



TORQUE TESTER

mini K1/S

mini K5/S

mini K20/S

mini Ke/S

OPERATOR'S HANDBOOK



KOLVER S.r.l - Via Corner, 19/21 - 36016 THIENE - ITALY - tel. +39 0445 371068 fax. +39 0445 371069
kolver@kolver.it - www.kolver.it

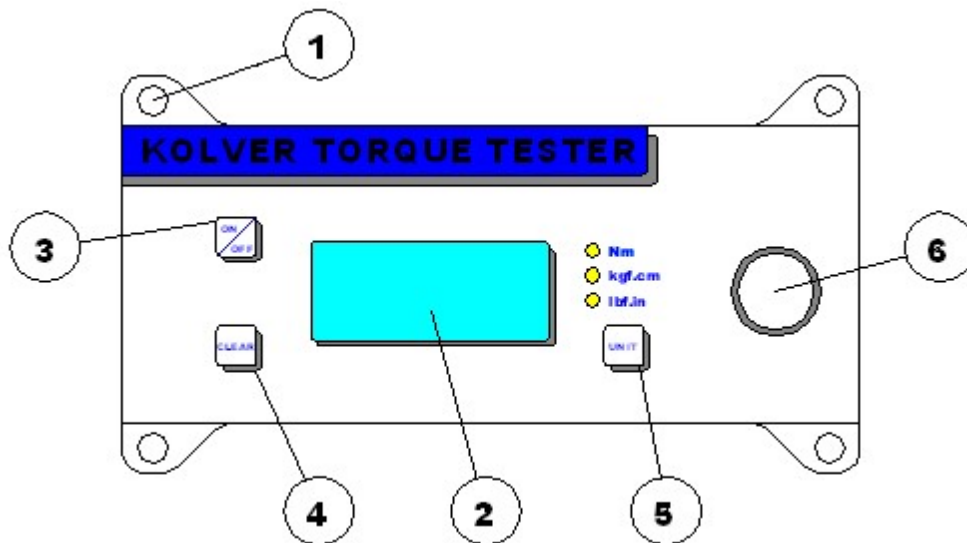
1. APPLICATIONS

Recommended for all hand screwdrivers, wrenches, or power tools.

2. FEATURES

Model	Torque range Nm	Accuracy
miniK1/S	0,05 – 1	± 1 cNm
miniK5/S	0,3 – 5	± 2 cNm
miniK20/S	0,5 – 20	± 3 cNm
minike/5/S	0,5 - 5	± 3 cNm
minike/25/S	2 - 25	± 10 cNm
minike/50/S	5 - 50	± 10 cNm

- Built-in transducer to measure on joint simulator.
- External transducer (**miniKe/S**).
- Three units of torque measurements: Nm, Kgf.cm, lbf.in.
- Battery powered (9V) and AC adapter cord. 9V batteries provide 20 hours of continuous operation.
- Manual and auto reset functions to clear displayed values.
- Automatic shut down.
- Better performances on hard joint
- Correction factor (FATC): to connect more ext. transducers on the same tester.
- Mini USB to connect to PC and to communicate to Torque Analyzer.
- Certificate of calibration.



3. DESCRIPTION

1. Mounting holes
2. Display 4 digit / 8 lines
3. "ON/OFF" key : press for 3 seconds to switch tester on or off
4. "CLEAR" key : press to reset the displayed value
5. "UNIT" key : press to select the unit of torque measurements
6. Internal transducer or port for external transducer

4. MOUNTING

It is strongly recommended securing the tester through slots “1” to a workbench before operating. Immobilizing the tester when checking torque values over 1 Nm is critical for the safety the operator as well as for the accuracy of torque measurements during operation.

5. JOINT SIMULATOR

The Joint Simulator (JS) consists of a screw compressing a series of washers. The way the washers are mounted can simulate soft or hard joint. The screw comes with a ¼” hex male head for proper fit to any ¼” hex female screwdriver drive. Hardened thread components increase accuracy and life. Since a joint simulator cannot duplicate actual joints, the torque values displayed on the minik may vary from the actual torque that a screwdriver will apply to the actual assembly.

When critical applications are involved, we recommend to verify the torque output of the power tool being used on the actual assembly through an external transducer.

Minik1 is supplied with a built-in joint simulator.

NB. We recommend to grease the JS each 1000 cycles.

6. STARTING AND OPERATING THE TESTER

1. Immobilize the tester when checking torque values over 1 Nm. This is critical for the safety the operator as well as for the accuracy of torque measurements during operation.

2. Switch the tester on pushing the ON/OFF key.

If used only with battery check its status. If the tester does not switch on or the display is not clear enough, please replace the battery. When used it the AC adapter, this will disable the battery. The battery is not rechargeable. The display will show the main screen:



3. Insert the joint simulator into its 13mm hex seat and make sure the screw is in its upper position (if not run the driver anticlockwise to unscrew it). The tester is ready for a measuring cycle.

In minik1, only unscrew before measuring.

4. Run the joint simulator screw all the way down until it stops and read the torque value on the display. Run the screw up to be ready for the next cycle.

5. Press the “ON/ESC” key for 3 seconds to switch the tester off. The tester features a built-in auto shut off mode function to save power when not in use. If there is no activity for 3 minutes, such as key press or no torque input, the tester will shut down. To restore power press the “ON/ESC” key for 3 seconds

NB. Before starting, always check that the screen displays 0.000. Instead push CLEAR.

7. SELECTING THE UNIT

MEASURING UNIT: Nm, kgf.cm and lbf.in

To change unit: press **Unit** key until the desired unit has been selected.

Each unit is indicated by a LED of different color: red for Nm, green for kgf.cm and yellow for lbf.in .

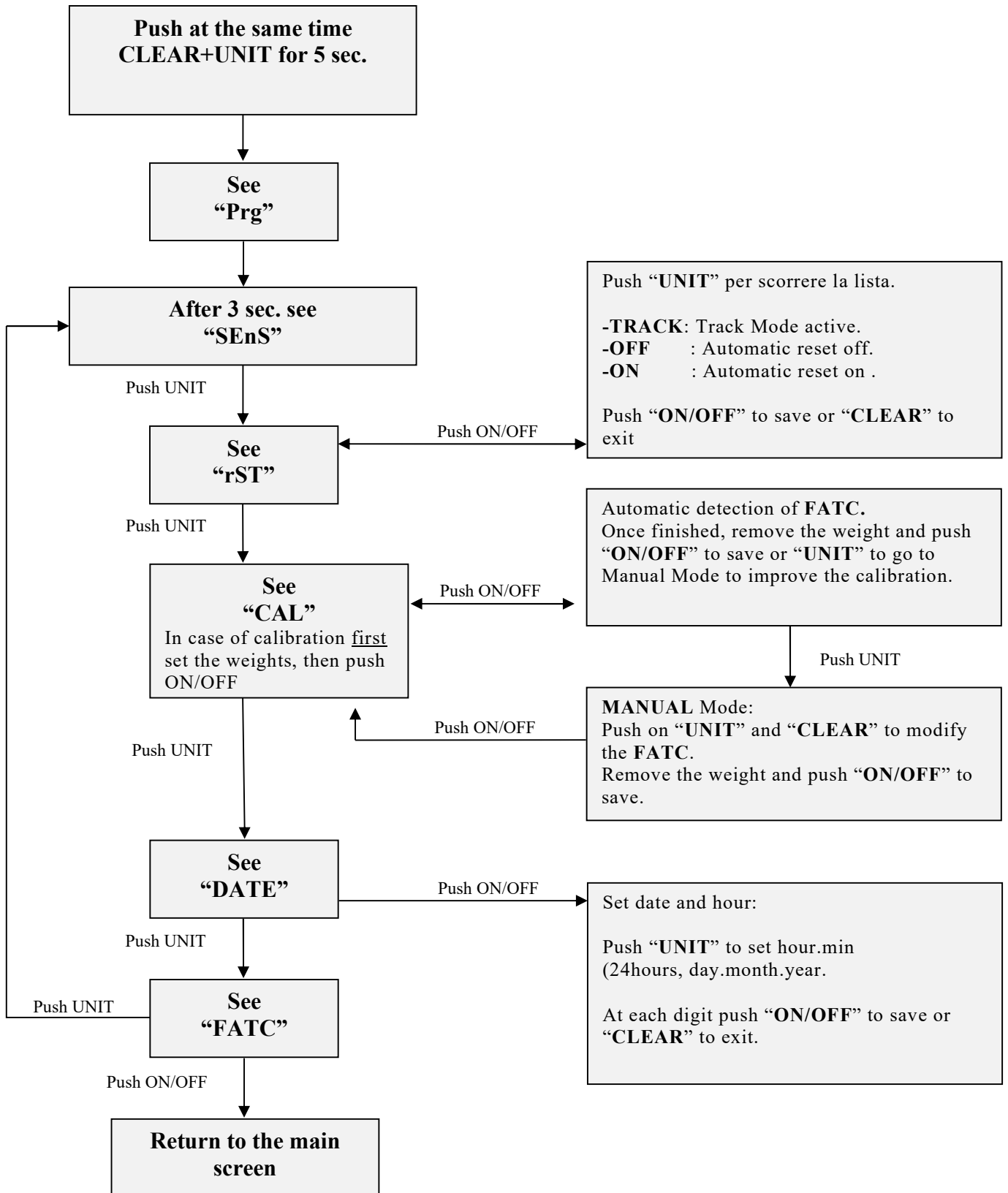
8. SELECTING MANUAL OR AUTO RESET

The flow chart below shows how to select **Manual** or **Auto Reset**.

Sens, **Cal** and **Fatc** functions (sensitivity, calibration and correction factor) can be modified only by authorized personnel.

When you select **Manual Reset “Coff”**: you need to push “CLEAR” to remove readings from the display and reset all values to zero.

When you select **Auto reset “Con”**: any new measure will replace the previous one without resetting the value to zero.



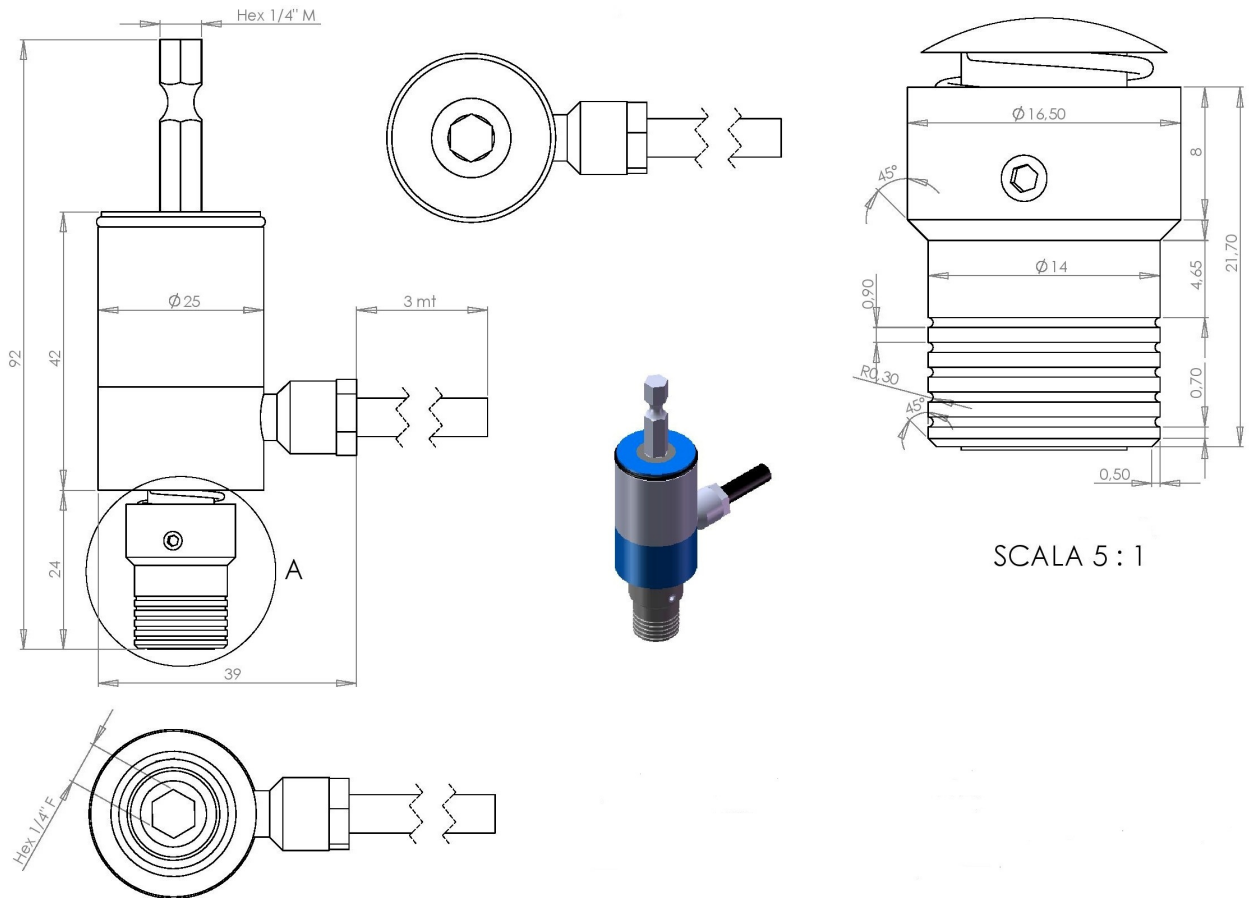
9. EXTERNAL TRANSDUCER for miniKe

The minike readouts support an external rotary or non rotary transducer. The minike can read torque up to 500 Nm. The external transducer must be calibrated together with the minike here at Kolver before shipment. The following transducers are always available ex stock:

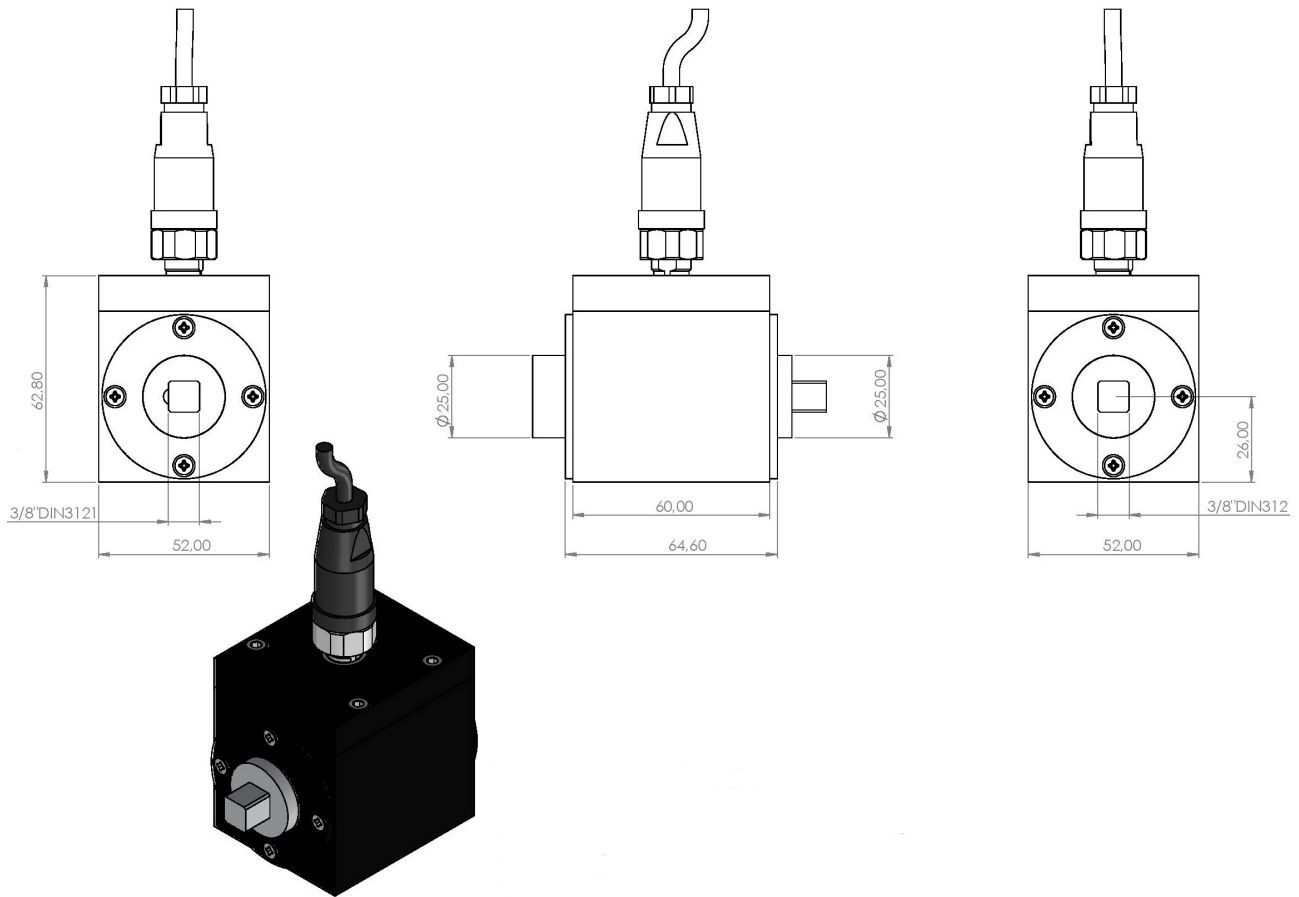
Model	Torque range Nm
KTE5	0.5 – 5.0
KTE25	2.0 – 25.0
KTE50	5.0 – 50.0

Rotary and non rotary transducers for lower or higher torque ranges available on request.

KTE5-KTE25



KTE50



10. MAINTENANCE

The miniker testers are maintenance free. The electronics and the internal transducers have no wearing parts except the battery once its charge is over. The internal transducer should be calibrated every 12 to 30 months, depending on the frequency of use.

WARNING: The overload protection of the internal transducer is limited to 125% of nominal value. Damages due to overloading will result in inaccurate readings and will not be covered by our warranty.

IMPORTANT: the calibration certificate has a maximum validity of 26 months (ref. DIN 51309, ISO 6789-2). The instrument must be calibrated again (regardless of the date of last calibration):

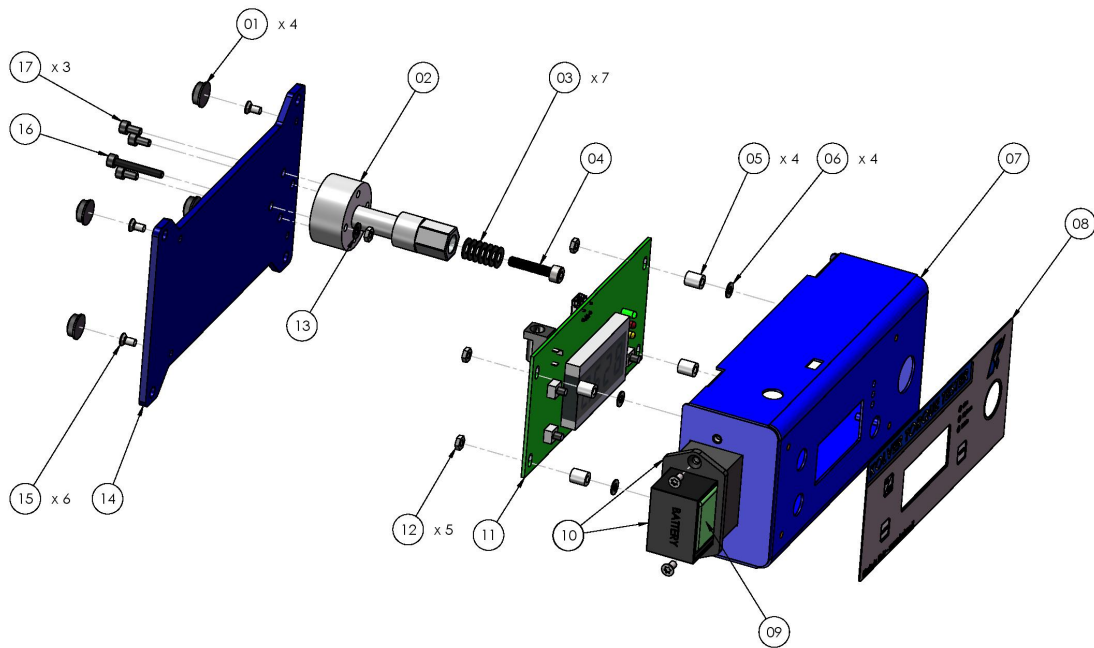
- if it has been overloaded
- after any corrective maintenance (eg: upgrade with new software)
- after improper use (eg: tested with impact wrench or jacks)
- in case of doubt about the measurement results.

11. WARRANTY

1. This KOLVER product is guaranteed against defective workmanship or materials, for a maximum period of 12 months following the date of purchase from KOLVER, provided that its usage is limited to single shift operation throughout that period. If the usage rate exceeds of single shift operation, the guarantee period shall be reduced on a prorata basis.
2. If, during the guarantee period, the product appears to be defective in workmanship or materials, it should be returned to KOLVER or its distributors, transport prepaied, together with a short description of the alleged defect. KOLVER shall, at its sole discretion, arrange to repair or replace free of charge such items.
3. This guarantee does not cover repair or replacement required as a consequence of products which have been abused, misused or modified, or which have been repaired using not original KOLVER spare parts or by not authorized service personnel.
4. KOLVER accepts no claim for labour or other expenditure made upon defective products.
5. Any direct, incidental or consequential damages whatsoever arising from any defect are expressly excluded.
6. This guarantee replaces all other guarantees, or conditions, expressed or implied, regarding the quality, the marketability or the fitness for any particular purpose.
7. No one, whether an agent, servant or employee of KOLVER, is authorized to add to or modify the terms of this limited guarantee in any way. However it's possible to extend the warranty with an extra cost. Further information at kolver@kolver.it

