

OmegaGT XA MI 3360 Instruction manual Ver. 1.8. 10, Code no. 20 752 658



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Manufacturer:

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i. About the instruction manual

- This Instruction manual contains detailed information on the OmegaGT XA, its key features, functionalities and use.
- It is intended for technically qualified personnel responsible for the product and its use.
- Please note that LCD screenshots in this document may differ from the actual instrument screens in details due to firmware variations and modifications.
- We reserve the right to make technical modifications without notice as part of the further development of the product.

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1 General description

1.1 Warnings and notes



1.1.1 Safety warnings

In order to reach high level of operator safety while carrying out various measurements using the OmegaGT XA instrument, as well as to keep the test equipment undamaged, it is necessary to consider the following general warnings:

- Read this user manual carefully, otherwise use of the instrument may be dangerous for the operator, for the instrument or for the equipment under test!
- Consider warning markings on the instrument!
- If the test equipment is used in manner not specified in this user manual the protection provided by the equipment may be impaired!
- Do not use the instrument and accessories if any damage is noticed!
- Regularly check the instrument and accessories for correct functioning to avoid hazard that could occur from misleading results.
- Consider all generally known precautions in order to avoid risk of electric shock while dealing with hazardous voltages!
- Use only standard or optional test accessories supplied by your distributor!
- Only test equipment provided or approved by Metrel should be connected to 3-PHASE ADAPTER connector.
- Do not connect external voltage to CLAMP inputs. It is intended only for connection of Clamps approved by Metrel.
- Use only earthed mains outlets to supply the instrument!
- If working on other than 230 V TN/TT voltage systems refer to chapter 1.2.1 230 V / 110 V operation.
- In case a fuse has blown refer to chapter 8.2 Fuses to replace it!
- Calibration, adjustment and repairing of the instrument is allowed to be carried out only by a competent authorized person!
- Metrel Auto Sequences® are designed as guidance to tests in order to significantly reduce testing time, improve work scope and increase traceability of the tests performed. METREL assumes no responsibility for any Auto Sequence® by any means. It is the user's responsibility, to check adequacy for the purpose of use of the selected Auto Sequence®. This includes type and number of tests, sequence flow, test parameters and limits.

1.1.2 Warnings related to safety of measurement functions

1.1.2.1 Flash HV

A voltage of up to 3 kV_{AC} between FLASH and mains socket LN terminals / 1.5 kV_{AC} between main socket's LN and PE socket terminals / 1.5 kV_{AC} between FLASH and mains socket PE terminal is applied to the instrument's outputs during the test. Although the current of the HV source is limited to safe level special safety consideration must be taken when performing this test!

1.1.2.2 Differential leak., Ipe leak., Touch leak., Ileak (W-PE), Primary leak., Power, Leak's & Power, Equipment leak., Applied part leak.

Load currents higher than 10 A can result in high temperatures of fuse holders! It is advisable not to run tested devices with load currents above 10 A for more than 15 minutes. Recovery period for cooling is required before proceeding with tests! Maximum intermittent duty cycle for measurements with load currents higher than 10 A is 50 %.

1.1.2.3 Insulation resistance

Do not touch the test object during the measurement or before it is fully discharged! Risk of electric shock!

1.1.3 Markings on the instrument

- Read the Instruction manual with special care to safety operation«. The symbol requires an action!
- Dangerous high voltage is present on terminals during the test. Consider all precautions in order to avoid risk of electric shock.
- **C E** Mark on your equipment certifies that this equipment meets requirements of all subjected EU regulations.



This equipment should be recycled as electronic waste.

1.2 Power management

1.2.1 230 V / 110 V operation

The instrument works on 110 V and 230 V mains. 110 V and 230 V appliances can be fully tested, except if testing 110 V appliances in IT or CT supply system; see *Appendix F* for limitations.

In UK and Aus/Nz models only 110 V mains voltage will be applied to the mains test socket if the 110 V test adapter (A 1474) is connected to the instrument.

1.2.2 Battery and charging, auto power off

The instrument has an in-built rechargeable battery pack. The battery is charged whenever the instrument is connected to the mains. When the instrument is disconnected from mains, the battery provides power to the instrument to stay energized for 1 minute. This is indicated by the battery symbol in the upper right corner of the LCD. Operation with the instrument is not possible except the mains was disconnected during the RCD test. As long as the instrument is energized it will be ready to use immediately after connected to mains voltage again. This enables faster testing of appliances.

If the instrument is not reconnected to mains within 1 minute it will completely switch off. When connected to mains again, a normal power up procedure will be taken.



Figure 1.1: Indication of battery status

Notes:

- A flat or faulty battery will result in an immediate power off after the instrument is disconnected from the mains.
- Charging time of the battery is about 14 h.

1.2.3 Power Off, Restart

Instrument is powered by battery:

when pressing the ESC key for ca 5 s the instrument will switch off. Instrument is connected to mains:

• when pressing the ESC key for ca 5 s the instrument will restart.

1.3 Standards applied

The OmegaGT XA instrument is manufactured and tested according to the following regulations, listed below.

Electromagnetic compatibility (EMC)

EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC
	requirements – Part 1: General requirements
	Class B (Portable equipment used in controlled EM environments)

Safety (LVD)

EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements
EN 61010-2-030	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-030: Particular requirements for testing and measuring circuits
EN 61010-031	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test
EN 61010-2-032	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-032: Particular requirements for hand-held and hand-manipulated current sensors for electrical test and measurement
EN 61557	Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Equipment for testing, measuring or monitoring of protective measures Instrument complies with all relevant parts of EN 61557 standards.

Functionality

Code of Practice	Household and similar electrical appliances
	Inspection after repair, modification of electrical appliances - Periodic
	inspection on electrical appliances
VDE 0701-702	General requirements for electrical safety
IEC/EN 60974-4	Arc welding equipment – Part 4: Periodic inspection and testing
	Medical electrical equipment - Recurrent test and test after repair of
IEC/EN 62353	medical electrical equipment
AS/NZS 3760	In-service safety inspection and testing of electrical equipment
NEN 3140	Operation of electrical installations – Low voltage

2 Instrument set and accessories

2.1 Standard set of the instrument

- Instrument MI 3360 OmegaGT XA
- Bag for accessories
- Flash test probe (MI 3360 F only)
- IEC test cable 3 x 1.5 mm², 2 m
- Test lead (black)
- Test tip (black)
- Alligator clip (black)
- Mains cable, 3 x 1.5 mm², 2 m
- USB cable
- Calibration Certificate
- Short form instruction manual
- CD with instruction manual (full version) and PC SW Metrel ES Manager

2.2 Optional accessories

See the attached sheet for a list of optional accessories that are available on request from your distributor.

3 Instrument description

3.1 Front panel



Figure 3.2: Front panel

1	Mains supply connector
2	F1, F2 fuses (T 16 A / 250 V)
3	Clamp inputs
4	Barcode scanner and RFID / NFC reader / writer device serial port
5	PC / Printer serial port
6	Fuse checker
7	MicroSD card slot
8	USB communication port
9	Escape key / reset key
10	Keypad
11	TAB key
12	Shortcut keys
13	Mains test socket
14	Data connection 3 phase adapter
15	PE connector
16	IEC test connector
17	P/S (probe) connector,
	P/AP (probe / applied part) connector
18	FLASH output connector
19	LN connector
20	Colour TFT display with touch screen

4 Instrument operation

The instrument can be manipulated via a keypad or touch screen.

4.1 General meaning of keys

	Cursor keys are used to: - select appropriate option
×	RUN key is used to: - confirm selected option - start and stop measurements
ESC	Escape key is used to: return to previous menu without changes abort measurements reset instrument (long press >5 sec) switch OFF instrument from standby mode (long press >5 sec)
ТАВ	Option key is used to: - expand column in control panel - show detailed view of options
	Shortcut keys for immediate access to the Memory Organizer, Auto Sequences® menu and Single Tests menu.

4.2 General meaning of touch gestures

R	 Tap (briefly touch surface with fingertip) is used to: select appropriate option confirm selected option start and stop measurements
Sec.)	 Swipe (press, move, lift) up/ down is used to: scroll content in same level navigate between views in same level
Pro long	Long press (touch surface with fingertip for at least 1 s) is used to: - select additional keys (virtual keyboard) - enter cross selector from single test screens
	 Tap Escape icon is used to: return to previous menu without changes; abort / stop measurements

4.3 Virtual keyboard

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Name Obiec	: t							
Q T	2 W	3 E	⁴ R	s T	6 Y	⁷ U	i c	0 0 P
Å	S	Ď	F	Ĝ	Ĥ	Ĵ	° K	Ĺ
shift	z	×	Ċ	v) B	Ň	Å	-
♪ e	ng	;				:	12#	4

Figure 4.1: Virtual keyboard

Options:

shift	Toggle case between lowercase and uppercase. Active only when alphabetic characters' keyboard layout selected.
←	Backspace Clears last character or all characters if selected. (If held for 2 s, all characters are selected).
\mathbf{L}	Enter confirms new text.
12#	Activates numeric / symbols layout.
ABC	Activates alphabetic characters.
eng	English keyboard layout.
GR	Greek keyboard layout.
RU	Russian keyboard layout.
↓	Returns to the previous menu without changes.

4.4 Safety checks

At start up and during operation the instrument performs various safety checks to ensure safety and to prevent any damage. These safety pre-tests are checking for:

- Correct input mains voltage
- Presence of input PE connection,

- Any external voltage against earth on mains test socket
- Excessive leakage currents through measuring I/O's,
- Too low resistance between L and N of tested device,
- Proper operation of safety relevant internal electronic circuits

If a safety check fails, an appropriate warning message will be displayed and safety measures will be taken. The warnings and safety measures are described in chapter 4.5 Symbols and messages.

4.5 Symbols and messages

Warning!		Supply voltage warning	
Instrument is connect earthing / centre tapp or PE is not connected Some measurements	nected to an IT	Possible causes:	
	cted. its will not be	 No earth connection. 	
available. Would you like to proceed? YES NO		 Instrument is connected to an IT earthing system. Press YES to continue normally or NO to continue in a limited mode (measurements are disabled). 	
		Warning:	
	The instrument must be earthed properly to wo safely!		
Warn	ing!	Resistance L-N > 30 kΩ	
Resistance L–N is k0hm). Check fus Would you like to	s too high(>30 e / switch. proceed?	In pre-test a high input resistance was measured. Possible causes:	
YES	NO	 Device under test is not connected or switched on 	
		 Input fuse of device under test is blown. 	
		Select YES to proceed with or NO to cancel measurement.	
Warning!		Resistance L-N < 10 Ω	
Resistance L—N is very low (<10 Ohm). Would you like to proceed? YES NO		In pre-test a very low resistance of the device under test supply input was measured. This can result in a high current after applying power to the device under test. If the too high current is only of short duration (caused by a short inrush current) the test can be performed otherwise not.	
		Select YES to proceed with or NO to cancel measurement	
War	ning!	Resistance L-N < 30 Ω	
Resistance L-N i Would you like to	s low (<30 Ohm). 9 proceed?	In pre-test a low input resistance of the device under test was measured. This can result in a high current	
YES	NO	arter applying power to the device. If the high current is only of short duration (caused by a short inrush current)	

the test can be performed, otherwise not.

	Select YES to proceed with or NO to cancel measurement.	
Warning! LN crossed! Fix and press yes to retry.	Warning for proper connection in some PRCD measurements. Connection of PRCD's plug must be changed in order to proceed.	
YES NO	Select YES to retry after reconnection with or NO to cancel measurement.	
Improper input voltage Check mains voltage and PE connection!	Warning for improper supply voltage condition. If pressing OK instrument will continue to work in a limited mode (measurements are disabled).	
ок		
Error External voltage on P – PE is too high!	In pre-test a too high external voltage was detected between P and PE terminals. The measurement was cancelled. Press OK to continue.	
Error External voltage on socket PE is too high!	In pre-test a too high external voltage was detected between LN and PE terminals. The measurement was cancelled. Press OK to continue.	
ок		
ок Error Unom differs from Umain	The set Unom differs too much from the measured mains voltage. Parameter or mains voltage must be changed.	
ок Error Unom differs from Umain OK	The set Unom differs too much from the measured mains voltage. Parameter or mains voltage must be changed.	
ок Error Unom differs from Umain OK Warning! Leakage is high(>3.5 mA). Would you like to proceed?	The set Unom differs too much from the measured mains voltage. Parameter or mains voltage must be changed.	
ок Error Unom differs from Umain OK Warning! Leakage is high(>3.5 mA). Would you like to proceed? YES NO	The set Unom differs too much from the measured mains voltage. Parameter or mains voltage must be changed.	
OK Error Unom differs from Umain OK OK Warning! Leakage is high(>3.5 mA). Would you like to proceed? YES NO Error Measurment stopped because of too high leakage current. OK	The set Unom differs too much from the measured mains voltage. Parameter or mains voltage must be changed. In pre-test a possible high leakage current was detected. It is likely that a dangerous leakage current (higher than 3.5 mA) will flow after applying power to the device under test. Select YES to proceed with or NO to cancel measurement. The measured leakage (Idiff, Ipe, Itouch) current was higher than 20 mA. Measurement was aborted. Press OK to continue.	

Error I load is too high (>16 A)! OK	The load current higher than 16 A is detected. Measurement is aborted. Press OK to continue.
Error I load is too high (>10 A)! OK	The average load current higher than 10 A over the last 5 min test interval is detected. Measurement is stopped. Recovery period for cooling is required before proceeding with tests! Press OK to continue.
Error Active polarity pretest failed! OK	The polarity pre-test of the cable / PRCD has failed. Press OK to continue.
Error 115 V adapter must not be connected when instrument is connected to 230 V power supply. OK	Instrument prohibits the test because 115 V adapter is connected to the instrument and the instrument is powered with 230 V.
	The instrument is overheated. The measurement can't be carried out until the icon disappears. Press OK to continue.
-0-0-	The device under test should be switched on (to ensure that the complete circuit is tested).
SU	In case of simultaneously measuring of Riso, Riso-S or Isub, Isub-S. If the voltage has dropped because of one measurement the other measurement is also compromised.
	Red dot indicates phase of measurement where higher leakage was measured. Applicable only if phase reversal is enabled during the measurement.
	Warning ! A high voltage is / will be present on the instrument output! (Withstanding test voltage, Insulation test voltage, or mains voltage).

L	Warning!		
4	A very high voltage is / will be present on the instrument output! (Flash test voltage).		
CAL	Test leads resistance in Continuity / Protective Earth measurement is not compensated.		
CAL	Test leads resistance in Continuity / Protective Earth measurement is compensated.		
3ph	Measurement can't be started. 3 phase adapter should be disconnected from the instrument.		
3ph	Measurement in combination with appropriate 3 phase adapter can be carried out.		
3ph	The measurement can be carried out only in combination with appropriate 3 phase adapter.		
\checkmark	Test passed.		
×	Test failed.		
	Conditions on the input terminals allow starting the measurement; consider other displayed warnings and messages.		
	Conditions on the input terminals do not allow starting the measurement, consider displayed warnings and messages.		
	Stop the measurement.		
*	Bluetooth communication inactive.		
*	Bluetooth communication active.		

4.6 Instrument main menu

Main Menu	03:23
· D	1
Single Tests	Memory Organizer
··· >>	≣∰
Auto Sequences®	General Settings

From the instrument Main Menu different main operation menus can be selected.

Figure 4.2: Main menu

Options

Single Tests	Single Tests Menu with single tests, see chapter 6 Single tests.
Auto Sequences®	Auto Sequences® Menu with customized test sequences, see chapter 7 <i>Auto</i> <i>Sequences</i> ®.
Memory Organizer	Memory Organizer Menu for working with and documentation of test data, see chapter 5 <i>Memory Organizer</i> .
⊟ coor General Settings	General Settings Menu for setup of the instrument, see chapter <i>4.7 General settings</i> .

4.7 General settings

In the General Settings menu general parameters and settings of the instrument can be viewed or set.



Figure 4.3: Setup menu

Options in General Settings menu

CO	Language
Language	Instrument language selection.
Date / Time	Date / Time Instruments Date and time.
₩orkspace Manager	Workspace Manager Manipulation with project files. Refer to chapter <i>4.10 Workspace Manager</i> for more information.
Est Auto Seq. groups	Auto Sequence® groups Manipulation with lists of Auto Sequences®. Refer to chapter <i>4.11 Auto</i> Sequence® groups for more information.
User accounts	User accounts User account settings.
OOO	Profiles
Profiles	Selection of available instrument profiles.
ें	Settings
Settings	Setting of different system / measuring parameters.
ेंट्रे	Devices
Devices	Setting of external devices.
호 스	Initial Settings
Initial Settings	Factory settings.
i	About
About	Basic instrument data.

4.7.1 Language

In this menu the language of the instrument can be set.



Figure 4.4: Select language menu

4.7.2 Date and time

In this menu date and time of the instrument can be set.

_	🗅 Date	e/Time			02:1	2
	1	Dec	2014	10	32	
	^	^	^	^	^	
	\sim	\sim	\sim	\sim	\sim	
		Set		Cancel		

Figure 4.5: Setting data and time menu

4.7.3 Profiles

Refer to Chapter 4.9 Instrument profiles for more information.

4.7.4 Workspace Manager

Refer to Chapter 4.10 Workspace Manager for more information.

4.7.5 Auto Sequence® groups

Refer to Chapter 4.11 Auto Sequence® groups for more information.

4.7.6 Settings



Figure 4.6: Settings menu

Setting options:

	Description	
Touch screen	ON – touch screen is active.	
	OFF – touch screen is deactivated.	
Keys & touch sound	ON – sound is active.	
	OFF – sound is deactivated.	
Equipment ID	Increment – offered ID will be incremented +1.	
	Replicate – offered ID will be the same as last used.	
	Blank – equipment ID will not be offered.	
Equipment name	Replicate – offered name will be the same as last used.	
	Blank – equipment name will not be offered.	
Retest period	Replicate – offered retest period will be the same as last used.	
	Blank- retest period will not be offered.	
Unom	Nominal Line to earth voltage [100 V, 110 V, 120 V, 220 V, 230 V or 240	
	V] (is used for normalization of leakage current results if testing medical equipment).	
RCD Standard	Selection of appropriate standard for RCD tests.	
PRCD Standard	Selection of appropriate standard for PRCD tests.	
Ch_1 clamp type	Setting of current clamp type.	
Result	In case the measurement consists of multiple measurements taken successively, the worst or the last result can be displayed at the end.	
	Worst – the worst result will be displayed at the end of test.	
	Last – last result will be displayed at the end of test.	
	Notes:	
	 In general the worst result(s) of the main result is considered. 	
	Sub-result(s) taken at the same time as the worst case of the main result are displayed	
	 In the function Leak's & Power the worst case of Idiff and I touch 	
	are considered. The Power result measured at the time of worst	

	 Idiff is displayed. In the function Riso, Riso-S the worst case of Riso and Riso-S are considered. The Um result measured at the time of worst Riso is displayed. For the Power measurement the last result is considered regardless of the Result setting. 		
Test mode	Standard – Visual and Functional inspection status fields should be set manually.		
	Expert – All Visual and Functional inspection status fields are filled automatically with PASS status.		
Auto seq. flow	Ends if fail – Auto Sequence will end after first fail status of measurement / inspection is detected. Proceeding tests will be skipped. Proceeds if fail – Auto Sequence will proceed even if fail status of		
	measurement / inspection is detected.		
Device (adapter)	Selection and enabling of external device (adapter) [A1322/A1422, A1694]		
Ext. Keyboard	ON – enable external BT keyboard. (See A 1578 manual for details.) OFF – external BT keyboard is disabled.		
Limit Uc	Conventional touch voltage limit [25 V, 50 V]		

4.7.7 Initial Settings

In this menu internal Bluetooth module can be initialized and the instrument settings, measurement parameters and limits can be set to initial (factory) values.

Initial Settings	17:15		
- Bluetooth module will be initialized. - Instrument settings, measurement parameters and limits will reset to default values. - Memory data will stay intact.			
ок	Cancel		

Figure 4.7: Initial settings menu

Warning!

Following customized settings will be lost when setting the instruments to initial settings:

- Measurement limits and parameters
- · Global parameters, System settings and Devices in General settings menu
- · Opened Workspace and Auto Sequence® group will be deselected.
- User will be signed out.

Note:

Following customized settings will stay:

Profile settings

- Data in memory (Data in Memory organizer, Workspaces, Auto Sequence® groups and Auto Sequences®)
- User accounts

4.7.8 About

In this menu instrument data (name, serial number, FW and HW version and date of calibration) can be viewed.

About	14:14
Name	MI 3360 OmegaPAT XA
S/N	12344321
FW version	0.14.0.6774 - AOAA
HW version	1.0
Date of calibration	19.Jul.2016
(C) Metrel d.d., 2016, http://www.metrel.si	



Note:

• Adapter info is also displayed if connected.

4.7.9 User Accounts

The demand to sign in can prevent from unauthorized persons to work with the instrument. In this menu user accounts can be managed:

- Setting if signing in to work with the instrument is required or not.
- Adding and deleting new users, setting their user names and passwords.

The user accounts can be managed by the administrator.

Factory set administrator password: ADMIN

It is recommended to change factory set administrator password after first use. If the custom password is forgotten the second administrator password can be used. This password always unlocks the Account manager and is delivered with the instrument.

If a user account is set and the user is signed in the user's name will be stored in memory for each measurement.

Individual users can change their passwords.

4.7.9.1 Signing in

If signing in is demanded the user must enter the password in order to work with the instrument.



