

ALLURIS

innovative Messinstrumente
für physikalische Größen

***BEDIENUNGSANLEITUNG
OPERATION MANUAL
NOTICE D'UTILISATION
INSTRUCCIONES DE SERVICIO
ISTRUZIONI PER L'USO***



***DIGITALES AUSZUGSKRAFTMESSGERÄT FÜR KABELVERBINDUNGEN
DIGITAL FORCE GAUGE FOR WIRE TERMINALS
DYNAMOMETRE NUMERIQUE PAR JONCTIONS DE CÂBLES
DINAMOMÉTRICO DIGITAL POR CABLES CON UNIONS ADECUADAS
DINAMOMETRI DIGITALES A DI CAVI CON CONNETTORI***

(BDA VERSION 2.4)

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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 if 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 5°...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 FMT-W40

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 FMT-W30 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.

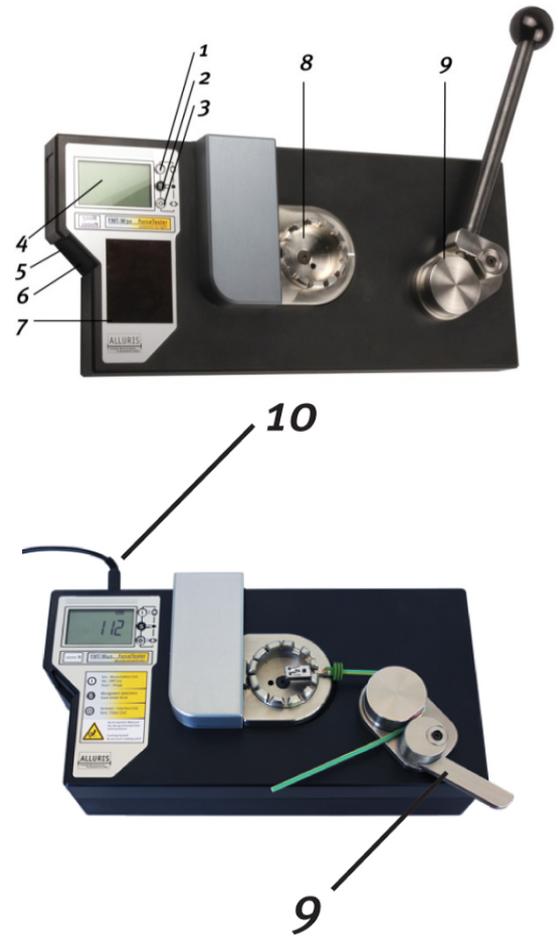
2.3 Attach the 24V DC power supply (motorized pull tester FMT-W40 only)

The motorized pull tester FMT-W40 is delivered with 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.

2.4 Instrument overview

1. **I-Button** turns the instrument on and off (keep pressed for > 2s) and to start the measurement.
2. **S-Button** to save test results, to recall statistical data and to start the setting menu (keep pressed for > 2s).
3. **O-Button** delete (tare) measured values and statistical data, to navigate during setting processes and to change measuring units (N/kg/lb). The units can be changed only before you start the first measurement or after deleting all memorized values.
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 FMT-W40 with eccentrically spring loaded roller grip.
10. Motorized version FMT-W40 **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 **I-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 **I-Button** for 2 seconds, else the AUTO-OFF function will turn the instrument off automatically (manual pull tester FMT-W30 only; see chap. 6).



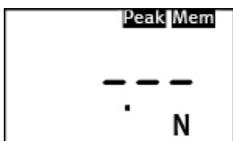
Indication of the instrument type (W30 manual version; W40 motorized version)



Display next recommended calibration date (YY.MM)



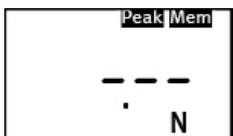
Display measurement range [N]



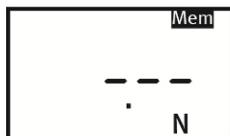
Start display with default setting; mode PEAK with drag function and MEM for active memory and calculation of statically values.

