

# User Manual



IP67

K / L - Series



## Hinweis / Note / Remarque / Nota / Nota / Nota / Let op / Poznámka / Obs / Uwaga / Not / Примечание

Hinweis !	Ihr Messgerat ist aus Präzisionsteilen hergestellt und sorgfältig kalibriert. Versuchen Sie deshalb nie, das Gerät zu zerlegen, oder irgendwelche Verstellungen innerhalb des Gerätes vorzunehmen. Vor jeder Messreihe ist das Gerät durch eine Vergleichsmessung mit einem Einstellring/Endmas zu überprüfen!
Note !	This measuring gage is manufactured with high precision parts and carefully adjusted. Therefore never try to disassemble or change any of the interior parts of this gage. Prior to each series of measurements, the gage is to be tested through a comparison measurement with an adjustment ring/gage block!
Remarque !	Cette jauge de mesure est fabriquée avec des pièces de haute précision et soigneusement calibrée. N'essayez donc jamais de démonter ou de changer l'une des parties intérieures de cette jauge. Avant chaque série de mesures, la jauge doit être testée par une mesure de comparaison avec une bague de réglage ou un bloc étalon!
Nota !	Questo strumento di misurazione è realizzato con componenti ad alta precisione ed è stato accuratamente regolato. Pertanto, non tentare mai di smontare o modificare alcun componente interno di questo strumento di misurazione. Prima di ciascuna serie di misurazioni, il misuratore deve essere collaudato eseguendo una misura di comparazione per mezzo di un anello di regolazione/blocco di calibro.
Nota !	Este instrumento de medición ha sido fabricado con piezas de alta precisión y ajustado cuidadosamente. Por lo tanto, no intente desmontar ni cambiar ninguna de las piezas interiores de este instrumento. Antes de cada serie de mediciones, se debe probar el calibrador por medio de medición comparativa con un bloque patrón de ajuste.
Nota !	Este aparelho de medição é fabricado com peças de alta precisão e cuidadosamente ajustado. Portanto, nunca tente desmontar ou alterar nenhuma das peças internas deste medidor. Antes de cada série de medições, o medidor deve ser testado através de uma medição de comparação com um anel de ajuste / bloco de medidores!
Let op !	Dit meetinstrument is vervaardigd met precisieonderdelen en is zorgvuldig afgesteld. Probeer daarom nooit de binnenste delen van deze meter te demonteren of te vervangen. Voor elke meetreeks moet de meter worden gecontroleerd door een testmeting uit te voeren op een afstelring/eindmaat.
Poznámka !	Tento měřicí přístroj byl vyroben s použitím vysoko přesných součástí a pečlivě nastaven. Proto se nikdy nepokusujte rozebírat ani měnit žádné vnitřní části tohoto měřidla. Před každou sérií měření je nutné měřidlo otestovat srovnávacím měřením pomocí seřizovacího kolečka/koncové měrky!
Obs !	Denna mätare är tillverkad med högprecisionsdels och är noggrant justerad. Försök därför aldrig att demontera eller byta någon av de invändiga delarna av denna mätare. Innan varje omgång av mätningar så bör mätaren testas med en jämförelsemätning med hjälp av en justeringsring/justeringspassbit!
Uwaga !	Przyrząd pomiarowy zawiera części precyzyjne i jest dokładnie wyregulowany. Nie należy demontać ani modyfikować wewnętrznych części przyrządu. Przed każdą serią pomiarów przyrząd należy poddać testowi pomiaru porównawczego z wykorzystaniem pierścienia regulacyjnego/płytek wzorcowych!
Not !	Bu ölçüm aleti, yüksek hassasiyetli parçalar ile üretilmiştir ve dikkatlice ayarlanmıştır. Bu nedenle aletin iç parçalarını hiçbir zaman sökmeye veya değiştirmeye çalışmayın. Her bir ölçüm dizisi öncesinde alet, ayar halkası/mastar bloğu kullanılarak karşılaştırmalı ölçüm metodu ile test edilmelidir!
Примечани !	Данное измерительное устройство изготовлено из высокоточных деталей и тщательно отрегулировано. Поэтому никогда не пытайтесь разобрать или изменить какие-либо внутренние части этого устройства. Перед каждой серией измерений устройство необходимо проверять с помощью сравнительных измерений с регулировочным кольцом/измерительным блоком!