Figure 4.9: Sign in menu

Options

User signing in



The user should be selected first. The last used user is displayed in the first row.



Goes to Password entry menu.

To sign in, the selected user password must be entered and confirmed.

The user password consists of a up to 4 digit number.

Administrator signing in



Enters Account manager menu.

The administrator password must be entered and confirmed first.

Administrator password consists of letters and/or numbers. Letters are case sensitive.

4.7.9.2 Changing user password, signing out



Figure 4.10: User profile menu

Options	
<	Signs out the set user.
	Enters procedure for changing the user's password.
* 11:24 New password	The actual password must be entered first followed by the new password.
1 2 3 4 5 6 7 8 9 ← 0 ←	
8	Enters the Account manager menu.
16:56 Password ADMIN	The Account manager menu is accessed by selecting Account Manager in Sign in menu or User profile menu. The administrator password must be entered and confirmed first.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	The factory set default administrator password is: ADMIN

4.7.9.3 Managing accounts

anagei	r		07:33
<	YES		Ø
	NO	>	
			•••
		anager X YES NO	anager VES NO

Figure 4.11: Account manager menu

Options	
Sign in required Every reboot NO >	Field for setting if signing in is required to work with the instrument.
	Field for setting if signing is required once or at each power on of the instrument.
	Enters procedure for changing the administrator password.
▲ \$ 11:24 New password	
1 2 3 4 5 6 7 8 9	
	The actual password must be entered first followed by the new password.
	Enters menu for editing user accounts.



Figure 4.12: Edit accounts menu

Options	
+	Opens the window for adding a new user account.
Add New Username PETER Password 1000 Add Cancel	In the Add New window the name and initial password of the new user account are to be set. 'Add' confirms the new user account.
	Changes password of the selected user account.
×	Deletes all user accounts. Deletes the selected user account.

4.7.9.4 Setting Black-box password

Black-box password can be set by administrator from the Account manager menu. Set Blackbox password is valid for all users. Default Black-box password is empty (disabled).

Options



Add or edit Black-box password. Enter to modify.

Ð								01:40
lackho	y nas	sswor	Ч					
BLAC	KB	ΟX	vi -					
Q N	2 N	³ E	Å R	Ť	β Υ	Ū	ŝ	D P
Å	ŝ	# D	F	Ğ	Å	Ĵ	Ř	Ĺ
shift	ż	×	Ċ	Ý	B	Ň	M	-
1	2#	;				:	eng	



Keyboard for entering new Black-box password is opened. Empty string disables password. Confirm entry.

Black-box password is changed.

4.8 Devices

In this menu operation with external devices is configured.

Devices			Devices			15:19	
Writting device	1	Printer PW 220		Auto save		On print	>
, the				Tag format		РАТ	>
Port		Bluetooth		Reading device			
Bluetooth device nam	ie	RW220		Туре	<	Socket CHS 7 2D	>
Print labels		50mm x 25.5mm		Port		Bluetooth	
Printed date		Test date	>	Bluetooth device na	me	Socket 7Xi [74FD1E]	

Figure 4.13: Devices settings menu

Writing devices	
Туре	Sets appropriate writing device (Serial printer, Bluetooth printer), RFID writer).
Port	Sets/views communication port of selected writing device.
Bluetooth device name	Goes to menu for pairing with selected Bluetooth device.
Bluetooth dongle	Initializes Bluetooth Dongle.
Print labels	Selects label form size. See Appendix C Print labels and write / read RFID / NFC tags for details.
Printed date	Selects date printed on label text area, Options: [Test date, Retest date]. See Appendix C Print labels and write / read RFID / NFC tags for details.
Auto save	Sets simultaneous saving of finished Auto Sequence when label is printed or RFID / NFC tag is written. Options: [On print, On write, OFF] See chapter <i>7.2.3 Auto Sequence</i> ® <i>result screen</i> for details.
Tag format	Sets PAT tag / label format or generic tag /label format. See Appendix C Print labels and write / read RFID / NFC tags for details.
Tag type	Selects tag type to be printed, Options: [simple, classic, QR]
	See Appendix C Print labels and write / read RFID / NFC tags for details.
Tags	Selects number of tags, Options: [1 tag, 2 tags]
	See Appendix C Print labels and write / read RFID / NFC tags for details.
Reading devices	
Туре	Sets appropriate reading device (QR or barcode scanner, RFID reader, android device via aMESM application).
Port	Sets/views communication port of selected reading device.
Bluetooth device name	Goes to menu for pairing with selected Bluetooth device.

4.9 Instrument profiles

 Profiles
 02:13

 Profiles
 •

 • AOAB - EU
 X

 AOAD - EU
 11

In this menu the instrument profile can be selected from the available ones.

Figure 4.14: Instrument profile menu

The instrument uses different specific system and measuring settings in regard to the scope of work or country it is used. These specific settings are stored in instrument profiles.

By default, each instrument has at least one profile activated. Proper licence keys must be obtained to add more profiles to the instrument.

If different profiles are available, they can be selected in this menu.

Refer to Appendix B Profile Notes for more information about functions specified by profiles.

Loads the selected profile. The instrument will restart automatically with new profile loaded.Image: selected profileEnters option for deleting a profile.Image: selected profileBefore deleting the selected profile, user is asked for confirmation.Image: selected profileImage: selected profile </th <th>••••••</th> <th></th>	••••••	
Enters option for deleting a profile.	•	Loads the selected profile. The instrument will restart automatically with new profile loaded.
Profiles 02:30 Profiles 0 AnAA Warning! C YES NO 411 Before deleting the selected profile, user is asked for confirmation.	×	Enters option for deleting a profile.
	Profiles 02:30 Profiles • • ANAA Warning! Are you sure to delete profile? • YES NO	Before deleting the selected profile, user is asked for confirmation.

Options

4.10 Workspace Manager

The Workspace Manager is intended to manage with different Workspaces and Exports stored on the microSD card.

4.10.1 Workspaces and Exports

The works with OmegaGT XA MI 3360 can be organized with help of Workspaces and Exports. Exports and Workspaces contain all relevant data (measurements, parameters, limits, structure objects) of an individual work.



Figure 4.15: Organization of Workspaces and Exports on microSD card

Workspaces are stored on microSD card on directory WORKSPACES, while Exports are stored on directory EXPORTS. Export files can be read by Metrel applications that run on other devices. Exports are suitable for making backups of important works or can be used for storage of works if the removable microSD card is used as a mass storage device. To work on the instrument an Export should be imported first from the list of Exports and converted to a Workspace. To be stored as Export data a Workspace should be exported first from the list of Workspaces and converted to an Export.

4.10.2 Workspace Manager main menu

🗅 🛛 Workspace Manager 00:02 5 Workspace Manager 06:19 WORKSPACES: **EXPORTS: Grand hotel Union Grand hotel Union** ÷ **Hotel Cubo Hotel Cubo Hotel Slon Hotel Slon** Grand hotel Toplice Grand hotel Toplice 444 444

In Workspace manager Workspaces and Exports are displayed in two separated lists.

Figure 4.16: Workspace manager main menu

Options

	List of Workspaces. Displays a list of Exports.
+	Adds a new Workspace. Refer to Chapter <i>4.10.2.3 Adding a new</i> <i>Workspace</i> for more information.
EXPORTS:	List of Exports.
	Displays a list of Workspaces.

4.10.2.1 Operations with Workspaces

Only one Workspace can be opened in the instrument at the same time. The Workspace selected in the Workspace Manager will be opened in the Memory Organizer.



Figure 4.17: Workspaces menu

Options

-	
•	Marks the opened Workspace in Memory Organizer. Opens the selected Workspace in Memory Organizer. Refer to chapters <i>5 Memory Organizer</i> and <i>4.10.2.4 Opening a Workspace</i> for
	more information.
×	Deletes the selected Workspace. Refer to chapter <i>4.10.2.5 Deleting a Workspace / Export</i> for more information.
+	Adds a new Workspace. Refer to chapter <i>4.10.2.3 Adding a new Workspace</i> for more information.
	Exports a Workspace to an Export. Refer to chapter <i>4.10.2.7 Exporting a Workspace</i> for more information.
	Opens options in control panel / expands column.

4.10.2.2 Operations with Exports



Figure 4.18: Workspace manager File menu

Options

×	Deletes the selected Export. Refer to chapter <i>4.10.2.5 Deleting a Workspace / Export</i> for more information.
	Imports a new Workspace from Export. Refer to chapter <i>4.10.2.6 Importing a Workspace</i> for more information.
	Opens options in control panel / expands column.

4.10.2.3 Adding a new Workspace

1	Workspace Manager 08:10 WORKSPACES: Image: mail of the second se	New workspaces can be added from the Workspace manager screen.
2	+	Enters option for adding new Workspace.
		Keypad for entering name of a new Workspace is displayed after selecting New.



After confirmation a new Workspace is added in the list in Main Workspace Manager menu.

4.10.2.4 Opening a Workspace



4.10.2.5 Deleting a Workspace / Export



Workspace / Export to be deleted should be selected from the list of Workspaces / Exports.

Opened workspace can't be deleted.

2 🗙

Enters option for deleting a Workspace / Export.
	 Workspace Manager WORKSPACES: Gran Warning! Hote Are you sure to delete workspace? Hote YES NO 	09:03 • * *	Before deleting the selected Workspace / Export the user is asked for confirmation.
3	Workspace Manager WORKSPACES: Grand hotel Union Hotel Cubo	09:03 ++	Workspace / Export is removed from the Workspace / Export list.

4.10.2.6 Importing a Workspace

1	Workspace Manager EXPORTS: Grand hotel Union Hotel Cubo Hotel Sion Grand hotel Toplice	06:19 *	Select an Export file to be imported from Workspace Manager Export list.
2			Enters option Import.
	Workspace Manager EXPORTS: Grand hot Import to workspace? Hotel Cub Grand hotel Toplice Hotel Slor YES NO Grand hotel Toplice	06:20 *	Before the import of the selected file the user is asked for confirmation.
3	Workspace Manager WorkSPACES:	00:02 ■↔●	The Imported Export file is added to the list of Workspaces.
	Grand hotel Union	+	Note:
	Hotel Slon Grand hotel Toplice	444	If a Workspace with the same name already exists the name of the imported Workspace will be changed (name_001, name_002, name_003).

4.10.2.7 Exporting a Workspace

1	Workspace Manager 03:50 WORKSPACES: • Grand hotel Union * Hotel Cubo * Hotel Slon * Grand hotel Toplice ************************************	Select a Workspace from Workspace manager list to be exported to an Export file.
2	≥</th <th>Enters option Export.</th>	Enters option Export.
	Workspace Manager 06:22 WORKSPACES: • Gran • Hote Vouwish to export workspace? Hote YES I Grand hotel Toplice •	Before exporting the selected Workspace, the user is asked for confirmation.
3	Workspace Manager 06:22 WORKSPACES: • Grand Workspace exported to folder Hotel C Grand hotel Toplice_001 Hotel S OK • Grand hotel Toplice	Workspace is exported to Export file and is added to the list of Exports. Note: If an Export file with the same name already exists the name of the Export file will be changed (name_001, name_002, name_003,).
	Workspace Manager 06:37 EXPORTS: • Grand hotel Union * Hotel Cubo * Hotel Slon • Grand hotel Toplice • Grand hotel Toplice_001 •	

4.11 Auto Sequence® groups

The Auto Sequences® in OmegaGT XA MI 3360 can be organized by using lists. In a list a group of similar Auto Sequences® is stored. The Auto Sequence® groups menu is intended to manage with different lists of Auto Sequences® that are stored on the microSD card.



Figure 4.19: Organization of Auto Sequences® on microSD card

Folders with lists of Auto Sequences® are stored in *Root__MOS__VAT* on the microSD card.

4.11.1 Auto Sequence® groups menu

In Auto Sequence® groups menu lists of Auto Sequences® are displayed. Only one list can be opened in the instrument at the same time. The list selected in the Auto Sequence® groups menu will be opened in the Auto Sequences® main menu.

🛨 Auto Sequence® groups	10:05
CLASS I	•
CLASS II	×
CLASS III	
	444

Figure 4.20: Auto Sequence® groups menu

4.11.1.1 Operations in Auto Sequence® groups menu

Options	
•	Opens the selected list of Auto Sequences®. Previously selected list of Auto Sequences® will be closed automatically.
	Refer to chapter <i>4.11.1.2 Selecting a list of Auto Sequences</i> ® for more information.
~	Deletes the selected list of Auto Sequences.
	Refer to chapter <i>4.11.1.3 Deleting a list of Auto Sequences</i> ® for more information.
444	Opens options in control panel / expands column.

4.11.1.2 Selecting a list of Auto Sequences®

1	Auto Sequence® groups CLASS I CLASS II CLASS III	10:05 • •	A list of Auto Sequences® can be selected from the Auto Sequence® groups menu.
2	•		Enters option for selecting a list.
	Auto Sequence® groups CLASS I CLASS II CLASS III	10:05 • ×	Selected list of Auto Sequences® is marked with a blue dot.
		414	Previously selected list of Auto Sequences® is closed automatically.

4.11.1.3 Deleting a list of Auto Sequences®

1	Auto Sequence® groups CLASS I CLASS II CLASS III	14:05 • *	A list of Auto Sequences® to be deleted can be selected from the Auto Sequence® groups menu.
2	×		Enters option for deleting a list.
+	 ▲ Auto Sequence® groups CLASS I CLAST CLAST CLAST Are you sure you want to remove this Auto Sequence® group? YES NO 	14:06 • *	Before deleting the selected list of Auto Sequences® the user is asked for confirmation.
3	Auto Sequence® groups CLASS I CLASS III	14:06 • *	A list of Auto Sequences® is removed.

5 Memory Organizer

Memory Organizer is a tool for storing and working with test data.

5.1 Memory Organizer menu

The data is organized in a tree structure with Structure objects and Measurements. OmegaGT XA has a multi-level structure. The hierarchy of Structure objects in the tree is shown on *Figure 5.1*. For a list of available structure objects see *Appendix A Structure objects in OmegaGT XA*.



Figure 5.1: Tree structure and its hierarchy

5.1.1 Measurement statuses

Each measurement has:

- a status (Pass or Fail or no status)
- a name
- results

or

limits and parameters

A measurement can be a Single test or an Auto Sequence. For more information, refer to chapters *6 Single tests* and *7 Auto Sequences*®.

Statuses of Single tests





at least one single test in the Auto sequence passed and no single test failed

at least one single test in the Auto sequence failed



at least one single test in the Auto sequence was carried out and there were no other passed or failed single tests

empty Auto sequence with empty single tests

5.1.2 Structure Objects

Each Structure object has:

- an icon
- a name
- parameters

Optionally they can have:

- > an indication of the status of the measurements under the Structure object
- a comment or a file attached

Structure objects supported are described in Appendix A Structure objects in OmegaGT XA.



Figure 5.2: Structure object in tree menu

5.1.2.1 Measurement status indication under the Structure object

Overall status of measurements under each structure element / sub-element can be seen without spreading tree menu. This feature is useful for quick evaluation of test status and as guidance for measurements.

Options

		🗂 Memory Organizer	22:50
	There are no measurement result(s)	Ironing room	
		Iron SN 12341234	E
		O Continuity	
<u> </u>	under selected structure object.	O R iso	+
	Measurements should be made.	O Differential Leakage	//
		Trouser press SN 23452345	•••
		Figure 5.3: Example of status - N measurement result(s)	No

		Memory Organizer	00:28
		🖃 <u>ល</u> ្ល Ironing room	
	One or more measurement result(s) under selected structure object has	🖃 🔁 ron SN 12341234	20
		Continuity	00:25
	failed. Not all measurements under	R iso	00:26
	made yet.	O Differential Leakage	+
		Trouser press SN 23452345	
		Figure 5.4: Example of stat Measurements not completed result(s)	us - with fail
		스 Memory Organizer	00:29
		Memory Organizer	00:29
	All measurements under selected	Memory Organizer Image: Memory Organizer <td>00:29</td>	00:29
2.	All measurements under selected structure object are completed but one	Memory Organizer Image: Second system Image: Second syst	00:29
	All measurements under selected structure object are completed but one or more measurement result(s) has	Memory Organizer Image: Second system Image: Second syst	00:29
2 •	All measurements under selected structure object are completed but one or more measurement result(s) has failed.	Memory Organizer Image: Second system Image: Second syst	00:29
a •	All measurements under selected structure object are completed but one or more measurement result(s) has failed.	Memory Organizer Memory Organizer Image: Second state of the	00:29 00:25 00:25 00:26 00:29 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 00:4 0

Note:

 There is no status indication if all measurement results under each structure element / sub-element have passed or if there is an empty structure element / sub-element (without measurements).

5.1.3 Selecting an active Workspace in Memory Organizer

Memory Organizer and Workspace Manager are interconnected so an active Workspace can be selected also in the Memory Organizer menu.

Procedure



3	Workspace Manager WORKSPACES: Workspace 002 Workspace 001 Workspace 003	02:17 × * *	Choose desired Workspace from a list of Workspaces.
4	•		Use Select button to confirm selection.
5	Memory Organizer Workspace 003 Node	02:18 E 4 0 111	New Workspace is selected and displayed on the screen.

5.1.4 Adding Nodes in Memory Organizer

Structural Elements (Nodes) are used to ease organization of data in the Memory Organizer. One Node is a must; others are optional and can be created or deleted freely.

Proced	lure	
0	▲ Memory Organizer 02:18 Workspace 003 ► ▲ Node ▲ 【11]	Press the active Workspace in Memory Organizer Menu.
2	V	Select Add New Structure Element in Control panel.
3	Add New 14:56 → ≥ Node Create	Press "Create" to confirm.
4	Memory Organizer 02:22 Workspace 003 Image: Constraint of the second se	New Structure Element (Node) is added. Note: To change the name of a Node, see chapter <i>5.1.5.13 Rename a Structure object.</i>

5.1.5 Operations in Tree Menu

In the Memory organizer different actions can be taken with help of the control panel at the right side of the display. Possible actions depend on the selected element in the organizer.

5.1.5.1 Operations on measurements (finished or empty measurements)

The measurement must be selected first. Operation options can be selected from the menu on the right side of the screen. Menu options are adopted to measurement status, empty, finished, finished and saved, as presented on *Figure 5.6*.



Figure 5.6: A measurement is selected in the tree menu

Options

ī	Views results of measurement. The instrument goes to the measurement memory screen. Refer to chapters 6.1.1.5 Single test memory screen and 7.2.4 Auto Sequence® memory screen Auto Sequence® memory screen for more information.
	Starts a new measurement. The instrument goes to the measurement start screen. Refer to chapters 6.1.1.1 Single test start screen and 7.2.1 Auto Sequence® view menu for more information.
	Saves a measurement. Saving of measurement on a position after the selected (empty or finished) measurement.
	Clones the measurement. The selected measurement can be copied as an empty measurement under the same Structure object. Refer to <i>Chapter 5.1.5.7 Clone a measurement</i> for more information.
	Copies & Paste a measurement. The selected measurement can be copied and pasted as an empty measurement to any location in structure tree. Multiple "Paste" is allowed. Refer to <i>Chapter 5.1.5.9 Copy & Paste a measurement</i> for more information.
•	Adds a new measurement. The instrument goes to the Menu for adding measurements. Refer to <i>Chapter</i> <i>5.1.5.5 Add a new measurement</i> for more information.
	Views and edit comments. The instrument displays comment attached to the selected measurement or opens keypad for entering a new comment.
∕ ×	Deletes a measurement. Selected Measurement can be deleted. User is asked for confirmation before the deleting. Refer to <i>Chapter 5.1.5.12 Delete a measurement</i> for more information.

5.1.5.2 Operations on Structure objects

The structure object must be selected first.

	D Memory Organizer 22:11 🗂 Memory Organizer 22:46			
	E De Living room			
	🖃 🔊 , Ironing room 📃 🐨 🔊 , Ironing room			
_	🗉 🔁 kron SN 12341234 🔹 🔤 🔝 kron SN 12341234			
	Trouser press SN 23452345			
	O Riso			
	O Touch Leakage			
	Figure 5.7: A structure object is selected in the tree menu			
Options				
	Starts a new measurement. First type of measurement (single test or Auto sequence®) should be selected. After proper type is selected the instrument goes to single test or Auto Sequence® selection screen. Refer to <i>Chapters 6.1 Selection modes</i> and <i>7.1</i> <i>Selection of Auto Sequences</i> ® for more information.			
	Saves a measurement.			
	Saving of measurement under the selected Structure object.			
	View / edit parameters and attachments.			
	Parameters and attachments of the Structure object can be viewed or edited. Refer to Chapter 5.1.5.3 View / Edit parameters and attachments of a Structure object for more information.			
	Adds a new measurement.			
4	The instrument goes to the Menu for adding measurement into structure. Refer to <i>Chapter 5.1.5.5 Add a new measurement</i> for more information.			
	Adds a new Structure object.			
14	A new Structure object can be added. Refer to Chapter <i>5.1.5.4 Add a new Structure Object</i> for more information.			
6	Attachments.			
	Name and link of attachment is displayed.			
	Clones a Structure object.			
	Selected Structure object can be copied to same level in structure tree (clone). Refer to <i>Chapter 5.1.5.6 Clone a Structure object</i> for more information.			
	Copies & Paste a Structure object.			
	Selected Structure object can be copied and pasted to any allowed location in structure tree. Multiple "Paste" is allowed. Refer to <i>Chapter 5.1.5.8 Copy & Paste a Structure object</i> for more information.			