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

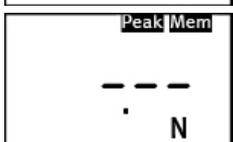
After the self-test routine the display shows the symbols PEAK and MEM and the SI-dimension Newton [N]. These symbols indicate the default setting in operation mode PEAK with high measuring rate (app. 1 kHz) and drag functions with the possibility to save measuring results for statistical calculations.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



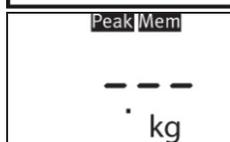
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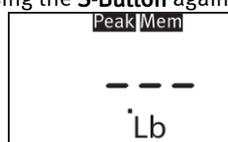
If you want the updated actual force values to be shown during testing instead of the drag function with PEAK values, you press the **S-Button**. The PEAK symbol starts flashing. Please consider that in the combination of this mode with memory is not advisable as the memory always captures the actually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



O
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O
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If you would like to get your measuring values in other units then the SI-dimension N you press the O-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.



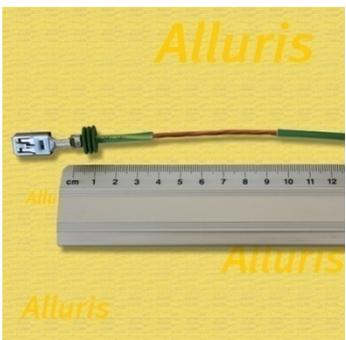
Place the cable connection into the adapter, so that the sleeve of the cable connector stays securely inside the ring and cannot be pulled out through the slot.



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

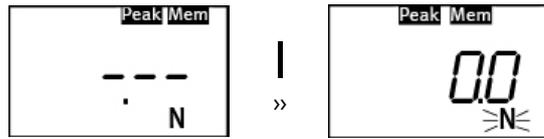


The manual pull tester needs a free length of the cable off minimum 14cm (5.5"), the motorized version a length of 10cm (4").

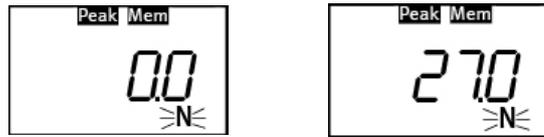
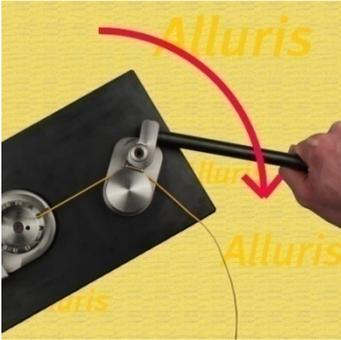


Soft cable coatings may slide through the clamp fixture or be pulled out of the crimp sleeve. In this case please cut off the coating in 4cm to 8cm (2...3") distance to the cable joint under test.

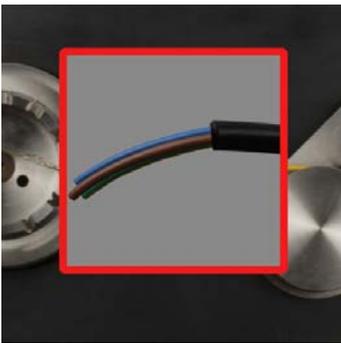
3.4 Start measuring (AutoTara) with manual pull tester FMT-W30



By pressing the **I-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 100Hz 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.

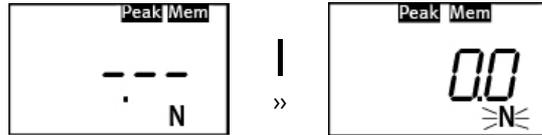
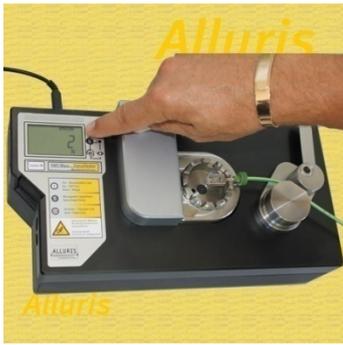
3.5 Memorize measuring values with manual pull tester FMT-W30



With the manual pull tester FMT-W30 you can save the test result by pressing the **S-Button** as long as the unit symbol (N) flashes and the letter „S“ in the main display prompts the memory. Two short beeps indicate that the value is stored. After saving the value the display is reset to 0.0 and you can start the next test by pressing the **I-Button**.

