



**INSTRUCTION MANUAL**

WTT-220X / WTTM-220X

**Wire Terminal Tester**

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Thank you for choosing one of our high quality instruments. Please read the entire operation manual thoroughly before using this instrument for the first time. The information contained herein will help you to achieve accurate and reproducible results and to avoid misuse or damages.

This instrument is designed for measuring tensile strength of soldered or solder-free (crimped) cable joints with end sleeves, pins, solder pins or similar wire terminal components in the field of quality control or design validation.

## 1. Safety Precautions



The load cell can be damaged when the measuring system is overloaded. The maximal measuring range limit of 1000N (100kg/220lb) must not be exceeded.

Transport and store the instrument with care. This reduces the risk of damage to the load cell, caused by accidental mechanical effects.

Operate the instrument in appropriate environments only. The instrument is equipped with a temperature compensation for 0°...40°C. Use the instrument in this temperature range only.

Very frequent use of the motorized pull tester FMT-W40(higher 1 test cycle per minute) may lead to overheating of the motor. A overheat protection is implemented; nevertheless you may use the instrument in environments up to 30°C (86°F) only.



Due to the nature of the material small particles may occur in the moment of the tensile break of wires. You may wear protection glasses and protection gloves in order to prevent injuries.



Don't touch during the pull test or while the roller cam returns to its home position the rotating parts of the instrument. Do not take your hand into the gap between the cable, the terminal adapter and clamp cam. In spite of the low speed or the manual operation of the lever you may injure yourself.

## 2. General Information

### 2.1. Scope of Supply, unpacking and Setting Up

The scope of supply consists of:

- Measuring instrument with integrated electronics
- Hand lever or roller grip
- USB Interface cable for optional software FMT-W\_Connect
- CD with software FMT-W\_Connect (without license key)
- Operation manual
- 24V DC power supply (Part. no.: FMT-958) for motorized pull tester WTTM-220X

Remove the transportation cover and position the main instrument on a level, stable surface. The surface should be clean and grease-free, so that the instrument does not slip. Please bear in mind that the instrument weighs approximately 14 kg.

Please retain the transport packing in case you would like to return the instrument for the recommended annual recalibration.

### 2.2. Energy Harvesting (manual pull tester WTT-220X only)



The instrument utilizes, also when turned off, the ambient light at the work place as energy source and charges an internal storage, to ensure that tests can be made even if the solar cell is covered for a short while. After storing the instrument for more than 2 month in the dark, you should expose it at least for 8 hours in regular working environment (> 250 Lux) before use.

### 2.3. Attach the 24V DC power supply (motorized pull tester WTTM-220X only)

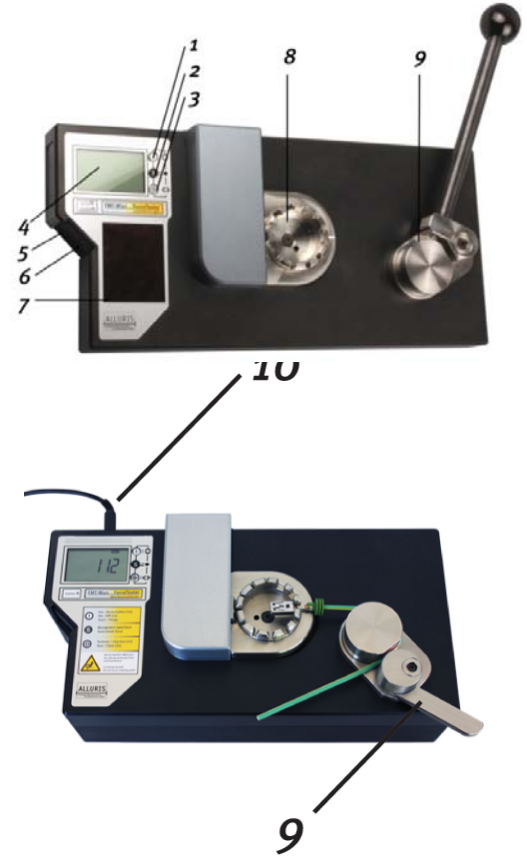
The motorized pull tester WTTM-220X is delivered with an universal power supply for 110-220VAC (50/60Hz) and power cords with EU-plug and US-plug. Choose the power cord accordingly and connect first the DC plug into the socket on the rear side of the instrument. Then you may connect the power cord to your wall socket or AC power net.

The power consumption is related to the operation state of the motor, the 3A power supply delivers always enough energy to generate the action. You may not replace it by any other power supply but the delivered one (Part no.: FMT-958). In case you

do not utilize the instrument for a longer period, you may disconnect from the power net in order to prevent waste of energy in standby mode.

