



m&h RADIO-WAVE TOUCH PROBE

RWP20.50-G (2.4 GHz)



Manual Version V01.00-REV01.00
Release Date 2016-01-15

Table of Contents

1	Description	5
1.1	General	5
1.1.1	Preface	5
1.1.2	Safety Instructions	5
1.1.3	Intended Use	6
1.1.4	Declaration of Conformity	6
1.1.5	FCC- / RSS-Declaration	6
1.1.6	Validity	6
1.2	Purpose.....	6
1.3	System Components	7
1.4	Variant Overview	8
1.5	Technical Data	9
1.5.1	Technical Data, General (all Measuring Units)	9
1.5.2	Technical Data with Measuring Unit MY21.00	9
1.5.3	Technical Data with Measuring Unit PP41.00	9
1.5.4	Technical Data with Temperature Measuring Unit TP44.10	9
1.6	Dimensions	10
1.6.1	Dimensions with Measuring Unit MY21.00	10
1.6.2	Dimensions with Measuring Unit PP41.00	11
1.6.3	Dimensions with Temperature Measuring Unit TP44.10	12
1.7	Transmission and Reception Area	13
1.8	Activation Methods	14
1.8.1	Activation Method - AZ (patented)	14
1.8.2	Activation Method - WS (patented)	14
1.8.3	Activation Method - ME	14
1.8.4	Activation Method - BI (Bidirectional Activation)	14
1.9	Delivery Contents, Accessories and Spares	15
1.9.1	Explanation of Order Numbers.....	15
1.9.2	Delivery Contents	15
1.9.3	Accessories, General	15
1.9.4	Styli	16
1.9.5	Temperature Sensors.....	21
1.9.6	Shanks.....	22
1.9.7	Pullstuds	24
1.9.8	Spares	26
2	Operation	27
2.1	Tools, Measurement and Test Equipment	27
2.2	Changing Sensor/Stylus	28
2.2.1	Changing Sensors (Temperature Measuring Unit TP44.10)	28
2.2.2	Changing Stylus (Measuring Unit MY21.00)	28
2.2.3	Changing Stylus (Measuring Unit PP41.00)	29
2.3	Replacing Battery	30
2.4	Aligning Stylus to Spindle Centre	31
2.5	Optical Status Display	32
2.6	Measuring Unit Replacement	33


2.7	Setting the Activation Method/Code and Interference Safety	34
2.7.1	Setting Procedure.....	34
2.7.2	Menu Structure.....	35
2.8	Adjusting Trigger Force (Measuring Unit PP41.00 only).....	36
2.9	Maintenance and Cleaning (Measuring Unit PP41.00 only)	37
2.10	Probe Extension	38
2.11	Modular System (Measuring Units PP41.00 and MY21.00)	39

1 Description

1.1 General

1.1.1 Preface

The safety instructions in this manual have to be strictly observed to guarantee the safe and reliable operation of the touch probe. The meaning of the symbols related to the safety instructions is described in the table below:

 CAUTION	CAUTION indicates a hazard which can lead to injuries if not avoided.
NOTICE	NOTICE indicates information considered important, but not hazard-related (e.g. messages relating to property damage).
INFORMATION	INFORMATION indicates important information or helpful advice for working with the described device.

1.1.2 Safety Instructions

NOTICE	
Risk of material damage!	
<ul style="list-style-type: none"> Manual or automatic positioning of the touch probe must be protected, in a way that the machine axis stops feeding if the probe is triggered outside the measuring process! 	
NOTICE	
Risk of material damage!	
<ul style="list-style-type: none"> Feedhold or spindle-stop resulting from a trigger or ready signal from a touch probe should only happen if the probe is actually in the spindle. This safety logic will protect the machine against a possible spindle or feeding stop in normal milling operation if a signal from a probe reaches the control under one of the conditions outlined below: <ul style="list-style-type: none"> Battery replacement and subsequent functional check of the touch probe by manually switching it on. Another machine with a radio-wave touch probe installed is started up and this touch probe transmits on the same channel as a touch probe previously installed. 	
NOTICE	
Risk of material damage caused by third-party parts!	
<ul style="list-style-type: none"> Only use the original spare parts listed in these operating instructions to perform maintenance and repairs. 	
INFORMATION	
The information given in this manual can be changed by the manufacturer at any time. The user is therefore responsible for regularly enquiring about updated information.	

1.1.3 Intended Use

The radio-wave touch probe is a partly completed machine for incorporation in machine tools or machines for machining. It is used for measuring different workpiece geometries as well as for temperature measurement.

Any other use or any use beyond that described is not deemed to be proper. The manufacturer is not liable for any resulting damage. The risk is borne solely by the user.

Only use the radio-wave touch probe once it has been professionally installed into the finished machine and once the compliance of the entire machine with the EC Machinery Directive 2006/42 EC has been confirmed.

Correct use is also deemed to include reading the operating instructions as well as compliance with all information contained in them – in particular the safety instructions. Furthermore, intended use is also deemed to include all inspection and maintenance work being carried out at the stipulated intervals.

1.1.4 Declaration of Conformity

Declarations of Conformity can be requested as required. The contact information for this purpose is listed at the end of these operating instructions.

1.1.5 FCC- / RSS-Declaration

- This device complies with Part 15 of the FCC Rules [and with Industry Canada licence-exempt RSS standard(s)].
Operation is subject to the following two conditions:
 - (1) This device may not cause harmful interference, and
 - (2) This device must accept any interference received, including interference that may cause undesired operation.
- This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the device is operated in a commercial environment. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- The radiated output power of the device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such a manner that the potential for human contact during normal operation is minimized.

1.1.6 Validity

These operating instructions are valid for the hardware available at the date of creation of these operating instructions. The manufacturer reserves the right to make technical modifications.

The latest version of these operating instructions can be downloaded at www.mh-inprocess.com under **Downloads**.

1.2 Purpose

The radio-wave touch probe IRP20.50 is used for workpiece measurement, and automatic determination and compensation of deviating angular positions of workpieces. Moreover, it is used for setting zero points inside the machine tool.

The radio-wave touch probe RWP20.50 is capable of measuring workpiece geometries, like edges, bores, pins, slots, webs, angles, corners and circular arches. It is also suitable for measuring complex geometries, like three-dimensional surfaces and for measurements involving picot axes.

In addition the radio-wave touch probe RWP20.50 can be used for measuring temperatures on workpiece surfaces. Radio-wave transmission ensures that the measuring signals from the touch probe can be transmitted to the receiver over large distances.

1.3 System Components

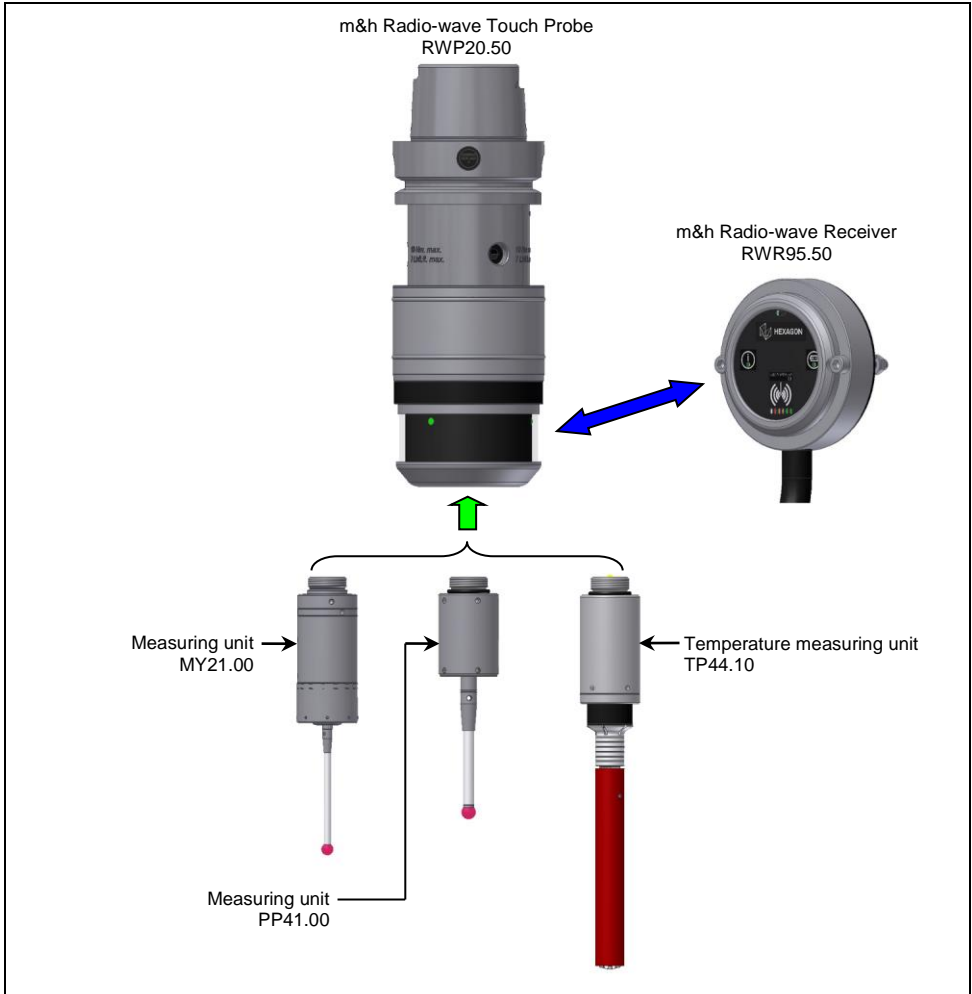

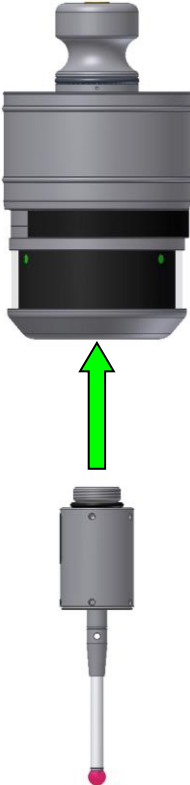



Fig. 1 System components

1.4 Variant Overview

20.50-G-MY	20.50-G-PP	20.50-G-TP
m&h radio-wave touch probe with measuring unit MY21.00	m&h radio-wave touch probe with measuring unit PP41.00	m&h radio-wave touch probe with temperature measuring unit TP44.10
 <p>The diagram shows the 20.50-G-MY variant. At the top is the probe head, a grey cylindrical component with a rounded top. Below it is the measuring unit MY21.00, a grey cylindrical component with a white stem and a red tip. A green arrow points upwards from the measuring unit to the probe head, indicating its assembly position.</p>	 <p>The diagram shows the 20.50-G-PP variant. At the top is the probe head, a grey cylindrical component with a rounded top. Below it is the measuring unit PP41.00, a grey cylindrical component with a white stem and a red tip. A green arrow points upwards from the measuring unit to the probe head, indicating its assembly position.</p>	 <p>The diagram shows the 20.50-G-TP variant. At the top is the probe head, a grey cylindrical component with a rounded top. Below it is the measuring unit TP44.10, a grey cylindrical component with a white stem and a red tip. A green arrow points upwards from the measuring unit to the probe head, indicating its assembly position.</p>

