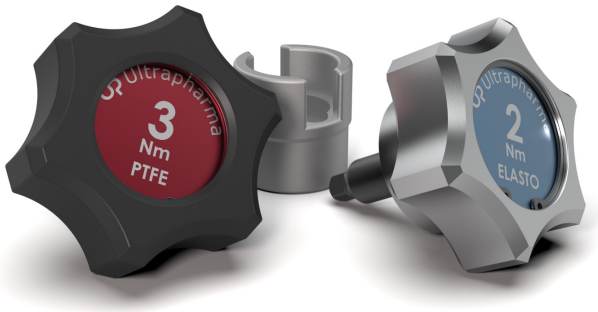
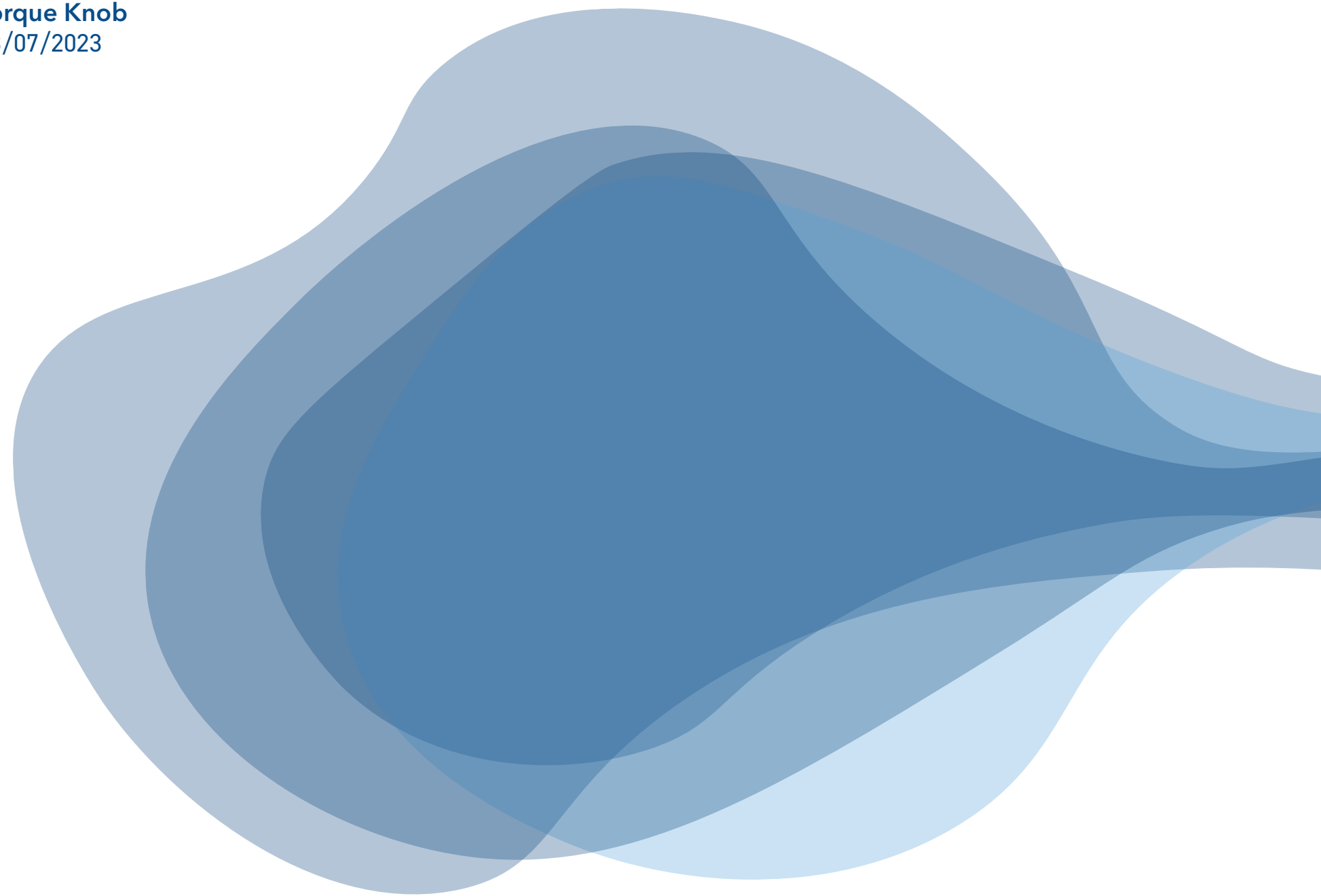


