

## Technical Data KT 630-3

<b>Test points</b>				
Type of test point cards	RM60	RM80	RM100 / RM16	RM120
Max. number of test point cards	16			
Max. number of test points	1024		512	
Test point interface	Female connector DIN 41612, 64-way		Female connector DIN 41612, 32-way	
<b>General</b>				
Power supply	100 – 240 VAC (50 - 60 Hz)			
Dimensions (W x H x D)	450 mm x 275 mm x 395 mm			
Weight	approx. 19 kg			
Environmental conditions	Temperature range: operation: +10 °C – +40 °C storage: +10 °C – +60 °C			
	Relative humidity: 20 % – 70 %, non-condensing			
Operating	Operating unit consisting of a high-contrast LC-display with 4 x 20 characters and 11 keys			
	Operating languages: German, English, French, Italian, Spanish, Danish, Czech, Polish, Hungarian and Japanese (further languages on request)			
Features	Self-learning of known good samples			
	Programming with test program editor NT Control LT (PC software)			
	Elaborate possibilities for the output and formatting of test results for printer and/or file			
	Expanded label and report printing, also to file			
	Test procedure control for the customization to special test tasks			
	Division of the test procedure into single test steps (segments) e.g. for the test of switch positions or for segment specific parameters			
	Visual check of LEDs			
Diagnosis	Self-diagnosis for the measurement electronics and the test point cards			
Interfaces	Network			
	Serial interfaces RS232 / 3 x USB 2.0 (1 x front, 2 x rear)			
	3 x I/O, digital, 24 V, D-Sub 15-way			
	Interface for warning lamp red-green, foot switch, test result lamp			
	Pin number probe for test point identification			
	Safety loop for the protection of the work place			
	RJ12 interface for the connection of a temperature and humidity sensor			
Specialties	Microsoft® Network Client and server software pre-installed and configured			
Data storage	Flash Memory 2 GB internal and USB flash drive ≥ 2 GB			
Scope of delivery	KT 630, main cable, pin number probe, USB flash drive with NT Control LT and detailed documentation			

<b>Options (Excerpt)</b>	
	Test program selection via I/O card
	Checking and testing with barcode
	Correction value determination for R, C, L and Z
	Digital I/O interfaces 24 V, 8, 16 or 24 I/Os, D-Sub 37-way
	Test system remote control via digital I/Os, serial interface or all common field-bus systems
	Temperature and humidity protocol, 0 - 100 % rF $\pm 2$ %, -40 - 80 °C $\pm 0.3$ K
	Adapter cables as well as I/O connection cables and I/O interface boards
	Interface for adaptronic test tables
	Handles / installation set 19"
	UNICAD converter for CAD- and Excel link data

## Measurement electronics MT20

<b>Low voltage test</b>	
Test voltage	1 – 25 V programmable in steps of 1 V ( $\pm 3$ %, min. 0.2 V)
Test current	max. 25 mA
Threshold continuity test	1 Ohm – 1 kOhm ( $\pm 5$ %, min. 1 Ohm)
Threshold short-circuit test	20 kOhm – 1 MOhm ( $\pm 5$ %) Option: up to 5 MOhm ( $\pm 20$ % at test voltages $\geq 20$ V)
<b>Component test</b>	
Resistors	1 Ohm – 1 MOhm ( $\pm 5$ %, min. 1 Ohm) Option: up to 5 MOhm ( $\pm 20$ % at test voltages $\geq 20$ V)
Capacitors	10 nF – 20 mF ( $\pm 10$ %) Option: from 100 pF ( $\pm 10$ %, $\pm 20$ pF)
Diodes	Forward voltage: < 1.0 V Reverse voltage: max. 25 V
Zener diodes	Forward voltage: < 3.0 V Zener voltage: max. 20 V ( $\pm 10$ %)
LEDs	Forward-Voltage: < 4.0 V Reverse voltage: max. 25 V
Suppressor diode	Break-down voltage: 3 V – 23 V ( $\pm 10$ %)

