



PRODUCT CATALOG VALVE TECHNOLOGY

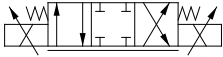
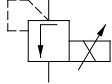
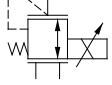
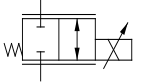


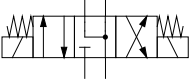
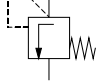


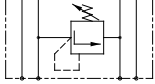
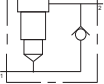

LEADERSHIP IN **HYDRAULIC** SOLUTIONS

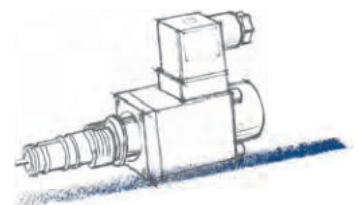
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Table of contents

CONTENTS		CHAPTER
Proportional directional valves		1
Proportional pressure relief valves		2
Proportional pressure control valves		3
Proportional throttle valves		4
Proportional flow control valves		5
Electronics and sensors		6
Directional valves		7
Pressure valves		8
Flow valves		9
Check valves		10
Special valves		11
Manifolds and accessories		12
Appendix: general information		I





Subplate Mounting Valves

W4_E-5PS03

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 5 l/min
size NG 3

W4_E-1AS06

direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 25 l/min
size NG 6, DIN 24340 A06

Screw-in Valves

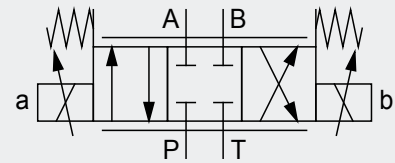
S22E-1V08

pilot operated, solenoid operated
operating pressure max. 250 bar
nominal flow 25 l/min
cavity SAE08

Proportional directional valve W42E-5PS03 and W43E-5PS03



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 5 l/min
 size NG 3 (company standard)



010111_W4_E-5PS03_e
 03.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	5
Accessories and additional information	6

Characteristics

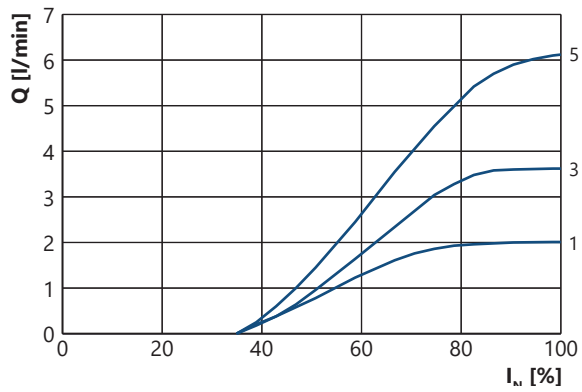
- proportional directional valve in spool design
- miniature edition
- minimum oil leakage
- spring centred spool
- maintenance-free
- available with various volume flows

Technical data

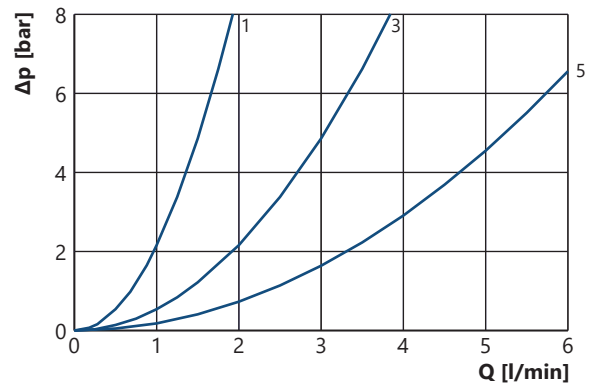
<i>Hydraulic</i>	Operating pressure max.:	315 bar port T: 75 bar summed pressure A, B: 350 bar	
	Flow rate:	1, 3, 5 l/min at $\Delta p = 7$ bar	
	Flow direction:	see symbols in type code	
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request	
	Viscosity range:	10 - 350 cSt	
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$	
	Repeatability:	< 3 % with optimized PWM-signal*	
	Hysteresis:	< 5 % with optimized PWM-signal*	
		* at 20 % to 100 % of the nominal valve current	
	<hr/>		
	<i>Mechanic</i>	Design :	spool type, direct operated
Size:		NG 3 (company standard)	
Fluid temperature:		-20 °C to +80 °C	
Ambient temperature:		-20 °C to +50 °C	
Storage temperature:		-30 °C to +60 °C (non-condensing)	
Installation position:		any, preferably horizontal	
Maximum acceleration:		5 g	
Weight:		4/2-way-design: 0,42 kg 4/3-way-design: 0,58 kg	
Material:		valve parts: steel seals: NBR, Viton optional	
Surface protection:		coil: zinc coated body: nitrocarburized	
<hr/>			
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC	
	Nominal valve current:	1,3 A (12 V), 0,63 A (24 V)	
	Nominal resistance (R20):	5,9 Ω (12 V), 24,0 Ω (24 V)	
	Power consumption:	9,6 W at nominal valve current	
	Shifting time:	100 % ED	
	Control command:	PWM-signal	
	PWM-frequency:	typically 140 Hz (depending on application)	
	Protection class:	IP65 with correctly mounted and locked mating connector	
	Electric termination:	electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire	
	Electronic controllers:	see chapter 6 " <i>electronics and sensor technology</i> " as well as our online catalogue at www.weber-hydraulik.com .	

Performance

Flow rate diagram (Q/I) W4_E-5PS03 at $\Delta p = 7$ bar



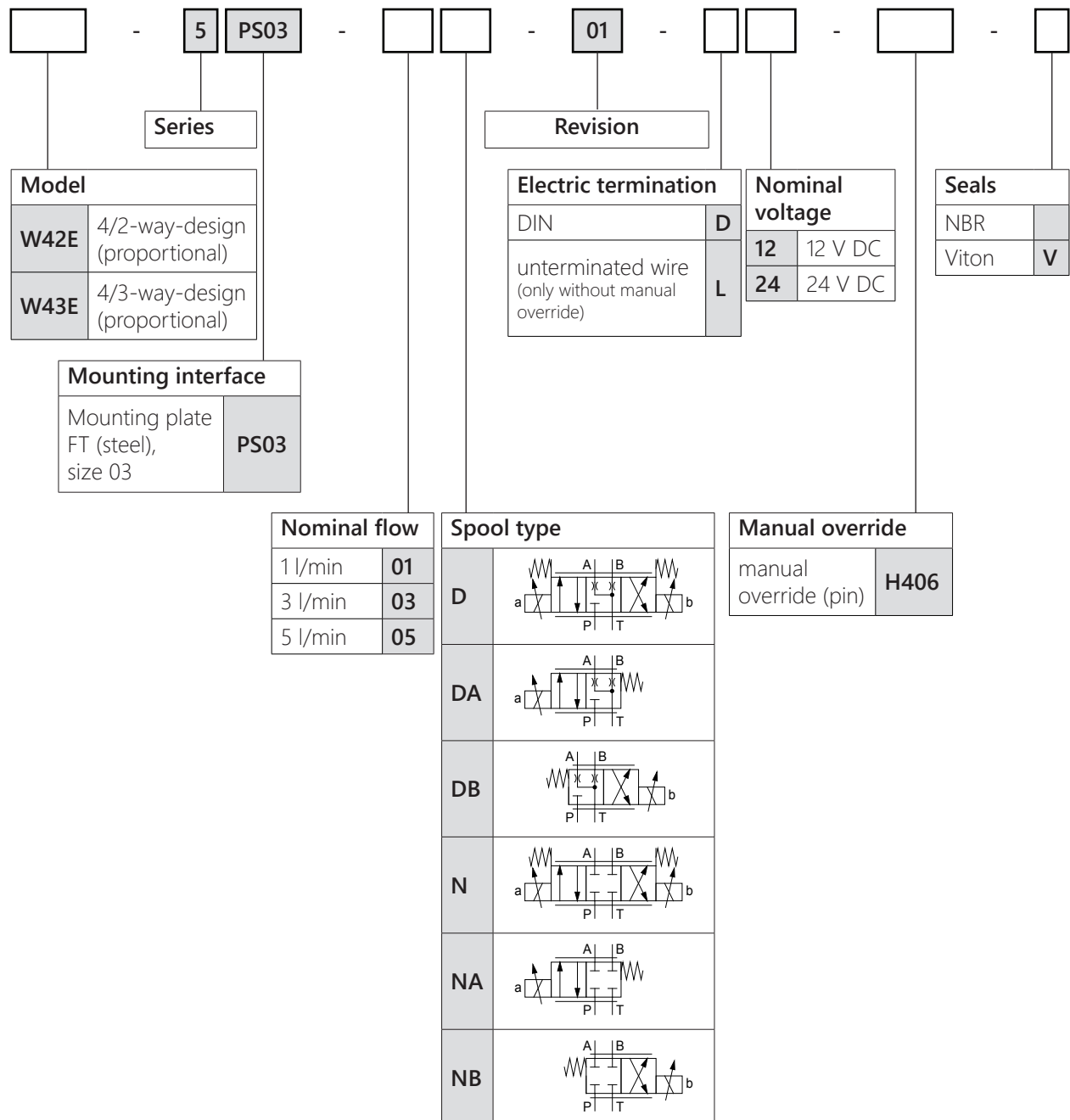
Pressure drop diagram ($\Delta p/Q$) W4_E-5PS03 at I_N



NOTE Maximum tolerance of flow rate $\pm 10\%$ at symmetric flow. Maximum pressure drop at control edge Δp : 20 bar.

Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Type code



Accessories and additional information

<i>Accessories/spare parts</i>	Part:	Article number:
	Socket connector DIN EN 175301-803*, shape B, black	149.0005
	Socket connector DIN EN 175301-803*, shape B, grey	149.0004
	Adapter plug DIN EN 175301-803*, shape B to shape A	109.0006
	Seal kit W43_-5PS03 (NBR)	405.0066
	Seal kit W43_-5PS03 (Viton)	405.0067
	Adapter plate NG 6 to NG 3, including seals and screws	203.0153
	Mounting plate NG 3, ports sidewise	151.0171

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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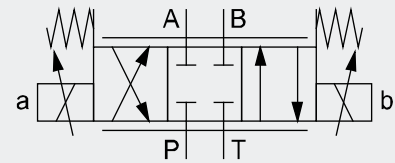
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Proportional directional valve W42E-1AS06 and W43E-1AS06



direct operated, solenoid operated
 operating pressure max. 350 bar
 volume flow max. 25 l/min
 size NG 6, DIN 24340 A06



010130_W4_E-1AS06_e
 01.2020

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	5
Accessories and additional information	6

Characteristics

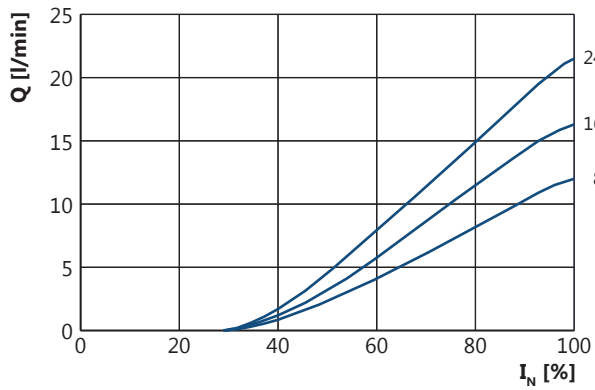
- proportional directional spool valve
- spring centred spool
- controls volume and direction of flow rate
- maintenance-free
- rotatable and replaceable coils
- available with various volume flows

Technical data

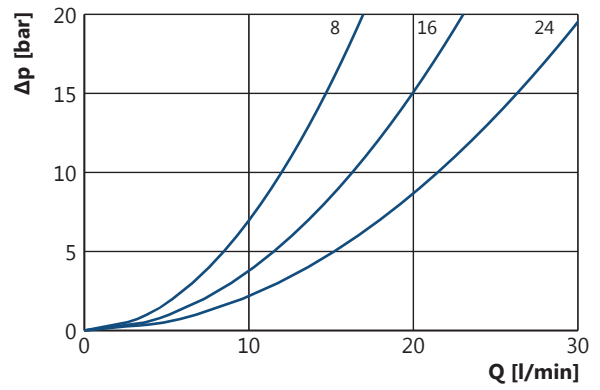
<i>Hydraulic</i>	Operating pressure:	port P, A, B: 350 bar (if T = 0 bar) port T: 210 bar (if P and A or P and B max. 315 bar)
	Flow rate:	8, 16, 24 l/min at $\Delta p = 10$ bar
	Flow direction:	see symbols in type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current
	<hr/>	
<i>Mechanic</i>	Design :	spool type, direct operated
	Size:	NG 6 (DIN 24340 A06, ISO 4401-03, CETOP 3)
	Fluid temperature:	-20 °C to +65 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Maximum acceleration:	5 g
	Weight:	4/2-way-design: 1,6 kg 4/3-way-design: 2,1 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	coil: zinc-nickel body: comparable
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,8 A (12 V), 0,9 A (24 V)
	Nominal resistance (R20):	2,7 Ω (12 V), 12,6 Ω (24 V)
	Power consumption:	21,6 W (at nominal valve current)
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 85 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

Performance

Flow rate diagram (Q/I) W4_E-1AS06 at $\Delta p = 10$ bar



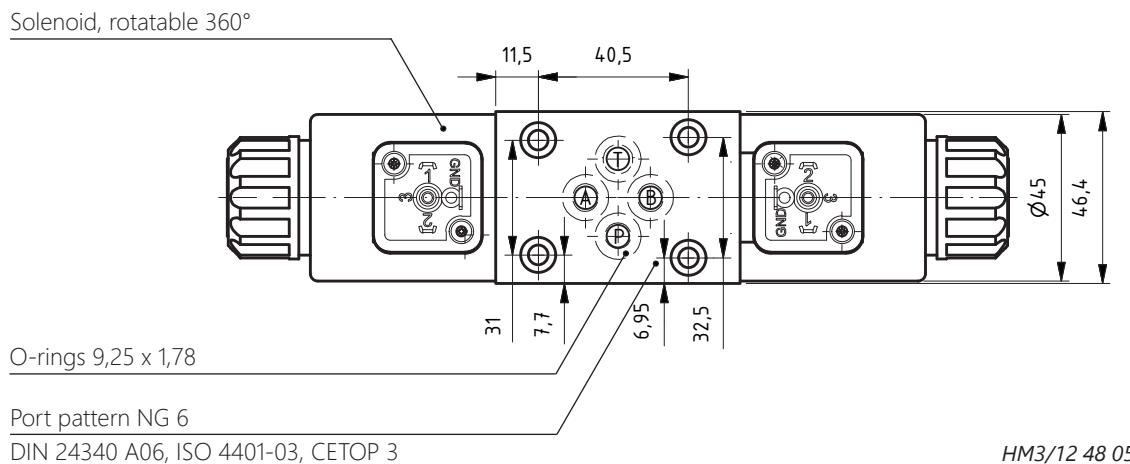
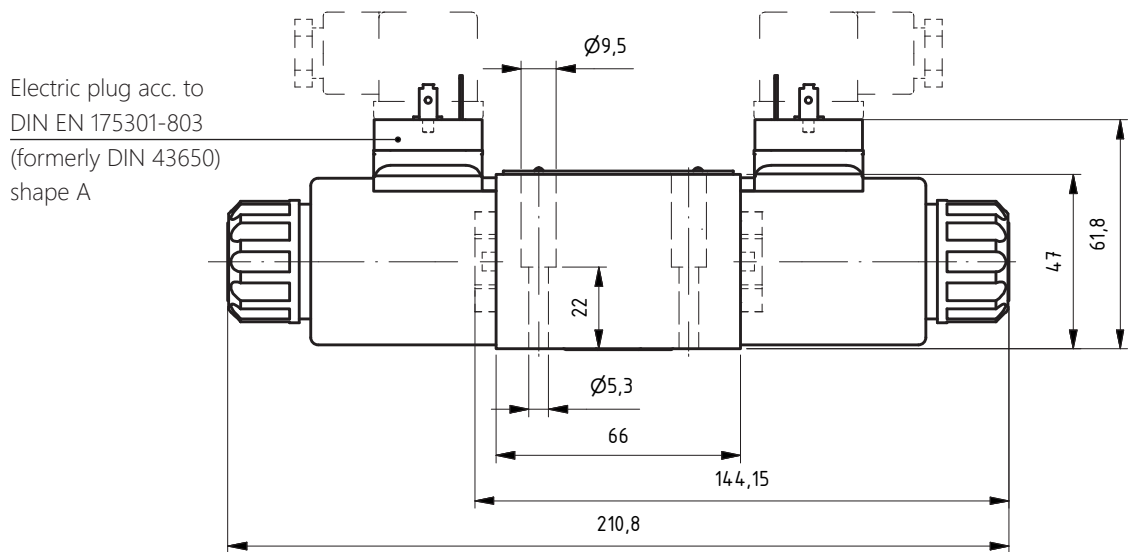
Pressure drop diagram ($\Delta p/Q$) W4_E-1AS06 at I_N



NOTE Maximum tolerance of flow rate $\pm 10\%$ at symmetric flow. Maximum pressure drop at control edge Δp : 20 bar.

Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

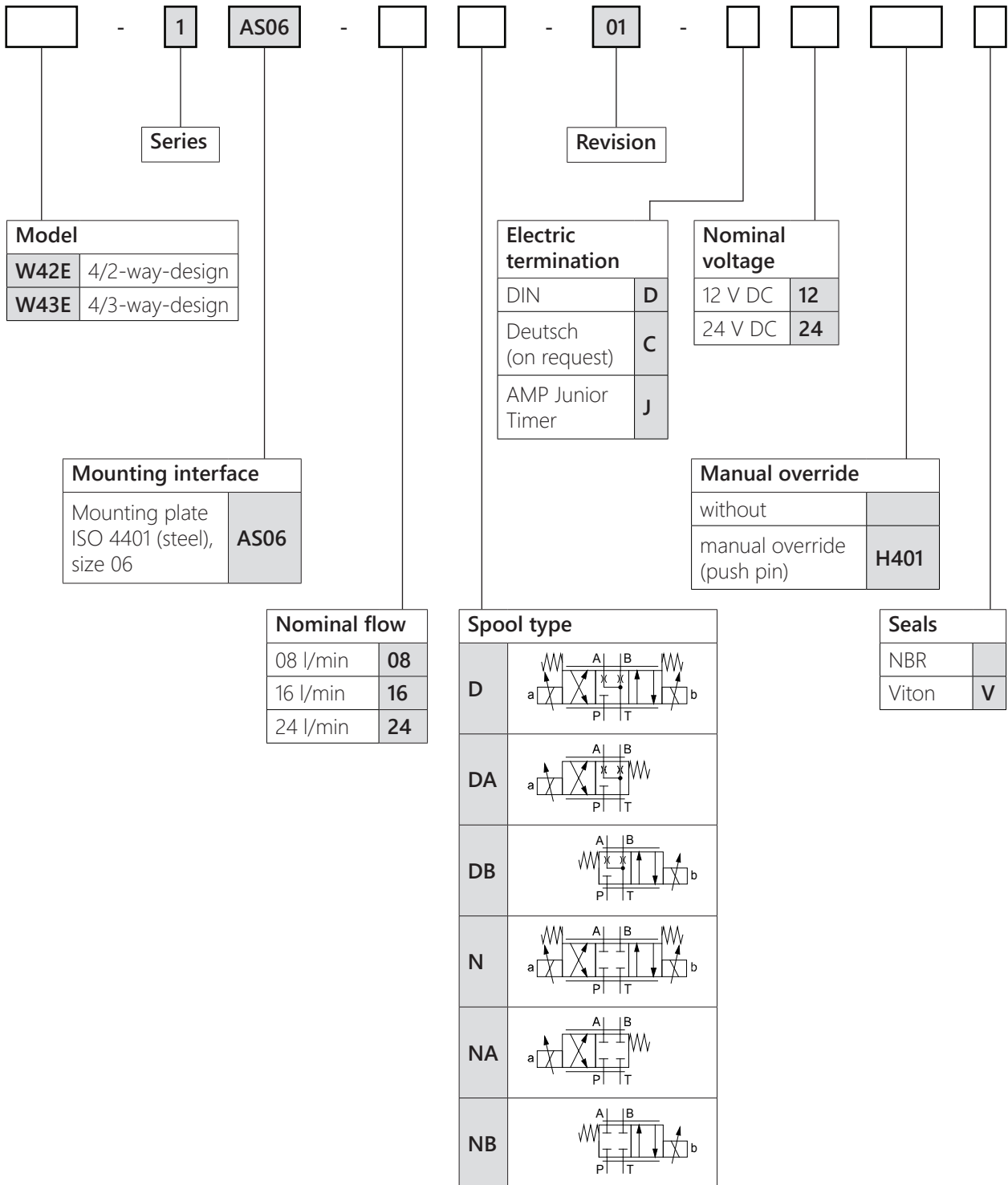


NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 - 12.9. Installation torque: $5,7 \pm 0,3$ Nm.
The minimum screw-in depth depends on the material of the screw and the material in which it is screwed in.
Steel typically: $1,2 \times d$ 12.9 (10.9)
Aluminium typically: $1,6 \times d$ 8.8 (10.9)
If in doubt, please use the appropriate table books or carry out tests.
The mounting surface of the valve must have a flatness better than 0,01 mm.

NOTE For a detailed drawing of the port pattern please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

<i>Accessories/spare parts</i>	Article:	Material number:
	Socket connector DIN EN 175301-803*, shape A, black	149.0007
	Screw M5 x 30 DIN EN ISO 4762, 12.9	1093159
	Seal kit W4_E-1AS06 (NBR)	405.0070
	Seal kit W4_E-1AS06 (Viton)	405.0071
	Coil 12 V DIN EN 175301-803*, shape A	147.0011
	Coil 24 V DIN EN 175301-803*, shape A	147.0009
	Coil 12 V, AMP Junior Timer	147.0007
	Coil 24 V, AMP Junior Timer * (formerly DIN 43650)	147.0010

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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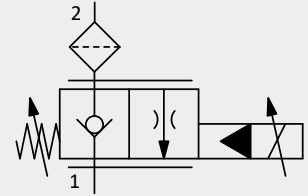
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Proportional 2/2-way poppet valve S22E-1V08



pilot operated, solenoid operated
 operating pressure max. 250 bar
 nominal flow 25 l/min
 cavity SAE08



010210_S22E-1V08_e
 02.2021

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	3
Type code	4
Accessories and additional information	4

Characteristics

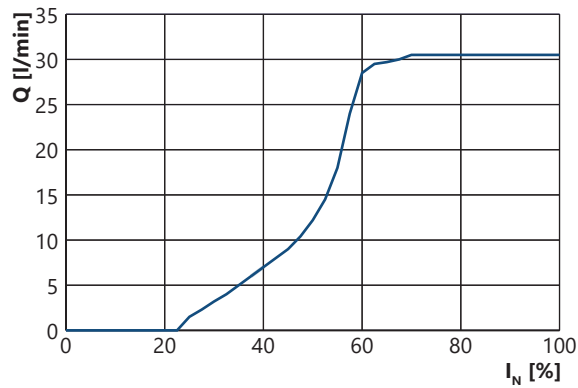
- proportional poppet valve
- compact design
- leakage free closing
- volume flow control
- maintenance-free
- rotatable and replaceable solenoid coils

Technical data

<i>Hydraulic</i>	Operating pressure max.:	250 bar
	Nominal flow:	25 l/min
	Flow direction:	1 to 2 check valve function, 2 to 1 proportional throttle
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 20/18/15
<hr/>		
<i>Mechanic</i>	Design:	screw-in poppet valve, pilot operated
	Size:	SAE08
	Fluid temperature:	-30 °C to +110 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,39 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	2,17 A (12 V), 1,08 A (24 V)
	Nominal resistance (R20):	5,54 Ω (12 V), 22,16 Ω (24 V)
	Power consumption max.:	26 W at nominal valve current (coil temperature 20 °C)
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer, Deutsch connector
Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com	

Performance

Flow rate diagram (Q/I) S22E-1V08 at $\Delta p = 75 \text{ bar}$

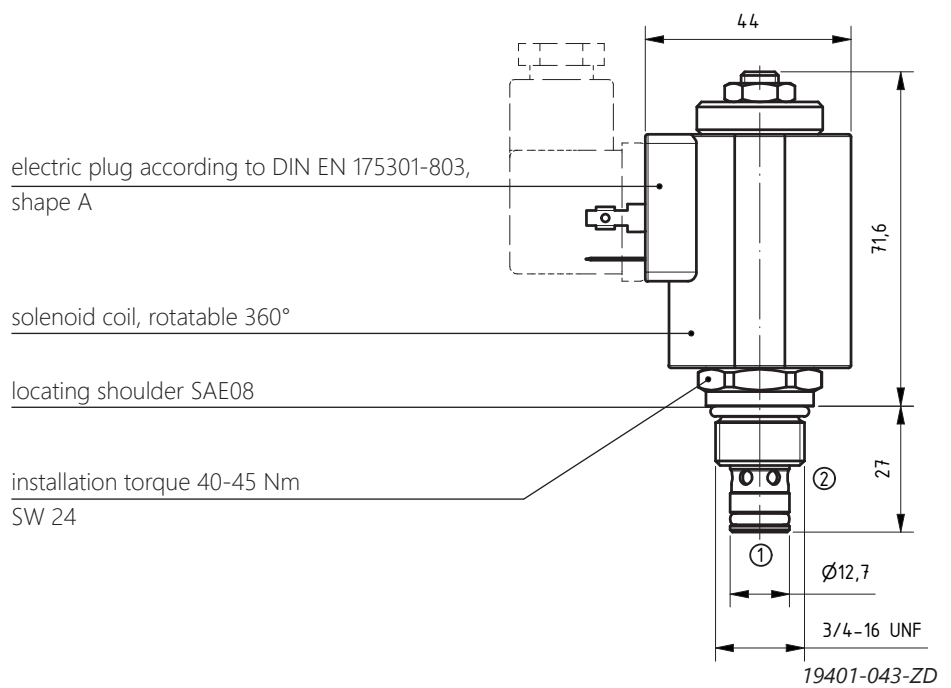


Test conditions

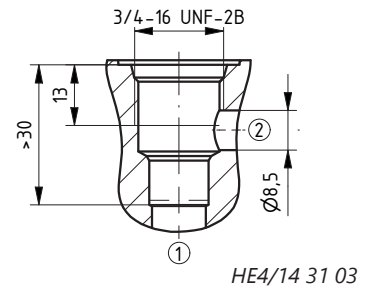
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

Screw-in valve S22E-1V08



Cavity SAE08



NOTE For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at www.weber-hydraulik.com.

NOTE Please contact us for appropriate manifolds.



direct operated types

DBE-1RS10

direct operated, solenoid operated
operating pressure max. 500 bar
volume flow max. 4,5 l/min
in-line body G 1/4"

EEPDBDS 02

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 2 l/min
cavity T-8A

EPDBD 03

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 3 l/min
cavity EPDBD 03

EPDBD 05

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 12 l/min
various cavities, degressive version available

EPDBD 05-EX acc. to ATEX-directive

direct operated, solenoid operated
operating pressure max. 250 bar
volume flow max. 12 l/min
cavity EPDBD 05

pilot operated types

EPDB 08

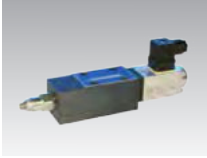
pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 80 l/min
various cavities, degressive version available

EPDBS 10

pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 150 l/min
cavity T-3A, degressive version available

Proportional Valves with large nominal size

pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 760 l/min
different versions available, suitable in-line bodies and subplates up to NG 25



pilot operated types

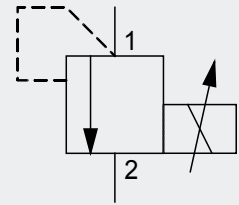
EPDZA-06

pilot operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 40 l/min
mounting plate NG 6

Proportional pressure relief valve DBE-1RS10



direct operated, solenoid operated
 operating pressure max. 500 bar
 volume flow max. 4,5 l/min
 in-line body G 1/4"



020110_DBE-1RS10_e
 03.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	3
Type code	4
Accessories and additional information	4

Characteristics

- proportional pressure relief valve in spool design
- high-pressure valve up to 500 bar
- minimum oil leakage
- maintenance-free
- rotatable and replaceable coil

Technical data

<i>Hydraulic</i>	Operating pressure max.:	500 bar (dynamic, with free return flow in port T)
	Operating pressure min.:	10 bar
	Flow rate:	4,5 l/min at differential pressure control $\Delta p = 10$ bar
	Flow direction:	1 (P) to 2 (T) (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20% to 100% of the nominal valve current

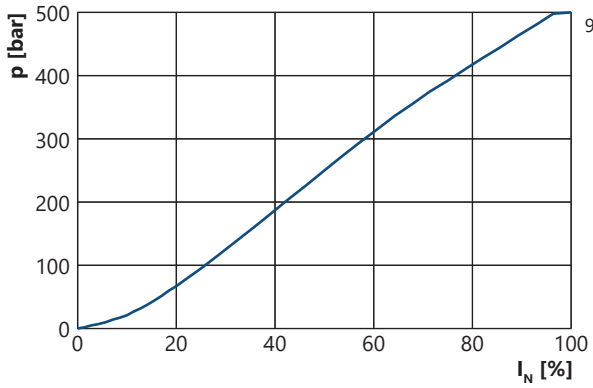
NOTE The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design :	spool valve in in-line body, direct operated by solenoid
	Size:	G 1/4"
	Fluid temperature:	-20 °C to +65 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Weight:	3,7 kg
	Material:	steel
	Surface protection:	coil: zinc coated steel in-line body: steel

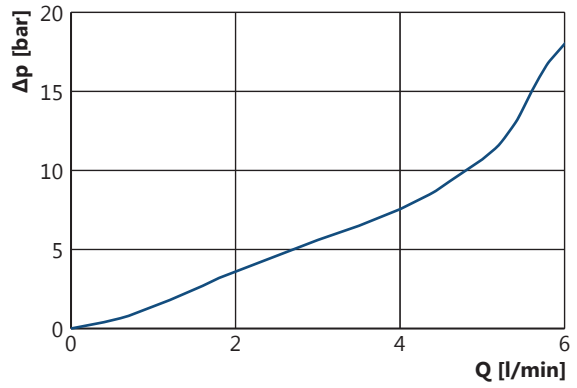
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	2,8 A (12 V), 1,4 A (24 V)
	Nominal resistance (R20):	3,2 Ω (12 V), 12,8 Ω (24 V)
	Power consumption:	35 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

Performance

Pressure drop diagram (p/I) DBE-1RS10 at Q = 1,5 l/min

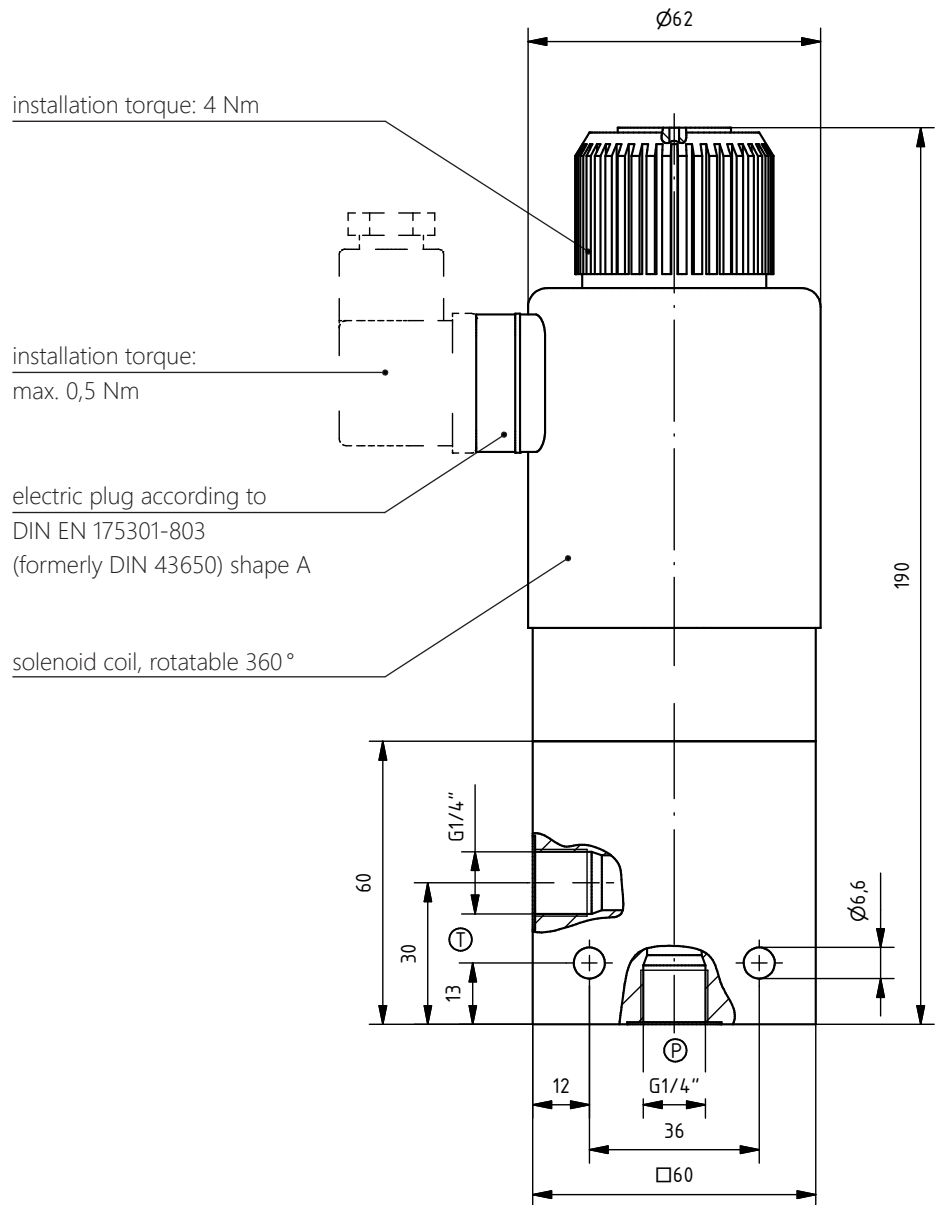


Pressure drop diagram (Δp/Q) DBE-1RS10 at I = 0 mA (currentless)

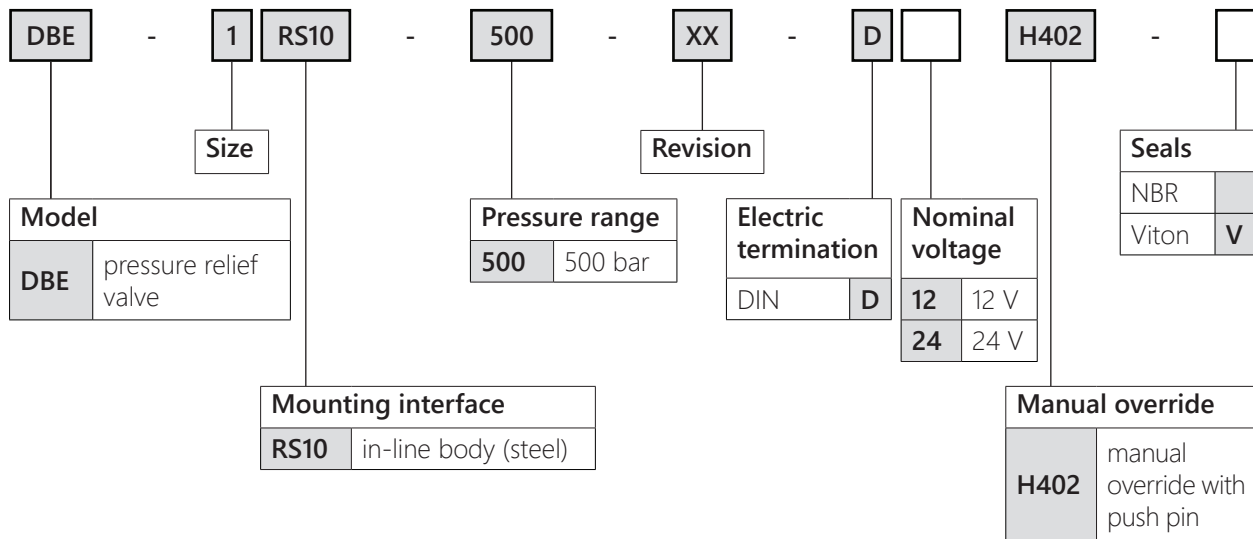


Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions



HM3/13 16 07

Type code**Accessories and additional information**

Accessories/ spare parts	Part:	Article number:
	Socket connector DIN EN 175301-803*, shape A, black	149.0007
	Coil 12 V, DIN EN 175301-803*, shape A	147.0020
	Coil 24 V, DIN EN 175301-803*, shape A	147.0019

* (formerly DIN 43650)

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

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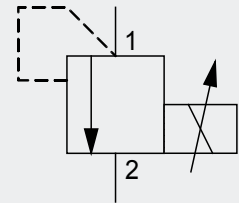
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Proportional pressure relief valve EEPDBDS 02



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 2 l/min
 cavity T-8A



020120_EPDDBDS02_e
 04.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	5
Appendix	5

Characteristics

- screw-in valve for cavity T-8A
- miniature edition (edge length of solenoid: 25 mm)
- suitable as pilot valve
- low vibration
- maintenance-free

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar (with free return flow in port 2)
	Flow rate:	see pressure drop diagram
	Flow rate min.:	0,2 l/min
	Pressure setting range:	see type code
	Flow direction:	1 to 2 (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current

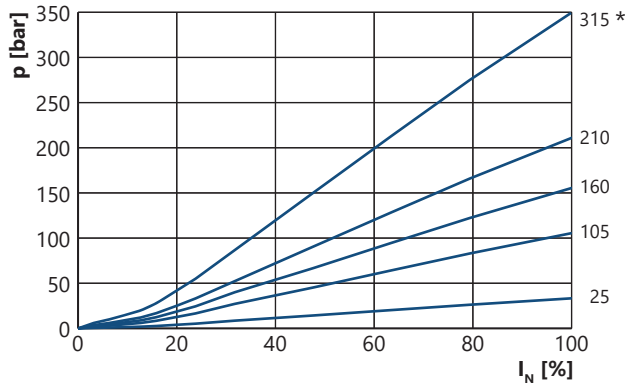
NOTE The pressure on port 2 adds directly to the set pressure. The total pressure of port 1 and 2 must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design :	screw-in valve, direct operated by solenoid
	Size:	T-8A cavity
	Fluid temperature:	-10 °C to +65 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,24 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel, partially burnished

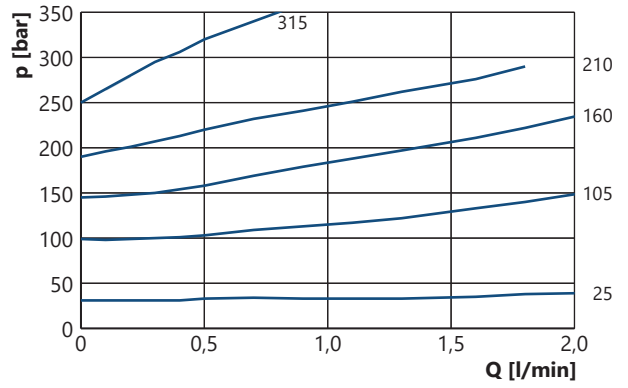
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,2 A (12 V), 0,63 A (24 V)
	Nominal resistance (R20):	6 Ω (12 V), 24 Ω (24 V)
	Power consumption max.:	9,6 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

Pressure drop diagram (p/I) EEPDBDS 02 at Q = 0,5 l/min

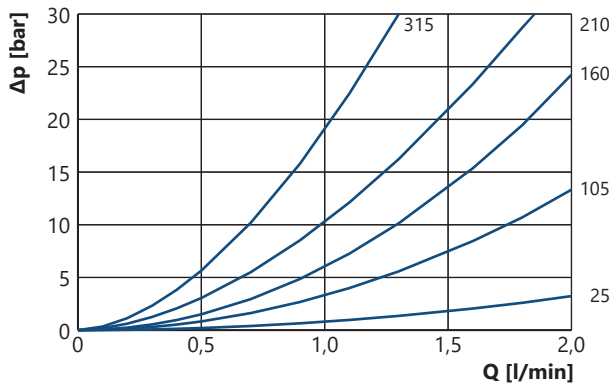


Pressure drop diagram (p/Q) EEPDBDS 02 at I_N



* The maximum operating pressure of 315 bar is not to be exceeded.

Pressure drop diagram ($\Delta p/Q$) EEPDBDS 02 at I = 0 mA (currentless)



Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

*Screw-in valve
EEPDBDS 02*

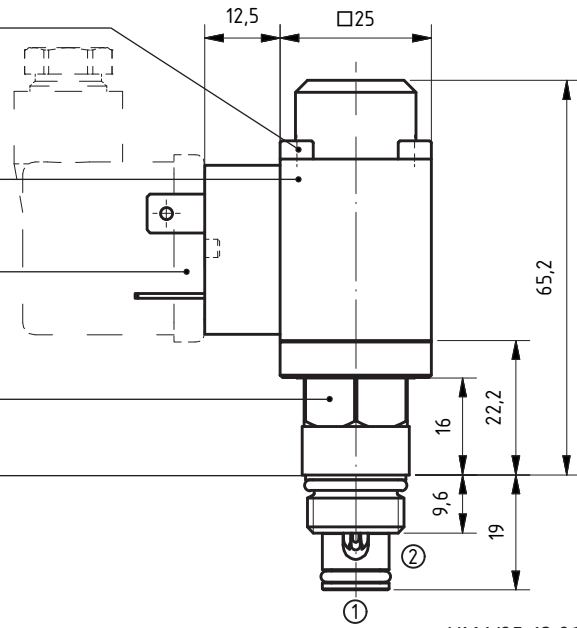
installation torque: $1,1 \pm 0,1$ Nm
SW 2,5

solenoid rotatable

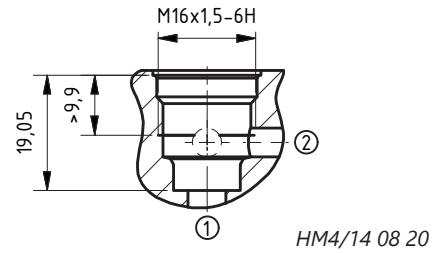
electric plug according to
DIN EN 175301-803
(formerly DIN 43650) shape B

installation torque: 35 Nm
SW 19

locating shoulder T-8A



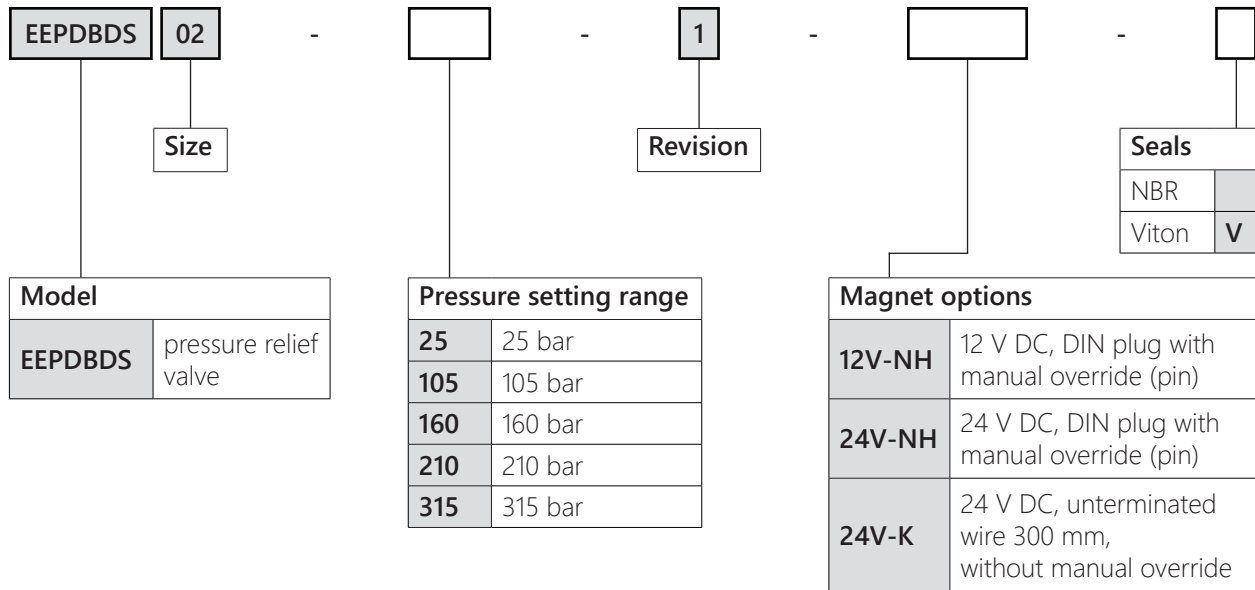
Cavity T-8A



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide a variety of suitable manifolds for T-8A. Please contact us for further assistance.

Type code



Appendix

*Accessories/
spare parts*

Part:	Material number:
Socket connector DIN EN 175301-803*, shape B, black	149.0005
Seal kit EEPDBDS 02 (NBR)	405.0072
Seal kit EEPDBDS 02 (Viton)	405.0069

* (formerly DIN 43650)

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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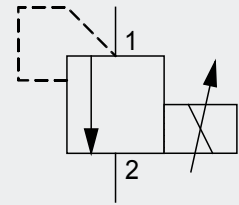
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Proportional pressure relief valve EPDBD 03



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 3 l/min
 cavity EPDBD 03



020130_EPDBD_03_e
 03.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	6
Accessories and additional information	6

Characteristics

- slip-in valve for cavity EPDBD 03
- miniature edition (edge length of solenoid: 25 mm)
- suitable as pilot valve
- low vibration
- maintenance-free

Technical data

<i>Hydraulic</i>	Operating pressure max.:	250 bar (dynamic) 315 bar (with free return flow in port 2) with aluminium in-line body max. 250 bar
	Flow rate:	2,6 l/min at Δp according to pressure drop diagrams
	Pressure setting range:	see type code
	Flow direction:	1 (P) to 2 (T) (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_{5(c)} > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20% to 100% of the nominal valve current and approximately 10 to 63 cSt

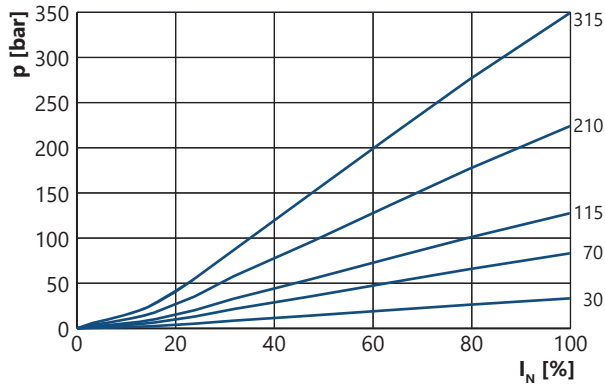
NOTE The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design :	EEPDBD slip-in valve, EPDBDR in in-line body, direct operated by solenoid
	Size:	03
	Fluid temperature:	-20 °C to +65 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably with solenoid facing down
	Weight:	EEPDBD 03: 0,24 kg EPDBDR 03: 0,34 kg
	Material:	valve parts: steel, in-line body: aluminium seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel, partially burnished in-line body: anodized aluminium

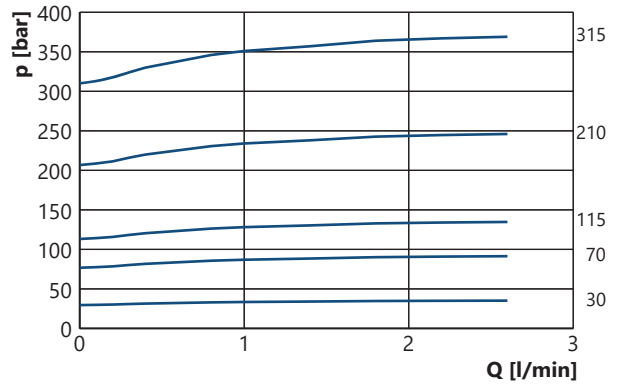
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,2 A (12 V), 0,63 A (24 V)
	Nominal resistance (R20):	6 Ω (12 V), 24 Ω (24 V)
	Power consumption:	9,6 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

Performance

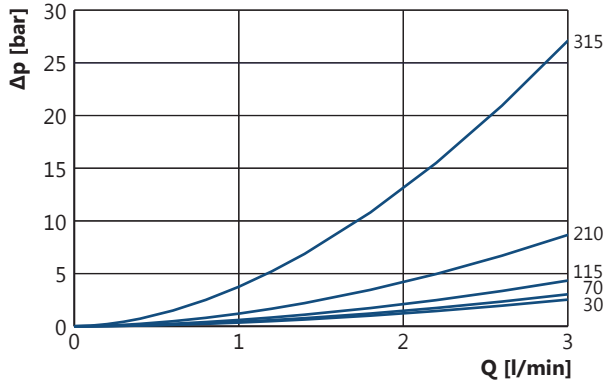
Pressure drop diagram (p/I) EEPDBD 03 at Q = 1,0 l/min



Pressure drop diagram (p/Q) EEPDBD 03 at I_N



Pressure drop diagram (Δp/Q) EEPDBD 03 at I = 0 mA (currentless)



Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.

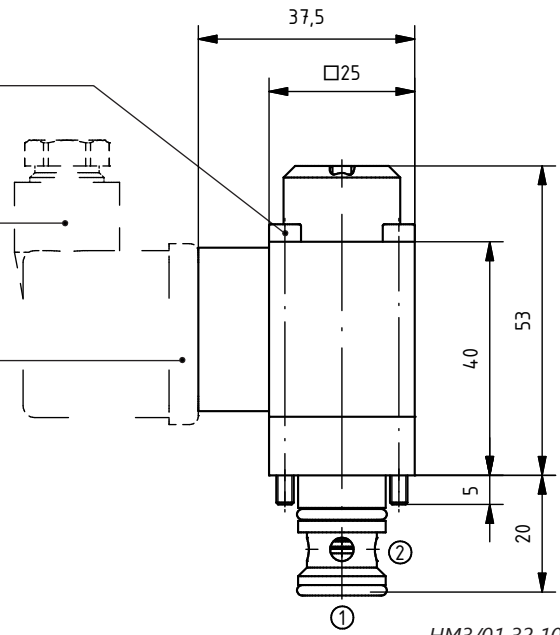
Dimensions

*Slip-in valve
EEPDBD 03*

installation torque: 1 Nm
SW 2,5

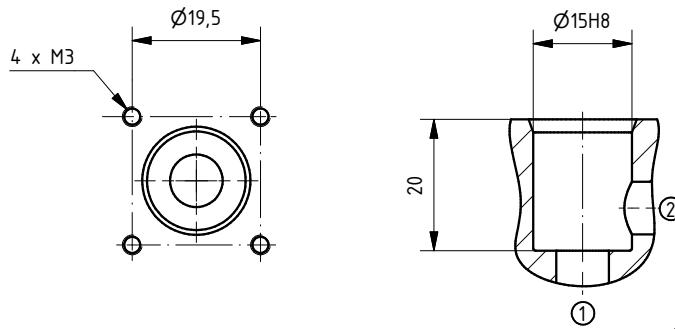
installation torque:
max. 0,5 Nm

electric plug according to
DIN EN 175301-803
(formerly DIN 43650) shape B



HM3/01 32 10

Cavity EPDBD 03



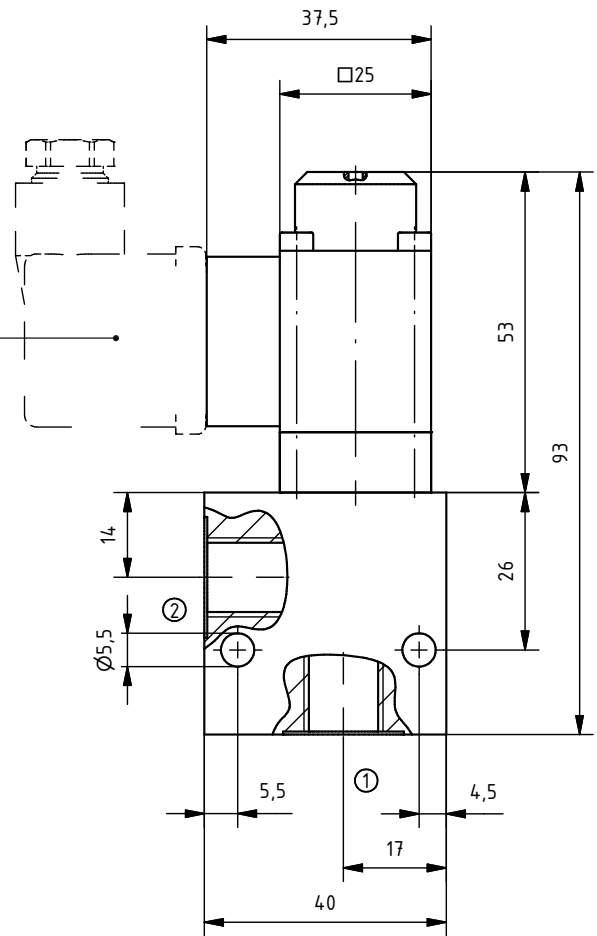
HM4/14 08 24

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Dimensions

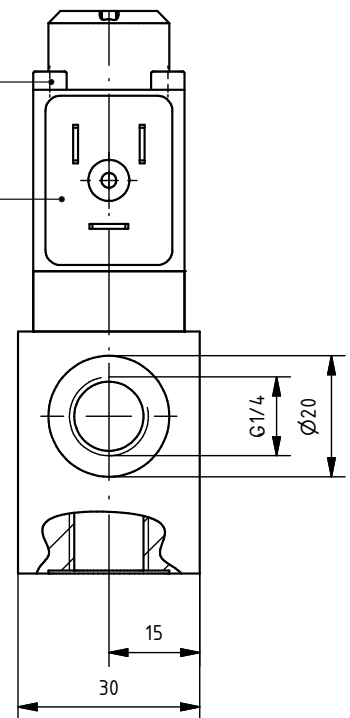
*Slip-in valve in
in-line body G 1/4"
EPDBDR 03*

installation torque:
max. 0,5 Nm



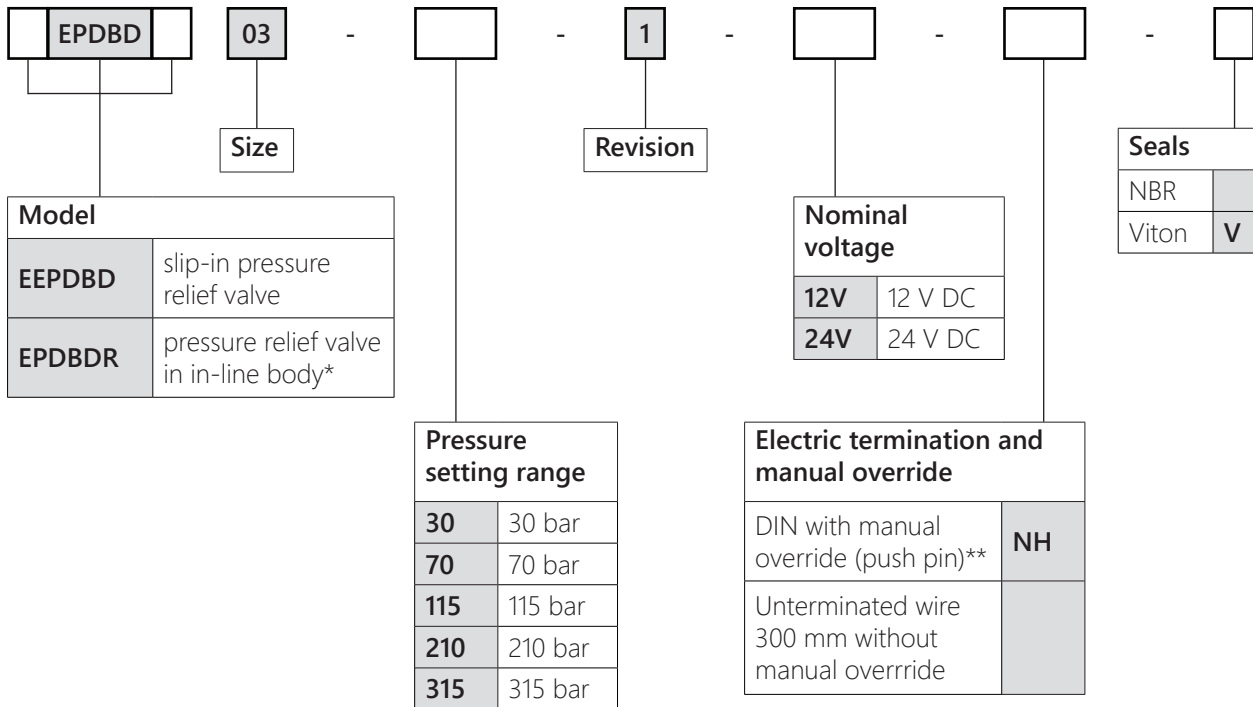
installation torque: 1 Nm
SW 2,5

electric plug according to
DIN EN 175301-803
(formerly DIN 43650) shape B



HM3/01 32 10

Type code



*In-line body up to max. 210 bar operating pressure available

**Manual override up to max. 210 bar operating pressure available

Accessories and additional information

Accessories/ spare parts	Part:	Article number:
	Socket connector DIN EN 175301-803*, shape B, black	149.0005
	Seal kit EEPDBD 03 (NBR)	405.0076
	Seal kit EEPDBD 03 (Viton)	405.0077
	* (formerly DIN 43650)	

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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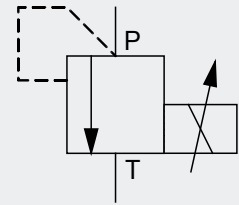
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Proportional pressure relief valve EPDBD 05



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 12 l/min
 cavity EPDBD 05 or
 cavity T-10A or C-10-2



020140_EPDBD_05_e
 07.2016

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	3
Dimensions	4
Type code	8
Appendix	9

Characteristics

- proportional pressure relief valve in spool design
- slip-in valve for cavity EEPDBD 05
- or screw-in valve for cavity T-10A
- or screw-in valve for cavity C-10-2
- suitable as pilot valve
- low vibration
- maintenance-free
- degressive versions available
- versions according to the ATEX-directive for the use in potentially explosive atmospheres available (see datasheet 020141_EPDBD_05_EX_e)

Technical Data

<i>Hydraulic</i>	Operating pressure max.:	315 bar (with free return flow in port T), for aluminium manifolds: 210 bar max. pressure at port T: 35 bar
	Flow rate:	pressure range 25-115 bar: 12 l/min pressure range 175-315 bar: 8 l/min at $\Delta p = 10$ bar
	Pressure setting range:	see type code
	Flow direction:	P to T (T to P not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PMW-signal*
	Hysteresis:	< 5 % with optimized PMW-signal*
		* at 20 % to 100 % of the nominal valve current.

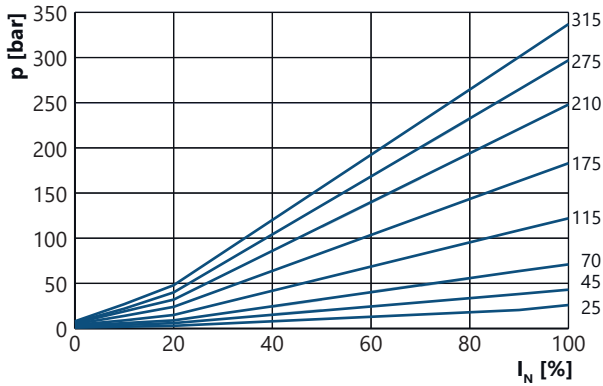
NOTE The pressure at port T adds directly to set pressure.

<i>Mechanic</i>	Design:	EEPDBD slip-in valve, EPDBDR in in-line body, ZEPDBD in sandwich body NG 6, EPDBDA in mounting plate NG 6 EEPDBDS screw-in valve T-10A EEPDBDM screw-in valve C-10-2, direct operated
	Size:	05
	Fluid temperature:	-25 °C to +70 °C
	Ambient temperature:	-25 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	EEPDBD 05: 0,7 kg, EPDBDR 05: 1,13 kg, ZEPDBD(05/06): 1,05 kg, EPDBDA (05/06): 0,99 kg EEPDBDS 05: 0,74 kg, EEPDBDM: 0,73 kg
	Material:	valve parts and in-line body: steel, sandwich body and mounting plate: aluminium; seals: NBR, optional Viton
	Surface protection:	exterior parts and in-line body: zinc coated steel, par- tially burnished, sandwich body and mounting plate: anodized aluminium

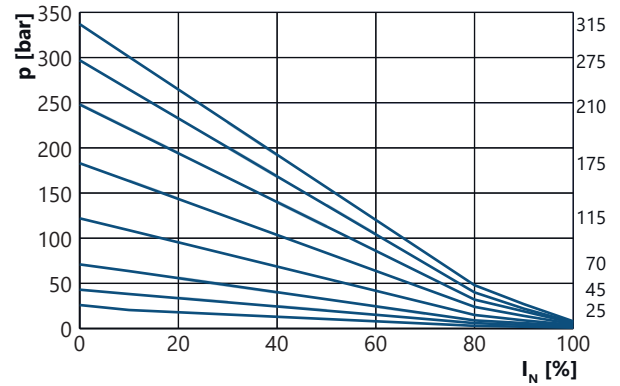
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer, unterminated wire
	Electronic controllers:	see chapter 6 "electronics and sensor technology" as well as our online catalogue at www.weber-hydraulik.com

Performance

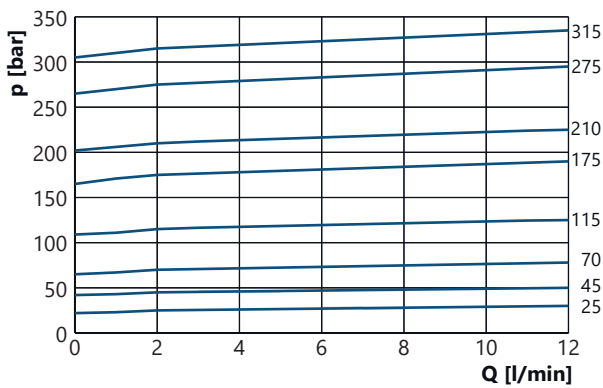
Pressure drop diagram (p/I) EPDBD 05 at Q = 0,8 l/min



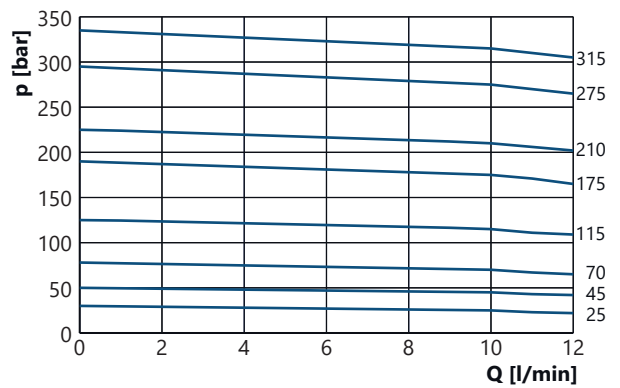
Pressure drop diagram (p/I) EPDBD 05 degressive version at Q = 0,8 l/min



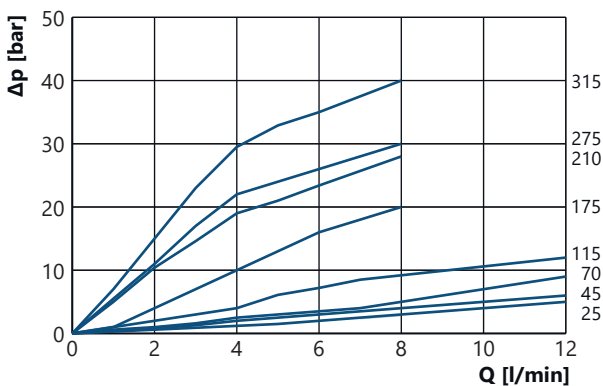
Pressure drop diagram (p/Q) EPDBD 05 at I_N



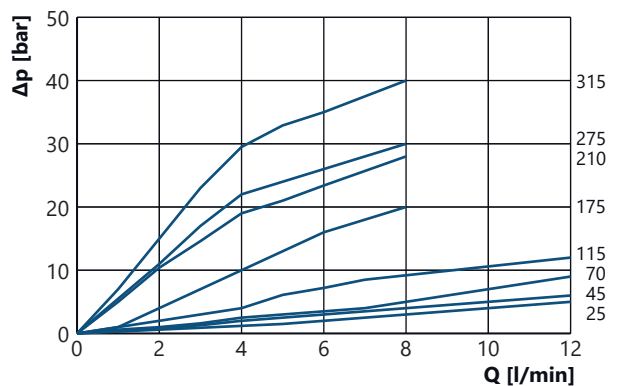
Pressure drop diagram (p/Q) EPDBD 05 degressive version at I_N



Pressure drop diagram (Δp/Q) EPDBD 05 at I = 0 mA (currentless)



Pressure drop diagram (Δp/Q) EPDBD 05 degressive version at I = 100% (full current)



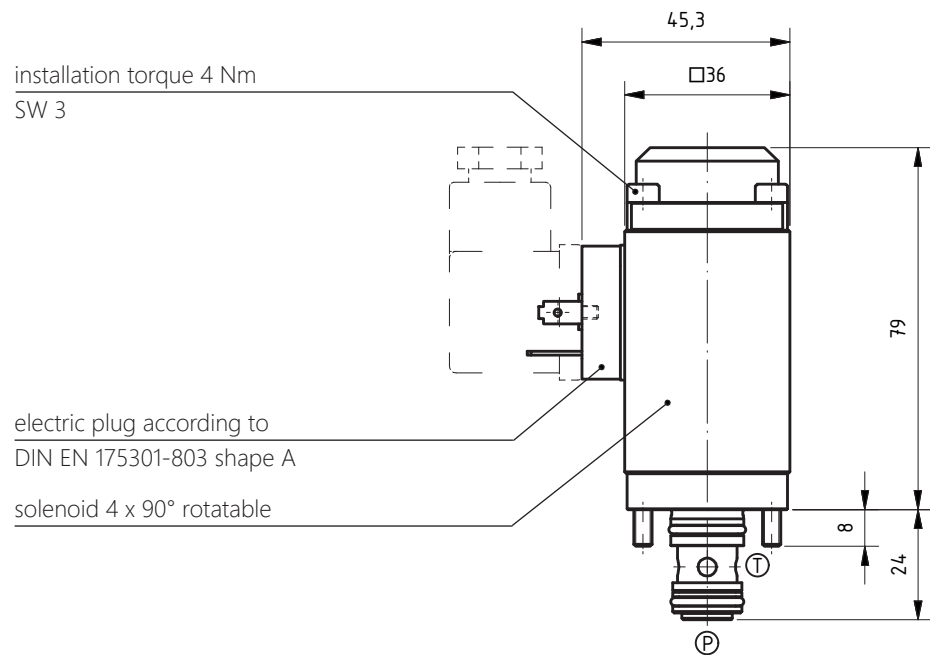
Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)

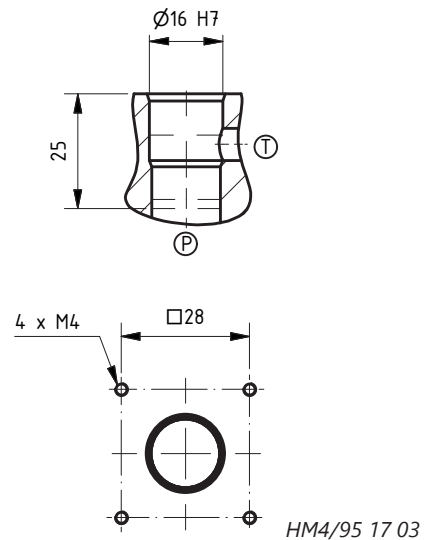
Higher volume flow and viscosity lead to higher pressure at port P. The higher the pressure setting range, the stronger this effect will be.

Dimensions

Slip-in valve
EEPDBD 05



Cavity
EEPDBD 05

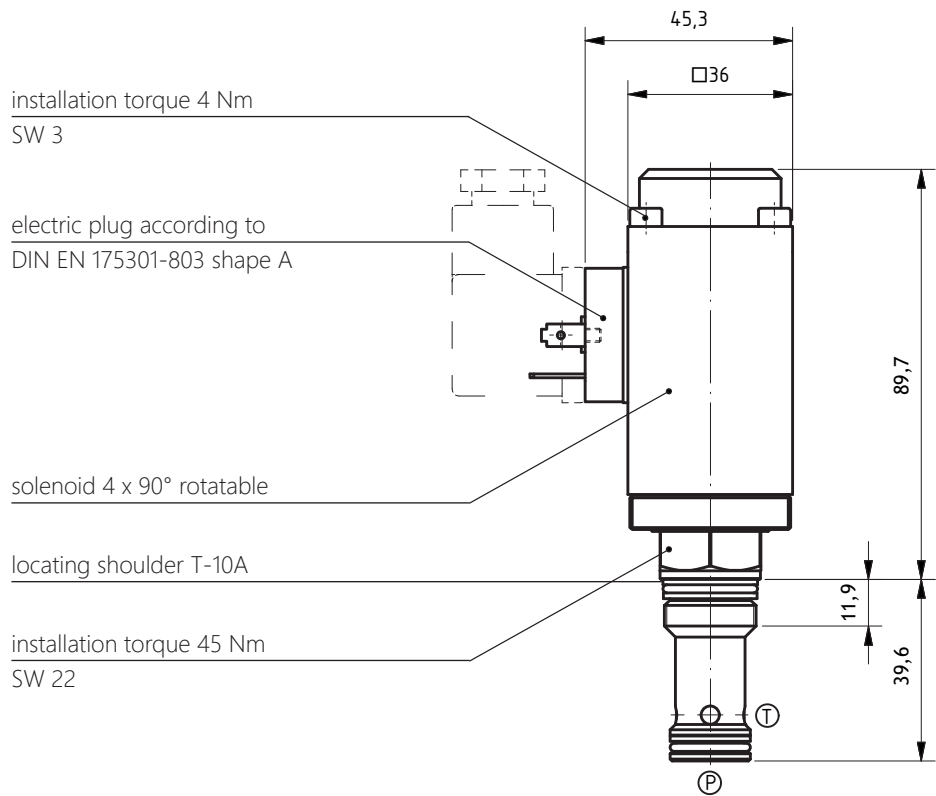


NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „*valve cavities and port patterns*“ or our online catalogue at www.weber-hydraulik.com.

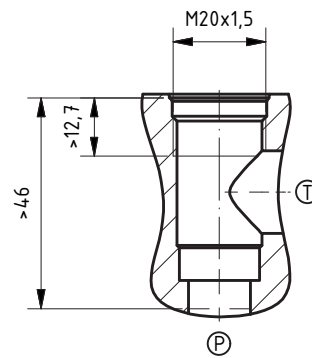
NOTE The valve is also available as EPDBDR 05 in in-line body, as ZEPDBD (05/06) in a sandwich body NG 6 and as EPDBDA (05/06) in a mounting plate NG 6. Dimension sheets are available upon request.

Dimensions

*Screw-in valve
EEPDBDS 05*



Cavity T-10A



HM4/91 42 01

NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as degressive version.

Dimensions

Screw-in valve EEPDBDM 05

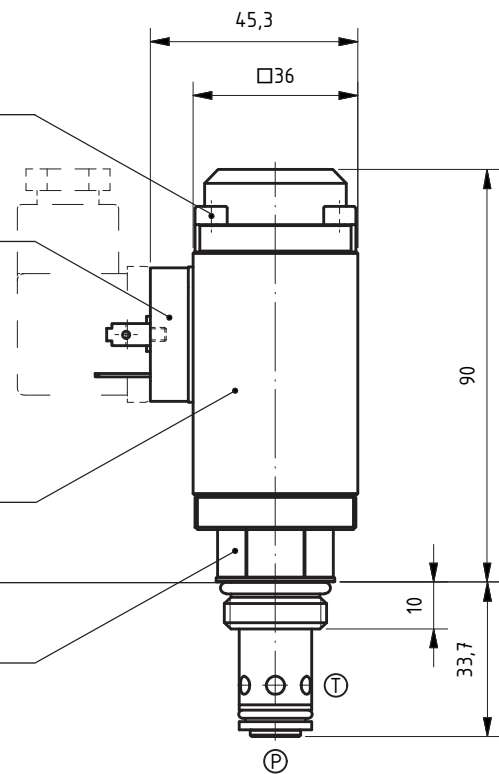
installation torque 4 Nm
SW 3

electric plug according to
DIN EN 175301-803 shape A

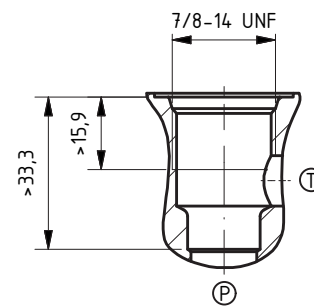
solenoid 4 x 90° rotatable

locating shoulder C-10-2

installation torque 45 Nm
SW 22



Cavity C-10-2



H4/94 47 01

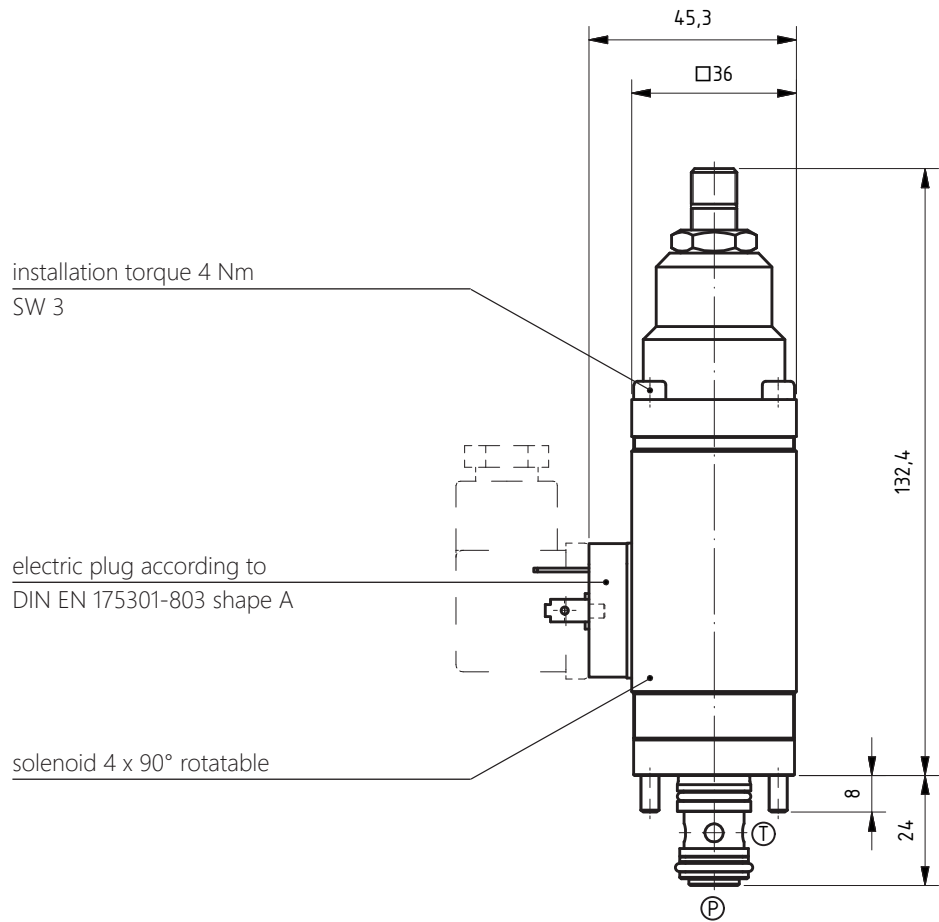
NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „*valve cavities and port patterns*“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide a variety of suitable manifolds for C-10-2. Please contact us for further assistance.

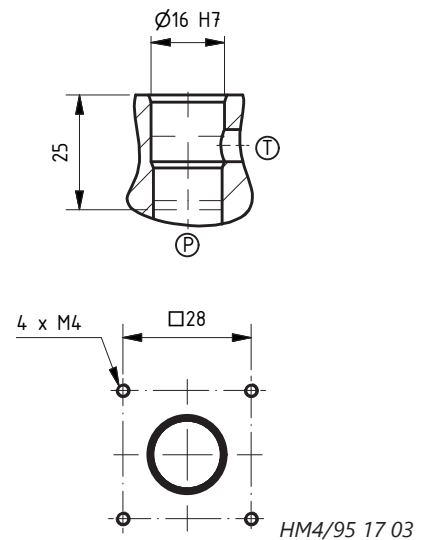
NOTE The valve is also available as degressive version.

Dimensions

*Slip-in valve
EEPDBD 05
degressive*



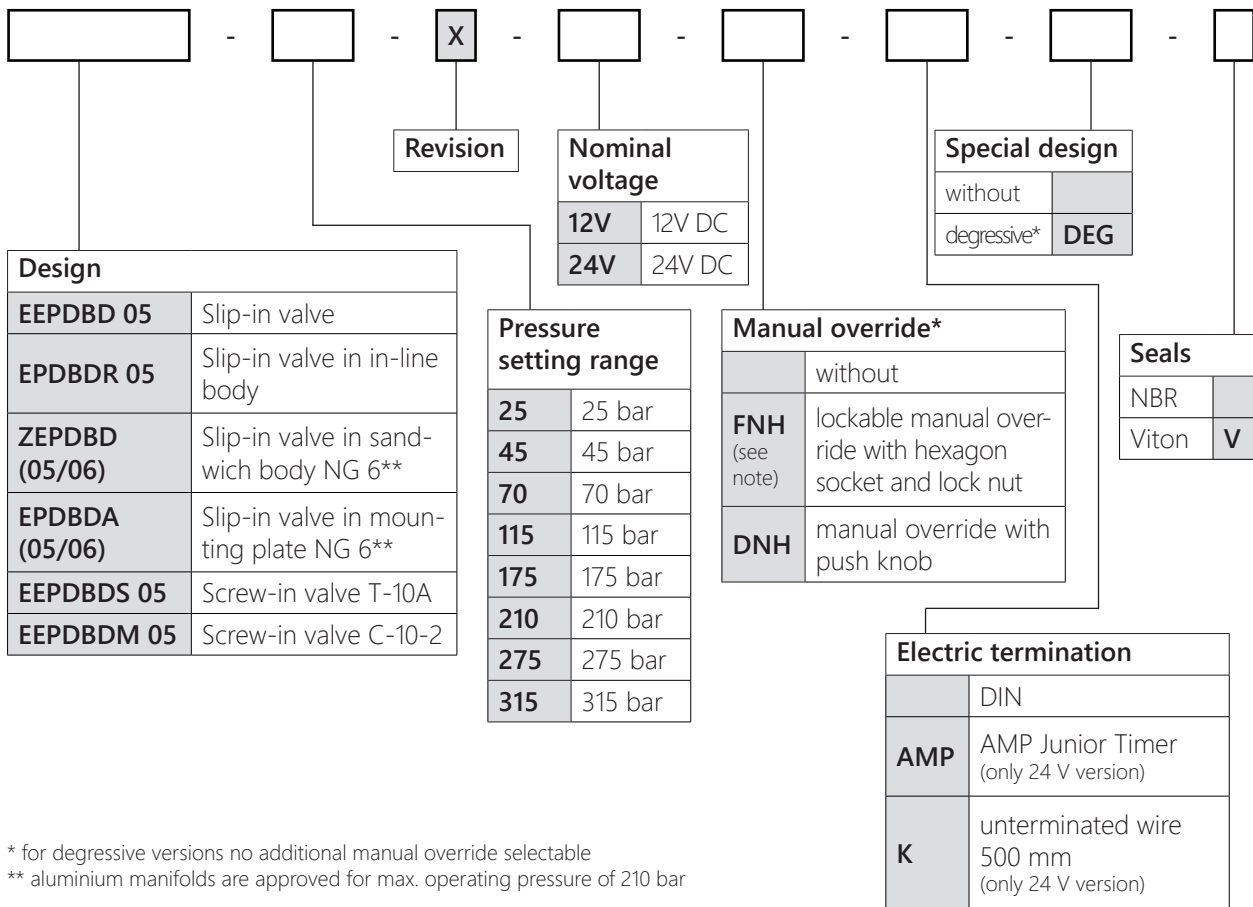
Cavity EEPDBD 05



NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.

NOTE The degressive version of the valve is also available as EEPDBDS 05 (with cavity T-10A) or as EEPDBDM 05 (with cavity C-10-2).

Type code



* for degressive versions no additional manual override selectable
 ** aluminium manifolds are approved for max. operating pressure of 210 bar

NOTE FOR FNH



The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure relief function of the valve. Be aware that the valve can not fulfil its pressure relief function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system! The application as a pressure relief valve with extended throttle function is dangerous and not suggested. All liability for doing so lies with the operator!

Appendix

<i>Accessories/ spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit EEPDBD 05 (NBR)	405.0050
	Seal kit EEPDBD 05 (Viton)	405.0051
	Seal kit T-10A (NBR)	405.0013
	Seal kit T-10A (Viton)	405.0037
	Seal kit C-10-2 (NBR)	405.0079
	Seal kit C-10-2 (Viton)	405.0080

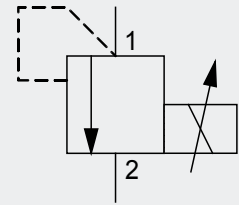
NOTE For appropriate electronic controllers, see chapter 6 „*electronics and sensor technology*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „*general operating manual*“ or will be provided upon request.

Proportional pressure relief valve EPDBD 05 acc. to ATEX-directive



direct operated, solenoid operated
 operating pressure max. 250 bar
 volume flow max. 12 l/min
 cavity EPDBD 05



020141_EPDBD_05_EX_e
 07.2017

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	3
Dimensions	3
Type code	4
Appendix	4
Set-up	5

Characteristics



- proportional pressure relief valve in spool design
- according to the ATEX-directive for the use in potentially explosive atmospheres
- slip-in valve for cavity EPDBD 05
- suitable as pilot valve
- low vibration
- maintenance-free

Technical Data


<i>Hydraulic</i>	Operating pressure max.:	250 bar (with free return flow in port 2), Tank pressure max.: 35 bar
	Flow rate:	pressure range 20-80 bar: 12 l/min pressure range 120-220 bar: 8 l/min at $\Delta p = 10$ bar
	Pressure setting range:	see type code
	Flow direction:	1 (P) to 2 (T) (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_{5(c)} > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current

NOTE The pressure at port 2 adds directly to the set pressure.

<i>Mechanic</i>	Design:	EEPDBD slip-in valve, EPDBDR in in-line body, ZEPDBD in sandwich body NG 6, EPDBDA in mounting plate NG 6, direct operated
	Size:	05
	Fluid temperature:	-30 °C to +50 °C
	Ambient temperature:	-30 °C to +50 °C
	Storage temperature:	-30 °C to +50 °C (non-condensing)
	Installation position:	any
	Weight:	EEPDBD 05: 2,7 kg, EPDBDR 05: 3,1 kg, ZEPDBD(05/06) and EPDBDA (05/06): 3,0 kg
	Material:	valve parts and in-line body: steel, sandwich body and mounting plate: aluminium; seals: NBR, optional Viton
	Surface protection:	exterior parts and in-line body: zinc coated steel, partially burnished, sandwich body and mounting plate: anodized aluminium

<i>Electric</i>	Nominal voltage:	24 V DC
	Nominal valve current:	0,6 A
	Nominal resistance (R20):	23,1 Ω
	Power consumption:	15,6 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 85 Hz (depending on application)
	Protection system:	IP67 according to IEC/EN 60529, IP69K according to DIN 40050-9 with intended assembling
	Protection class:	III according to DIN VDE 0580
	Electric termination:	15 meter connecting cable FL4G11Y 2x1,5 mm ² with explosive protection acc. to the ATEX-directive IECEx/ATEX  0637,  II 2G Ex mb IIC T4 Gb, II 2D Ex mb IIIC T130° Db in acc. with EN 60079-0:2012/IEC 60079-0:2011, EN 60079-18:2009/IEC 60079-18:2009

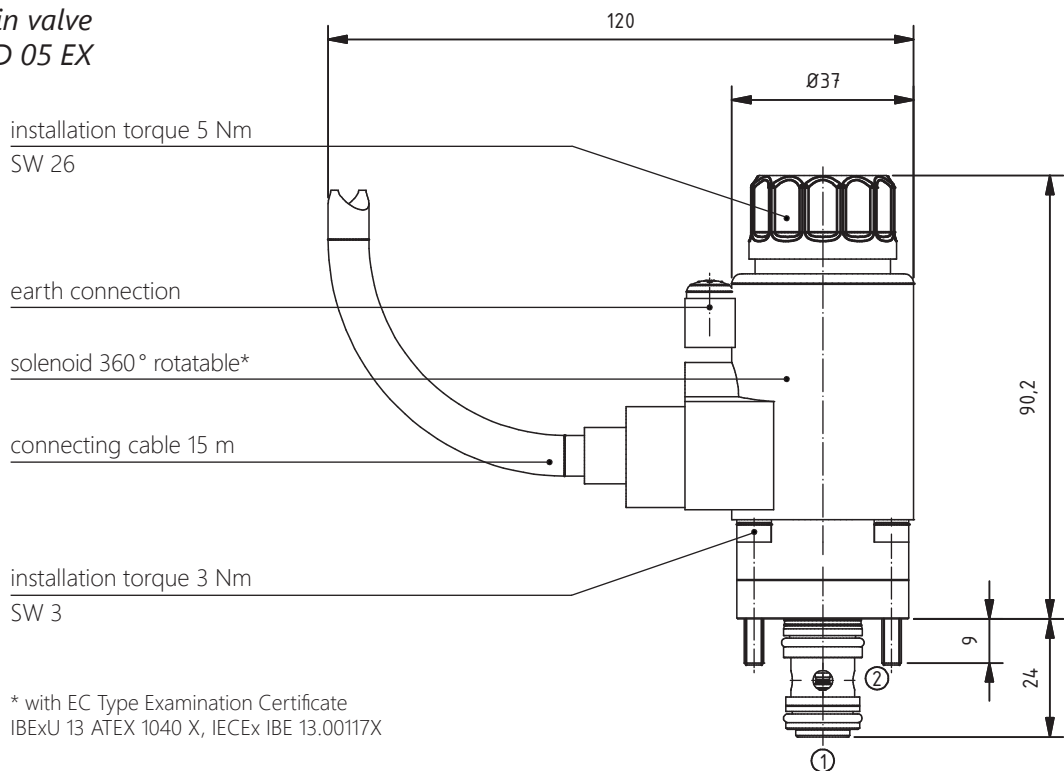
Technical Data

Electric EC Type Examination Cert.: IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X
 Electronic controllers: see chapter 6 "electronics and sensor technology" as well as our online catalogue at www.weber-hydraulik.com.
 Electronics that are used in explosion protected areas must be Ex-certified!

Performance Performance graphs upon request.

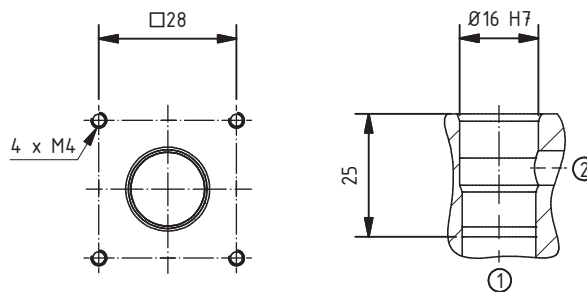
Dimensions

*Slip-in valve
EEPDBD 05 EX*



* with EC Type Examination Certificate
IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X

*Cavity
EEPDBD 05 EX*

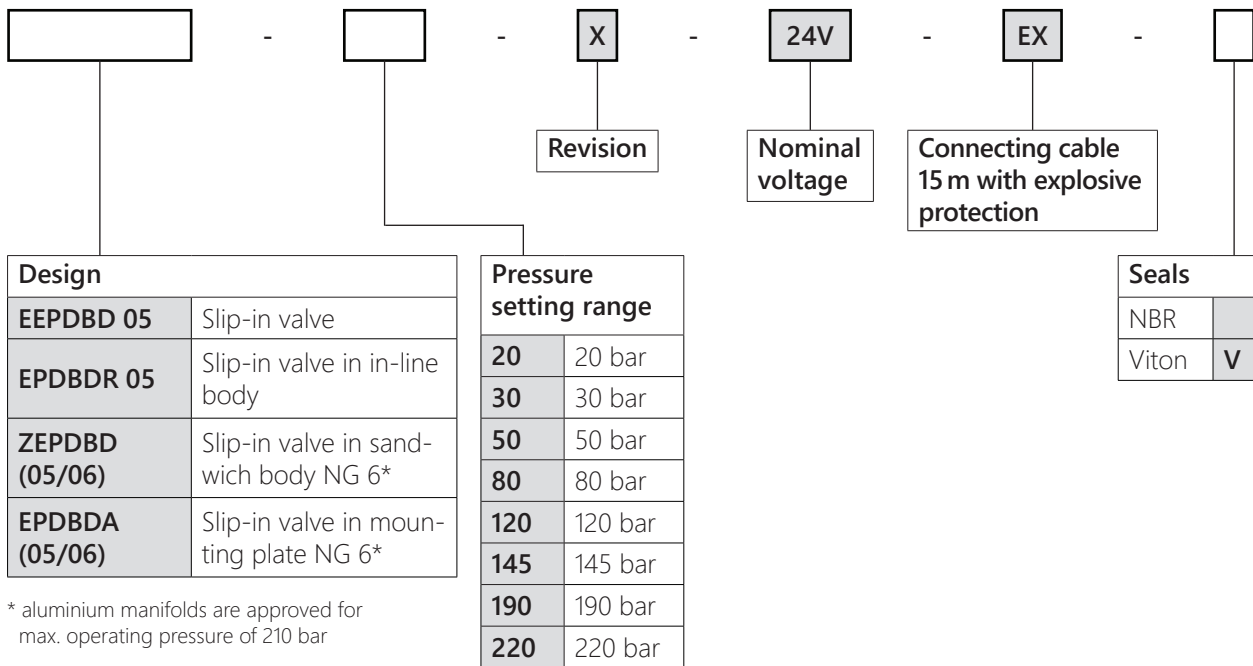


HM4/09 22 04

NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as EPDBDR 05 in in-line body, as ZEPDBD (05/06) in a sandwich body NG 6 and as EPDBDA (05/06) in a mounting plate NG 6. Dimension sheets are available upon request.

Type code



Appendix

Accessories/
spare parts

Article:

Article number:

Seal kit EEPDBD 05 (NBR)

405.0050

Seal kit EEPDBD 05 (Viton)

405.0051

NOTE



For the appropriate electronic controllers, see chapter 6 „electronics and sensor technology“ as well as our online catalogue at www.weber-hydraulik.com.

Please consider whether the electronic controller will be located inside or outside of the explosion protected area. Electronics that are used in explosion protected areas must be certified according to the ATEX-directive!

Set-up

The solenoid coil may only be operated when installed on the appropriate valve. Further information can be found in the provided operation manual of the solenoid. When operating the valve, information contained in the provided operation manual of the solenoid, as well as our general operating manual must be followed precisely!

Single or multiple mounting of the valve in single operation must have a minimum size of 46 x 46 x 66 mm and a base plate $\geq 46 \times 30 \times 66$ mm. The material must be Fe or material with the same or better thermal conductivity.

The installation of these electrical components must be carried out by an electrician with adequate qualifications.

Each solenoid must be short-circuit fuse protected suitable to its nominal valve current (max. $3 \times I_N$ according to IEC/EN 60127-2). This could, for example, be a motor protecting switch with thermal quick release and short-circuit protection (adjusted to the rated current).

The installed fuse must have a voltage rating equal or larger than the rated voltage of the solenoid, and the fuse should be installed in the associated power supply. If this is not possible, the fuse can be installed separately if the appropriate safety instructions are carefully considered.

When connecting the fuse to the circuit, it is of utmost importance to consider whether the fuse will be located inside, or outside of the explosion protected area. If the fuse will be connected to the circuit inside of the explosion protected area, then it must be mounted in an Ex-certificated terminal box.

For equipotential bonding, a ground terminal is provided on the outside of the solenoid.

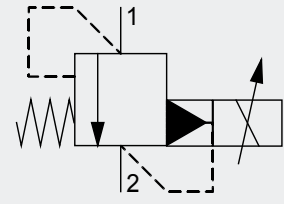
Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „*general operating manual*“ or will be provided upon request.

Proportional pressure relief valve EPDB 08



pilot operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 80 l/min
 cavity T-10A or C-10-2



020210_EPDB_08_e
 03.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	7
Accessories and additional information	8

Characteristics

- proportional pressure relief valve in spool design
- screw-in valve for cavity T-10A
- or slip-in valve for cavity C-10-2
- low vibration
- maintenance-free
- degressive version available

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar (with free return flow in port 2) with aluminium manifolds 210 bar max. pressure at port 2: 35 bar
	Flow rate:	80 l/min
	Pressure setting range	see type code
	Flow direction:	1 (P) to 2 (T) (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current

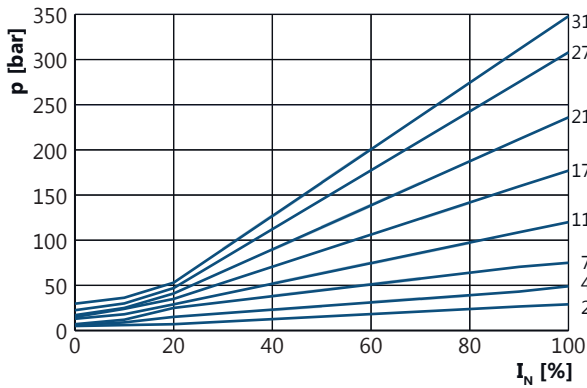
NOTE The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	EEPDBS screw-in valve T-10A or EEPDBM screw-in valve C-10-2, EPDBSA screw-in valve in mounting plate NG 6, pilot operated
	Size:	08
	Fluid temperature:	-25 °C to +70 °C
	Ambient temperature:	-25 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	EEPDBS 08 and EEPDBM 08: 0,7 kg, EPDBSA 08: 1,1 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel, partially burnished

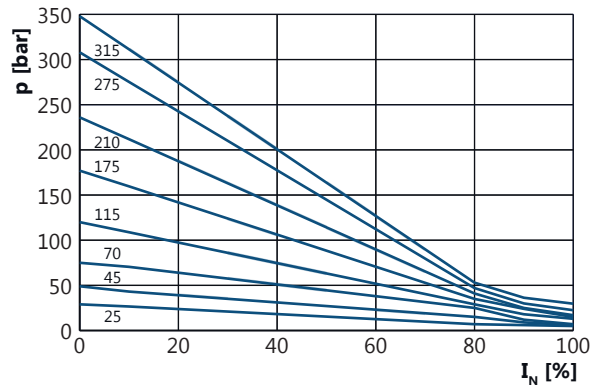
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com	

Performance

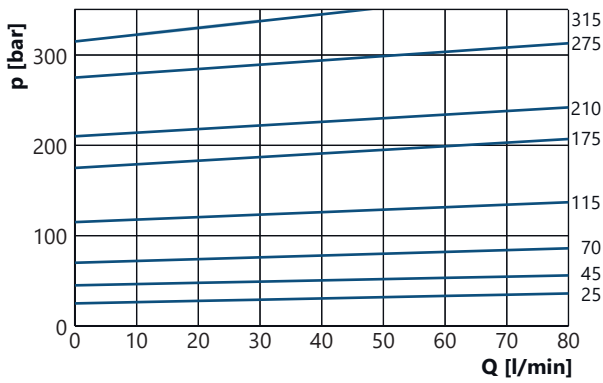
Pressure drop diagram (p/I) EEPDB 08 at Q = 20 l/min



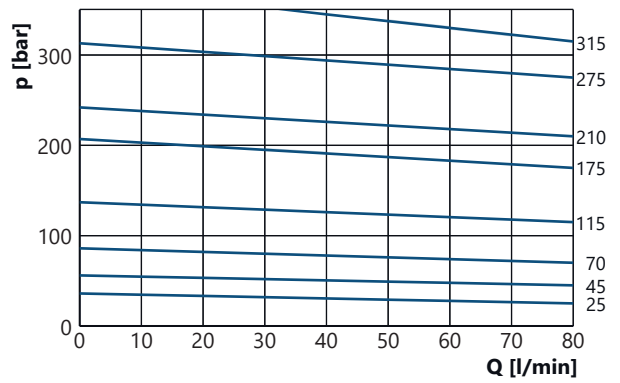
Pressure drop diagram (p/I) EEPDB 08 degressive version at Q = 20 l/min



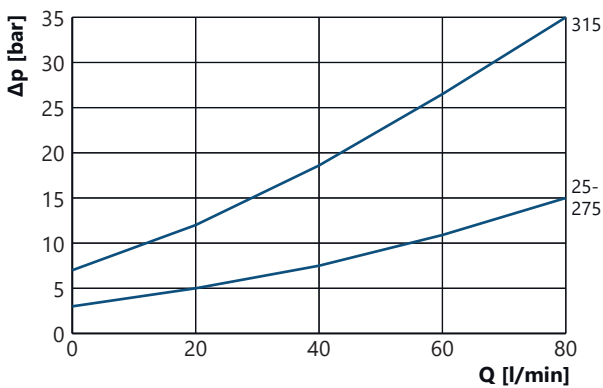
Pressure drop diagram (p/Q) EEPDB 08 at I_N



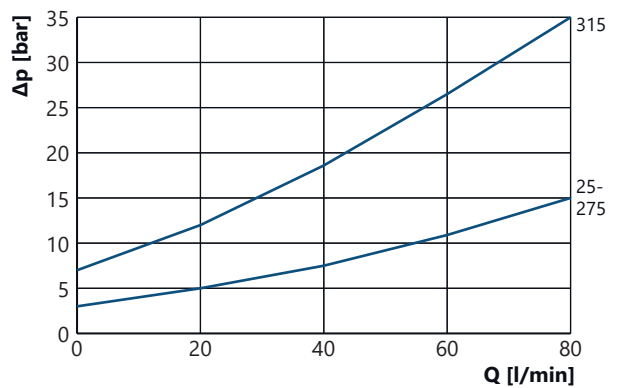
Pressure drop diagram (p/Q) EEPDB 08 degressive version at I_N



Pressure drop diagram (Δp/Q) EEPDB 08 at I = 0 mA (currentless)



Pressure drop diagram (Δp/Q) EEPDB 08 degressive version at I = 100 % (full current)

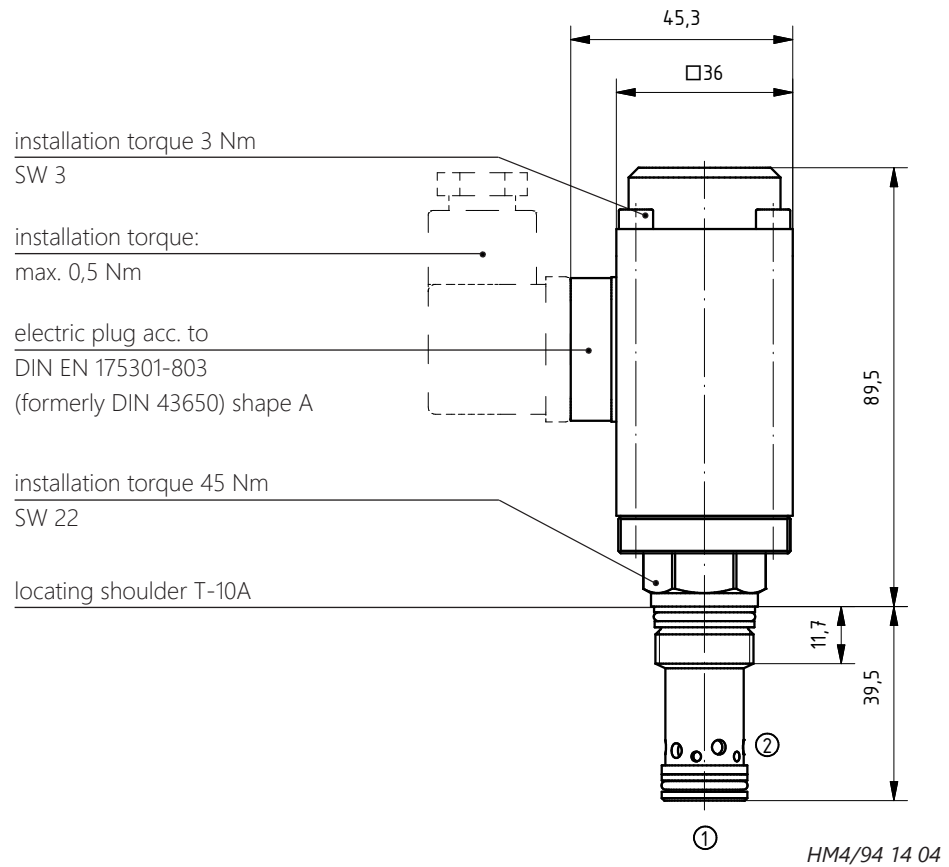


Test conditions

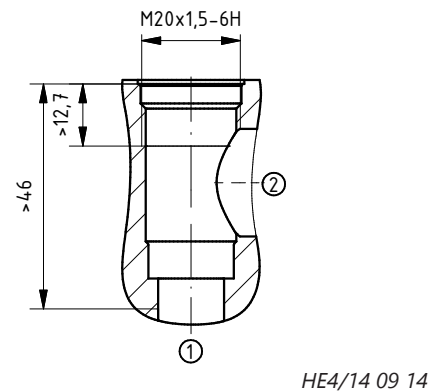
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.

