

M201

Precision High Voltage Capacitance Bridge



Precision High Voltage Capacitance Bridge **M201** measures the capacitance and dissipation factor ($\tan\delta$) with high accuracy.

Measuring using **M201** requires the use of the external high voltage standard capacitor. Maximum test voltage is limited highest voltage value of standard capacitor.

FEATURES AND BENEFITS

- High measurement accuracy C& $\tan\delta$ testing: up to $\pm 0,002\%$ (C_x) and $\pm 0,00002$ ($\tan\delta$)
- Measurement of C& $\tan\delta$ at test current up to 50 A
- Easy handling
- Small size and low weight

APPLICATIONS

M201 is used for:

- Precision C& $\tan\delta$ measurement of standard capacitors
- Precision C& $\tan\delta$ measurement of capacitors and HV cables with large capacitance
- C& $\tan\delta$ testing on rated voltage of: Instrument Transformers, Power Transformers, Bushings, Switches, Surge Arresters, Capacitors, Cables
- Metrological research

TEST ARRANGEMENT

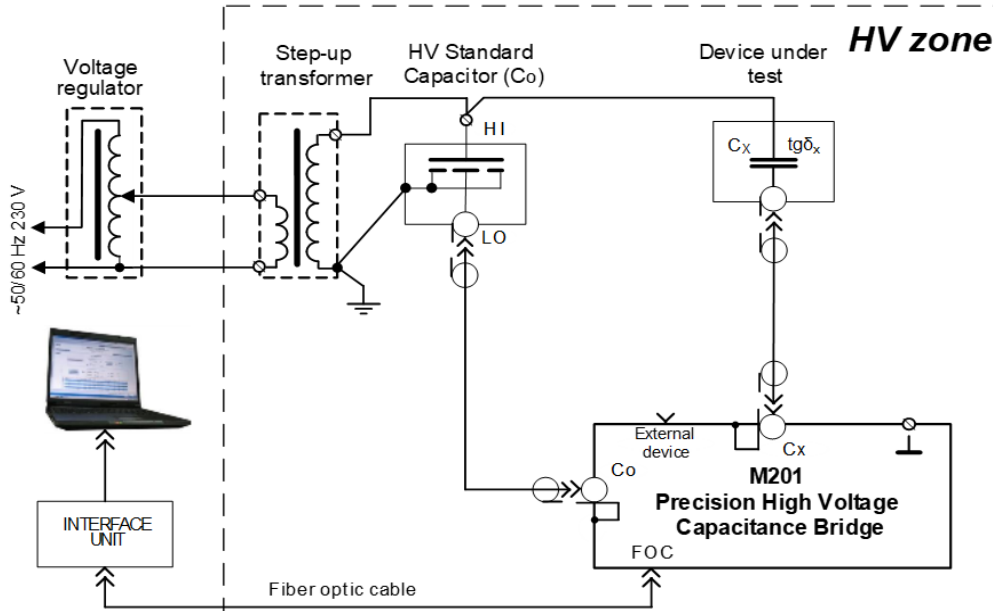


Fig.1 The circuit for measurements of capacitance less than 1 μF (test current up to 0,5 A)

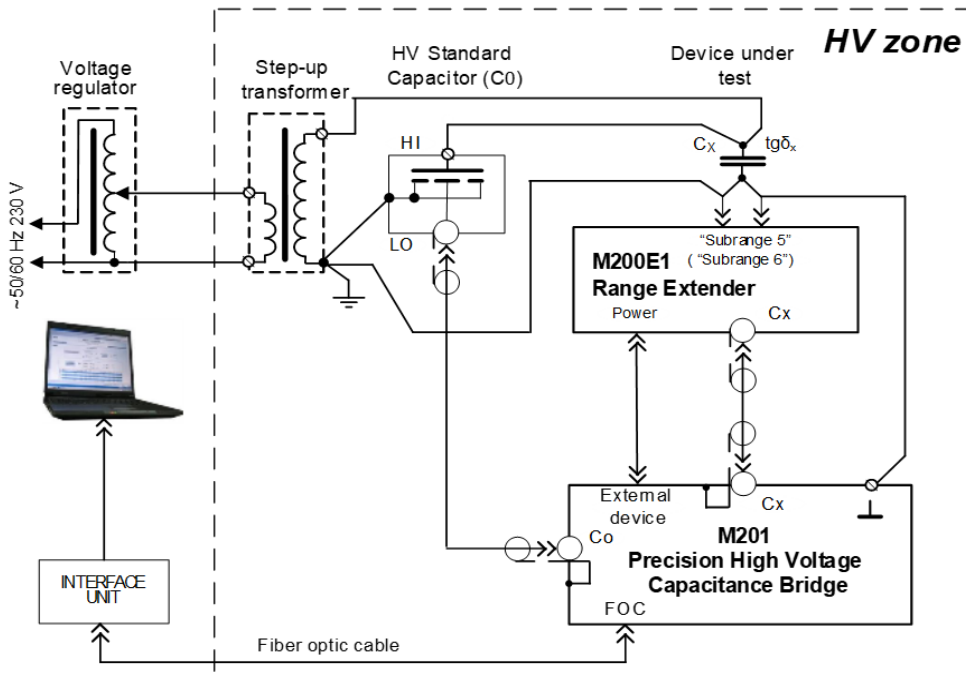


Fig.2 The circuit for measurements of capacitance more than 1 μF (test current up to 50 A)

TECHNICAL SPECIFICATIONS

Measurement ranges and error limits of M201 without error limits of the standard capacitor

