Testing **Cable Tie Tighten Pistols**

(Determining the tension force of cable tie hand tools)



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Messtechnik



MI&T GmbH Measuring Instruments & Testers

Advanced Force Measurement

The MI&T GmbH is specialized in measuring and testing technologies in the field of force, force/stroke as well as strain measurements. We offer testers and test stations e.g. for tensile and peel tests of electrical wiring harnesses, tensile and compressive force measurements of test electronic components and assemblies, as well as for testing springs, plastic materials, medical products and packages, among many others.

The MI&T GmbH stands for consequent innovations in the area of high-precision force measurement and industrial controls. We place particular emphasis on precision, easy operation and high reliability and particularly on competent advice and satisfaction of our customers and business partners.

We provide a comprehensive range of high-quality test stations, test systems and force measuring gauges for force, force/stroke as well as strain measurement. The versatile MI&T measuring instruments and testers in combination with application specific clamping tools and test fixtures provide flexible test systems for diverse test applications in quality control, research, development and production control.

The MI&T offers a wide range of standard clamping tools and test fixtures as well as especially designed special tools for customer-specific applications. Equipped with custom-designed testing tools and fixtures the MI&T testers and test stations can be used for manifold applications.

Competence for your measuring instruments and testers:

Calibration at regular intervals and faultless operating measuring instruments are the precondition for verifiable and reliable measuring data.

The qualified team of the MI&T GmbH offers a wide variety of services in the field of service, traceable calibration and repairs of measuring instruments and testers manufactured by our company, as well as for measuring instruments and testers of other manufacturers.

You can find further information about our product range and services offered as well as our general catalogue and various brochures under www.MIT-Tester.de.





General Information

Normally the manufacturers of standard cable tie hand tools don't refer exact force values (e. g. in Newton) to the possible settings of the tensile force of the cable tie tools. After adjustment of the tensile force of the respective cable tie pistol the actual tensile force should be tested. Additional the tensile force of the cable tie tool should be tested again in periodically intervals and if necessary the cable tie pistol should be re-adjusted.

To obtain accurate and reproducible measurement results during the tests of tensile forces of cable tie pistols it is important to fix the cable tie pistol to be tested firmly in a suitable special fixture without deforming the pistol's casing, Also important is that the tensioning tool of the pistol is aligned as axially as possible to the force sensor of the test device without any angle to the tensile force direction. To obtain reproducible and comparable test results the setup and positioning of the cable tie tool in the test equipment should always be the same. These prerequisites are fulfilled using **MI&T** KBP tool sets in combination with suitable **MI&T** testers and test benches.

For testing cable tie tighten pistols customers can choose from a variety of testing devices of **MI&T**'s delivery program.

1. The versatile **MI&T** testers in combination with suitable special test fixtures can be used for testing cable tie tighten pistols. The tool set KBP required for this kind of test is available in different versions for almost every model of available manually and pneumatically operated cable tie tighten pistol. The KBP tool sets can be assembled on the quick change tool receptions of both manually operated **MI&T** testers and motorized **MI&T** test stations, which are used apart from that with appropriate test fixtures for other kind of tests, e.g. for pull tests of crimped connections. Thus testers which are already in use on the customer's side can be used by completion with a KBP tool set in a simple manner for testing the tensile force of cable tie tighten pistols.

2. For testing manually operated cable tie tighten pistols **MI&T** offers alternatively a special KBP tool set for motorized **MI&T** test stations, which enables to actuate the trigger of manually operated cable tie pistols with a constant actuating speed, in order to avoid influences to the test procedure by different ways of actuation of the pistol trigger by the operator.

3. With the test benches models PTB and FTB and corresponding KBP tool sets small and light-weight test benches as stand-alone test apparatuses are available, which are ideally suited for mobile use also. These test benches ensure high-precision measurements of the tensile force of cable tie tensioning tools.

4. With the test device DFG-KBP 500 a cost-effective, small and mobile test device is available. If frequent testing of cable tie pistols is required the DFG-KBP 500 can be used for tests to be carried out quickly without inserting and fixing the pistol in a special fixture. We recommend this alternative in addition to a test device with firmly fixed and exact positioned cable tie tighten pistol in the case that frequent in-process testing is required.

The various options for the test equipment for testing cable tie pistols are presented below in detail.

