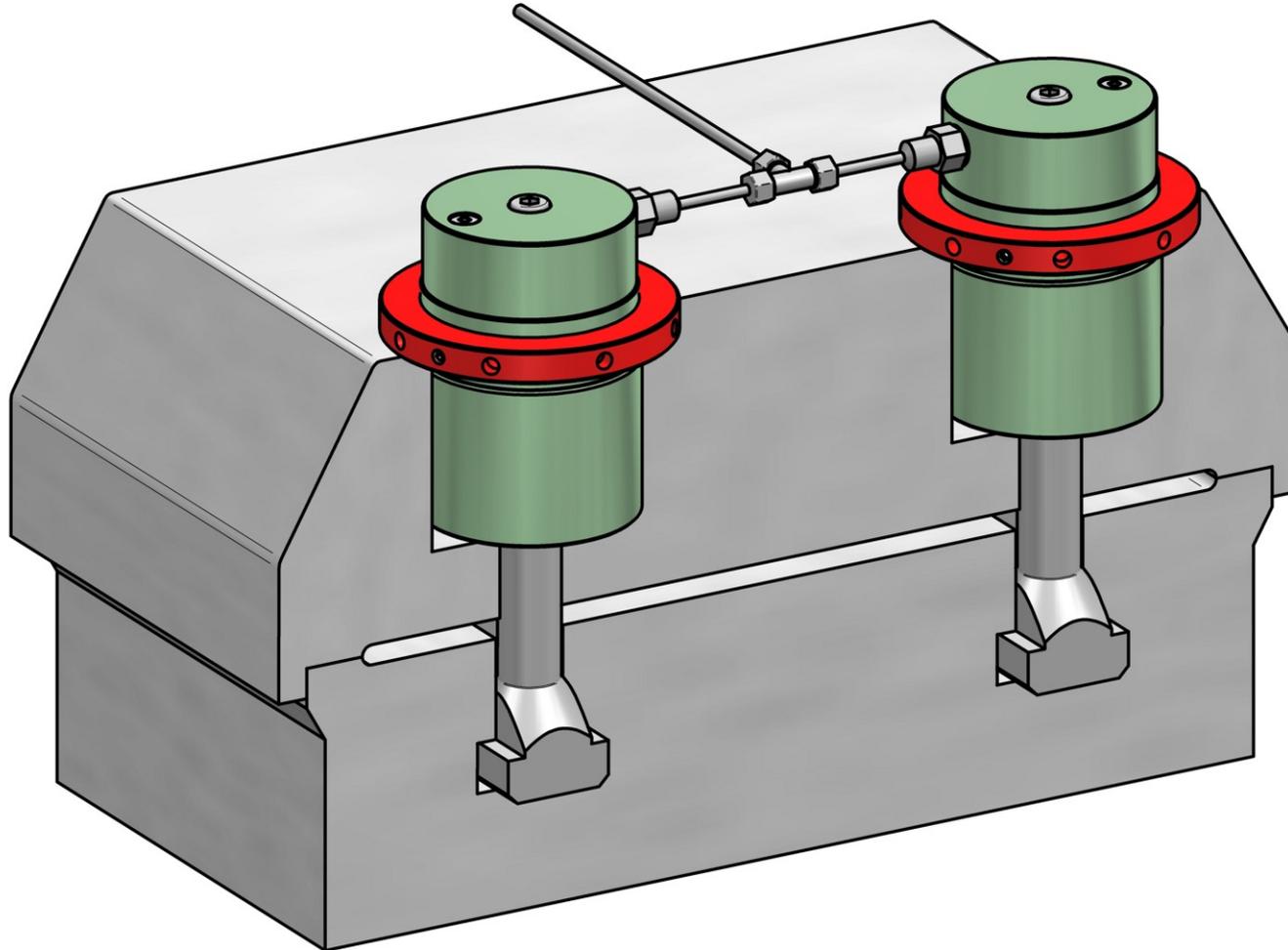
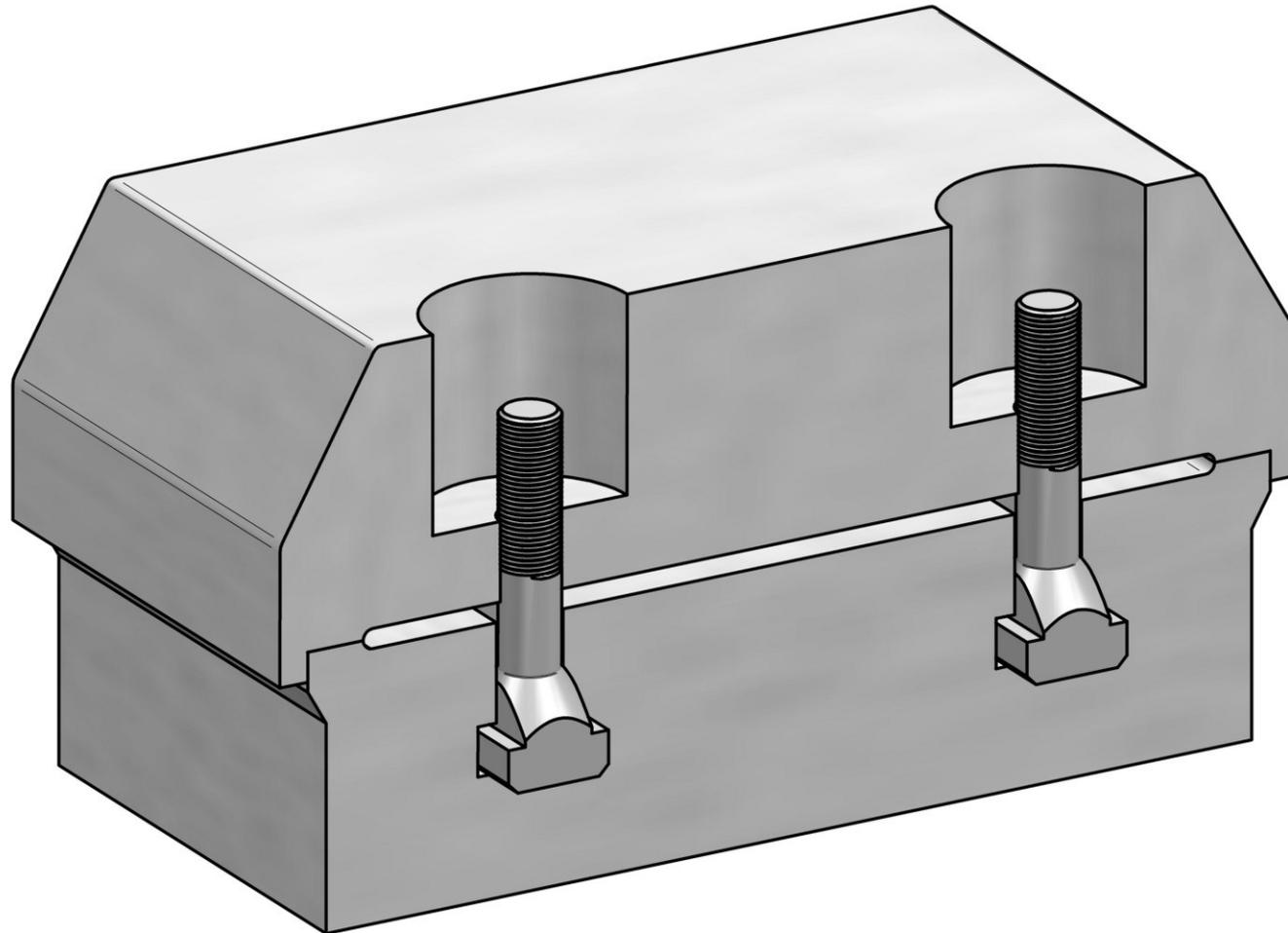