# subranges	C_x/C_0	Test current, A	Limits of relative error for the capacitance measurement, %	Limits of absolute error for the $\tan\delta$ measurement
1	0,01...0,1	0...0,5	$\pm [2 \cdot 10^{-3} + 2 \cdot 10^{-4} \cdot (C_0/C_x - 10) + \tan\delta_x - \tan\delta_0]$	$\pm [2 \cdot 10^{-5} + 2 \cdot 10^{-6} \cdot (C_0/C_x - 10) + 0,005 \cdot \tan\delta_x - \tan\delta_0]$
	0,1...1,0		$\pm (1 \cdot 10^{-3} + \tan\delta_x - \tan\delta_0)$	$\pm (1 \cdot 10^{-5} + 0,005 \cdot \tan\delta_x - \tan\delta_0)$
2	1,0...10		$\pm (2 \cdot 10^{-3} + \tan\delta_x - \tan\delta_0)$	$\pm (2 \cdot 10^{-5} + 0,005 \cdot \tan\delta_x - \tan\delta_0)$
3	10...10 ²		$\pm (5 \cdot 10^{-3} + \tan\delta_x - \tan\delta_0)$	$\pm (5 \cdot 10^{-5} + 0,005 \cdot \tan\delta_x - \tan\delta_0)$
4	10 ² ...10 ³	0,03...5		
5*	10 ³ ...10 ⁴	0,3...50		
6*	10 ⁴ ...10 ⁵			

* With M200E1 using

Measurement ranges and error limits of M201 when using standard capacitor included in the kit

# subranges	C_x/C_0	Test current, A	Limits of relative error for the capacitance measurement, %	Limits of absolute error for the $\tan\delta$ measurement
1	0,01...0,1	0...0,5	$\pm [5 \cdot 10^{-3} + 2 \cdot 10^{-4} \cdot (C_0/C_x - 10) + \tan\delta_x - \tan\delta_0]$	$\pm [5 \cdot 10^{-5} + 2 \cdot 10^{-6} \cdot (C_0/C_x - 10) + 0,005 \cdot \tan\delta_x - \tan\delta_0]$
	0,1...1,0		$\pm (4 \cdot 10^{-3} + \tan\delta_x - \tan\delta_0)$	$\pm (4 \cdot 10^{-5} + 0,005 \cdot \tan\delta_x - \tan\delta_0)$
2	1,0...10		$\pm (5 \cdot 10^{-3} + \tan\delta_x - \tan\delta_0)$	$\pm (5 \cdot 10^{-5} + 0,005 \cdot \tan\delta_x - \tan\delta_0)$
3	10...10 ²		$\pm (8 \cdot 10^{-3} + \tan\delta_x - \tan\delta_0)$	$\pm (8 \cdot 10^{-5} + 0,005 \cdot \tan\delta_x - \tan\delta_0)$
4	10 ² ...10 ³	0,03...5		
5*	10 ³ ...10 ⁴	0,3...50		
6*	10 ⁴ ...10 ⁵			

* With M200E1 using

TECHNICAL SPECIFICATIONS

Limits of relative error for the testing voltage measurement	$\pm 1 \%$
Limits of absolute error for the testing voltage frequency measurement	$\pm 0,1 \text{ Hz}$
Power mains	
Measuring Unit	built-in rechargeable battery
Charging Unit:	
Rated voltage	220/230 V
Rated frequency	50 Hz*
Normal conditions:	
Temperature range	15 °C...25 °C
Relative humidity	up to 80 % non-condensing
Operating conditions:	
Temperature range	0...40 °C
Relative humidity	up to 80 % non-condensing
Size:	
M201	250 × 185 × 350 mm
M201E1	130 × 200 × 200 mm
Weight:	
M201	10 kg
M201E1	4 kg
Standards	
Safety	EN 61010-1:2010
EMC	EN 61326-1:2013
Calibration interval	2 years recommended

* Measuring at the frequency of 60 Hz can be agreed with the customer

ORDERING INFORMATION
Scope of supply

The following items are supplied with the standard M201 modification:

No	Item Name	Part no.	
1	M201 Measuring Unit	411722.015-01	
2*	High-voltage Measuring Capacitor 45	411634.032	
3*	High-voltage Measuring Capacitor 100	411634.033	
4*	High-voltage Measuring Capacitor 230	411634.034	
5	Charging Unit	436112.016	
6	Interface Unit	411619.019	
7*	FOC Fiber-optic cable; 5 m FOC Fiber-optic cable; 10 m FOC Fiber-optic cable; 30 m	468615.014-03 468615.014-04 468615.014-05	
8	Instrument cable IC1; 3 m (2 pcs)	685611.030-01	
9	Instrument cable IC2; 1,5 m (2 pcs)	685611.010-01	
10	Instrument cable IC3; 5 m (2 pcs)	685611.042-01	

* Please specify modification when ordering

No	Item Name	Part no.	
11	Instrument cable IC4; 1 m	685611.050-01	
12	M201 Software (installation disk)	411213.016 K	
13	Operating manual	411213.016 OM	
14	Passport	411213.016 P	
15	Package bag for Measuring Unit	323382.053-01	
16	Package bag for accessories	323382.053-01	
Additional order			
17	Fully installed Laptop		
18	Range Extender M200E1	411521.001-01	
19	M200E1 Instrument cable (IC6)	685692.001-01	
20	M200E1 HV cable (HVC1)	685651.007-01	
21	M200E1 Power cable	685612.004-01	
22	Package bag for M200E1	323382.057-01	
23	Package bag for M200E1 accessories	323382.058	

OLTEST LLC

Development and production
of measurement devices

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