### 2.3 Instrument overview

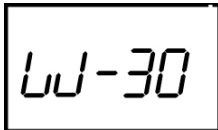
1. **Start Button** turns the instrument on and off (keep pressed for > 2s) and to start the measurement.
2. **P Button** to toggle between Peak and Real-Time display mode.
3. **U-Button** toggles between measuring units.
4. **Display** with:  
5-digit indication of the measured value and measuring units;  
indication of the operation mode, memory and limits;  
indication of results with up/down pointers for tensile force limits.
5. **USB-socket** for data transfer with FMT-W\_Connect software to produce a test protocol.
6. **Hirose-socket** for service, adjusting the load-cell and limit signal output.
7. **Solar cell** to power the instrument without USB interface connected.
8. **Terminal adapter** with 12 slots to place the connector.
9. **Rotating wire clamp** with hand lever to clamp and pull the cable. Motorized version WTTM-220X with eccentrically spring loaded roller grip.
10. Motorized version WTTM-220X **DC-socket** for 24V power supply and red status LED.



## 3. Operating procedures

### 3.1 Turn the instrument ON/OFF

Switch the instrument on by pressing the **Start Button Taste** until all display symbols light up. After a self-test routine 3 information displays are shown to inform about the model number, the recommended date of next calibration and the nominal measuring range (Fn). To turn the instrument off you may press the **Start Button** for 3 seconds, else the AUTO-OFF function will turn the instrument off automatically (see chap. 6).



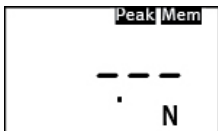
Indication of the instrument type



Display next recommended calibration date (YY.MM)



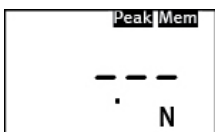
Display measurement range [N]



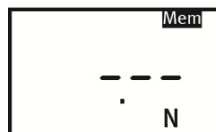
Start display with default setting; mode PEAK with drag function and MEM for active memory and calculation of statically values.

### 3.2 General information about the display und function of the keypad during and in between the measurements

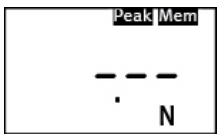
After the self-test routine the display shows the symbols PEAK and MEM and the SI-dimension Newton [N]. These symbols indicate the default setting in operation mode PEAK with high measuring rate (app. 1kHz) and drag functions with the possibility to save measuring results for statistical calculations. Whenever you want to change the default settings, you have to return to this display.



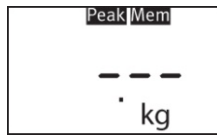
S  
<<  
>>



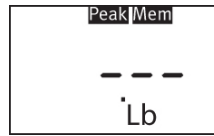
If you want the updated actual force values to be shown during testing instead of the drag function with PEAK values, you press the **P Button**. The PEAK symbol starts flashing. Please consider that in the combination of this mode with memory is not advisable as the memory always captures the actually displayed value. By pressing the **P Button** again you return to the PEAK mode with dragging function.



0  
>>>



0  
>>>



If you would like to get your measuring values in other units than the SI-dimension N you press the U Button. Every time you press the button (in start menu only) the units changes between N >> kg >> Lb

### 3.3 Preparing the measurement



Select the smallest slot suitable for the test sample diameter and rotate the fixture so the selected slot is in the 3 o'clock position, closest to the wire clamp fixture.



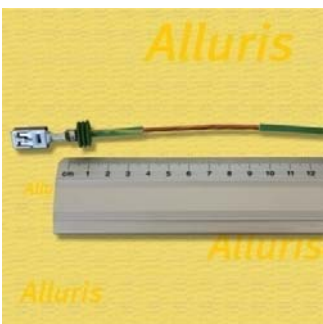
Place the cable connection into the adapter, so that the sleeve of the cable connector stays securely inside the ring and cannot be pulled out through the slot.



The wire clamp fixture should be positioned in the full open position.

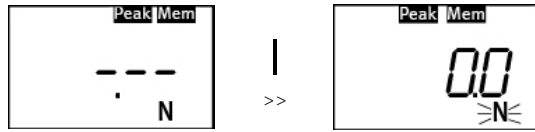


The manual pull tester needs a free length of the cable off minimum 14cm (5.5"), the motorized version a length of 10cm (4").



Soft cable coatings may slide through the clamp fixture or be pulled out of the crimp sleeve. In this case please cut off the coating in 4cm to 8cm (2...3") distance to the cable joint under test.

### 3.4 Start measuring (Auto Zero) with manual pull tester WTT-220X

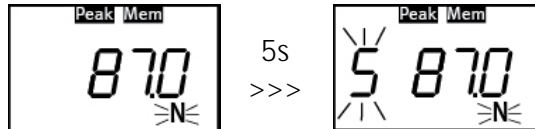
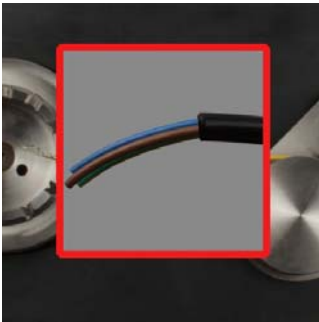


By pressing the **Start Button** you start the measurement, the symbol of the measuring dimension (N) flashes and the instrument performs an AUTO-TARA to reset.



