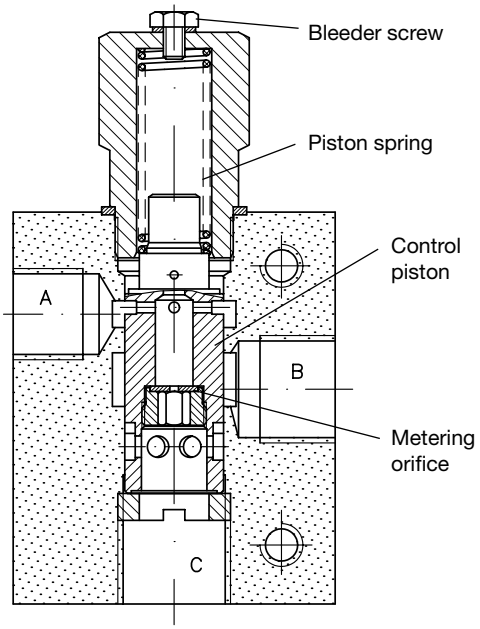
Flow divider type TV 3

with privilege division

Pression p_{max} = 300 bar
Flow Q_{max} = 60 lpm
Max. privileged flow $Q_{A\ max}$ = 8.8 lpm

Section drawing of TV 3



1. General

The valve devides the flow (Q_C) entering at port C in two flows(Q_A and Q_B). The previliged flow (Q_A) leaving at port A is kept constant and a residual flow (Q_B) leaving at port B. This residual flow can be calculated as it is the difference Q_C - Q_A i.e. whenever Q_C changes Q_B will change as well whereas Q_A remains constant (as long as $Q_C > Q_A$).

The flow division is achieved by way of a spring-loaded piston which, in its current control setting with ring grooves in the housing, displays a throttle cross section which closes towards A and opens towards B simultaneously. The control setting is determined by a metering orifice, whose flow resistance will move the piston against the spring force. The orifice bore determines the flow Q_A.

The valve is only working properly when there is a flow at both ports A and B. When there is no flow at one of the outlet ports, the valve will stop the flow to the other one as well. But there will be always a minimum leakage flow (depending on the pressure difference) via the the piston /bore gap. Either a pressure limiting valve or a valve with idle circulation mode (in case of directional valve control) has to be installed in the respective consumer line to maintain proper function of the privilege flow devider when one side (A or B) would show no flow otherwise.

2. Types available, main data

Coding example:

TV 3 - 2,5

Table 1: Basic type, and size

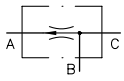
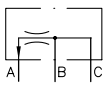
Design	Coding	Flow $Q_{C\ max}$ (lpm)	Press. p_{max} (bar)	Connections A | B, C	Mass (weight) approx. (kg)	Symbols
Pipe connection	**TV 3**	60	300	G 3/8 | G 1/2 ISO 228/1 (BSPP)	1.0	
Manifold mounting	**TV 3 P**	60	300	For dimensions, see sect. 4	1.0	

Table 2: Available metering orifices

Identific. (= ∅ mm)	**1,6**	**1,8**	**2,0**	**2,4**	**2,5**	**2,7**	**3,2**	**3,3**
Guide line Q_A (lpm)	2.7	3.2	4.1	5.4	5.8	6.9	8.8	10.2
	see also coding sect. 3							

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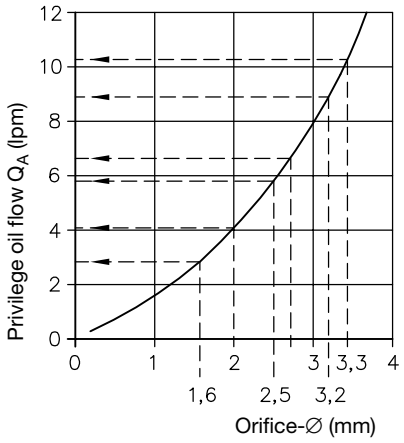
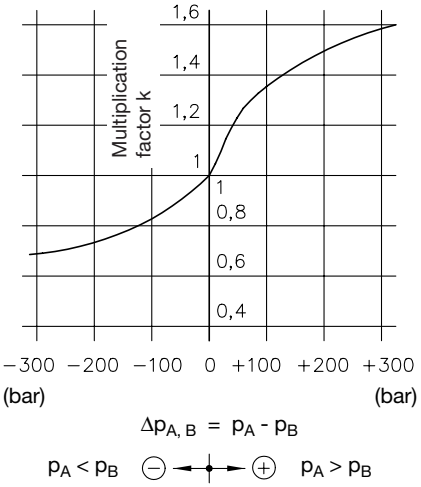
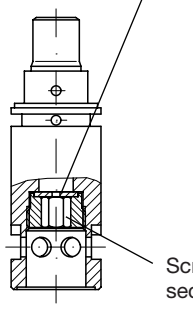
3. Additional data

