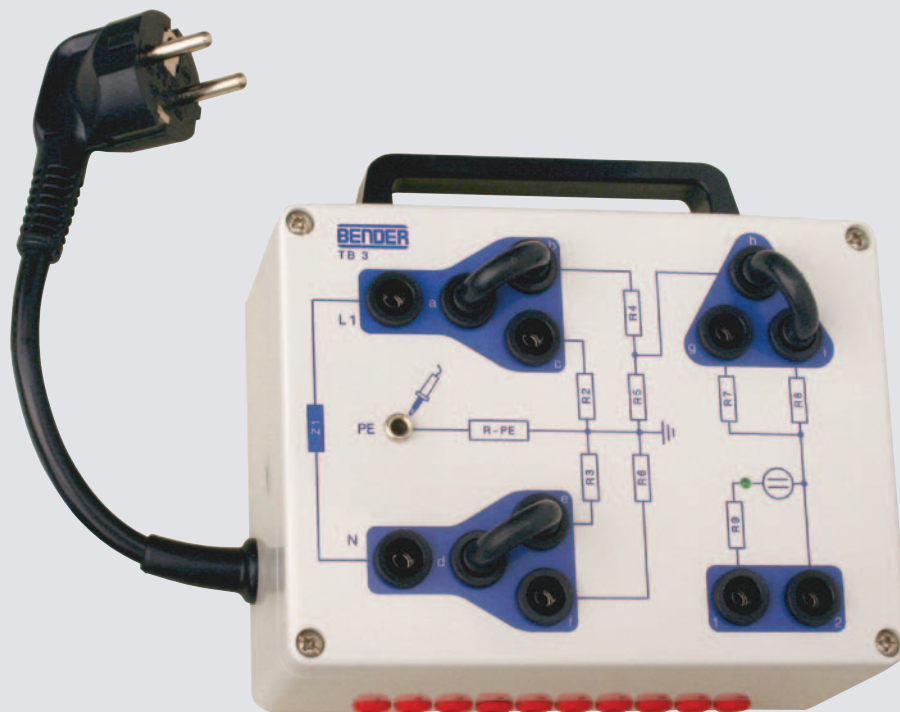


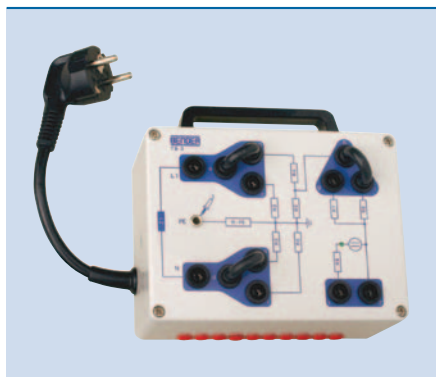
Test box TB3

- testing the measuring values of safety testers
- suitable for UNIMET® 800ST and μ P safety tester
- comprehensive system self-test



Test box TB3

for system self-test of Bender safety-testers



TB3

Device characteristics

- Test box for UNIMET® 800ST
- Time and cost saving through simple handling
- Simulation of a standardised DUT
- 10 patient sockets for individual calibration
- Magnetic adhesive stripes allow simple fixing to the safety tester

Intended use

The TB3 box is intended to be used for testing UNIMET® 800ST and μ P601 devices. Different measurements are performed in order to determine whether it is necessary to have the devices calibrated at factory. The TB3 test box simulates a standardized test object. After testing, the results must be compared with the measurement values indicated in the tables "tolerance values". Tolerances of test box and safety testers are already included.

The test with the test box TB3 does not supersede the recommended 24-month calibration for UNIMET® 1000ST/1100ST or 36-month calibration for UNIMET® 800ST.

Requirements for a correct test

- Make sure that no printer or PC is connected to the test device.
- The test device must be connected to an earthed and a stable supply.
- Perform a zero balancing for the test probe at the UNIMET® 1000ST/1100ST and UNIMET® 800ST (refer to the operating instructions "UNIMET® 1000ST/1100ST and UNIMET® 800ST").

Please note

- A graphic in the adjacent picture shows how the plug of the test box TB3 has to be inserted:
 - UNIMET® 1000ST/1100ST and UNIMET® 800ST: from the top
 - μ P safety tester: from below
- Safety testers with universal system voltage must be set in accordance with the supply voltage.