(With the motorized version FMT-W40 you may save a value at any time by pressing the S-Button. The measuring mode will not be stopped at this point but after the drive has returned to its home position.)

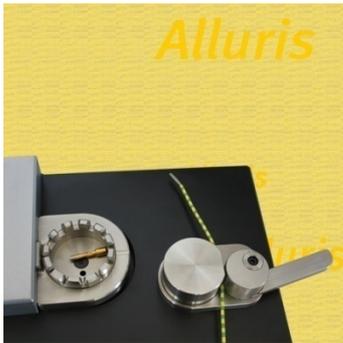
3.6 Start measuring (AutoTara) with motorized pull tester FMT-W40



By pressing the **I-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 setted pull speed.

If the minimal force of the automatic break detection (activate with P18) is not reached the cable clamp rotates to its maximum position and returns to the home position. If you press the I-button during the measurement it also returns to its home position and the measuring will be stopped.

If a setted force limit is reached an adjustable dwell time starts. (Default 0s). After the dwell time the drive either returns to its home position or tears the cable until it breaks depending on the chosen operation mode.



An automatic break detection (activate with P18) 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 **S-button** during the measurement (unit flashes) you can save the value to the memory. Two short beeps indicate that the value is prompted. The indicated value can be saved to the memory only once.

3.7 Automatic memorizing of measured values with motorized pull tester FMT-W40

The motorized pull tester FMT-W40 is able to memorize the measured values automatically. The memory function has to be activated (submenu P21=1), and the submenu P22 defines one of three possibilities to capture the value. You may choose to memorize the force value:

- While reaching the force limit (minimum tensile strength) or start of the dwell time; (1)
- At the end of the dwell time; (2)
- At the break; (3)
- or not automatically; (0)

See also chapter 6 for detailed information. All settings can also be done via USB using FMT-W_Connect software.

3.8 Display statistical data



(nur bei FMT-W30)

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

S
»»



Highest value of all saved tests.

S
»»



Lowest value of all saved tests.

S
»»



Average (arithmetic medium) of all saved tests.

S
»»



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 FMT-W30, the USB connection to your PC has to be established during the entire test cycle.

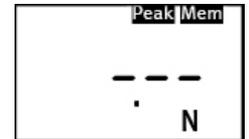
3.9 Delete displayed data and statistics

To delete the actually displayed data you press the **o-Button**, the display shows the value "0.0". By pressing the **o-Button** for a longer time (>2s) you delete all memorized data at the same time. Subsequently you can change the setting or load new test limits.

The memory and static function can be turned off. (see chap. 6)



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2S



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 of the motorized pull tester FMT-W40. Utilizing the optional software FMT-W_Connect other pull speeds can be setted.

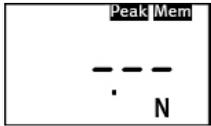
AWG	Cross section	Cable diameter	SAE AS7928 Table II	IEC 60352 Teil 2	UL 486 C	NASA Std 8739.4
30	0,06 mm ²	0,36 mm		6 N	6 N	
28	0,09 mm ²	0,38 mm		11 N	11 N	22 N
26	0,14 mm ²	0,48 mm	32 N	18 N	18 N	36 N
24	0,22 mm ²	0,61 mm	45 N	28 N	28 N	36 N
22	0,34 mm ²	0,76 mm	67 N	40 N	40 N	57 N
20	0,56 mm ²	0,97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

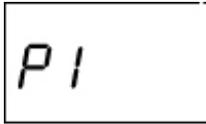
You can set these values in the limit comparator function. The lower limit activates the buzzer (with FMT-W30 only if USB-cable is connected) and an interrupted peep signalizes that the limit is not reached (yet). After exceeding the upper limit, the displayed pointer changes from down to up and the 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. Nevertheless you can adjust the limits directly after you have restarted the instrument or deleted all saved data, by pressing the **S-Button** for 2 seconds until the display shows P1. Select the setting menu P3 for the upper limit and P4 for the lower limit by pressing the **I-Button** and adjust the limit values.



S

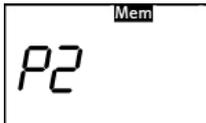


O

Pressing the **o-Button** you enter into the submenu level P11 to P17 (see chap. 6)

With a short press on the **S-Button** you return to the main setting menu.

