

## Mechanical vs hydraulic clamping

*PSV 2001 is one of the most common mechanical type in use. This is a comparison between that and ETP most common type ETP-CLASSIC and ETP-EXPRESS for a 40 mm shaft:*

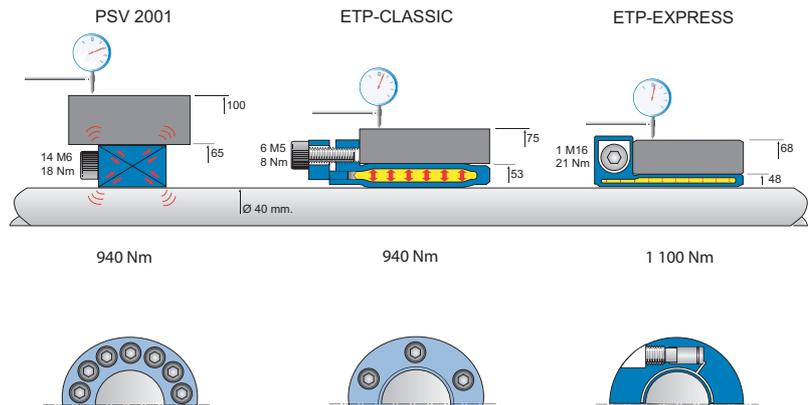
PSV 2001 has many more and bigger screws which has to be tightened to a higher tightening torque. The most part of the tightening torque is just used to overcome the internal friction between the conical sleeves and does not create any higher transmittable torque. The tightening torque for ETP-CLASSIC/ETP-EXPRESS is automatically transformed into an increase in internal pressure and surface pressure against hub and shaft surface for transmitting of torque.

The design with mechanical sleeves, with uneven wall thicknesses, causes uneven surface pressure to shaft and hub with high stress concentrations at the ends. This damages the contact surfaces and makes it difficult to get good concentricity. ETP-CLASSIC/ETP-EXPRESS are self centering because of the hydraulic pressure which is uniform along and around the contact surfaces. This gives good centering, low unbalance and less vibration.

The high surface pressure which is necessary, in combination with the short contact length, in order to transmit the torque means that the hub has to be big to withstand the pressure for mechanical types. For ETP-CLASSIC/ETP-EXPRESS a thin hub can be used because of the even and reasonable surface pressure, even hubs of aluminium can be used.

The tightening of the screws for mechanical types often damages the screws and also the sleeves.

### Standard type



This means that it is not suitable for repeated mounting/dismantling. ETP-CLASSIC/ETP-EXPRESS can be repeatedly mounted/dismantled with the same good result every time.

*The differences are even more obvious when comparing the designs in stainless versions.*

The high friction coefficient for stainless to stainless surfaces, means even higher internal friction losses for a mechanical type. Also a lower tightening torque for stainless screws leads to a more than 50% decrease in torque transmission capacity. ETP-CLASSIC R compensates lower tightening torque for the screws with the addition of 1-3 screws in the flange. Due to space reasons mechanical types do not have the same possibilities.

ETP-EXPRESS R with its internal pressure system, one screw which activates a piston, the same pressure is built up in the sleeve, thus the same level of transmittable torque is achieved.

#### Conclusion:

**Why tighten up to 15 screws when less, or even just one screw, gives higher torque transmission!**

### Stainless type