## Measurement electronics MT1500DC

<b>High voltage test</b>			
Test voltage	RM60 / RM100 / RM16	40 – 1000 VDC ( $\pm 2\%$ ); in steps of 1 V	
	RM80 / RM120	40 – 1500 VDC ( $\pm 2\%$ ); in steps of 1 V	
Test current	max. 2 mA (safety current limited according to EN 61010)		
Testing times	Rise time 0 – 60000 ms; in steps of 10 ms Dwell time 0 – 60000 ms; in steps of 10 ms		
Insulation test	500 kOhm – 2 GOhm Option: up to 10 GOhm (not valid for Distributed Test Systems or unearthed operation) in steps of 500 kOhm		
Dielectric strength test	Fast recognitions of voltage breakdowns at test voltages $\geq 200$ V (arc detections)		
Accuracy in dependence of the voltage:			
<b>Voltage</b>	<b>500 kOhm – 500 MOhm</b>	<b>&gt; 500 MOhm – 2 GOhm</b>	<b>&gt; 2 GOhm – 10 GOhm</b>
1500 V	2 %	5 %	15 %
$\geq 1000$ V	2 %	5 %	$\geq 15\%$
$\geq 500$ V	2 %	$\geq 15\%$	$\geq 15\%$
	<b>500 kOhm – 100 MOhm</b>	<b>&gt; 100 MOhm – 2 GOhm</b>	<b>&gt; 2 GOhm – 10 GOhm</b>
$\geq 100$ V	2 %	$\geq 15\%$	$\geq 15\%$
<b>High current test</b>			
Test current	50 mA – 2 A (1 A with RM16); in steps of 10 mA		
Test voltage	max. 22 VDC		
Test times	Dwell time 0 – 60000 ms; in steps of 100 ms		
Threshold continuity test	500 mOhm – 10 Ohm, $\pm 2\%$ , min. 200 mOhm 10 Ohm – 1 kOhm, $\pm 5\%$ (dwell time $\geq 100$ ms) in steps of 500 mOhm		
Four-wire measurement 1 mOhm (option)	1 mOhm – 1000 Ohm; in steps of 1 mOhm $\pm 2\%$ , min. 1 mOhm at test current $\geq 1$ A $\pm 5\%$ , min. 5 mOhm at test current $< 1$ A, min. 50 mOhm		
	<b>Resolution</b>	<b>Measuring range</b>	
	13 $\mu$ Ohm	at 2 A test current: 100 $\mu$ Ohm – 50 mOhm	
	245 $\mu$ Ohm	at 2 A test current: 50 mOhm – 1 Ohm	
	4,9 mOhm	at 2 A test current: 1 Ohm – 11 Ohm	
	0.045 % of measured value	if test current of 2 A is not reached due to voltage limitation: 11 Ohm – 1000 Ohm	
	Note: The measuring ranges change depending on the specified test current.		
Four-wire measurement 100 $\mu$ Ohm (option)	100 $\mu$ Ohm – 1000 Ohm; minimum step size 100 $\mu$ Ohm		
	Measuring range 100 $\mu$ Ohm – 1 mOhm: Measurement accuracy absolute $\pm 20\%$ at test current 2 A Repeating accuracy $\pm 10$ $\mu$ Ohm Measuring time min. 4.8 s		
Not suitable for unearthed operation.	Measuring range 1 mOhm – 1000 Ohm: $\pm 2\%$ , min. 1 mOhm at test current $\geq 1$ A $\pm 5\%$ , min. 5 mOhm at test current $< 1$ A, min. 50 mOhm		
	<b>Resolution</b>	<b>Measuring range</b>	
	1 $\mu$ Ohm	at 2 A test current: 100 $\mu$ Ohm – 50 mOhm	
	16 $\mu$ Ohm	at 2 A test current: 50 mOhm – 1 Ohm	
	305 $\mu$ Ohm	at 2 A test current: 1 Ohm – 11 Ohm	
	0.0028 % of measured value	if test current of 2 A is not reached due to voltage limitation: 11 Ohm – 1000 Ohm	
	Note: The measuring ranges change depending on the specified test current.		