## Safety Instructions and Declaration of Conformity

 	<p>Only insert recommended battery types (see scope of delivery)! Other battery types can pose a health hazard and cause personal injuries. The batteries supplied are <u>not</u> rechargeable!</p> <p>Insert the batteries with correct polarity and use them according to this manual.</p>
	<p>Only hand your device to third parties together with the manual.</p>
	<p>Dispose of batteries and device according to applicable laws. Do <u>not</u> throw the battery into fire.</p>
<b>Note</b> 	<p>Do <u>not</u> use any electrical marking equipment.</p>
<b>CE</b>	<p>This gauge complies with the Low Voltage Directive (2014/35/EU) from 26/02/2014 and the Directive on Electromagnetic Compatibility (2014/30/EU) from 26/02/2014</p> <p>This gauge is RoHS-compliant according to Directive 2011/65/EU from 08/06/2011.</p>
	<p>This gauge is PFOS-compliant according to Directive 2006/122/EC from 12/12/2006.</p>
	<p>This device is REACH-compliant according to Regulation (EC) No. 1907/2006 from 18/12/2006</p>
	<p>This device is WEEE-compliant according to Directive 2012/19/EU from 04/07/2012.</p>

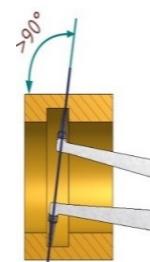
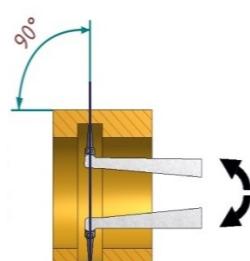
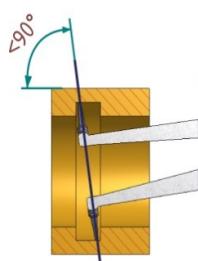
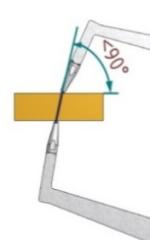
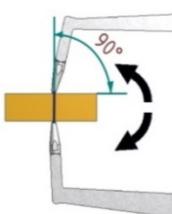
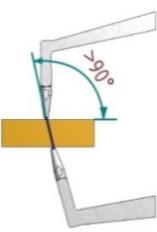
see page 45 for a graphical representation of the functions

- Setup Menu**
- 1 Initial State** The initial state is a prerequisite for the functioning of all the programs and setting options described.
  - 2 Absolute and Relative Mode** Switching from "Absolute Mode" to "Relative Mode"
  - 3 Measuring Programs** Switching measuring programs (MIN/MAX/HOLD)
  - 4 Tolerance Program (TOL)** Activation and deactivation of the tolerance function
    - 4.1** Accessing the tolerance range selection
    - 4.2** Selection and confirmation of the tolerance range
    - 4.3** Deactivation of the tolerance function
  - 5 Key Lock** Deactivation of the key lock. (**Key lock reactivates after 20 seconds!**)
  - 6 Data Logger (D-LOG) Use** Storage of measured values in the internal memory of the device
  - 7 Back Button** One-step jump back
  - 8 Setup Menu**
    - 8.1** Accessing the setup menu
    - 8.2** Switch between menu items and selection
  - 9 Zero Point Correction (OFFSET)** Setting the offset value
  - 10 Tolerance Program (TOL)** Setting the tolerance limits
    - 10.1** Selecting the tolerance range
    - 10.2** Setting the lower tolerance limit (TOL LO)
    - 10.3** Setting the upper tolerance limit (TOL UP)
  - 11 Switching MM/INCH (UNIT)** Selection of the unit of measurement
  - 12 Choice of Scale Division Value (SCALE)** Selection of the scale resolution
  - 13 Auto-Power-OFF (A-OFF)** Selection of the time after which the device switches to standby

