	65
SEH 3-5/..(S, ST) SEHF 3-5/..(S, ST) SEHD 3-5/..(S, ST)	100	69.70	70	30	73	22	47	40	22.7	M10, 12 deep	22.7	54.7	24	47	20	60

Type	o	p	r	s	t	u	v	Ports (ISO 228-1)	
								A, P, R	Z, T
SEH 3-3/..(S, ST) SEHF 3-3/..(S, ST) SEHD 3-3/..(S, ST)	40	67.5	12.5	13	11	21	15	G 1/2	G 1/4
SEH 3-4/..(S, ST) SEHF 3-4/..(S, ST) SEHD 3-4/..(S, ST)	48	72.5	12.5	11	15	25	19	G 3/4	G 1/4
SEH 3-5/..(S, ST) SEHF 3-5/..(S, ST) SEHD 3-5/..(S, ST)	51.7	87.5	17.5	12	11	27	22	G 1	G 1/4

Pressure adjustment for the version with a pressure-limiting valve

Pressure setting range (bar)	Travel f_{max} (mm)	Δp (bar) per revolution
10 to 200	4	90
200 to 315	4	150

SEH 3-..S-WN 1 F, SEH 3-..S-WN 1 D, SEHF 3-..S-WN 1 F
SEHF 3-..S-WN 1 D, SEHD 3-..S-WN 1 F, SEHD 3-..S-WN 1 D



- 1 Pilot control port Z: only in conjunction with a pressure-limiting valve
- 2 Directional seated valve, see D 7470 A/1
- 3 see "Mechanical minimum-flow limiter"

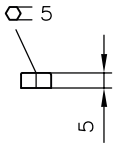
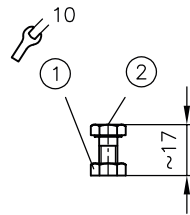
NOTICE

Only one fastening hole can be used.

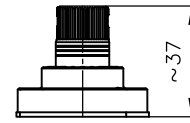
Type	L	B	H	a	b	c	d	e	f	g	h	i
SEH 3-3/..S-WN1F(D) SEHF 3-3/..S-WN1F(D) SEHD 3-3/..S-WN1F(D)	80	49.75	50	22	59	15	39	36	17	M8, 8 deep	19	40
SEH 3-4/..S-WN1F(D) SEHF 3-4/..S-WN1F(D) SEHD 3-4/..S-WN1F(D)	85	59.8	60	30	60	19	41	32	21	M8, 10 deep	21	46
SEH 3-5/..S-WN1F(D) SEHF 3-5/..S-WN1F(D) SEHD 3-5/..S-WN1F(D)	100	69.7	70	30	73	22	47	40	22.7	M10, 12 deep	22.7	54.7
Type	k	l	m	n	o	p	r	u	v	Ports (ISO 228-1)		
										A, P, R	Z, T	
SEH 3-3/..S-WN1F(D) SEHF 3-3/..S-WN1F(D) SEHD 3-3/..S-WN1F(D)	15	34	8	64	40	67.5	12.5	21	15	G 1/2	G 1/4	
SEH 3-4/..S-WN1F(D) SEHF 3-4/..S-WN1F(D) SEHD 3-4/..S-WN1F(D)	23	41	10	65	48	72.5	12.5	25	19	G 3/4	G 1/4	
SEH 3-5/..S-WN1F(D) SEHF 3-5/..S-WN1F(D) SEHD 3-5/..S-WN1F(D)	24	47	20	60	51.7	87.5	17.5	27	22	G 1	G 1/4	

Pressure adjustment for the version with a pressure-limiting valve

Pressure setting range (bar)	Travel f_{\max} (mm)	Δp (bar) per revolution
10 to 200	4	90
200 to 315	4	150

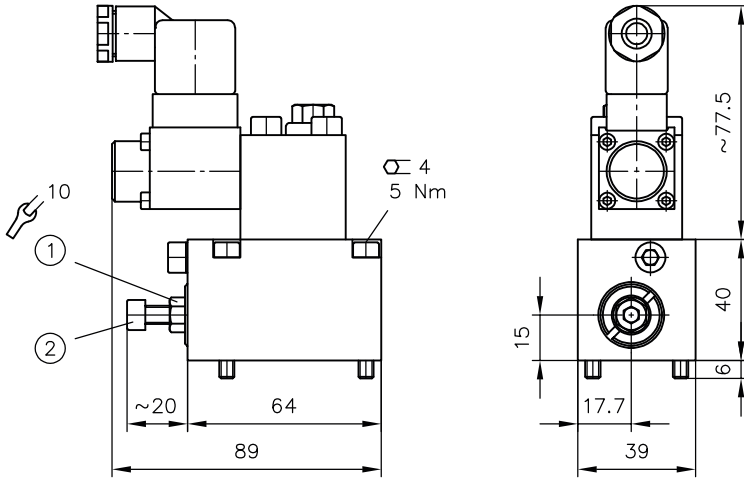
Mechanical minimum-flow limiter**For type SEH****For type SEHF**