Q	Cut & Paste a Structure.
	Selected Structure with child items (sub-structures and measurements) can be moved to any allowed location in structure tree. Refer to chapter 5.1.5.10 Cut & Paste a Structure object with sub-items for more information.
	Views and edit comments. The instrument displays comment attached to the selected Structure object or
	opens keypad for entering a new comment.
	Deletes a Structure object.
X	Selected Structure object and sub-elements can be deleted. User is asked for confirmation before the deleting. Refer to Chapter <i>5.1.5.11 Delete a Structure object</i> for more information.
R	Renames a Structure object.
	Selected Structure object can be renamed via keypad. Refer to <i>Chapter 5.1.5.13</i> Rename a Structure object for more information.

5.1.5.3 View / Edit parameters and attachments of a Structure object

The parameters and their content are displayed in this menu. To edit the selected parameter tap on it or press RUN key to enter menu for editing parameters.

	📩 Memory Organizer	/ Parameters 00:22
	🔜 IT Equipment	
Parameters	Appliance ID	IT Equipment
	Inventary No.	PC 12344321
	Name	PC / Monitor
	Location (Room)	Living room
	Figure 5.8: Example of \	/iew / Edit parameters m



Procedure and options

3	Memory Organizer / Parameters 00:22	Example of Parameters menu.
	Appliance ID IT Equipment	
	Inventary No. PC 12344321	
	Name PC / Monitor	
	Location (Room)	
4	▲ 12:45 Appliance ID I I Equipment I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I </th <th>In menu for editing parameters the parameter's value can be selected from a dropdown list or entered via keypad. Refer to chapter <i>4 Instrument operation</i> for more information about keypad operation.</th>	In menu for editing parameters the parameter's value can be selected from a dropdown list or entered via keypad. Refer to chapter <i>4 Instrument operation</i> for more information about keypad operation.
②a	Ø	Select Attachments in Control panel.
	*) Mamory Organizer / Attachments 11-51	Attachments
(Ja	Implicities Implicities Implicities TV receiver SN 34567 Implicities Implicities Implicities Implicit	The name of attachment can be seen. Operation with attachments is not supported in the instrument.
Øb		Select Comments in Control panel.
Зh	스 Comment: Project 06:39	View or edit comments
	This is a sample comment inserted to the structure object.	Complete comment (if exists) attached to the structure object can be seen on this screen. Press RUN key or tap on screen to open keypad
		for entering a new comment.
	Sinit 2 ∧ 5 V B N M 12# ,	

5.1.5.4 Add a new Structure Object

This menu is intended to add new structure objects in the tree menu. A new structure object can be selected and then added in the tree menu.



1 1000		
1	Memory Organizer 06:49 Node ▶ Example ▶ > Node □ > Node □ > Location ● (11) ●	Default initial structure.
2		Select Add Structure in Control panel.
3	Add New 10:01 Image: Add New Create Image: Constraint on the second sec	Add a new structure object menu.
3a	↓ > Location	Tap on a structure type selection window. A list of available structure items is displayed. Select one from a list. Arrow indicates the position where structure item will be inserted. Child item to the currently selected structure item

Procedure and options

→ 🔁 Appliance

level.

Structure item located in the same

3b	Appliance ID Name Equipment User	12345 CD / DVD player	In menu for editing name and parameters the parameter's value can be selected from a dropdown list or entered via keypad. Refer to chapter <i>4 Instrument operation</i> for more information about keypad operation.
4	Create		Create new structure item.
5	Memory Organizer Node \ Location Example Node Node D Location 2345	09:53	New object added.

5.1.5.5 Add a new measurement

In this menu new empty measurements can be set and then added in the structure tree. The type of measurement, measurement function and its parameters are first selected and then added under the selected Structure object.



Procedure and options



3	Add new m	easurement	Add new measurement menu.
	Single Tests		
	R iso		
	params & limits:	2.00 MO	
	Add	Cancel	
(3)a	type:		Type of test can be selected from this field.
οu	Single Tests		Options: (Single Tests, Auto Sequences®)
			Tap on field or press the RUN key to modify.
3b	measurement: R iso		Last added measurement is offered by default.
	 Single Tests VISUAL CONT LEAK POWE FLASH OTHE Single Tests 	07:27 I ISO R RCD FUNCT. 111 111 111 111 111 111 111 1	To select another measurement tap on filed or press the RUN to open menu for selecting measurements. Refer to <i>Chapters 6.1 Selection modes</i> and <i>7.1 Selection of Auto Sequences</i> for more information.
	RPAT RW Riso Riso		
3c	Riso, 500 V, 5 s, ,	,,2.00 MΩ	
	Parameters & Limits Type Uiso Limit(Riso) Comment 1	Riso > 500 V - 5 s > 2.00 MR >	Select parameter and modify it as described earlier. Refer to <i>Chapter 6.1.1.2 Setting parameters and limits of single tests</i> for more information.
4	Add		Adds the measurement under the selected Structure object in the tree menu.
	Cancel		Returns to the structure tree menu without changes.
5	Memory Organizer Node \ Project Example >	07:28 07:28 0 0 0 0 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	New empty measurement is added under the selected Structure object.

5.1.5.6 Clone a Structure object

In this menu selected structure object can be copied (cloned) to same level in the structure tree. Cloned structure object have same name as original.

Clone	 Include structure parameters Include structure attachments Include sub structures Include sub measurements
	Clone Cancel
	Figure 5.11: Clone Structure Object menu



5.1.5.7 Clone a measurement

By using this function a selected empty or finished measurement can be copied (cloned) as an empty measurement to the same level in the structure tree.

Procedure and options

1	Memory Organizer Memory Organizer Memory Organizer Note: Sample project Note: Sample project Note: Sample project Riso Sample Sample Project Riso Riso Riso Riso	22:04 CO 21:46 	Select the measurement to be cloned.
2	Clone		Select Clone option from control panel.
3	Memory Organizer Memory Organizer Memory Organizer Kiso Kiso	22:04 21:44 	The new empty measurement is displayed.

5.1.5.8 Copy & Paste a Structure object

In this menu selected Structure object can be copied and pasted to any allowed location in the structure tree.

Procedure and options

1	Memory Organizer Mode Appliance_FD P Sample project Sample project P Iving room P SAT Receiver	22:07 Image: Constant state Image: Constant state </th <th>Select the structure object to be copied.</th>	Select the structure object to be copied.
2	Сору		Select Copy option from control panel.
3	Memory Organizer Node Appliance_FD Sample project S	22:08 Clone Copy Paste Copy Delete Rename	Select location where structure element should be copied.



5.1.5.9 Copy & Paste a measurement

In this menu selected measurement can be copied to any allowed location in the structure tree.

Procedure

1	Memory Organizer 01:25 Iving room Iving room Image: Comparison of the comparison	Select the measurement to be copied.
2	Сору	Select Copy option from control panel.
3	Memory Organizer 01:27 Image: Share Sector Image: Share Sector	Select location where measurement should be pasted.
4	Paste	Select Paste option from control panel.
5	Memory Organizer 01:27 Image: Safe Receiver Image: Safe Receiver Image: Safe Receiver	The new (empty) measurement is displayed in selected Structure object. Note: The Paste command can be executed one or more times.

5.1.5.10 Cut & Paste a Structure object with sub-items

In this menu selected Structure object with sub-items (sub-structures and measurements) can be cut and pasted (moved) to any allowed location in the structure tree.

Procedure

0	Memory Organizer Node Example Node Node Node Node_2	09:46 *** *** *** *** *** ***	Select the structure item to be moved.
2	Cut		Select Cut option from Control panel.

3	 Memory Organizer Example ≥ Node □ Project □ Location ≥ Node_2 	09:46	Select new location where structure object (with sub-structures and measurements) should be moved.
4	Paste		Select Paste option from Control panel.
5	Memory Organizer Node_2 Example Node Node_2 Node_2 Project Node_2 Riso	09:47	The structure object (with sub-structures and measurements) is moved to selected new location and deleted from previous location in the tree structure.

5.1.5.11 Delete a Structure object

In this menu selected Structure object can be deleted.

Proce	edure	
1	Memory Organizer 01:36 Image: Sample project Image: Sample project Image: Sample project Image: Sample project	Select the structure object to be deleted.
2	Delete	Select Delete option from control panel.
3	Memory Organizer 01:37 Image: Sample project Image: Sample project Are you sure you want to delete? Image: Sample project Image: SAT Receiver Image: Sample project Image: YES NO Image: YES NO Image: Sample project Image: Sample project Image: Sample project Imag	A confirmation window will appear.
@a	YES	Selected structure object and its sub-elements are deleted.



5.1.5.12 Delete a measurement

In this menu selected measurement can be deleted.

Procedure

1	Memory Organizer 01:33 Image: Sample project Image: Copy Image: Sample project <	Select a measurement to be deleted.
2	Delete	Select Delete option from control panel.
3	Memory Organizer 01:40 Sample project Image: Continuity Continuity Image: Continuity YES NO Continuity Image: Continuity Image: Continuity Image: Continuity	A confirmation window will appear.
@a	YES	Selected measurement is deleted.
٩b	NO	Returns to the tree menu without changes.

5.1.5.13 Rename a Structure object

In this menu selected Structure object can be renamed.

Procedure

1	Memory Organizer 02:10 Image: Sample project Image: Constant Consta	Select the structure object to be renamed.
2	Rename	Select Rename option from control panel.
3	• • • • • • • • • • • • • • •	Virtual keypad will appear on screen. Enter new text and confirm.

5.1.5.14 Recall and Retest selected measurement

Proce	edure	
1	Memory Organizer 22:04 	Select the measurement to be recalled.
2	Recall results	Select Recall results in control panel.
3	 Memory 1/1: R iso 14:32 Riso 1.02 μΩ C C 	Measurement is recalled.
	Um 525 v Type Riso Uiso 500 V Duration 5 s L Limit(Riso) 1.00 MD 14:31:18 114	Parameters and limits can be viewed but cannot be edited.
4	C	Select Retest in control panel.

5		Measurement retest starting screen is displayed.
5a	▶ Parameters & Limits 14:35 Type Riso > Uiso 500 V Duration 5 s > L Limit(Riso) 1.00 MD > Comment 1	Parameters and limits can be viewed and edited.
6	Start Test	Select Run in control panel to retest the measurement.
Ø		Results / sub-results after re-run of recalled measurement.
8	Save results	Select Save results in control panel.
	Memory Organizer 14:37 Image: Sample project Image: Sample project Image: Sample project Image: Sample project	Retested measurement is saved under same structure item as original one. Refreshed memory structure with the new performed measurement is displayed.

5.1.6 Searching in Memory Organizer

In Memory organizer it is possible to search for different structure objects and parameters.

Procedure

1	Memory Organizer 15:00 Workspace012 ■ Node	Search function is available from the active workspace directory line.
	 Sample project Somple project Living room TV Receiver SAT Receiver 	Use external device for data entry or follow instructions below for instrument search function.
2	Search	Select Search in control panel to open Search setup menu.
3	Search 12:37 Name / Equip. ID Q Status > Test date From To Retest date From To (11) (11)	The parameters that can be searched for are displayed in the Search setup menu. Note: Equipment ID, Test date and Retest date (if applicable) refer only to the following structure objects: Appliance, Appliance FD, Medical equipment, Medical equipment FD, Welding equipment and Welding equipment FD.
3a	Name / Equip. ID $ \begin{array}{c} $	The search can be narrowed by entering a text in the Name and Equipment ID field. Strings can be entered using the on-screen keyboard.
3 b	Status	The search can be narrowed on base of statuses. If searching by status, instrument will display all structure objects that include one or more measurements with searched status.
3c	Test date Retest date 16 Dec 2015 A A A V V V Set Cancel	The search can be narrowed on base of test dates / retest dates (from / to).

3d	Clear filters	Clears all filters. Sets filters to default value.
4	Search	Searches through the Memory Organizer for objects according to the set filters. The results are shown in the Search results screen presented on <i>Figure 5.12</i> and <i>Figure 5.13</i> .



Figure 5.12: Search results screen – Page view

Options

>	Next page.
<	Previous page.

Note:

Search result page consist of up to 50 results.

Search results	17:01
Page 1/2	Έ.
<mark>≥]</mark> • 12015002	
<mark>≥</mark> ₀ 12015003	
<mark>a</mark> , 12015110	R
ali 12015112	
12015113	



Options



Goes to location in Memory Organizer.

	View / edit parameters and attachments. Parameters and attachments of the Structure object can be viewed or edited. Refer to Chapter 5.1.5.3 View / Edit parameters and attachments of a Structure object for more information.
P	Attachments. Name and link of attachment is displayed.
	Views comment. The instrument displays comment attached to the selected Structure object.
R 📬	Renames the selected Structure object. Refer to <i>Chapter 5.1.5.13 Rename a Structure object</i> for more information.

6 Single tests

Single tests can be selected in the Main single test menu or in Memory Organizer's main and submenus.

6.1 Selection modes

In Single tests main menu Area group and two different modes for selecting single tests are available.

Options



LEAK SUB Sub-leakage	LEAK DIFF Differential Lea	LEAK IPE Ipe Leakage	
LEAK TOUCH Touch Leakage	I, P	LEAK IW Heak (W-PE)	
	IAP LEAK	LEAK ItouchME	
Equipment Lea	Applied Part Le	Touch Leakage	444

For the selected group a submenu with all single tests that belongs to the selected group and Area group is displayed.

6.1.1 Single test screens

In the Single test screens measuring results, sub-results, limits and parameters of the measurement are displayed. In addition on-line statuses, warnings and other information are displayed.



Figure 6.1: Single test screen organisation

6.1.1.1 Single test start screen

Single test start screen can be opened from Memory organizer or from Single test main menu.



Figure 6.2: Single test start screen

Options	
	Starts the measurement.
Å	
?	Opens help screens. Refer to chapter 6.1.3 Help screens for more information.
	Opens menu for changing parameters and limits. Refer to chapter <i>6.1.1.2 Setting parameters and limits of single tests</i> for more information.
Type Riso Uiso 500 V Duration Off L Limit(Riso) Off	

6.1.1.2 Setting parameters and limits of single tests

▲ Parameters	& Limi	ts	08:33	13 t3	01:48
Duration		Off	>		1 s
Output		40 V			2 s
H Limit(Isub)	<	0.25 mA	>	t3	3 s
L Limit(Isub)	<	1.00 mA	>		4 s
				(<u>)</u> (5 s



Options

•				
Off		Selects parameter (white) or limit (red).		
40 V				
0.25 mA				
1.00 mA				
Off		Selects value of parameter or limit.		
2 s		In case of many (multiple pages of) parameters or limits:		
3 s		 The scroll bar on the right side of screen can be used 		
5 s		- With right / left keys it can be jumped page up /		
10 s		page down		
.	07:55	Enters custom value of parameter or limit.		
H Limit [A]		Custom values can be entered by using the on-screen		
1.00m		keyboard.		
1 2 3 m				
<u>4 5 6 k</u>				
7 8 9 M				

6.1.1.3 Single test screen during test





Options (during test)

ا بخ	Stops the single test measurement.
P ۲	Proceeds to the next step of the measurement (if measurement consists of more steps).
ESC	Aborts measurement.

6.1.1.4 Single test result screen



Figure 6.5: Single test result screen

Options (after measurement is finished)



Starts a new measurement.

Saves the result.

A new measurement was selected and started from a Structure object in the structure tree:

The measurement will be saved under the selected Structure object.

A new measurement was started from the Single test main menu:

- Saving under the last selected Structure object will be offered by default. The user can select another Structure object or create a new Structure

object. By pressing the key in Memory organizer menu the measurement is saved under selected location.

An empty measurement was selected from structure tree and started:

- The result(s) will be added to the measurement. The measurement will change its status from 'empty' to 'finished'.

An already carried out measurement was selected from structure tree, viewed and then restarted:

- A new measurement will be saved under the selected Structure object.



Adds comment to the measurement. The instrument opens keypad for entering a comment.



Opens help screens. Refer to chapter *6.1.3 Help screens* for more information.

	Opens screen for changing parameters and limits.	
Type Riso Uiso 500 V Duration 5 s L Limit(Riso) 1.00 MΩ	Refer to chapter 6.1.1.2 Setting parameters and limits of single tests for more information.	
	Enters cross selector. Refer to chapter 6.1 Selection modes for more information.	
Riso 199.9 MΩ um 525 v		

6.1.1.5 Single test memory screen



Figure 6.6: Single test memory screen



6.1.2 Single test (inspection) screens

Visual and Functional inspections can be treated as a special class of tests. Items to be visually or functionally checked are displayed. In addition on-line statuses and other information are displayed.



Figure 6.7: Inspection screen organisation

6.1.2.1 Single test (inspection) start screen



Figure 6.8: Inspection start screen

Options (inspection screen was opened in Memory organizer or from Single test main menu)




Opens help screens. Refer to chapter 6.1.3 Help screens for more information.

6.1.2.2 Single test (Inspection) screen during test

Inspection		09:17	Inspection	09:26
Visual IEC/EN 60974-4	X	\checkmark	Functional	
Torch/electrode holder, welding current return clamp	×	×	mechanical operation	Р
no missing or defective insulation			electrical operation	
no defective connections			safety relevant functions	
no defective, damaged switches	×	•		×
no_other_damage		•••		444

Figure 6.9: Inspection screen (during inspection)

Options (during test)				
Visual IEC/EN 60974-4	Selects item.			
 Mains supply 				
effective cable anchorage				
	Applies a pass to the selected item or group of items.			
×	Applies a fail to the selected item or group of items.			
	Clears status in selected item or group of items.			
	Applies a status that item or group of items was checked.			
R. II	A status can be applied.			
	Multiple taps toggles between statuses.			
ネ	Toggle between statuses.			
Р	Power is applied to the mains test socket to power up the tested equipment during a functional inspection. The instrument displays and starts the Power measurement, refer to <i>Chapter 6.2.9 Power</i> .			
	Stops Power measurement.			
	Stops the inspection.			



Stops the inspection. Goes to the result screen.

Rules for automatic applying of statuses:

- The parent item(s) can automatically get a status on base of statuses in child items.
 - the fail status has highest priority. A fail status for any item will result in a fail status in all parent items and an overall fail result.
 - if there is no fail status in child items the parent item will get a status only if all child items have a status.
 - Pass status has priority over checked status.
- The child item(s) will automatically get a status on base of status in the parent item
 - All child items will get the same status as applied to the parent item.

Note

- Inspections and even inspection items inside one inspection can have can have different status types. For example some basic inspections don't have the 'checked' status.
- Only inspections with overall statuses can be saved.

6.1.2.3 Single test (Inspection) result screen



Figure 6.10: Inspection result screen

Options (after inspection is finished)



A new inspection was started from the Single test main menu: _ Saving under the last selected Structure object will be offered by default. The user can select another Structure object or create a new Structure object. By pressing the key in Memory organizer menu the inspection is saved under selected location. An empty inspection was selected in structure tree and started: The result(s) will be added to the inspection. The inspection will change its status from 'empty' to 'finished'. An already carried out inspection was selected in structure tree, viewed and then restarted: A new measurement will be saved under the selected Structure object. Adds comment to the measurement. The instrument opens keypad for entering a comment. Opens help screens. Refer to chapter 6.1.3 Help screens for more information.

6.1.2.4 Single test (inspection) memory screen



Figure 6.11: Inspection memory screen

Options



6.1.3 Help screens

→ HELP 8/46: Flash 3kV 2/2	11:22	🗅 HELP 35/46: Riso L	N-AP 3/4	11:22

Help screens contain diagrams for proper connection of the instrument.



Options:	
?	Opens help screen.
the second secon	Goes to previous / next help screen.

6.2 Single test measurements

6.2.1 Visual inspection

1nspection	12:16
Visual	
wiring connection points	?
cables	
covers, housing	
inscriptions and markings	
_	444



Test circuit



Figure 6.14: Visual inspection test circuit

Visual inspection procedure

- Select the appropriate Visual function.
- Start the inspection.
- Perform the visual inspection of the appliance / equipment.
- Apply appropriate ticker(s) to items of inspection.
- End inspection.
- Save results (optional).

Inspection	09:25	・ Visual Test		04:57
Functional	🖌 🕨	Visual IEC/EN 60974-4	X	
mechanical operation		 Torch/electrode holder, welding current return clamp 	×	B
electrical operation		no missing or defective insulation		
safety relevant functions		no defective connections		
		no defective, damaged switches	×	
		no_other_damage		•••

Figure 6.15: Examples of Visual inspection results

6.2.2 Continuity // Protective earth resistance

🛨 Continuity	10:23	Protective Earth Resistance	09:50
RΩ		RΩ	⊟
	<u>T</u>		$\langle \bullet \rangle$
Output P/S - PE	$\langle \bullet \rangle$	Output P/S - PE CAL	?
Duration Off H Limit(R) 0.1 Ω	444	Duration Off Limit(R) 0.1 Ω	444



Test results / sub-results

R..... Resistance

Test parameters

Output (Continuity)	Output: [P/S – PE, MS_PE – IEC_PE]
Output (Protective earth resistance)	Output: [P/S – PE]
Test current	I out: [0.2 A, 10 A, 25 A]
Duration	Duration: [Off, 2 s 180 s]

Test limits

Limit (R) (Continuity)	H Limit(R): [Off, Custom, 0.01 Ω 9 Ω]
Limit (R) (Protective earth resistance)	Limit(R): [Off, Custom, 0.1 Ω 0.5 Ω]

Specific options

	Calibrate - Compensation of test lead / IEC test cable resistance. Refer to chapter <i>6.2.2.1</i> for procedure details.
ţĻţ	Lim. Calculator – Continuity resistance H Limit(R) calculator. Refer to chapter <i>6.2.2.2</i> for details.