Insert the free end of the cable using a small amount of tension in the wire clamp fixture. The groove in the fixture helps to align the cable properly. Now close the clamp by pulling the lever.

As you continue to pull the hand lever slowly, the tensile force increases, which works upon the cable as a retention force. An additional tensile force develops, which works upon the cable connection.

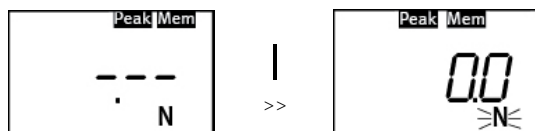
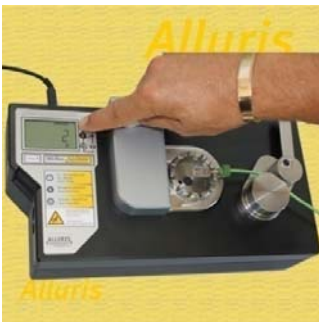


As you continue to pull the hand lever slowly, the tensile force increases, which works upon the cable as a retention force. An additional tensile force develops, which works upon the cable connection.

The peak value, which mostly appears before the connection snaps up, is captured at 1000Hz and is indicated in the display.

After 5 seconds of unchanged measuring values, the instrument stops the measurement automatically and the letter „S“ flashes in the display indicates that you might save the data.

### 3.6 Start measuring (Auto Zero) with motorized pull tester WTM-220X



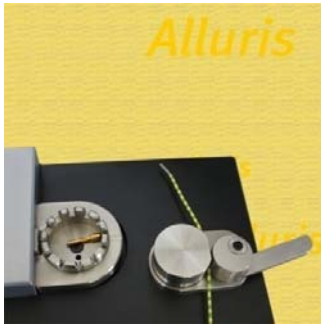
By pressing the **Start Button** you start the measurement, the symbol of the measuring dimension (N) flashes and the instrument performs an AUTO-TARA to reset. Now the motor starts with the set pull speed.

If the minimal force of the automatic break detection is not reached the cable clamp rotates to its maximum position and returns to the home position. If you press the Start Button during the measurement it also returns to its home position and the measuring will be stopped.

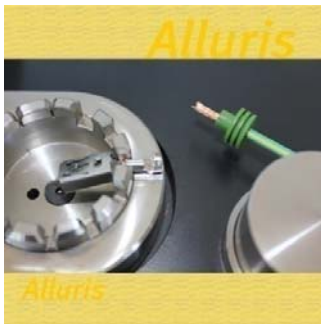
If a set force limit is reached an adjustable dwell time starts. (Default 0s). After the dwell time the drive either returns to home position or



tears the cable until it breaks depending on the chosen operation mode.



An automatic break detection becomes active if 25% of the force limit (minimum tensile strength) (P3) or a force of 40N is reached. If the actual measured force falls below this level the cable clamp returns to its home position and the measuring will be stopped.



>>>

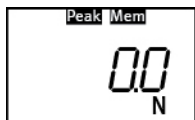


By pressing the P Button during the measurement (unit flashes) you can save the value to the memory. Two short beeps indicate that the value is prompted.

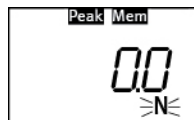
### 3.8 Display statistical data



S  
>>>



S  
>>>



After you finish the (last) measurement you can recall the statistical results by pressing the P Button.

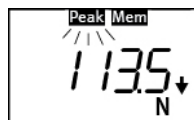
(nur bei FMT-W30)

S  
>>>



Highest value of all saved tests.

S  
>>>

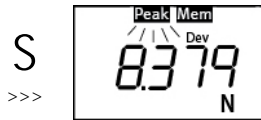


Lowest value of all saved tests.

S  
>>>



Average (arithmetic medium) of all saved tests.



Standard deviation related to the average.

Using the optional **Software FMI-S\_Connect** the statistic data can be replenished with the instruments base data and the work order data. If the USB interface is connected the single test values can be transferred and documented also. To capture single test values of the manual pull tester WTT-220X, the USB connection to your PC has to be established during the entire test cycle.

#### 4. Tensile force limit control

Depending on the wire strength and the related standard, the following tensile strength should at least be achieved. All below mentioned standards can be performed with a pull speed of 100mm/min (4"/min), the default speed off the motorized pull tester WTT-220X. Utilizing the optional software FMT-W\_Connect other pull speeds can be set.