- 1 Lock nut
Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.
- 2 Set screw

For type SEHD

4.2.2 For manifold mounting

SEH 2-2/..P

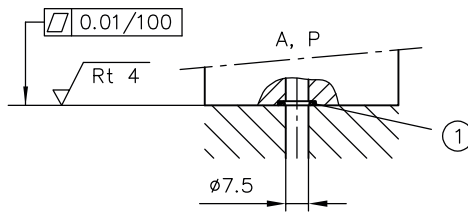
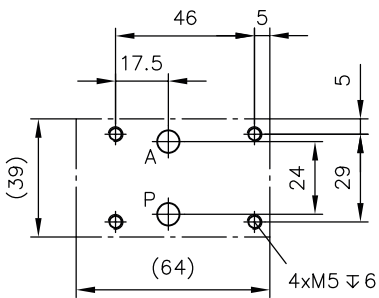


1 Lock nut

Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.

2 Set screw

Hole pattern of the base plate



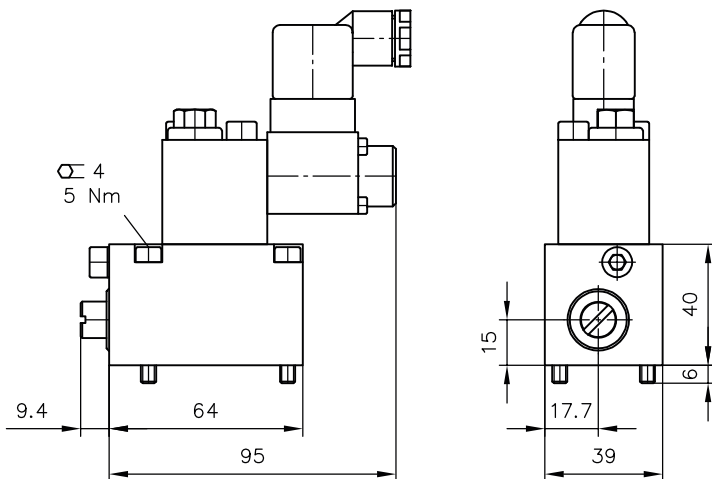
1 O-ring

O-ring NBR 90 Sh

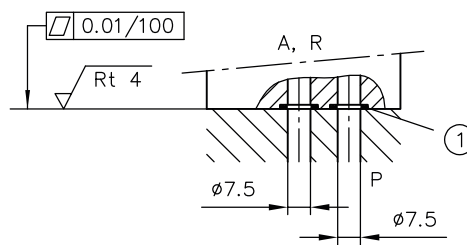
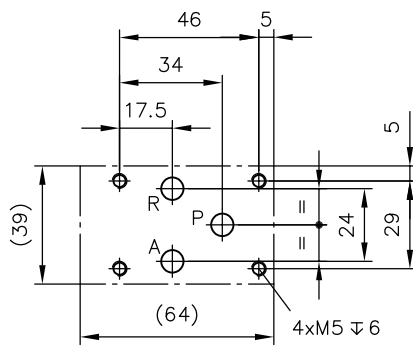
P, A