I

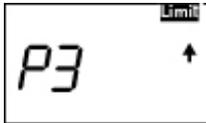


O

Pressing the **o-Button** you enter the submenu P2 (see chap. 6)

With a short press on the **S-Button** you return to the main setting menu.

I



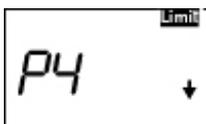
O



Press the **o-Button** to select the digit you want to change, the digit starts flashing. With the **I-Button** you scroll the desired value.

With a short press on the **S-Button** you return to the main setting menu.

I



O



Press the **o-Button** to select the digit you want to change, the digit starts flashing. With the **I-Button** you scroll the desired value.

The submenu P4 does not apply with the motorized version FMT-W40. The lower limit is adjusted automatically to 25% (or max. 40N) of the upper limit.

With a short press on the **S-Button** you return to the main setting menu.

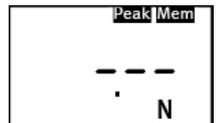
I



O

Pressing the **o-Button** you enter the submenu Po (see chap. 6)

By pressing the **S-Button** for a longer time (>2s) you return to the main operation menu.



The limit comparator function is deactivated by setting the limit back to „0000.0“ or by resetting the instrument to the original works defaults by using the setting menu Po (see chap. 7). The auto break detection stays active at 40N even if P3 = 0.

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:

- Increase the measuring resolution
- Configure the operation modes, the automatic memorizing and the pull speeds of the motorized pull tester FMT-W40
- 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 (32 bit or 64 bit), and MsOffice 2007 or MsExcel 2007 and higher (32 bit) 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

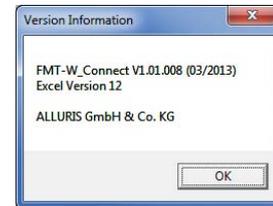
The installation process automatically after you loaded the CD. After the installation process you have to activate the Add-In for MsExcel. Please consult your MsExcel help to add C:\Programme\Alluris\FMT-W_Connect\Add-In\FMI-W_Connect.xla to your Add-In folder.

In Excel 2007 you have to click on the Office button (left upside), in Excel 2010 you have to click the file tab (left upside). Click Options, and then click the Add-Ins category. Near the bottom of the Excel Options dialog box, make sure that Excel Add-ins is selected in the Manage box, and then click Go. In the Add-Ins dialog box, select search and choose C:\Programme\Alluris\FMT-W_Connect\Formular.xlsx. Then exit all dialogs with OK.

After activation open the template C:\Programme\Alluris\FMT-W_Connect\Formular.xlsx. For using the software to protocolling and data streaming you have to choose FMT-W_Connect > START in the tab for Add-Ins. The submenus are explained as follow:

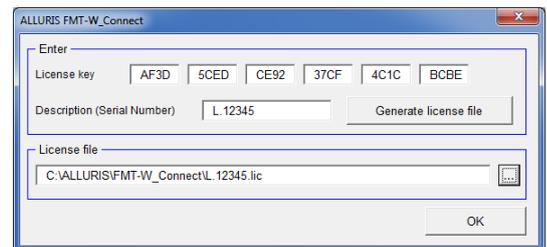
Version

The table informs about the version of the installed software.



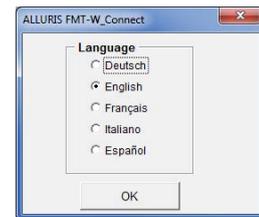
License

After installing the software a license file has to be generated and saved in the Alluris 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.