Type	Piston valve	
Design	Full steel design, piston hardened and ground, running surfaces polished	
Hydraulic connection	Type TV 3:	ISO 228/1 (BSPP), suitable for threaded pipe fittings with shape B male fittings, DIN 3852-2
	Type TV 3 P:	Manifold mounting
Installation position	Any, Bleeding is necessary when installed in upright position (see below)	
Flow direction	from C to A and B	
Pressure medium	Hydraulic oil conforming DIN 51524 part 1 to 3: ISO VG 10 to 68 conform. DIN 51519 Viscosity range: Viscosity during start min. approx. 4; max. approx. 1500 mm^2/s opt. service: approx. 10 ... 500 mm^2/s Also suitable are biologically degradable pressure fluids type HEPG (Polyalkylenglykol) and type HEES (Synth. Ester) at service temperatures up to approx. +70 °C. Obey general insturctions in D 5488/1, sect. 2	
Temperature	Ambient: approx. -40 ... +80°C; Fluid: -25 ... +80°C; Take note of the viscosity ranges! Start temperature down to -40°C are allowable (Pay attention to the viscosity range during start!), as long as the operation temperature during subsequent running is at least 20K (Kelvin) higher. Biological degradable pressure fluids: Pay attention to manufacturer's information. With regard to the compatibility with sealing materials do not exceed +70°C.	

Q_A orifice characteristic for $p_A = p_B$

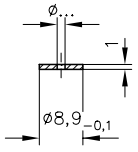






Orifices-∅	Order-Nr
1.6	7360 050 a
1.8	7360 050 e
2	7360 050 g
2.4	7360 050 h
2.5	7360 050 b
2.7	7360 050 d
3.2	7360 050 c
3.3	7360 050 f

Screw (part No. 7360 054) secured with LOCTITE 241

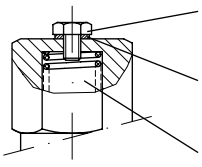


Material St 1203m
DIN 1541

The above Q_A characteristic (recommended value) applies to equal pressure at outlets A and B. If the pressures are different, the constant flow changes slightly depending on the current pressure difference $P_{A,B} = P_A - P_B$ corresponding to $Q_{A\ actual} = k \cdot Q_A$.

The privilege oil flow Q_A allocated to the orifice ∅ is only to be regarded as a recommended value.
The most frequently required Q_A ranges between approx. 2... 10 lpm can be recorded with the metering orifices available as standard. The only important thing is that the desired value has been determined when ordering and is quoted by the corresponding orifice identification number. Later replacement of orifices would only be possible by heating the removed control piston to approx. 180°C with the aid of a hot-air gun, because a threaded ring fixing the orifices is secured with Loctite and this bonding only becomes yielding over 150°C.