9.25x1.78

SEH 3-2/..P



Hole pattern of the base plate



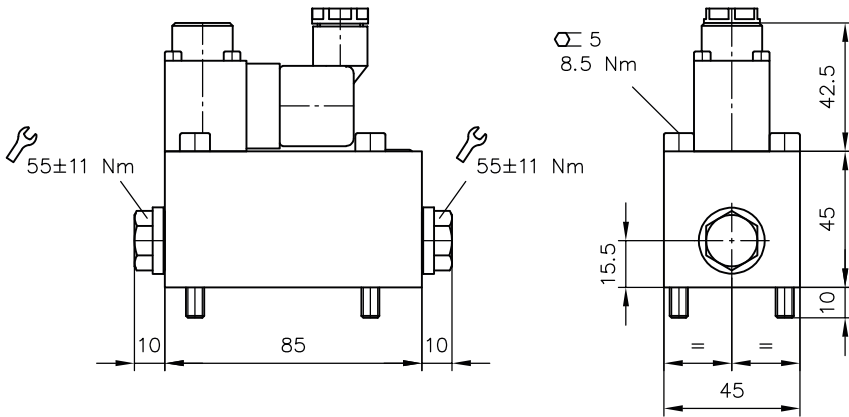
1 O-ring

O-ring NBR 90 Sh

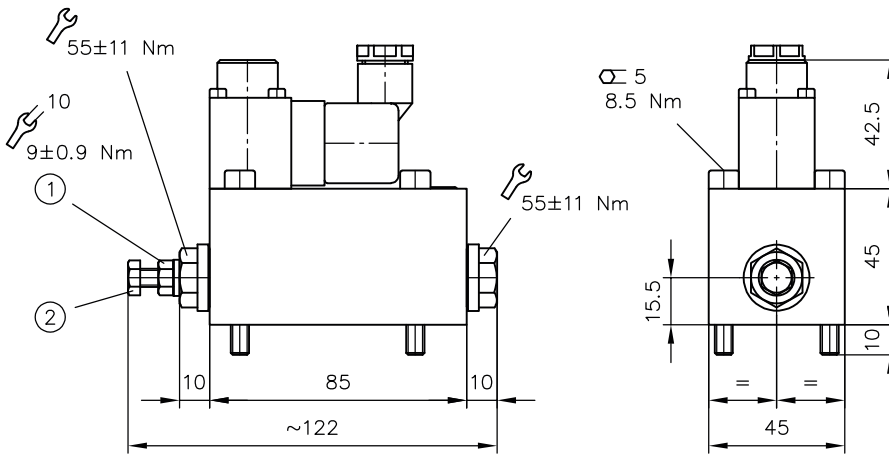
P, A

9.75x1.78

SEH 2-3/..P



SEHF 2-3/..P

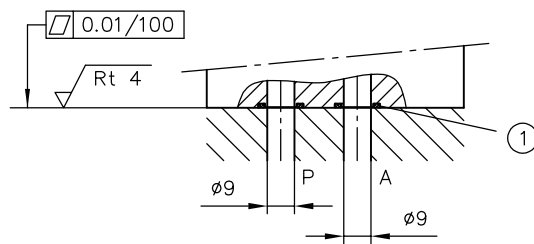
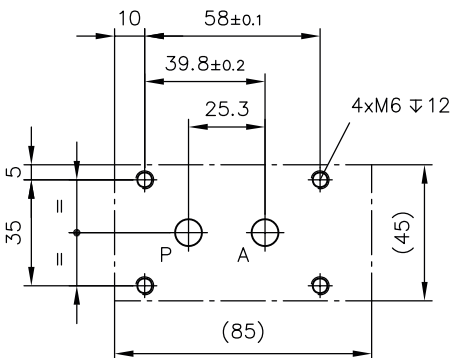


1 Lock nut

Before making adjustments: loosen the lock nut (seal-lock nut) of the set screw sufficiently to prevent the thread from damaging the vulcanised sealing ring.