Torque Knob

Property of Ultrapharma BV

Torque Knob
03/07/2023

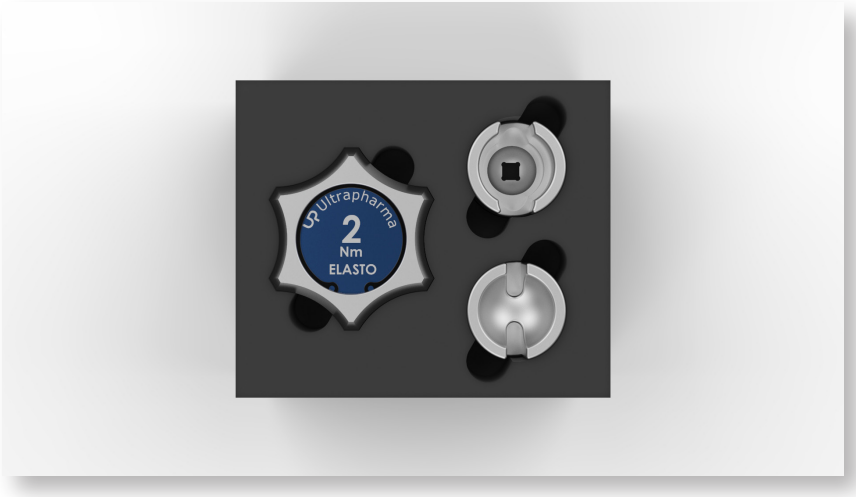


Ultrapharma bv

Table of Contents

1. Introduction

The Torque Knob prevents over-compression by setting a Torque limit. The Torque Knob is an easy tool to use. With two sockets to choose from the Torque Knob fits all wing nuts. It can even be used for MHP clamps with hex bolts. Depending on the gasket material you can chose the specific Torque in Nm. Turn until it starts clicking. By using the Torque Knob you introduce consistency in your system. The clean ability increases dramatically because of less gasket intrusion in the flow path.



2. Over-Compression

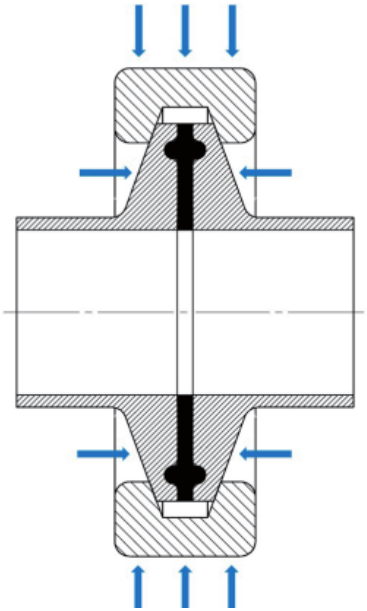
Over-compression & Misalignment

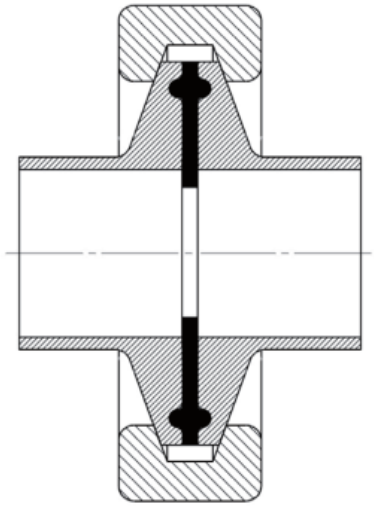
In a perfect world where all connections are perfectly aligned and access to the connection is easy, we would not be talking about over-compression. Unfortunately in the real world, it is slightly different. Piping is hardly ever aligned perfectly, so we have to use force to bring ferrules together and make a leak proof connection. The force we apply comes from the clamp that we us to bring two parts together. Each sealing material has compression limitations, which means you cannot endlessly keep on closing the clamp around the ferrules. By doing so you destroy the gasket.

This is a common problem with elastomeric gaskets. The typical shape of the Tri-Clamp and the ferrules are designed to match. Both components have a built-in 20° angled surface so when the wing nut is closed. The clamp slides over the surface of the ferrule compressing the gasket in an axial direction. In theory, until the gasket is flush with the internal diameter of the pipe illustrated in figure 1. In the real world, it is impossible to know when the gasket is flush with the ID, simply because we can´t look inside the pipe-work.

As the human mind seeks security and therefore we apply a couple more turns to the wing-nut, this pushes the gasket over the edge creating a situation as illustrated in figure 2. The gasket material is now inside the flow path.

We can advise you with the recommended torque for each specific size and compound.





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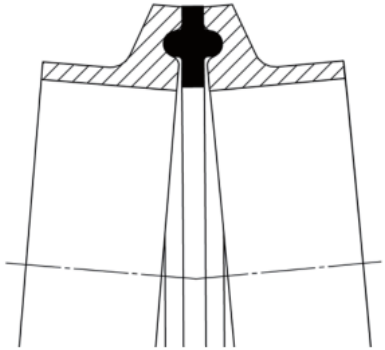
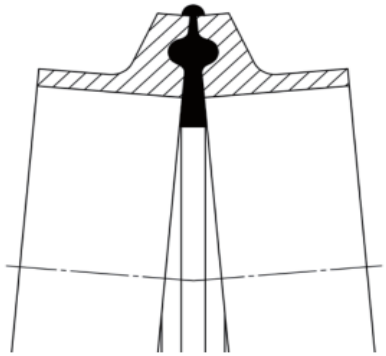
Due to misalignment, we are exposing the gasket to uneven forces. As you can witness in the images the bottom side of the gasket is compressed much more than the top part. This results in a situation where there is gasket material pushed inside the tubing causing a ridge. This ridge has a significant impact on the performance of the whole system. The flow capacity is reduced and the chances of solid material building up on both sides of the gasket are eminent.