For detailed descriptions and technical data of our test equipment please see or catalogue or visit our website www.MIT-Tester.de

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Testing cable tie tighten pistols with the KBP tool set on MI&T Testers

The tool set KBP for testing the tensile force of cable tie hand tools can be assembled on the quick change tool receptions of **MI&T** testers. The tool sets consist of a special fixture for the cable tie pistol for assembly on the load slide of the tester and either of a plug-in plate with 3 pins of diameter 12, 20 and 30 mm or alternatively a suitable clamping tool for assembly on the measuring point of the tester (e. g. SG 80 or KSH-6/M).

For the test the cable tie is looped around one of the 3 pins or clamped in another suitable testing tool and the strip end is inserted through the cable tie head. The tie is tightened firmly in such a way that one stroke of the pistol is sufficient to tension and cut-off. The free strip end is inserted into the open side of the cable tie tool head according to manufacturer's instructions. The head of the tool must have a distance of only a few millimetres to the cable tie head. Then the manual lever of the cable tie tool (trigger) is pulled to the stop. As soon as the pre-selected tension force of the pistol is reached, the free tie end is cut-off by the tool automatically. The tension force achieved at cut-off of the cable tie is determined and indicated on tester's display.

The special fixture for the cable tie pistol must be designed for the respective cable tie pistol model. Due to the manifold different shapes and dimensions of the different cable tie pistol models there is no all-purpose fixture, suitable for all pistol models, available. In principle special fixtures for all models of cable tie pistols are available respectively can be designed on request. Our standard delivery programme provides fixtures for cable tie tools model HellermannTyton MK3SP, MK3PNSP, MK 6PN, EVO 7, MK 7, MK 7HT, MK 7P, MK9, MK 9HT as well as Panduit GS2B, GS4H, PPTS and GTS.

The KBP tool sets are available for all tester models up to a nominal load of 1000 N and with tool reception bar on tester's load slide.





Testing manually operated cable tie tighten pistols: Motor-driven actuation of the pistol trigger

In order to avoid influences to the test procedure by the operator during the tests of manually operated cable tie tighten pistols, for motorized testers of model series FTM, ATM and MTM also a special KBP tool set can be used, which enables to actuate the trigger of manually operated cable tie pistols with a constant actuating speed using the drive unit of the test station. Thus possible influences caused by different ways of actuation of the pistol trigger by the operator can be excluded during the test.

Using test stations ATM and MTM the test procedure can be carried out as an automated test so that after starting the test the test station actuates the trigger of the cable tie pistols with the selected actuation speed until the tension force of the pistol is reached and the cable tie is cut-off. After the cut-off of the cable tie end by the pistol the load slide of the test station stops and drives back automatically to the starting position.



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Test Benches PTB and FTB for testing cable tie tighten pistols:

With the test benches models PTB and FTB and corresponding KBP tool sets small and handy test benches as stand-alone test apparatuses are available, which are ideally suited for mobile use also. The test benches ensure high-precision measurements of the tension force of cable tie tensioning tools. The use of the PTB and FTB test benches offers a low-cost alternative if no suitable force testers are available on customer's side, if the available testers can't be taken from the ongoing operation of quality control for testing the cable tie pistols or if a small and handy test bench for mobile use is required.

- Small and handy Test Benches with high-precision measuring system for testing the tension force of cable tie tighten pistols (cable tie hand tools)
- Quick change tool mounting adapters for assembly of different fixtures for different models of cable tie pistols and for test fixtures for the cable tie head.
- Test benches can be positioned length- and crosswise to the operator because the force gauge can be fixed user-defined at both sides of the test bench's housing and in any orientation.
- Model PTB 50 with indication range 0-500 N, • resolution 0.5 N, accuracy class 0.5 (relative error)
- Model FTB available with different measuring ranges: FTB 5: range 0-50 N with resolution 0.01 N FTB 10: range 0-100 N, with resolution 0.02 N FTB 25: range 0-250 N, with resolution 0.05 N FTB 50: range 0-500 N, with resolution 0.1 N FTB 100: range 0-1000 N, with resolution 0.2 N Accuracy class FTB models: 0.25 (relative error)
- Easy to operate and space-saving test benches. .
- 10000 Hz internal update rate for exact force readings.
- Indication and operation of the measuring system via durable • infrared sensor screen with dot matrix LCD-Display.
- Peak Point Mode with indication of the highest measured force . value.
- Tracking Mode with indication of current force values.
- Tare compensation.
- Optical and acoustic overload indication .
- High mechanical overload protection of load cell.
- FTB models: Set point capability with optical and acoustic status • signal.
- FTB models: Measured value memory. •
- FTB models: Real time clock for data output with date and time. •
- FTB models: Single and listing output (with statistical evaluation) • of measured values.
- Serial port for data output of measured values. .
- Dimensions of basic unit: 275x116x124 mm (LxWxH). weight ca. 4 kg