<b>Setup Menu</b>	<p><b>14 Data Logger (D-LOG)</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td><td><b>14.1</b> <b>ON</b> Activating the data logger</td></tr> <tr> <td></td><td><b>14.2</b> <b>PRINT</b> Printout of the saved measurement values</td></tr> <tr> <td></td><td><b>14.3</b></td></tr> <tr> <td></td><td><b>D-OUT</b> Transferring the measurement values to connected peripherals</td></tr> <tr> <td></td><td><b>14.4</b> <b>RESET</b> Resetting the D-LOG memory</td></tr> <tr> <td></td><td><b>14.5</b> <b>OFF</b> Deactivating the data logger</td></tr> </table> <p><b>15 Factory Settings (RESET)</b> Reset the device to factory settings</p> <p><b>16 Vibration (VIBRAT)</b> Activation and deactivation of tactile feedback</p>		<b>14.1</b> <b>ON</b> Activating the data logger		<b>14.2</b> <b>PRINT</b> Printout of the saved measurement values		<b>14.3</b>		<b>D-OUT</b> Transferring the measurement values to connected peripherals		<b>14.4</b> <b>RESET</b> Resetting the D-LOG memory		<b>14.5</b> <b>OFF</b> Deactivating the data logger
	<b>14.1</b> <b>ON</b> Activating the data logger												
	<b>14.2</b> <b>PRINT</b> Printout of the saved measurement values												
	<b>14.3</b>												
	<b>D-OUT</b> Transferring the measurement values to connected peripherals												
	<b>14.4</b> <b>RESET</b> Resetting the D-LOG memory												
	<b>14.5</b> <b>OFF</b> Deactivating the data logger												

### Error Messages

ERR06	Tolerance limit outside the permissible range
ERR07	OFFSET outside the permissible range. <b>The device must be sent to the service centre to correct this error (ERR 07).</b>
ERR08	Reference point in "Relative Mode" outside the display range
ERR09	No communication with the PC or peripherals
ERR10	Communication breakdown during data transfer
ERR11	Bluetooth connection information has been lost, remove the gauge from all paired devices and start pairing again!
ERR12	Bluetooth connection could not be established after 30 sec., start pairing again!
ERR13	Key(s) blocked or keyboard defective! Please make sure that the keyboard is not being operated. If the error persists, please contact the service center.



1

00 1 mm  
0.00  
0-20

2

<0>  
0-Pre 0.00

3

MODE  
MIN MAX HOLD  
0-20

4.1

&lt;TOL&gt;

TOL

4.2

MODE  
DATA  
▼

→ OK SET

0.00 TOL  
100-1000

4.3

&lt;TOL&gt;