Dimensions

Screw-in valve EEPDBS 08



Cavity T-10A



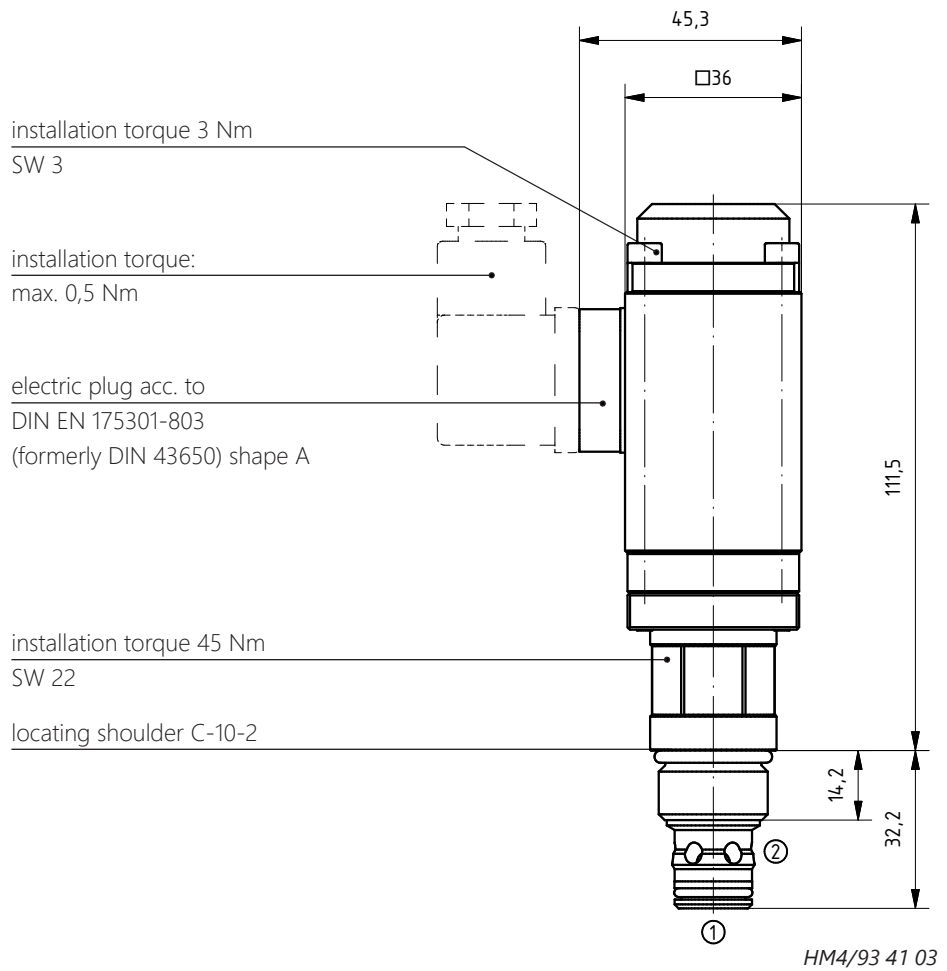
NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

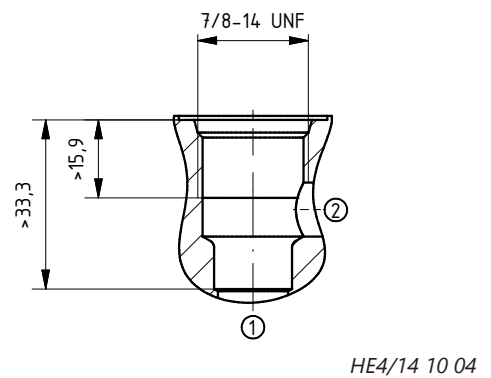
NOTE The valve is also available as EPDBSA (08/06) in a mounting plate NG 6. Please contact us for further information.

Dimensions

*Slip-in valve
EEPDBM 08*



Cavity C-10-2



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide a variety of suitable manifolds for C-10-2. Please contact us for further assistance.

Dimensions

Screw-in valve
EEPDBS 08 degressive



Do not adjust!

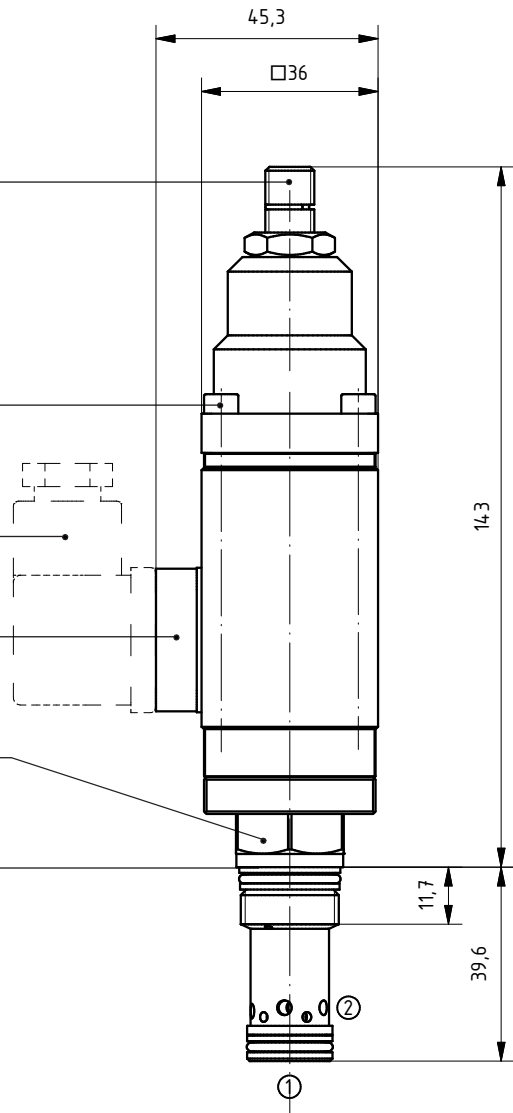
installation torque 3 Nm
SW 3

installation torque:
max. 0,5 Nm

electric plug acc. to
DIN EN 175301-803
(formerly DIN 43650) shape A

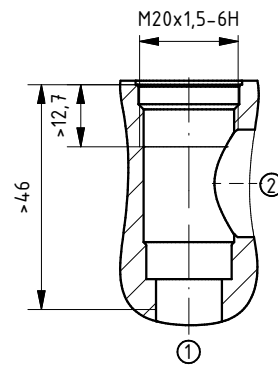
installation torque 45 Nm
SW 22

locating shoulder T-10A



Cavity T-10A

HM4/06 51 01

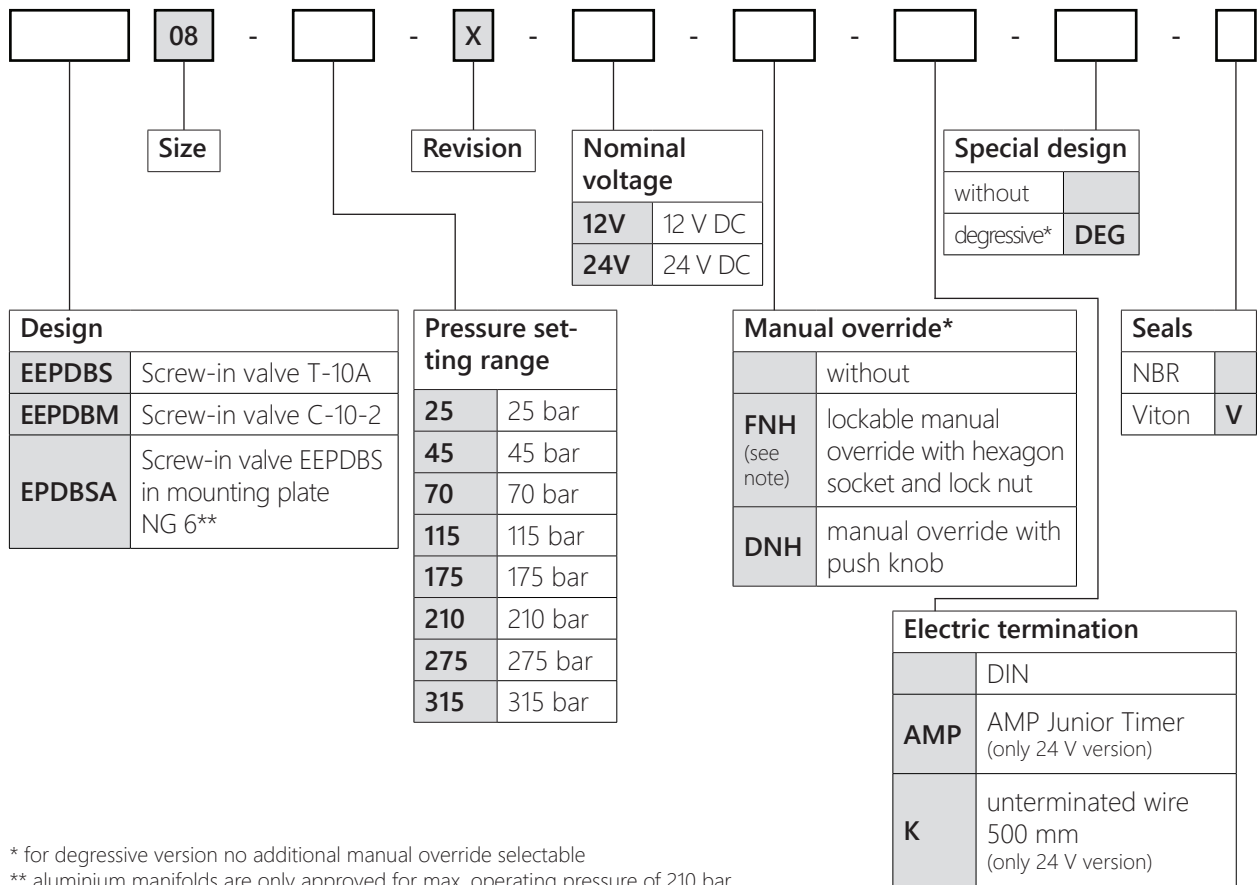


HE4/14 09 14

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

Type code



NOTE FOR FNH



The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure relief function of the valve. Be aware that the valve can not fulfil its pressure relief function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system! The application as a pressure relief valve with extended throttle function is dangerous and not suggested. All liability for doing so lies with the operator! In case the manual override FNH is screwed in to achieve a throttle function (even though this is not suggested), the reduction of the nominal valve current has to be taken into consideration.

Accessories and additional information

<i>Accessories/ spare parts</i>	Part:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit T-10A (NBR)	405.0013
	Seal kit T-10A (Viton)	405.0037
	Seal kit C-10-2 (NBR)	405.0079
	Seal kit C-10-2 (Viton)	405.0080

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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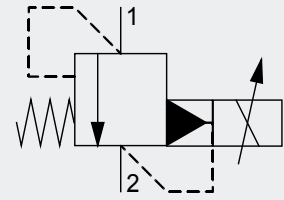
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Proportional pressure relief valve EPDBS 10



pilot operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 150 l/min
 cavity T-3A



020220_EPDBS_10_e
 06.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	6
Accessories and additional information	6

Characteristics

- proportional pressure relief valve in spool design
- screw-in valve for cavity T-3A
- low vibration
- maintenance-free
- degressive version available

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar (with free return flow in port 2) max. pressure at port 2: 35 bar
	Flow rate:	150 l/min
	Pressure setting range:	see type code
	Flow direction:	1 (P) to 2 (T) (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20% to 100% of the nominal valve current

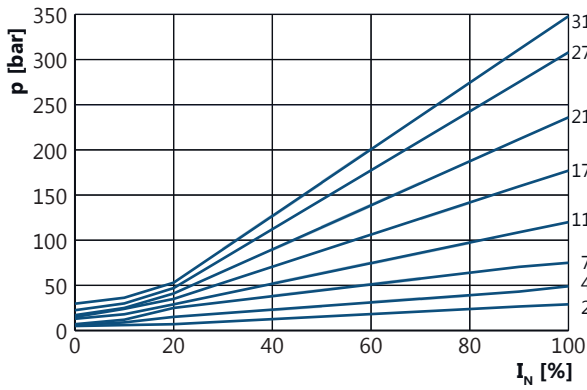
NOTE The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	EEPDBS screw-in valve T-3A, EPDBSA screw-in valve in mounting plate NG 10, pilot operated
	Size:	10
	Fluid temperature:	-25 °C to +70 °C
	Ambient temperature:	-25 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	EEPDBS 10: 0,84 kg, EPDSA 10: 1,78 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel, partially burnished

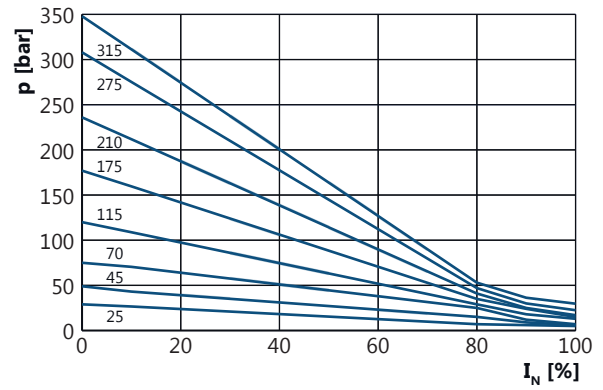
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

Performance

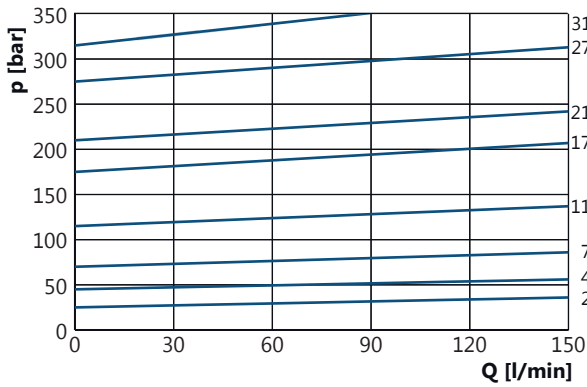
Pressure drop diagram (p/I) EPDBS 10 at Q = 35 l/min



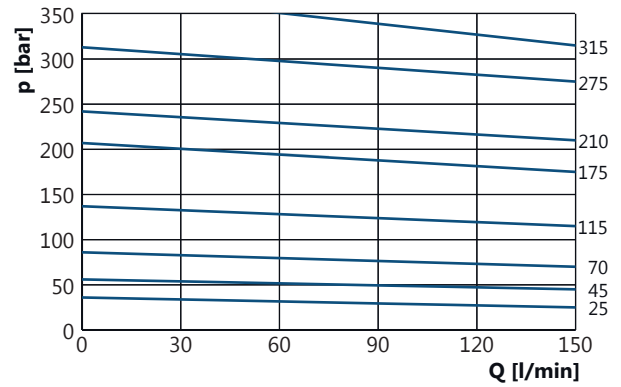
Pressure drop diagram (p/I) EPDBS 10 degressive version at Q = 35 l/min



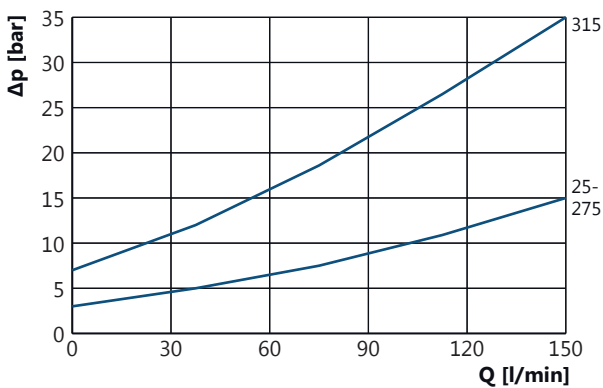
Pressure drop diagram (p/Q) EPDBS 10 at I_N



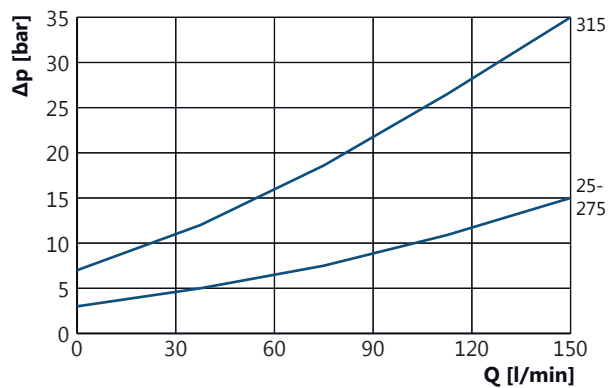
Pressure drop diagram (p/Q) EPDBS 10 degressive version at I_N



Pressure drop diagram (Δp/Q) EPDBS 10 at I = 0 mA (currentless)



Pressure drop diagram (Δp/Q) EPDBS 10 degressive version at I = 100 % (full current)

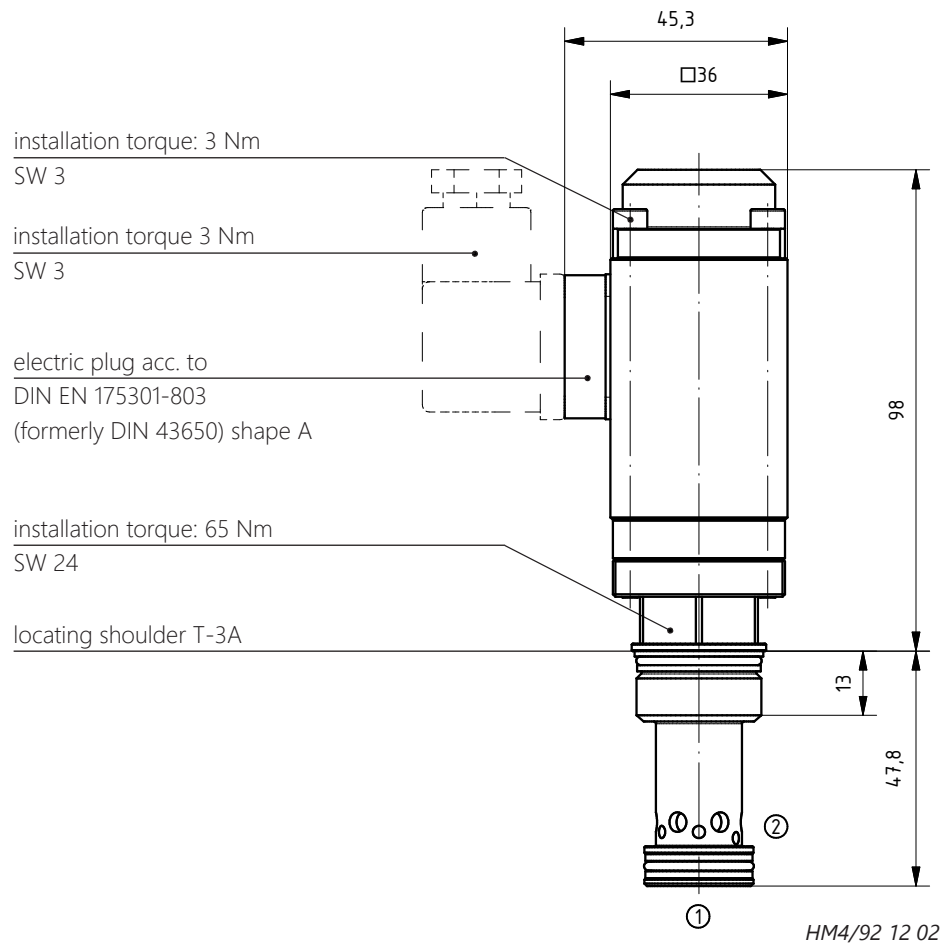


Test conditions

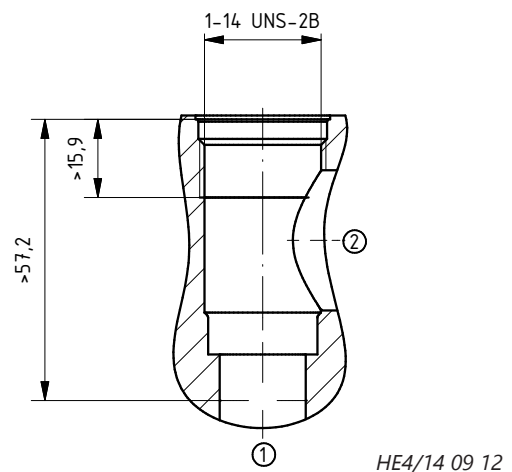
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.

Dimensions

Screw-in valve EEPDBS 10



Cavity T-3A



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as EPDBSA 10 in a mounting plate NG 10. Dimension sheets are available upon request.

Dimensions

Screw-in valve
 EPDBS 10
 degressive version



Do not adjust!

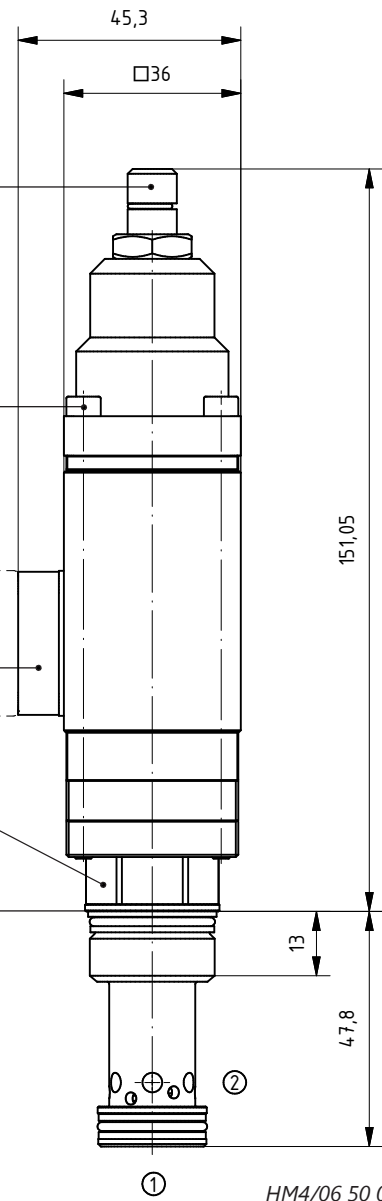
installation torque: 3 Nm
 SW 3

installation torque:
 max. 0,5 Nm

electric plug acc. to
 DIN EN 175301-803
 (formerly DIN 43650) shape A

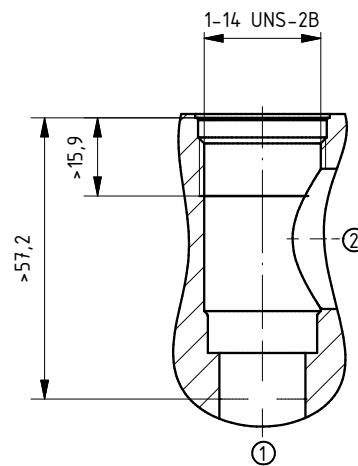
installation torque 65 Nm
 SW 24

locating shoulder T-3A



HM4/06 50 02

Cavity T-3A

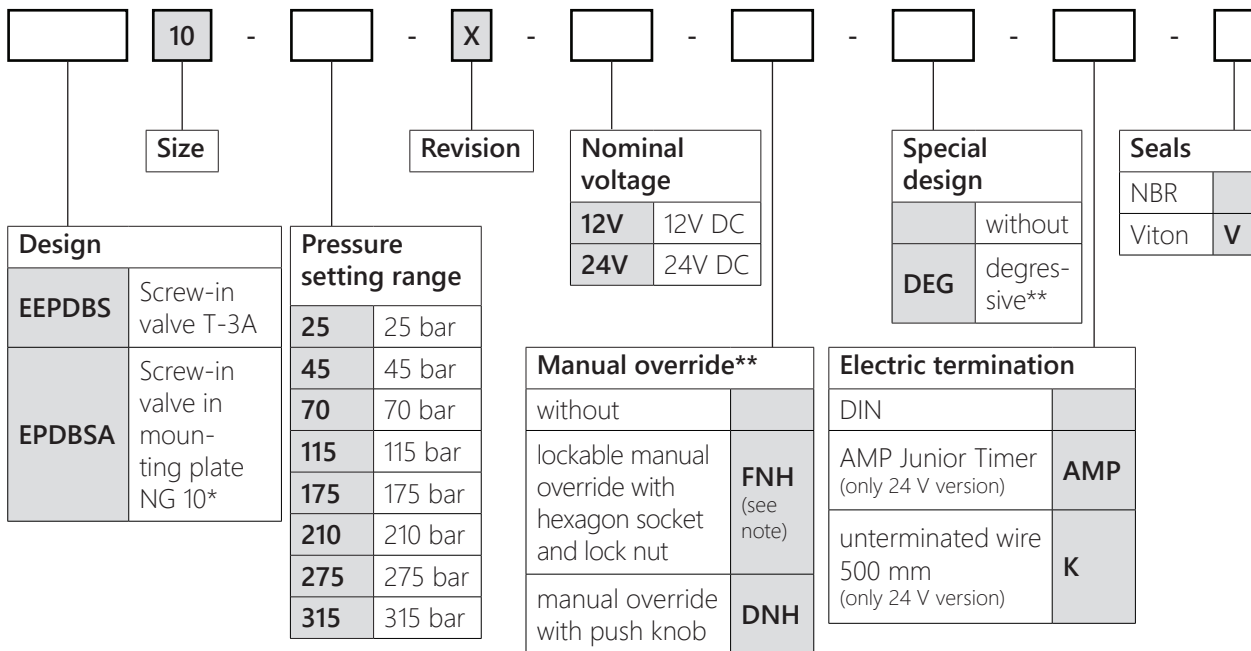


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NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

Type code



* aluminium manifolds are only approved for max. operating pressure of 210 bar

** for degressive version no additional manual override selectable

NOTE FOR FNH



The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure relief function of the valve. Be aware that the valve can not fulfil its pressure relief function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system! The application as a pressure relief valve with extended throttle function is dangerous and not suggested. All liability for doing so lies with the operator! In case the manual override FNH is screwed in to achieve a throttle function (even though this is not suggested), the reduction of the nominal valve current has to be taken into consideration.

Accessories and additional information

Accessories/ spare parts	Part:	Article number:
	Socket connector DIN EN 175301-803*, shape A, black	149.0007
	Seal kit T-3A (NBR)	405.0040
	Seal kit T-3A (Viton)	405.0041

* formerly DIN 43650

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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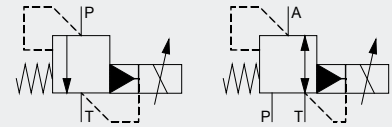
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Pilot-operated proportional valves with large nominal size



pressure relief valves
pressure control valves
pilot operated, solenoid operated
max. operating pressure 315 bar
max. volume flow 760 l/min



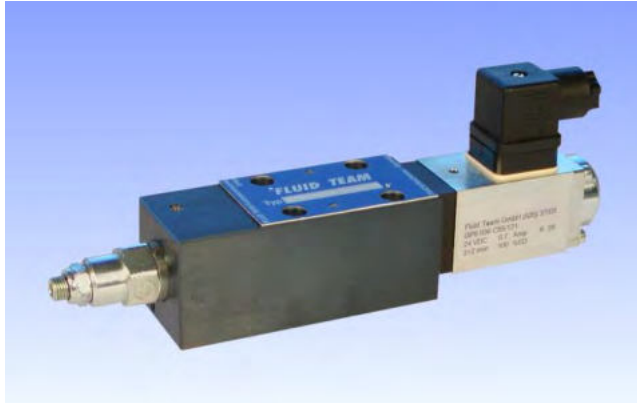
020230_Info16_25_e
07.2018

- Pilot-operated proportional pressure relief valves or pressure control valves with large nominal size
- Modular set-up out of proportional pilot valves and mechanical cartridge valves with cavities up to T-19A
- Pressure relief valves up to 760 l/min
- Pressure control valves up to 320 l/min
- Suitable in-line bodies and subplates up to NG 25
- Varied combinations with different technical characteristics possible

- We would be happy to develop with you the ideal solution for your project.

Proportional Sequence Valve EPDZA

Cover Plate CETOP/ISO 3 • max. 350 bar • max. 40 l/min



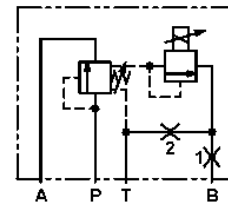
Description

The proportional sequence valve EPDZA lets the oil of P flow after A, starting from a proportionally adjustable opening pressure. If the pressure drops again, the valve closes with small hysteresis. Contrary to standard pressure relief valves the actual opening pressure remains constantly, independent of pressure fluctuations in channel A. The EPDZA consists of a mechanical pressure relief valve, which is pilot-controlled by a proportional pressure relief valve. The spring chamber of the mechanical valve is separately relieved over channel T. If the pressure fluctuations are negligible in the T-channel, the pilot flow can be led also after T (plug 1, see symbol). Otherwise it must flow off after channel B (plug 2). The valve has a mechanical maximum pressure setting. Below this setting the valve works proportionally.

Applications

- The EPDZA is used for the more exact setting of consumer or system pressures, since it is independent of pressure fluctuations of the flowing off oil.
- For clamping and brake functions, in order to guarantee that a certain pressure is given before the oil flows to further consumers.

Symbol



Technical Data

for terms and definitions see chapter 12

Hydraulic

Rated Pressure:	max. 350 bar
Rated Flow:	max. 40 l/min
Pressure Ranges:	see model code
Minimum Pressure:	see model code. Flow rate and viscosity dependently. Pressure at port T adds directly to the setting.
Fluids:	oils as per DIN 51524, others upon request
Viscosity Range:	10 – 350 cSt
Filtration:	class 18/16/13, filter β 6...10 \geq 75
Pilot Flow (from P to B):	appr. 0,15 – 0,20 l/min
Leakage (from P to T):	max. 50 ccm/min/ 100 bar/ 32 cSt
Repeatability:	< X% *
Hysteresis:	< X% *
Linearity:	< X% *

* at optimum dither signal between the 20% and 100% values of the pressure range

Mechanical

Design:	piston-sleeve style pilot operated
Ambient Temperature:	-20 °C – +50 °C
Fluid Temperature:	-20 °C – +80 °C

Installation:	no restrictions
Weight:	1,33 kg
Materials:	valve parts: steel body: aluminium seals: NBR, Viton backup rings: Teflon, PU solenoid: zinc plated ext. valve parts: zinc plated, burnished body: anodised
Surface Protection:	

Electrical

Nominal Voltage:	24 V DC; 12 V DC
Rated Current:	700 mA (24 V); 1700 mA (12 V)
Nominal Resistance (R ₂₀):	25 Ω (24 V); 4 Ω (12 V)
Wattage:	max. 20 W
Cyclic Duration Factor:	100 %
Control Command:	PWM (Pulse-Width-Modulated DC)
Dither Frequency:	preferably 140 Hz
Environmental Protection:	IP 65
Electrical Termination:	plug as per DIN 43650 form A, incl. square connector Pg9
Control Devices:	see chapter 6 'Electronic Amplifiers'

Performance

Oil: HLVP 32, temperature: 40 °C (~ 32 cSt). I= 100 % = 700 mA (24 V) or 1700 mA (12 V).
Higher oil flows and higher viscosities will cause higher pressures at port P.

Pressure vs. Current ($\Delta p/I$) at Q=

Pressure vs. Flow ($\Delta p/Q$) at max. setting

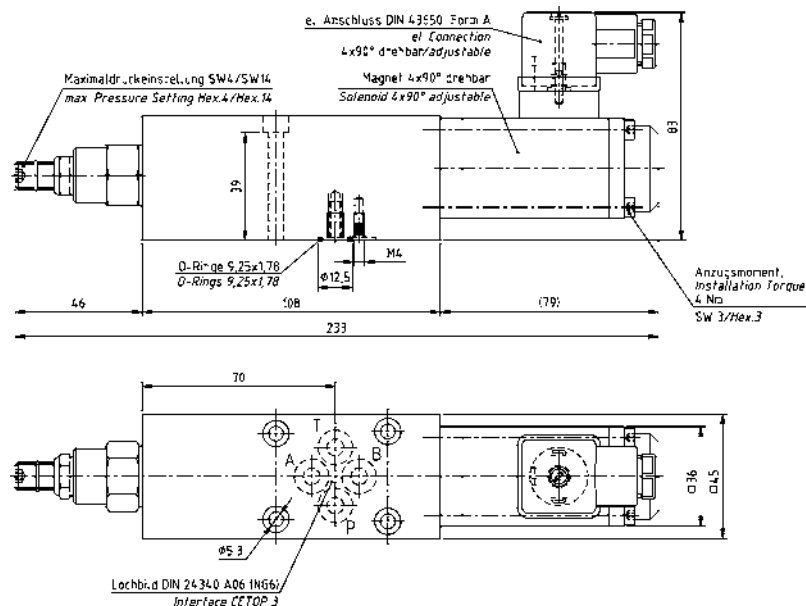
Pressure vs. Flow ($\Delta p/Q$) no current (I= 0 mA)

Leakoil from P to T ($Q/\Delta p$) below setting

Model Code

EPDZA 06	-	350	-	0	-	*	-	24V	/	*
Proportional Sequence Valve, Pilot Operated, Size 06		Pressure Range		Pilot Flow Plug		Design		Nominal Voltage		Special Executions
		350 = X - 350 bar		0 = to B and T (no plug) 1 = to T 2 = to B		(intern)		12V DC 24V DC		

Dimensions [mm]



H3-941302



direct operated types

EPDRD3-04

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 4 l/min
cavity EPDRD3-04, mounting plates NG 4 and NG 6

EPDRD3-04 acc. to ATEX-directive

direct operated, solenoid operated
operating pressure max. 250 bar
volume flow max. 4 l/min
cavity EPDRD3-04, mounting plates NG 4 and NG 6

EPDRD3-05

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 12 l/min
cavity T-11A or C-10-3, various housings

pilot operated types

EPDR3-06

pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 30 l/min
sandwich body or mounting plate NG 6

EPDR3-08

pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 40 l/min
cavity T-11A or C-10-3, various housings

EPDRS3-10

pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 80 l/min
cavity T-2A, various housings

Proportional Valves with large nominal size

pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 320 l/min
suitable in-line bodies and subplates up to NG 25

Accessories

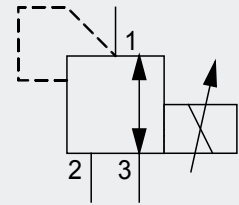
Pressure Sequence Body ZRV-06

pressure control from 0 bar
operating pressure max. 250 bar
volume flow max. 30 l/min
pressure sequence body NG 6

Proportional pressure control valve EPDRD3-04



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 4 l/min
 cavity EPDRD3-04



030110_EPDRD3_04_e
 06.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	3
Dimensions	4
Type code	8
Accessories and additional information	9

Characteristics

- 3-way proportional pressure control valve in spool design
- slip-in valve for cavity EPDRD3-04
- suitable as pilot valve
- compact design
- minimum oil leakage
- low vibration
- maintenance-free
- degressive version available
- versions according to the ATEX-directive for the use in potentially explosive atmospheres available (see datasheet 030111_EPDRD3_04_EX_e)
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)

Technical Data

<i>Hydraulic</i>	Operating pressure max.:	port 2 (P): 315 bar, with aluminium manifolds: 210 bar port 1 (A): 45 bar, pressure port 3 (T) < pressure port 1 (A)
	Flow rate:	4 l/min
	Pressure setting range:	see type code
	Flow direction:	see symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current.

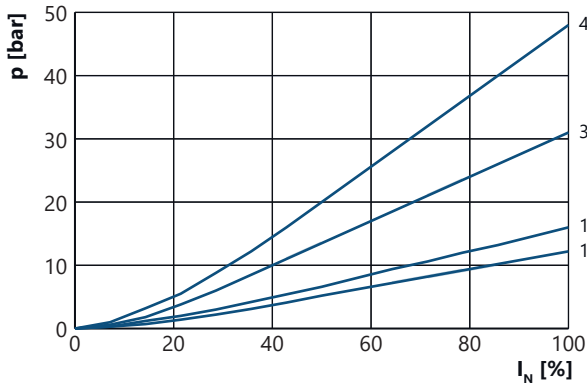
NOTE The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	EEPDRD slip-in valve, EPDRDR in in-line body, EPDRDA in mounting plate NG 4 or NG 6, direct operated
	Size:	04
	Fluid temperature:	-25 °C to +70 °C
	Ambient temperature:	-25 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Maximum acceleration:	5 g, crossways
	Weight:	EEPDRD3-04: 0,7 kg, EPDRDR3-04: 0,96 kg, DEPDRDR3-04: 1,86 kg, EPDRDA3-04/04: 0,92 kg, EPDRDA3-04/06: 0,98 kg, DEPDRDA3-04/06: 1,82 kg
	Material:	valve parts: steel, in-line body and mounting plate: aluminium; seals: NBR, optional Viton
	Surface protection:	solenoid: zinc coated steel in-line body and mounting plate: anodized aluminium

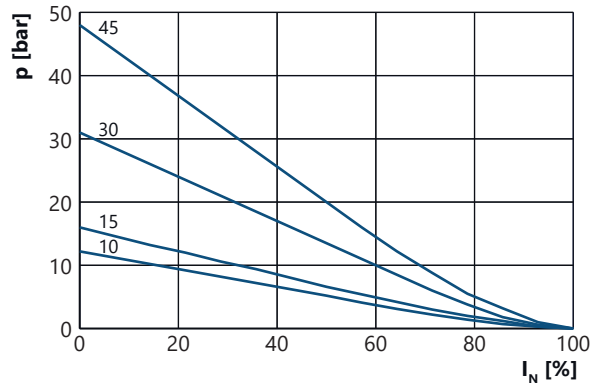
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

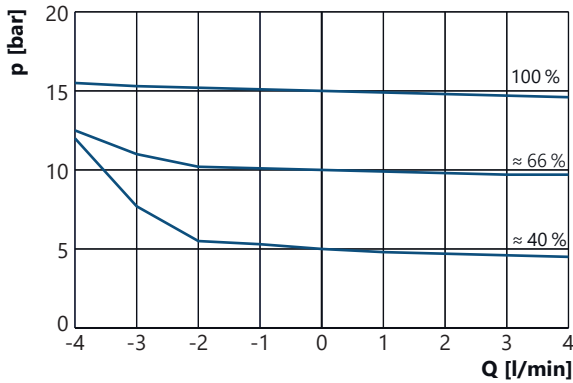
Pressure drop diagram (p/I) EPDRD3-04 at Q = 0 l/min (static)



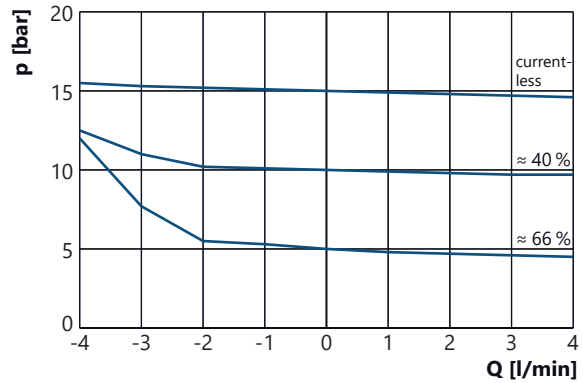
Pressure drop diagram (p/I) EPDRD3-04 degressive version at Q = 0 l/min (static)



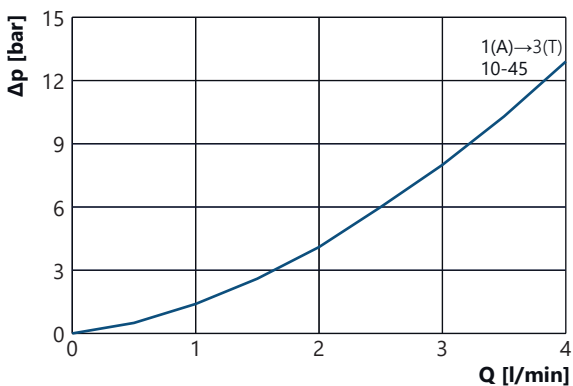
Pressure drop diagram (p/Q) EPDRD3-04 with 15 bar spool at various currents



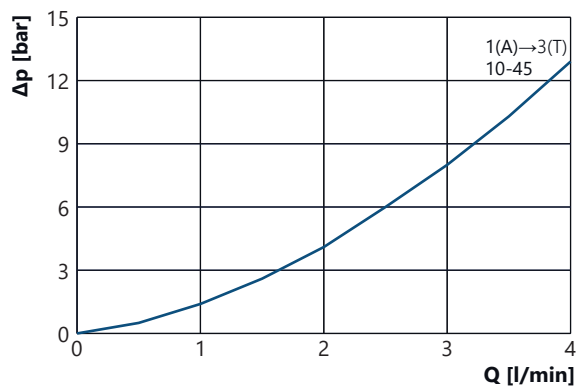
Pressure drop diagram (p/Q) EPDRD3-04 degressive version with 15 bar spool at various currents



Pressure drop diagram (Δp/Q) EPDRD3-04 at I = 0 mA (currentless)



Pressure drop diagram (Δp/Q) EPDRD3-04 degressive version at I = 100% (full current)



Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the characteristic curves.

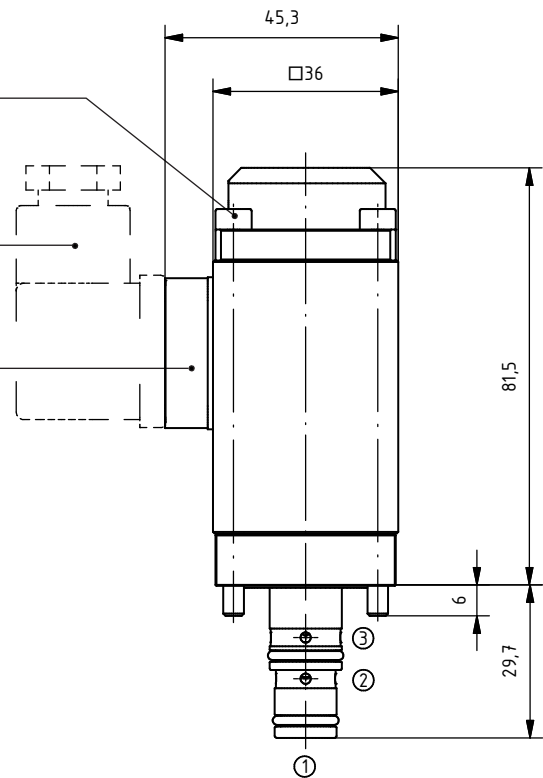
Dimensions

Slip-in valve EPDRD3-04

installation torque 3 Nm
SW 3

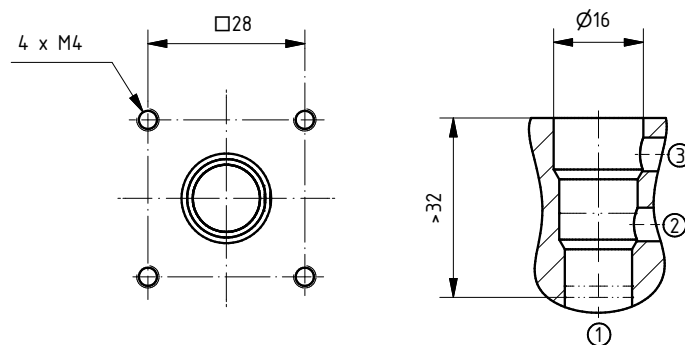
installation torque:
max. 0,5 Nm

electric plug according to
DIN EN 175301-803
shape A



HM3/90 44 04

Cavity EPDRD3-04



HE4/14 10 06

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as EPDRDA3-04/04 in a mounting plate NG 4 or as EPDRDA3-04/06 in a mounting plate NG 6. Dimension sheets are available upon request.

NOTE The valve is also available as degressive version.

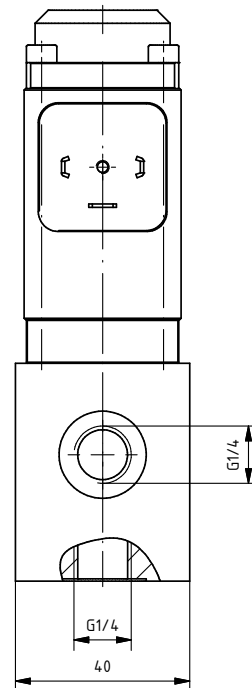
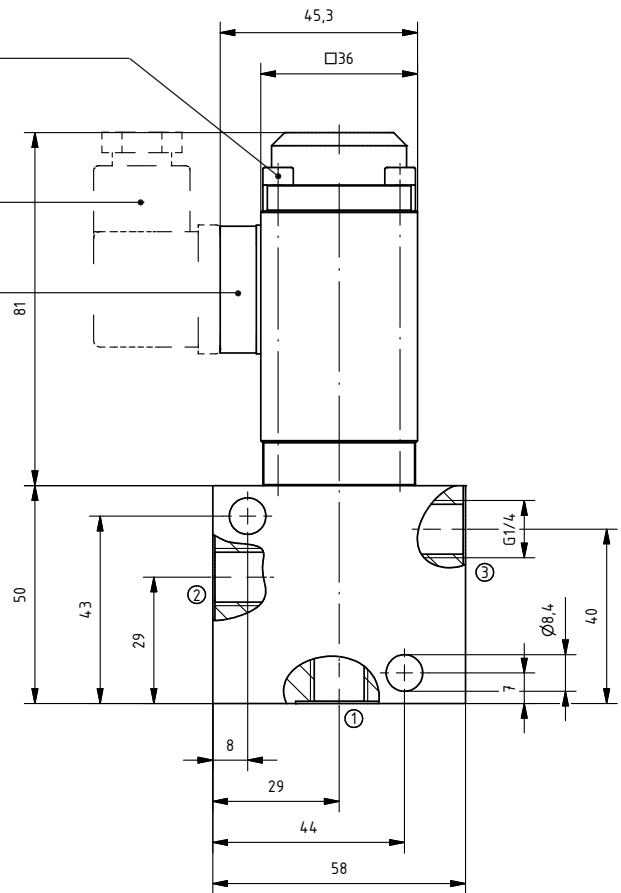
Dimensions

*Slip-in valve in
in-line body G 1/4"
EPDRDR3-04*

installation torque 3 Nm
SW 3

installation torque:
max. 0,5 Nm

electric plug according to
DIN EN 175301-803
shape A



HM3/94 39 03

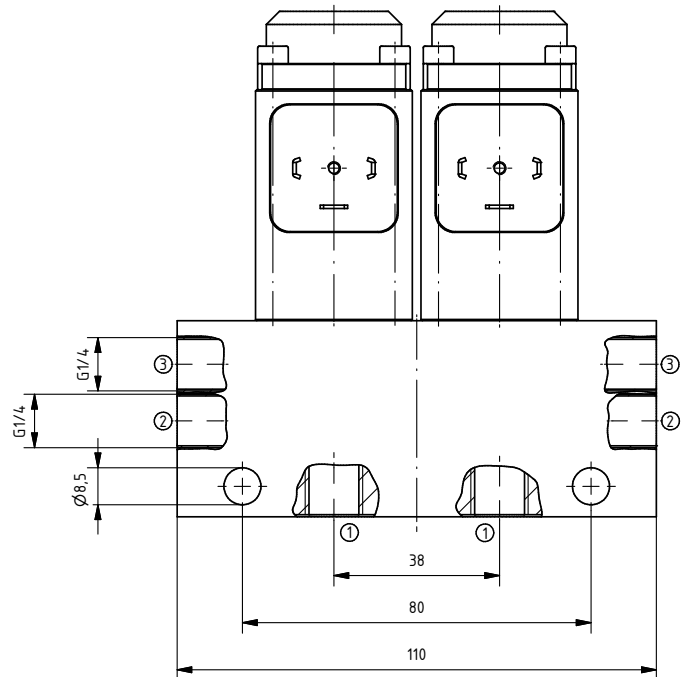
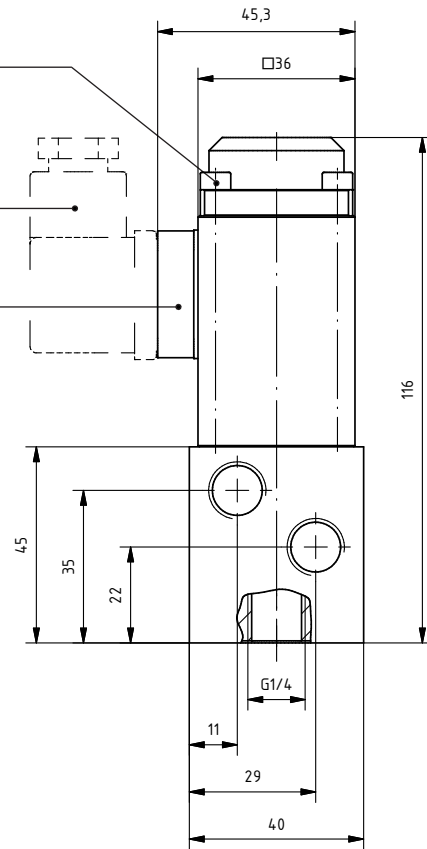
Dimensions

Two slip-in valves in
double-in-line body
G 14" DEPDRDR3-04

installation torque 3 Nm
SW 3

installation torque:
max. 0,5 Nm

electric plug according to
DIN EN 175301-803
shape A



HM4/98 35 03

Dimensions

*Slip-in valve
EEPDRD3-04
degressive*

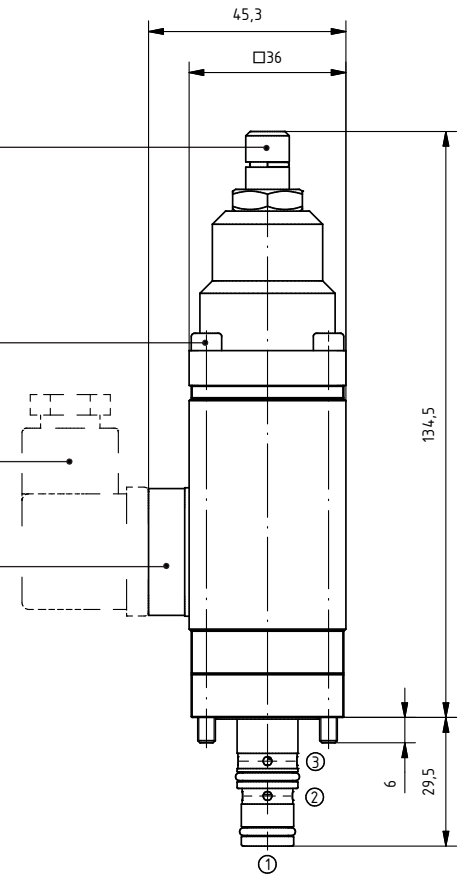


Do not adjust!

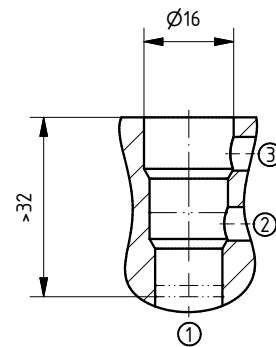
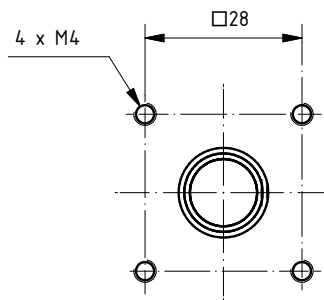
installation torque 3 Nm
SW 3

installation torque:
max. 0,5 Nm

electric plug according to
DIN EN 175301-803 shape A



HM4/12 46 04

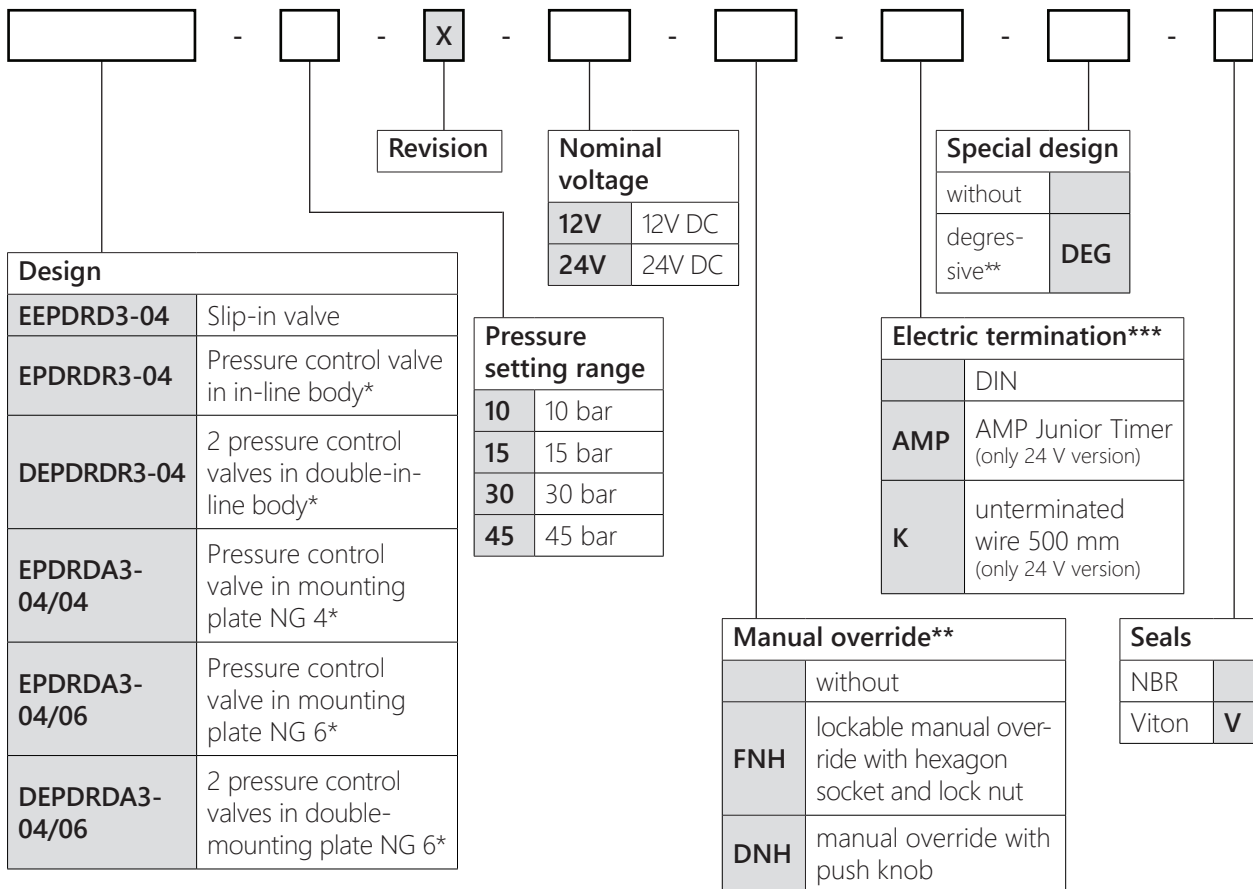


HE4/14 10 06

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as EPDRDR3-04 in an in-line body, and as EPDRDA3-04/04 in a mounting plate NG 4 or as EPDRDA3-04/06 in a mounting plate NG 6. Dimension sheets are available upon request.

Type code



* aluminium manifolds are approved for max. operating pressure of 210 bar

** for degressive versions no additional manual override selectable

*** DEUTSCH plug on request

NOTE FOR FNH



The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system!

Accessories and additional information

<i>Accessories/ spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit EEPDRD3-04 (NBR)	405.0060
	Seal kit EEPDRD3-04 (Viton)	405.0097

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



WEBER-HYDRAULIK ValveTech GmbH
 Felix-Wankel-Str. 4, 78467 Konstanz
 Phone: +49 7531 9748-0
 Fax: +49 7531 9748-44

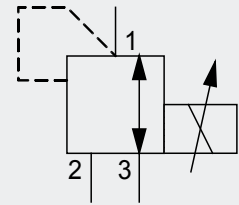
www.weber-hydraulik.com
info.de-k@weber-hydraulik.com

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Proportional pressure control valve EPDRD3-04 acc. to ATEX-directive



direct operated, solenoid operated
 operating pressure max. 250 bar
 volume flow max. 4 l/min
 cavity EPDRD3-04



030111_EPDRD3_04_EX_e
 07.2018

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	3
Dimensions	3
Type code	4
Accessories and additional information	4
Set-up	5

Characteristics



- 3-way proportional pressure control valve in spool design
- according to the ATEX-directive for the use in potentially explosive atmospheres
- slip-in valve for cavity EPDRD3-04
- suitable as pilot valve
- compact design
- minimum oil leakage
- low vibration
- maintenance-free
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)

Technical Data

<i>Hydraulic</i>	Operating pressure max.:	port 2 (P): 250 bar, with aluminium manifolds: 210 bar port 1 (A): 45 bar, pressure port 3 (T) < pressure port 1 (A)
	Flow rate:	4 l/min
	Pressure setting range:	see type code
	Flow direction:	see symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20% to 100% of the nominal valve current

NOTE The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	EEPDRD slip-in valve, EPDRDR in in-line body, EPDRDA in mounting plate NG 4 or NG 6, direct operated
	Size:	04
	Fluid temperature:	-30 °C to +50 °C
	Ambient temperature:	-30 °C to +50 °C
	Storage temperature:	-30 °C to +50 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Maximum acceleration:	5 g, crossways
	Weight:	EEPDRD3-04: 2,7 kg, EPDRDR3-04: 2,96 kg, DEPDRDR3-04: 3,86 kg, EPDRDA3-04/04: 1,92 kg, EPDRDA3-04/06: 1,98 kg, DEPDRDA3-04/06: 3,82 kg
	Material:	valve parts: steel, in-line body and mounting plate: aluminium; seals: NBR, optional Viton
	Surface protection:	solenoid: zinc coated steel, partially burnished, in-line body and mounting plate: anodized aluminium

<i>Electric</i>	Nominal voltage:	24 V DC
	Nominal valve current:	0,6 A
	Nominal resistance (R20):	23,1 Ω
	Power consumption:	15,6 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 85 Hz (depending on application)
	Protection system:	IP67 according to IEC/EN 60529, IP69K according to DIN 40050-9 with intended assembling
	Protection class:	III according to DIN VDE 0580
	Electric termination:	15 meter connecting cable FL4G11Y 2x1,5 mm ² with explosive protection acc. to the ATEX-directive IECEx/ATEX  0637,  II 2G Ex mb IIC T4 Gb, II 2D Ex mb IIC T130° Db in acc. with EN 60079-0:2012/ IEC 60079-0:2011, EN 60079-18:2009/ IEC 60079-18:2009

Technical Data

Electric EC Type Examination Cert.: IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X

Electronic controllers: see chapter 6 *“electronics and sensors”* as well as our online catalogue at www.weber-hydraulik.com.



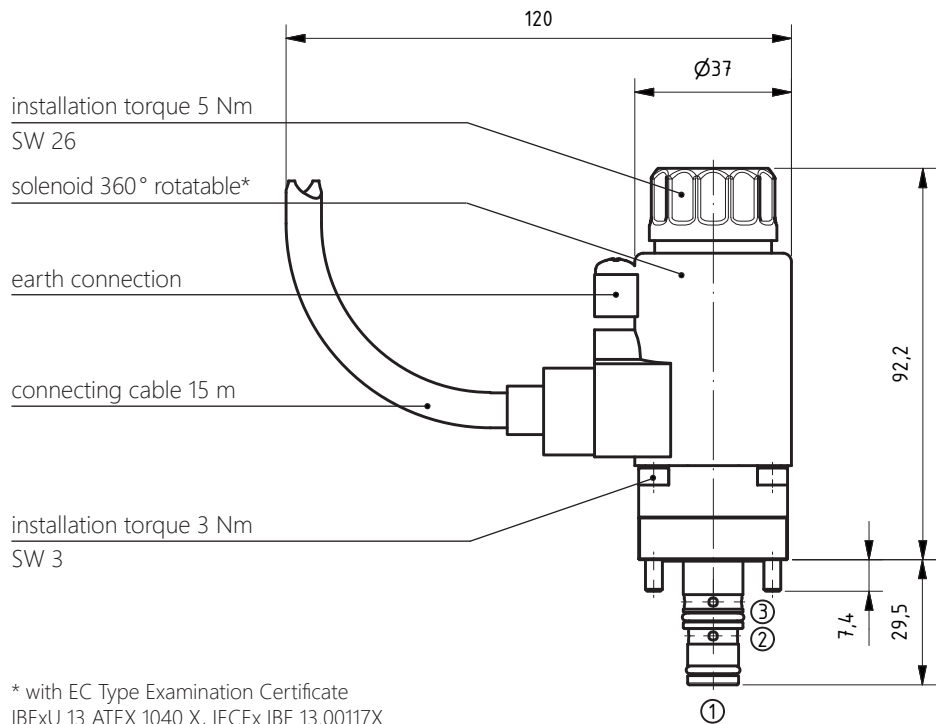
Electronics that are used in explosion protected areas must be Ex-certified!

Performance

Performance graphs upon request.

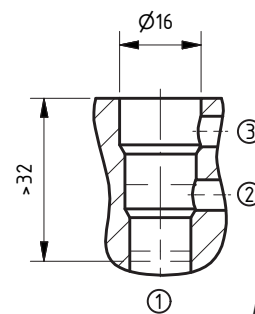
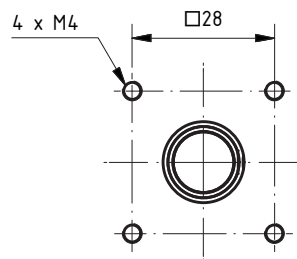
Dimensions

*Slip-in valve
EPDRD3-04 EX*



* with EC Type Examination Certificate
IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X

*Cavity
EPDRD3-04*

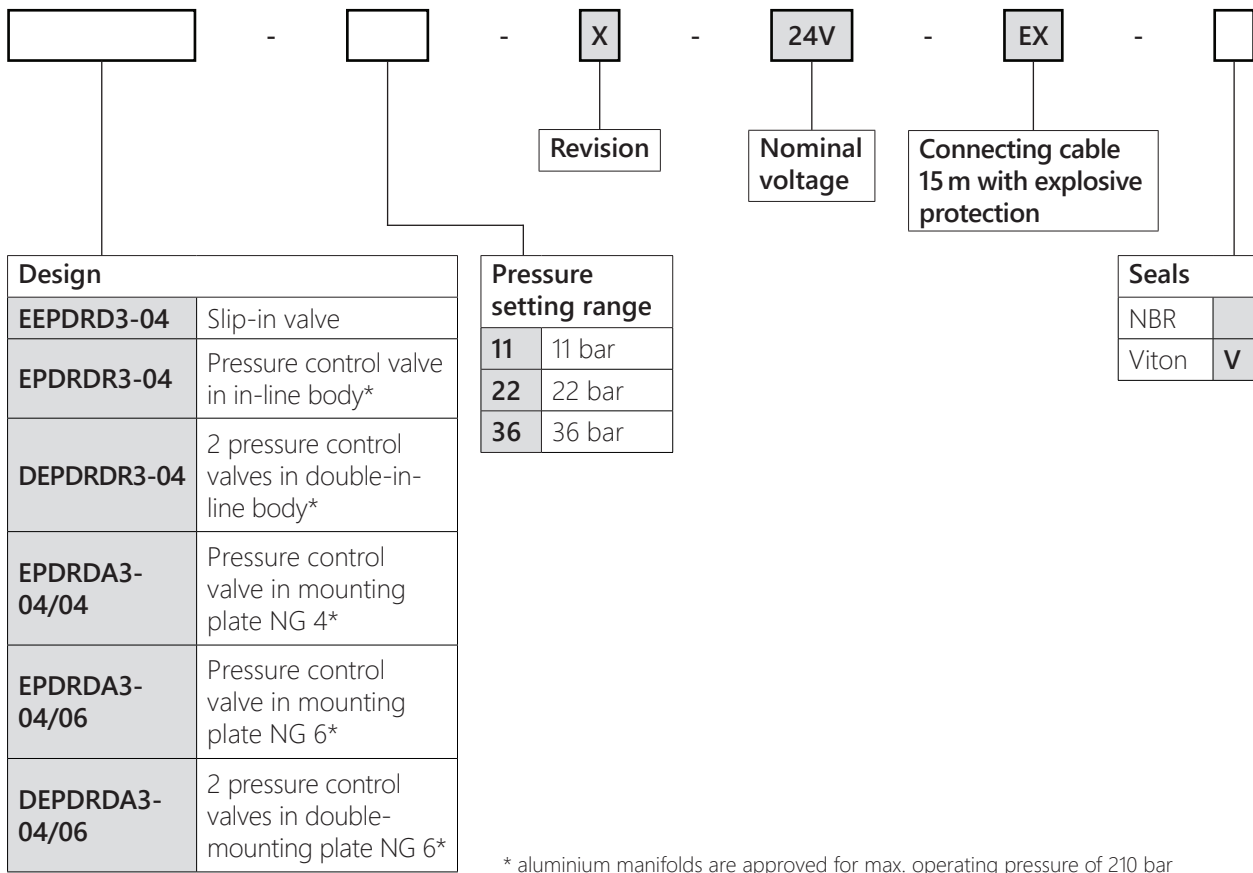


HM3/14 44 11

NOTE For a detailed drawing of the cavity please see chapter 11 *„general information”* or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as EPDRDR3-04 in an in-line body, and as EPDRDA3-04/04 in a mounting plate NG 4 or as EPDRDA3-04/06 in a mounting plate NG 6. Dimension sheets are available upon request.

Type code



Accessories and additional information

Accessories/ spare parts	Article:	Article number:
	Seal kit EEPDRD3-04 (NBR)	405.0060
	Seal kit EEPDRD3-04 (Viton)	405.0097

NOTE



For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at www.weber-hydraulik.com. Please consider whether the electronic controller will be located inside or outside of the explosion protected area. Electronics that are used in explosion protected areas must be certified according to the ATEX-directive!

Set-up

The solenoid coil may only be operated when installed on the appropriate valve. Further information can be found in the provided operation manual of the solenoid. When operating the valve, information contained in the provided operation manual of the solenoid, as well as our general operating manual must be followed precisely!

Single or multiple mounting of the valve in single operation must have a minimum size of 46 x 46 x 66 mm and a base plate $\geq 46 \times 30 \times 66$ mm. The material must be Fe or material with the same or better thermal conductivity.

The installation of these electrical components must be carried out by an electrician with adequate qualifications.

Each solenoid must be short-circuit fuse protected suitable to its nominal valve current (max. $3 \times I_N$ according to IEC/EN 60127-2). This could, for example, be a motor protecting switch with thermal quick release and short-circuit protection (adjusted to the rated current).

The installed fuse must have a voltage rating equal or larger than the rated voltage of the solenoid, and the fuse should be installed in the associated power supply. If this is not possible, the fuse can be installed separately if the appropriate safety instructions are carefully considered.

When connecting the fuse to the circuit, it is of utmost importance to consider whether the fuse will be located inside, or outside of the explosion protected area. If the fuse will be connected to the circuit inside of the explosion protected area, then it must be mounted in an Ex-certificated terminal box.

For equipotential bonding, a ground terminal is provided on the outside of the solenoid.

Manual

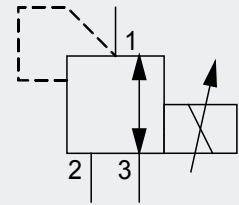
Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



Proportional pressure control valve EPDRD3-05



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 12 l/min
 cavity T-11A or C-10-3



030120_EPDRD3_05_e
 06.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	3
Dimensions	4
Type code	7
Accessories and additional information	8

Characteristics

- 3-way proportional pressure control valve in spool design
- screw-in valve for cavity T-11A or
- screw-in valve for cavity C-10-3
- minimum oil leakage
- low vibration
- maintenance-free
- degressive version available
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)

Technical Data

<i>Hydraulic</i>	Operating pressure max.:	315 bar, with aluminium manifolds: 210 bar pressure at port 3 (T) < pressure at port 1 (A)
	Flow rate:	12 l/min
	Pressure setting range:	see type code
	Flow direction:	see symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current.

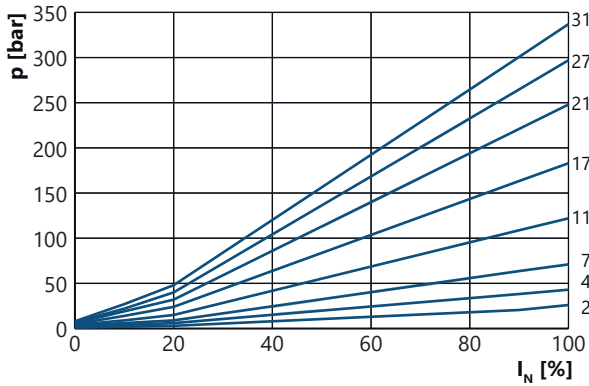
NOTE The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	EEPDRDS screw-in valve T-11A, EEPDRDM screw-in valve C-10-3, or EPDRDSA screw-in valve in mounting plate NG 6, direct operated
	Size:	05
	Fluid temperature:	-25 °C to +70 °C
	Ambient temperature:	-25 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Maximum acceleration:	5 g, crossways
	Weight:	EEPDRDS3-05: 0,76 kg, EEPDRDM3-05: 0,86 kg, EPDRDSA3-05/06: 1,07 kg
	Material:	valve parts: steel, mounting plate: aluminium, seals: NBR, optional Viton
	Surface protection:	exterior parts: zinc coated steel, partially burnished mounting plate: anodized aluminium

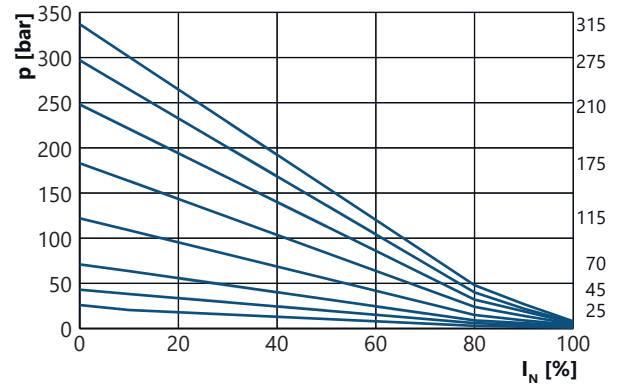
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

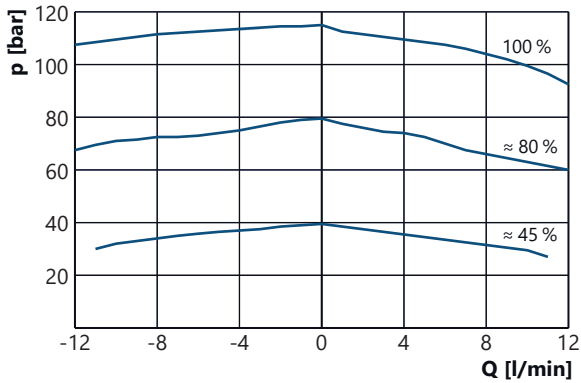
Pressure drop diagram (p/I) EPDRD3-05 at Q = 0 l/min (static)



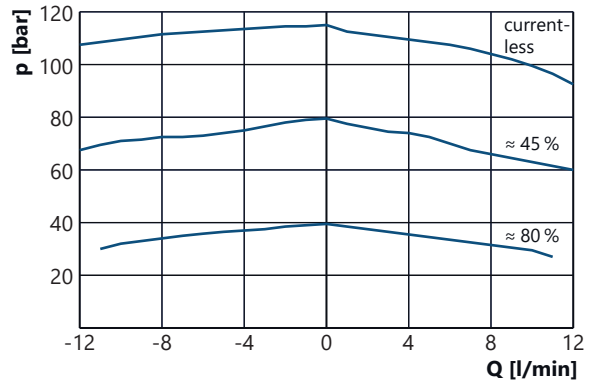
Pressure drop diagram (p/I) EPDRD3-05 degressive version at Q = 0 l/min (static)



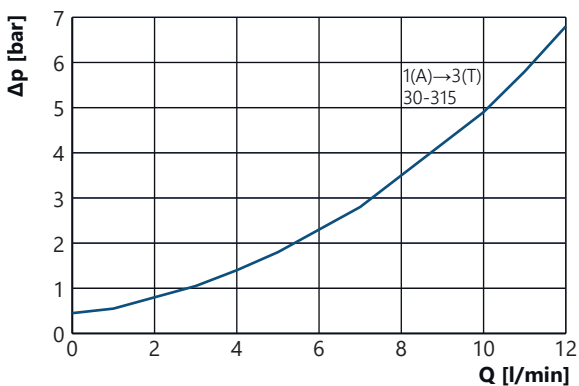
Pressure drop diagram (p/Q) EPDRD3-05 with 115 bar spool at various currents



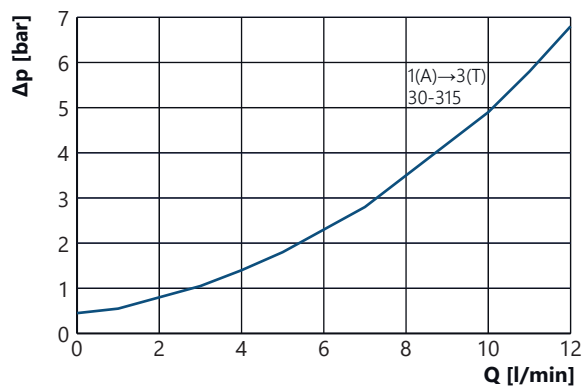
Pressure drop diagram (p/Q) EPDRD3-05 degressive version with 115 bar spool at various currents



Pressure drop diagram ($\Delta p/Q$) EPDRD3-05 at I = 0 mA (currentless)



Pressure drop diagram ($\Delta p/Q$) EPDRD3-05 degressive version at I = 100% (full current)



Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the characteristic curves.

Dimensions

Screw-in valve EEPDRDS3-05

installation torque 3 Nm

SW 3

installation torque:

max. 0,5 Nm

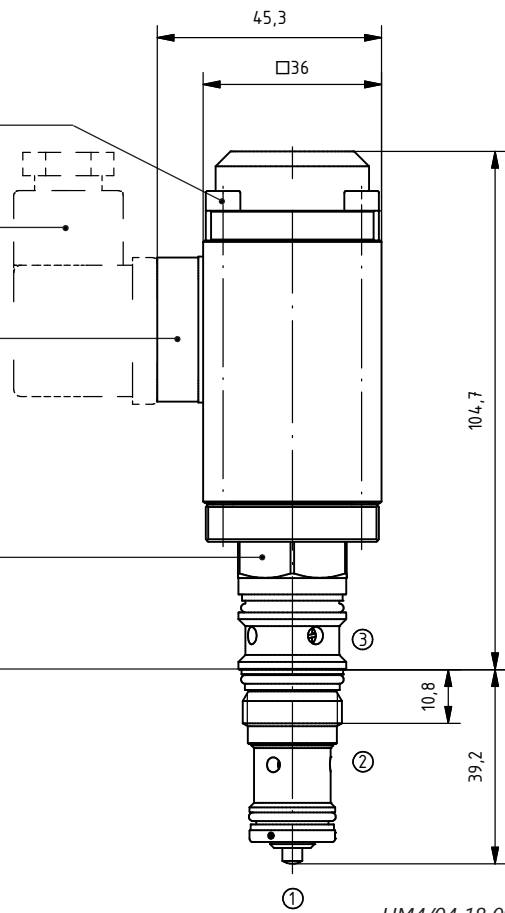
electric plug according to

DIN EN 175301-803 shape A

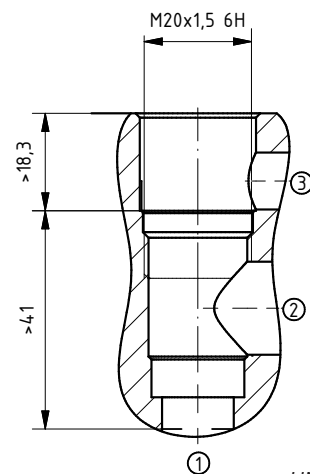
installation torque 45 Nm

SW 22

locating shoulder T-11A



Cavity T-11A



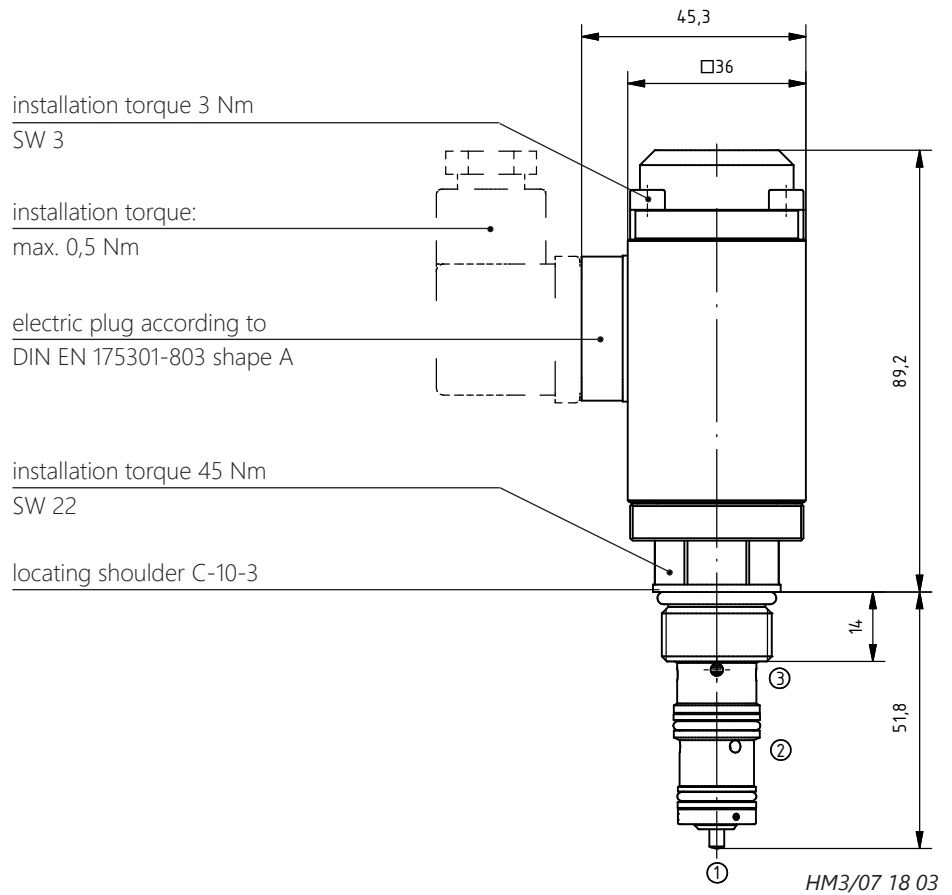
NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

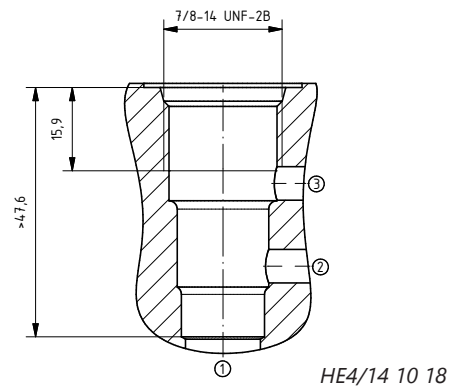
NOTE The valve is also available as degressive version.

Dimensions

*Screw-in valve
EEPDRDM3-05*



Cavity C-10-3



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide a variety of suitable manifolds for C-10-3. Please contact us for further assistance.

NOTE The valve is also available as degressive version.

Dimensions

Screw-in valve
EEPDRDS3-05
degressive



Do not adjust!

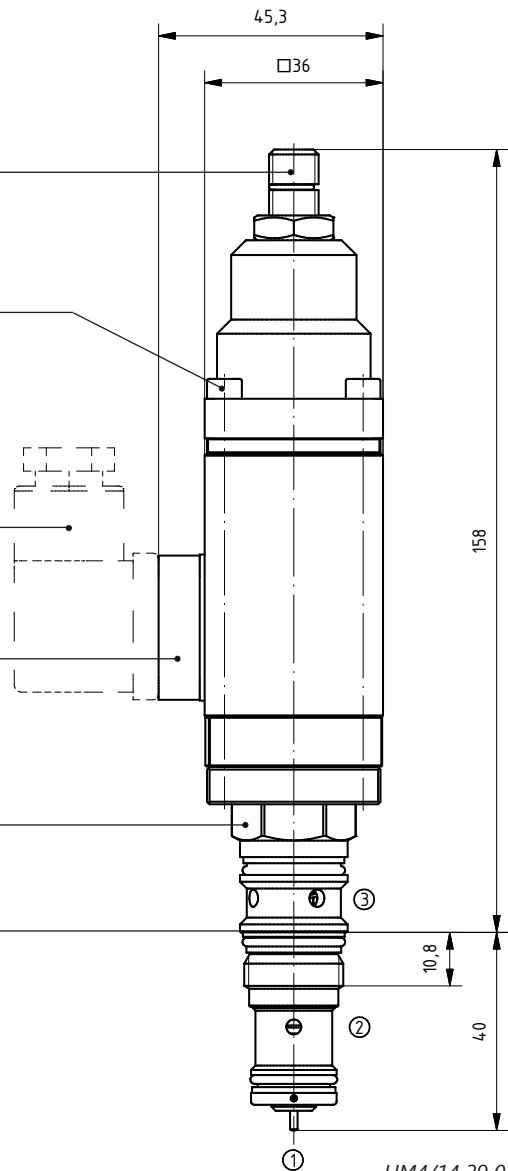
installation torque 3 Nm
SW 3

installation torque:
max. 0,5 Nm

electric plug according to
DIN EN 175301-803 shape A

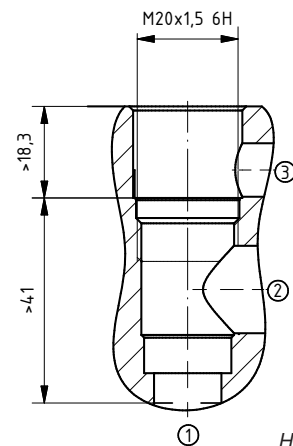
installation torque 45 Nm
SW 22

locating shoulder T-11A



HM4/14 39 03

Cavity T-11A



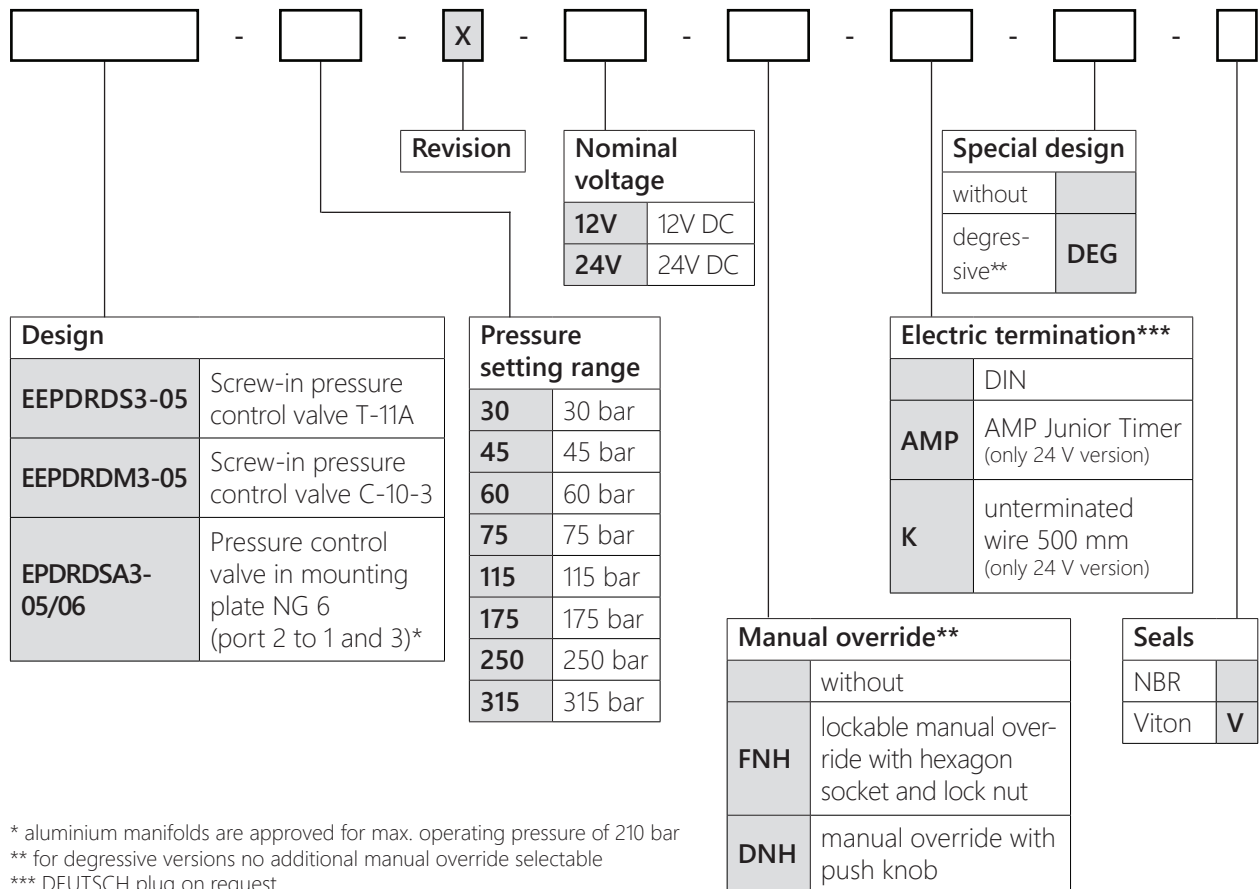
HM4/04 18 09

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The degressive version of the valve is also available as EEPDRDM3-05 (with cavity C-10-3).

Type code



NOTE FOR FNH



The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.
The FNH should never be screwed in and locked when used in conjunction with a running system!

Accessories and additional information

<i>Accessories/ spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit T-11-A (NBR)	405.0038
	Seal kit T-11-A (Viton)	405.0039
	Seal kit C-10-3 (NBR)	405.0063
	Seal kit C-10-3 (Viton)	405.0096

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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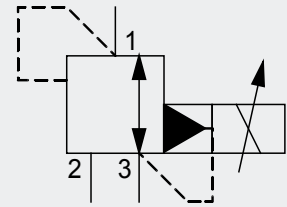
www.weber-hydraulik.com
info.de-k@weber-hydraulik.com

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Proportional pressure control valve EPDR3-08



pilot operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 40 l/min
 cavity T-11A or C-10-3



030220_EPDR3_08_e
 06.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	7
Accessories and additional information	8

Characteristics

- 3-way proportional pressure control valve in spool design
- screw-in valve for cavity T-11A or
- screw-in valve for cavity C-10-3
- low vibration
- maintenance-free
- degressive version available
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar, with aluminium manifolds: 210 bar
	Flow rate:	40 l/min
	Pressure setting range:	see type code
	Flow direction:	see hydraulic symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current

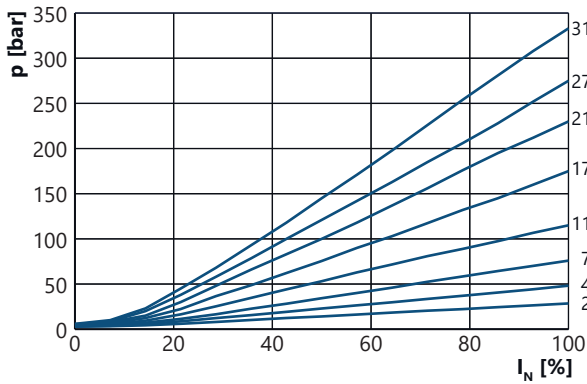
NOTE The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	EEPDRS screw-in valve T-11A or EEPDRM screw-in valve C-10-3, EPDRSA screw-in valve in mounting plate NG 6, pilot operated
	Size:	08
	Fluid temperature:	-25 °C to +70 °C
	Ambient temperature:	-25 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Maximum acceleration	5 g, crossways
	Weight:	EEPDRS3-08: 0,76 kg, EEPDRM3-08: 0,79 kg, EPDRSA3-08/06: 1,01 kg
	Material:	valve parts: steel, mounting plate: aluminium seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel, mounting plate: anodized aluminium

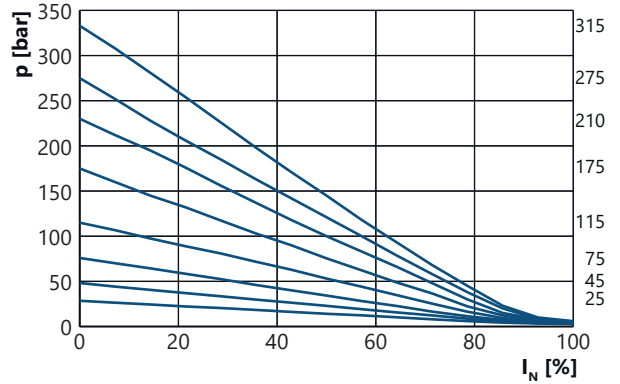
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

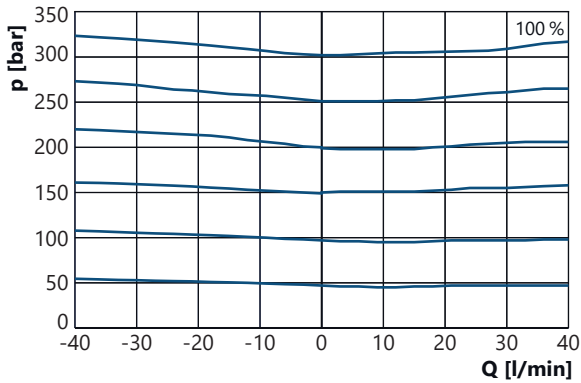
Pressure drop diagram (p/I) EPDR3-08 at Q = 1,0 l/min



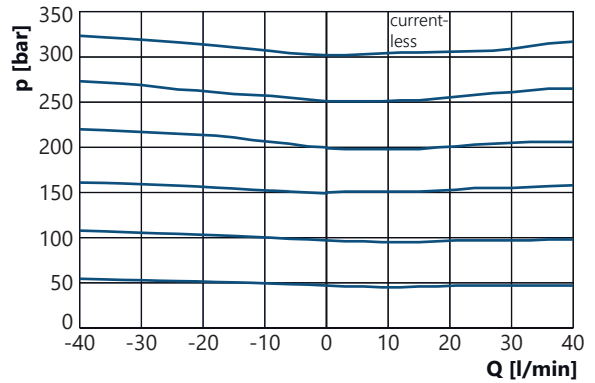
Pressure drop diagram (p/I) EPDR3-08 depressive version at Q = 1,0 l/min



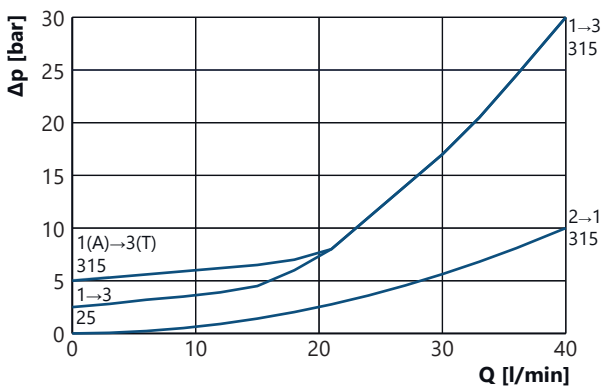
Pressure drop diagram (p/Q) EPDR3-08 with 315 bar spool at various currents



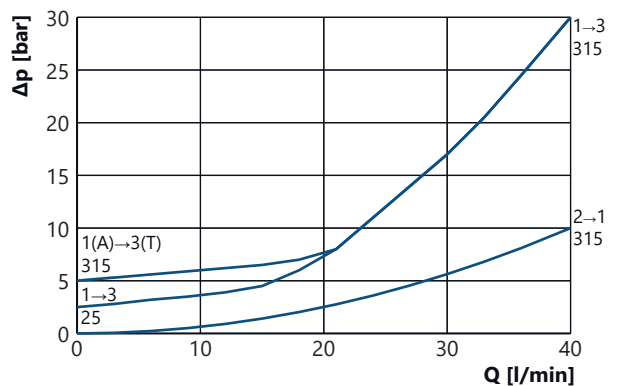
Pressure drop diagram (p/Q) EPDR3-08 depressive version with 315 bar spool at various currents



Pressure drop diagram (Δp/Q) EPDR3-08 at I = 0 mA (currentless)



Pressure drop diagram (Δp/Q) EPDR3-08 depressive version at I = 100% (full current)

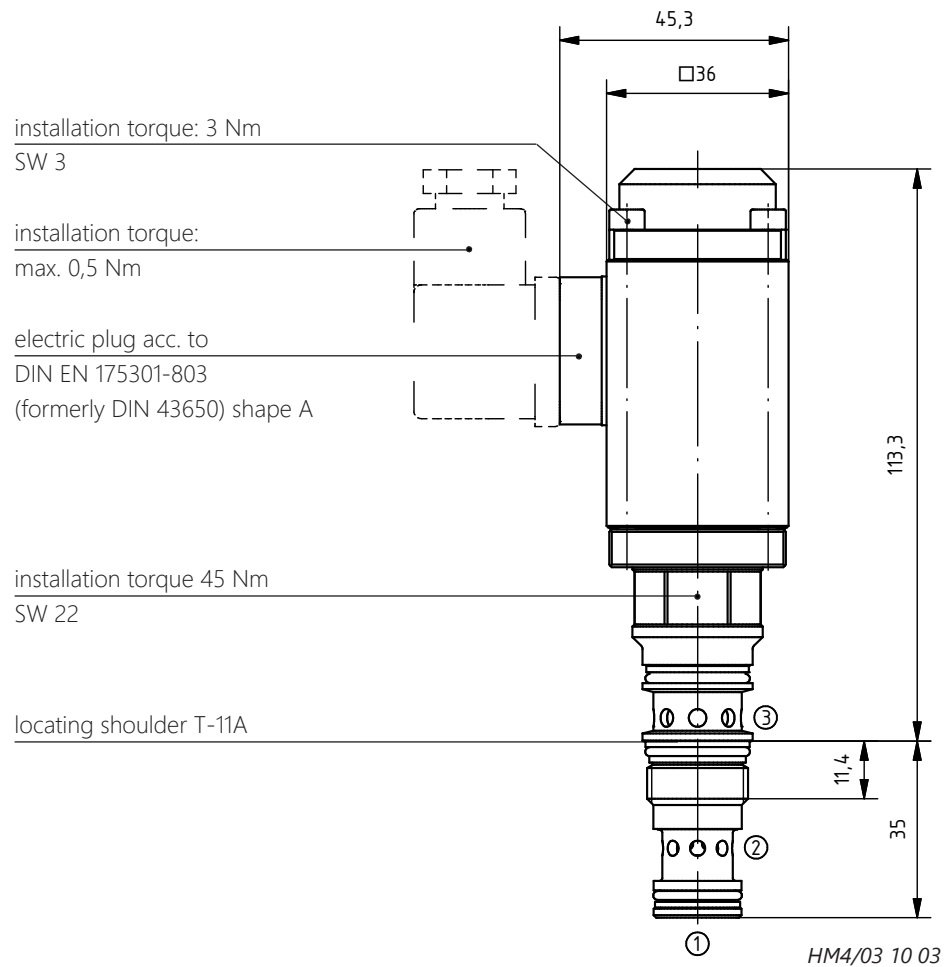


Test conditions

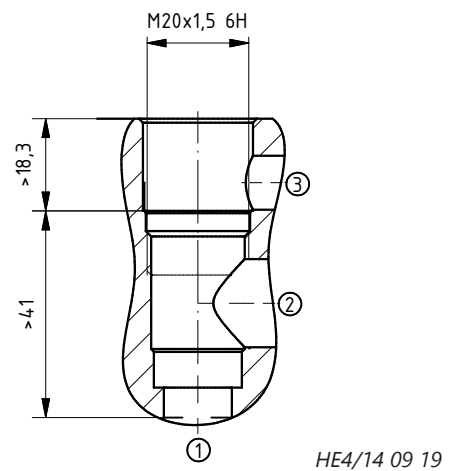
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the characteristic curves.

Dimensions

Screw-in valve EEPDRS3-08



Cavity T-11A



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

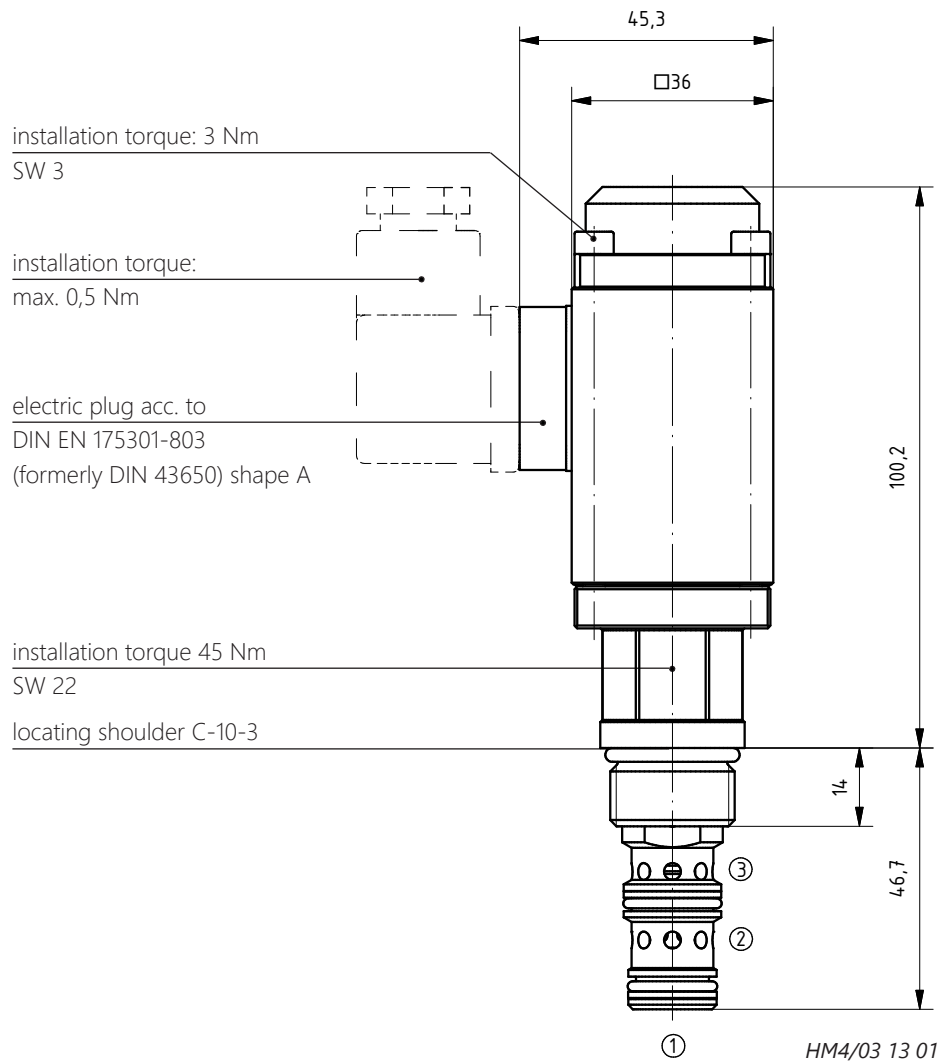
NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as EPDRSA3 08/06 in a mounting plate NG 6. Dimension sheets are available upon request.

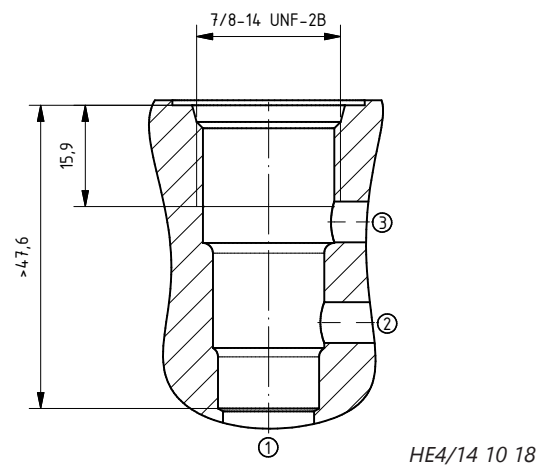
NOTE The valve is also available as degressive version.

Dimensions

Screw-in valve
EEPDRM3-08



Cavity C-10-3



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide a variety of suitable manifolds for C-10-3. Please contact us for further assistance.

NOTE The valve is also available as degressive version.

Dimensions

Screw-in valve
EEPDRS3 08
degressive



Do not adjust!

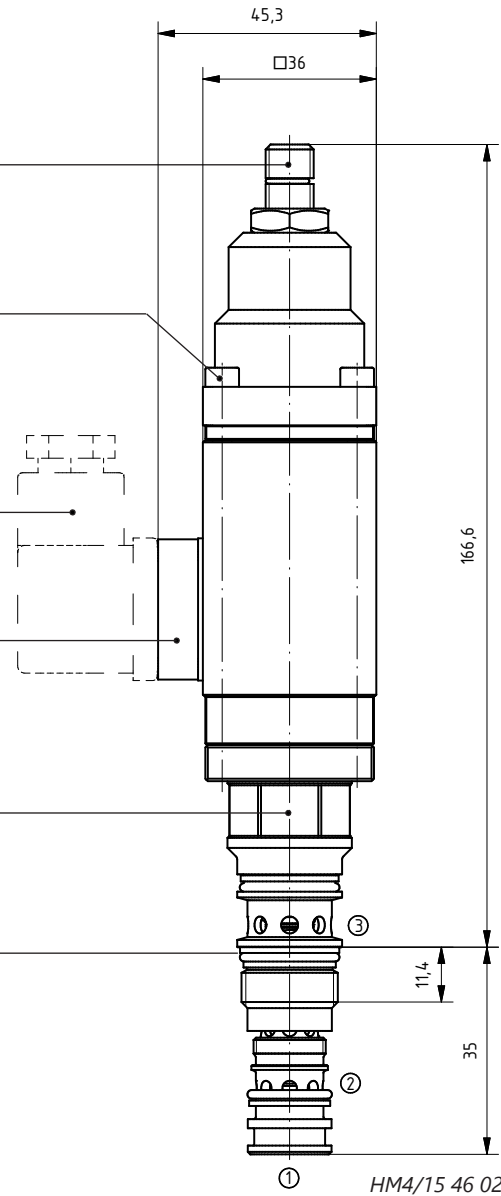
installation torque: 3 Nm
SW 3

installation torque:
max. 0,5 Nm

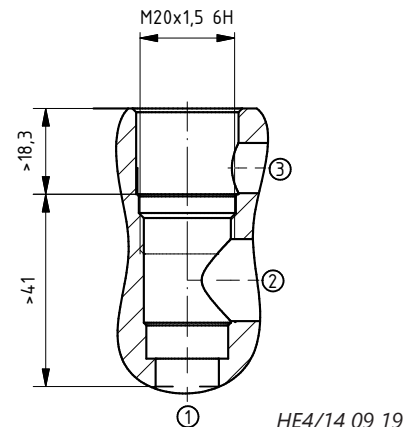
electric plug acc. to
DIN EN 175301-803
(formerly DIN 43650) shape A

installation torque 45 Nm
SW 22

locating shoulder T-11A



Cavity T-11A

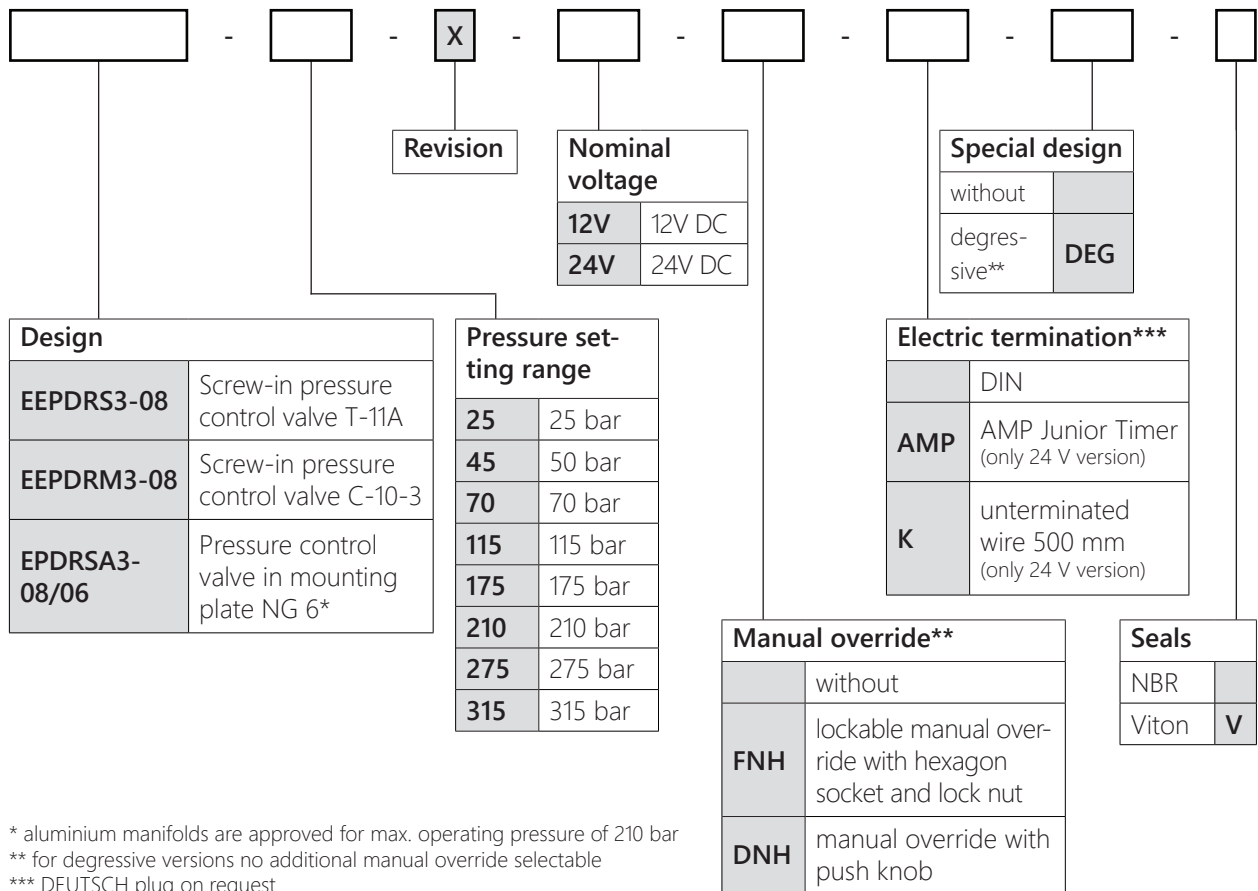


NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The degressive version of the valve is also available as EEPDRM3-08 (with cavity C-10-3).