Test circuits



Figure 6.17: Continuity MS PE – IEC PE



Figure 6.18: Continuity P/S – PE



Figure 6.19: Protective Earth Resistance

Continuity // Protective earth resistance measurement procedure

- Select the **Continuity // Protective Earth Resistance** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.20: Example of Continuity and Protective Earth Resistance measurement results

6.2.2.1 Compensation of test lead / IEC test cable resistance

This chapter describes how to compensate the test leads resistance in **Continuity (Output = P/S – PE)** and **Protective Earth Resistance (Output = P/S – PE)** functions, and how to compensate IEC test cable resistance in **Continuity (Output = MS_PE – IEC_PE)** and **PE conductor (PRCD)** functions. Compensation can be carried out to eliminate the influence of test lead / IEC test cable resistance and the internal resistances of the instrument and adapters on the measured resistance.

Connection for compensating the resistance of test lead / IEC test cable



Figure 6.21: Shorted test lead / IEC test cable

Compensation of test lead / IEC test cable resistance procedure

- Select the **Continuity // Protective Earth Resistance** function.
- Set parameters (Output, Test current).
- Connect test lead to the instrument between P/S terminal and PE terminal on test socket or connect IEC test cable between IEC connector and test socket, depending on settings, see Figure 6.21.
- Touch the _____ key to compensate test lead / IEC test cable resistance.
- Symbol Symbol is displayed if the compensation was carried out successfully.



Figure 6.22: Result with old and new calibration values

Note:

The calibration value is correct only for the output (P/S terminal – PE terminal on test socket) at which the calibration was carried out.

6.2.2.2 Limit Calculator

It is useful tool to determine continuity resistance high limit, especially when testing mains power extension cords with or without PRCDs.

Limit calculator is included in Continuity and PE_conductor (PRCD) functions and can be accessed from options panel.

Limit Calculator screens are presented on Figure 6.23.



Figure 6.23: Limit Calculator screens

Four Limit rules are offered:

A: VDE / In < 16A

Continuity and PE_conductor(PRCD) resistance limit is derived from table on wire length basis. Table is based on VDE 0701-0702 standard for nominal current In < 16A.

L wire length	R Limit [Ω]
L <= 5 m	0.3
5 m < L <= 12.5 m	0.4
12.5 m < L <= 20 m	0.5
20 m < L <= 27.5 m	0.6
27.5 m < L <= 35 m	0.7
35 m < L <= 42.5 m	0.8
42.5 m < L <= 50 m	0.9
50 m < L <= 57.5 m	1.0

B: Calculator

Continuity and PE_conductor(PRCD) resistance limit is calculated by the formula:

$$R = \rho \frac{L}{A} + 0.1\Omega$$

Where:

 ρ specific resistance of copper 1,68×10^-8 Ωm

L wire length selected from a list (1 m, 2 m, 3 m, ..., 100 m) or Custom numeric entry A..... wire cross section selected from a list (0.50 mm², 0.75 mm², 1.00 mm², 1.50 mm²,

 2.5 mm^2 , 4.0 mm^2 , 10.0 mm^2) or Custom numeric entry

C: NEN 3140

Continuity and PE_conductor(PRCD) resistance limit is derived from table on wire length and wire cross-section basis. Table is based on NEN 3140 standard.

	Wire cross-section [mm ²]						
L wire length	1.5	2.5	4	6	10	16	25
	R Limit [Ω]						
L <= 2 m	0.22	0.21	0.21	0.21	0.20	0.20	0.20
2 m < L <= 5 m	0.26	0.24	0.22	0.21	0.21	0.21	0.20
5 m < L <= 10 m	0.32	0.27	0.24	0.23	0.22	0.21	0.21
10 m < L <= 15 m	0.38	0,31	0.27	0.24	0.23	0.22	0.21
15 m < L <= 20 m	0.43	0.34	0.29	0.26	0.24	0.22	0.21
20 m < L <= 25 m	0.49	0.38	0.31	0.27	0.24	0.23	0.22
25 m < L <= 30 m	0.55	0.41	0.33	0.29	0.25	0.23	0.22
30 m < L <= 35 m	0.61	0.45	0.35	0.30	0.26	0.24	0.22
35 m < L <= 40 m	0.67	0.48	0.38	0.32	0.27	0.24	0.23
40 m < L <= 45 m	0.73	0.52	0.40	0.33	0.28	0.25	0.23
45 m < L <= 50 m	0.78	0.55	0.42	0.35	0.29	0.25	0.24

D: Custom

Continuity and PE_conductor(PRCD) resistance limit is directly selected from a list (Off, 0.01 Ω ... 0.09 Ω , 0.1 Ω ... 0.9 Ω , 1 Ω ... 9 Ω) or H Limit Custom numeric entry.

Select Limit Calculator from options panel of (1)Continuity or PE_conductor(PRCD) test screen to -0open Limit Calculator screen. Select Limit rule by using on-screen or keyboard (2) Calculator Limit rule < > arrow keys. Alternatively, selection is possible from the list. VDE / In < 16 A By taping on the Limit rule field, list of available Calculator Limit rules is presented. Tap on the chosen rule Limit rule field and screen returns to Limit Calculator. NEN 3140 Custom Select parameters value for chosen Limit rule by (3) Limit rule VDE / In < 16 A > using on-screen or keyboard arrow keys. 5 m < L <= 12.5 m Length > < By tapping on parameter field, value can be Limit rule Calculator < > selected from presented list. > Lenath < 5 m Calculator rule allow custom value Length and **Cross Section** < Custom: 15 mm2 Cross section entry with on-screen keyboard, when Custom is selected from the value list.

Procedure and parameter selection

	L <= 5 m 5 m < L <= 12.5 m 12.5 m < L <= 20 m	40 m 50 m 70 m	1.50 mm2 2.5 mm2 4.0 mm2	Examples of parameter value lists: -VDE rule Length parameter list -Calculator rule Length parameter list -Calculator rule Cross section parameter list.
	27.5 m < L <= 35 m	100 m Gustom: 12 m	10.0 mm2 Custom	Speed up parameters selection with: -using scroll bar on the right side of the screen, -keyboard right / left keys for page up / down.
Li	mit rule	< Custo	m	Custom rule is intended for direct H Limit entry.
H H	Limit	ح 0.07 ۱	n >	Select value from the list: - by using arrow keys, - tap on the field to open list and chose value,
0.	.35			Custom value is selected from the list.
	4 7 ←	2 3 5 6 8 9 0	<u>k</u> <u>M</u>	Example of on-screen numeric keyboard – direct H Limit custom value entry.
4	4			Apply option selection from Limit Calculator options bar automatically overwrite H Limit(R) parameter of selected single test - Continuity or PE_conductor(PRCD).

6.2.3 Flash test



Figure 6.24: Flash test menu

Test results / sub-results

I measured a.c. test current

Test parameters

Output test voltage	U test: [1500 V, 3000 V]
Duration	Duration: [Off, 2 s 180 s]

Test limits

Limit (I)	Limit(I):	[Custom, 0.50 mA 2.25 mA]
-----------	-----------	--------------------------	---

Test circuits



Figure 6.25: Flash test 1500 V



Figure 6.26: Flash test 3000 V

Flash measurement procedure

- Select the **Flash** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.27: Examples of Flash measurement results

Notes:

- Flash test 1500 V is intended for CLASS I appliances.
- Flash test 3000 V is intended for CLASS II appliances. If Flash test 3000 V is conducted on CLASS I appliances with unearthed conductive parts then both tests (3000 V between LN and unearthed conductive part and 1500 V between LN and PE) are tested simultaneously and current through PE is also considered.

6.2.4 Insulation resistance (Riso, Riso-S)



Figure 6.28: Insulation resistance test menus

Test results / sub-results

Riso...... Insulation resistance Riso-S Insulation resistance-S Um....... Test voltage

Test parameters

Type of test	Type [Riso, Riso-S, (Riso, Riso-S)]
Nominal test voltage	Uiso [250 V, 500 V]
Duration	Duration [Off, 2 s 180 s]

Test limits

Limit (Riso)	L Limit(Riso) [Off, Custom, 0.01 MΩ 10.0 MΩ]
Limit (Riso-S)	L Limit(Riso-S) [Off, Custom, 0.10 MΩ 10.0 MΩ]

Test circuits



Figure 6.29: Insulation resistance Riso (socket)



Figure 6.30: Insulation resistance Riso (LN – PE)



Figure 6.31: Insulation resistance measurement with probe Riso-S (socket – P/S)

Insulation resistance measurement procedure

- Select the **R iso** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.32: Examples of Insulation resistance measurement results

Note:

The current through the P/S probe is also considered in the Riso result.

6.2.5 Sub-leakage (Isub, Isub-S)

1	🖆 Sub-leakage	01:48	Sub-leakage	01:48	Ĵ Sub-leakage	01:50
	•				lsub mA	
	Isub mA	⊟	Isub-S mA		Isub-S mA	
		?		?		?
	Type Isub Duration 3 s H Limit/(sub) Off		Type Isub-S Duration 3 s H Limit(Isub-S) 1.00 mA		Type Isub, Isub-S Duration 3 s H Limit/Isub) 1.00 mA	
					H Limit(Isub-S) 0.50 mA	

Figure 6.33: Sub Leakage test menus

Test results / sub-results

Isub Sub-leakage current Isub-S..... Sub-leakage current-S

Test parameters

Type of test	Type [Isub, Isub-S, (Isub, Isub-S)]
Duration	Duration [Off, 2 s 180 s]

Test limits

Limit (Isub)	H Limit(Isub) [Off, Custom, 0.25 mA 15.0 mA]
Limit (Isub-S)	H Limit(Isub-S) [Off, Custom, 0.25 mA … 15.0 mA]

Test circuits



Figure 6.34: Sub-leakage Isub (socket)



Figure 6.35: Sub-leakage Isub (LN – PE)





Sub-leakage measurement procedure

- Select the **Sub-leakage** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.37: Examples of Sub-leakage measurement results

Note:

When P/S probe is connected during the Sub-leakage measurement, then the current through it is also considered.

6.2.6 Differential Leakage



Figure 6.38: Differential Leakage test menu

Test results / sub-results

Idiff Differential Leakage current P..... Power

Test parameters

Duration	Duration [Off, 2 s 180 s]
Change status	Change [YES, NO]
	 YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket. NO: The phase voltage is applied only to the right live output of the mains test socket.
*Delay time	Delay [0.2 s 5 s]

Test limits

Limit (Idiff)	H limit [Off, Custom, 0.25 mA 15.0 mA]

Test circuit



Figure 6.39: Differential leakage

Differential Leakage measurement procedure

- Select the **Differential Leakage** function.
- Set test parameters / limits.
- · Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.40: Examples of Differential Leakage measurement results

6.2.7 Ipe Leakage



Figure 6.41: Ipe Leakage test menu

Test results / sub-results

Ipe PE current P..... Power

Test parameters

Duration	Duration [Off, 2 s 180 s]
Change status	Change [YES, NO]
	 YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket. NO: The phase voltage is applied only to the right live output of the mains test socket.
*Delay time	Delay [0.2 s 5 s]

Test limits

Limit (ipe) H Limit(ipe) [OII, Custom, 0.25 mA 15.0 mA]	Limit (Ipe)	H Limit(lpe) [Off, Custom, 0.25 mA 15.0 mA]
-----------------------------------------------------------	-------------	---------------------------------------------

Test circuit



Figure 6.42: Ipe leakage

Ipe Leakage measurement procedure

- Select the Ipe Leakage function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuit above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.43: Examples of Ipe Leakage measurement results

6.2.8 Touch Leakage



Figure 6.44: Touch Leakage test menu

Test results / sub-results

Itou Touch Leakage current P..... Power

Test parameters

Duration	Duration [Off, 2 s 180 s]
Change status	Change [YES, NO]
	 YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket. NO: The phase voltage is applied only to the right live output of the mains test socket.
*Delay time	Delay [0.2 s 5 s]

Test limits

Limit (Itou)	H limit(Itou) [Off, Custom, 0.25 mA 15.0 mA]

Test circuit



Figure 6.45: Touch Leakage

Touch Leakage measurement procedure

- Select the **Touch Leakage** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuit above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).

♪ Touch Leakage		Touch Leakage		
Itou 0.000 mA 🗸		5 66 🗙		
P 50 W		P 50 w		
Duration Off Change YES		Duration Off Change YES	F	
Delay 5 s H Limit(Itou) 0.50 mA		Delay 5 s H Limit(Itou) 0.50 mA		

Figure 6.46: Examples of Touch Leakage measurement results

6.2.9 Power



Figure 6.47: Power measurement menu

Test results / sub-results

P	Active power
S	Apparent power
Q	Reactive power
PF	Power factor
THDu	Total harmonic distortion - voltage
THDi	Total harmonic distortion – current
Cos Φ	cosinus Φ
1	Load current
U	Voltage

Test parameters

Duration	Duration [Off, 2 s 180 s]

Test limits

High Limit (P)	H limit(P) [Off, Custom, 10 W 3.50 kW]
Low Limit (P)	L limit(P) [Off, Custom, 10 W 3.50 kW]

Test circuit



Figure 6.48: Power

Power measurement procedure

- Select the **Power** function.
- Set test parameters / limits.
- · Connect device under test to the instrument (see test circuit above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).

→ Power	09:27	⊥ Power	09:28
P 3.27 kW 💙 THDu 1.9 %		P 3.33 kW 🗙 THDu 1.7 %	
S 3.27 kVA THDi 1.9 %		S 3.33 kVA THDi 1.7 %	
Q 58 Var CosΦ 1.00i		Q 59 Var CosΦ 1.00i	
PF1.00i I 14.61 A	?	PF1.00i I 14.74 A	?
U 224 V		U 226 V	
Duration 3 s H Limit(P) 3.30 kW L Limit(P) Off	444	Duration 3 s H Limit(P) 1000 W L Limit(P) Off	444

Figure 6.49: Examples of Power measurement results

6.2.10 Leak's & Power

Ŀ	Leak's & Power			
P	w	THDu	%	
ltou Idiff	mA mA	THDi CosФ	A 	
S Q	VA VAr	l U	A V	?
PF Durat			Dff	
Chan H Lim L Lim	ge it(P) it(P)	300 200	w \Lambda 🗗	

Figure 6.50: Leak's & Power measurement menu

Test results / sub-results

P	Active power
Itou	Touch Leakage current
Idiff	Differential Leakage current
S	Apparent power
Q	Reactive power
PF	Power factor
THDu	Total harmonic distortion - voltage
THDi	Total harmonic distortion - current
Cos Φ	cosinus Φ
I	Load current
U	Voltage

Test parameters

Duration	Duration [Off, 2 s 180 s]
Change status	Change [YES, NO]
	 YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket. NO: The phase voltage is applied only to the right live output of the mains test socket.
*Delay time	Delay [0.2 s 5 s]

Test limits

High Limit (P)	H Limit(P) [Off, Custom, 10 W 3.50 kW]
Low Limit (P)	L Limit(P) [Off, Custom, 10 W 3.50 kW]
High Limit (Idiff)	H Limit(Idiff) [Off, Custom, 0.25 mA 15.0 mA]
High Limit (Itou)	H Limit(Itou) [Off, Custom, 0.25 mA 15.0 mA]

Test circuit



Figure 6.51: Leak's and Power

Leak's & Power measurement procedure

- Select the Leak's & Power function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuit above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.52: Examples of Leak's & Power measurement results

6.2.11 PRCD test

PRCD		09:41	S PRCD	09:42	S PRCD	09:42
			(*) (-)		(+) (−) t I∆N ×1msms	
tΔN _	ms		t I∆Nmsms		t IΔN ×5msms	
		?		?	t IΔN ×0.5msms	?
IAN RCD type Mode	30 mA AC single		IAN 30 mA RCD type A Mode single		IAN 30 mA RCD type A Mode suite	
Multiplier Phase Design	1 (*) 2 pole		Multiplier 1 Phase (+,-) Design 2 pole		Design 2 pole PRCD Standard General	

Figure 6.53: PRCD measurement menu

Test results / sub-results

t ΔN	trip out time
t I∆N x1, (+)	trip-out time ($I_{\Delta}=I_{\Delta N}$, (+) positive polarity)
t I∆N x1, (-)	trip-out time ($I_{\Delta}=I_{\Delta N}$, (-) negative polarity)
t I∆N x5, (+)	trip-out time ($I_{\Delta}=5 \times I_{\Delta N}$, (+) positive polarity)
t I∆N x5, (-)	trip-out time ($I_{\Delta}=5 \times I_{\Delta N}$, (-) negative polarity)
t I∆N x0.5, (+)	trip-out time ($I_{\Delta}=\frac{1}{2} \times I_{\Delta N}$, (+) positive polarity)
t I∆N x0.5, (-)	trip-out time ($I_{\Delta}=\frac{1}{2} \times I_{\Delta N}$, (-) negative polarity)
ld	trip out current
ld (+)	<pre>trip-out current ((+) positive polarity)</pre>
ld (-)	trip-out current ((-) negative polarity)

Test parameters

Type [AC, A, B, B+, F]
ΙΔΝ [10 mA, 15 mA, 30 mA, 100 mA*, 300 mA*]
Mode [single, auto]
Multiplier [0.5, 1, 5]
Phase [+, -, (+,-)]
Design [2 pole, 3 pole, K/Di (varistor), S (3 pole), S+]
PRCD standard [General, AS/NZS 3017]

* in combination with 3 – phase adapters

Test limits

Test limits for Pass / Fail statuses are set automatically, depending on set parameters.

Test circuit



Figure 6.54: PRCD test

PRCD measurement procedure

- Select the PRCD function.
- Set test parameters / limits.
- Connect the PRCD to the instrument (see test circuit above).
- Start measurement.
- Switch ON the PRCD within 15 s when prompted on the display.
- Reactivate PRCD within 15 s when prompted on the display.
- Save results (optional).





6.2.12 RCD test

S RCD	09:44	L RCD	09:47	S RCD	09:47
		(+) (-)		(+) (-) t IAN x1msms	
t ΔN ms		t I <u>AN</u> msms		t IΔN x5msms	
UcV	?	UcV	?	t IΔN x0.5msms	?
IAN 30 mA RCD type AC Mode single		IAN 30 mA RCD type A Mode single		UcV	
Multiplier 1 Phase (*)		Multiplier 1 Phase (*,-)	•••	IAN 30 mA RCD type A Mode auto	

Figure 6.56: RCD measurement menu

Test results / sub-results

+ ANI	trin out time
LΔIN	
t I∆N x1, (+)	trip-out time ($I_{\Delta}=I_{\Delta N}$, (+) positive polarity)
t I∆N x1, (-)	trip-out time ($I_{\Delta}=I_{\Delta N}$, (-) negative polarity)
t I∆N x5, (+)	trip-out time ($I_{\Delta}=5 \times I_{\Delta N}$, (+) positive polarity)
t I∆N x5, (-)	trip-out time ($I_{\Delta}=5 \times I_{\Delta N}$, (-) negative polarity)
t I∆N x0.5, (+)	trip-out time ($I_{\Delta}=\frac{1}{2} \times I_{\Delta N}$, (+) positive polarity)
t I∆N x0.5, (-)	trip-out time ($I_{\Delta}=\frac{1}{2} \times I_{\Delta N}$, (-) negative polarity)
ld	trip out current
ld (+)	trip-out current ((+) positive polarity)
ld (-)	trip-out current ((-) negative polarity)
Uc	Contact voltage

Test parameters

RCD type	Type [AC, A, B, B+, F]
Nominal current	ΙΔΝ [10 mA, 15 mA, 30 mA]
Test mode	Mode [single, auto]
Multiplication factor IAN	Multiplier [0.5, 1, 5]
Phase Starting polarity	Phase [+, -, (+,-)]
in single mode	
RCD Standard	RCD standard [EN 61008 / EN 61009, AS/NZS 3017]
Random phase	Random phase [No, Yes]

Test limits

Uc	Contact voltage limit [Custom, 25 V, 50 V]

Test limits for Pass / Fail statuses are set automatically, depending on set parameters.

Test circuit



Figure 6.57: RCD test

RCD measurement procedure

- Connect the instrument to the circuit with RCD (see test circuit above).
- Switch ON the RCD.
- Select the RCD function.
- Set test parameters / limits.
- Start measurement.
- Reactivate RCD within 15 s when prompted on the display.
- Save results (optional).

S RCD	14:35	♪ RCD	14:56
101	/	(+) (-) t IAN x1 9.9 ms 9.1 ms	
t AN IJIMms		t IΔN x5 8.7 ms 7.9 ms	
Uc 0.2v		t IΔN x0.5>300.0 ms 280.4 ms	
LΔN 30 mA Type AC	?	uc 0.6v	?
Mode single Phase (*)		IAN 30 mA Type A Mode auto	444

Figure 6.58: Examples of RCD measurement results

6.2.13 PE conductor (PRCD)



Figure 6.59: PE conductor (PRCD) test menu

Test results / sub-results

R.....Resistance

Result......Indication that the protection of the varistor in PE connection works properly

Test parameters

Type of PRCD	Design [2 pole, 3 pole, K/Di (varistor), S (3 pole), S+]
Duration	Duration [Off, 2 s 180 s]
Nominal current	IΔN [10 mA, 15 mA, 30 mA, 100 mA, 300 mA]
Nominal current (K/Di varistor)	IΔN [10 mA, 30 mA]

Test limits

Limit	H Limit(R) [Off, Custom, 0.01 Ω 9 Ω]

Specific options

	Calibrate - Compensation of test lead / IEC test cable resistance. Refer to chapter <i>6.2.2.1</i> for procedure details.
- Th	Lim. Calculator – PE_conductor(PRCD) resistance H Limit(R) calculator. Refer to chapter <i>6.2.2.2</i> for details.