2 Set screw

Hole pattern of the base plate



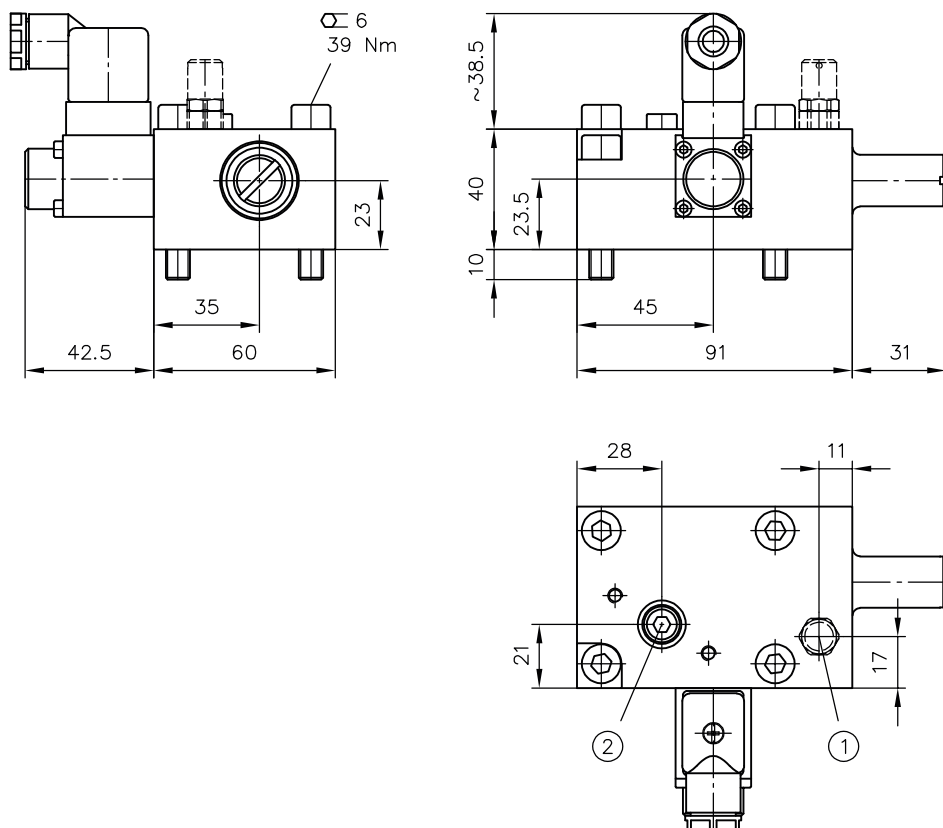
1 O-ring

O-ring NBR 90 Sh

P, A

10.82x1.78

SEH 3-3/..P, SEHF 3-3/..P, SEHD 3-3/..P
 SEH 3-3/..PS, SEHF 3-3/..PS, SEHD 3-3/..PS

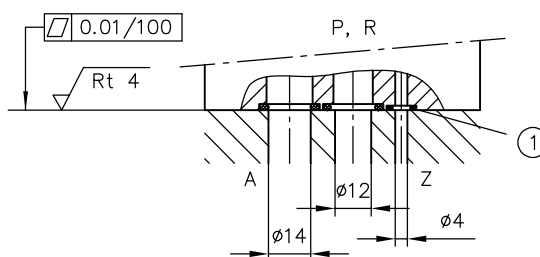
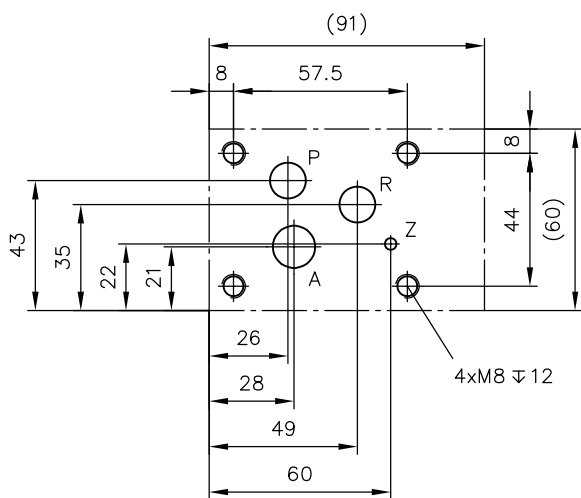


- 1 Pressure-limiting valve in the case of type SEHF(D) 3-3/..-PS
- 2 see "Mechanical minimum-flow limiter"

Pressure adjustment for the version with a pressure-limiting valve

Pressure setting range (bar)	Travel f_{max} (mm)	Δp (bar) per revolution
10 to 200	4	90
200 to 315	4	150