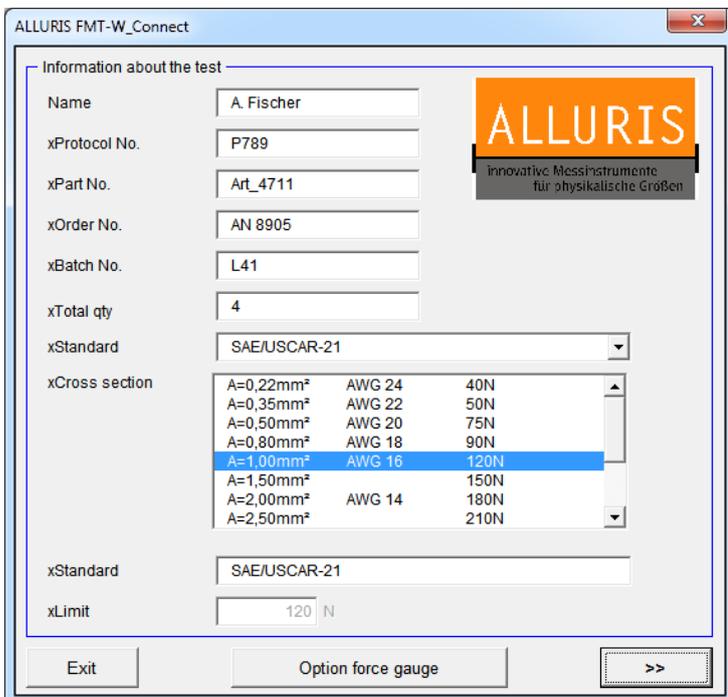


Language

Select the desired language for all tables and reports.



5.3 Start FMT-W_Connect



Open MS Excel with Windows Start Menu > All Programs > Alluris > FMT-W_Connect>Formular.

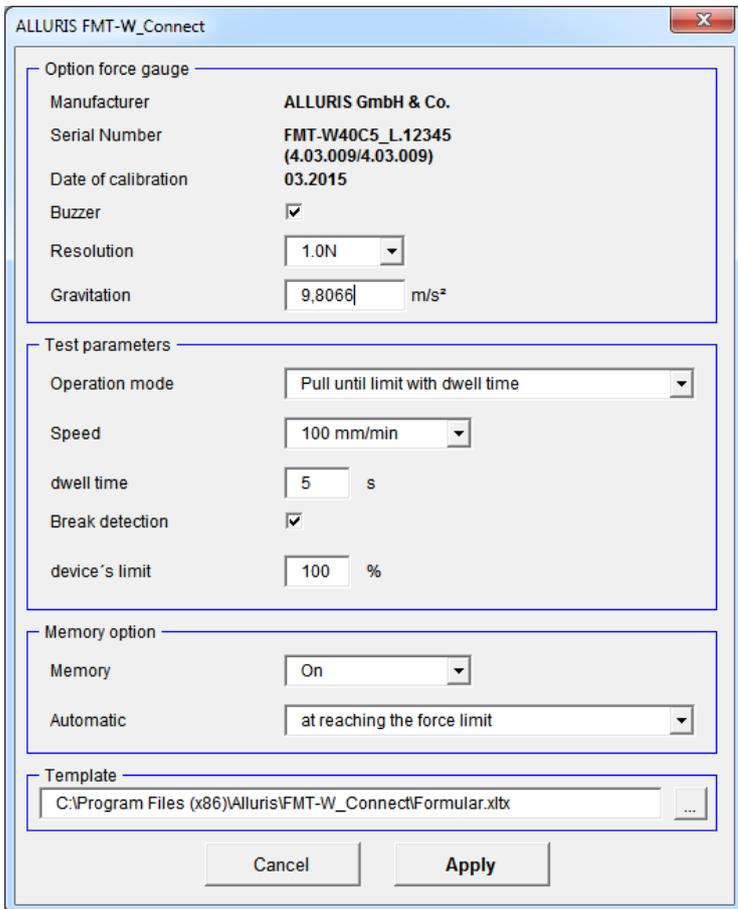
By clicking the button [Option Force Gauge] you access a table for general settings of the pull tester.

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 a specific standard. According to the chosen standard a table will open with cable dimensions. The field Limit shows the minimum tensile strength required according to the chosen standard and cable dimensions. By selecting the option >User defined< in the field Standard you may set the limit manually in the field Limit.

You may enter manually an individual description of the the standard in the field Standard below.

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



Option force gauge

Select the resolution of the force measurement and switch on and off the buzzer function. If you want to change the gravitation to your local environment you influence 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 settled value and if you work in other than international standard units [N].

Test parameters (FMT-W40 only)

The motorized pull tester FMT-W40 can be utilized for destructive and non-destructive testing. For non-destructive testing choose the option "Pull to force limit" in the box Operation mode.