AWG	Cross section	Cable diameter	SAE AS7928 Table II	IEC 60352 Teil 2	UL 486 C	NASA Std 8739.4
30	0,06 mm <sup>2</sup>	0,36 mm		6 N	6 N	
28	0,09 mm <sup>2</sup>	0,38 mm		11 N	11 N	22 N
26	0,14 mm <sup>2</sup>	0,48 mm	32 N	18 N	18 N	36 N
24	0,22 mm <sup>2</sup>	0,61 mm	45 N	28 N	28 N	36 N
22	0,34 mm <sup>2</sup>	0,76 mm	67 N	40 N	40 N	57 N
20	0,56 mm <sup>2</sup>	0,97 mm	85 N	60 N	45 N	92 N
18	0,93 mm <sup>2</sup>	1,27 mm	170 N	90 N	45 N	142 N
16	1,25 mm <sup>2</sup>	1,44 mm	223 N	135 N	68 N	183 N
14	1,93 mm <sup>2</sup>	1,80 mm	312 N	200 N	100 N	290 N
12	3,16 mm <sup>2</sup>	2,29 mm	490 N	275 N	138 N	459 N
10	4,65 mm <sup>2</sup>	3,10 mm		355 N		707 N

Remarks: **DIN 41611/3** is replaced by DIN IEC 60352 Part 2  
**MIL-T-7928** is replaced by SAE AS7928 Table II  
**BS5B178** corresponds to IEC 60352 Part 2  
**UL486A** corresponds to IEC 60352 Part 2

You can set these values in the limit comparator function. The lower limit activates the buzzer (if USB-cable is connected) and an interrupted peep signalizes that the limit is not reached (yet). After exceeding the upper limit, the displayed pointer changes from down to up and the continuous peep indicates that the minimum tensile strength was reached. You may use this function also for non-destructive testing.

##### 4.1. Setting of limits

In order to set the limits easily and in accordance to the above mentioned standards we recommend the use of the optional **Software FMI-W\_Connect**, where you can choose the appropriate limit from a table accordingly after selecting the test standard.

#### 5. Data transfer and generating a test report with FMT-W\_Connect

The optional software FMT-W\_Connect enables you to utilize the USB-interface in connection with your PC or notebook. The data transfer can be used to:

- Enlarge the measuring range of the manual pull tester WTT-220X to 1000N and to increase the measuring resolution;
- To configure the operation modes and the pull speeds of the motorized pull tester WTTM-220X.
- Set the limit comparator function based on international standards for minimum tensile strength of crimped connectors easily;
- Generate a test report as PDF format and to print and file the customized report;
- Adjust the calculation base between the international standard (SI) for the dimension force in Newton [N] to weight dimension Pounds [lb] or Kilograms [kg] according to the effective gravitation at the place of operation.

##### 5.1 System requirements

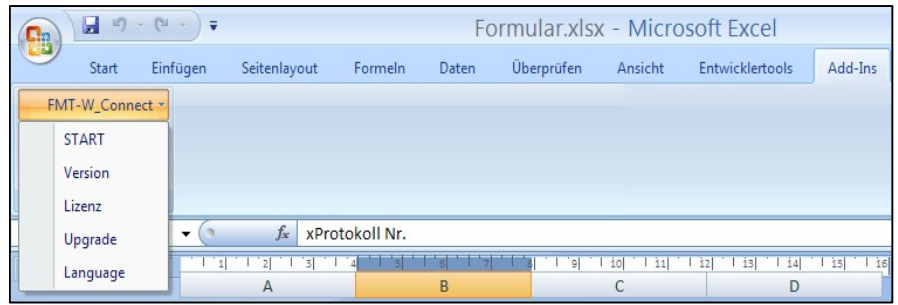
To install the software a PC or notebook with available USB-port is needed. The operation system Windows XP or Windows 7, and MsOffice 2007 or MsExcel 2007 and higher should be installed. To load the software you need administration rights on the work station. You should install the software with the appropriate USB drivers before you connect the pull tester the first time to your workstation. USB drivers can be found on the installation CD-Rom.

##### 5.2 Installation / Activate the Excel AddIn



InstallShield will guide you through the installation process after you loaded the CD. The new folder C:/Alluris will be compiled. After the installation process you have to activate the Add-In for MsExcel. Please consult your MsExcel help to add FMI-W\_Connect to your Add-In folder.

After adding FMT-W\_Connect to your Add-Ins you open the C:/Checkline/FMT-W\_Connect/Formular.xlsx. Click on the menu Add-Ins and open the table FMT-W\_Connect and START the software.



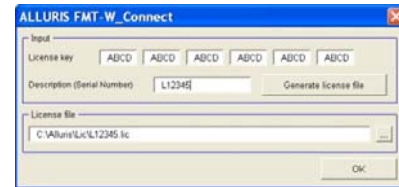
### Version

The table informs about the version of the installed software.