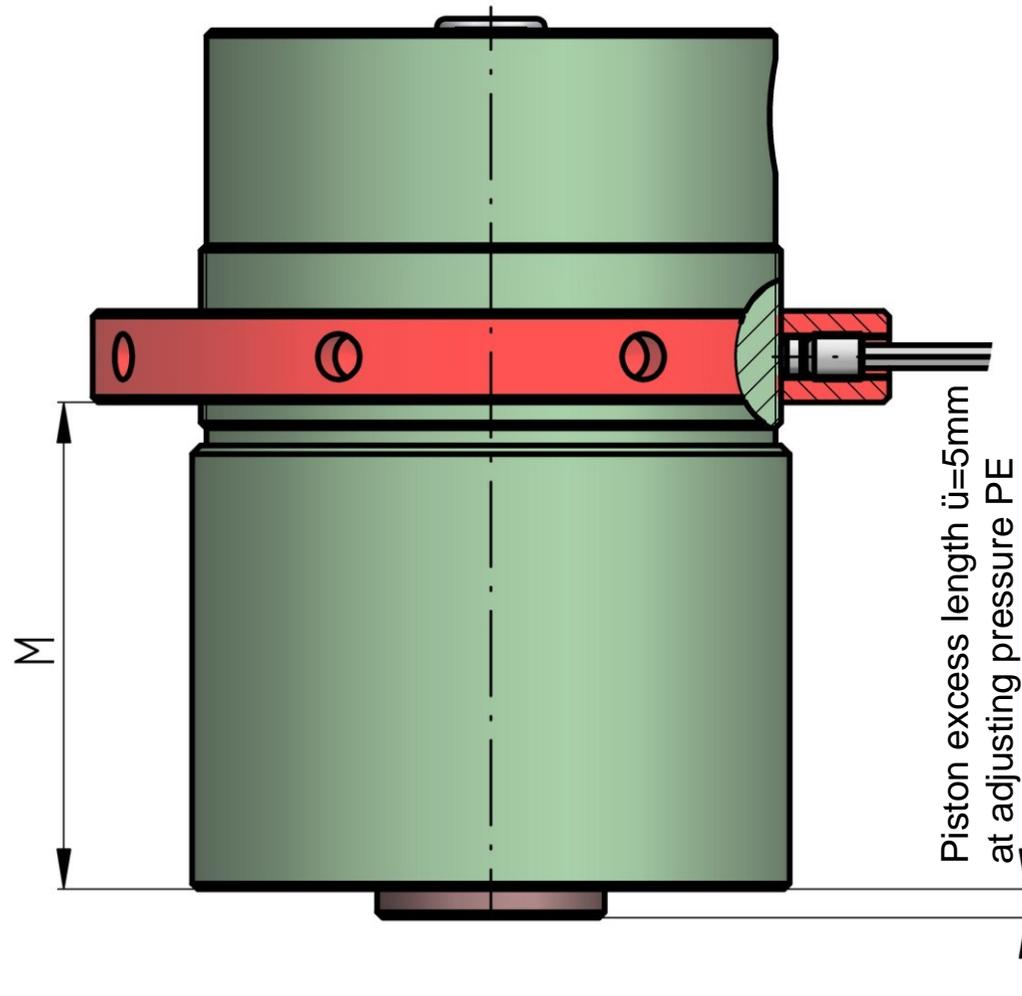
Operating instructions – instruction for installation of spring clamp cylinder Series ZSF