Select the desired pull speed and set a dwell time in order to stop the drive after exceeding the limit set. The drive will start again the chosen programm after this period of time.

You may switch on and off the automatic break detection (see chapter 3.6).

You may set a limit superior to the selected standard in the box Device's limit. If you set e. g. 120 % with a standard requiring 30 N the instrument is parametrized to 36 N. This allows pulling further while testing than the limit set, to compensate for a relaxing of the test object. The test report refers to the limit of 30 N set by the standard.

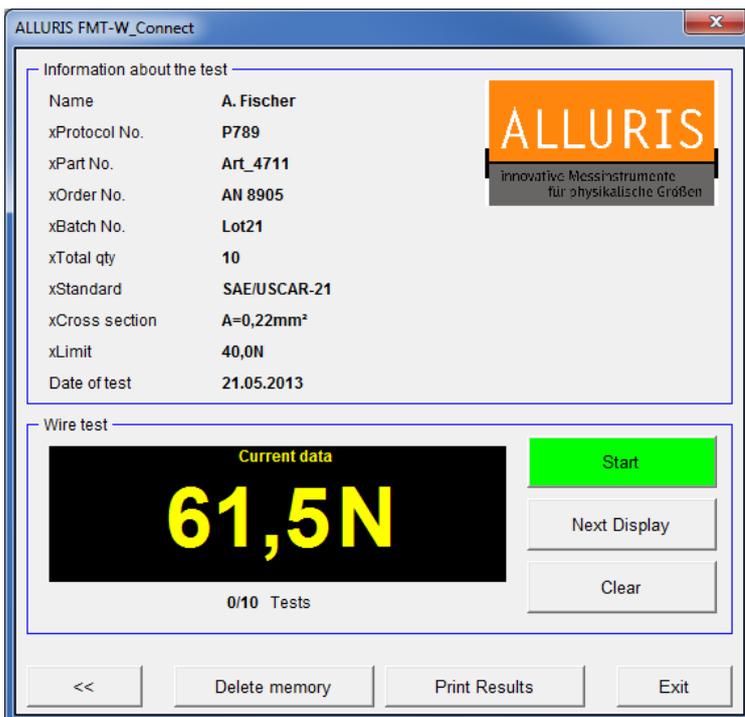
Memory option (FMT-W40 only)

The motorized pull tester FMT-W40 can memorize the captured measuring values automatically. Select the desired mode/time of memorizing the data:

- reaching the force limit
- end of dwell time
- tensile force at the moment the cable joint tears
- start of returning the roller cam

Template

Select the directory for the template to generate a test report. This template will be opened when starting the FMT-W_Connect automatically.



Start the test procedure as described before. The software registers the measuring results each time you press the **S-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 [Exit] closes the program.

With the [<<]-key you may return to the previous window.

5.4 Save and printout measuring protocol

Test report

Company	Company Alluris GmbH & Co. KG Basler Straße 65 79100 Freiburg Germany		
Test person	AxF		
Test instrument	Type/Model Manufacturer Serial No. Last calibration date	FMT-W40C5 ALLURIS GmbH & Co. KG L.12345 05.2014	
Test	Date xStandard Speed	17.06.2014 IEC 60352-2 200 mm/min	
Test data	xProtocol No. xPart No. xOrder No. xBatch No. xTotal qty xCross section xLimit	P789 Art_4711 AA90 L41 4 A=0,22mm ² 28,0N	
Results	Number of tests OK NG Maximum Minimum Average Deviation	4 3 1 50,0N 23,5N 38,8N 99,999	100,00% (total quantity) 75,00% (Series of test) 25,00% (Series of test)

Test results details

1	50,0N	
2	38,0N	
3	23,5N	NG
4	43,5N	

The test report is generated as PDF file and saved automatically in the folder C:\Alluris\FMT-W_Connect\“Serialnumber of device“\“Date“\.

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

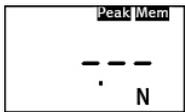
Fields with gray background are filled by the data entered in FMT-W_Connect and the data of the testing equipment.

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.

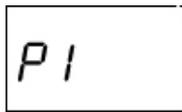
Each single test result is listed at the end of the report.

