

MULTIFUNCTION POWER METER WITH I/O

MODEL **APLUS**

DESCRIPTION

The APLUS is a powerful platform for measuring power systems. This universal measurement device can be easily integrated into the process environment on site by means of the communication interface, digital I/O ports, or analog outputs. The included PC software packages allow for remote configuration and control of multiple units.



MODEL SELECTION

APLUS - 1 1 E 0

BASIC UNIT		FREQUENCY	INSTRUMENT POWER		COMMUNICATION INTERFACE		I/O EXTENSIONS		TEST CERTIFICATE	DATA LOGGER			
0	no display, DIN-rail mount	1	50/60Hz, CTs	1	24-230Vdc or 100-230Vac	3	RS-485 Modbus/RTU + Profibus DP	0	(none)	E	includes cert.	0	(none)
1	LED display, panel mount					5	RS-485 Modbus/RTU + Ethernet Modbus/TCP	1	2 relay, 4 analog and 2 digital I/Os				
2	TFT display, panel mount												



5 YEAR WARRANTY

SPECIFICATIONS

INPUT

Current, Nominal 1 to 5Aac, selectable
 Maximum 7.5Aac
 Overload without damage 10A, continuous
 100A, 10 x 1s, at 100s intervals
 Burden $\leq I^2 \times 0.01 \Omega$ per phase
 Voltage, Nominal 57.7 to 400VL-N, 100 to 693VL-L
 Maximum 480VL-N, 832VL-L (sinusoidal)
 Overload without damage 480VL-N, 832VL-L continuous,
 600VL-N, 1040VL-L, 10 x 10s, at 10s intervals
 800VL-N, 1386VL-L, 10 x 1s, at 10s intervals
 Burden $\leq V^2 / 3M\Omega$ per phase
 Frequency Range 45...50/60...65Hz
 True RMS measurement up to 63rd harmonic
 System Configurations Accommodated:
 Single-phase ... 2-wire or 3-wire
 Three-phase ... 3-wire, balanced load (1 1/2 element)
 3-wire, unbalanced load (2 ele., 3 ele.)
 4-wire, balanced load (1 ele.)
 4-wire, unbalanced load (2 1/2 ele., 3 ele.)

INSTRUMENT POWER

Nominal ... 100-230Vac $\pm 15\%$, 50-400Hz or 24-230Vdc $\pm 15\%$
 Burden $\leq 7VA$

COMMUNICATION INTERFACE

Modbus/RTU RS-485 (max. 32 devices)
 Physical max. 4000 ft (1200m), via plug-in terminals
 Baud Rate 1.2 to 115.2kBaod
 Profibus DP RS-485, (max. 32 devices)
 Physical max. 4000 ft (1200m), via 9-pin D-Sub socket
 Baud Rate automatically detected (9.6k-12M Bit/s)
 Ethernet Ethernet 100Base TX
 Physical via RJ45 connector
 Mode 10/100 MBit/s, full/half duplex, auto negotiation
 Protocol Modbus/TCP, NTP (time synchronization)

I/O INTERFACE

Basic Device 1 relay output, SPDT
 1 digital output (fixed)
 1 digital input (fixed)
 I/O Extension 1 2 relay outputs, SPDT
 4 bidirectional analog outputs
 2 digital inputs/outputs

DIGITAL INPUTS/OUTPUTS

I/O extensions are individually configurable as inputs or outputs.
 Connections via plug-in terminals.
 Inputs (according to EN 61 131-2, 24Vdc, Type 3):
 Voltage, Nominal 12 / 24Vdc (30V max.)
 Logical Zero -3 to +5V
 Logical One 8 to 30V
 Outputs (partially according to EN 61 131-2):
 Voltage, Nominal 12 / 24Vdc (30V max.)
 Current, Nominal 50mA (60mA max.)
 Load Capability 400 Ω -1M Ω

RELAY OUTPUTS

Connections via plug-in terminals
 Contacts SPDT, latching
 Load Capacity 250Vac, 2A, 500VA or 30Vdc, 2A, 60W

ANALOG OUTPUTS

Connections plug-in terminals, galvanically isolated
 Linearization linear, quadratic or knee point
 Range $\pm 20mA$ (24mA max.)
 Uncertainty $\pm 0.2\%$ F.S.
 Burden $\leq 500\Omega$
 Burden Influence $\leq 0.2\%$
 Residual Ripple $\leq 0.4\%$

NOTE: Refer to the Device Handbook (Operator's Manual), ModBus (-TCP) Interface, System Booklet and Safety Instructions for additional information.



Ohio Semitronics, Inc.
 What Can We Measure for You?