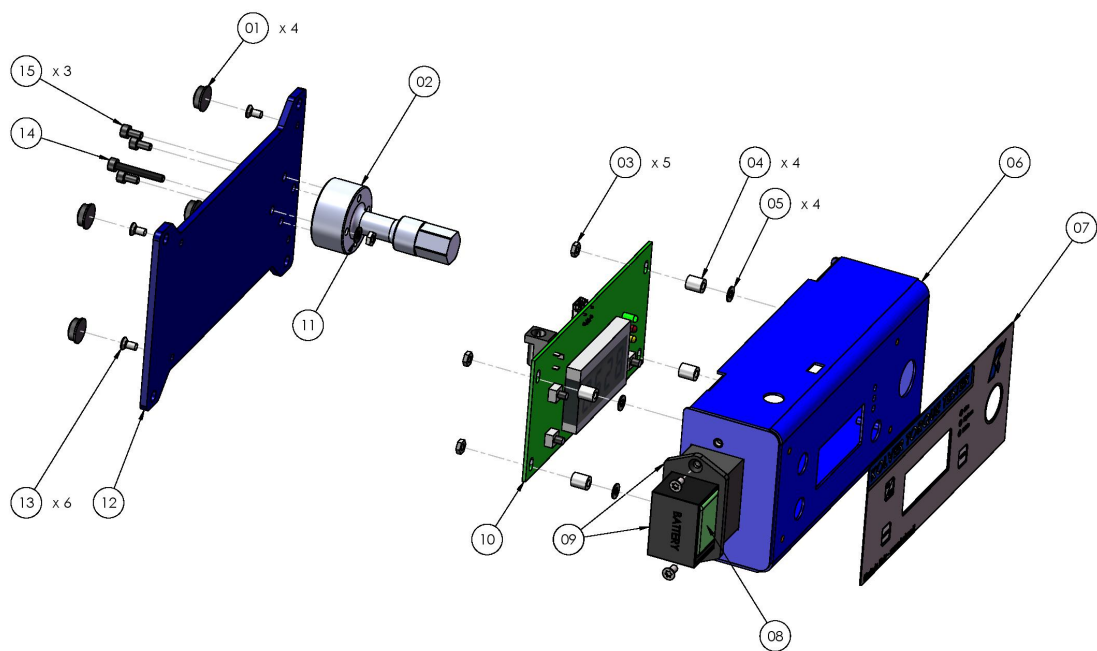
EXPLODED VIEWS AND PART LISTS

Minik1/S



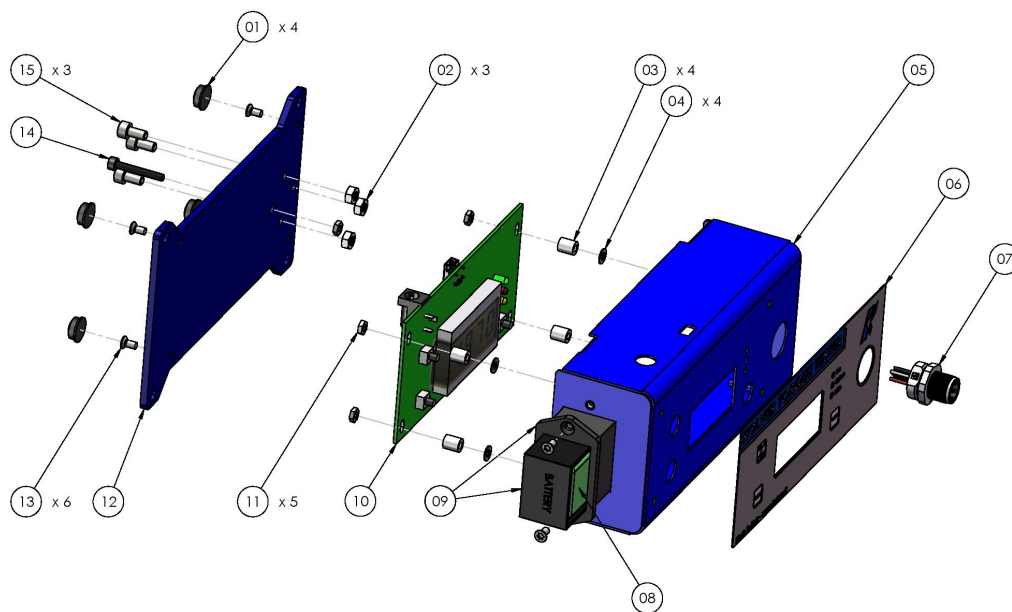
REF	DESCRIPTION	CODE
1	Plastic support (4 pcs)	800016
2	Internal transducer 1Nm (miniK1)	240505
3	Washer M4 (7 pcs)	241015
4	Screw M4 x 20	241014
5	Flat washer M3 (4 pcs)	800042
6	Nut 6,3 mm (4 pcs)	241003
7	Metal housing miniK../S	240001/BCU
8	Membrane miniK	241008
9	Battery 9V not rechargeable	241010
10	Battery seat miniK	241005
11	Board miniK + display	241002/N
12	Screw M3 (5 pcs)	800056
13	Washer M3	800041
14	Base miniKe	240001/BF2
15	Screw M3 x 6 TSP (6 pcs)	801002
16	Screw M3 x 22	241012
17	Screw M4 x 8 (3 pcs)	241011
	Bit - hex 1/4", L=50 mm, diam. 4 mm	FE-13040
	Case	241000
	Power supply 12V	241009/N

minik5/S – minik20/S



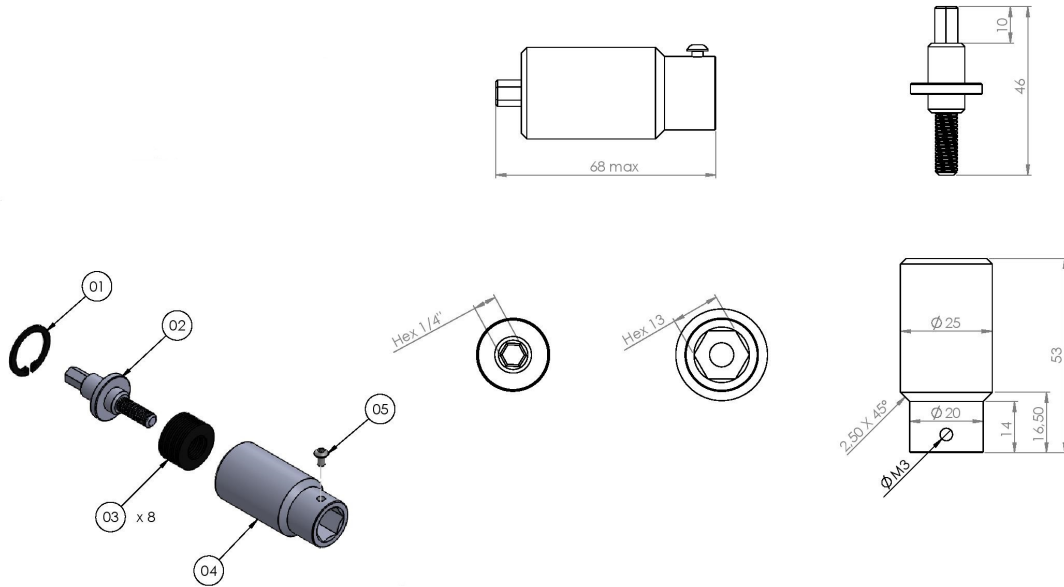
REF	DESCRIPTION	CODE
1	Plastic support (4 pcs)	800016
2	Internal transducer 5Nm (miniK5/s)	240503
	Internal transducer 20Nm (miniK20/s)	240504
3	Washer M3 (5 pcs)	800041
4	Flat washer M3 (4 pcs)	800042
5	Nut 6,3 mm (4 pcs)	241003
6	Metal housing miniK../S	240001/BCU
7	Membrane miniK	241008
8	Battery 9V not rechargeable	241010
9	Battery seat miniK	241005
10	Board miniK + display	241002/N
11	Screw M3 (5 pcs)	800056
12	Base miniKe	240001/BF2
13	Screw M3 x 6 TSP (6 pcs)	801002
14	Screw M3 x 22	241012
15	Screw M4 x 8 (3 pcs)	241011
	Joint simulator M6 (miniK5)	240600
	Joint simulator M8 (miniK20)	240800
	Case	241000
	Power supply 12V	241009/N

Minike/xx/S



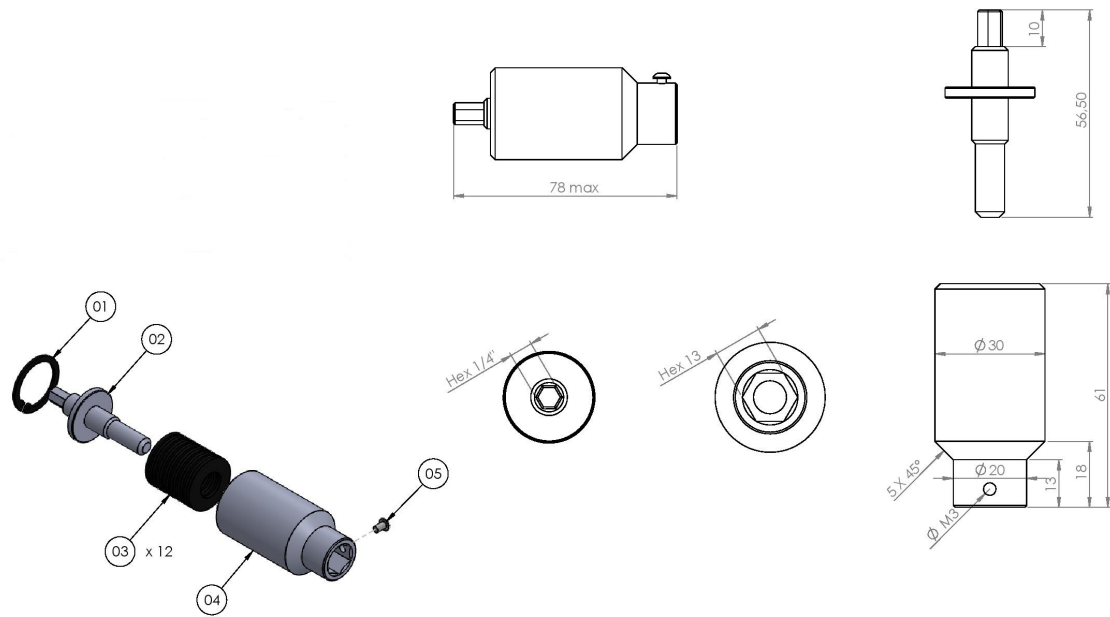
REF	DESCRIPTION	CODE
1	Plastic support (4 pcs)	800016
2	Washer M3 (3 pcs)	800041
3	Flat washer M3 (4 pcs)	800042
4	Nut 6,3 mm (4 pcs)	241003
5	Metal housing miniK../S	240001/BCU
6	Membrane miniK	241008
7	Connector M 5 pin	231666
8	Battery 9V not rechargeable	241010
9	Battery seat miniK	241005
10	Board miniK + display	241002/N
11	Screw M3 (5 pcs)	800056
12	Base miniKe	240001/BF2
13	Screw M3 x 6 TSP (6 pcs)	801002
14	Screw M3 x 22	241012
15	Screw M4 x 8 (3 pcs)	241011
	Case	241000
	Power supply 12V	241009/N

M6 (code 240600)



Pos.	Description	Code
01	Seiger	240601
02	Joint shaft	240602
03	Washer spring (8)	240603
04	Joint housing	240604
05	Screw M3x5	872443/ZN

M8 (code 240800)



Pos.	Description	Code
01	Seiger	240801
02	Joint shaft	240802
03	Washer spring (12)	240803
04	Joint housing	240804
05	Screw M3x5	872443/ZN

DECLARATION OF CONFORMITY



KOLVER S.r.l.
VIA MARCO CORNER, 19/21
36016 THIENE (VI) ITALIA

Declare that the new tool here described: Torque tester:

mini K1/S	021402/S	Mini KE/5/S	021405/5/S
Mini K5/S	021403/S	Mini KE/25/S	021405/25/S
Mini K20/S	021404/S	Mini KE/50/S	021405/50/S

Is in conformity with the following standards and other normative documents: 2006/42/CE, LVD 2014/35/UE, EMCD 2014/30/UE, EN 62841-2-2:2014, EN 62841-1: 2015, EN 60204-1, EN 61000-6-2, EN 61000-6-4.

It is also in conformity with RoHS III normative (2011/65/UE and following 2015/863).

Name: Giovanni Colasante
Position: General Manager
Person authorized to compile the technical file in Kolver

Thiene, January 1st 2021

Giovanni Colasante

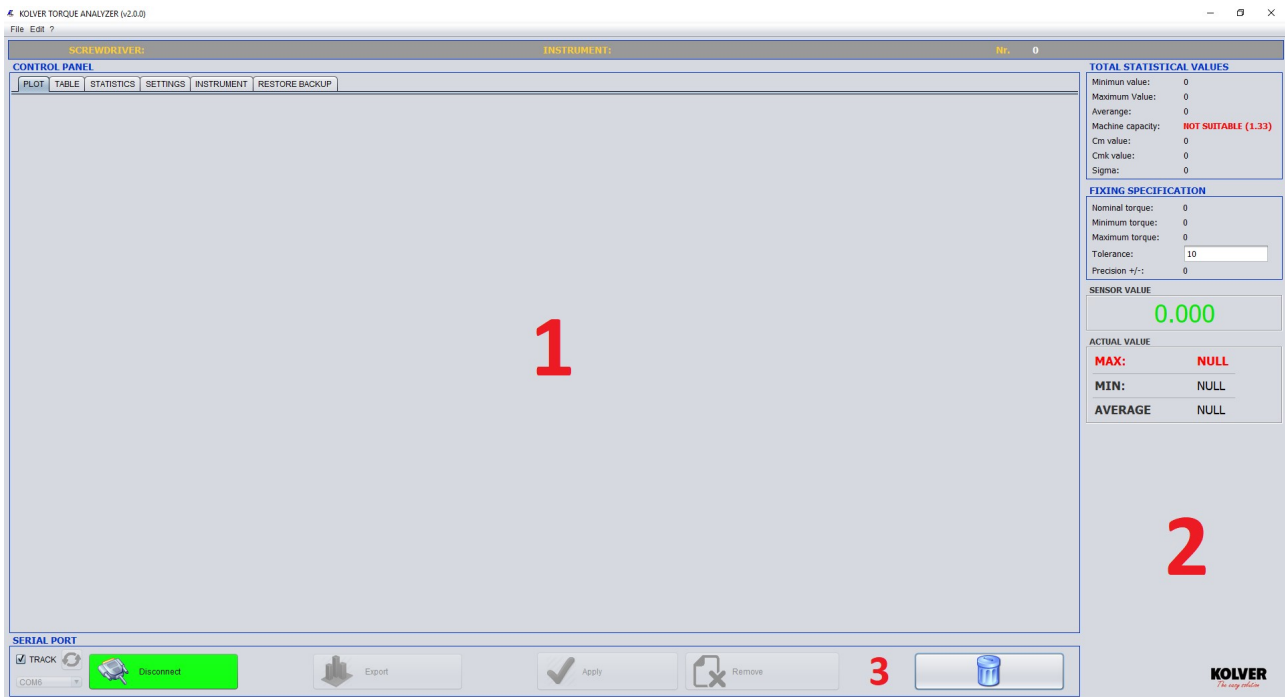
KOLVER TORQUE ANALYZER

Torque Analyzer software allows for communication between our mini k/s and mini ke/s series torque testers and your PC. Torque Analyzer software allows the capture of torque measurements directly from the torque tester including track mode, graphic display readings, and the real-time calculation of the machine capacity represented by Cm and Cmk dat0061.

