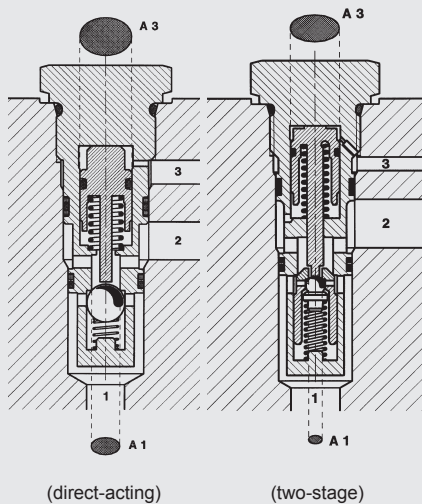


FUNCTION



Note:
Images show option with piston seal

The pilot-to-open check valve ERVE 08021 is a direct-acting poppet valve. Its function is to hold the load in its position - leak-free (less than 5 drops per minute). The valve allows flow from port 2 to port 1. In the opposite direction, the poppet is pressed onto the seat by the closing spring and the pressure at port 1, and blocks flow from 1 to 2. If a sufficiently high control pressure is introduced at port 3, the poppet is opening against the closing spring and oil flows from 1 to 2. In this case port 2 must not be pressurized.

The check valves ERVE 16021 and ERVE 20021 are acting according to the same principle but with first stage decompression. The first stage only opens when a control pressure is introduced, which leads to a damped relief of the pressurized fluid. A further stroke of the spool then causes the main stage to open, permitting flow from 1 to 2.

Check valve Poppet Type, Pilot-to-Open Cartridge – 350 bar ERVE 08021, ERVE 16021 and ERVE 20021

FEATURES

- To prevent creeping of cylinders and loads which are controlled by spool valves
- To prevent uncontrolled movement of loads
- Hardened and ground internal valve components to ensure minimal wear and extended service life
- Low pressure drop by CFD optimized flow path
- Load is held in position leak-free
- Exposed surfaces Zinc-Nickel plated for increased corrosion protection (1.000 h salt spray test)

SPECIFICATIONS*

Operating pressure:	max. 350 bar		
Nominal flow:	ERVE 08021	max. 30 l/min	
	ERVE 16021	max. 150 l/min	
	ERVE 20021	max. 300 l/min	
Cracking pressure:	1 bar (from port 2 to port 1)		
Leakage:	Leakage-free (max. 5 drops/min $\approx 0,25 \text{ cm}^3/\text{min}$ at 350 bar)		
Control volume:	ERVE 08021	0.3 cm ³	
	ERVE 16021	1.55 cm ³	
	ERVE 20021	3.3 cm ³	
Pilot ratio φ :	$\varphi = \frac{A_3}{A_1}$		
	ERVE 08021	$\varphi = 3.4$	
	ERVE 16021	$\varphi = 13.0$	
	ERVE 20021	$\varphi = 13.4$	
Control pressure p_{ctrl} :	Pressure required to cancel shut-off function of the valve across port 3 (flow from 1 to 2) p_2 = pressure across port 2 p_1 = pressure across port 1 Δp = pressure differential from performance curves		
	Release main stage	Release first stage	Keep open
ERVE 08021	$p_{\text{ctrl}} = 0.3 \times p_1 + 2.5 \text{ bar}$	not available	$p_{\text{ctrl}} = p_2 + \Delta p + 4.5 \text{ bar}$
ERVE 16021	$p_{\text{ctrl}} = 0.55 \times p_1 + 2.5 \text{ bar}$	$p_{\text{ctrl}} = 0.08 \times p_1 + 3 \text{ bar}$	$p_{\text{ctrl}} = p_2 + \Delta p + 5.0 \text{ bar}$
ERVE 20021	$p_{\text{ctrl}} = p_1 + 3.5 \text{ bar}$	$p_{\text{ctrl}} = 0.08 \times p_1 + 4 \text{ bar}$	$p_{\text{ctrl}} = p_2 + \Delta p + 6.0 \text{ bar}$
Media operating temperature range:	min. -20 °C to max. +120 °C		
Ambient temperature range:	min. -20 °C to max. +120 °C		
Operating fluid:	Hydraulic oil to DIN 51524 Part 1, 2 and 3		
Viscosity range:	min. 2.8 mm ² /s to max. 380 mm ² /s		
Filtration:	Class 21/19/16 according to ISO 4406 or cleaner		
MTTF _d :	150 years		
Installation:	No orientation restrictions		
Materials:	Valve body:	high tensile steel	
	Piston:	hardened and ground steel	
	Seals:	FKM (standard)	
	Back-up rings:	PTFE	
Cavity:	08021, 16021, 20021		
Weight:	ERVE 08021	0.1 kg	
	ERVE 16021	0.45 kg	
	ERVE 20021	1.4 kg	