Type code



NOTE FOR FNH



The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.
The FNH should never be screwed in and locked when used in conjunction with a running system!

Accessories and additional information

<i>Accessories/ spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit T-11A (NBR)	405.0038
	Seal kit T-11A (Viton)	405.0039
	Seal kit C-10-3 (NBR)	405.0063
	Seal kit C-10-3 (Viton)	405.0096

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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 Fax: +49 7531 9748-44

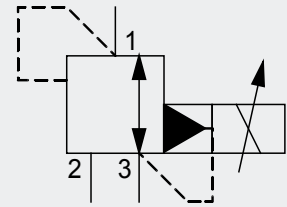
www.weber-hydraulik.com
info.de-k@weber-hydraulik.com

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Proportional pressure control valve EPDRS3-10



pilot operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 80 l/min
 cavity T-2A



030230_EPDRS3_10_e
 07.2018

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	6
Accessories and additional information	7

Characteristics

- 3-way proportional pressure control valve in spool design
- screw-in valve for cavity T-2A
- low vibration
- maintenance-free
- degressive version available
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar, with aluminium manifolds: 210 bar
	Flow rate:	80 l/min
	Pressure setting range:	see type code
	Flow direction:	see hydraulic symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current

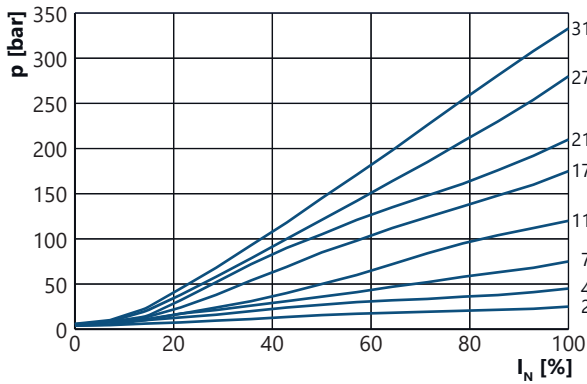
NOTE The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	EEPDRS screw-in valve T-2A, EPDRSA screw-in valve in mounting plate NG 10, pilot operated
	Size:	10
	Fluid temperature:	-25 °C to +70 °C
	Ambient temperature:	-25 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Maximum acceleration:	5 g, crossways
	Weight:	EEPDRS3-10: 0,86 kg, EPDRSA3-10: 1,69 kg
	Material:	valve parts: steel, mounting plate: aluminium seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel, mounting plate: anodized aluminium

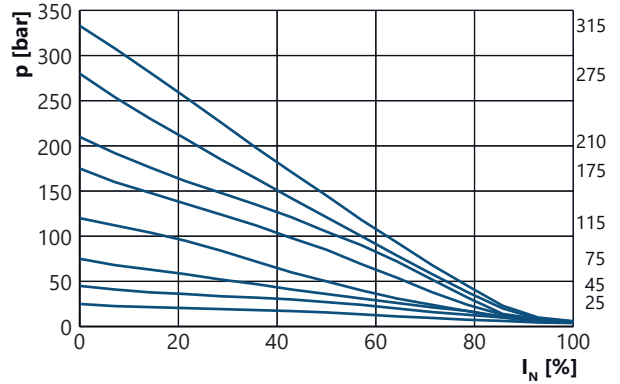
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

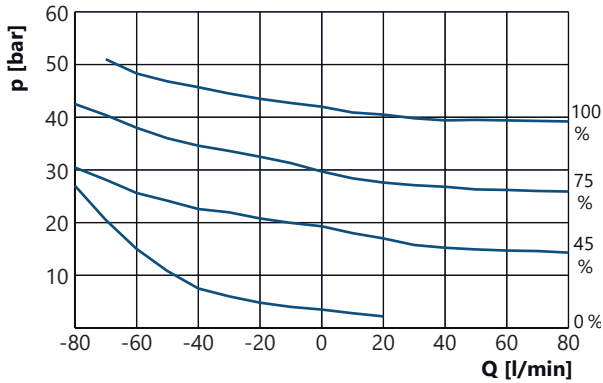
Pressure drop diagram (p/I) EPDRS3-10 at Q = 1,0 l/min



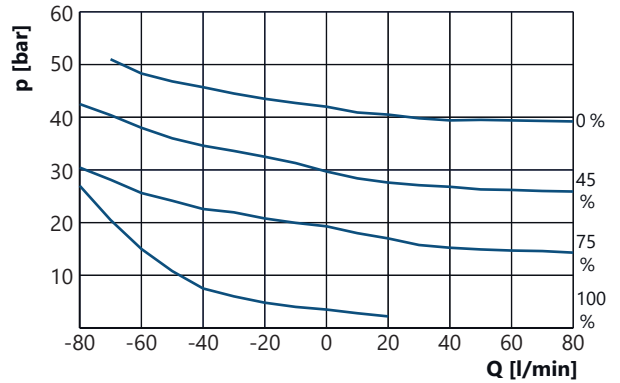
Pressure drop diagram (p/I) EPDRS3-10 degressive version at Q = 1,0 l/min



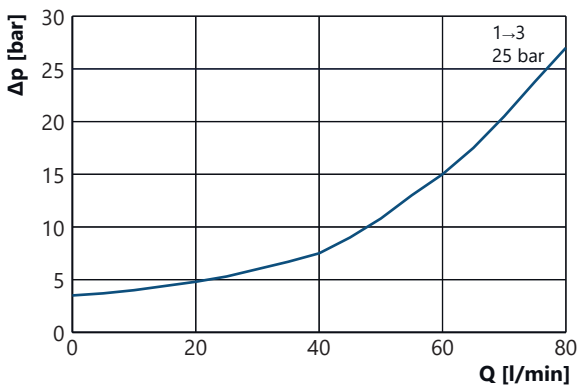
Pressure drop diagram (p/Q) EPDRS3-10 with 25 bar spool at various currents



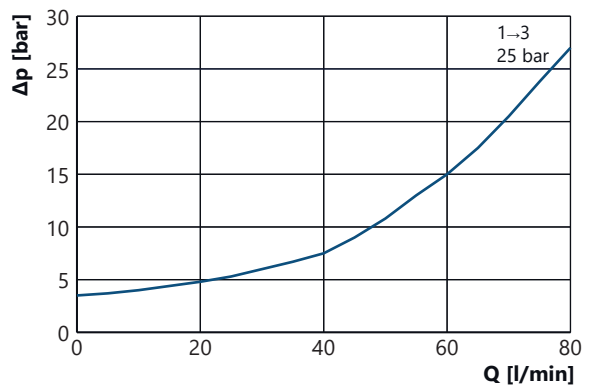
Pressure drop diagram (p/Q) EPDRS3-10 degressive version with 25 bar spool at various currents



Pressure drop diagram ($\Delta p/Q$) EPDRS3-10 at I = 0 mA (currentless)



Pressure drop diagram ($\Delta p/Q$) EPDRS3-10 degressive version at I = 100% (full current)

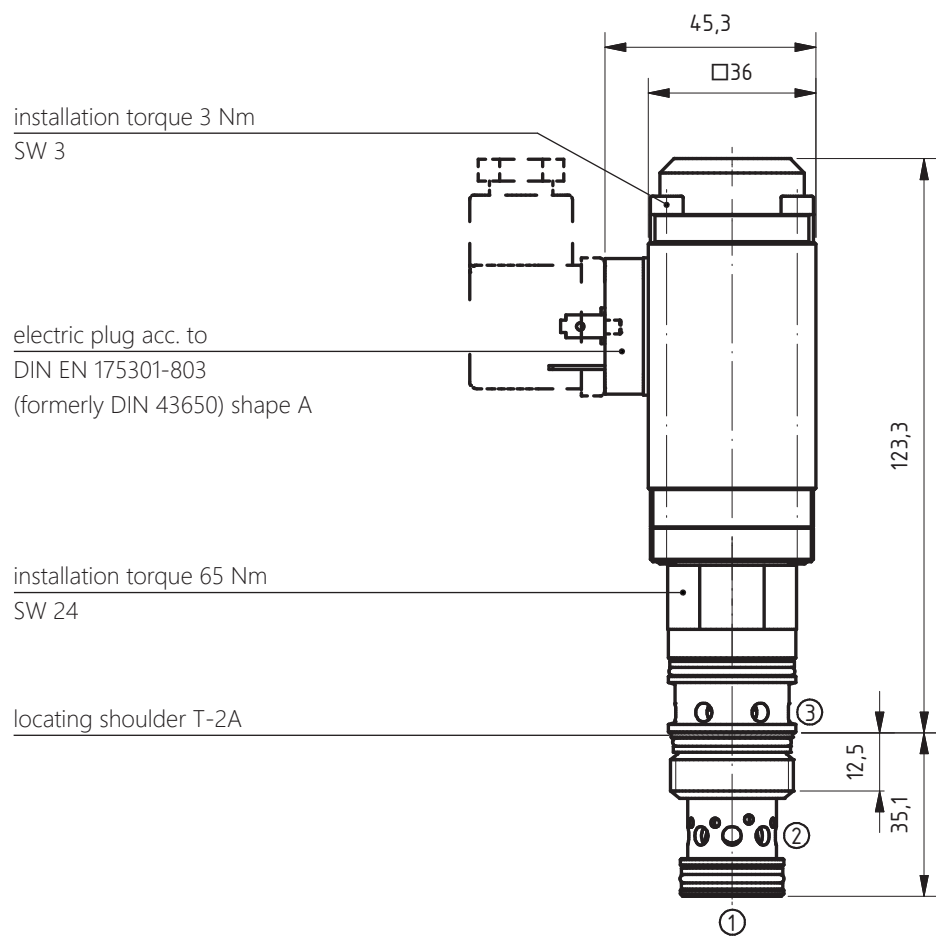


Test conditions

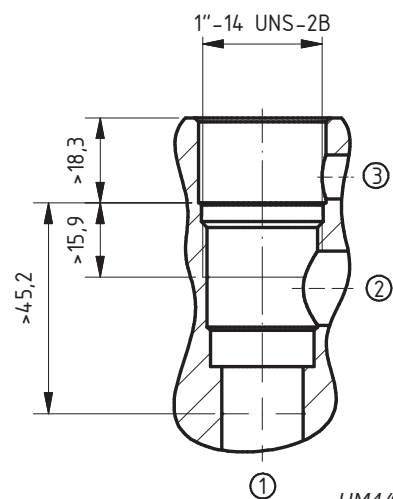
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the characteristic curves.

Dimensions

Screw-in valve EEPDRS3-10



Cavity T-2A



HM4/05 25 01

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as EPDRSA3-10 in a mounting plate NG 10. Dimension sheets are available upon request.

NOTE The valve is also available as degressive version.

Dimensions

Screw-in valve
 EPDRS3-10
 degressive



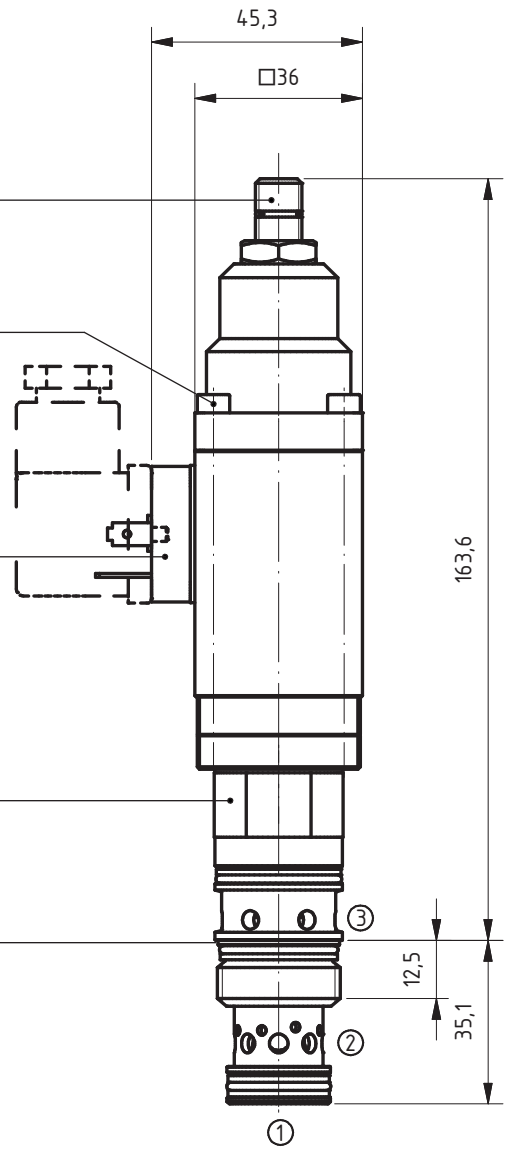
Do not adjust!

installation torque 3 Nm
 SW 3

electric plug acc. to
 DIN EN 175301-803
 (formerly DIN 43650) shape A

installation torque 65 Nm
 SW 22

locating shoulder T-2A

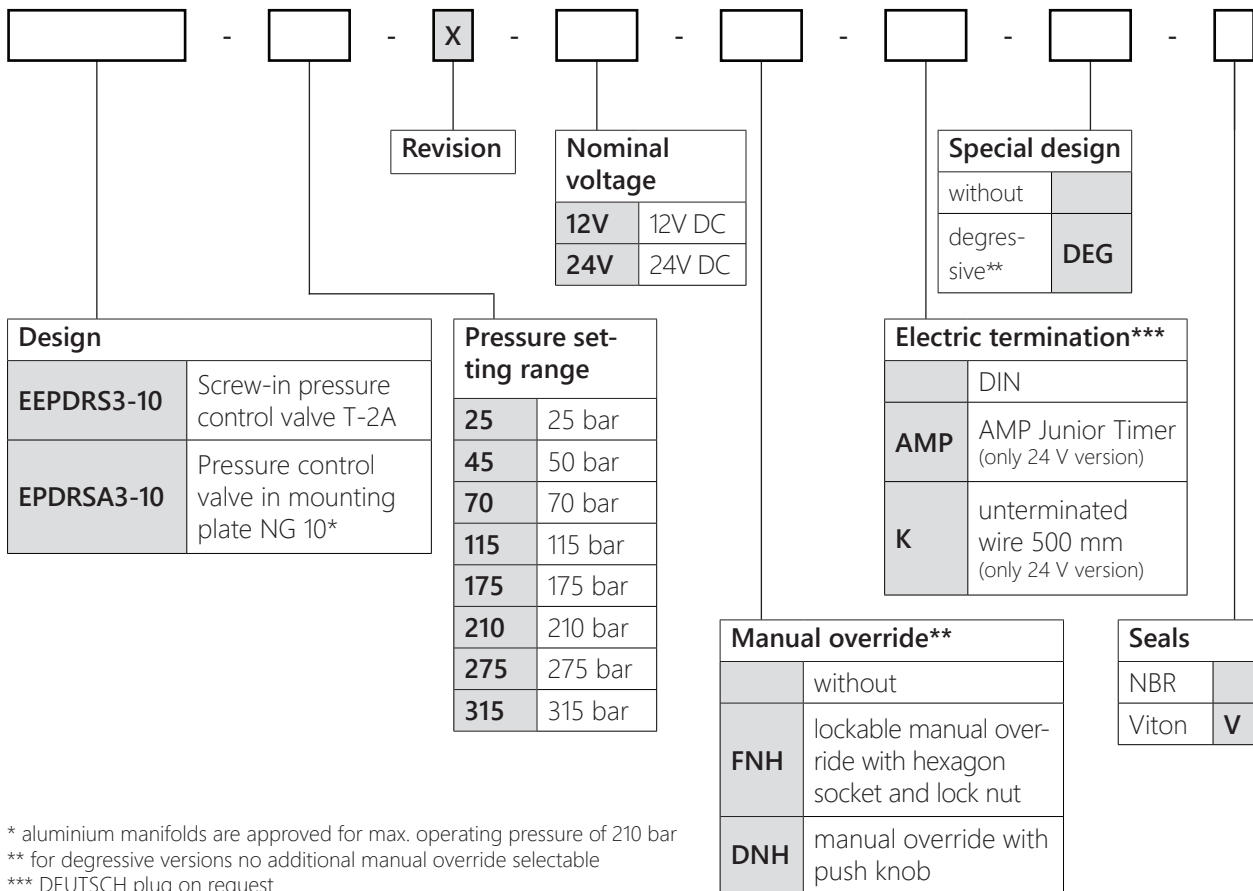


HM4/15 50 14

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

Type code



NOTE FOR FNH



The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system!

Accessories and additional information

<i>Accessories/ spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit T-2A (NBR)	405.0042
	Seal kit T-2A (Viton)	405.0043

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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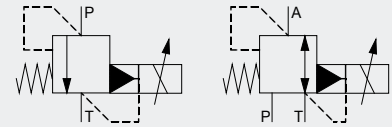
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Pilot-operated proportional valves with large nominal size



pressure relief valves
pressure control valves
pilot operated, solenoid actuated
max. operating pressure 315 bar
max. volume flow 320 l/min



030240_Info16_25_e
07.2018

- pilot-operated proportional pressure relief valves or pressure control valves with large nominal size
- modular set-up out of proportional pilot valves and mechanical cartridge valves with cavities up to T-19A
- pressure relief valves up to 760 l/min
- pressure control valves up to 320 l/min
- suitable in-line bodies and subplates up to NG 25
- varied combinations with different technical characteristics possible

- We would be happy to develop with you the ideal solution for your project.

Proportional Pressure Reducing/Relieving Valve Size 06

pilot operated • 3-way function • max. 315 bar • max. 30 l/min



Description

The proportional pressure reducing/relieving valve size 06 is a pilot operated valve. It reduces a higher input pressure into a lower consumer pressure. The consumer pressure can be set proportionally to the solenoid current. If the adjusted pressure on the consumers side is exceeded, the pressure relief function of the valve is used (3 way function). It flows so long oil from the consumer after T, until the adjusted pressure is again reached.

The valve is applicable also as a pure pressure-reducing valve (2-way-function). The third port (T) may not be closed however. All internal parts are hardened and ground/ honed. In order to achieve an optimal resolution,

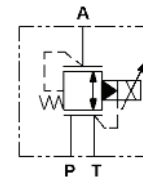
numerous pressure ranges are available. The valve has a precise and good-natured responding mode.

Note: if the difference between input pressure and consumer pressure is very high, the oil should be very clean (filtration up to 3 µm is necessary).

Designs

The valve is available in a sandwich body CETOP/ISO 3 (DIN 24340 A06, NG 6).

Symbol



Technical Data

for terms and definitions see chapter 12

Hydraulic

Rated Pressure:	port P and A: max. 315 bar port T: not higher than port A pressure
Rated Flow:	max. 30 l/min
Pressure Ranges:	see model code
Minimum Pressure:	appr. 6 bar
Fluids:	oils as per DIN 51524, others upon request
Viscosity Range:	10 – 350 cSt
Pilot Flow:	appr. 0,15 – 0,20 l/min/ 32 cSt
Filtration:	class 18/16/13, filter β 6...10 ≥ 75

Mechanical

Ambient Temperature:	-20 °C – +50 °C
Fluid Temperature:	-20 °C – +80 °C
Installation:	no restrictions
Weight:	1,51 kg
Materials:	valve parts: steel seals: NBR backup rings: Teflon, PU solenoid: zinc plated body: anodised ext. valve parts: burnished
Surface Protection:	

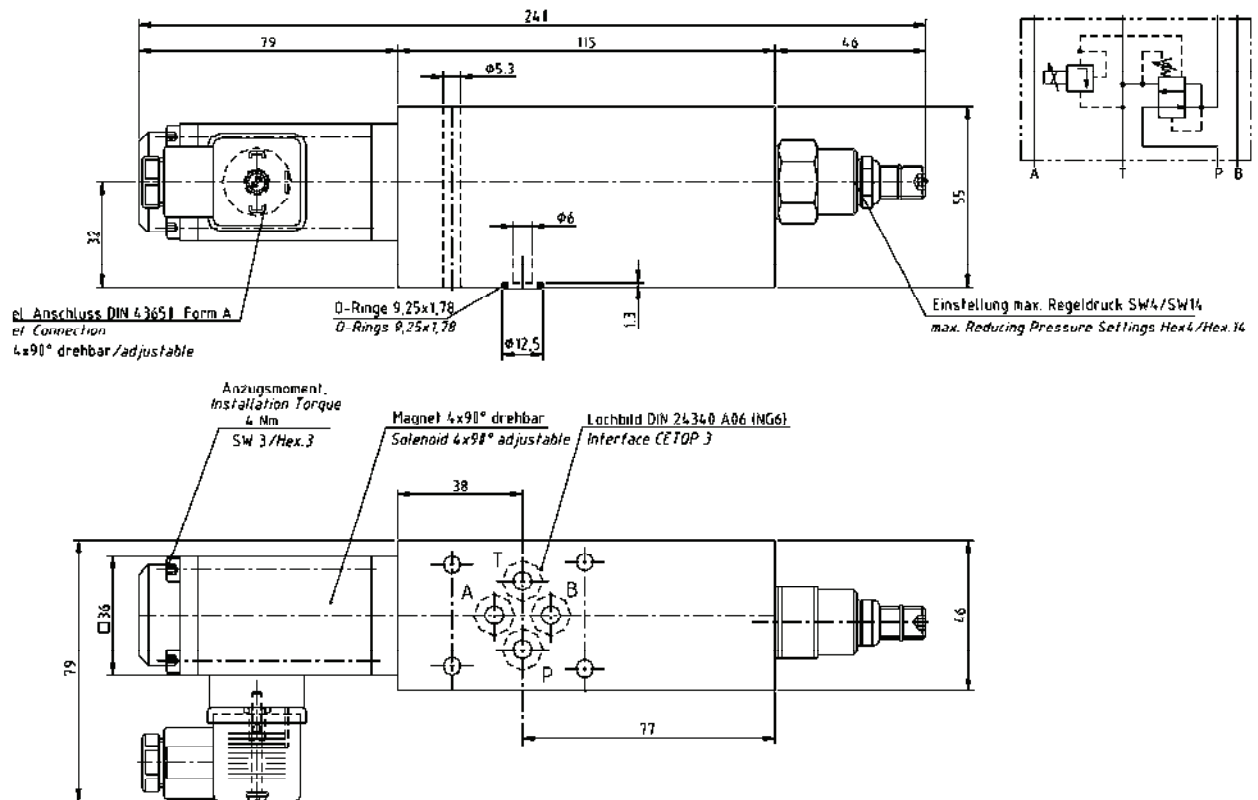
Electrical

Nominal Voltage:	24 V DC; 12 V DC
Rated Current:	700 mA (24 V); 1700 mA (12 V)
Nominal Resistance (R ₂₀):	25 Ω (24 V); 4 Ω (12 V)
Power Consumption:	17 W (24 V); 20 W (12 V)
Cyclic Duration Factor:	100 %
Control Command:	PWM (Pulse-Width-Modulated DC)
Dither Frequency:	preferably 140 Hz
Environmental Protection:	IP 65
Electrical Termination:	plug as per DIN 43650 form A, incl. square connector Pg9
Control Devices:	see chapter 6 'Electronic Amplifiers'

Model Code

ZEPDR3-06	-	175	-	*	-	24V	/	*
3-Way Proportional Pressure Reducing Valve, pilot operated, size 06		Pressure Range		Design		Nominal Voltage		Special Executions
deliverable executions:		25 = 25 bar		(intern)		12V = 12 V DC		
Sandwich body: ZEPDR3-06 = CETOP/ISO 03 (NG 6) function in P		45 = 45 bar				24V = 24 V DC		
		70 = 70 bar						
		115 = 115 bar						
		175 = 175 bar						
		210 = 210 bar						
		315 = 315 bar						

Dimensions (mm)

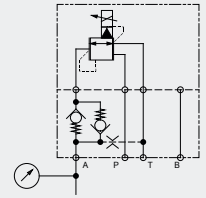


H3-940907

Pressure sequence body ZRV06



pressure control from 0 bar
 operating pressure max. 250 bar
 volume flow max. 30 l/min
 pressure sequence body NG 6



030310_ZRV06_e
 01.2020

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	2
Dimensions	3
Symbol	4
Type code	4
Accessories and additional information	4

Characteristics

- enables pressure control starting from 0 bar, with pilot operated proportional pressure control valves
- available with nozzle or plug

Technical data

<i>Hydraulic</i>	Operating pressure max.:	250 bar
	Flow rate max.:	30 l/min
	Flow direction:	from A to T, from P to A
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
	Opening pressure:	to A (pre-load pressure): 6 bar from A (check valve): 2 bar

NOTE The use of the pressure sequence body ZRV reduces the max. pressure control-range of the proportional pressure control valve to approximately 2 bar respectively 6 bar.

NOTE The pressure control range can not be below tank pressure.

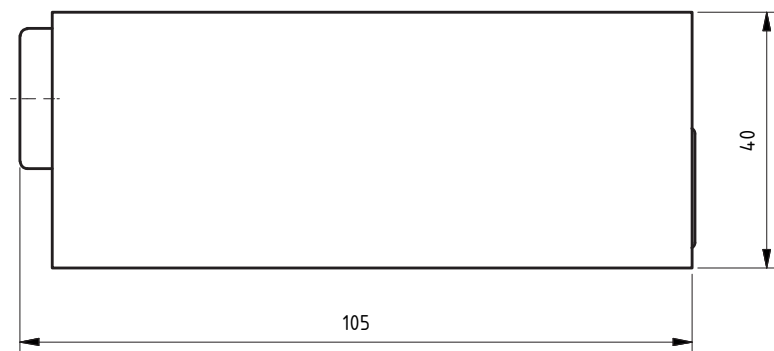
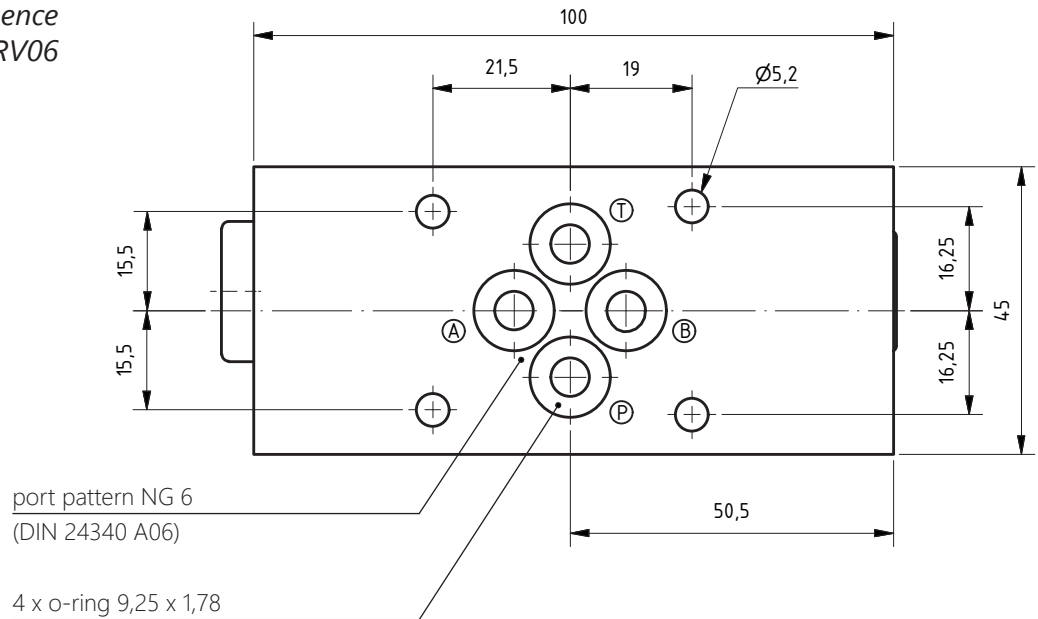
<i>Mechanic</i>	Design:	pressure sequence body ZRV for pressure control valves
	Size:	06
	Fluid temperature:	-20 °C to +70 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Weight:	0,47 kg
	Material:	valve parts: steel, pressure sequence body: aluminium, seals: NBR
	Surface protection:	pressure sequence body: anodized aluminium

Performance

Performance graphs upon request.

Dimensions

Pressure sequence
body ZRV06



HM4/020602

NOTE For a detailed drawing of the port pattern please see chapter 11 „*general information*“ under the category „*port patterns*“ or our online catalogue at www.weber-hydraulik.com.

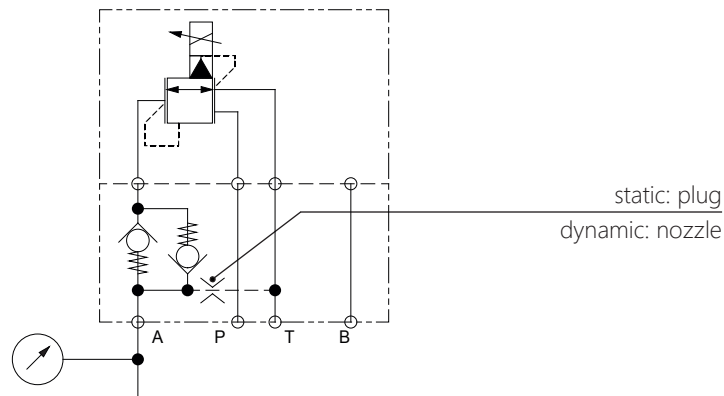
NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 - 8.8. Installation torque: $3,3 \pm 0,2$ Nm.
The minimum screw-in depth depends on the material of the screw and the material in which it is screwed in.

Steel typically:	1,2 x d	12.9 (10.9)
Aluminium typically:	1,6 x d	8.8 (10.9)

If in doubt, please use the appropriate table books or carry out tests.

Symbol

Example with pressure control valve



Type code

ZRV06	-		-		-	X
Pressure sequence body NG 6		Pre-load pressure		Nozzle		Revision
		2 2 bar		B with nozzle (0,5 mm)		
		5 6 bar		X with plug		

Accessories and additional information

<i>Accessories/ spare parts</i>	Article: 4 x o-ring 9,25 x 1,78 (NBR)	Material number: 401.0128
-------------------------------------	---	-------------------------------------

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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PVDE2-11
direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 25 l/min
cavity PVDE2-11 or T-13A



PVDE2-11 acc. to ATEX-directive
direct operated, solenoid operated
operating pressure max. 250 bar
volume flow max. 20 l/min
cavity PVDE2-11



PVDES2-14
direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 80 l/min
cavity T-5A

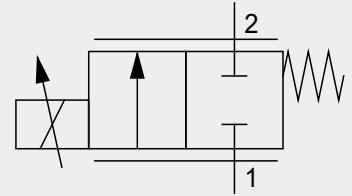


PVDES2-18
direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 195 l/min
cavity T-16A

Proportional throttle valve PVDE_2-11



direct operated, solenoid operated
 operating pressure max. 350 bar
 volume flow max. 21 l/min
 cavity PVDE2-11 or T-13A



040110_PVDE_2-11_e
 07.2021

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	7
Accessories and additional information	8

Characteristics

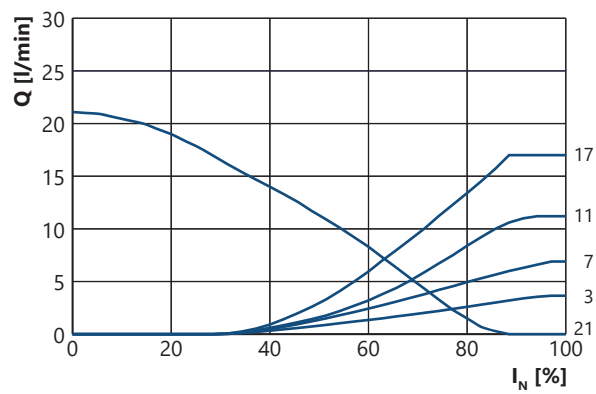
- proportional 2/2-way throttle valve
- normally open or normally closed models
- slip-in valve for cavity PVDE2-11
- or screw-in valve for cavity T-13A
- maintenance-free
- also available with EX-plug according to the ATEX-directive for the use in potentially explosive atmospheres (see datasheet 040111_PVDE_2-11_EX_e)

Technical data

<i>Hydraulic</i>	Operating pressure max.:	350 bar, differential pressure control Δp max. 25 bar
	Flow rate:	3, 7, 11, 17, 21 l/min at differential pressure control $\Delta p = 10$ bar
	Performance limit:	max. nominal flow rate also at a higher differential pressure control Δp
	Flow direction:	1 to 2 (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20% to 100% of the nominal valve current
	<i>Mechanic</i>	Design :
Size:		11
Fluid temperature:		-20 °C to +65 °C
Ambient temperature:		-20 °C to +50 °C
Storage temperature:		-30 °C to +60 °C (non-condensing)
Installation position:		any
Maximum acceleration:		3 g
Weight:		PVDE2-11: 0,61 kg, PVDR2-11: 1,27 kg, PVDES2-11: 0,72 kg
Material:		valve parts and manifold: steel seals: NBR, Viton optional
Surface protection:		exterior parts: zinc coated steel
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4,0 Ω (12 V), 25,0 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer or unterminated wire
	Electronic controllers:	see chapter " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

Performance

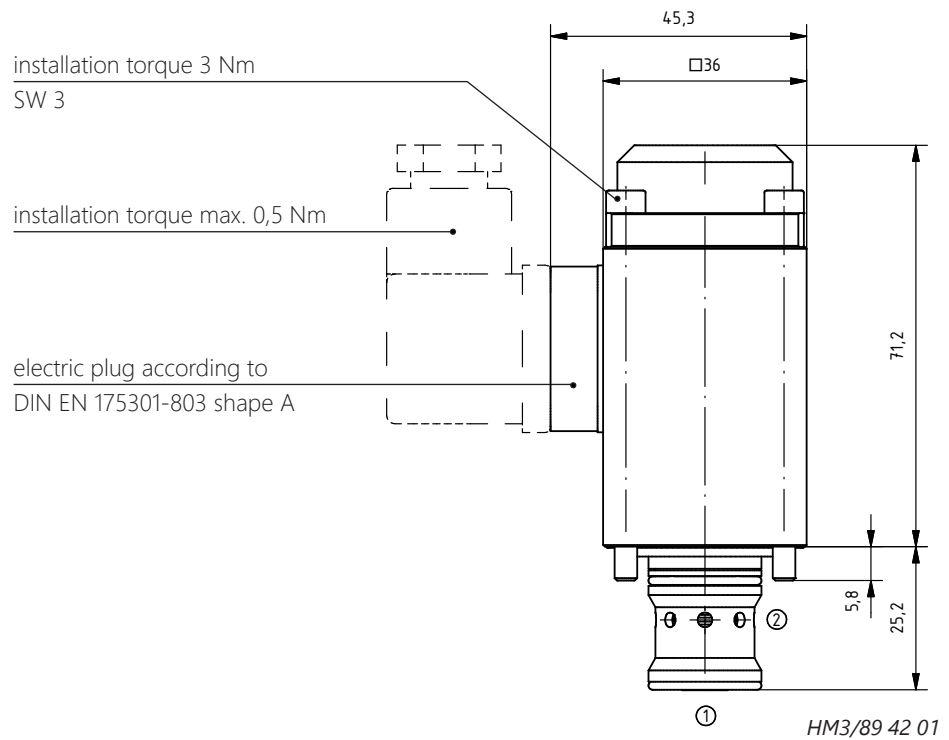
Flow rate diagram (Q/I) PVDE2-11 at $\Delta p = 10$ bar



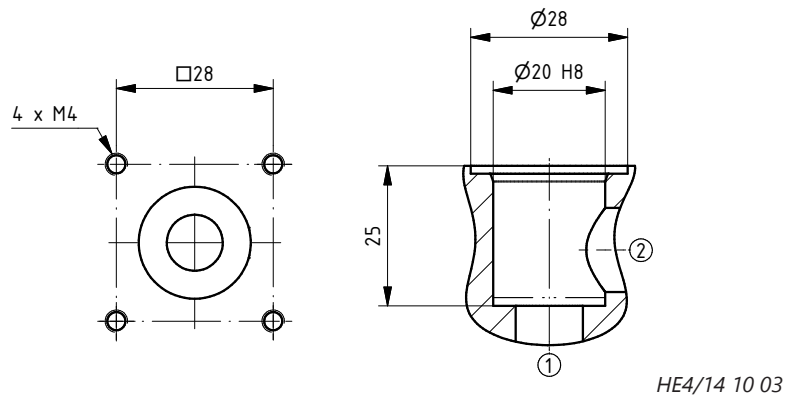
Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

Slip-in valve PVDE2-11



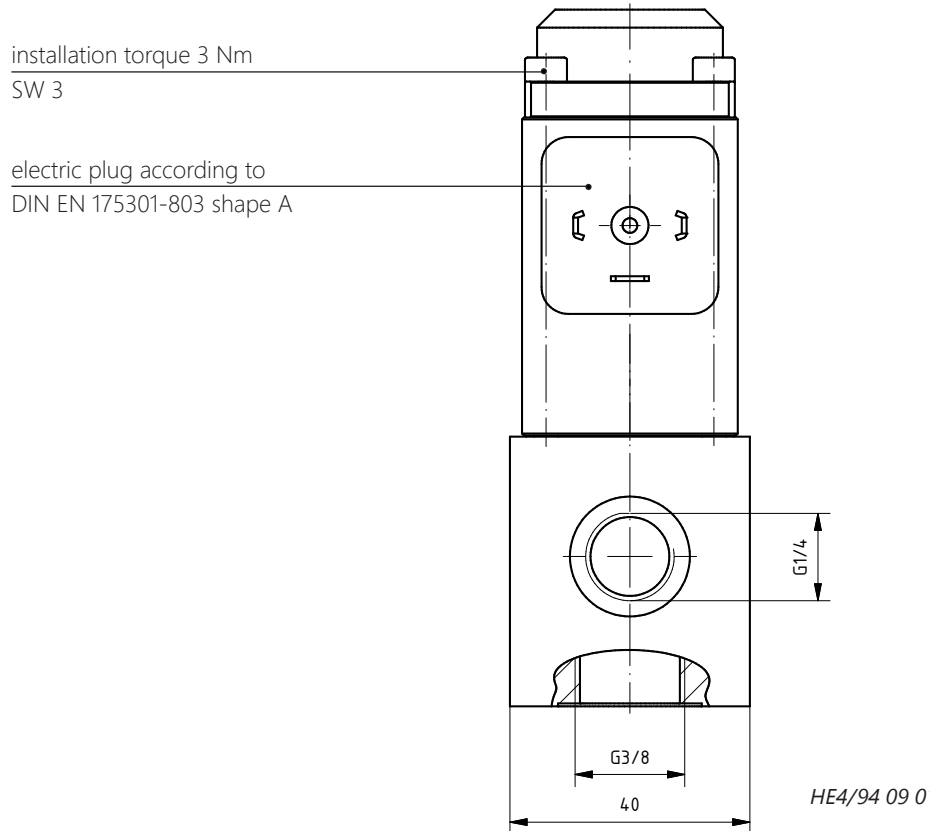
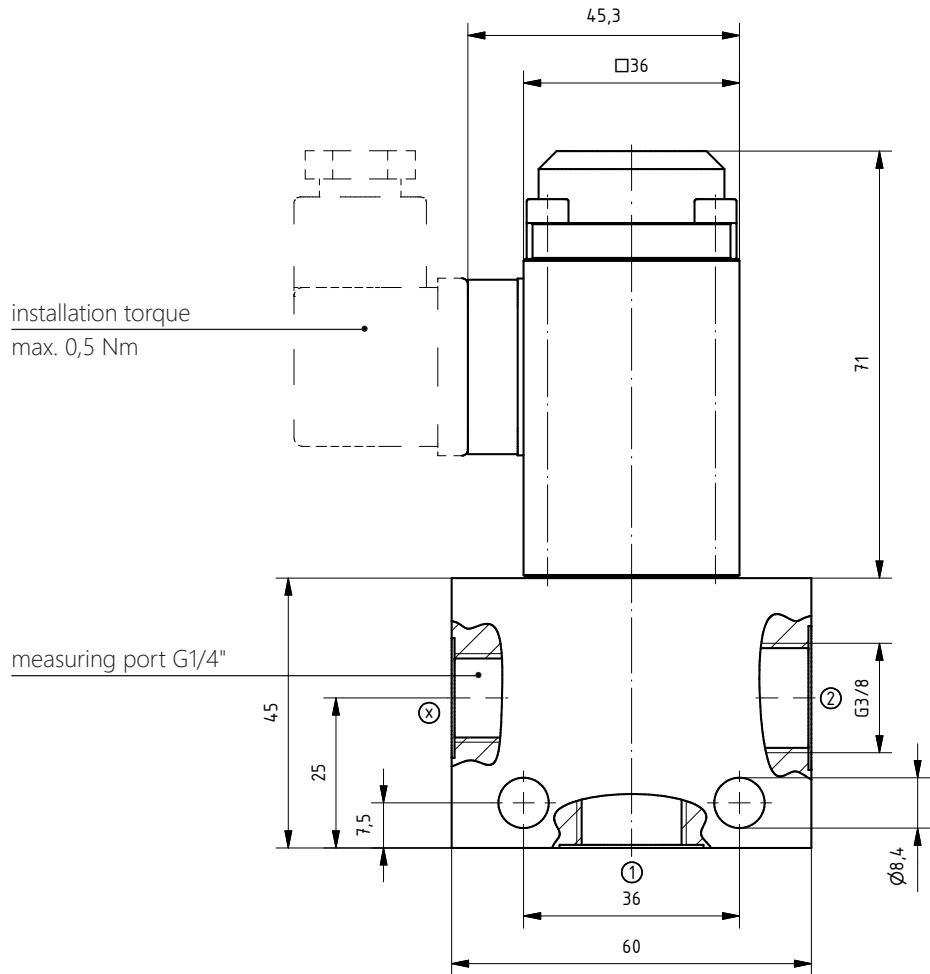
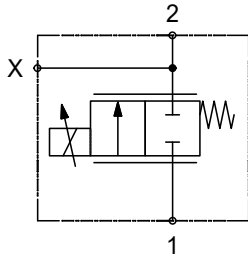
Cavity PVDE2-11



NOTE For a detailed drawing of the cavity please see our „general information“ or our online catalogue at www.weber-hydraulik.com.

Dimensions

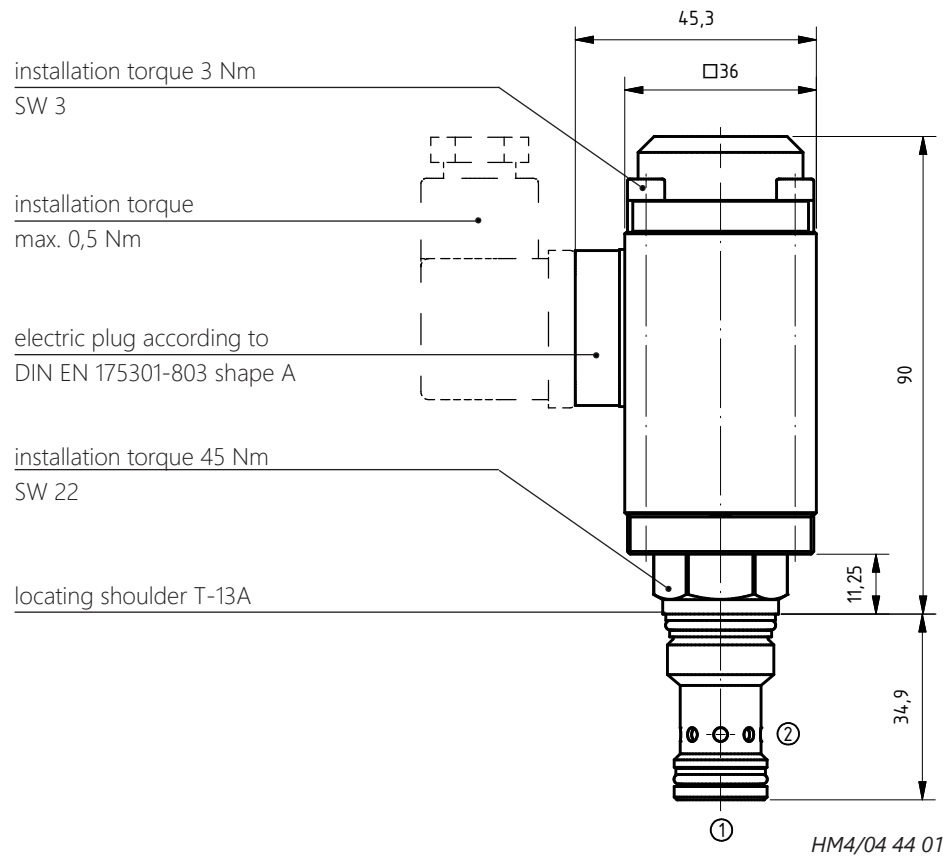
*Slip-in valve in
in-line body G3/8"
PVDR2-11*



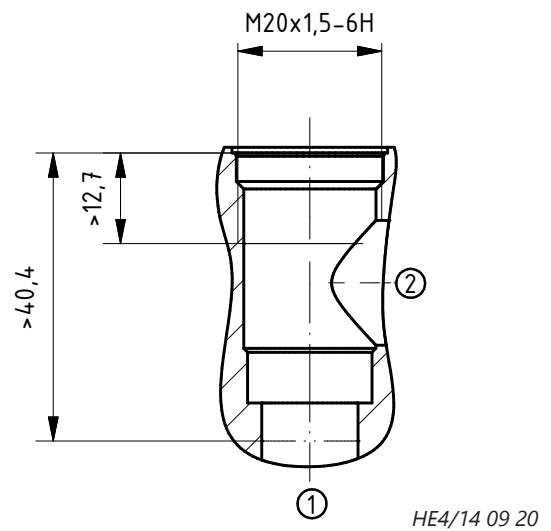
HE4/94 09 01

Dimensions

Screw-in valve PVDES2-11



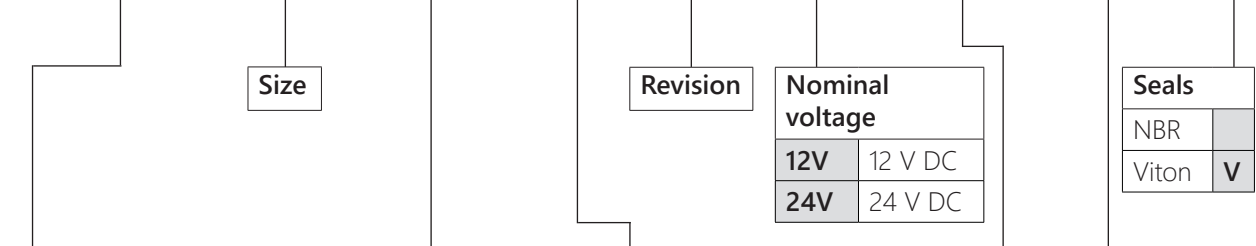
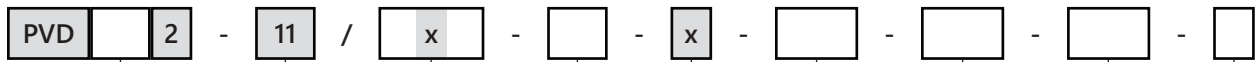
Cavity T-13A



NOTE For a detailed drawing of the cavity please see our „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide a variety of suitable manifolds for T-13A. Please contact us for further assistance.

Type code



Model	
E	slip-in valve
R	in in-line body
ES	screw-in valve

Nominal flow at $\Delta p = 10 \text{ bar}$	
1 x 1	3 l/min
2 x 1	7 l/min
2 x 2	11 l/min
4 x 1,5	17 l/min
4 x 3	21 l/min

Manual override	
without	
spring loaded manual override (push knob)	DNH
lockable manual override with hexagon socket and lock nut	FNH
lockable manual override with hand wheel and lock nut	HNH

Electric Termination	
DIN	
AMP Junior Timer (only for 24 V model)	AMP
unterminated wire 500 mm (only for 24 V model)	K

Spool type	
SG	<p>normally closed</p>
SO	<p>normally open</p>

Accessories and additional information

<i>Accessories/ spare parts</i>	Article:	Material number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit PVDE2-11 (NBR)	405.0020
	Seal kit PVDE2-11 (Viton)	405.0068
	Seal kit T-13A (NBR)	405.0013
	Seal kit T-13A (Viton)	405.0037
	a variety of alternative solenoids with manual overrides are available on request	

NOTE For the appropriate electronic controllers, see our chapter „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in the chapter „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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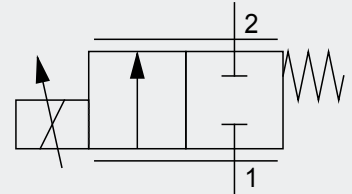
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Proportional throttle valve PVDE_2-11-EX according to ATEX-directive



direct operated, solenoid operated
 operating pressure max. 250 bar
 volume flow max. 20 l/min
 cavity PVDE2-11



040111_PVDE_2-11_EX_e
 07.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	3
Type code	5
Accessories and additional information	5
Set-up	6



Characteristics

- proportional 2/2-way throttle valve in spool design
- according to the ATEX-directive for the use in potentially explosive atmospheres
- normally open or normally closed models
- slip-in valve for cavity PVDE2-11
- maintenance-free

Technical data

<i>Hydraulic</i>	Operating pressure max.:	250 bar, differential pressure control Δp max. 25 bar
	Flow rate:	2,4, 5,6, 8,8, 13,6 l/min; 16,8 l/min (only SO), 20 l/min (only SG) at differential pressure control $\Delta p = 10$ bar
	Performance limit:	max. nominal flow rate also at a higher differential pressure control Δp
	Flow direction:	1 to 2, (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current

<i>Mechanic</i>	Design :	PVDE slip-in design or PVDR in in-line body, direct operated by solenoids
	Size:	11
	Fluid temperature:	-30 °C to +50 °C
	Ambient temperature:	-30 °C to +50 °C
	Storage temperature:	-30 °C to +50 °C (non-condensing)
	Installation position:	any
	Maximum acceleration:	3 g crossways
	Weight:	PVDE2-11: 2,6 kg, PVDR2-11: 3,27 kg
	Material:	valve parts and manifold: steel seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel

<i>Electric</i>	Nominal voltage:	24 V DC
	Nominal valve current:	0,6 A
	Nominal resistance (R20):	23,1 Ω
	Power consumption:	15,6 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 85 Hz (depending on application)
	Protection system:	IP67 according to IEC/EN 60529, IP69K according to DIN 40050-9 with intended assembling
	Protection class:	III according to DIN VDE 0580
	Electric termination:	15 meter connecting cable FL4G11Y 2x1,5 mm ² with explosive protection acc. to the ATEX-directive IECEx/ATEX  0637,  II 2G Ex mb IIC T4 Gb, II 2D Ex mb IIIC T130° Db in acc. with EN 60079-0:2012 + A11:2013 / IEC 60079-0:2011 + Cor.:2012 + Cor.:2013, EN 60079-18:2015 / IEC 60079-18:2014

Technical Data

Electric EC Type Examination Cert.: IBExU 13 ATEX 1040 X, IECEx IBE 13.0017X

Electronic controllers: see chapter 6 *"electronics and sensors"* as well as our online catalogue at www.weber-hydraulik.com.



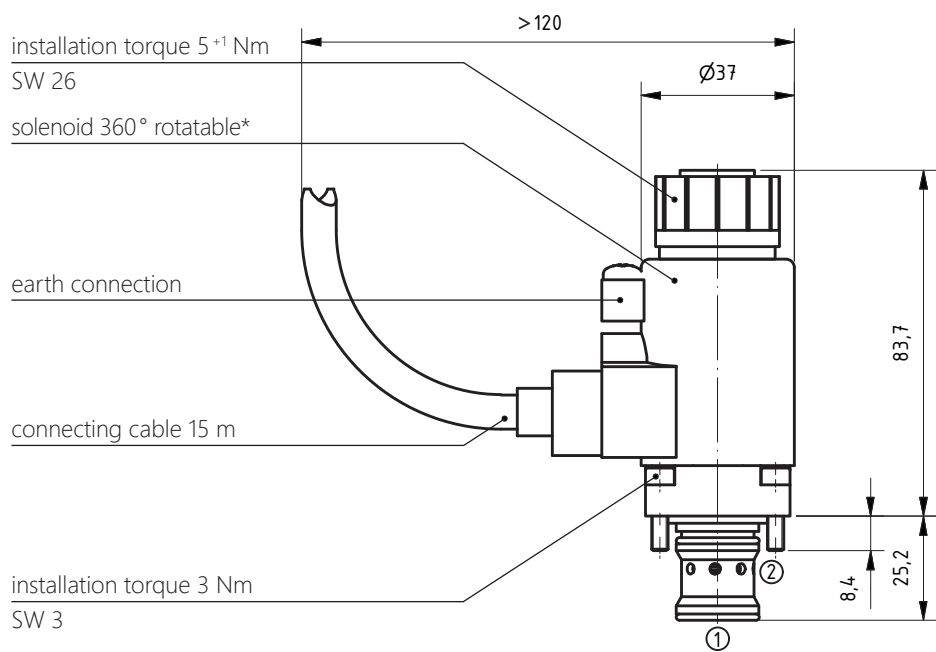
Electronics that are used in explosion protected areas must be Ex-certified!

Performance

Performance graphs upon request

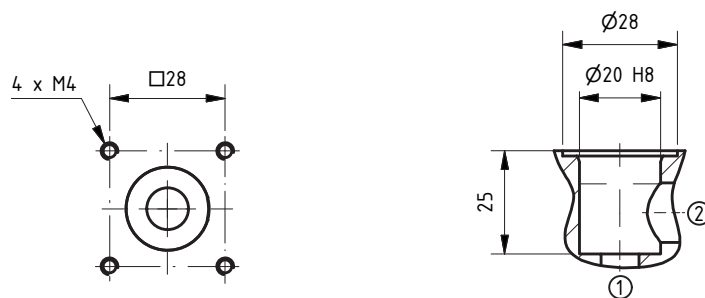
Dimensions

*Slip-in valve
PVDE2-11-EX*



* with EC Type Examination Certificate
IBExU 13 ATEX 1040 X, IECEx IBE 13.0017X

Cavity PVDE2-11

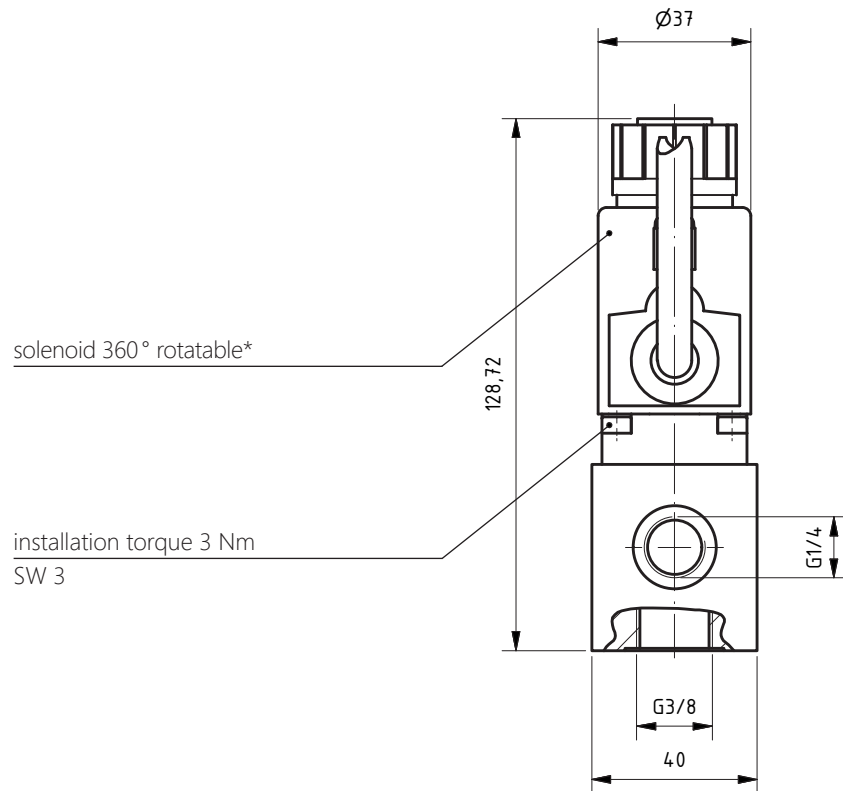
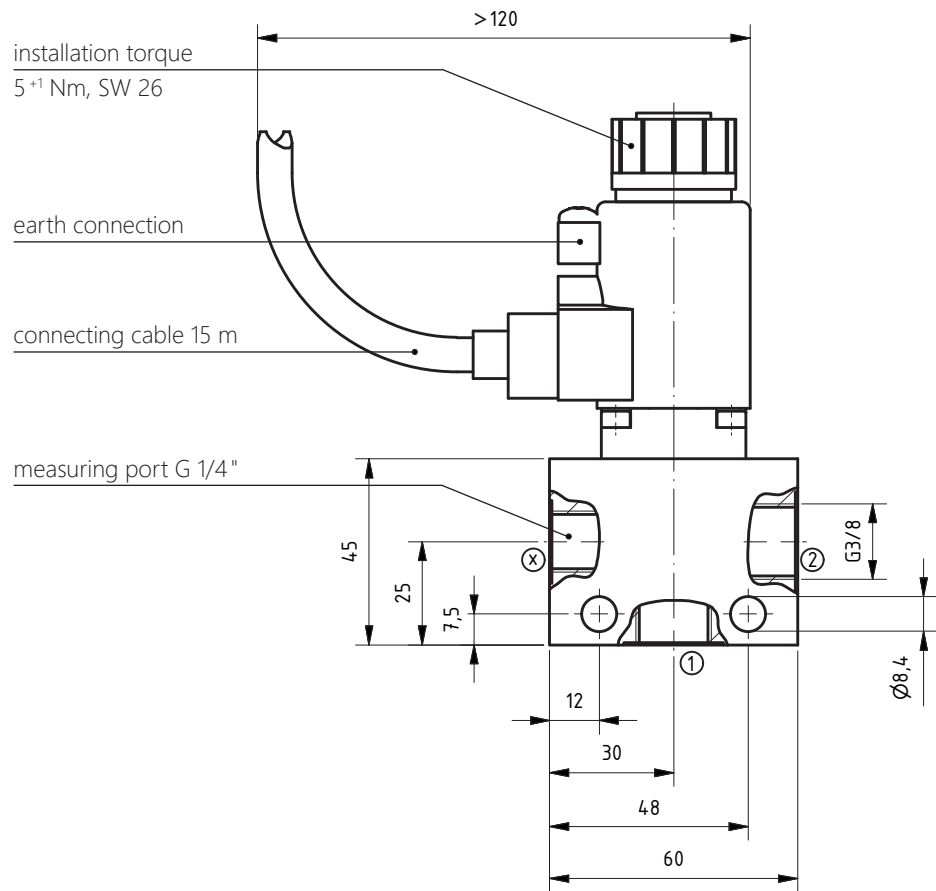
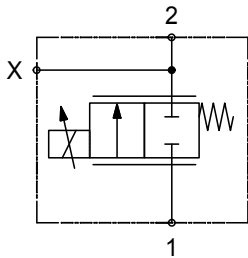


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NOTE For a detailed drawing of the cavity please see chapter 11 *"general information"* or our online catalogue at www.weber-hydraulik.com.

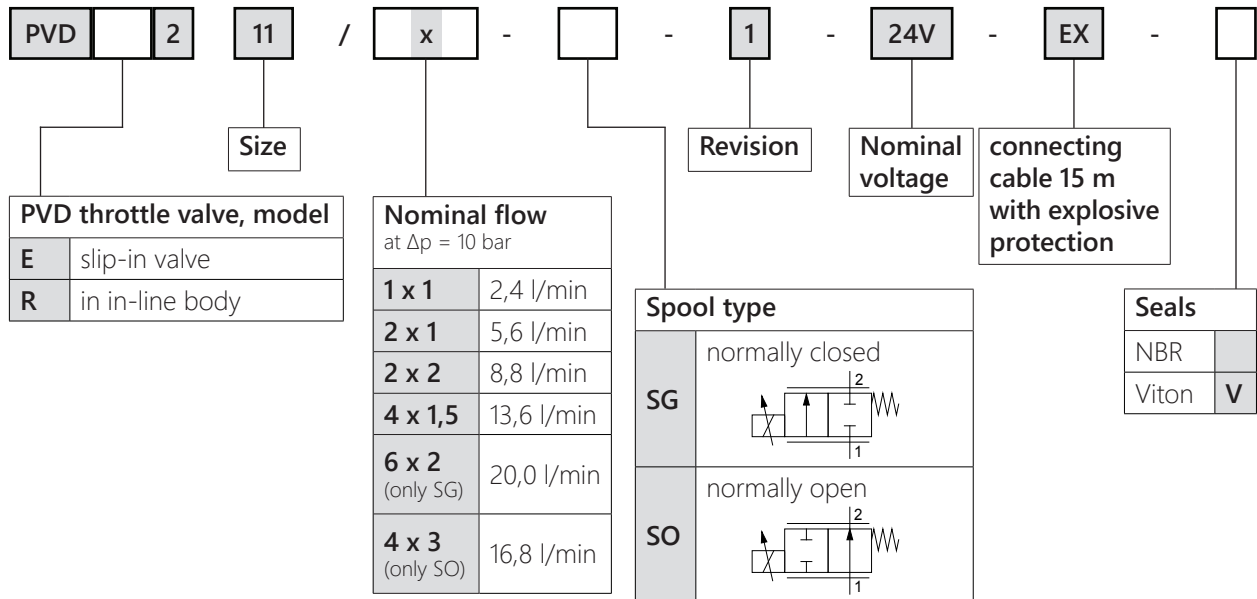
Dimensions

*Slip-in valve in
in-line body G 3/8"*
PVDR2-11_EX



* with EC Type Examination Certificate
IBExU 13 ATEX 1040 X, IECEx IBE 13.0017X

Type code



Accessories and additional information

Accessories/ spare parts	Article:	Material number:
	Seal kit PVDE2-11 (NBR)	405.0020
	Seal kit PVDE2-11 (Viton)	405.0068

NOTE



For the appropriate electronic controllers, see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com. Please consider whether the electronic controller will be located inside or outside of the explosion protected area. Electronics that are used in explosion protected areas must be certified according to the ATEX-directive!

Set-up

The solenoid coil may only be operated when installed on the appropriate valve. **Further information can be found in the provided operation manual of the solenoid. When operating the valve, information contained in the provided operation manual of the solenoid, as well as our general operating manual- must be followed precisely!**

Single or multiple mounting of the valve in single operation must have a minimum size of 46 x 46 x 66 mm and a base plate $\geq 46 \times 30 \times 66$ mm. The material must be Fe or material with the same or better thermal conductivity.

The installation of these electrical components must be carried out by an electrician with adequate qualifications.

Each solenoid must be short-circuit fuse protected suitable to its nominal valve current (max. $3 \times I_N$ according to IEC/EN 60127-2). This could, for example, be a motor protecting switch with thermal quick release and short-circuit protection (adjusted to the rated current).

The installed fuse must have a voltage rating equal or larger than the rated voltage of the solenoid, and the fuse should be installed in the associated power supply. If this is not possible, the fuse can be installed separately if the appropriate safety instructions are carefully considered.

When connecting the fuse to the circuit, it is of utmost importance to consider whether the fuse will be located inside, or outside of the explosion protected area. If the fuse will be connected to the circuit inside of the explosion protected area, then it must be mounted in an Ex-certificated terminal box.

For equipotential bonding, a ground terminal is provided on the outside of the solenoid.

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „**general information**“ under the category „**general operating manual**“ or will be provided upon request.



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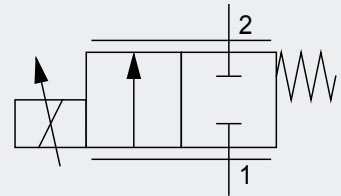
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Proportional throttle valve PVDES2-14



direct operated, solenoid operated
 operating pressure max. 350 bar
 volume flow max. 80 l/min
 cavity T-5A



040120_PVDES2-14_e
 06.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	3
Type code	5
Accessories and additional information	5

Characteristics

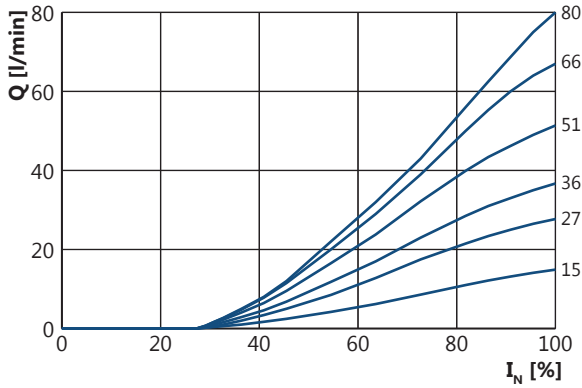
- proportional 2/2-way throttle valve in spool design
- normally open or normally closed models
- screw-in valve for cavity T-5A
- maintenance-free
- rotatable and replaceable solenoid coil

Technical data

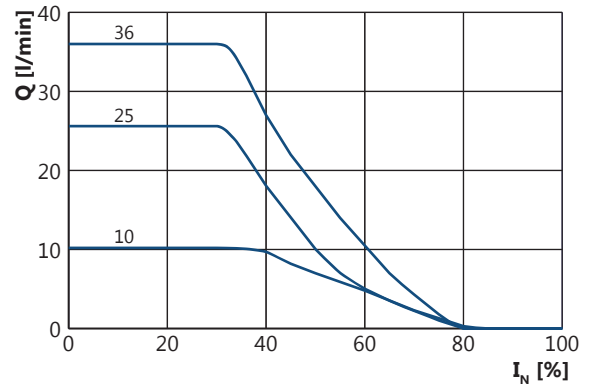
<i>Hydraulic</i>	Operating pressure max.:	350 bar, differential pressure control Δp max. 25 bar
	Flow rate:	see type code at differential pressure control $\Delta p = 10$ bar
	Performance limit:	max. nominal flow rate also at a higher differential pressure control Δp
	Flow direction:	1 to 2 (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
		* at 20 % to 100 % of the nominal valve current
	<i>Mechanic</i>	Design :
Size:		14
Fluid temperature:		-20 °C to +65 °C
Ambient temperature:		-20 °C to +50 °C
Storage temperature:		-30 °C to +60 °C (non-condensing)
Installation position:		any
Maximum acceleration:		5 g
Weight:		PVDES: 0,7 kg, PVDR: 2,1 kg
Material:		valve parts and manifolds: steel seals: NBR, Viton optional
Surface protection:	exterior parts: zinc coated steel	
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	12 V: DIN and AMP 2,3 A, Deutsch 2,0 A 24 V: DIN and AMP 1,1 A
	Nominal resistance (R20):	12 V: DIN and AMP 2,7 Ω , Deutsch 3,85 Ω 24 V: DIN and AMP 12,6 Ω
	Power consumption:	23 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, Deutsch connector
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

Performance

Flow rate diagram (Q/I) PVDES2-14 at $\Delta p = 10$ bar, normally closed



Flow rate diagram (Q/I) PVDES2-14 at $\Delta p = 10$ bar, normally open



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

Screw-in valve
PVDES2-14

installation torque: 4 Nm

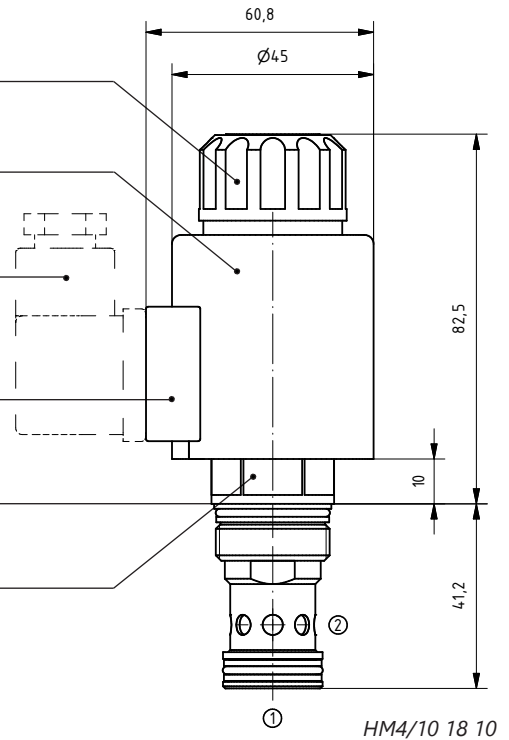
solenoid coil,
rotatable 360°

installation torque:
max. 0,5 Nm

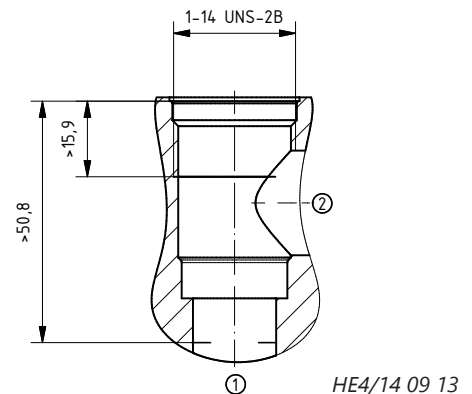
electric plug according to
DIN EN 175301-803
(formerly DIN 43650) shape A

locating shoulder T-5A

installation torque: 60 to 65 Nm
SW 24



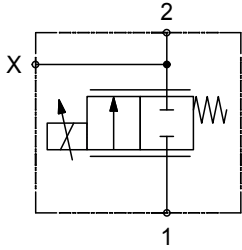
Cavity T-5A



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

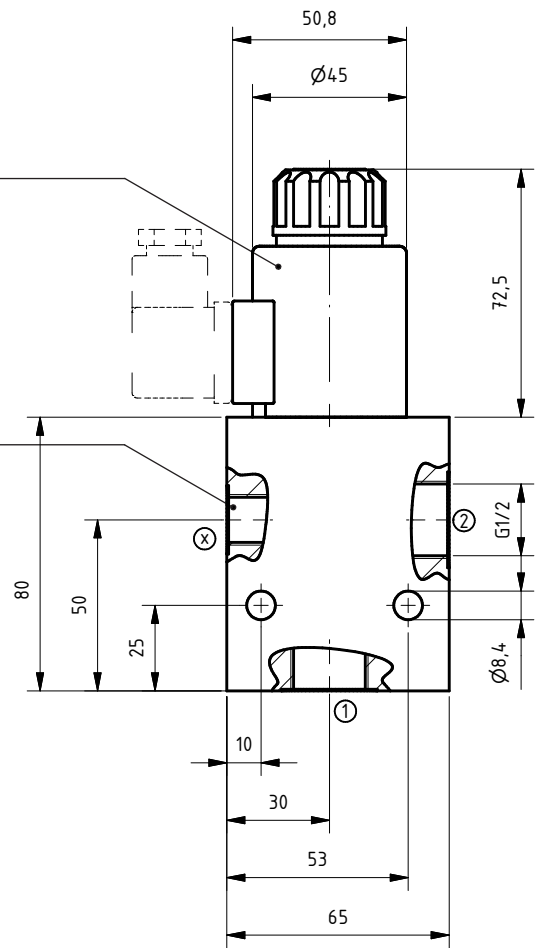
Dimensions

*Screw-in valve in
in-line body G1/2"
PVDR2-14*



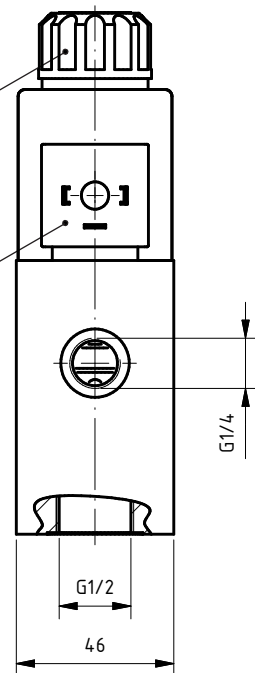
solenoid coil,
rotatable 360°

measuring port G1/4"



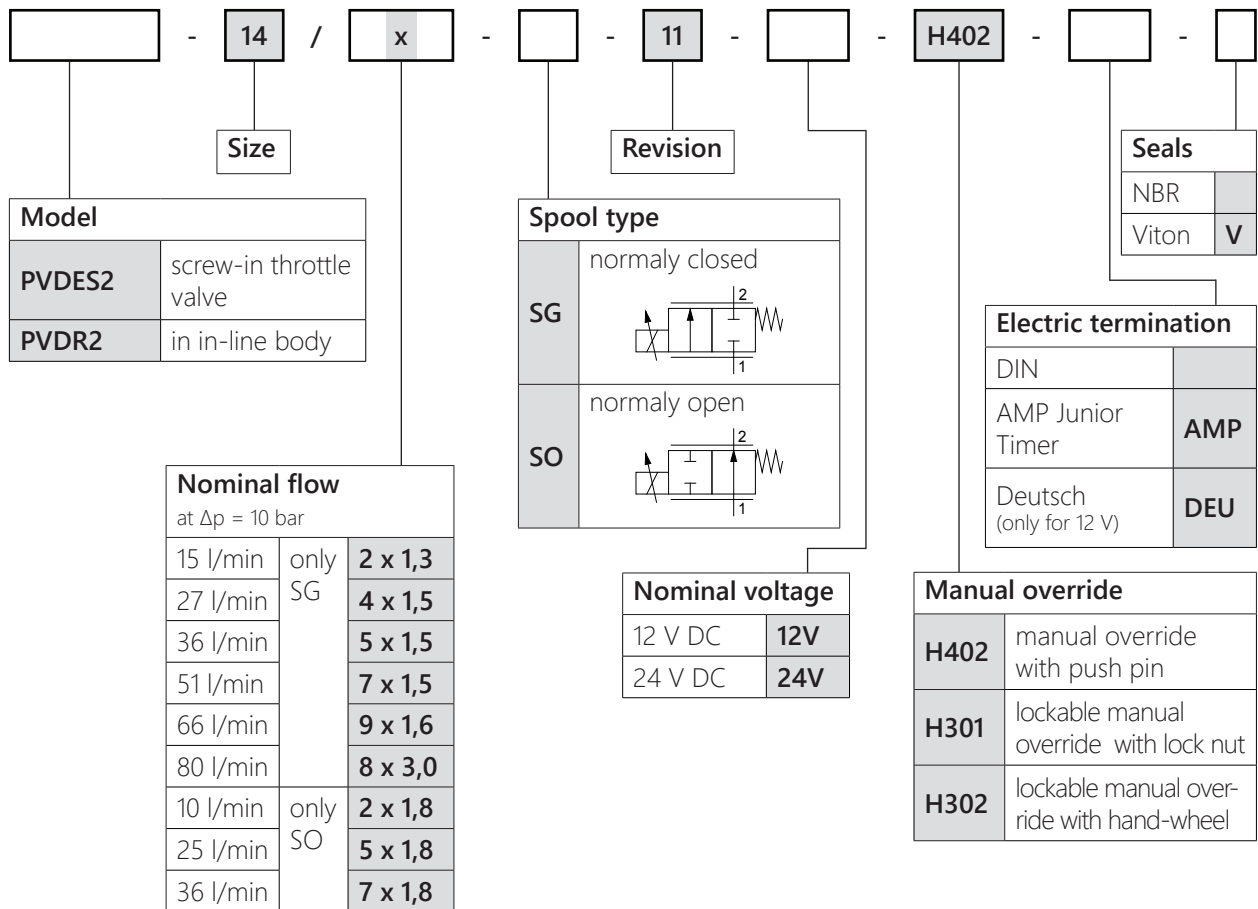
installation torque: 4 Nm

electric plug according
to DIN EN 175301-803
(formerly DIN 43650)
shape A



HMA/14 11 28

Type code



Accessories and additional information

Accessories/ spare parts	Part:	Article number:
	Socket connector DIN EN 175301-803*, shape A, black	149.0007
	Socket connector DIN EN 175301-803*, shape A, grey	149.0008
	Seal kit T-5A (NBR)	405.0040
	Seal kit T-5A (Viton)	405.0041
	Coil 12 V, DIN EN 175301-803*, shape A	147.0011
	Coil 24 V, DIN EN 175301-803*, shape A	147.0009
	Coil 12 V, AMP Junior Timer	147.0007
	Coil 24 V, AMP Junior Timer	147.0010
	Coil 12 V, Deutsch connector	147.0012

* (formerly DIN 43650)

NOTE For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.



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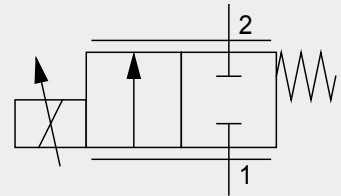
www.weber-hydraulik.com
info.de-k@weber-hydraulik.com

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Proportional throttle valve PVDES2-18



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 195 l/min
 cavity T-16A



040130_PVDES2-18_e
 01.2020

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	3
Type code	4
Accessories and additional information	5

Characteristics

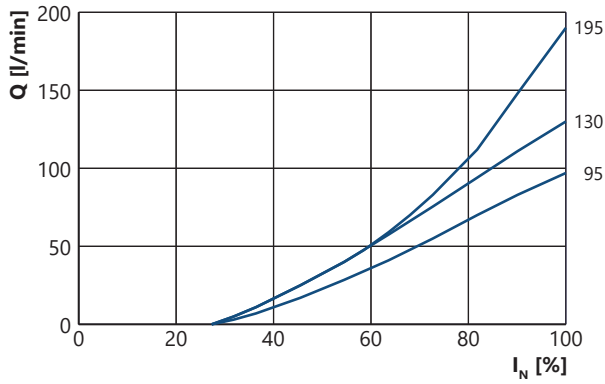
- proportional 2/2-way throttle valve in spool design
- normally open or normally closed models
- screw-in valve for cavity T-16A
- high flow rate
- maintenance-free
- rotatable and replaceable solenoid coil

Technical data

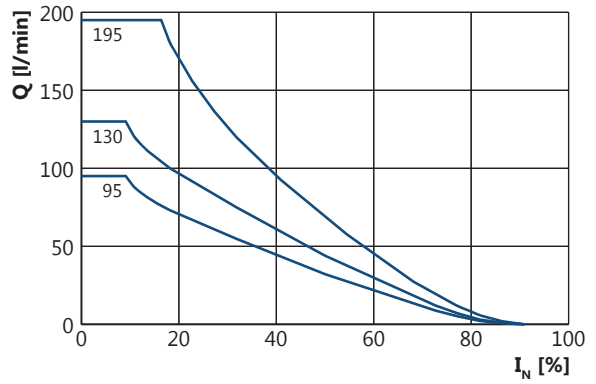
<i>Hydraulic</i>	Operating pressure max.:	315 bar (dynamic) differential pressure control Δp max. 25 bar
	Flow rate:	95, 130, 195 l/min at differential pressure control $\Delta p = 10$ bar
	Performance limit:	max. nominal flow rate also at a higher differential pressure control Δp
	Flow direction:	1 to 2 (2 to 1 not allowed)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PMW-signal*
	Hysteresis:	< 5 % with optimized PMW-signal*
		* at 20 % to 100 % of the nominal valve current
<i>Mechanic</i>	Design:	screw-in valve, direct operated
	Size:	18
	Fluid temperature:	-20 °C to +65 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Maximum acceleration:	3 g
	Weight:	1,9 kg including coil
	Material:	valve parts: steel seals: NBR, Viton optional
Surface protection:	exterior parts: zinc coated steel	
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	2,28 A (12 V), 1,1 A (24 V)
	Nominal resistance (R20):	3,9 Ω (12 V), 16,5 Ω (24 V)
	Power consumption (P20):	20,3 W (12 V), 20 W (24 V)
	Power consumption max.:	30,6 W (12 V), 30,1 W (24 V)
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 85 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803, shape A
Electronic controllers:	see chapter 6 „ <i>electronics and sensors</i> “ as well as our online catalogue at www.weber-hydraulik.com .	

Performance

Flow rate diagram (Q/I) PVDES2-18 at $\Delta p = 10$ bar, normally closed



Flow rate diagram (Q/I) PVDES2-18 at $\Delta p = 10$ bar, normally open

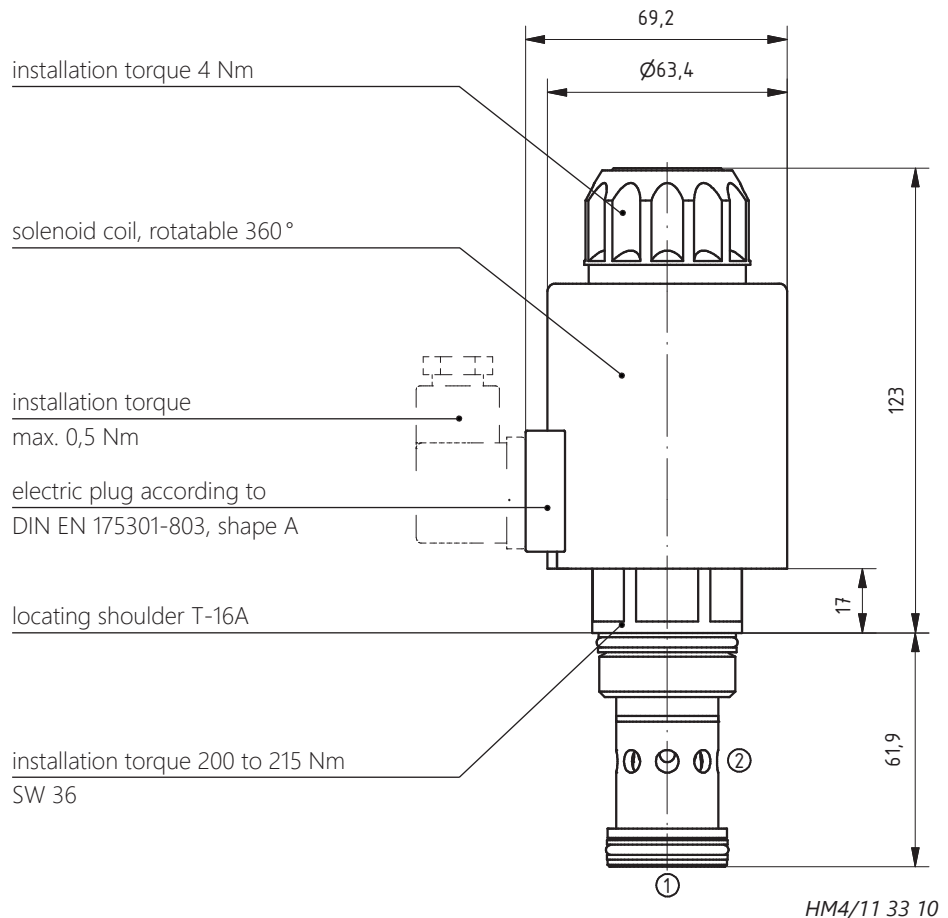


Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

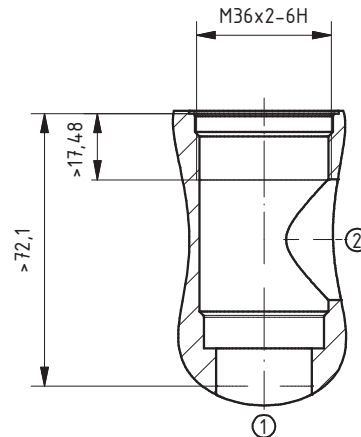
Dimensions

Screw-in valve
PVDES2-18



Dimensions

Cavity T-16A

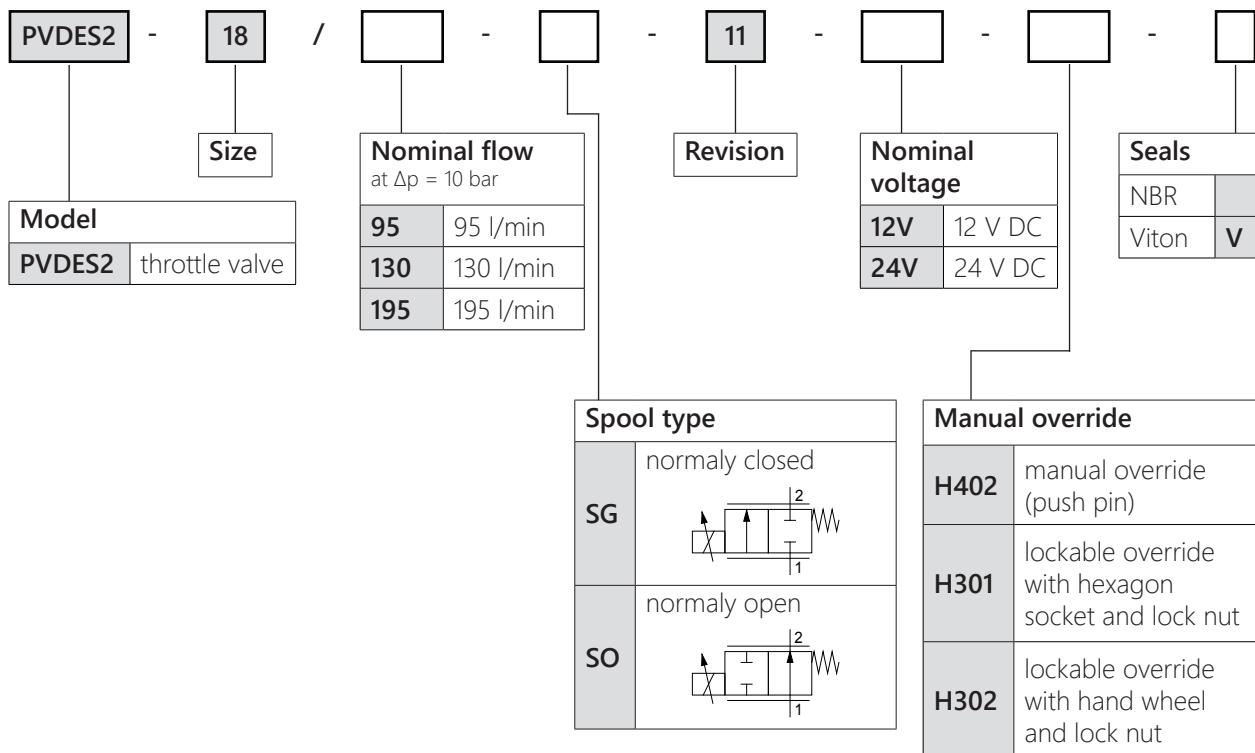


HE4/14 10 01

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

<i>Accessories/ spare parts</i>	Article:	Material number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit T-16A (NBR)	1094187
	Seal kit T-16A (Viton)	1094190
	Coil 12 V, DIN EN 175301-803, shape A	147.0020
	Coil 24 V, DIN EN 175301-803, shape A	147.0019

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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EPSR2-11 and EPSR3-11

direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 20 l/min
in-line body, sandwich body or mounting plate NG 6

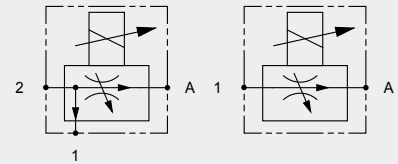
EPSR2-14 and EPSR3-14

direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 70 l/min
in-line body or sandwich body NG 6 or NG 10

Proportional flow control valve EPSR2-11 and EPSR3-11



direct operated, solenoid operated
 operating pressure max. 350 bar
 volume flow max. 20 l/min
 in in-line body, sandwich body NG 6
 or mounting plate NG 6



050110_EPSR_11_e
 07.2018

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	3
Type code	6
Accessories and additional information	7

Characteristics

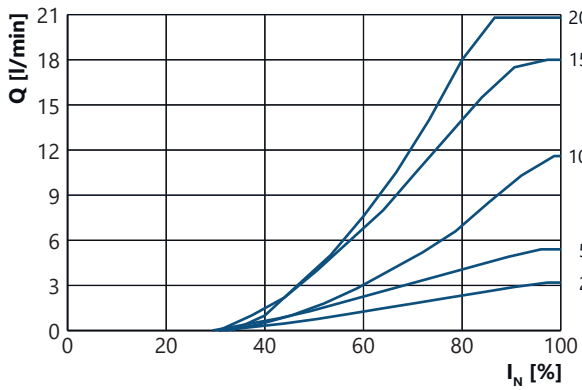
- 2- or 3-way proportional flow control valve in in-line body, in sandwich body NG 6 or in mounting plate NG 6
- normally open or normally closed models
- available with or without check valve
- maintenance-free

Technical data

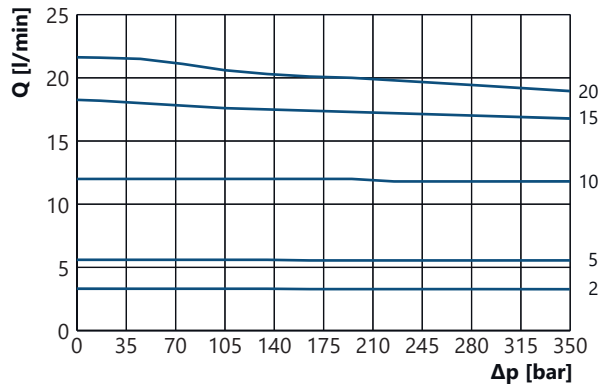
<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow rate:	see type code, at differential pressure control $\Delta p = 7$ bar
	Flow direction:	see symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
	* at 20 % to 100 % of the nominal valve current	
	<hr/>	
<i>Mechanic</i>	Design:	Slip-in valve in in-line body or in sandwich-body or mounting plate NG 6
	Size:	11
	Fluid temperature:	-20 °C to +65 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Maximum acceleration:	3 g, crossways
	Weight:	EPSR: 2,39 kg, EPSRV: 1,63 kg, ZEPSR: 2,41 kg, EPSRA: 1,84 kg
	Material:	valve parts and manifolds: steel, seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	1,7 A (12 V), 0,7 A (24 V)
	Nominal resistance (R20):	4 Ω (12 V), 25 Ω (24 V)
	Power consumption:	16 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

Performance

Flow rate diagram (Q/I) EPSR2-11



Pressure drop diagram (p/Q) EPSR2-11



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

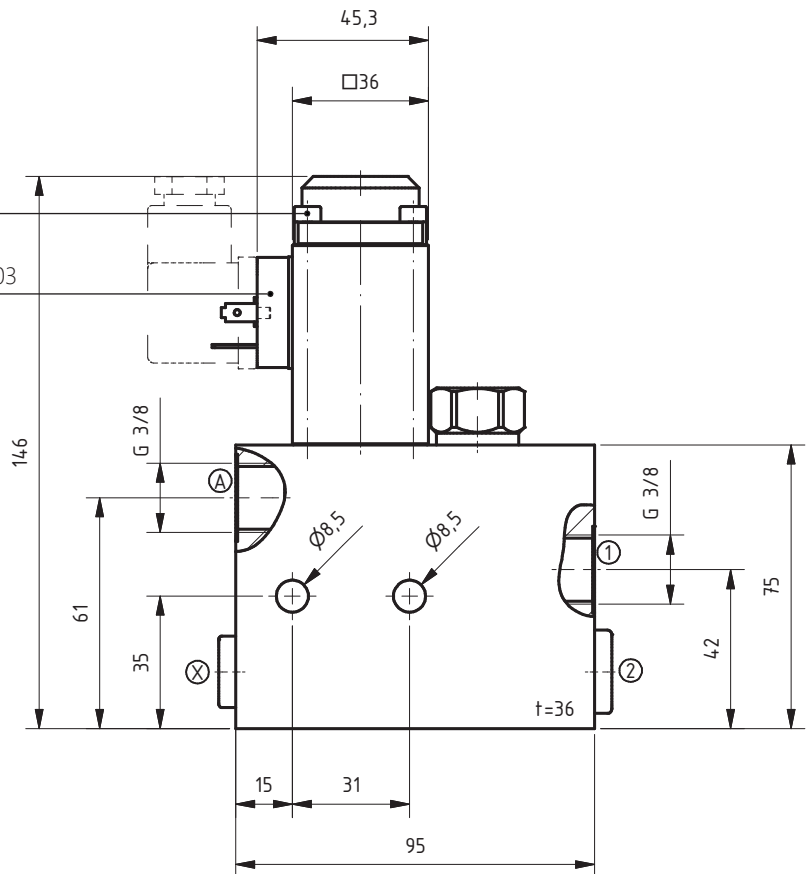
Dimensions

Proportional flow control valve in in-line body EPSR 11

installation torque 3 Nm

SW 3

electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A

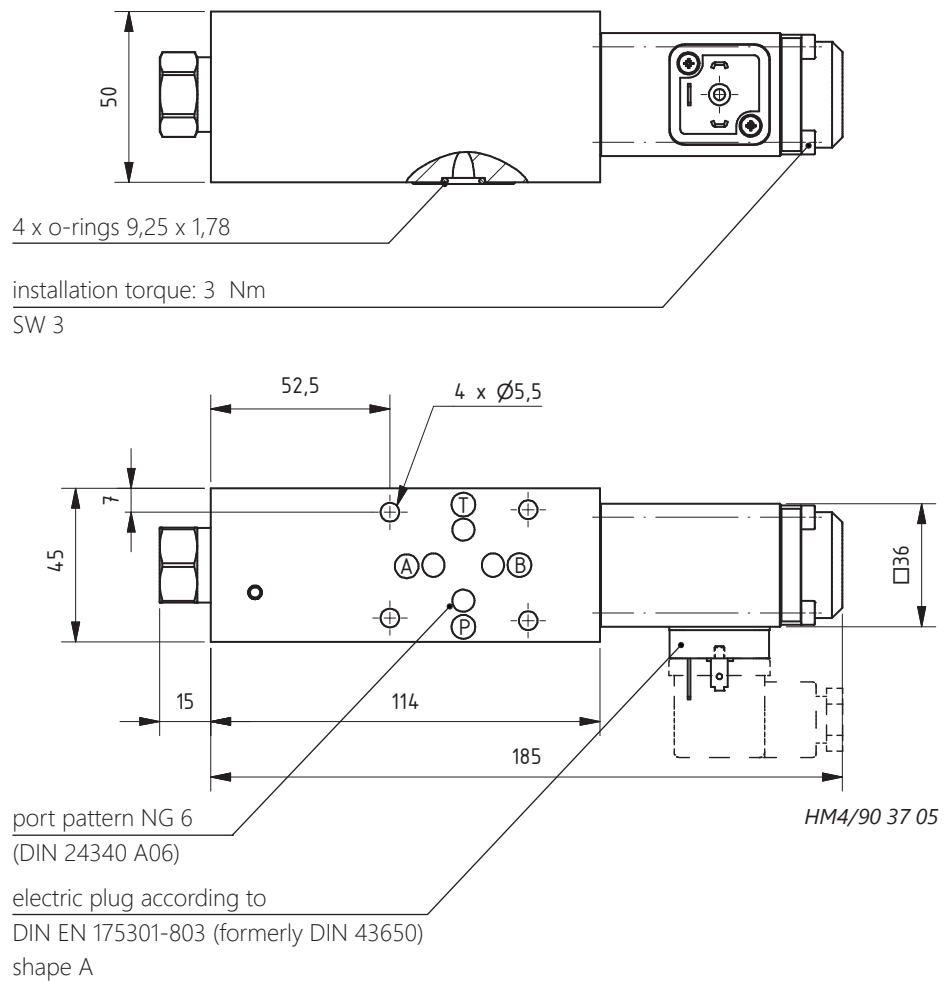


HM3/90 08 02

NOTE The valve is also available as EPSRA-06-11 in a mounting plate NG 6. Dimension sheets are available upon request.

Dimensions

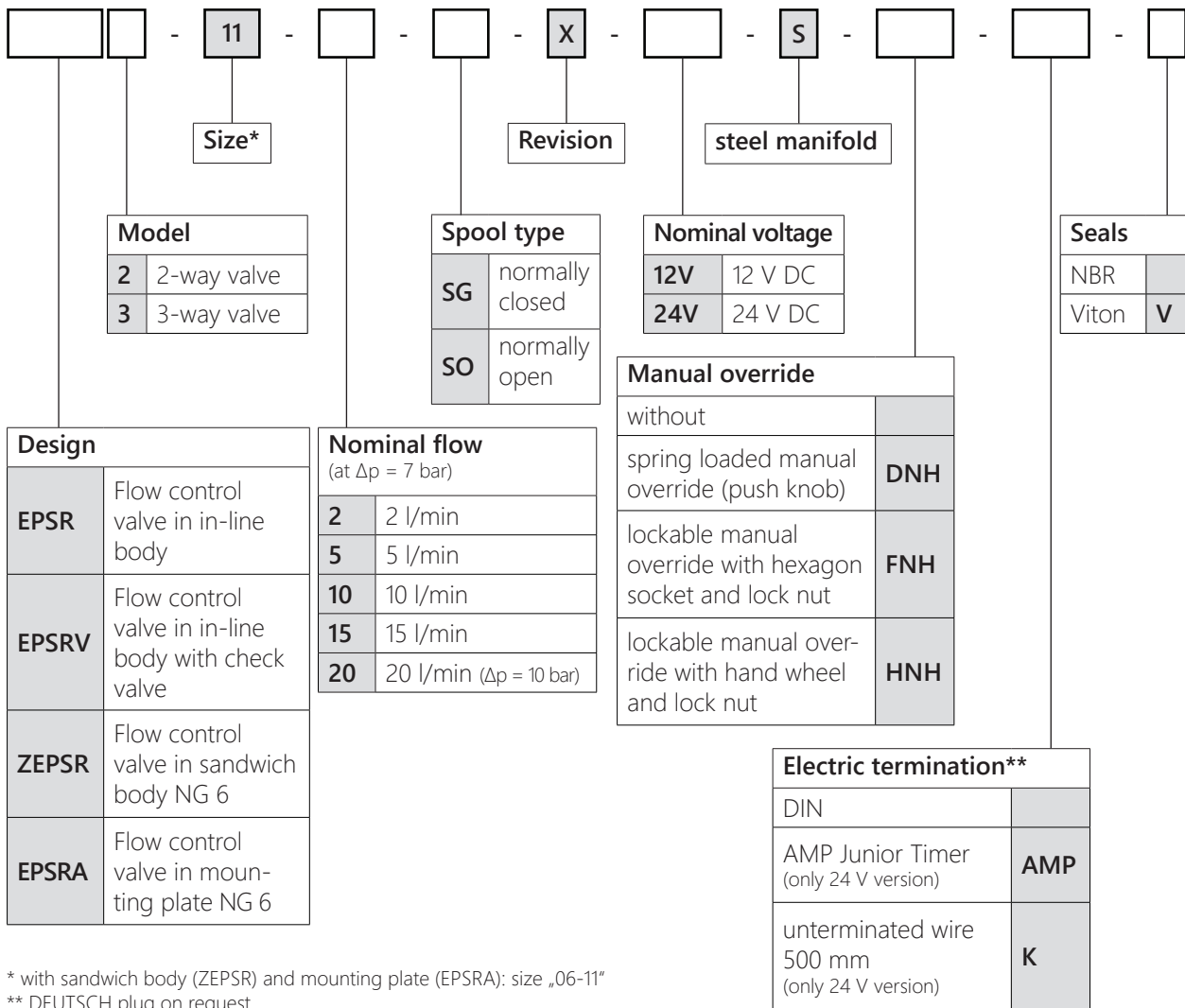
Proportional flow control valve in sandwich body NG 6 ZEPSR 06-11



NOTE For a detailed drawing of the port pattern please see chapter 11 „*general information*“ under the category „*port patterns*“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 60 - 12.9. Installation torque: 6 Nm, screw-in depth min. 8 mm.

Type code



Accessories and additional information

<i>Accessories / spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Seal kit PVDE2-11 (NBR)	405.0020
	Seal kit PVDE2-11 (Viton)	405.0068
	Seal kit T-13A (NBR)	405.0013
	Seal kit T-13A (Viton)	405.0037
	4 x o-ring 9,25 x 1,78 (NBR)	401.0128
	4 x o-ring 9,25 x 1,78 (Viton)	401.0147
	A variety of alternative electric terminations and manual overrides are available on request	

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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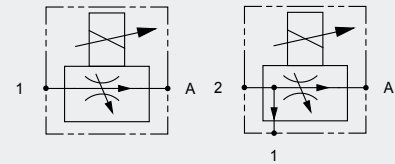
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Proportional flow control valve EPSR2-14 and EPSR3-14



direct operated, solenoid operated
 operating pressure max. 350 bar
 volume flow max. 70 l/min
 in in-line body or
 sandwich body NG 6 or NG 10



050120_EPSR_14_e
 07.2018

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	3
Type code	5
Accessories and additional information	6

Characteristics

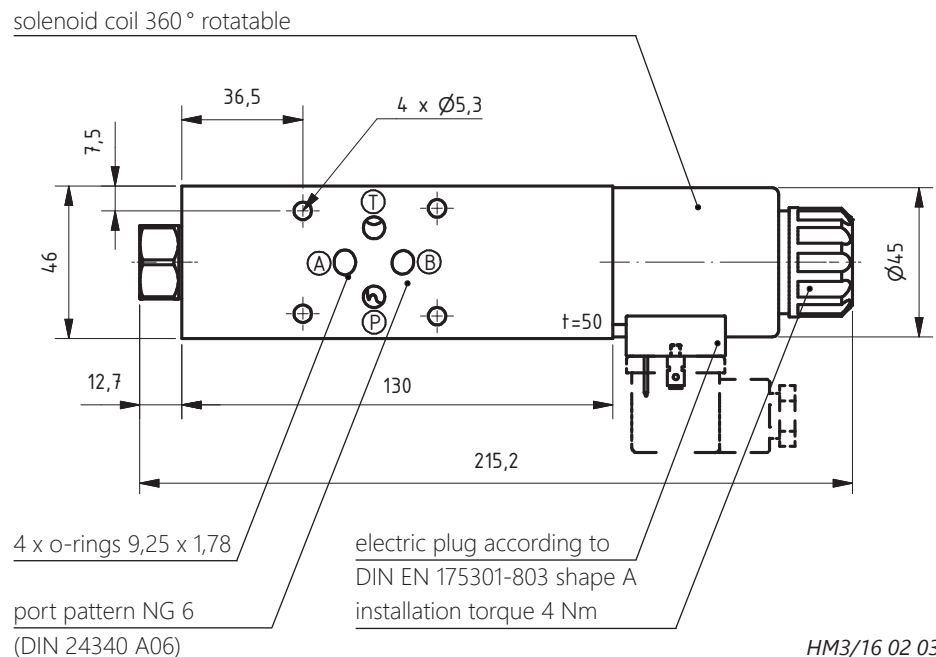
- 2- or 3-way proportional flow control valve in in-line body or in sandwich body NG 6 or NG 10
- normally open or normally closed models
- versions available where surplus flow can be pressurised
- maintenance-free
- rotatable and replaceable coils

Technical data

<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow rate:	see type code, at differential pressure control $\Delta p = 7$ bar
	Flow direction:	2-way: 1 to A, 3-way: 2 to A (1 = tank)
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_{5(c)} > 200$
	Repeatability:	< 3 % with optimized PWM-signal*
	Hysteresis:	< 5 % with optimized PWM-signal*
	* at 20 % to 100 % of the nominal valve current	
	<hr/>	
<i>Mechanic</i>	Design:	Screw-in valve in in-line body or in sandwich-body NG 6 or NG 10
	Size:	14
	Fluid temperature:	-20 °C to +65 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Maximum acceleration:	5 g, crossways
	Weight:	EPSR: 4,30 kg, ZEPSR2-06: 3,88 kg, ZEPSR3-06: 2,69 kg ZEPSR3-10: 5,65 kg
	Material:	valve parts and manifolds: steel, seals: NBR, Viton optional
Surface protection:	exterior parts: zinc coated steel	
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	12 V: DIN and AMP 2,3 A, DEUTSCH 2,0 A 24 V: DIN and AMP 1,1 A
	Nominal resistance (R20):	12 V: DIN and AMP 2,7 Ω , DEUTSCH 3,85 Ω 24 V: DIN and AMP 12,6 Ω
	Power consumption:	23,0 W at nominal valve current
	Shifting time:	100 % ED
	Control command:	PWM-signal
	PWM-frequency:	typically 140 Hz (depending on application)
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, DEUTSCH
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com .