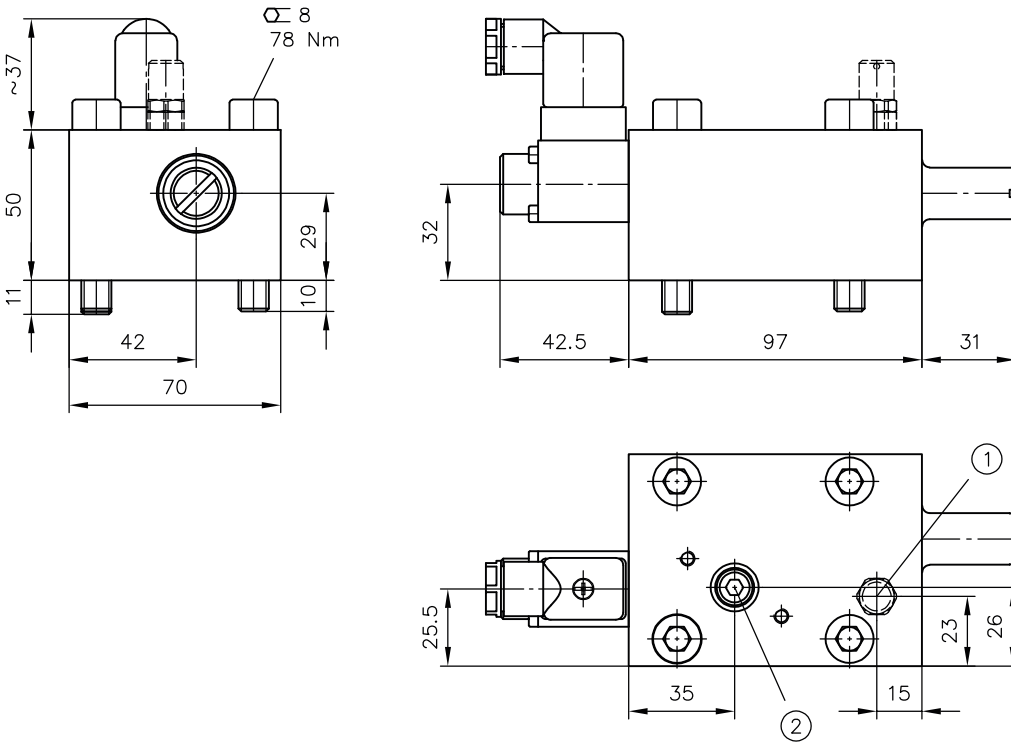
Hole pattern of the base plate



1 O-ring

O-ring NBR 90 Sh	
P, R, A	15x2.5
Z	6x2

SEH 3-4/...-P, SEHF 3-4/...-P, SEHD 3-4/...-P
SEH 3-4/...-PS, SEHF 3-4/...-PS, SEHD 3-4/...-PS

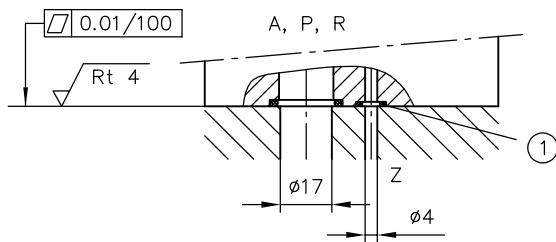
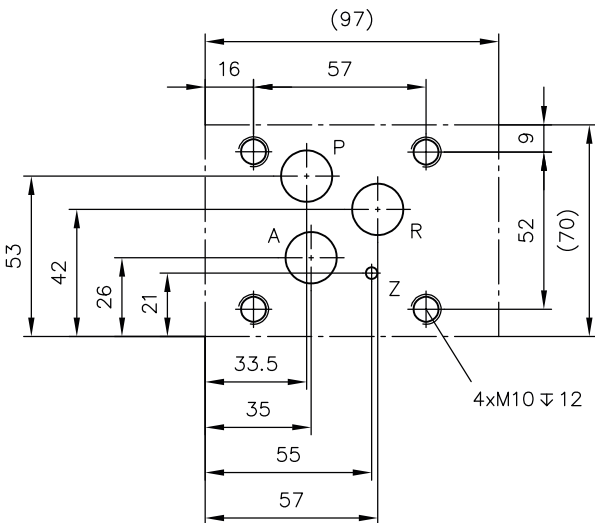


- 1 Pressure-limiting valve in the case of type SEHF(D) 3-4/...-PS
- 2 see "Mechanical minimum-flow limiter"

Pressure adjustment for the version with a pressure-limiting valve

Pressure setting range (bar)	Travel f_{max} (mm)	Δp (bar) per revolution
10 to 200	4	90
200 to 315	4	150

Hole pattern of the base plate

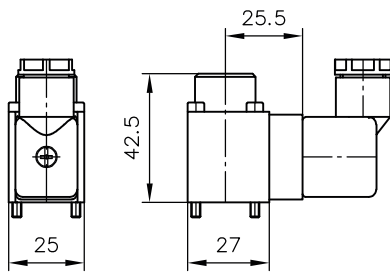


1 O-ring

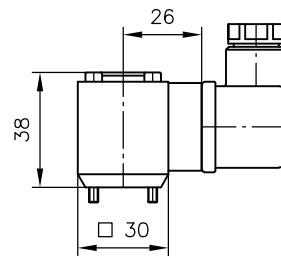
O-ring NBR 90 Sh	
P, R, A	18.75x2.62
Z	6x2

4.2.3 Solenoid version

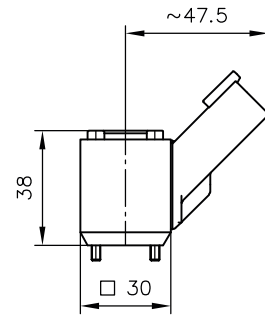
X., G..



