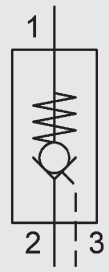
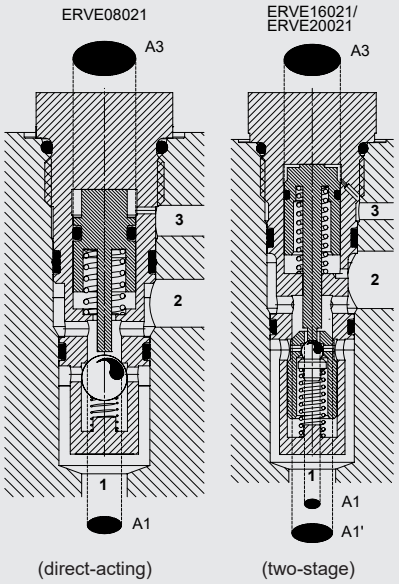
Check valve Poppet Type Pilot-to-Open Cartridge – 350 bar

ERVE08021, ERVE16021 and ERVE20021



up to 300 l/min
up to 350 bar

FUNCTION



Note:
Images show option with piston seal

The pilot-to-open check valve ERVE08021 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 ERVE16021 and ERVE20021 are acting according to the same principle but with first stage decompression (A1). 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 (A1') to open, permitting flow from 1 to 2.

FEATURES

- To prevent creeping of cylinders and loads which are controlled by spool valves
- To prevent uncontrolled movement of loads
- 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:	ERVE08021 max. 30 l/min ERVE16021 max. 150 l/min ERVE20021 max. 300 l/min
Cracking pressure:	1 bar (from port 2 to port 1)
Leakage:	Leakage-free (max. 5 drops/min ≙ 0.25 cm³/min at 350 bar)
Control volume:	ERVE08021 0.3 cm³ ERVE16021 1.55 cm³ ERVE20021 3.3 cm³
Pilot ratio φ:	$\varphi = \frac{A3}{A1}$ Relief at ERVE08021 Pre-relief at ERVE16021 and ERVE20021 ERVE08021 φ = 3.4 or φ = 6 or φ = 2.5 (Version -04 only) ERVE16021 φ = 13 (φ' = 1.9) ERVE20021 φ = 13.4 (φ' = 1.0)
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
ERVE08021	$p_{ctrl} = 0.3 \times p_1 + 2.5$ bar	not available	$p_{ctrl} = p_2 + \Delta p + 4.5$ bar
ERVE16021	$p_{ctrl} = 0.55 \times p_1 + 2.5$ bar	$p_{ctrl} = 0.08 \times p_1 + 3$ bar	$p_{ctrl} = p_2 + \Delta p + 5.0$ bar
ERVE20021	$p_{ctrl} = p_1 + 3.5$ bar	$p_{ctrl} = 0.08 \times p_1 + 4$ bar	$p_{ctrl} = p_2 + \Delta p + 6.0$ 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 mm²/s to max. 380 mm²/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) NBR (optional, media temperature range up to -30 °C) Back-up rings: PTFE
Cavity:	08021, 16021, 20021
Weight:	ERVE08021 0.1 kg ERVE16021 0.45 kg ERVE20021 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

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

Pilot ratio φ
2.5 = 2.5 : 1 (ERVE08021-04 only)
3.4 = 3.4 : 1 (ERVE08021 only)
6 = 6 : 1 (ERVE08021 only)
13 = 13 : 1 (ERVE16021 only)
13.4 = 13.4 : 1 (ERVE20021 only)

Opening pressure
1 = 1 bar
2 = 2 bar (ERVE08021 only)
8.5 = 8.5 bar (ERVE08021-04 only)
13 = 13 bar (ERVE08021 only)
15 = 15 bar (ERVE08021-04 only)
22 = 22 bar (ERVE08021-04 only)

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

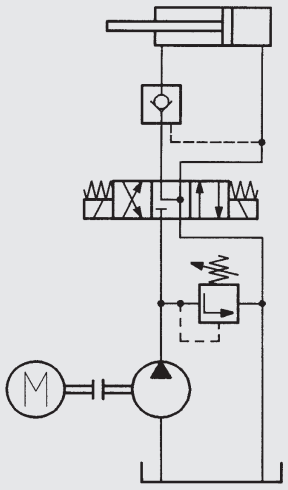
Code	Part No.	Material	Ports		Pressure
R08021-01X-01	275033	Steel, zinc-plated	G3/8,	G1/4	350 bar
R08021-10X-01	283841	Steel, zinc-plated	G3/8,	G1/4	350 bar
R16021-01X-01	277051	Steel, zinc-plated	G1,	G1/4	350 bar
R20021-01X-01	275276	Steel, zinc-plated	G1 1/4,	G1/4	350 bar