1. INSTALLATION

Torque Analyzer is a plug-and-play software.

Just launch the “Kolver_Torque_Analyzer_ver_X_X_X.exe” (X_X_X is the version of the software).



1: Kolver_Torque_Analyzer_ver1_0_1 software main screen

The home page is made of three sections:

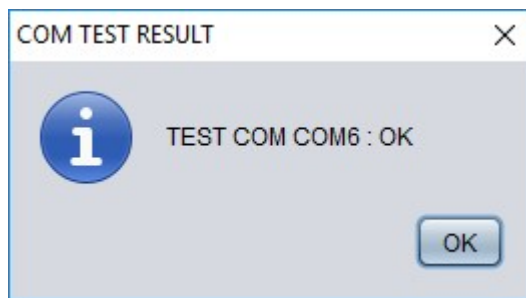
- 1- “Control Panel”: to display results, graphics, tables, setting and info of the tester.
- 2- “Report”: to display values (max, min, cm, cmk, in total, in real time...etc.)
- 3- “Interface”: connection, modification and export of data.

2. CONNECTION TO MINIK/S

Connect the minik/s to your pc through the usb port. Then push the Connect button.

The software will display the correct connection (see Picture 2).

Unless it will show the error and how to proceed.



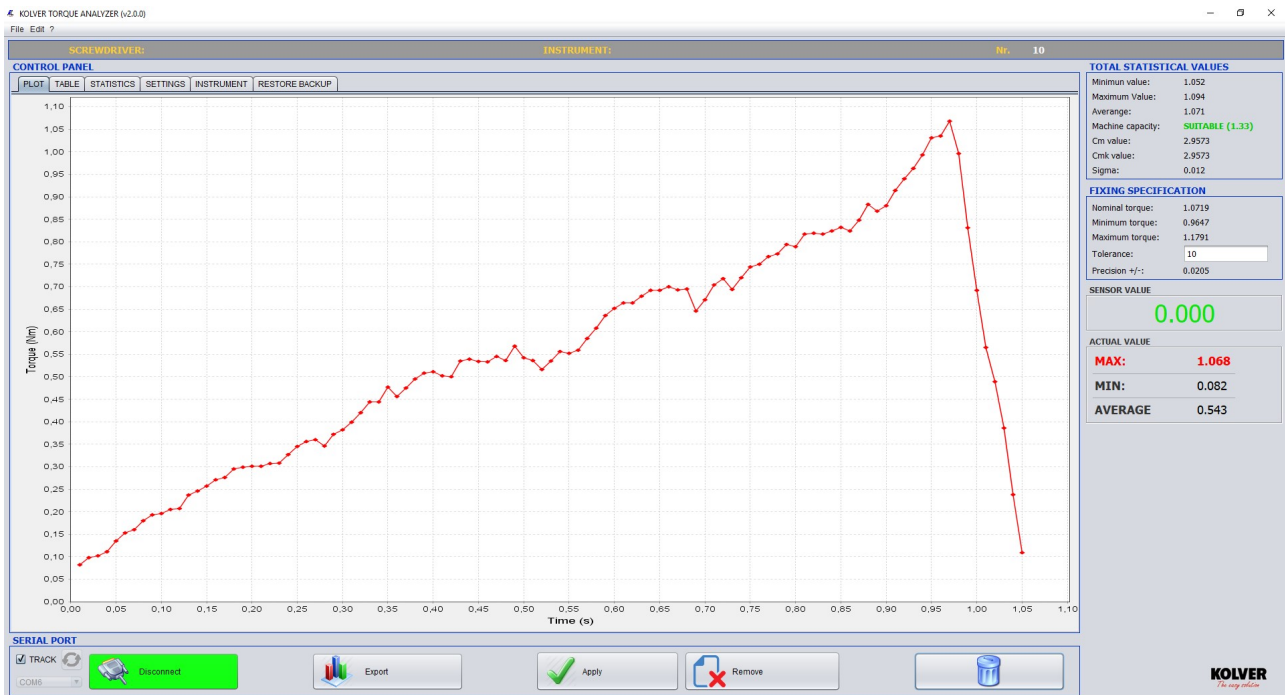
2 :Output of correct connection.

3. TORQUE VALUE CAPTURE

How to capture the torque values:

- 1- **Track Mode:** it allows to capture and display the trend of the torque signal given by the minik/s.
- 2- **Max Value Mode:** it allows to capture and display the max torque value given by the minik/s.

The mode must be set on the minik/s: on the main screen flag or not the Track option. However, Torque Analyzer has been designed to automatically align the receipt of the first measure by detecting the capture mode set in mini k.



Picture 3: To flag Track mode.

4. DISPLAY AND SETUP

“Control Panel” area has 4 sections:

- A. **GRAPHIC:** This section allows to display the graphics of the values (See picture 3). There is also the possibility to zoom on specific areas. Two types of visualizations:
 - 1- ‘X-Y Plot’ : temporal visualization of values.
 - 2- ‘Bar Plot’ : bar visualization of values.

Type of visualization can be set from the menu:
Edit → Modify → Chart.

B. TABLE: in this section all the values are displayed (max and min, average, date,...).

The screenshot shows the 'KOLVER TORQUE ANALYZER (v2.0.0)' software interface. The main window is titled 'SCREWDRIVER: INSTRUMENT: Nr. 100'. The 'CONTROL PANEL' has tabs for 'PLOT', 'TABLE', 'STATISTICS', 'SETTINGS', 'INSTRUMENT', and 'RESTORE BACKUP'. The 'TABLE' tab is active, displaying a table with 10 rows of data. The columns are: NUM, MIN [Nm], MAX [Nm], AVERAGE [Nm], HOUR, DATE, SCREWDRIVER, and STATUS. The data for the first 10 rows is as follows:

NUM	MIN [Nm]	MAX [Nm]	AVERAGE [Nm]	HOUR	DATE	SCREWDRIVER	STATUS
1	0.31	4.303	1.895	13:45:44	11/5/2017	TOP15	OK
2	0.328	4.319	1.921	13:45:47	11/5/2017	TOP15	OK
3	0.328	4.331	1.855	13:45:50	11/5/2017	TOP15	OK
4	0.322	4.269	2.052	13:45:56	11/5/2017	TOP15	OK
5	0.307	4.538	1.962	13:45:59	11/5/2017	TOP15	OK
6	0.307	4.455	2.028	13:46:01	11/5/2017	TOP15	OK
7	0.31	4.365	1.914	13:46:04	11/5/2017	TOP15	OK
8	0.301	4.296	1.79	13:46:10	11/5/2017	TOP15	OK
9	0.301	4.248	2.086	13:46:13	11/5/2017	TOP15	OK
10	0.358	4.248	1.925	13:46:16	11/5/2017	TOP15	OK

On the right side, the 'TOTAL STATISTICAL VALUES' section shows: Minimum value: 4.212, Maximum Value: 4.523, Average: 4.342, Machine capacity: SUITABLE (1.33), Cm value: 2.6406, CmK value: 2.6406, Sigma: 0.0548. The 'FIXING SPECIFICATION' section shows: Nominal torque: 4.3421, Minimum torque: 3.9079, Maximum torque: 4.7764, Tolerance: 10, Precision f-: 0.0416. The 'SENSOR VALUE' section shows a large green '0.000'. The 'ACTUAL VALUE' section shows: MAX: NULL, MIN: NULL, AVERAGE: NULL. The bottom of the interface has a 'SERIAL PORT' section with 'TRACK' checked, 'COM1' selected, and buttons for 'Connect', 'Export', 'Apply', and 'Remove'. The KOLVER logo is in the bottom right corner.

Picture 4 : "TABLE" section; 10 values.

C. STATISTICS

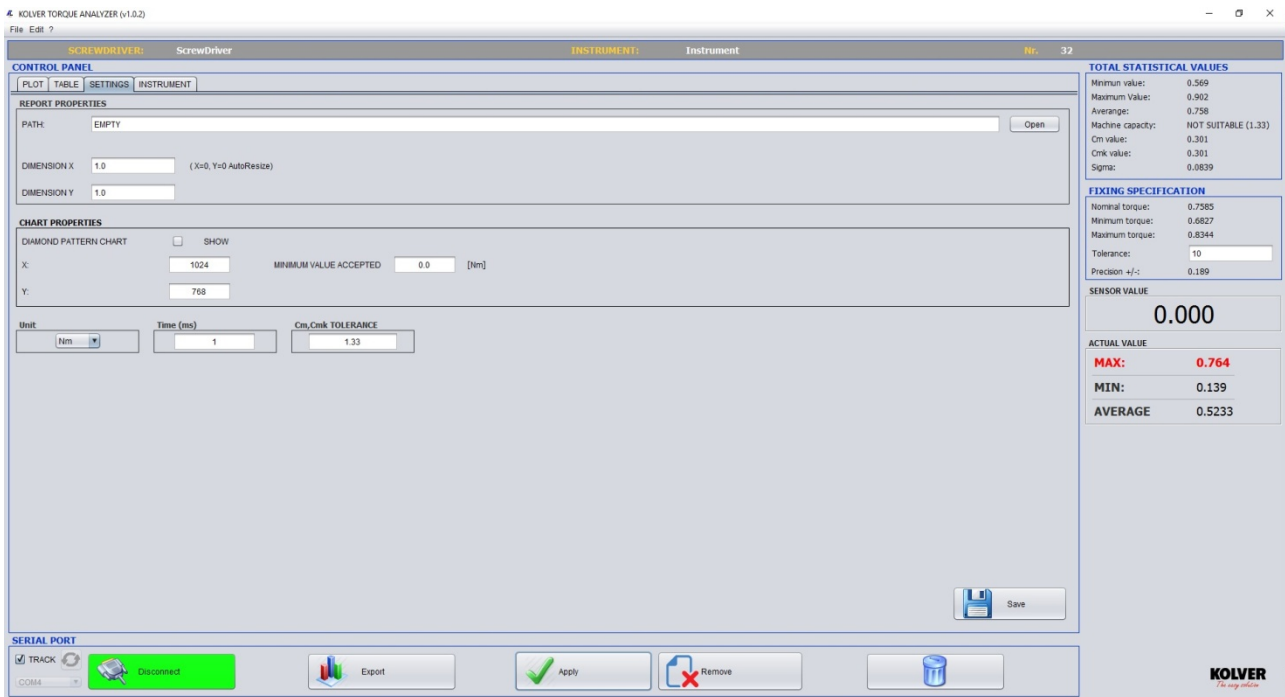
In this section, In questa sezione è possibile visualizzare informazioni descrittive di carattere statistico sulla base di criteri di rilevazione, classificazione, sintesi e rappresentazione dei dati appresi (Fig.5).

Other features:

- PROPRIETIES:** it allows to choose how to visualize the curve to plot and any graphics shake if needed.
- PLOT:** Print/ Update statistics graphics.
- REPORT:** to export the data in pdf file.
- LOAD:** to upload data previously sampled and saved.
- SAVE:** Salva l'intero set di dati, relativo alle misurazioni fatte e presenti in tabella, con la possibilità di recupero successivo.