Test circuit





PE conductor (PRCD) measurement procedure

- Select the **PE conductor (PRCD)** function.
- Set test parameters / limits.
- Compensate IEC plug adapter (optional).
- Connect device under test to the instrument (see test circuit above).
- Start measurement.
- Switch ON the PRCD within 15 s when prompted on the display. Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.61: Examples of PE conductor (PRCD) results

Note:

- Mains voltage is applied to the PRCD during the test.
- The instrument uses different test methods in regard to the set PRCD type. For 2 pole, 3 pole, S (3 pole) and S+ PRCDs the resistance of PE conductor is measured. For K/Di PRCDs the operation of the varistor in the PE connection is tested.
- L and N conductors are not allowed to be crossed in this test. Reconnect the PRCD's plug if necessary.
- PE resistance of IEC plug adapter can be compensated. See chapter 6.2.2.1 Compensation of test lead / IEC test cable resistance for details.

6.2.14 Open conductor (PRCD)

In this test the instrument disconnects individual conductors on the supply side and the response of the PRCD is checked.

Open_conductor (PRCD) 10:22		Open_conductor (PRCD)	10:23
PE open		Lopen	
		Nopen PEopen	
	?		?
Open PE		Open auto L,N,PE	
Design S (3 pole)		Design S (3 pole)	444

Figure 6.62: Open conductor measurement menu

Test results / sub-results

L open	Result for open L conductor [Pass, Fail]
N open	Result for open N conductor [Pass, Fail]
PE open	Result for open PE conductor [Pass, Fail]

Test parameters / limit

Conductor opened by the instrument	Open [L, N, PE, (auto L,N), (auto L,N,PE)]
Type of PRCD	Design [2 pole, 3 pole, K/Di (varistor), S (3 pole), S+]

Test circuit



Figure 6.63: Open conductor (PRCD) test

Open conductor (PRCD) measurement procedure

- Select the Open Conductor (PRCD) function.
- Set test parameters.
- Connect the PRCD to the instrument (see test circuit above).
- Start measurement.
- Switch ON the PRCD within 15 s when prompted on the display.
- Reactivate PRCD within 15 s when prompted on the display.
- Save results (optional).



Figure 6.64: Examples of PRCD measurement results

6.2.15 PRCD PE probe test



Figure 6.65: PRCD PE probe test menu

Test results / sub-results

Result.....Indication of the test [Pass, Fail]

Test parameters / limits

Test mode	Test [manual, auto]
Type of PRCD	Design [2 pole, 3 pole, K/Di (varistor), S (3 pole), S+]

Test circuits



Figure 6.66: PRCD PE probe test (manual)



Figure 6.67: PRCD PE probe test (auto)

PRCD PE probe test measurement procedure (Test = manual)

- Select the **PRCD PE probe test** function.
- Set test parameters (Test = manual)
- Connect the PRCD to be tested to the instrument (see test circuits above).
- Start measurement.
- The instrument applies power to the mains test socket for 10 s (timer is displayed).
- Switch ON the PRCD and with test probe touch the On button of the PRCD (see test circuit above), while power is on. If the PRCD has built in detection for high voltage on PE it will trip.
- Manually apply test result status and end the test.
- Save results (optional).

PRCD PE probe test measurement procedure (Test = auto)

- Select the **PRCD PE probe test** function.
- Set test parameters (Test = auto)
- · Connect the PRCD to be tested to the instrument (see test circuits above).
- Start measurement.
- Switch ON the PRCD within 15 s when prompted on the display.
- Reactivate PRCD within 15 s when prompted on the display.
- The instrument applies power to the mains test socket for 10 s (timer is displayed).
 With test probe touch the On button of the PRCD (see test circuit above). If the PRCD has built in detection for high voltage on PE it will trip.
- Test result status is automatically applied and test is ended.
- Save results (optional).

PRCD PE probe test	10:18	PRCD PE probe test	10:59
Result PASS		Result FAIL	
· · · · · · · · · · · · · · · · · · ·			
			?
Test auto	?	Test manual	
Design S (3 pole)	444	Design S (3 pole)	

Figure 6.68: Examples of PRCD PE probe test

Notes:

A safe but high voltage is applied to the test lead during the test. Do not touch the exposed tip at the end of the test lead. Risk of not dangerous but unpleasant electric shock!

6.2.16 Polarity

➡ Polarity	13:50	▲ Polarity	13:50
Result		Result	
	?		?
Mode normal		Mode active	
LN cross allowed		LN cross not allowed	444

Figure 6.69: Polarity test menus

Test results / sub-results

Result..... Indication of the test [Pass, Description of the fault]

Test parameters / limits

Test mode	Mode [normal, active]
Test status	Status [On, Off] (disable test status within Auto Sequence® for K/Di PRCD)
L and N cross	LN cross [not allowed, allowed] (phase and neutral change permission)
Wiring map ^{*)}	Wiring map [standard, L1-L2-L3-N-PE, L2-L3-L1-N-PE, L3-L1-L2-N-PE, L3-

L2-	L1-N-PE, L2-L1-L3-N-PE, L1-L3-L2-N-PE, L1-L2-L3-PE, L2-L3-L1-PE, L3-
L1-	L2-PE, L3-L2-L1-PE, L2-L1-L3-PE, L1-L3-L2-PE, L1-N-PE, L2-N-PE, L3-
N-F	PE, Rotation 123 (N), Rotation 321 (N), Rotation 123, Rotation 321]

^{*)} Wiring map parameter replaces LN cross parameter if active polarity mode is selected and Metrel 3-phase adapter (A 1322 or A 1422) is connected

Test circuits



Figure 6.70: Polarity test (manual)



Figure 6.71: Polarity test (auto)

Polarity measurement procedure (Mode = normal)

- Select the **Polarity** function.
- Set test parameters (Mode = normal).
- Connect the cable to be tested to the instrument (see test circuits above).
- Start measurement.
- Save results (optional).

Polarity measurement procedure (Mode = active)

- Select the **Polarity** function.
- Set test parameters (Mode = active).
- Connect the (PRCD) cable to be tested to the instrument (see test circuits above).
- Start measurement.
- Switch ON the switch / PRCD within 15 s when prompted on the display.
- Save results (optional).



Figure 6.72: Examples of Polarity test

Note:

 Active polarity test is intended for testing cords equipped with (P)RCD or mains operated switches.

6.2.17 Clamp current



Figure 6.73: Clamp current test menu

Test results / sub-results

I.....Current

Test parameters

Indication of which current is measured with clamps	Test [Differential leakage, PE leakage, Current]
Duration	Duration [Off, 2 s 180 s]
Current clamp model	Ch1 clamp type [A1579]

Test limits

Test circuit



Figure 6.74: Clamp current

Clamp current measurement procedure

- Select the Clamp current function.
- Set test parameters / limits.
- Connect the current clamp to the instrument.
- Embrace wire(s) that has to be measured with current clamp (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).

▲ Clamp current	09:09		09:09
		ung 1 10 ¥	
Test Differential leakage Duration Off	?	Test Differential leakage Duration Off	?
Ch1 clamp type A1579 Limit(I,ldiff,lpe) 1.00 mA	444	Ch1 clamp type A1579 Limit(I,Idiff,Ipe) 1.00 mA	

Figure 6.75: Examples of Clamp current measurement results

Note:

The frequency range of this measurement is limited. This measurement cannot be used for measuring leakage currents of appliances that are able to generate leakage currents with frequencies above 10 kHz or above the specified frequency range of the clamp.

6.2.18 Insulation resistance – Riso (welding equipment)



Figure 6.76: Insulation resistance (welding equipment) test menus

Test results / sub-results

Riso Insulation resistance Um...... Test voltage

Test parameters

Test type	Test [LN-W, W-PE, LN-PE, LN (Class II) - P]
Duration	Duration [Off, 2 s 180 s]
Nominal test voltage	Uiso [500 V]dc

Test limits

|--|

Test circuit, Riso (welding equipment) measurement procedure

- Select the **Riso** function.
- Set test parameters / limits.
- Connect METREL 3-phase adapter (A 1422) to the instrument*.
- · Connect device under test to the 3-phase adapter*.
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).

*For more information refer to chapter *Measurements according to IEC/ EN 60974-4* – Insulation resistance in 3-phase adapter user manual.

∽ Riso	17:56	∽ R iso	17:56
n ia >199_9µ0 ✓			
Um 525 v		Um 116v	
Test LN-PE A 3ph 3ph	?	Test LN-PE A 3ph 3ph 3ph	?
Limit(Riso) 5.0 MΩ		Limit(Riso) 5.0 MΩ	

Figure 6.77: Examples of Insulation resistance (welding equipment) measurement results

Note:

•

This test is applicable only with connected METREL 3-phase adapter (A1422).

6.2.19 Welding Circuit Leakage – I leak (W-PE)



Figure 6.78: Ileak W-PE test menu

Test results / sub-results

lw.....Leakage current

Test parameters

Duration	Duration [Off, 2 s 180 s]
Change status	Change [YES, NO] YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left
	 NO: The phase voltage is applied only to the right live output of the mains test socket.
*Delay time	Delay [0.2 s 5 s]

Test limits

High Limit (Iw)	Limit(Iw) [Off, Custom, 3.50 mA 10.00 mA]

Test circuit, I leak (W-PE) measurement procedure

- Select the I leak (W-PE) function.
- Set test parameters / limits.
- Connect METREL 3-phase adapter (A 1422) to the instrument*.
- · Connect device under test to the 3-phase adapter*.
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).

*For more information refer to chapter Measurements according to IEC/ EN 60974-4 – Welding circuit leakage current in 3-phase adapter user manual.

└── I leak (W-PE)	17:59	└── I leak (W-PE)	17:59
w 0.01			
Duration Off <mark>3ph</mark> Change NO	?	Duration Off <mark>3ph</mark> Change NO	?
Limit(lvv) 3.50 mA W2	• • •	Limit(lw) 3.50 mA W2	444

Figure 6.79: Examples of Ileak W-PE Leakage measurement results

Note:

• This test is applicable only with connected METREL 3-phase adapter (A1422).
6.2.20 Primary Leakage



Figure 6.80: Primary Leakage menu

Test results / sub-results

Idiff Primary leakage current

Test parameters

Duration	Duration [Off, 2 s 180 s]
Change status	Change [YES, NO] YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket.
	NO: The phase voltage is applied only to the right live output of the mains test socket.
*Delay time	Delay [0.2 s 5 s]

Test limits

High Limit (Idiff)	H Limit(Idiff) [Off, Custom, 0.25 mA 15.0 mA]
--------------------	-----------------------------------------------

Test circuit, Primary Leakage measurement procedure

- Select the Primary Leakage function.
- Set test parameters / limits.
- Connect METREL 3-phase adapter (A 1422) to the instrument*.
- Connect device under test to the 3-phase adapter*.
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).

*For more information refer to chapter Measurements according to IEC/ EN 60974-4 – Primary Leakage current in 3-phase adapter user manual.

🗂 Primary Leakage	18:03	♪ Primary Leakage	18:03
		Later 4.72	
Duration Off Change NO	?	Duration Off <mark>3ph</mark> Change NO	?
H Limit(ldiff) 0.50 mA	444	H Limit(Idiff) 0.50 mA	444

Figure 6.81: Examples of Ileak W-PE Leakage measurement results

Notes:

- This test is applicable only with connected METREL 3-phase adapter (A1422).
- > The differential current measurement principle is used for this test.

6.2.21 No-load voltage



Figure 6.82: No-load voltage menu

Test results / sub-results

Urms...... maximum no-load rms value Up.....maximum no-load peak value

Test parameters

Voltage type on welding output	W-output [a.c., d.c.]
Rated no-load voltage	Rated U ₀ no-load voltage [Custom, 20 V 99 V, -]

Test limits

Limit (a.c. rms)	Limit (Urms) [Off, 48 V, 80 V, 100 V]
Limit (a.c. peak)	Limit (Up) [Off, 68 V, 113 V, 141 V]
Limit (d.c. peak)	Limit (Up) [Off, 113 V, 141 V]
Limit	Limit (Up) [U _{0p} +/- 15 %]

Test circuit, No-load voltage measurement procedure

- Select the **U No Load** function.
- Set test parameters / limits.

- Connect METREL 3-phase adapter (A 1422) to the instrument*.
- Connect device under test to the 3-phase adapter*.
- Start measurement.
- Press 'Next' when the message Ready is displayed.
- Save results (optional).

*For more information refer to chapter Measurements according to IEC/ EN 60974-4 – No load voltage in 3-phase adapter user manual.



Figure 6.83: Examples of No-load voltage measurement results

Note:

• This test is applicable only with connected METREL 3-phase adapter (A1422).

6.2.22 Insulation resistance – Riso (medical equipment)



Figure 6.84: Insulation resistance (medical equipment) test menus

Test results / sub-results

Riso Insulation resistance Um...... Test voltage

Test parameters

Test	Test_Riso_ME [LN-PE, LN-P/S, LN-AP, PE-AP]
Duration	Duration [Off, 2 s 180 s]
Nominal test voltage	Uiso [500 V]

Test limit

Limit (Riso)	Limit(Riso) [Off, Custom, 2 MΩ … 70 MΩ]

Test circuits



Figure 6.85: Insulation resistance – LN-PE



Figure 6.86: Insulation resistance – LN-P/S



Figure 6.87: Insulation resistance – LN-AP



Figure 6.88: Insulation resistance – PE-AP

RISO measurement procedure

- Select the **Riso** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.89: Examples of Insulation resistance (medical equipment) measurement results

6.2.23 Equipment Leakage (medical equipment)

🗂 Equipment Leakage	15:16	🛨 Equipment Leakage	15:17	ち Equipment Leakage	15:17
legmA		legmA		legmA	
UlpeV		UlpeV		UlpeV	
PW	?	PW	?		?
Duration Off Method Differential		Duration Off Method Direct		Duration Off Method Alternative	
Unom 100 V Limit(leq) Off		Unom 240 V Limit(leq) Off		Unom 240 V Limit(leq) Off	

Figure 6.90: Equipment leakage measurement menu

Test results / sub-results

leq Equipment leakage current

Ulpe...... Measured voltage between phase and earth

P..... Active power

Test parameters

Duration	Duration [Off, 2 s 180 s]		
Test method	Method [Alternative, Direct, Differential]		
Change status	Change [YES, NO]		
	 YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket. NO: The phase voltage is applied only to the right live output of the mains test socket. 		
*Delay time	Delay [0.2 s 5 s]		
Nominal line to earth voltage whose value corresponds to the nominal mains voltage	Unom [100 V 240 V]		

Test limits

Limit (leq) (alternative)	Limit(leq) [Off, 500 µA, 1000 µA]
Limit (leq) (direct, differential)	Limit(leq) [Off, 100 µA, 500 µA]

Test circuits



Figure 6.91: Equipment Leakage (alternative) on Class I ME



Figure 6.92: Equipment Leakage (alternative) on Class II ME



Figure 6.93: Equipment Leakage (direct) on Class I



Figure 6.94: Equipment Leakage (differential) on Class I ME



Figure 6.95: Equipment Leakage (direct, differential) on Class II ME

Equipment Leakage measurement procedure

- Select the **Equipment Leakage** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).



Figure 6.96: Examples of Equipment leakage measurement results

6.2.24 Applied Part Leakage (medical equipment)

Applied Part Leakage		🛨 Applied Part Leakage	07:39
lapmA		lapmA	
UapV		Uap V	
P W	?		?
Duration Off Method direct		Duration Off Method alternative	
Unom 240 V Limit(lap) Off	444	Limit(lap) 240 V	444

Figure 6.97: Applied part leakage measurement menu

Test results / sub-results

- lap.....Applied part leakage current
- Uap......Voltage between applied part and earth during measurement
- P..... Active power

Test parameters

Duration	Duration [Off, 2 s 180 s]		
Test method	Method [Alternative, Direct]		
Change status	Change [YES, NO]		
	 YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket. NO: The phase voltage is applied only to the right live output of the mains test socket. 		
*Delay time	Delay [0.2 s 5 s]		
Nominal line to earth voltage	Unom [100 V 240 V]		
whose value corresponds to			
the nominal mains voltage			

Test limits

Limit (lap) (alternative, direct) Limit(lap) [Off, 50 µA, 5000 µA]

Test circuit







Figure 6.99: Applied part leakage (alternative) on Class II ME



Figure 6.100: Applied part leakage (direct) on Class I ME



Figure 6.101: Applied part leakage (direct) on Class II ME

Applied part leakage measurement procedure

- Select the **Applied part leakage** function.
- Set test parameters / limits.
- · Connect device under test to the instrument (see test circuits above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).

Applied Part Leakage 07:55		Applied Part Leakage	07:59
lap 0.004 _{mA}		Jap 5.81 mA 🗙	
Uap 223 V		Uap 54 v	
P 12W			
Duration Off Method direct	?	Duration Off Method alternative	?
Unom 240 V Limit(lap) 50 µA	444	Unom 240 V Limit(lap) 5000 µA	444

Figure 6.102: Examples of Applied part leakage measurement results

6.2.25 Touch Current (medical equipment)

ニ Touch Current			
Iteu			
Ulpe	WA		
P	W	?	
Duration Change			
Unom Limit(Itou)	240 V Off	444	

Figure 6.103: Touch current measurement menu

Test results / sub-results

Itou Touch current Ulpe...... Measured voltage between phase and earth P..... Active power

Test parameters

Duration	Duration [Off, 2 s 180 s]			
Change status	Change [YES, NO]			
	 YES: The instrument measures leakage current in two sequential steps with delay* in between. The phase voltage is firstly applied to the right live output of the mains test socket and secondly to the left live output of the mains test socket. NO: The phase voltage is applied only to the right live output of the mains test socket. 			
*Delay time	Delay [0.2 s 5 s]			
Nominal line to earth voltage	Unom [100 V 240 V].			
whose value corresponds to				
the nominal mains voltage				

Test limits

Limit (Itou) Limit(Itou) [Off, Custom, 100 µA]

Test circuit



Figure 6.104: Touch current

Applied part leakage measurement procedure

- Select the **Touch Current** function.
- Set test parameters / limits.
- Connect device under test to the instrument (see test circuit above).
- Start measurement.
- Measurement can be stopped manually or by timer.
- Save results (optional).





6.2.26 Functional test



Figure 6.106: Functional test menu

Test parameters (optional)

For the optional Power measurement the parameters and limits are the same as set in Power test.

Test circuit



Figure 6.107: Functional test

Functional test inspection procedure

- Select the appropriate Functional test function.
- Start the inspection.
- Power on the appliance through the mains test socket. Power measurement screen is displayed (optional).
- Perform the functional inspection of the appliance / equipment.
- Apply appropriate ticker(s) to items of inspection.
- End inspection.
- Save results (optional).



Figure 6.108: Examples of Functional test results

7 Auto Sequences®

Pre-programmed sequences of measurements can be carried out in Auto Sequences® menu. The sequence of measurements, their parameters and flow of the sequence can be programmed. The results of an Auto sequence® can be stored in the memory together with all related information.

Auto Sequences[®] can be pre-programmed on PC with the Metrel ES Manager software and uploaded to the instrument. On the instrument parameters and limits of individual single test in the Auto Sequence[®] can be changed / set.

7.1 Selection of Auto Sequences®

The Auto Sequence® list from Auto Sequence® groups menu should be selected first. Refer to chapter *4.11 Auto Sequence*® groups for more details.

7.1.1 Selecting an active Auto Sequence® group in Auto Sequences® menu

Auto Sequences® and Auto Sequence® group menus are interconnected so an active Auto Sequence® group can be selected also in the Auto Sequences® menu.

Procedure





New Auto Sequence® group is selected and all Auto Sequences® within that group are displayed on the screen.

7.1.2 Searching in Auto Sequences® menu

In Auto Sequence® menu it is possible to search for Auto Sequences® on base of their Name or Short code.

Procedure



3b	Clear filters	Clears all filters. Sets filters to default value.
4	Search	Searches through the active Auto Sequence® group according to the set filters. The results are shown in the Search results screen presented on <i>Figure</i> 7.1 and <i>Figure</i> 7.2



Figure 7.1: Search results screen – Page view

Options:

>	Next page.
<	Previous page.

Note:

Search result page consist of up to 50 results.

Search results	18:08
Page 1/2	'E = >
"))) Cl_1_lso	5
CI_1_ISO_AICP	
₩₩ Ci_1_la	
₩₩ CI_1_Isola	

Figure 7.2: Search results screen with Auto Sequences® selected

Options:

Έ.

Goes to location in Auto Sequences® menu.



7.1.3 Organization of Auto Sequences® in Auto Sequences® menu

The Auto Sequences® to be carried out can be selected from the Main Auto Sequences® menu. This menu can be organized in a structural manner with folders, sub-folders and Auto Sequences®. Auto Sequence® in the structure can be the original Auto Sequence® or a shortcut to the original Auto Sequence®.

Auto Sequences[®] marked as shortcuts and the original auto Sequences[®] are coupled. Changing of parameters or limits in any of the coupled Auto Sequences[®] will influence on the original Auto Sequence[®] and all its shortcuts.