1.5 Technical Data

1.5.1 Technical Data, General (all Measuring Units)

Power supply	1x 9 V battery, block, 6LR61, Lithium: 1200 mAh, Alkaline: 550 mAh	
Material	Stainless steel, POM	
Weight without Shank	approx. 920 g	
Temperature Range	Operation: 10°C - 50°C, Storage: 5°C - 70°C	
Sealing	IP68: EN60529	
Maximum Battery Life for Temperature Measurement with Lithium Battery	Setting	Life-time
Maximum Battery Life for Workpiece Measurement with Lithium Battery	Setting	Life-time

1.5.2 Technical Data with Measuring Unit MY21.00

Sensing Directions	$\pm X; \pm Y; -Z$
Maximum Stylus Overtravel	$XY = \pm 14^\circ; Z = -4.5 \text{ mm}$
Trigger Force with 50 mm Stylus	$XY = 1 \text{ N}$ $Z = 6 \text{ N}$
Recommended Probing Feedrate	max. 2000 mm/min
Unidirectional Repeatability (deflection from one direction)	max. 1 μm (2 Sigma) with 50 mm stylus and 254 mm/min probing feedrate

1.5.3 Technical Data with Measuring Unit PP41.00

Sensing Directions	$\pm X; \pm Y; -Z$
Maximum Stylus Overtravel	$XY = \pm 12.5^\circ; Z = -6 \text{ mm}$
Trigger Force with 50 mm Stylus	$XY = 0.3 - 1.4 \text{ N}$ (factory setting = 1 N) $Z = 2.5 - 12.5 \text{ N}$ (factory setting = 8.5 N)
Recommended Probing Feedrate	max. 2000 mm/min
Unidirectional Repeatability (deflection from one direction)	max. 1 μm (2 Sigma) with 50 mm stylus and 254 mm/min probing feedrate

1.5.4 Technical Data with Temperature Measuring Unit TP44.10

Sensing Directions	$-Z$
Maximum Stylus Overtravel	-6.9 mm
Trigger Force	13 N
Recommended Probing Feedrate	500 mm/min

1.6 Dimensions

1.6.1 Dimensions with Measuring Unit MY21.00

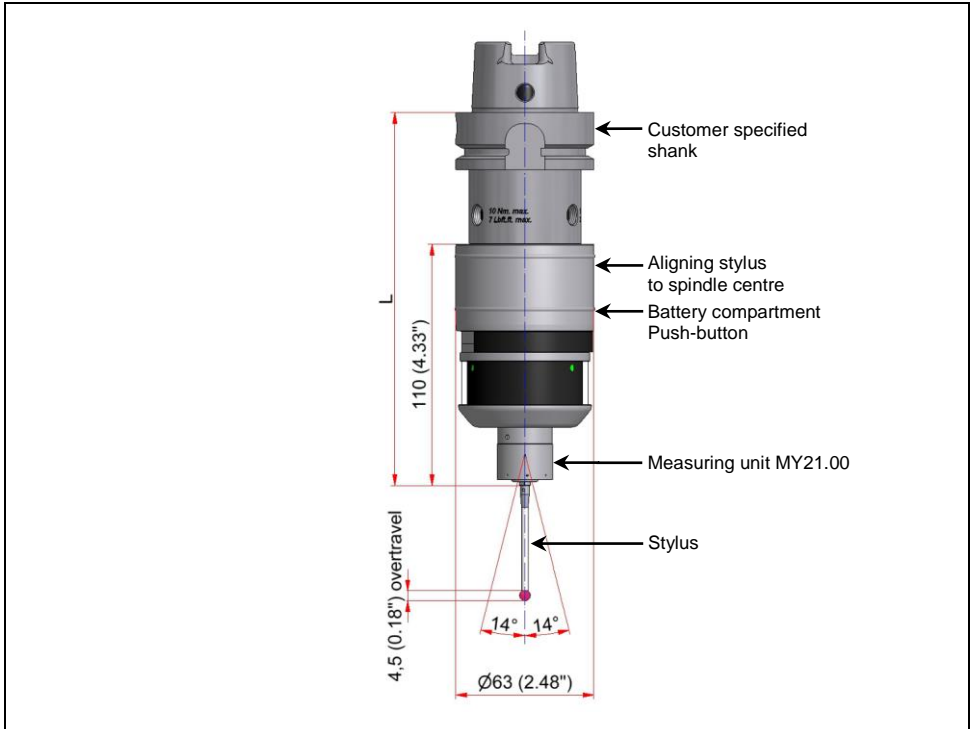


Fig. 2 Dimensions with measuring unit MY21.00

1.6.2 Dimensions with Measuring Unit PP41.00

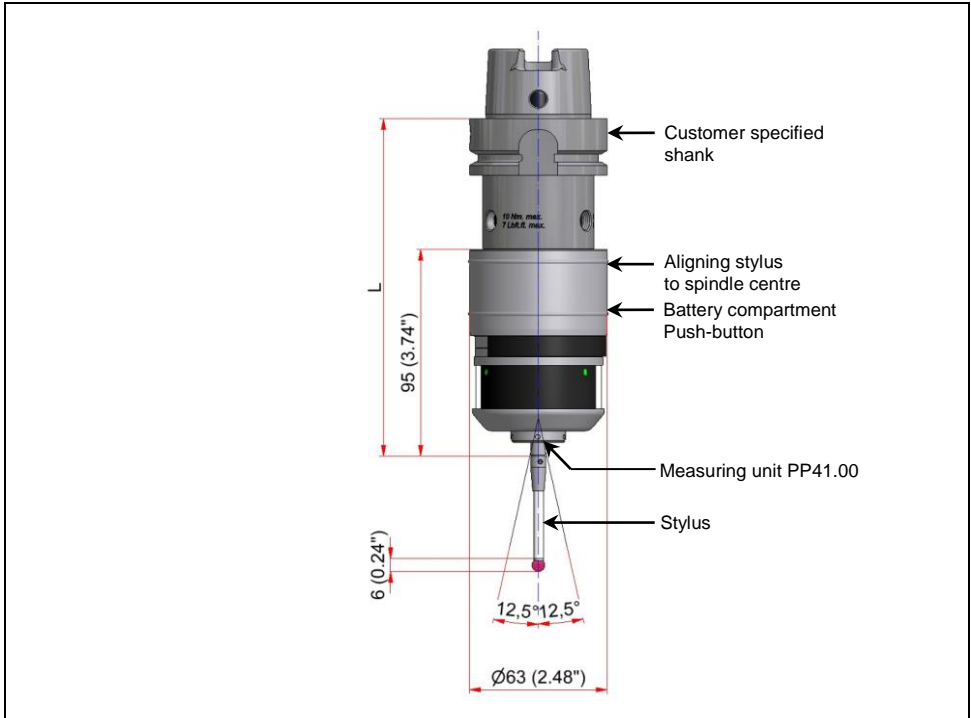


Fig. 3 Dimensions with measuring unit PP41.00

1.6.3 Dimensions with Temperature Measuring Unit TP44.10

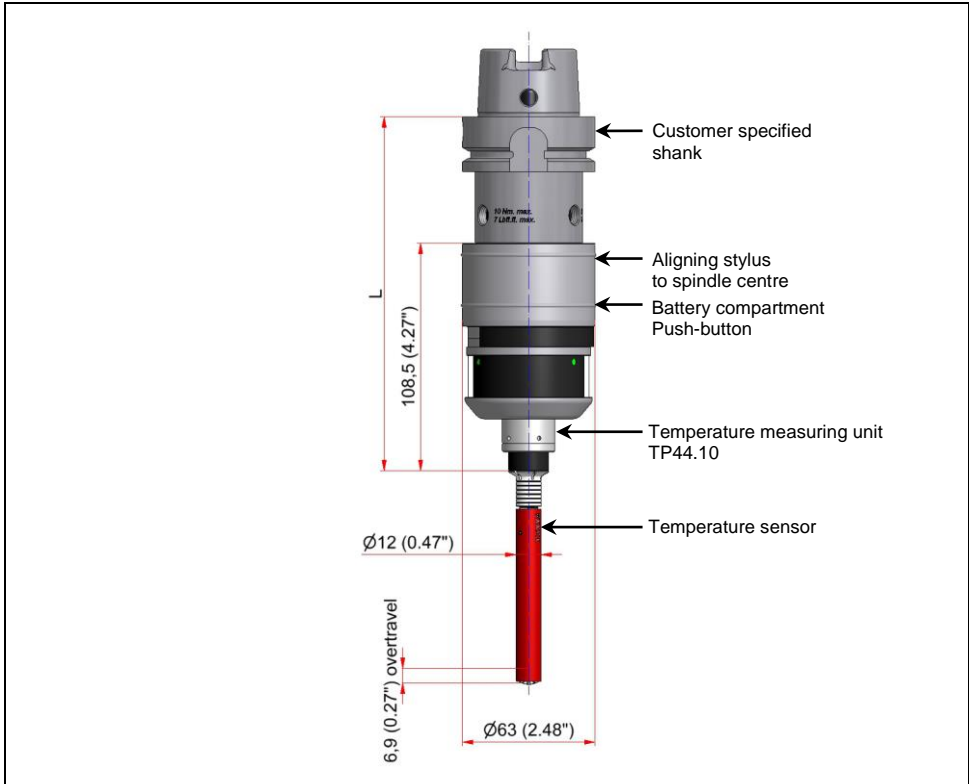


Fig. 4 Dimensions with Temperature Measuring Unit TP44.10

1.7 Transmission and Reception Area

INFORMATION

The transmission/reception ranges shown below only apply under optimum operating conditions.