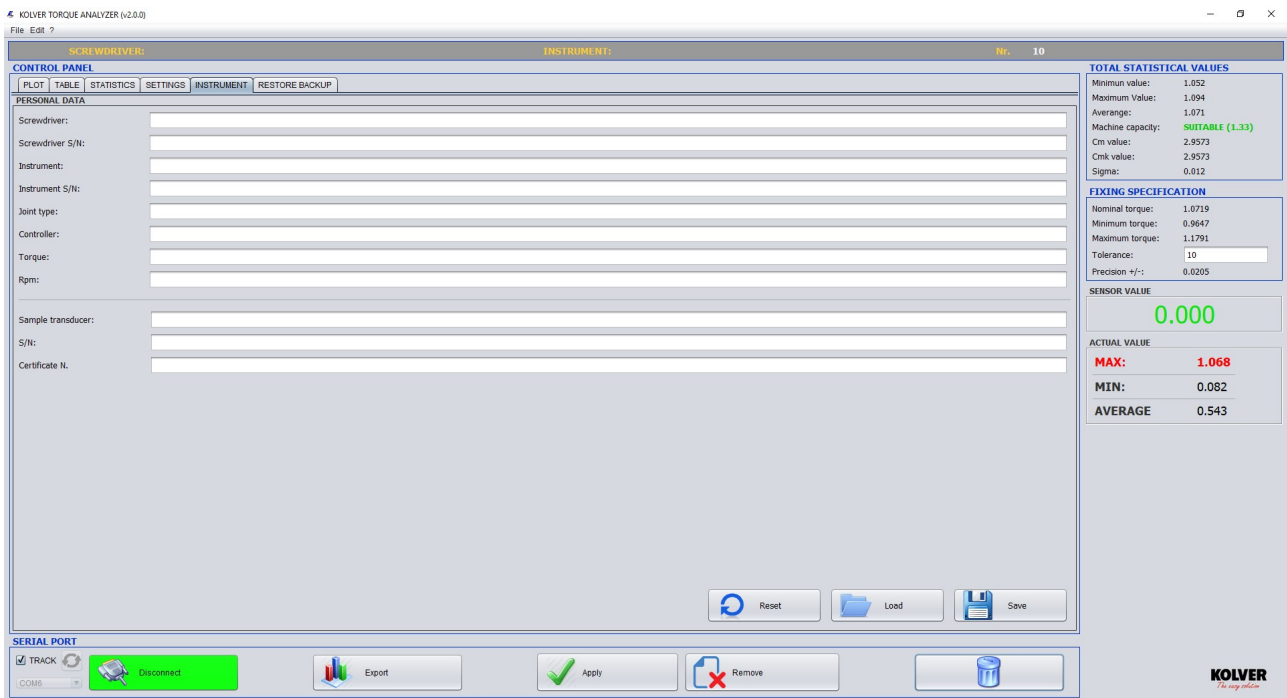
D. SETTINGS: Setting section (reports, graphics, date, torque tester info).



Picture 6 : "SETUP" Section

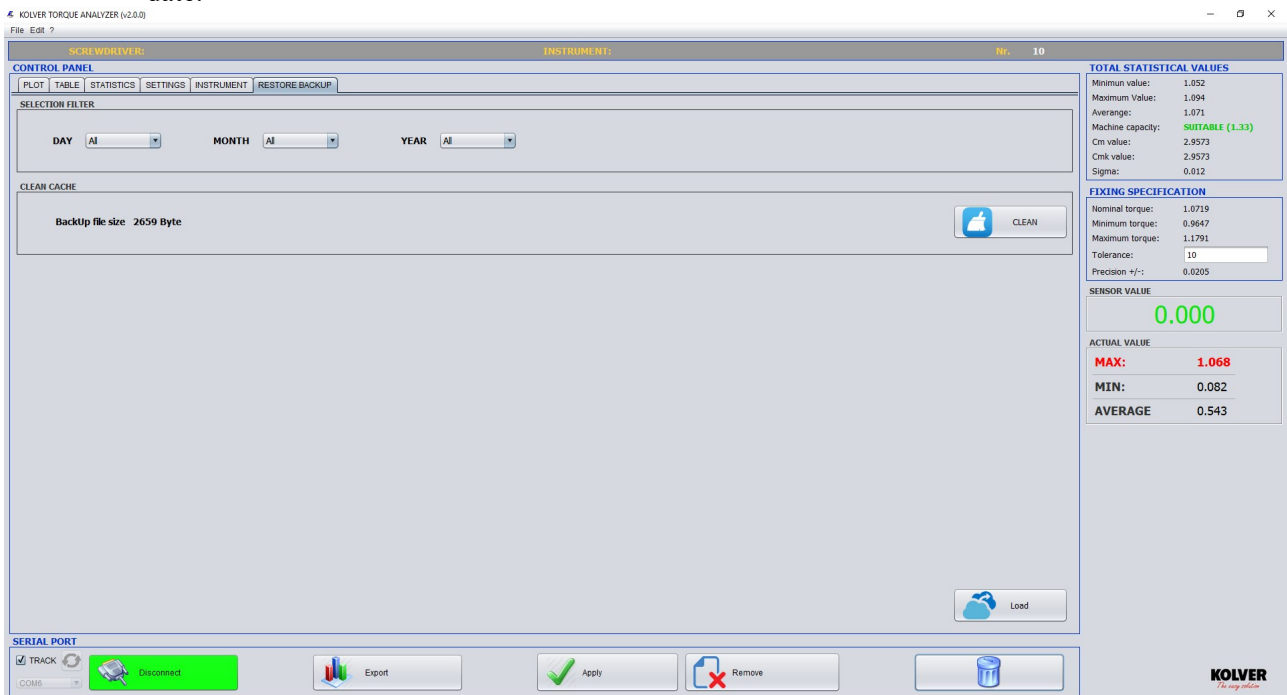
1- REPORT

- **Path:** path to search the image file to enter in the head of the report.
We suggest to upload images not bigger than 240x240 pixels.
- **Dimension X:** Value of adaptation along the X axis of the uploaded image.
- **Dimension Y:** Value of adaptation along the Y axis of the uploaded image.
- **Torque range:** the value should be included in the rpre-set torque range to be defined as correct.

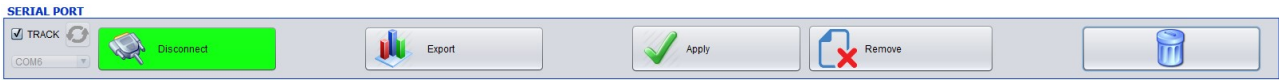


Picture 7 : "TESTER" section.

- F. **BACKUP:** Data are automatically saved in a backup file.
Available a section of the software to restore the data with filters on day, month, year and delete date.



5. RESULTS: MODIFICATION AND EXPORT



Picture 9 : Connection, data capture, export.

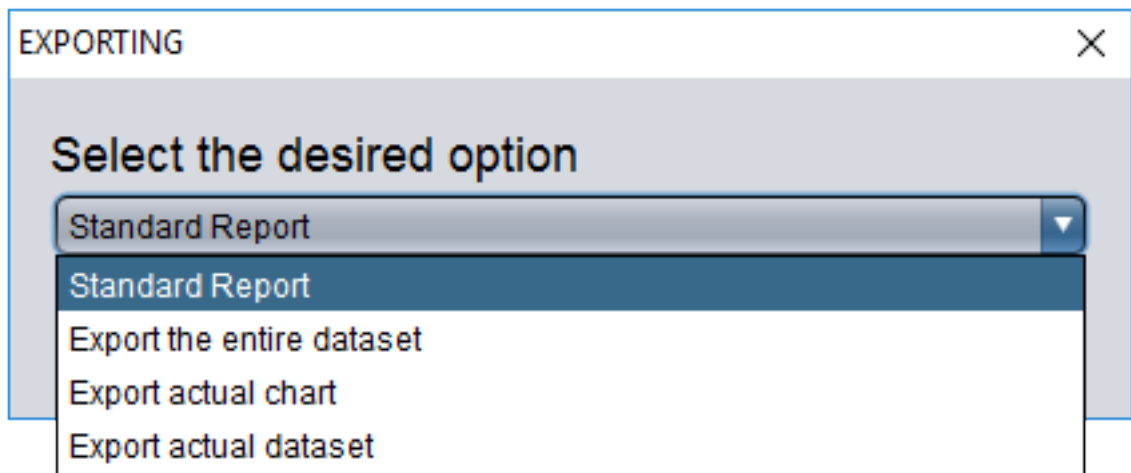
A- MODIFICATION

It's possible to modify or delete one or more captured data (see picture 7).

- **Removal:** in the "TABLE" section of the Control Panel, select one or more rows to be deleted. Then push "Delete" to confirm.
To delete all the data, push the basket icon, then confirm.
- **Modify:** in the "TABLE" section of the Control Panel, position the cursor on the cell to modify, double click, enter the data and push Apply to confirm.
In case of any error, they won't be considered and the value will remain the same. In case of typing error, in the Menu → File → Go back.

B- EXPORT

While pushing "Export", it will be displayed a window to select how to export the results (see Picture 10).



Picture 10 : To select how to export

-**Standard Report:** it allows to export a standard report (.xls file) including 30 values max, Cm, Cmk and all the feature of the tester used.

CALIBRATION REPORT



PERSONAL DATA

SCREWDRIVER:	Screwdriver	CONTROL:	Controller
S/N:	Screwdriver S/N	S/N:	Instrument S/N
MEASURING INSTRUMENT:	Instrument	TORQUE:	Torque
FIXING JOINT:	Joint	RPM:	Rpm
		UNIT:	Nm

FIXING SPECIFICATION

NOMINAL TORQUE:	3.2921
MINIMUM TORQUE:	2.9628
MAXIMUM TORQUE:	3.6213
TOLLERANCE:	10
PRECISION +/-:	0.0288
TESD. TEST:	Sample Trasducer
S/N:	S/N
CERTIFICATE NUM.:	Certificate N.

MEASURED DATA

READINGS	
1	3,381
2	3,289
3	3,2579
4	3,387
5	3,296
6	3,328
7	3,325
8	3,252
9	3,2119
10	3,332
11	3,302
12	3,219
13	3,233
14	3,244
15	3,264
16	3,379
17	3,362
18	3,35
19	3,387
20	3,318
21	3,2349
22	3,284
23	3,274
24	3,283
25	3,286
26	3,214
27	3,309
28	3,243
29	3,219
30	3,298

STATISTICAL VALUES RESULT

MINIMUM VALUE:	3.212
MAXIMUM VALUE:	3.387
AVERAGE VALUE:	3.2921
MACHINE CAPACITY:	SUITABLE (1.33)
CM:	2.0551
CMK:	2.0551
SIGMA:	0.0533

Measures carried out by:

OP. NAME

DATE: 2017/02/10

SIGNATURE:

Responsible

- Complete set of values:** it allows to export all the captured values (.xls file) and the graphics of the results.
- Export current graphic:** it allows to export any value in Graphic section of the Control Panel (.pgn file). For the resolution of the image see SETTING chapter.
- **Export last measure:** it allows to export (.xls file) the set of data referring to the last measure done. The table will show on X: time and on Y: torque value.

6. REPORT AREA

In this section, it will be displayed the statistics results of all the values including the instantaneous data. In particular:

- Max value:** max value of torque acquired
- Min value:** min value of torque acquired (only in Track mode).
- Average value:** average value of torque acquired (only in Track mode).

- Cm:** value that indicates the machine capacity or process within the tolerance range.
- Cmk:** value that indicates the machine capacity or process within the tolerance range of the nominal torque value. A high Cmk indicated the the machine or the has a low dispersion, and is well centered in the middle of the range of tolerance.
- Capacity:** it indicates if the process f measurement is suitable or not.

Cm, Cmk \geq 1.33 → SUITABLE

Cm, Cmk $<$ 1.33 → NOT SUITABLE

There is the possibility to modify the index of tolerance to check the capacity (default=1.33): in “SETTINGS”, set the desired value in “TOLERANCE Cm,Cmk”.

- Nominal Torque (Cn):** average torque value
- Max torque:** Cn+Tolerance(Cn)%
- Min torque:** Cn-Tolerance(Cn)%

- **Sensor value:** torque value given from the mini k.
- Current values:** values referred to the last one acquired.

7. LANGUAGE

Four languages available: English, French, Spanish and Italian.
To change the language, in the menu push on Edit →Language.