### License

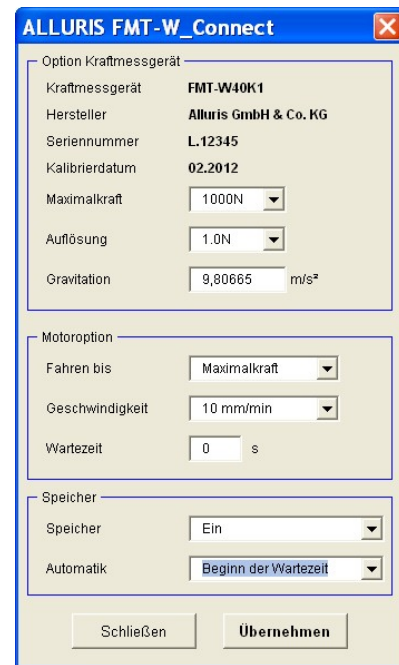
After installing the software a license file has to be generated and saved in the Checkline folder. Please enter the received license key and the serial no. of your pull tester and click "generate license file". The license key has to match the serial no. of the instrument it was ordered for.



### Option force measuring

Select the measuring range and resolution. If you want to change the gravitation to your local environment you influent the calculation base for the weight dimensions [lb] and [kg]. The change should be done only, if the gravitation at your place of operation significantly deviates from the set value and if you work in other than international standard units [N].

Before you do any changes in this area please consult our website [www.alluris.de/de/Anwendungen/newton.php](http://www.alluris.de/de/Anwendungen/newton.php)



### Motor option (WTTM-220X only)

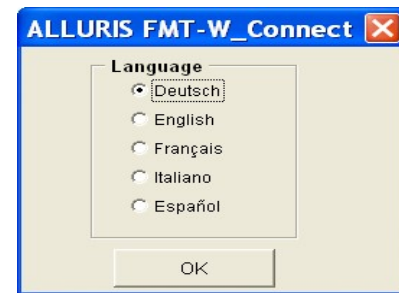
The motorized pull tester WTTM-220X can be utilized for destructive and non-destructive testing. For non-destructive testing choose the option „Maximum Force“. Select the desired pull speed and adjust a dwell time in order to stop the drive after exceeding the set limit. The drive will start again after the adjusted time has passed, either returning to its home position or tearing the cable joint.

### Memory option (WTTM-220Xonly)

The motorized pull tester WTTM-220X can memorize the captured measuring values automatically. Select the desired mode/time of memorizing the data, start or end of dwell time, tensile force at the moment the cable joint tears.

## Language

Select the desired language for all tables and reports.



## 5.3 Start FMT-W\_Connect

Information about the test

Tester: AxF

xProtokoll Nr.: P678

xArtikel Nr.: A4711

xAuftrags Nr.: AA90

xLos Nr.: L41

xGesamtmenge: 10

xNorm: IEC 60352 Teil 2

xKabelquerschnitt

AWG 30	A=0,06mm <sup>2</sup>	Ø=0,36mm	6N
AWG 28	A=0,09mm <sup>2</sup>	Ø=0,38mm	11N
AWG 26	A=0,14mm <sup>2</sup>	Ø=0,48mm	18N
AWG 24	A=0,22mm <sup>2</sup>	Ø=0,61mm	28N
AWG 22	A=0,34mm <sup>2</sup>	Ø=0,76mm	40N
AWG 20	A=0,56mm <sup>2</sup>	Ø=0,97mm	60N
AWG 18	A=0,93mm <sup>2</sup>	Ø=1,27mm	90N
AWG 16	A=1,25mm <sup>2</sup>	Ø=1,44mm	135N
AWG 14	A=1,93mm <sup>2</sup>	Ø=1,80mm	200N
AWG 12	A=3,16mm <sup>2</sup>	Ø=2,29mm	275N
AWG 10	A=4,65mm <sup>2</sup>	Ø=3,10mm	355N

xGrenzwert: B N

Force gauge: FMT-W30C5  
Manufacturer: Alluris GmbH & Co. KG  
Serial Number: L.12345  
Date of calibration: 12.2011  
Date of test: 14.12.2011

ALLURIS  
innovative Messinstrumente für physikalische Größen

Cancel OK

Open the MsExcel with Windows Start Menu >All Programs>Alluris>FMT-W\_Connect>Formular.

Enter all necessary protocol data for your specific test procedure. The total quantity is needed to calculate the respective relative number of tests.

The entered data will be completed with the basic information about the force testing equipment.

Now select the specific standard and the cable dimension for your test procedure. The limit setting will be downloaded to the instrument in order to compare this value with the result of the tensile testing. You may change the limit setting in the field [Limit].

Click the [OK] button to download the entered data to the pull tester and to the test report.