0.00  
0-20

5



6



7



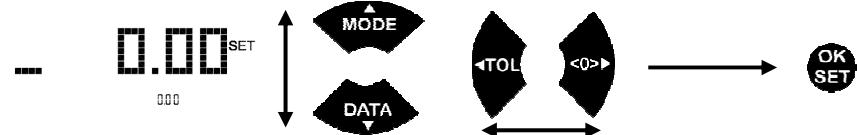
8.1



8



9

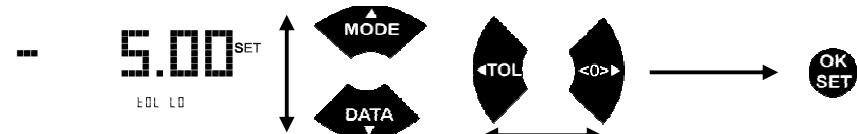


10.1

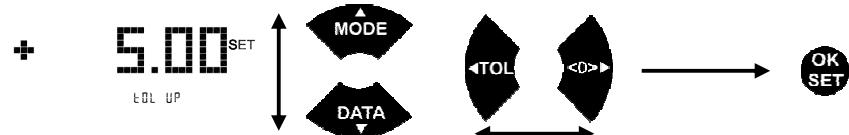


SETUP

10.2



10.3

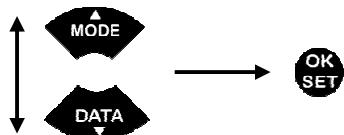


**SETUP**

**11**

**MM SET INCH SET**

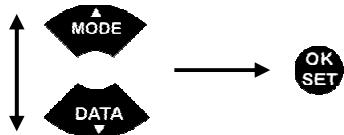
3. UNIT 3. UNIT



**12**

**00.1mm  
0.0 | SET**

4. SCALE



**13**

**10MIN SET**

5. RULE-OFF

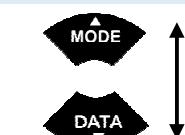


**14**

**14.1**

**ON SET**

6. dRER-LOG



**14.2**

**PRINT SET**

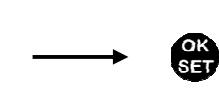
6. dRER-LOG



**14.3**

**D-OUT SET**

6. dRER-LOG



**14.4**

**RESET SET**

6. dRER-LOG



**14.5**

**OFF SET**

6. dRER-LOG

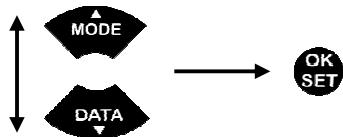


**SETUP**

**15**

**YES<sup>SET</sup>**

RESET

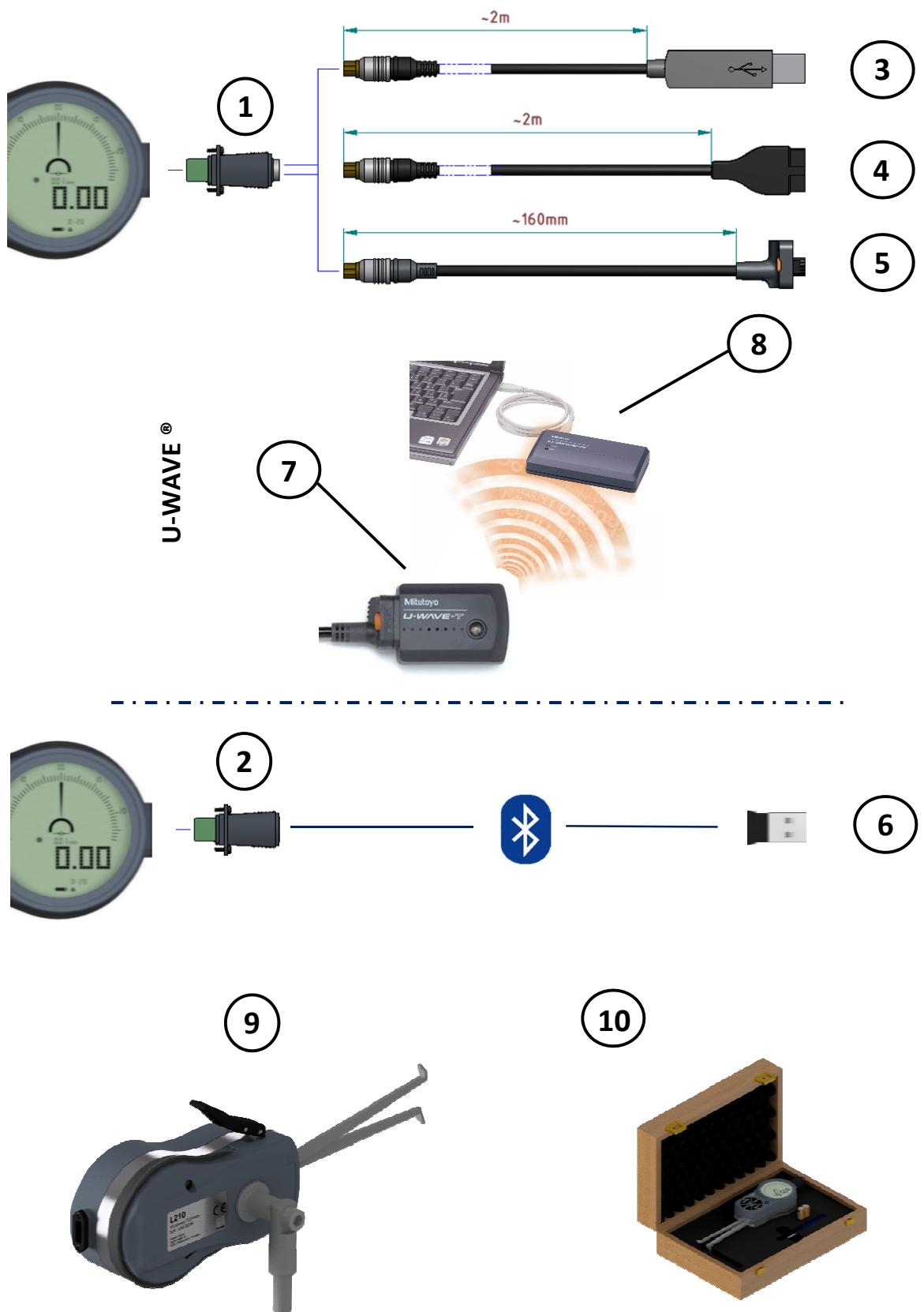


**16**

**OFF<sup>SET</sup>**

OFF RATE





	Nr.		Teile-Nr.
D	1	Schnittstellenadapter	1961-09
	2	Schnittstellenadapter Bluetooth	1961-13
	3	Datenkabel USB - V2.0	2482-05
	4	Datenkabel DIGIMATIC - V2.0	2482-07
	5	Datenkabel U-WAVE®	2482-04
	6	USB Bluetooth 4.0 Dongle	0682-60
	7	U-WAVE®-T-Sender (IP67)	2482-01