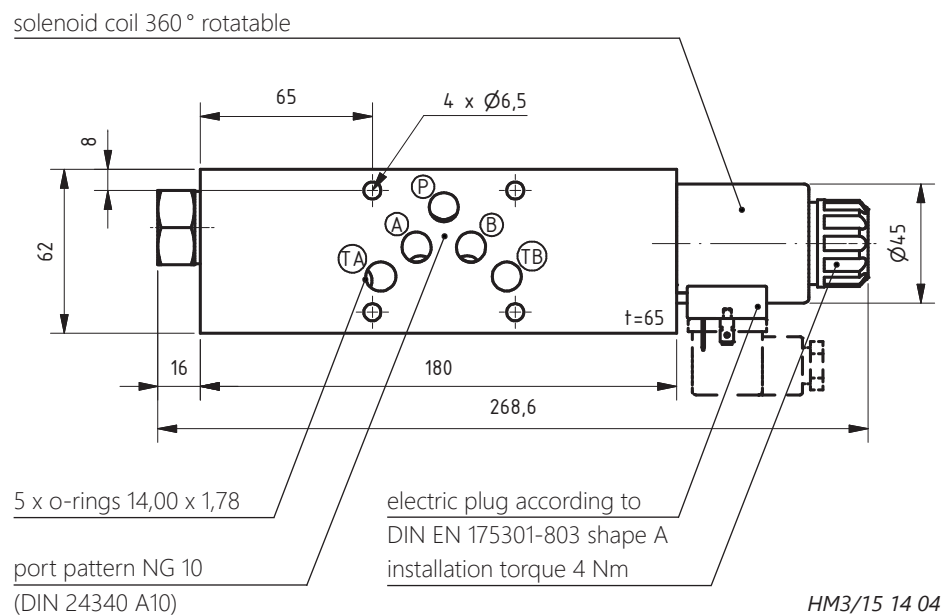
Dimensions

Proportional flow control valve in sandwich body NG 6 ZEPSR-06-14



NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 60 - 12.9. Installation torque: $6,3 \pm 0,3$ Nm, screw-in depth min. 8 mm.

Proportional flow control valve in sandwich body NG 10 ZEPSR-10-14



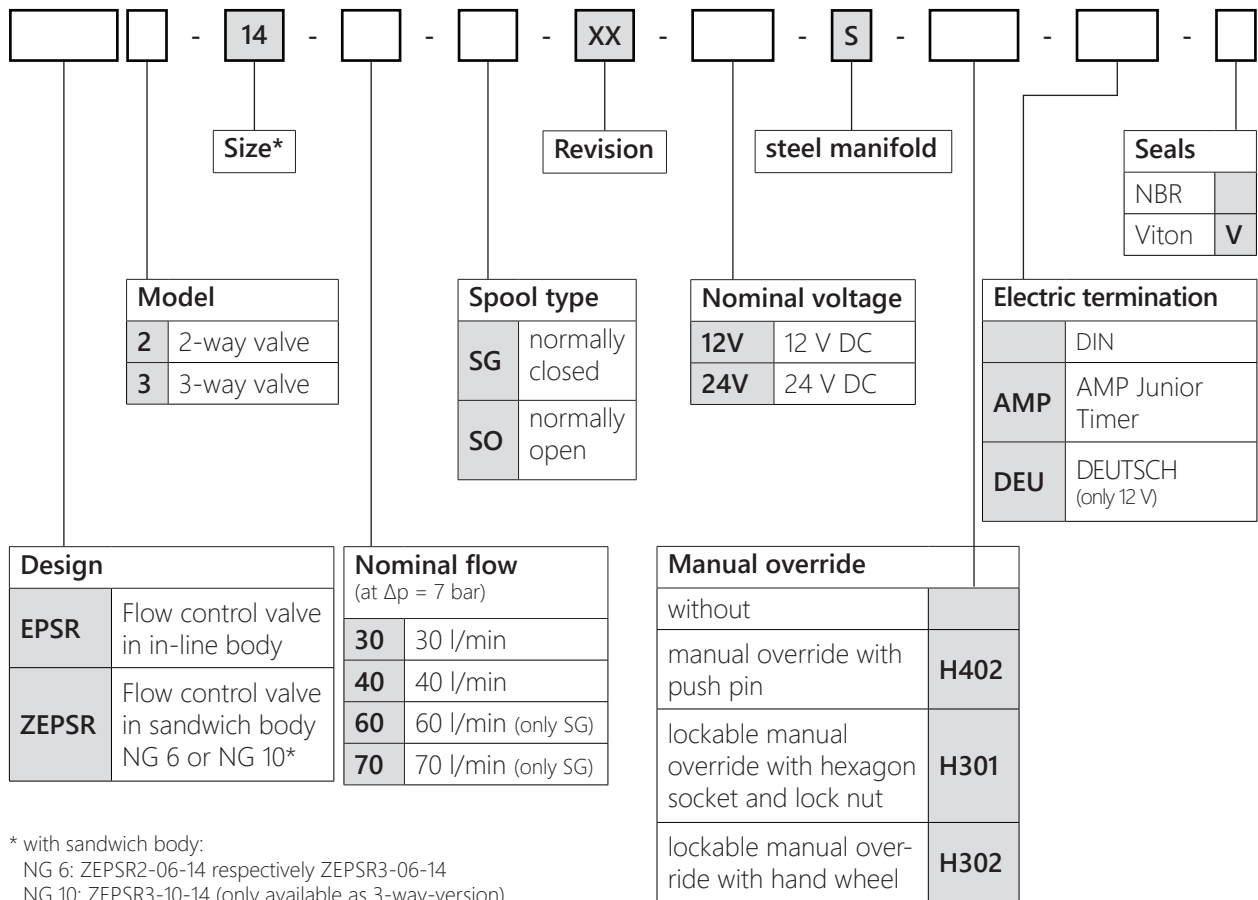
NOTE Operating pressure max.: P, A, B: 350 bar; TA, TB: 10 bar.

NOTE The valve is also available as EPSRA2-10-14 in a mounting plate NG 10. Dimension sheets are available upon request.

NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M6 x 30 - 12.9. Installation torque: $10 \pm 0,5$ Nm, screw-in depth min. 8 mm.

NOTE For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at www.weber-hydraulik.com.

Type code



* with sandwich body:
 NG 6: ZEPSR2-06-14 respectively ZEPSR3-06-14
 NG 10: ZEPSR3-10-14 (only available as 3-way-version)

NOTE The valve is also available as **EPSRR** where the surplus flow can be pressurised and can therefore be supplied to a second actuator. Please contact us for further information.

Accessories and additional information

<i>Accessories / spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Socket connector DIN EN 175301-803, shape A, grey	149.0008
	Coil 12 V, DIN EN 175301-803, shape A	147.0011
	Coil 24 V, DIN EN 175301-803, shape A	147.0009
	Coil 12 V, AMP Junior Timer	147.0007
	Coil 24 V, AMP Junior Timer	147.0010
	Coil 12 V, DEUTSCH connector	147.0012
	Seal kit EPSR2(3)-14 (NBR)	405.0116
	Seal kit EPSR2(3)-14 (Viton)	405.0117
	Seal kit ZEPSR2-06-14 (NBR)	405.0118
	Seal kit ZEPSR2-06-14 (Viton)	405.0119
	Seal kit ZEPSR3-06-14 (NBR)	405.0120
	Seal kit ZEPSR3-06-14 (Viton)	405.0121
	Seal kit ZEPSR2(3)-10-14 (NBR)	405.0122
	Seal kit ZEPSR2(3)-10-14 (Viton)	405.0123

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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Proportional Chopper Amplifier

SC-/ ESC-/ DSC-2000

electric amplifier for proportional valves
operating voltage 8-35 V DC
maximum current 2,6 A



VB-3A

electric amplifier for proportional valves
maximum current 1600 mA
input signal 0-5 V and 0-10 V or
input signal 0-20 mA and 4-20 mA



Accessories

Pressure Transmitter MODS

compact and robust universal pressure transmitter
shock and vibration resistant
nominal voltage 12-32 V DC
measuring range 6-600 bar

Proportional Chopper Amplifier SC-/ESC-/DSC-2000-U



electric amplifier for
proportional valves
operating voltage 8-35 V DC
maximum current 2,6 A

060110_SC2000_e
01.2021

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Dimensions	3
Operational elements	4
Type code	4
Accessories and additional information	4
Set up	5

Characteristics

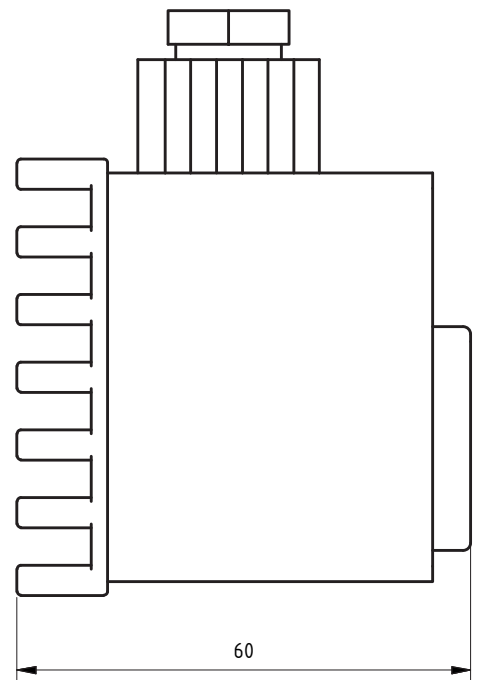
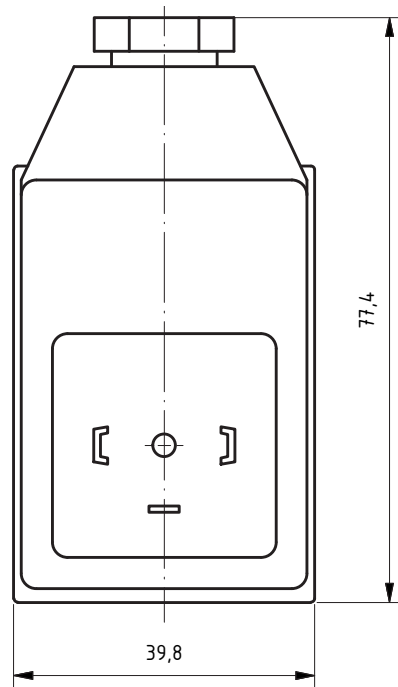
- compact design
- compensating the temperature-dependent magneto-resistance of the proportional solenoid
- multi-course potentiometers for adjusting I_{min} , I_{max} and time ramp
- LED signaling
- fuse-protected output 2 A or 3 A
- external voltage or current control

Technical data

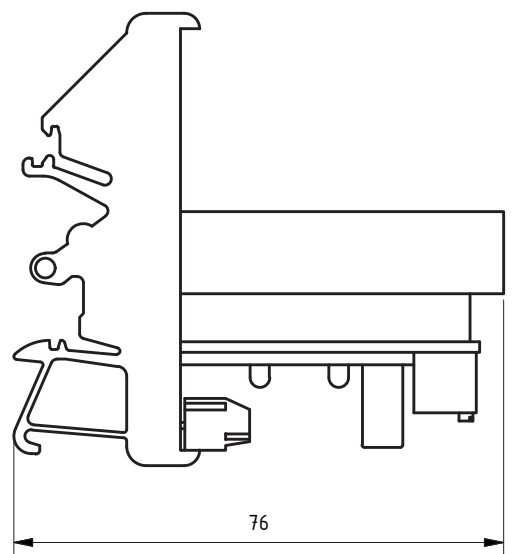
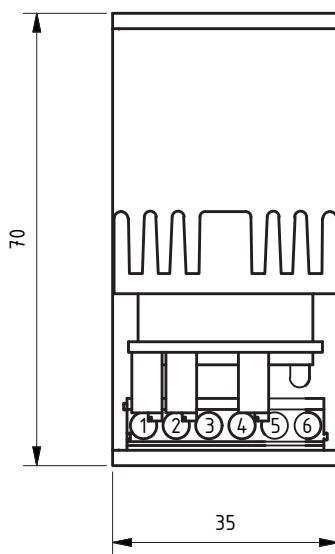
<i>Mechanic</i>	Design:	amplifier module, amplifier for installation onto mounting rails, double amplifier for 2 prop. solenoids for installation onto mounting rails
	Ambient temperature:	-20 °C to +60 °C
	Installation position:	any
	Weight:	SC-2000-U: 0,32 kg ESC-2000-U: 0,08 kg DSC-2000-U: 0,14 kg
	Maximum acceleration:	2 G
	<hr/>	
<i>Electric</i>	Operating voltage:	8 to 35 V DC
	Nominal voltage (solenoid):	12 V DC, 24 V DC
	Nominal resistance (solenoid):	2,5 to 60 Ω
	Maximum current:	0 to 2,6 A adjustable
	Minimum current:	0 to 0,6 A adjustable
	Dither frequency:	140 Hz, 85 Hz, 300 Hz
	Stand-by current consumption:	0,016 A
	Ramp generator:	0 to 5 s adjustable
	Protection class:	IP65
	Fuse:	Wickmann microfuse 2 A (max. 3 A)
	Shifting time:	100 % ED
	Input signal:	0 to 10 V (0 to 5 V) 0 to 20 mA (external load resistor) 4 to 20 mA (special version)
	Deviation:	0,6 % / Ω for temperature fluctuations of the solenoid 0,3 % / V for voltage fluctuations
Electromagnetic compatibility:	CE conform to EMV standard 2004/108/EG Transient emissions EMA: EN 55 011-1B Stability EMB: EN 50 082-2	

Dimensions

SC-2000-U

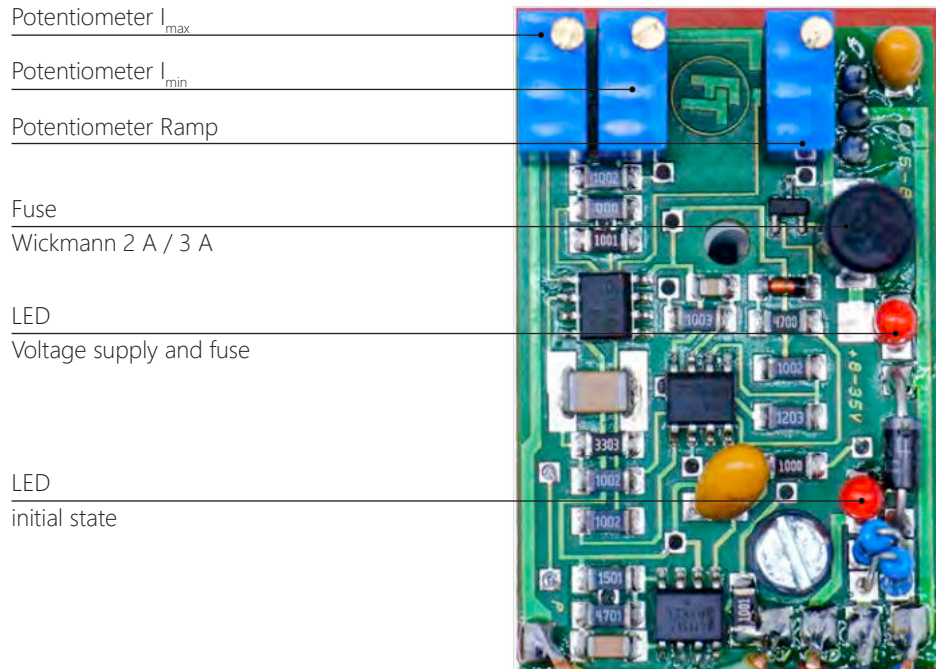


ESC-2000-U

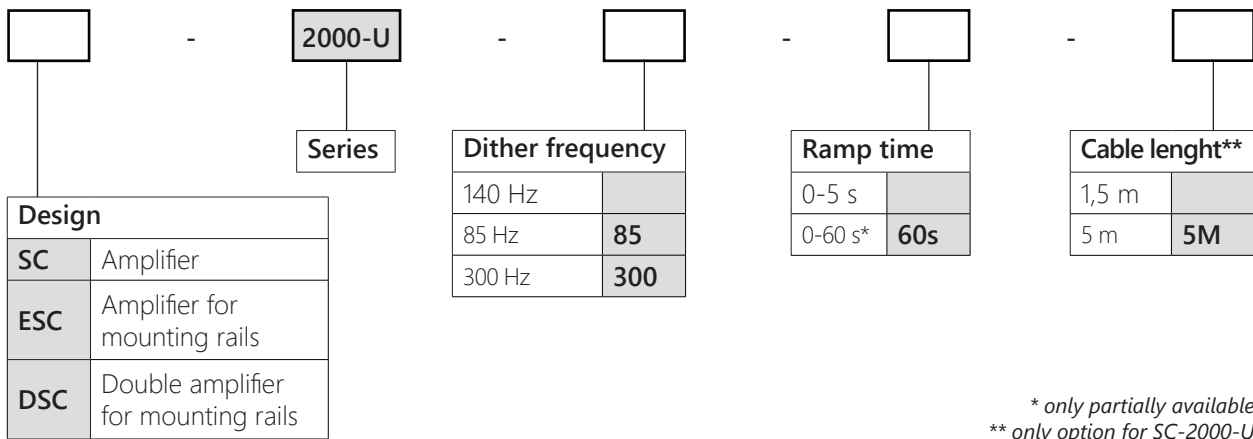


NOTE For the double amplifier DSC-2000-U a second board will be integrated. The dimensions stay the same.

Operational elements



Type code



Accessories and additional information

Accessories/ spare parts	Article:	Article number:
	Adapter plug DIN EN 175301-803 shape B to shape A	109.0006
	Replacement fuse 2 A	109.0003
	Replacement fuse 3,15 A	109.0004

Set up

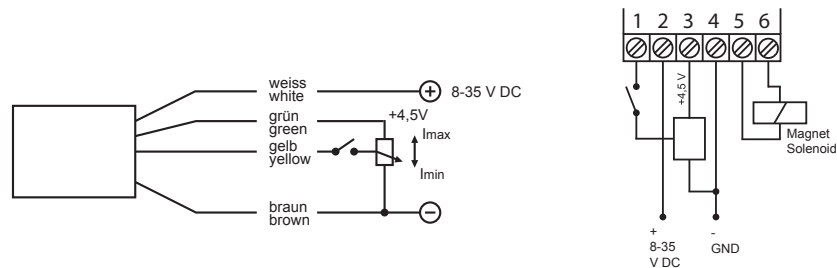
NOTE The chopper amplifier has to be adjusted on-load (with connected prop. solenoid). Never disconnect the solenoid while the operating current is connected.

To get optimal results and to avoid defects on the chopper amplifier and the valves, adjust the chopper amplifier with the following instructions

Adjust minimum current (I_{min}) always before maximum current (I_{max}).

Potentiometer control

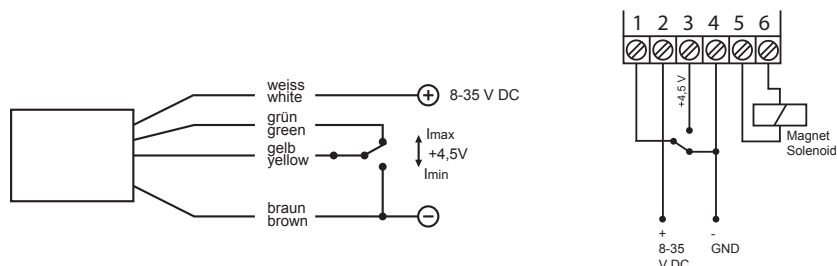
- ▶ Connect supply voltage (see figure).
- ▶ Connect external potentiometer (see figure).



- ▶ Switch on hydraulic supply.
- ▶ Observe the function of the valve.
- ▶ Set external potentiometer to minimum value.
- ▶ Adjust the I_{min} potentiometer so that there is no hydraulic outlet (pressure or volume flow).
- ▶ Set external potentiometer to maximum value.
- ▶ Adjust the I_{max} potentiometer so that the desired max. pressure or volume flow is reached.
- ▶ The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- ▶ If there is still a dead range, repeat the basic adjustments (I_{min} and I_{max}).
- ▶ Adjust the ramp potentiometer to the desired value (0-5 s).

Two-point control

- ▶ Connect supply voltage (see figure).
- ▶ Connect selector switch (min./max. value, see figure).
- ▶ Adjust selector switch to minimum value (1 to 4 connected).



- ▶ Switch on hydraulic supply.
- ▶ Observe the function of the valve.
- ▶ Adjust the I_{min} potentiometer so that there is no hydraulic outlet (pressure or volume flow).

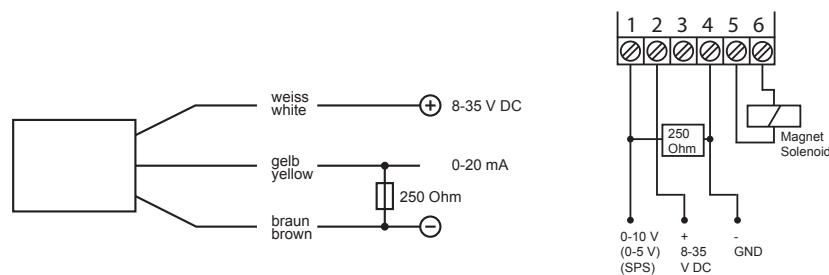
Set up

Two-point control

- ▶ Adjust selector switch to maximum value (1 to 3 connected).
- ▶ Adjust the I_{\max} potentiometer so that the desired max. pressure or volume flow is reached.
- ▶ The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- ▶ If there is still a dead range, repeat the basic adjustments (I_{\min} and I_{\max}).
- ▶ Adjust the ramp potentiometer to the desired value (0-5 s).

External current control 0-20 mA

- ▶ Connect load resistor (250 Ω , see figure).
- ▶ Connect supply voltage (see figure).
- ▶ Connect external current control (see figure).

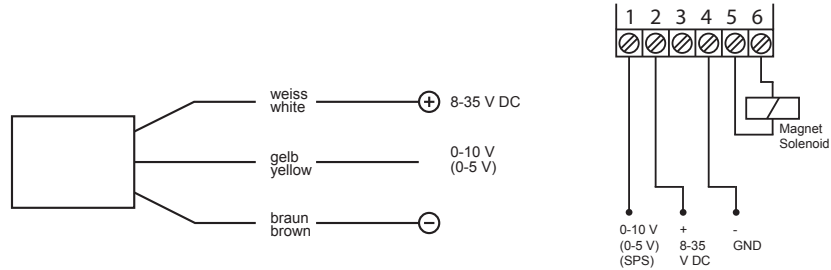


- ▶ Switch on hydraulic supply.
- ▶ Observe the function of the valve.
- ▶ Adjust external current to approx. 0,05 mA.
- ▶ Adjust the I_{\min} potentiometer so that there is no hydraulic outlet (pressure or volume flow).
- ▶ Adjust external current to 20 mA.
- ▶ Adjust the I_{\max} potentiometer so that the desired max. pressure or volume flow is reached.
- ▶ The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- ▶ If there is still a dead range, repeat the basic adjustments (I_{\min} and I_{\max}).
- ▶ Adjust the ramp potentiometer to the desired value (0-5 s).

Set up

External voltage control

- ▶ Connect supply voltage (see figure).
- ▶ Connect external voltage control (5/10 V, see figure).



- ▶ Switch on hydraulic supply.
- ▶ Observe the function of the valve.
- ▶ Adjust external voltage to approx. 0,005 V.
- ▶ Adjust the I_{\min} potentiometer so that there is no hydraulic outlet (pressure or volume flow).
- ▶ Adjust external voltage to accumulated value (5/10 V).
- ▶ Adjust the I_{\max} potentiometer so that the desired max. pressure or volume flow is reached.
- ▶ The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- ▶ If there is still a dead range, repeat the basic adjustments (I_{\min} and I_{\max}).
- ▶ Adjust the ramp potentiometer to the desired value (0-5 s).

Proportional Chopper Amplifier VB-3A



electric amplifier for
proportional valves
maximum current 1600 mA
input signal 0-5 V and 0-10 V or
input signal 0-20 mA and 4-20 mA

060120_VB-3A_e
01.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Dimensions	2
Front panel	3
Connections	3
Type code	4
Set up	4

Characteristics

- compensating the temperature-dependent magneto-resistance of the proportional solenoid
- multi-course potentiometers for adjusting I_{min} , I_{max} and time ramp
- 2 ramp functions
- dither frequency adjustable between 100 Hz and 500 Hz
- LED signaling
- external enable function
- for installation onto mounting rails according to DIN EN50022 or 50035

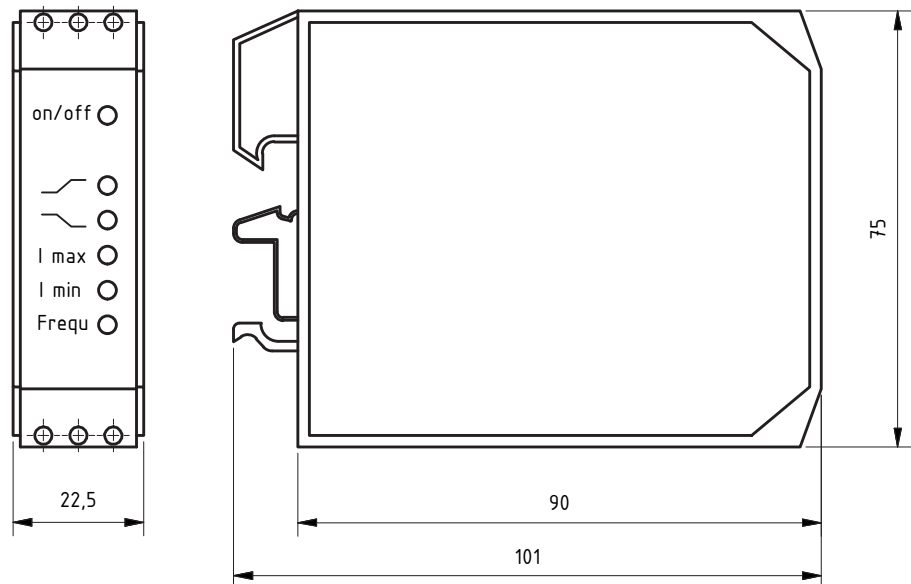
Technical data

<i>Mechanic</i>	Design:	chopper amplifier for installation onto mounting rails
	Ambient temperature:	-20 °C to +60 °C
	Installation position:	any
	Weight:	0,10 kg
	Maximum acceleration:	2 G

<i>Electric</i>	Operating voltage:	12 V DC to 36 V DC
	Nominal voltage (solenoid):	12 V DC, 24 V DC
	Auxiliary voltage:	10 V DC (max. 20 mA current consumption)
	Maximum current Out:	300 mA to 1600 mA adjustable
	Minimum current Out:	10 mA to 500 mA adjustable
	Stand-by current consumption:	40 mA
	Dither frequency:	100 Hz to 500 Hz adjustable
	Ramp generator:	up and down ramp separately adjustable up to 80 mA/s
	Protection class:	IP20
	Shifting time:	100% ED
	Input signal:	0-5 V, 0-10 V, optional 0-20 mA, 4-20 mA
	Output:	short-circuit-proof
	Electric termination:	screw terminals up to 1,5 qmm

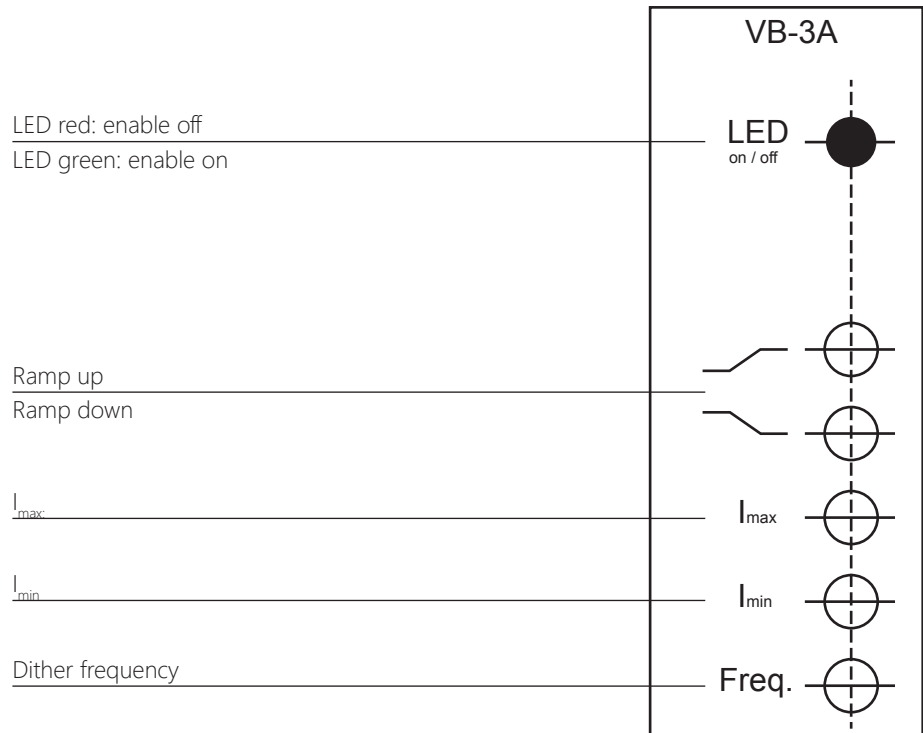
Dimensions

Chopper amplifier
VB-3A



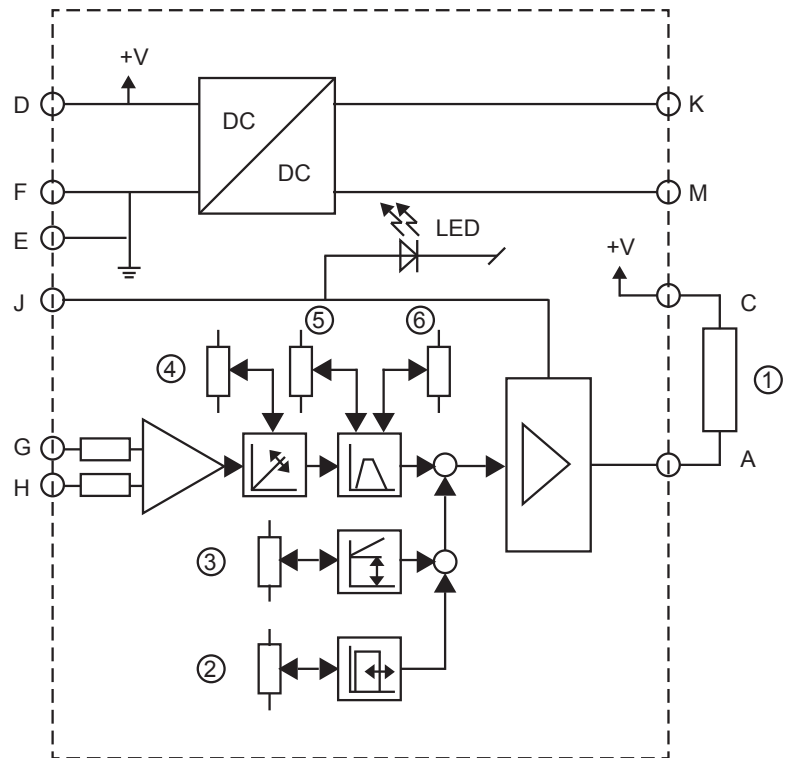
HE4/152318

Front panel

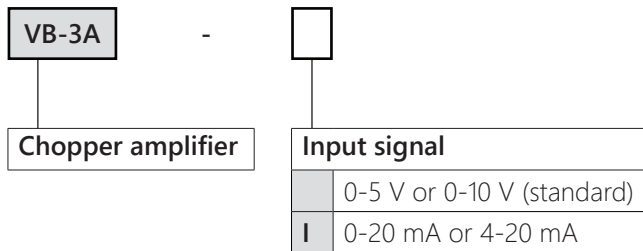


Connections

Legend	
1	solenoid
2	dither frequency
3	I_{min}
4	I_{max}
5	ramp up
6	ramp down
A, C	connection solenoid
M	0 V
K	10 V
D	12-36 V DC
F, E	0 V
J	enable
G, H	input



Type code



Set up

NOTE The chopper amplifier has to be adjusted on-load (with connected proportional solenoid).
Never disconnect the solenoid while the operating current is connected.

To get optimal results and to avoid defects on the chopper amplifier and the valves, adjust the chopper amplifier with the following instructions.

Adjust minimum current (I_{\min}) always before maximum current (I_{\max}).

Basic adjustment

- ▶ Connect supply voltage (+ to D, - to F).
- ▶ To activate the amplifier, connect the enable supply to terminal J.
- ▶ Connect solenoid to terminal A and C.
- ▶ **Connect input signal:**
 - **External voltage control (SPS):**
 - ▶ Connect external voltage control to terminals H (5/10 V+) and G (-/GND).
 - **Potentiometer control:**
 - ▶ Bridge terminal M to terminal G.
 - ▶ Connect external potentiometer to terminals K (10 V+), M (0 V) and H (center tap).
 - **External current control (VB-3A-I):**
 - ▶ Connect external current control to terminals H (+) and E (-).
- ▶ Switch on operating voltage and hydraulic supply.
- ▶ Observe the function of the valve.
- ▶ Set input signal to minimum value.
- ▶ Adjust the I_{\min} potentiometer so that there is no hydraulic outlet (pressure or volume flow).
- ▶ Set input signal to maximum value.
- ▶ Adjust the I_{\max} potentiometer so that the desired max. pressure or volume flow is reached.
- ▶ The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- ▶ If there is still a dead range, repeat the basic adjustments (I_{\min} and I_{\max}).

Set up

Basic adjustment for ramp time and dither frequency

- The ramp-up time can be adjusted with the ramp potentiometer. To extend the ramp time, turn potentiometer to the left.

The basic adjustment of the dither frequency (125 Hz) is suitable for most applications. The frequency has to be changed if:

- large valves are pilot operated with small proportional valves (lower frequency) or
- the frequency should be less audible (higher frequency). Though the hysteresis can decline.

Enable

By switching the enable voltage, the ramps are bypassed.

Enable voltage: < 1 V: enable off
> 4 V to 36 V: enable on



Pressure Transmitter MODS



piezoresistive
 shock and vibration resistant
 nominal voltage 12 - 32 V DC
 measuring range -1 - 600 bar

060210_MODS_e
 02.2020

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Dimensions	3
Pin assignment	3
Type code	4
Accessories and additional information	4

Characteristics

- robust
- compact
- pressure peak resistant
- overload protected
- with reverse voltage protection
- limitation of power loss
- electronic calibration
- stainless steel
- fully welded, "dry" measuring cell, therefore no internal transmission media
- applicable with all standard signals for industry, hydraulics and pneumatics
- various signal-, thread- and connecting options available
- Certifications: German Lloyd (GL) for marine applications
 CE-Directive 2014/30/EU
 CE-Directive 2014/68/EU
 Railway applications (DIN EN 50155)

Technical data

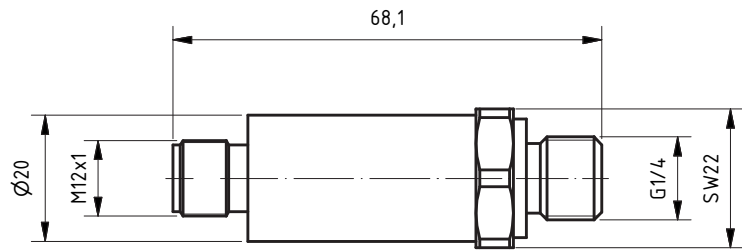
<i>Hydraulic</i>	Measuring range:	see type code
	Pressure type:	relative pressure
	Overload pressure:	2 x full scale*
	Burst pressure:	3 x full scale*
<hr/>		
<i>Mechanic</i>	Design:	screw-in pressure transmitter
	Fluid temperature:	-40 °C to +125 °C
	Ambient temperature:	-40 °C to +105 °C
	Installation position:	any
	Weight:	0,1 kg
	Material:	stainless steel
	Measuring principle:	piezoresistive
	Shock resistance:	1000 g according to DIN EN 60068-2-32
	Vibration resistance:	20 g according to DIN EN 60068-2-6
Damping:	∅0,6 mm at hydraulic connector, integrated in sensor	
<hr/>		
<i>Electric</i>	Nominal voltage:	12 - 32 V DC or 5 V DC ±10 %
	Protection class:	IP67 (according to plug-system, if correctly mounted)
	Response time:	≤ 2 ms
	Output signal:	see type code
	Electric termination:	Electric plug M12x1, 4-pin Electric plug DIN EN 175301-803, shape A, 3-pin + PE
	Electromagnetic compatibility:	25 V/m (according to DIN EN 61000-4-3)
	Temperature coefficient in compensated temperature range:	≤ 0,15 % / 10 K
	Radiation:	< 30 BµV/m (according to DIN 61000-4-3)
	Accuracy @ RT:	≤ 0,50 % of the range
	Stability/Year:	≤ 0,15 % of the range
	Non-linearity:	≤ 0,15 % of the range

NOTE Due to electronic calibration the pressure transmitter has a total error of 2 % of full scale*. Customised versions with better accuracy are available on request.

* integral linearity error

Dimensions

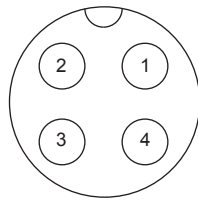
MODS



HE4/152321

Pin assignment

electric plug
M12x1, 4-pin

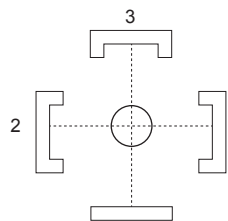


View on MODS-sensor

Output signal	Pin 1	Pin 2	Pin 3	Pin 4
A	supply voltage + (12 - 32 V DC)	n.c.	output signal 4 - 20 mA	n.c.
B	supply voltage + (12 - 32 V DC)	n.c.	GND	output signal 0 - 20 mA
C	supply voltage + (12 - 32 V DC)	n.c.	GND	output signal 0 - 10 V DC
D	supply voltage + (5 V DC ±10%)	n.c.	GND	output signal 0,5 - 4,5 V DC ratiometric
E	supply voltage + (12 - 32 V DC)	output signal 4 - 20 mA	GND	n.c.

n.c. = not connected

electric plug
DIN EN 175301-803
shape A,
3-pin + PE



View on MODS-sensor

Output signal	Pin 1	Pin 2	Pin 3
C	supply voltage + (12 - 32 V DC)	GND	output signal 0 - 10 V DC

Type code

MODS	-		-	G 1/4	-		-	
Pressure transmitter		Measuring range		Connection thread (DIN 3852)	Output signal		Electric plug	
		6	-1 - 6 bar		4 - 20 mA	A	M12x1	M12
		60	0 - 60 bar		0 - 20 mA	B	DIN EN 175301-803 shape A, 3-pin + PE	N
		160	0 - 160 bar		0 - 10 V DC	C		
		250	0 - 250 bar		0,5 - 4,5 V DC	D		
		400	0 - 400 bar		4 - 20 mA (3-wire)	E		
		600	0 - 600 bar					

Accessories and additional information

Accessories/
spare parts

Article:

Seal ring (Viton)

Material number:

1095335



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2/2-way Poppet Valves

2/2-way Poppet Valve MSVT

direct operated or pilot operated
normally open or normally closed
operating pressure max. 350 bar
volume flow max. 40 l/min

2/2-way Miniature Pilot Poppet Valve SMSVP

direct operated
normally closed
operating pressure max. 250 bar
volume flow max. 2 l/min

Sandwich Body 2/2-double Poppet Valve ZMSV2

pilot operated, normally closed
operating pressure max. 315 bar
volume flow max. 80 l/min
sandwich body NG 6, NG 10

3/2-way Poppet Valves

3/2-way Miniature Pilot Poppet Valve SMSV6

direct operated
normally closed
operating pressure max. 250 bar
volume flow max. 2 l/min

3/2-way Compact Poppet Valve MSV3/2

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 20 l/min
cavity MSV3/2

3/2-way Poppet Valve S32S-A1X34

direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 30 l/min
cavity S32S-X34

Spool Valves

3/2-way Compact Poppet Valve MSV3/2

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 20 l/min
cavity MSV3/2

Hot Oil Shuttle W33H-1X06

operating pressure max. 420 bar
volume flow max. 40 l/min
screw-in valve for cavity NCS06/4



Spool Valves

4/2, 4/3 Directional Valve W4_S-5PS03

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 8 l/min
size NG 3

4/2, 4/3 Directional Valve W4_S-A1AS06

direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 80 l/min
size NG 6, DIN 24340 A06

4/2, 4/3 Directional Valve W4_S-A2AS06

direct operated, solenoid operated
operating pressure max. 250 bar
volume flow max. 50 l/min
size NG 6, DIN 24340 A06

Shuttle Valves

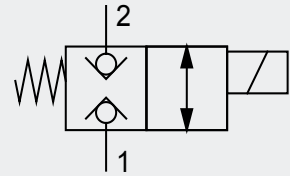
Shuttle Valve FTRW

operating pressure max. 350 bar
volume flow max. 15 l/min

2/2-way poppet valve MSVT



solenoid operated
operating pressure max. 350 bar
volume flow max. 40 l/min



080120_MSVT_e
01.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	4
Accessories and additional information	5

Characteristics

- screw-in poppet valve
- pilot operated or direct operated available
- normally open or normally closed models available
- maintenance-free

Technical Data

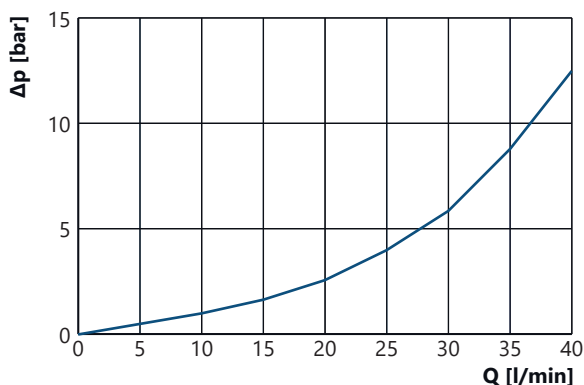
<i>Hydraulic</i>	Operating pressure max.:	350 bar (MSVT 20 and MSVT 21: 250 bar, flow from 1 to 2: 150 bar)
	Flow rate:	40 l/min (MSVT 20: 15 l/min, MSVT 21: 30 l/min)
	Flow direction:	from 2 to 1 (1 to 2)
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	3 - 400 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_{5(c)} > 200$

<i>Mechanic</i>	Design:	Screw-in valve
	Fluid temperature:	-10 °C to +80 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,31 kg
	Material:	valve parts: steel, coil: plastic seals: NBR
Surface protection:	burnished/zinc coated	

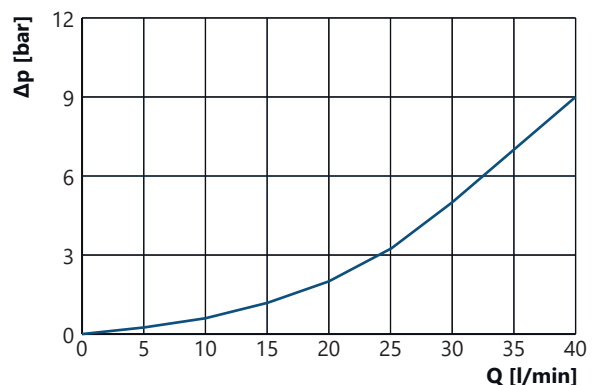
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal resistance (R20):	8 Ω (12 V), 26 Ω (24 V)
	max. power consumption:	18 W (12 V), 22 W (24 V)
	Shifting-time:	100 % ED
	Protection class:	IP65 correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A

Performance

Pressure drop diagram ($\Delta p/Q$) MSVT-03 and MSVT-04

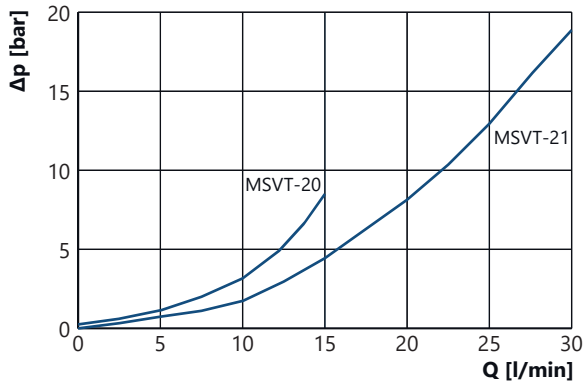


Pressure drop diagram ($\Delta p/Q$) MSVT-07

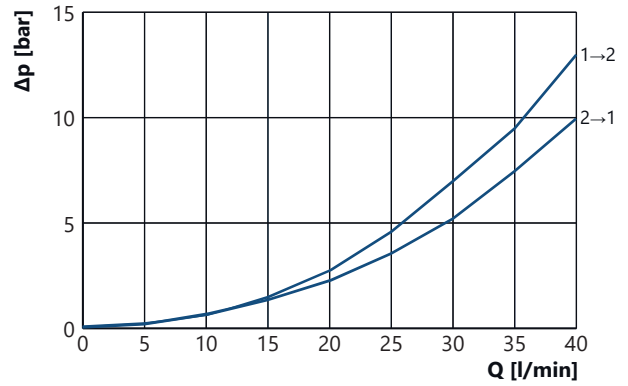


Performance

Pressure drop diagram ($\Delta p/Q$) MSVT-20 and MSVT-21



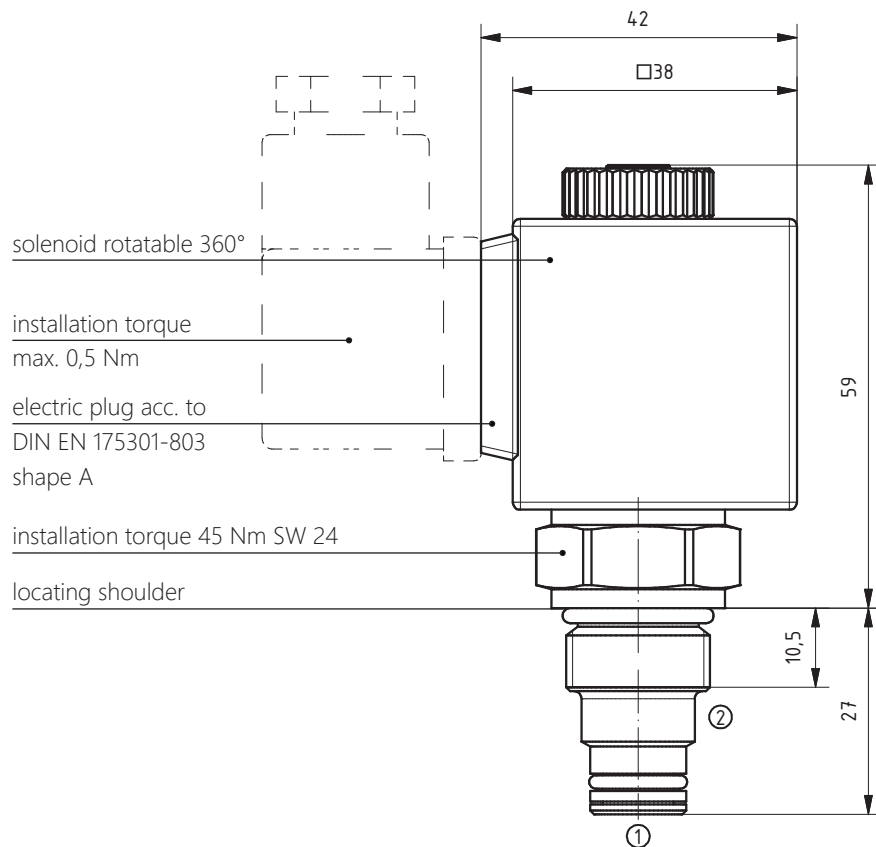
Pressure drop diagram ($\Delta p/Q$) MSVT-22



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

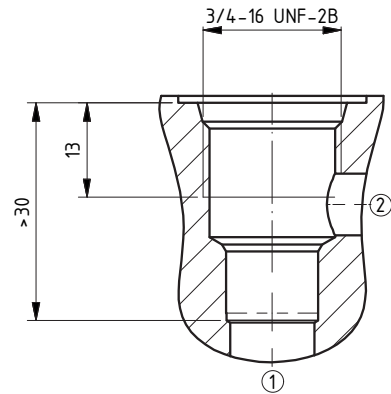
Screw-in valve
MSVT



HM4/07 13 04

Dimension

Cavity MSVT



HE4/14 31 03

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Model	
03	normally closed
04	normally closed with manual override
07	normally open
20	bi-directional, normally closed (15 l/min)
21	bi-directional, normally closed (30 l/min)
22	bi-directional, normally closed

Nominal voltage	
12 V	12 V DC
24 V	24 V DC

Accessories and additional information

<i>Accessories / spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Socket connector DIN EN 175301-803, shape A, grey	149.0008
	Aluminium housing 3/8"	093.0024
	Steel housing 3/8"	153.0139

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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Sandwich body-2/2-double poppet valve ZMSV2

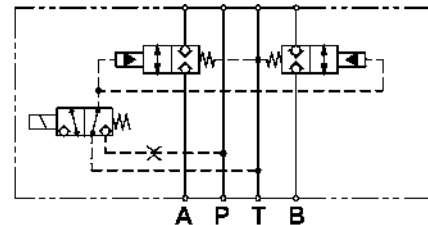
NG 6, NG 10 • one solenoid valve operates A and B • max. 80 l/min



Description

The ZMSV2 includes two hydraulically controlled 2/2-way-poppet valves. They are both operated by a pilot valve. Therefore channel A and B can be shut off tight, regardless of the load pressure. The switching process is slightly damped, to avoid negative effects of sudden decompression. The minimum switching pressure (pressure difference between channel P and T) should be at least 20 bar. The sandwich bodies are available in size NG 6 or NG 10 (also with X-and Y-channel).

Symbol



Technical Data

for terms and definitions see chapter 12

Hydraulic

Rated pressure:	max. 315 bar
Rated flow:	NG 6: max. 40 l/min NG 10: max. 80 l/min
Minimum pressure:	20 bar (P-T)
Fluids:	hydraulic fluids acc. to DIN 51524, others upon request
Viscosity Range:	10 – 300 cSt
Filtration:	min. 25 µm, optimally 15 µm
Leakage:	max. 5 drops/min.

Mechanic

Ambient temperature:	-20 °C – +40 °C
Fluid temperature:	-20 °C – +80 °C
Installation position:	any
Weight:	NG 6: 1,76 kg; NG 10: 3,10 kg

Materials:

valve parts: steel

body: aluminium

Seals:

NBR, Viton optional

Backup rings: Teflon, PU

Surface protection:

body: anodized

ext. valve parts: zinc plated, burnished

Electric

Nominal voltage: 24 V DC ± 10 %

Nominal resistance (R₂₀): 29 Ω

Power consumption: max. 20 W

Shifting time: 100 % ED

Protection class: IP 65

Electric termination:

electric plug acc. to DIN 43650

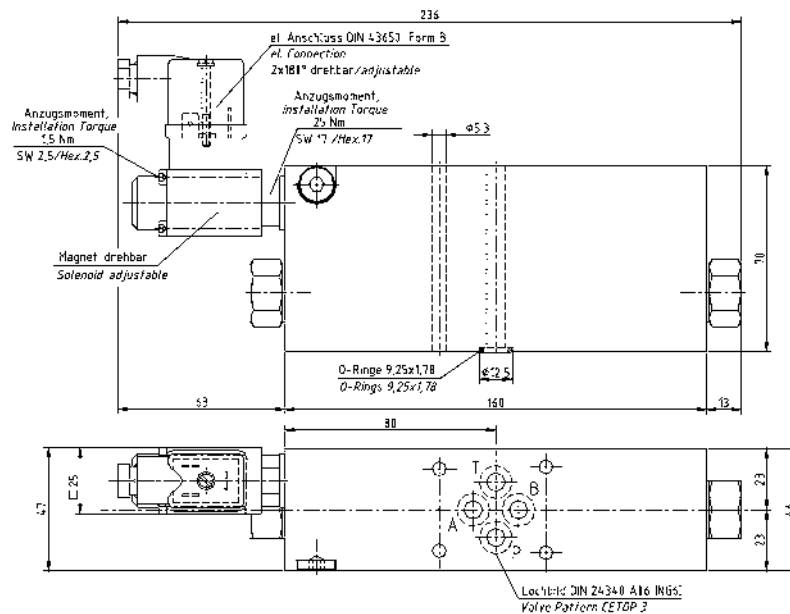
shape B, incl. female connector Pg7

Type code

ZMSV2-06-A/B		SGV	*	24V	*
Sandwich body-2/2-double poppet valve, in A and in B		Function	Revision	Nominal voltage	Special designs
Available models:		SGV = normally closed, pilot operated	(in-house)	24 V DC	
NG 6 (DIN 24340 A06)	ZMSV2-06-A/B				
NG 10 (DIN 24340 A10)	ZMSV2-10-A/B				
NG 10 (DIN 24340 A10 with X and Y)	ZMSV2-10Y-A/B				

Dimensions

NG 6



H3-954407

NG 10

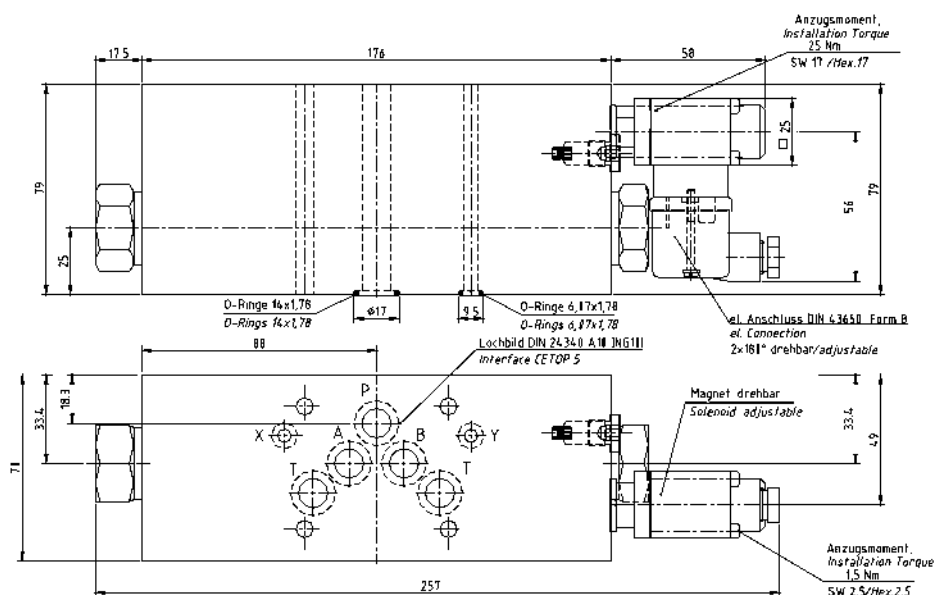


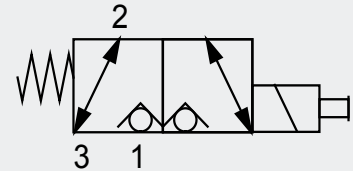
Fig. shows model with X and Y channel

H3-934301

3/2-way poppet valve MSV32



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 20 l/min



080220_MS32_e
 06.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	4
Accessories and additional information	4

Characteristics

- screw-in poppet valve
- with manual override
- also available in in-line body or mounting plate NG 6
- maintenance-free

Technical Data

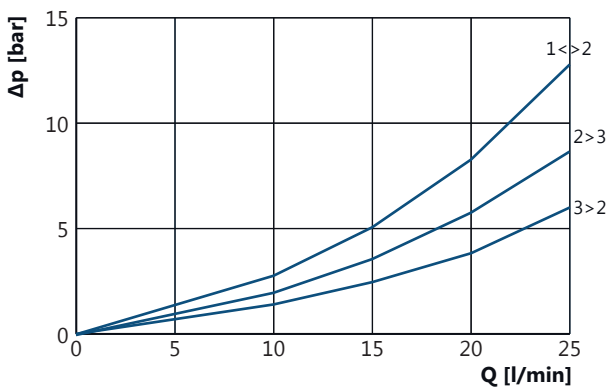
<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow rate:	20 l/min
	Flow direction:	see symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	3 - 400 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_{5(c)} > 200$

<i>Mechanic</i>	Design:	screw-in poppet valve
	Size:	MSV3/2
	Fluid temperature:	-10 °C to +80 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,42 kg
	Material:	valve parts: steel seals: NBR, backup rings: PU, Teflon
Surface protection:	zinc coated steel	

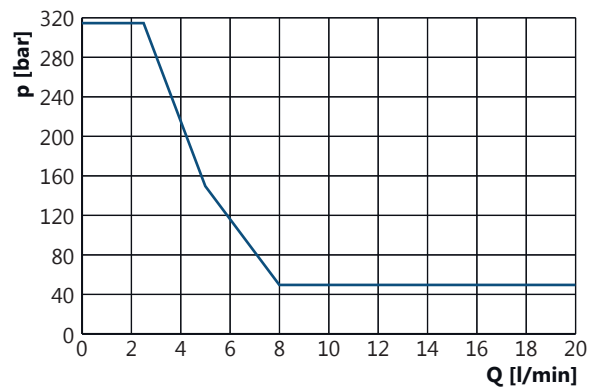
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal resistance (R20):	5,8 Ω (12 V), 22 Ω (24 V)
	Max. power consumption:	27 W
	Shifting time:	100 % ED
	Protection class:	IP65 correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

Pressure drop diagram ($\Delta p/Q$) at I_N

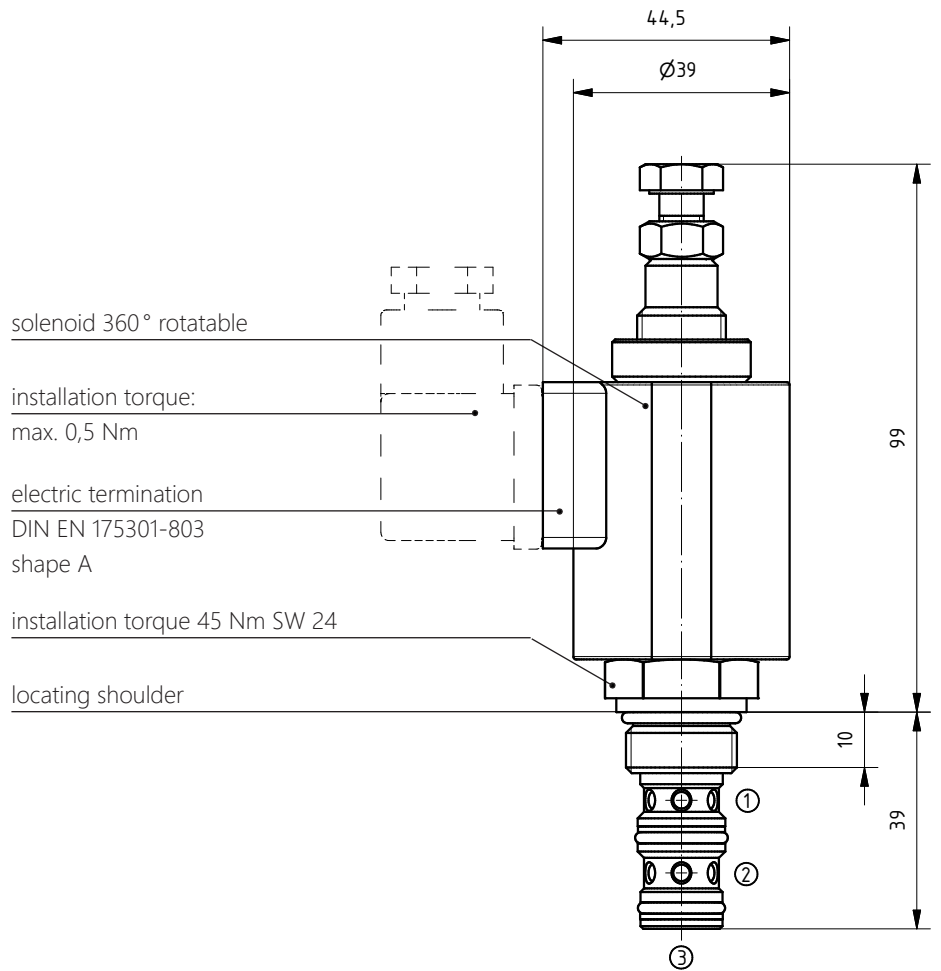


Switching power diagram (p/Q) at I_N



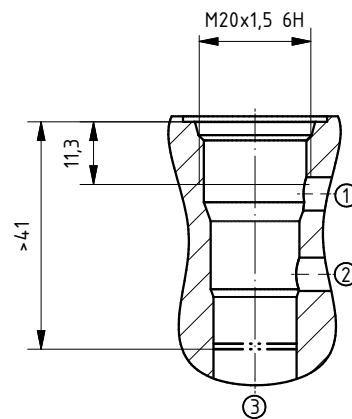
Dimensions

Screw-in valve
MSV3/2



HM4/94 44 01

Cavity MSV3/2



HE4/14 10 22

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as LMSVA-06 in a mounting plate NG 6. Dimension sheets are available upon request.

Type code

	-		-	NH	-		-	
		Nominal voltage		lockable manual override		Electric Termination		Body
		12 V 12 V DC				DIN		without
		24 V 24 V DC				AMP Junior Timer	AMP	in-line body G 3/8" 90°
3/2-way poppet valve								G3/8
MSV3/2	screw-in valve							
LMSVA-06-321	in mounting plate NG 6, 0-position P closed							
LMSVA-06-322	in mounting plate NG 6, 0-position P open							

Accessories and additional information

<i>Accessories / spare parts</i>	Article:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Socket connector DIN EN 175301-803, shape A, grey	149.0008
	Sealing kit MSV32 (NBR)	405.0006

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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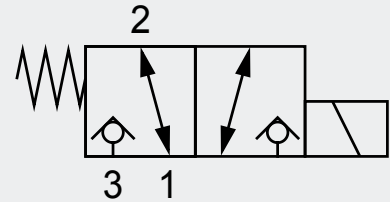
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3/2-way poppet valve S32S-A1X34



direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 30 l/min



080221_S32S_A1X34_e
06.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	4
Accessories and additional information	4

Characteristics

- 3/2-way- screw-in poppet valve
- leak-free
- for on-off bi-directional control of flow to actuators with leak-free closing in both directions
- all ports can be fully pressurized
- maintenance-free
- rotatable and replaceable coil

Technical Data

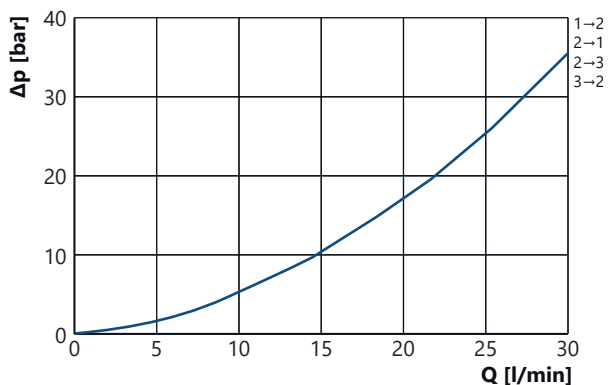
<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow rate:	30 l/min
	Flow direction:	see symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	3 - 400 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_{5(c)} > 200$

<i>Mechanic</i>	Design:	screw-in poppet valve
	Size:	34
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,43 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	exterior parts: zinc coated steel (240 h salt spray test acc. to ISO 9227)

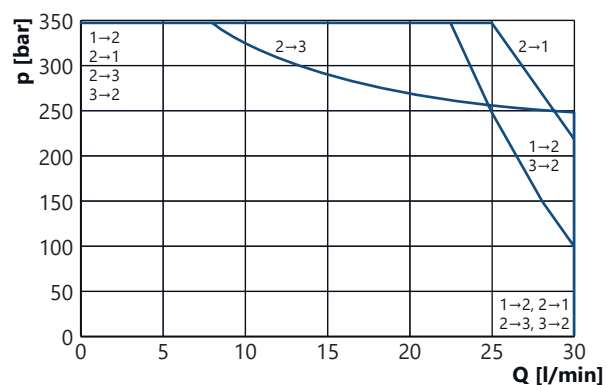
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	2,0 A (12 V), 0,93 A (24 V)
	Nominal resistance (R20):	6 Ω (12 V), 26 Ω (24 V)
	Shifting time:	100 % ED
	Protection class:	IP65 correctly mounted and locked mating connector
	Electric termination:	Electric plug according to DIN EN 175301-803, shape A

Performance

Pressure drop diagram ($\Delta p/Q$)



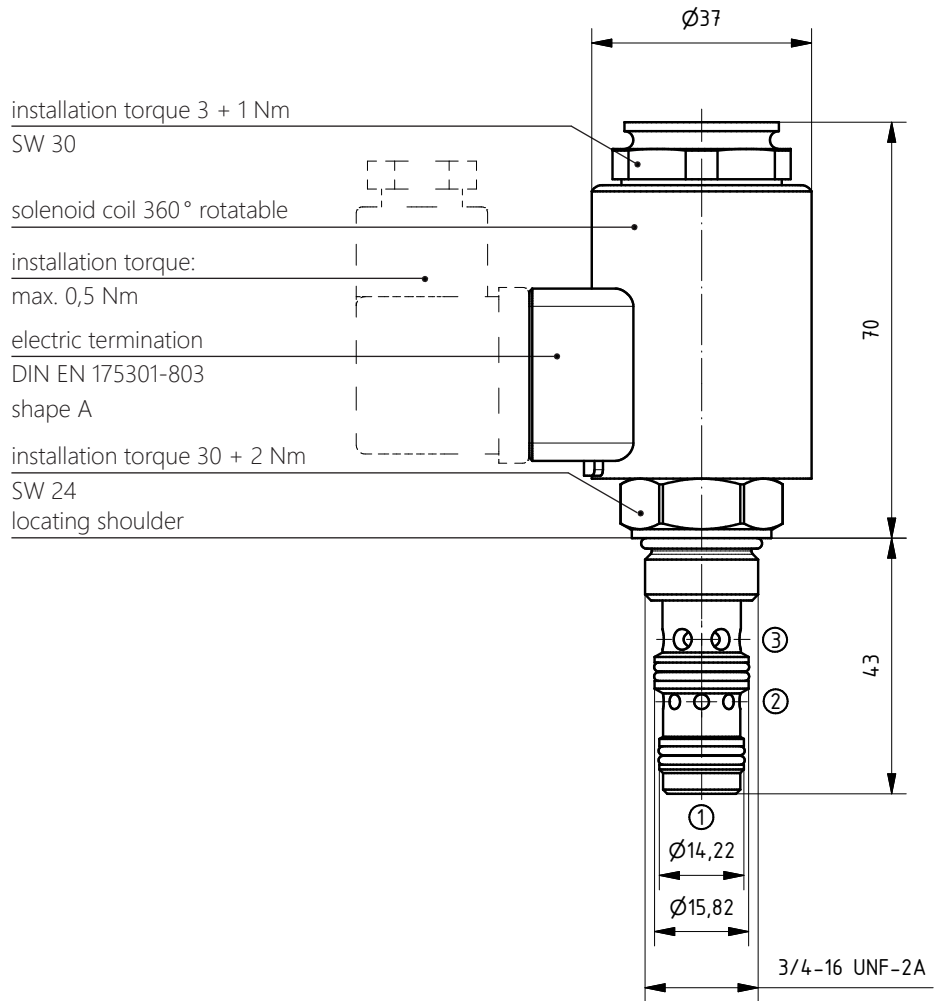
Switching power diagram (p/Q)



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

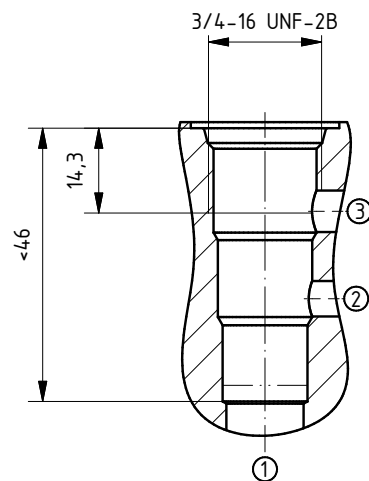
Dimensions

Screw-in valve
S32S-A1X34



HM3/17 04 02

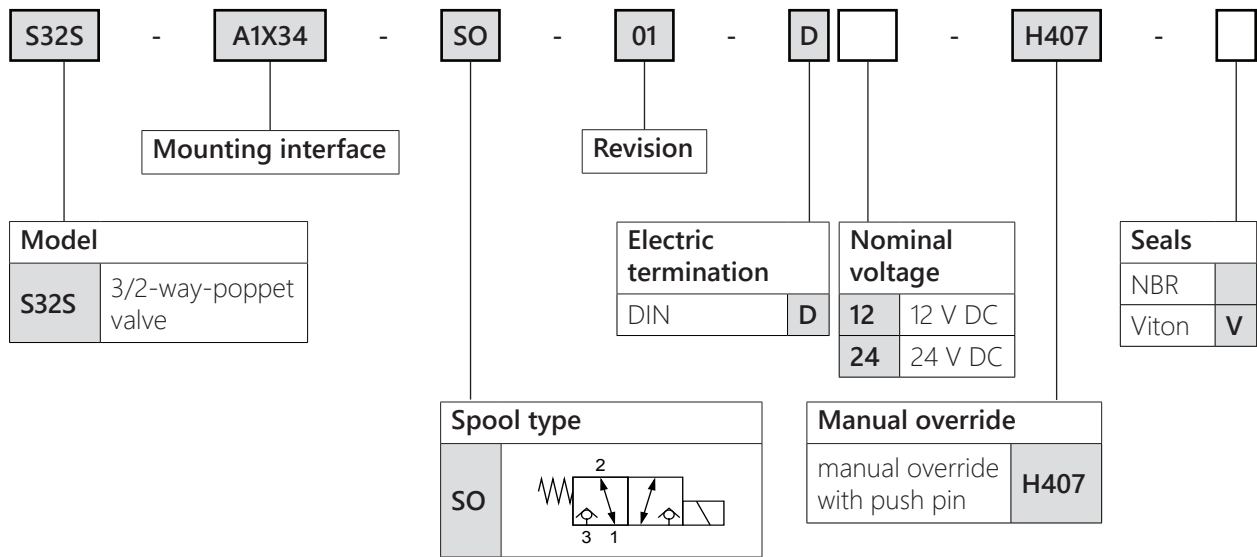
Cavity S32S-X34



HM3/18 12 06

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

Accessories / spare parts

Appropriate manifolds, different electric terminations and various kinds of manual overrides are available upon request. Please contact us for further information.

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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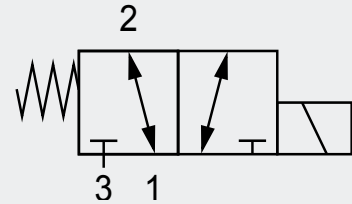
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3/2-way Compact Spool Valve MV3/2



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 20 l/min



080320_MV32_e
 09.2018

Table of contents

Contents	Page
Characteristics	1
Performance	2
Dimensions	3
Type code	4
Accessories and additional information	4

Characteristics

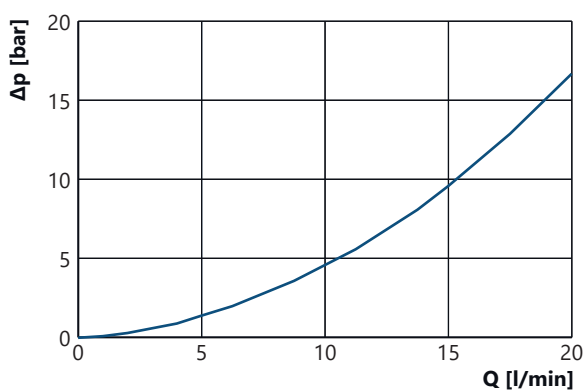
- screw-in spool valve
- with manual override
- also available in in-line body or mounting plate NG 6
- maintenance-free

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow rate:	20 l/min
	Flow direction:	see symbol
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	3 - 400 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
<hr/>		
<i>Mechanic</i>	Design:	screw-in valve
	Size:	MV3/2
	Fluid temperature:	-10 °C to +80 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,5 kg
	Material:	valve parts: steel seals: NBR, backup rings: PU, Teflon
	Surface protection:	zinc coated
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal resistance (R20):	5,8 Ω (12 V), 22 Ω (24 V)
	Max. power consumption:	27 W
	Shifting time:	100 % ED
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer

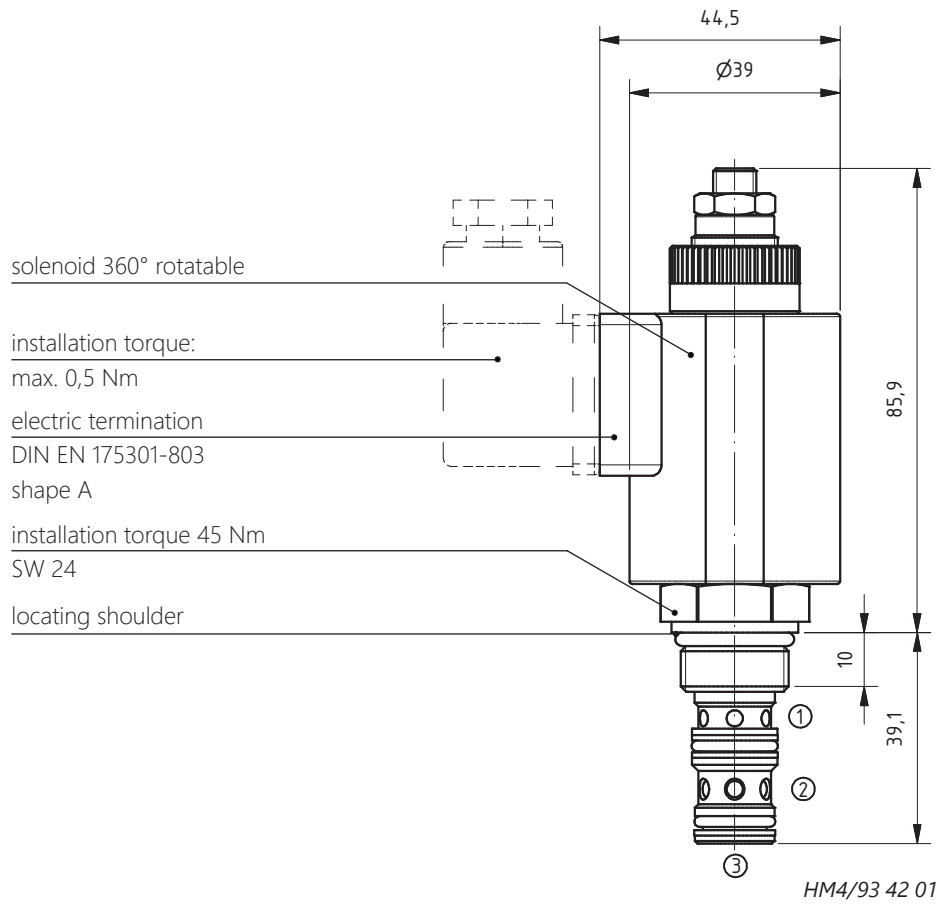
Performance

Pressure drop diagram ($\Delta p/Q$) at I_N

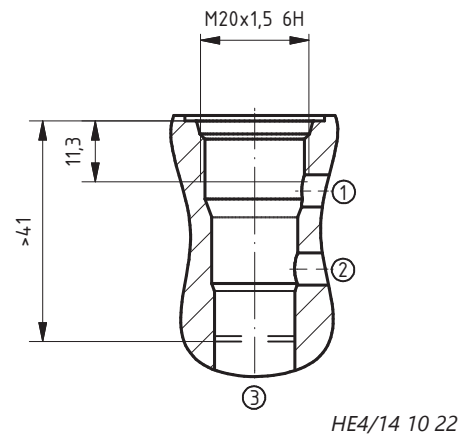


Dimensions

Screw-in valve
MV3/2



Cavity MV3/2



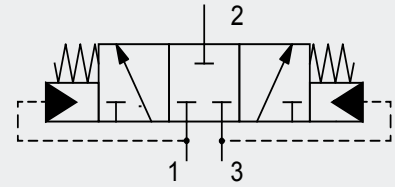
NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as LMVA-06 in a mounting plate NG 6. Dimension sheets are available upon request.

Hot oil shuttle W33H-1X06



direct operated
operating pressure max. 420 bar
volume flow max. 40 l/min
cavity NCS06/4



090610_W33H-1X06_e
05.2020

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	2
Dimensions	3
Type code	5
Accessories and additional information	5

Characteristics

- directional flush valve in spool design
- screw-in valve for cavity NCS06/4
- used e.g. for cooling in closed circuits
- also available in in-line body G3/8" or mounting plate NG 10
- robust and durable
- minimum oil leakage
- maintenance-free

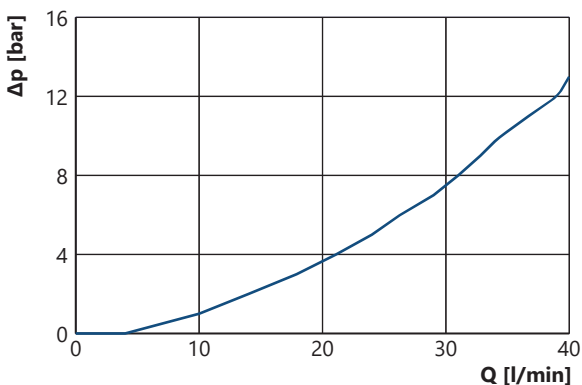
Technical data

<i>Hydraulic</i>	Operating pressure max.:	420 bar
	Flow rate max.:	40 l/min
	Switching pressure:	10 bar
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
Filtration:	oil cleanliness according to ISO 4406 (1999) 20/18/15, filter with β 5(c) > 200	

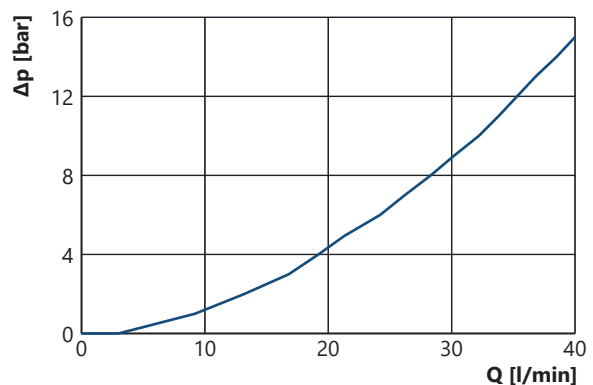
<i>Mechanic</i>	Design :	W33H spool type screw-in valve, cavity NCS06/4 or in in-line body G3/8"
	Fluid temperature:	-20 °C to +90 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	valve: 0,17 kg valve in in-line body: 0,97 kg
	Material:	valve parts: steel seals: NBR / PUR, Viton optional
Surface protection:	zinc coated	

Performance

Pressure drop diagramm ($\Delta p/Q$) W33H-1X06
from 1 to 2



Pressure drop diagramm ($\Delta p/Q$) W33H-1X06
from 3 to 2



Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

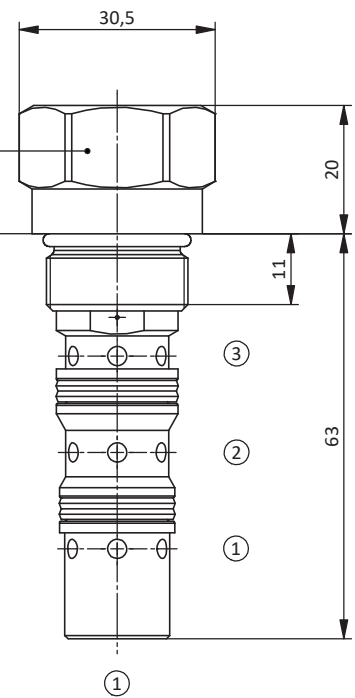
Dimensions

Screw-in valve
W33H-1X06

installation torque 65 ± 5 Nm

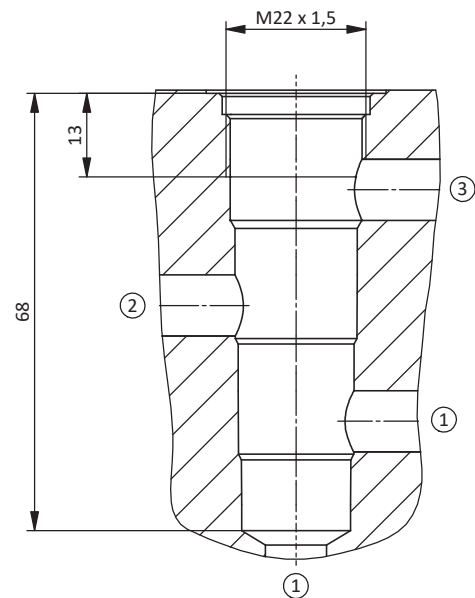
SW 27

locating shoulder NCS06/4



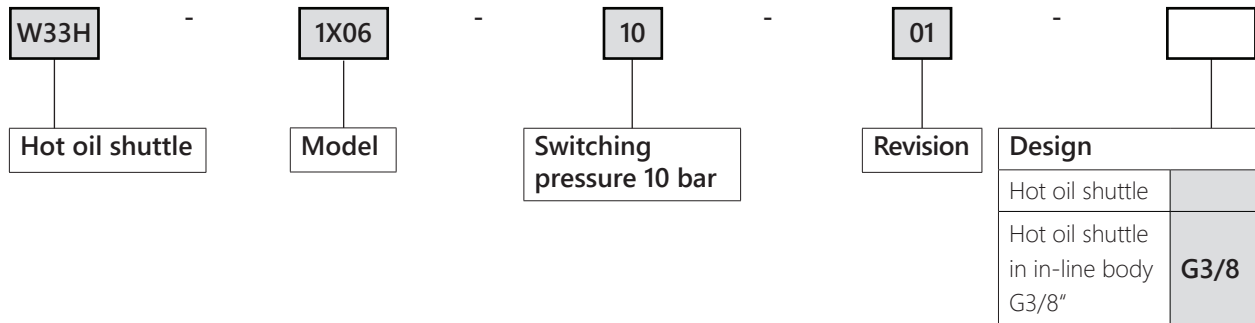
19501-009-TR-0

Cavity NCS06/4



20501-079-TR-0

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

NOTE On request the valve is also available in a mounting plate NG 10 as W33H-1X06-10-01-NG10.

Accessories and additional information*Accessories /
spare parts***Article:**

Seal kit NCS06/4 (NBR) for W33H-1X06-10-01

Material number:

1097614

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.

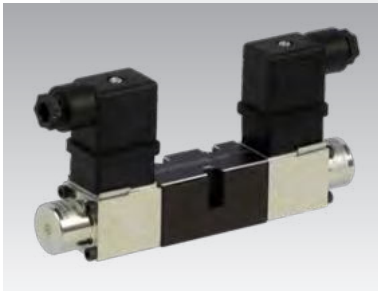


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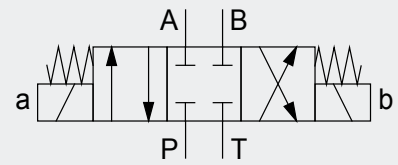
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On/off directional valve W42S-5PS03 and W43S-5PS03



direct operated, solenoid operated
 operating pressure max. 315 bar
 volume flow max. 8 l/min
 size NG 3 (company standard)



080311_W4_S-5PS03_e
 06.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	3
Dimensions	4
Type code	5
Accessories and additional information	6

Characteristics

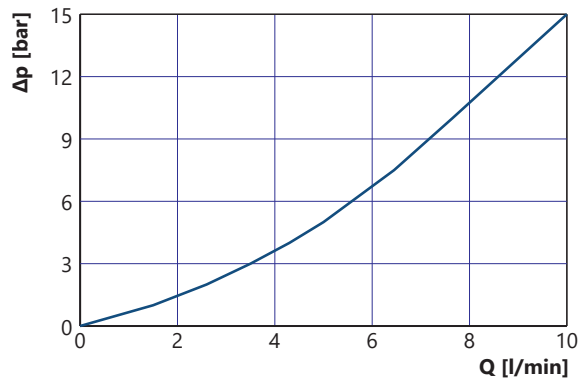
- on/off directional spool valve
- miniature edition
- 2-way- or 3-way-version available
- spring centred spool
- maintenance-free

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar port T: 75 bar summed pressure A, B: 350 bar
	Flow rate:	8 l/min at $\Delta p = 7$ bar
	Flow direction:	see symbols in type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
	<hr/>	
<i>Mechanic</i>	Design :	spool type, direct operated
	Size:	NG 3 (company standard)
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any, preferably horizontal
	Maximum acceleration:	5 g
	Weight:	4/2-way-design: 0,42 kg 4/3-way-design: 0,62 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	coil: zinc coated body: nitrocarburized
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	2 A (12 V), 1 A (24 V)
	Nominal resistance (R20):	5,9 Ω (12 V), 24,0 Ω (24 V)
	Power consumption:	24 W at nominal valve current
	Shifting time:	100% ED
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire

Performance

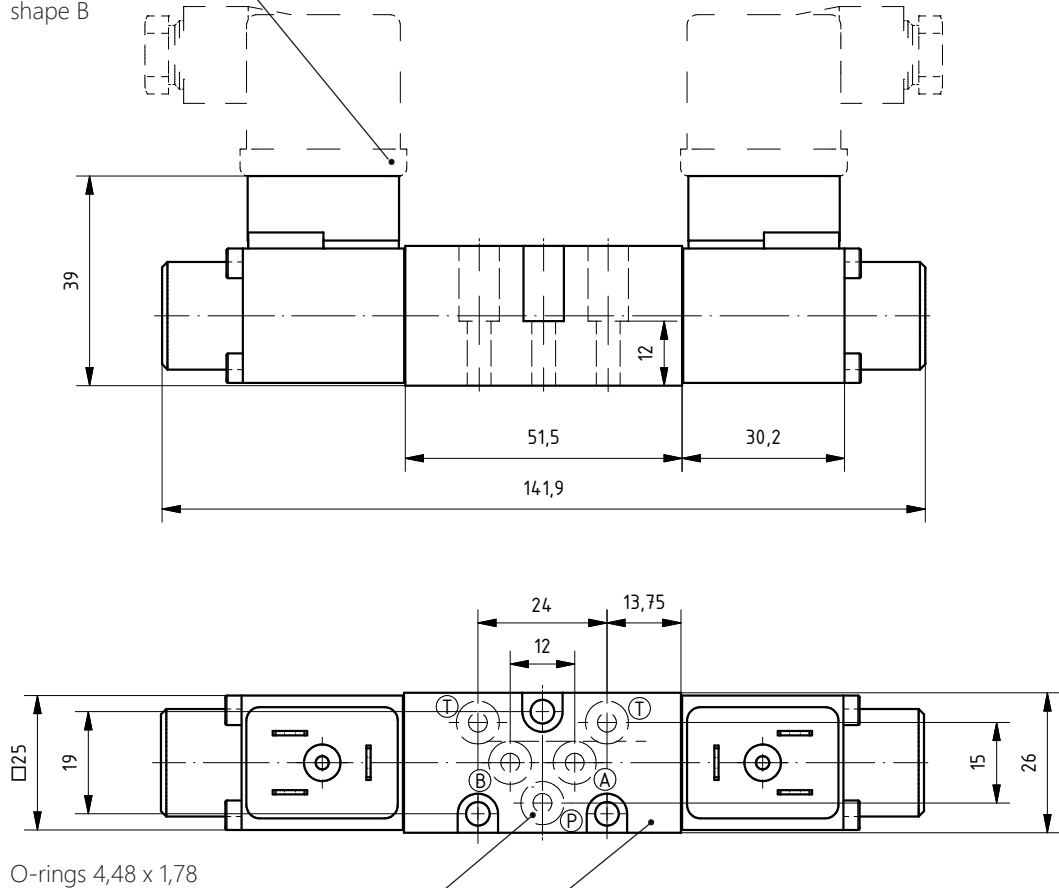
Pressure drop diagram ($\Delta p/Q$) W4_S-5PS03



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

Electric plug acc. to
DIN EN 175301-803
(formerly DIN 43650)
shape B



O-rings 4,48 x 1,78

Port pattern NG 3
(company standard)

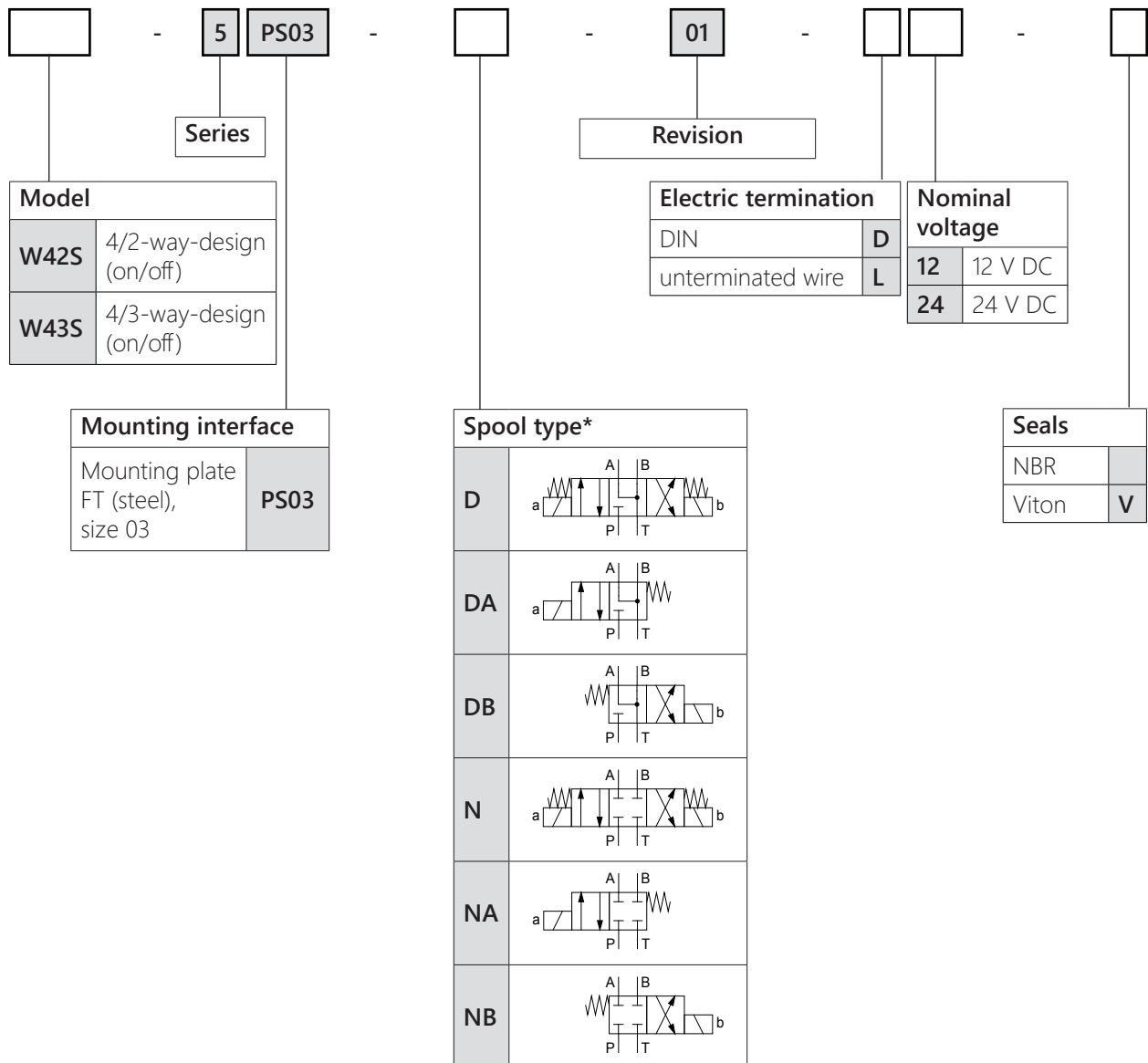
HM3/17 48 05

NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M4 x 30 - 12.9. Installation torque: $2,2 \pm 0,2$ Nm, screw-in depth min. 7 mm. The mounting surface of the valve must have a flatness better than 0.01 mm.

NOTE For the appropriate mounting plates, see our „*accessories*“ or contact us.

NOTE For a detailed drawing of the port pattern please see chapter 11 „*general information*“ under the category „*port patterns*“ or our online catalogue at www.weber-hydraulik.com.

Type code



*Other spool types are available upon request.

Accessories and additional information

<i>Accessories/spare parts</i>	Part:	Article number:
	Socket connector DIN EN 175301-803*, shape B, black	149.0005
	Socket connector DIN EN 175301-803*, shape B, grey	149.0004
	Adapter plug DIN EN 175301-803*, shape B to shape A	109.0006
	Seal kit W43_-5PS03 (NBR)	405.0066
	Seal kit W43_-5PS03 (Viton)	405.0067
	Adapter plate NG 6 to NG 3, including seals and screws	203.0153
	Mounting plate NG 3, ports sidewise	151.0171

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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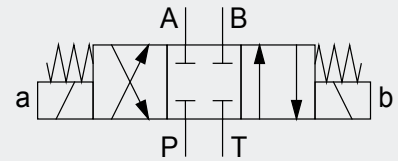
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On/off directional valve W42S-A1AS06 and W43S-A1AS06



direct operated, solenoid operated
 operating pressure max. 350 bar
 volume flow max. 80 l/min
 size NG 6, DIN 24340 A06



080330_W4_S-A1AS06_e
 07.2018

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	3
Dimensions	4
Type code	5
Accessories and additional information	6

Characteristics

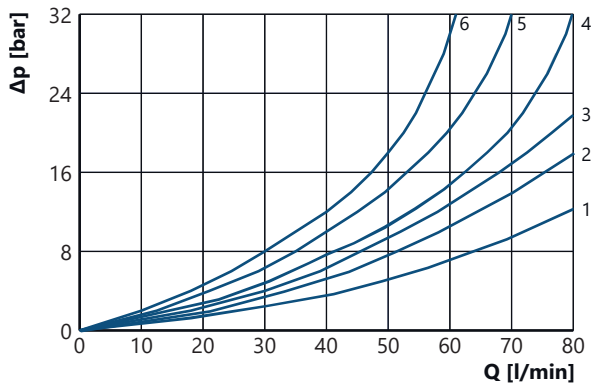
- on/off directional spool valve
- 2-way- or 3-way-version available
- spring centred spool
- maintenance-free
- rotatable and replaceable coils

Technical Data

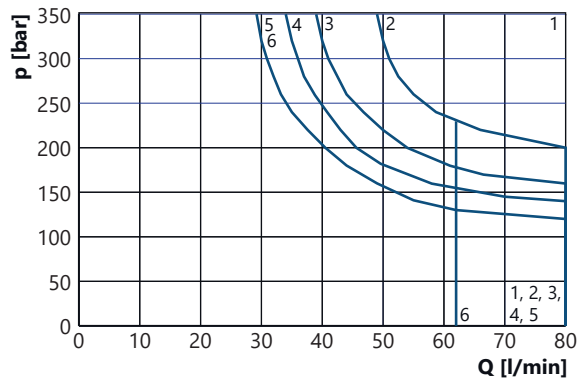
<i>Hydraulic</i>	Operating pressure max.:	port P, A, B: 350 bar port T: 210 bar
	Flow rate max.:	80 l/min
	Flow direction:	see symbols in type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	20 - 400 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 21/18/15, filter with β 5(c) > 200
	<hr/>	
<i>Mechanic</i>	Design:	spool type, direct operated by solenoids
	Size:	NG 6 (DIN 24340 A06, ISO 4401-03, CETOP 3)
	Fluid temperature:	-30 °C to +80 °C
	Ambient temperature:	-20 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Maximum acceleration:	5 g
	Weight:	4/2-way-design: 1,6 kg 4/3-way-design: 2,2 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	solenoid: zinc coated body: phosphatised
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	2,7 A (12 V), 1,3 A (24 V)
	Nominal resistance (R20):	4,41 Ω (12 V), 18,6 Ω (24 V)
	Power consumption max.:	32,6 W (12 V), 31 W (24 V)
	Shifting time:	100 % ED
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, DEUTSCH
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

Pressure drop diagram ($\Delta p/Q$) W4_S-A1AS06



Switching power diagram (p/Q) W4_S-A1AS06 at I_N



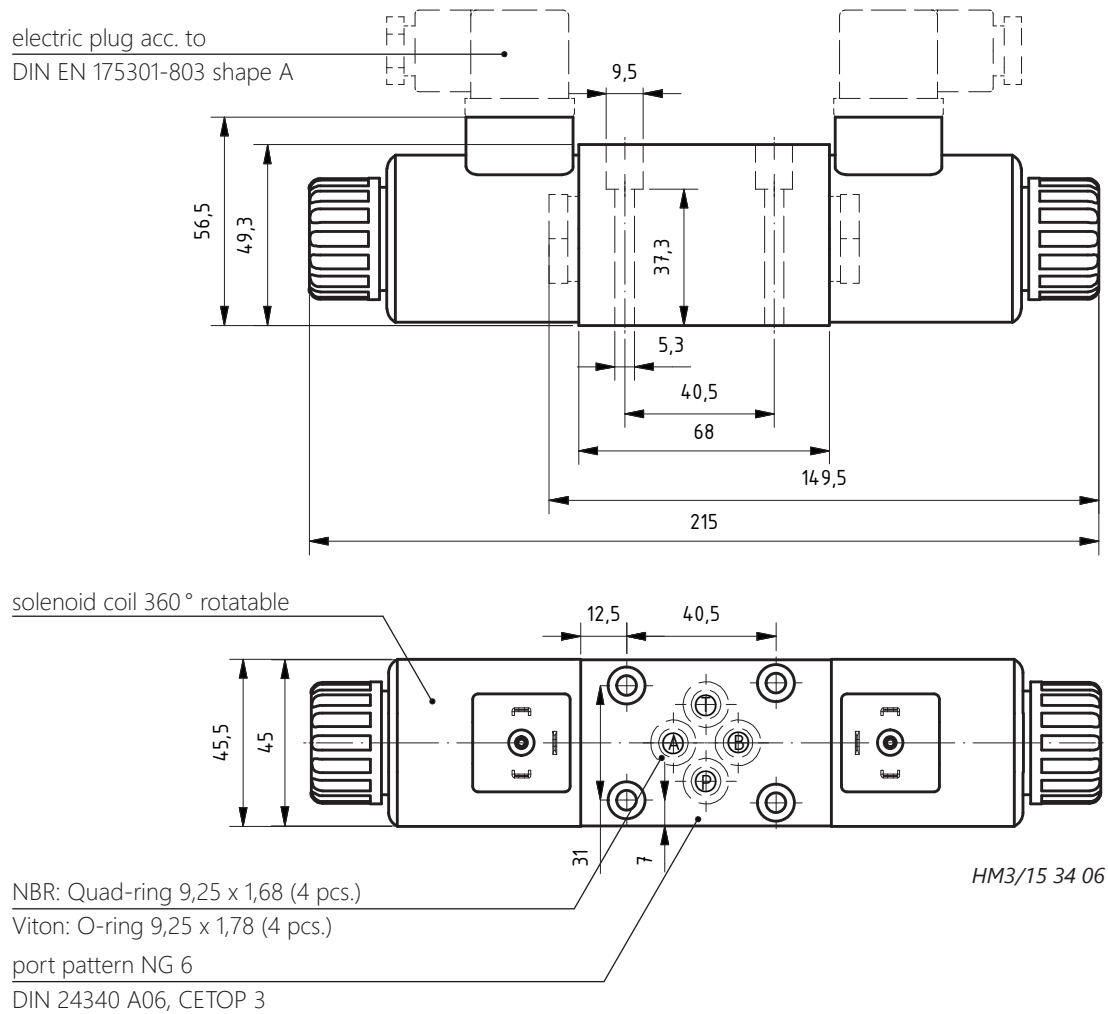
Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

spool type*	P-A	P-B	A-T	B-T	P-T
N	2	2	3	3	
NA		2	3		
NB	2	2	3	3	
D	2	2	2	2	
H	2	2	2	3	3
C	5	5	5	6	3
CA	2			3	4
CB	5	5	5	6	3
R11	2	2	3	3	
R21	2	2	3	3	

spool type*	
N	1
NA	1
NB	1
D	2
H	3
C	6
CA	6
CB	6
R11	3
R21	4

* The different spool types are pictured in the type code on page 5.

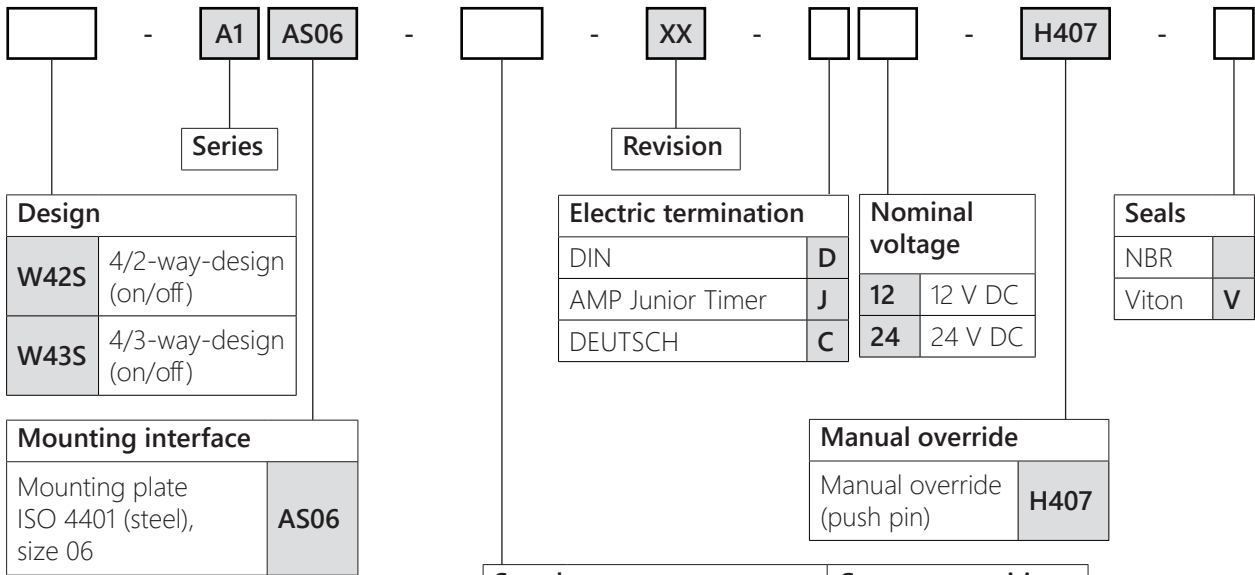
Dimensions



NOTE The valve must be mounted with four fitting screws according to DIN EN ISO 4762 M5 x 45 - 10.9. Installation torque: 8,9 Nm.