Information about the test

Tester: AxF

xProtokoll Nr.: P678

xArtikel Nr.: A4711

xAuftrags Nr.: AA90

xLos Nr.: L41

xGesamtmenge: 10

xNorm: IEC 60352 Teil

xKabelquerschnitt: AWG 30

xGrenzwert: 6,0N

Force gauge: FMT-W30C5  
Manufacturer: Alluris GmbH & Co. KG  
Serial Number: L.12345  
Date of calibration: 12.2011  
Date of test: 14.12.2011

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Wire test

Positive peak

75,5 N ↑

0/10 Tests

Start

Next Display

Clear

End Protocol Delete memory

Start the test procedure as described before. The software registers the measuring results each time you press the **P Button**. You can operate the pull tester alternatively remote from your PC or notebook.


After finalizing all tests for your batch you click the **PROTOCOL** button to generate a test report as PDF-file, which can be filed or printed out.

Before you start the next series of test you may delete the memory by clicking [DELETE MEMORY].

Clicking [END] closes the program.

## 5.4 Save and printout measuring protocol

### Test report


<b>Company</b>	Company Alluris GmbH & Co. KG Basler Straße 65 79100 Freiburg Germany	 innovative Messinstrumente für physikalische Größen																					
<b>Test person</b>	AxF																						
<b>Test instrument</b>	Type/Model: FMT-W30C5 Manufacturer: Alluris GmbH & Co. KG Serial No.: L.12345 Last calibration date: 12.2011																						
<b>Test</b>	Date: 14.12.2011 xStandard: IEC 60352 Teil 2																						
<b>Test data</b>	xProtocol No.: P678 xPart No.: A4711 xOrder No.: AA90 xBatch No.: L41 xTotal qty: 10 xCross section: AWG 26 xLimit: 18,0N																						
<b>Results</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Number of tests</td> <td style="width: 30%;">4</td> <td style="width: 40%;">40,00% (total)</td> </tr> <tr> <td>OK</td> <td>2</td> <td>50,00% (test lot)</td> </tr> <tr> <td>NG</td> <td>2</td> <td>50,00% (test lot)</td> </tr> <tr> <td>Maximum</td> <td>53,0N</td> <td></td> </tr> <tr> <td>Minimum</td> <td>12,5N</td> <td></td> </tr> <tr> <td>Average</td> <td>24,8N</td> <td></td> </tr> <tr> <td>Standard deviation</td> <td>99,999</td> <td></td> </tr> </table>		Number of tests	4	40,00% (total)	OK	2	50,00% (test lot)	NG	2	50,00% (test lot)	Maximum	53,0N		Minimum	12,5N		Average	24,8N		Standard deviation	99,999	
Number of tests	4	40,00% (total)																					
OK	2	50,00% (test lot)																					
NG	2	50,00% (test lot)																					
Maximum	53,0N																						
Minimum	12,5N																						
Average	24,8N																						
Standard deviation	99,999																						

**Test results details**

	1	53,0N	
	2	18,5N	
	3	12,5N	NG
	4	15,0N	NG

  
 innovative Messinstrumente  
 für physikalische Größen

Copyright: Alluris GmbH Co. KG  
 Freiburg - Germany

The test report is generated as PDF file and saved automatically in the folder C:/Alluris/FMT-W\_Connect/"Serialnumber of device"/.

You may customize the report specifically to your company details with your own logo etc. The template is filed in C:/Alluris/FMT-W\_Connect/Formular.xlsx

Fields with gray background are filled by the data entered in FMT-W\_Connect and the data of the testing equipment.

The field description (starting with x in the template) can be edited. The edited text appears in the FMT-W\_Connect table the next time you start the program.

Each single test result is listed at the end of the report.

