

Technical Manual

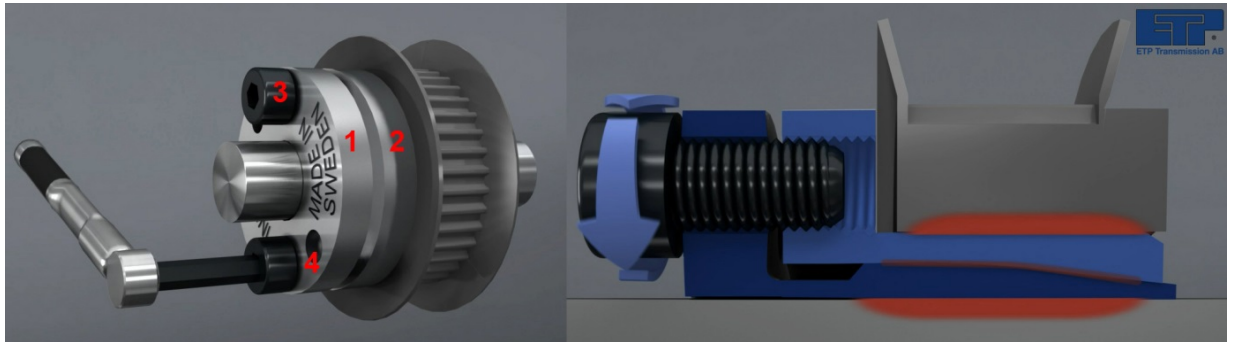
ETP MINI incl type R



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Description of the different parts



<p>1./2.</p>	<p>Inner/outer sleeve of steel, hardness approx. 250 Vickers (250 Brinell, 101 Rockwell B, 23 Rockwell C).</p> <p>For type R material according to: ISO 683/13:1986.</p> <p>Both the inner and outer sleeve are slotted with two slots in each sleeve. The two sleeves are mounted together in such a way that there is an angle of 90° between the slots.</p>
<p>3.</p>	<p>Screws DIN 912 of quality 12.9, for type R DIN 912 of quality A4 also named according to ISO standard: ISO 4762 (similar to ANSI B 18.3 but metric). The threads for the screws for type R are plated for decreased friction. These screws are not available on the open market, can only be bought through us.</p> <p>Key width and threads for the screws are all metric also for the inch sizes of ETP-MINI.</p>
<p>4.</p>	<p>Threads for dismantling.</p>

Mounting/dismantling tips

Comments to the instruction which is enclosed with each product:

Mounting

After the shaft and hub are cleaned, it is OK to put some thin oil on the surfaces, it makes the mounting easier and only slightly affects the torque capacity.

Use a torque wrench if the full load capacity of ETP-MINI is going to be used.

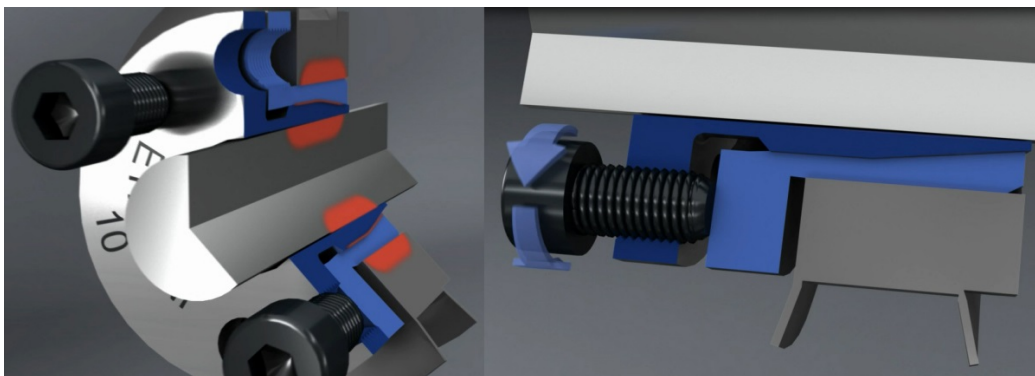
If the screws need to be changed make sure to use the right quality: 12.9 DIN 912, or for type R: A4 DIN 912.

When tightening the screws, the inner and outer sleeve will move axially relatively each other. This means that also the hub will move. The distance it moves, depends on the tolerances on all the four surfaces which are in contact. This can be compensated for, by putting ETP-MINI in an approximate axial position, in the opposite direction before tightening the screws. It must be measured for each specific mounting.

ETP-MINI can be mounted over a shaft with a keyway.

If mounting is going to be done frequently put some grease on the thread regularly. This is especially important for type R.

Dismantling



The screws, at least one, need to be dismantled completely and moved to the threaded bore in the flange. When tightening, the screw will push the two sleeves apart.

To avoid damaging the threads it may be necessary to use two screws.

The tip of a screw driver could also be pressed in between the two flanges in order to press them apart. Make sure that the screws are completely loose before doing this.

Size of screws

When designing you have to allow for space along the shaft for the screws to be untightened completely and moved to the dismantling threads.