* see "Conditions and instructions for valves" in brochure 53.000

MODEL CODE

ERVE08021 - 01 - C - V - 6 - 15

Basic model

Pilot-to-open check valve

Type

- 01 = phosphated surface
- 04 = zinc-nickel-plated surface

Body and ports*

- C = cartridge only
- Inline connection housings, see table

Seals

- V = FKM (standard)
- N = NBR (optional)
- VS = FKM with piston seal
- NS = NBR with piston seal

Pilot ratio ϕ

- 2.7 = 2.7 : 1
- 3.4 = 3.4 : 1
- 6 = 6 : 1
- 13 = 13 : 1
- 13.4 = 13.4 : 1

Opening pressure

- 1 = 1 bar
- 2 = 2 bar
- 15 = 15 bar

Standard models

Model code	Part No.
ERVE08021-01-C-V-3,4-1	710000
ERVE16021-01-C-V-13-1	710001
ERVE08021-01-C-V-13,4-1	710002

Other models on request

*Standard inline bodies

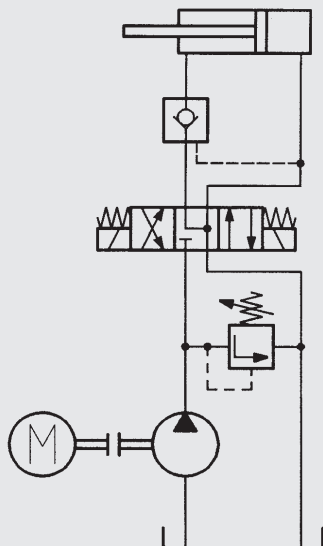
Code	Part No.	Material	Ports	Pressure
R08021-01X-01	275033	Steel, zinc-plated	G3/8, G1/4	420 bar
R08021-10X-01	283841	Steel, zinc-plated	G3/8, G1/4	420 bar
R16021-01X-01	277051	Steel, zinc-plated	G1, G1/4	420 bar
R20021-01X-01	275276	Steel, zinc-plated	G1 1/4, G1/4	420 bar

Other line bodies on request

Seal kits

Code	Material	Part No.
FS METRISCH 080../V	FKM	3877546
FS METRISCH 160../V	FKM	3877598
FS METRISCH 200../V	FKM	3877655

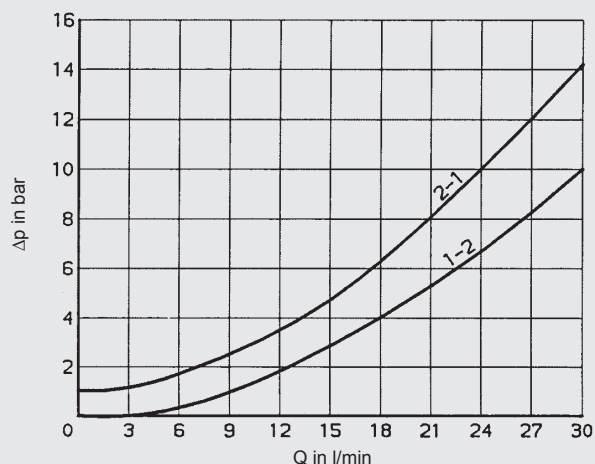
CIRCUIT DIAGRAM EXAMPLE



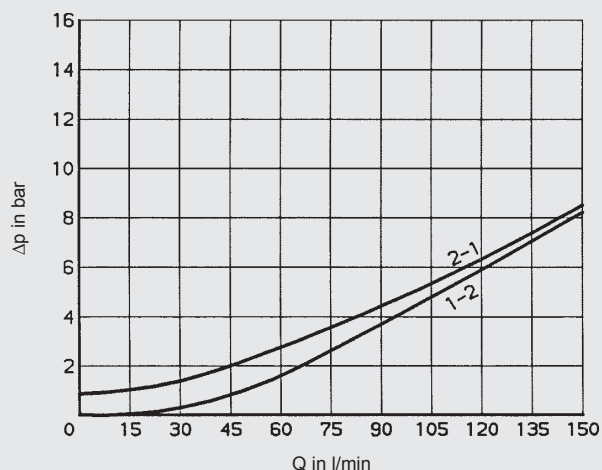
PERFORMANCE

Measured at $\sqrt{\nu} = 36 \text{ mm}^2/\text{s}$, $T_{\text{oil}} = 50 \text{ }^\circ\text{C}$