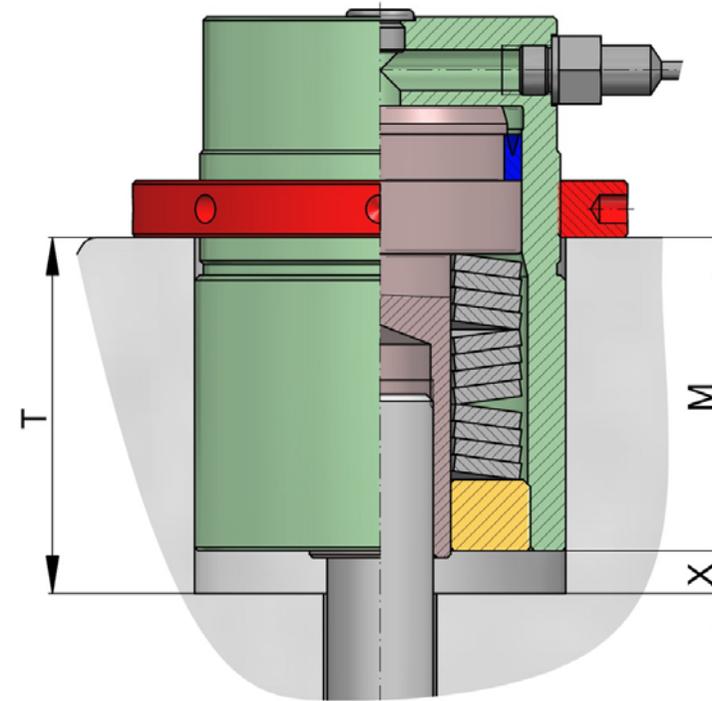
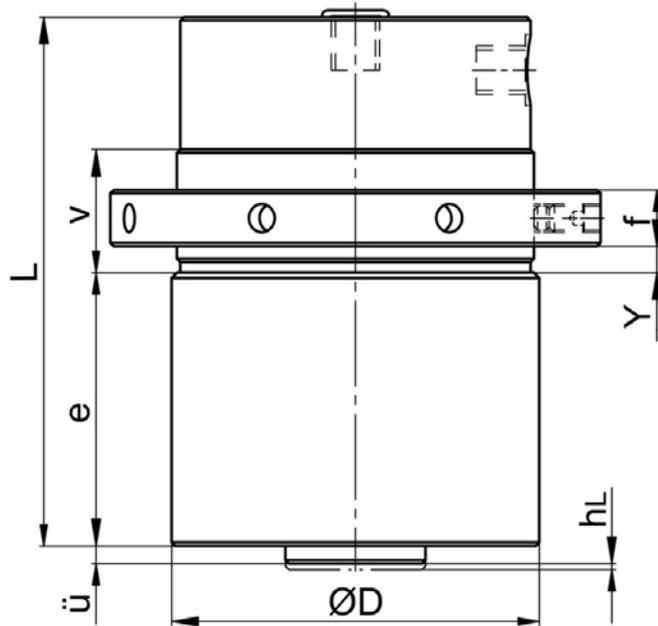
- ① Application example:
Slide clamping with parallel operation with spring clamping cylinder type ZSF 10.000



② Assembly of T-slot screw or tension bolt (consider anti-twist protection)