	8	U-WAVE®-R-Empfänger	2482-02
	9	Stativhalterung	8007-10
	10	Holzkasten	1732-65
	No.		Part No.
GB	1	Interface Adapter	1961-09
	2	Interface Adapter Bluetooth	1961-13
	3	USB - V2.0 data cable	2482-05
	4	DIGIMATIC - V2.0 data cable	2482-07
	5	U-WAVE® data cable	2482-04
	6	USB Bluetooth 4.0 dongle	0682-60
	7	U-WAVE®-T transmitter (IP67)	2482-01
	8	U-WAVE®-R receiver	2482-02
	9	Tripod holder	8007-10
	10	Wooden box	1732-65
	N°		N° de pièce
F	1	Adaptateur d'interface	1961-09
	2	Adaptateur d'interface Bluetooth	1961-13
	3	Câble de données USB - V2.0	2482-05
	4	Câble de données DIGIMATIC - V2.0	2482-07
	5	Câble de données U-WAVE®	2482-04
	6	Clé USB Bluetooth 4.0	0682-60
	7	Émetteur U-WAVE®-T (IP67)	2482-01
	8	Récepteur U-WAVE®-R	2482-02
	9	Support de trépied	8007-10
	10	Boite en bois	1732-65
	N.		Codice articolo
I	1	Adattatore di interfaccia	1961-09
	2	Adattatore di interfaccia Bluetooth	1961-13
	3	Cavo dati USB - V2.0	2482-05
	4	DIGIMATIC - Cavo dati V2.0	2482-07
	5	Cavo dati U-WAVE®	2482-04
	6	Dongle USB Bluetooth 4.0	0682-60
	7	Trasmettitore U-WAVE®-T (IP67)	2482-01
	8	Ricevitore U-WAVE®-R	2482-02
	9	Supporto per treppiede	8007-10
	10	Scatola di legno	1732-65