Figure 7.3: Examples of organized Auto Sequences® in main Auto Sequences® menu

Options:	
	The original Auto Sequence®.
CI_1_la	A shortcut to the original Auto Sequence®.
	Starts the selected Auto Sequence®.
	The instrument immediately starts the Auto sequence®.
	Enters menu for more detail view of selected Auto sequence®.
ĿQ	This option should also be used if the parameters / limits of the selected
	Sequence® view menu for more information.
	Enters Auto Sequence® Configurator menu.
	See chapter 7.2.1.3 Auto Sequence® Configurator menu for details.

7.2 Organization of an Auto Sequence®

An Auto Sequence® is divided into three phases:

- Before starting the first test the Auto Sequence® view menu is shown (unless it was started directly from the Main Auto Sequences® menu). Parameters and limits of individual measurements can be set in this menu.
- During the execution phase of an Auto Sequence®, pre-programmed single tests are carried out. The sequence of single tests is controlled by pre-programmed flow commands.
- After the test sequence is finished the Auto Sequence® result menu is shown. Details of individual tests can be viewed and the results can be saved to Memory organizer.

7.2.1 Auto Sequence® view menu

In the Auto Sequence® view menu, the header and the single tests of selected Auto Sequence® are displayed. The header contains Name, Short code and description of the Auto Sequence®. Before starting the Auto Sequence®, test parameters / limits of individual measurements can be changed.

7.2.1.1 Auto Sequence[®] view menu (Header is selected)





Options:

	Starts the Auto Sequence®.
± <u>₽</u>	Enters Auto Sequence® Configurator menu. See chapter 7.2.1.3 Auto Sequence® Configurator menu for details.

7.2.1.2 Auto Sequence® view menu (measurement is selected)



Figure 7.5: Auto Sequence® view menu - measurement selected

Options:	
Visual	Selects single test.
Continuity	
Differential Lea	
	Opens menu for changing parameters and limits of selected measurements.
Output P/S - PE l out 0.2 A Duration 5 s Comment 1 Comment 2 H Limit(R) 0.3 D	Refer to chapter <i>6.1.1.2 Setting</i> parameters and limits of single tests for more information how to change measurement parameters and limits.
	Starts the Auto Sequence®.
?	Opens help screens. Refer to chapter <i>6.1.3 Help screens</i> for more information.
	Selects Multiple points.
Multiple points	



7.2.1.3 Auto Sequence® Configurator menu

Auto Sequence® Configurator menu options are active only when single tests within selected Auto sequence® contain configurable limits and / or parameters. They can be changed to suit requirements of current object under test before Auto sequence® execution. Original settings are overwritten for intended Auto sequence® execution only.

Select Configurator option from Auto sequence® Main screen or View screen to open Configurator menu presented on *Figure 7.6.* below.

Available settings are organized in groups, each group starts with concerned Single test name. Limit Calculator is referred to Continuity or PE_conductor(PRCD) functions. Refer to Single test description chapter for details of parameters and limits setting / calculation.

📥 Auto S	equen	ce® Configurator		10:07	Auto S	equen	ce® Configurator		10:06
Limit Calculator –	<	Calculator	>		Limit Calculator –	<	Calculator	>	_
Length	<	2 m	>		Length	<	2 m	>	
Cross Section	<	1.50 mm2	>		Cross Section	<	1.50 mm2	>	
H Limit		0.1 Ω			H Limit				
Polarity				444	Polarity				444
LN cross		not allowed	>		LN cross		not allowed		

Figure 7.6: Auto Sequence® Configurator menu – opened from Auto Sequence® Main menu on the left, on the right opened from Auto Sequence® view menu

Options:

	Starts the Auto Sequence® from Configurator menu. Option is available, if configurator was opened from Auto Sequence® Main menu. New configuration is automatically applied to all related single tests.
-	Confirms limits and parameters setting and returns to view menu. Option is available, if configurator was opened from Auto Sequence® view menu. Start the Auto Sequence® from view menu with confirmed configuration.

7.2.1.4 Indication of Loops

R iso x3

The attached 'x3' at the end of single test name indicates that a loop of single tests is programmed. This means that the marked single test will be carried out as many times as the number behind the 'x' indicates. It is possible to exit the loop before, at the end of each individual measurement.

7.2.1.5 Managing multiple points

If the device under test has more than one test point for an individual single test and the selected Auto Sequence® predicts only one test point (one single test) it is possible to change the Auto Sequence® appropriately. Single tests with enabled Multiple points ticker will be executed in a continuous loop. It is possible to exit the loop anytime at the end of each individual measurement.

The Multiple points setting is valid only for the actual Auto Sequence[®]. If the user often tests appliances with more than one test points it is recommended to program a special Auto Sequence[®] with pre-programmed loops.

7.2.2 Step by step execution of Auto Sequences®

While the Auto Sequence® is running, it is controlled by pre-programmed flow commands. Examples of actions controlled by flow commands are:

- pauses during the Auto Sequence®
- buzzer Pass / Fail sound after the tests
- pre-set data off appliances
- expert mode for Inspections
- skip non-safety notifications
- etc.

The actual list of flow commands is available in chapter *E.5 Description of flow commands*.

5 Demo	17:50
Subleakage test.	
Test will continue in 1 s.	
	444

Figure 7.7: Auto Sequence® – Example of a pause with message



Figure 7.8: Auto Sequence® – Example of a finished measurement with options for proceeding

Options (during execution of an Auto Sequence®):

	Proceeds to the next step in the test sequence.
	Repeats the measurement.
C	Displayed result of a single test will not be stored.
	Ends the Auto Sequence® and goes to Auto Sequence® result screen. Refer to chapter <i>7.2.3 Auto Sequence</i> ® result screen for more information.
E	Exits the loop of single tests and proceeds to the next step in the Auto Sequence®.
	Opens menu for viewing parameters and limits of a current measurement.
Output P/S-PE iout 0.2 A Duration 5s comment 1 comment 2 H Limit(R) 0.3 D	
	Adds comment.
	The instrument opens keypad for entering a comment to a current measurement.

The offered options in the control panel depend on the selected single test, its result and the programmed test flow.

Notes:

- During Auto Sequences® the popup Warning messages (see chapter 4.5 Symbols and messages) are displayed only before the single test inside one Auto Sequence®. This default setting can be changed with appropriate flow command. For more information about programming Auto Sequences® refer to chapter Appendix E Programming of Auto Sequences® on Metrel ES Manager.
- If Inspection Expert mode flow command is set, the visual inspection screen and Functional inspection screen are displayed for 1 second and an overall PASS is automatically applied at the end of test. In between, the automatic procedure can be stopped and statuses can be applied manually.

7.2.3 Auto Sequence® result screen

After the Auto Sequence® is finished the Auto Sequence® result screen is displayed. At the left side of the display the single tests and their statuses in the Auto Sequence® are shown.

In the middle of the display the header of the Auto Sequence® with Short code and description of the Auto Sequence® is displayed. At the top the overall Auto Sequence® result status is displayed. Refer to chapter *5.1.1 Measurement statuses* for more information.



Figure 7.9: Auto Sequence® result screen

Options	
	Starts a new Auto Sequence®.
	View results of individual measurements.
EQ	The instrument goes to menu for viewing details of the Auto Sequence®.
	Saves the Auto Sequence® results.
	A new Auto Sequence® was selected and started from a Structure object in the structure tree:
	 The Auto Sequence® result will be saved under the selected Structure object.
	A new Auto Sequence® was started from the Auto Sequence® main menu:
	 Saving under the last selected Structure object will be offered by default. The user can select another Structure object or create a
	new Structure object. By pressing in Memory organizer menu the Auto Sequence result is saved under selected location.
	An empty measurement was selected in structure tree and started:

	 The result(s) will be added to the Auto Sequence®. The Auto Sequence® will change its overall status from 'empty' to 'finished'.
	An already carried out Auto Sequence® was selected in structure tree, viewed and then restarted:
	 A new Auto Sequence result will be saved under the selected Structure object.
	Print label or goes to Print label menu. Menu is offered only if additional Label Type setting options are available. For more information refer to chapter <i>Appendix C - Print labels</i> <i>and write / read RFID / NFC tags</i>
	Print and Save Auto Sequence [®] results simultaneously. Option is available if Devices parameter Auto save is set to On print, see chapter 4.8 Devices for more information.
é	Write RFID / NFC tag. All data including Auto Sequence® results are written to the RFID/NFC writing device. Refer to <i>Appendix C - Print labels and write / read RFID / NFC tags</i> for supported tag types.
	Write RFID / NFC tag and Save Auto Sequence® results simultaneously. Option is available if Devices parameter Auto save is set to On write, see chapter 4.8 Devices for more information.
	Adds comment. The instrument opens keypad for entering a comment to Auto

Note:

 Options menu content depends on Devices settings menu. If no writing device is set, then 'Print label' and 'Write RFID' icons are hidden. Only one writing device can be set at the same time.

			continuity		
Visual 😑	\checkmark	iā	0 04		⊟
Continuity 📃	21.Jun.2014 13:50:52 Class I appliance.			•	
Differential	mains vortage will be applied to the appliance during the auto test.				
Functional 😑			Output P/S - PE		
		444	Duration5 sH Limit(R)0.3 Ω		444

Figure 7.10: Details of menu for viewing details of Auto Sequence® results

Options (menu for viewing details of Auto Sequence® results):



Details of selected single test in Auto Sequence® are displayed.

View parameters and limits of selected single test.
Add comment to selected single test results.
View / edit comment to single test results, when recalled from memory.

7.2.4 Auto Sequence® memory screen

In Auto Sequence® memory screen details of the Auto Sequence® results can be viewed, labels can be printed and a new Auto Sequence® can be restarted.



Figure 7.11: Auto Sequence® memory screen

Options:

Ç	Retest the Auto Sequence [®] . Enters menu for a new Auto Sequence [®] .
Ĩ	Enters menu for viewing details of the Auto Sequence®. Refer to chapter 7.2.3 Auto Sequence® result screen for more information.
Ē	Print label or goes to Print label menu. Menu is offered only if additional Label Type setting options are available. For more information refer to chapter 7.2.5 Print label menu.
é	Write RFID / NFC tag. All data including Auto Sequence [®] results are written to the RFID / NFC writing device. Refer to <i>Appendix C - Print labels and write / read RFID / NFC tags</i> for supported tag types.

Note:

 Options menu content depends on Devices settings menu. If no writing device is set, then 'Print label' and 'Write RFID' icons are hidden. Only one writing device can be set at the same time.

7.2.5 Print label menu

In the Print label menu, the label type to be printed can be set. For more information about supported labels, refer to *Appendix C - Print labels and write / read RFID / NFC tags.*



Figure 7.12: Print label menu

Print label options:

Label type	Tag type [simple, classic, QR]		
	Simple – data in text format, without barcode		
	Classic – label with barcode (includes Short code and appliance ID)		
	QR – label with QR code (all data, including results)		
No. of tags	Tags [1 tag, 2 tags]		
	1 tag – single tag will be printed		
	2 tags – two separate labels will be printed (one for appliance and one for the mains cord)		

Option:



Print label(s).

8 Maintenance

8.1 Periodic calibration

It is essential that all measuring instruments are regularly calibrated in order for the technical specification listed in this manual to be guaranteed. We recommend an annual calibration.

8.2 Fuses

There are two fuses on the left side panel:

F1, F2: T 16 A / 250 V / $(32 \times 6,3)$ mm / 1500 A: intended for instrument protection. For position of fuses refer to chapter 3.1 Front panel.

Warnings!

- Switch off the instrument and disconnect all test accessories and mains cord before replacing the fuses.
- Replace blown fuses with the same type as defined in this document.

8.3 Service

For repairs under or out of warranty please contact your distributor for further information.

Unauthorized person is not allowed to open the OmegaGT XA instrument. There are no user replaceable parts inside the instrument.

8.4 Cleaning

Use a soft, slightly moistened cloth with soap water or alcohol to clean the surface of OmegaGT XA instrument. Leave the instrument to dry totally before using it.

Notes:

- > Do not use liquids based on petrol or hydrocarbons!
- Do not spill cleaning liquid over the instrument!

9 Communications

The instrument can communicate with the Metrel ES Manager PC software. The following action is supported:

- Saved results and Tree structure from Memory organizer can be downloaded and stored to a PC.
- Tree structure and Auto Sequences[®] from Metrel ES Manager PC software can be uploaded to the instrument.

Metrel ES Manager is a PC software running on Windows 7, Windows 8, Windows 8.1 and Windows 10.

There are three communication interfaces available on the instrument: RS-232, USB and Bluetooth. Instrument can also communicate to various external devices (android devices, test adapters, scanners, printers,...).

9.1 USB and RS232 communication with PC

The instrument automatically selects the communication mode according to detected interface. USB interface has priority.

How to establish an USB or RS-232 link:

•	RS-232 communication: connect a PC COM port to the instrument PC / PRINTER
•	USB communication: connect a PC USB port to the instrument USB connector using
	the USB interface cable.
•	Switch on the PC and the instrument.
•	Run the Metrel ES Manager software.
,	Select communication port (COM port for USB communication is identified as "Measurement Instrument USB VCom Port").
•	The instrument is prepared to communicate with the PC.

9.2 Bluetooth communication

The internal Bluetooth module enables easy communication via Bluetooth with PC and Android devices.

How to configure a Bluetooth link between instrument and PC

•	Switch On the instrument.
•	On PC configure a Standard Serial Port to enable communication over Bluetooth link between instrument and PC. Usually no code for pairing the devices is needed.
•	Run the Metrel ES Manager software.
•	Select configured communication port.
•	The instrument is prepared to communicate with the PC.

How to configure a Bluetooth link between instrument and Android device

•	Switch On the instrument.
•	Some Android applications automatically carry out the setup of a Bluetooth connection. It is preferred to use this option if it exists. This option is supported by Metrel's Android applications.
•	If this option is not supported by the selected Android application then configure a Bluetooth link via Android device's Bluetooth configuration tool. Usually no code for pairing the devices is needed.
•	The instrument and Android device are ready to communicate.

Notes:

- Sometimes there will be a demand from the PC or Android device to enter the code. Enter code '1234' to correctly configure the Bluetooth link.
- The name of correctly configured Bluetooth device must consist of the instrument type plus serial number, eg. *MI 3360-12240429I*. If the Bluetooth module got another name, the configuration must be repeated.
- In case of serious troubles with the Bluetooth communication it is possible to reinitialize the internal Bluetooth module. The initialization is carried out during the Initial settings procedure. In case of a successful initialization "INITIALIZING... OK!" is displayed at the end of the procedure. See chapter 4.7.7 Initial Settings.
- Check if there are available Metrel Android applications for this instrument.

9.3 Bluetooth communication with printers and scanners

OmegaGT XA instrument can communicate with supported Bluetooth printers and scanners. Contact Metrel or your distributor which external devices and functionalities are supported. See Chapter *4.8 Devices* for details how to set the external Bluetooth device.

9.4 RS232 communication with other external devices

It is possible to communicate with serial scanners and RFID / NFC reader / writer device via the BARCODE serial port and with serial printers via the PC / PRINTER serial port. Contact Metrel or your distributor which external devices and functionalities are supported. See Chapter *4.8 Devices* for details how to set the external device.

9.5 Connections to test adapters

9.5.1 Active 3 Phase Adapter /Plus (A 1322 / A 1422)



Figure 9.1: Connecting Active 3 Phase Adapter /plus (A 1322 / A 1422)

Notes:

- See 3-phase adapter user manual for more details.
- Do not connect other devices than Metrel test adapters to the 3 PHASE ADAPTER connector.

9.5.2 110 V Test Adapter (A 1474)

110 V Adapter (A 1474) is used as interface to connect 110 V appliances to the instrument.



Figure 9.2: Connecting 110 V Test Adapter (A 1474)

Note:

• Instrument detects the adapter and blocks measurements if mains voltage is too high.

9.5.3 Tip Commander (A 1694)

Tip Commander (A 1694) enables remote controlled execution of measurements.



Figure 9.3: Connecting Tip Commander (A 1694)

Note:

• Tip Commander (A 1694) should be enabled in Settings menu for operation.

10 Technical specifications

10.1 Continuity // Protective earth resistance

Continuity

	Range	Resolution	Accuracy
	0.00 Ω 19.99 Ω	0.01 Ω	\pm (2 % of reading + 2 D)
D	20.0 Ω 99.9 Ω	0.1 Ω	\pm 3 % of reading
ĸ	100.0 Ω 199.9 Ω	0.1 Ω	\pm 5 % of reading
	200 Ω 999 Ω	1 Ω	indicative

Operating range (acc. to EN 61557-4)	0.08 Ω 199.9 Ω
Test currents	0.2 A,10 A, 25 A
Current source (at nominal mains voltage, use	e of standard accessories)
	> 0.2 A at R < 2 Ω
	> 10 A at R < 0.1 Ω at 230 V
	> 25 A into short circuit at 230 V
Open circuit voltage	< 9 V a.c.

Test terminals:

Continuity	
R (200 mA)	P/S – PE, Socket PE; Socket PE – IEC PE
R (10 A, 25 A)	P/S – Socket PE; Socket PE – IEC PE

Protective earth resistance

R (200 mA)	P/AP – PE, Socket PE
R (10 A, 25 A)	P/AP – Socket PE

10.2 Insulation Resistance (Riso, Riso-S)

Insulation resistance, Insulation resistance -S (250 V, 500 V)

	Range	Resolution	Accuracy
Diag	0.00 MΩ 19.99 MΩ	0.01 MΩ	\pm (3 % of reading + 2 D)
RISO Riso-S	20.0 ΜΩ 99.9 ΜΩ	0.1 MΩ	\pm 5 % of reading
1130-0	100.0 MΩ 199.9 MΩ	0.1 MΩ	\pm 10 % of reading

Output voltage

•	Range	Resolution	Accuracy
Um	0 V 600 V	1 V	\pm (3 % of reading + 2 D)

Operating range (acc. to EN 61557-2) $0.08 \text{ M}\Omega \dots 199.9 (999) \text{ M}\Omega$ Nominal voltages Un...... 250 V, 500 V (-0%, +10%)Short circuit current...... max. 2.0 mA

Test terminals:

Riso	LN, Socket LN – PE, Socket PE, P/S
Riso-S	LN, Socket LN – P/S

10.3 Sub-Leakage Current, Substitute Leakage Current - S

Substitute leakage current, Substitute leakage current - S

	Range	Resolution	Accuracy
Isub	0.00 mA 1.99 mA	0.01 mA	\pm (3 % of reading + 3 D)
Isub-S	2.00 mA 19.99 mA	0.01 mA	±(5 % of reading)

Operating range (acc. to EN 61557-16).....0.02 mA ... 19.99 mA Open circuit voltage......230 V a.c., 110 V a.c. Current calculated to mains supply voltage (110 V or 230 V) is displayed.