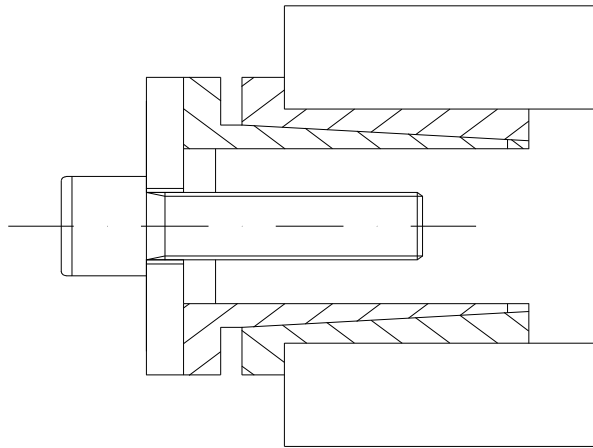
At least one of the screws needs to be completely dismantled and moved to the threads in the flange of the inner sleeve when dismantling ETP-MINI.

Therefore we here give you the size and length of the screws. Space in the axial direction has to be reserved for the screw and the allen key.

ETP-MINI	Screw sizes x total length incl. head	Number of pcs.
6	M3 x 11	2
R6	M3 x 11	3
¼"	M3 x 11	2
8	M4 x 12	2
R8	M4 x 12	3
9	M4 x 12	2
3/8"	M4 x 12	2
10	M4 x 12	2
R10	M4 x 12	3
11	M4 x 14	2
12	M4 x 14	2
R12	M4 x 14	3
½"	M4 x 14	2
14	M4 x 14	3
R14	M4 x 14	4

Screw forces

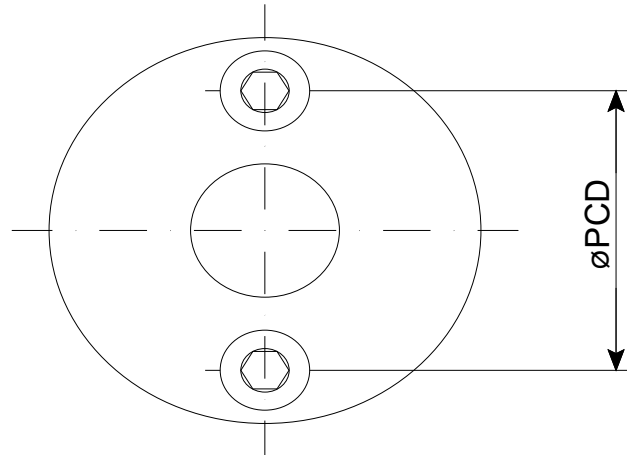
If you want to use a central screw in the shaft, which presses directly on to the flange of the inner sleeve, according to the picture, the size and tightening torque of that screw have to be chosen to give the same total axial force as the present screws.



ETP-MINI	Force from 1 screw (N)	Total force (N)
6	3 650	7 300
R6	2 000	6 000
1/4"	3 650	7 300
8	5 500	11 000
R8	3 400	10 200
9	5 500	11 000
3/8"	5 500	11 000
10	5 500	11 000
R10	3 400	10 200
11	5 500	11 000
12	5 500	11 000
R12	3 400	10 200
1/2"	5 500	11 000
14	5 500	16 500
R14	3 400	13 600

Screw pitch circle diameter

The following list gives the PCD for the screws:



ETP-MINI	Ø PCD (mm)
6	18
R6	18
1/4"	18
8	20
R8	20
9	21
3/8"	21
10	21
R10	21
11	23
12	23
R12	23
1/2"	23
14	27
R14	27

Tolerances

Recommended tolerances for ETP-MINI and ETP-MINI type R are, h10-k6(shaft) and H8(hub).

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	Shaft	
ETP		
6/R6	0,0004	-0,0019
¼"-10/R10	0,0004	-0,0023
11-14/R14	0,0005	-0,0028

ETP	Hub	
6/R6	0	0,0006
¼"-10/R10	0	0,0009
11-14/R14	0	0,0011

FAQ

Why has not the hydraulic principle been used for smaller sizes?

The hydraulic principle gets very expensive to manufacture for small sizes, as the sleeves are thin and the tolerances close. For smaller machinery the performance which can be achieved with a mechanical type, is in most cases sufficient.

What is unique with ETP-MINI?

The recess close to the flange on the outer diameter of the inner sleeve, makes the inner sleeve easy to deform elastically, thus causing a high surface pressure and high transmittable torque with only a few screws. The small outer diameter in relation to the inner diameter makes it possible to have a thin hub. The fact that the sleeves are not slotted all through, makes it possible to get a good runout at the same time as the transmittable torque and the shaft tolerance can be increased.

Why is the tightening torques for the screw lower than what is recommended for quality 12.9?

This is because we want to have a certain safety margin against damage and wear of the threads in the flange.

What happens if the tolerances on shaft or hub are too wide?

Then the inner and/or outer sleeve will get permanently deformed, the transmittable torque will be decreased and there is a risk that the flanges will be tightened to contact with each other.