It is recommended that the receiver is arranged so that it is within an angle of 0° to 60° relative to the touch probe for maximum possible transmission/reception range (see Fig. 5).

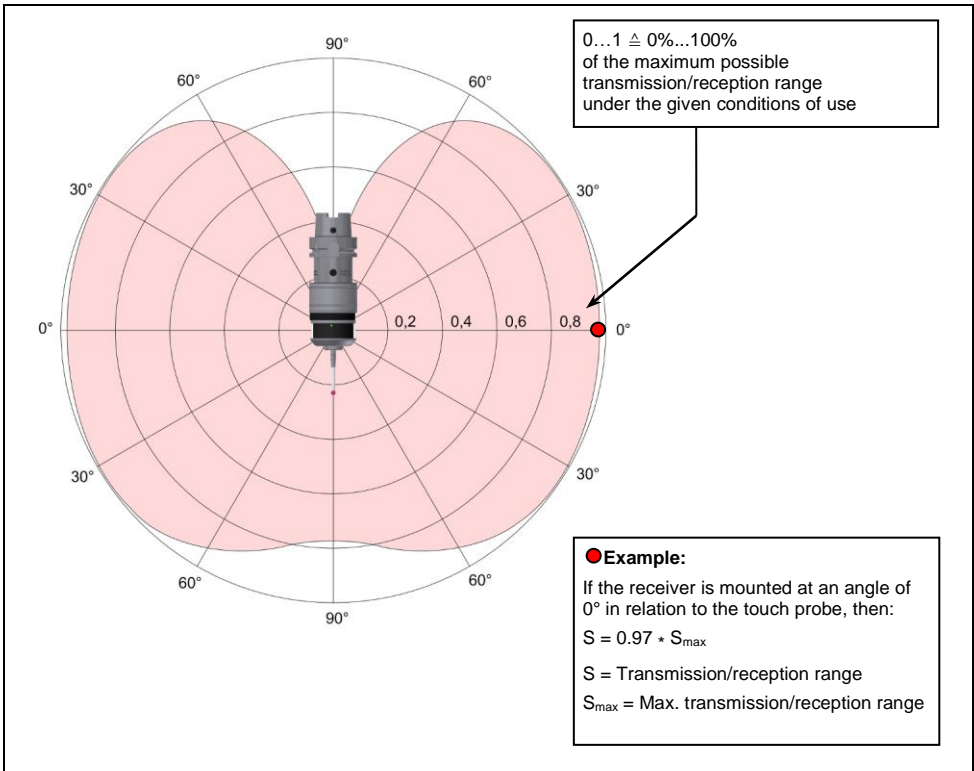


Fig. 5 Transmission and Reception Area (Emission/Reception Behaviour of Antenna)

1.8 Activation Methods

For activation of the radio-wave touch probe RWP20.50-G there are four different methods (see Fig. 6). These methods are described in the subsequent chapters.

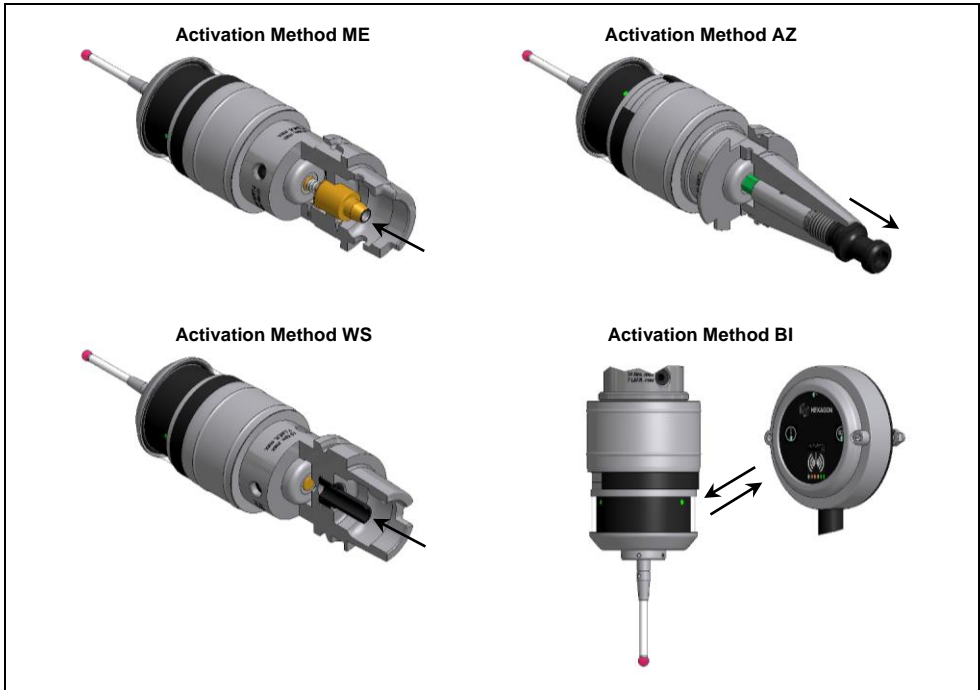


Fig. 6 Overview of activation methods (stylus not included in the delivery contents)

1.8.1 Activation Method - AZ (patented)

Activation method AZ is a mechanical activation method. If the shank is equipped with a pullstud, the probe is activated via tension on the pullstud (refer to Fig. 6).

1.8.2 Activation Method - WS (patented)

Activation method WS can be applied to all machines with programmable through-spindle coolant or switchable air blast > 3.5 bar. The touch probe is activated by programmed switching on of the medium by the M code. The probe is active while under pressure (refer to Fig. 6).

1.8.3 Activation Method - ME

Activation method ME is a mechanical activation method. The probe is activated by a mechanical switch inside the HSK. If the probe is on inside the spindle, the probe is off inside the magazine (refer to Fig. 6).

1.8.4 Activation Method - BI (Bidirectional Activation)

In the case of the activation method BI, the probe is directly activated via a radio-wave signal sent from the receiver.

1.9 Delivery Contents, Accessories and Spares

1.9.1 Explanation of Order Numbers

The order numbers for different touch probe configurations can be broken down as follows:

20.50-G	-	PP	-	SK40	-	06-VCE	-	AZ
Touch probe		Measuring Unit		Shank		Pullstud for activation method		Activation Method
20.50-G		MY = MY21.00		Chapter		Chapter 1.9.7		Chapter 1.7
G=2.4 GHz		PP = PP41.00		1.9.6				
		TP = TP44.10						

INFORMATION






A complete order number must contain at least the number of the touch probe, the description of the measuring unit and the desired activation method (e.g. 20.50-MY-WS).
If an activation method other than "AZ" is required, the text block for definition of the pullstud is not necessary. For orders without shank, the text block for shank definition need not be applied.









1.9.2 Delivery Contents

Order Number	Description
25.00-G-MM-AA	Radio-wave Touch Probe RWP20.50
	1x Battery (9 V, 1200 mAh, Lithium) (5677)
	Tool box (25.50-TB)
	Storage Box (5682)

MM = Measuring unit
AA = Activation method

1.9.3 Accessories, General

Order Number	Description	Illustration
41.00-PP	Measuring unit PP41.00	
21.00-MY	Measuring unit MY21.00	
44.10-TP	Temperature measuring unit TP44.10	
41.00-KA	Cross adapter	
41.00-KA-V	Screw plug for cross adapter	

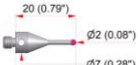





Order Number	Description	Illustration
21.00-VE30	Extension (L=30 mm/1.18")	
21.00-VE50	Extension (L=50 mm/1.97")	
41.00-VE100	Extension (L=100 mm/3.94")	
41.00-VE200	Extension (L=200 mm/7.87")	
91.00-V50	Probe extension (L=50 mm/1.97")	
91.00-V75	Probe extension (L=75 mm/2.96")	
91.00-V100	Probe extension (L=100 mm/3.94")	
5682	Storage box	

1.9.4 Styli

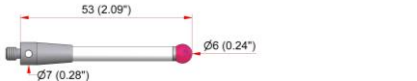


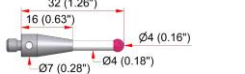




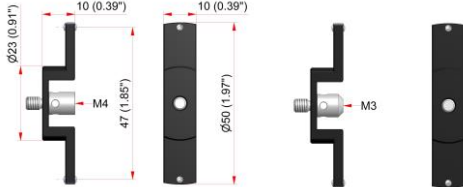
INFORMATION

- PP41.00 = connecting thread M4
- MY21.00 = connecting thread M3


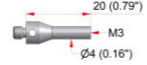
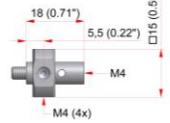