Short time interruptions AMC (option)	Interruptions $\geq 1 \mu\text{s}$	
<b>Component test</b>		
<b>Varistors</b>		
Varistor voltage	RM60 / RM100 / RM16	40 – 900 VDC
	RM80 / RM120	40 – 1300 VDC
Test current	1 mA	
<b>Surge arrestors</b>		
Breakdown voltage	RM60 / RM100 / RM16	100 – 900 VDC
	RM80 / RM120	100 – 1300 VDC
Ramp	100 V/s or 1000 V/s	

## Measurement electronics option MT40-40 / MT40-250

<b>Low voltage test</b>		
Test voltage:	MT40-40	0.2 – 40 V ( $\pm 1\%$ , $\pm 10$ mV); in steps of 0,1 V
	MT40-250	0.25 – 250 V ( $\pm 2\%$ , $\pm 125$ mV); in steps of 0,25 V
Test current:	MT40-40	0.1 – 100 mA ( $\pm 1\%$ , $\pm 0.025$ mA); in steps of 0,025 mA
	MT40-250	0.1 – 10 mA ( $\pm 1\%$ , $\pm 0.025$ mA); in steps of 0.025 mA
Time factor (waiting time):	0 – 650 ms; in steps of 10 $\mu$ s	
Threshold for continuity test:	1 Ohm – 1 kOhm ( $\pm 2\%$ , min. 1 Ohm); in steps of 1 Ohm	
Threshold for short circuit test:	20 kOhm – 10 MOhm ( $\pm 2\%$ ); in steps of 10 kOhm Option: up to 100 MOhm ( $\pm 10\%$ ); in steps of 10 kOhm	
<b>Component test</b>		
Resistors:	1 – 10 MOhm ( $\pm 2\%$ , min. 1 Ohm) Option: up to 100 MOhm ( $\pm 10\%$ )	
Capacitors:	10 nF – 20 mF ( $\pm 5\%$ ) Option: from 10 pF ( $\pm 10\%$ , min. 5 pF) max. test voltage at $\geq 500$ $\mu$ F = 2,2 V; at 10 $\mu$ F – 500 $\mu$ F = 4,2 V; at 500 nF – 10 $\mu$ F = 5 V; at $< 500$ nF = 40 V (Limit Cap.Volt = OFF)	
Diodes:	Forward voltage: $\leq 1.0$ V MT40-40: reverse voltage max. 40 V MT40-250: reverse voltage max. 250 V	
Zener diodes:	Forward voltage: $\leq 1.0$ V MT40-40: Zener voltage $> 2.4$ V; max. 35 V ( $\pm 10\%$ ) MT40-250: Zener voltage $> 2.4$ V; max. 200 V ( $\pm 10\%$ )	
LEDs:	Forward voltage: $\leq 4.0$ V MT40-40: reverse voltage max. 40 V MT40-250: reverse voltage max. 250 V	
Suppressor diodes:	MT40-40: breakdown voltage 3 V – 35 V ( $\pm 10\%$ ) MT40-250: breakdown voltage 3 V – 200 V ( $\pm 10\%$ )	