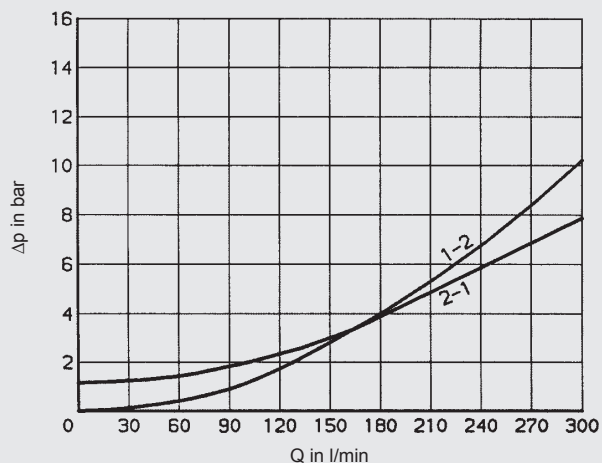
ERVE 08021



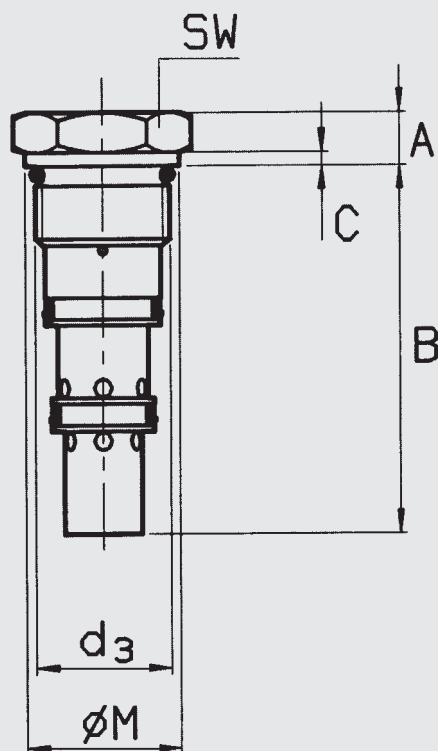
ERVE 16021



ERVE 20021



DIMENSIONS

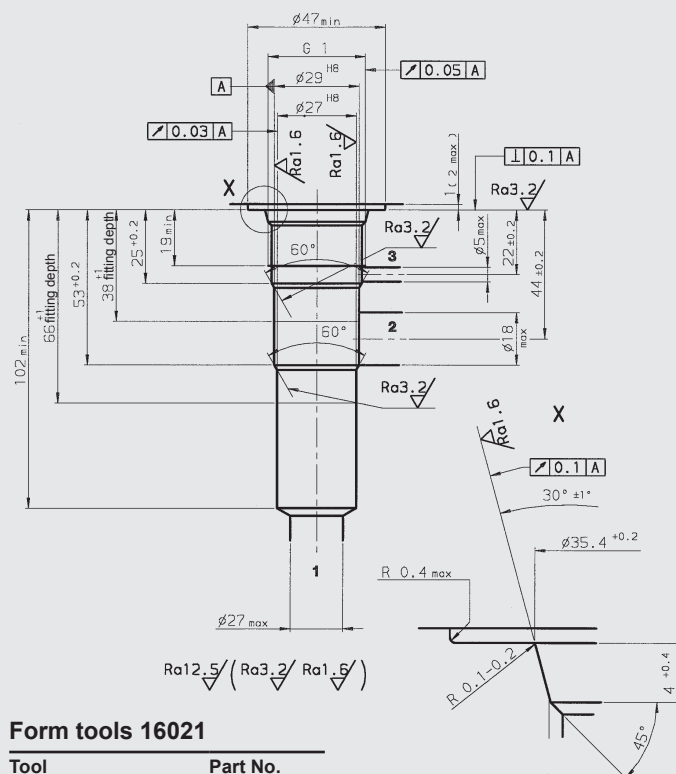


Millimeter
Subject to technical modifications

Nom. size	d3	A	B	C	ØM	SW	Torque
ERVE 08021	G 1/2	8	56	2	24	24	25 ⁺⁵ Nm
ERVE 16021	G 1	16	100	3	40	41	150 ⁺¹⁰ Nm
ERVE 20021	G 1 1/2	20	125	3	54	55	150 ⁺¹⁰ Nm