Test terminals:

Isub	LN, Socket LN – PE, Socket PE, P/S
Isub-S	LN, Socket LN – P/S

10.4 Differential Leakage current

Differential leakage current

	Range	Resolution	Accuracy
Idiff	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	\pm (5 % of reading)

Power (active)

•	Range	Resolution	Accuracy
Р	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Operating range (acc. to EN 61557-16)0.010 mA ... 19.99 mA Influence of load current< 0.02 mA/A

Test terminals:

ldiff	Socket L,N – Socket PE, P/S
Р	Socket L – Socket N

10.5 PE leakage current

PE leakage current

	Range	Resolution	Accuracy
lpe	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	±(5 % of reading)

Power (active)

	Range	Resolution	Accuracy
D	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
F	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Operating range (acc. to EN 61557-16)0.010 mA ... 19.99 mA

Test terminals:

lpe	Socket L,N – Socket PE
Р	Socket L – Socket N

10.6 Touch leakage current

Touch leakage current

	Range	Resolution	Accuracy
lpe	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	\pm (5 % of reading)

Power (active)

	Range	Resolution	Accuracy
P 0	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Operating range (acc. to EN 61557-16).....0.010 mA ... 19.99 mA

Test terminals:

Itou	Socket L,N – P/S
Р	Socket L – Socket N

10.7 Power

Power (active)

	Range	Resolution	Accuracy
Б	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
Г	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Power (apparent)

	Range	Resolution	Accuracy
<u>د</u>	0 VA 999 VA	1 VA	\pm (5 % of reading + 5 D)
3	1.00 kVA 3.70 kVA	10 VA	\pm 5 % of reading

Power (reactive)

	Ran	ge	Resolution	Accuracy
Q	±(0 \	/Ar 999) VAr	1 VAr	\pm (5 % of reading + 5 D)
	±(1.0	00 kVAr 3.70) kVAr	10 VAr	\pm 5 % of reading

Power factor

	Range	Resolution	Accuracy
PF	0.00i 1.00i 0.00c 1.00c	0.01	\pm (5 % of reading + 5 D)

Total Harmonic Distortion (voltage)

	Range	Resolution	Accuracy
THDU	0.0 % 99.9 %	0.1 %	\pm (5 % of reading + 5 D)

Total Harmonic Distortion (current)

	Range	Resolution	Accuracy
THDI	0.00 A 16.00 A	0.01 A	\pm (3 % of reading + 5 D)

Cosinus Φ

	Range	Resolution	Accuracy
Cos Φ	0.00i 1.00i 0.00c 1.00c	0.01	\pm (5 % of reading + 5 D)

Current

	Range	Resolution	Accuracy
Ι	0.00 A 16.00 A	0.01 A	\pm (3 % of reading + 5 D)

Voltage

	Range	Resolution	Accuracy
	0.0 V 199.9 V	0.1 V	\pm (3 % of reading + 10 D)
0	200 V 264 V	1 V	±3 % of reading

Test terminals:

P,S,Q,PF,THDU,THDI, Cos Φ, I, U	Socket L – Socket N
---------------------------------	---------------------

10.8 Leak's & Power

Power (active)

	Range	Resolution	Accuracy
P	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
F	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Touch leakage current

	Range	Resolution	Accuracy
ltou	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	±(5 % of reading)

Operating range (acc. to EN 61557-16)0.010 mA ... 19.99 mA

Differential leakage current

	Range	Resolution	Accuracy
Idiff	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	±(5 % of reading)

Operating range (acc. to EN 61557-16).....0.010 mA ... 19.99 mA Influence of load current< 0.02 mA/A

Power (apparent)

	Range	Resolution	Accuracy
<u>د</u>	0 VA 999 VA	1 VA	\pm (5 % of reading + 5 D)
3	1.00 kVA 3.70 kVA	10 VA	\pm 5 % of reading

Power (reactive)

	Range	Resolution	Accuracy
0	0 VAr 999 VAr	1 VAr	\pm (5 % of reading + 5 D)
Q	1.00 kVAr 3.70 kVAr	10 VAr	\pm 5 % of reading

Power factor

	Range	Resolution	Accuracy
PF	0.00i 1.00i 0.00c 1.00c	0.01	\pm (5 % of reading + 5 D)

Total Harmonic Distortion (voltage)

	Range	Resolution	Accuracy
THDU	0.0 % 99.9 %	0.1 %	\pm (5 % of reading + 5 D)

Total Harmonic Distortion (current)

	Range	Resolution	Accuracy
THDI	0.00 A 16.00 A	0.01 A	\pm (3 % of reading + 5 D)

Cosinus Φ

	Range	Resolution	Accuracy
Cos Φ	0.00i 1.00i 0.00c 1.00c	0.01	\pm (5 % of reading + 5 D)

Current

	Range	Resolution	Accuracy
I	0.00 A 16.00 A	0.01 A	\pm (3 % of reading + 5 D)

Voltage

	Range	Resolution	Accuracy
	0.0 V 199.9 V	0.1 V	\pm (3 % of reading + 10 D)
U	200 V 264 V	1 V	±3 % of reading

Test terminals:

P,S,Q,PF,THDU,THDI, Cos Φ, Ι, U	Socket L – Socket N
Idiff	Socket L,N – Socket PE, P/S
Itou	Socket L,N – P/S

10.9 PRCD test

Trip-out time

	Range	Resolution	Accuracy
	0 ms … 300 ms (999 ms*) (½×I∆N)	1 ms	± 3 ms
tΔN	0 ms 300 ms (Ι _{ΔΝ})	1 ms	± 3 ms
	0 ms … 40 ms (5×I _{∆N})	1 ms	± 3 ms

*According to standard AS/NZS 3017

Trip out-current

	Range	Resolution	Accuracy
IΔ	$0.2 \times I_{\Delta N} \dots 2.2 \times I_{\Delta N}$	$0.05 \times I_{\Delta N}$	$\pm 0.1 \times I_{\Delta N}$

Test current type:..... sine-wave (AC), pulsed (A,F), smooth DC (B,B+) Test currents (IΔN): 10 mA, 15 mA, 30 mA100 mA and 300 mA with A1322, A1422 Test current size (PRCD standard is AS/NZS 3017)..... ± 5% Test current size (general).....-0/+10%

Test terminals:	
tΔN, IΔ	Socket – IEC

10.10 RCD test

Trip-out time

	Range	Resolution	Accuracy			
	0 ms … 300 ms (999 ms*) (½×I _{∆N})	1 ms	± 3 ms			
t∆N	0 ms 300 ms (I _{∆N})	1 ms	± 3 ms			
	0 ms … 40 ms (5×I _{∆N})	1 ms	± 3 ms			

*According to standard AS/NZS 3017

Trip out-current

	Range	Resolution	Accuracy
IΔ	$0.2 \times I_{\Delta N} \dots 2.2 \times I_{\Delta N}$	$0.05 \times I_{\Delta N}$	$\pm 0.1 \times I_{\Delta N}$

Contact voltage

	Range	Resolution	Accuracy
Uc	0.0 V 19.9 V	0.1 V	(-0 % / +15 %) of reading \pm 20 D
	20.0 V 99.9 V	0.1 V	(-0 % / +15 %) of reading

Test current type:..... sine-wave (AC), pulsed (A,F), smooth DC (B,B+) Test currents (I Δ N): 10 mA, 15 mA, 30 mA Test current size (RCD standard is AS/NZS AS/NZS)...... \pm 5% Test current size (EN 61008/EN 61009).....-0/+10%

|--|

tΔN, IΔ	Mains Socket	

10.11 PE conductor (PRCD)

PE conductor	(Ty	pe = 2	pole, 3	pole, S((3	pole)	, S+))
---------------------	-----	--------	---------	----------	----	-------	-------	---

	Range	Resolution	Accuracy
R	0.00 Ω 19.99 Ω	0.01 Ω	\pm (2 % of reading + 2 D)
	20.0 Ω 99.9 Ω	0.1 Ω	\pm 3 % of reading
	100.0 Ω 199.9 Ω	0.1 Ω	\pm 5 % of reading
	200 Ω 999 Ω	1Ω	indicative

 Test terminals:
 Socket PE – IEC PE

PE conductor (Type = K/ Di (varistor))

Test principle:

A voltage is applied between PE connections of the PRCD-K. There is a 'PASS' if PRCD trips.

Test terminals:

Result

Socket – IEC

10.12 Open conductor (PRCD)

Test principle:

Mains voltage is applied to the mains test socket. Disconnection of the L, N and PE connections is performed inside the instrument. There is a 'PASS' if the PRCD trips.

Test terminals:

L open, N open, PE open	Socket – IEC			

10.13 PRCD PE probe test

Test principle:

Mains voltage is applied to the mains test socket. A safe voltage sufficiently high to activate the protection circuit in the PRCD is applied to the P/S terminal.

Test voltage (active)> 100 V a.c. Maximal current< 1 mA
Test terminals:

Result (manual)	Socket, P/S
Result (auto)	Socket – IEC, P/S

10.14 Polarity

Test voltage (normal).....< 50 V Test voltage (active).....mains voltage Power consumption of tested device during the active test......< 25 VA

Test terminals: Result (normal, active) Socket – IEC

10.15 Clamp current

True RMS current using 1000:1 current clamp

	Range	Resolution	Accuracy
	0.10 mA 9.99 mA	0.01 mA	\pm (5 % of reading + 10 digits)
I	10.0 mA 99.9 mA	0.1 mA	\pm (5 % of reading + 5 digits)
ldiff	100 mA 999 mA	1 mA	\pm (5 % of reading + 5 digits)
lpe	1.00 A 9.99 A	0.01 A	\pm (5 % of reading + 5 digits)
	10.0 A 24.9 A	0.1 A	\pm (5 % of reading + 5 digits)

Accuracy of current transformer is not considered. Frequency range of current clamp is not considered.

Test terminals:

I, Idiff, Ipe	CLAMPS terminals

10.16 Flash test

Current a.c. (apparent)

	Range	Resolution	Accuracy
I	0.00 mA 2.50 mA	0.01 mA	\pm (5 % of reading + 5 D)

Test terminals:

I (1500 V)	Socket LN – Socket PE
I (3000 V	3 kV Socket LN – FLASH
	(1.5 kV Socket LN – Socket PE, 1.5 kV FLASH – Socket PE)

10.17 Insulation resistance Riso (welding equipment)

	Range	Resolution	Accuracy
	0.00 MΩ 19.99 MΩ	0.01 MΩ	\pm (3 % of reading + 2 D)
Riso	20.0 MΩ 99.9 MΩ	0.1 MΩ	\pm 5 % of reading
	100.0 MΩ 199.9 MΩ	0.1 MΩ	± 10 % of reading

Output voltage

	Range	Resolution	Accuracy
Um	0 V 600 V	1 V	\pm (3 % of reading + 2 D)

Test terminals:

Riso LN-W	A 1422: Socket L1 L2 L3 N (16A-5p, 32A-5p or 16A-3p) – W1 W2
Riso W-PE	A 1422: Socket PE (16A-5p, 32A-5p or 16A-3p) – W1 W2
Riso LN-PE	A 1422: Socket L1 L2 L3 N (16A-5p, 32A-5p or 16A-3p) – Socket PE (16A-
	5p, 32A-5p or 16A-3p)
Riso LN (Class II)	A 1422: Socket L1 L2 L3 N (16A-5p, 32A-5p or 16A-3p) – MI 3360: P/S
- P	

10.18 Welding Circuit leakage (lleak W-PE)

Refer to chapter *Technical specifications* in 3-phase adapter instrument user manual.

10.19 Primary Leakage (I diff)

Refer to chapter *Technical specifications* in 3-phase adapter instrument user manual.

10.20 No-load voltage

Refer to chapter *Technical specifications* in 3-phase adapter instrument user manual.

10.21 Insulation Resistance (medical equipment)

Riso

	Range	Resolution	Accuracy
Dias	0.00 MΩ 19.99 MΩ	0.01 MΩ	\pm (3 % of reading + 2 D)
RISU	20.0 MΩ 199.9 MΩ	0.1 MΩ	\pm 5 % of reading

Output voltage

	Range	Resolution	Accuracy
Um	0 V 600 V	1 V	\pm (3 % of reading + 2 D)

Operating range (acc. to EN 61557-2) 0.08 M Ω ... 199.9 (999) M Ω Nominal voltages Un...... 500 V (- 0 %, + 10 %) Short circuit current...... max. 2.0 mA

Test terminals:

Riso (LN-PE)	LN, Socket LN – PE, Socket PE
Riso (LN-P/S)	LN, Socket LN – P/S
Riso (LN-AP)	LN, Socket LN – P/AP
Riso (PE-AP)	PE, Socket PE – P/AP

10.22 Equipment leakage

Equipment leakage current (direct, differential, alternative)

	5 1 7		
	Range	Resolution	Accuracy
leq	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	±(5 % of reading)

Ulpe (direct, differential, alternative)

	Range	Resolution	Accuracy
Ulpe	0 V 299 V	1 V	\pm (2 % of reading + 2 D)

Power (direct, differential)

	Range	Resolution	Accuracy
P 0 W 999 W 1.00 kW 3.7	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Operating range direct and differential method (acc. to EN 61557-16).....0.010 mA ... 19.99 mA Operating range alternative method (acc. to EN 61557-16)......0.020 mA ... 19.99 mA Influence of load current (differential method)......< 0.02 mA/A

Test terminals:

leq (alternative)	LN, Socket LN – PE, Socket PE, P/S, P/AP	
leq (direct, differential)	Socket L,N – PE, Socket PE, P/S, P/AP	
Ulpe	Socket L – Socket PE	
P (direct, differential)	Socket L – Socket N	

10.23 Applied Part leakage

Applied Part leakage current (direct, alternative)

	Range	Resolution	Accuracy
lap	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	\pm (5 % of reading)

Uap (direct, alternative)

	Range	Resolution	Accuracy
Uap	0 V 299 V	1 V	\pm (2 % of reading + 2 D)

Power (direct)

	Range	Resolution	Accuracy
Ρ	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Operating range direct method (acc. to EN 61557-16).....0.010 mA ... 19.99 mA Operating range alternative method (acc. to EN 61557-16).....0.020 mA ... 19.99 mA

Test terminals:	
lap (alternative)	Socket LNPE, PE – P/AP
lap (direct)	Socket L,N,PE, PE – P/AP
Uap	Socket PE, PE – P/AP
Р	Socket L – Socket N

10.24 Touch current (medical equipment)

Touch current

	Range	Resolution	Accuracy
ltou	0.000 mA 1.999 mA	1 µA	\pm (3 % of reading + 3 D)
	2.00 mA 19.99 mA	0.01 mA	±(5 % of reading)

Ulpe (direct)

	Range	Resolution	Accuracy
Ulpe	0 V 299 V	1 V	\pm (2 % of reading + 2 D)

Power (direct)

	Range	Resolution	Accuracy
P 0 W 999 W 1.00 kW 3.70 kW	0 W 999 W	1 W	\pm (5 % of reading + 5 D)
	1.00 kW 3.70 kW	10 W	\pm 5 % of reading

Operating range (acc. to EN 61557-16)0.010 mA ... 19.99 mA

Test terminals

Itou	Socket L,N – P/S
Ulpe	Socket L – Socket PE
Р	Socket L – Socket N

10.25 General data

Mains supply

Supply voltage, frequency	110 V / 230 V AC, 50 Hz / 60 Hz
Supply voltage tolerance	±10 %
Max. power consumption	300 VA (without load on test socket)
Max. load	10 A continuous, 16 A short duration, 1.5 kW motor
Mains supply overvoltage category	CAT II / 300V
Altitude	≤ 2000 m

Measuring categories

Instrument:	Cat II / 300 V
Test socket:	Cat II / 300 V
Plug test cable:	Cat II / 300 V
Altitude	≤ 2000 m

Protection classifications

Power supply	.Class I, mains supply, Class II, only battery supply
Pollution degree	.2
Degree of protection	.IP 40
• •	.IP 20 (mains test socket)
Case	.Shock proof plastic / portable
Display	.Colour TFT display, 4.3 inch, 480 x 272 pixels
T 1	

Touch screen.....Capacitive

Communication

Memory	depends on microSD card size
RS232 interfaces	2
USB 2.0	Standard USB Type B
Bluetooth	Class 2

Dimensions (w×h×d):	31 cm × 13 cm × 25 cm
Weight	6.1 kg

Reference conditions

Reference temperature range:.....15 °C ... 35 °C Reference humidity range:......35 % ... 65 % RH

Operation conditions

Working temperature range:0 °C ... +40 °C Maximum relative humidity:85 % RH (0 °C ... 40 °C), non-condensing

Storage conditions

Temperature range:	10 °C +60 °C
Maximum relative humidity: .	
	80 % RH (40 °C 60 °C)

Accuracies apply for 1 year in reference conditions. Temperature coefficient outside these limits is 0.2 % of measured value per °C plus 1 digit, otherwise noted.

Fuses

2 x T 16 A / 250 V, 32 mm × 6.3 mm / 1500 A

Appendix A Structure objects in OmegaGT XA

Structure elements used in Memory Organizer are instrument's Profile dependent.

Symbol	Default name	Description
>_	Node	Node
	Project	Project
(Location	Location
2	Client	Client
2	Appliance	Appliance (basic description)
A	Appliance FD	Appliance (full description)
<u>.</u> ۸-	Medical device	Medical device (basic description)
^ -	Medical device FD	Medical device (full description)
₩	Welding device	Welding device (basic description)
×	Welding device FD	Welding device (full description)
	Element	Universal element

Appendix B Profile Notes

There are no specific profile notes for OmegaGT XA MI 3360.

Appendix C

The instrument supports different printers, label size forms and two tag formats (PAT and Generic); listed parameters setting is described in chapter *4.8 Devices*. By setting the printer, label size forms and tag formats are limited.

Tag content can be presented as text only or arranged as text area and machine-readable code area – barcode or QR code – in addition.

The instrument supports RFID / NFC reader / writer device; tag type supported is NTAG216.

Please check with Metrel or distributor which printers and labels are supported in your OmegaGT XA instrument.

C.1 PAT tag format

It is intended for tagging of individual appliance with Auto Sequence® test data. To start printing, Auto Sequence® should be finished and saved or reopened from memory structure. When required, printing of two labels of the same test can be set.

Available tag data presented in text area are:

- Auto Sequence® short Test code
- Appliance ID
- Appliance name
- Test date
- Retest date
- Auto Sequence® test status
- User name (who currently performed test or who performed saved test, if printed from memory)

Available tag data presented in machine-readable area are:

- Auto Sequence® short Test code
- Appliance ID
- Appliance name
- Test date
- Test period (from appliance description)
- Appliance location (from appliance description)
- Auto Sequence® test status
- User name (who currently performed test or who performed saved test, if printed from memory)
- Auto Sequence® measurements results

Actual tag content depends on label type selection, when printing. Content of 1st and 2nd label is also adopted, when 2-label printing is selected.

Following tables describe tag content arrangement and its data for supported form sizes and chosen label type.

Label type	Form size W x H (mm)	Tag content arrangement	Data1 st label	Data 2 nd label
Classic		Barcode	Test code, appliance ID	Appliance ID
		Text	Test code, appliance ID, test or retest date, status, user	Appliance ID, test or retest date, status, user
QR	50 x 25.5	QR	Test code, appliance ID, appliance name, test date, test period, location, user, status, measurement results.	Appliance ID, appliance name, test date, test period, location, user, status
		Text	Test code, appliance ID, appliance name, test or retest date, status, user	Appliance ID, appliance name, test or retest date, status, user
Simple		Text	Appliance ID, appliance name, status, test or retest date, user	

Label type	Form size W x H (mm)	Tag content arrangement	Data1 st label	Data 2 nd label
Classic		Barcode	Test code, appliance ID	Appliance ID
L		Text	Test code, appliance ID, test and retest date, status, user	Appliance ID, test and retest date, status, user
QR L	43 x 99	QR	Test code, appliance ID, appliance name, test date, test period, location, user, status, measurement results.	Appliance ID, appliance name, test date, test period, location, user, status
		Text	Test code, appliance ID, appliance name, test and retest date, status, user	Appliance ID, appliance name, test and retest date, status, user

Label type	Size W x H (mm)	Tag content arrangement	Data1 st label	Data 2 nd label
Classic L		Barcode	Test code, appliance ID	Appliance ID
(inverted)		Text	Test code, appliance ID, test and retest date, status, user	Appliance ID, test and retest date, status, user
QR L (inverted)	100 x 50	QR	Test code, appliance ID, appliance name, test date, test period, location, user, status, measurement results.	Appliance ID, appliance name, test date, test period, location, user, status
		Text	Test code, appliance ID, appliance name, test and retest date, status, user	Appliance ID, appliance name, test and retest date, status, user

- Notes:
 2nd label is intended to mark supply cords.
 Data not available will not be printed on the label.

- Test or Retest date: is set in the General Settings => Devices => Writing devices menu.
- If Auto Sequence® was modified, its short code is marked with asterisk (*).

Following table describes data content written on RFID / NFC tag.

RFID / NFC tag type	Data
NTAG216	Test code, appliance ID, appliance name, test date, test period, location, user, status, measurement results.

C.2 Generic tag format

It is intended for tagging structure objects (element, appliance, equipment), which could be tested and their location under parent structure object is important. Label printing can be started from selected structure object (element, appliance, equipment), even if no Auto Sequence® is associated with it, or from finished Auto Sequence® saved under it.

Tag data presented in text area are:

- Parent structure object ID (name) (← Object_name)
- Auto Sequence® short test code (if printing from Auto Sequence®; if printing from object field is omitted)
- Object ID (name)
- ➤ Test date (|→ DD.MM.YYYY) or Retest date (→| DD.MM.YYYY), which one is selected in General Settings => Devices => Writing devices menu
- Status (printing from object: overall status of all tests appended to the object or substructure objects; printing from Auto Sequence®: its status)
- User name (Printing from Auto Sequence: user who performed test; printing from object: current signed-in user)

Tag data presented in machine-readable area are:

- Parent structure object ID (name)
- Auto Sequence® short test code (if printing from Auto Sequence®; if printing from object field is omitted)
- Object ID (name)
- Test date
- Test period (from appliance description)
- Auto Sequence® status (field is omitted, if not printing from Auto Sequence®)
- Object status (overall status of all tests appended to the object or sub-structure objects)
- User name (Printing from Auto Sequence®: user who performed test; printing from object: current signed-in user)

Following table describes tag content arrangement and its data for supported label form size.

Form size W x H (mm)	Tag content arrangement	Data
	Text	Parent object name, Test code, Object ID, test or retest date, status, user
50 x 25.5	QR	Parent object name, Test code, Object ID, test date, test period, Auto Sequence® status, Object status, user.

Notes:

- Data not available will not be printed on the label.
- Object without appended Auto Sequence® test has no status!
- If Auto Sequence® was modified, its short code is marked with asterisk (*).
- Object status depends on all measurements (Auto Sequences® or Single tests) appended to the object or sub-structure objects, see chapter 5.1.2.1 Measurement status indication under the Structure object for details.

Following table describes data content written on RFID / NFC tag.

RFID / NFC tag type	Data
NTAG216	Parent object name, Test code, Object ID, test date, test period, Auto Sequence® status, Object status, user.

Appendix D Default list of Auto Sequences®

Default list of Auto Sequences® for MI 3360 OmegaGT XA instrument is available on Metrel home page: <u>http://www.metrel.si</u>

Appendix E Programming of Auto Sequences® on Metrel ES Manager

The Auto Sequence® editor is a part of the Metrel ES Manager software. In Auto Sequence® editor Auto Sequence® can be pre-programmed and organized in groups, before uploaded to the instrument.

E.1 Auto Sequence® Editor workspace

To enter Auto Sequence® Editor's workspace, select Auto Sequence® Editor in Home Tab of Metrel ES Manager PC SW. Auto Sequence® Editor workspace is divided in four main areas. On the left side , structure of selected group of Auto Sequence® is displayed. In the middle part of the workspace, the elements of the selected Auto Sequence® are shown. On the right side, list of available Single tests and list of Flow commands are shown.

--- >>

Single test area contains three tabs, Measurements, Inspections and Custom Inspections tab. Custom Inspections and their tasks are programmed by user.