NOTE For a detailed drawing of the port pattern please see chapter 11 „*general information*“ under the category „*port patterns*“ or our online catalogue at www.weber-hydraulik.com.

Type code



Spool type		Crossover position
N		
NA		
NB		
D		
H		
C		
CA		
CB		
R11		
R21		

Accessories and additional information

<i>Accessories/spare parts</i>	Part:	Article number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Socket connector DIN EN 175301-803, shape A, grey	149.0008
	Srew DIN EN ISO 4762 M5 x 45 - 10.9	on request
	Seal kit W4_S-A1AS06 (NBR)	on request
	Seal kit W4_S-A1AS06 (Viton)	on request
	Coil 12 V DIN EN 175301-803, shape A	on request
	Coil 24 V DIN EN 175301-803, shape A	on request
	Coil 12 V, AMP Junior Timer	on request
	Coil 24 V, AMP Junior Timer	on request
	Coil 12 V, DEUTSCH	on request
	Coil 24 V, DEUTSCH	on request

NOTE For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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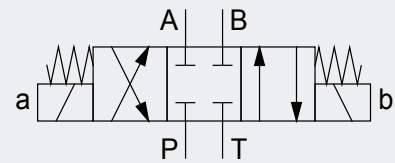
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On/off directional valve W42S-A2AS06 and W43S-A2AS06



direct operated, solenoid operated
 operating pressure max. 320 bar
 volume flow max. 60 l/min
 size NG 6, DIN 24340 A06



080340_W4_S-A2AS06_e
 03.2021

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	3
Dimensions	4
Type code	5
Accessories and additional information	6

Characteristics

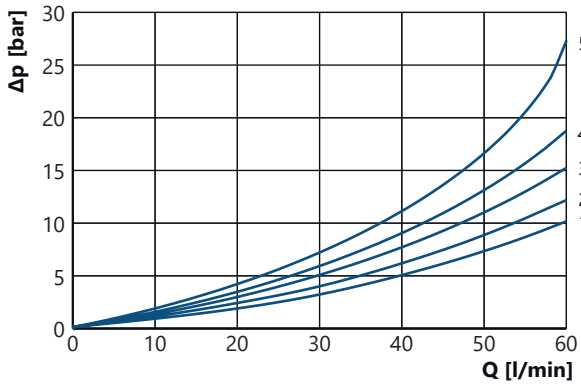
- on/off directional spool valve
- 2-way- or 3-way-version available
- spring centred spool
- maintenance-free
- rotatable and replaceable coils

Technical Data

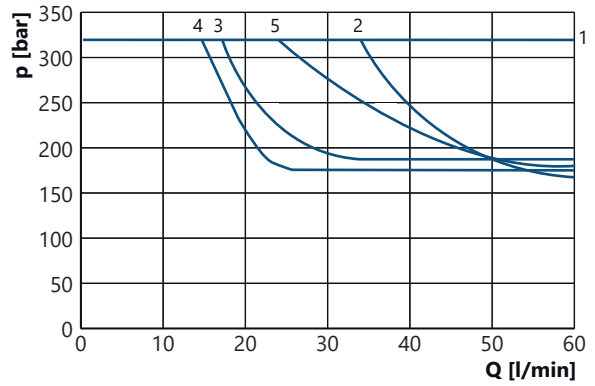
<i>Hydraulic</i>	Operating pressure max.:	port P, A, B: 320 bar port T: 100 bar
	Flow rate max.:	60 l/min
	Flow direction:	see symbols in type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	20 - 400 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 21/18/15, filter with β 5(c) > 200
	<hr/>	
<i>Mechanic</i>	Design:	spool type, direct operated by solenoids
	Size:	NG 6 (DIN 24340 A06, ISO 4401-03, CETOP 3)
	Fluid temperature:	-30 °C to +80 °C
	Ambient temperature:	-30 °C to +50 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Maximum acceleration:	5 g
	Weight:	4/2-way-design: 1,3 kg 4/3-way-design: 1,6 kg
	Material:	valve parts: steel seals: NBR, Viton optional
	Surface protection:	body: phosphatised solenoid: zinc coated
<hr/>		
<i>Electric</i>	Nominal voltage:	12 V DC, 24 V DC
	Nominal valve current:	2,41 A (12 V), 1,16 A (24 V)
	Nominal resistance (R20):	4,9 Ω (12 V), 19 Ω (24 V)
	Power consumption max.:	28,9 W (12 V), 31 W (24 V)
	Shifting time:	100 % ED
	Protection class:	IP65 with correctly mounted and locked mating connector
	Electric termination:	electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer, Deutsch DT04-2P
	Electronic controllers:	see chapter 6 " <i>electronics and sensors</i> " as well as our online catalogue at www.weber-hydraulik.com

Performance

Pressure drop diagram ($\Delta p/Q$) W4_S-A1AS06



Switching power diagram (p/Q) W4_S-A1AS06 at 80% of I_N



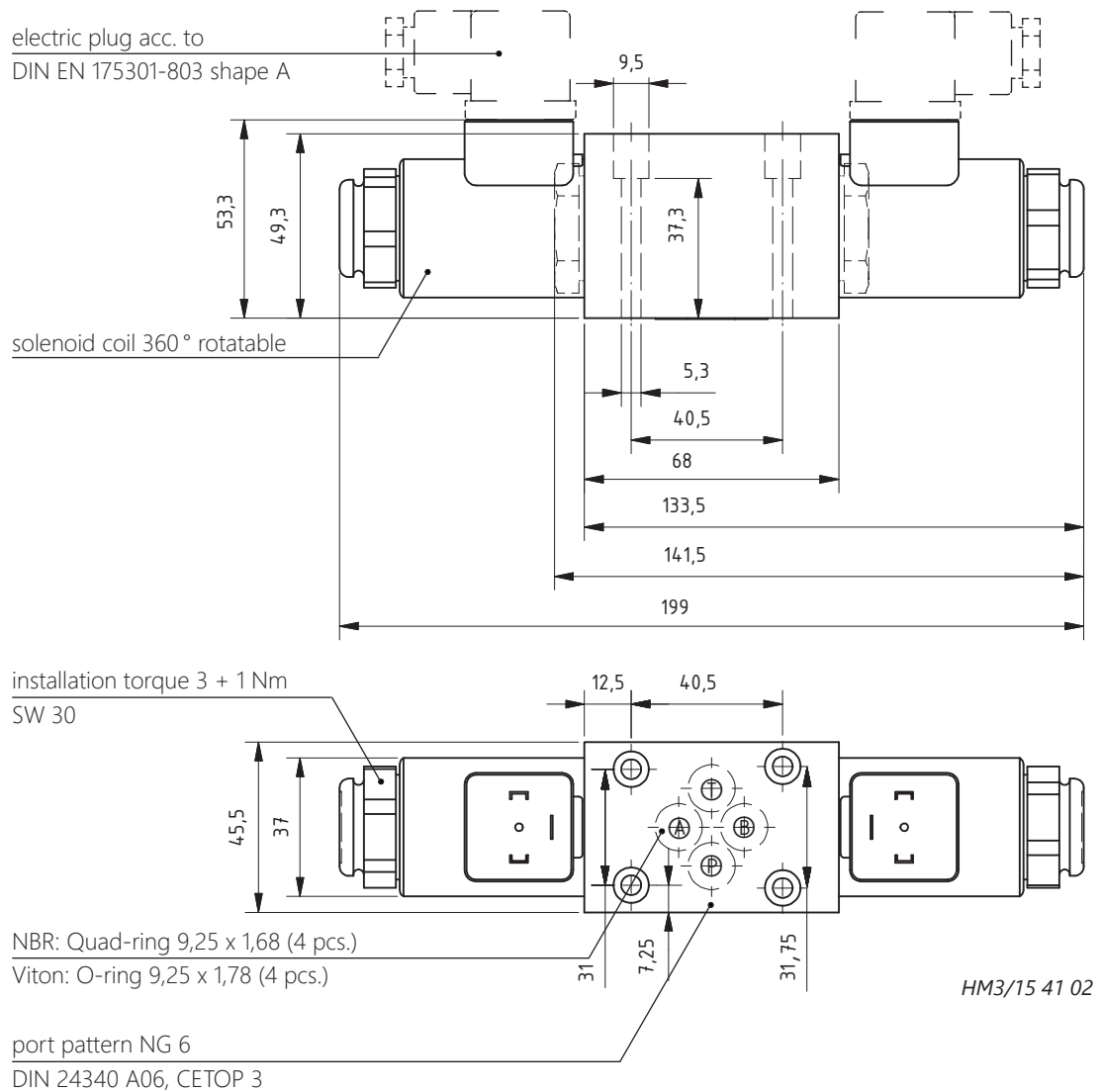
Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Spool type*	P-A	P-B	A-T	B-T	P-T
N	1	1	2	2	
NA		1	2		
NB	1	1	2	2	
D	1	1	1	1	
H	1	1	1	2	2
C	4	4	4	5	2
CA	1			2	3
CB	4	4	4	5	2
R11	1	1	2	2	
R21	1	1	2	2	

Spool type*	
N	2
NA	2
NB	2
D	3
H	1
C	4
CA	4
CB	4
R11	1
R21	5

* The different spool types are pictured in the type code on page 5.

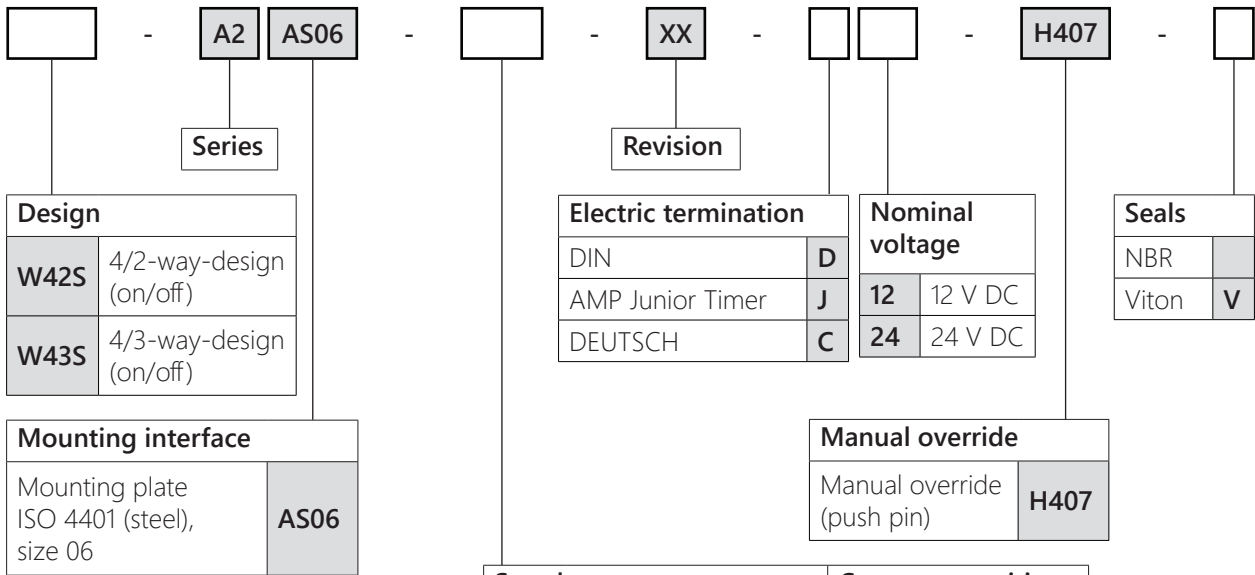
Dimensions



NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 45 - 10.9. Installation torque: 8,9 Nm.

NOTE For a detailed drawing of the port pattern please see our „general information“ under the category „port patterns“ or our online catalogue at www.weber-hydraulik.com.

Type code



	Spool type	Crossover position
N		
NA		
NB		
D		
H		
C		
CA		
CB		
R11		
R21		

Accessories and additional information

<i>Accessories/spare parts</i>	Article:	Material number:
	Socket connector DIN EN 175301-803, shape A, black	149.0007
	Srew DIN EN ISO 4762 M5 x 45 - 10.9	on request
	Seal kit W4_S-A2AS06 (NBR)	on request
	Seal kit W4_S-A2AS06 (Viton)	on request
	Coil 12 V DIN EN 175301-803, shape A	on request
	Coil 24 V DIN EN 175301-803, shape A	on request
	Coil 12 V, AMP Junior Timer	on request
	Coil 24 V, AMP Junior Timer	on request
	Coil 12 V, Deutsch DT04-2P	on request
	Coil 24 V, Deutsch DT04-2P	on request

NOTE For the appropriate electronic controllers, see chapter „*electronics and sensors*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in the chapter „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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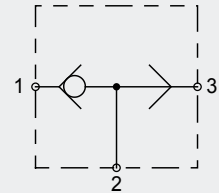
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Shuttle valve FTRW



operating pressure max. 350 bar
volume flow max. 15 l/min



090310_FTRW_e
07.2018

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Dimensions	2
Type code	3

Characteristics

- screw-in shuttle valve
- sizes G1/8" or G1/4" available
- compact design
- maintenance-free

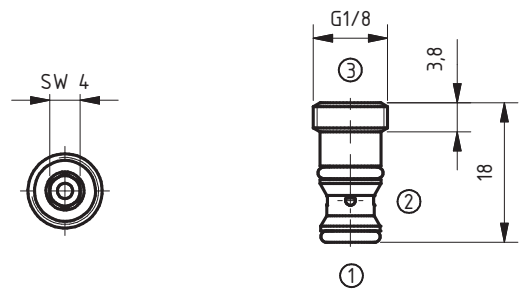
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	FTRW-2,5: 315 bar FTRW-5: 350 bar
	Flow rate:	FTRW-2,5: 8 l/min FTRW-5: 15 l/min
	Flow direction	from 1 or 3 to 2
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

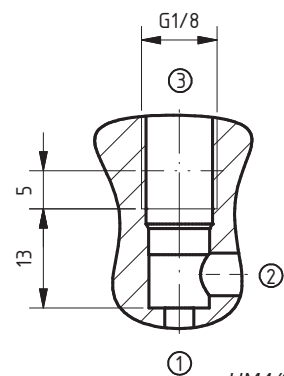
<i>Mechanic</i>	Design:	screw-in valve
	Size:	G1/8" or G1/4"
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	FTRW-2,5: 0,005 kg FTRW-5: 0,012 kg
	Material:	valve parts: steel seals: NBR

Dimensions

Shuttle valve
FTRW-2,5



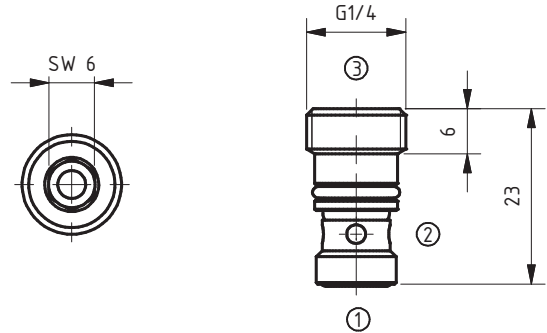
Cavity FTRW-2,5



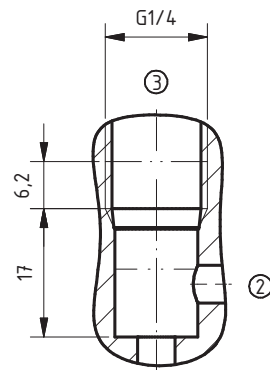
HM4/98 12 02

Dimensions

Shuttle valve
FTRW-5



Cavity FTRW-5



① HM4/08 44 02

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

FTRW

Shuttle valve

-

Size	
2,5	G 1/8"
5	G 1/4"

-

N

Seal NBR

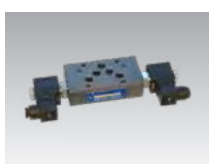
Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.



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Pressure relief valves

Pressure Relief Valve DBG1

direct operated
operating pressure max. 365 bar
volume flow max. 15 l/min
cavity DBG1

Pressure Relief Valve DBG4

direct operated
operating pressure max. 350 bar
volume flow max. 30 l/min
cavity DBG4

Pressure Relief Valve EDB

direct operated, with anti-cavitation/check function
operating pressure max. 420 bar
volume flow max. 60 l/min
cavity EDB, T-10A or T-13A

Pressure Relief Valve DBT

direct operated
operating pressure max. 350 bar
volume flow max. 50 l/min
cavity T-13A

Pressure Relief Valve DB12-FT

direct operated
operating pressure max. 350 bar
volume flow max. 100 l/min
available with CE type examination

Pressure discharge valves

Pressure Discharge Valve ZMSVD2

operating pressure max. 315 bar
volume flow max. 30 l/min
sandwich body NG 6, NG 10, NG 16
discharge from A and B to T

Pressure switching valves

High/low pressure switching valve ZHD/ND

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 80 l/min
sandwich body NG 6, NG 10

Accumulator charging valves

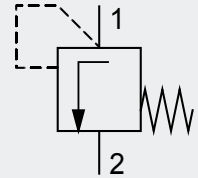
Accumulator Charging Valve SLV

pilot operated
operating pressure max. 315 bar
volume flow max. 60 l/min
mounting plate NG 6, NG 10

Pressure relief valve DBG1



direct operated
 max. operating pressure 365 bar
 max. volume flow 15 l/min



090130_DBG1_e
 07.2018

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	3

Characteristics

- screw-in pressure relief valve
- compact design
- maintenance-free

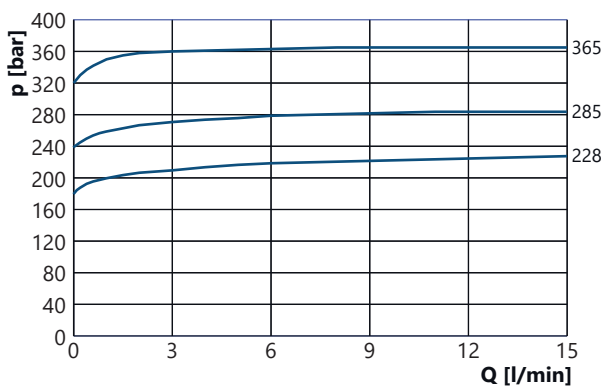
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	365 bar
	Tank pressure max.:	100 bar
	Flow rate:	15 l/min
	Flow direction:	1 (P) to 2 (T)
	Pressure setting range:	see type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	12 - 400 cSt
Filtration:	oil cleanliness according to ISO 4406 (1999) 20/18/15, filter with β 5(c) > 200	

<i>Mechanic</i>	Design:	screw-in valve
	Fluid temperature:	-30 °C to +80 °C
	Ambient temperature:	-40 °C to +80 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,067 kg
	Material:	valve parts: steel seal: NBR, PTFE
Surface protection:	exterior parts: zinc coated steel	

Performance

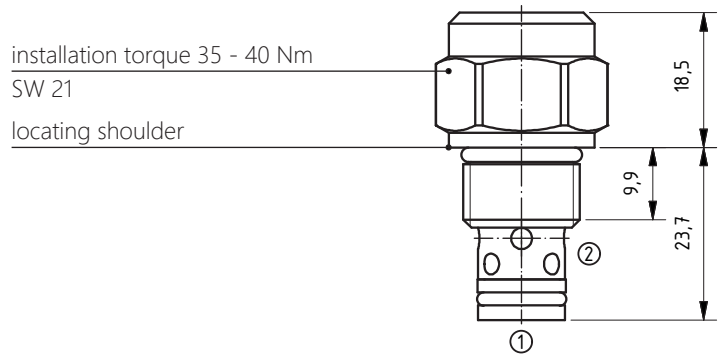
Pressure drop diagram (p/Q) DBG1



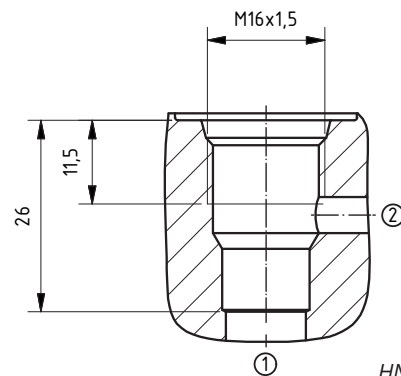
Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

Screw-in valve
DBG1



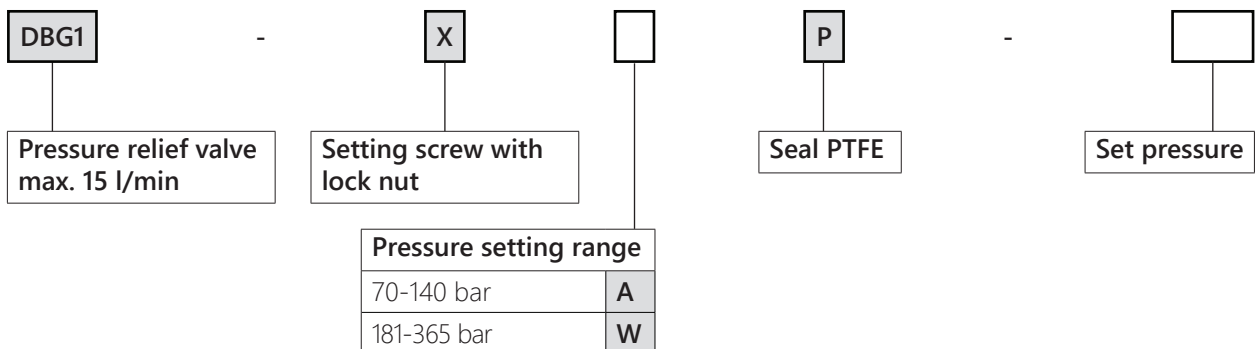
Cavity DBG1



HM3/09 49 08

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.



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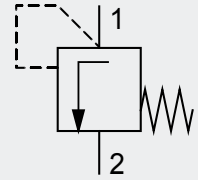
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Pressure relief valve DBG4



direct operated
max. operating pressure 350 bar
max. volume flow 30 l/min



090140_DBG4_e
07.2018

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	4

Characteristics

- screw-in pressure relief valve
- compact design
- low leakage
- maintenance-free

Technical Data

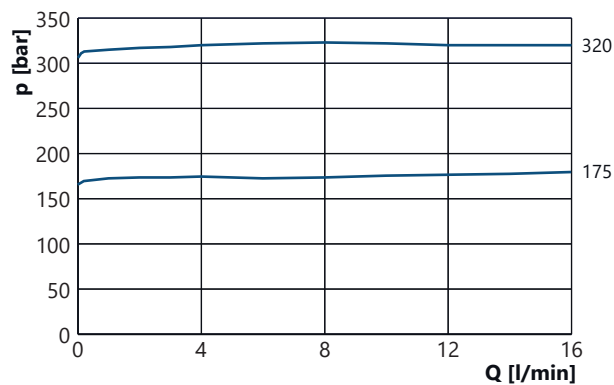
<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Tank pressure max.:	100 bar
	Flow rate:	30 l/min
	Flow direction:	1 (P) to 2 (T)
	Pressure setting range:	175 bar respectively 320 bar $\pm 3\%$
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$

NOTE The pressure at port 2 (T) adds directly to the set pressure.

<i>Mechanic</i>	Design:	screw-in valve
	Fluid temperature:	-30 °C to +80 °C
	Ambient temperature:	-40 °C to +80 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,215 kg
	Material:	valve parts: steel, seals: NBR
	Surface protection:	exterior parts: zinc coated steel

Performance

Pressure drop diagram (p/Q) DBG4

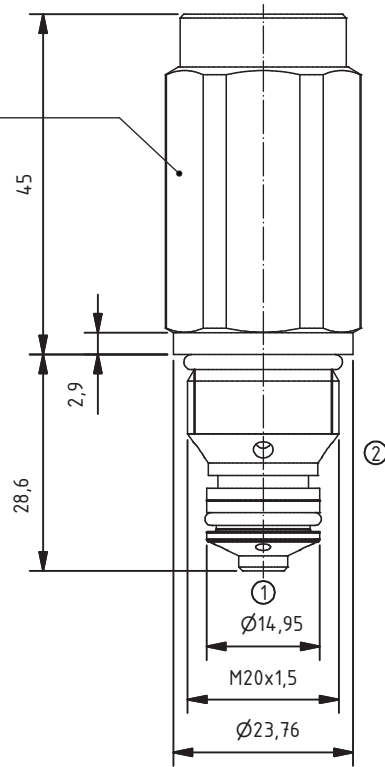


Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

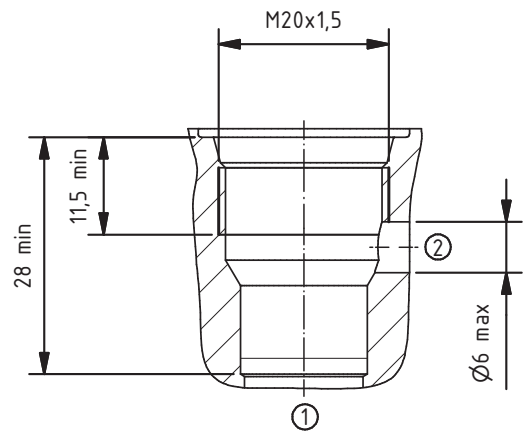
Dimensions

Screw-in valve DBG4

installation torque 25 +5 Nm
SW 24



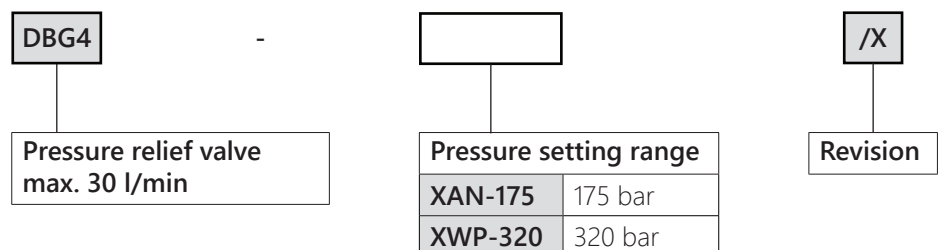
Cavity DBG4



HM3/09 49 15

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

<i>Accessories / Spare parts</i>	Article:	Article number:
	Seal kit DBT4 (NBR)	405.0114

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.



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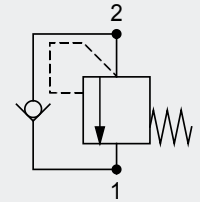
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Pressure relief valve EDB



direct operated
with anti-cavitation/check function
max. operating pressure 420 bar
max. volume flow 60 l/min
cavity EDB, T-10A or T-13A



090120_EDB_e
09.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	2
Dimensions	3
Type code	7
Accessories and additional information	7

Characteristics

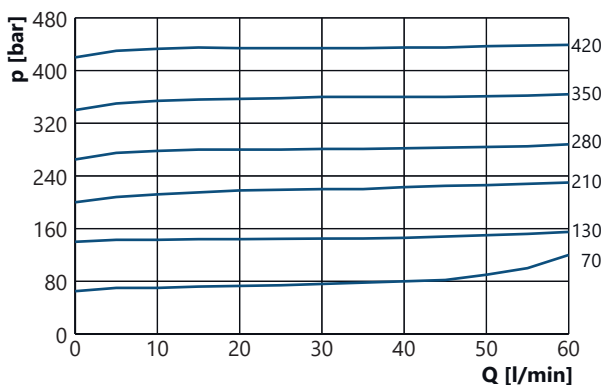
- pressure relief valve with anti-cavitation/check function
- slip-in valve for cavity EDB or
- screw-in valve T-10A or T-13A
- also available in in-line body or as double slip-in valve in in-line body
- compact design
- minimum oil leakage
- maintenance-free

Technical data

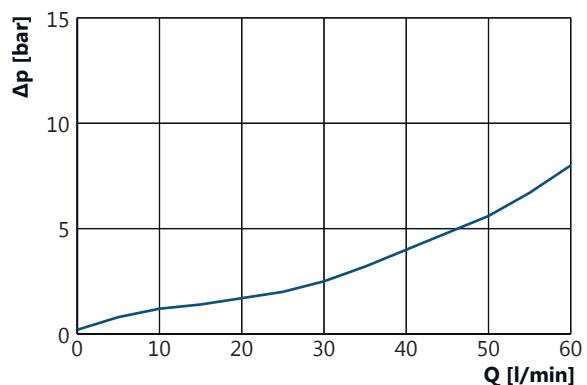
<i>Hydraulic</i>	Operating pressure max.:	EDB: 420 bar EDB38, DEDB, EDB10, EDB13: 350 bar	
	Flow rate max.:	EDB: 60 l/min EDB38, DEDB, EDB10, EDB13: 50 l/min	
	Pressure setting range:	see type code	
	Opening pressure anti-cavitation valve:	<0,5 bar	
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request	
	Viscosity range:	7,4 - 420 cSt	
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200	
	Hysteresis:	10 %	
	<i>Mechanic</i>	Design :	EDB: slip-in valve, EDB38: slip-in valve in in-line body, DEDB: double valve in in-line body, EDB10/EDB13: cartridge valve T-10A/T-13A
		Fluid temperature:	-30 °C to +80 °C
Ambient temperature:		-30 °C to +80 °C	
Storage temperature:		-30 °C to +60 °C (non-condensing)	
Installation position:		any	
Weight:		EDB: 0,015 kg, EDB38: 0,3 kg, DEDB: 1,15 kg, EDB10/EDB13: 0,06 kg	
Material:		valve parts: steel seals: NBR, Viton optional	
Surface protection:		exterior parts: zinc coated steel	

Performance

Pressure diagram (p/Q) EDB from 2 to 1



Pressure drop diagram (Δp /Q) anti-cavitation/ check valve from 1 to 2



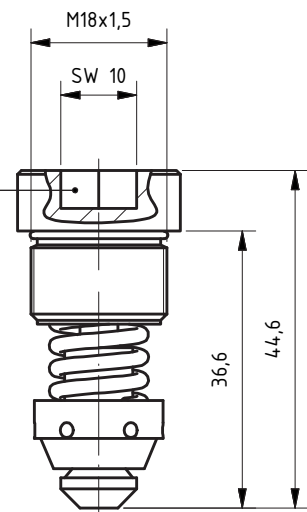
Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.
Factory pressure settings established at Q = 10 l/min.

NOTE With manifolds the performance may vary.

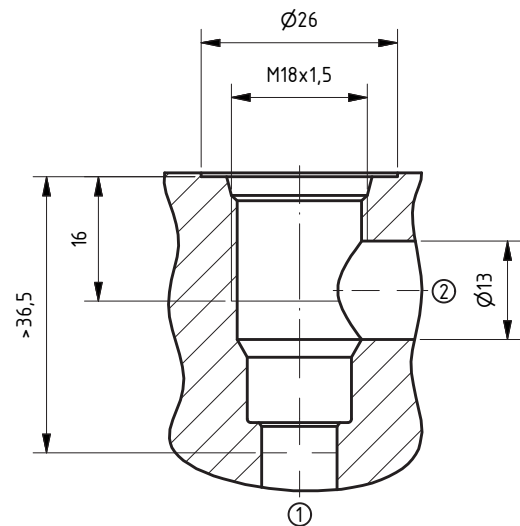
Dimensions

Slip-in valve EDB

installation torque 35 - 40 Nm



Cavity EDB

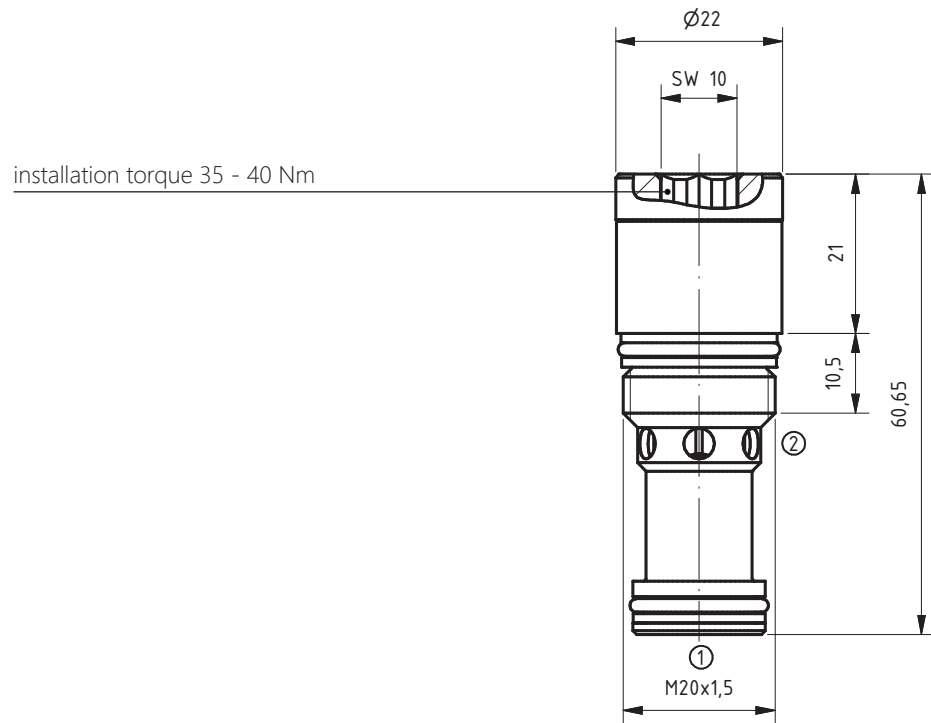


HE4/15 26 01

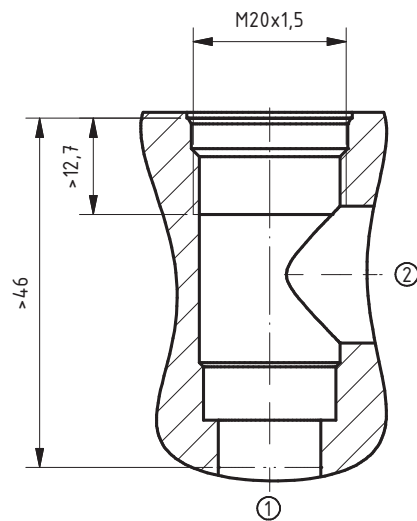
NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Dimensions

Cartridge valve
EB10



Cavity T-10A



HE4/15 27 10

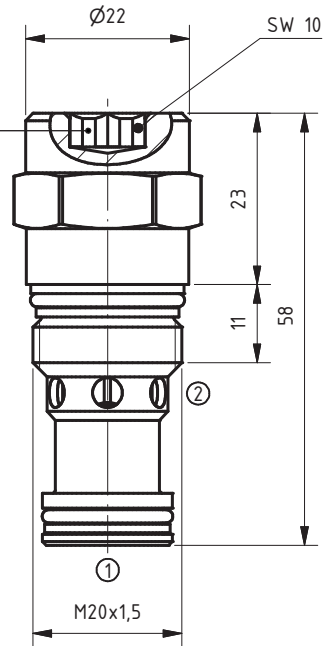
NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

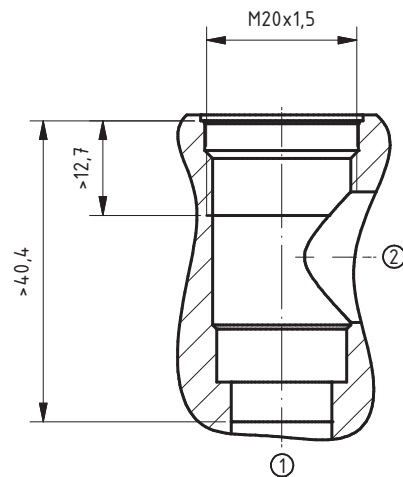
Dimensions

Cartridge valve
EDB13

installation torque 35 - 40 Nm



Cavity T-13A



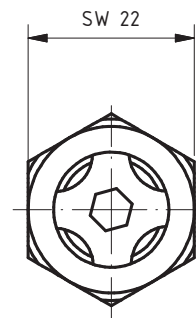
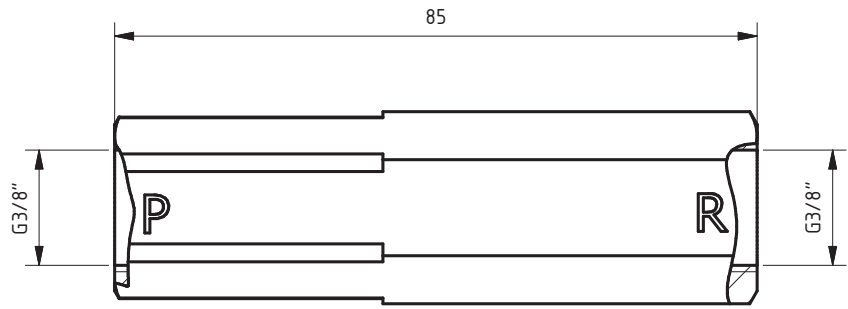
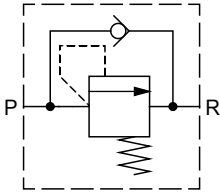
HE4/15 27 11

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

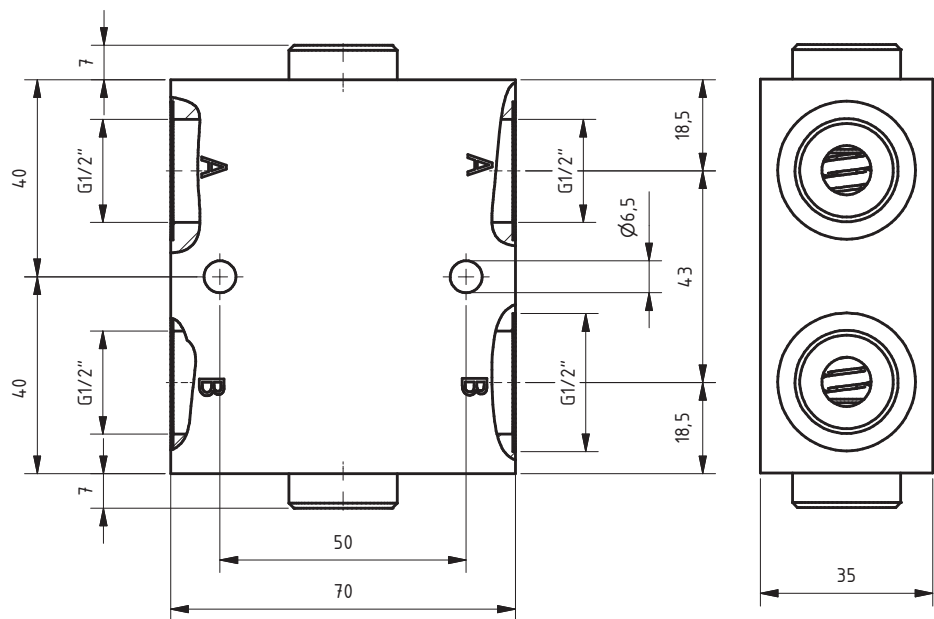
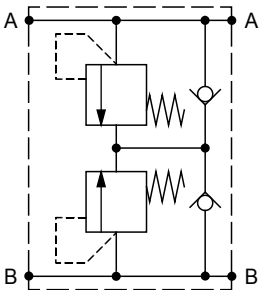
Dimensions

*Slip-in valve in
in-line body
EDB38*



HM4/08 04 14

*double slip-in valve
in in-line body
DEDB*



HM3/15 37 06

Type code

	-		-		
Design		Pressure setting range*		Locking screw	
EDB	slip-in valve	20-70 bar	20-70	with locking screw, with CV*** spring	
EDB38	slip-in valve in in-line body (G 3/8")	71-130 bar	71-130	without locking screw, with CV spring	F
DEDB	double slip-in valve in in-line body (G 1/2")	131-210 bar	131-210	without locking screw, without CV spring	O
EDB10	cartridge valve T-10A	211-280 bar	211-280		
EDB13	cartridge valve T-13A	281-350 bar	281-350		
		351-420 bar**	351-420		

* Please select pre-adjusted pressure setting according to your needs.
Once set, the pressure setting is permanent and can not be changed afterwards.
Exception: The EDB is available with or without a fixed pressure setting.
** only available for EDB
*** CV = check valve

NOTE Factory pressure settings are established at Q = 10 l/min.

Accessories and additional information

Accessories/ spare parts	Article:	Material number:
	Seal kit T-10A / T-13A (NBR)	405.0036
	Seal kit T-10A / T-13A (Viton)	405.0037

NOTE For appropriate manifolds see chapter 10 „*connecting plates and manifolds*“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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Fax: +49 7531 9748-44

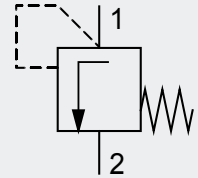
www.weber-hydraulik.com
info.de-k@weber-hydraulik.com

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Pressure relief valve DBT



direct operated
operating pressure max. 350 bar
volume flow max. 50 l/min



090110_DBT_e
07.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	6
Accessories and additional information	7

Characteristics

- screw-in pressure relief valve
- also available in in-line body or sandwich body
- compact design
- maintenance-free

Technical Data

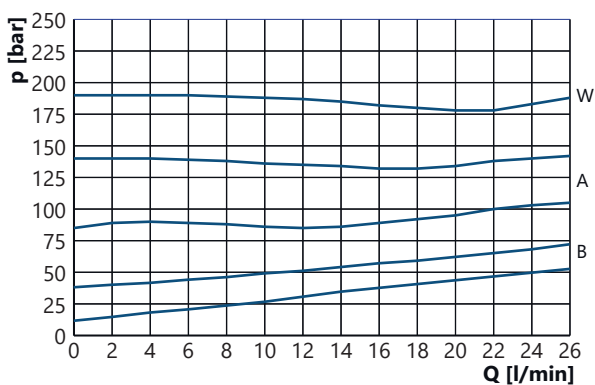
<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Tank pressure max.:	DBT1: 350 bar, DBT2 and DBT3: 70 bar
	Flow rate:	see type code
	Flow direction:	1 (P) to 2 (T)
	Pressure setting range:	see type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

NOTE The pressure on port 2 (T) adds directly to the set pressure. The total pressure of port 1 (P) and 2 (T) must not exceed the maximum operating pressure.

<i>Mechanic</i>	Design:	screw-in valve
	Fluid temperature:	-30 °C to +80 °C
	Ambient temperature:	-30 °C to +80 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	DBT1, DBT3: 0,14 kg DBT2: 0,10 kg
	Material:	valve parts: steel seals: NBR, backup rings: PU, teflon
	Surface protection:	zinc coated

Performance

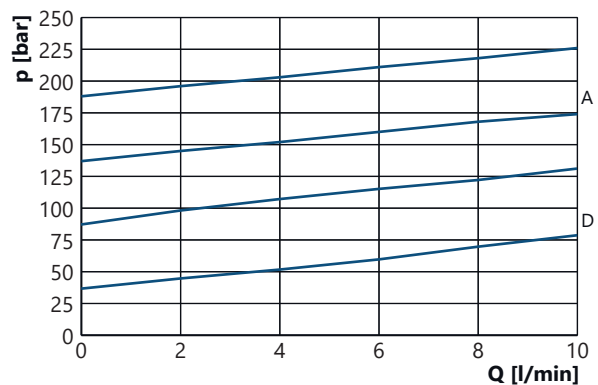
Pressure diagram (p/Q) DBT1 and DBT3



Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.

Pressure diagram (p/Q) DBT2

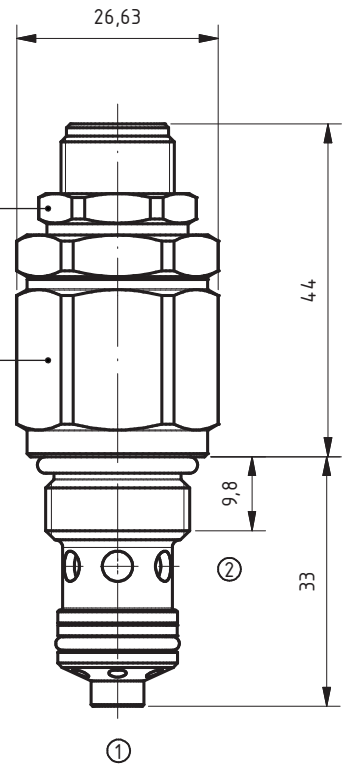


Dimensions

Screw-in valve DBT1

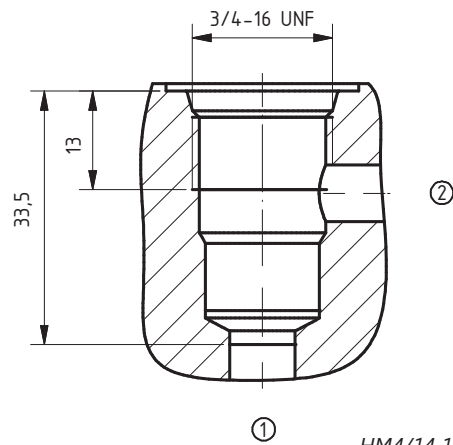
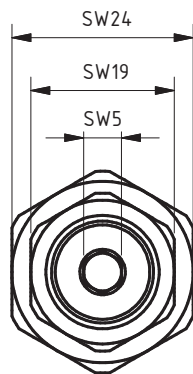
installation torque 18 - 22 Nm
SW 19

installation torque 40 - 45 Nm
SW 24



HM4/14 33 09

Cavity DBT1



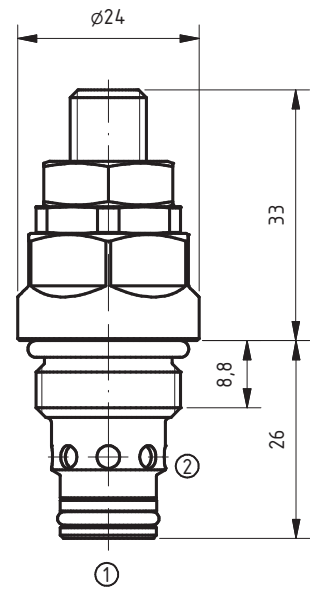
HM4/14 11 22

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available in an in-line body. Dimension sheets are available upon request.

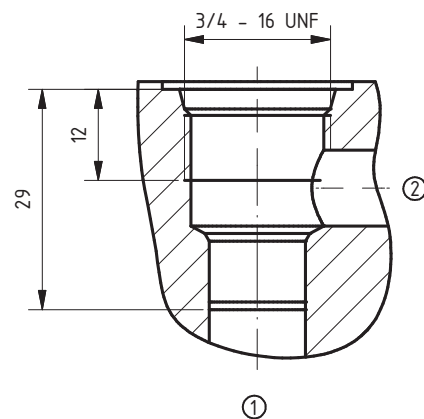
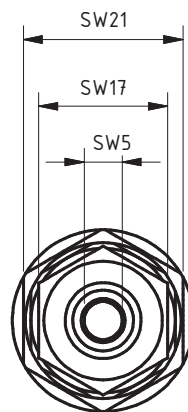
Dimensions

Screw-in valve DBT2



HM4/14 33 08

Cavity DBT2 (STO)



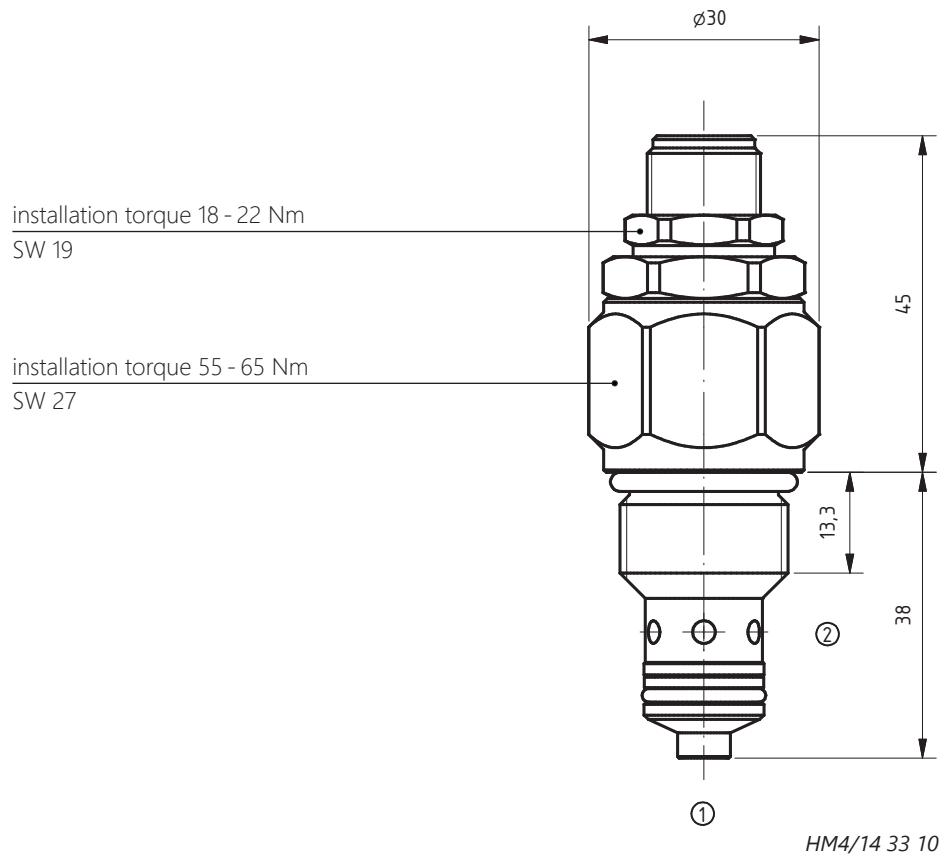
HM4/14 33 08

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

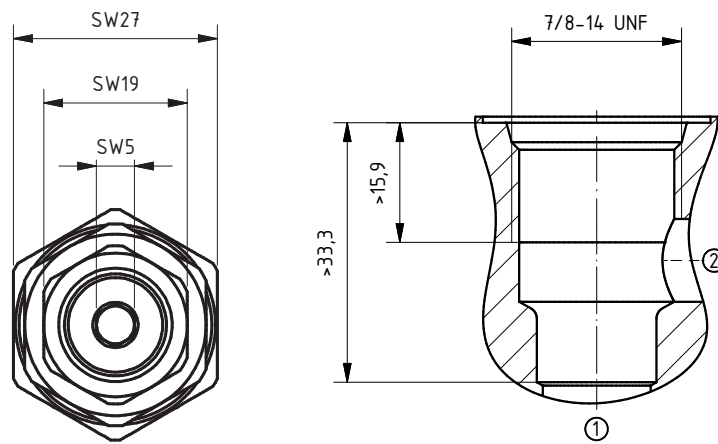
NOTE The valve is also available in an in-line body. Dimension sheets are available upon request.

Dimensions

Screw-in valve DBT3



Cavity DBT3 (C-10-2)

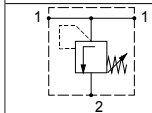
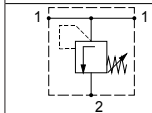
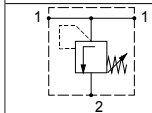
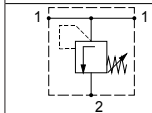
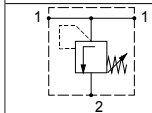
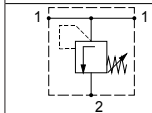
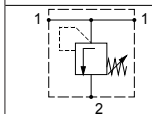
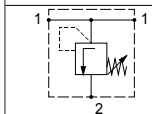
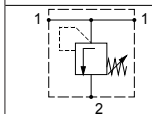
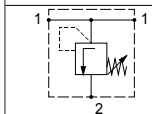
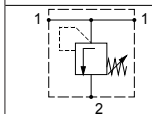
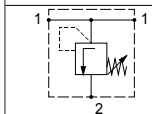
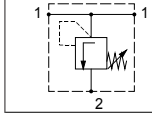
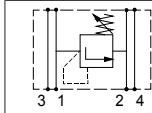
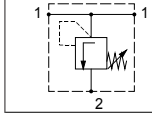
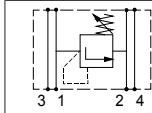
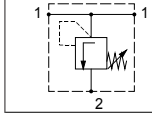
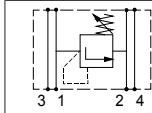


HE4/14 10 04

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available in an in-line body or in a sandwich body. Dimension sheets are available upon request.

Type code

<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">DBT1</div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">Pressure relief valve max. 25 l/min</div>	-	<div style="text-align: center; margin-bottom: 10px;">L</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;">Setting screw with lock nut</div> <div style="text-align: center; margin-bottom: 10px;">Pressure setting range</div> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>20-130 bar</td><td>B</td></tr> <tr><td>40-180 bar</td><td>A</td></tr> <tr><td>180-350 bar</td><td>W</td></tr> </table>	20-130 bar	B	40-180 bar	A	180-350 bar	W	-	<div style="text-align: center; margin-bottom: 10px;">N</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;">Seal NBR</div>	-	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto 10px auto;"></div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Symbol</th> <th colspan="2">Body</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">  </td> <td style="width: 60%;">without</td> <td style="width: 20%;"></td> </tr> <tr> <td style="text-align: center;">  </td> <td>in-line body G 3/8</td> <td style="text-align: center;">RG3</td> </tr> </tbody> </table>	Symbol	Body			without			in-line body G 3/8	RG3
20-130 bar	B																				
40-180 bar	A																				
180-350 bar	W																				
Symbol	Body																				
	without																				
	in-line body G 3/8	RG3																			
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">DBT2</div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">Pressure relief valve max. 10 l/min</div>	-	<div style="text-align: center; margin-bottom: 10px;">L</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;">Setting screw with lock nut</div> <div style="text-align: center; margin-bottom: 10px;">Pressure setting range</div> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>10-60 bar</td><td>D</td></tr> <tr><td>40-270 bar</td><td>A</td></tr> </table>	10-60 bar	D	40-270 bar	A	-	<div style="text-align: center; margin-bottom: 10px;">N</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;">Seal NBR</div>	-	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto 10px auto;"></div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Symbol</th> <th colspan="2">Body</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">  </td> <td style="width: 60%;">without</td> <td style="width: 20%;"></td> </tr> <tr> <td style="text-align: center;">  </td> <td>in-line body G 3/8</td> <td style="text-align: center;">9702</td> </tr> </tbody> </table>	Symbol	Body			without			in-line body G 3/8	9702		
10-60 bar	D																				
40-270 bar	A																				
Symbol	Body																				
	without																				
	in-line body G 3/8	9702																			
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">DBT3</div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">Pressure relief valve max. 50 l/min</div>	-	<div style="text-align: center; margin-bottom: 10px;">L</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;">Setting screw with lock nut</div> <div style="text-align: center; margin-bottom: 10px;">Pressure setting range</div> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr><td>40-200 bar</td><td>A</td></tr> <tr><td>180-350 bar</td><td>W</td></tr> </table>	40-200 bar	A	180-350 bar	W	-	<div style="text-align: center; margin-bottom: 10px;">N</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto 10px auto;">Seal NBR</div>	-	<div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto 10px auto;"></div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Symbol</th> <th colspan="2">Body</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">  </td> <td style="width: 60%;">in-line body G 3/8</td> <td style="width: 20%; text-align: center;">RG2</td> </tr> <tr> <td style="text-align: center;">  </td> <td>sandwich body NG 6</td> <td style="text-align: center;">ZW6</td> </tr> </tbody> </table>	Symbol	Body			in-line body G 3/8	RG2		sandwich body NG 6	ZW6		
40-200 bar	A																				
180-350 bar	W																				
Symbol	Body																				
	in-line body G 3/8	RG2																			
	sandwich body NG 6	ZW6																			

NOTE Special pressure settings are available on request. Please contact our customer service: anfrage.dekw@weber-hydraulik.com.

Accessories and additional information

<i>Accessories / Spare parts</i>	Article:	Material number:
	Seal kit DBT1 (NBR)	407.0003
	Seal kit DBT3 (NBR)	407.0007
<i>Manual</i>	Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „ <i>general information</i> “ under the category „ <i>general operating manual</i> “ or will be provided upon request.	



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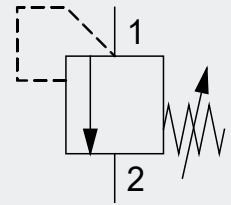
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Pressure relief valve DB12-FT



direct operated
max. operating pressure 350 bar
max. volume flow 100 l/min



090150_DB12-FT_e
09.2021

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	4
Accessories and additional information	4

Characteristics

- screw-in pressure relief valve
- available with preset pressure and plumbed
- low-vibration
- maintenance-free

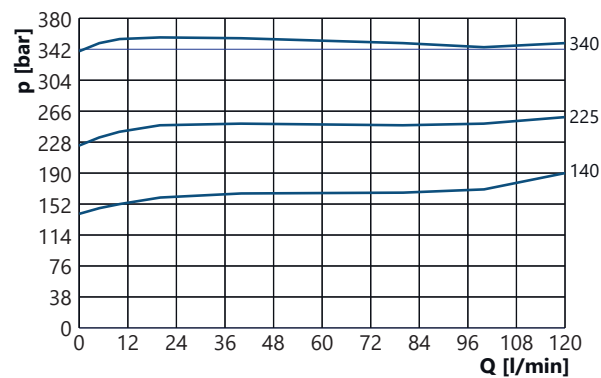
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow rate:	100 l/min
	Pressure setting range:	10 - 350 bar
	Flow direction:	1 (P) to 2 (T) pressure relief function
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	10 - 350 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

<i>Mechanic</i>	Design:	DB12-FT-XWN: screw-in valve plumbed, DB12-FT-LWN: screw-in valve adjustable
	Fluid temperature:	-30 °C to +85 °C
	Ambient temperature:	-30 °C to +80 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,45 kg
	Material:	valve parts: steel seals: NBR, PTFE
Surface protection:	exterior parts: zinc coated steel	

Performance

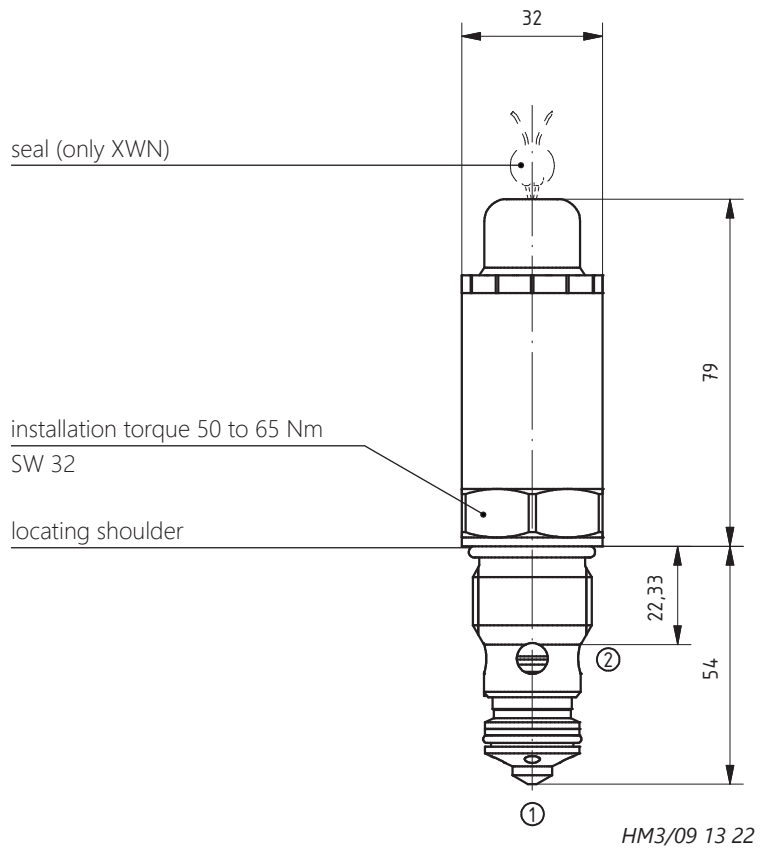
Pressure drop diagram (p/Q) DB12-FT



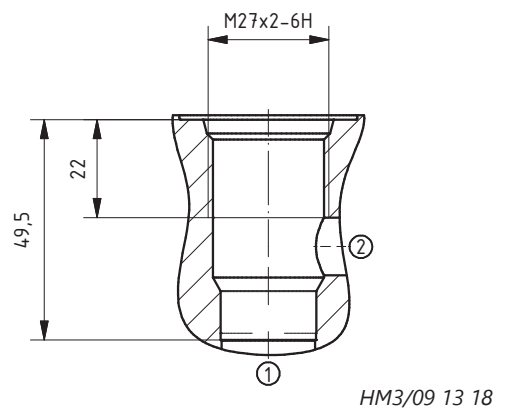
Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

Screw-in valve
DB12-FT

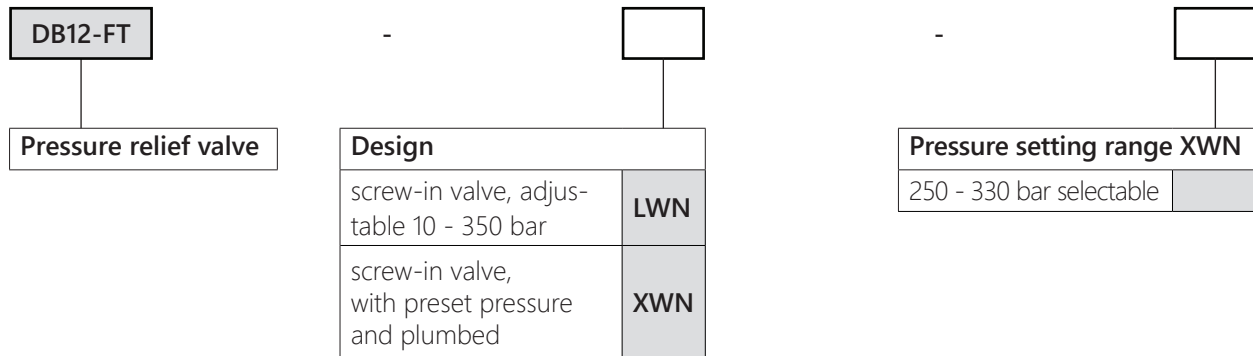


Cavity DB12-FT



NOTE For a detailed drawing of the cavity please see our „general information“ under the category „valve cavities 2-way designs“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide suitable manifolds. Please contact us for further assistance.

Type code**Accessories and additional information***Accessories / spare parts***Article:**

Seal kit DB12-FT (NBR)

Material number:

405.0084

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in the chapter „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



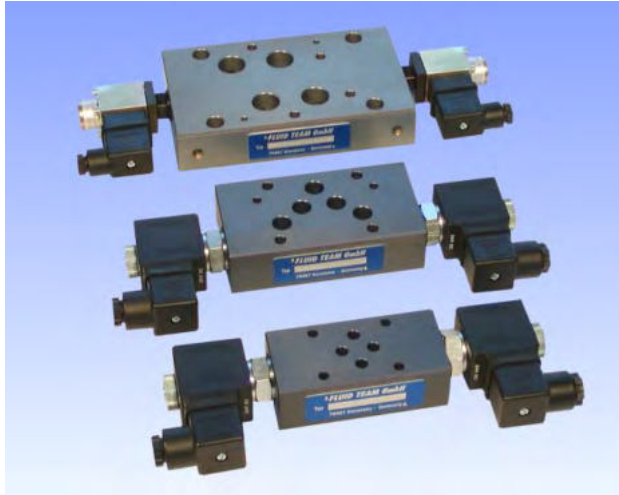
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 info.de-k@weber-hydraulik.com

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Pressure Discharge Valve ZMSVD2

Sandwich Body CETOP/ISO 3, 5, 7 • opens A and B to T

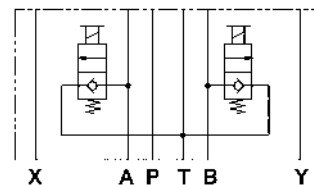


Description

With the pressure discharge valve ZMSVD2 is simple eliminating of residual pressures in the A and B channels of sandwich packages possible. The channels A and B are dischargeable thereby separately over two 2/2-way poppet valves to the tank (T channel). By the use of compact valves increase in altitude is small.

Symbol

CETOP/ISO 5 with X and Y channel shown



Application

The ZMSVD2 finds particularly in tooling machines use. Example: core strain discharge of injection moulding machines (before tool changes).

Technical Data

for terms and definitions see chapter 12

Hydraulic

Rated Pressure: max. 315 bar
 Rated Flow over CETOP/ISO 3, 5: max. 30 l/min
 Poppet Valve: CETOP/ISO 7: max. 2 l/min
 Fluids: oils as per DIN 51524, others upon request
 Viscosity Range: 10 – 350 cSt
 Filtration: class 20/18/14, filter β 10...16 \geq 75
 Leakage: max. 5 drops/ min.

Mechanic

Ambient Temperature: -20 °C – +50 °C
 Fluid Temperature: -20 °C – +80 °C
 Installation: no restrictions
 Weight: CETOP/ISO 3: 0,84 kg
 CETOP/ISO 5: 1,06 kg
 CETOP/ISO 7: 1,39 kg

Materials:

valve parts: steel
 body: Aluminium
 seals: NBR
 back up rings: Teflon, PU
 valve: zinc plated, burnished
 body: anodised

Surface Protection:

Electrical

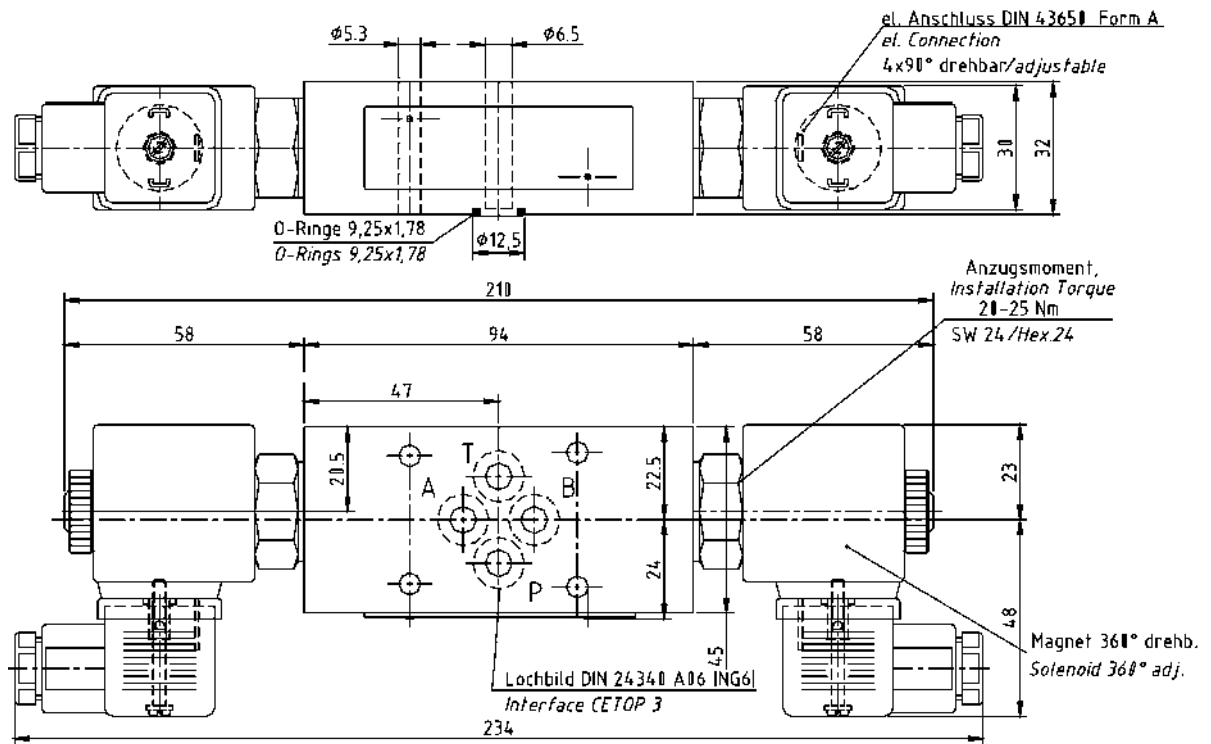
Nominal Voltage: 24 V DC, 12 V DC, \pm 10%
 Nominal Resistance (R_{20}): CETOP/ISO 3, 5: 24V: 26 Ω ; 12V: 8 Ω
 CETOP/ISO 7: 24V: XX Ω ; 12V: X Ω
 Wattage: 22 W
 Cyclic Duration Factor: 100 %
 Environmental Protection: IP 65
 Electrical Termination: CETOP/ISO3, 5: plug as per DIN 43650 form A, incl. square connector Pg9
 CETOP/ISO 7: plug as per DIN 43650 form B, incl. square connector Pg7

Model Code

ZMSVD2	-	A/T-B/T	-	1	-	24V
Pressure Discharge Valve, Sandwich Body		Function		Design		Voltage
deliverable executions:		A/T-B/T = discharge from A and B to T				24V DC 12V DC
CETOP/ISO 3 (NG 6)	ZHD/ND-06					
CETOP/ISO 5 (NG 10)	ZHD/ND-10					
CETOP/ISO 5 (with X + Y)	ZHD/ND-10Y					
CETOP/ISO 7 (NG 16)	ZHD/ND-16					

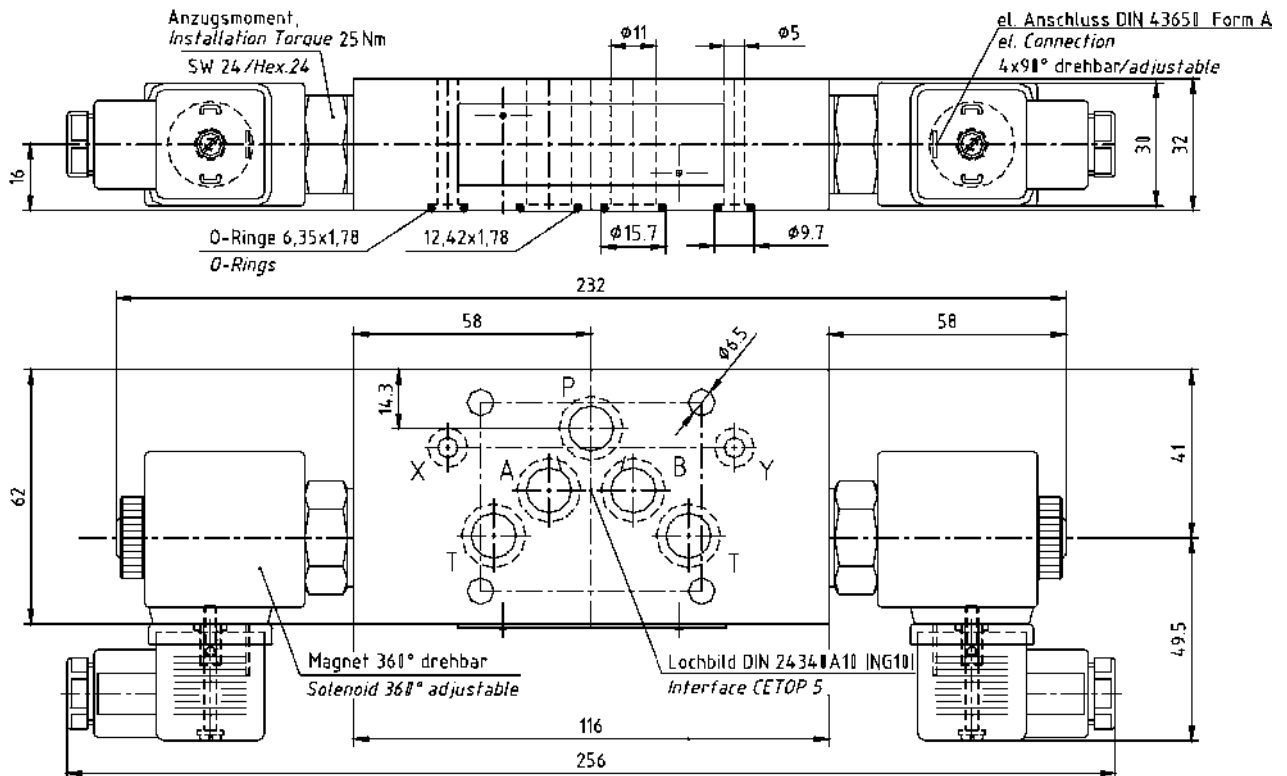
Dimensions [mm]

ZMSVD2-06-... CETOP/ISO 3 (NG 6)



H3-000703

ZMSVD2-10Y-... *) CETOP/ISO 5 (NG 10)

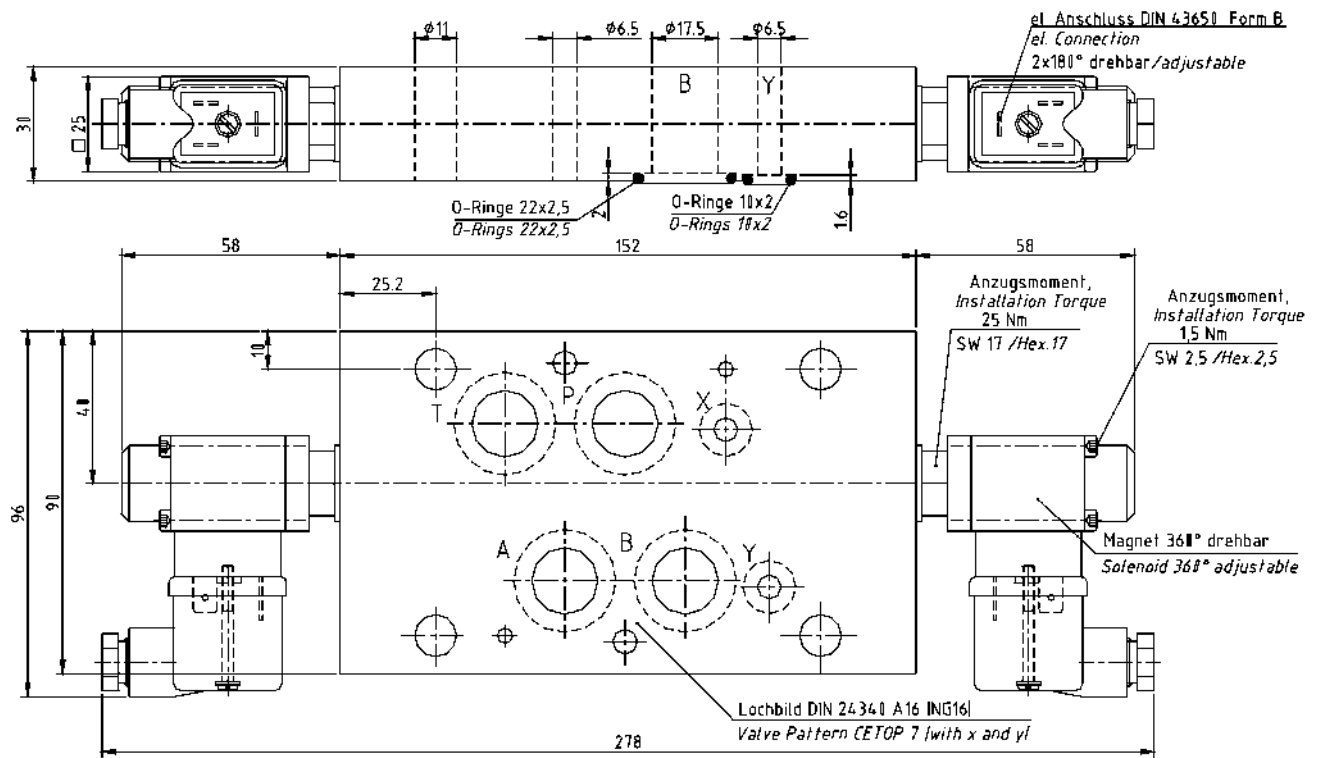


*) fig. shows interface with X- and Y-channel. The other dimensions are identic.

H3-000705

ZMSVD2-16-...

CETOP/ISO 7 (NG 16)



H3-930202

Accumulator Load Valve SLV

Cover Plate NG 6, NG 10 • max. 315 bar • max. 30 respectively 60 l/min



Description

The WEBER-HYDRAULIK ValveTech accumulator load valve SLV is a shift valve with a pressure-dependent shifting point. The shift pressure is measured in port B. If the shift pressure is reached, the valve opens the connection from P to T, the pump is in pressure-free circulation. As soon as the pressure falls at port B to the reset point, the valve closes the connection of P to T, the accumulator will be loaded again. The reset pressure lies approx. 15% below adjusted shift pressure (= reset hysteresis). The SLV is available as a cover plate CETOP/ISO 3 (SLV 6) and CETOP/ISO 5 (SLV 10). The setting of the shift pressure can be done on demand. If the accumulator is fitted directly to the cover plate, devices with integrated check valve are available.

Technical Data

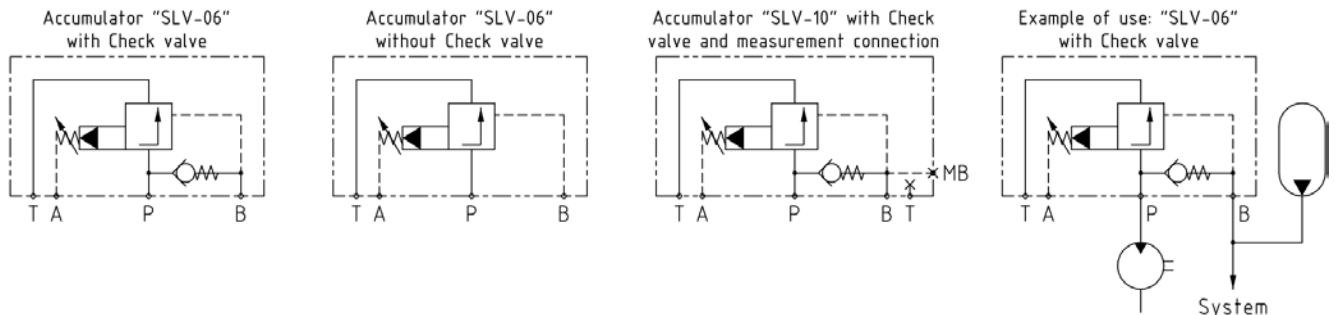
Hydraulic

Rated pressure: max. 315 bar
 Switching pressure: see model code
 Hysteresis: see model code
 Rated flow: SLV 6: max. 30 l/min
 SLV 10: max. 60 l/min
 Fluids: Oils as per DIN 51524,
 Others upon request
 Viscosity: 3 – 400 cSt
 Filtration: min. 25 µm

Mechanic

Design: pilot operated
 Operation temperature: -20 °C – +80 °C
 Installation: no restrictions
 Weight: SLV 6: 1,3 kg
 SLV 10: 1,9 kg
 Materials: valve parts: steel
 body: aluminium
 seals: NBR (Viton available)
 back up rings: Teflon; PU
 valve zinc plated
 body anodised
 Surface protection:

Symbols

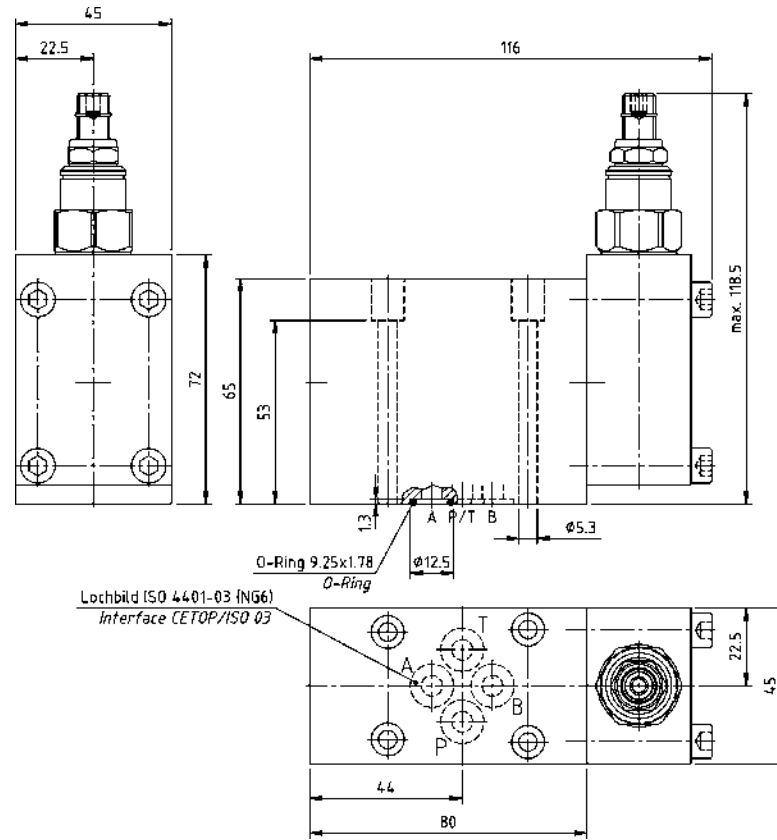


Model Code

SLV 6	-	210	-	15	-	3	-	RV
Accumulator Load Valve Surface Mount Body		Shift Pressure Range		Hysteresis		Design		Check Valve „P“ to „B“
Available options:		55 = 18 – 55 bar 105 = 35 – 105 bar 210 = 70 – 210 bar 350 = 140 – 315 bar		15 = 15% On request: 20 = 20% 30 = 30% 50 = 50%		internal		0 = without check valve RV = with check valve
NG 6 SLV 6								
NG 10 SLV 10								

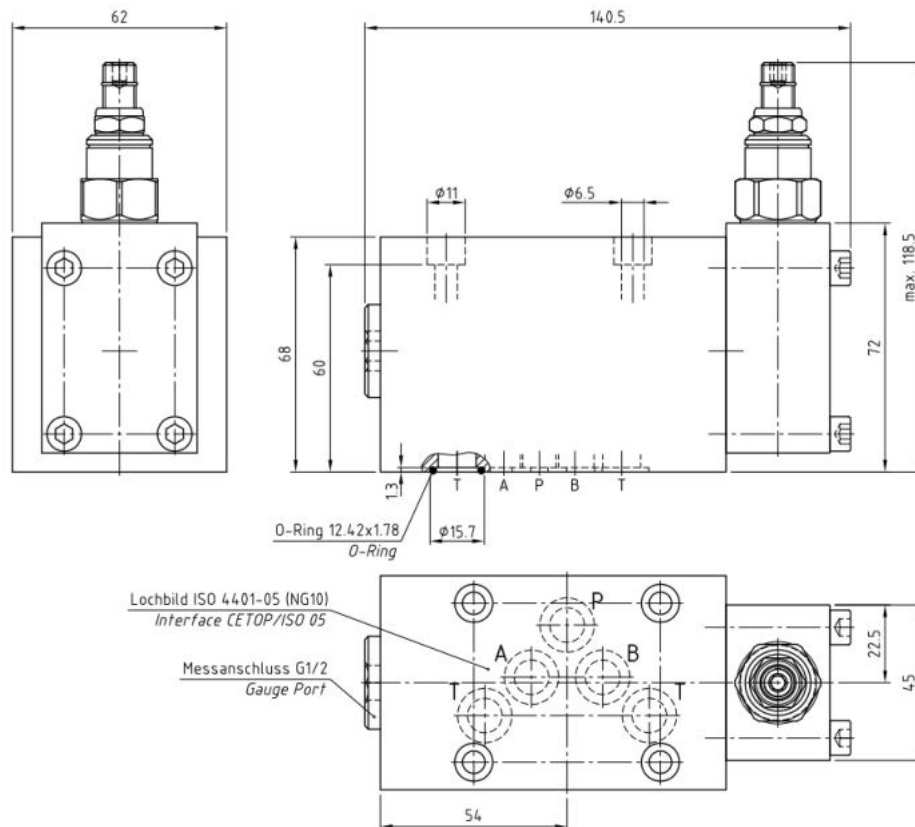
Dimensions [mm]

SLV 6 with / without Check Valve



HM3/071401

SLV 10



HM3/001401



Throttle Valves

Throttle Valve STD

operating pressure max. 350 bar
screw-in valve for cavity STD



Throttle Valve STE

operating pressure max. 315 bar
screw-in valve for cavity STE



Throttle Valve STO

operating pressure max. 315 bar
screw-in valve for cavity STO



Flow control valves

Flow Control Valve VCL

operating pressure max. 210 bar
volume flow max. 40 l/min



Flow Control Valve VCD

operating pressure max. 315 bar
volume flow max. 150 l/min



Flow Control Valve VCM

operating pressure max. 315 bar
volume flow max. 9 l/min



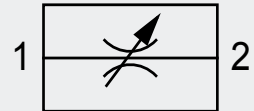
3-way Flow Control Valve SR3

operating pressure max. 250 bar
volume flow max. 60 l/min
in-line body G 1/2"
available with or without pressure control

Throttle valve STD



max. operating pressure 350 bar
screw-in valve for cavity STD



090470_STD_e
04.2018

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	3

Characteristics

- screw-in throttle valve
- for manual limitation of volume flows
- compact design
- maintenance-free

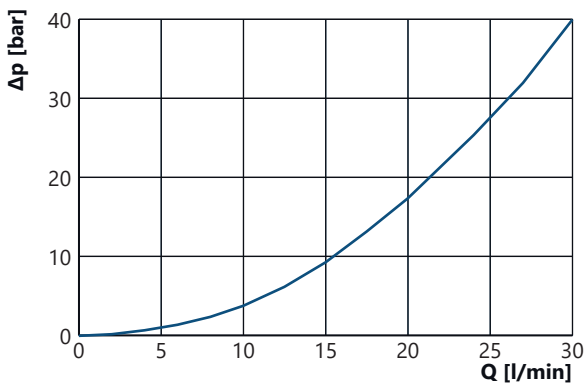
Technical data

<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow direction:	throttling in both directions
	Nominal width:	Ø 3,5 mm
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200	

<i>Mechanic</i>	Design:	screw-in valve
	Adjusting method:	with spindle-setting screw
	Adjusting range:	approx. 7 turns
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,0094 kg
Material:	valve parts: steel O-ring: NBR, backup ring: teflon	

Performance

Pressure drop diagram $\Delta p/Q$ STD fully opened

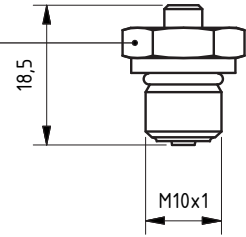


Test conditions Oil: HLP 32, temperature: 40 °C (~46 cSt)

Dimensions

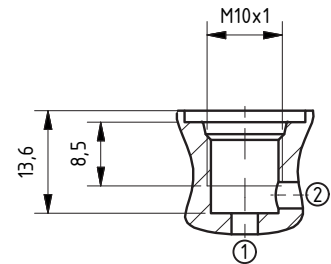
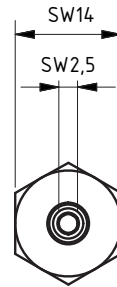
Throttle valve STD

installation torque 7,6 - 8,4 Nm
SW 14



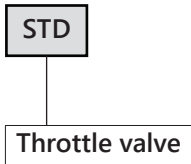
HM4/09 18 04

Cavity STD



NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „general operating manual“ or will be provided upon request.



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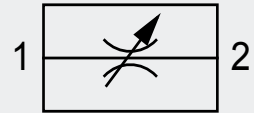
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Throttle valve STE



max. operating pressure 315 bar
screw-in valve for cavity STE



090460_STE_e
06.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	3

Characteristics

- screw-in throttle valve
- for manual limitation of volume flows
- compact design
- maintenance-free

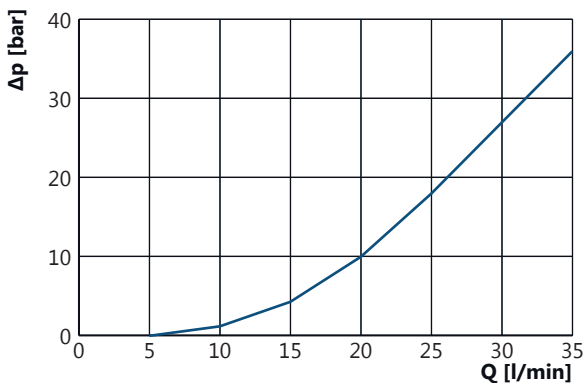
Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow direction:	throttling in both directions
	Nominal width:	Ø 7...9 mm
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

<i>Mechanic</i>	Design:	screw-in valve
	Adjusting method:	with spindle-setting screw
	Adjusting range:	approx. 9 turns
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,03 kg
Material:	valve parts: steel O-ring: NBR, backup ring: teflon	

Performance

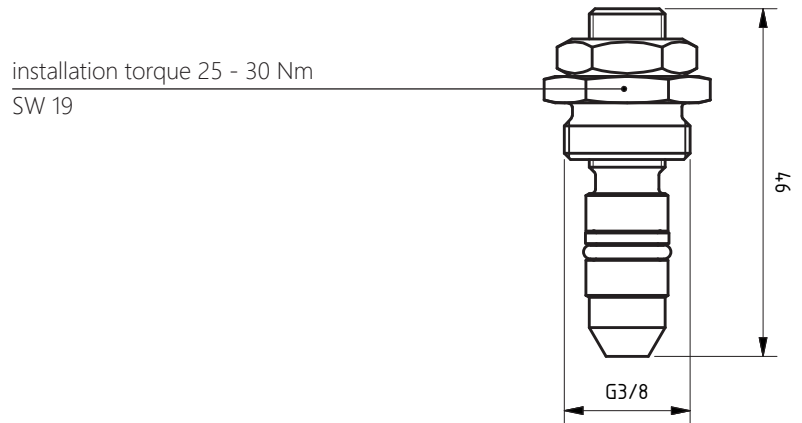
Pressure drop diagram $\Delta p/Q$ STE fully opened



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

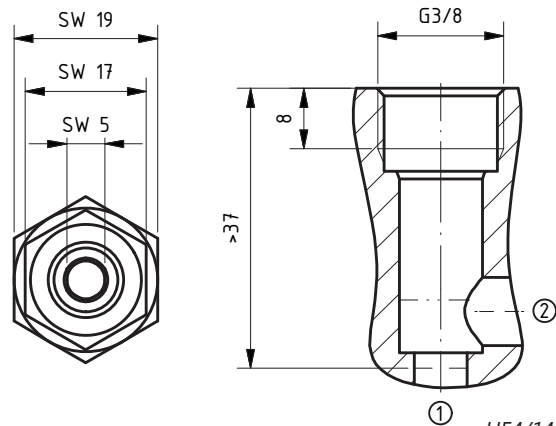
Dimensions

Throttle valve STE



HM4/04 50 01

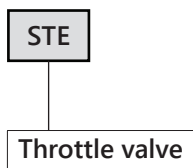
Cavity STE



HE4/14 31 21

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

Accessories /
spare parts

Article:

Seal kit STE

Article number:

405.0030

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.



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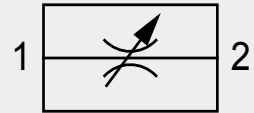
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Throttle valve STO



max. operating pressure 315 bar
screw-in valve for cavity STO



090450_STO_e
06.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	4
Accessories and additional information	4

Characteristics

- screw-in throttle valve
- for manual limitation of volume flows
- compact design
- maintenance-free

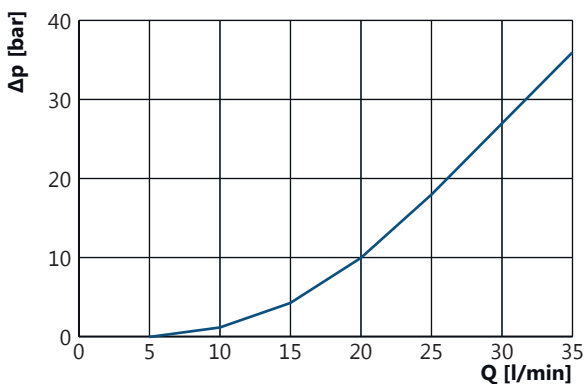
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow direction:	throttling in both directions, the pressure at port 1 should be the higher pressure
	Nominal width:	Ø 3 mm
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

<i>Mechanic</i>	Design:	screw-in valve
	Adjusting method:	with spindle-setting screw, optionally hand wheel
	Adjusting range:	approx. 4 turns
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,08 kg
Material:	valve parts: steel O-rings: NBR, backup ring: teflon	

Performance

Pressure drop diagram $\Delta p/Q$ STO fully opened

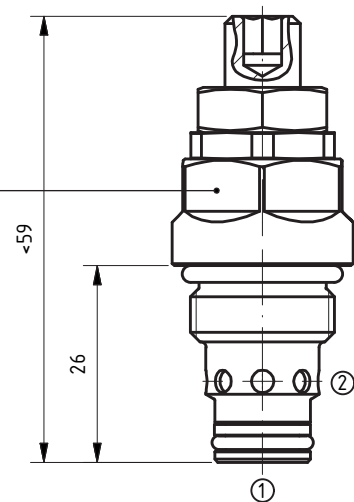


Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

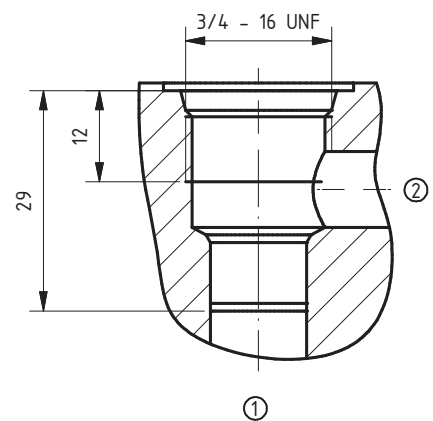
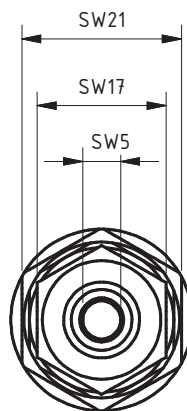
Throttle valve STO

installation torque 35 - 40 Nm
SW 21



HE4/14 33 08

Cavity STO (DBT2)



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

STO

Throttle valve

NOTE The valve is also available with hand wheel.

Accessories and additional information

<i>Accessories / spare parts</i>	Article:	Article number:
	Manifold straight 3/8"	093.0024

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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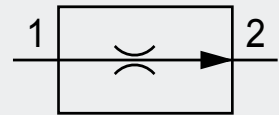
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Flow control valve VCL



operating pressure max. 210 bar
volume flow max. 40 l/min



090430_VCL_e
02.2020

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	4

Characteristics

- screw-in flow control valve
- various sizes available
- compact design
- load compensated
- maintenance-free

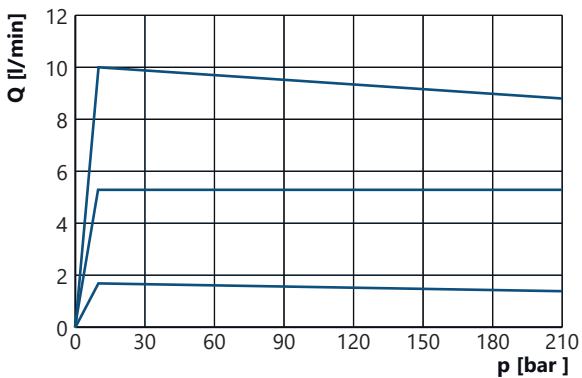
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	210 bar
	Flow rate max.:	see type code
	Tolerance presetting volume flow:	G 1/4": $\pm 20\%$, G 3/8": $\pm 15\%$, G 1/2": $\pm 10\%$
	Flow direction:	1 to 2: flow control 2 to 1: free through orifice
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$	

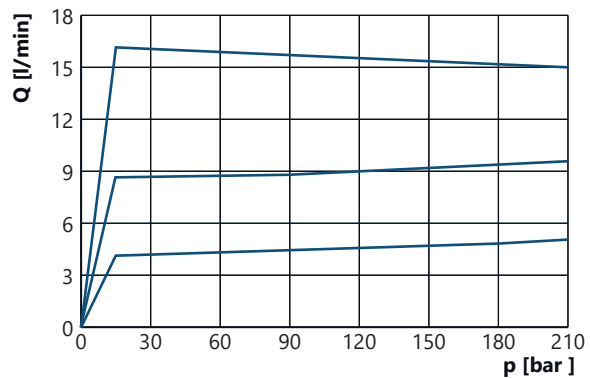
<i>Mechanic</i>	Design:	screw-in valve
	Size:	G 1/4", G 3/8", G 1/2"
	Fluid temperature:	-30 °C to +100 °C
	Ambient temperature:	-30 °C to +100 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	see table in dimensions
	Material:	steel

Performance

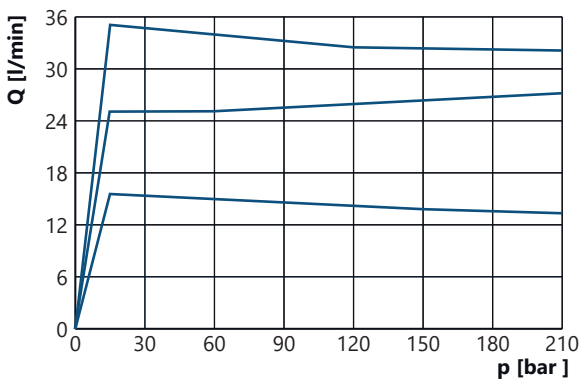
Performance diagram (Q/p) VCL-14 at $\Delta p = 10$ bar



Performance diagram (Q/p) VCL-38 at $\Delta p = 10$ bar



Performance diagram (Q/p) VCL-12 at $\Delta p = 10$ bar

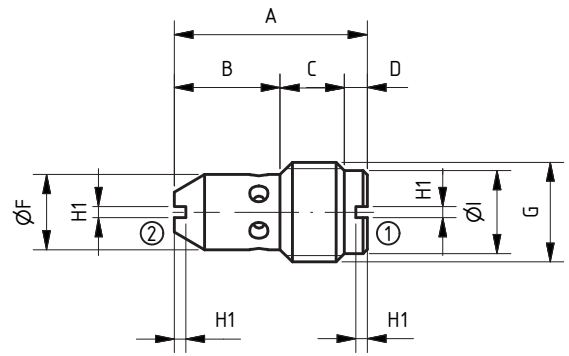


Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

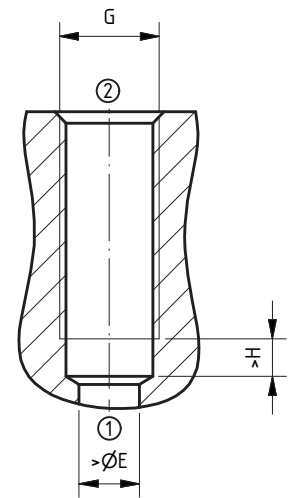
Dimensions

Flow control valve
VCL



HE4/03 48 01

Cavity VCL



NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Size G	A [mm]	B [mm]	C [mm]	D [mm]	E Ø [mm]	F Ø [mm]	H [mm]	H1 [mm]	I Ø [mm]	Weight [kg]
G 1/4"	25,5	13,5	8,5	3	8	10	5	1,5	11	0,011
G 3/8"	28	15	10,5	2	11	14	5	1,5	14,5	0,024
G 1/2"	35	19,5	13	2	14	17,5	5	1,5	17,5	0,048

NOTE The valve ist also available as double flow control valve DVCL in inline body G 1/4" for flow control in both directions. Dimension sheets are available upon request.

Type code



Design	
VCL	Flow control valve
DVCL	Double flow control valve (only G 1/4")



Size		max. volume flow [l/min]
14	G 1/4"	10
38	G 3/8"	16
12	G 1/2"	40



Presetting [l/min]
volume flow ranges on request

Accessories and additional information

<i>Accessories / Spare parts</i>	Article:	Material number:
	In-line body G 1/4"	138.0008
	In-line body G 3/8"	138.0009
	In-line body G 1/2"	138.0010
	In-line body G 3/4"	138.0011
	In-line body with sealing lip G 1/4"	138.0013
	In-line body with sealing lip G 3/8"	138.0007

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „**general information**“ under the category „**general operating manual**“ or will be provided upon request.



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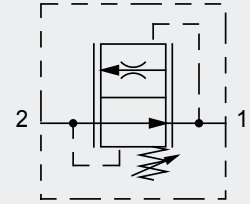
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Flow control valve VCD



max. operating pressure 315 bar
max. volume flow 150 l/min



090420_VCD_e
08.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	4
Type code	5
Accessories and additional information	5

Characteristics

- screw-in flow control valve
- also available as meter-out or meter-in control valve in a sandwich body NG 6
- various sizes available
- compact design
- maintenance-free

Technical Data

<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow rate max.:	see type code
	Flow direction:	1 to 2: flow control 2 to 1: without function
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

<i>Mechanic</i>	Design:	screw-in valve
	Size:	G1/2", G1/4", G3/4", G3/8"
	Fluid temperature:	-30 °C to +100 °C
	Ambient temperature:	-30 °C to +100 °C
	Storage temperature:	-30 °C to +80 °C (non-condensing)
	Installation position:	any
	Weight:	see table in dimensions
Material:	steel	

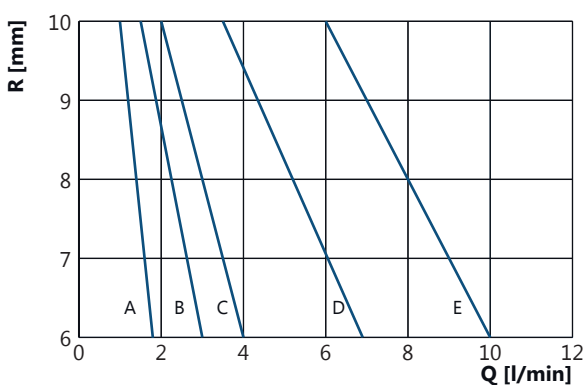
Performance

volume flow setting range

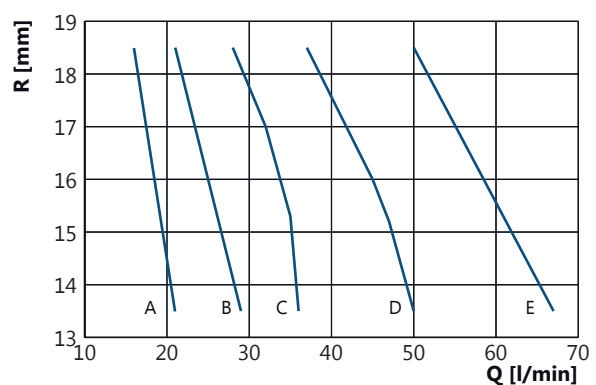
Size G	A [l/min]	B [l/min]	C [l/min]	D [l/min]	E [l/min]
G 1/4"	1-1,6	1,6-2,5	2,5-4	4-6,3	6,3-10
G 3/8"	2,5-4	4-6,3	6,3-10	10-16	16-25
G 1/2"	16-21	21-28	28-37	37-50	50-67
G 3/4"	37-50	50-67	67-90	90-120	120-150

NOTE The spring length flow diagrams represent the obtained flow range related to orifices A to E with a nominal pressure Δp of 50 bar.