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4242 Reynolds Drive
 Hilliard, Ohio 43026-1264

TELEPHONE: 614-777-1005

TOLL FREE: 1-800-537-6732

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SPECIFICATIONS (Continued)

MEASUREMENT UNCERTAINTY

Ref. Cond.: 15-30°C, sinusoidal, meas. over 8 cycles, PF=1, 50-60Hz
 Voltage, Current $\pm (0.08\% \text{ Rdg.} + 0.02\% \text{ F.S.})^{**}$
 Power $\pm (0.16\% \text{ Rdg.} + 0.04\% \text{ F.S.})^{**}$
 Power Factor $\pm 0.1^\circ$ **
 **Additional uncertainty for voltage of 0.1% and for PF of 0.1° if neutral wire is not connected. F.S. Power based on F.S. Current x F.S. Voltage
 Frequency $\pm 0.01\text{Hz}$
 Voltage & Current Imbalance $\pm 0.5\%$
 Harmonics $\pm 0.5\%$
 THD Voltage, TDD Current $\pm 0.5\%$
 Active Energy Class 0.5S, EN 62053-22
 Reactive Energy Class 2, EN 62053-23

REAL-TIME CLOCK

Uncertainty.. $\pm 2 \text{ min./mo.}$ (15-30°C), trimmable via software
 Synchronizationvia sync pulse or NTP server
 Battery Life.....> 10 years

PHYSICAL AND ENVIRONMENTAL

NOTE: Intended for indoor use only!

Enclosure MaterialPolycarbonate (Makrolon)
 Weight.....1.1 lb (500g)
 Flammability Class.....UL94V-0, halogen-free
 Operating Temperature.....-10 ... 15 ... 30 ... + 55°C
 Storage Temperature-25 to +70°C
 Temperature Effect.....0.5 x basic uncertainty per 10°C
 Long-term Drift.....0.2 x basic uncertainty per year
 Others Usage group II (EN 60688)
 Relative Humidity < 95% non-condensing
 Altitude $\leq 2000\text{m}$ max.
 OrientationAny

APPLIED STANDARDS, REGULATIONS & DIRECTIVES

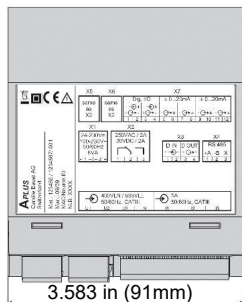
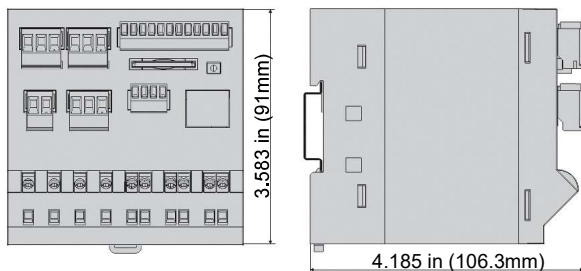
IEC/EN 61010-1 Safety of electric measuring, control & laboratory equipment
IEC/EN 60688 Transducers for converting AC variables into analog or digital signals
DIN 40110 AC quantities
IEC/EN 60068-2-1/-2/-3/-6/-27 ambient tests: -1 Cold, -2 Dry heat, -3 Damp heat, -6 Vibration, -27 Shock
IEC/EN 60529 Protection type by case
2002/95/EG (RoHS) EC directive on the restriction of the use of certain hazardous substances
IEC/EN 61000-6-2/6-4 Electromagnetic compatibility (EMC) standards for industrial environments
IEC/EN 61131-2 Programmable controllers - equipment, requirements and tests (digital I/O 12/24Vdc)
IEC/EN 61326 EMC requirements for electrical equipment for measurement, control & laboratory use
IEC/EN 62053-31 Pulse output devices for electronic and electromechanical meters (SO output)
UL94V-0 Test for flammability of plastic materials for parts in devices and appliances

SAFETY & ENVIRONMENTAL

Current inputs are galvanically isolated from each other.
 Protection class.....II (protective insulation, voltage inputs via protective impedance)
 Pollution degree2
 Protection RatingIP64 (front), IP40 (housing), IP20 (terminals)
 Measurement Category CAT III, CAT II (relays)

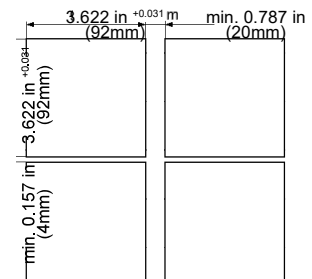
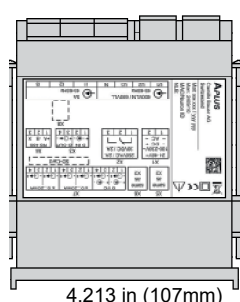
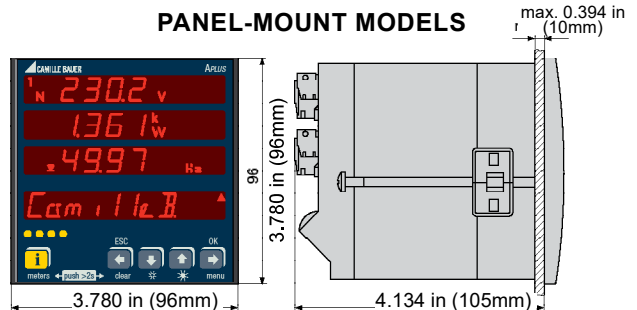
CASE DIMENSIONS & CONNECTIONS

DIN-RAIL MOUNT MODELS (NO DISPLAY)



Mounts on standard 35mm Top-Hat Din-Rail per EN50022.

PANEL-MOUNT MODELS



Panel Cut-out, showing multiple units



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