	N.º	Parte N.º
E	1	Adaptador de interfaz 1961-09
	2	Adaptador de interfaz Bluetooth 1961-13
	3	USB - cable de datos V2.0 2482-05
	4	DIGIMATIC - cable de datos V2.0 2482-07
	5	Cable de datos U-WAVE® 2482-04
	6	Dongle USB Bluetooth 4.0 0682-60 Incluido en el volumen de suministro de 1961-13 !
	7	Transmisor U-WAVE®-T (IP67) 2482-01
	8	Receptor U-WAVE®-R 2482-02
	9	Soporte para trípode 8007-10
	10	Caja de madera 1732-65
	N.º	Peça N.º
P	1	Adaptador de interface 1961-09
	2	Adaptador de interface Bluetooth 1961-13
	3	Cabo de dados USB - V2.0 2482-05
	4	DIGIMATIC - Cabo de dados V2.0 2482-07
	5	Cabo de dados U-WAVE® 2482-04
	6	Dispositivo dongle de USB Bluetooth 4.0 0682-60 Incluído no âmbito da entrega de 1961-13 !
	7	Transmissor U-WAVE®-T (IP67) 2482-01
	8	Recetor U-WAVE®-R 2482-02
	9	Suporte para tripé 8007-10
	10	Caixa de madeira 1732-65
	Nr.	Onderdeelnr.
NL	1	Interface-adapter 1961-09
	2	Interface-adapter Bluetooth 1961-13
	3	USB - V2.0 datakabel 2482-05
	4	DIGIMATIC - V2.0 datakabel 2482-07
	5	U-WAVE®-datakabel 2482-04
	6	USB Bluetooth 4.0-dongle 0682-60 Inbegrepen in de leveringsomvang van 1961-13 !
	7	U-WAVE®-T-transmitter (IP67) 2482-01
	8	U-WAVE®-R-ontvanger 2482-02
	9	Statiefhouder 8007-10
	10	Houten kist 1732-65
	Č.	Číslo dílu
CZ	1	Adaptér rozhraní 1961-09
	2	Adaptér rozhraní Bluetooth 1961-13
	3	Datový kabel USB – V2.0 2482-05
	4	Datový kabel DIGIMATIC – V2.0 2482-07
	5	Datový kabel U-WAVE® 2482-04
	6	Hardwarový klíč USB Bluetooth 4.0 0682-60 Zahrnuto v rozsahu dodávky
	7	Vysílač U-WAVE®-T (IP67) 2482-01 1961-13 !
	8	Přijímač U-WAVE®-R 2482-02
	9	Držák stativu 8007-10
	10	Dřevěná krabice 1732-65

	Nej.	Artikelnummer
S	1	Gränssnittsadapter 1961-09
	2	Gränssnittsadapter Bluetooth 1961-13
	3	USB – V2.0-datakabel 2482-05
	4	DIGIMATIC – V2.0-datakabel 2482-07
	5	U-WAVE®-datakabel 2482-04
	6	USB Bluetooth 4.0-dongel 0682-60 Ingår i leveransomfattningen
	7	U-WAVE®-T-sändare (IP67) 2482-01 för 1961-13 !
	8	U-WAVE®-R-mottagare 2482-02
	9	Stativhållare 8007-10
	10	Trälåda 1732-65
	Nr	Element nr
PL	1	Adapter interfejsu 1961-09
	2	Adapter interfejsu Bluetooth 1961-13
	3	Kabel danych USB – wer. 2.0 2482-05
	4	Kabel danych DIGIMATIC – wer. 2.0 2482-07
	5	Kabel danych U-WAVE® 2482-04
	6	Klucz USB Bluetooth 4.0 0682-60 Zawarte w zakresie dostawy
	7	Nadajnik U-WAVE®-T (IP67) 2482-01 1961-13 !
	8	Odbiornik U-WAVE®-R 2482-02
	9	Uchwyt na statyw 8007-10
	10	Drewniane pudło 1732-65
	No.	Parça No.
TR	1	Arayüz Adaptörü 1961-09
	2	Arayüz Adaptörü Bluetooth 1961-13
	3	USB - V2.0 veri kablosu 2482-05
	4	DIGIMATIC - V2.0 veri kablosu 2482-07
	5	U-WAVE® veri kablosu 2482-04
	6	USB Bluetooth 4.0 dongle (donanım kilidi) 0682-60 1961-13 nolu parçanın teslimatı kapsamındadır!
	7	U-WAVE®-T verici (IP67) 2482-01
	8	U-WAVE®-R alıcı 2482-04
	9	Tripod tutucu 8007-10
	10	Ahşap kutu 1732-65
	№	Деталь №
RUS	1	Интерфейсный адаптер 1961-09
	2	Интерфейсный адаптер Bluetooth 1961-13
	3	Кабель передачи данных USB – V2.0 2482-05
	4	Кабель передачи данных DIGIMATIC – V2 2482-07
	5	Кабель передачи данных U-WAVE® 2482-04
	6	USB-ключ Bluetooth 4.0 0682-60 Входит в комплект поставки 1961-13 !
	7	Передатчик U-WAVE®-T (IP67) 2482-01
	8	Приемник U-WAVE®-R 2482-02
	9	Держатель штатива 8007-10
	10	Деревянная коробка 1732-65