3. Why using a Torque tool?

The Torque-Knob prevents over-compression because of its preset (and calibrated) torque limit. The Torque-Knob is an easy tool to use. With two sockets to choose from the Torque Knob fits all Wing-Nuts. It can even be used for MHP clamps.

Depending on the gasket material you can chose the specific torque in Nm.

Place the knob and socket over the wing nut. Turn it clockwise, once it "clicks" you have reached the desired torque with a precision of 4%. PTFE type gaskets require to "settle" this means that they need to be re-torqued after the first and sometimes second sterilization cycle. Re-torqueing is always done at the same torque level, not higher.

Gas. Material	Rec. Torque Nm	Pressure @ 20°C	SIP @ 135°C	Pressure after SIP 20°C	Cycles
EPDM	1,5 - 2 Nm	30 Bar	2,2 Bar (2h)	30 Bar	1
SILICONE	1,5 - 2 Nm	30 Bar	2,2 Bar (2h)	30 Bar	1
FKM	1,5 - 2 Nm	30 Bar	2,2 Bar (2h)	30 Bar	1
TRI-BOND	2 Nm	30 Bar	2,2 Bar (2h)	20 Bar	1
PTFE ENVELOPE	3 Nm	25 Bar	2,2 Bar (2h)	6 Bar	1
PTFE SOLID	3 Nm	30 Bar	2,2 Bar (2h)	10 Bar	1
STEM-FLON	4 Nm	8 Bar	2,2 Bar (2h)	8 Bar	1

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4. Specifications

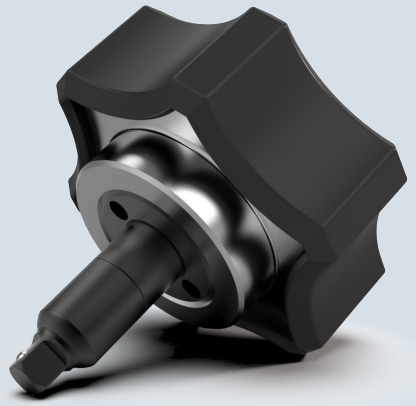
Materials

The outer part is made of anodized aluminum with hardened steel spring.
The inner part and shaft are made of hardened steel.
The connection is a ¼" square.

Available Sizes

UP-TN-1,5NM	Torque Knob for Elastomers 1,5 Nm, without Socket, BLUE Plate
UP-TN-2,0NM	Torque Knob for Tri-Bond 2,0 Nm, without Socket, BLUE Plate
UP-TN-2,5NM	Torque Knob for Tri-Bond 2,5 Nm, without Socket, BLUE Plate
UP-TN-3,0NM	Torque Knob for PTFE & PTFE-envelop 3,0 Nm, without Socket, RED Plate
UP-TN-4,0NM	Torque Knob for Steam-Flon 4,0 Nm, without Socket, RED Plate

Every Torque knob is supplied with an EPDM sleeve. This sleeve is more ergonomic and is safer to use when the operator uses gloves.



Available Extensions

Unfortunately we are not living in a perfect world, you might need some helpful extensions to reach in corners or difficult areas.

Available Sizes

UP-TN-SOCKET
UP-TN-SOCKET-AC
UP-TN-SWIVEL-0.25
UP-TN-13MM-SPANNER
UP-TN-EXT-0.25-**MM

**Different lengts available upon request

UP-TN-SOCKET

UP-TN-SOCKET-AC

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Calibration

Every single Torque Knob is checked in-house and code-marked by hand before it leaves our warehouse. We check if the torque(Nm) is correct and it will be calibrated if necessary. We will write down the results on a calibration certificate, which is always included with the Torque knob. As a service we offer to recalibrate the Torque knob after 1 year of use, free of charge. This way you don't have to worry about calibrating protocols.

*The recommended torque per gasket material can be found in the table on p.7

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Torque Knob Calibration Certificate

Test Instrument Identification

Manufacturer	Electromatic Equipt. Co., Inc.	Model	TT-QC-100i-1/4E
Type	Torque Tester	S/N	3843-1

Torque Knob Identification

UP-TN-2.5NM	

Serial Number	00192	Date of Manufacturing	8/19

Calibration Number	Calibration Date	Manufacturer Standards (Nm)	Readings (Nm)	Standard Tolerance -4% (Nm)	Standard Tolerance +4% (Nm)
		1.5		1.440	1.560
		2.0		1.920	2.080
1	10-02-2023	2.5	2.461	2.400	2.600
		3.0		2.880	3.120
		4.0		3.840	4.160

Date : 10-02-2023
Customer : ABC
SAP Ordernumber : 181033492

Signed: _____
Arne Booiman
Technical Department

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Notes

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