٥	Metrel AutoSe	eq_PAT_GT.atmpx - /	Auto Sequence® Editor				
							۵
File	uto Sequence®	Communication	Tools				
Open New Save Close New Folder N	w Auto Sequence® Delete	Download Upload	Custom Inspection Editor				
Metrel AutoSeq_PAT_GT.atmpx ×							Ŧ
Auto Sequence® group			SO ATCP		Single test	8	
🔊	•_•	Class I a	ppliance with isolated accessible		Measurement	Inspections	Custom Inspections
Name	-	Conductr Insulation	ve parts. n resistance and substitute leaka	ae	Medical equip	oment	
VDE 0701-0702 TEST CODES	O	current n	neasurements are applicable.	-	▲ Portable app	liances	
CI 1 Iso (PA01)			•		Clamp curre	nt	
EL_1_IS0_AICP (PA02)			U		Open_condu	ctor (PRCD)	E
CI_1_la (PA03)	Auto Sequence® code:	PA02 Rea	idonly		Continuity		
CI_1_Ia_AICP (PA04)					Differential L	.eakage	
ED CI_2_Iso (PA05)	Header				Flash		
CI_2_lbs (PA06)	APPLIANCE INFO				lpe Leakage		
CI_1_Isola (PA07)					Leak"s & Po	wer	
CI_1_Isola_AICP (PA08)	BUZZER mode				PE conduct	or (PRCD)	
CI_2_Isolbs (PA09)					Polarity		
CI_2 (PA10)			-	ļ			
CI_3_Iso (PA11)	Visual		*		Flow Comm	ands 🛛 🚺	
CI_3 (PA12)	SINGLE TEST						
					PAUSE		
Class I (PA20)	OPERATION AFTER EN	ND OF TEST			8117758	-	
Class II (PA21)					BUZZER MOC	ie	
Class III (PA22)	Continuity		*		NO NOTIFICA	TION mode	
	Continuity		× .				
CI_1_Iso_risc_env (WA50)	SINGLE TEST				APPLIANCE I	NFO	
Cl_1_lso_normal_env (WA51)		ID OF TEST					
Cl_1_lso_protection (WA52)	OPERATION AFTER EP	ND OF TEST			FLOW PROT	OCOL	
CI_1_<32A_risc_env (WA53)					INSPECTION	EXDERT mod	•
CL_1_≤32A_normal_env (WA54)	R iso		•		INSPECTION	EXPERT 1100	0
EIL1_≤32A_protection (WA55)							
CI_1_>32A_risc_env (WA56)	SINGLE LEST						
CL1_>32A_normal_env (WA57)	OPERATION AFTER FI	ND OF TEST					

Figure E.1: Auto Sequence® Editor workspace

An Auto Sequence[®] begins with Name, Description and Image, followed by the first step (Header), one or more measuring steps and ends with the last step (Result). By inserting

appropriate Single tests (measurements, inspections and custom inspections) 3 and Flow commands 4 and setting their parameters, arbitrary Auto Sequences® can be created.

Header APPLIANCE INFO BUZZER mode	Figure E.2: Example of an Auto Sequence® header
Continuity 🌣	
PAUSE SINGLE TEST OPERATION AFTER END OF TEST	Figure E.3: Example of a measurement step
Result PAUSE RESULT SCREEN	Figure E.4: Example of an Auto Sequence® result

E.2 Managing groups of Auto Sequences®

The Auto Sequences[®] can be divided into different user defined groups of Auto Sequences[®]. Each group of Auto Sequences[®] is stored in a file. More files can be opened simultaneously in Auto Sequence[®] editor.

Within Group of Auto Sequences[®], tree structure can be organized, with folders / subfolders containing Auto Sequences[®]. The three structure of currently active Group of Auto Sequences[®] is displayed on the left side of the Auto Sequence[®] editor workspace, see *Figure E*.5.



Figure E.5: Group of Auto Sequences® tree organization

Operation options on Group of Auto Sequences® are available from menu bar at the top of Auto Sequence® Editor workspace.

File operation options:

	Opens a file (Group of Auto Sequences®).
	Creates a new file (Group of Auto Sequences®).
8.	Saves / Saves as the opened Group of Auto Sequences® to a file.
\bigotimes	Closes the file (Group of Auto Sequences®).

Group of Auto Sequences® view options:

*	Expand all folders / subfolders / Auto Sequences®.
	Collapse all folders / subfolders / Auto Sequences®.
Q	Search by name within Auto Sequence [®] group. See Appendix E.2.2 Search within selected Auto Sequence [®] group for details.

Group of Auto Sequences® operation options (also available by right clicking on Folder or Auto Sequence®):

	Adds a new folder / subfolder to the group
	Adds a new Auto Sequence® to the group.
×	Deletes: - the selected Auto Sequence® - the selected folder with all subfolders and Auto Sequences®

Right click on the selected Auto Sequence® or Folder opens menu with additional possibilities:

C	Auto Sequence®: Edit Name, Description and Image (see <i>Figure E.6</i>). Folder: Edit folder name
	Auto Sequence®: Copy to clipboard
	Folder: Copy to clipboard including subfolders and Auto Sequences®
F83	Auto Sequence®: Paste it to selected location
LE	Folder: Paste it to selected location
	Auto Sequence®: Creates shortcut to selected Auto Sequence®

Double click on the object name allows it name edit:

	Auto Sequence® name: Edit Auto Sequence® name			
	Rew Auto Sequence®			
DOUBLE CLICK	Folder name: Edit folder name			
	Portable / Handheld Equipment			

Drag and drop of the selected Auto Sequence® or Folder / Subfolder moves it to a new location:

DRAG & DROP	"Drag and drop" functionality is equivalent to "cut" and "paste" in a single move.
	 move to folder insert

E.2.1 Auto Sequence® Name, Description and Image editing

When EDIT function is selected on Auto Sequence®, menu for editing presented on *Figure E.6* appear on the screen. Editing options are:

Name: Edit or change the name of Auto Sequence®.

Description: Any text for additional description of Auto Sequence® can be entered.

Image: Image presenting Auto sequence® measuring arrangement can be entered or deleted.

	Enters menu for browsing to Image location.
x	Deletes the Image from Auto Sequence®.

Figure E.6: Editing the Auto Sequence® Name, Description and Image

E.2.2 Search within selected Auto Sequence® group

By entering the text into search box and click on the search \checkmark icon, found results are highlighted with yellow background and first found result (Folder or Auto Sequence[®]) is focused. Click on the Search icon \checkmark again focus next search result. Search functionality is implemented in Folders, Subfolders and Auto Sequence[®] of selected Auto Sequence[®] Group.

Search text can be cleared by selecting the Clear ¹⁰⁰ button.

Metrel AS_PAT_GT_N	/I3360_ang_V3.atmpx*	×
Auto Sequence@	🖲 group	
۱	Iso	8 R
Name		
👻 🚞 VDE 0701-0702	TEST CODES	
DI_1_ISO (PA	(01)	0
DI_1_Iso_Al	CP (PA02)	
CI_1_la (PA)	03)	
DI_1_la_AIC	P (PA04)	
The second secon	405)	
CI_2_lbs (PA)	406)	
≣ DCI_1_ <mark>Iso</mark> la (F	PA07)	
CI_1_ <mark>lso</mark> la_A	AICP (PA08)	
The second secon	(PA09)	
D CI_2 (PA10)		
EDCI_3_ISO (PA	(11)	
ED CI_3 (PA12)		U
🚽 🚞 VDE 0701 - 070	2 SIMPLE TEST CODES	
Dess I (PA2	:0)	
Class II (PA2	21)	

Figure E.7: Example of Search result within Auto Sequence® group

E.3 Elements of an Auto Sequence®

E.3.1 Auto Sequence® steps

There are three kinds of Auto Sequence® steps.

Header

The Header step is empty by default. Flow commands can be added to the Header step.

Measurement step

The Measurement step contains a Single test and the Operation after end of test flow command by default. Other Flow commands can also be added to the Measurement step.

Result

The Result step contains the Result screen flow command by default. Other Flow commands can also be added to the Result step.

E.3.2 Single tests

Single tests are the same as in Metrel ES Manager Measurement menu. Limits and parameters of the measurements can be set. Results and sub-results can't be set.

E.3.3 Flow commands

Flow commands are used to control the flow of measurements. Refer to chapter *E.5 Description of flow commands* for more information.

E.3.4 Number of measurement steps

Often the same measurement step has to be performed on multiple points on the device under test. It is possible to set how many times a Measurement step will be repeated. All carried out individual Single test results are stored in the Auto Sequence® result as if they were programmed as independent measuring steps.

E.4 Creating / modifying an Auto Sequence®

If creating a new Auto Sequence[®] from scratch, the first step (Header) and the last step (Result) are offered by default. Measurement steps are inserted by the user.

Options:

Adding a measurement step	By double clicking on a Single test a new measurement step will appear as the last of measurement steps. It can also be dragged and dropped on the appropriate position in the Auto Sequence®.	
Adding flow commands	Selected flow command can be dragged from the list of Flow commands and dropped on the appropriate place in any Auto Sequence® step.	
Changing position of flow command within measurement step	By a click on an element and use of	

Viewing / changing parameters of flow commands or single tests.	By a double click on the element.
Setting number of measurement step repetitions	By setting a number in the field.

Right click on the selected measurement step / flow command:

N 1		Copy – Paste before
3	Сору	A measurement step / flow command can be copied and
	Paste before	pasted above selected location on the same or on another Auto Sequence®.
	Paste after	
TEST	Delete	Copy – Paste after A measurement step / flow command can be copied and
		pasted under selected location on the same or on another Auto Sequence®.
		Delete
		Deletes the selected measurement step / flow command.

E.5 Description of flow commands

Double click on inserted Flow Command opens menu window, where text or picture can be entered, external commands can be activated and parameters can be set.

Flow commands Operation after end of test and Results screen are entered by default, others are user selectable from Flow Commands menu.

Pause

A Pause command with text message or picture can be inserted anywhere in the measuring steps. Warning icon can be set alone or added to text message. Arbitrary text message can be entered in prepared field Text of menu window.

Parameters:

Pause type	Show text and/or warning (\blacksquare check to show warning icon) Show picture (\square browse for image path)
Duration	Number in seconds, infinite (no entry)

Buzzer mode

Passed or failed measurement is indicated with beeps.

- Pass double beep after the test
- Fail long beep after the test

Beep happens right after single test measurement.

Parameters

State	On – enables Buzzer mode
	Off – disables Buzzer mode

No notifications mode

Instrument skips pre-test warnings (see chapter 4.5 Symbols and messages for more information).

Parameters

State	On – enables No notifications mode
	Off – disables No notifications mode

Appliance info

Instrument enables to automatically select the appliance type and add the Appliance ID, Appliance name and Retest period to the Auto Sequence®.

Parameters

Repeat Setting	Repeat: The same Appliance ID will be offered each til			
		same Auto Sequence® is carried out successively in a		
		loop.		
	Increment:	A four digit number will be added to the Appliance ID		
		and incremented each time if the same Auto		
		Sequence® is carried out successively in a loop.		
Appliance type	Selects the ty	pe of the appliance (Appliance, Appliance_FD, Medical		
	Equip., Medical Equip. FD, Welding Equip., Welding Equip. FD)			
Default Appliance ID	Enter default	Appliance ID		
Appliance name	Enter Appliance name.			
	Options:			
	🗹 Editable -	- allows Appliance name to be modified while running		
	Auto Sequen	ce®. Menu with a list of Appliance names and possibility		
	to enter custo	om Appliance name is offered within the test		
	Not editab	le – Default Appliance name is used. Appliance name		
	cannot be mo	dified while running Auto Sequence®		
Retest period	Retest period	in months.		
	Options:			
	🗹 Editable –	allows Retest period to be modified while running Auto		
	Sequence®.	Numeric keypad for entering custom Retest period is		
	offered within	the test.		
	Not editab	le – Default Retest period is used. Retest period cannot		
	be modified w	while running Auto Sequence®		
	1			

Note

This flow command is active only if Auto Sequence® is started from the Auto Sequence® Main menu.

Inspection Expert mode

If Inspection Expert mode flow command is set, the Visual inspection screen and Functional inspection screen within Auto Sequence® are displayed for 1 second and an overall PASS is automatically applied at the end of test. In between, the automatic procedure can be stopped and statuses can be applied manually.

Inspection Expert mode is disabled by default.

Parameters

State	On – enables automatic settings of tickers in Visual and Functional tests.
	Off – disables automatic settings of tickers in Visual and Functional tests.

Operation after end of test

This flow command controls the proceeding of the Auto Sequence® in regard to the measurement results.

Parameters

Operation after end of test	The operat	ion can be individually set for the case the	
– pass	measurement passed, failed or ended without a status.		
– fail			
– no status	Manual:	The test sequence stops and waits for appropriate command (RUN key, external command) to proceed.	
	Auto:	The test sequence automatically proceeds.	

Result screen

This flow commands control the proceeding after the Auto Sequence® has ended.

Parameters

Auto Save	Auto Sequence® results are stored in the momentary workspace.
	A new Node with the date and time will be created. Under the Node Auto Sequence® results or (if Appliance info flow command is set) a new appliance and Auto Sequence® results will be stored.
	Up to 100 Auto Sequence® results or appliances can be automatically stored under the same node. If more results / appliances are available, they are split to multiple nodes. Local Save Flow setting is disabled by default.
	Note This flow command is active only if Auto Sequence® is started from the Auto Sequence® Main menu (not from the Memory organizer).
Auto Print	Auto Sequence® results are automatically printed. Print label menu will not be displayed. All printer and tag settings from Devices menu applies.
	Note This flow command is active only if Auto Sequence® is started from the Auto Sequence® Main menu (not from the Memory organizer).

E.6 Custom Inspections programming

Arbitrary set of tasks dedicated to specific user defined Inspections can be programmed with application of Custom Inspection Editor Tool, accessible from Auto Sequence® Editor workspace. Custom Inspections are stored in dedicated file *.indf with user defined name. For application of Custom Inspections as a single test within Auto Sequence® group, appropriate file containing specific Custom Inspection should be opened first.

E.6.1 Creating and editing Custom Inspections



Custom Inspection Editor workspace is entered by selecting <u>custom happenetor</u> icon from Auto Sequences® main menu. It is divided in two main areas, as presented on *Figure E*.8:



Custom Inspection **Name** and **Scope** of inspection (Visual or Functional)

Name of Custom Inspection Item tasks and Type of Item Pass / Fail checkbox marking



Figure E.8: Custom Inspection Editor workspace

Custom Inspection Editor Main menu options:

	Opens existing Custom Inspection Data file. By selecting, menu for browsing to location of *.indf file containing one or more Custom Inspections data appear on the screen. Selected file is opened in dedicated tab marked with file name.
	Creates a new Custom Inspection Data file. New tab with empty workspace is opened. Default name of the new tab is <i>Inspection Data File</i> ; it could be renamed during Save procedure.
•	Saves / Saves as Custom Inspection Data file opened on active tab. Menu for browsing to the folder location and editing of file name is opened. Browse to the location, confirm overwriting, if file already exists or edit file name to save it as a new Custom Inspection Data file.

Add New Custom Inspection.



New inspection with default name Custom Inspection and default scope Visual appear on the editor workspace. It contains one Item task with default name Custom Inspection and default Type Pass_Fail_Checked_Empty. Default Name and Type can be edited – changed.



Remove selected custom inspection.

To select inspection, click to the inspection Name field. To remove it, select icon from editor main menu. Before removal, user is asked to confirm deletion.

Edit Name and Scope of Inspection

Name			
Visual PR			÷
Functiona	")	Undo	
Visual Mu	\mathbb{W}	Cut	
Functiona	гП	Copy	
Visual Ou		Deate	
Functiona	4	Paste	
	×	Delete	
		Select All	
	_		_

Inspection Name edit:

Click to the Inspection Name field to start editing it. Drag cursor, with left mouse button pressed, to select letters and words. Position cursor and double-click to select word of the name. Actions could be performed with keyboard also. Press right mouse button to activate Edit menu and select appropriate action as presented on the left figure. Menu is case sensitive; options



Inspection Scope edit:

currently not available are greyed out.

Click to Inspection Scope field to open selection menu presented on left figure. Options:

Visual is intended for observation of test object

Functional allows functional test of observed object

Edit Item task structure of Inspection





ADD New Item task procedure:

presented on left figure.

the right side of Editor workspace.

own Child Item tasks and so on.

Position cursor above Item task Name and apply right mouse click to select Item task and open menu with options: Add New: new Item task is added on the top tree level Add New Child: new child Item task is added under selected Item Remove selected: delete selected Item task with all subtasks

Item tasks of the selected Inspection are listed in Name column on

Each Item task can have Child Item tasks, Child Item can have its

Arbitrary tree structure of Item tasks and subtasks can be built as

Default Name of New Item task is *Custom Inspection*, default Type Pass Fail Checked Empty and both can be edited – changed.

Name			Item tooke containing Child Item tooke are marked with triangle in	
⊿	Ite	em task	front of their Name	
		Child Item task	nont of their name.	
	⊿	Child Item task	Click on triangle mark:	
		Child Item task	collapse Item task tree structure	
		Child Item task		
	Item task		expands item task free structure	

Edit Name and Type of Item task

Na	me						
⊿	No	o visible injury					
Housing condition							
Switches condition							
	⊿	Connecti	5	Undo			
		Cable	\checkmark	Cut			
		Plug r	-	Conv			
		Socke	L.	copy ry			
⊿	Ма	rking		Paste			
	⊳	PRCD typ	×	Delete			
	⊳	Operating		Select All			
		Applied s		Select All			
Ту	pe						
Pa	ss_F	ail_Empty		-			
Pa	ss_l	ail_Checked	_Emp	ty			
Pass_Fail_Empty							
	-						

Edit Name of Item task:

Click to the Item task Name field to start editing it. Drag cursor, with left mouse button pressed, to select letters and words. Position cursor and double-click to select word of the name. Actions could be performed with keyboard also. Press right mouse button to activate Edit menu and select

appropriate action as presented on the left figure. Menu is case sensitive; options currently not available are greved out.

Туре	-
Pass_Fail_Empty	
Pass_Fail_Checked_Empty	C
Pass_Fail_Empty	
	t ti
	D
	•
	P
×	

dit Type of Item task:

lick to Item Type field to open selection menu presented on left gure. Selectable checkbox status assignment options are:

ass_Fail_Checked_Empty: Pass, Fail, Checked, Empty (default)

ass Fail Empty: Pass, Fail selection, Empty (default) value

E.6.2 Applying Custom Inspections

Custom inspections can be applied in Auto Sequences®. Direct assignment of Custom inspection to the Metrel ES manager structure objects is not possible.

After custom created Inspection Data file is opened, available inspections are listed in Custom Inspections tab of Single test area of Auto Sequence® Editor, see chapter E.1 Auto Sequence® Editor workspace for details.

Custom Inspection is added to Auto sequence as a Single test, see chapter E.4 Creating / modifying an Auto Sequence® for details.

Opening / changing Inspection Data File

Single test Measurement Inspections Custom Inspections Custom Inspection sample01 Custom Inspection sample02 Custom Inspection sample03	Position cursor within Custom inspections List area and apply mouse right click to open Option menu: Refresh: Refresh content of already opened Inspection Data file. Browse for custom Inspection file:					
Browse for custom inspection file Refresh	Menu for browsing to folder location of new Inspection Data file is opened.					
Single test Measurement Inspections Custom Inspections Visual PRCD protected extension cord Image: Custom Inspection cord Image: Custom Inspection cord	After confirmation of selection, new Inspection Data file is opened and list of available Custom Inspections is changed.					
Functional PRCD protected extension cord						
Visual Multi-outlet extension cord	 If Metrel ES Manager Work scope is changed, 					
Functional Multi-outlet extension cord						
Visual Outdoor extension cord	opened Inspection Data file remains active and available Custom Inspections remains the same.					
Functional Outdoor extension cord						

Appendix F Testing 110 V appliances

When testing 110 V appliances in IT or CT supply system, some test functions in the instrument are omitted due to safety reasons. Following is a list of applicable test functions.

	Supply system		
Test function	110 V CT	110 V IT	Note
Continuity	\checkmark	✓	
Protective earth resistance	✓	✓	
Flash test	\checkmark	✓	
Insulation resistance (Riso, Riso-S)	\checkmark	✓	
Sub-leakage ISUB	\checkmark	✓	
Differential Leakage	\checkmark	✓	
lpe Leakage	\checkmark	✓	
Touch Leakage	\checkmark	\checkmark	
Power	\checkmark	\checkmark	
Leak's & Power	\checkmark	✓	
PRCD test	none	none	
PE conductor (PRCD)	none	none	
RCD test	\checkmark	\checkmark	See note for IT
Open conductor (PRCD)	none	none	
PRCD PE probe test	none	none	
<i>Polarity</i> - Normal	\checkmark	\checkmark	
Polarity - Active	none	none	
Clamp current	\checkmark	\checkmark	
Insulation resistance – Riso (medical equipment)	\checkmark	\checkmark	
Equipment Leakage (medical equipment)	\checkmark	\checkmark	
Applied Part Leakage (medical equipment)	\checkmark	\checkmark	
Touch Current (medical equipment)	✓	\checkmark	
Functional test	\checkmark	\checkmark	

Notes:

- List of applicable functions contains and is related to functions, that are directly applied by the instrument MI 3360 OmegaGT XA only.
- In general, omitted are tests where active RCD or active circuit breaker has to be supplied for their operation.
- In 110 V IT, the maximum RCD test current can be I_{SFL} (IT first fault short circuit current).