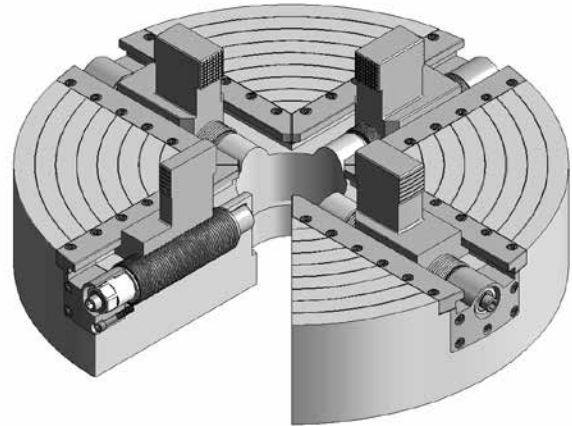


## Power Clamping Screws I Series MSP/MSPD-HSP

For face plates and surface plates on jaw boxes as well as grinding and turning machines and special machines

The JAKOB power clamping screws have been developed for the highest demands and maximum workpiece weights with optimum operational safety. They are primarily suited for integration in jaw boxes or for direct installation in face plates of lathes, grinding and special machines. Diverse clamping screw series with different constructions and profile requirements are available. The user can choose between hydraulic or mechanical, and single or double actuating designs.

All parts are made of heat-treated steel and produced with high precision. This guarantees a clamping element with highest sturdiness and reliability.



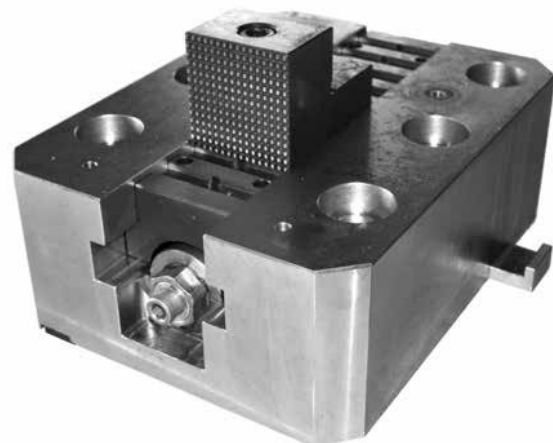
### Essential features of performance:

- ✓ enormous clamping force, low actuation torque
- ✓ maximum reliability, high stiffness
- ✓ large clamping stroke, high alignment accuracy
- ✓ simple manual operation
- ✓ minimum maintenance

### Application examples:



Face plate for turning center with 8 power clamping screws Type MSP 200 for clamping of turbine rotors up to 350 tons total weight.



Double actuating power clamping screw series MSPD 80 for clamping direction internal and external integrated in jaw box.

# Power Clamping Screws I Series MSP/MSPD-HSP

## Mechanical Power Clamping Screw Series MSP / MSPD

The force transmission in the mechanical power clamping screws is generated by a special mechanical key clamping system. The sophisticated geometry of the key mechanics have very large transmission surfaces and a self-locking mechanism to ensure low wear and the highest reliability. Especially worth mentioning is the double-acting version, Series MSPD, with a simple automatic reverser to change clamping direction from external to internal clamping. Furthermore, its simple, manual operation and low installation cost are relevant. When taking the main technical and economic assessment criteria into consideration, the MSP/MSPD Series can be recommended as the ideal version for most applications.

## Hydromechanical Power Clamping Screw Series HSP

The hydromechanical power clamping screw's operating principle is based on power amplification, resulting from the area ratio of a primary and secondary piston. In the distinctly smaller primary piston, an internal oil pressure of up to 600 bar is generated and at the same time a long stroke distance is travelled. The secondary piston, with its larger effective area with smaller clamping stroke produces an extremely large axial force, which is transmitted through the external thread to the piston housing on the clamping shoe. HSP power clamping screws are only provided for external clamping direction. They excel with their long clamping strokes and low actuation torques. However, due to the necessary, mechanical safeguard (counter ring), significantly higher expenses are to be expected.

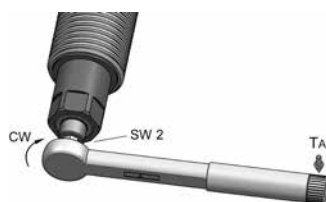
### Note:

- During calculation of installation length L1 bearing rings or axial washers must be taken into account.
- Basically, except the fitting position L1, the thread of the screw housing or the dimensions of the bearing pin can be customised to fit customer needs. That might be necessary, especially when replacing defective older model clamping screws and when retrofitting machine tools. Please get in touch with us if you have variances from standard dimensions.
- Clamping force monitoring can be integrated using our additionally available Force Monitoring System (FMS). See page 10 for more information.
- Operating tools available upon request.