## Technical Data

External measurement		K110	K110T	K110S	K1R10	K1R10S	K220	K220T	K220S	K2R20	K2R20S
Measuring range	[mm]	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 20	0 - 20	0 - 20	0 - 20	0 - 20
Numerical interval	[mm]	0,005	0,005	0,005	0,005	0,005	0,01	0,01	0,01	0,01	0,01
Max. permissible errors "G"	[mm]	0,015	0,02	0,015	0,015	0,015	0,03	0,04	0,03	0,03	0,03
Repeatability limit "r"	[mm]	0,005	0,005	0,005	0,005	0,005	0,01	0,01	0,01	0,01	0,01
Measuring force	[N]	0,8 - 1,2	0,8 - 1,2	0,8 - 1,2	0,8 - 1,2	0,8 - 1,2	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6
Type of measuring contact	[mm]	Ball ø1,5	Flat ø6	Chisel-R 0,4	Ball ø1,5	Chisel-R 0,4 / Ball ø1,5	Ball ø1,5	Flat ø10	Chisel-R 0,4	Ball ø1,5	Chisel-R 0,4 / Ball ø1,5
Max. adjustable OFFSET	[mm]	±0,3	±0,3	±0,3	±0,3	±0,3	±0,6	±0,6	±0,6	±0,6	±0,6
Reference temperature	[°C]						20				
Working temperature	[°C]						+10 to +30				
Storage temperature	[°C]						-10 to +50				
Power supply							2x 1,5 Volt Micro AAA / MN2400 / LR03 (particularly DURACELL)				
Data output							USB + DIGIMATIC + U-WAVE© + Bluetooth (→ Accessories / Interfaces)				
Protection class							IP67				

All gages can be changed into "inch".

Factory setting is checked subject to VDI/VDE/DGQ 2618 Part 12.1

## Technical Data

Internal measurement		L102	L105	L210	L220	L230	L240	L250	L260	L270	L280
Measuring range	[mm]	2,5 - 12,5	5 - 15	10 - 30	20 - 40	30 - 50	40 - 60	50 - 70	60 - 80	70 - 90	80 - 100
Numerical interval	[mm]	0,005	0,005	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
Max. permissible errors "G"	[mm]	0,015	0,015	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
Repeatability limit "r"	[mm]	0,005	0,005	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
Measuring force	[N]	0,8 - 1,2	0,8 - 1,2	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6	1,1 - 1,6
Type of measuring contact	[mm]	Chisel -R 0,1	Ball ø0,6	Ball ø1	Ball ø1	Ball ø1	Ball ø1	Ball ø1	Ball ø1	Ball ø1	Ball ø1
Max. adjustable OFFSET	[mm]	±0,3	±0,3	±0,6	±0,6	±0,6	±0,6	±0,6	±0,6	±0,6	±0,6
Reference temperature	[°C]						20				
Working temperature	[°C]						+10 to +30				
Storage temperature	[°C]						-10 to +50				
Power supply							2x 1,5 Volt Micro AAA / MN2400 / LR03 (particularly DURACELL)				
Data output							USB + DIGIMATIC + U-WAVE© + Bluetooth (→ Accessories / Interfaces)				
Protection class							IP67				

All gages can be changed into "inch".

Factory setting is checked subject to VDI/VDE/DGQ 2618 Part 13.1



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