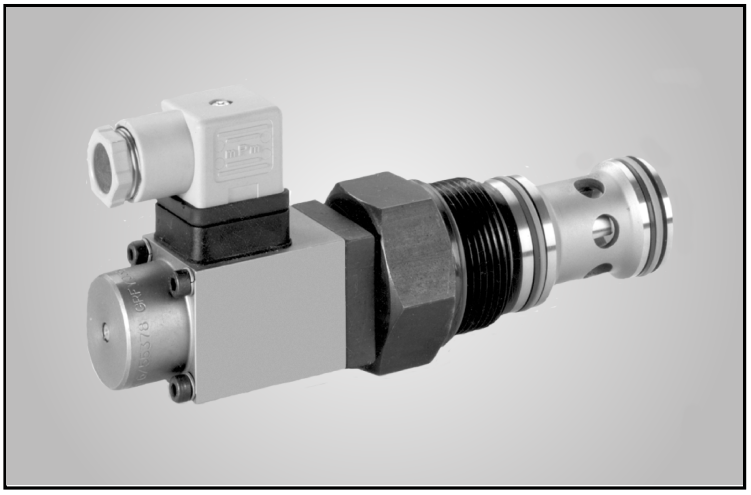
QSVEH1-16/20

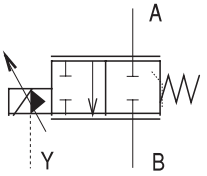


DIFFERENTIAL PROPORTIONAL THROTTLE VALVES

|KE 6081| 11/13 |

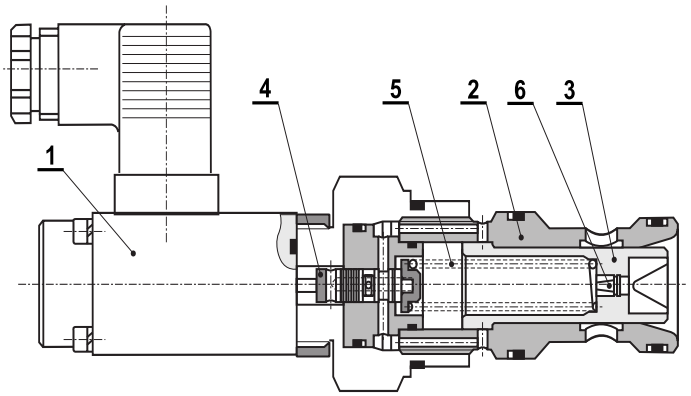
D_n = 16/20 mm | p_{max} = 35 MPa | Q_{max} = 120 / 300dm^3/min

Proportional differential throttle valves QSVEH allow a continuous flow regulation between port A and B. These valves designed as screw-in cartridges are equipped with UNF thread to fit SAE cavity used in manifolds. It can also be used in conjunction with two- or three-way pressure compensators as a two- or three-way pressure compensated flow control valve.



FUNCTIONAL DESCRIPTION

This valve is a normaly closed condition. In the closed condition the pressure of the fluid in the A port is sensed through the orifice **6** and acts on the main spool **3**. Since the pilot spool **4** is a pressure balanced design, the main spool is held closed due to the hydraulic pressure and the force of the spring **5**. When a current signal is applied to the valve, the proportional selenoid **1** extends. The force of the selenoid **1**, which is directly proportional to the applied signal pushes the pilot spool **4** forwards. At this time the pilot spool **4** connects the pilot side flow to the tank port internally, thus creating a pressure drop across the orifice **6**. This will allow the main spool **3** to move backwards, allowing flow from A port to B port. As the main spool **3** opens, the forces between the spring **5** and selenoid **1** acting on the pilot spool **4** become unbalanced. As the force balance is re-established, the main spool **3** stops mooving. This allows the valve to be used as proportional flow-controlling unit controlled by steeplessly varied input current signal.



