

## Technical Information TI-F10 Locking Units

- Holding in both load directions
- Hydraulic or pneumatic actuation

For further information on technical data and optional accessories, please see: **Technical Data Sheets** (see *chapter „Synopsis of available types“*)

A detailed description of control, mounting and performance-test of the Locking Units can be found in the operating manuals.

### Purpose

Locking Units clamp a shaft infinitely variably without changing its position, and absorb axial forces in both directions. Depending on their type they are released by hydraulic or pneumatic pressure. The clamping force is generated by spring action or by hydraulic pressure.

### Function

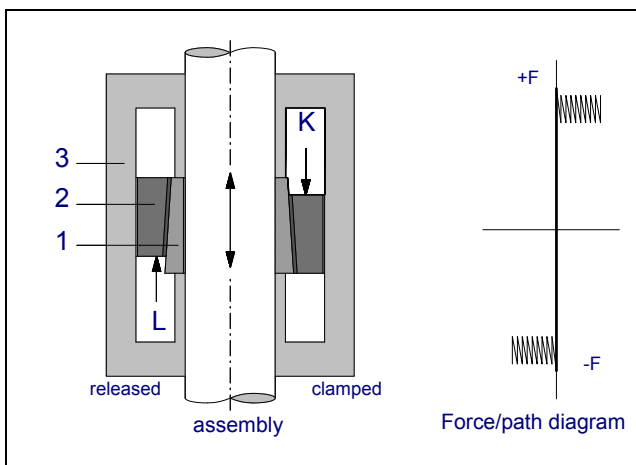


Fig. 1: Functional principle

The clamping system consists of a conical sleeve (1), Fig. 1 and a clamping ring (2), Fig. 1. The sleeve is axially fixed in the housing (3), Fig. 1 allowing only radial movement. The clamping ring (2), is guided by the housing (3) and is forced in an axial direction over the sleeve (1) to achieve the clamp-



ing action. The clamping force  $K$  is generated by pressure or spring action and is intensified by means of conical (or inclined) surfaces. The force  $L$  releases the Locking Unit. A well-defined clearance ensures that the shaft can move without any friction.

Locking Units absorb forces in both directions. In case of overload, the shaft slips through the clamping unit and will normally cause no damage. However, applications with recurrent overload should be avoided, except the Locking Unit is explicitly suited to this. Depending on force-level, slipping speed, and rod quality, seizing potential exists.

### Locking by springs / releasing by pressure

Types KFH, KFP and others

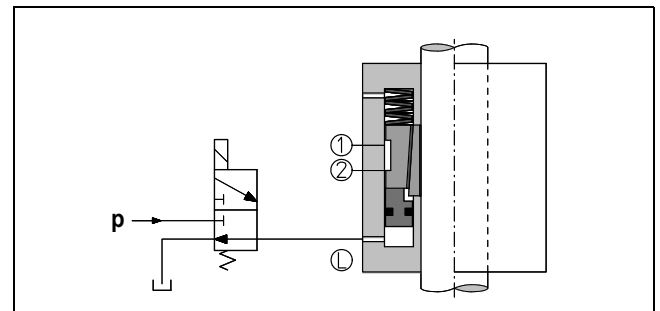


Fig. 2: Schematic diagram; locking by springs / releasing by pressure

If the unit is pressureless - as shown in the schematic drawing - the rod is clamped by spring force and the full nominal holding force can be carried. Proximity switch 1 signals "rod clamped".

During every operational cycle, the 3/2-way valve is actuated electrically and releases the Locking Unit. In all other operational conditions, as well as in case of power failure, emergency stop, etc. the locking unit is actuated, secures the rod and stops the load. In case of pressure failure, the load is secured in the same way. To avoid possible problems, the shaft should not be moved unless proximity switch 2 signals "clamping released".

## Clamping and releasing by pressure

### Types KB and KBP

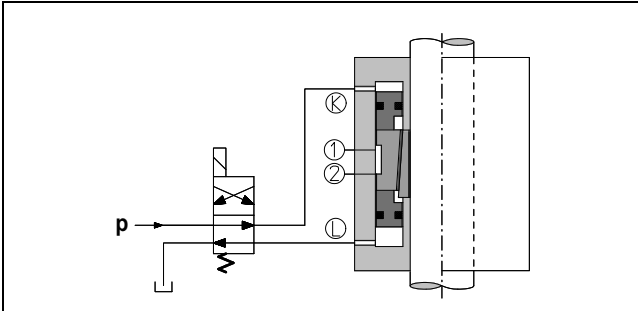


Fig. 3: Schematic diagram; clamping and releasing by pressure

If port K is pressurized - as shown in the schematic drawing - the rod is clamped by force of the annular hydraulic (or pneumatic) piston and can hold a force proportional to the applied pressure. Using the nominal pressure, the full nominal holding force is achieved. Proximity switch 1 signals "rod clamped".

By switching the valve, pressure is applied to port L, which releases the Locking Unit. To avoid possible problems, the shaft should not be moved unless proximity switch 2 signals "clamping released".

## Synopsis of available types

	Series	Locking by	Rod diameter [mm]	Holding force F [kN]	Characteristics	TI-
<b>Basic information</b>						F10
<b>Hydraulic releasing</b>	KFH	Spring force	18 - 140	5 - 600	Standard	F50
	KFHL	Spring force	18 - 125	5 - 165*	Approval by Lloyd's Register	F52
	KFHR	Spring force	18 - 140	5 - 600	For use in humid conditions	F53
	KFHS	Spring force	18 - 125	5 - 165*	Approval by DGUV	F55
	KFHA	Spring force	18 - 70	9 - 125	For standard cylinders	F60
	KB	Pressure	40 - 200	80 - 150	Locking by hydraulic pressure	F15
<b>Pneumatic releasing</b>	KFPC	Spring force	30 - 40	12 - 30	Compact design	F21
	KFPA	Spring force	16 - 40	0.9 - 10.9	For standard cylinders	F22
	KFPD	Spring force	30 - 40	120 - 500 Nm**	Torque absorption	F23

\* admissible load M ( $F = 2 \times M$ )

\*\* for axial forces between 12 - 30 kN

### More product information

For details on data of the various Locking Units, please refer to the data sheets (TI) as named above.