Ordering information

Version	Type	Art. No.
Standard (German)	TB3 test box	B 9602 0025
CH	TB3 test box	B 9602 0055

Technical Data

Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 250 V
Rated impulse voltage/pollution degree	4 kV/3

Voltage ranges

Nominal system voltage U_n	100...240 V
Rated frequency f_n	AC 48...62 Hz
Output voltage U12	7.39 V ($\pm 2.5\%$)
Max. power consumption	35 VA at 50 Hz, 230 V

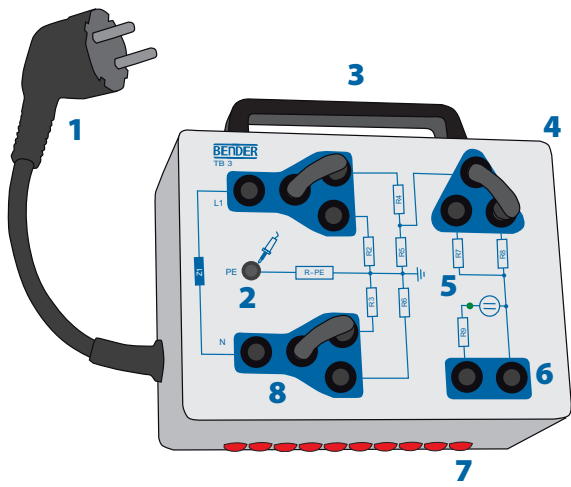
Evaluation of tolerance values

Precalculation	110 %
Tolerance	10 %
Built-in resistors	
R - MD (safety tester)	1000 Ω
R - PE	0.233 Ω
R3	25 000 Ω
R4	1 000 000 Ω
R5	1 500 000 Ω
R6	100 000 000 Ω
R7	1 000 000 Ω
R8	100 000 Ω
R9	130 000 Ω

Other

Ambient temperature (during operation)	0...+50 °C
Ambient temperature (during storage)	-10...+70 °C
Operating mode	continuous operation
Mounting	any position
Protection class	Class I
Dimensions in mm (H x W x D)	148 x 160 x 76
Weight	≤ 900 g
24-month calibration interval	

Displays and controls



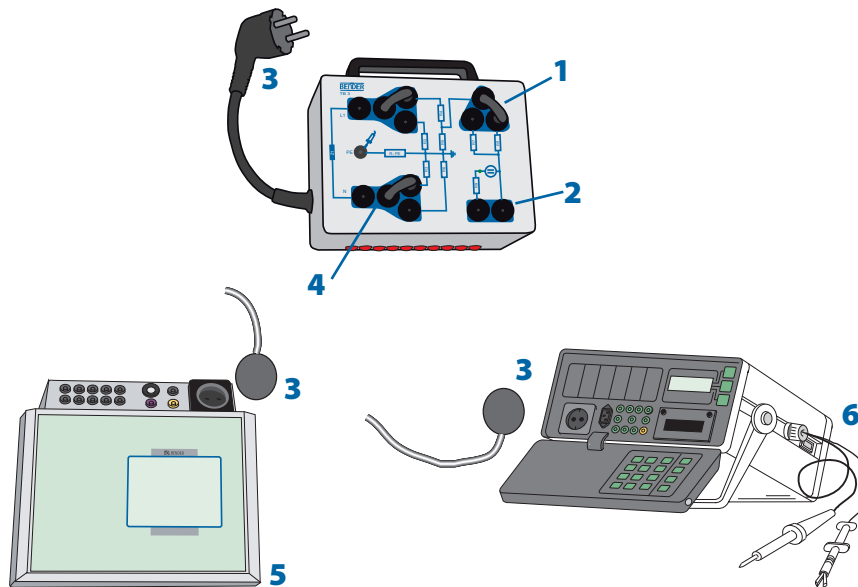
- 1 - Mains plug; only to be used for the test socket of the safety tester
- 2 - Socket for the connection of the test probe
- 3 - Carrying handle
- 4 - Enclosure, magnetic adhesive stripes allow simple fixing to the safety tester μ P601
- 5 - LED lights when voltage is applied at the mains plug
- 6 - Sockets for the patient connections 1 and 2 of the safety tester
- 7 - The sockets 1 and 2 at the side of the test box TB3 are internally connected to the sockets on the front. The sockets 3...10 can be used to test the patient connections 3...10 at the safety tester (patient auxiliary current measurement). The measured values differ from the values documented in the table "tolerance values".



Sockets on the side

- 8 - Jumpers allow simulation of different test situations

Connections



- 1 - Jumpers. Insert the jumpers in such a way that the following sockets are connected:

μ P601	UNIMET® 800ST
a-b	a-b
d-e	d-f
h-i	h-i

- 2 - Connect the patient sockets 1 and 2 of the safety tester (at UNIMET® 800ST socket 2 only) to the respective socket of the test box TB3.