## 7. Technical data

		<b>WTT-220X</b>	<b>WTTM-220x</b>
<b>Measuring Range</b>	Range in Newton (N)	0,0...500,0 N (adjustable with FMT-W_Connect 0,0...1000N)	0,0...1000,0 N
	<i>Alternative units</i>	N   kg   lb	
<b>Wire Diameter</b>	<i>Slot width terminal adapter</i>	0,5   0,8   1,0   1,3   1,5   2,0   2,5   3,0   3,5   4,0   5,0   6,0 mm	
	<i>Clamp opening</i>	0,1 ... 6,0 mm (continuously variaböe)	
	<i>Dia. Range IEC 60352-2</i>	Cross section 0,05 ... 10 mm <sup>2</sup> (AWG8...30)	
	<i>Dia. Range SAE AS7928 II</i>	AWG 12 ... 28	
<b>Resolution</b>		0,5N (0,05kg / 0,1lb)	1 N (0,1kg / 0,2lb)
<b>Accuracy</b>	<i>@ 23°C (F.S.)</i>	+/- 0,5% (+/- 1 increment of resolution)	
	<i>Tk (absolute)</i>	selfadjusting at start	
	<i>Tk (relative)</i>	+/- 0,02% (°K)	
<b>Betriebsarten</b>	<i>Standard</i>	displays real time value in N   kg   lb	
	<i>PEAK</i>	displays peak value in N   kg   lb (umschaltbar)	
	<i>Pulls until break</i>		yes
	<i>Pull test with dwell time</i>		yes
	<i>Pull-Release (until force limit)</i>		yes
<b>Pull Speed</b>	<i>Speed</i>		10   25   50   100   150   200 mm/min
	<i>Accuracy</i>		+/- 5%
<b>Overload</b>	<i>max. admissible</i>	200 % (F.S.)   alarm at 120% (F.S.)	
<b>Display</b>	<i>Type</i>	LCD, 5-stellig, 12mm hoch	
	<i>Update (Standard)</i>	1000 msec   500 msec   333 msec   200 msec   100 msec   50 msec (einstellbar)	
	<i>Update (Peak)</i>	ca. 1 msec	
<b>Memory</b>	<i>Manual memory</i>	Capacity of 1000 test cycles   Statistics with display of average, maximum, minimum and standard deviation	
	<i>Auto memory</i>		ja
<b>Power supply</b>	<i>Type</i>	Solar cell With USB connected via PC	24 VDC   3A universal power supply Standby consumption: 42mA Average consumption (drive active): 0,8A
<b>Interface</b>	<i>USB 2.0</i>	Optional software FMT-W_Connect	
<b>Temperature range</b>	<i>Operation</i>	0...40° C	0°... 30° C
	<i>Storage</i>	-20°... 60° C (rF < 80%)	
<b>Protection code</b>		IP 40	
<b>Weight</b>		app. 14 kg	
<b>Dimensions</b>	<i>LxWxH (without lever)</i>	350x160x75 mm	320 x 160 x 115 mm
<b>Housing material</b>		Main plate surface hardened steel, Grip and fixtures stainless steel, cover anodized aluminum	Main plate surface hardened steel, Grip and fixtures stainless steel, cover anodized aluminum and polystyrene.

## 8. Maintenance and calibration



This instrument is maintenance-free under proper use. Torn parts of wire must not fall into the spaces around the connection adapter; should this occur, blow them off or remove them using the vacuum cleaner.

Force gauges should be inspected and re-calibrated on a regular base, at least once a year. Our calibration services comprise the inspection, and calibration according ISO 9001:2008 approved procedures and a readjusting of the load cell if necessary. (E-mail address: [service@checkline.com](mailto:service@checkline.com)).

## 9.0 Trouble shooting (FAQ)

Does the instrument work also after a being stored in the dark for a longer period?	Yes. Even after a self discharging of the internal energy storage the instrument can be used immediately. A back-up battery saves guaranties the basic function of the device; see chap. 2.3.
The instrument shows already minute values before the cable is fixed!	The electronic captures minute changes after taring and those are shown in the PEAK display (<1,5N). This does not affect the accuracy of measurement as the PEAK register is refreshed always with the highest captured value while pulling off the terminal.
The peak value cannot be saved	You may have changed the mode from PEAK measurement with dragging function to

because the display shows 0,0 after the break!	steady update of the actual value (PEAK symbol flashes). Delete the memory by pressing the <b>O-Button</b> and change the mode back to PEAK with dragging function by pressing the <b>P Button</b> until the PEAK symbol light up stops flashing.
The instrument shows no consistent values!	Please pay attention to torn parts of wire in the spaces around the connection adapter; should this occur, blow them off or remove them using the vacuum cleaner..
The display shows "OverL"!	The load exceeds the maximum range. Release the load and inspect the instrument. If no consistent value is shown it might be necessary to replace the load cell.
The USB connection is interrupted!	Please check whether FMT-W_Connect incl. the USB driver is installed and the USB-ports can be used.
The display does not light up and the drive does not run.	Please check power connection. In case of drive failure (e.g. overheating) the red LED beside the DC socket will be illuminated. Switch the instrument off, and wait appr. 15min until the drive cooled down and all capacitors discharged. If the LED still lights up when switching on the instrument please contact our technical service.
A loud vibrating sound occurs but the clamping device does not turn and the pull force does not increase.	They drive might be blocked and overloaded! Switch the instrument off and remove the blockage. Restart the instrument, the clamping device will return to its home position.
The measuring does not start immediatly after pressing the Start Button.	The drive performs a reference run (very slow speed) after switching the instrument on or after a measuring cycle.
The buzzer has no sound!	Please check whether the buzzer is activated (submenu P17=1) and a limit is set.
The clamping device returns to its home pos, although the joint did not break or the limit is not reached.	The real time force slipped under 25% of the set maximal force limit (e.g. the cable coating slides or peels off) or the limit switch for the final position of the clamping device was reached.
The cable slides through the clamping device or the coat peels off!	Remove the cable coating in 4 to 8cm distance to the cable joint. (See also chapter 3.3).