ORDERING CODE

Q S V E H 1 - [ ] / [ ] 2 4 S [ ] - 1

Q S Proportional throttle valve

MOUNTING
V Manifold (Cartridge)

CONTROL METHOD
E H Electrohydraulic

1 Innovation stage

SIZE
16 Dn = 16mm
20 Dn = 20mm

SPOOL TYPE

	Dn = 16mm	Dn = 20mm
C	40 [dm3/min]	100 [dm3/min]
E	80 [dm3/min]	200 [dm3/min]
D	120 [dm3/min]	300 [dm3/min]

24S SELENOID VOLTAGE 24V DC, 800mA

CONNECTOR
no code Connector DIN 43650
B No connector

1 SEALING Standard

INSTALLATION, SERVICE AND MAINTENANCE

Valves of type QSVEH are provided sith UNF thread to fit SAE cavity of the manifold. It is recommended to use ESH6 control unit to drive QSVEH valves. ESH6 control unit allows direct valve control (by external voltage or by manually operated potentiometer) or connecting the valve to the superior control loop. If a control unit ESH6 is ordered together with the valve, the default setup and adjustment is performed by the producer.

DELIVERY

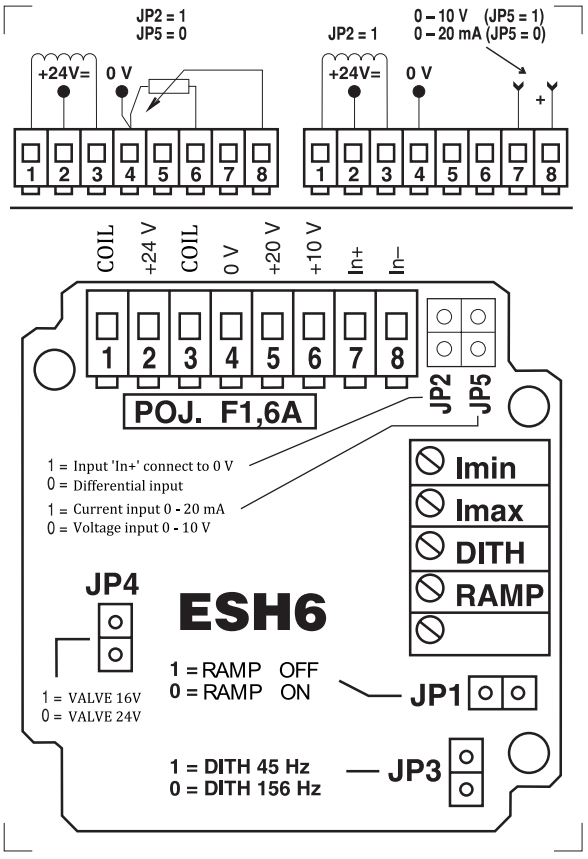
Differential proportional throttle valves are delivered with sealing. Electronic driver ESH6 and spare parts (see page 8) are not included in package. These must be ordered separetly.

ELECTRONIC DRIVER

Technical data	Value
Dimensions	75 x 80 x 50 mm
Weight	250g
Colour	grey RAL 7001
Voltage	24 V DC (23 - 35 V)
Reference voltage	+10 V (+-5%), max 10 mA
DITHER	45/156 Hz (+-7%), switchable
Output current I_{max}	approx 80mA
Input	0 - 10 V, differential

FOR MORE INFORMATION ABOUT ESH6 CONTROL UNIT SEE CATALOGUE KE 6050.