Adjustment diagram spring length (R/Q) G 1/4"

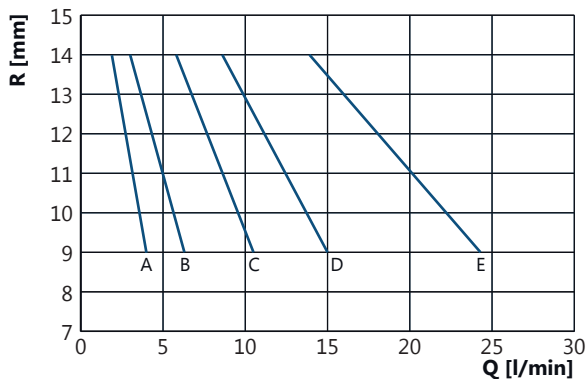


Adjustment diagram spring length (R/Q) G 1/2"

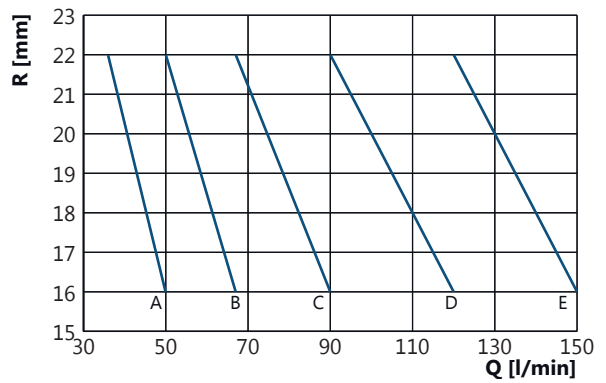


Performance

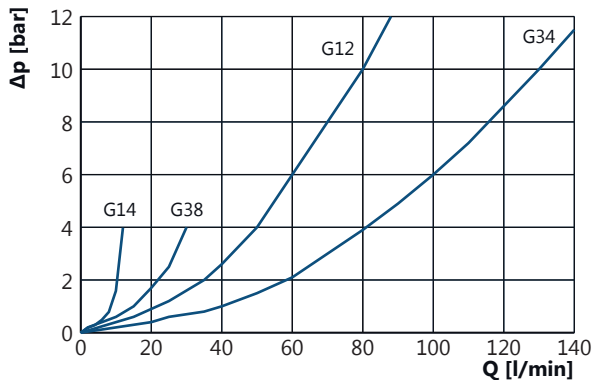
Adjustment diagram spring length (R/Q) G 3/8"



Adjustment diagram spring length (R/Q) G 3/4"



Pressure drop diagram ($\Delta p/Q$) VCD

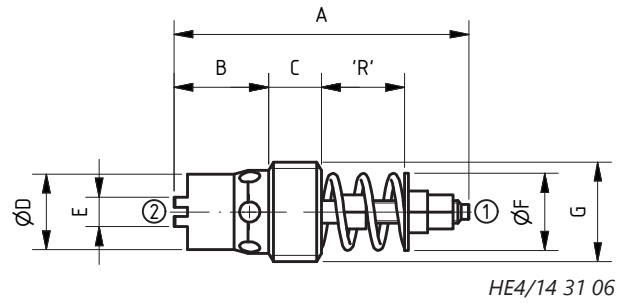


Test conditions

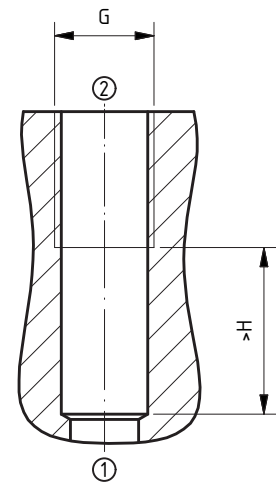
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

Flow control valve
VCD



Cavity VCD



Size G	A [mm]	B [mm]	C [mm]	D Ø [mm]	E [mm]	F Ø [mm]	H [mm]	Weight [kg]	SW1	SW2	Inst. torque [Nm]	Flow max. [l/min]
G 1/4"	39	12,5	7	10	4	10,3	22	0,012	5,5	4,5	6	10
G 3/8"	43	13,5	7	11,5	4	14	23	0,022	7	6	8	11,5
G 1/2"	49	16	8	15	6	18,2	27	0,036	7	6	12	15
G 3/4"	60	21	10	20	6	23	31	0,072	7	6	15	20

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

VCD	-	□	-	□	-	□
Flow control valve						
Size		Volume flow setting range [l/min]		Presetting [l/min] (optional)		
14	G 1/4"	A	1-1,6	fixed volume flow presetting, selectable according to setting range		
		B	1,6-2,5			
		C	2,5-4			
		D	4-6,3			
		E	6,3-10			
38	G 3/8" *	A	2,5-4			
		B	4-6,3			
		C	6,3-10			
		D	10-16			
		E	16-25			
12	G 1/2"	A	16-21			
		B	21-28			
		C	28-37			
		D	37-50			
		E	50-67			
34	G 3/4"	A	37-50			
		B	50-67			
		C	67-90			
		D	90-120			
		E	120-150			

* **NOTE** The valve VCD-38 is also available as **meter-out or meter-in control valve** in a sandwich body NG 6. Dimension sheets are available upon request.

Accessories and additional information

Accessories / Spare parts	Article:	Material number:
	In-line body G 1/4"	138.0008
	In-line body G 3/8"	138.0009
	In-line body G 1/2"	138.0010
	In-line body G 3/4"	138.0011
	In-line body with sealing lip G 1/4"	138.0013

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „**general information**“ under the category „**general operating manual**“ or will be provided upon request.



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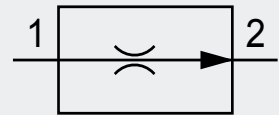
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Flow control valve VCM



max. operating pressure 315 bar
max. volume flow 9 l/min



090440_VCM_e
01.2017

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Dimensions	2
Type code	3
Appendix	3

Characteristics

- screw-in flow control valve
- various volume flows available
- compact design
- maintenance-free

Technical Data

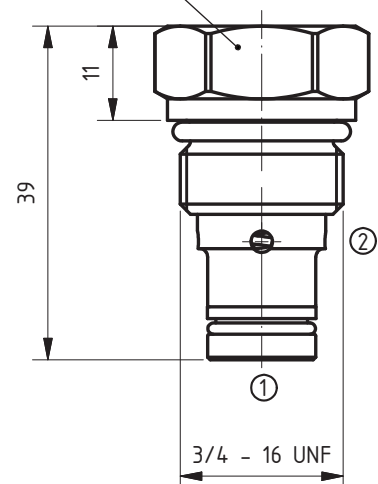
<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow rate:	see type code at differential pressure control $\Delta p = 5,3$ bar
	Flow direction:	1 to 2: flow control 2 to 1: without function
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$

<i>Mechanic</i>	Design:	screw-in valve
	Size:	08
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-30 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,06 kg
	Material:	valve parts: steel, seals: NBR
Surface protection:	zinc coated steel	

Dimensions

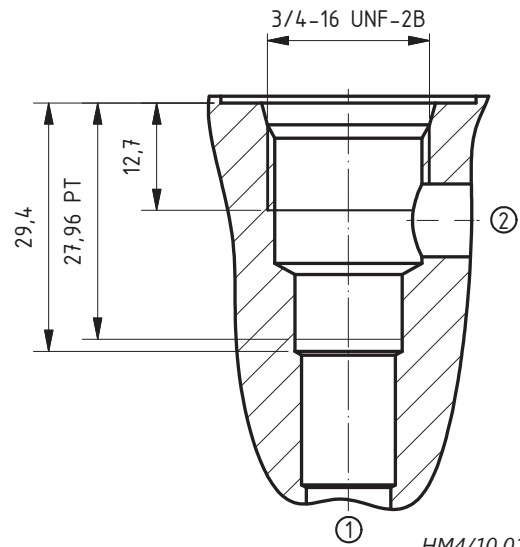
Flow control valve
VCM

installation torque 27 ± 3 Nm
SW 22



Dimensions

Cavity VC 08-2



NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.

Type code

VCM-08	-																			
Flow control valve		<table border="1"> <thead> <tr> <th colspan="2">Nominal flow at $\Delta p = 5,3$ bar</th> </tr> </thead> <tbody> <tr> <td style="background-color: #cccccc;">0,85</td> <td>0,85 l/min*</td> </tr> <tr> <td style="background-color: #cccccc;">1,5</td> <td>1,5 l/min**</td> </tr> <tr> <td style="background-color: #cccccc;">2,5</td> <td>2,5 l/min**</td> </tr> <tr> <td style="background-color: #cccccc;">3,0</td> <td>3,0 l/min**</td> </tr> <tr> <td style="background-color: #cccccc;">4,2</td> <td>4,2 l/min**</td> </tr> <tr> <td style="background-color: #cccccc;">6,0</td> <td>6,0 l/min*</td> </tr> <tr> <td style="background-color: #cccccc;">7,5</td> <td>7,5 l/min*</td> </tr> <tr> <td style="background-color: #cccccc;">9,0</td> <td>9,0 l/min*</td> </tr> </tbody> </table>	Nominal flow at $\Delta p = 5,3$ bar		0,85	0,85 l/min*	1,5	1,5 l/min**	2,5	2,5 l/min**	3,0	3,0 l/min**	4,2	4,2 l/min**	6,0	6,0 l/min*	7,5	7,5 l/min*	9,0	9,0 l/min*
Nominal flow at $\Delta p = 5,3$ bar																				
0,85	0,85 l/min*																			
1,5	1,5 l/min**																			
2,5	2,5 l/min**																			
3,0	3,0 l/min**																			
4,2	4,2 l/min**																			
6,0	6,0 l/min*																			
7,5	7,5 l/min*																			
9,0	9,0 l/min*																			

* tolerance $\pm 10\%$ l/min of nominal flow
 ** tolerance $+20\%$ l/min of nominal flow

Appendix

Accessories /
Spare parts

Article:
Seal kit VCM-08 (NBR)

Article number:
405.0113

Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „general operating manual“ or will be provided upon request.



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Component Coupling Check Valves

Component Coupling Check Valve KK-M14 x 1,5

operating pressure max. 315 bar
volume flow max. 20 l/min



Check Valves

Check Valve RBR

operating pressure max. 350 bar
volume flow max. 80 l/min



Check Valve RHR

operating pressure max. 350 bar
volume flow max. 120 l/min



Check Valve RKR

operating pressure max. 350 bar
volume flow max. 80 l/min



Double Check Valve DRV

direct operated
pre-load function
operating pressure max. 350 bar
volume flow max. 50 l/min



Shuttle Valves

Shuttle Valve FTRW

operating pressure max. 350 bar
volume flow max. 15 l/min



Hose Burst Valves

Hose Burst Valve RBS1

operating pressure max. 315 bar
volume flow max. 150 l/min



Anti Cavitation Valves

Hydraulic Motor Anti Cavitation Valve HNV

cavitation protection for orbital engines
with hollow bolts G3/8"



Component coupling check valve KK-M14x1,5



operating pressure max. 315 bar
volume flow max. 20 l/min

090510_KK14_e
05.2021

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Performance	2
Dimensions	2
Type code	4
Mounting instruction	4
Accessories and additional information	4

Characteristics

- for use in jig manufacturing and others
- blocks oil channel of components when seperated
- compact design
- flow direction from either side
- hardened and honed parts
- minimum oil leakage
- maintenance-free

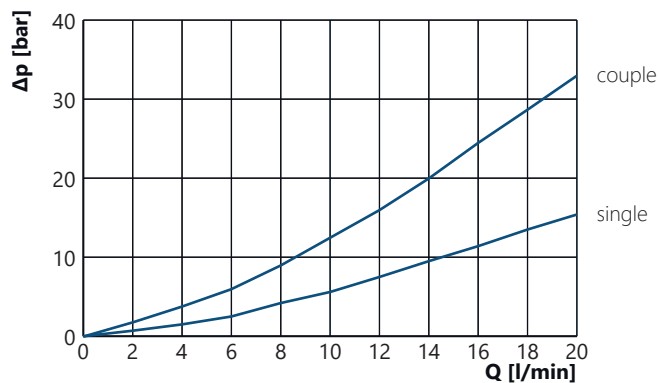
Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow rate max.:	20 l/min
	Flow direction:	any
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

<i>Mechanic</i>	Design:	Screw-in coupling
	Size:	M14 x 1,5
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,01 kg
	Material:	steel
	seals: NBR	
Surface protection:	burnished steel	

Performance

Pressure drop diagram ($\Delta p/Q$) KK-M14x1,5

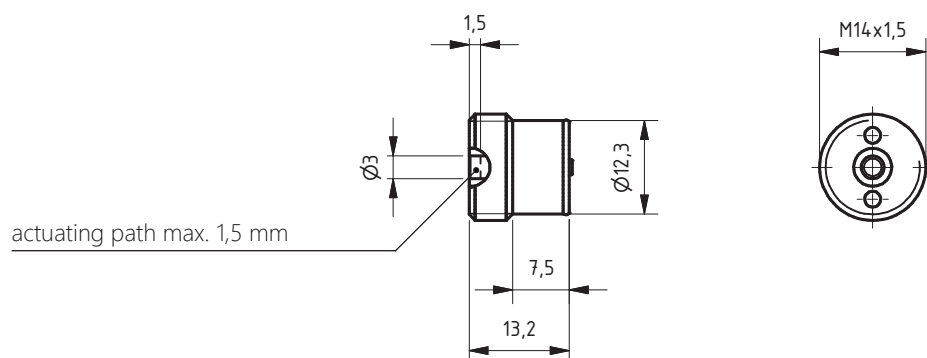


Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt).
Higher viscosity changes the performance diagrams.

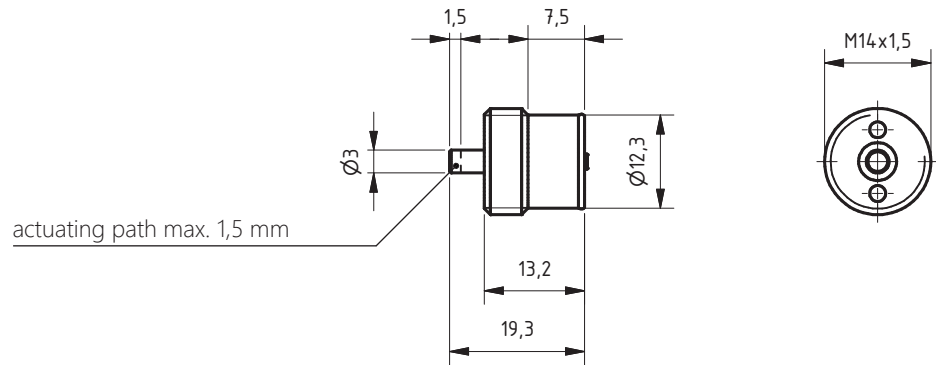
Dimensions

Component coupling
KK-M14x1,5
with short pin

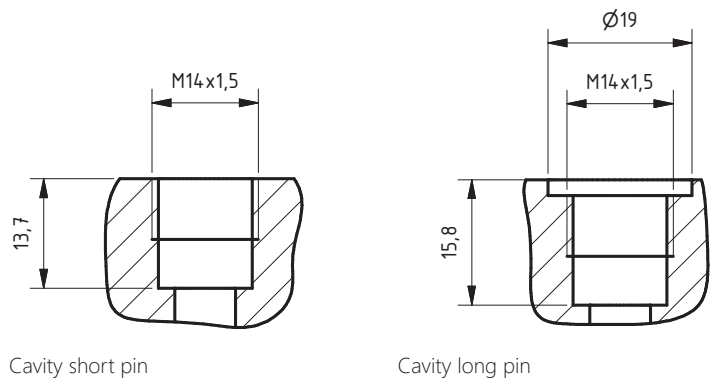


Dimensions

Component coupling
KK-M14x1,5
with long pin

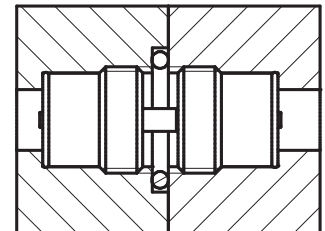


Cavity KK-M14x1,5



NOTE For a detailed drawing of the cavity please see our „*general information*“ under the category „*valve cavities 2-way designs*“ or our online catalogue at www.weber-hydraulik.com.

Mounted couplings
KK-M14x1,5



HM4/07 22 01

NOTE Place corresponding o-ring in the right position of the respective cavity before mounting the couplings (see mounting instructions).

NOTE The component couplings must be mounted as pairs (one coupling with long pin combined with one coupling with short pin). Two component couplings of the same kind (long/long or short/short) are not compatible.

- NOTES**
- For external tightness the counterbore must be 2,1 mm (for o-rings with $\text{Ø } 2,62 \text{ mm}$).
 - The pins may not be exposed to radial forces.
 - The actuation path of the pin must not exceed 1,5 mm.
 - Coupling and decoupling only when system is depressurized.
 - When decoupled, the (long) pin of the valve (Material-No. 1090906) exceeds the surface about 3,5 mm.

Type code

Component coupling	Model	Material number
KK-M14x1,5	long pin	1090906
KK-M14x1,5	short pin	1090912

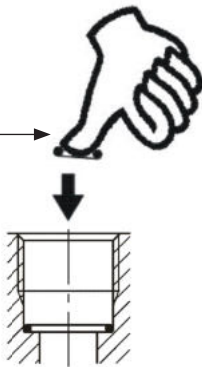
NOTE The component coupling check valves are sold in 10 pieces per unit.

Mounting instruction

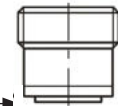
NOTE The mounting instruction is also enclosed with the shipping notes of every delivery.

KK-M14x1,5 with o-ring 11 x 1 for standard cavity according to datasheet

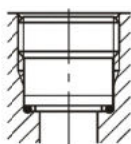
Step 1:
carefully place o-ring 11 x 1 on the bottom of the standard cavity before screwing in the valve



Step 2:
screw valve (without o-ring) in the standard cavity



3. Result:
Mounted component coupling check valve with o-ring 11 x 1

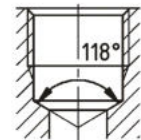


KK-M14x1,5 with o-ring 9 x 1 for customer specific cavity

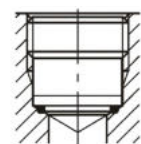
Step 1:
carefully mount o-ring 9 x 1 on valve



Step 2:
screw valve (with mounted o-ring) in the customer specific cavity



3. Result:
Mounted component coupling check valve with o-ring 9 x 1



Accessories and additional information

*Accessories/
spare parts*

Article:	Material number:
Screw-in tool AVA1C for KK M14x1,5, including additional bore 3,5 x 8	139.0007
O-ring 9,0 x 1,0	401.0028
O-ring 11,0 x 1,0	401.0101

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in the chapter „**general information**“ under the category „**general operating manual**“ or will be provided upon request.



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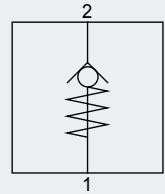
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Check valve RBR



operating pressure max. 350 bar
volume flow max. 80 l/min



090240_RBR_e
05.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	3

Characteristics

- screw-in ball-type check valve
- various sizes available
- compact design
- maintenance-free

Technical Data

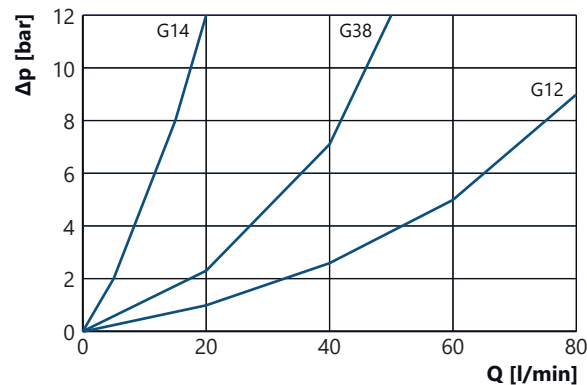
<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow rate max.:	80 l/min
	Flow direction:	from 2 to 1
	Pressure setting range:	see type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	5 - 800 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

NOTE The pressure at port 1 adds directly to the crack pressure.

<i>Mechanic</i>	Design:	ball-type screw-in valve
	Size:	see type code
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	see table
	Material:	valve parts: steel seals: NBR

Performance

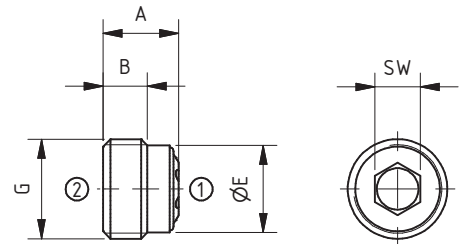
Pressure drop diagram ($\Delta p/Q$) RBR



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

Check valve RBR

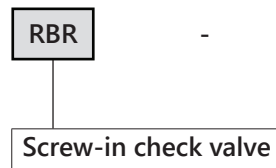


HE4/14 31 10

Size G	A [mm]	B [mm]	E Ø [mm]	SW	Weight [kg]	Installation torque [Nm]
G 1/4"	10	5,5	11,5	6	0,005	15
G 3/8"	11,2	6,7	14,95	6	0,015	20
G 1/2"	13,2	8	18,7	8	0,020	30

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Size	Volume flow max. [l/min]	Crack pressure [bar]
14 G 1/4"	20	0,3
38 G 3/8"	50	0,3
12 G 1/2"	80	0,3

Accessories and additional information

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.



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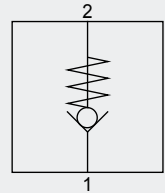
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Check valve RHR



operating pressure max. 350 bar
volume flow max. 120 l/min



090230_RHR_e
07.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	3

Characteristics

- screw-in check valve
- various sizes available
- compact design
- maintenance-free

Technical Data

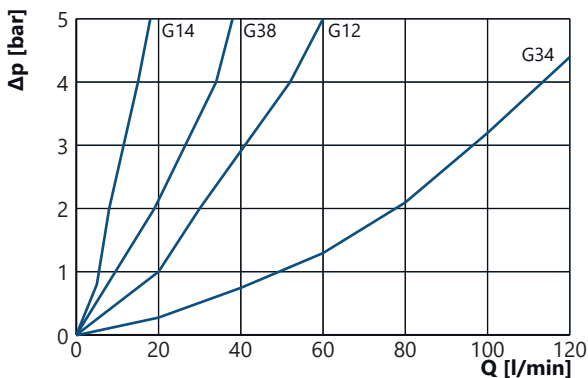
<i>Hydraulic</i>	Operating pressure max.:	350 bar, for RHR-34: 500 bar
	Flow rate:	max. 120 l/min
	Flow direction:	from 1 to 2
	Pressure setting range:	see type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200	

NOTE The pressure at port 2 adds directly to the crack pressure.

<i>Mechanic</i>	Design:	screw-in valve
	Size:	G 1/4", G 3/8", G 1/2", G 3/4"
	Fluid temperature:	-25 °C to +80 °C
	Ambient temperature:	-30 °C to +80 °C
	Storage temperature:	-30 °C to +80 °C (non-condensing)
	Installation position:	any
	Weight:	see table at dimensions
	Material:	valve parts: steel seals: NBR

Performance

Pressure drop diagram ($\Delta p/Q$) RHR

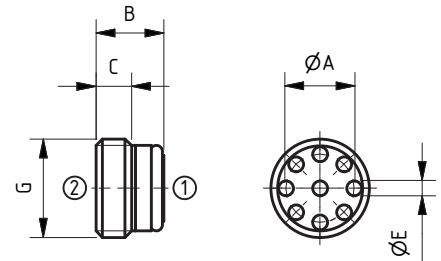


Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.

Dimensions

Check valve RHR

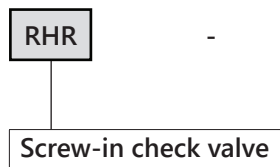
Size G	A Ø [mm]	B [mm]	C [mm]	E Ø [mm]	Weight [g]	Inst. torque [Nm]
G 1/4"	8,5	8,8	4,4	2,2	5	15
G 3/8"	10,8	12	7	3	15	20
G 1/2"	14,2	14,7	8	3,8	19	30
G 3/4"	18,5	17,5	10	4,6	45	80



HE4/14 31 12

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Size	Volume flow max. [l/min]	Crack pressure [bar]
14 G 1/4"	20	< 0,5
38 G 3/8"	50	< 0,5
12 G 1/2"	80	< 0,5
34 G 3/4"	120	0,1

Accessories and additional information

Accessories / spare parts	Article:	Material number:
	Mounting tool W1 for RHR-14	139.0001
	Mounting tool W2 for RHR-38	139.0002
	Mounting tool W5 for RHR-12	139.0005
	Mounting tool W7 for RHR-34	139.0020

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.



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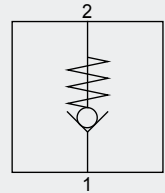
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Check valve RKR



operating pressure max. 350 bar
volume flow max. 80 l/min



090220_RKR_e
12.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	3
Accessories and additional information	3

Characteristics

- screw-in check valve
- reciprocally mountable
- various sizes available
- compact design
- maintenance-free

Technical Data

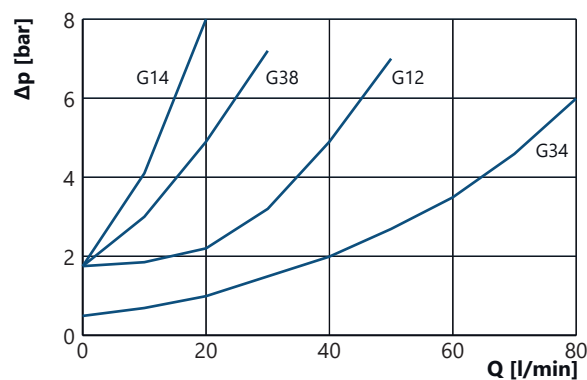
<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow rate max.:	80 l/min
	Flow direction:	from 1 to 2
	Pressure setting range:	see type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

NOTE The pressure at port 2 adds directly to the crack pressure.

<i>Mechanic</i>	Design:	screw-in valve
	Size:	G 1/4", G 3/8", G 1/2", G 3/4"
	Fluid temperature:	-30 °C to +100 °C
	Ambient temperature:	-30 °C to +100 °C
	Storage temperature:	-3W0 °C to +80 °C (non-condensing)
	Installation position:	any
	Weight:	see table
	Material:	valve parts: steel seals: NBR

Performance

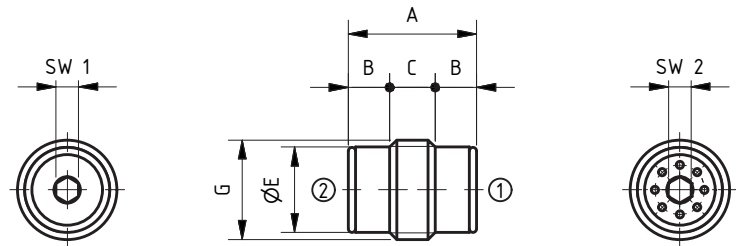
Pressure drop diagram ($\Delta p/Q$) RKR



Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

Check valve RKR



HE4/14 31 13

Size G	A [mm]	B [mm]	C [mm]	E [mm]	SW 1	SW 2	Weight [kg]	Installation torque [Nm]
G 1/4"	17,0	5,5	6,0	11,3	3	3	0,02	6
G 3/8"	18,5	5,5	7,5	14,8	4	3	0,03	6
G 1/2"	22,5	6,5	9,5	18,5	6	5	0,04	10
G 3/4"	28,5	7,0	14,5	24,1	8	8	0,07	20

NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

RKR

Screw-in check valve

Size	Volume flow max. [l/min]	Crack pressure [bar]	Special crack pressure [bar]
14 G 1/4"	15	2,3	-
38 G 3/8"	30	1,75	2 / 4
12 G 1/2"	50	1,75	0,3 / 10 / 15
34 G 3/4"	80	0,3	-

Accessories and additional information

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.



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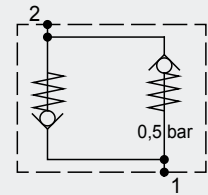
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Double check valve DRV



direct operated
pre-load function
max. operating pressure 350 bar
max. volume flow 50 l/min



090210_DRV_e
03.2017

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Dimensions	3
Type code	4
Appendix	4

Characteristics

- double check valve with pre-load function
- also available in in-line body
- compact design
- maintenance-free

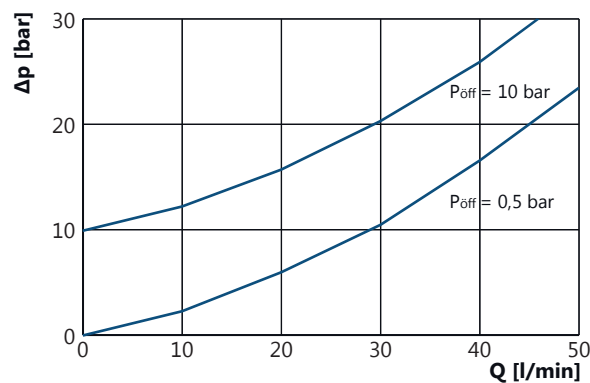
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	350 bar
	Flow rate:	max. 50 l/min
	Flow direction:	from 1 to 2: sequence pressure from 2 to 1: bypass
	Pressure setting range:	see type code
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

<i>Mechanic</i>	Design:	Screw-in valve
	Size:	G 1/2"
	Fluid temperature:	-30 °C to +80 °C
	Ambient temperature:	-30 °C to +80 °C
	Storage temperature:	-30 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,06 kg
	Material:	valve parts: steel seals: NBR

Performance

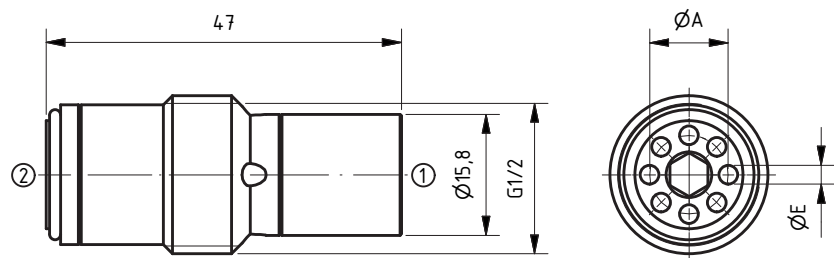
Pressure drop diagram ($\Delta p/Q$) DRV



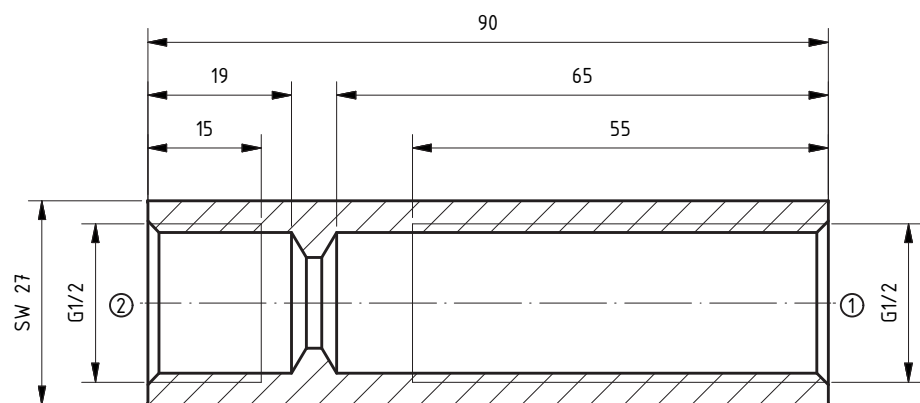
Test conditions Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

Double check valve
DRV



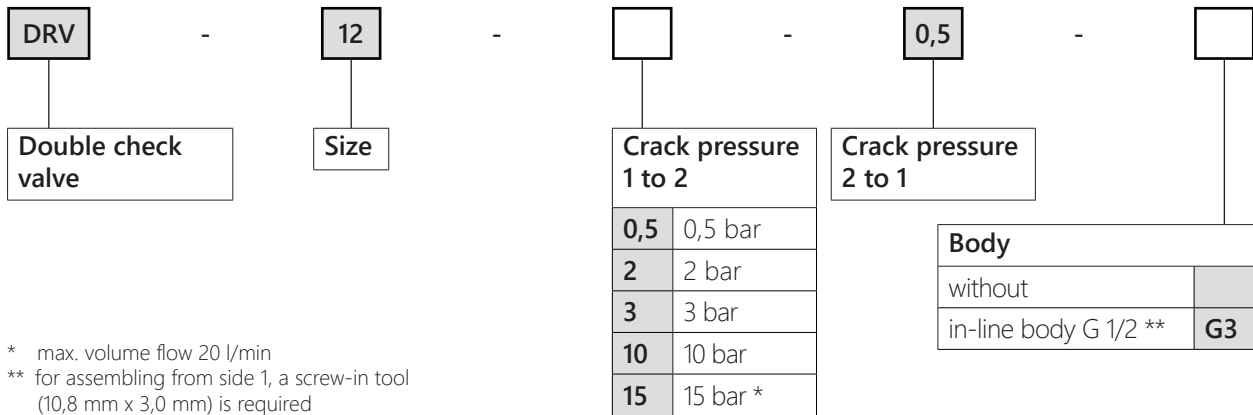
DRV in body G3



HE4/14 31 07

NOTE For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „*valve cavities and port patterns*“ or our online catalogue at www.weber-hydraulik.com.

Type code



* max. volume flow 20 l/min

** for assembling from side 1, a screw-in tool (10,8 mm x 3,0 mm) is required

Appendix

Accessories / spare parts

Part:

Screw-in tool

Article number:

139.0002

Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „*general operating manual*“ or will be provided upon request.



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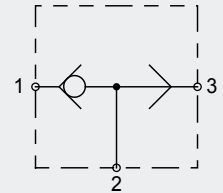
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Shuttle valve FTRW



operating pressure max. 350 bar
volume flow max. 15 l/min



090310_FTRW_e
07.2018

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Dimensions	2
Type code	3

Characteristics

- screw-in shuttle valve
- sizes G1/8" or G1/4" available
- compact design
- maintenance-free

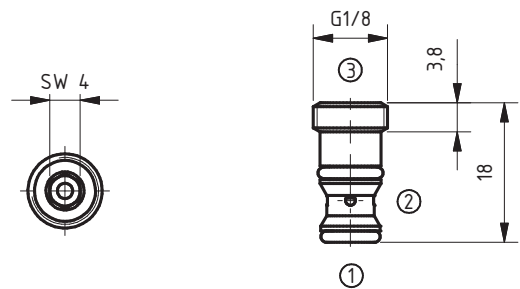
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	FTRW-2,5: 315 bar FTRW-5: 350 bar
	Flow rate:	FTRW-2,5: 8 l/min FTRW-5: 15 l/min
	Flow direction	from 1 or 3 to 2
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

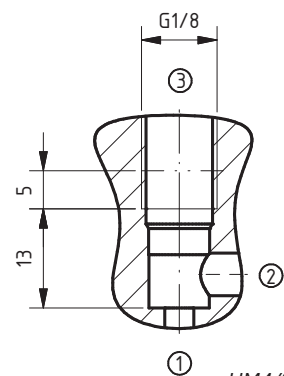
<i>Mechanic</i>	Design:	screw-in valve
	Size:	G1/8" or G1/4"
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	FTRW-2,5: 0,005 kg FTRW-5: 0,012 kg
	Material:	valve parts: steel seals: NBR

Dimensions

Shuttle valve
FTRW-2,5



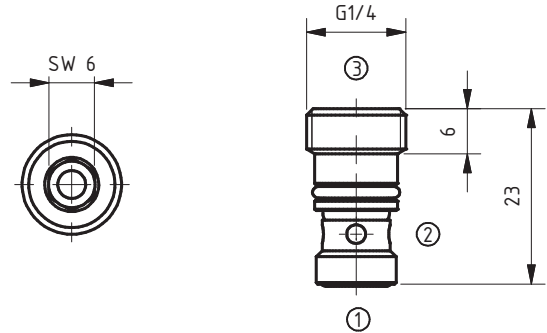
Cavity FTRW-2,5



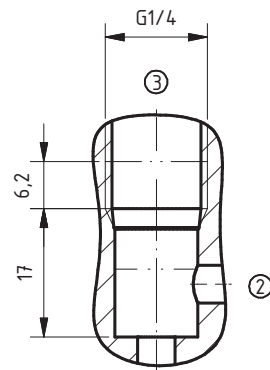
HM4/98 12 02

Dimensions

Shuttle valve
FTRW-5



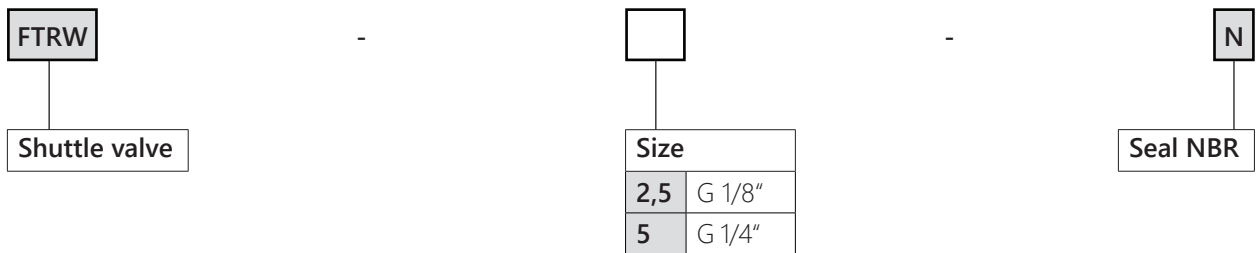
Cavity FTRW-5



① HM4/08 44 02

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.



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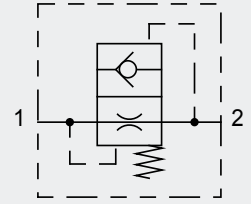
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Hose burst valve RBS1



operating pressure max. 315 bar
volume flow max. 150 l/min



090410_RBS1_e
07.2019

Table of contents

Contents	Page
Characteristics	1
Technical Data	2
Performance	2
Type code	4
Accessories and additional information	4

Characteristics

- screw-in hose burst valve
- to prevent sudden pressure loss due to tubing or hose breaks
- various sizes available
- easy to install
- compact design
- maintenance-free

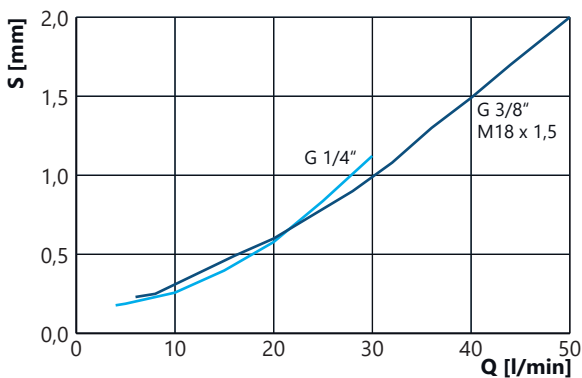
Technical Data

<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow rate max.:	see type code
	Flow direction:	1 to 2: without function 2 to 1: working direction
	Hydraulic fluid:	mineral oil according to DIN 51524, other hydraulic fluids upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

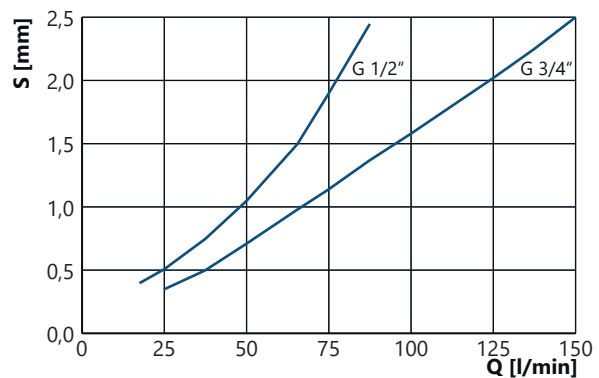
<i>Mechanic</i>	Design:	screw-in valve
	Size:	G 1/4", G 3/8", G 1/2", G 3/4", M18 x 1,5
	Fluid temperature:	-30 °C to +100 °C
	Ambient temperature:	-30 °C to +100 °C
	Storage temperature:	-30 °C to +80 °C (non-condensing)
	Installation position:	any
	Weight:	see table at dimensions
Material:	steel	

Performance

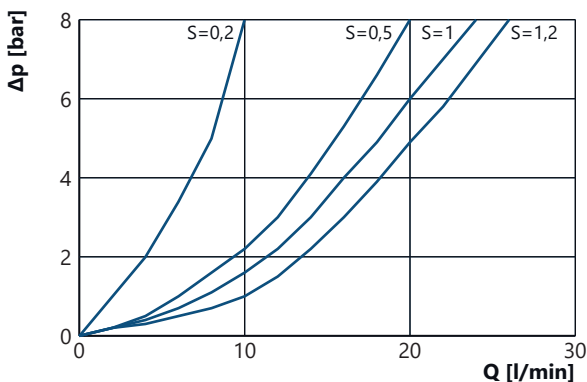
Adjusting diagram clearance (S/Q) G 1/4" and G 3/8", M18 x 1,5



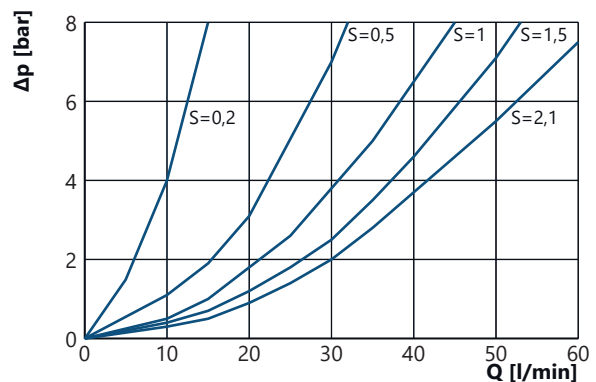
Adjusting diagram clearance (S/Q) G 1/2", G 3/4"



Pressure drop diagram ($\Delta p/Q$) from 1 to 2 RBS1-14

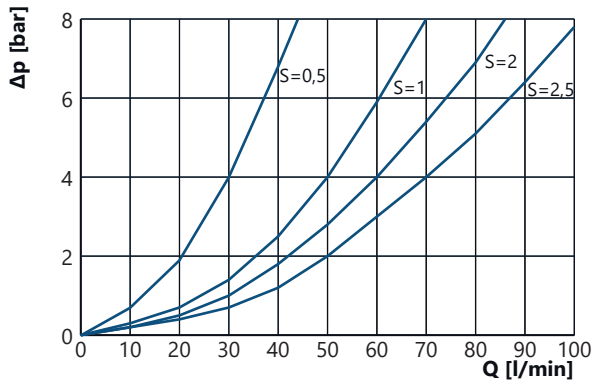


Pressure drop diagram ($\Delta p/Q$) from 1 to 2 RBS1-38, RBS1-M18

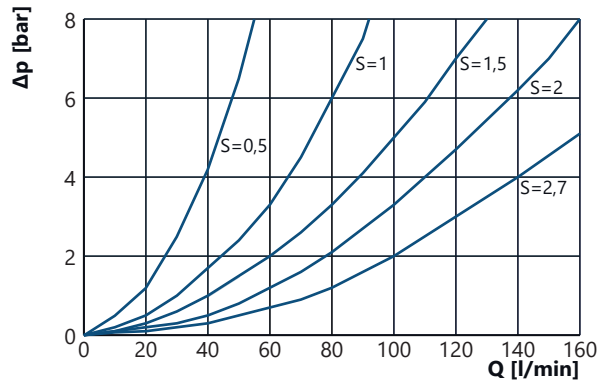


Performance

Pressure drop diagram ($\Delta p/Q$) from 1 to 2
RBS1-12



Pressure drop diagram ($\Delta p/Q$) from 1 to 2
RBS1-34

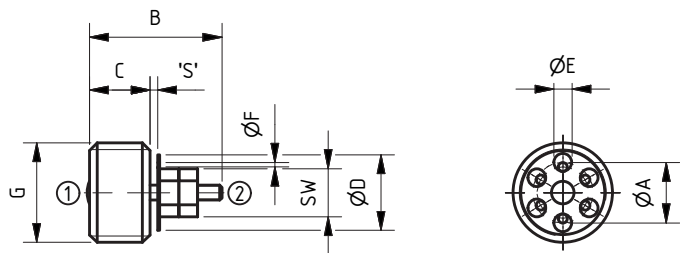


Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

Dimensions

Hose burst valve
RBS1



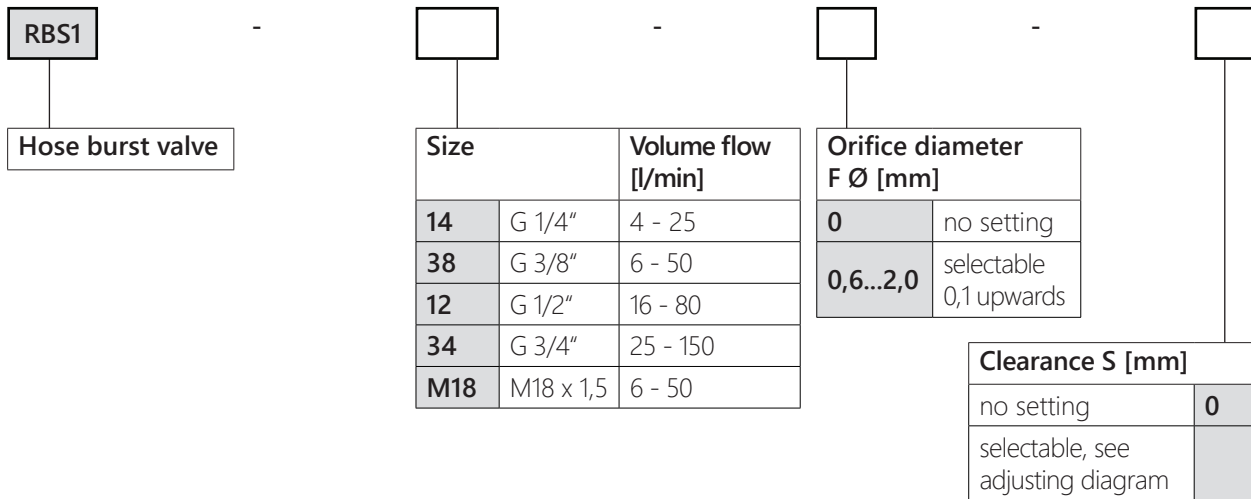
HE4/14 31 20

Size G	A Ø [mm]	B [mm]	C [mm]	D Ø [mm]	E Ø [mm]	F Ø [mm]	Weight [g]	SW
G 1/4"	8	17,5	8	9,5	2,4	0,6...2	5	2
G 3/8"	10,5	23	10,5	12,5	3,5	0,6...2	10	3
G 1/2"	13	25	12	15	4,5	0,6...2	20	4
G 3/4"	16	30,5	17	18,5	6	0,6...2	42	10
M18 x 1,5	10,5	23	10,5	12,5	3,5	0,6...2	15	3,5

NOTE

For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code



Accessories and additional information

<i>Accessories / spare parts</i>	Article:	Material number:
	In-line body G 1/2"	138.0010
	In-line body G 3/8"	138.0009
	In-line body G 1/4"	138.0008
	In-line body G 3/4"	138.0011
	Mounting tool W1 for RBS1-14	139.0001
	Mounting tool W3 for RBS1-38 and RBS1-M18	139.0003
	Mounting tool W4 for RBS1-12	139.0004
	Mounting tool W6 for RBS1-34	139.0006

NOTE Other manifolds are available upon request.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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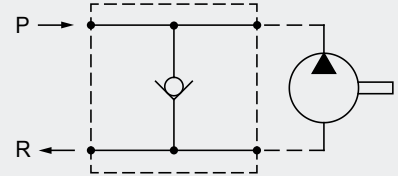
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Bypass anti cavitation valve HNV



cavitation protection for orbital motors
with hollow bolts G 3/8"



070410_HNV_e
07.2018

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Dimensions	2
Type code	3
Set-up	3
Accessories and additional information	3

Characteristics

- hydraulic motor bypass valve
- cavitation protection for Danfoss OMM and similar motors
- the check valve ensures a backflow of oil in case of motor overrun
- space-saving installation possible
- maintenance-free

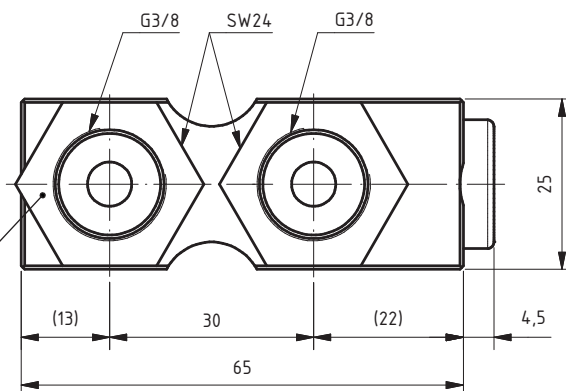
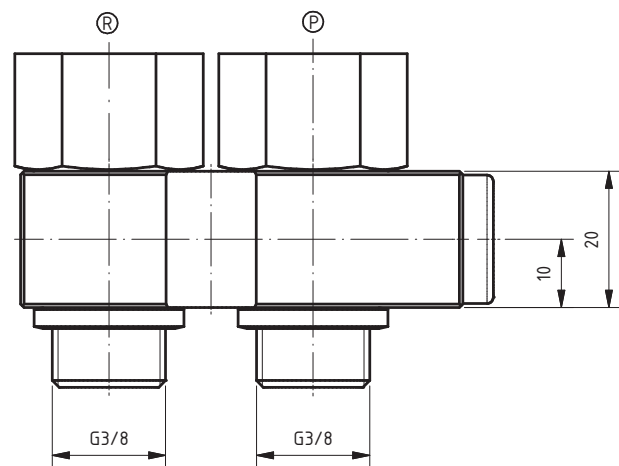
Technical data

<i>Hydraulic</i>	Operating pressure max.:	210 bar
	Flow rate max.:	10 l/min
	Opening pressure at check valve:	0,3 bar
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

<i>Mechanic</i>	Design:	bypass anti cavitation valve
	Size:	G 3/8"
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	0,23 kg
	Material:	body: aluminium hollow bolts and steel sealing rings: steel
Surface protection:	aluminium: anodized, steel: zinc coated	

Dimensions

Bypass anti cavitation valve HNV



installation torque 45 - 50 Nm
SW24

HM4/94 45 01

Type code

Article description	Article number
Bypass anti cavitation valve HNV including G 3/8" hollow bolts	203.0029

Set-up

The installation torque values of port P and R are maximum values which are not to be exceeded (Nm, couter material steel), otherwise this might lead to damage at the steel sealing ring. The correct installation torque must be guaranteed by using the necessary tools (torque wrench) and procedure.

If leakage occurs at the steel sealing ring despite the correct installation torque, the system must never be tightened with a higher torque, but it might be necessary to replace the bypass anti cavitation valve and/or its counterpart, as well as the steel sealing ring.

The system is designed to absorb hydraulic forces. If there are any mechanic forces, e.g. applied through hydraulic tubing, this may lead to failure.

Any hydraulic tubing must be mounted with the system beeing turned off and stress-relieved.

Accessories and additional information

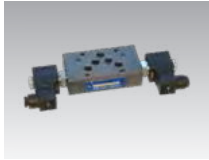
<i>Accessories/ spare parts</i>	Article:	Article number:
	hollow bolt G 3/8"	805.0001
	steel sealing ring R 3/8"	809.0011
<i>Manual</i>	Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „ <i>general operating manual</i> “ or will be provided upon request.	



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Pressure Discharge Valve ZMSVD2

operating pressure max. 315 bar
volume flow max. 30 l/min
sandwich body NG 6, NG 10, NG 16
discharge from A and B to T



Rapid Traverse/Creep Valve ZMSR

operating pressure max. 250 bar
volume flow max. 30 l/min
sandwich body NG 6



High/Low On/Off Valve ZHD/ND

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 80 l/min
sandwich body NG 6, NG 10



Accumulator Charging Valve SLV

pilot operated
operating pressure max. 315 bar
volume flow max. 60 l/min
mounting plate NG 6, NG 10



Hydraulic Accumulator Safety Block HSB-06

direct operated, manuell or solenoid operated
operating pressure max. 350 bar
volume flow max. 40 l/min
mounting plate NG6



Hydraulic Motor Bypass Throttle Valve HBV

operating pressure max. 315 bar
volume flow max. 30 l/min
with hollow bolts G 3/8"

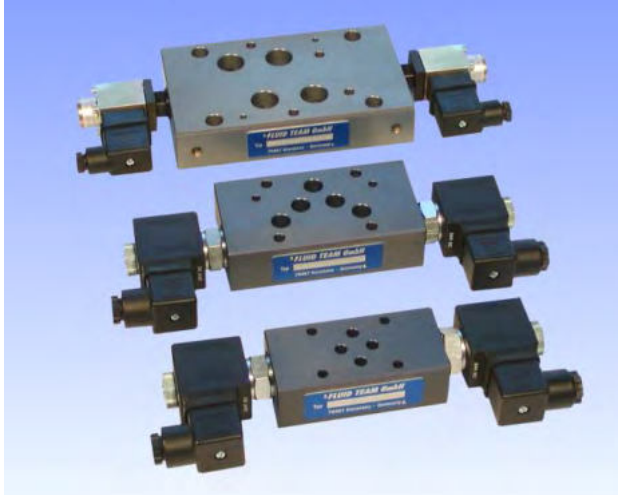


Block system LRF

with load pressure feedback
operating pressure max. 315 bar
NG 6 and NG 10

Pressure Discharge Valve ZMSVD2

Sandwich Body CETOP/ISO 3, 5, 7 • opens A and B to T

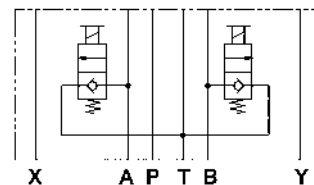


Description

With the pressure discharge valve ZMSVD2 is simple eliminating of residual pressures in the A and B channels of sandwich packages possible. The channels A and B are dischargeable thereby separately over two 2/2-way poppet valves to the tank (T channel). By the use of compact valves increase in altitude is small.

Symbol

CETOP/ISO 5 with X and Y channel shown



Application

The ZMSVD2 finds particularly in tooling machines use. Example: core strain discharge of injection moulding machines (before tool changes).

Technical Data

for terms and definitions see chapter 12

Hydraulic

Rated Pressure: max. 315 bar
 Rated Flow over CETOP/ISO 3, 5: max. 30 l/min
 Poppet Valve: CETOP/ISO 7: max. 2 l/min
 Fluids: oils as per DIN 51524, others upon request
 Viscosity Range: 10 – 350 cSt
 Filtration: class 20/18/14, filter β 10...16 \geq 75
 Leakage: max. 5 drops/ min.

Mechanic

Ambient Temperature: -20 °C – +50 °C
 Fluid Temperature: -20 °C – +80 °C
 Installation: no restrictions
 Weight: CETOP/ISO 3: 0,84 kg
 CETOP/ISO 5: 1,06 kg
 CETOP/ISO 7: 1,39 kg

Materials:

valve parts: steel
 body: Aluminium
 seals: NBR
 back up rings: Teflon, PU
 valve: zinc plated, burnished
 body: anodised

Surface Protection:

Electrical

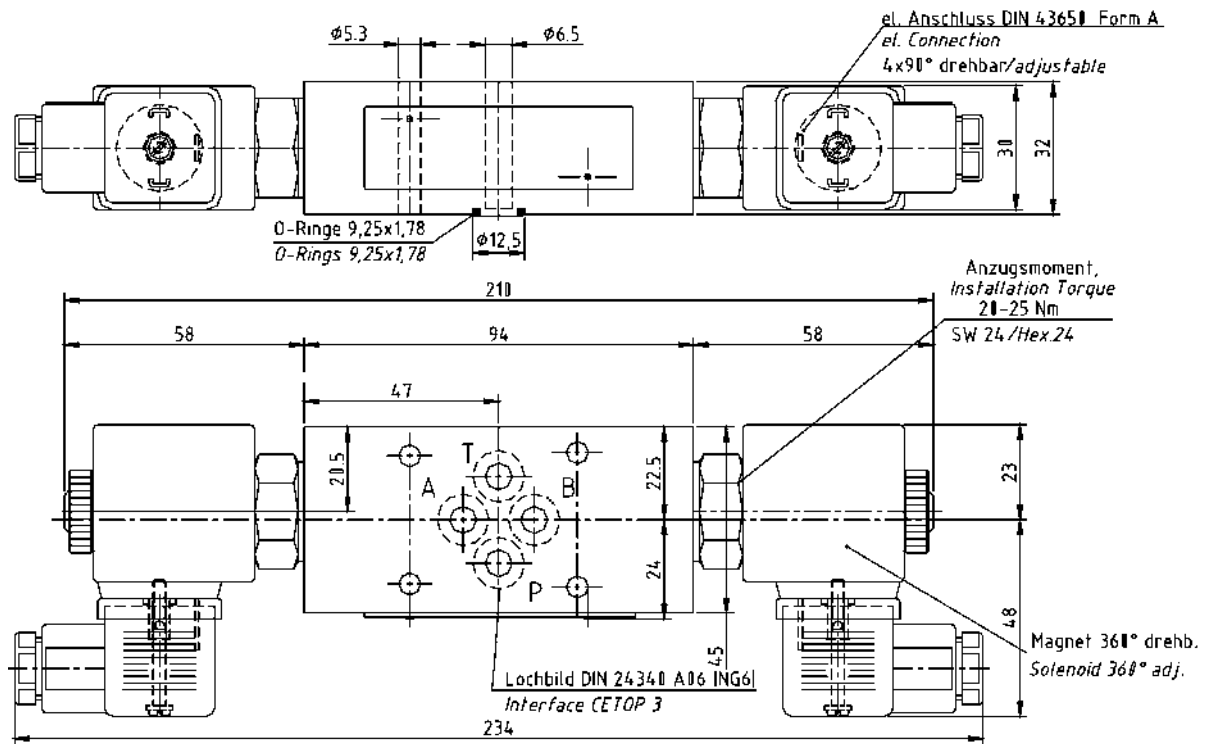
Nominal Voltage: 24 V DC, 12 V DC, \pm 10%
 Nominal Resistance (R_{20}): CETOP/ISO 3, 5: 24V: 26 Ω ; 12V: 8 Ω
 CETOP/ISO 7: 24V: XX Ω ; 12V: X Ω
 Wattage: 22 W
 Cyclic Duration Factor: 100 %
 Environmental Protection: IP 65
 Electrical Termination: CETOP/ISO3, 5: plug as per DIN 43650 form A, incl. square connector Pg9
 CETOP/ISO 7: plug as per DIN 43650 form B, incl. square connector Pg7

Model Code

ZMSVD2	-	A/T-B/T	-	1	-	24V
Pressure Discharge Valve, Sandwich Body		Function		Design		Voltage
deliverable executions:		A/T-B/T = discharge from A and B to T				24V DC 12V DC
CETOP/ISO 3 (NG 6)						
ZHD/ND-06						
CETOP/ISO 5 (NG 10)						
ZHD/ND-10						
CETOP/ISO 5 (with X + Y)						
ZHD/ND-10Y						
CETOP/ISO 7 (NG 16)						
ZHD/ND-16						

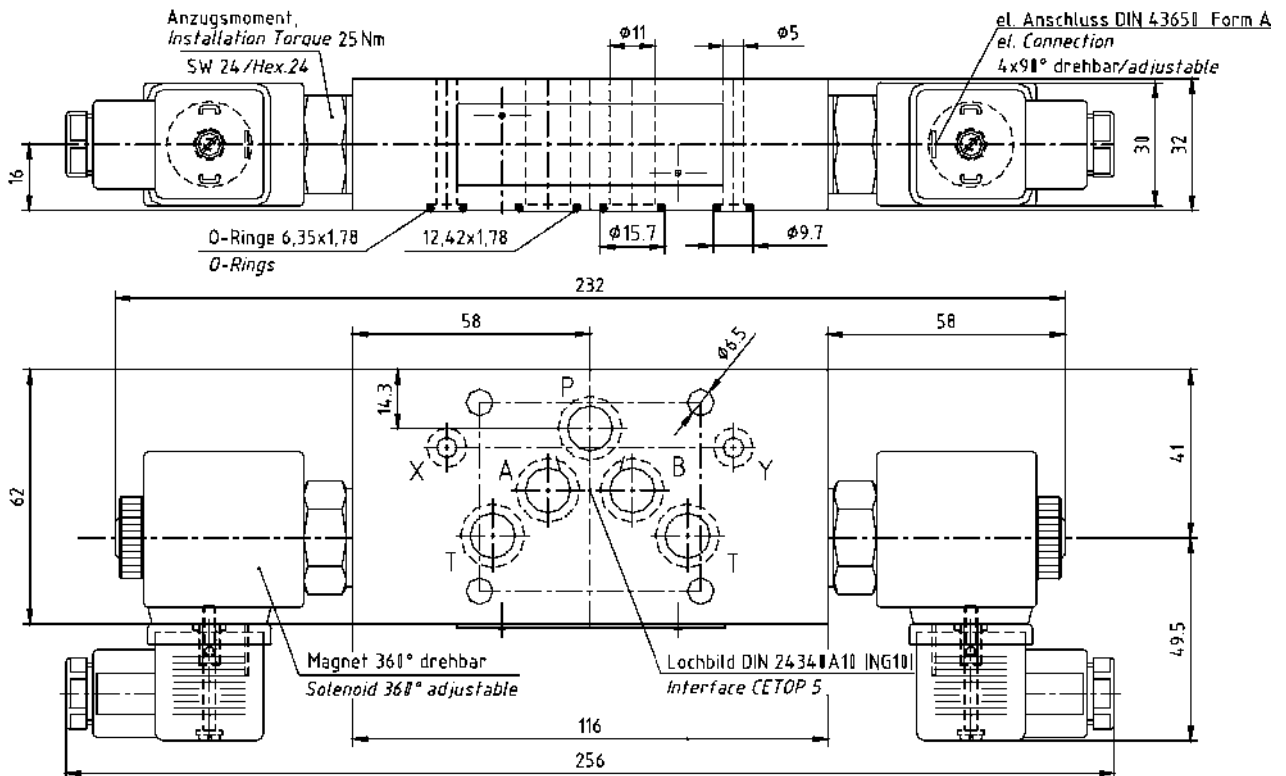
Dimensions [mm]

ZMSVD2-06-... CETOP/ISO 3 (NG 6)



H3-000703

ZMSVD2-10Y-... *) CETOP/ISO 5 (NG 10)

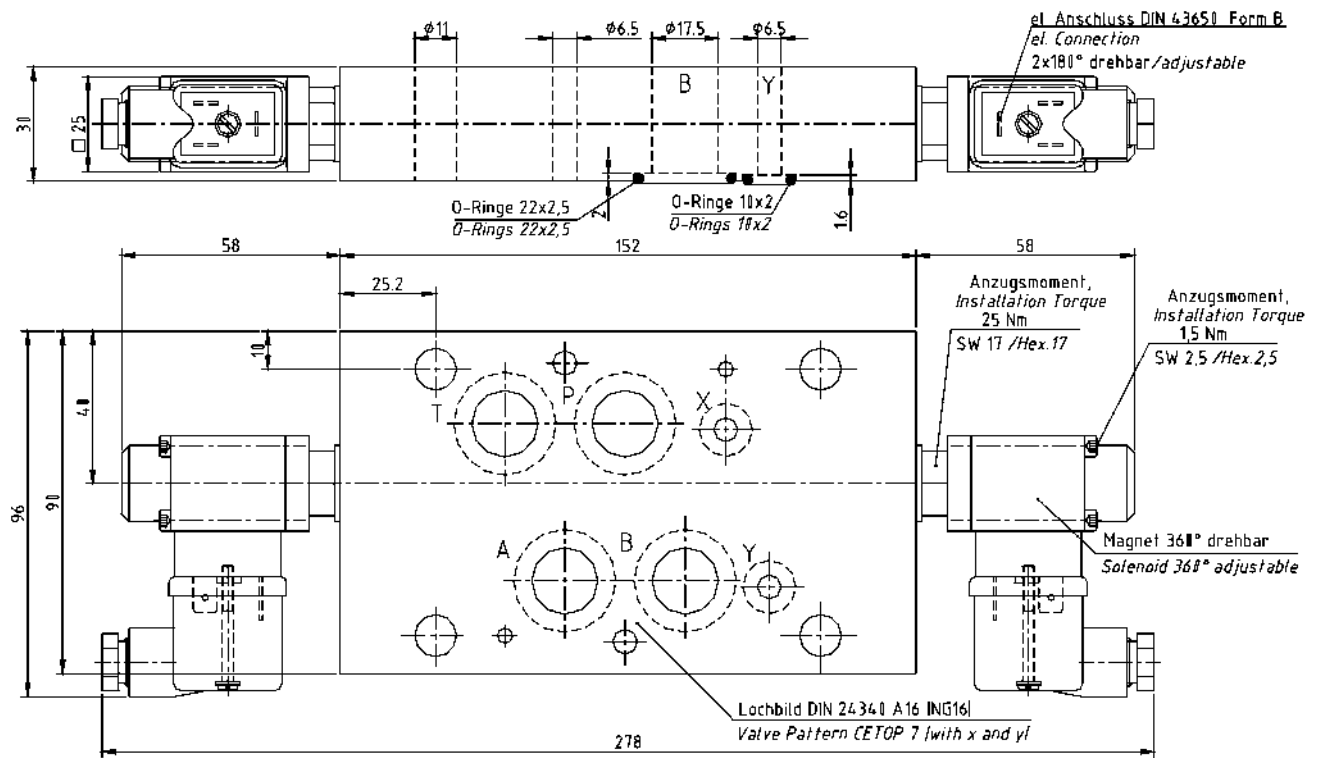


*) fig. shows interface with X- and Y-channel. The other dimensions are identic.

H3-000705

ZMSVD2-16-...

CETOP/ISO 7 (NG 16)



H3-930202

High/low flow rate shift valve ZMSRP2, ZMSRT2

sandwich body CETOP/ISO 3 • in P or T • max. 30 l/min

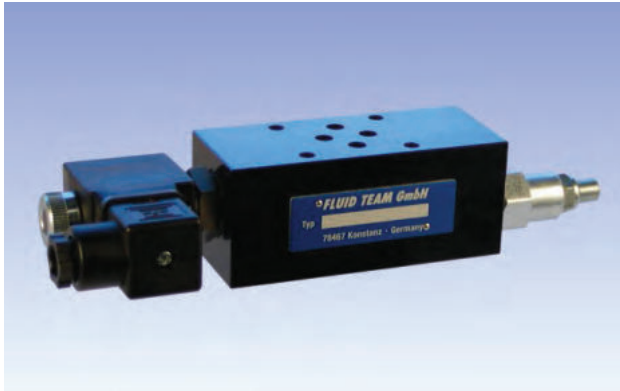


fig. ZMSRP2

Description

With the FLUID TEAM high/low flow rate shift valve ZMSR*2 it is possible to shift between two flow rate values. If the 2/2 poppet valve is open, the entire approaching oil can flow through the sandwich body. If it is closed, the flow control valve comes to function. Here it can be chosen between a pressure compensated 2-way flow control valve and a restrictor (needle) valve. Because of the sharp-edged orifice these valves are very insensitive to viscosity. Due to the balanced needle these valves are easily adjustable even with high pressures. For the 2/2 poppet valve you can choose between the version 'normally closed' and 'normally open'. The ZMSRP2 limits the approaching oil flow in P, the ZMSRT2 limits the oil flow running off to T.

Technical Data

for terms and definitions see chapter 12

Hydraulic

Rated Pressure: max. 250 bar
 Rated Flow: max. 30 l/min (through poppet valve)
 Fluids: oils as per DIN 51524, others upon request
 Viscosity Range: 10 – 350 cSt
 Filtration: class 18/16/13, filter $\beta_{6...10} \geq 75$

Mechanical

Ambient Temperature: -20 °C – +50 °C
 Fluid Temperature: -20 °C – +80 °C
 Installation: no restrictions
 Weight: 0,9 kg
 Materials: valve parts: steel
 body: aluminium
 seals: NBR
 back up rings: Teflon, PU
 Surface Protection: valve: zinc plated
 body: anodised

Electrical

Nominal Voltage: 24V DC, 12V DC, 205V DC; $\pm 10\%$
 Nominal Resistance (R_{20}): 24V: 22 Ω ; 12V: 5,8 Ω ; 205V: 1,6 k Ω
 Power Consumption: 27 W
 Cyclic Duration Factor: 100 %
 Environmental Protection: IP 65
 Electrical Termination: plug as per DIN 43650 form A, incl. coupler socket Pg9

Symbols

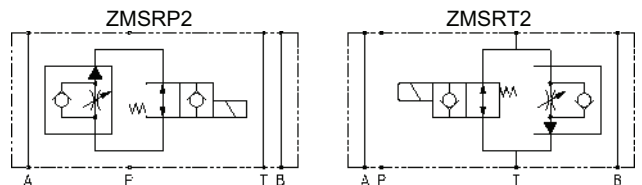


fig. with flow control valve (FDBA) and 2/2 poppet valve normally open (MSVT-07)

Note: for further technical data see data sheet MSVT (chapter 8).

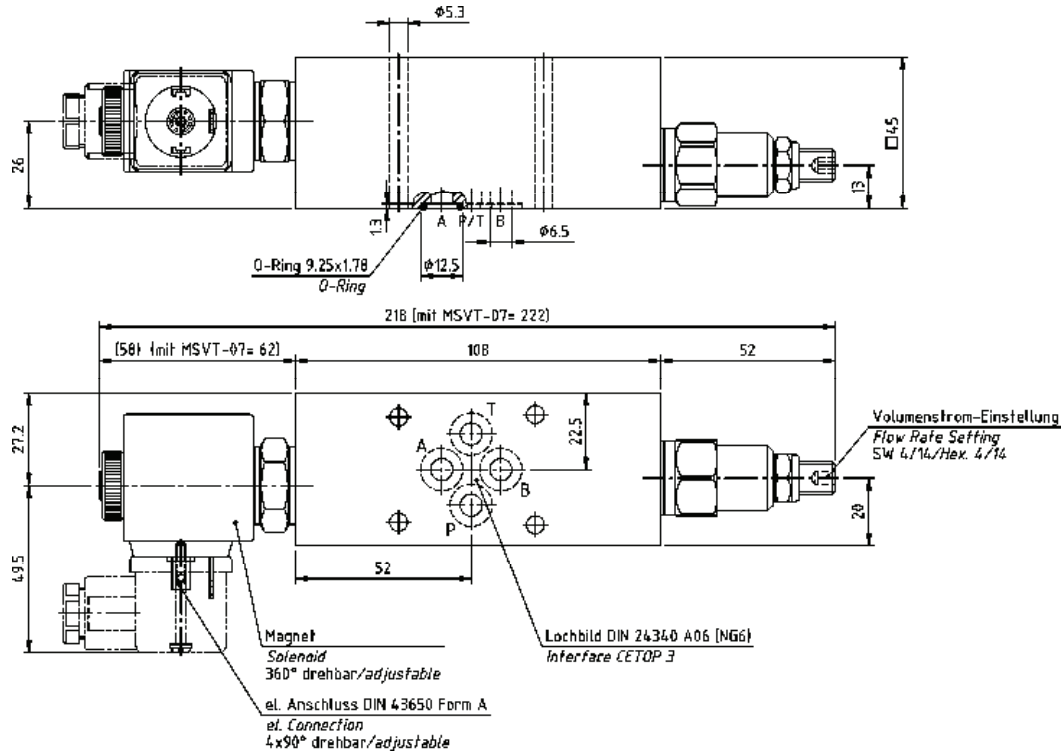
Model Code

ZMSRP2-06	–	FDBA	–	L	A	N	–	MSV3	–	24V	
High/Low Flow Rate Shift Valve	Flow Control Valve						Poppet Valve	Voltage			
deliverable executions:	Type	Control	Adjustment Range	Seals		MSVT-03 normally closed	12V DC 24V DC 205V DC				
Function in P	ZMSRP2-06	L = screw with lock nut	A = - for FDBA: 1 – 23 l/min - for NCCB: orifice- \varnothing 0 – 4,8 mm	N = NBR							MSVT-07 normally open
Function in T	ZMSRT2-06			NCCB = needle valve							

Dimensions (mm)

ZMSRP2-06-...

Function in P

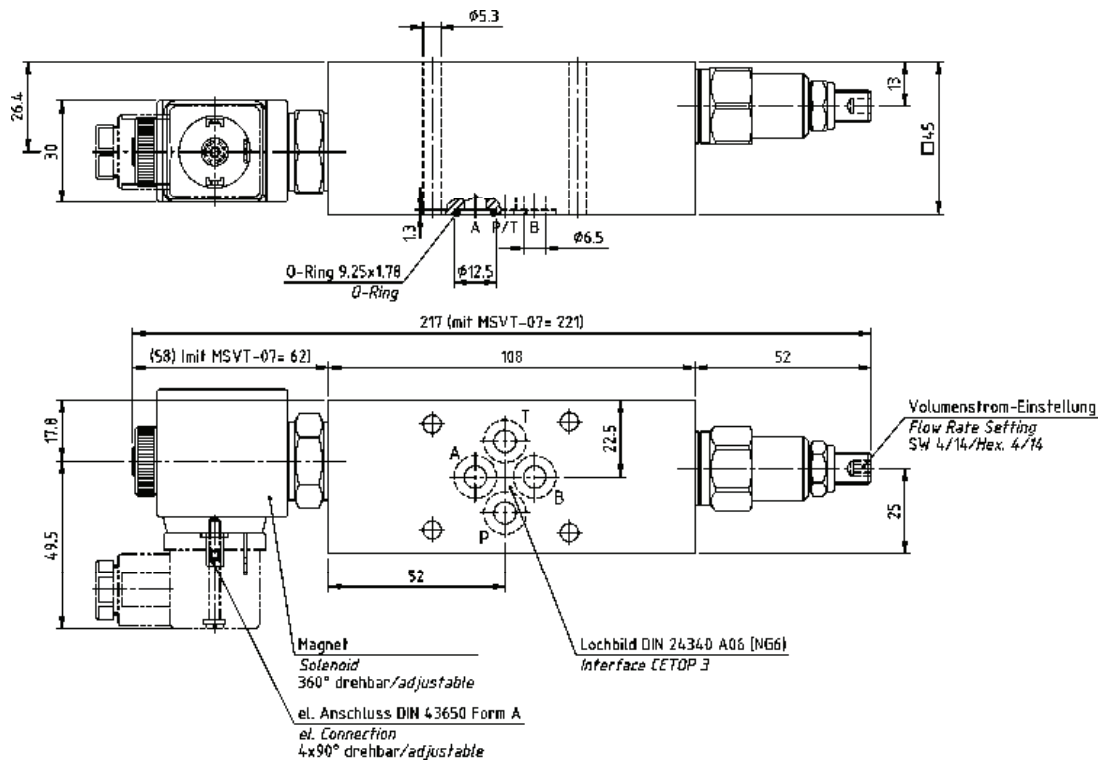


Turn screw clockwise to decrease flow.
 Complete adjustment range in 5 turns.
 Leakage at shutoff: < 0,4 l/min/ 315 bar/ 32 cSt.

H3/91 20 01

ZMSRT2-06-...

Function in T



notes for flow control valve: see above

H3/91 25 09

Accumulator Load Valve SLV

Cover Plate NG 6, NG 10 • max. 315 bar • max. 30 respectively 60 l/min



Description

The WEBER-HYDRAULIK ValveTech accumulator load valve SLV is a shift valve with a pressure-dependent shifting point. The shift pressure is measured in port B. If the shift pressure is reached, the valve opens the connection from P to T, the pump is in pressure-free circulation. As soon as the pressure falls at port B to the reset point, the valve closes the connection of P to T, the accumulator will be loaded again. The reset pressure lies approx. 15% below adjusted shift pressure (= reset hysteresis). The SLV is available as a cover plate CETOP/ISO 3 (SLV 6) and CETOP/ISO 5 (SLV 10). The setting of the shift pressure can be done on demand. If the accumulator is fitted directly to the cover plate, devices with integrated check valve are available.

Technical Data

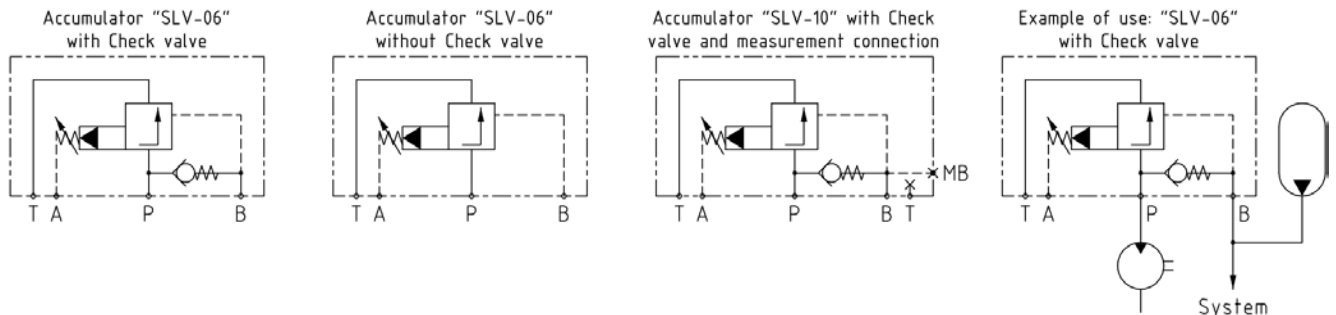
Hydraulic

Rated pressure: max. 315 bar
 Switching pressure: see model code
 Hysteresis: see model code
 Rated flow: SLV 6: max. 30 l/min
 SLV 10: max. 60 l/min
 Fluids: Oils as per DIN 51524,
 Others upon request
 Viscosity: 3 – 400 cSt
 Filtration: min. 25 µm

Mechanic

Design: pilot operated
 Operation temperature: -20 °C – +80 °C
 Installation: no restrictions
 Weight: SLV 6: 1,3 kg
 SLV 10: 1,9 kg
 Materials: valve parts: steel
 body: aluminium
 seals: NBR (Viton available)
 back up rings: Teflon; PU
 valve zinc plated
 body anodised
 Surface protection:

Symbols

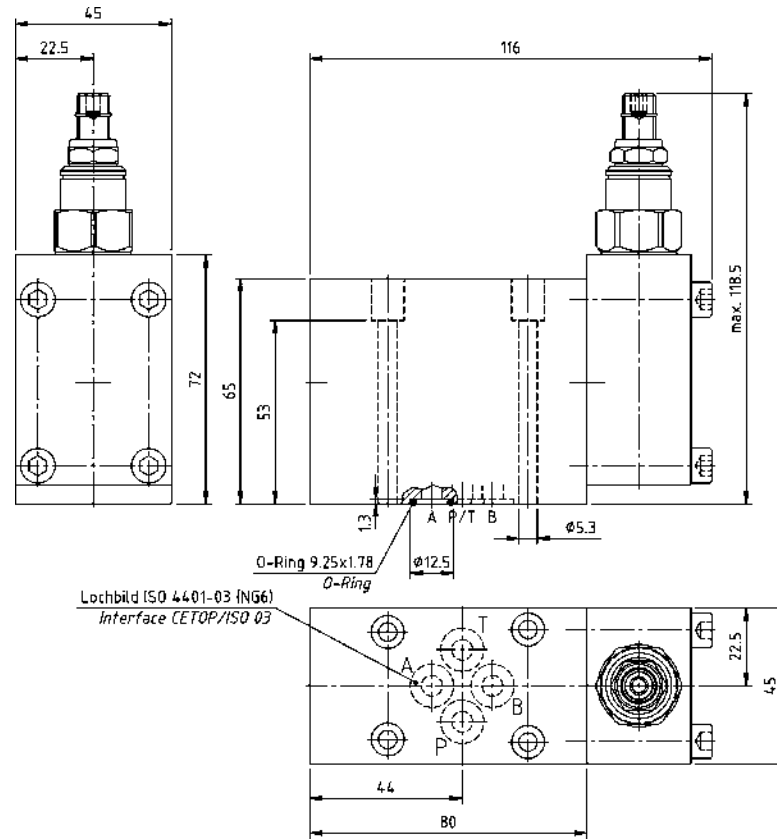


Model Code

SLV 6		210		15		3		RV	
Accumulator Load Valve Surface Mount Body		Shift Pressure Range		Hysteresis		Design		Check Valve „P“ to „B“	
Available options:		55 = 18 – 55 bar		15 = 15%		internal		0 = without check valve	
NG 6 SLV 6		105 = 35 – 105 bar		On request:				RV = with check valve	
NG 10 SLV 10		210 = 70 – 210 bar		20 = 20%					
		350 = 140 – 315 bar		30 = 30%					
				50 = 50%					

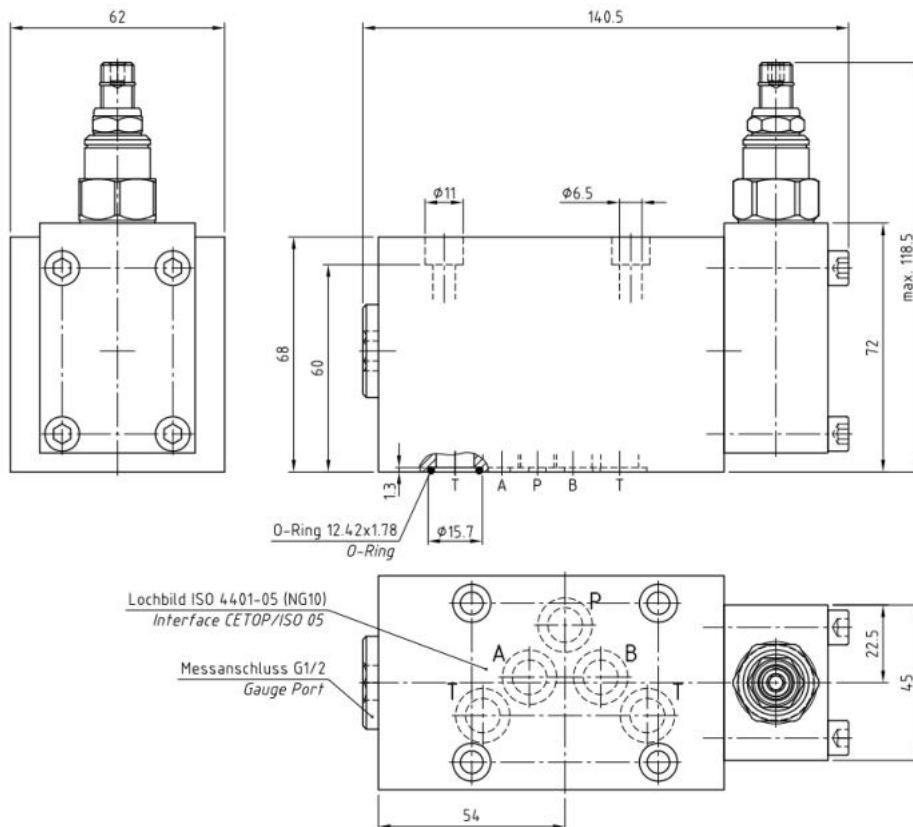
Dimensions [mm]

SLV 6 with / without Check Valve



HM3/071401

SLV 10



HM3/001401

Accumulator Safety Valve HSB-06

cover plate CETOP 3 • pressure relief valve as per 97/23/EC • max. 40 l/min



Description

The hydraulic accumulator safety valve HSB-06 is used for the prescribed security and discharge of hydraulic systems with accumulators. By the execution as CETOP/ISO 3 (NG 6) cover plate is an assembly without pipework in sandwich body packs possible. Additional functions, e.g. (restrictor-) check valves, are simple with standard bodies to add. By the internal connection of the channels A, B and P there are additional connection possibilities, e.g. for the accumulator, for consumers, measuring etc.

The direct operated pressure relief valve is according to 97/23/EC, and can be supplied preset. Various options stand to the selection: pressure discharge manually (with screw) or electrically (over 2/2 poppet valve) as well as a Minimesse® measure coupling in P.

Technical Data

for terms and definitions see chapter 12

Hydraulic

Rated Pressure: with manual discharge: 350 bar
with electrical discharge: 250 bar
Flow Rate: max. 40 l/min
Adjustment Range: see diagram at page 2
Fluids: oils as per DIN 51524,
others on request
Viscosity Range: 12 – 230 cSt
Filtration: class 18/16/13, filter β 6...10 \geq 75

Mechanic

Ambient Temperature: manual discharge: -20 °C – +60 °C
electrical discharge: -20 °C – +50 °C
Fluid Temperature: -20 °C – +60 °C
Installation: no restrictions
Weight: 2,1 kg (with el. discharge)
Materials: valve parts, body: steel; seals: NBR,
back up rings: Teflon, PU
Surface Protection: valves: zinc plated, phosphated
body: zinc plated

sandwich body check valve
if A = consumer port

sandwich body needle valve with free
flow check, for fast loading and slow
unloading of the accumulator

Electrical

Nominal Voltage: 24 V DC \pm 10%
Power Consumption: 22 W
Nominal Resistance (R_{20}): 26 Ω
Cyclic Duration Factor: 100 %
Environmental Protection: IP 65
Electrical Termination: plug as per DIN 43650 form A,
incl. square connector Pg9

subplate body with interface CETOP/ISO 3
B = accumulator port
A = consumer or gauge port

Symbols / Assembling Examples

Model Code

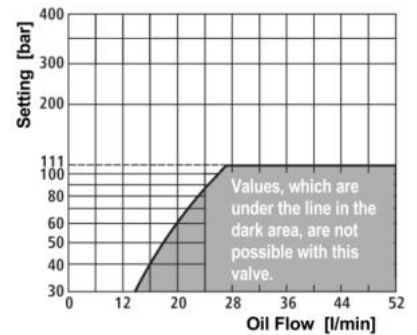
HSB-06	-	E	-	M	-	210
Accumulator Safety Valve CETOP 3		Pressure Discharge		Gauge Port		Suffix
		A = manual (screw) E = electrical, 24 V DC, normally open		O = plugged M = Minimesse coupling M16x2		setting [bar] special executions

Safety Regulations for presetted Pressure Relief Valves after Pressure Equipment Directive 97/23/EC

After 97/23/EC the increase of the system pressure due to the oil flow may not be larger than 10 % of the adjusted pressure setting. **Note!** The system pressure increases due to the increasing flow rate by the back pressure in the blow-off line (port T). Before the order of a presetted valve it must be considered that the existing flow rate of the application is less than the maximum flow rate in the diagram at the right side. This diagram shows the maximally permissible flow rate related to the setting pressure. The indicated maximally permissible flow rate q_{Vmax} may not be exceeded. Blow-off (T) lines of relief valves must out-flow safely.

Absolutely consider the operation notes!

- In the work the indicated pressure is set with a flow rate by 2 l/min.
- The indicated maximally permissible flow rate applies to applications without back-pressure in the blow-off line (port T).
- With removing the valve's sealing the permission after DGRL is no longer valid!
- Always consider the 'pressure equipment directive 97/23/EC'-guidelines!



Dimensions (mm)

HSB-06-A-O-... manual discharge

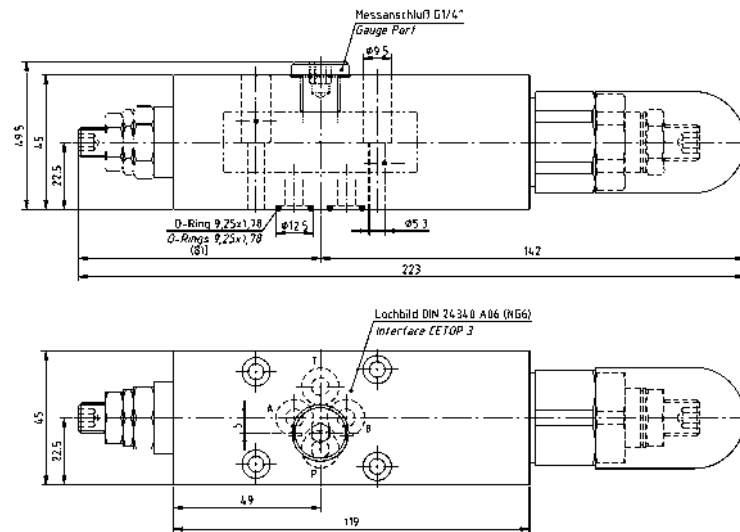


Abb. Meßanschluß verschlossen

H3-033902

HSB-06-E-M-... electrical discharge

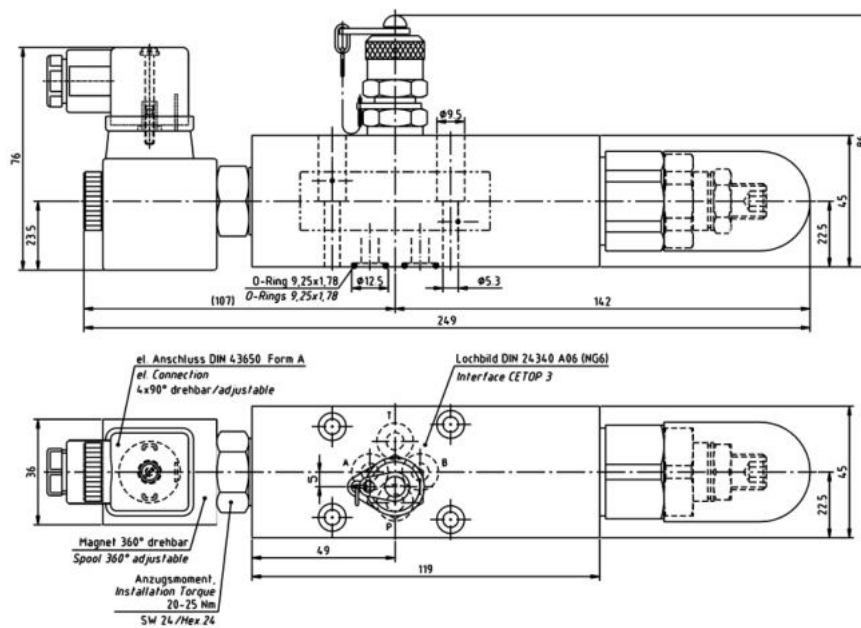
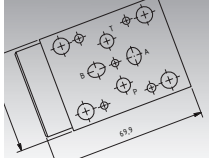


fig. with Minimes® coupling

H3-033903

Mounting Plates, Sandwich Bodies and Manifolds



Connecting Plates and Manifolds
suitable for various cavities

Hollow Bolt Body HSS
for counterbalance valves or pilot to open check valves
cavity T-11A or T-2A



Sensors

Pressure Transmitter MODS
compact and robust universal pressure transmitter
shock and vibration resistant
nominal voltage 12-32 V DC
measuring range 6-600 bar



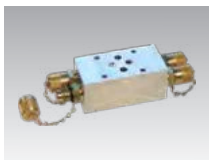
Line Mount Bodies, Tools

Line Mount Bodies, Tools
operating pressure max. 350 bar



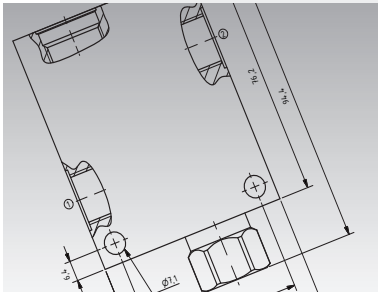
Subplates and Measuring Plates

Mounting Plate MR
operating pressure max. 315 bar
NG 6



Measuring Plate MP
operating pressure max. 315 bar
NG 6 and NG 10

Connecting Plates and Manifolds



suitable for various cavities

100220_Manifolds_e
05.2021

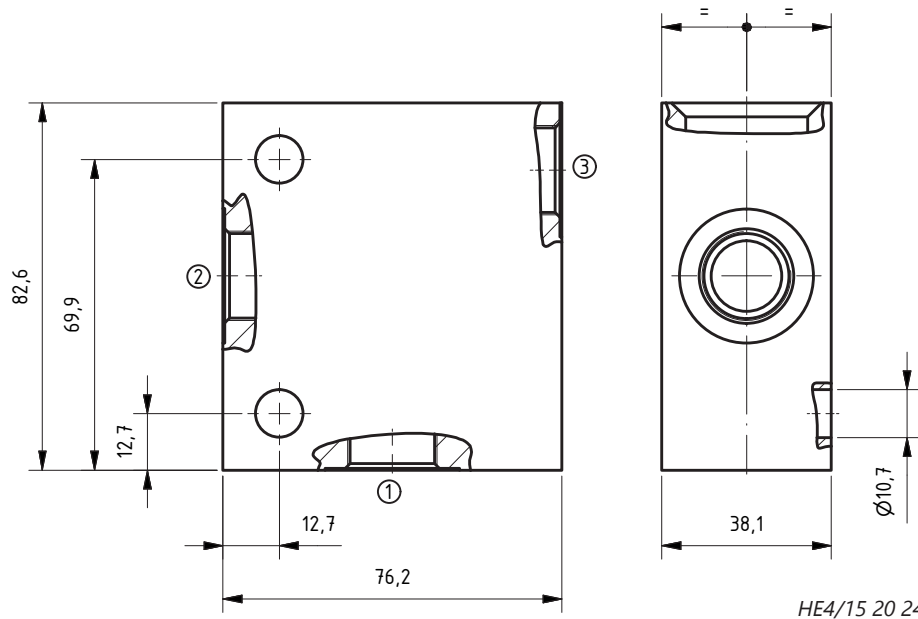
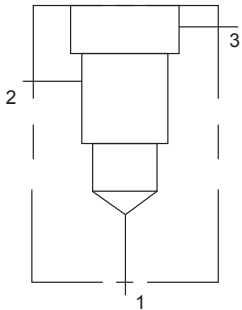
Table of contents

Contents	Page
Cavity T-2A	2
Cavity T-3A	4
Cavity T-5A	5
Cavity T-8A	6
Cavity T-10A	7
Cavity T-11A	11
Cavity T-13A	14
Cavity T-16A	16

NOTE All aluminium manifolds are approved for a maximum operating pressure of 210 bar.

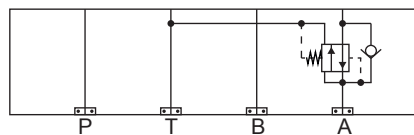
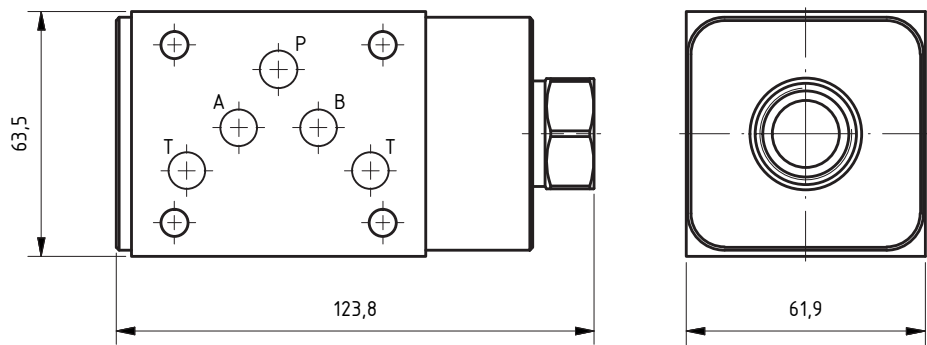
Cavity T-2A

Manifold 90°
BAV, BAW



Type	Ports	Weight [kg]
BAV	G 1/2"	0,49 (Alu)
BAV/S		1,30 (Steel)
BAW	G 3/4", Port 3: G 1/2"	0,27 (Alu)
BAW/S		0,70 (Steel)

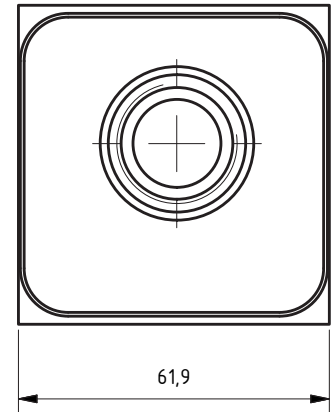
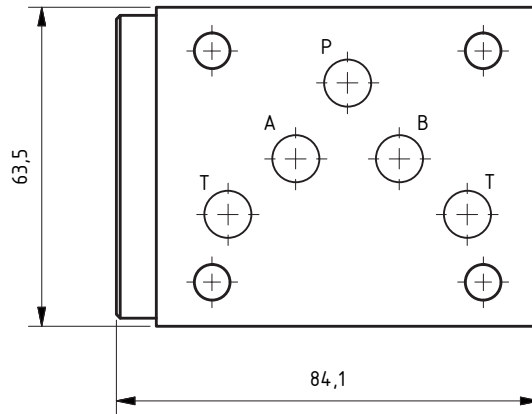
Sandwich body
NG 10 in A
BB2



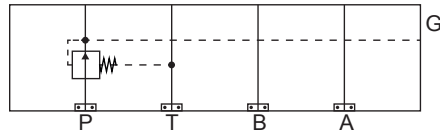
Type	Weight [kg]
BB2	1,11 (Alu)

Cavity T-2A

*Sandwich body
NG 10 in P
BBP*

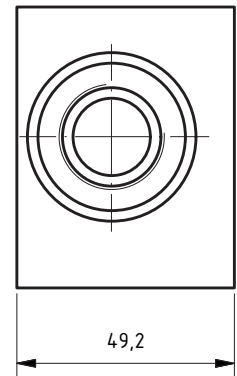
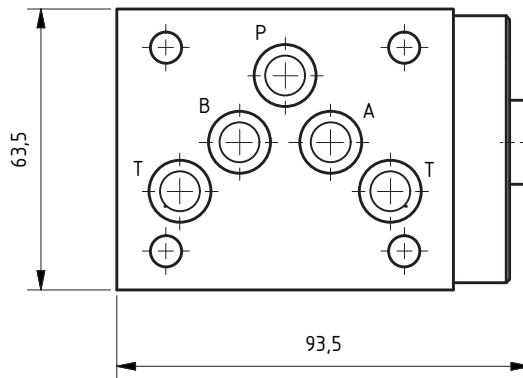


HM3/15 20 27

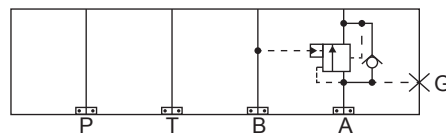


Type	Weight [kg]
BBP	0,72 (Alu)
BBP/S	1,88 (Steel)

*Sandwich body
NG 10 in A
BBA*



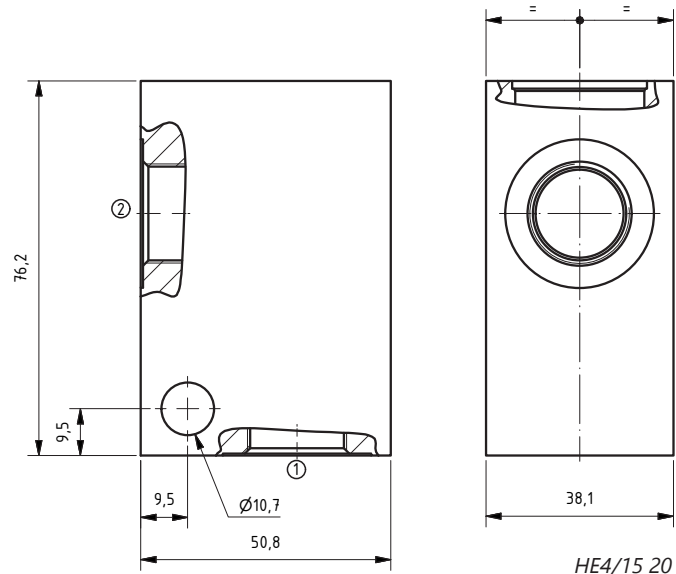
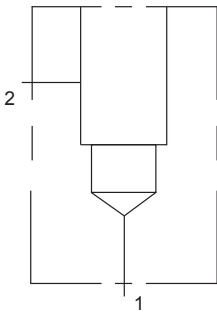
HM3/15 20 27



Type	Weight [kg]
BBA	0,57 (Alu)
BBA/S	1,47 (Steel)

Cavity T-3A

Manifold 90°
G 1/2"
CAV, CAW

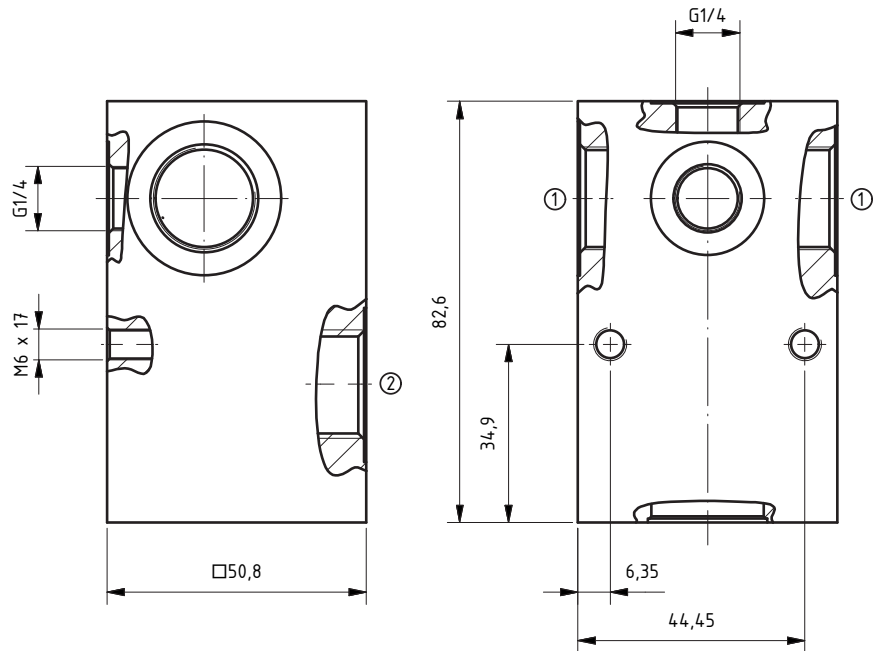
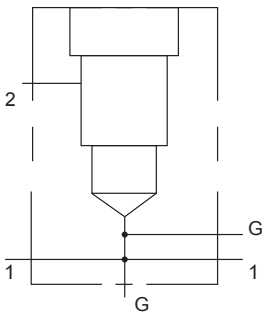


HE4/15 20 19

Type	Ports	Weight [kg]
CAV	G 1/2"	0,29 (Alu)
CAV/S		0,76 (Steel)

Type	Ports	Weight [kg]
CAW	G 3/4"	0,27 (Alu)
CAW/S		0,70 (Steel)

Manifold 90°
CEV, CEW

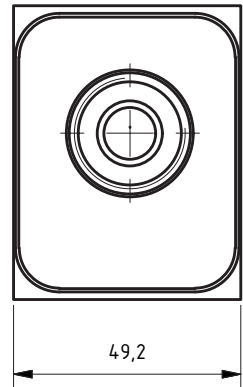
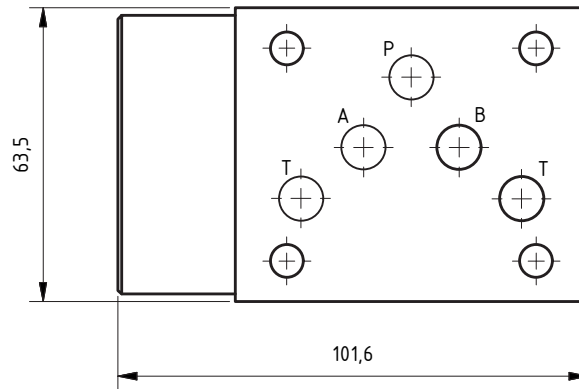


HE4/15 20 21

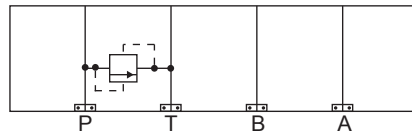
Type	Ports	Weight [kg]
CEV	G 1/2"	0,45 (Alu)
CAV/S		1,17 (Steel)
CEW	G 3/4"	0,41 (Alu)
CEW/S		1,08 (Steel)

Cavity T-3A

Sandwich body
NG 10 P→T
CBP



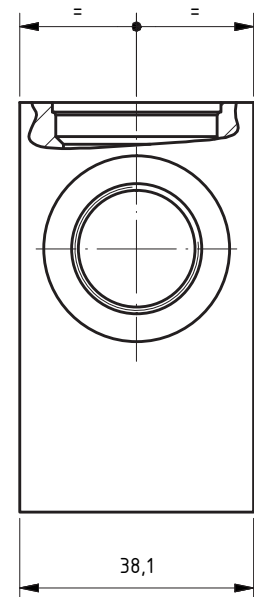
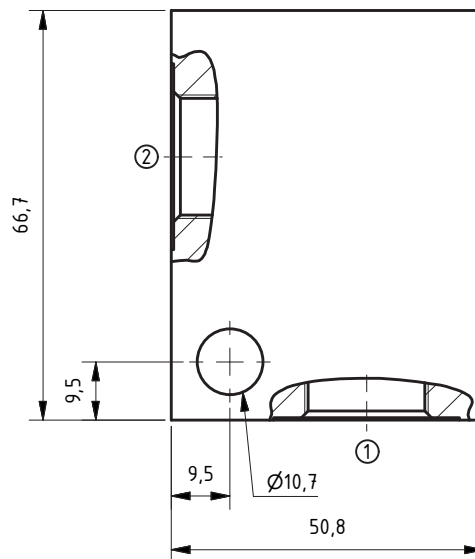
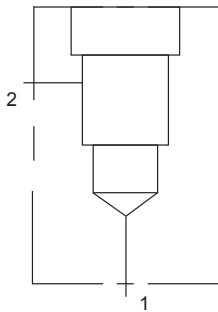
HE4/15 20 23



Type	Weight [kg]
CBP	0,71 (Alu)
CBP/S	1,85 (Steel)

Cavity T-5A

Manifold 90°
G 1/2"
DAV



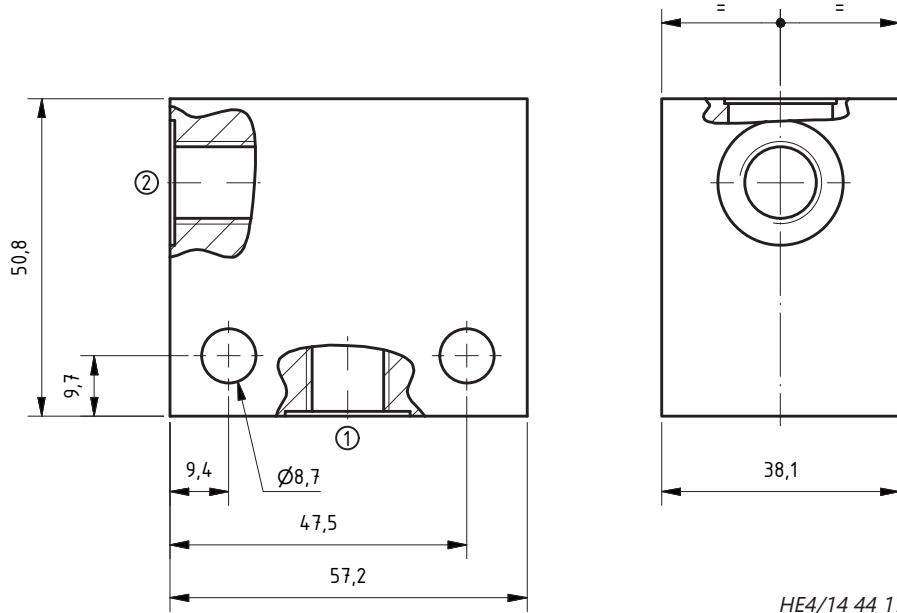
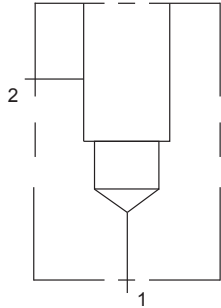
HE4/15 21 01

Type	Weight [kg]
DAV	0,25 (Alu)
DAV/S	0,66 (Steel)

NOTE Other manifolds and sandwich bodies are available upon request.