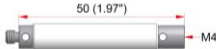
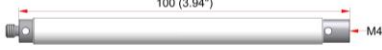
M4 styli with shaft $\varnothing 7$, steel

Order Number	Illustration
91.00-T20/2-ST-M4-D7 (stainless steel shaft, ruby ball)	
91.00-T20/3-ST-M4-D7 (stainless steel shaft, ruby ball)	
91.00-T20/4-ST-M4-D7 (stainless steel shaft, ruby ball)	
91.00-T20/5-ST-M4-D7 (stainless steel shaft, ruby ball)	
91.00-T20/6-ST-M4-D7 (stainless steel shaft, ruby ball)	
91.00-T20/8-ST-M4-D7 (stainless steel shaft, ruby ball)	

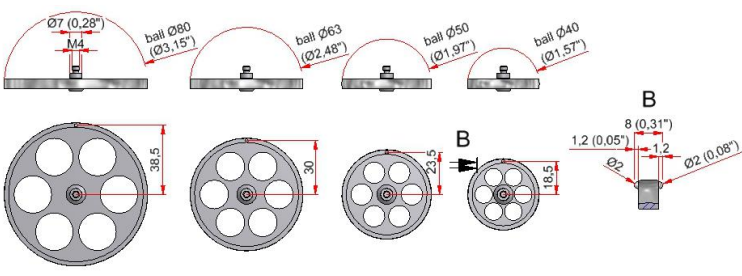
M4 styli with shaft $\varnothing 7$, ceramic

Order Number	Illustration
91.00-T53/6-KE-M4 (ceramic shaft, ruby ball)	
91.00-T83/6-KE-M4 (ceramic shaft, ruby ball)	
91.00-T103/6-KE-M4 (ceramic shaft, ruby ball)	
91.00-T32/4-KE-M4 (ceramic shaft, ruby ball)	
91.00-T42/4-KE-M4 (ceramic shaft, ruby ball)	
91.00-T42.5/5-KE-M4 (ceramic shaft, ruby ball)	
91.00-T52.5/5-KE-M4 (ceramic shaft, ruby ball)	
91.00-T62.5/5-KE-M4 (ceramic shaft, ruby ball)	
91.00-TS-ST-M4 91.00-TS-ST-M4/M3 (disc-stylus, steel, $\varnothing 50$ mm)	

Accessories for M4 styli

Order Number	Illustration
91.00-S-M4/M4 (stylus adapter)	
91.00-TA-M4/M3 (stylus adapter)	
91.00-TK-ST-M4 (5-way stylus centre)	
91.00-TV30-KE-M4 (stylus extension, ceramic)	
91.00-TV50-KE-M4 (stylus extension, ceramic)	
91.00-TV100-KE-M4 (stylus extension, ceramic)	

Ball Disc Stylus M4

Order Number	Illustration
<p>91.00-TS80-ST-M4</p> <p>91.00-TS63-ST-M4</p> <p>91.00-TS50-ST-M4</p> <p>91.00-TS40-ST-M4</p>	

Clamp Adapter M4

Order Number	Illustration
<p>41.00-KM-M4 (clamped to shaft $\varnothing 7$, with cap head screw AF2 mm, radially adjustable)</p>	

M3 styli with shaft $\varnothing 4$, tungsten carbide

Order Number	Illustration
21.00-T20/1-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T20/2-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T20/3-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T20/4-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T20/5-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T20/6-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T30/2-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T30/3-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T30/4-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T30/5-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T30/6-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T40/2-HM-M3 (Tungsten carbide shaft, ruby ball)	
21.00-T40/3-HM-M3 (Tungsten carbide shaft, ruby ball)	

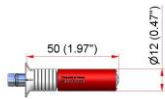

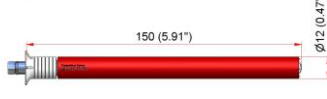
M4 styli with shaft Ø4, ceramic

Order Number	Illustration
21.00-T30/4-KE-M3 (Ceramic shaft, ruby ball)	
21.00-T40/4-KE-M3 (Ceramic shaft, ruby ball)	
21.00-T40/5-KE-M3 (Ceramic shaft, ruby ball)	
21.00-T50/5-KE-M3 (Ceramic shaft, ruby ball)	
21.00-T60/5-KE-M3 (Ceramic shaft, ruby ball)	

Accessories for M3 styli

Order Number	Illustration
21.00-TV10-ST-M3 (Stylus extension, stainless steel)	
21.00-TV20-ST-M3 (Stylus extension, stainless steel)	
21.00-TV30-ST-M3 (Stylus extension, stainless steel)	
21.00-TV40-ST-M3 (Stylus extension, stainless steel)	
21.00-TV50-KE-M3 (Stylus extension, ceramic)	
21.00-TV60-KE-M3 (Stylus extension, ceramic)	
21.00-TV100-KE-M3 (Stylus extension, ceramic)	
91.00-S-M3/M4 (Break shaft adapter)	
21.00-S-M3/M3 (Break shaft adapter)	
21.00-S-M3 (Stylus adapter)	
91.00-TA-M3/M4 (Stylus adapter)	

1.9.5 Temperature Sensors

Order Number	Illustration
44.00-T50 (Temperature sensor) (L=50 mm/1.97")	 <p>50 (1.97") $\phi 12$ (0.47")</p>
44.00-T100 (Temperature sensor) (L=100 mm/3.94")	 <p>100 (3.94") $\phi 12$ (0.47")</p>
44.00-T150 (Temperature sensor) (L=150 mm/5.91")	 <p>150 (5.91") $\phi 12$ (0.47")</p>

1.9.6 Shanks

NOTICE

Risk of collision caused by incorrect input of probe length

The touch probe length specified in the subsequent tables is only valid for measuring unit PP41.00. For the additional available measuring units the following values have to be **added**:

- MY21.00 (15 mm or 0.59")
- TP44.10 (13.5 mm or 0.53")

Shanks for activation method AZ

Possible shanks	Activation pulling force	Length L (Fig. 3) with PP41.00	Order Number (MM = Measuring unit, XX=AZ-type, refer to)
DIN69871-SK30	315 N	133 mm (5.24")	20.50-G-MM-SK30-XX-AZ
DIN69871-SK40	830 N	135 mm (5.31")	20.50-G-MM-SK40-XX-AZ
DIN69871-SK50	760 N	135 mm (5.31")	20.50-G-MM-SK50-XX-AZ
DIN2080-SK50	760 N	131 mm (5.16")	20.50-G-MM-DIN2080-SK50-XX-AZ
DIN69871-SK60	-	155 mm (6.10")	20.50-G-MM-SK60-XX-AZ
BT40	830 N	135 mm (5.31")	20.50-G-MM-BT40-XX-AZ
BT50	760 N	150 mm (5.90")	20.50-G-MM-BT50-XX-AZ
CAT40	830 N	135 mm (5.31")	20.50-G-MM-AN40-XX-AZ
CAT50	760 N	135 mm (5.31")	20.50-G-MM-AN50-XX-AZ
Nikken-NC5-46	-	154 mm (6.06")	20.50-G-MM-NC5-46-AZ
Nikken-NC5-63	-	154 mm (6.06")	20.50-G-MM-NC5-63-AZ
Other shanks	-	-	Upon request

Shanks for activation method WS

Possible shanks	Activation pressure (Coolant/Spindle air)	Length L (Fig. 3) with PP41.00	Order Number (MM = Measuring unit)
DIN69871-SK30	3.5 bar (50 psi) – 50 bar (725 psi)	133 mm (5.24")	20.50-G-MM-SK30-WS
DIN69871-SK30-MUBEA	3.5 bar (50 psi) – 50 bar (725 psi)	133 mm (5.24")	20.50-G-MM-SK30-MUBEA-WS
DIN69871-SK40	3.5 bar (50 psi) – 50 bar (725 psi)	135 mm (5.31")	20.50-G-MM-SK40-WS
DIN69871-SK50	3.5 bar (50 psi) – 50 bar (725 psi)	135 mm (5.31")	20.50-G-MM-SK50-WS
DIN2080-SK50	3.5 bar (50 psi) – 50 bar (725 psi)	131 mm (5.16")	20.50-G-MM-DIN2080-SK50-WS
DIN69871-SK60	3.5 bar (50 psi) – 50 bar (725 psi)	155 mm (6.10")	20.50-G-MM-SK60-WS
BT30	3.5 bar (50 psi) – 50 bar (725 psi)	133 mm (5.24")	20.50-G-MM-BT30-WS
BT40	3.5 bar (50 psi) – 50 bar (725 psi)	135 mm (5.31")	20.50-G-MM-BT40-WS
BT50	3.5 bar (50 psi) – 50 bar (725 psi)	150 mm (5.91")	20.50-G-MM-BT50-WS
CAT40	3.5 bar (50 psi) – 50 bar (725 psi)	135 mm (5.31")	20.50-G-MM-AN40-WS
CAT50	3.5 bar (50 psi) – 50 bar (725 psi)	135 mm (5.31")	20.50-G-MM-AN50-WS
DIN69893-HSK-A63	3.5 bar (50 psi) – 50 bar (725 psi)	155 mm (6.10")	20.50-G-MM-HSK63A-WS
DIN69893-HSK-F63	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-HSK63F-WS
DIN69893-HSK-A80	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-HSK80A-WS
DIN69893-HSK-A100	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-HSK100A-WS
Coromant Capto C5	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-C5-WS
Coromant Capto C6	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-C6-WS
Coromant Capto C8	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-C8-WS
Nikken-NC5-46	3.5 bar (50 psi) – 50 bar (725 psi)	154 mm (6.06")	20.50-G-MM-NC5-46-WS
Nikken-NC5-63	3.5 bar (50 psi) – 50 bar (725 psi)	154 mm (6.06")	20.50-G-MM-NC5-63-WS
Kennametal KM63	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-KM63-WS
Kennametal KM80	3.5 bar (50 psi) – 50 bar (725 psi)	160 mm (6.30")	20.50-G-MM-KM80-WS
D28-VDI40-W	3.5 bar (50 psi) – 50 bar (725 psi)	137 mm (5.39")	20.50-G-MM-VDI40-WS
D28-VDI50-W	3.5 bar (50 psi) – 50 bar (725 psi)	137 mm (5.39")	20.50-G-MM-VDI50-WS
D28-VDI60-W	3.5 bar (50 psi) – 50 bar (725 psi)	137 mm (5.39")	20.50-G-MM-VDI60-WS
D28-VDI80-W	3.5 bar (50 psi) – 50 bar (725 psi)	137 mm (5.39")	20.50-G-MM-VDI80-WS
Other shanks	-	-	Upon request