CONNECTION

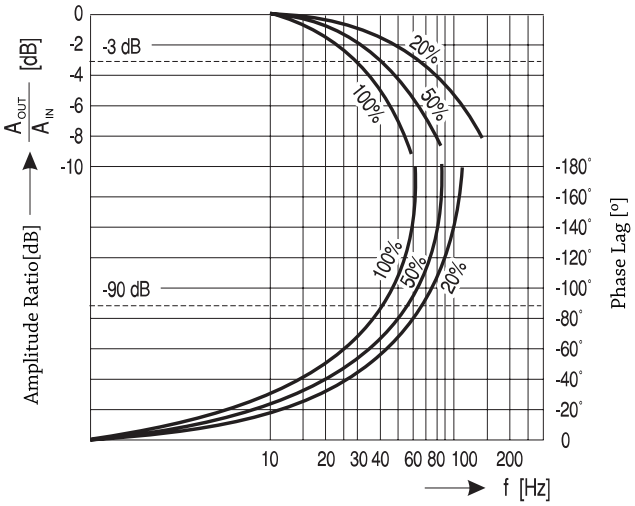


TECHNICAL DATA

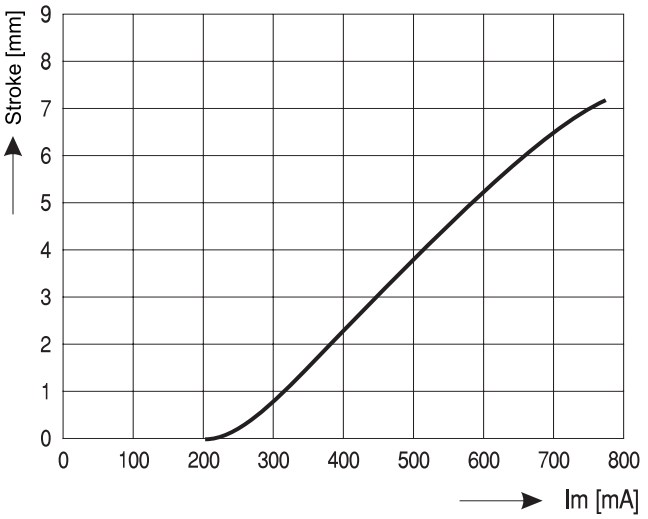
Technical data	Symbol	Unit	QSVEH 1-16	QSVEH 1-20
Name and symbol			differential proportional throttle valve	
Type marking			see ordering code	
Design execution			cartridge	
Installation method			Manifold mounting	
Branch circuit connection			Drillings in the manifold	
Installation dimensions		mm	see installation dimensions	
Installation position			Any desired position	
Flow direction			A - B	
Environment temperature range	min.	°C	-25	
	max.	°C	+60	
Hydraulic data				
Input	min.	MPa		
	max.	MPa	350	
Output	min.	MPa		
	max.	MPa	35	
Working fluid temperature range	min.	°C	-25	
	max.	°C	+60	
Oil viscosoty range	min.	mm^2/s	2.8	
	max.	mm^2/s	380	
Working viscosity	v_n	mm^2/s	35	
Installation dimensions			see Cavity dimensions	
Nominal flow	Q_n	dm^3/min	see Characteristics	
Weight	m	kg	1	1.5
Electric data				
Solenoid design			DC solenoid	
Current regulation		mA	0 up to 800, constant	
Nominal, limit current	I_n, I_g	mA	800	
Actuating current (reactive)	I	mA	170	
Limit power	P	W	17.4	
Nominal power	P	W	11.4	
Actuating power	P	W	0.84	
Resistance	R	Ω	24.6	
Voltage	U	V	23 up to 35	
Nominal current hysteresis	H_I	%	3.1 up to 0.5	
Nominal pressure hysteresis	H_P	%	3.7 up to 0.6	
Reaction time		ms	switch-on-approx. 90	
		ms	switch-off-approx. 50	
Electric loading factor			100% ED	
Electric insulation			IP 55 DIN 40 050	
Correlation temperature		°C	50	
Limit temperature		°C	155 (Insulation class F)	
Connection			according to DIN 43 650	

CHARACTERISCICS QSEH1-16

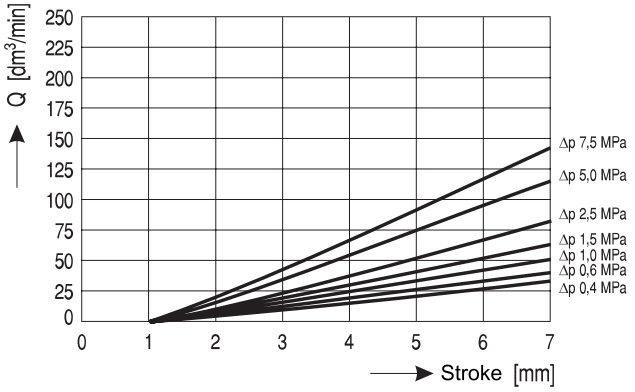
Frequency response



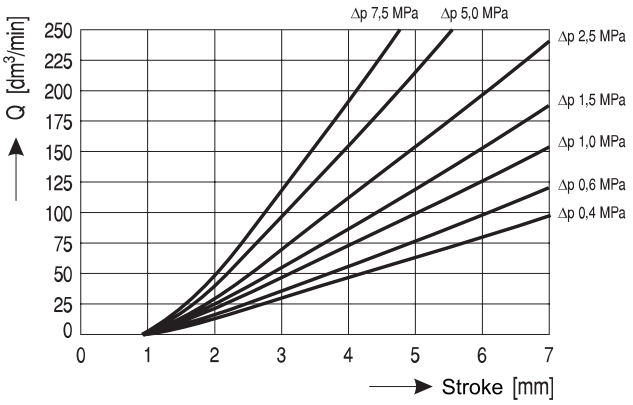
Current vs. Stroke Characteristic curve



Performance Curves - C spool



Performance Curves - D spool



Performance Curves - E spool

Formula:

To calculate flow at different pressure drops, use the formula below:

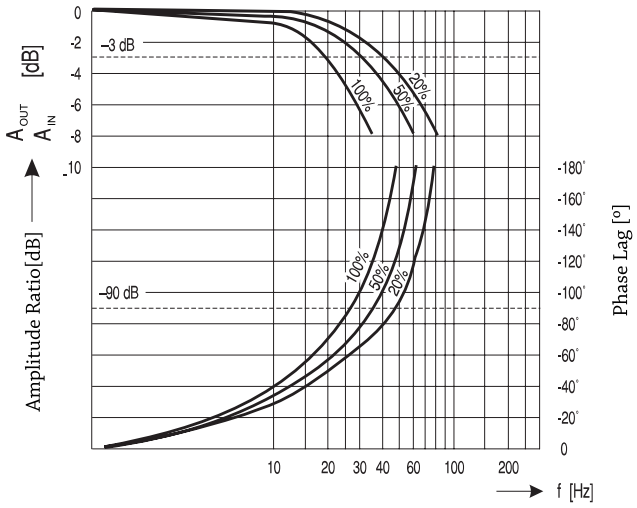
$$Q_x = Q_{\Delta p=10Bar} \cdot \sqrt{\frac{\Delta p_x}{10}}$$

Where:

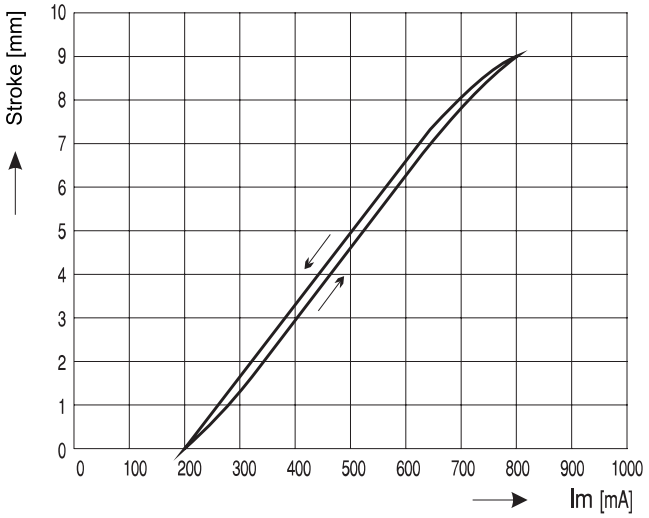
Q_x	Flow at pressure drop
$Q_{\Delta p=10Bar}$	Flow at 10 [Bar] pressure drop (from curves)
Δp_x	Pressure drop [Bar] at which flow is calculated