8. SYSTEM REQUIREMENTS

It's necessary to install the following software:

- **Java (64-bit)** (<https://www.java.com/it/download/>)



K1 - K5 - K20

TORQUE TESTER

OPERATOR'S HANDBOOK



1.FEATURES OVERVIEW

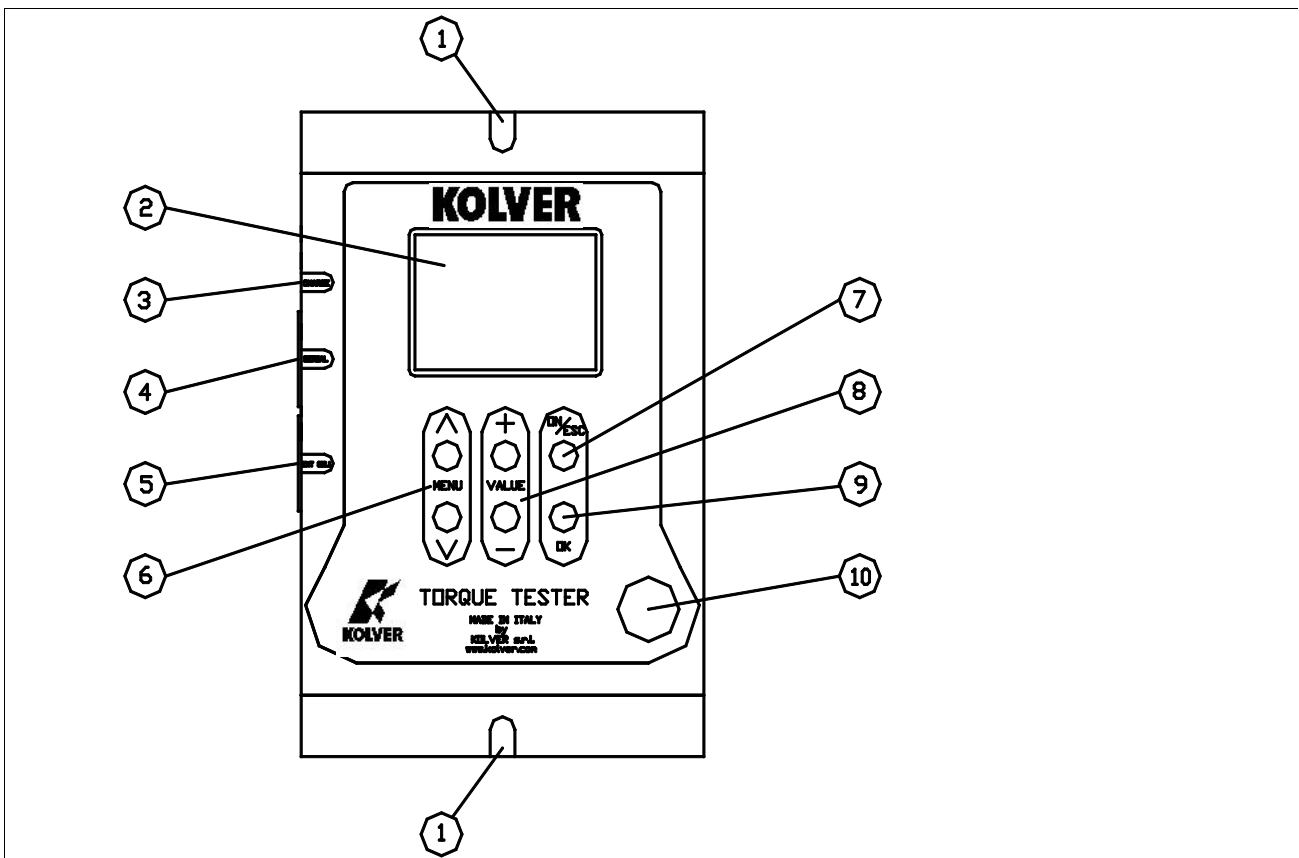
Controlling torque is quintessential for companies to ensure that product's quality, safety and reliability isn't compromised. Insufficiently torqued fasteners can vibrate loose overtime and when excessively torqued the threaded fasteners can strip. Using a quality torque tester has become increasingly important for many companies to secure that proper torque is being applied.

- The K1.K5.K20 Torque Tester is built for accuracy and reliability ever demanded for these kinds of products. This tester accurately measures torque for most tools, meeting the demands to test multiple torque ranges for various tools used in production. The analyser features a built-in transducer and supports most external size transducers. Utilizing a high-performance circuitry system, the tester can store and download torque readings to a computer at high speeds. This allows a powerful collection of analytical data to be stored for future reference and statistical analysis of tools. Offering three modes of operation (Track, Peak + and Peak -) this versatile analyser provides the operator a variety of ways to smoothly verify torque applied with a selection of four measuring units. Models ranging in torque up to 20 Nm with the built-in transducer and up to 999 Nm with the external transducer.
- Recommended for all hand screwdrivers, wrenches, or power tools.
- Measuring range with built in transducer:
K1 0.05-1 Nm, K5 0.3-5 Nm, K20 0.5-20 Nm
- ACCURACY:

	Clockwise	Counterclockwise
K1	± 1% full scale	± 2% full scale
K5	± 0,6% full scale	± 1% full scale
K20	± 1% full scale	± 1.5% full scale
- Selection from the menu of three operation modes: (Track, Peak +, Peak -) and four units of torque measurements: (N.m, cN.m, lbf.in, kgf.cm).
- Port for external transducers.
- <, =, > signals to indicate validity of torque readings with buzzer for audible user feedback.
- RS-232 interface to download values stored in memory (500 values capacity).
- Manual and auto reset functions to clear displayed values.
- Calibration will allow for both a fast calibration (using mV/V transducers rated output) and a true (dead weight) calibration.

2. DESCRIPTION AND USER INTERFACE

1. Mounting holes
2. Display with 8 lines/ 16 digits
3. CHARGE: External power supply 5,5 – 2,5mm and battery charger port
4. SERIAL: RS232 output
5. EXT CELL: External transducer input and GO signal output
6. MENU keys to move through the menu. Key ^ to enter the menu.
7. Key “ON/ESC” :
 - Press for 3 seconds to switch the tester on or off.
 - Press to return to the previous screen
8. Keys: VALUE + and - to increase or decrease values when setting numbers
9. Key OK : press once
 - To enter a sub-menu
 - To save settings
 - To reset torque values displayed when in MANUAL clear mode
10. Internal transducer: 13mm hex male to accept the joint simulator



3. MOUNTING

It is strongly recommend securing the tester through slots “1” to a workbench before operating. Immobilizing the tester when checking torque values over 3 Nm is critical for the safety the operator as well as for the accuracy of torque measurements during operation.

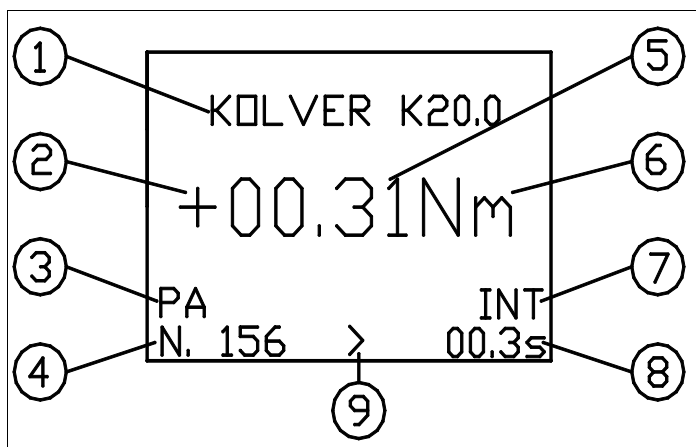
4. JOINT SIMULATOR (run down adapter)

The Joint Simulator (JS) consists of a screw compressing a series of washers (see §11). The way the washers are mounted can simulate soft or hard joint. The screw comes with a ¼” hex male head for proper fit to any ¼” hex female screwdriver drive. Hardened thread components increase accuracy and life. One semi-elastic JS included. Hard joint simulator available on request.

NB. It is suggested to grease the JS each 1000 cycles.

5. STARTING AND OPERATING THE TESTER

- Connect the battery charger/power supply unit.
- Push the “ON/ESC” key. The display will show the main screen.

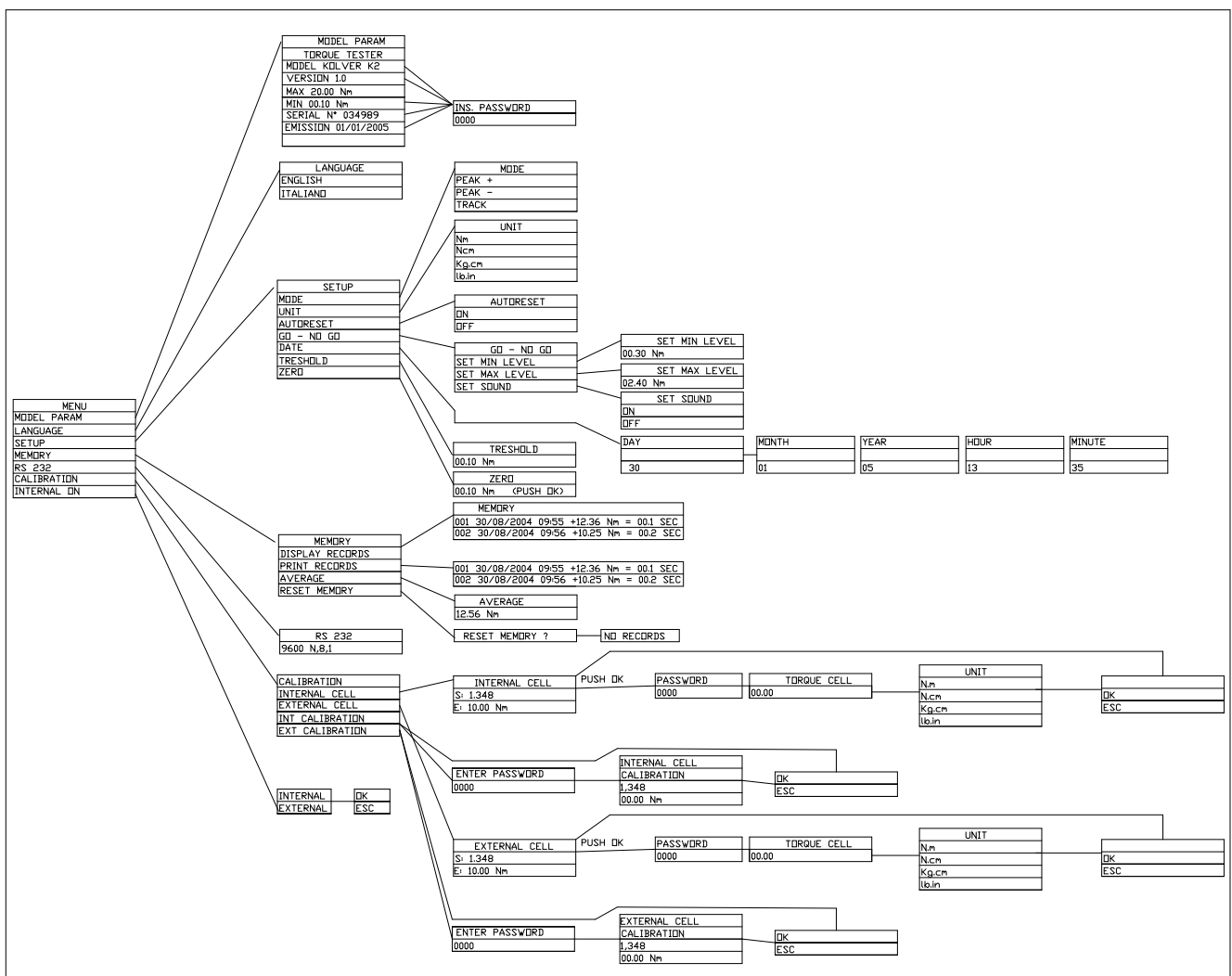


1. Model
2. “+” tightening, “-“ untightening.
3. Mode of operation: PA (peak +), PS (peak -), Track
4. Number of measures since last reset
5. Torque value measured
6. Measuring unit
7. Transducer in use : INT or EXT
8. Time of tightening cycle
9. = GO, > < NO GO used to monitor lower and upper torque limit and receive a visual and audible warning

- Push the ^ key to enter the menu and adjust the various settings to your requirements.
- Insert the joint simulator into its 13mm hex. seat and make sure the screw is in its upper position (if not run the driver anticlockwise to unscrew it). The tester is ready.
- Run the joint simulator screw all the way down until it stops and read the torque value on the display. Run the screw up to be ready for the next cycle.
- Press the “ON/ESC” key for 3 seconds to switch the tester off. The Tester features a built-in auto shut off mode function to save power when not in use. If there is no activity for 5 minutes, such as key press or no torque input, the tester will shut down. To restore power press the “ON/ESC” key for 3 seconds.
- In case of a deadlock, press the Reset button and restart the tester.
- When the tester is turned on, it is necessary to check and possibly zero the Zero in the setup menu to avoid errors in the measurements. If the zero is not correct, NO ZERO will be displayed next to the setup line. (see §Zero in Menu Options).