6. General settings (P1), Setting of memory (P2) and reset works defaults (Po)

To customize the instrument to the application, some of the factory settings (defaults) can be changed. These adjustments will be saved in the microprocessor and be recalled when you switch on the force gauge the next time. In order to change the setting you press the **S-Button** for approx. 2 second until the code P1 is displayed. Press the **I-Button** to choose the submenu.



S



o



I

N
kg
lb

In menu P11 you can select the measuring unit by pressing the **I-Button**. The chosen unit flashes in the display. Default setting is the SI-dimension **Newton (N)**. Pressing the **o-Button** you change to the next submenu.

With a short press on the **S-Button** you return to the main setting menu.

o



I

1
2
3
5
10

The load cell captured the force with a rate of 3,6kHz. The display update is limited to **10Hz** in order to make the display readable. You may reduce this rate by selecting an appropriate value with the **I-Button**. Pressing the **o-Button** you change to the next submenu.

With a short press on the **S-Button** you return to the main setting menu.

o



I

5
10
20
30

The measurement will be stopped automatically if no new force values are captured for **5 seconds**. You may change this period by pressing the **I-Button**. Pressing the **o-Button** you change to the next submenu. (Applies for FMT-W30 only)

With a short press on the **S-Button** you return to the main setting menu.

o



I

1/2
3/5
10
30
60
90

If you operate the pull tester with the USB port not connected and if you are not in setting modes, the device turns off automatically after **5 minutes** without any button being pressed. You may change this period by pressing the **I-Button**. Pressing the **o-Button** you change to the next submenu. (Applies for FMT-W30 only)

With a short press on the **S-Button** you return to the main setting menu..

o



I

1
0

The pull tester tares and resets the PEAK automatically with start of each measurement in order to eliminate any influences by change of the material and temperature. In some cases it might be useful to deactivate this functionality by pressing the **I-Button** to Select **o=AutoTare OFF**. Pressing the **o-Button** you change to the next submenu.

With a short press on the **S-Button** you return to the main setting menu.

o



I

1
0

If the limit comparator is activated a buzzer signalizes with an interrupted or permanent peep, whether the limit is not reached or exceeded (with FMT-W30 the USB-port has to be connected). You may switch **OFF=0** the buzzer, although the limit comparator is active by pressing the **I-Button**. Pressing the **o-Button** you return to the first submenu.

With a short press on the **S-Button** you return to the main setting menu.

o



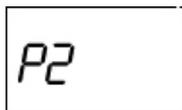
I

1
0

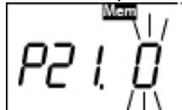
FMT-W40 only:
By pressing the **I-Button** an automatic break detection can be switched on and off (see chapter 3.6).

With a short press on the **S-Button** you return to the main setting menu.

I



o

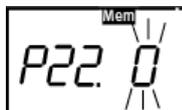


I

1
0

The function code P2 can be selected in order to switch the memory and statistic function **ON=1** and **OFF=0**.

o



I

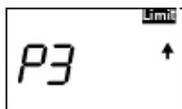
0
1
2
3

The submenu P22 configures the automatic memory function for the motorized pull tester.

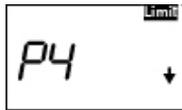
0 = Disable automatic memory function
1 = Save measuring value when reaching the limit.
2 = Save measuring value at end of dwell time
3 = Save peak value

With a short press on the **S-Button** you return to the main setting menu.

I

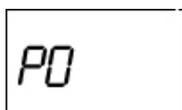


I



The setting menus P3 and P4 are used for limit comparator functions. (see chap. 4.1)

I



o

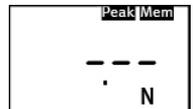


I

0
1

To return to the originally works defaults select the setting menu Po. Press the **o-Button**, the display shows P01 and a flashing o. Press now the **I-Button**, until "1" is flashing. Confirm by pressing the **S-Button** that all changed setting should be reseted to the original defaults. The display shows now **RESET**. To reconfirm that the μ Processor is reseted. Leave the setting mode with a long press of the **S-Button**.

With a long press on the **S-Button** (>2 seconds) you leave the setting menu and return to the main operating menu.