- ③ Adjust ring nut to mounting position „M“ (see page 4) and lock this position



$$M = e + Y$$

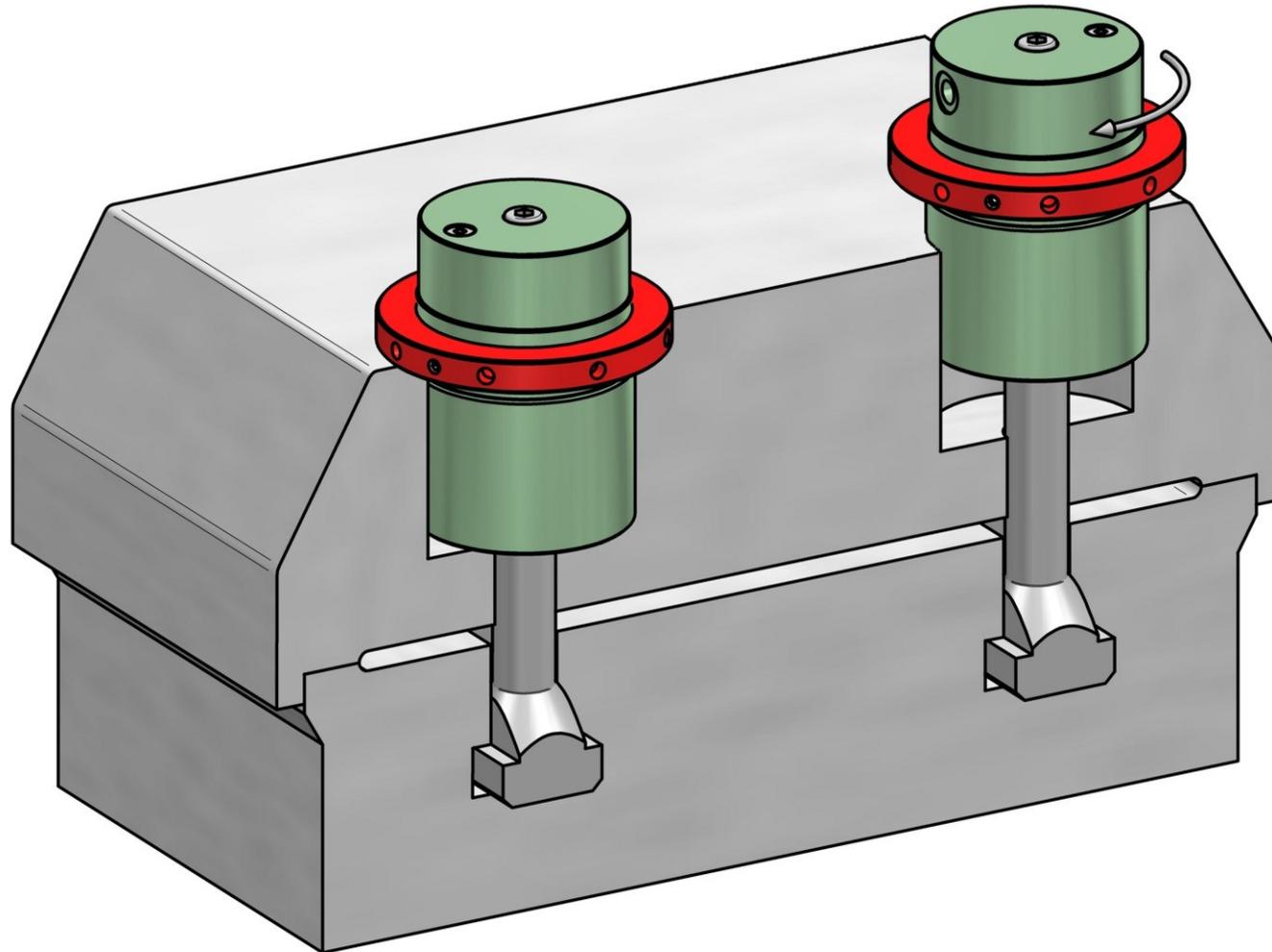
$$x = \ddot{u} + h_{Lmax} + s$$

$$T = M + x$$

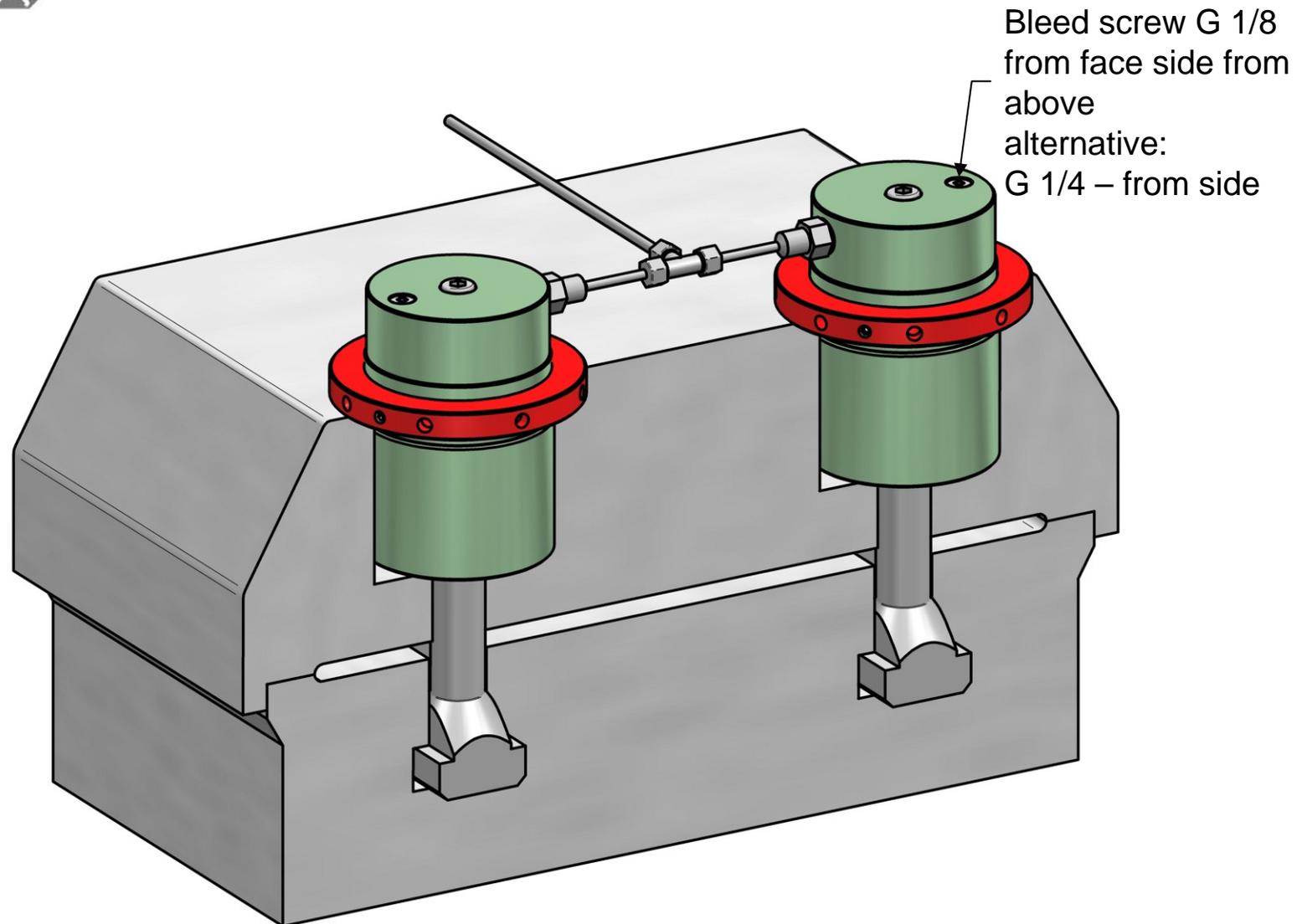
T = depth of cylindrical bore
 dimensions e / v / f / h_{Lmax} see data sheet
 Y = define position of ringnut according to "v" und "f"
 h_{Lmax} = maximum release stroke
 s = safety distance = at least 1-2 mm
 ü = piston dimension at adjusting pressure = approx. 5 mm

Example: Type ZSF 10.000
 M = 78 + 4 = 82 mm
 x = 5 + 1,5 + 1,5 = 8 mm
 T = 82 + 8 = 90 mm