CHARACTERISCICS QSEH1-20

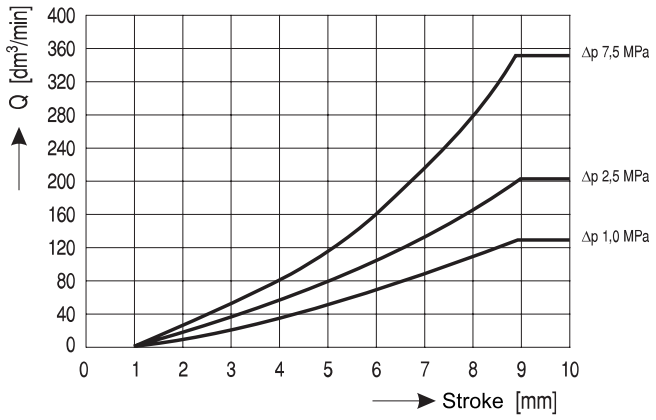
Frequency response



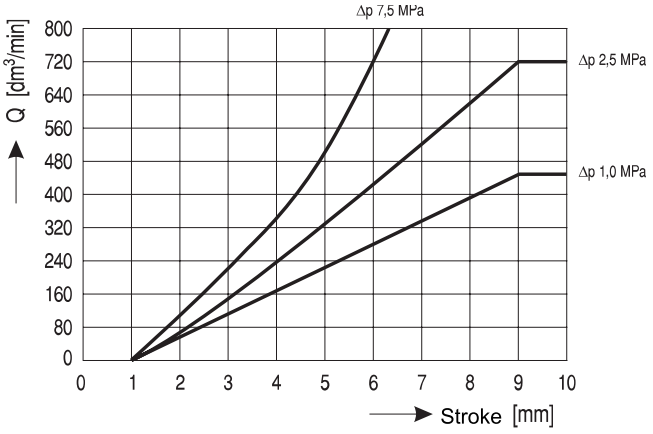
Current vs. Stroke Characteristic curve



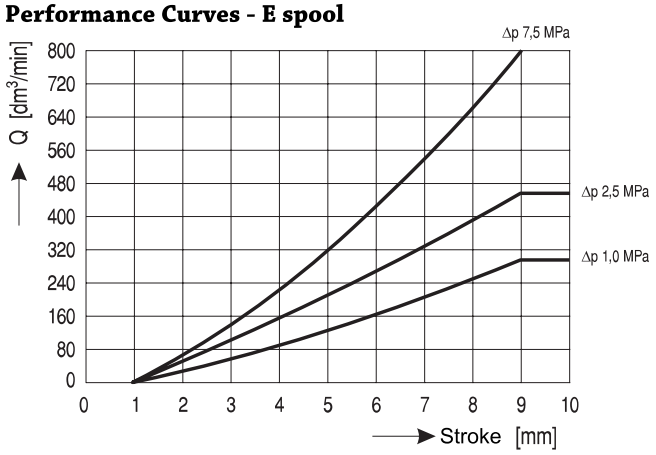
Performance Curves - C spool



Performance Curves - D spool



Performance Curves - E spool



Formula:

To calculate flow at different pressure drops, use the formula below:

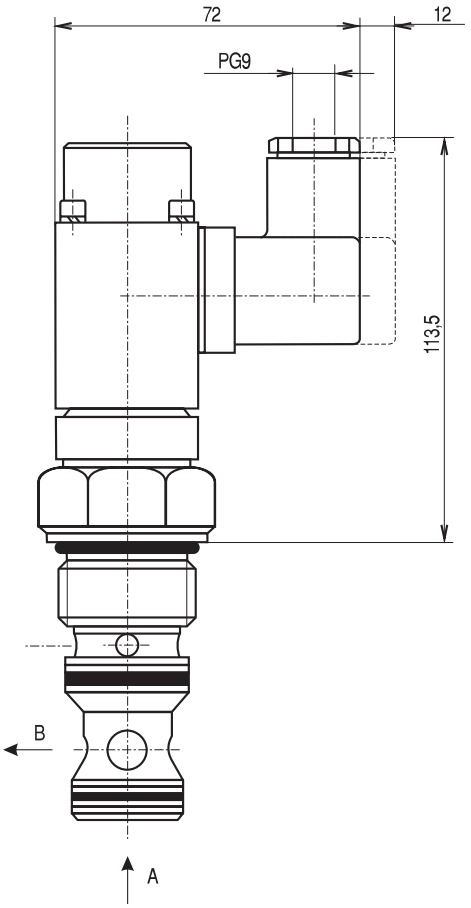
$$Q_x = Q_{\Delta p=10Bar} \cdot \sqrt{\frac{\Delta p_x}{10}}$$

Where:

Q_x	Flow at pressure drop
$Q_{\Delta p=10Bar}$	Flow at 10 [Bar] pressure drop (from curves)
Δp_x	Pressure drop [Bar] at which flow is calculated