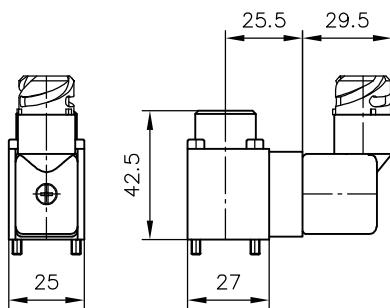
X..DIN, G..DIN, L..DIN



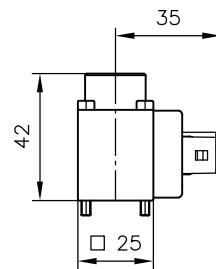
DT..



S..



AMP..



Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

Essential requirements for the product to function correctly and safely:

- ▶ All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ▶ The product must only be assembled and put into operation by specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
 - ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).

DANGER

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

- ▶ Depressurise the hydraulic system.
- ▶ Perform safety measures in preparation for maintenance.

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.

The instructions for the complete technical system must also always be followed.

NOTICE

- ▶ Read the documentation carefully before usage.
- ▶ The documentation must be accessible to the operating and maintenance staff at all times.
- ▶ Keep documentation up to date after every addition or update.

CAUTION

Overloading components due to incorrect pressure settings.

Risk of minor injury. Parts may burst or fly off, and uncontrolled leakage of hydraulic fluid.

- Pay attention to the maximum operating pressure of the pump, valves and fittings.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

! NOTICE

New hydraulic fluid from the manufacturer may not have the required purity.

Damage to the product is possible.

- ▶ Filter new hydraulic fluid to a high quality when filling.
- ▶ Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level [see Chapter 3, "Parameters"](#)).

Additionally applicable document: [D 5488/1](#) oil recommendations

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

6 Other information

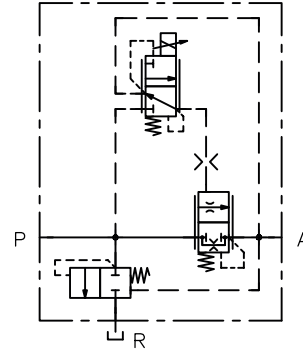
6.1 Version with orifice with coding F0

see Chapter 2.2.3, "Flow rate range", Metering orifice, closed when de-energised with compulsory lock-out circuit for the pressure compensator

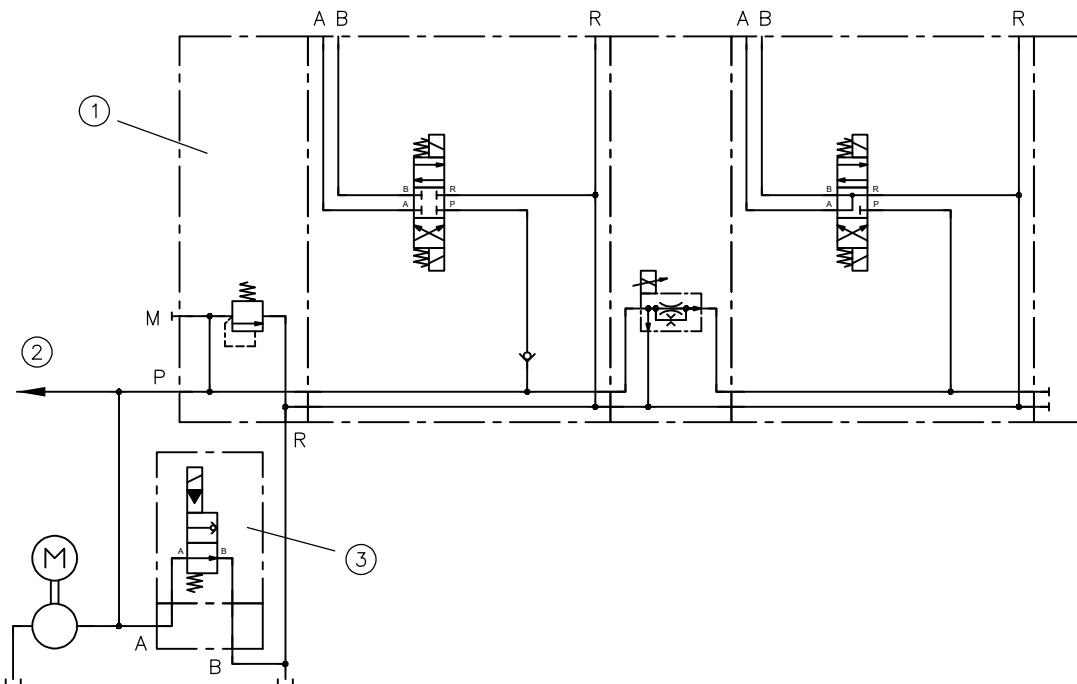
It differs from the standard version in that there is a defined stroke limitation element for the closed F metering orifice in the idle position, which takes the form of a washer (can be retrofitted). The slight residual opening maintains a connection from the P-side to the A-side and thus to the rear of the pressure compensator (spring cavity).