Cavity T-8A

Manifold 90°
G 1/4"
WFP



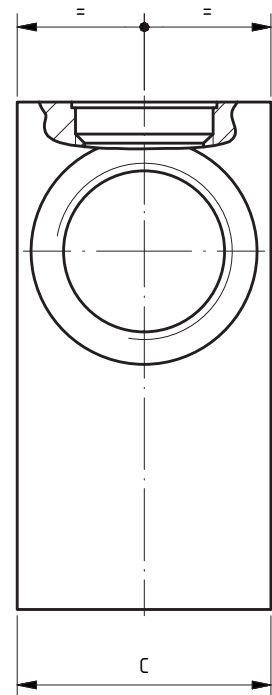
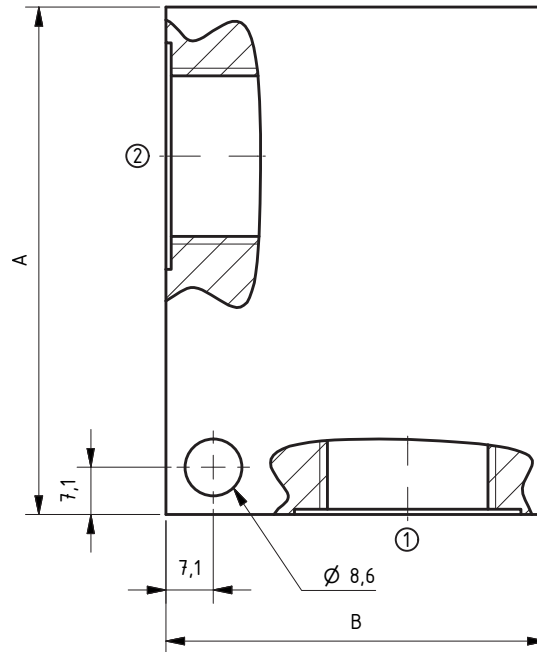
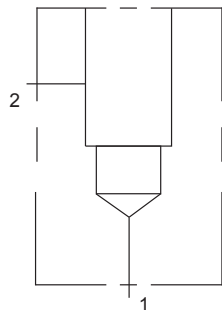
HE4/14 44 17

Type	Weight [kg]
WFP	0,26 (Alu)
WFP/S	0,69 (Steel)

NOTE Other manifolds and sandwich bodies are available upon request.

Cavity T-10A

In-line body
FAU, FAV, FAW

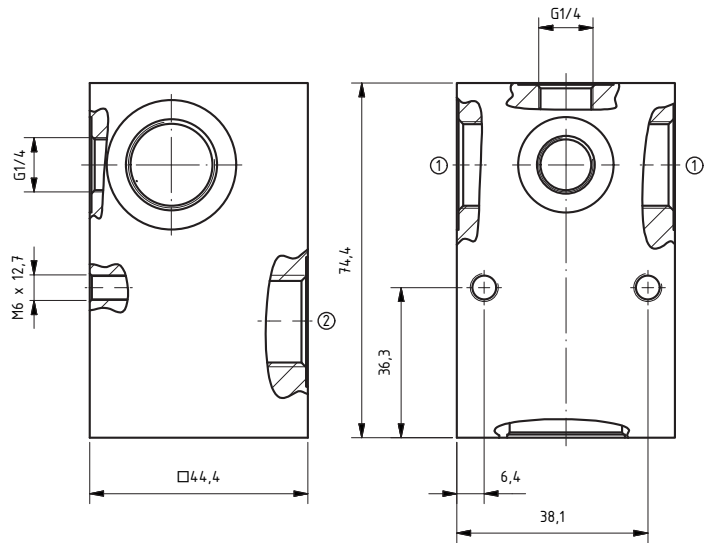
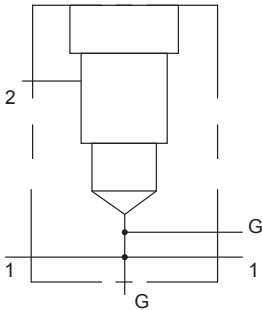


HE3/14 45 07

Type	Ports	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Weight [kg]
FAU	G 3/8"	63,5	41,1	31,8	25,4	26,2	0,20 (Alu)
FAU/S							0,48 (Steel)
FAV	G 1/2"	76,2	57,2	38,1	36,3	36,3	0,38 (Alu)
FAV/S							0,96 (Steel)
FAW	G 3/4"	76,2	57,2	38,1	36,3	36,3	0,36 (Alu)
FAW/S							0,92 (Steel)

Cavity T-10A

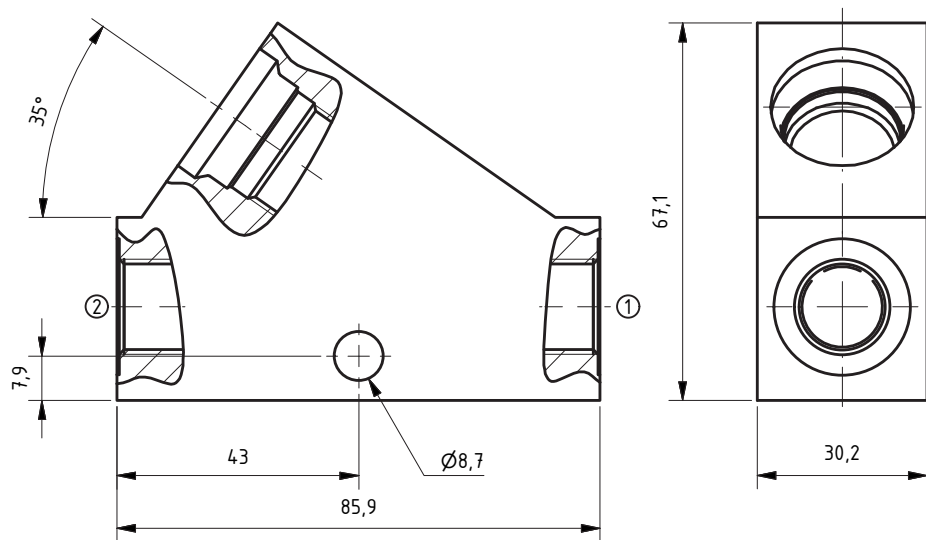
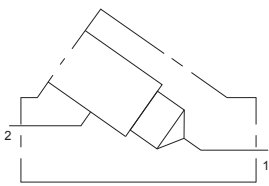
In-line body
 1 open
 FEU, FEV



HE4/14 46 01

Type	Ports	Weight [kg]
FEU	G 3/8"	0,32 (Alu)
FEU/S		0,84 (Steel)
FEV	G 1/2"	0,30 (Alu)
FEV/S		0,80 (Steel)

Manifold straight
 G 3/8"
 FCU

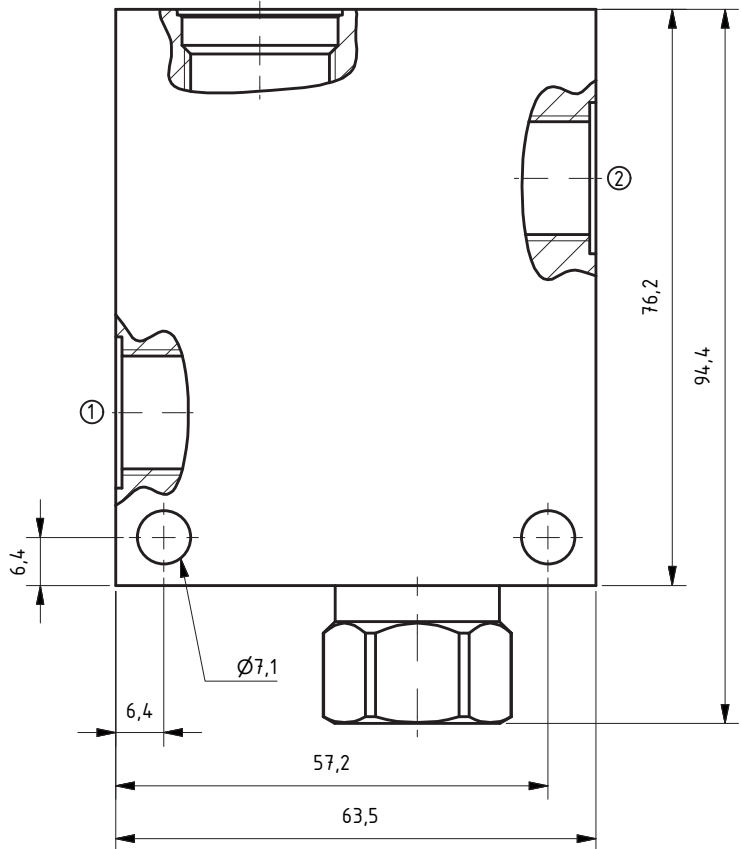
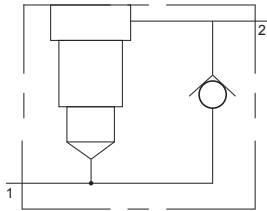


HE4/14 46 02

Type	Weight [kg]
FCU	0,26 (Alu)
FCU/S	0,67 (Steel)

Cavity T-10A

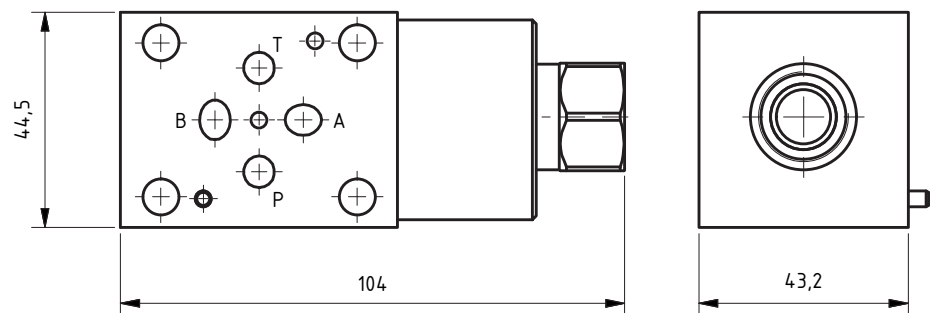
Manifold 90°
G 3/8"
FNU



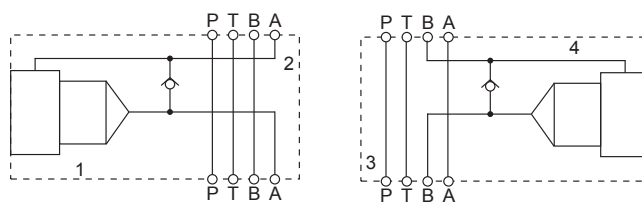
HE4/14 46 03

Type	Weight [kg]
FNU	0,42 (Alu)
FNU/S	0,92 (Steel)

*Sandwich body NG 6
FB4*



HM3/14 46 04

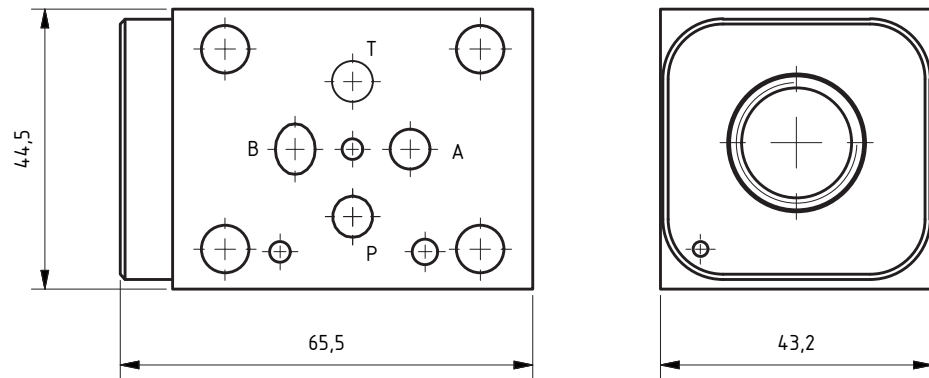


Type	Weight [kg]
FB4	0,44 (Alu)
FB4/S	0,97 (Steel)

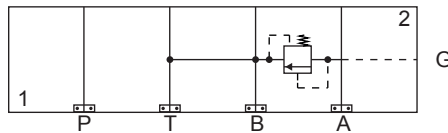
NOTE The sandwich body is available with unloading port at A or at B.

Cavity T-10A

Sandwich body NG 6
FBA, FBP, FBT

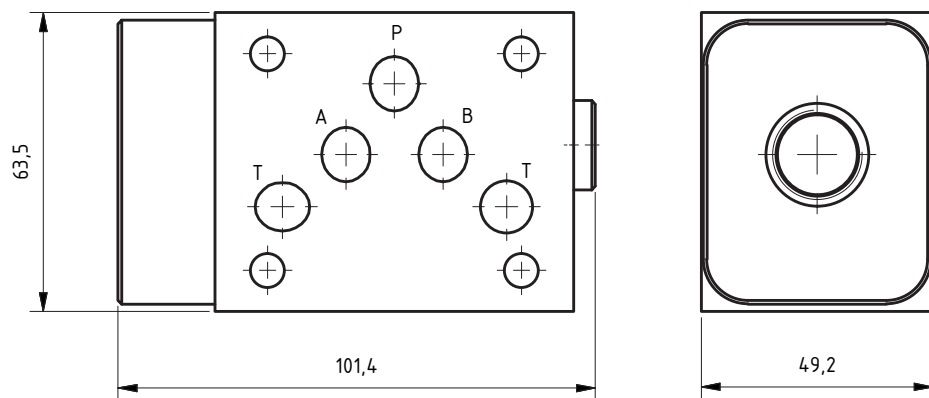


HE4/14 48 08

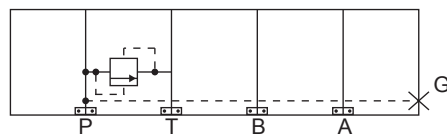


Type	Ports	Design	Weight [kg]
FBA/M	metric	A→T or B→T	0,30 (Alu)
FBA/T			0,70 (Steel)
FBP/M	metric	P→T	0,30 (Alu)
FBP/T			0,70 (Steel)
FBT/M	metric	from T	0,30 (Alu)
FBT/T			0,70 (Steel)

Sandwich body
NG 10, P→T
CBE



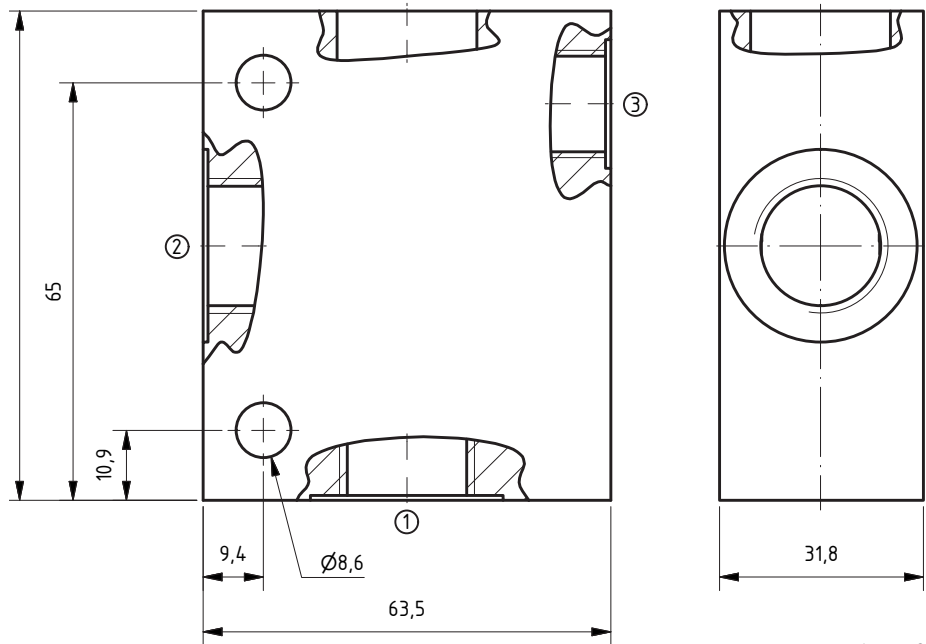
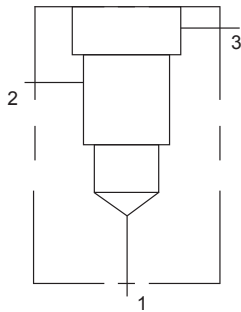
HE4/14 50 08



Type	Weight [kg]
CBE/M	0,69 (Alu)
CBE/T	1,78 (Steel)

Cavity T-11A

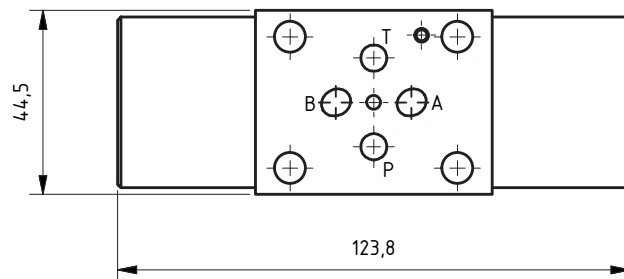
Manifold 90°
EAV, ECV, ECT, EAU,
ECU



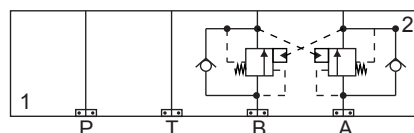
HE4/14 47 01

Type	Port 1	Port 2	Port 3	A [mm]	Weight [kg]
EAV	G 1/2"	G 1/2"	G 3/8"	61,7	0,32 (Alu)
EAV/S					0,83 (Steel)
ECV	G 1/2"	G 1/2"	G 1/4"	64,3	0,32 (Alu)
ECV/S					0,83 (Steel)
ECT	G 1/4"	G 1/4"	G 1/4"	64,3	0,34 (Alu)
ECT/S					0,89 (Steel)
EAU	G 3/8"	G 3/8"	G 3/8"	61,7	0,33 (Alu)
EAU/S					0,86 (Steel)
ECU	G 3/8"	G 3/8"	G 1/4"	64,3	0,33 (Alu)
ECU/S					0,87 (Steel)

**Sandwich body NG 6
EBY**



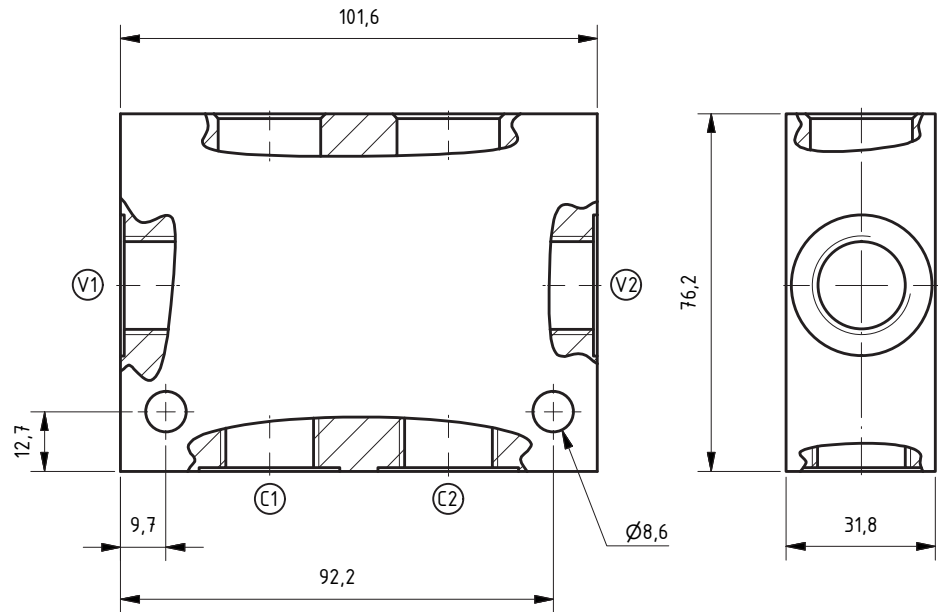
HE4/14 51 08



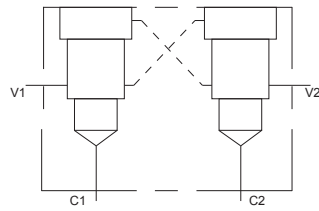
Type	Weight [kg]
EBY	0,48 (Alu)
EBY/S	1,22 (Steel)

Cavity T-11A

Manifold 90°
YEV, YEU

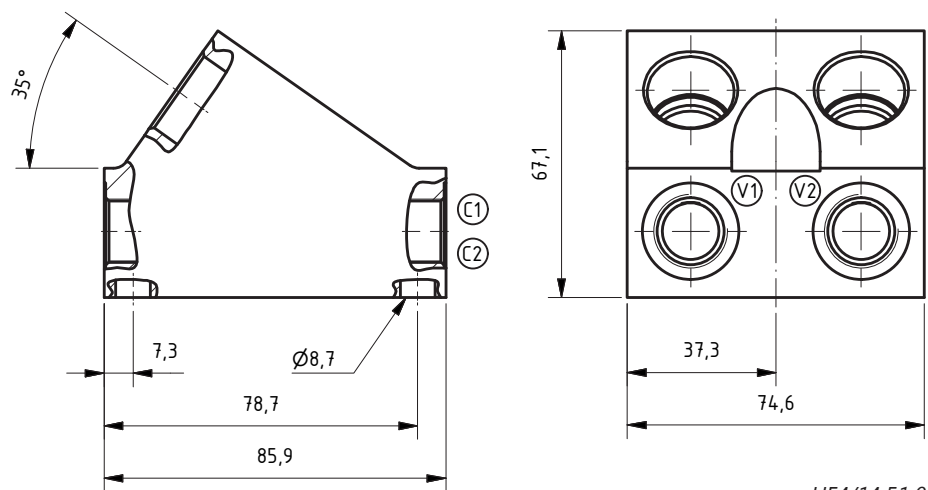


HE4/14 47 03

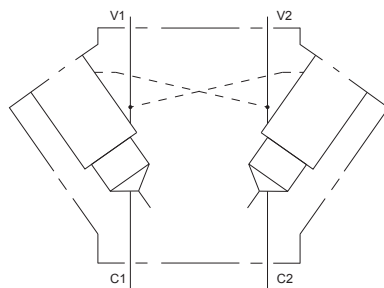


Type	Ports	Weight [kg]
YEV	G 1/2"	0,49 (Alu)
YEV/S		1,29 (Steel)
YEU	G 3/8"	0,52 (Alu)
YEU/S		1,36 (Steel)

Manifold straight
XEU



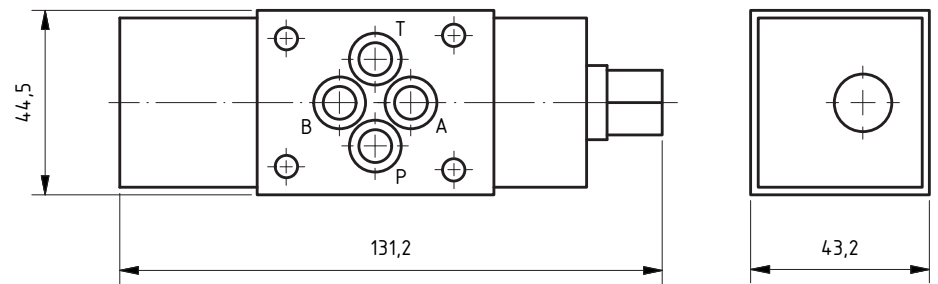
HE4/14 51 07



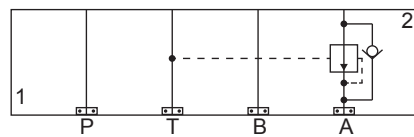
Type	Weight [kg]
XEU	0,65 (Alu)
XEU/S	1,71 (Steel)

Cavity T-11A

Sandwich body NG 6
EB2

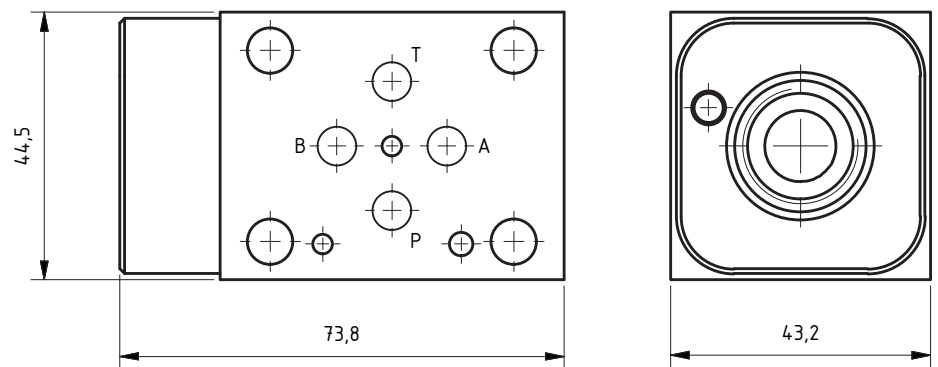


HE4/14 34 26

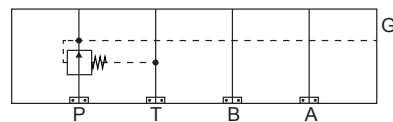


Type	Weight [kg]
EB2	0,56 (Alu)
EB2/S	1,24 (Steel)

Sandwich body NG 6
EBP



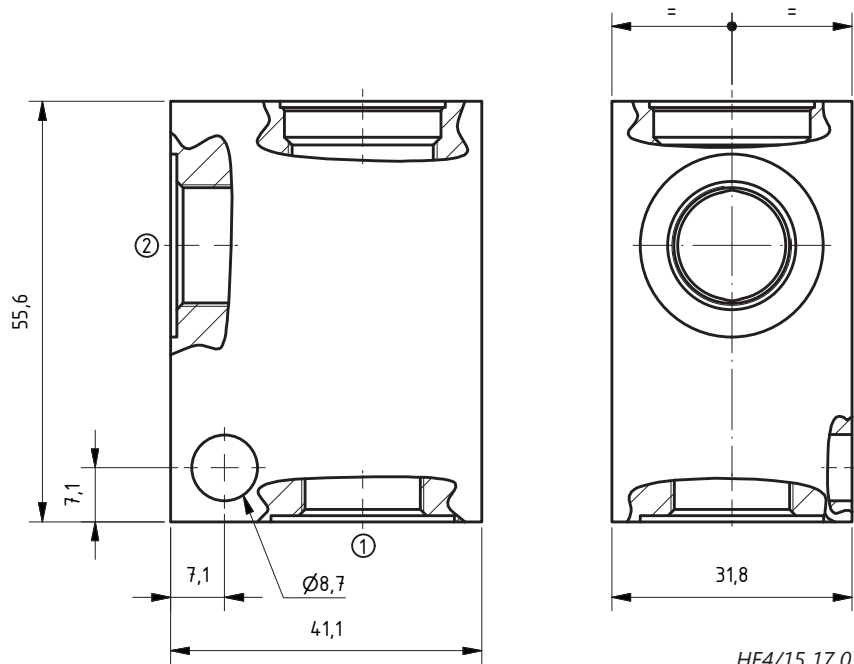
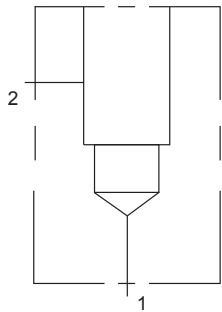
HE4/14 51 10



Type	Weight [kg]
EBP/M	0,32 (Alu)
EBP/T	0,77 (Steel)

Cavity T-13A

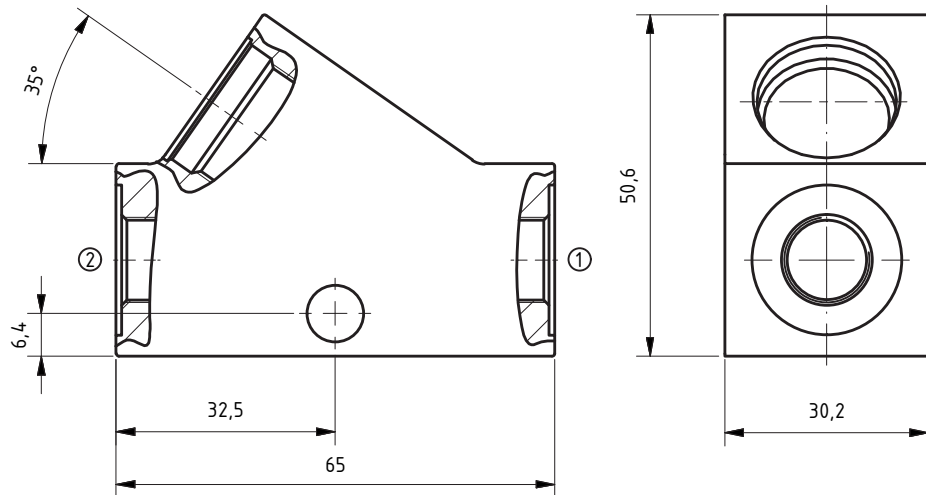
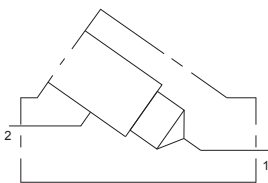
Manifold 90°
G 3/8"
GAU



HE4/15 17 03

Type	Weight [kg]
GAU	0,15 (Alu)
GAU/S	0,28 (Steel)

Manifold straight
GCT, GCU

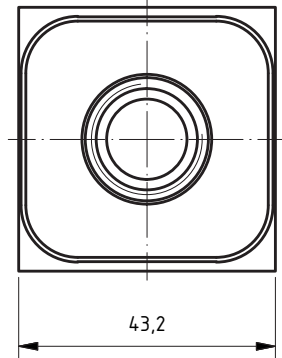
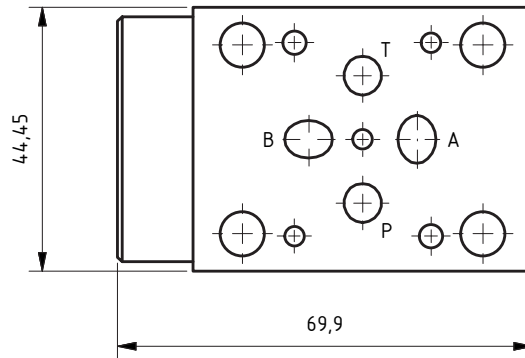


HE4/15 17 04

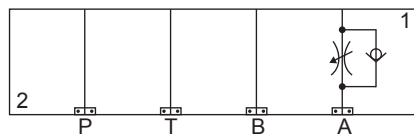
Type	Ports	Weight [kg]
GCT	G 1/4"	0,15 (Alu)
GCT/S		1,39 (Steel)
GCU	G 3/8"	0,14 (Alu)
GCU/S		0,37 (Steel)

Cavity T-13A

Sandwich body NG 6
GBA
in A or B

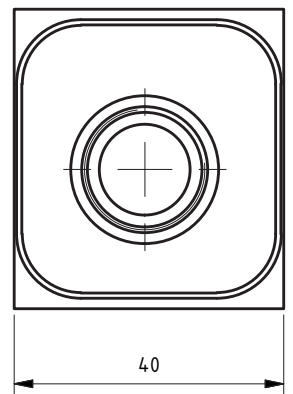
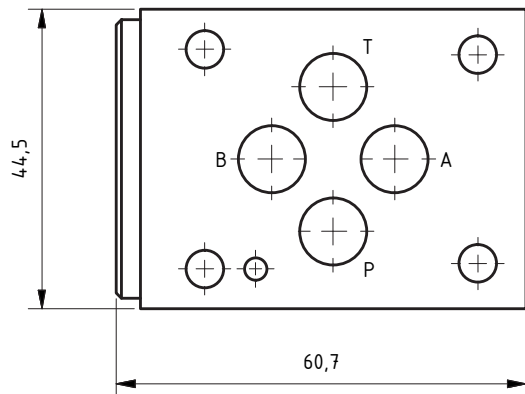


HE4/15 17 06

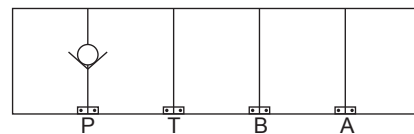


Type	Weight [kg]
GBA	0,3 (Alu)
GBA/S	0,76 (Steel)

Sandwich body NG 6
Z6S
in P



HE4/15 17 07

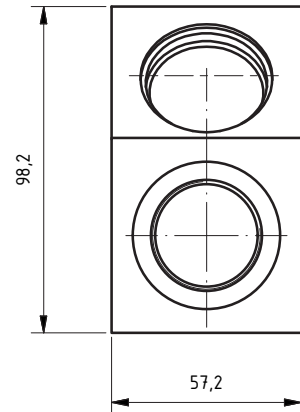
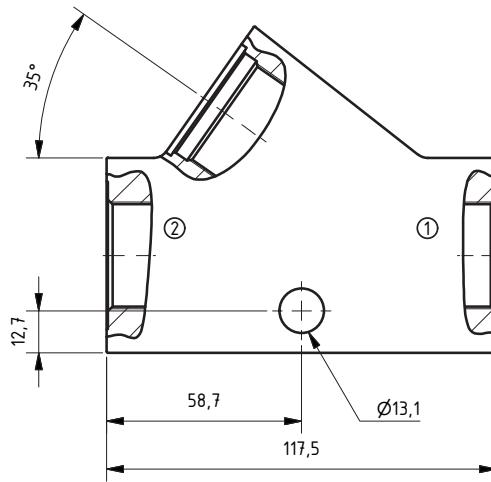
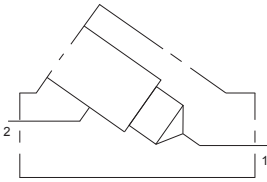


Type	Weight [kg]
Z6S	0,23 (Alu)
Z6S/S	0,61 (Steel)

NOTE Other manifolds and sandwich bodies are available upon request.

Cavity T-16A

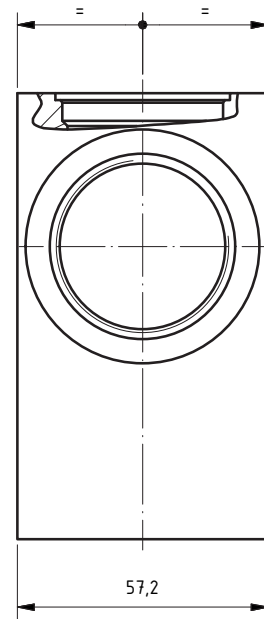
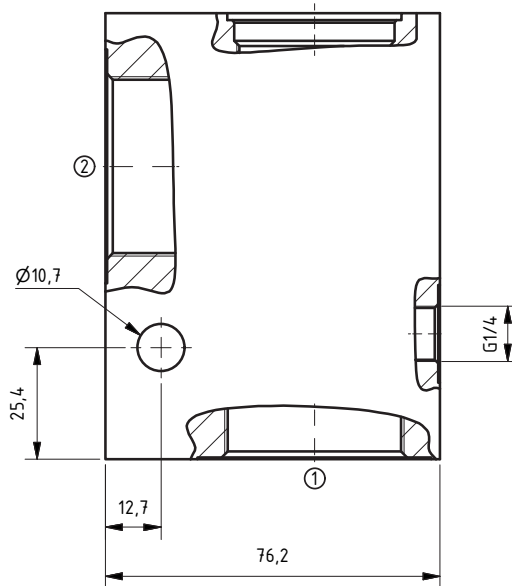
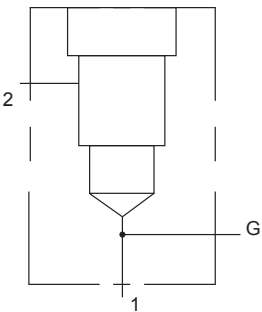
Manifold straight
ICX



HE3/15 21 03

Type	Weight [kg]
ICX	0,96 (Alu)
ICX/S	2,51 (Steel)

Manifold 90°
G 1 1/4"
IAY, IAX



HE3/15 21 02

Type	Ports	Weight [kg]
IAY	G 1 1/4"	0,8 (Alu)
IAY/S		2,09 (Steel)
IAX	G 1"	0,88 (Alu)
IAX/S		2,31 (Steel)

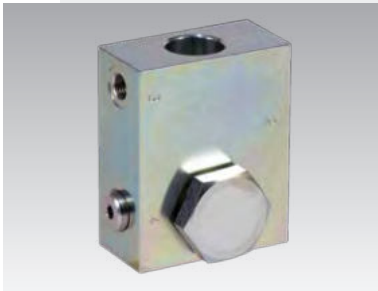


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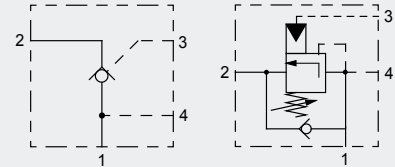
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Hollow bolt body HSS



for counterbalance valves or pilot to open check valves with cavity T-11A or T-2A



100210_HSS_e
06.2019

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Dimensions	2
Table of dimensions	3
Type code	3
Set-up	4
Accessories and additional information	4

Characteristics

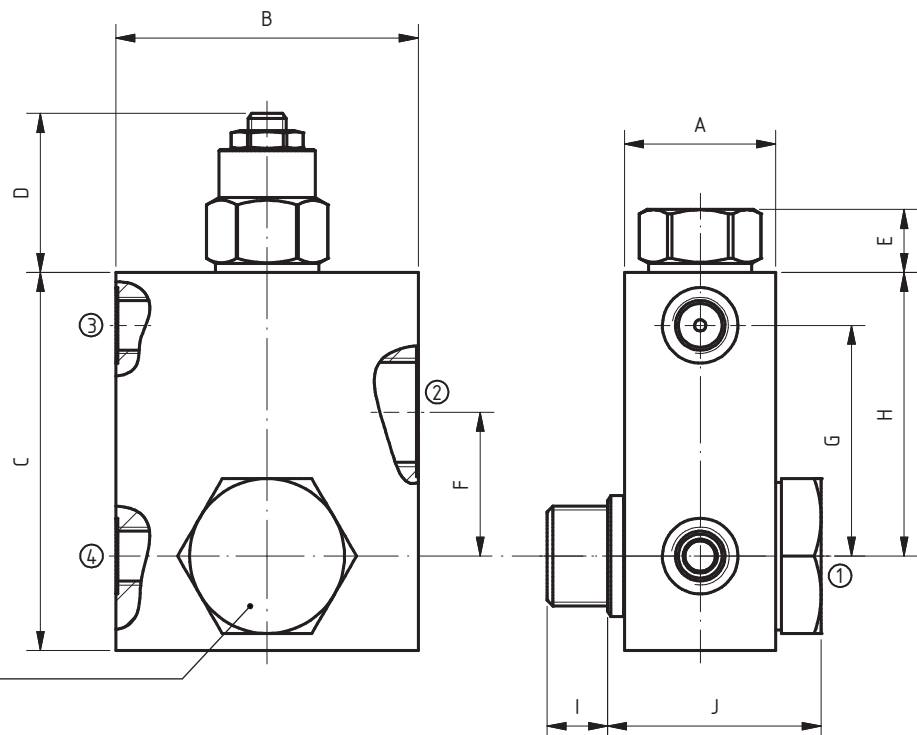
- hollow bolt body for counterbalance valves or pilot to open check valves
- space-saving installation possible
- dead space is minimized
- available in many variations
- available with already mounted valves
- turnable
- hollow bolt can be mounted from both sides
- maintenance-free

Technical data

<i>Hydraulic</i>	Operating pressure max.:	315 bar
	Flow rate:	depending on valve
	Hydraulic fluid:	mineral oil according to DIN 51524, others upon request
	Viscosity range:	7,4 - 420 cSt
	Filtration:	oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
<i>Mechanic</i>	Design:	Hollow bolt body
	Size:	G 1/4", G 3/8", G 1/2", G 3/4", M18 x 1,5
	Fluid temperature:	-20 °C to +80 °C
	Ambient temperature:	-20 °C to +80 °C
	Storage temperature:	-20 °C to +60 °C (non-condensing)
	Installation position:	any
	Weight:	without valves, see <i>table of dimensions</i>
	Material:	steel seal at Usit-ring: NBR
	Surface protection:	zinc coated steel

Dimensions

Hollow bolt body HSS



for installation torque and width across flats (SW) see table of dimensions

HE4/14 33 01

Table of dimensions

1	G 1/4"	G 3/8"	G 1/2"	G 3/4"	M 18 x 1,5
Cavity	T-11A	T-11A	T-11A	T-2A	T-11A
2	G 1/4"	G 3/8"	G 1/2"	G 3/4"	G 1/2"
3 and 4	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 1/4"
A [mm]	30	30	30	40	30
B [mm]	60	55	65	80	65
C [mm]	75	80	85	100	80
D [mm]*	33	33	33	55	33
E [mm]**	13	13	13	17	13
F [mm]	27	27	30	38	27
G [mm]	51	51	54	61	51
H [mm]	63	63	66	75	63
I [mm]	12	12	14	16	14
J [mm]	41	39	48	57	48
SW	19	22	27	41	24
Installation torque [Nm]	22 ± 1,1	40 ± 2	65 ± 3,3	180 ± 9	50 ± 2,3
Weight [kg] ***	0,85	0,85	1,0	2,0	1,0
Article number	203.0144	203.0003	203.0005	203.0006	203.0012

* Dimension „D“ applies to counterbalance valves with L-control (e.g. CBCA-LAN)

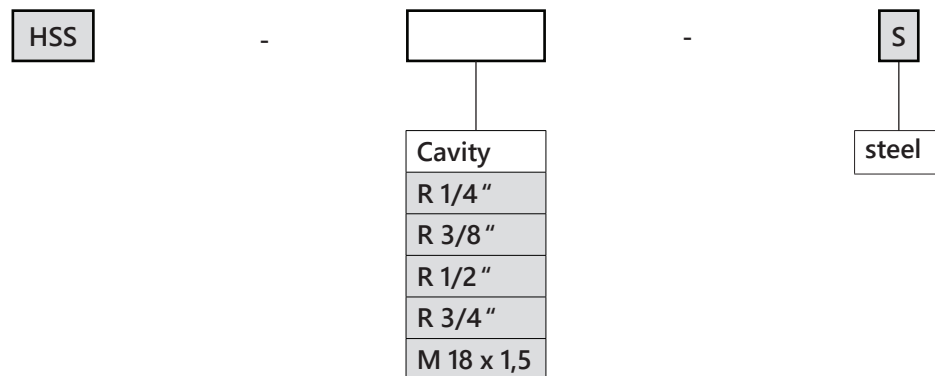
** Dimension „E“ applies to pilot to open check valves without manual load release (e.g. CKCB-XCN)

*** Weight of hollow bolt body without any valves

NOTE The installation torque values of the hollow bolt are maximum values which are not be exceeded (Nm, couter material steel). This must be guaranteed by using the necessary tools (torque wrench) and procedure.

NOTE The steel sealing ring may not be replaced by any other sealing! It has a functional purpose in absorbing forces. Other sealing rings (e.g. copper, or USIT-rings) are not permitted!

Type code



NOTE The hollow bolt bodies HSS are available with a variety of counterbalance valves and pilot to open check valves. They can also be provided with a Minimes® test-point. Please contact us for more information.

Set-up

The hollow bolt body HSS must be fitted completely before mounting on the cylinder. Through inappropriate mounting of the hollow bolt body to the cylinder, it is possible that additional forces lead to leaking due to loosened parts.

If mounted inappropriately, it is possible that the steel sealing ring damages the cylinder and/or the hollow bolt body.

If leakage occurs at the steel sealing ring despite the correct installation torque, the system must never be tightened with a higher torque, but it might be necessary to replace the cylinder and/or the hollow bolt body, as well as the steel sealing ring.

The system is designed to absorb hydraulic forces. If there are any mechanic forces, e.g. applied through hydraulic tubing, this may lead to failure.

Any hydraulic tubing must be mounted to the hollow bolt body with the system being turned off and stress-relieved.

Accessories and additional information

*Accessories/
spare parts* Please contact us for fitting steel sealing rings, locking screws or valves as spare parts for the hollow bolt body HSS.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „*general information*“ under the category „*general operating manual*“ or will be provided upon request.



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Pressure Transmitter MODS



piezoresistive
 shock and vibration resistant
 nominal voltage 12 - 32 V DC
 measuring range -1 - 600 bar

060210_MODS_e
 02.2020

Table of contents

Contents	Page
Characteristics	1
Technical data	2
Dimensions	3
Pin assignment	3
Type code	4
Accessories and additional information	4

Characteristics

- robust
- compact
- pressure peak resistant
- overload protected
- with reverse voltage protection
- limitation of power loss
- electronic calibration
- stainless steel
- fully welded, "dry" measuring cell, therefore no internal transmission media
- applicable with all standard signals for industry, hydraulics and pneumatics
- various signal-, thread- and connecting options available
- Certifications: German Lloyd (GL) for marine applications
 CE-Directive 2014/30/EU
 CE-Directive 2014/68/EU
 Railway applications (DIN EN 50155)

Technical data

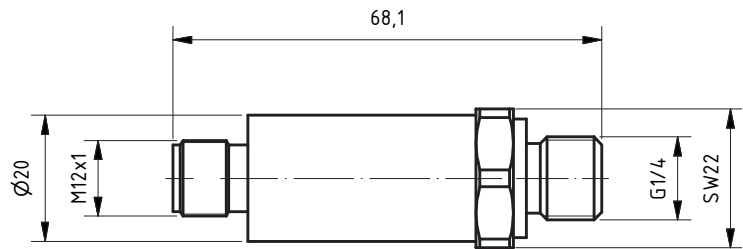
<i>Hydraulic</i>	Measuring range:	see type code
	Pressure type:	relative pressure
	Overload pressure:	2 x full scale*
	Burst pressure:	3 x full scale*
<hr/>		
<i>Mechanic</i>	Design:	screw-in pressure transmitter
	Fluid temperature:	-40 °C to +125 °C
	Ambient temperature:	-40 °C to +105 °C
	Installation position:	any
	Weight:	0,1 kg
	Material:	stainless steel
	Measuring principle:	piezoresistive
	Shock resistance:	1000 g according to DIN EN 60068-2-32
	Vibration resistance:	20 g according to DIN EN 60068-2-6
Damping:	∅0,6 mm at hydraulic connector, integrated in sensor	
<hr/>		
<i>Electric</i>	Nominal voltage:	12 - 32 V DC or 5 V DC ±10 %
	Protection class:	IP67 (according to plug-system, if correctly mounted)
	Response time:	≤ 2 ms
	Output signal:	see type code
	Electric termination:	Electric plug M12x1, 4-pin Electric plug DIN EN 175301-803, shape A, 3-pin + PE
	Electromagnetic compatibility:	25 V/m (according to DIN EN 61000-4-3)
	Temperature coefficient in compensated temperature range:	≤ 0,15 % / 10 K
	Radiation:	< 30 BµV/m (according to DIN 61000-4-3)
	Accuracy @ RT:	≤ 0,50 % of the range
	Stability/Year:	≤ 0,15 % of the range
	Non-linearity:	≤ 0,15 % of the range

NOTE Due to electronic calibration the pressure transmitter has a total error of 2 % of full scale*. Customised versions with better accuracy are available on request.

* integral linearity error

Dimensions

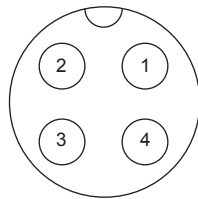
MODS



HE4/152321

Pin assignment

electric plug
M12x1, 4-pin

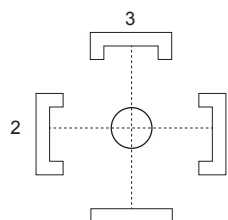


View on MODS-sensor

Output signal	Pin 1	Pin 2	Pin 3	Pin 4
A	supply voltage + (12 - 32 V DC)	n.c.	output signal 4 - 20 mA	n.c.
B	supply voltage + (12 - 32 V DC)	n.c.	GND	output signal 0 - 20 mA
C	supply voltage + (12 - 32 V DC)	n.c.	GND	output signal 0 - 10 V DC
D	supply voltage + (5 V DC ±10%)	n.c.	GND	output signal 0,5 - 4,5 V DC ratiometric
E	supply voltage + (12 - 32 V DC)	output signal 4 - 20 mA	GND	n.c.

n.c. = not connected

electric plug
DIN EN 175301-803
shape A,
3-pin + PE



View on MODS-sensor

Output signal	Pin 1	Pin 2	Pin 3
C	supply voltage + (12 - 32 V DC)	GND	output signal 0 - 10 V DC

Type code

MODS	-		-	G 1/4	-		-	
Pressure transmitter		Measuring range		Connection thread (DIN 3852)	Output signal		Electric plug	
		6	-1 - 6 bar		4 - 20 mA	A	M12x1	M12
		60	0 - 60 bar		0 - 20 mA	B	DIN EN 175301-803 shape A, 3-pin + PE	N
		160	0 - 160 bar		0 - 10 V DC	C		
		250	0 - 250 bar		0,5 - 4,5 V DC	D		
		400	0 - 400 bar		4 - 20 mA (3-wire)	E		
		600	0 - 600 bar					

Accessories and additional information

Accessories/
spare parts

Article:

Seal ring (Viton)

Material number:

1095335



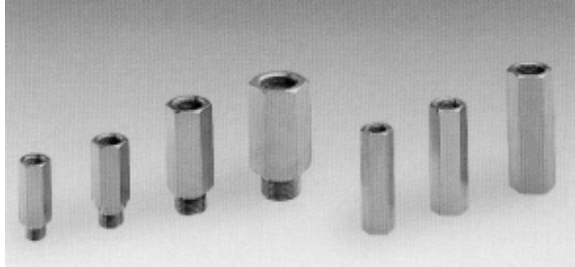
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Line Mount Bodies, Tools

for small screw in valves • steel zinc plated • max. 350 bar

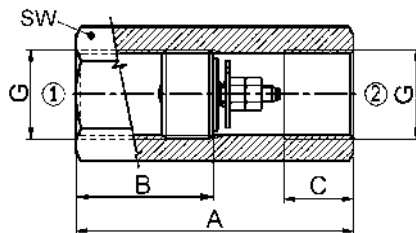


Description

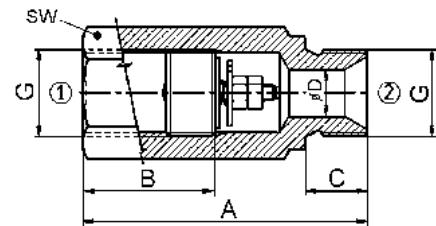
Suitable for the FLUID TEAM small screw in valve program. The zinc plating ensures a good corrosion protection. The housings are rated for 350 bar.

Deliverable Executions

female-female
type G2, G3



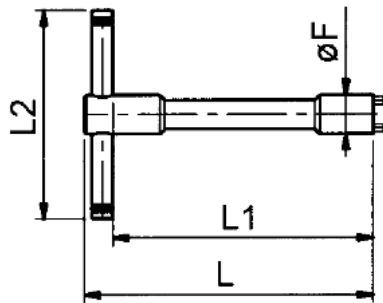
female-male with sealing shoulder
type G5, G5B, G6



Type	Size G	A	B	C	Ø D	SW (Hex.)	Weight [kg]	Torque [Nm]	Art.-No.
G2	suitable for VCD, VCL, RBS1								
	BSPP 1/4	66		13	-	19	0,09	-	138.0008
	BSPP 3/8	70	37	13	-	22	0,12	-	138.0009
	BSPP 1/2	80	42	15	-	27	0,20	-	138.0010
	BSPP 3/4	100	51	17	-	32	0,29	-	138.0011
G3	suitable for DRV, RKR, RHR								
	BSPP 1/2	90	65 *)	15	-	27	0,23	-	138.0012
G5	suitable for RBS1								
	BSPP 1/4	50	23	12	6	19	0,06	30	138.0003
	BSPP 3/8	60	25	12	9	22	0,10	50	138.0004
	BSPP 1/2	73	32	14	12	27	0,17	65	138.0005
	BSPP 3/4	110	55	16	16	32	0,32	180	138.0006
G5B	suitable for VCL, RHR, RKR								
	BSPP 3/8	60	43	12	9	22	0,10	50	138.0007
G6	suitable for VCD, VCL, RBS1					stud M12x1,5; drilling: BSPP 1/4			
	M12x1,5 / BSPP 1/4	72	42	12	6	19	0,10	30	138.0013

*) body with 118° drilling angle for O-ring sealing

Screw-In Tool



For Valve	Type	Art.- No.	L	L1	L2	ØF	Hole Circle x Pin-Ø
RBS1 G 1/4 RHR G 1/4	W1	139.0001	120	110	60	11,3	8,5 x 2,0
RHR G 3/8	W2	139.0002	120	110	60	15,0	10,8 x 2,4
RBS1 G 3/8	W3	139.0003	120	110	60	15,0	10,5 x 3,0
RBS1 G 1/2	W4	139.0004	120	110	60	18,8	13,0 x 3,9
RHR G 1/2	W5	139.0005	120	110	60	18,8	14,2 x 3,4
RBS1 G 3/4	W6	139.0006	120	110	60	24,0	16,0 x 5,5



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General Conditions of Purchase: GCP



General Operating Manual

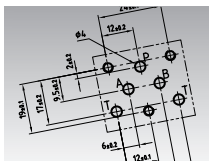
assembly

commissioning

maintenance



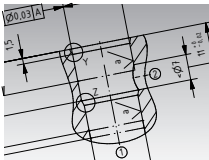
Seal Kit Installation Guide



Valve Cavities and Port Patterns

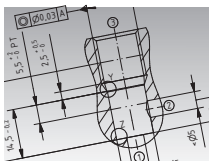
Port Patterns

NG 3 to NG 25



Valve Cavities

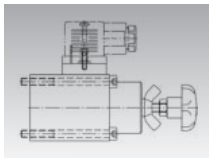
2-way designs



Valve Cavities

3-way designs

Manual Overrides and Electrical Connectors

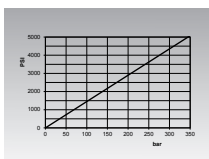


Manual Overrides

designs

Electrical Connectors

designs



Test Conditions

Test Conditions and Standards

applied standards

General terms and conditions of purchase of the WEBER-HYDRAULIK Group

Contents

§ 1 General, Scope of Agreement	3
§ 2 Quote, Tender Documents	4
§ 3 Prices, Terms of payment	5
§ 4 Time of delivery, Delay in delivery	6
§ 5 Performance, Delivery, Passing of risk, Default in acceptance	6
§ 6 Quality, Documentation	7
§ 7 Inspection of defects, Warranty	8
§ 8 Product liability, Indemnity, Third-party insurance.....	9
§ 9 Intellectual property rights of third partys.....	10
§ 10 Recourse against the supplier	10
§ 11 Statute of limitation	10
§ 12 Replacement parts	11
§ 13 Retention of title, Provision of parts, Tools, Confidentiality	11
§ 14 Compliance with statutory provisions.....	12
§ 15 Export control, Import regulations.....	12
§ 16 Assignment	13
§ 17 Applicable law. Place of jurisdiction, Place of performance, Severability.....	13
§ 18 Data privacy	14

The following General Conditions of Purchase of WEBER-HYDRAULIK Group apply to all companies of WEBER-HYDRAULIK Group, which have their domicile in Germany or Austria. These companies are listed on the website www.weber-hydraulik.com. As far as in the following General Conditions of Purchase the words “we”, “us” or “our” etc. appear these refer always to the company of WEBER-HYDRAULIK Group which has placed the order with the supplier.

§ 1 General, Scope of Agreement

1. Our terms and conditions of purchase only apply to companies in accordance with § 310 (4) of the German Civil Code (BGB) as well as public corporations and special funds under public law.
2. Our purchasing conditions apply exclusively; We do not recognize any terms and conditions of the supplier that conflict with or deviate from our purchasing conditions, unless we have expressly agreed to their validity in writing. Our silence on such deviating conditions in particular does not count as recognition or approval, not even in the case of future contracts. Our terms and conditions of purchase shall apply in place of any general terms and conditions of the supplier even if we accept the supplier's delivery without reservation while being aware of the supplier's terms and conditions that conflict with or deviate from our terms and conditions of purchase or we order after the supplier has indicated the applicability of his general terms and conditions, unless we have expressly waived the application of our purchasing conditions. The exclusion of the general terms and conditions of the supplier also applies if these purchasing conditions do not contain any special provisions for individual regulation points. By accepting our order confirmation, the supplier expressly acknowledges that he waives his legal objection derived from the general terms and conditions.
3. All agreements made between us and the supplier for the purpose of executing this contract must be set down in writing.
4. Our purchasing conditions also apply to future business, even if we should not refer to them in individual cases.
5. Individual agreements made with the supplier on a case-by-case basis (including side agreements, additions and changes) always take precedence over these terms and conditions of purchase. A written contract or our written confirmation is decisive for the content of such agreements, subject to proof to the contrary.
6. Legally relevant declarations and notifications by the supplier in relation to the contract (e.g. setting a deadline, reminder, withdrawal) must be in writing, i.e. to be submitted in writing or text form (e.g. letter, email, fax). Statutory formal requirements and other evidence, especially in the event of doubts about the legitimacy of the declaring party, remain unaffected.
7. Our employees are not entitled to add to the content of the contract or to deviate from it. This does not apply to our organs and authorized signatories as well as to the persons authorized by them.

8. References to the validity of legal regulations are only used for clarification purposes. Even without such a clarification, the statutory provisions apply unless they are directly changed or expressly excluded in these purchasing conditions.

§ 2 Quote, Tender Documents

1. Our order is binding at the earliest when it is submitted or confirmed in writing. The supplier must inform us of obvious errors (e.g. typing and calculation errors) and incompleteness of the order including the order documents for the purpose of correction or completion before acceptance; otherwise the contract is deemed not to have been concluded.
2. The supplier is required to confirm our order in writing within a period of 7 working days or, in particular, to execute it without reservation by sending the goods (acceptance).
3. We are entitled to change the time and place of delivery as well as the type of packaging at any time by giving written notice of at least 10 working days before the agreed delivery date. The same applies to changes to product specifications, insofar as these can be implemented within the framework of the normal production process of the supplier without significant additional effort, whereby in these cases the notification period according to the preceding sentence is at least 20 working days. We will reimburse the supplier for any proven and reasonable additional costs incurred as a result of the change. If such changes result in delays in delivery that cannot be avoided in the normal production and business operations of the supplier with reasonable efforts, the originally agreed delivery date will be postponed accordingly. The supplier will notify us in writing of the additional costs or delays in delivery that he can expect from a careful assessment in good time before the delivery date, but at least within 10 working days after receipt of our notification in accordance with sentence 1.
4. We are entitled to terminate the contract at any time by giving a written declaration stating the reason if we can no longer use the ordered products in our business due to circumstances that have arisen after the conclusion of the contract. In this case, we will reimburse the supplier for the partial service he has provided.
5. We reserve property rights and copyrights to our images, drawings, calculations and other documents; they may not be made accessible to third parties without our express written consent. They are to be used exclusively for production based on our order; After the order has been processed, they and any copies thereof are to be returned to us without being asked. They are to be kept secret from third parties, in this respect the regulation of § 12 Paragraph 4 applies in addition.

§ 3 Prices, Terms of payment

1. The price shown in the order is binding. Unless otherwise agreed in writing, the price includes delivery "free domicile" including packaging. The return of the packaging requires a special agreement.
2. All prices include the statutory sales tax, if this is not shown separately. The legal value added tax is not included in the price. Unless otherwise agreed in individual cases, the price includes all services and ancillary services of the supplier (e.g. assembly, installation) as well as all ancillary costs (e.g. proper packaging, transport costs including any transport and liability insurance).
3. We can only process invoices if they - in accordance with the specifications in our order - state the order number shown there; The supplier is responsible for all consequences resulting from non-compliance with this obligation, unless he can prove that he is not responsible for them.
4. Unless otherwise agreed in writing, we shall pay the purchase price within 14 days of complete delivery and service (including any agreed acceptance) and receipt of a proper invoice, with a 3% discount or within 60 days of receipt of the invoice net. In the case of bank transfers, the payment is made on time if our transfer order is received by our bank before the payment deadline has expired; We are not responsible for delays caused by the banks involved in the payment process.
5. We do not owe any maturity interest. In the event of default in payment, we owe default interest in the amount of five percentage points above the base rate in accordance with Section 247 of the German Civil Code.
6. We are entitled to rights of set-off and retention as well as the objection of a non-fulfilled contract to the extent permitted by law. In particular, we are entitled to withhold payments due as long as we are still entitled to claims against the supplier from incomplete or defective services.
7. The supplier has a right of set-off or retention only for counterclaims that have been legally established or are undisputed.

§ 4 Time of delivery, Delay in delivery

1. The delivery time stated in the order is binding. Early deliveries are not permitted.
2. The supplier is obliged to inform us immediately in writing of any imminent or actual non-compliance with a delivery date, its causes and the expected duration of the delay. The occurrence of the delay in delivery remains unaffected.
3. If the supplier does not provide his service or does not provide his service within the agreed delivery time or if he is in default, our rights - in particular to withdrawal and compensation - are based on the statutory provisions. In particular, we are entitled to demand compensation instead of performance after a reasonable period has expired without result. If we demand compensation, the supplier has the right to prove that he is not responsible for the breach of duty. The regulations in paragraph 4 remain unaffected.
4. In the event of a delay in delivery, we are entitled - in addition to further legal claims - to assert a contractual penalty of 0.5% of the order value for each week of delay in delivery (excluding sales tax), however the contractual penalty is limited to 5% of the total order value (excluding sales tax). The contractual penalty can be requested in addition to performance. Claims for damages instead of and in addition to the service and the right to withdraw from the contract remain unaffected. However, the contractual penalty is to be offset against any delay damage claimed by us. In the event of the fulfillment of the delivery obligations, we can declare the reservation of the assertion of the contractual penalty until the due date of the final payment. Der Lieferant ist verpflichtet, uns über jegliche drohende oder eingetretene Nichteinhaltung eines Liefertermins, deren Ursachen und die voraussichtliche Dauer der Verzögerung unverzüglich schriftlich in Kenntnis zu setzen. Der Eintritt des Lieferverzugs bleibt davon unberührt.

§ 5 Performance, Delivery, Passing of risk, Default in acceptance

1. Without our prior written consent, the supplier is not entitled to have the services owed by him performed by third parties (e.g. subcontractors). The supplier bears the procurement risk for his services, unless otherwise agreed in individual cases (e.g. limitation to stock).
2. Delivery is "free domicile" to the location specified in the order. If the destination is not specified and nothing else has been agreed, delivery must be made to our place of business. The respective destination is also the place of performance for the delivery and any subsequent performance (obligation to provide). The supplier is obliged to provide adequate transport insurance. With the elimination of the SVS / RVS as of June 30, 1998, any declarations made regarding the ban customers / partial ban are no longer valid. We have been a waiver customer in the freight forwarding agreement since July 1st, 1998.

3. The delivery must be accompanied by a delivery note stating the date (issue and dispatch), content of the delivery (article number and quantity) and our order identifier (date and number). If the delivery note is missing or incomplete, we are not responsible for any resulting delays in processing and payment. A corresponding dispatch note with the same content must be sent to us separately from the delivery note.
4. The risk of accidental loss and accidental deterioration of the item is transferred to us upon delivery at the place of performance. If acceptance has been agreed, this is decisive for the transfer of risk. The statutory provisions of the law on contracts for work and services also apply accordingly to acceptance. The handover or acceptance is the same if we are in default of acceptance.
5. The statutory provisions apply to the occurrence of our default in acceptance. However, the supplier must also expressly offer us its services if a specific or definable calendar time has been agreed for an action or cooperation on our part (e.g. provision of material). If we are in default of acceptance, the supplier can demand reimbursement of additional expenses in accordance with the statutory provisions (Section 304 BGB). If the contract concerns an unjustifiable item to be manufactured by the supplier (custom-made product), the supplier is only entitled to further rights if we are obliged to cooperate and are responsible for the failure to cooperate.
6. The supplier is not entitled to make partial deliveries without our prior written consent.
7. Even if shipping has been agreed, the risk is only transferred to us when the goods are handed over to us at the agreed destination.

§ 6 Quality, Documentation

1. The supplier must comply with the recognized rules of technology, the safety regulations and the agreed technical data for his deliveries. He guarantees compliance with the "Quality Assurance Agreement for Suppliers of WEBER-HYDRAULIK GMBH", which is made available to him free of charge at any time upon request.
2. The supplier must document compliance with our "Quality Assurance Agreement for Suppliers of WEBER-HYDRAULIK GMBH" for deliveries and the measures taken for this in a suitable form. After prior written notification, we are entitled to check compliance with these guidelines in the supplier's works by our agents during normal working hours.

§ 7 Inspection of defects, Warranty

1. The statutory provisions apply to our rights in the event of material and legal defects in the goods (including incorrect and short deliveries as well as improper assembly, defective assembly, operating or operating instructions) and for other breaches of duty by the supplier, unless otherwise specified below.
2. According to the statutory provisions, the supplier is particularly liable for ensuring that the goods have the agreed quality when the risk is transferred to us. In any case, those product descriptions which - in particular by designation or reference in our order - are the subject of the respective contract or are included in the contract in the same way as these purchasing conditions apply as an agreement on the quality. It makes no difference whether the product description comes from us, the supplier or the manufacturer.
3. We do not waive warranty claims through acceptance or approval of submitted samples.
4. Notwithstanding Section 442, Paragraph 1, Sentence 2 of the German Civil Code, we are entitled to unlimited claims for defects even if the defect was unknown to us at the time the contract was concluded due to gross negligence.
5. The statutory provisions (§§ 377, 381 HGB) apply to the commercial inspection and notification obligation with the following stipulation: Our inspection obligation is limited to defects that emerge during our incoming goods inspection under external assessment including the delivery papers (e.g. transport damage, Wrong and underdelivery) or are recognizable during our quality control in the random sampling procedure. If acceptance has been agreed, there is no obligation to examine. In addition, it depends on the extent to which an investigation is feasible in the normal course of business, taking into account the circumstances of the individual case. Our obligation to notify us for defects discovered later remains unaffected. Irrespective of our duty to inspect, our complaint (notification of defects) is deemed to be prompt and timely if it is sent within 7 working days of discovery or, in the case of obvious defects, of delivery.
6. If we discover a defect in the delivered products, we are entitled to charge a flat fee of € 100 plus sales tax for testing the product and creating a test report. This does not exclude the assertion of higher costs for the inspection and examination of delivered defective goods from the point of view of damages.
7. Subsequent performance also includes the removal of the defective goods and their reinstallation, provided that the goods have been incorporated into another item or attached to another item in accordance with their type and purpose, our statutory right to reimbursement of corresponding expenses remains unaffected. The supplier bears the expenses necessary for the purpose of testing and subsequent performance even if it turns out that there was actually no defect. Our liability for damages in the event of an unjustified request to remedy defects remains unaffected; In this respect, however, we are only liable if we recognized or did not recognize through gross negligence that there was no defect.

8. Without prejudice to our legal rights and the regulations in Section 6, Paragraph 7, the following applies: If the supplier does not meet his obligations for subsequent performance - at our option by removing the defect (repair) or by delivering a defect-free item (replacement delivery) - within one of If we do not follow a reasonable deadline set by us, we can remedy the defect ourselves and demand compensation from the supplier for the expenses required for this or a corresponding advance payment. If the supplementary performance by the supplier has failed or is unreasonable for us (e.g. due to particular urgency, risk to operational safety or impending occurrence of disproportionate damage), no deadline is required; We will inform the supplier of such circumstances immediately, if possible in advance.
9. In addition, in the event of a material or legal defect, we are entitled to reduce the purchase price or withdraw from the contract in accordance with the statutory provisions. In addition, we are entitled to compensation for damages and expenses in accordance with the statutory provisions.
10. Upon receipt of our written notification of defects by the supplier, the limitation period for warranty claims is suspended until the supplier rejects our claims or declares the defect to have been eliminated or otherwise refuses to continue negotiations on our claims. In the case of replacement deliveries and the removal of defects, the warranty period for replaced and reworked parts begins again, unless we had to assume, based on the supplier's behavior, that the supplier was not obliged to take the action, but only carried out the replacement delivery or removal of defects for reasons of goodwill or similar reasons.

§ 8 Product liability, Indemnity, Third-party insurance

1. If third parties assert claims for damages based on product liability against us, the supplier is obliged to exempt us from such third party claims at the first request if the cause is in his sphere of control and organization and he is himself liable in the external relationship. This is especially the case if the cause of the existing or alleged defect lies in the products delivered by the supplier or if the supplier has failed to inform us of any risks associated with the use and installation of the products delivered by the supplier. This does not exclude the applicability of § 254 BGB. This indemnity obligation does not apply if the claim is based on gross negligence or willful breach of duty on our part.
2. Within the scope of his indemnification obligation, the supplier has expenses according to To reimburse §§ 683, 670 BGB, which result from or in connection with a claim by third parties including recall campaigns carried out by us. We will inform the supplier about the content and scope of recall measures - as far as possible and reasonable - and give him the opportunity to comment. Further legal claims remain unaffected. The validity of § 254 BGB is not excluded.
3. The supplier undertakes to take out product liability insurance with a coverage of € 10 million per personal injury / property damage - lump sum; if we are entitled to further claims for damages, these remain unaffected.

§ 9 Intellectual property rights of third parties

1. The supplier guarantees that the products he supplies do not infringe any third-party property rights in countries of the European Union or other countries in which he manufactures the products or has them manufactured.
2. If half claims are made against us by a third party, the supplier is obliged to release us from these claims upon first written request; we are not entitled to make such agreements with the third party without the consent of the supplier, in particular to conclude a settlement.
3. The supplier's obligation to indemnify relates to all expenses that we incur from or in connection with claims by a third party.
4. Our further legal claims due to legal defects in the products delivered to us remain unaffected. Claims based on legal defects become statute-barred 36 months after the transfer of risk.
5. § 254 BGB applies.

§ 10 Recourse against the supplier

1. We are entitled to our statutory recourse claims within a supply chain (supplier recourse according to §§ 445a, 445b, 478 BGB) in addition to the claims for defects. In particular, we are entitled to demand exactly the type of supplementary performance (repair or replacement delivery) from the supplier that we owe to our customers in individual cases. This does not restrict our statutory right to choose (Section 439 Paragraph 1 BGB).
2. Before we recognize or fulfill a defect claim asserted by our customer (including reimbursement of expenses in accordance with §§ 445a Paragraph 1, 439 Paragraph 2 and 3 BGB), we will notify the supplier and ask for a written statement, briefly explaining the facts. If a substantiated statement is not made within a reasonable period of time and if no amicable solution is found, the claim for defects actually granted by us shall be deemed owed to our customer. In this case, the supplier is responsible for providing evidence to the contrary.
3. Our claims from supplier recourse also apply if the defective goods are received by us or another entrepreneur, e.g. by incorporating it into another product.

§ 11 Statute of limitation

1. The mutual claims of the contracting parties expire in accordance with the statutory provisions, unless otherwise specified below.
2. Deviating from Section 438 (1) No. 3 BGB, the general limitation period for claims for defects is 3 years from the transfer of risk. If an acceptance has been agreed, the limitation period begins with the acceptance. The 3-year limitation period applies accordingly to claims arising from defects of title, whereby the statutory limitation period for real claims for surrender by third parties (Section 438 (1) No. 1 BGB) remains unaffected; In addition, claims based on

defects of title do not become statute-barred as long as the third party can still assert the right against us - especially in the absence of a statute of limitations.

3. The statute of limitations of the sales law including the above extension apply - to the legal extent - for all contractual claims for defects. Insofar as we are also entitled to non-contractual claims for damages due to a defect, the regular statutory limitation (§§ 195, 199 BGB) applies, unless the application of the limitation periods of the sales law in individual cases leads to a longer limitation period.

§ 12 Replacement parts

1. The supplier is obliged to keep spare parts for the products delivered to us for a period of at least 15 years after delivery.
2. If the supplier intends to discontinue the production of spare parts for the products delivered to us, he will inform us of this immediately after the decision to discontinue. This decision must - subject to paragraph 1 - be made at least 12 months before production is discontinued.

§ 13 Retention of title, Provision of parts, Tools, Confidentiality

1. If we provide parts to the supplier, we reserve title to them. Processing and transformation by the supplier are carried out for us. If our reserved goods are processed with other items that do not belong to us, we acquire co-ownership of the new item in the ratio of the value of our item (purchase price plus VAT) to the other processed items at the time of processing.
2. If the item provided by us is inseparably mixed with other items that do not belong to us, we shall acquire co-ownership of the new item in the ratio of the value of the reserved item (purchase price plus VAT) to the other mixed items at the time of mixing. If the mixing takes place in such a way that the supplier's item is to be regarded as the main item, it is agreed that the supplier shall transfer a proportion of the joint ownership to us; the supplier shall keep the sole ownership or joint ownership for us.
3. We reserve title to tools; the supplier is obliged to use the tools exclusively for the production of the goods we have ordered. The supplier is obliged to insure the tools belonging to us at replacement value at his own expense against fire, water and theft damage. At the same time, the supplier hereby assigns to us all claims for compensation from this insurance; We accept the assignment. The supplier is obliged to carry out any necessary maintenance and inspection work as well as all maintenance and repair work on our tools in good time at his own expense. He must notify us immediately of any malfunctions; if he culpably fails to do so, claims for damages remain unaffected. The supplier is obliged to return the tools we own to us upon first request. In relation to us, the supplier is considered to be the servant of such tools; he is not entitled to his own right of possession. Any rights of retention of the supplier to such tools are excluded - regardless of the legal reason.

4. The supplier is obliged to keep all images, drawings, calculations and other documents and information received strictly confidential. They may only be disclosed to third parties with our express consent. The confidentiality obligation also applies after this contract has been completed; it expires if and to the extent that the manufacturing system contained in the illustrations, drawings, calculations and other documents has become generally known.
5. Insofar as the security interests to which we are entitled in accordance with paragraph 1 and / or paragraph 2 exceed the purchase price of all our unpaid reserved goods by more than 10%, we are obliged to release the security interests at our discretion at the request of the supplier.

§ 14 Compliance with statutory provisions

1. In connection with each delivery item or each service provided, the supplier must ensure compliance with all statutory provisions, ordinances and other regulations, in particular all safety and environmental provisions. In particular, the regulations of the European directives must be observed for all deliveries.
2. The supplier is obliged to comply with the requirements and obligations in connection with substance bans in accordance with statutory provisions and ordinances for each individual delivery item. This applies in particular to the requirements and obligations of the REACH regulation EC No. 1907/2006, the RoHS directive RL 2011/65 EU in its currently applicable version, including the respective changes and additions, and their implementation in national law by the member states of the EU . At our request, the supplier will provide us with written product-specific declarations of conformity, which also apply to our customers and which we can pass on to our customers.
3. The supplier is obliged to adhere to the relevant export restrictions and to notify us in writing of any authorization requirements for (re-) exports of his goods in accordance with German, European and US export and customs regulations as well as the export and customs regulations of the country of origin of his goods immediately upon ordering to inform. The supplier will reimburse us for all additional costs and other damage that we incur due to incomplete or incorrect information, insofar as it is responsible for these.

§ 15 Export control, Import regulations

1. The supplier acknowledges and undertakes, in the event of an intended provision of information, products, goods, materials, services or technology (hereinafter referred to as goods) to us, of which the supplier is aware or, after careful examination, gives reason for acceptance has that the restrictions in German, EU, US or other applicable regulations (e.g. licensing obligations, personal or country-related sanctions) are subject to us immediately and before the export, re-export, transfer, disclosure or provision of the controlled goods via them Inform about restrictions. As far as the supplier is aware, the supplier should inform us where

these are listed (e.g. on the US Commerce Control List) and which restrictions apply to export, re-export, the transfer, disclosure or provision of the controlled goods under the applicable regulations.

2. The supplier shall, at its own expense, obtain and retain any stateily authorizations, permits, approvals, registrations, permits or licenses that the supplier may need to export, re-export, pass on, disclose or provide goods under this agreement.
3. The supplier further acknowledges that he will cooperate with us by providing us with information and other support on request that are required for the export qualification, export documentation and issuing of export permits (if necessary) for the inspected goods.
4. In any case, the supplier guarantees that it will not export, re-export, pass on, disclose or make available controlled goods without our express prior written consent.

§ 16 Assignment

The supplier is not entitled to assign his claims from the contractual relationship to third parties. This does not apply if it is a question of money claims.

§ 17 Applicable law. Place of jurisdiction, Place of performance, Severability

1. All contracts between us and the supplier are subject to the substantive law of the Federal Republic of Germany, excluding the provisions of international private law and excluding the provisions of the UN Sales Convention (CISG).
2. If the supplier suspends his payments, if a preliminary insolvency administrator is appointed or if insolvency proceedings are opened against the supplier's assets, we are entitled to withdraw from the contract in whole or in part or to terminate the contract. In this case, we can make use of the facilities available for the continuation of the work or the deliveries and services provided by the supplier up to now against reasonable remuneration.
3. If the supplier is a registered trader and has his seat in the European Union, Switzerland, Norway or Iceland at the time of the initiation of the procedure, the exclusive place of jurisdiction for all disputes arising from or in connection with the business relationship between us and the supplier is the seat of our company that placed the delivery order. Notwithstanding this, however, we are entitled to take legal action at any other general or special place of jurisdiction.
4. As far as the preceding paragraph 3 is not applicable, all disputes that arise in connection with the respective delivery contract or about its validity will be finally decided in accordance with the arbitration rules of the German Institution for Arbitration (DIS), excluding the ordinary legal process. The place of arbitration is Heilbronn. The language of the arbitration is German.
5. The place of performance for all obligations arising from the business relationship is the seat of our company that placed the delivery order.

6. Should a provision of this contract be or become wholly or partially ineffective / void or not feasible for reasons of the law of the general terms and conditions according to §§ 305 to 310 BGB, the statutory regulations apply. Should a current or future provision of the contract be or become wholly or partially ineffective / void or unenforceable for reasons other than the provisions relating to the law of the general terms and conditions according to §§ 305 to 310 BGB, the validity of the remaining provisions of this contract shall apply not affected, unless the execution of the contract - also taking into account the following regulations - would represent an unreasonable hardship for one party. The same applies if there is a gap that needs to be filled after the contract has been concluded. Contrary to any principle according to which a severability maintenance clause is basically only intended to reverse the burden of proof, the validity of the remaining contractual provisions should be maintained under all circumstances and thus § 139 BGB should be waived altogether. The parties will replace the ineffective / void / unenforceable provisions or gaps that need to be filled for reasons other than the provisions relating to the law of the general terms and conditions according to §§ 305 to 310 BGB with an effective provision, which in its legal and economic content of the ineffective / void / unenforceable provisions and the overall purpose of the contract. § 139 BGB (partial invalidity) is expressly excluded. If the invalidity of a provision is based on a measure of performance or time (deadline or date) specified therein, the provision must be agreed with a legally permissible measure that comes closest to the original measure.

§ 18 Data privacy

The information requirements according to Art. 13, 14 GDPR and further information on data protection can be found on our website at <https://www.weber-hydraulik.com/datenschutz/> in section 1.5 Suppliers / Customers.



GENERAL TERMS AND CONDITIONS OF SALE AND DELIVERY ("TERMS OF SALE") OF THE WEBER-HYDRAULIK GROUP

Version 19.2

The following General Terms and Conditions of Sale and Delivery of the WEBER-HYDRAULIK Group shall apply to all companies of the WEBER-HYDRAULIK Group with seat in Germany or Austria. These companies are listed on the website www.weber-hydraulik.com. To the extent that the words "we", "us" or "our" are used in the following General Terms and Conditions of Sale and Delivery (hereinafter referred to as "Terms of Sale"), such shall refer to the respective company of the WEBER-HYDRAULIK Group to which the contract was awarded by the Ordering Party.

Section 1 General Provisions, Scope

1. Our Terms of Sale shall apply only to entrepreneurs as well as to legal entities under public law or special assets under public law in accordance with Section 310 [1] BGB [*German Civil Code*].
2. Our Terms of Sale shall apply exclusively; we do not acknowledge any terms to the contrary or any deviating terms used by the Ordering Party (hereinafter also referred to as the "Customer"), unless such have been expressly approved by us in writing.

Our silence regarding such deviating provisions shall in particular not be interpreted as acknowledgement or approval thereof, neither with respect to future contracts.

Our Terms of Sale shall apply in lieu of any general terms and conditions used by the Ordering Party, even if we accept the order of the Ordering Party without reservation although we are aware that terms of the Ordering Party contrary to or deviating from our Terms of Sale exist, or if we effect delivery although the Ordering Party has pointed out that his general terms and conditions apply - unless we have expressly waived the application of our Terms of Sale.

The exclusion of the general terms and conditions of the Ordering Party shall also apply if these Terms of Sale do not include any special stipulations for individual aspects requiring regulation.

By accepting our acknowledgement of order, the Ordering Party expressly acknowledges that he waives any demurrer that may be derived from his general terms and conditions.

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LEADERSHIP IN HYDRAULIC SOLUTIONS

Kreissparkasse Heilbronn
Commerzbank Heilbronn
Volksbank im Unterland
Deutsche Bank Stuttgart

SWIFT/BIC: HEISDE66
SWIFT/BIC: DRESDEFF620
SWIFT/BIC: GENODES1VLS
SWIFT/BIC: DEUTDESS620

IBAN: DE37 6205 0000 0005 7848 33
IBAN: DE61 6208 0012 0702 0417 00
IBAN: DE75 6206 3263 0015 2630 02
IBAN: DE53 6207 0081 0015 9160 00

Sitz der Gesellschaft: Güglingen, Amtsgericht Stuttgart
HRB 320 054, Ust-IdNr.: DE 145 786 047
Geschäftsführer: Christine Grotz, Jürgen Lotter
Vorsitzender des Aufsichtsrates: Alfred Hagebusch



3. Our Terms of Sale shall also apply to all future orders, without requiring express agreement on their incorporation in each specific case; they shall also apply if we effect delivery to the Ordering Party without reservation although we are aware that the Ordering Party uses terms and conditions contrary to or deviating from our Terms of Sale.
4. All and any agreements entered into between us and the Customer for the execution of the contract shall be made in writing.
5. Our Terms of Sale shall apply in particular to contracts governing the sale and/or delivery of movable property (hereinafter referred to as “goods”), irrespective of whether we manufacture the goods ourselves or purchase them from our suppliers (Sections 433, 651 BGB). Unless otherwise agreed, the present Terms of Sale shall apply as a framework agreement also for similar future contracts in the version applicable at the time the order was placed by the Ordering Party and/or in the text form last communicated [*“text form” as defined under § 126b BGB - German Civil Code-*] to the Ordering Party, without any requirement on our part to refer to them in each individual case.
6. Any individual agreements entered into with the Ordering Party in individual cases (including collateral agreements, supplements and changes) shall in any event have priority over these Terms of Sale. Subject to proof to the contrary, the contents of such agreements shall be governed by a written contract and/or our written acknowledgement.
7. Our employees shall not be entitled to add to the contractual content or deviate from such content. Such shall not apply to our responsible bodies or persons vested with general commercial power of representation [*German “Prokura”*] or to persons specifically authorized by the latter to this effect.
8. Legally relevant declarations and notifications from the Ordering Party relating to the contract (e.g. setting deadlines, dunning letters, withdrawal) must be given in writing, i.e. in written or text form (e.g. letter, email, fax). Legal formal requirements and additional supporting evidence, in particular in cases of doubt relating to the lawful entitlement of the declaring party shall remain unaffected hereby.
9. Any reference to the application of statutory provisions shall be for the purpose of clarification only. The statutory provisions shall also apply without such clarification, unless they are directly modified or explicitly excluded by these Terms of Sale.

Section 2 Offer, Conclusion of Contract, Tender Documents, Changes, Quotes

1. Our offers are without obligation and non-binding. Such shall not apply if a written offer has been explicitly stipulated as legally binding.



2. The order of the goods or the order placed by the Customer shall be deemed a binding contract offer. We can accept orders or commissions within 14 days of their receipt.
3. Within the framework of order placement, the Customer must provide us with all customer-specific requirements and documentation necessary for the execution of the order, including but not limited to technical drawings, test instructions, raw material analyses etc. The Customer must in particular notify us of the tolerances and standards which must be observed. The Customer shall be liable for ensuring that all the documentation and information are correct. We shall not be liable for any defects resulting from any errors in this documentation or information.
4. Acceptance can be declared either in writing (e.g. by way of acknowledgement of order) or by delivering the goods to the Customer.
5. Each order shall be governed by our written acknowledgement of order. If the Customer has any objections as to the contents of the acknowledgement of order, he must oppose such acknowledgement of order without delay. Otherwise the contract shall take effect in accordance with the acknowledgement of order. In the event of any deviations in the content of drawings the specifications in the acknowledgement of order shall be authoritative.
6. We shall be entitled to make structural modifications to the products delivered by us insofar as such modifications are the result of enhancements of the respective series product and if the modified products are at least commercially and technically equivalent to the products ordered by the Customer and can be used by the Customer the same way as the products originally to be delivered.
7. If our scope of services needs to be modified due to missing or incorrect information provided by the Customer, we shall be entitled to effect such modifications; any costs or damage incurred thereby must be reimbursed to us by the Customer.
8. Any information provided by us relating to the subject-matter of the delivery or service (e.g. weights, dimensions, values in use, capacity, tolerances and technical specifications) as well as any depictions thereof provided by us (e.g. drawings and images) shall only be deemed approximately authoritative unless the usability of such information for the contractually intended purpose requires precise conformity. These shall not constitute guaranteed characteristics but are descriptions or designations of the delivery or service. Deviations customary in the trade and deviations which are the result of legal provisions or which represent technical improvements as well as the replacement of components by equivalent parts shall be permissible insofar as they do not adversely affect the usability for the contractually intended purpose.
9. We reserve title and copyrights to all and any images, drawings, calculations and other documents of companies of the WEBER-HYDRAULIK Group. Irrespective of whether such records are protected by law they constitute valuable company knowhow. Therefore, disclosure to any third party or commercial use by the Ordering Party beyond the purpose of the respective delivery contract shall



require our express consent. Such shall not apply to documents or records that are generally known and in the public domain.

Section 3 Prices, Terms of Payment

1. Unless otherwise provided for in the acknowledgement of order our prices shall be “ex works”, exclusive of value-added tax, packaging, transportation and insurance. Any customs duties, fees, taxes and other public dues shall be borne by the Customer.
2. Our prices are exclusive of the statutory value-added tax; it will be indicated separately at the statutory rate on the date of the invoice and must be paid separately by the Ordering Party.
3. In the case of sale by dispatch (item 7.1 hereof) the Customer shall bear the transportation costs ex warehouse as well as the costs of any transport insurance that the Customer may require. If we do not charge the transport costs actually incurred in the individual case, a flat-rate transport fee shall be deemed agreed (exclusive of transport insurance) at a rate of 3% of the net value of the goods. Any customs duties, fees, taxes and other public dues shall be borne by the Customer.
4. Deduction of discounts shall only be permissible if such has been specifically agreed in writing.
5. Unless otherwise provided for in the acknowledgement of order the purchase price shall be due for payment net (without deduction) within 14 days of the date of the invoice. However, even within the scope of an ongoing business relationship we shall be entitled at any time to effect delivery, in whole or in part, only with advance payment. The respective reservation will be made with the acknowledgement of order at the latest.
6. Upon expiration of the aforesaid term of payment the Customer will be in default of payment. During default the purchase price shall bear interest at the statutory rate of default interest applicable at the time. We reserve the right to assert further damages caused by the delay. With respect to merchants our claim for payment of the commercial default interest (Section 353 HGB [*German Commercial Code*]) shall be unaffected. Payment shall be deemed effected in due time if it is received on our account within the deadline.
7. The Customer may only offset counterclaims that are undisputed, recognized by us and recognized by non-appealable judgment or that are in reciprocity to our claims. Furthermore, the Customer may only enforce a right of retention if his counterclaim is based on the same contractual relationship. If the delivery is defective the counterclaims of the buyer shall remain unaffected, in particular in accordance with item 9.4 of these Terms of Sale.
8. If, after conclusion of the contract it becomes apparent that our claim to the purchase price is at risk due to the Customer’s inability to perform (e.g. filing of application for the initiation of insolvency

proceedings), based on statutory provisions we shall be entitled to refuse performance and – after setting a deadline, if applicable, to withdraw from the contract (Section 321 BGB). In the case of contracts on the production of non-fungible goods (custom-made items) we shall have the right to withdraw from the contract immediately; the statutory provisions on the waiver of deadlines shall remain unaffected.

9. If it has been agreed that delivery shall be effected more than 4 months after conclusion of the respective delivery contract we reserve the right to reasonably adjust the delivery prices if and to the extent that such is necessary on account of an increase in material or energy costs and/or a general wage increase in the metal industry affecting our company. If such results in a price increase of more than 10% the Ordering Party shall be entitled to withdraw from the contract.

Section 4 Sampling/Approval

1. Unless otherwise agreed, sampling will be carried out before the commencement of serial production of the products to be delivered by us. After sampling an initial sample test report will be prepared.
2. Upon delivery of the initial samples and the initial sample test report the Customer must review the same and, if no defects are found, declare his approval within a reasonable period of time. Approval may also be provided by the Customer by placing an order for serial production of the parts to be delivered by us after receipt of the initial sample test report. The order placement shall then be deemed the declaration of approval.

Section 5 Duty of Information of the Customer

1. If the respective specifications are not provided in the documentation indicated under item 2.3 hereof, the Customer must provide us with all necessary information required for proper and correct production of the products to be delivered by us by commencement of serial production at the latest. This shall include but not be limited to detailed information on the handling of the parts.
2. The Customer undertakes to inform us if usage of the products to be delivered by us is associated with specific risks. Such applies in particular to use of the products to be delivered by us in safety-relevant areas, such as the automotive sector, medical engineering, aerospace and armaments.

Section 6 Delivery, Time of Delivery, Delay in Delivery

1. Any binding periods and dates for delivery must be expressly agreed in writing. In case of non-binding or approximate (approx., around, about etc.) delivery periods or dates we shall use our best efforts to comply with these periods or dates. If a specific calendar week has been agreed as time of delivery,

we shall have the right to effect delivery or performance up until and including the Sunday of such calendar week.

2. The delivery time results from the agreements concluded in accordance with the acknowledgement of order. Compliance with such shall require that all and any commercial and technical issues have been clarified and the Customer has fulfilled all of his obligations and, in particular, has provided a sufficient amount of any transport boxes or containers that may be required. If this is not the case, the time period for delivery will be reasonably extended. Such shall not apply if and to the extent that we are responsible for the delay.
3. The delivery time shall be deemed met if the delivery item has left our premises by the time the delivery period expires or if readiness for dispatch has been notified. If dispatch and/or acceptance of the delivery item is delayed for reasons for which the Customer is responsible we will charge him for the costs incurred by such delay, commencing one month after notification of readiness for dispatch and/or acceptance.
4. A delivery period or date agreed with the Ordering Party shall be deemed adequately extended if after placement of an order technical problems arise or technical issues require clarification for reasons for which we are not responsible.
5. If our Customer is in default of acceptance or otherwise culpably breaches duties of cooperation, we shall have the right to claim compensation for the damage incurred by us in this respect, including any additional expenses which may have been incurred. The right to assert any further claims shall be reserved. If the aforesaid condition is met the risk of accidental loss or accidental deterioration of the delivery item shall pass to our Customer at the point in time the Customer is in default of acceptance or in debtor's delay.
6. Whenever goods cannot be delivered for reasons for which we are not responsible, any costs incurred by us must be reimbursed. Our Customer shall be entitled to claim delivery of the delivery item manufactured inclusive of ancillary services, unless he is responsible for the non-delivery.
7. Upon expiration of an additional time period set by the Ordering Party in accordance with Section 323 BGB we shall have the right to ask the Ordering Party to declare within a time period of 10 days whether he insists that the contract be executed or whether he avails himself of his right to withdraw from the contract. If no such declaration is made by the Ordering Party within this time period we shall be entitled to withdraw from the contract.
8. We shall only be entitled to effect partial deliveries and partial services if
 - the partial delivery can be used by the Customer within the framework of the contractually intended purpose,
 - delivery of the remaining goods ordered is ensured.

9. If we are in default of delivery, the Customer must first grant us a reasonable grace period of at least 30 days – provided that this period is not unreasonable – in order to render performance. If this time period elapses without result, any claims for damages for breach of duty – irrespective of the reason thereof – shall apply only subject to the provisions of item 6.10 below.
10. If the Customer incurs any damage on account of our delayed delivery, he shall have the right – to the exclusion of any further claims – to claim compensation for the delay. Such compensation shall amount to 0.25% of the net payment for each commencing week that the delivery of the goods and/or service as a whole is in default, however not exceeding 2.5% of the net remuneration of the total delivery and/or total service which, due to the delay, cannot be delivered and/or provided by us in time or in accordance with the contract. Any further compensation paid by us for the damage caused by the delay shall be excluded. Such shall not apply if we have acted on intent, with gross negligence or maliciously, in the case of claims for injury to life, limb or health, in the case of default and if a fixed date of delivery within the meaning of the law has been agreed and a performance guarantee has been given or a procurement risk has been assumed in accordance with Section 276 BGB and in the case of compulsory statutory liability. We reserve the right to prove that no damage occurred at all or that the damage was considerably less.

Section 7 Passing of Risk, Packaging, Acceptance, Default in Acceptance

1. Unless otherwise specified in the acknowledgement of order, delivery shall be effected “ex works” (Incoterms 2010), which shall also be the place of performance for delivery and supplementary performance (if applicable). Upon request of the Customer and at his expense the goods will also be shipped to another point of destination (sale by dispatch). Unless otherwise agreed, we shall have the right to determine the respective type of shipment (in particular select the shipping company, dispatch route, packaging) ourselves.
2. Transport packaging as well as all other packaging in accordance with the Packaging Ordinance will not be taken back, with the exclusion of pallets. The Ordering Party undertakes to arrange for the disposal of the packaging at his own expense.
3. The risk of accidental loss and accidental deterioration shall pass to the Ordering Party as soon as the goods have left our premises, an external warehouse or, in the case of direct delivery of goods not manufactured by us, the warehouse of the sub-supplier. However, in the case of sales by dispatch the risk of accidental loss and accidental deterioration of the goods as well as the risk of delay shall already pass with delivery of the goods to the carrier, forwarding agent or other person or entity charged with the shipping of the goods. If acceptance has been agreed, such acceptance shall be authoritative for the passing of risk. In other respects, the statutory provisions of the law on contracts for work and services [*German “Werkvertragsrecht”*] shall also apply mutatis mutandis if acceptance has been agreed. Default in acceptance by the buyer shall be equivalent to delivery or acceptance. The

risk of accidental loss and accidental deterioration shall pass to the Customer with delivery at the latest.

4. If dispatch or collection of the goods is delayed as a consequence of circumstances for which the Ordering Party is responsible, risk shall pass to the Ordering Party with receipt of the notification of readiness for dispatch. In this case, after setting a reasonable time period that has however expired without results, we are entitled to otherwise dispose of the delivery items and to provide delivery to the Ordering Party with a reasonably extended term of delivery.
5. Warehouse costs incurred after the passing of risk shall be borne by the Customer. If the goods are stored in our warehouse, warehouse costs shall amount to 0.25% of the invoice amount of the stored delivery items for each completed week of storage. Assertion and proof of further storage costs shall be reserved.
6. If acceptance needs to be performed, the purchase item shall be deemed accepted, if and when
 - delivery and – if installation is also owed by us – installation is/are completed,
 - we have informed the Customer thereof pointing out the assumed acceptance as per this item 7 6. and have asked him to accept the goods,
 - 6 working days have passed since delivery or installation or if the Customer has started using the purchase item (e.g. has put the equipment delivered into operation) and if, in this case, 6 working days have passed since delivery or installation and
 - the Customer has failed to effect acceptance within this time period for a reason other than a defect notified to us that renders impossible or significantly impairs the use of the purchase item.

Section 8 Provision of Goods / Incoming Goods Inspection

1. The Customer must deliver the goods in such a way as to ensure that article name, quantity and weight are clearly visible and unambiguous identification is possible.
2. Upon receipt, we shall only inspect the goods of the Customer for external damage of packaging, boxes and the goods themselves. We will inform the Customer of any defects which may have been detected within 10 working days.
3. If damage occurs to the material provided by the Customer during the manufacturing process as a result of a breach of the obligations stipulated in items 5.1 or 5.2 hereof, we shall not be liable for this. If any damage or loss is incurred by us on account of this the Customer shall be obliged to provide compensation thereof.

Section 9 Liability for Defects

1. Unless otherwise provided for in the following, the provisions laid down by law shall apply to the rights of the buyer in the case of material defects and defects of title (including incorrect delivery and short delivery as well as improper assembly or faulty assembly instructions). The special provisions laid down by law relating to end delivery of unprocessed goods to a consumer, even if the latter has processed the goods, shall remain unaffected (supplier recourse as per Section 478 BGB). Claims from supplier recourse shall be excluded if the defective goods were further processed either by the buyer or another entrepreneur, e.g. by incorporation into another product.
2. The claims for defects asserted by the Customer require that he has observed his statutory obligations regarding inspection and reporting (Section 377, 381 HGB). If a defect is detected upon delivery, during inspection or at any later point in time we must be notified hereof in writing without delay. In any case, apparent defects must be reported in writing within 7 working days from delivery and any defects that were not apparent during inspection must be notified in writing within the same time period after detection. If the buyer fails to duly inspect the goods and/or fails to notify the defect, our liability shall be excluded for the defect that was not notified and/or not notified in time or not notified in the proper form or manner in accordance with the legal provisions.

We shall have the right to set up adequate guidelines specifying how the products delivered by us shall be inspected immediately upon receipt.

3. If the purchase item is defective, we shall, at our discretion, be entitled to effect supplementary performance by either remedying the defect or by delivering a new item free from defect in replacement. Our right to refuse supplementary performance if the respective conditions under statutory law are met shall be unaffected hereby. In the event of remedy of defect, we shall be under the obligation to bear all expenses required to remedy the defect, including but not limited to transport, travel, labour and material costs insofar as these costs are not increased by taking the purchase item to a place other than the place of delivery.
4. We shall have the right to make the supplementary performance owing conditional on the buyer paying the due purchase price. However, the buyer shall have the right to retain a part of the purchase price proportionate to the defect.
5. The buyer must grant us the necessary time and opportunity for the supplementary performance owed by us and must, in particular, provide us with the rejected goods for inspection or verification purposes. In the case of replacement delivery, the buyer must return the defective goods to us in accordance with the provisions laid down by law. If we were not originally under the obligation to incorporate the goods, supplementary performance shall include neither the disassembly of the defective item nor its re-incorporation.