- 3 - Insert the mains plug of TB3 into the test socket of the safety tester, as illustrated. Please observe the plug-in direction.
 - at UNIMET® 800ST, insert the supply cable from the top
 - at μ P-Sicherheitstester, insert supply cable from below
 In case of wrong plug-in direction test results will become unusable.
- 4 - Contact the test probe of the safety tester with the socket PE of TB3
- 5 - UNIMET® 800ST test system
- 6 - μ P601 safety tester

Calculation of the tolerance values of TB3 for a nominal voltage of AC 230 V

Nominal voltage: 230 V/Precalculation to: 110 %/Tolerance: 10 %						
Resistances (Ohm) as per nameplate on TB 3:						
R-MD	R-PE	R3	R4	R5	R8	R9
1000	0.233	25000	1000000	1500000	100000	130000

output voltage (Volt) as per nameplate on TB 3: 7.39 V					
No.#	Measurement		test value	lower limit	upper limit
03	Protective earth resistance		0.233	0.208	0.258
07, 12	Earth leakage current	NC	0.097	0.086	0.108
08	Earth leakage current, phase reversed	NC	9.731	8.756	10.706
09, 10	Earth leakage current, line open	SFC	9.520	8.566	10.474
13	Earth leakage current, applied part / FE earthed, line open	SFC	9.426	8.482	10.370
14, 15, 20, 21	Encl. leakage current	NC	0.002	0.000	0.004
18, 19	Encl. leakage current, line open	SFC	0.002	0.000	0.004
16	Encl. leakage current, PE open	SFC	0.097	0.086	0.108
17	Encl. leakage current, PE open, phase reversed	SFC	9.731	8.756	10.706
23, 29	Patient leakage current	NC	0.217	0.194	0.240
25, 30	Patient leakage current, PE open	SFC	0.217	0.194	0.240
26	Patient leakage current, PE open, phase reversed	SFC	0.142	0.126	0.158
27, 28	Patient leakage current, line open	SFC	0.217	0.194	0.240
32	Patient leakage current with system voltage on applied part	SFC	0.361	0.323	0.399
35, 36, 41	Patient auxiliary current	NC	0.062	0.054	0.070
37, 38, 42	Patient auxiliary current	SFC	0.062	0.054	0.070

Calculation of the tolerance values of TB3 for a nominal voltage of AC 120 V

Nominal voltage: 120 V/Precalculation to: 110 %/Tolerance: 10 %						
Resistances (Ohm) as per nameplate on TB 3:						
R-MD	R-PE	R3	R4	R5	R8	R9
1000	0.233	25000	1000000	1500000	100000	130000

output voltage (Volt) as per nameplate on TB 3: 7.39 V					
No.#	Measurement		test value	lower limit	upper limit
03	Protective earth resistance		0.233	0.208	0.258
07, 12	Earth leakage current	NC	0.051	0.044	0.058
08	Earth leakage current, phase reversed	NC	5.077	4.568	5.586
09, 10	Earth leakage current, line open	SFC	4.967	4.469	5.465
13	Earth leakage current, applied part / FE earthed, line open	SFC	4.918	4.425	5.411
14, 15, 20, 21	Encl. leakage current	NC	0.001	0.000	0.003
18, 19	Encl. leakage current, line open	SFC	0.001	0.000	0.003
16	Encl. leakage current, PE open	SFC	0.051	0.044	0.058
17	Encl. leakage current, PE open, phase reversed	SFC	5.077	4.568	5.586
23, 29	Patient leakage current	NC	0.113	0.100	0.126
25, 30	Patient leakage current, PE open	SFC	0.113	0.100	0.126
26	Patient leakage current, PE open, phase reversed	SFC	0.074	0.065	0.083
27, 28	Patient leakage current, line open	SFC	0.113	0.100	0.126
32	Patient leakage current with system voltage on applied part	SFC	0.188	0.168	0.208
35, 36, 41	Patient auxiliary current	NC	0.062	0.054	0.070
37, 38, 42	Patient auxiliary current	SFC	0.062	0.054	0.070



Bender GmbH & Co. KG
 P.O. Box 1161 • 35301 Grünberg • Germany
 Londorfer Straße 65 • 35305 Grünberg • Germany
 Tel.: +49 6401 807-0 • Fax: +49 6401 807-259
 E-Mail: info@bender-de.com • www.bender-de.com

BENDER Group