Shanks for activation method ME

Possible shanks	Activation force	Length L (Fig. 3) with PP41.00	Order Number (MM = Measuring unit)
DIN69893-HSK-A50	30 N	155 mm (6.10")	20.50-G-MM-HSK-50A-ME
DIN69893-HSK-A63	30 N	155 mm (6.10")	20.50-G-MM-HSK-63A-ME
DIN69893-HSK-A80	30 N	160 mm (6.30")	20.50-G-MM-HSK-80A-ME
DIN69893-HSK-A100	30 N	160 mm (6.30")	20.50-G-MM-HSK-100A-ME
DIN69893-HSK-E50	30 N	155 mm (6.10")	20.50-G-MM-HSK-50E-ME
DIN69893-HSK-E63	30 N	155 mm (6.10")	20.50-G-MM-HSK-63E-ME
<i>Other shanks</i>	-		<i>Upon request</i>

Shanks for activation method BI












Possible shanks	Length L (Fig. 3) with PP41.00	Order Number (MM = Measuring unit)
DIN69871-SK30	133 mm (5.24")	20.50-G-MM-SK30
DIN69871-SK30-MUBEA	133 mm (5.24")	20.50-G-MM-SK30-MUBEA
DIN69871-SK40	135 mm (5.31")	20.50-G-MM-SK40
DIN69871-SK50	135 mm (5.31")	20.50-G-MM-SK50
DIN2080-SK50	131 mm (5.16")	20.50-G-MM-DIN2080-SK50
DIN69871-SK60	155 mm (6.10")	20.50-G-MM-SK60
BT30	133 mm (5.24")	20.50-G-MM-BT30
BT40	135 mm (5.31")	20.50-G-MM-BT40
BT50	150 mm (5.91")	20.50-G-MM-BT50
CAT40	135 mm (5.31")	20.50-G-MM-AN40
CAT50	135 mm (5.31")	20.50-G-MM-AN50
DIN69893-HSK-A50	155 mm (6.10")	20.50-G-MM-HSK50A
DIN69893-HSK-E50	155 mm (6.10")	20.50-G-MM-HSK50E
DIN69893-HSK-A63	155 mm (6.10")	20.50-G-MM-HSK63A
DIN69893-HSK-E63	155 mm (6.10")	20.50-G-MM-HSK-63E
DIN69893-HSK-F63	160 mm (6.30")	20.50-G-MM-HSK63F
DIN69893-HSK-A80	160 mm (6.30")	20.50-G-MM-HSK80A
DIN69893-HSK-A100	160 mm (6.30")	20.50-G-MM-HSK100A
Coromant Capto C5	160 mm (6.30")	20.50-G-MM-C5
Coromant Capto C6	160 mm (6.30")	20.50-G-MM-C6
Coromant Capto C8	160 mm (6.30")	20.50-G-MM-C8
Nikken-NC5-46	154 mm (6.06")	20.50-G-MM-NC5-46
Nikken-NC5-63	154 mm (6.06")	20.50-G-MM-NC5-63
Kennametal KM63	160 mm (6.30")	20.50-G-MM-KM63
Kennametal KM80	160 mm (6.30")	20.50-G-MM-KM80
D28-VDI40-W	137 mm (5.39")	20.50-G-MM-VDI40
D28-VDI50-W	137 mm (5.39")	20.50-G-MM-VDI50
D28-VDI60-W	137 mm (5.39")	20.50-G-MM-VDI60
D28-VDI80-W	137 mm (5.39")	20.50-G-MM-VDI80
<i>Other shanks</i>	<i>Upon request</i>	

1.9.7 Pullstuds

Order no.	AZ-01	AZ-02	AZ-22	AZ-04/17
AZ type (XX)	01	02	22	04/17
Type	DIN69872-13 for SK30	DIN69872-19 for SK40/CAT40	DIN69872-19 for BT40 (+3 mm)	ISO 7388/2 Type B for SK40/CAT40
Illustration				
Order no.	AZ-04+3MM	AZ-06	AZ-06-3MM	AZ-06-VCE
AZ type (XX)	04+3	06	06-3	06-VCE
Type	ISO 7388/2 Type B for BT40 (+3 mm)	JIS B 6339-Typ 1 for BT40	JIS B 6339 Type 1 for SK40/CAT40 (-3 mm)	Special for SK40/CAT 40
Illustration				
Order no.	AZ-07	AZ-07-3MM	AZ-08	AZ-08-3MM
AZ type (XX)	07	07-3	08	08-3
Type	JIS B 6339 Type 2 for BT40	JIS B 6339 Type 2 for SK40/CAT40 (-3 mm)	JIS B 6339 Type 3 for BT40	JIS B 6339 Type 3 for SK40/CAT40 (-3 mm)
Illustration				







Order no.	AZ-03	AZ-05/19	AZ-03+25MM	AZ-TOS KURIM
AZ type (XX)	03	05/19	03+25	TOS KURIM
Type	DIN69872-28 for SK50	ISO 7388/2 Typ B for SK50/CAT50	DIN69872-28 for SK50 (+25 mm)	for SK50
Illustration				
Order no.	AZ-13	AZ-14	AZ-15	AZ-SK60
AZ type (XX)	13	14	15	SK60
Type	JIS B 6339 Type 1 for BT50	JIS B 6339 Type 2 for BT50	JIS B 6339 Type 3 for BT50	DIN69872-40 for SK60
Illustration				

1.9.8 Spares

Order Number	Description	Illustration
5677	Battery (9 V, 1200 mAh, Lithium)	 A grey 9V lithium battery with a white label showing '9V' and two terminals on the right side.
5525	Snap ring	 A black, C-shaped metal snap ring.
1477	O-ring 53.5x1.2 Viton	 A green, circular Viton O-ring.
0506	Clamping screw	 A black, cylindrical clamping screw with a hexagonal base.
1352	Adjustment screw DIN913 M4x8 (AF2 mm)	 A silver, threaded adjustment screw with a hexagonal head.
3240	Service cover	 A grey, circular service cover with a central hole.
3455	16x1 Viton O-ring for service cover	 A green, circular Viton O-ring.
2906	Metal eyelid	 A silver, circular metal eyelid with a central hole.
2931	Conical spring	 A silver, conical metal spring.
2074	O-ring 24x2 Viton	 A green, circular Viton O-ring.
0857	O-ring 26x2 Viton	 A green, circular Viton O-ring.

2 Operation

2.1 Tools, Measurement and Test Equipment

Order Number	Description	Illustration
0227	Hexagon key AF1.3 mm	
1097	Hexagon key AF2 mm	
1665	Spanner AF2 mm	
0885	Mounting pin	
2951	C-spanner	
3079	Dial gauge	
25.50-TB	<p>Tool box, consisting of:</p> <ul style="list-style-type: none"> 1x Battery (9 V, 1200 mAh, Lithium) (5677) 2x Adjustment screw DIN913, M4x8, AF2 mm (1352) 1x Mounting pin (0885) 2x Spanner AF2 mm (1665) 2x C-spanner (2951) 2x Hexagon key AF2 mm (1097) 1x Hexagon key AF1.3 mm (0227) 	Not illustrated

2.2 Changing Sensor/Stylus

2.2.1 Changing Sensors (Temperature Measuring Unit TP44.10)

NOTICE

Risk of material damage!

- Clean and dry the probe well!
- Do NOT blow off with compressed air!
- Do not touch the sensor tip!

1. **Solely** hold the white base of the socket and pull carefully.
2. Press sensor completely into the socket and pay attention to the orientation of the contact plugs.

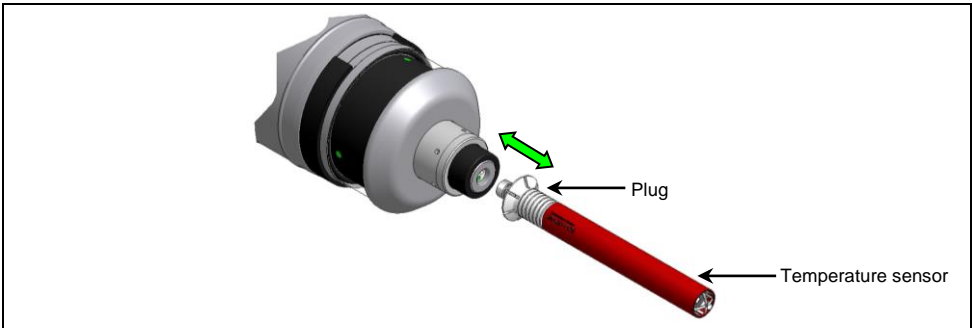


Fig. 7 Sensor change with temperature measuring unit TP44.10

2.2.2 Changing Stylus (Measuring Unit MY21.00)

NOTICE

Risk of material damage!

- Do not apply any turning force to the measuring unit!
- During replacement, always hold the stylus connection with the spanner AF4 mm!

1. Unscrew the stylus from the touch probe using the mounting pin.
2. Carefully screw the new stylus with mounting pin into the touch probe (Fig. 8).
3. Align the stylus to spindle centre (refer to chapter 2.4).
4. Calibrate the probe.