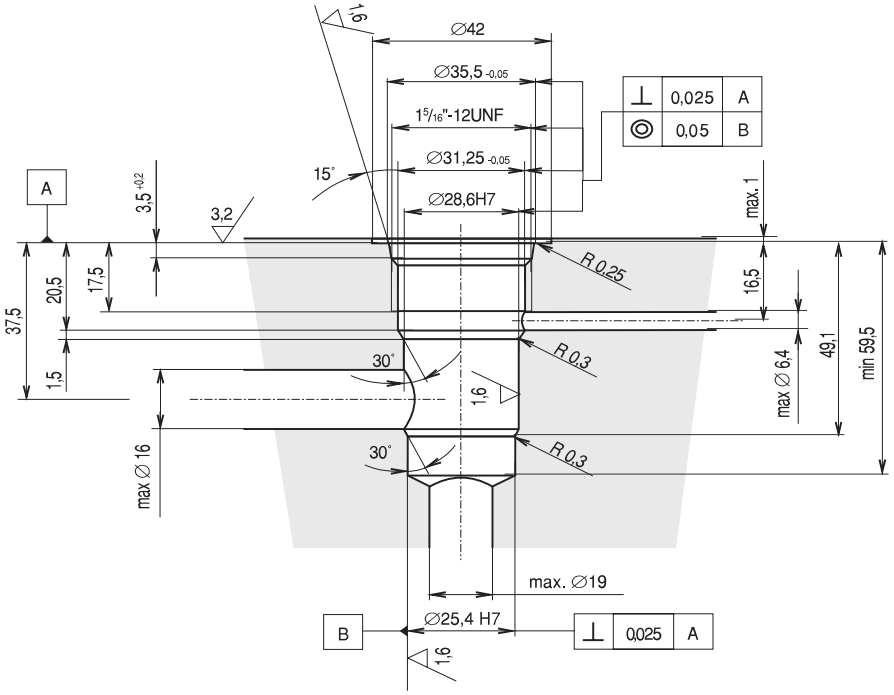
VALVE DIMENSIONS - QSVEH1-16

All dimensions in [mm]



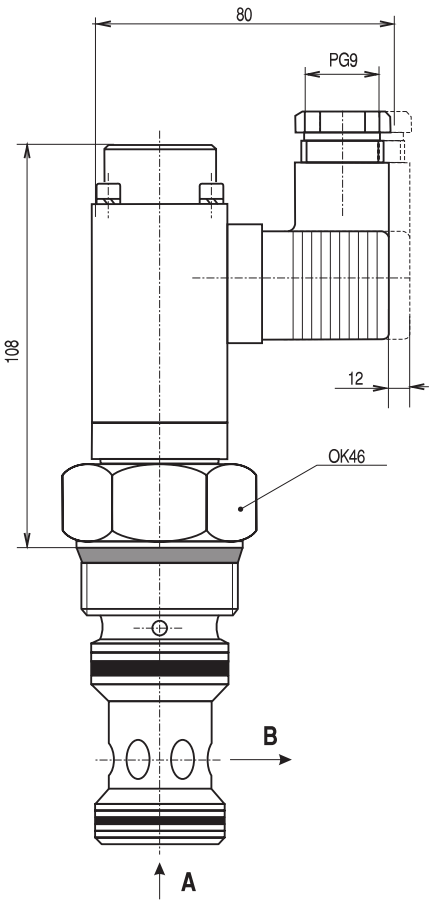
CAVITY DIMENSIONS - QSVEH1-16

All dimensions in [mm]



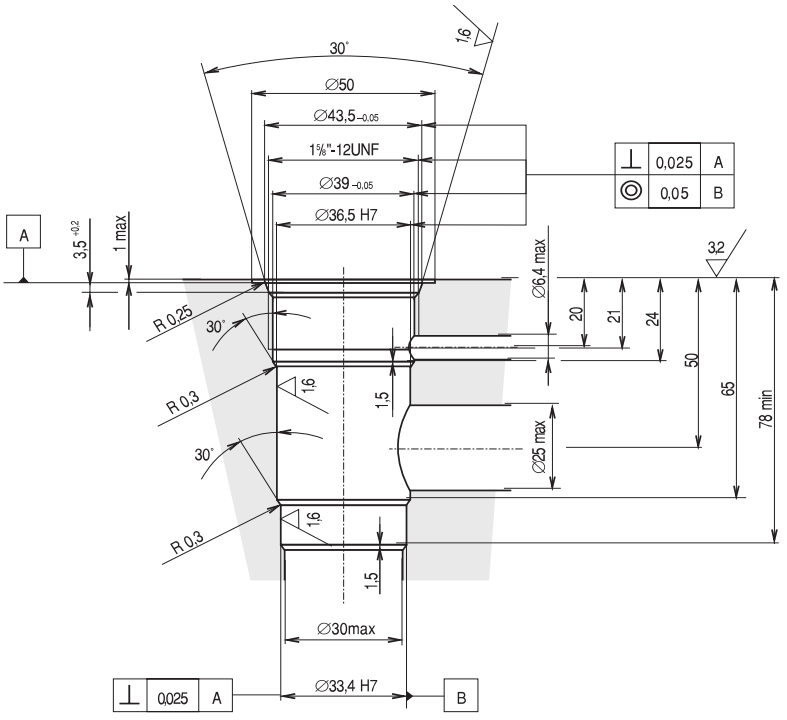
VALVE DIMENSIONS - QSVEH1-20

All dimensions in [mm]