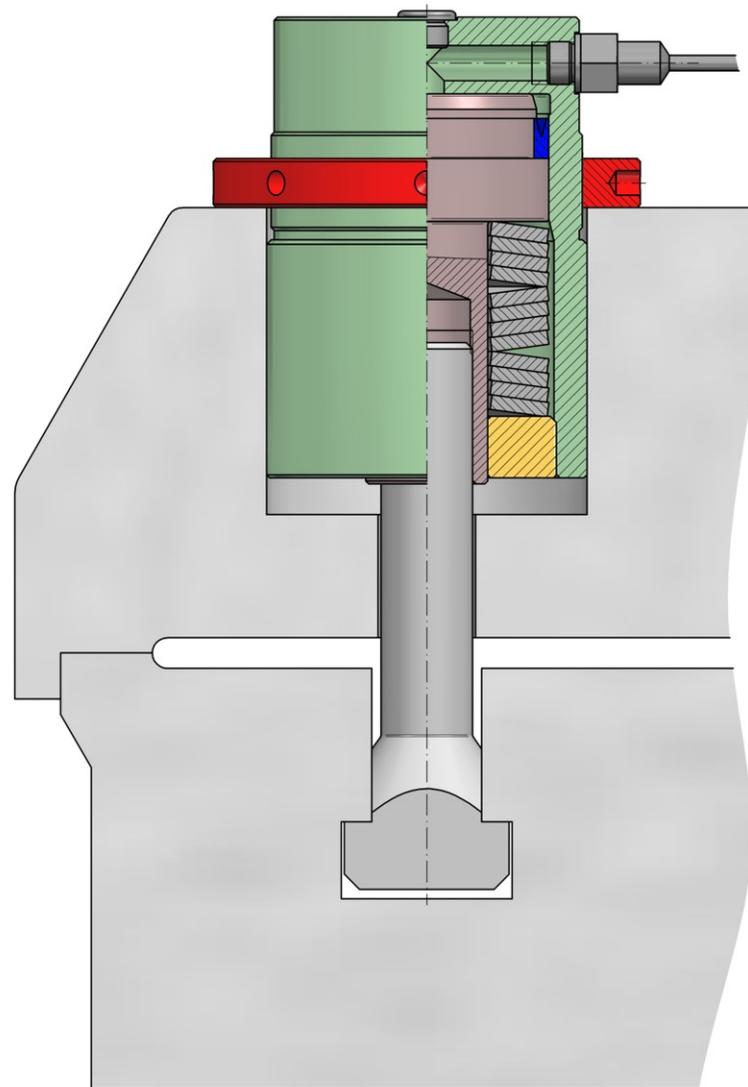
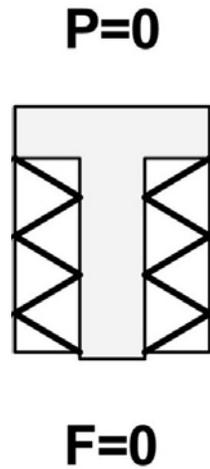
④ Determination of assembly length "M" and bore depth "T"



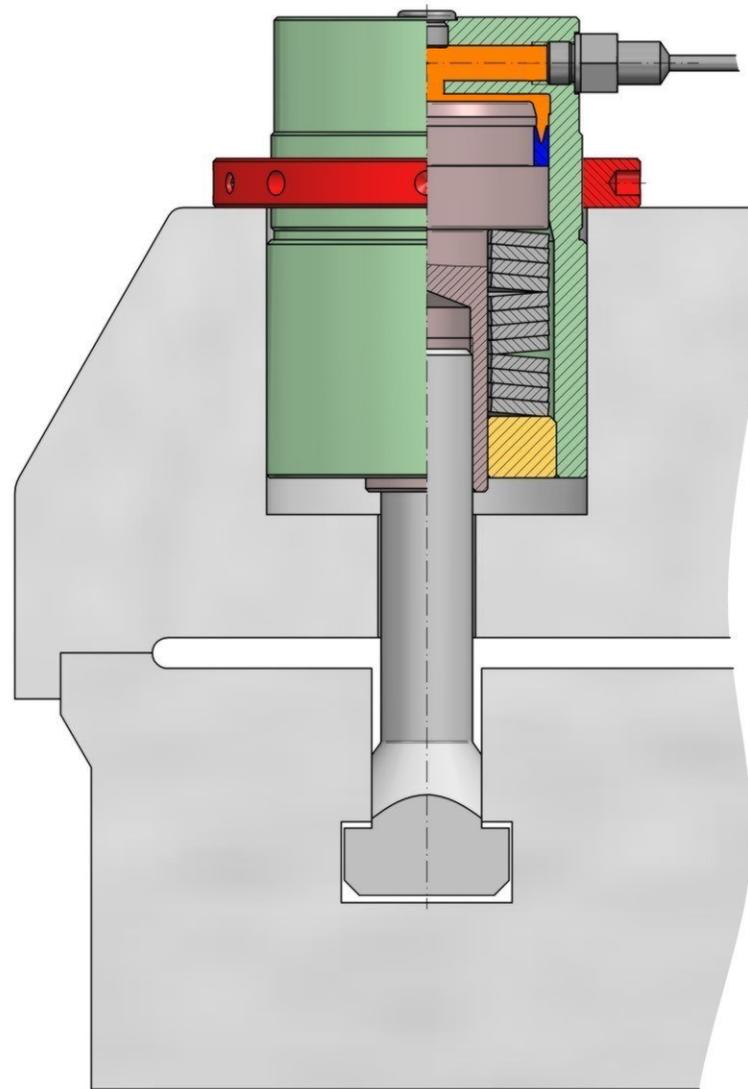
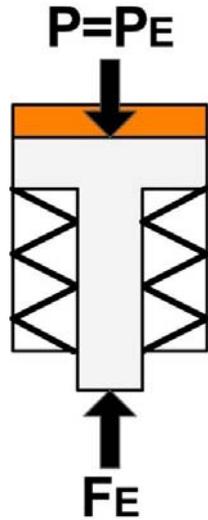
- ⑤ Screw in cylinder until the ringnut as well as tension bolt touches contact surface



