

# Single phase and three phase Power Calibrators

The C200 Series Power Calibrators are used for adjusting, checking and verification of measuring instruments used in power engineering: active and reactive power meters, phase meters, frequency meters, ammeters, voltmeters, transducers of these quantities, monitoring systems and frequency, voltage and current relays in single and three phase symmetrical and asymmetrical configurations for symmetrical and asymmetrical loads.

The C200 Calibrator is single phase and the C233 Calibrator is three phase source of alternating current and voltage. Enables generating alternating voltages up to 420V in four subranges 57-110-220-380V, alternating currents up to 20A (100A) in three (four) subranges 1-5-20-100A, frequency in range 45.00...70.00Hz and phase shift in range -90.0...0.00...+90.0°.

Voltage and current output signals are set by multi-turn potentiometers and are simultaneously indicated on 4.5 digit LED displays. Frequency and phase shift are also set by multi-turn potentiometers and are displayed on 4 digit LED displays too.

Instruments to be calibrated can safely be connected to the outputs without changing the set values since the calibrator can be switched to "standby" mode to isolate the output terminals.

Series C200 Calibrators has been built in standard 19" aluminium case. The C233 Calibrator is constructed in three cases and consists of one calibrator basic configuration (phase L1) and two calibrators in special configuration (phase L2 and phase L3).



C200 single phase source up to 20A  
C200B single phase source up to 100A



C233 three phase symmetrical source up to 20A  
C233B three phase symmetrical source up to 100A



C233C three phase asymmetrical source up to 20A  
C233BC three phase asymmetrical source up to 100A

## C200 Series single phase and three phase Power Calibrators

- Voltage source up to 420V
- Current source up to 20A (100A)
- Frequency range 45.00...70.00Hz
- Phase shift range 0...±90°

## TECHNICAL PARAMETERS OF OPTIONS C200 and C200B

Parameter	Range	Settings range	Resolution	Accuracy <sup>1)</sup>	Maximum Load
Voltage	57V	0.50...60.00V	0.01V	±0.05% of set value ±3 digits	250mA@60V
	110V	1.00...130.00V	0.01V		136mA@130V
	220V	2.0...250.0V	0.1V		70mA@250V
	380V	3.0...420.0V	0.1V		40mA@420V
Current	1A	0.0100...1.3000A	0.0001A	±0.05% of set value ±3 digits	12V@1.3A
	5A	0.050...6.000A	0.001A		6V@6A
	20A	0.200...19.999A	0.001A		1V@20A 2V@20A <sup>2)</sup>
	100A <sup>2)</sup>	1.00...100.00A	0.01A		0.7V@50A 0.3V@100A
Frequency	<sup>3)</sup>	45.00...70.00Hz	0.01Hz	±0.02Hz	
Phase shift		0.0...±90.0°	0.1°	±0.5° <sup>4)</sup>	
THD of voltage and current				0.5% of set value	
Weight and dimensions (with x height x depth)				14kg and (478x194x342)mm	
Power supply				230V±10% / 45...65Hz / 130VA (200VA for C200B)	

<sup>1)</sup> limits of error covers instability in 12 months, influence quantities (ambient temperature in range +20...+26°C, humidity and power supply voltage, load) and nonlinearity  
<sup>2)</sup> C200B option with additional 100A range  
<sup>3)</sup> frequency synchronization range is 49...61Hz  
<sup>4)</sup> for settings greater then 10% of voltage and current range

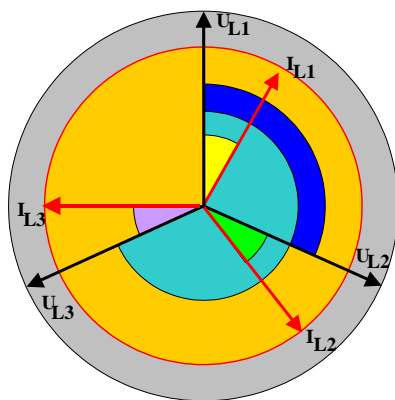
## TECHNICAL PARAMETERS OF OPTIONS C233 and C233B

Parameter	Range	Settings range	Resolution	Accuracy <sup>1)</sup>	Maximum Load
Voltage	57V	0.50...60.00V	0.01V	±0.05% of set value ±3 digits	250mA@60V
	110V	1.00...130.00V	0.01V		136mA@130V
	220V	2.0...250.0V	0.1V		70mA@250V
	380V	3.0...420.0V	0.1V		40mA@420V
Current	1A	0.0100...1.3000A	0.0001A	±0.05% of set value ±3 digits	12V@1.3A
	5A	0.050...6.000A	0.001A		6V@6A
	20A	0.200...19.999A	0.001A		1V@20A 2V@20A <sup>2)</sup>
	100A <sup>2)</sup>	1.00...100.00A	0.01A		±0.1% of set value ±3 digits 0.7V@50A 0.3V@100A
Frequency	<sup>3)</sup>	45.00...70.00Hz	0.01Hz	±0.02Hz	
Phase shift		0.0...±90.0°	0.1°	±0.5° <sup>4)</sup>	
Phase shift between voltages		120.0°	0.1°	±1.0° <sup>4)</sup>	
THD of voltage and current				0.5% of set value	
Weight and dimensions (with x height x depth)				3x14kg and 3x(478x194x342)mm	
Power supply				230V±10% / 45...65Hz / 130VA (200VA for C233B)	

<sup>1)</sup> limits of error covers instability in 12 months, influence quantities (ambient temperature in range +20...+26°C, humidity and power supply voltage, load) and nonlinearity  
<sup>2)</sup> C233B option with additional 100A range  
<sup>3)</sup> frequency synchronization range is 49...61Hz  
<sup>4)</sup> for settings greater then 10% of voltage and current range

## ADDITIONAL PARAMETERS OF OPTIONS C233C and C233BC

Parameter		Phase shift between voltages
$\chi_{U_{L2}, U_{L1}}$	Settings range	110.0...130.0°
	Intrinsic error	±1.0°
$\chi_{U_{L3}, U_{L1}}$	Settings range	230.0...250.0°
	Intrinsic error	±1.0°
$\phi_{L2}$	Settings range	$\phi_{L1} \pm 10.0^\circ$
	Intrinsic error	±0.5°
$\phi_{L3}$	Settings range	$\phi_{L1} \pm 10.0^\circ$
	Intrinsic error	±0.5°



- $U_{L1}, U_{L2}, U_{L3}$   
phase output voltages from range 0.5...420V
- $I_{L1}, I_{L2}, I_{L3}$   
phase output current from range 0.01...19.999A (100A for C233B)
- phase shift between output voltages is 120° (for C233) or from range 110.0...130.0° (for C233C)
- phase shift between output voltages is 240° (for C233) or from range 230.0...250.0° (for C233C)
- phase shift between output voltage and current from range 0.0...±90.0°
- phase shift between output current and voltage from range 0.0...±90.0° (for C233) or with values setting 0.0...±10.0° in relation to phase shift  (for C233C)

Calmet sp. z o.o.  
 Kukulcza 18, 65-472 Zielona Gora, Poland  
 Phone +48 68 324 04 56 Fax +48 68 324 04 57  
 E-mail: mail@calmet.com.pl Web access: http://www.calmet.com.pl