6. PROGRAM MENU

The flow chart below shows the complete menu options.



Push ^ key to enter the menu from the main screen. To move through the menus push ^ or V keys. The indicator < on the right side of the screen will signal the selected option. Push “OK” key to confirm the desired option.

Use + or - key to active digits when setting numbers and push OK to save them.

Protected parameters (such as calibration) need a password from Kolver or Kolver authorized distributor.

MENU OPTIONS

- **MODEL**

This screen gives you information on the unit you are using, like serial number, software version etc. Such data are password protected.

- **LANGUAGE**

You can choose between English and Italian.

- **SETUP**

The following is a quick reference for the Set-Up menu structure. If lost within the menu, you can turn the analyser OFF and ON at any time.

MODE:

The Torque Tester offers three different mode of displaying torque information during operation. The user will determine which mode is best suited for the application.

Key sequence to change mode:

- **Mode**
- $\wedge \circ \vee$.
- **OK**

PEAK +

The display retains the highest torque applied clockwise.

Use this mode during calibration or testing of any power tools as well as hand type torque wrench (dial, beam, and screwdriver).

PEAK -

The display retains the highest torque applied anticlockwise.

Use this mode when checking the torque needed to unscrew a tightened fastener.

TRACK

This mode constantly tracks increasing or decreasing torque variations. Use this mode to monitor varying torque on motors and machinery. Also for calibrating and testing Dial type wrenches on a loading bench.

MEASURING UNIT: Nm, Ncm, Kg.cm and lb.in

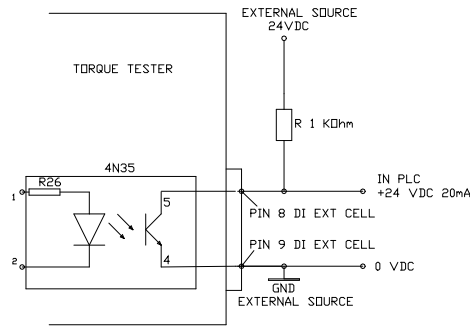
Key sequence to change unit:

- unit
- $\wedge \circ \vee$.
- **OK.**

AUTORESET: When off push OK to remove readings from the display and reset all values to zero. When on this process occurs automatically with any new measure.

GO - NO GO: The Torque Tester is equipped with visual (>, <, =) and audible (buzzer) signals to provide the user instant torque status during operation. These signals operate in conjunction with the tolerance (high limit, low limit) settings. Example: let us assume we want to calibrate our screwdriver in the range between 0.8 and 1.0 Nm. We will then set the Low limit to 0.8 and the High limit to 1.0. If our measure will fall inside the pre set limits the display will show =, if the measure is below 0.8 Nm we will see <, if over 1.0 Nm we will see >. A buzzer will also signal the measure was out of the required range. Push OK to stop the buzzer.

Note: When the values are within the pre set range an electric GO signal will be sent to pin 8 (pin 4 of 4N35) and 9 (pin 5 of 4N35) of connector EXT CELL, as per following diagram:



DATE: You can set day, month, year, hour and minute.

Key sequence to change values:

- date
- + or -.
- OK

TRESHOLD: The parameter “threshold” indicates the minimum torque level you need to measure. Values below this level will not be displayed. This setting enables the system to have excellent immunity to spurious signals. Key sequence to change values:

- Treshold
- + or - .
- OK.

ZERO: All transducers can experience some drift in the “zero” or “zero offset” point when shifting torque from clockwise to counter clockwise or vice versa and when the transducer has not been used for a certain time. This is a normal characteristic of transducers due to a hysteresis or lack of “retrace”. As a result, the display may not zero and show a torque value. Key sequence to reset the zero:

- Zero
- Push OK until you see 00.00

• MEMORY

The memory menu will give you access to the stored values, to display and print them. You can also see the average value of all the measure taken since you last reset the memory.

DISPLAY MEASURE: Push “OK” key and the screen will display all the data of the last measure taken: sequence number, torque value, unit, duration of detected torque, date, hour, signals = > < (see GO- NO GO). Push \vee e ^ keys to move through stored values. Push “ESC” to exit.

PRINT MEASURE: Push “OK” to send all data to the 232 serial port.

DATA DOWNLOADING

If you desire to download and display data on a computer, you can do so by using any serial communications software. One such program is Hyperterminal accessory, standard to Windows 95, NT, Windows 98, 2000 or XP. A description of operation is given below. This procedure may vary slightly depending on the Windows software version being used. This is just an example, if you have problems consult Windows Help files.

- Select “Start”, “Programs”, “Accessories”, and then “Hyperterminal”. Then select HyperTerminal.exe.

- When the program starts you will be asked to choose an icon and assign a name. Choose any icon you prefer and choose a name such as “Data_K5”, for example. Click OK.
- The “Connect To” screen will appear. Just click OK, or if you want to change the COM port, select the appropriate COM port and click OK.
- The “COM2 Properties” screen will appear. Choose 9600 Bits per second. Leave the default values for character format (8 Data Bits, Parity – None, and Stop Bits 1). Change the Flow Control to “None”. Click OK.
- Click “File” on the Menu Bar and select “Properties”. When the “Data_K5 Properties” screen appears choose the “Settings” tab and then choose “ASCII setup”. In “ASCII receiving” check the box “Append line feeds to incoming line ends”. Click OK then OK again.

Hyperterminal is now configured to allow torque values to be displayed on your computer screen. If you want to capture data to a file as it is downloaded, you must enable the file capture option. To capture to a file, select “Transfer” from the Menu Bar and select “Capture Text”. Then select the folder and file you wish to save it as.

You can also connect the 232 serial port to a serial printer for direct data printing.

Measurement Progressive Number	Date	Time	Rotation +/-	Torque	Unit	>=< go-nogo	Measurement Duration - sec
--------------------------------	------	------	--------------	--------	------	-------------	----------------------------

```

277 02/09/2000 09:12 +02.86 Nm = 00.4 SEC
278 02/09/2000 09:12 +03.63 Nm = 00.3 SEC
279 02/09/2000 09:12 +03.41 Nm = 00.3 SEC
280 02/09/2000 09:12 +03.46 Nm = 00.3 SEC
281 02/09/2000 09:12 +05.96 Nm > 00.6 SEC
282 02/09/2000 09:12 +07.60 Nm > 01.3 SEC
283 02/09/2000 09:12 +01.33 Nm < 00.3 SEC
284 02/09/2000 09:12 +01.51 Nm < 00.3 SEC
285 02/09/2000 09:13 +01.80 Nm < 00.4 SEC
286 02/09/2000 09:13 +02.53 Nm = 00.3 SEC
287 02/09/2000 09:13 +02.91 Nm = 00.3 SEC
288 02/09/2000 09:13 +02.49 Nm = 00.4 SEC
289 02/09/2000 09:13 +03.00 Nm = 00.3 SEC

```

MEDIA: Push “OK” to see the average value of all the measures taken since you last reset the memory. Please note that the program will consider the numerical values only and not the unit so make sure all the measures have been taken under the same unit and sense of rotation.

Push “ESC” to go back to the previous screen.

RESET MEMORY: Push “OK” , the screen will display: reset memory? to ask the operator for a further confirmation. Pushing the “OK” will delete the stored data and the screen will display: no values in memory. Push “ESC” to exit.

- **RS232**

The Configuration of the RS 232 port is: 9600 (bits per second), 8 (data bits), n (no parity), 1 (stop bits 1).

PIN		FUNCTION
2	TX	Serial transmission
5	GND	0Vdc

- **CALIBRATION**

The torque tester comes with a calibration certificate. Further calibrations should be performed by Kolver or authorized personnel. This menu section is password protected.

- **INTERNAL**

This option allows the user to select the transducer to be used during operation.

Although the Torque Tester features one internal transducer, it has the unique feature to be also used with an external transducer (optional). Key sequence to select the transducer:

- **OK**
- \wedge o v.
- **OK**

The main screen will show the selected option (INT or EXT) .

7. EXTERNAL TRANSDUCER

The K tester are the unique feature to support an external rotary transducer with Wheatstone bridge strain gauge. The tester can read rotary torque up to 20.00 Nm. External transducer for higher torque on request. The Internal/External parameter must be set to external as outlines in section (6) for the K tester to read the torque value from the external transducer.

The external transducer should be connected as follows:

	PIN	DESCRIPTION
"EXT CELL" INPUT	1	OUTPUT: + 2,5 V
	2	INPUT: + SIGNAL FROM TRANSDUCER
	3	OUTPUT: 0 V
	4	INPUT: - SIGNAL FROM TRANSDUCER

8. MAINTENANCE

The K testers are maintenance free. The electronics and the internal transducer have no wearing parts. The internal transducer should be calibrated every 12 to 30 months, depending on the frequency of use.

IMPORTANT: the calibration certificate has a maximum validity of 26 months (ref. DIN 51309, ISO 6789-2). The instrument must be calibrated again (regardless of the date of last calibration):

- if it has been overloaded
- after any corrective maintenance (eg: upgrade with new software)
- after improper use (eg: tested with impact wrench or jacks)
- in case of doubt about the measurement results.

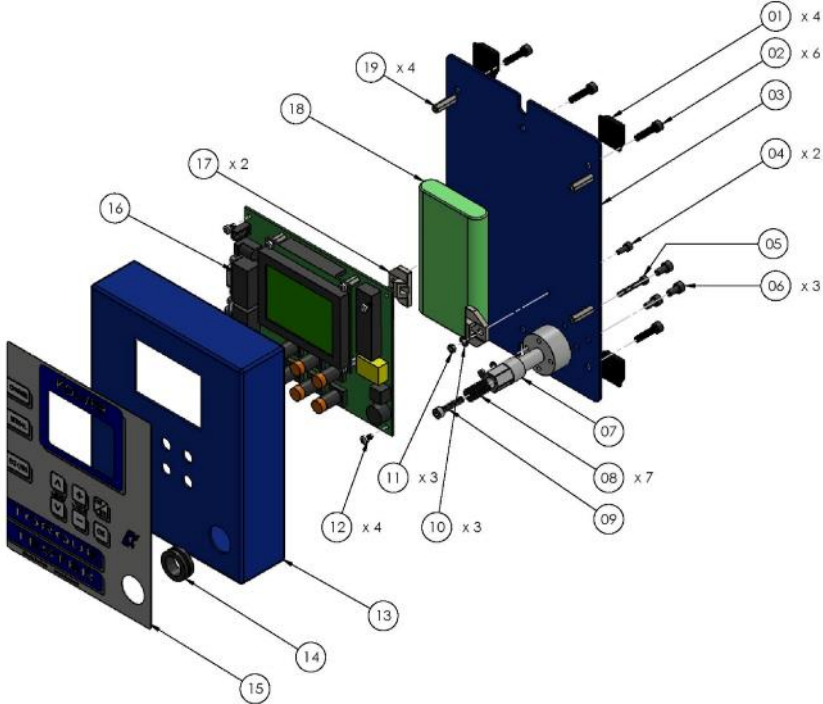
WARNING: The overload protection of the internal transducer is limited to 125% of nominal value. Damages due to overloading will result in inaccurate readings and will not be covered by our warranty.