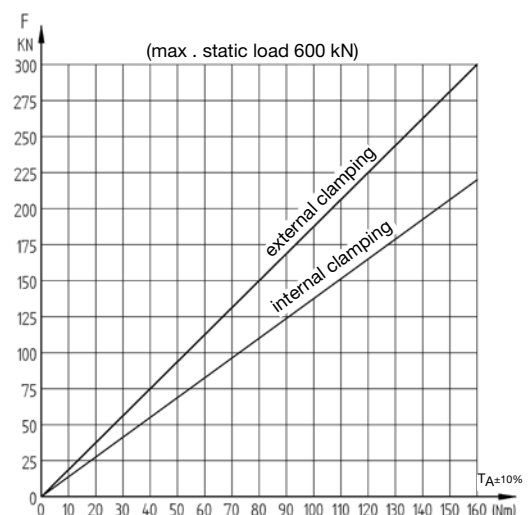
## Clamping Force Diagram

Each clamping screw is supplied with a clamping force diagram and a test report.

On request, the appropriate clamping force diagram can be supplied on an aluminum plate for fitting to the machine, as available information for the operating personnel. Due to friction loss in the clamping jaws or linear guides, the table or diagram values for the actuation torque must be corrected. The appropriate factor must be determined, if necessary, by the face plate or jaw box manufacturers either empirically or based on trials and tests.



Clamping force diagram "MSPD 120"

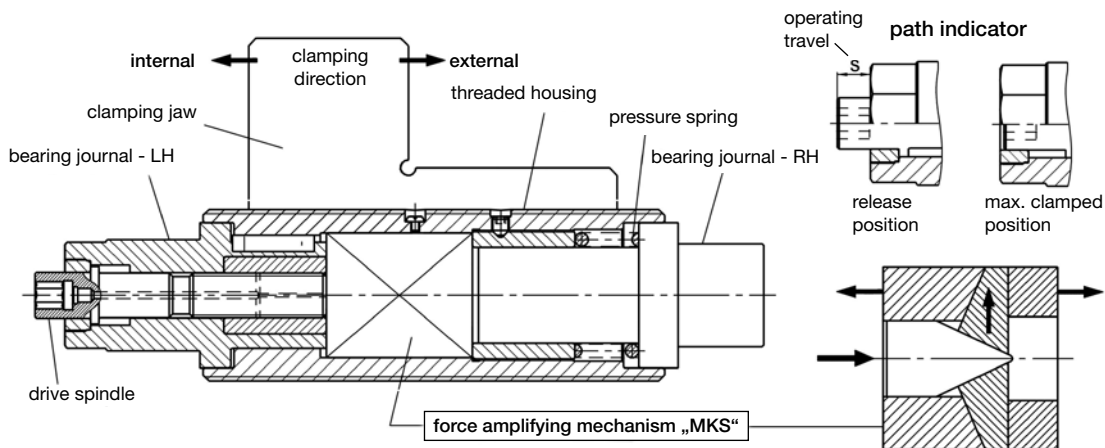


# Mechanical Power Clamping Screws I Series MSP/MSPD

## Design and function

The single acting Mechanical Power Clamping Screws of the “MSP” series have been developed for external clamping only, whereas the double acting ones of the “MSPD” series are designed for external (shafts, rollers) as well as internal clamping (pipes, bushes). These mechanical power clamping screws are equipped with a “wedge mechanic” system as force magnifier. The double acting version is equipped with an automatic mechanism to change clamping direction. This system generates high clamping forces with a simple operating procedure requiring low manual actuation torque. The state of the art “wedge mechanic” system is extremely robust and self-locking in every clamping stage. The high stiffness achieved thus also increases operational safety. No additional mechanical safety devices or supports are required for supporting the threaded power clamping screws.

The force amplification mechanic is activated through rotation of the drive spindle, which presses the threaded spindle and jaw against the workpiece. Clamping force is generated according to actuation torque. By changing the load direction from “external” to “internal”; the clamping direction within the force magnifier automatically changes without the need to undertake an additional reversal of the clamping direction by hand. Correspondingly, the clamping forces are passed on further; depending on the direction of clamping into the left bearing journal (LH) during external clamping, or in the right bearing journal (RH) during internal clamping. The reverse motion of the force magnifier and threaded power clamping screw is compensated by a compression spring which functions at the same time also as a return spring during unclamping.



## Operation:

### External clamping

The clamping jaw is prealigned and pretensioned by turning the external hexagon SW1 clockwise. A torque wrench should be used for force clamping and fine adjustment. By turning the internal hexagon SW2 clockwise, the drive spindle's force amplification is activated and clamping force is generated proportionally to the actuation torque until the torque wrench disengages upon reaching the preselected torque (see clamping force diagram). The clamping stroke can be controlled via an operating path indicator. The clamping procedure has to be repeated by loosening SW2 and pretensioning SW1 if the preselected starting torque has not been reached at the end of the operating path. Avoid exceeding the maximum actuating torque as it may cause damage.

### Internal clamping

The clamping jaw approaches the workpiece, is prealigned and pretensioned by turning the external hexagon SW1 counter-clockwise. This automatically changes the clamping direction to internal clamping. For this changeover the threaded housing of the power clamping screw with the jaw is maintained in a preloaded state and then subjected to an axial motion in reverse direction, i.e. the external hexagon SW1 should be turned by approx. one turn extra. The power clamping with internal hexagon SW2 is then done in a similar manner as the external clamping procedure.

### Release

Release is effected in reverse order by turning the internal hexagon SW2 counter-clockwise until the fixed stop. The drive spindle is reversed and the clamping system unclamped. The return spring pushes the threaded spindle with clamping jaw back, the force amplifier returns to its initial position.