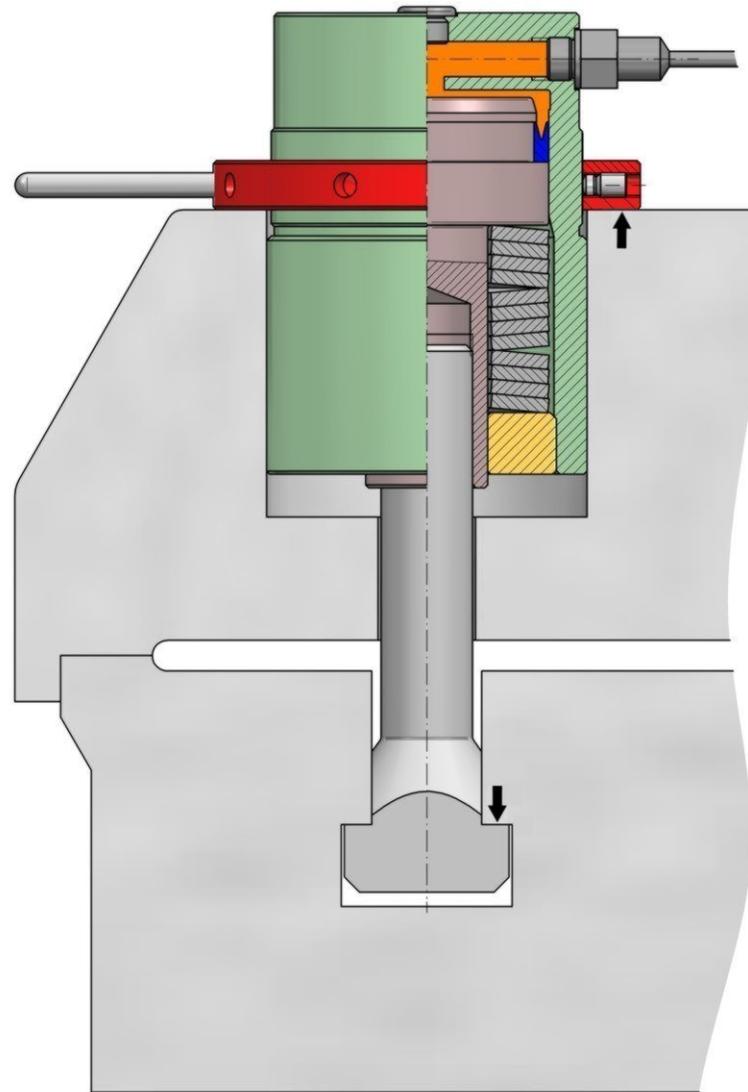
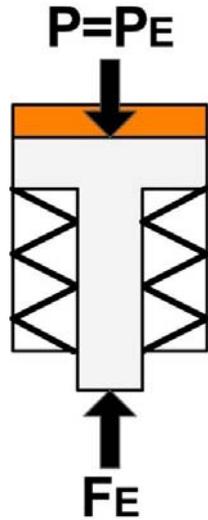
- ⑥ Installation of hydraulic connection and bleed cylinder afterwards
(optionally an anti-twist protection for cylinder housing is requested)



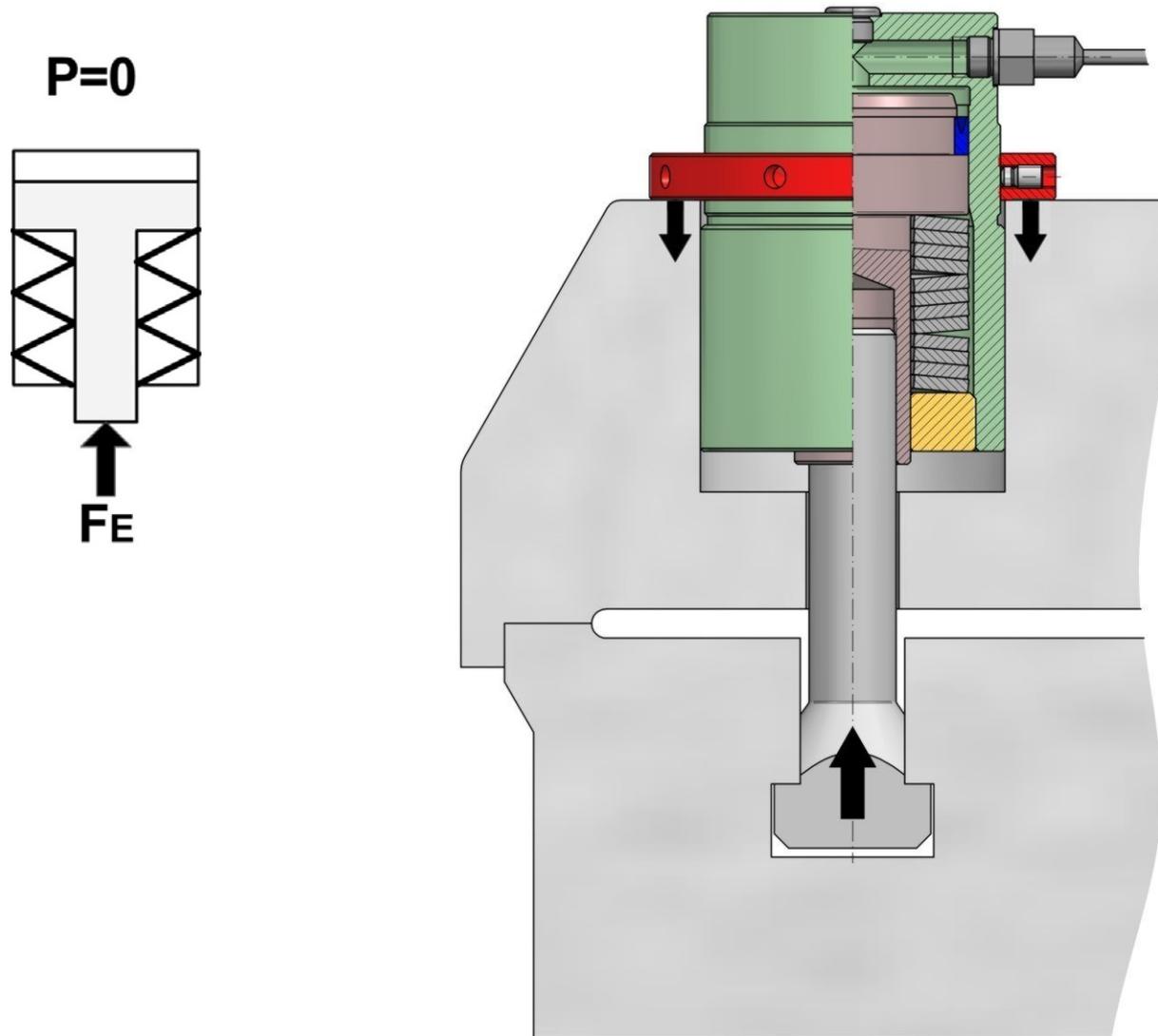
⑦ Initial position – without hydraulic pressure and without spring pre-load



