

Pressure controlled the 2-way directional valve type CNE

cartridge valve for simple tapped holes

Pressure $p_{max} = 500 \text{ bar}$

Flow $Q_{max} = 30 \text{ lpm}$

Other valves with same mounting hole:

Shut-off and throttle valves Typ CAV	D 7711
Check valves Typ CRK, CRB, CRH	D 7712
Pressure reducing valves type CDK	D 7745
Flow control valves type CSJ	D 7736
Pressure-dependent shut-off valves type CDSV	D 7876
Pressure valves type CMV, CSV	D 7710 MV

1. General information

Unloading relief valve (idle circulation valve) type CNE

Pressure controlled the 2-way directional valve (idle circulation valve) type CNE can be used for most different control tasks. But its main purpose is to switch one of the two pump circuits joined to a common pipe into idle circulation (low pressure circuit), as soon as the adjusted pressure setting in the common pipe is reached and exceeded by the remaining pump circuit (high pressure circuit). The valve is forced open and the idle circulation mode is maintained by the higher pressure in the control line.

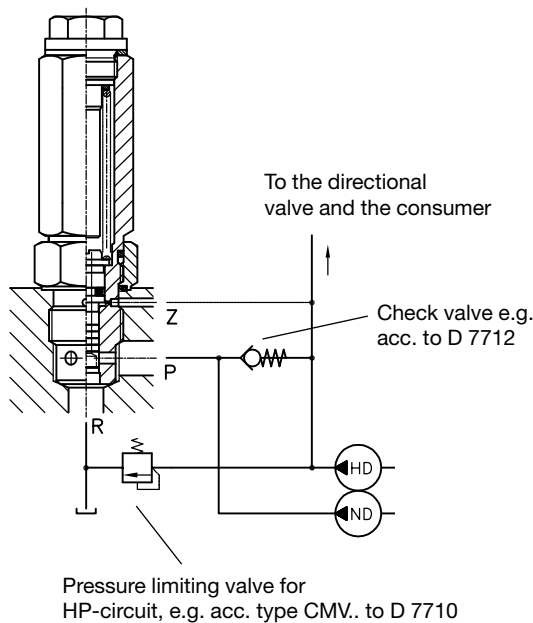
For switch-off pressure between 20 and 450 bar (depending on pressure range) and flows up to 30 lpm. Control port Z may be pressurized up to 500 bar. Type CNE 2 also acts as a pressure limiting valve for the low pressure circuit. There is always a minor leakage between ducts Z, P, and R because of the fitting gap of the switching spool and the mounting thread, see also sect. 3. Version CNE 21 features additionally a thread seal minimizing this effect, which is lacking with CNE 2. Type CNE 22 and CNE 23 features both a thread and a piston seal. All these versions with additional sealing show an increased switching hysteresis

Unique design feature of these valve types is the easy to manufacture mounting hole at the manifold. The sealing of the inlet to outlet takes place at the contact area between the facial sealing edge of the screwed-in end of the valve body and the stepped shoulder of the core diameter at the location thread. Any standard steel drill (point angle 118°) automatically forms this stepped shoulder when the core diameter is drilled. Therefore reaming of the hole and bevels to help the seals slip in are not necessary.

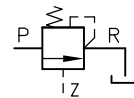
The sealing of the attached valve and its fixing at the manifold body are made by a sealing nut with a special thread seal and an O-ring.

Schematic cross-sectional drawing and symbols

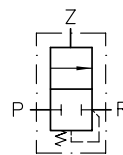
Type CNE



Symbols



Simplified flow pattern symbol



Detailed flow pattern symbol

2. Available versions, main data

Order examples: 2-way shut-off valve

CNE 2 C -30
CNE 22 B -350

Desired pressure setting (bar)
 within the various pressure ranges

Nomination	Basic type and size	Flow Q_{max} approx. (lpm)	Pressure range adjustable from ... to ... (bar) (adjustable by adding or removing washers)						Tapped journal metric fine thread confor. ISO	Torque (Nm) ¹⁾		Symbols Tool adjustable	
			L	M	A	B	C	D		E	Housing (Nm)		Sealing nut (Nm)
Pressure controlled 2-way shut-off valve	CNE 2 CNE 21 ²⁾ CNE 23 ²⁾	30	120... ...150	95... ...120	75... ...95	60... ...75	45... ...60	30... ...45	20... ...30	M20x1.5	50	40	
	CNE 22 ²⁾		---	---	---	320... ...450	150... ...320	---	---		70	60	