## Measurement electronics option MT2000 (3 mA / 6 mA)

<b>Dielectric strength test</b>		
<b>Voltage type:</b>	<b>AC, 50 Hz / 60 Hz</b>	
Test voltage:	RM60 / RM100 / RM16	100 – 750 VAC ( $\pm 5\%$ , min. 10 V); in steps of 5 V
	RM80 / RM120	100 – 1060 VAC ( $\pm 5\%$ , min. 10 V); in steps of 5 V
Short circuit current:	MT2000-3mA	max. 2.1 mA <sub>eff</sub> , 3 mA <sub>p</sub> ( $\pm 5\%$ ); non-programmable; safety current limited according to EN 50191
	MT2000-6mA	max. 4.2 mA <sub>eff</sub> , 6 mA <sub>s</sub> ( $\pm 5\%$ ); non-programmable
Test times:	Rise time:	80 – 65000 ms; in steps of 20 ms
	Dwell time:	40 – 65000 ms; in steps of 20 ms
	Fall time:	0 – 65000 ms; in steps of 20 ms
Breakdown detection:	<ul style="list-style-type: none"> <li>• Limit exceedance <math>I_{\max\text{real}}</math> 0.5 – 4.2 mA<sub>eff</sub>; in steps of 0,1 mA; <math>I_{\max\text{real}}</math> has to be lower than <math>I_{\max}</math></li> <li>• Limit exceedance <math>I_{\max}</math> 0.5 – 4.2 mA<sub>eff</sub>; in steps of 0,1 mA</li> <li>• Breakdown detector du/dt; non-programmable; fast and sensible breakdown detector. Prevents the unit under test from damage by the arc.</li> </ul>	
<b>Voltage type:</b>	<b>DC</b>	
Test voltage:	RM60 / RM100 / RM16	40 – 1000 VDC ( $\pm 5\%$ , min. 5 V); in steps of 5 V
	RM80 / RM120	40 – 1500 VDC ( $\pm 5\%$ , min. 5 V); in steps of 5 V
Short circuit current:	MT2000-3mA	max. 3 mA ( $\pm 5\%$ ); non-programmable; safety current limited according to EN 50191
	MT2000-6mA	max. 6 mA ( $\pm 5\%$ ); non-programmable
Test times:	Rise time:	20 – 65000 ms; in steps of 20 ms
	Dwell time:	20 – 65000 ms; in steps of 20 ms
	Fall time:	0 – 65000 ms; in steps of 20 ms
Breakdown detection:	<ul style="list-style-type: none"> <li>• Limit exceedance <math>I_{\max}</math> 0.5 – 6 mA; in steps of 0.1 mA</li> <li>• Breakdown detector du/dt; non-programmable; fast and sensible breakdown detector. Prevents the unit under test from damage by the arc.</li> </ul>	
<b>Insulation test</b>		
<b>Voltage type:</b>	<b>DC</b>	
Test voltage:	RM60 / RM100 / RM16	40 – 1000 VDC ( $\pm 5\%$ , min. 5 V); in steps of 5 V
	RM80 / RM120	40 – 1500 VDC ( $\pm 5\%$ , min. 5 V); in steps of 5 V
Short circuit current:	MT2000-3mA	max. 3 mA ( $\pm 5\%$ ); non-programmable; safety current limited according to EN 50191
	MT2000-6mA	max. 6 mA ( $\pm 5\%$ ); non-programmable
Test times:	Rise time:	20 – 65000 ms; in steps of 20 ms
	Dwell time:	20 – 65000 ms; in steps of 20 ms
Threshold for insulation test:	500 kOhm – 100 MOhm ( $\pm 5\%$ , voltage $\geq 100$ V) 100 MOhm – 2 GOhm ( $\pm 5\%$ , voltage $\geq 500$ V) optional: bis 10 GOhm ( $\pm 15\%$ , voltage $\geq 1000$ V) in steps of 500 kOhm Voltage breakdown detection at test voltages $\geq 200$ V	

Breakdown detection:	Breakdown detector du/dt; non-programmable; fast and sensible breakdown detector. Prevents the unit under test from damage by the arc.	
<b>Component test</b>		
<b>Varistors</b>		
Varistor voltage:	RM60 / RM100 / RM16	40 – 900 VDC
	RM80 / RM120	40 – 1300 VDC
Test current:	1 mA	
<b>Surge arrester</b>		
Breakdown voltage:	RM60 / RM100 / RM16	100 – 900 VDC
	RM80 / RM120	100 – 1300 VDC
Ramp:	100 V/s or 1000 V/s	

### Measurement electronics option MT\_EXT

<b>Voltage measurement</b>	
Voltage AC	0.2 – 500 V ( $\pm 3\%$ , min. 100 mV), max. 400 Hz
Voltage DC	0.2 – 700 V ( $\pm 3\%$ , min. 100 mV)

### Measurement electronics option MT\_LCR

<b>Component test</b>	
Test voltage	2 V ( $\pm 0.6$ V)
Measurement frequencies	100 Hz, 1 kHz, 10 kHz
Inductances	200 $\mu$ H – 1 H ( $\pm 5\%$ , min. 50 $\mu$ H)
Capacitors	100 pF – 10 $\mu$ F ( $\pm 5\%$ , min. 50 pF)
Resistors	1 Ohm – 50 kOhm ( $\pm 5\%$ , min. 100 mOhm)

Conditions for all tolerance statements: operating mode „Precise Mode“, earthbound operation, environmental conditions 15 – 35 °C / 20 – 60 % rel. humidity (non-condensing)

The statements for the component test refer to the test of single components, which are connected separately with test points.

Technical data and tolerances are subject to change depending on a specific ambient of the test object or application.