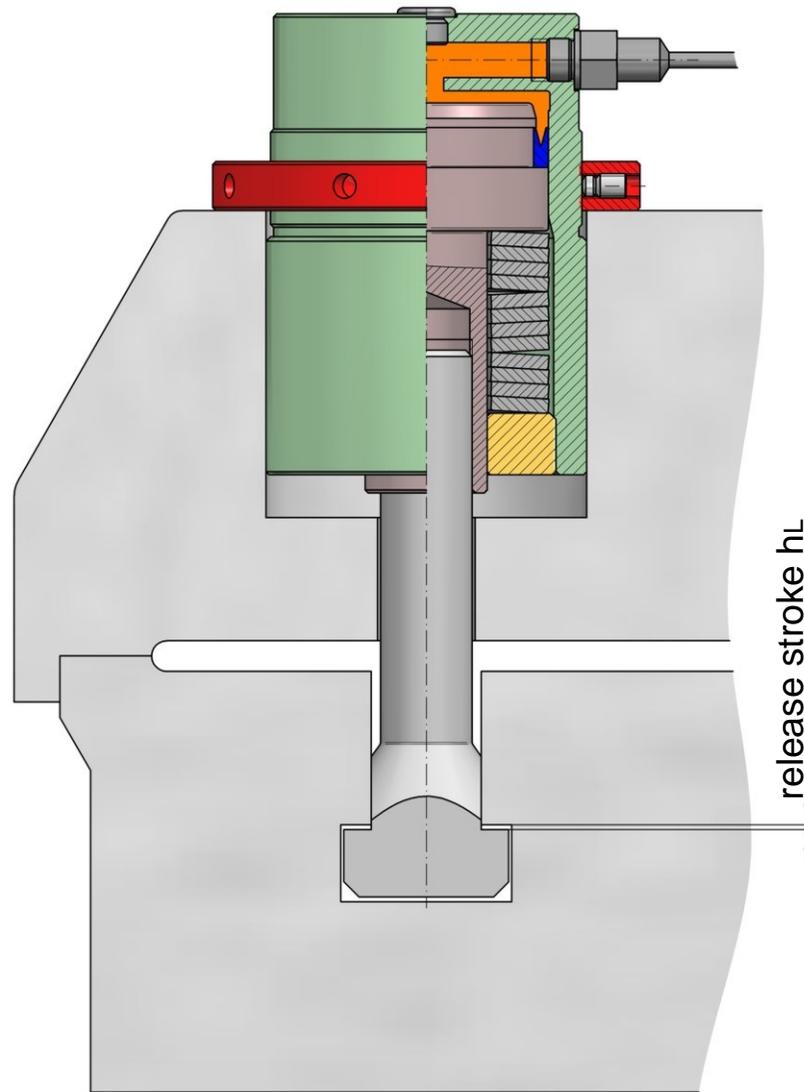
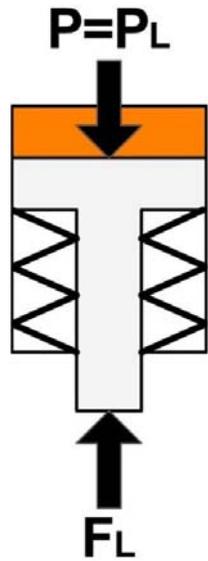
- ⑧ Load cylinder with adjusting pressure P_E – disk spring package is getting compressed
- stroke of pressure piston → T-slot bolt is getting released (ZSF 10.000: $P_E = 210 \text{ bar}$)



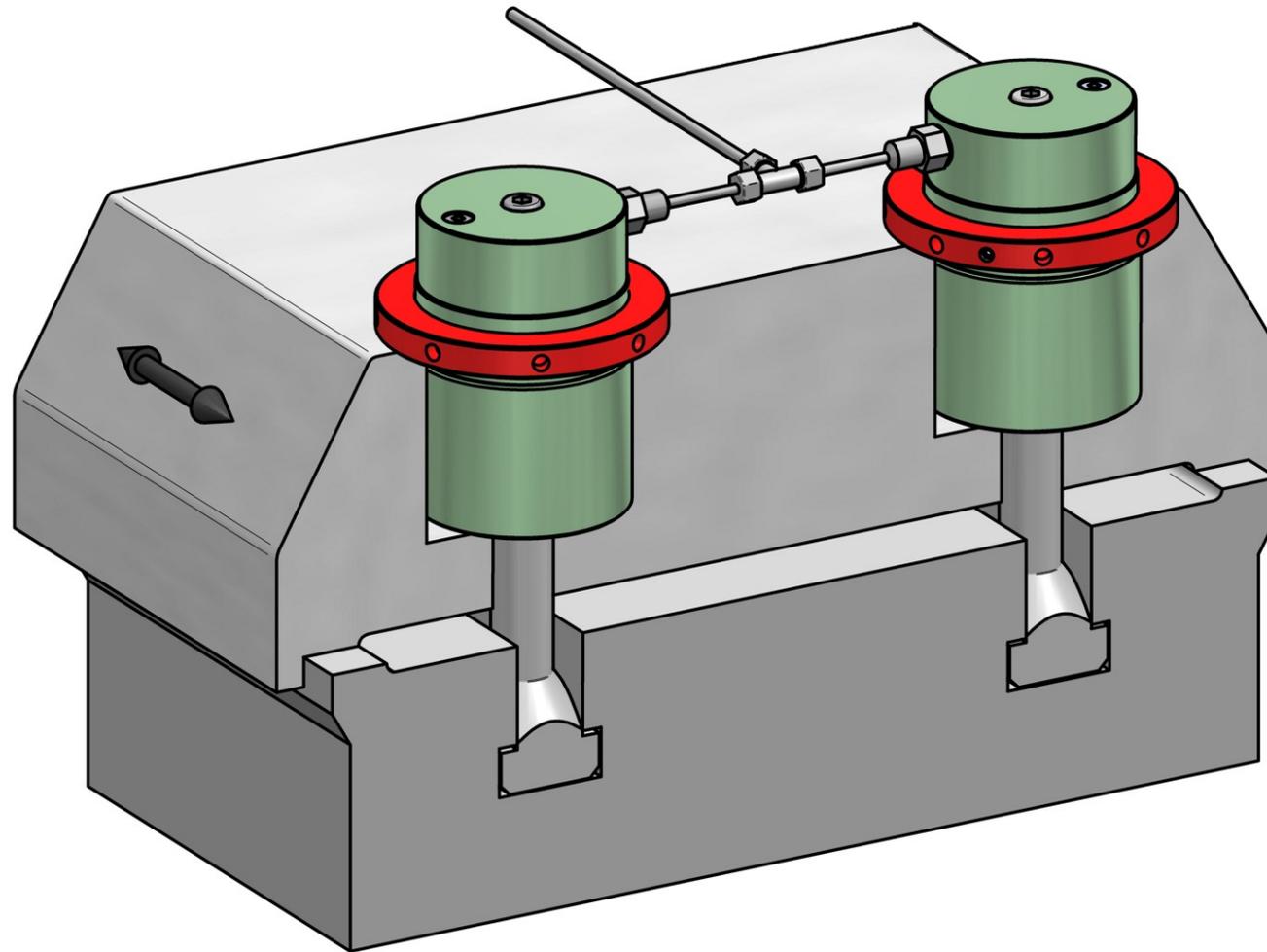
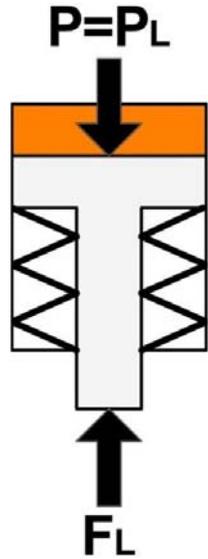
- ⑨ Positioning at adjusting pressure P_E : Turn ring nut until ring nut itself and tensioning bolt are at mechanical stop. Lock ring nut with set screw afterwards.