6. We shall be entitled to refuse supplementary performance if the total expenditure required for this amounts to more than 20% of the purchase price. The right of the buyer in such case to either reduce the purchase price or to withdraw from the contract, provided the respective statutory provisions are met, shall be unaffected hereby; the following item 11 hereof shall apply with respect to the respective claims for damages.
7. Item 11 hereof shall apply to claims for damages the buyer may have on account of defects in the products delivered by us and/or for compensation of wasted efforts.
8. The expenditure required for inspection and supplementary performance, including but not limited to transport, travel, labour and material costs as well as costs of assembly and disassembly, if applicable, shall be borne or refunded by us in accordance with the statutory provisions, if a defect actually exists. If products delivered by us are inspected by us as a consequence of a notification of defect by the Customer and the notification of defect turns out to be unfounded, the Customer shall bear the costs incurred hereby (in particular inspection and transport costs), which will be charged to him in accordance with our standard rates for maintenance and service work, unless the lack of defectiveness was not discernible for the buyer.
9. In the case of defects in components from other manufacturers which cannot be remedied by us for licencing or factual reasons we will, at our discretion, assert our warranty claims against the manufacturers and suppliers for the account of the Customer or will assign such claims to the Customer. In case of such defects, warranty claims can only be asserted against us if the respective other conditions are met and in accordance with the stipulations in these Conditions for Sale if legal enforcement of the aforesaid claims against the manufacturer and supplier was not successful or is futile, e.g. due to insolvency.
10. All and any liability on our part for products delivered by us shall become extinct if the products delivered by us are modified by the Customer, unless the Customer provides proof that such modifications are not the cause of the notified defect. Likewise, all and any liability on our part for defects of the products delivered shall become extinct if the products have not been maintained, cared for and used in accordance with our instructions and guidelines, unless the Customer is able to prove that deviating from our instructions and guidelines was not the cause of the defect notified by the Customer. The Customer undertakes to comply with our instructions and guidelines for maintenance, care and use of the products delivered and to document compliance in suitable form. Upon request, proof of the compliance with such instructions and guidelines must be provided to us. The warranty shall not be applicable if the Customer modifies the delivery item either himself or has it changed by a third party without the consent of the seller, rendering remedy of defect either impossible or only possible with an unreasonable amount of effort. In each case the Customer shall bear the additional costs of the remedy of the defect incurred by such modification.
11. In urgent cases, e.g. where the safety of operations is compromised or disproportionate damage needs to be prevented, the Customer shall be entitled to remedy the defect himself and claim from

us reimbursement of the expenditure necessary from an objective point of view. In such case, if the Customer remedies the defect himself, we must be notified thereof without delay - beforehand, if possible. The right of the Customer to take action himself shall not apply if we are entitled to refuse the respective supplementary performance in accordance with the provisions laid down by law.

12. If supplementary performance has failed despite two attempts or if a reasonable time period to be set by the buyer has expired without result or can be waived in accordance with the statutory provisions, the Customer shall be entitled to withdraw from the contract or to reduce the purchase price. In the event of a minor defect the right of withdrawal shall not apply.
13. In case of defects, any claims of the buyer for damages and/or compensation for expenses incurred to no avail shall only apply as stipulated under item 11 hereof and shall be excluded in all other respects.

Section 10 Liability for Software Defects

1. Following the respective notification of defects by the Ordering Party we shall remedy defects in the software supplied (software programmes and the corresponding documentation and circuits and other records) within a limitation period of 12 months from delivery. At our discretion, remedy will be effected by rectifying the defect, delivering software free from such defect or demonstrating ways to prevent the effects of the defect. At least three attempts at supplementary performance must be accepted in the event of a defect. An equivalent new software version or the equivalent previous software version without the defect must be accepted by the Ordering Party if such can be expected of him.

The limitation period shall not commence anew on account of the supplementary performance. If we refuse to carry out the supplementary performance, if the supplementary performance fails or cannot be expected of the Ordering Party, the Ordering Party shall be entitled to assert additional claims and may in particular demand a reduction of the purchase price or withdraw from the contract.

2. The software shall have the agreed properties and characteristics and shall be suited for the contractually intended use – in the absence of an agreement it shall be suited for its customary use. It shall meet the criteria of practical suitability and shall be of the quality customary for this kind of software; it is not possible to completely exclude software defects. Functional impairment of the software as a result of hardware defects, environmental conditions, operating errors or the like does not constitute a defect. A negligible reduction in quality shall not be taken into account.
3. The Ordering Party shall assist us in error analysis and remedy of defect in particular by providing a substantiated description of the problems that arise, providing comprehensive information and by granting us the time and opportunity necessary for remedying the defect. At our discretion, defects

may be remedied on site or at our business premises. Services can also be performed remotely. The Ordering Party must, at his own expense, arrange for the necessary technical requirements and must provide us electronic access to the software upon prior notification.

4. We shall be entitled to charge additional costs if the software was modified, used outside its prescribed environment or was handled incorrectly. We shall be entitled to charge compensation for expenses incurred if no defect is detected and if negligence was involved when the Ordering Party notified the defect. The burden of proof shall be with the Ordering Party. Section 254 BGB shall apply mutatis mutandis.
5. Our liability shall be excluded if the minimum requirements regarding the Ordering Party's hardware and software facilities as stated in the agreed specifications are not met, if the software is installed at the Ordering Party on different hardware to the hardware quoted in the agreed specifications without our consent, which must be provided in text form, if different software to the software disclosed to us when agreement was made on the specifications has been installed on the same hardware or connected hardware of the Customer on which the software is installed and the customer does not provide us with evidence that such different software has not caused any disruptions in the use of the delivery item and/or the software, if the Customer has modified the software without our previous consent in text form or if the Ordering Party has not used the software in accordance with its intended use.
6. Unless otherwise stipulated herein we shall not be liable for any damage that did not originate in the delivered software itself; we shall in particular not be liable for loss of data or other consequential damage. In other respects, item 11 hereof shall apply to claims for damages and claims for compensation of wasted efforts.
7. The provisions of item 9 hereof shall apply mutatis mutandis.

Section 11 Liability and Claims for Damages

1. Any claims for damages asserted by the Ordering Party against us shall be excluded insofar as neither the corporate bodies, executives, employees or other ancillary agents of WEBER-HYDRAULIK GMBH can be charged with intent or gross negligence.
2. The present limitation of liability shall not apply if obligations are breached, the fulfilment of which are essential for the proper execution of the contract and the observance of which der Customer may regularly rely on (so-called "cardinal obligations" [= *fundamental obligations going to the root of the contract*]). However, even if such essential obligations are breached – unless there is no intent or gross negligence on the part of WEBER-HYDRAULIK GMBH – the damage to be compensated in such case shall be limited to the purchase price of the respective delivery order; furthermore, the amount of the maximum damage shall be limited to the common and foreseeable damage.

3. Furthermore, the aforesaid limitation of liability shall not apply in the case of injury to life, limb or health.
4. The aforesaid limitation of liability shall apply to claims for damages of whatever kind asserted by the Ordering Party and arising out of the contractual relationship, including but not limited to damage caused by delay, damages for non-performance, damages for defects of the products delivered or for a breach of the consultation and information obligations. The aforesaid limitation of liability shall also apply to the costs for recall actions implemented by the Ordering Party as a consequence of a defect of the products delivered by us, irrespective of the fact whether the claim for compensation of costs of the Ordering Party is based on damage claims relating to tort or contractually based damage claims or on management without mandate (“negotiorum gestio”).
5. If products delivered by us are delivered to places outside the territory of the Federal Republic of Germany, we cannot assume any liability that the products do not infringe any industrial property rights of any third party. It shall always be the responsibility of the Customer to check and ensure whether the products delivered by us might infringe any industrial property rights of any third party in countries outside the Federal Republic of Germany. In this respect, the Customer undertakes to indemnify and hold us harmless from and against all and any claims asserted by any third party based on the infringement of industrial property rights. It shall always be the responsibility of the Customer to verify whether products delivered by us comply with the statutory and official rules and regulations in countries outside the Federal Republic of Germany and are compliant with the standards applicable there – unless their conformity with such statutory or official rules and regulations or standards is confirmed by us in writing.

Section 12 Retention of Title

1. We retain title to the purchase item until all payment due from the delivery contract has been received in full. If the Ordering Party acts in breach of the contract, in particular if the Ordering Party is in default of payment, we shall have the right to take back the purchase item. If we take back the purchase item such shall not constitute a withdrawal from the contract, unless such withdrawal has been expressly declared by us in writing. If we seize the purchase item such shall always constitute a withdrawal from the contract. We shall have the right to utilize the purchase item we have taken back, the proceeds resulting from such utilization shall then be offset against the amounts owed to us by the Ordering Party, less appropriate costs for utilization.
2. The Ordering Party undertakes to handle the purchase item with due care and must, in particular, adequately insure it at its replacement value at his own expense against theft and fire and water damage. If maintenance or inspection work is required the Ordering Party must carry out such work at his own expense in due time. As early as with the present, in order to secure the payment claims to which we are entitled, the Ordering Party shall assign to us all and any claims to which he may be

entitled against any third party or against the insurer due to the destruction or damage of the goods subject to retention of title. The Ordering Party undertakes to notify respective defects without delay; furthermore, upon our first request, he shall be under the obligation to disclose the assignment to the third parties or the insurer.

3. If the goods subject to retention of title are seized by third parties or in the event of other third-party interventions, the Ordering Party must inform us immediately thereof in writing so that we can file a court action in accordance with Section 771 ZPO [*German Code of Civil Procedure*].
4. The Ordering Party shall be entitled to sell the purchase item in the ordinary course of business. However, as early as with the present he shall assign to us all and any claims from such resale against his customers or third parties up to the sum total of the invoice (including VAT) of our claim, irrespective of whether the purchase item was resold without or after processing. The Ordering Party shall remain entitled to collect the claim even after assignment. Our entitlement to collect the claim ourselves shall remain unaffected hereby. However, we undertake not to collect the claim ourselves for as long as the Ordering Party meets his payment obligations using the proceeds from the resale, is not in default of payment and if, in particular, no application for the initiation of insolvency proceedings has been filed or if the Ordering Party has not discontinued his payments. However, if such is the case, we shall be entitled to demand that the Ordering Party discloses to us both the assigned claims and the respective debtors, provides all information necessary for collection, hands over the respective documentation and informs the debtors (third party) of the assignment.
5. Processing or transformation of the purchase item by the Ordering Party shall always be undertaken on our behalf. If the purchase item is processed with other products which do not belong to us, we shall acquire co-ownership of the new product in proportion to the value of the purchase item (sum total of the invoice inclusive of VAT) and the value of the other processed products at the time of processing. The same shall apply to the product created by such processing as for the purchase item delivered under retention of title.
6. If the purchase item is inseparably mixed or combined with other products not belonging to us, we shall acquire co-ownership of the new product in proportion to the value of the purchase item (sum total of the invoice inclusive of VAT) and the value of the other mixed or combined products at the time of such mixing or combining. If the purchase item is mixed or combined in such a way that the product of the Ordering Party is to be considered as the principal thing, it shall be deemed agreed that the Ordering Party shall assign to us co-ownership of this product on a pro rata basis. The Ordering Party shall store and safeguard for us the sole ownership or co-ownership thus generated.
7. The Ordering Party shall also assign to us any claims to secure the claims we have against him that may accrue against a third party by combining the purchase item with a piece of real estate.

8. Upon request of the Ordering Party, we undertake to release, at our option, the securities to which we are entitled, insofar as their realisable value exceeds the value of the claims to be secured by more than 10%.
9. If the products delivered by us are delivered to a country outside the Federal Republic of Germany that does not acknowledge the aforesaid retention of title, the Customer undertakes, upon first request, to obtain for us the respective liens and/or other security rights equivalent to the aforesaid retention of title and to take all measures that are necessary and useful in this respect. The Customer undertakes, if required, to advise us of the necessity of such liens or other security rights.

Section 13 Supply by our own Suppliers, Force Majeure

1. We shall be exempted from our obligation to effect delivery if such delivery is prevented by an event of Force Majeure. Events of Force Majeure shall include but not be limited to war, earthquake, flood and other disasters, strike, destruction of production facilities by fire or explosion – to the extent that we are not responsible for the impediment that hinders delivery, either at our site or at the site of our supplier. If the impediment continues for a duration of more than four weeks we shall, in such cases, be entitled to withdraw from the contract.
2. We shall not be liable for a delay in the delivery time if such delay is due to the fact that we are not supplied, or not supplied on time, with raw materials, components or semi-finished products by our own suppliers even though the respective cover transaction has been concluded and we are not responsible for the missing, delayed or defective delivery by the supplier and the supplier was selected by us with the customary care. In such case, we undertake to seek a replacement for the failed delivery without delay, if such replacement delivery by another supplier can be expected of us. A replacement delivery can only be expected of us if it is equivalent in price and quality to the delivery originally agreed. We undertake to inform the Ordering Party of the reasons for such delays in delivery immediately. If the delivery is delayed by more than two months as a consequence of such circumstances both we and the Ordering Party have the right to withdraw from the contract. Any payments or goods/services already received must be returned, any further claims shall be excluded.

Section 14 Software

1. If software and the related documentation are part of the deliveries and services the Ordering Party shall be granted the non-exclusive, non-transferrable, not sub-licensable and revocable right of use for internal use by the Ordering Party together with the products for which the software has been delivered. Use of the software on more than one system shall not be permitted.

Unless a specific license agreement has been concluded with us in writing, any other use of the

software and the related documentation, e.g. together with the Ordering Party's own hardware or the hardware of any third party, shall be expressly excluded.

2. We and/or the software supplier retain all and any other rights to the software and the documentation and circuits including any copies and subsequent supplements thereto. The award of sub-licenses shall not be permitted.

The Ordering Party must ensure that such software and documentation are not disclosed to any third party without our prior written consent.

3. The Ordering Party shall only be entitled to duplicate, rework, translate or convert the software from object code to source code within the scope permitted by law (Sections 69 a et. seq. German Copyright Act). Provision of source programmes shall require special written agreement. If the originals bear a copyright notice such notice must also be added to the copies by the Ordering Party.
4. Unless otherwise agreed, the right of use shall in each case be deemed granted with the acknowledgement of order and delivery of the software, the related documentation and any subsequent additions.

Section 15 Statute of Limitation

1. In derogation from Section 438 [1], number 3, BGB, the general limitation period for claims for material defects and defects of title shall be one year from delivery. If acceptance has been agreed, the limitation period shall commence with acceptance.
2. However, if the goods are a building or an object that, in conformity with its customary manner of utilization, has been used for a building and has caused its defectiveness (building material), claims will become statute-barred in five years from delivery in accordance with the statutory provision (Section 438 [1], no. 2, BGB). Any additional special provisions on limitation periods laid down by law shall remain unaffected (in particular Section 438 [1], no. 1, [3], Sections 444, 445b BGB).
3. The aforesaid limitation periods stipulated by sales law shall also apply to contractual and non-contractual claims for damages by the buyer based on a defect of the goods – unless the standard statutory limitation periods (Sections 195, 199 BGB) would, in an individual case, result in shorter limitation periods. However, claims for damages of the Customer in accordance with items 11.2. and 11.3 above as well as claims under the Product Liability Act shall become statute-barred in accordance with the statutory limitation periods exclusively.

Section 16 Confidentiality

Both parties undertake not to use any trade secrets of the other party of which they gain knowledge in the course of the collaboration or delivery for their own economic purposes beyond the purpose of the respective delivery contract or to pass them on to any third party. Obligation to confidentiality shall not apply if such trade secrets have become part of the public domain without the fault of the other party. Furthermore, obligation to confidentiality shall become extinct 5 years after the termination of the cooperation. Trade secrets shall be deemed industrial secrets within the meaning of Section 17 UWG [*German Act against unfair Competition*].

Section 17 Export Control, Import Regulations

1. In the absence of any derogating contractual agreements concluded with the Ordering Party the products delivered are intended to be placed on the market within the Federal Republic of Germany for the first time, or, in case of delivery outside the Federal Republic of Germany to the agreed country of first delivery (country of first delivery).
2. The export of specific goods by the Ordering Party from there may be subject to official authorisation – e.g. on account of their nature or intended use or final destination. If the Ordering Party exports the products delivered by us or has them exported by any third party, the Ordering Party undertakes to check this out himself and to strictly comply with the relevant export regulations and embargoes, in particular those of the European Union (EU), of Germany and/or other EU member states as well as those of the United States of America or Asian or Arab countries, if applicable, and of all third countries affected.

In addition to this, the Ordering Party is under the obligation to ensure that the required national product approvals or product registrations are obtained and that the stipulations under national law of the respective country for provision of user information in the local language as well as all import regulations are met before the Ordering Party delivers the products delivered by us to a country other than the country of first delivery agreed with us.

3. The Ordering Party will in particular check and ensure – and, upon request, provide us with proof - that
 - the products provided are not intended for military, nuclear or armaments use;
 - no deliveries of goods of US origin, of US software or US technology are made to companies and persons included in the US Denied Persons List (DPL); that without official authorisation no deliveries of goods of US origin are made to companies and persons included in the US Warning List, US Entity List or US Specially Designated Nationals and Blocked Persons List;

- no deliveries are made to companies and persons included in the List of Specially Designated Terrorists, of Foreign Terrorist Organizations, Specially Designated Global Terrorists or the EU Terrorist List or other relevant negative lists for export control;
 - no deliveries of the products supplied by us are made to military recipients;
 - no deliveries are made to recipients that have breached other provisions under export control regulations, in particular regulations of the EU or of the ASEAN countries;
 - all early warnings from the competent German authorities or the national authorities of the respective country of origin of the consignment are observed.
4. Access to and use of products delivered by us shall only be permitted if the aforesaid checks and assurances have been made by the Ordering Party; otherwise, the Customer shall refrain from the intended export and we shall be under no obligation to perform.
 5. If the products delivered by us are passed on to any third party, the Ordering Party undertakes to bind such third party in the same way as stipulated in items 17.1 – 17.4 above and to inform the third party that compliance with such legal provisions is imperative.
 6. If delivery outside the Federal Republic of Germany has been agreed, the Ordering Party shall ensure at his own expense that all national import regulations of the country of first delivery have been complied with regarding the products that are to be delivered by us.
 7. The Ordering Party shall indemnify and hold us harmless from and against all damage and expenditure resulting from the culpable breach of the aforesaid obligations stipulated in items 17.1 – 17.6.

Section 18 Choice of Law, Place of Jurisdiction, Place of Performance

1. All and any contracts concluded between us and the Supplier shall be governed by the substantive law of the Federal Republic of Germany, excluding the provisions of international private law and the UN Convention on Contracts for the International Sale of Goods (CISG).
2. If the Ordering Party is a registered trader with seat in the European Union, Switzerland, Norway or Iceland when the proceedings are initiated exclusive place of jurisdiction for all and any disputes arising out of or in connection with the business relationship between us and the Ordering Party shall be the place of business of our company that has been awarded the order. In derogation herefrom we shall however be entitled to bring an action at any other general or special legal venue before the court that has local jurisdiction at the respective place of business of the supplier.
3. To the extent that item 2 hereof shall not be applicable, all and any disputes arising in connection with the respective supply contract or its validity shall be settled by final and binding decision in accordance with the Rules of Arbitration of the German Arbitration Institute (Deutsche Institution für



Schiedsgerichtsbarkeit e.V. (DIS)) excluding the jurisdiction of the courts. Place of arbitration shall be Heilbronn. The language of the arbitration proceedings shall be German.

4. Place of performance for all obligations arising out of the business relationship shall be the place of business of our company to which the Customer has awarded the order.
5. Place of performance for delivery and payment including law suits concerning cheques and bills shall be the place of business of our company to which the Customer has awarded the order. We shall be entitled to also bring an action against the Ordering Party at his place of residence or place of business.
6. Should any of the provisions of the present General Terms and Conditions of Sale and Delivery be ineffective or void such shall not affect the effectiveness of the remaining provisions.



General operating manual

for assembly, commissioning and maintenance
of valves and hydraulic manifolds

110210_general_operating_manual
12.2020

Table of contents

Contents	Page
Important information	2
Important safety instructions	4
Transportation and storage	5
Assembly and commissioning	5
Maintenance and repairs	7
Disposal	8
Errors and troubleshooting	8
Technical Data	8

Important information

Range of validity of the operating manual

The present general operating manual exclusively refers to hydraulic components (in particular valves, manifolds, pressure sensors etc; referred to as valves in the following; but also analogously applies to electronic components) from WEBER-HYDRAULIK ValveTech GmbH. The following operating manual is aimed at the operator of the valves and the installation manufacturer and user. Among other things, it contains important safety information that should be known by the operator of the valves.

The indications of this general operating manual are to be inserted in the operating manual of the superordinate complete system. This operating manual should be kept accessible and always close to the valve or the superordinate machine installation.

Liability declaration

The declarations on liability for defects and claims for damages are listed in the general terms and conditions of WEBER-HYDRAULIK ValveTech GmbH. These are available to the customer at the latest since the conclusion of the contract.

Liability exclusion

The general terms and conditions apply. Among others, warranty and liability claims for personal and property damages are excluded if they can be traced back to one or more of the following causes:

- inappropriate use of the valve
- inadequate assembly, disassembly, commissioning and maintenance of the valve
- disregarding the operating manual
- disregarding the technical specifications of the valve
- unauthorized constructive modifications of the valve
- inappropriately conducted repairs
- action of foreign objects and acts of God

WEBER-HYDRAULIK ValveTech does not accept liability for incorrect, incomplete or missing information. We reserve the right to modifications.

Intended use

The commissioning, application and use of the valves may only occur as described in this operating manual. The valves may only be operated as components of a superordinate complete system, e.g. a machine installation and only in industrial domains as per the DIN EN ISO 4413 standard (Hydraulic fluid power - General rules and safety requirements for systems and their components).

The valves are **not approved** for the use in any of the following applications without the explicit written consent of WEBER-HYDRAULIK ValveTech:

- nuclear facility applications
- ordnance equipment
- aircraft or aerospace applications
- steering or braking systems for vehicles
- amusement rides (e.g. rollercoaster)

Intended use

- in explosive or hazardous environments, unless it is explicitly allowed by an indication of ATEX conformity

The valves are only planned for the use with hydraulic oils based on mineral oil under observation of the filtering requirements and the respective max. operating pressures, volumetric flows and temperatures (see respective data sheet of the valves). The use with other fluids is subject to the agreement of WEBER-HYDRAULIK ValveTech. Any use beyond this is not admissible.

The type label may not be removed or painted over.

All valves are checked by WEBER-HYDRAULIK ValveTech before delivery. Non-verified valves may not be installed.

Responsibility of the operator

The operator and user of the valves is responsible for the correct use. Indications in this operating manual pertaining to use, commissioning, storage and maintenance of the valves are thereby to be respected. The manufacturer and operator of the superordinate complete system, e.g. a machine installation, is responsible for the compliance with the applicable national and international safety and accident prevention measures for the specific application.

Selection and qualification of personnel

All works with or on the valves must be performed by trained and instructed persons with the required knowledge and experience. Works on electrical connections and electronic components may only be performed by an authorized expert electrician.

Explanation of symbols

Safety indications in this operating manual are marked with a symbol. The individual indications are introduced by signal words that express the extent of the danger. Indications on avoidance of dangers follow.

**DANGER**

Indicates the immediate risk of death and serious bodily harm.

**WARNING**

Indicates the risk of serious injury.

**CAUTION**

Indicates the risk of slight injury or material damages.

Important safety instructions

Following the safety indications and the applicable national and international safety directives helps in avoiding accidents, faults and errors.

When designing machines and using valves, the application-specific safety and accident prevention directives are to be respected, such as e.g. DIN EN ISO 12100 (Safety of machinery - General principles for design - Risk assessment and risk reduction) or DIN EN ISO 4413 (Hydraulic fluid power - General rules and safety requirements for systems and their components).



DANGER

Risk of death or injury due to squirting hydraulic oil under high pressure.

- Before working on valves, release pressure from hydraulic installation.
- Check pipes, tubes and screw connections of the hydraulic installation regularly.
- Immediately remedy leaks.
- Do not modify valves.



WARNING

Health hazard through skin contact with or swallowing of hydraulic oils.

- Before working on valves, drain reservoirs which are located on a higher level.
- If hydraulic oil was swallowed or has entered the bloodstream, immediately contact a physician. Do not induce vomiting. If necessary, bind limbs.



WARNING

Health hazard due to inhalation of oil mist.

- Do not directly inhale oil mists, carry respiratory protection if necessary.



CAUTION

Danger of contamination of water and soil by leaking hydraulic oil.

- Use collection containers.
- Dispose hydraulic oil adequately.
- Immediately remedy leaks.



CAUTION

Damages to the valve due to immersion in liquids.

- Do not plunge valves in liquids.

NOTE

When manipulating hydraulic oils, the respective safety regulations applicable for the product must be observed.

Transportation and storage

Packaging and transportation

- Carefully pack and unpack the valves.
- Immediately notify any transportation damages to the transporter and WEBER-HYDRAULIK ValveTech in writing.
- Keep the original packaging.
- Only transport valves in adequate closed original packaging.
- Always transport valves with dust protection.

Storage conditions

- Storing the valves:
 - at low air humidity (<65%)
 - at temperatures from -10 to +60 °C
 - without direct heat sources or sunlight
 - without exposure to ozone or ionizing radiation
 - only in adequate closed original packaging
 - always with dust protection

WEBER-HYDRAULIK ValveTech valves are usually checked with hydraulic oil in the factory and thereby protected against corrosion. If the valves were stored for more than 1 year, check for damages before assembly. If necessary, the valves can be sent to WEBER-HYDRAULIK ValveTech for inspection at added costs.

- Store seals (NBR) for max. 7 years.

NOTE

Oil residues can lead to resinification on the valves due to longer storage times.

- Remove any resinification before use.

Assembly and commissioning

The commissioning, application and use of the valves may only occur as described in this operating manual.



DANGER

Serious injury, burns or fires due to squirting hydraulic oil.

Before all works on the valves:

- Turn off the machine.
- Protect the machine against switching back on:
 - Lock main command installation and pull out key.
 - Append warning sign on the main switch.
- Switch off voltage to all lines in the hydraulic circuit.
- Release pressure from all pressure pipes and accumulators in the hydraulic circuit.

**CAUTION**

Risk of burns due to very hot valves and hydraulic connection tubes.

- Carry adequate work protection equipments (work gloves, protective goggles).
- Let all components cool off before beginning work.

Assembly conditions

- Ensure that valves or valve components remain undamaged.
 - Do not install damaged valves or valve components!
- Ensure that all seals are available and undamaged.
 - Do not install damaged seals!
- Do not directly assemble valves onto machine parts that are exposed to strong vibrations or shocks.
- Do not install valves on units that move in a jerky fashion and that do not correspond to the direction of movement of the piston.
- Assemble the valve so that no thermal overheating may occur.

Assembly

- Thoroughly clean the assembly surface/screw holes.
- Remove dust protection from the hydraulic connection.
- Assemble seals.
- Attach valve.
- Observe installation torques in the data sheet of the respective valve.
- **Slip-in valve:** tighten assembly screws in a non-distorted manner. Tighten screws crosswise.
- **Cartridge-valve:** tighten the valve at the screwing hexagon.
- Determine switch position of the valve.

NOTE

When installing valves with electrical connections or electronic components, observe the applicable directive (VDE directives or similar).

For the rated voltage it must be noted that the devices correspond to protection class III. Electrical equipment of protection class III may be only connected to low voltage systems (PELV, SELV)(IEC 60364-4-41).

Connection

- Check adequate state of the valves.
 - If necessary, remove residues or pollution.
- Connect connection lines. Observe installation indications in the data sheet of the valve.
- Ensure that all tubes and pipes are connected.
- Ensure that all screws and connections are correctly tightened.
- Fill hydraulic installation/valve with hydraulic oil.
- Bleed hydraulic installation at the highest point.
- The valve is ready for operation.

NOTE For correct bleeding of the hydraulic installation, observe the respective operating manual of the machine installation.

Operation The valves are components of a superordinate complete system.

- In order to operate this system or the superordinate machine installation, observe the corresponding operating manual.

**Decommissioning/
disassembly**

- Ensure that the hydraulic installation is pressure-less and at zero potential. If necessary, observe available pressure accumulators.
- Ensure that no components come loose or may move when letting off hydraulic oil.
- Disconnect connection lines.
- Collect exiting hydraulic oil with a container.
- Secure components that are to be held in position by the valves.
- Unscrew assembly screws of the valve.
- Remove valve and seals.

**Maintenance and
repairs**

Replacement components and sealing kits may be obtained from WEBER-HYDRAULIK ValveTech. Only use the sealing kits indicated on the data sheet of the valve.

Exchange seals

- Disassemble valves.
- Remove all seals and dispose them adequately.
- If necessary, clean valve.
- Carefully insert new seals and ensure fitting accuracy.
- Reattach valve. Thereby ensure that no seal slips out of place.
- Observe installation torques in the data sheet of the respective valve.
- Tighten assembly screws in a non-distorted manner crosswise or tighten the valve at the screwing hexagon.
- Determine switch position of the valve.

Damages/Faults

- Immediately notify the responsible person in case of damages or faults on valves or on the machine installation.
- If necessary, switch off the machine installation and secure it.

Repairs and modifications or retrofit of valves are to be exclusively performed by WEBER-HYDRAULIK ValveTech.

Disposal

- Disassemble valves.
- Drain valve until no more hydraulic oil drips out.
 - Collect hydraulic oil and dispose it adequately.
- Dispose the seals appropriately.
- Dispose the valve as metal waste.
- Dispose electronic components adequately as per the applicable regulations.

Errors and troubleshooting

- Leaks*
- If leaks occur, stop the machine.
 - Check the causes of the leaks by trained expert personnel.
 - If the valve is leaky, exchange the seals or the complete valve.
 - Do not operate the machine further with faulty valves!
- Other*
- Contact customer service.

Technical Data

- The technical data may be found in the corresponding data sheets/dimension sheets of the valves.



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Seal Kit Installation Guide

110220_installation_sealkit_e
07.2020

Manual and Safety Information

Information regarding installation, set-up and maintenance can be found in our „*general operating manual*“ on our webpage or can be provided upon request. Our operating manual must be read before any work is applied to any of our products.

Assembly, commissioning and operation, disassembly, service (including maintenance and repair) require basic mechanical/electrical/hydraulic knowledge, as well as knowledge of the appropriate technical terms. In order to ensure operating safety, these activities may therefore only be carried out by qualified technical personnel or an instructed person under the direction and supervision of qualified personnel. Qualified personnel are those who can recognize possible hazards and institute the appropriate safety measures due to their professional training, knowledge, and experience, as well as their understanding of the relevant conditions pertaining to the work to be done. Qualified personnel must observe the rules relevant to the subject area. Also observe the generally applicable, legal or otherwise binding regulations of the European or national legislation and the rules for the prevention of accidents and for environmental protection applicable in your country. The data specified in this document only serves to describe the product. No statements concerning a specific condition or suitability for a specific application can be derived from our information. The given information does not release the user from the obligation of own judgement and verification. It must be remembered that our products are subject to a natural process of wear and aging.

Installation

To install the seals use precaution. Do not use any sharp edged tools that may cut the seal and do not pass the seal over any rough or sharp surfaces. Minimize the stretch on the seal during installation. O-ring installation tools are commercially available from many seal manufacturers and tool suppliers. Screwdrivers and awls are not appropriate installation tools.

Note that the seal material must be compatible with the hydraulic fluid and assembly lubricants used in the system. Cartridges cannot be converted to a different seal material by simply changing the external seals. Most cartridge valves incorporate internal seals which can only be replaced by first disassembling the valve. Please contact us for a conversion to a different seal material.

NOTE

Before installation of the seal kit, refer to the corresponding datasheet, which can be found on our webpage at "*valve catalog*", or can be provided upon request.

Warranty

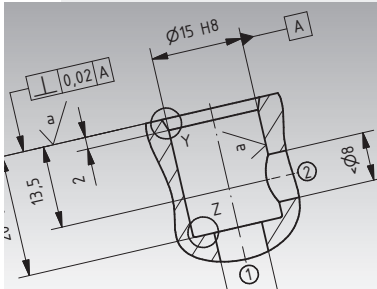
The warranty only applies to the delivered configuration. The warranty will not apply if the product is incorrectly assembled or handled or not used as intended.



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Valve cavities

2-way designs

110420_cavities2_e
06.2019

Table of contents

NOTE:

PT= reaming depth

AS= locating shoulder

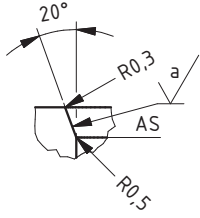
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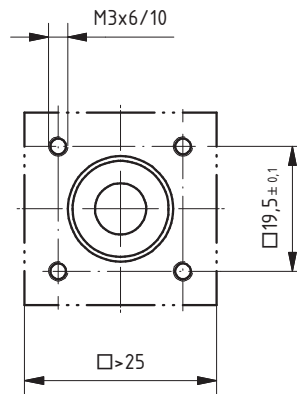
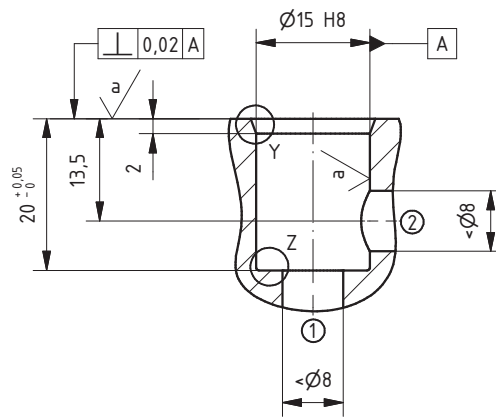
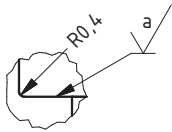
Content	Page
Cavity EPDBD 03	2
Cavity EPDBD 05	2
Cavity PVDE2-11	3
Cavity SMSVP	3
Cavity MSVT	4
Cavity DBT	4
Cavity EDB	5
Cavity DBG1	5
Cavity DBG4	6
Cavity DB12-FT	6
Cavity DRV	7
Cavity RKR	7
Cavity RHR	7
Cavity RBR	8
Cavity RBS1	8
Cavity VCD	8
Cavity VCL	9
Cavity VCM	9
Cavity STO/DBT2	10
Cavity STE	10
Cavity STD	11
Cavity KK-M14	11
Cavity C-10-2	12
Cavity T-3A	12
Cavity T-5A	13
Cavity T-8A	14
Cavity T-10A	14
Cavity T-13A	15
Cavity T-16A	16

Cavity EPDBD 03

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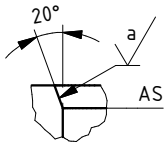
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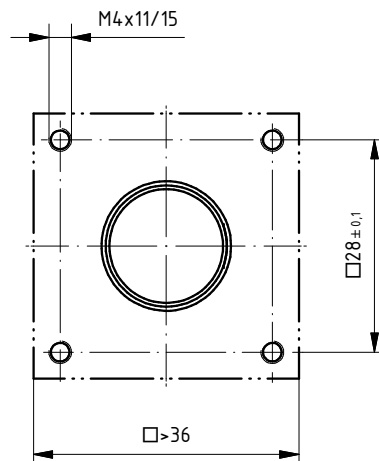
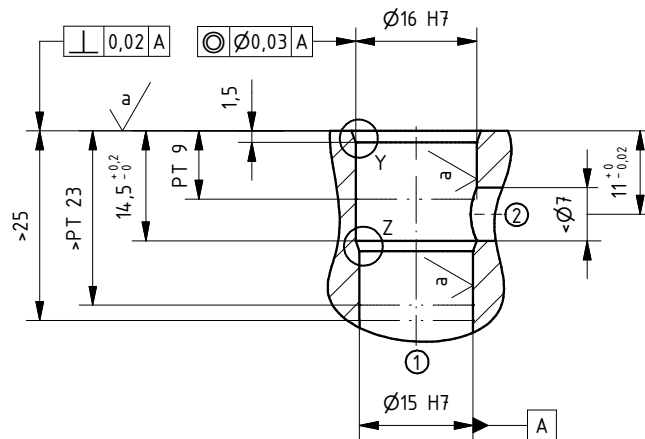
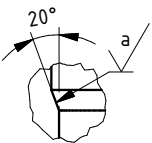
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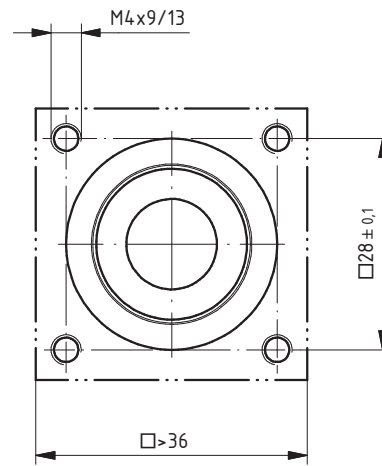
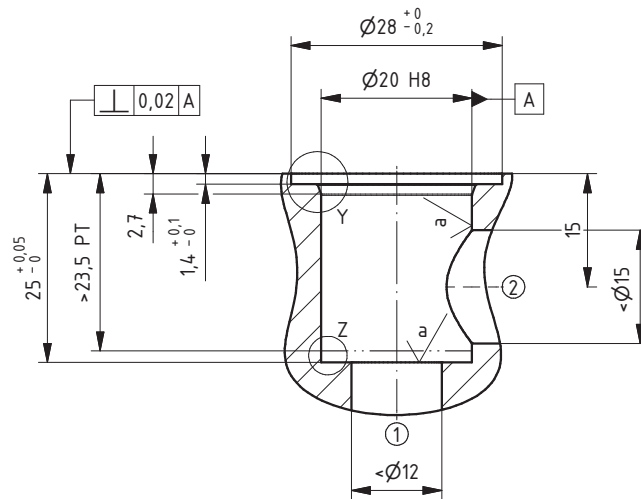
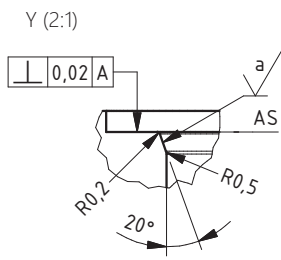


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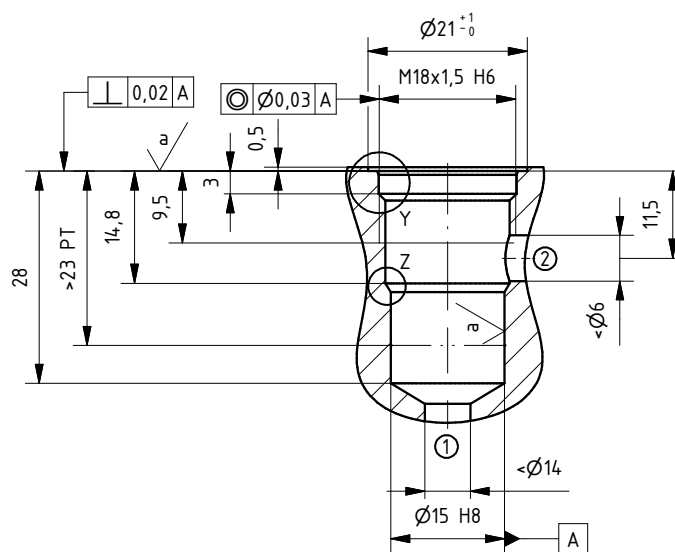
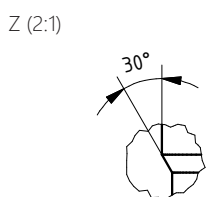
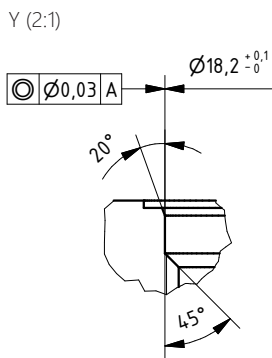
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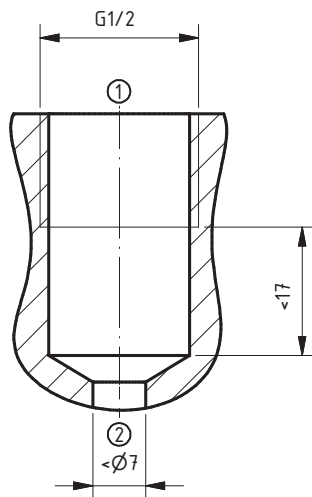
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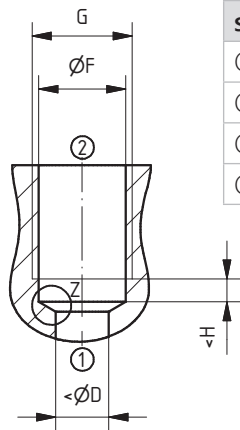
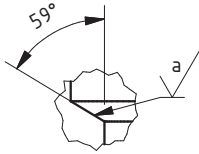
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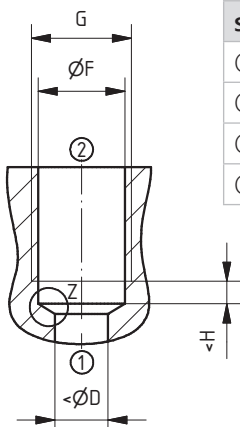
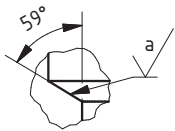


size G	$\varnothing D$ max.	$\varnothing F (+0,1)$	H max.
G 1/4"	7 mm	11,4 mm	3 mm
G 3/8"	9 mm	14,9 mm	3 mm
G 1/2"	12 mm	18,6 mm	4 mm
G 3/4"	17 mm	24,1 mm	5 mm

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Z (2:1)

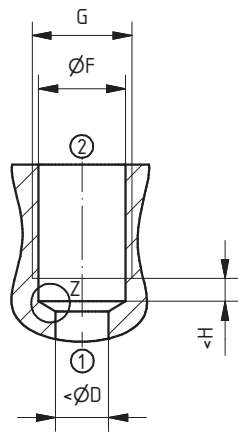
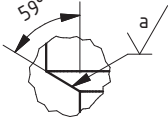


size G	$\varnothing D$ max.	$\varnothing F (+0,1)$	H max.
G 1/4"	7 mm	11,6 mm	3 mm
G 3/8"	9 mm	15,1 mm	3 mm
G 1/2"	12 mm	18,8 mm	4,5 mm
G 3/4"	16 mm	24,5 mm	4 mm

HE4/14 31 12

Cavity RBR

Z (2:1)

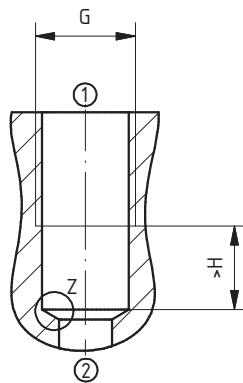
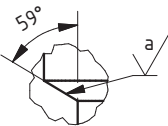


size G	Ø D max.	Ø F (+0,1)	H max.
G 1/4"	7 mm	11,6 mm	3 mm
G 3/8"	9 mm	15,1 mm	3 mm
G 1/2"	12 mm	18,8 mm	3 mm

HE4/14 31 10

Cavity RBS1

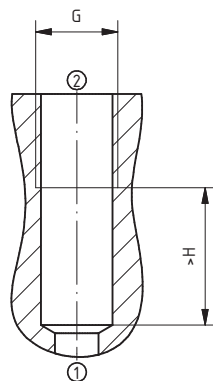
Z (2:1)



size G	H min.
G 1/4"	11 mm
G 3/8"	11 mm
G 1/2"	15 mm
G 3/4"	16 mm
M 18 x 1,5	11 mm

HE4/18 16 04

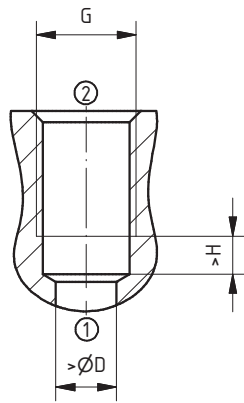
Cavity VCD



size G	H min.
G 1/4"	22 mm
G 3/8"	23 mm
G 1/2"	27 mm
G 3/4"	31 mm

HE4/14 31 06

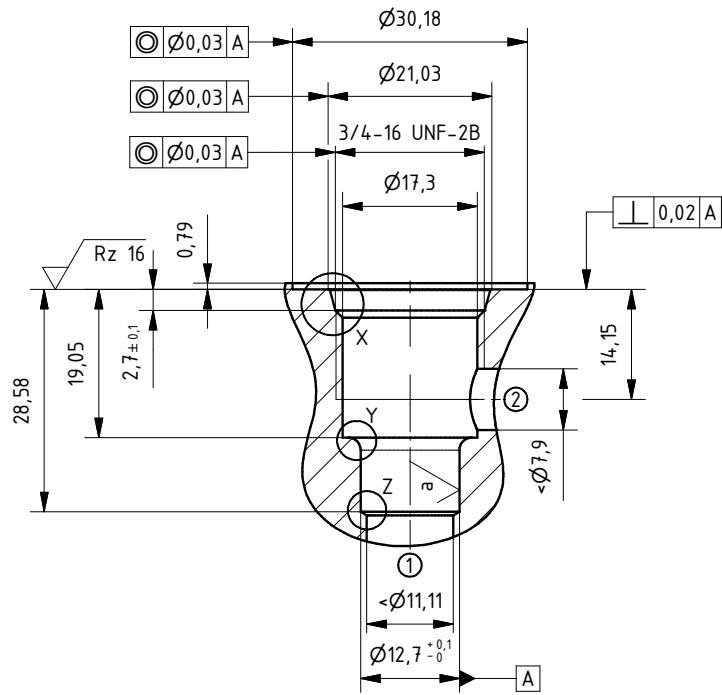
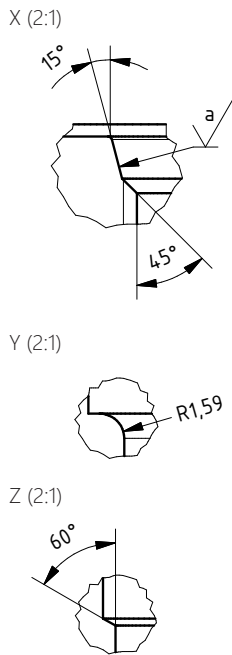
Cavity VCL



size G	Ø D min.	H min.
G 1/4"	8 mm	5 mm
G 3/8"	11 mm	5 mm
G 1/2"	14 mm	5 mm

HE4/14 21 02

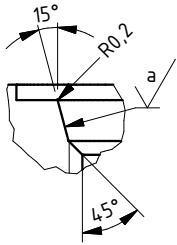
Cavity VCM



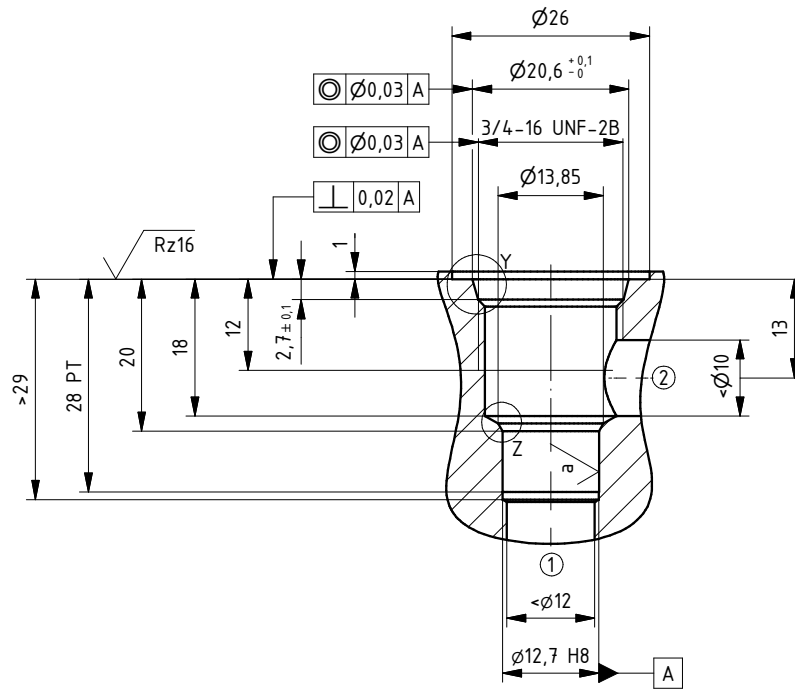
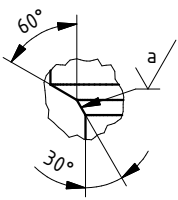
HE4/10 08 02

Cavity STO/DBT2

Y (2:1)



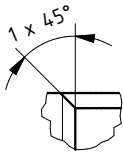
Z (2:1)



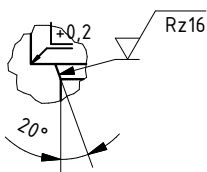
HE4/17 50 04

Cavity STE

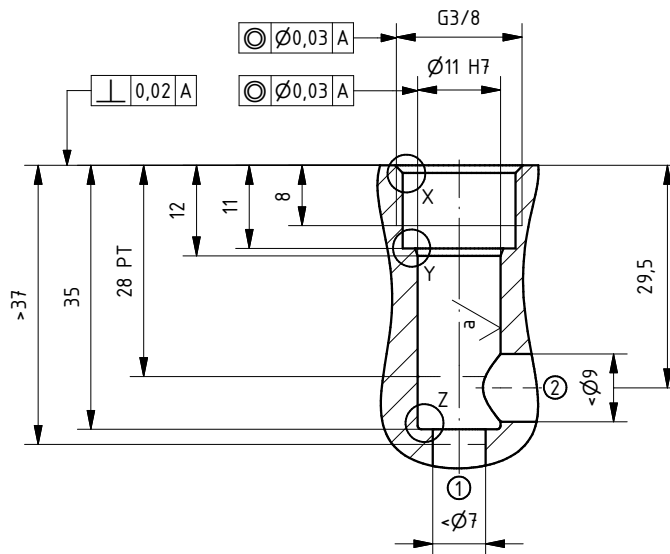
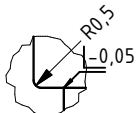
X (2:1)



Y (2:1)

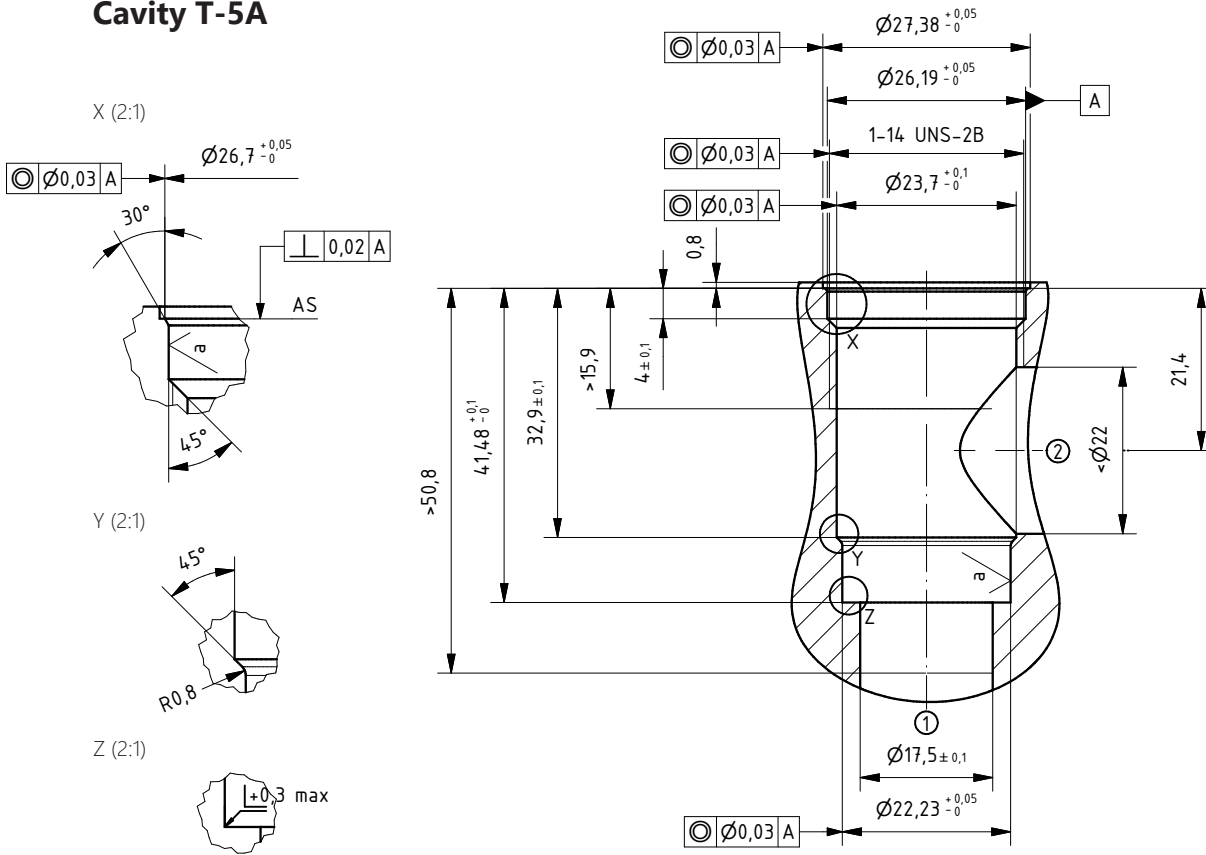


Z (2:1)



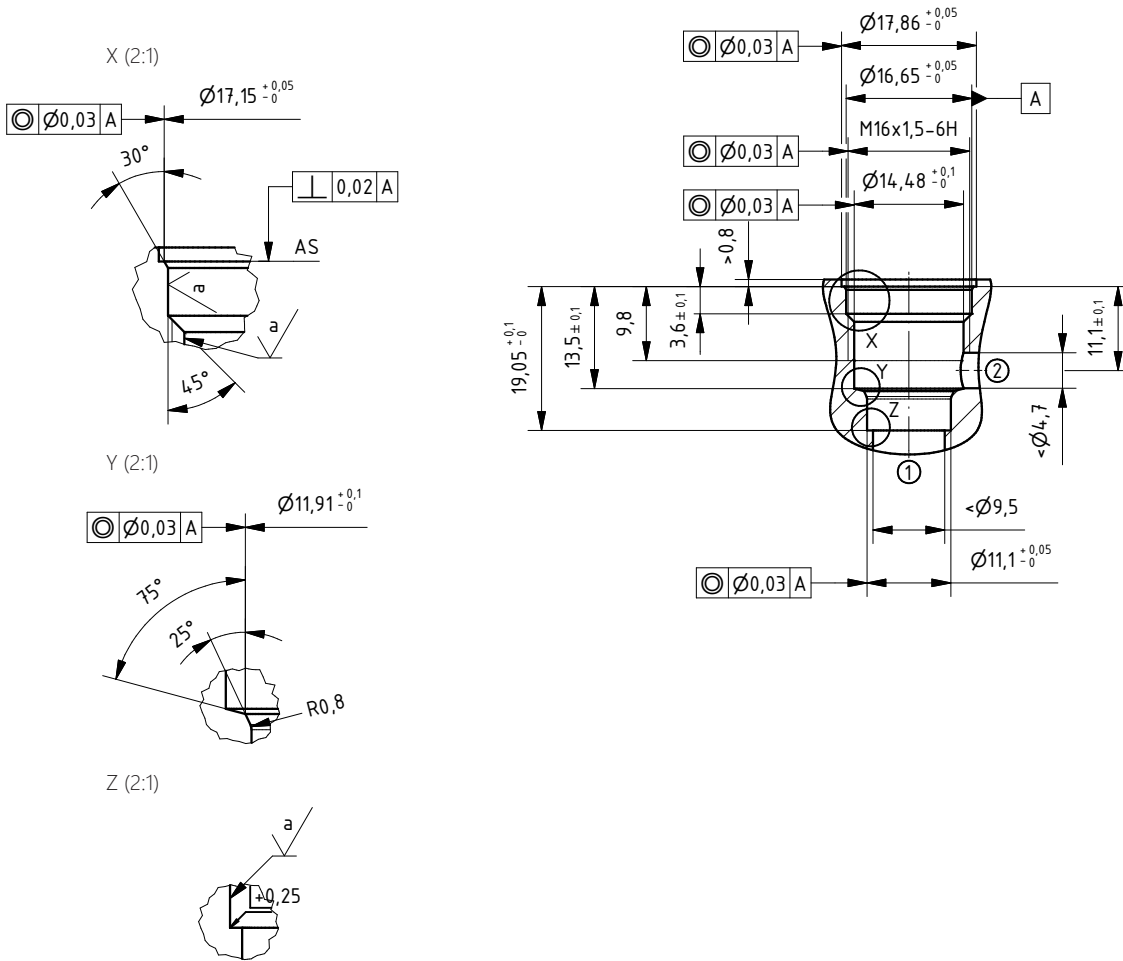
HE4/14 31 21

Cavity T-5A



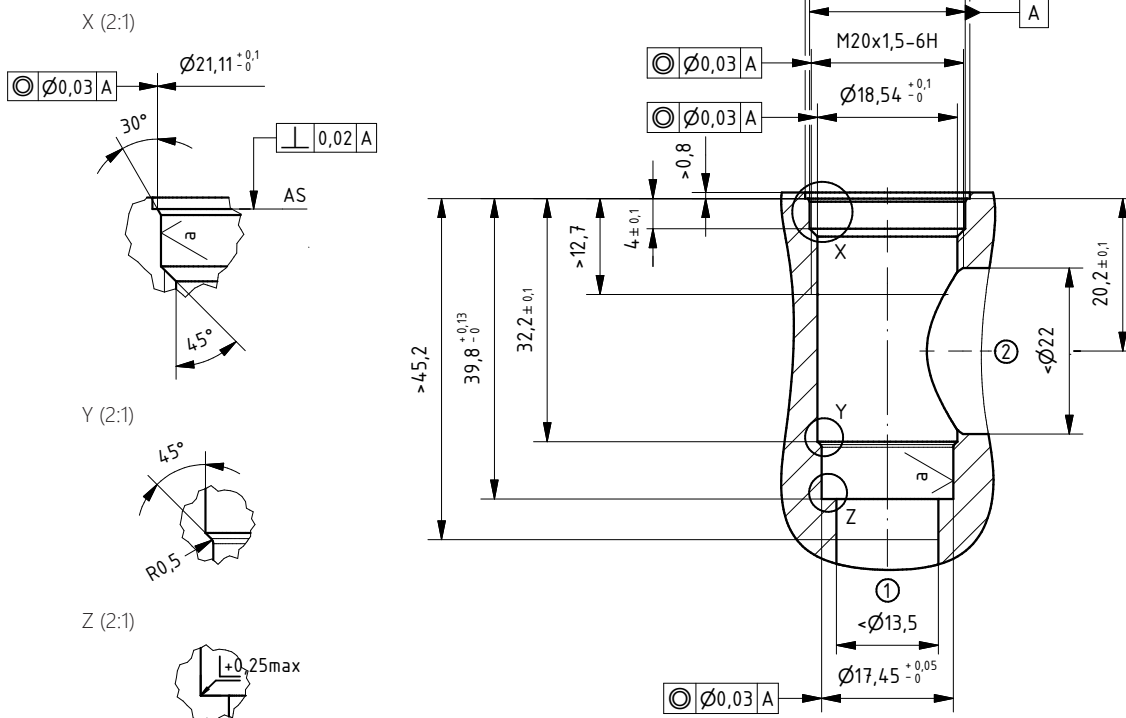
HE4/14 09 13

Cavity T-8A



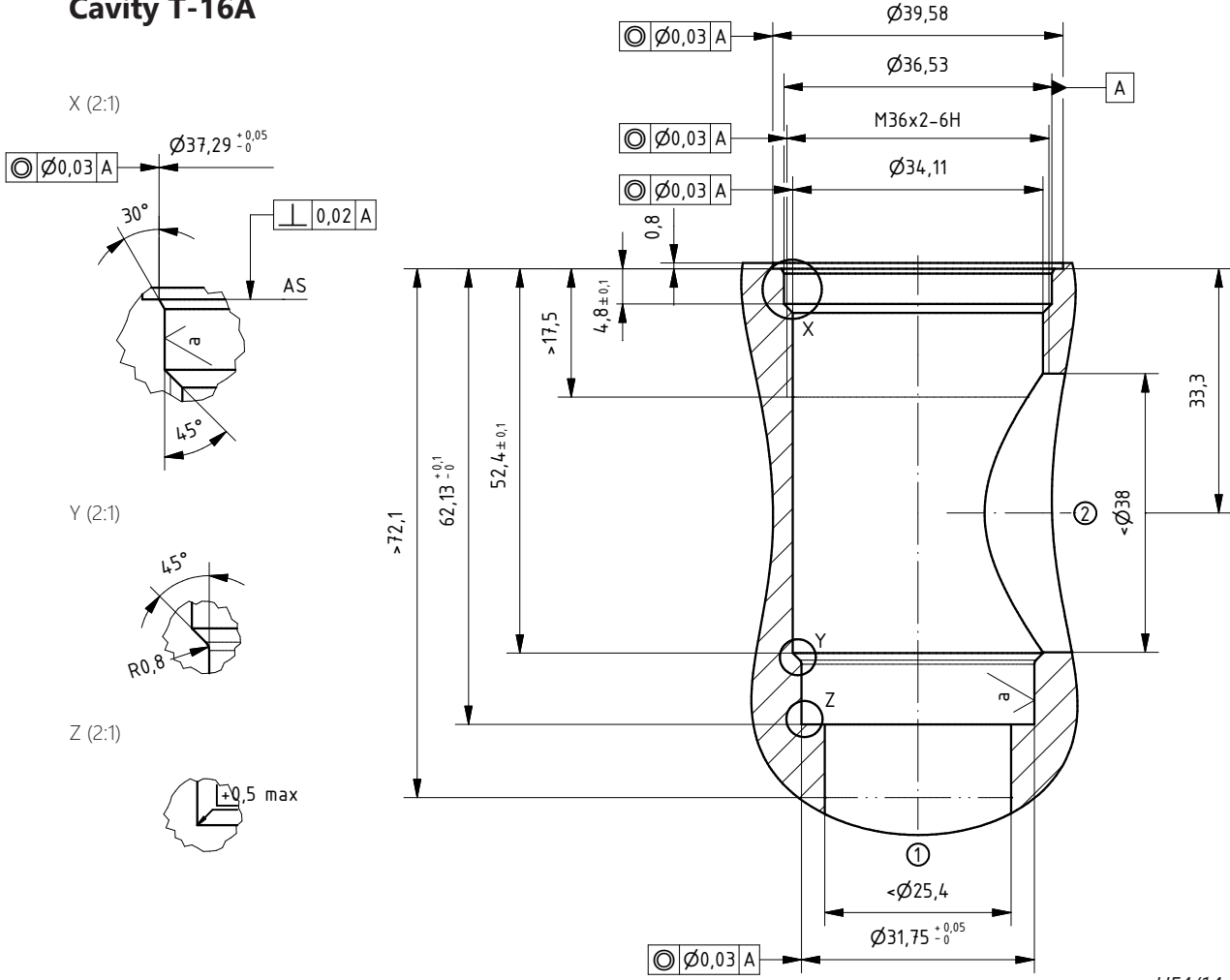
HE4/14 08 20

Cavity T-10A



HE4/14 09 14

Cavity T-16A



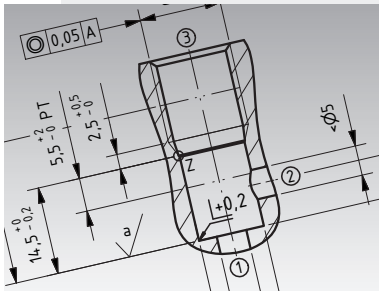
HE4/14 10 01



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Valve cavities 3-way designs

110430_cavities3_e
07.2018

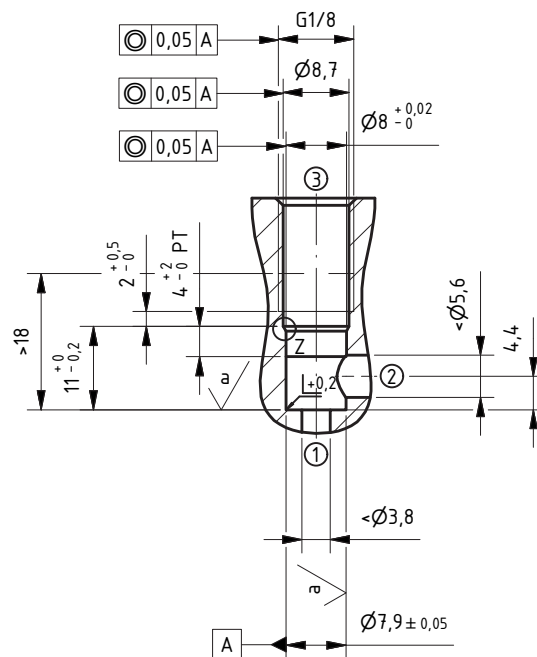
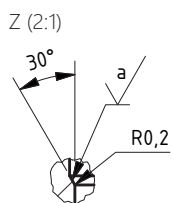
Table of contents

Content	Page
Cavity FTRW-2,5	1
Cavity FTRW-5	2
Cavity EEPDRD3-04	2
Cavity SMSV6	3
Cavity M(S)V3/2	3
Cavity C-10-3	4
Cavity T-11A	4
Cavity T-2A	5

NOTE

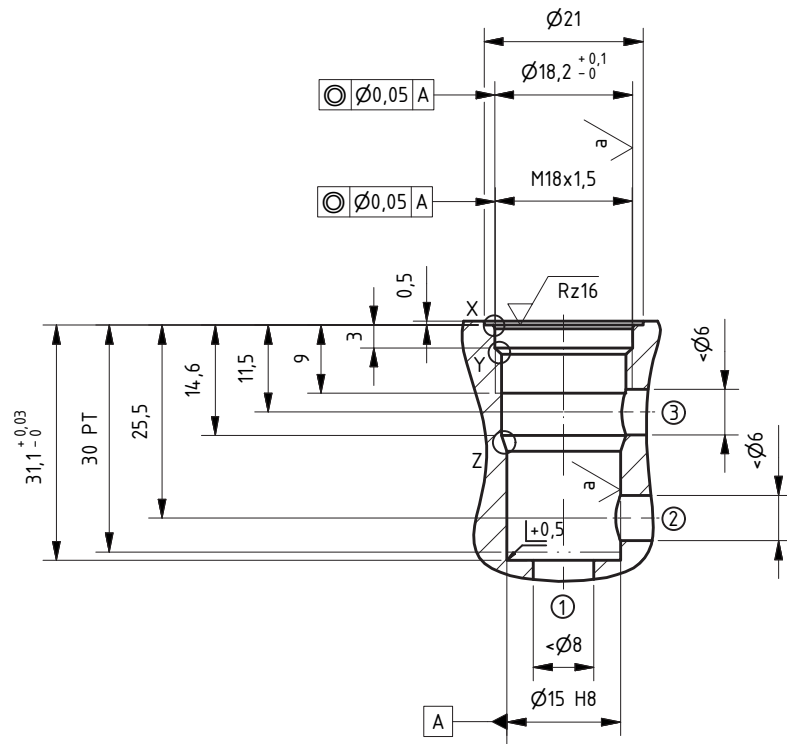
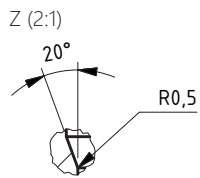
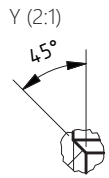
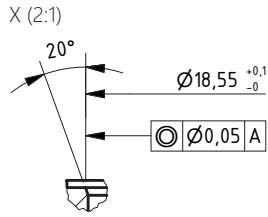
$$a = \sqrt{Rz6,3} \quad \text{PT} = \text{reaming depth}$$

Cavity FTRW-2,5



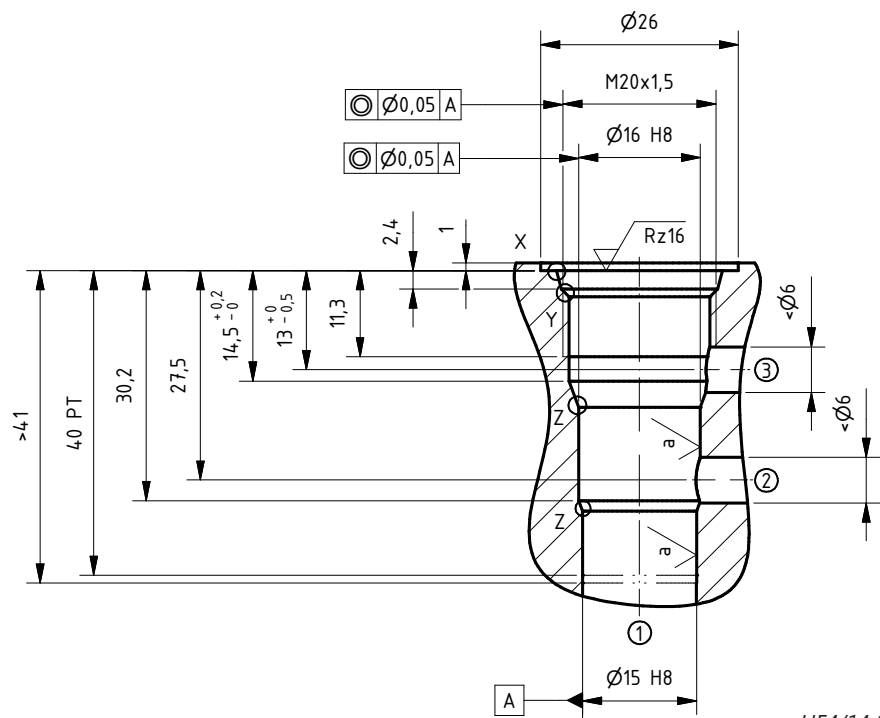
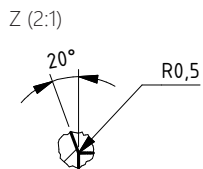
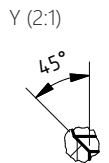
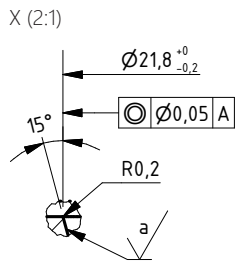
HE4/14 31 15

Cavity SMSV6



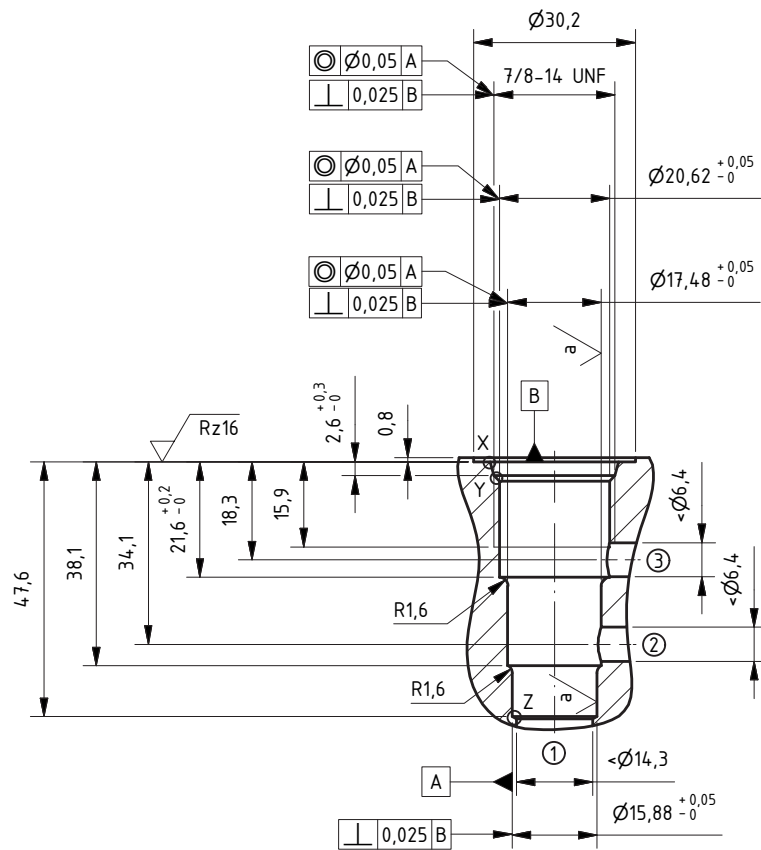
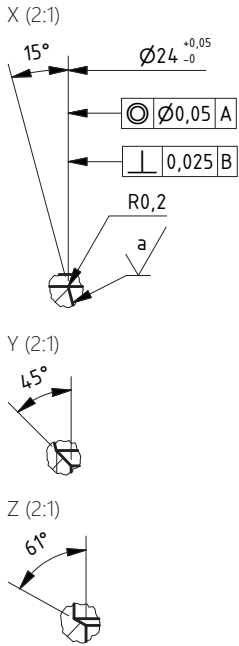
HE4/14 11 21

Cavity M(S)V3/2



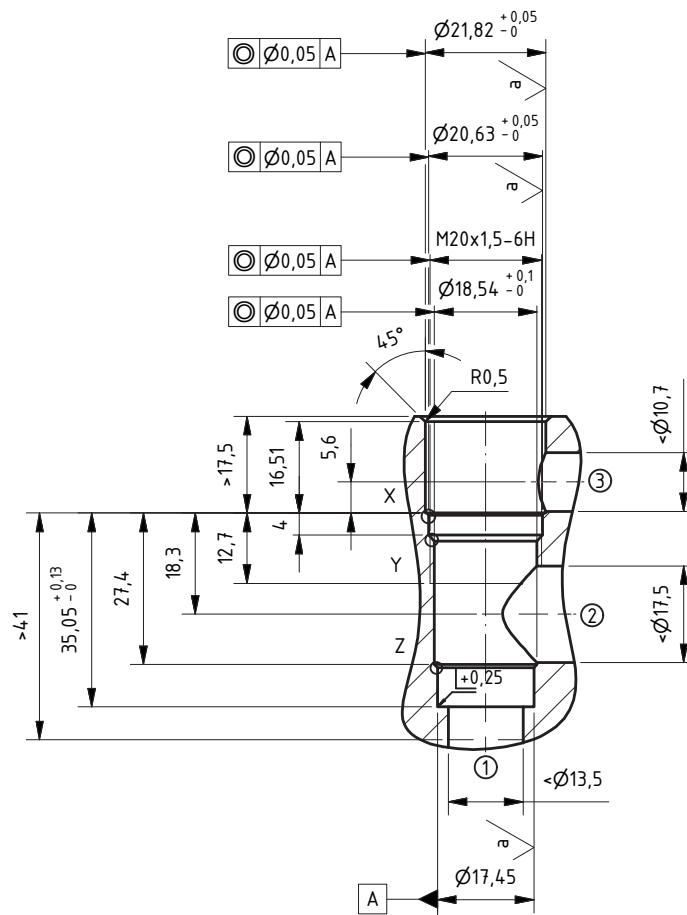
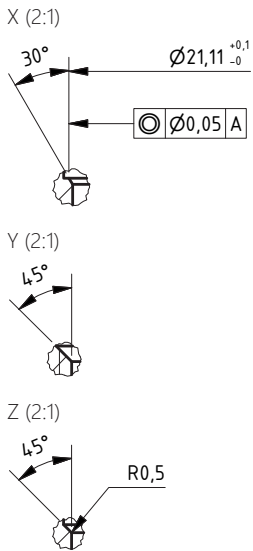
HE4/14 10 22

Cavity C-10-3



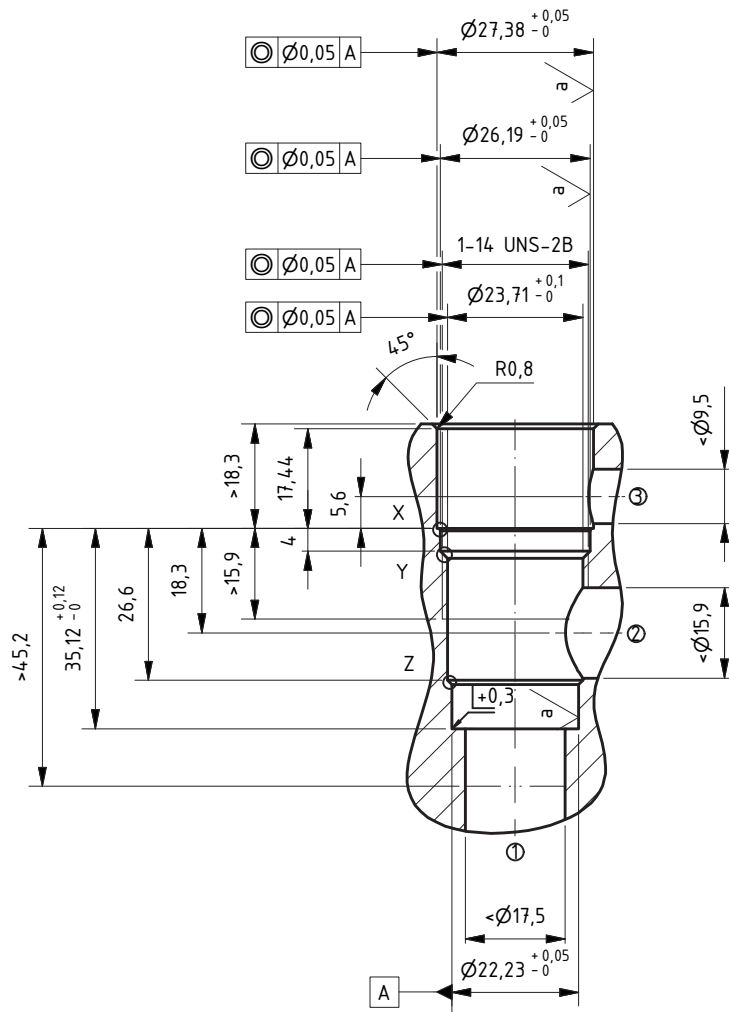
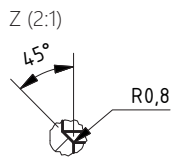
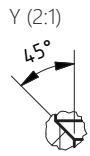
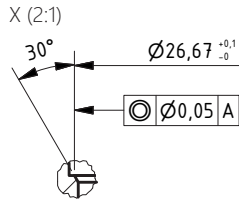
HE4/14 10 18

Cavity T-11A



HE4/14 09 19

Cavity T-2A



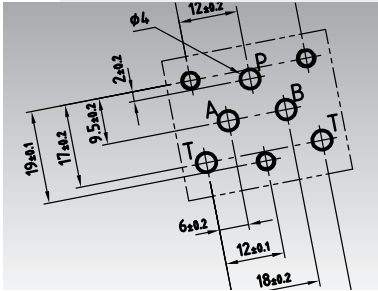
HE4/14 09 08



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Port patterns

NG 3 to NG 25

110410_port_patterns_e
07.2018

Table of contents

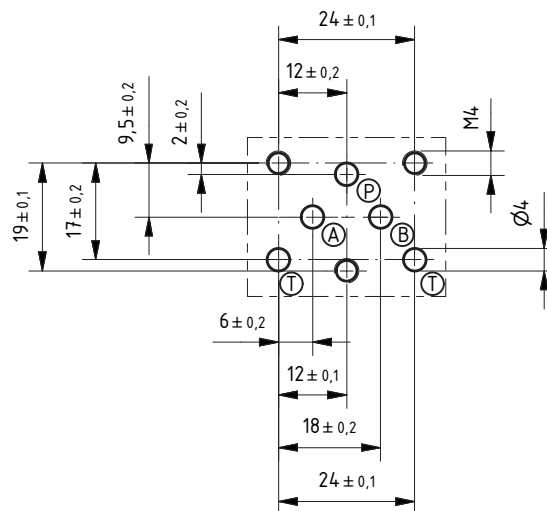
Contents	Page
NG 3	1
NG 3 compact	2
NG 4 compact	2
NG 4	3
NG 6	3
NG 10	4
NG 16	4
NG 25	5

NOTE

- Screw-in depth of mounting screws:
 steel: approximately 1,0 - 1,3 x d
 cast: approximately 1,3 - 1,5 x d
 aluminium: approximately 1,5 - 2,0 x d
 (d = diameter of thread)
- surface roughness at sealing area: Rz = 6,3

NG 3

(company standard)

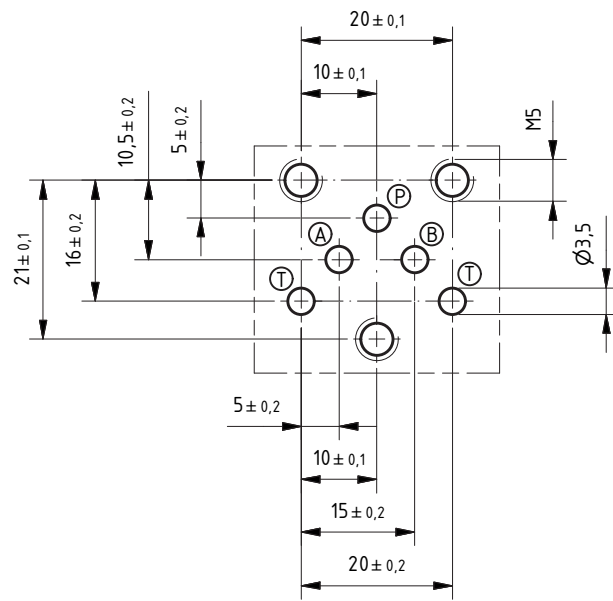


HE4/14 09 01

NOTE

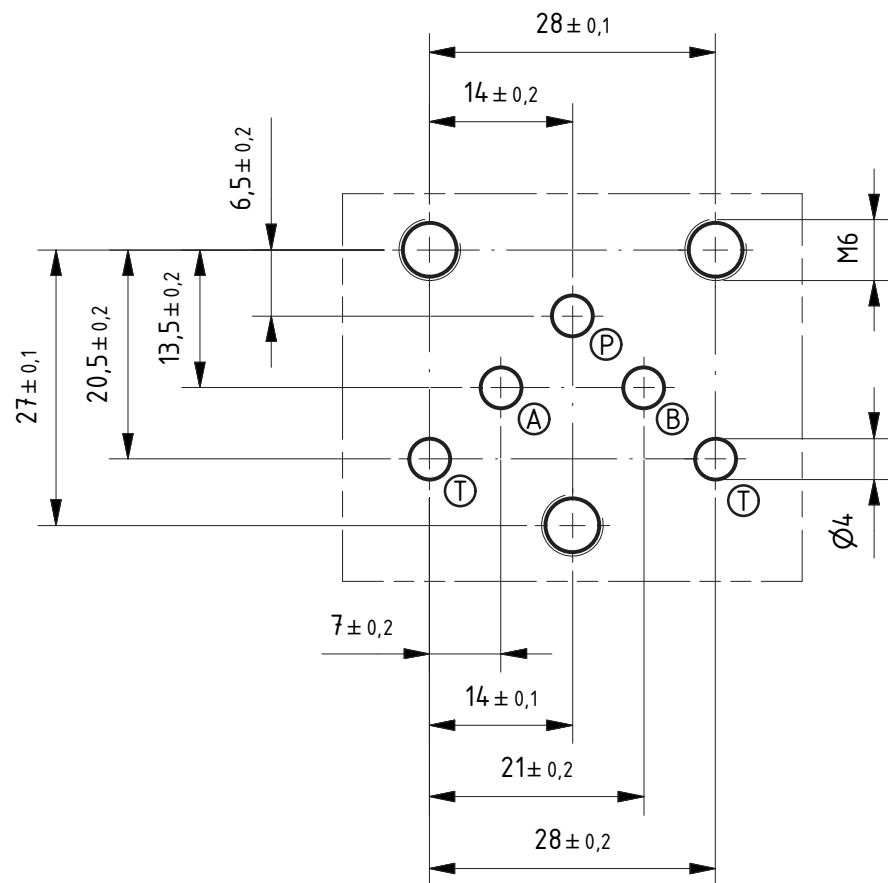
Most sandwich- and top-mount bodies have a second T-port (bottom right), unlike most subplates, which usually just have one T-port.

NG 3 compact



HE2/13 17 12

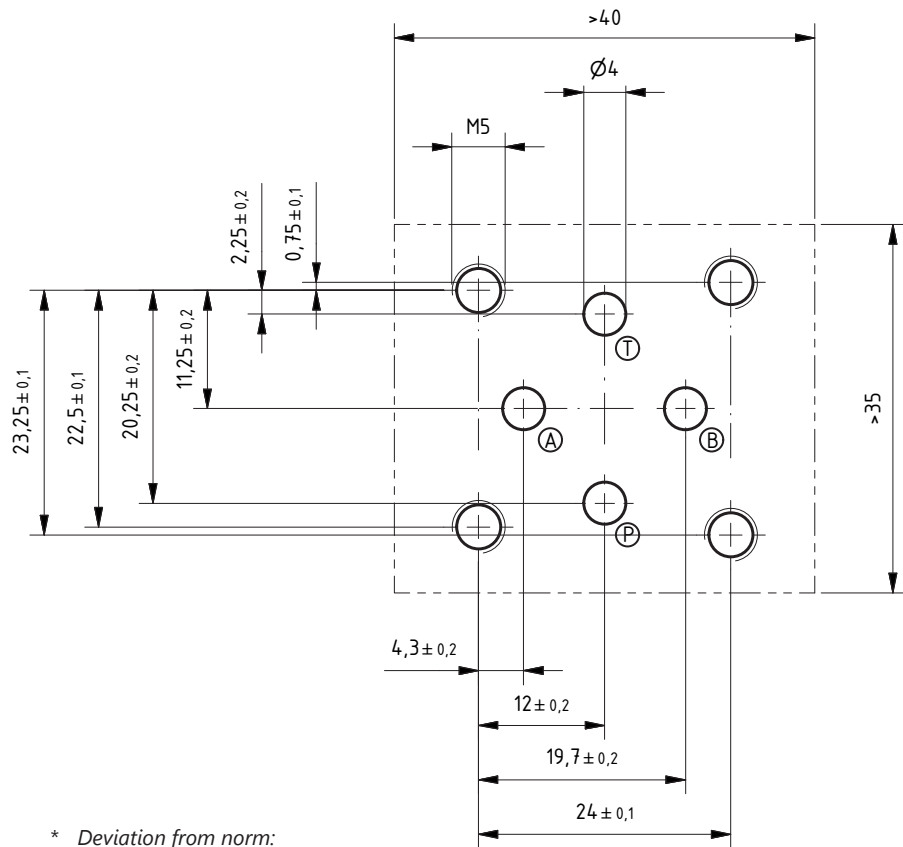
NG 4 compact



HE2/13 44 01

NG 4

ISO 4401-02-01*

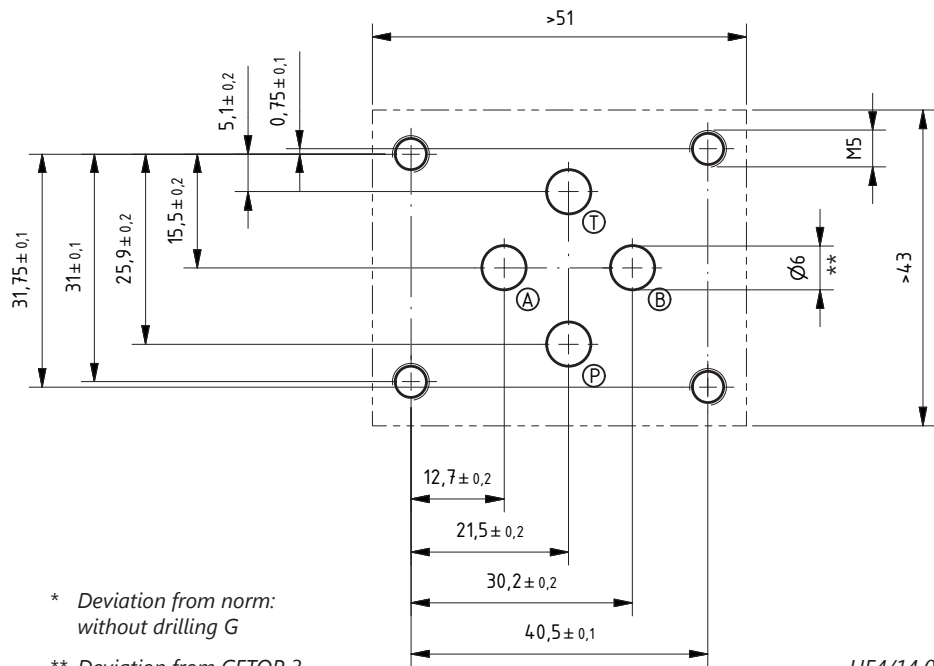


* Deviation from norm:
without drilling G

HE4/14 09 02

NG 6

DIN 24340 A06
ISO 4401-03-02*
CETOP 3*



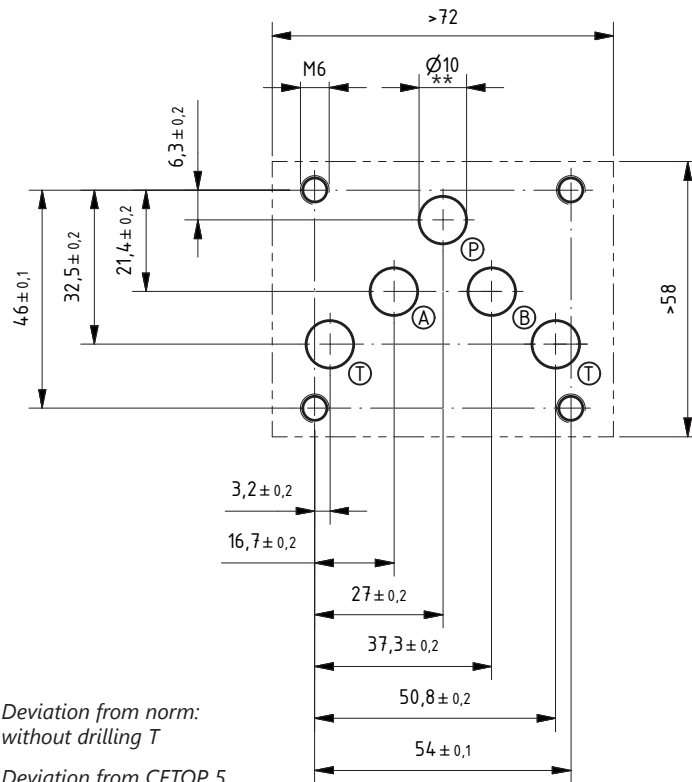
* Deviation from norm:
without drilling G

** Deviation from CETOP 3

HE4/14 09 03

NG 10

DIN 24340 A10
ISO 4401-05-04
CETOP 5*



* Deviation from norm:
without drilling T

** Deviation from CETOP 5

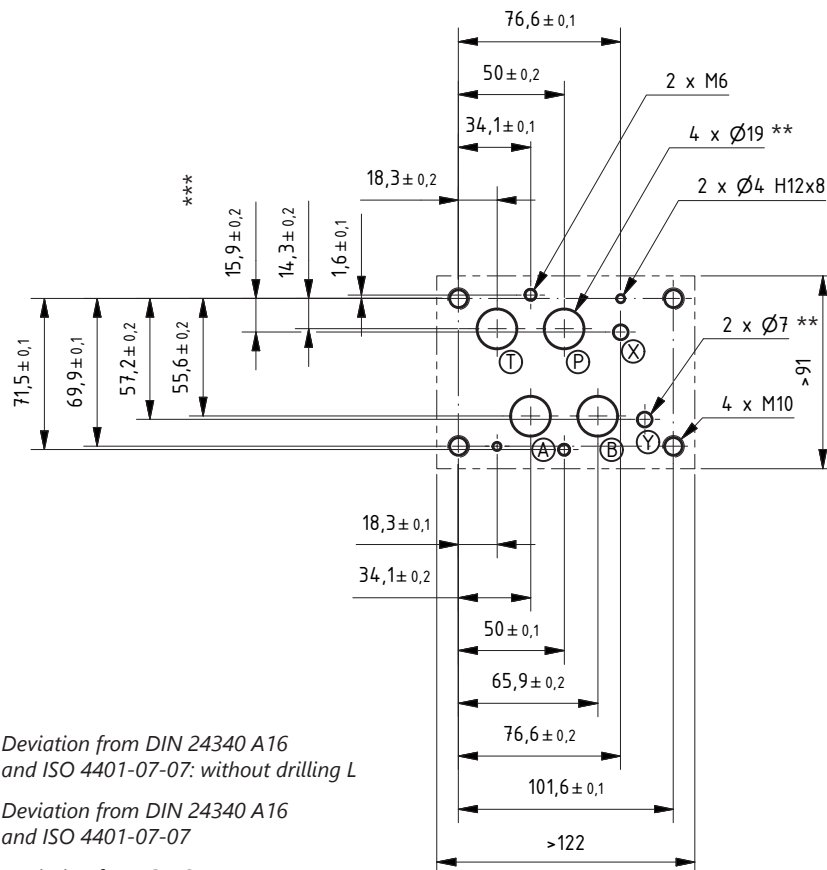
HE4/14 09 04

NOTE

Most sandwich- and top-mount bodies have a second T-port (bottom right), unlike most subplates, which usually just have one T-port.

NG 16

DIN 24340 A16*
ISO 4401-07-07*
CETOP 7



* Deviation from DIN 24340 A16
and ISO 4401-07-07: without drilling L

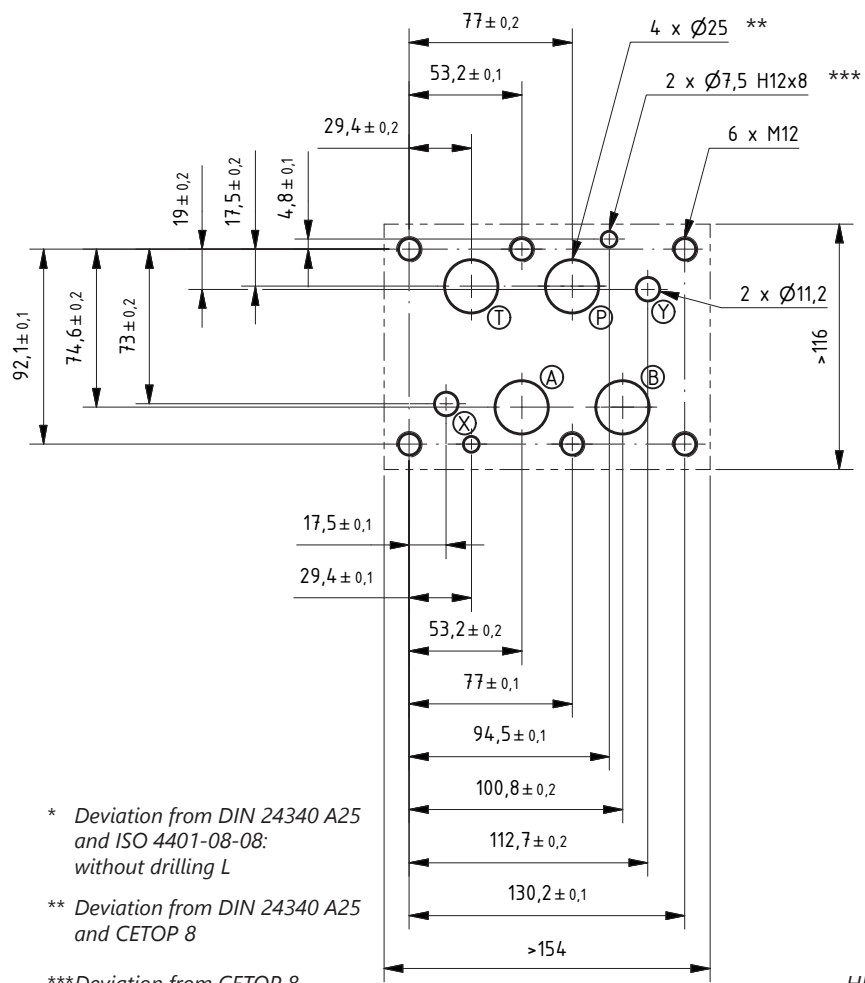
** Deviation from DIN 24340 A16
and ISO 4401-07-07

*** Deviation from CETOP 7

HE4/14 09 05

NG 25

DIN 24340 A25*
 ISO 4401-08-08*
 CETOP 8



* Deviation from DIN 24340 A25 and ISO 4401-08-08: without drilling L

** Deviation from DIN 24340 A25 and CETOP 8

*** Deviation from CETOP 8

HE4/14 09 06



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Manual overrides Designs

110510_manualoverride
07.2018

Characteristics

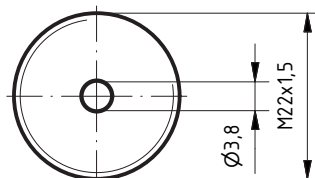
- manual override works directly on the solenoid
- available as lockable or not lockable versions
- lockable versions for mechanical standard settings of the valve
- for cases of disturbance or implementing

NOTE You can check the available manual overrides for the particular valves in the type code on the datasheet of each valve.

NOTE The pictures exemplify the designs of the manual overrides. The connections to the solenoid may vary according to the different sizes of the valves.

Manual override with push pin NH (H402)

- not lockable
- for operation the internal pin has to be pushed with a pointed object
- when releasing the pin, it switches back into the basic position
- not for continuous operation

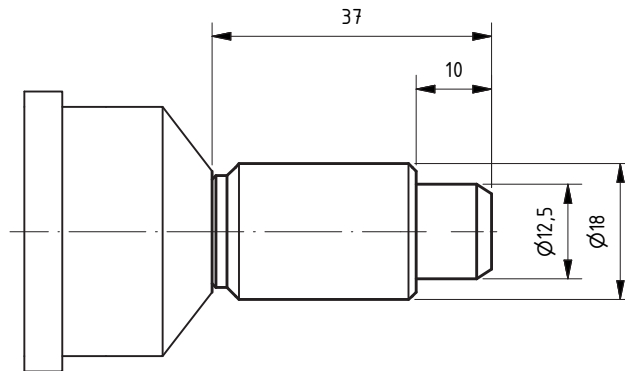


HE4/124818

*Manual override with
push knob
DNH (H405)*



- not lockable
- for operation the knob has to be pushed
- when releasing the knob, it switches back into the basic position
- not for continuous operation

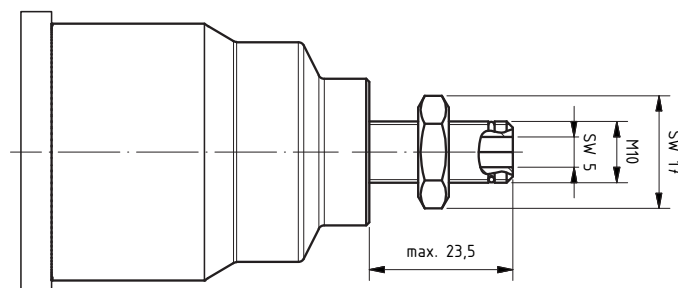


HM4/143014

*Manual override with
lock nut
FNH (H301)*



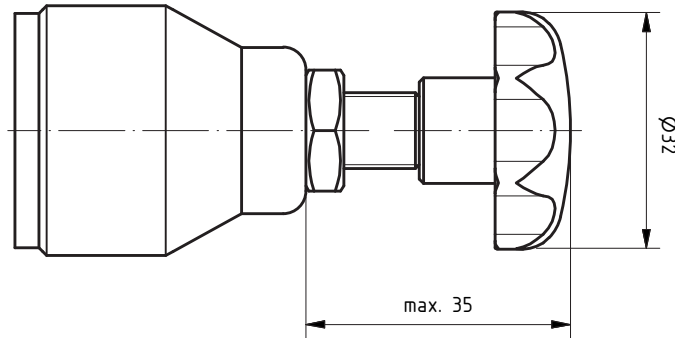
- lockable with screw
- suitable for mechanical standard settings



HE4/151906

*Manual override with
lock nut and
hand-wheel
H302*

- lockable with hand-wheel
- suitable for mechanical standard settings



HMA/143010

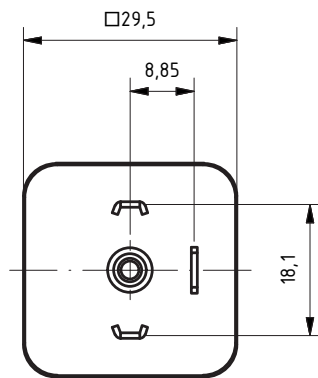


Electrical connectors Designs

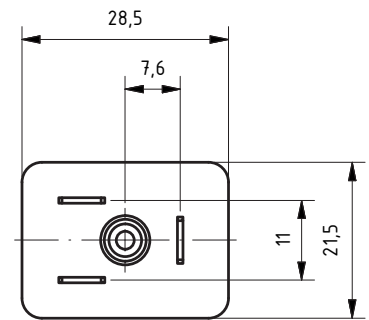
110520_el_connectors
07.2018

NOTE You can check the available connectors for the particular valves in the type code on the datasheet of each valve.

Connector DIN
43650 shape A and B



Shape A



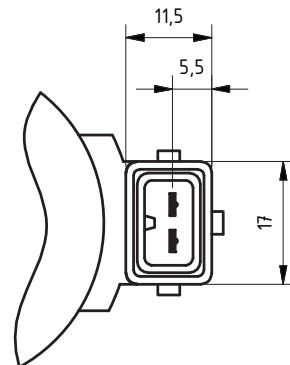
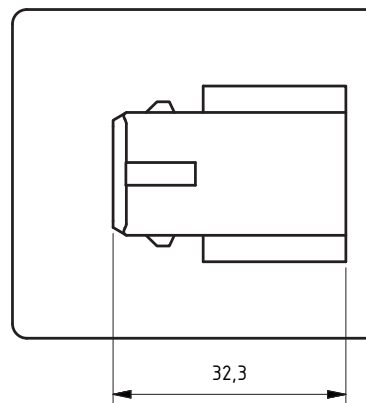
Shape B

HE4/151705

Connector AMP
Junior Timer



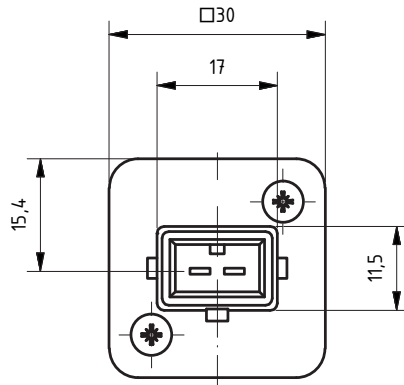
For round solenoid bodies.



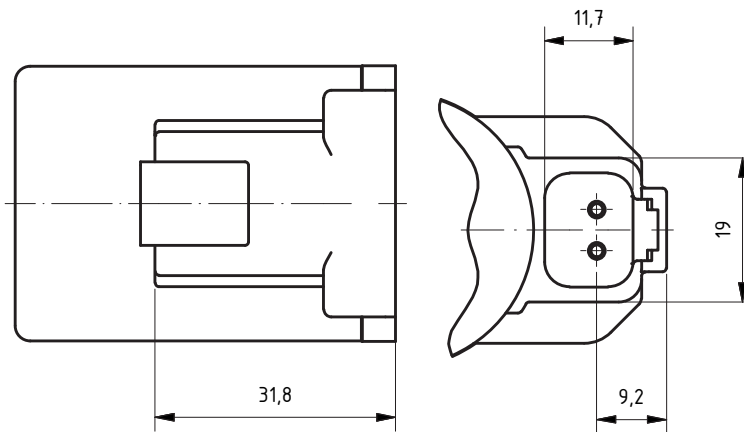
HE4/151901

*Connector AMP
Junior Timer*

For rectangular solenoid bodies.



*Connector Deutsch
DT04-2P*



HE4/151902

*Unterminated wire
300 mm*

Only available for rectangular solenoid bodies.



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Test conditions and standards

valid for WEBER-HYDRAULIK ValveTech valves

110610_standards
07.2018

Test conditions

- unless otherwise noted, all tests are made with hydraulic oil after DIN 51524 type HLP 32 or HLVP 32
- Oil temperature $40^{\circ}\text{C} \pm 3^{\circ}\text{C}$
- Viscosity 32 cSt
- Purity level (DIN EN ISO 4406) 16/14/11 or better

Applied standards

- Fluid technology: DIN EN ISO 4413
- Hydraulic oil: DIN 51524
- Filtration: ISO 4406
- Protection classes (IP...): EN 60529