## 10.0 Accessories (Interchangeable terminal fixtures)



The scope of supply comprises a standard terminal adapter, mounted in our works. If your testing material requires special adapters for the terminal of your cable, you may find one of the options below useful. In order to change the rotating adapter easily you place a 4mm pin or M4 screw (max. 25mm (1")) into the hole and rotated it to a 3 o'clock position. Now the rotation is blocked and you are able to open the screw in the center. Replace the terminal adapter and tighten the screw before you release the pin or M4 screw.



Pin for ring terminals  
Diameter > 3,5mm  
Part.No.: FMT-931



Slotted terminal adapter  
For mini-crimps with beveled contour  
Part.No.: FMT-953



Raw body for terminal adapters  
Adapter for own machining of special applications  
Part.Nr.: FMT-951



Roller grip 1kN, Opening 0...7mm  
for pull test of welded wire and cable connections

Part.No.: FMT932WT

L-Crimp-adapter  
For 3,5mm L-crimps (other sizes on request)

Part.No.: FMT-932



## A-1 Declaration of Conformity

**Hersteller (Manufacturer):** Alluris GmbH & Co. KG  
Basler Strasse 65  
DE 79100 Freiburg, Germany

**Produkt (product):** Digitales Auszugskraftmessgerät (*Digital Pull Force Tester*)

**Artikel Nr. (Type / Part.No.):** WTT-220X / WTTM-220X

Wir bestätigen hiermit die Konformität des Produktes mit der EU-Richtlinie EMC 92/336/EEC bezogen auf die nachfolgenden Normen und Klassifizierungen.

*We hereby confirm that the product complies with the requirements of the EMC Directive 92/336/EEC and conforms the following specification:*

EN 55022 (RF Emission)	Class B
EN 61000-4-2 (ESD)	Criteria A
EN 61000-4-3 (RF Field)	Criteria A
EN 61000-4-4 (Burst)	Criteria A
EN 61000-4-8 (Magn. Field)	Criteria A

Für den motorisierten Typ FMT-W40K1 bestätigen wir zusätzlich die Konformität des Produktes mit der EU-Maschinenrichtlinie 2006/42/EG.

*For the motorized version type FMT-W40K1 we confirm additionally that the product complies with the requirements of the EMC Directive 2006/42/EEC.*

In Übereinstimmung mit der WEEE Richtlinie 2002/96/EC ist dieses Gerät eingestuft als "Monitoring and Control Instrument" und darf nicht als unsortierter Hausmüll entsorgt werden. Sie können das Gerät zum Recyclen oder der ordnungsgemäßen Entsorgung an uns zurücksenden. (WEEE Reg.No. DE 49318045) Mehr Informationen erhalten Sie auf unserer Website [www.alluris.de](http://www.alluris.de)

*In accordance to WEEE Directive 2002/96/EC this device is categorized as "Monitoring and Control Instrument" and should not be disposed as unsorted municipal waste. You may return it to Alluris for recycling. (WEEE Reg.No. DE 49318045). For more information please contact our website [www.alluris.de](http://www.alluris.de).*

Die Übereinstimmung mit allen anzuwendenden Anforderungen der EU-Richtlinien wird hiermit und durch das CE-Zeichen auf dem Gerät bestätigt.

*The compliance to the requirements of all applicable EU directives is confirmed by the CE-marking of the product.*

Freiburg (Germany), Dezember 2011





### ***A-2 Kalibrierung (Werksprüfzeugnis DIN EN 10204, 2-1)***

Wir bestätigen hiermit, dass das Gerät im Produktionsprozess entsprechend den Anforderungen der DIN EN 9001:2008 geprüft wurde. Das Messgerät entspricht in allen Punkten den in den Technischen Daten beschriebenen Werten.

Die zur Bestimmung der Genauigkeit benutzten Instrumente und Gewichtsätze lassen sich auf das weltweit anerkannte (ILAC) Gewichtsnormale der Physikalisch-Technischen Bundesanstalt (PTB, Braunschweig) im Rahmen des DAkkS zurückführen

### ***A-2 Calibration Confirmation (acc. DIN EN 10204, 2-1)***

*We hereby confirm in accordance to DIN EN 10204, 2.1 that this instrument has been tested in accordance with ISO 9001:2008 approved procedures. The instrument meets all specified technical data's and the accuracy was tested better than the accuracy stated in the technical data.*

*The equipment and weights used for test and calibration are traceable to the international recommended (ILAC) and approved standards of the DAkkS (Deutsche Akkreditierungsstelle GmbH) at the Physikalisch-Technischen Bundesanstalt (PTB).*