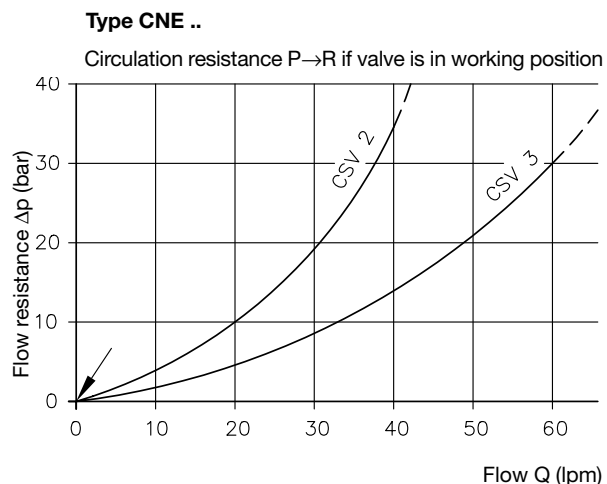
1) This applies to manifolds made of steel, spheroidal cast and other common material (e.g. light alloy). For perm. torque, see sect. 4 ++

2) For difference to type CNE 2, see description in sect. 1.
 CNE 21: Additional thread seal
 CNE 22 (23): Additional thread and a piston seal

3. Further data

Nomination	Pressure controlled the 2-way directional valve, cartridge type		
Design	Spool type valve		
Material	Steel body gas nitrided, sealing nut galv. zinc plated, internal functional parts hardened and ground.		
Installation position	Any		
Port coding	P = Inlet (pump side) R = Outlet (return $p_R \leq 50$ bar) Z = Control port	Codings intended for circuit plans and assembly instructions. These may be found in the overview on page 1 or at the dimensional drawings in sect. 4 ++. No codings are applied to the valve body.	
Mass (weight)	Type CNE .. = approx. 200 g		
Switching hysteresis	Type CNE 2, CNE 21 approx. 6 bar, Type CNE 22, CNE 23 approx. 12 bar		
Pressure alteration (rough guideline)	Pressure range (bar)	per mm spring pre-load CNE 2, CNE 21 and CNE 23	CNE 22
Attention: It is necessary to check pressure variation with pressure gauge!	L	10.5 bar	
	M	6.3 bar	
	A	4.2 bar	
	B	2.5 bar	32 bar
	C	1.7 bar	11 bar
	E	0.9 bar	
Static overload capacity	approx. $2 \times p_{max}$ at tightened state and. With sealing nut locked ($p_{max} = 500$ bar).		
Leakage oil	Type CNE 2 and CNE 21: Negligible leakage exists between connections $Z \rightarrow R$ and $Z \rightarrow P$ (LP circuit) due to spool and thread clearance. Leakage is only observable when a direct connection to the consumer exists without a directional seated valve in between.		
		Leakage flow rate $Z \rightarrow P(R)$ (ccm/min)	
		CNE 2	CNE 21
	$p_Z = 200$ bar	100	55
	$p_Z = 500$ bar	250	160
		Viscosity during measurements approx. $60 \text{ mm}^2/\text{s}$	
Pressure fluid	Hydraulic oil conforming DIN 51524 part 1 to 3: ISO VG 10 to 68 conforming DIN 51519. Viscosity limits: min. approx. 4, max. approx. $1500 \text{ mm}^2/\text{s}$; opt. operation approx. $10... 500 \text{ mm}^2/\text{s}$. Also suitable are biologically degradable pressure fluids types HEPG (Polyalkylenglycol) and HEES (Synth. Ester) at service temperatures up to approx. $+70^\circ\text{C}$.		
Temperature	Ambient: approx. $-40 \dots +80^\circ\text{C}$ Fluid: $-25 \dots +80^\circ\text{C}$, Note the viscosity range! Permissible temperature during start: -40°C (observe start-viscosity!), as long as the service temperature is at least 20K higher for the following operation. Biologically degradable pressure fluids: Observe manufacturer's specifications. By consideration of the compatibility with seal material not over $+70^\circ\text{C}$.		

Δp-Q-curves (guideline)



4. Unit dimensions

All dimension in mm and subject to change without notice!