9. GUARANTEE

1. This KOLVER product is guaranteed against defective workmanship or materials, for a maximum period of 12 months following the date of purchase from KOLVER, provided that its usage is limited to single shift operation throughout that period. If the usage rate exceeds of single shift operation, the guarantee period shall be reduced on a prorata basis.
2. If, during the guarantee period, the product appears to be defective in workmanship or materials, it should be returned to KOLVER or its distributors, transport prepaied, together with a short description of the alleged defect. KOLVER shall, at its sole discretion, arrange to repair or replace free of charge such items.
3. This guarantee does not cover repair or replacement required as a consequence of products which have been abused, misused or modified, or which have been repaired using not original KOLVER spare parts or by not authorized service personnel.
4. KOLVER accepts no claim for labour or other expenditure made upon defective products.
5. Any direct, incidental or consequential damages whatsoever arising from any defect are expressly excluded.
6. This guarantee replaces all other guarantees, or conditions, expressed or implied, regarding the quality, the marketability or the fitness for any particular purpose.
7. No one, whether an agent, servant or employee of KOLVER, is authorized to add to or modify the terms of this limited guarantee in any way. However it's possible to extend the warranty with an extra cost. Further information at kolver@kolver.it.

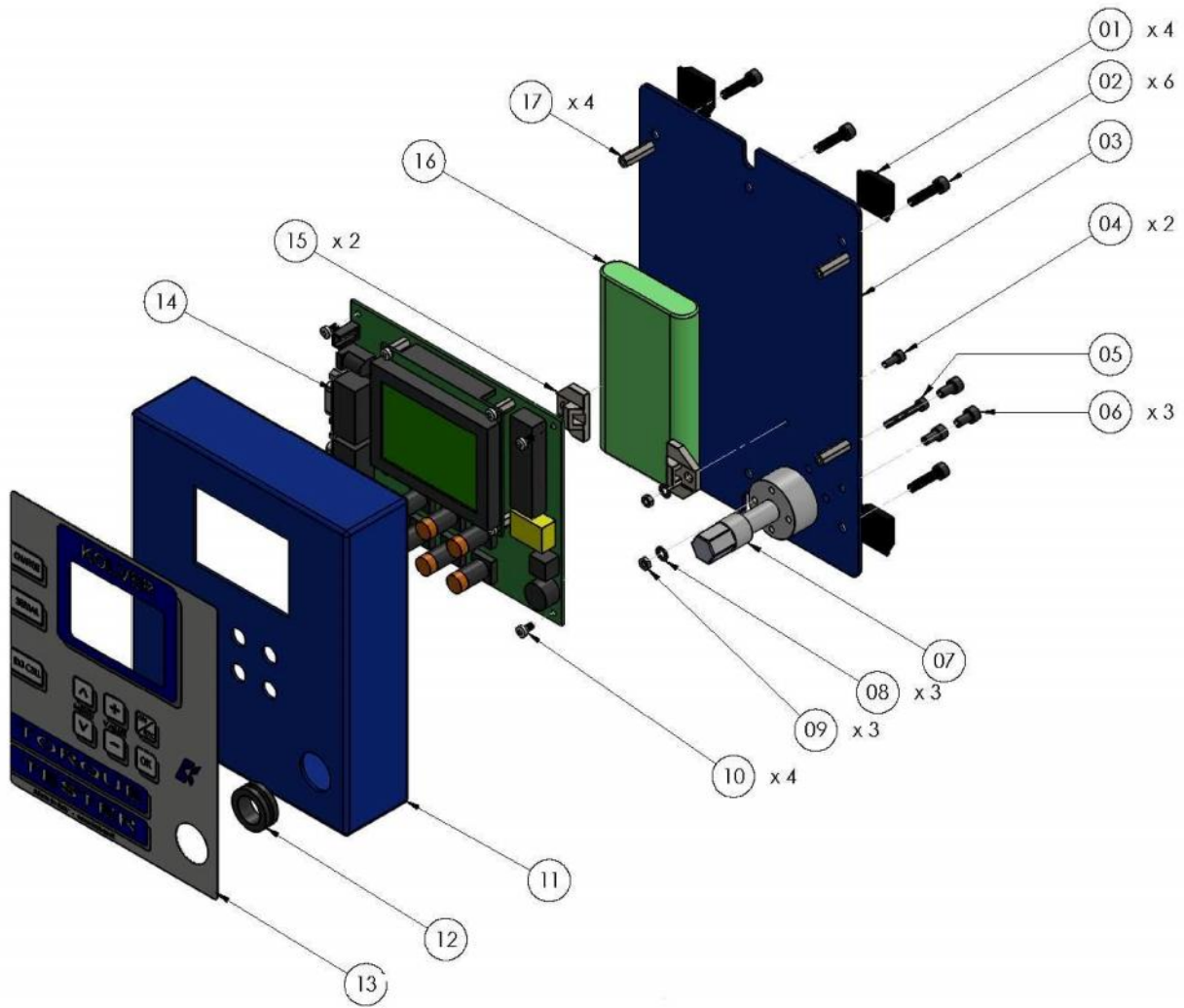
10. PARTS LIST

K1



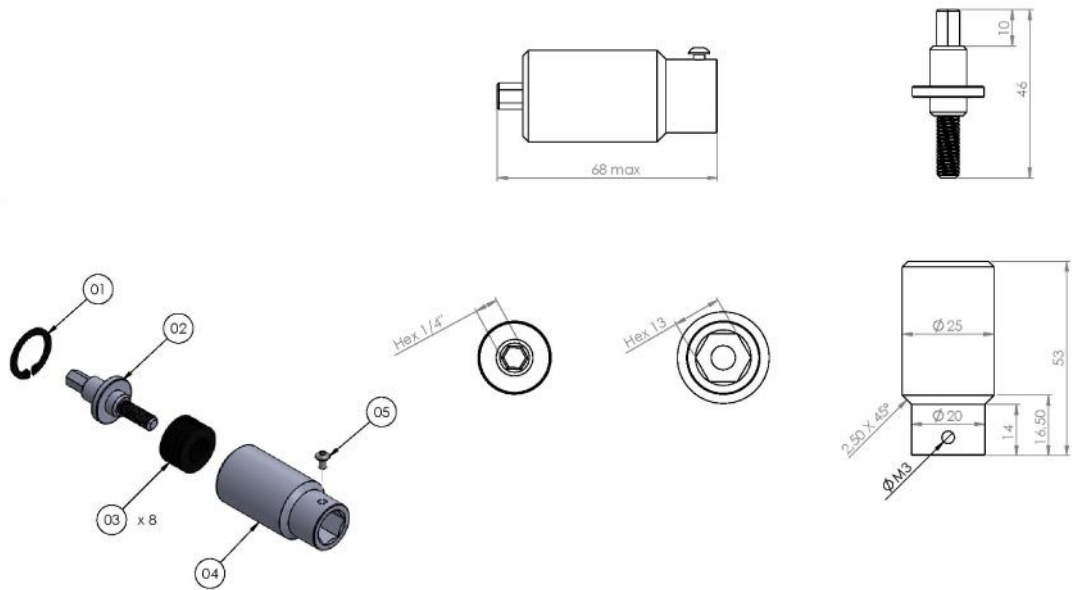
REF	DESCRIPTION	CODE
1	Plastic support (4 pcs)	800016/B
2	Screw M4 x 14 (6 pcs)	240006
3	Base	240013
4	Screw M3 x 6 (2 pcs)	231504
5	Screw M3 x 22	241012
6	Screw M4 x 8 (3 pcs)	241011
7	Internal transducer 1Nm (K1)	240405
8	Washer M4 (7 pcs)	241015
9	Screw M4 x 20	241014
10	Washer (3 pcs)	800041
11	Screw M3 (3 pcs)	800056
12	Screw M3 x 5 (4 pcs)	240605
13	Metal housing	240001
14	PVC Washer	240017
15	Membrane	240008
16	Board and display	240002
17	Battery support (2 pcs)	800169
18	Battery 9,6V 1500mAh	240007
19	Turret M3 x 18 (4 pcs)	240016
	Joint simulator M6 (K1)	240600
	Case	240000
	Battery charger 15V 360mA	240003/N
	External transducer	ON REQUEST

K5 – K20



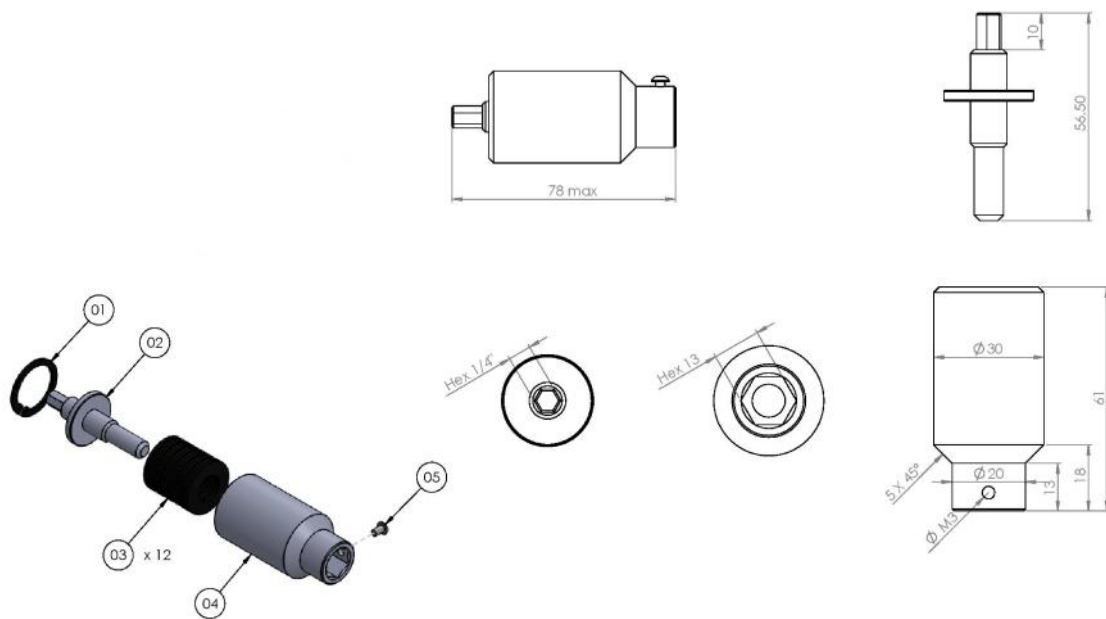
REF	DESCRIPTION	CODE
1	Plastic support (4 pcs)	800016/B
2	Screw M4 x 14 (6 pcs)	240006
3	Base	240013
4	Screw M3 x 6 (2 pcs)	231504
5	Screw M3 x 22	241012
6	Screw M4 x 8 (3 pcs)	241011
7	Internal transducer 5Nm (K5)	240503
	Internal transducer 20Nm (K20)	240504
8	Washer (3 pcs)	800041
9	Screw M3 (3 pcs)	800056
10	Screw M3 x 5 (4 pcs)	240605
11	Metal housing	240001
12	PVC Washer	240017
13	Membrane	240008
14	Board and display	240002
15	Battery support (2 pcs)	800169
16	Battery 9,6V 1500mAh	240007
17	Turret M3 x 18 (4 pcs)	240016
	Joint simulator M6 (K5)	240600
	Joint simulator M8 (K20)	240800
	Case	240000
	Battery charger 15V 360mA	240003/N
	External transducer	ON REQUEST

M6 (code 240600) – K1 & K5



Pos.	Description	Code
01	Seiger	240601
02	Joint shaft	240602
03	Washer spring (8)	240603
04	Joint housing	240604
05	Screw M3x5	872443/ZN

M8 (code 240800) – K20



Pos.	Description	Code
01	Seiger	240801
02	Joint shaft	240802
03	Washer spring (12)	240803
04	Joint housing	240804
05	Screw M3x5	872443/ZN

DECLARATION OF CONFORMITY



**KOLVER S.r.l.
VIA MARCO CORNER, 19/21
36016 THIENE (VI) ITALIA**

Declare that the new tool here described: Torque tester:

K1 020402

K5 020403

K20 020404

Is in conformity with the following standards and other normative documents: 2006/42/CE, LVD 2014/35/UE, EMCD 2014/30/UE, EN 62841-2-2:2014, EN 62841-1: 2015, EN 60204-1, EN 61000-6-2, EN 61000-6-4.

It is also in conformity with RoHS III normative (2011/65/UE and following 2015/863).

Name: Giovanni Colasante
Position: General Manager
 Person authorized to compile the technical file in Kolver

Thiene, Jan. 1st 2021

Giovanni Colasante