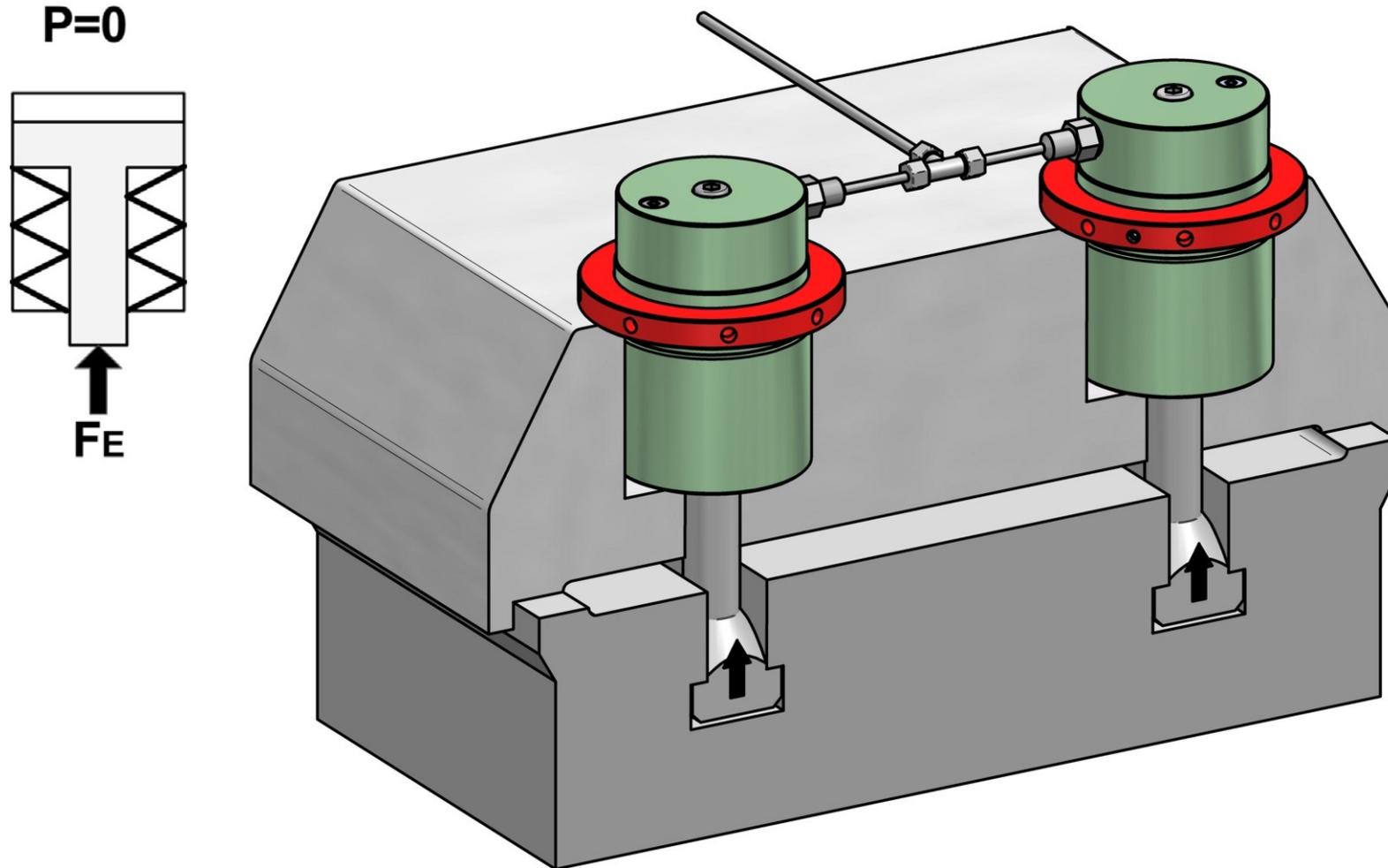
- ⑩ Clamping operation: release hydraulic pressure $P=0$ bar - disk spring package is clamping with nominal clamping force F_E (Typ ZSF 10.000: $F_E=100$ kN)



- ① Release operation: load with release pressure P_L , cup spring package is stronger compressed – resultant is release stroke h_L (ZSF 10.000: $P_L=320$ bar / $h_L=1,5$ mm)



- ⑫ Release position: T-slot bolt respectively tensioning bolt are in released position, now the slide can be moved axial to the new clamping position



- ⑬ Release hydraulic pressure $P=0$ bar – the slide is safely clamped at new working position