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

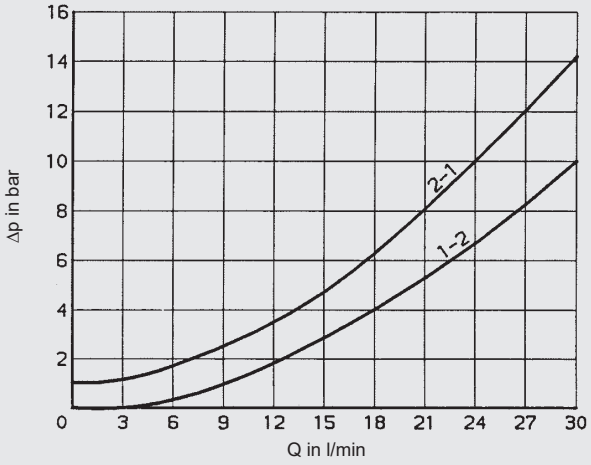
CIRCUIT DIAGRAM EXAMPLE



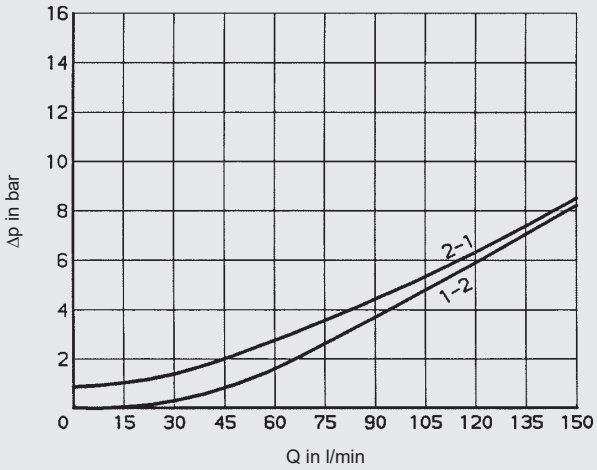
TYPICAL PERFORMANCE

measured at ν = 36 mm²/s, T_{oil} = 50 °C

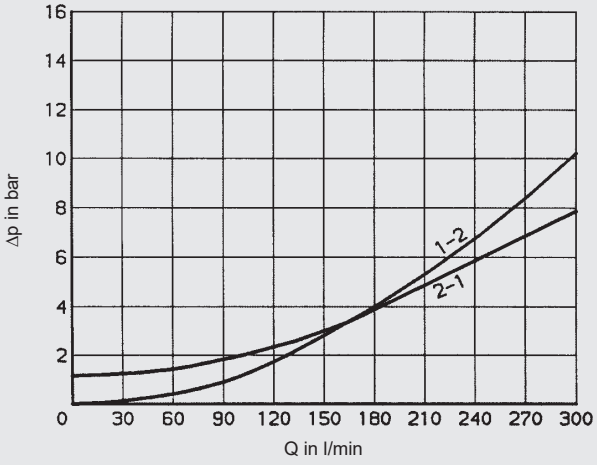
ERVE08021



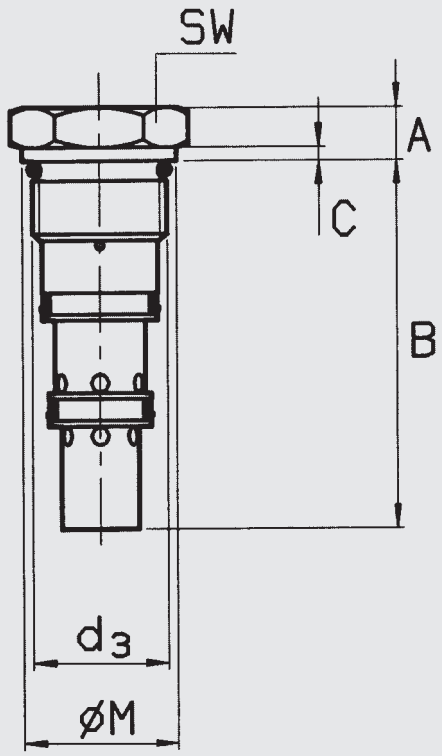
ERVE16021



ERVE20021



DIMENSIONS

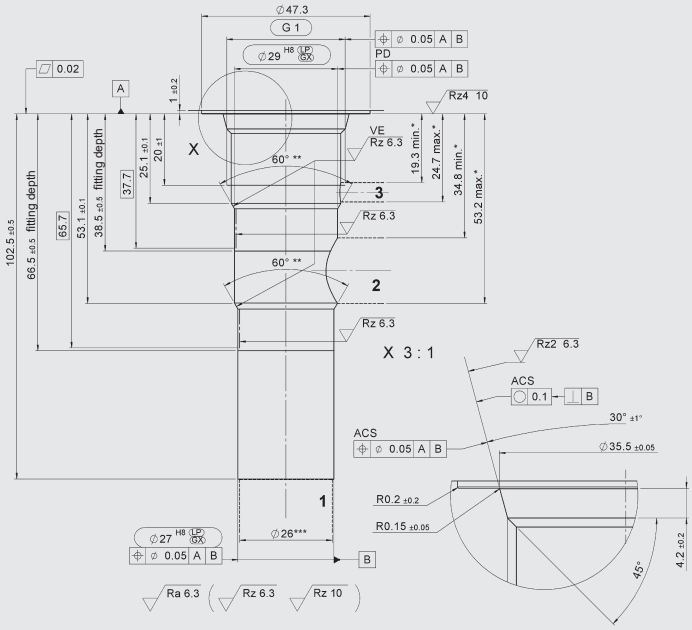


Millimeter
Subject to technical modifications

Nom. size	d3	A	B	C	ØM	SW	Torque
ERVE08021	G ½	8	56	2	24	24	25^{+5} Nm
ERVE16021	G 1	16	100	3	40	41	150^{+10} Nm
ERVE20021	G 1½	20	125	3	54	55	150^{+10} Nm

CAVITY

16021 (ERVE16021)



VE = visual examination
* Allowed drilling zone (for manifold design)
** Sharp edges should be avoided by rounding to a radius of 0.1 mm to 0.2 mm
*** largest pre-dilling diameter (nominal tool diameter)

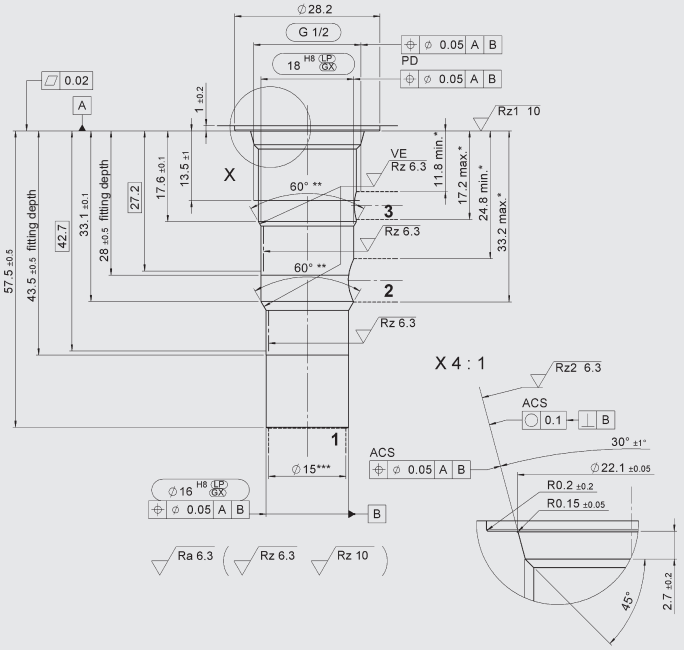
Form tools 16021

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