4.1. Pressure controlled the 2-way directional valve

Type CNE 2

Valve housing
a/f 22
torque 50 Nm

Sealing nut
a/f 24
torque 40 Nm

Sealing edge

Note for assembly, see sect. 4.2

O-ring
17.17x1.78
AU 90 Sh

Kantseal DKAR 00018
-N9011 NBR 90 Sh
18.77x22.13x1.68

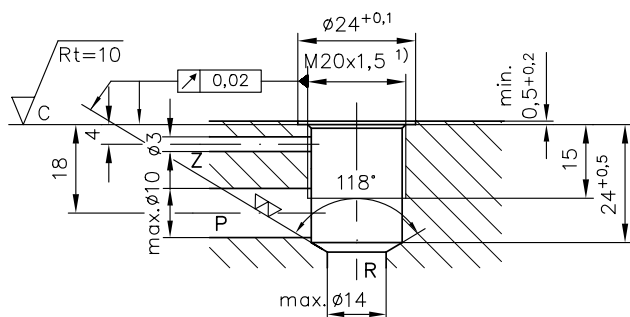
Type CNE 21 CNE 22 CNE 23

Thread seal via seal ring
M20x1.5

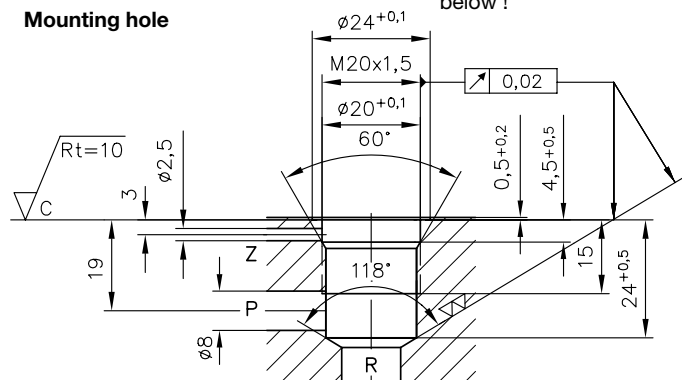
CNE 22:
a/f 30

CNE 22:
a/f 27

Mounting hole



Mounting hole



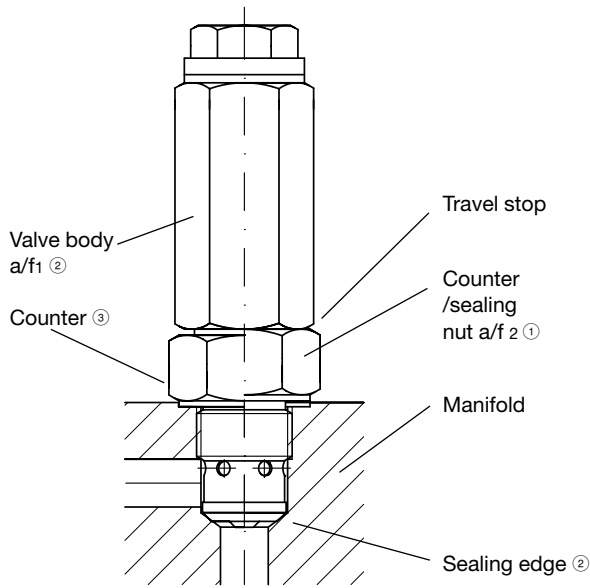
For missing data see below !

Note: Tapped plugs for the mounting holes, see sect. 4.2

2) Sink (counter bore) of the thread = Ø20+0.2

4.2. Assembly instructions

Screw in and locking

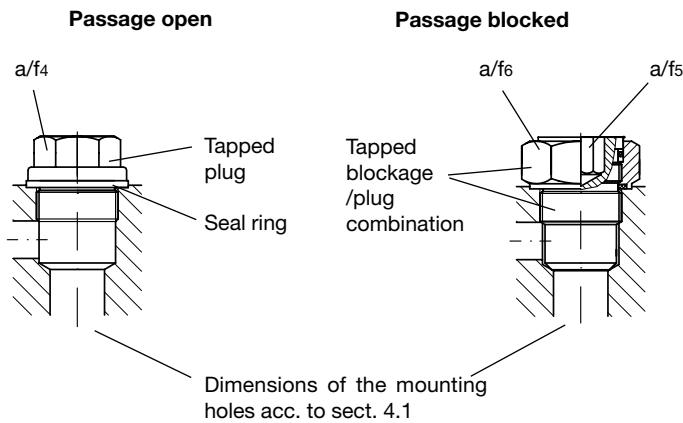


- ① Before screwing the valve body into the manifold loosen the counter/sealing nut until the travel stop.
- ② Screw in the valve body (a/f 1) and tighten with the correct tightening moment. The metallic sealing of the inlet to the outlet takes place at the contact area of the facial sealing edge and the stepped shoulder of the core diameter at the location thread.
- ③ Retighten the counter/sealing nut with the correct torque.

Type and size	Valve body		Counter and sealing nut	
	Spanner size a/f1 (mm)	Torque (Nm)	Spanner size a/f2 (mm)	Torque (Nm)
CNE 2 CNE 21 CNE 23	22	50	24	40
CNE 22	30	70	27	60

Tapped plugs

Mounting holes in the manifold may be blocked if required by tapped plugs, e.g. if uniform manufactured manifolds should be equipped with or without cartridge valves depending on application.



Type and size	Passage open Tapped plug			Seal ring DIN 7603-Cu	Passage blocked Tapped blockage/plug combination complete				
	DIN 910	a/f4 (mm)	Torque (Nm)		Drawing No.	Tapped part		Counter/sealing nut ¹⁾	
					a/f5 (mm)	Torque (Nm)	a/f6 (mm)	Torque (Nm)	
CNE 2	M20x1.5	19	50	A20x24x1.5	Z 7715 019	10	50	24	40
CNE 21 CNE 22 CNE 23	M20x1.5	19	50	A20x24x1.5	Z 7748 050	10	50	24	40
Mass (weight)	M20x1.5 + seal ring = approx. 70 g			Z 7715 019 = approx. 95 g Z 7748 050 = approx. 95 g					

1) For thread seals and O-rings see sect. 4.1 to 4.3