Fig. 8 Stylus change with measuring unit MY21.00

2.2.3 Changing Stylus (Measuring Unit PP41.00)

NOTICE

Risk of material damage!

The measuring mechanism is sensitive, therefore never use excessive force when screwing in the stylus!

- The torque for screwing in the stylus is $M=2$ Nm!
- When using a break shaft adapter (91.00-S-M4/M4), only screw in the stylus with a maximal torque of 1 Nm (0.74 lbf.ft)!

1. Unscrew the stylus from the touch probe using the mounting pin.
2. Carefully screw the new stylus with mounting pin into the touch probe (Fig. 9).
3. Align the stylus to spindle centre (refer to chapter 2.4).
4. Calibrate the probe.

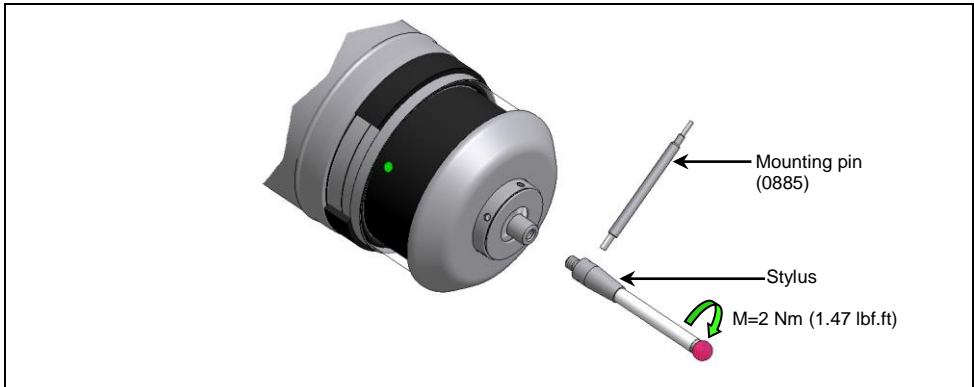


Fig. 9 Stylus change with measuring unit PP41.00

2.3 Replacing Battery

NOTICE

Risk of material damage!

- Clean and dry the probe well before opening!
- Do NOT blow off with compressed air!
- Replace empty battery immediately!

1. Laterally pull the snap ring off from the probe (1./Fig. 10).
2. Carefully slide the battery compartment sleeve down (2./Fig. 10).

INFORMATION

The touch probe RWP20.50 is protected against wrong polarity. Therefore there is no need to pay attention to the polarity when inserting a new battery!

3. Take the used battery out of the battery compartment and insert a new battery (3./Fig. 10).

NOTICE

Risk of material damage!

- When closing the battery compartment, ensure the O-ring is properly seated!

4. Carefully slide the battery compartment sleeve upwards (4./Fig. 10).
5. Position the snap ring at the probe laterally and slide it over the probe (5./Fig. 10).

INFORMATION

After changing the battery, the time for starting the touch probe (reboot) is approx. 5 s!

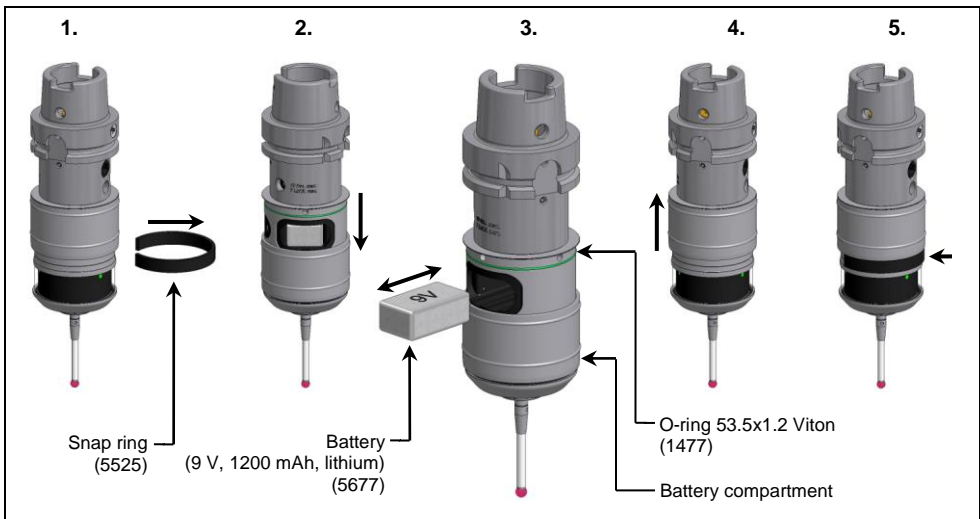


Fig. 10 Battery replacement

2.4 Aligning Stylus to Spindle Centre

NOTICE

Risk of material damage!

- Clean and dry the probe well!
- Do NOT blow off with compressed air!

1. Remove the snap ring from the side of the probe.
2. Slide battery compartment sleeve downward.
3. Adjust the probe with the adjustment screws A (4x) to within less than 5 μm (Fig. 11).
4. Tighten the adjustment screws A (4x) against each other (Fig. 11).
5. Slide the battery compartment sleeve back up again and push the snap ring back on.
6. Check the alignment of the stylus.
7. Calibrate the probe.

NOTICE

Risk of material damage!

- When closing the battery compartment sleeve, make sure the O-ring is properly seated!

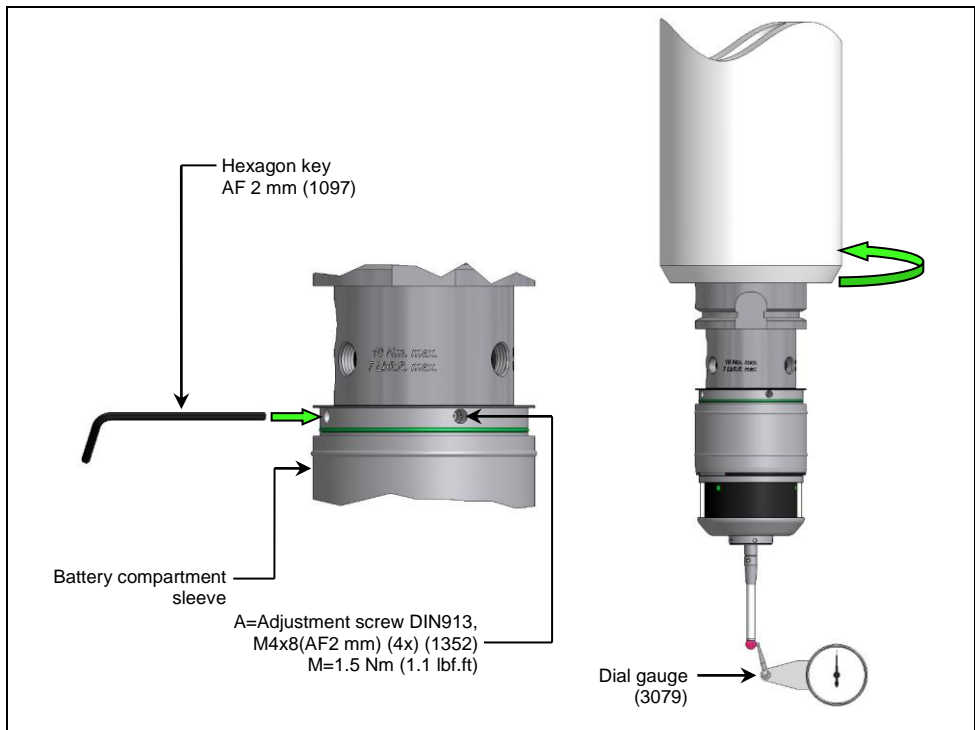


Fig. 11 Align stylus to spindle centre

2.5 Optical Status Display

The table below gives an overview of the blinking patterns of the LEDs (Fig. 12) and their meaning.

LEDs blinking green	Touch probe is transmitting signals
LEDs blinking green/red	Low battery
LEDs blinking orange	Stylus deflected
LEDs permanently red	Error
LEDs permanently red (for 5 s after battery is inserted)	Temperature measuring unit inserted
LEDs permanently blue (for 5 s after battery is inserted)	Mechanical measuring unit inserted
LEDs blinking blue	Activation attempt without coupled receiver within reach



Fig. 12 Optical status display

2.6 Measuring Unit Replacement

1. Remove the stylus or the temperature sensor respectively according to chapter 2.2 and 2.2.1.
2. Remove the battery from the touch probe according to chapter 2.3.
3. Insert the C-spanner into the bores of the measuring unit and carefully unscrew the measuring unit in a counter-clockwise direction.

NOTICE

Risk of material damage!

- When inserting the new measuring unit, ensure that the O-rings inside the touch probe housing and on the measuring unit are properly seated!

4. Insert the new measuring unit into the touch probe and carefully screw it in by hand.
5. Insert the C-spanner into the bores of the new measuring unit, screw the measuring unit completely to the stop.
6. Mount the stylus or the temperature sensor respectively according to chapter 2.2 and 2.2.1.
7. Reinsert the battery into the touch probe according to chapter 2.3.

INFORMATION

After changing the battery, the time for starting the touch probe (reboot) is approx. 5 s!