CAVITY

16021 (ERVE 16021)



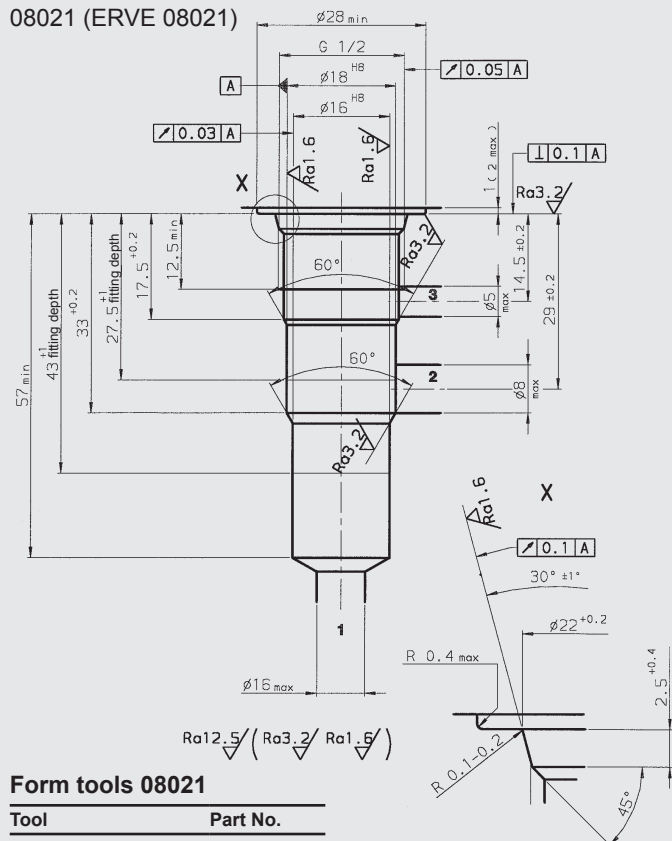
Form tools 16021

Tool	Part No.
Countersink	170035
Reamer	169965
Tap	1002661
Plug gauge	174879

Millimeter
Subject to technical modifications

CAVITY

08021 (ERVE 08021)



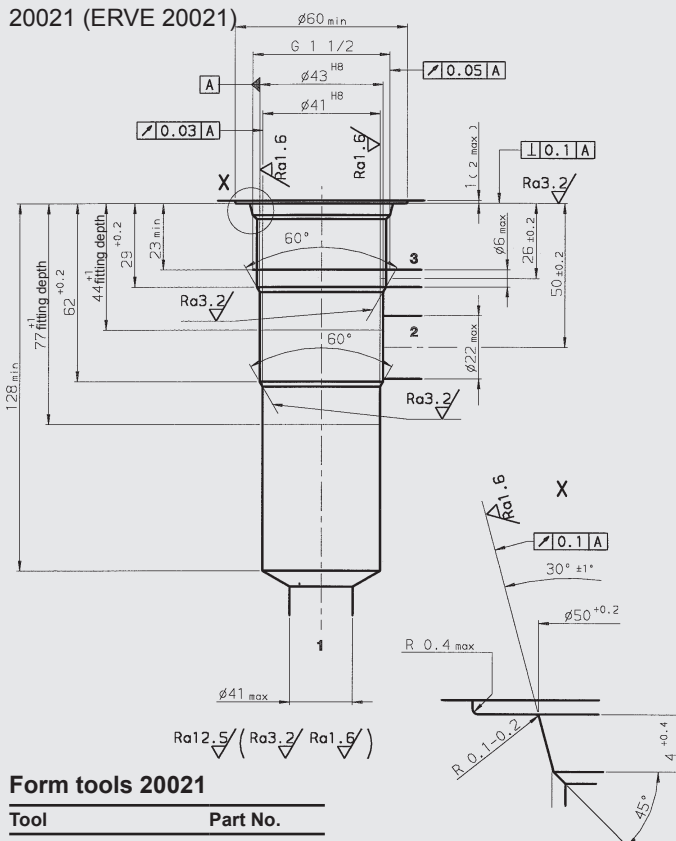
Form tools 08021

Tool	Part No.
Countersink	170031
Reamer	169962
Tap	1002667
Plug gauge	169939

Millimeter
Subject to technical modifications

CAVITY

20021 (ERVE 20021)



Form tools 20021

Tool	Part No.
Countersink	170034
Reamer	169966
Tap	1002524
Plug gauge	174880

Millimeter
Subject to technical modifications