

# Amplifier Units

## CMS 156: 3 Phase Voltage and Current Amplifier (3 x 250 V, 3 x 25 A)

VEHV1030



CMS 156 amplifier units can be used in combination with any CMC test set or in conjunction with digital real time power system network simulators. The outputs are galvanically separated from the inputs as well as from ground and are used independently or in addition to those of the CMC test sets. The connection to a CMC test set is made by a control cable at the back of the units.

Used for tests requiring

- six independent voltage phases (e.g. for testing synchronizing devices with two independent three-phase voltage systems)
- more current channels than provided by the CMC test sets

### Technical Data<sup>1</sup>

Voltage amplifiers		
Setting range	3-phase AC (L-N)	3 x 0 ... 250 V
	1-phase AC (L-L)	1 x 0 ... 500 V
	DC (L-N)	3 x 0 ... ±250 V
Power	3-phase AC (L-N)	3 x 75 VA at 75 ... 250 V
	1-phase AC (L-N)	1 x 150 VA at 75 ... 250 V
	1-phase AC (L-L)	1 x 150 VA at 150 ... 500 V
	DC (L-N)	1 x 212 W at ±(150 ... 250 V)
Accuracy	error < 0.03 % typ., < 0.1 % guar.	
Distortion (THD+N) <sup>2</sup>	< 0.03 % typ., < 0.1 % guar.	
Bandwidth (-3dB)	> 6 kHz	
Phase lag at 50/60 Hz (autom. corrected by a CMC)	1.95°/2.34°	
Input voltage	0 ... 5 V	
Amplification	50 V / V	
Current amplifiers		
Setting range	3-phase AC (L-N)	3 x 0 ... 25 A
	1-phase AC (L-N)	1 x 0 ... 75 A
	DC (L-N)	1 x 0 ... ±25 A
Power	3-phase AC (L-N)	3 x 70 VA at 7.5 A
	1-phase AC (3L-N)	1 x 210 VA at 22.5 A
	1-phase AC (L-L)	1 x 140 VA at 7.5 A
	DC (L-N)	1 x 140 W at ±10.5 A
	3/6 phase operation	
single phase operation		

Current amplifiers (cont.)		
Accuracy	error < 0.03 % typ., < 0.1 % guar.	
Distortion (THD+N) <sup>2</sup>	< 0.1 % typ., < 0.3 % guar.	
Bandwidth (-3dB)	> 6 kHz	
Phase lag at 50/60 Hz	1.88°/2.26°	
Input voltage	0 ... 5 V	
Amplification	5 A / V	
Max. compliance voltage (L-N)/(L-L)	15 Vpk / 30 Vpk	
Amplifiers, general <sup>3</sup>		
Input impedance	> 40 kΩ	
Galvanic isolation Input/Output	1.5 kVDC	
Galvanic isolation amplifier groups	1.5 kVDC	
Connection	4 mm (0.16 in) banana sockets/comb. socket	
Amplifiers, if controlled by a CMC		
Frequency	range sine signals	10 ... 1000 Hz
	range transient signals	DC ... 3.1 kHz
	accuracy/-drift	±0.5 ppm / ±1 ppm
	resolution	5 μHz
Phase	angle range	- 360° ... +360°
	resolution	0.001°
	error at 50/60 Hz	< 0.02° typ., < 0.1° guar.
Output voltage resolution	12 mV	
Output current resolution	1 mA	
Power supply		
Nominal input voltage	110 – 240 VAC, 1-phase	
Permissible input voltage	99 ... 264 VAC	
Nominal frequency	50/60 Hz	
Permissible frequency range	45 ... 65 Hz	
Power consumption	< 1000 VA	
Connection	Standard AC socket (IEC 60320)	
Environmental conditions		
Operation temperature	0 ... +50 °C (+32 ... +122 °F)	
Storage temperature	-25 ... +70 °C (-13 ... +158 °F)	
Humidity range	Relative humidity 5 ... 95 %, non-cond.	
Vibration	IEC 60068-2-6 (20 m/s <sup>2</sup> at 10 ... 150 Hz)	
Shock	IEC 60068-2-27 (15 g/11ms half-sine)	
EMC	Emission	Directive 2004/108/EC (CE conform) EN 61326-1, EN61000-6-4, EN61000-3-2/3 FCC Subpart B of Part 15 Class A
	Immunity	EN 61326-1, EN61000-6-2, EN 61000-4-2/3/4/5/6/11
Safety	Directive 2006/95/EC (CE conform) EN 61010-1, EN 60950-1, UL 61010-1, CAN/CSA-C22.2 No 61010-1-04	
Miscellaneous		
Weight	14.7 kg (32.4 lbs)	
Dimensions (WxHxD, without handle)	450 x 145 x 390 mm (17.7 x 5.7 x 15.4 in)	
Certifications	TÜV-GS	

<sup>1</sup> Guaranteed values valid over one year within 23 °C ± 5 °C (73 °F ± 10 °F), in the frequency range of 10 ... 100 Hz at nominal value. Specifications for three-phase systems under symmetrical conditions (0°, 120°, 240°).

<sup>2</sup> THD+N: Values at 50/60 Hz with 20 kHz bandwidth

<sup>3</sup> All current and voltage outputs are fully overload and short-circuit proof and protected against external high-voltage transient signals and overtemperature