Millimeter
Subject to technical modifications

CAVITY

08021 (ERVE08021)



VE = visual examination
* Allowed drilling zone (for manifold design)
** Sharp edges should be avoided by rounding to a radius of 0.1 mm to 0.2 mm
*** largest pre-dilling diameter (nominal tool diameter)

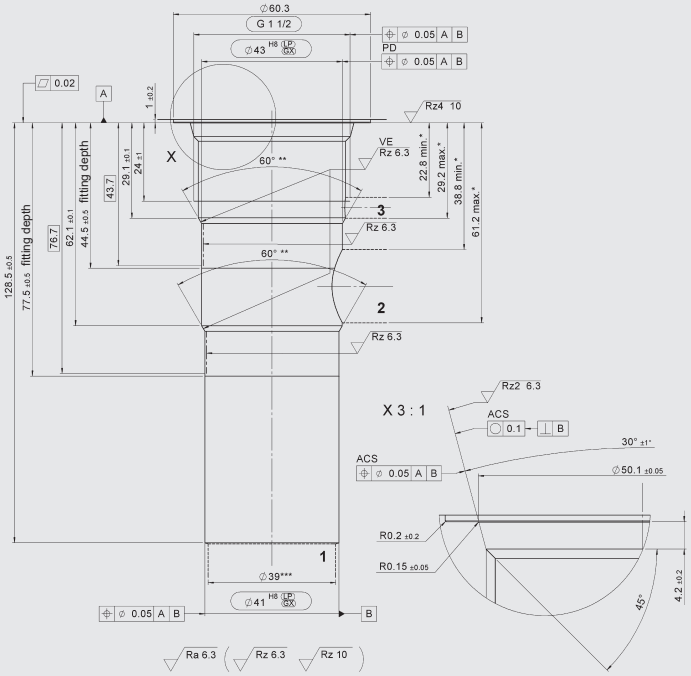
Form tools 08021

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

Millimeter
Subject to technical modifications

CAVITY

20021 (ERVE20021)



VE = visual examination
* Allowed drilling zone (for manifold design)
** Sharp edges should be avoided by rounding to a radius of 0.1 mm to 0.2 mm
*** largest pre-dilling diameter (nominal tool diameter)

Form tools 20021

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

Millimeter
Subject to technical modifications

NOTE

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

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