7. Technical data

		<i>FMT-W30C5</i>	<i>FMT-W30K1</i>	<i>FMT-W40C5</i>	<i>FMT-W40K1</i>
Measuring Range	Range in Newton (N)	0...500 N	0...1000 N	0...500 N	0...1000 N
	<i>Alternative units</i>	N kg lb			
Wire Diameter	<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 variable)			
	<i>Dia. Range IEC 60352-2</i>	0,05 ... 4 mm ² (AWG10...30)	0,05 ... 6 mm ² (AWG8...30)	0,05 ... 4 mm ² (AWG10...30)	0,05 ... 6 mm ² (AWG8...30)
	<i>Dia. Range SAE AS7928 II</i>	AWG 14 ... 28	AWG 10 ... 28	AWG 14 ... 28	AWG 10 ... 28
Resolution		0,5N (0,05kg / 0,1lb)	1 N (0,1kg / 0,2lb) 0,5 N (0,05kg / 0,1lb)*	0,5 N (0,05kg / 0,1lb)	1 N (0,1kg / 0,2lb) 0,5 N (0,05kg / 0,1lb)*
Accuracy	<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)			
Betriebsarten	<i>Standard</i>	displays real time value in N kg lb			
	<i>PEAK</i>	displays peak value in N kg lb (selectable)			
	<i>Pulls until break</i>				Yes
	<i>Pull test with dwell time</i>				Yes)*
	<i>Pull-Release (until force limit)</i>				Yes)*
Pull Speed	<i>Speed</i>	10 25 50 100 150 200 mm/min)*			
	<i>Accuracy</i>	+/- 5%			
Overload	<i>max. admissible</i>	200 % (F.S.) alarm at 120% (F.S.)			
Display	<i>Type</i>	LCD, 5-digit, 12mm high			
	<i>Update (Standard)</i>	1000 msec 500 msec 333 msec 200 msec 100 msec 50 msec (selectable)			
	<i>Update (Peak)</i>	ca. 1 msec			
Memory	<i>Manual memory</i>	Capacity of 1000 test cycles Statistics with display of average, maximum, minimum and standard deviation			
	<i>Auto memory</i>				Yes)*
Power supply	<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	
Interface	<i>USB 2.0</i>	Optional software FMT-W_Connect			
Temperature range	<i>Operation</i>	5°...40° C		5°... 30° C	
	<i>Storage</i>	-20°... 60° C (rF < 80%)			
Protection code		IP 40			
Weight		app. 14 kg			
Dimensions	<i>LxWxH (without lever)</i>	350x160x75 mm		320 x 160 x 115 mm	
Housing material		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.	

)* function or setting requires software FMT-W_Connect

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@alluris.de).

8.1 5-Years extended warranty

We grant for all Alluris force gauges a 5 years extended warranty period starting with the date of purchase, subject to the registration of the device before it is taken into operation and the service and calibration at regular intervals in our calibration laboratory. Consumption material, normal wear and tear as well as damages caused by improper use are excluded from this warranty. Apart from that the warranty clause of our general conditions of sales and delivery are valid.

8.2 Register for updates

In order to receive information about product changes and updates and to enjoy full warranty, please register your product at www.alluris.de/service.php.

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 because the display shows 0,0 after the break!	You may have changed the mode from PEAK measurement with dragging function to steady update of the actual value (PEAK symbol disappears). Delete the memory by pressing the o-Button and change the mode back to PEAK with dragging function by pressing the S-Button until the PEAK symbol shows up.
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 l-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 setted.
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 setted 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 (Exchangable terminal fixtures)



The scope of supply comprises a standard terminal adapter, premounted 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.No.: 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



Adapter for ring terminals. Turntable with 8 pins
(D=2|3|4|5|6|8|10|12mm).

Part.No.: FMT-956

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.): FMT-W30C5 | FMT-W30K1 | FMT-W40C5 | FMT-W40K1

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 die motorisierten Typen FMT-W40xx bestätigen wir zusätzlich die Konformität des Produktes mit der EU-Maschinenrichtlinie 2006/42/EG.

For the motorized version types FMT-W40Kxx 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

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.

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), Juli 2012



Alluris GmbH & Co. KG
Basler Strasse 65
DE 79100 Freiburg - Germany

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 Gewichtssätze 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).

Alluris GmbH & Co. KG

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ALLURIS

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für physikalische Größen

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