This compensates for leakage-related losses from the spring cavity to R when the directional spool valves or directional seated valves that are connected at consumer side A are not actuated and in the closed centre position. As a result, a pressure balance is maintained between the pressure compensator's control side (front side) and rear side.

The pressure compensator is forced closed by the spring force (outlet R) and remains there, or immediately moves from a previous control position into the closed position, ensuring it does not disrupt the oil supply to the hydraulic circuit ahead due to outlet R closing too slowly or not at all.



Circuit example



- 1 Auxiliary circuit with e.g. SWS 2 A6-G/M/R/02-ZSE 15 F-D/M/0/02-1-G 24-200 according to D 7951. In this example, the pressure-limiting valve safeguards the pressure of both circuits jointly.
- 2 To the main circuit with e.g. directional valve banks with closed centre position SWS on the P-side.
- 3 Seated valve, e.g. EM 11 S-3/8 according to D 7490/1 as idle circulation valve.

Application

Enables a controlled supply of pressure oil in hydraulic circuits that are connected in parallel, instead of the 2-way flow control valves that would otherwise be required for these kinds of circuits.

Example:

Provides a variable supply of pressure oil to an auxiliary circuit which is branched off from a main circuit that has a constant supply of oil. The pressure compensator is forced into the closed position when it is not actuated, i.e. when the directional valves belonging to this (auxiliary) circuit are also in the closed neutral position. This enables the consumers of the upstream constant flow (main) circuit to be actuated without any disruptions caused by the pressure compensator adopting uncontrolled positions that result in a loss of oil towards port R.

Advantage

Only the lower power loss associated with a 3-way control concept occurs in the auxiliary circuit. The residual flow of oil is only returned to the tank against the current consumer pressure. In the case of a conventional 2-way control system, the residual oil is discharged to the tank via the pressure-limiting valve and subject to the maximum pressure set there, which results in a higher power loss.

Restriction

Must not be actuated at the same time as the upstream hydraulic (main) circuit. Compared with the standard version, the slight opening of the control cross section on the metering orifice slightly increases the minimum usable consumer oil flow $Q_{A \min}$ that can be achieved.

i INFORMATION

The metering orifice is slightly open in the neutral position.

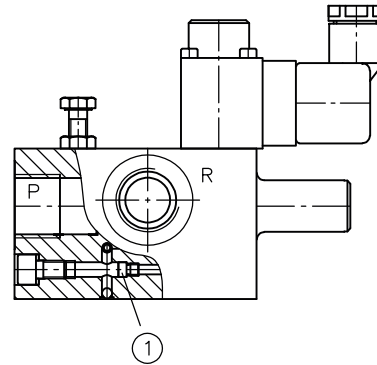
6.2 Version with bypass orifice with coding B 0.6

see Chapter 2.2.4, "Model and additional functions"

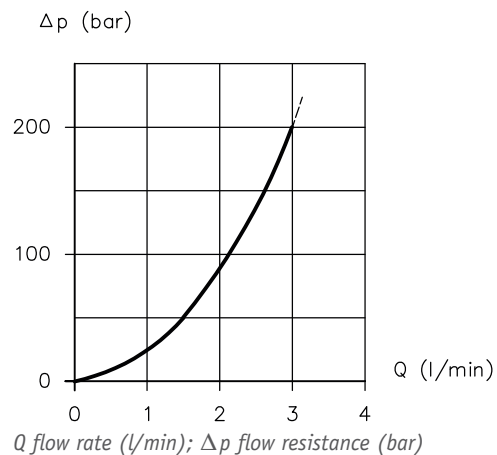
If a bypass orifice of $\varnothing 0.6$ mm is fitted between A and R, then when the metering orifice is closed (proportional solenoid is de-energised), the pressure is quickly reduced on the A-side (consumer) and thus also in the control or spring cavity of the pressure compensator. This enables the pressure compensator to switch to idle circulation (against the controller spring pre-tension of approx. 6 bar).