8. When using PP41.00 or MY21.00 align the stylus to the spindle centre.
9. Calibrate the probe.

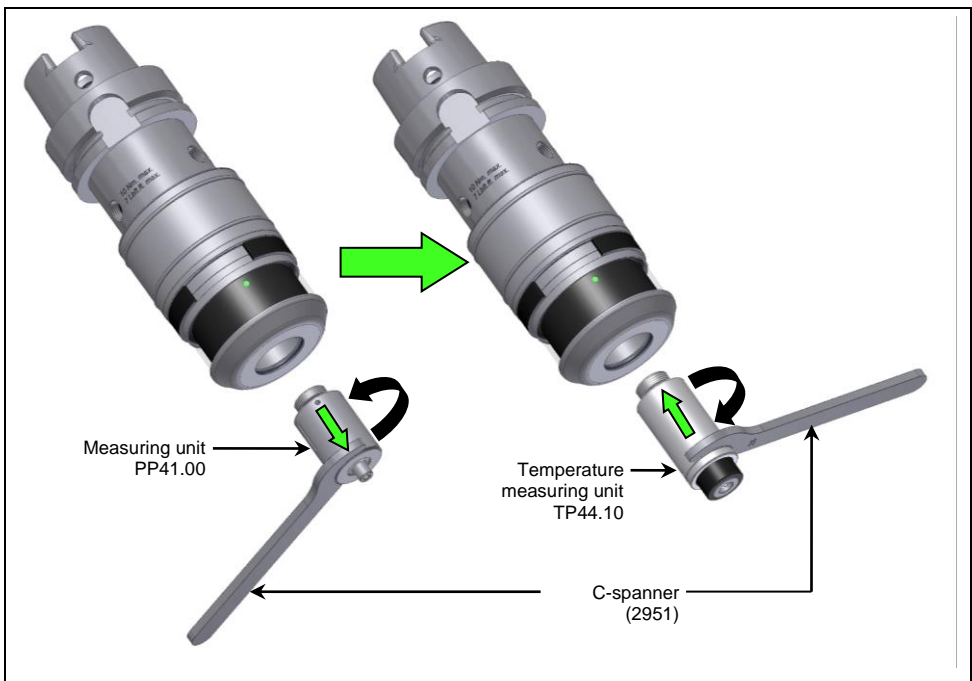


Fig. 13 Measuring unit replacement (Example: PP41.00 -> TP44.10)

2.7 Setting the Activation Method/Code and Interference Safety

2.7.1 Setting Procedure

NOTICE

Risk of material damage!

- Clean and dry the probe well before opening!
- Do NOT blow off with compressed air!

1. Slide the battery compartment sleeve partially down, keeping the battery held in place in the touch probe.
2. Press the push-button for approx. 1 s to display the activation method or the activation code set.

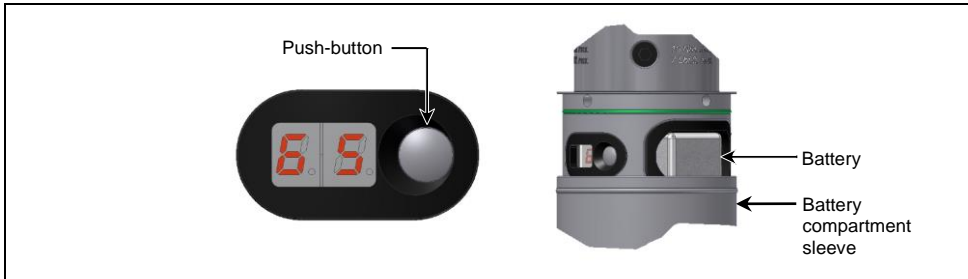


Fig. 14 Entering the settings

3. Keep pressing the push-button to set the activation method or the activation code (refer also to 2.7.2, setting level 2).
 - ▶ After approx. 3 s, the display automatically jumps to the setting of the interference safety.
4. Press the push-button to set the interference safety (refer also to 2.7.2, setting level 3).
 - ▶ After approx. 3 s, the display starts to blink if the push-button is not pressed again. The push-button is now in synchronisation mode and can be synchronised with a receiver.

NOTICE

Risk of measuring deviations!

- The push-button needs to be urgently recalibrated to avoid measuring deviations after the interference safety setting has been changed!

5. Synchronise the touch probe. To do this, hold the IR interface of the touch probe directly in front of the IR interface on the receiver. The receiver needs to be switched on for this (refer to Fig. 15).
 - ▶ After successful synchronisation, both LEDs briefly illuminate green on the receiver and the display on the touch probe stops blinking. Additionally the LEDs on the touch probe are lit in green.

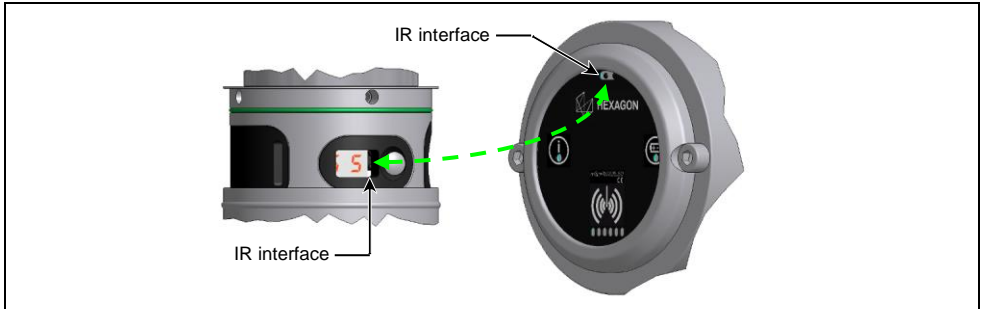


Fig. 15 Synchronisation

6. Close the battery compartment sleeve.

NOTICE

Risk of material damage!

- When closing the battery compartment, ensure the O-ring is properly seated!

2.7.2 Menu Structure

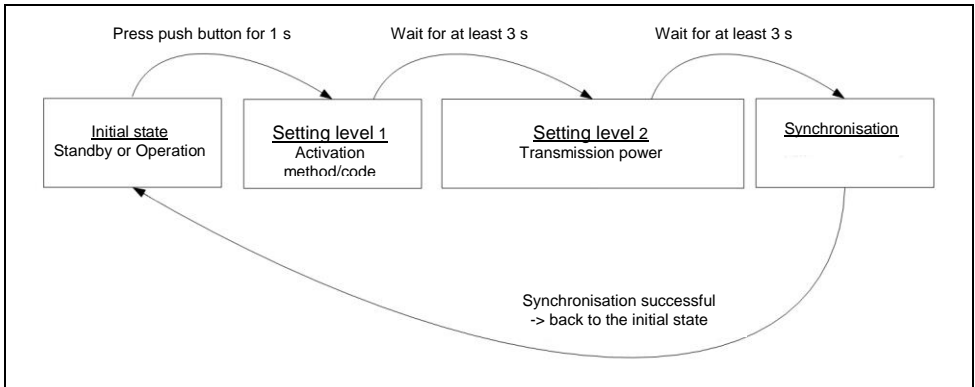


Fig. 16 Menu structure

Setting level 1		
	Activation	Activation code
0	AZ	-
1	WS/ME	-
A	BI	A
B	BI	B
C	BI	C

Setting level 2	
Interference safety	
0.0.	Fast
0.1.	Normal
0.2.	Secure

2.8 Adjusting Trigger Force (Measuring Unit PP41.00 only)



NOTICE!

If there are strong vibrations in the machine or if heavy probe inserts are used, this can lead to an increase in the trigger force to improve the measurement results.

1. Unscrew the stylus (refer to chapter 2.2).
2. Increase or decrease the trigger force with a hexagon key AF1.3 mm (refer to Fig. 17).

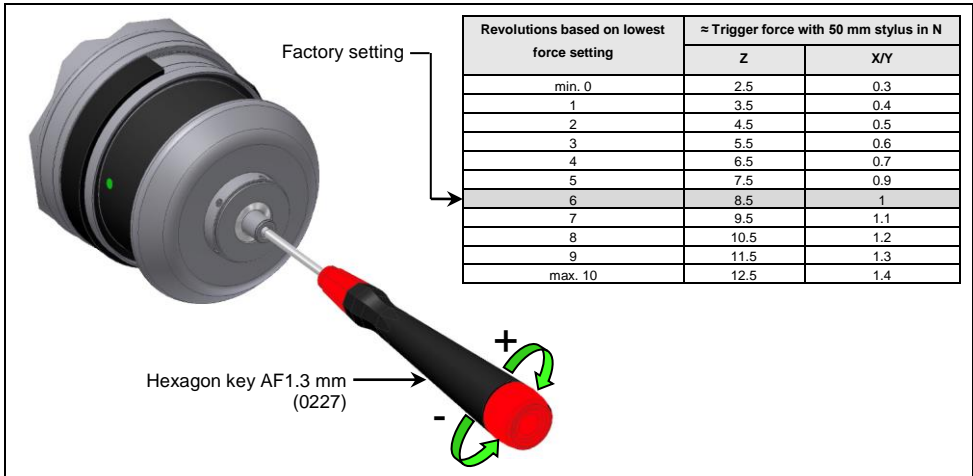


Fig. 17 Adjusting trigger force

3. Screw in the stylus (refer to chapter 2.2) and align the stylus to the spindle centre (refer to chapter 2.4).
4. Calibrate the probe.

2.9 Maintenance and Cleaning (Measuring Unit PP41.00 only)

NOTICE

Risk of material damage!

- Clean and dry the probe well before opening!
- Do NOT clean with compressed air or high pressure water!
- Do NOT use any sharp tools (these could damage the inner seal)!

1. Unscrew the stylus.

INFORMATION

Dirt can collect under the metal eyelid.

2. Remove the service cover with metal eyelid and conical spring by hand.
3. Clean probe and parts under running water.
4. Reassemble all parts.
5. Align the stylus to spindle centre.
6. Calibrate the probe!