Bleeding



Bleeder
ISO 4017-M 4x6-8.8-A2K

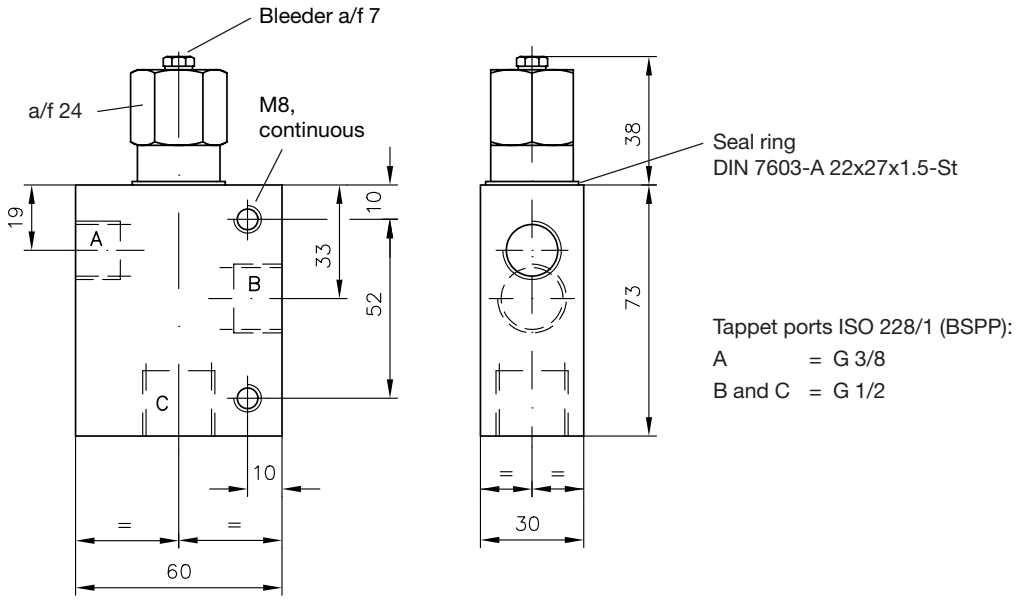
Seal ring A 4x8x1
DIN 7603-Cu

Spring cavity

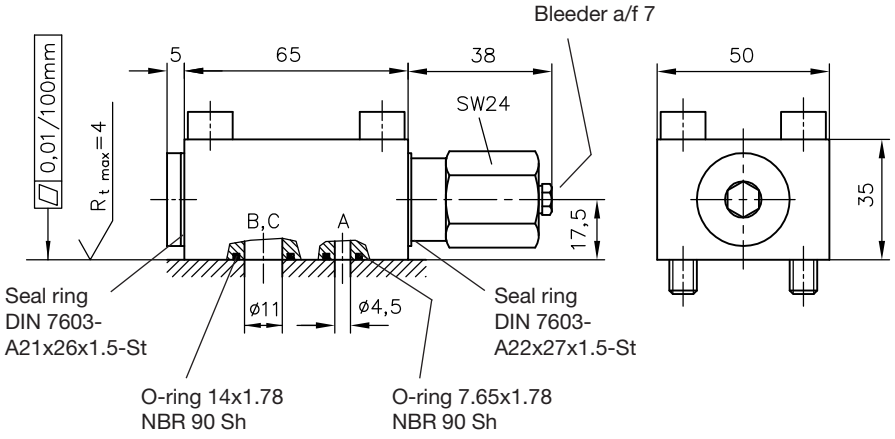
Usually any air which entered the spring cavity during initial operation or fluid service will be flushed out during subsequent operation. The spring cavity has to be bled via the bleeder screw, in case the device is installed in upright position (spring cavity in top position) or a whirring noise does occur. Procedure: Run the system in unloaded state (reduce the system pressure if possible). Loosen the bleeder (do not remove) until no more bubbles are detected. Retighten the bleeder and reset the pressure limiting valve (use a pressue gauge)!

4. Dimensions of units

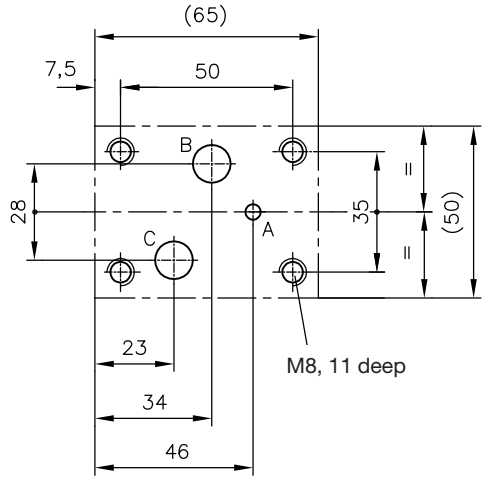
Type TV 3



Type TV 3 P



Hole pattern of the manifold (top view)



All dimensions are in mm, subject to change without notice!