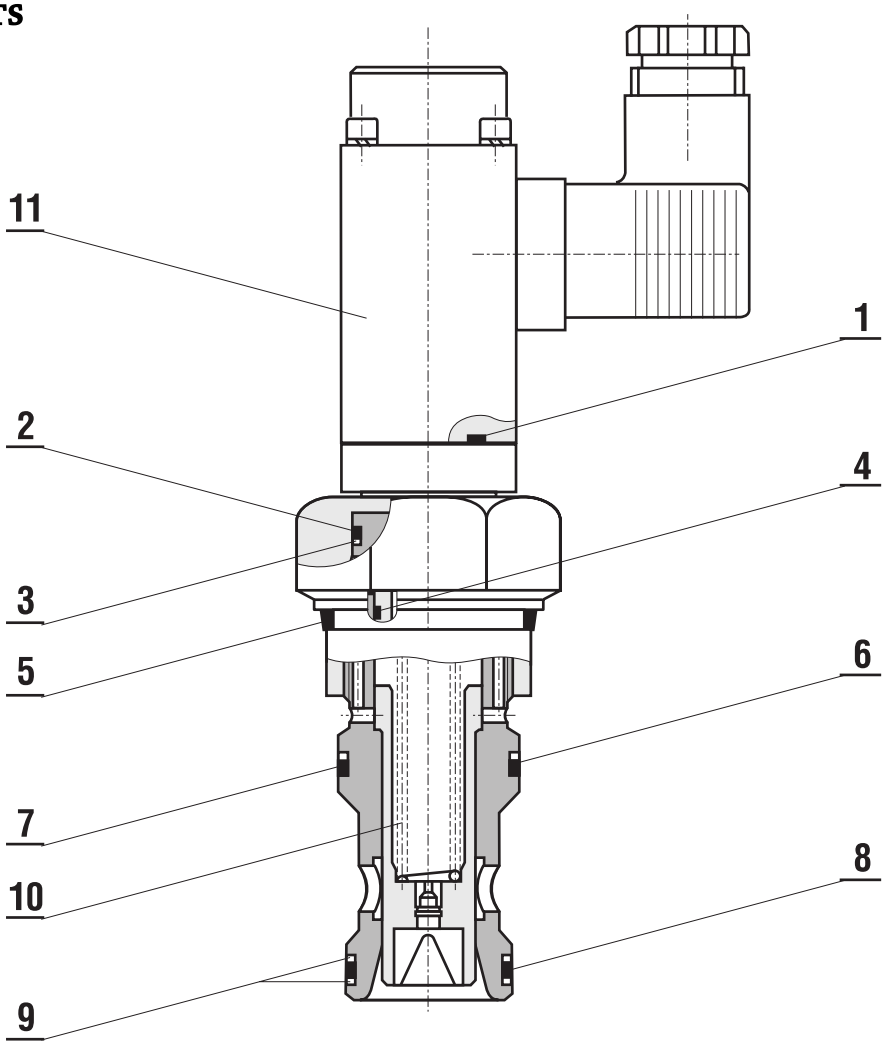


CAVITY DIMENSIONS - QSVEH1-20

All dimensions in [mm]



SPARE PARTS



Position	Designation	Identification	
		QSVEH1-16	QSVEH1-20
1	O-ring NBR80	18.77 x 1.78	18.77 x 1.78
2	O-ring NBR70	20.35 x 1.78	26.70 x 1.78
3	Back-up ring N300-90	8 - 019	8 - 023
4	O-ring NBR80	12.42 x 1.78	18.77 x 1.78
5	O-ring NBR80	29.82 x 2.62	37.77 x 2.62
6	O-ring NBR70	23.47 x 2.62	31.42 x 2.62
7	Back-up ring N300-90	8 - 119	8 - 124
8	O-ring NBR70	20.29 x 2.62	28.24 x 2.62
9	Back-up ring N300-90	8 - 117	8 - 122
10	Spring	Drw. No. 10203	Drw. No. 10231
11	Proportional solenoid 24 V	GRFY035 F20B01 24 V	

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