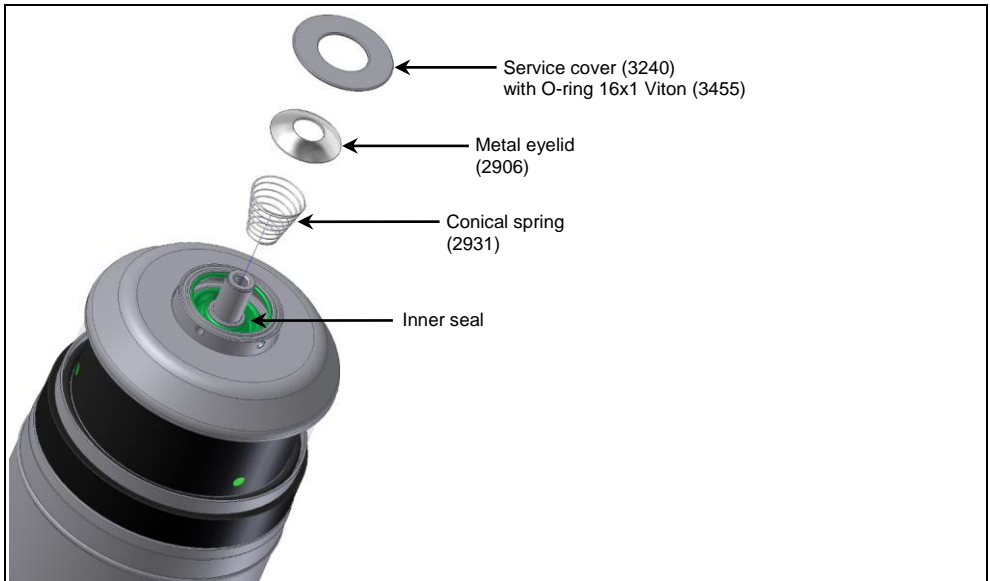


Fig. 18 Maintenance and cleaning of the radio-wave touch probe RWP20.50-G

2.10 Probe Extension

NOTICE

Danger of material damage!

- Wipe the probe clean and dry before dismounting!
- Do NOT blow off with compressed air!
- When assembling the extension, ensure the O-rings are properly seated.
- Align probe to spindle centre.
- Calibrate the probe.

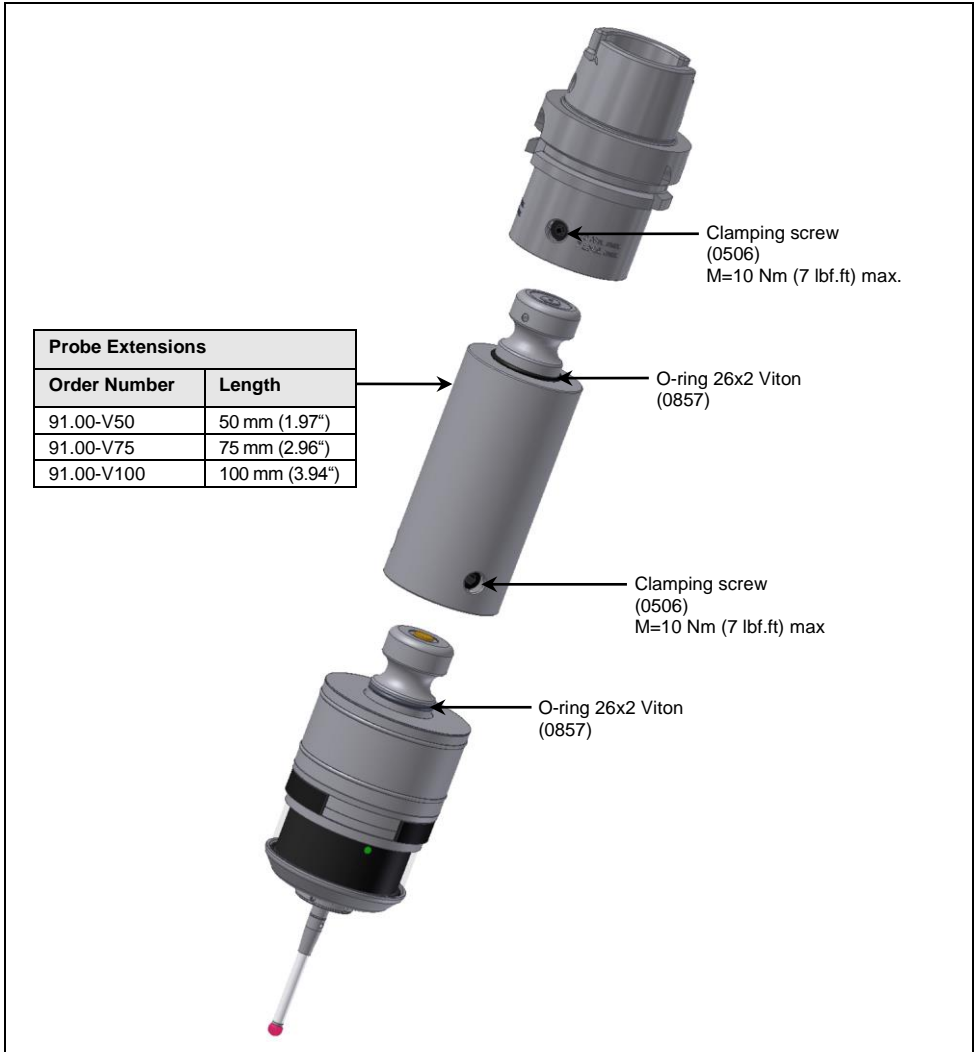


Fig. 19 Probe extension

2.11 Modular System (Measuring Units PP41.00 and MY21.00)

NOTICE

Danger of material damage!

- Wipe the probe clean and dry before dismounting!
- Do NOT blow off with compressed air!
- When screwing in the extension, make sure the O-ring is properly seated.
- The probe may be extended by a maximum of 400 mm!
- Align probe in the spindle axis to the spindle centre.
- Calibrate the probe.

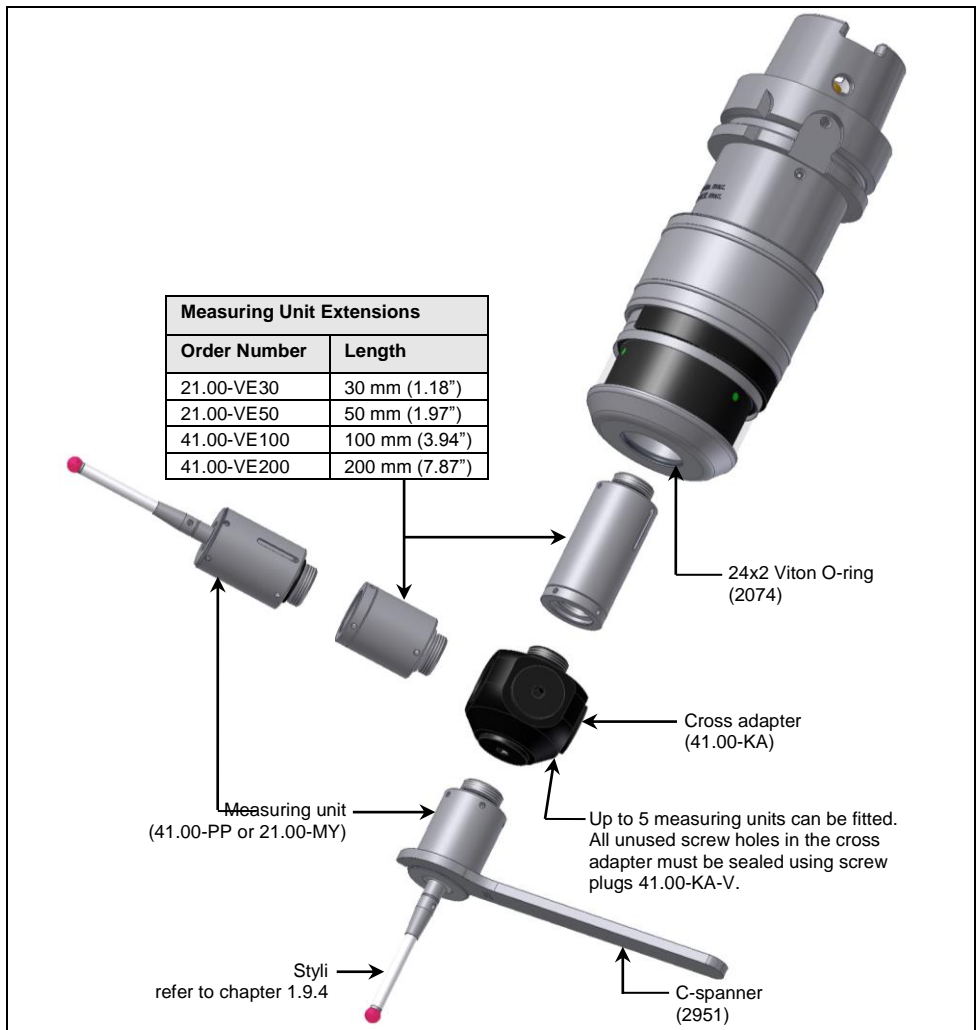


Fig. 20 Modular system



HEXAGON
MANUFACTURING INTELLIGENCE

Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit HexagonMI.com.














Hexagon Manufacturing Intelligence is part of Hexagon (Nasdaq Stockholm: HEXA B; hexagon.com), a leading global provider of information technologies that drive quality and productivity across geospatial and industrial enterprise applications.

m&h Inprocess Messtechnik GmbH

Am Langholz 11
88289 Waldburg
Germany

Tel. +49 (0)7529 9733 0
Fax +49 (0)7529 9733 7
sales.mh@hexagon.com
www.mh-inprocess.com

m&h – Part of Hexagon Manufacturing Intelligence

-  COORDINATE MEASURING MACHINES
-  3D LASER SCANNING
-  SENSORS
-  PORTABLE MEASURING ARMS
-  SERVICES
-  LASER TRACKERS & STATIONS
-  MULTISENSOR & OPTICAL SYSTEMS
-  WHITE LIGHT SCANNERS
-  METROLOGY SOFTWARE SOLUTIONS
-  CAD / CAM
-  STATISTICAL PROCESS & CONTROL
-  AUTOMATED APPLICATIONS
-  MICROMETERS, CALIPERS AND GAUGES

-  m&h PROBING SYSTEMS
-  m&h LASER TOOL SETTERS
-  m&h TOOL SETTERS
-  m&h MEASURING SOFTWARE