Clamping Tools and Test Fixtures:

for testing cable tie pistols

Special Fixtures KBP for cable tie pistols Clamping Crown SG 80 3 pin Plug-in Plate SL-3P Quick Action Gripper KSH-6

For detailed description of tools and fixtures for testing cable tie pistols please see corresponding tool pages in our catalogue.







Merrtechnik Prüftechnik

Test Bench FTB (lengthwise positioned)

For detailed descriptions and technical data of our test equipment please see or catalogue or visit our website www.MIT-Tester.de

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Test Device DFG-KBP 500

Test device for testing the tensile force of cable tie tighten pistols, consisting of a Digital Force Gauge model DFG 500 with special slit fixture for cable tie heads and a carrier plate with slotted panel.

The DFG-KBP test device is universally suitable for all manually and pneumatically operated cable tie pistols.

DFG-KBP 500H with horizontal arrangement of slots.

DFG-KBP 500V with vertical arrangement of slots. The supporting surface of the carrier plate of DFG-KBP 500V in front of the slotted panel facilitates the correct axial alignment of the cable tie tighten pistol during the test.

The test device is well suited for mobile use and for tests to be carried out quickly.

We recommend this cost-effective test device for frequent in-process testing of cable tie pistols in addition to a test device with firmly fixed and exact positioned cable tie tighten pistol (e. g. PTB or FTB test bench).

Test Device DFG-KBP 500V:

Overall dimensions ca. 245x70x40 mm, weight ca. 1,1 kg **Test Device DFG-KBP 500H:**

Overall dimensions ca. 195x70x40 mm, weight ca. 1 kg

Digital Force Gauge DFG 500 with range 0-500 N

- Resolution 0.05 N.
- Accuracy error: $\leq 0.2\%$ F.S.
- Easy to read LCD Display with LED backlight and automatic 180° switching.
- Easy handling, operation by 5 capacitive touch keys.
- Peak Point Mode (Peak and Auto Peak mode selectable).
- Tracking Mode with continuous indication of current force values.
- Tare compensation.
- Programmable low and high set points.
- Measured value memory for 1000 measured values.
- Switchable units: N, gf, kgf, ozf, lbf.
- Set-up menu for general parameter selection.
- Serial and USB Interface.
- Mechanical overload protection up to 200% of rated load and overload display.
- Rechargeable battery and mains operation.
- Auto-Power-Off with user-selectable timing.

The Digital Force Gauge DFG is available with other force ranges also.

Test procedure with DFG-KBP 500V:

Reset the peak value memory of the DFG force gauge to zero. Lay the cable tie into the slotted special fixture (A) of the DFG force gauge to fix the cable tie head and lay strap of the cable tie through the slit of the slotted panel (B) of the carrier plate. Position the pistol nose (C) down flat onto the supporting surface (D) of the carrier plate with the nose of the tensioning tool flush to the slotted panel. Insert the strap of the cable tie into the tensioning tool and pull the strap flush against the slotted fixture (A). Then pull the trigger of the tensioning tool continuously until the cable tie is cut off. The tension force achieved at the cut off is determined and indicated on the gauge's display.







Digital Force Gauge DFG 500



Test setup with DFG-KBP 500H



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Advanced Force Measurement

Product Range:

Universal Test Station MTM



Motorized Test Station ATM



Motorized Tester FTM



Digital Tester FTS



Pull/Press Tester FTH

Pull/Press Tester PTH 50



Universal Test Station MTM

Motorized Test Station ATM



Motorized Tester FTM



Heavy-duty Test Station STM



Cable Tester FTC



Cable Tester PTC





Force Measuring System CMS



Hand Tester DFG



Manual Test Stand TSH



Testing Tools & Fixtures



Keytast Data Logger





Precision Load Cells



Digital Force Gauge DFGS



Motorized Test Stands



Printer & Micrometers



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MI&T – Advanced Force Measurement High quality test equipment made in Germany





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