The orifice B 0.6 can be accessed from port A (after removing the HAWE tapped plug with O-ring 4x1 NBR 90 Sh), meaning the user can also retrofit it themselves after removing these parts (standard carburettor orifice M4 x $\varnothing 0.6$).

Depending on the consumer pressure at port A, the flow rate according to the Q-l characteristic line, see Chapter 3.4, "Characteristic lines", is reduced in line with the adjacent bypass flow rate.



1 Orifice of $\varnothing 0.6$



Application

Enables automatic switchovers, even if the consumer at A is blocked. This negates the need for the 2/2-way solenoid that would otherwise be required.

Restriction

Not suitable for control systems where a load-induced back pressure (e.g. weight load in the case of single-acting hydraulic cylinders) from the consumer acts on A. This load-induced back pressure can be blocked using an external check valve (e.g. RC1-E in A).

i INFORMATION

In normal operation, a certain amount of the consumer's usable volume flow is continuously drawn via the orifice, depending on the current pressure at A / R.

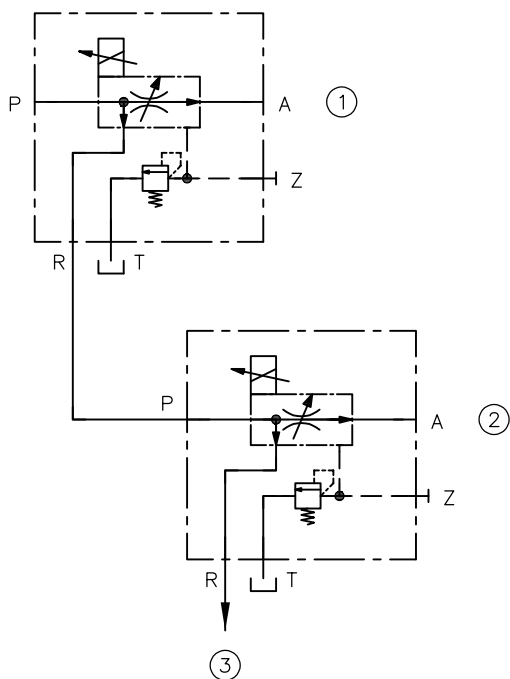
As a result, this has a slightly negative impact on the load independency see Chapter 3.4, "Characteristic lines".

6.3 Version with a pressure-limiting valve with coding ST

see Chapter 2.2.4, "Model and additional functions"

The outflow oil from the pressure-limiting valve is discharged via a drain port T that must be connected separately. This ensures that the pressure setting remains independent of the current pressure at port R.

Circuit example



- 1 Consumer 1
- 2 Consumer 2
- 3 Other consumer or tank

6.4 Version with additional proportional pressure-limiting valve

By connecting a proportional pressure-limiting valve type PMV 41-4./.. or PMVP 4-4./.. at the control port Z of 3-way flow control valves (with an integrated pressure-limiting valve with a fixed setting), it is possible to proportionally control both the flow rate and operating pressure and, when de-energised, achieve idle circulation $P \rightarrow R$ of around 8 to 10 bar (applies to flow controllers with open and closed orifice).

The existing pilot pressure-limiting valve in the flow control valve must be set to a maximum operating pressure which is higher than the operating pressure to be controlled using PMV 41-4./.. or PMVP 4-4./.. and can be considered a maximum pressure safeguard mechanism.

6.5 Accessories, spare and individual parts

Accessories, spare and individual parts To purchase spare parts, please see [HAWE Hydraulik interactive contact map](#).

Line connectors

Type	Version	Order coding	Order number
SE	Line connector (black)	MSD 3-309	6217 0002-00
	Line connector (grey)	MSD 3-309	6217 0003-00
SEH	Line connector (black)	MSD 6-209	6236 5004-00
	Line connector (black) for DIN solenoid	MSD 3-309	6217 0002-00

References

Additional versions

- Flow control valve type SD, SF and SK: D 6233
- 2-way flow control valve type SR2 (size 8): D 6402
- 2-way flow control valve type SR2 (size 6): D 6403
- 3-way flow control valve type SR3 (size 6): D 6404

