MULTIFUNCTION POWER METER WITH I/O — MODEL APLUS

DESCRIPTION

The APLUS is a powerful platform for measuring, monitoring and analyzing 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, as well as analyzing acquired data.

MODEL SELECTION

APLUS - □□□□ □□□

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	1	RS-485 Modbus/RTU	0	(none)	0	(none)	0	(none)
1	LED display, panel mount	2	50/60Hz, Rogowski			2	Ethernet Modbus/TCP NTP	1	2 relay, 4 analog and 2 digital I/Os	E	includes cert.	1*	with logger
2	TFT display, panel mount					3*	RS-485 Modbus/RTU + Profibus DP	2	2 relays and 6 digital I/Os				
						4	RS-485 Modbus/RTU + RS-485 Modbus/RTU						
						5	RS-485 Modbus/RTU + Ethernet Modbus/TCP						

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2002/95/EC ROHS COMPLIANT

5 YEAR WARRANTY

*Data logger cannot be combined with Profibus DP interface.

SPECIFICATIONS

INPUT

Current, Nominal ..... 1 to 5Aac, selectable
Maximum 7.5Aac
Overload without damage ..... 10A, continuous
100A, 10 x 1s, at 100s intervals
Burden ..... ≤ I^2 x 0.01 Ω per phase
Voltage, Nominal ..... 57.7 to 400V_{L-N}, 100 to 693V_{L-L}
Maximum ..... 480V_{L-N}, 832V_{L-L} (sinusoidal)
Overload without damage .... 480V_{L-N}, 832V_{L-L} continuous,
600V_{L-N}, 1040V_{L-L}, 10 x 10s, at 10s intervals
800V_{L-N}, 1386V_{L-L}, 10 x 1s, at 10s intervals
Burden ..... ≤ V^2 / 3MΩ 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 (1½ element)
3-wire, unbalanced load (2 ele., 3 ele.)
4-wire, balanced load (1 ele.)
4-wire, unbalanced load (2½ ele., 3 ele.)

INSTRUMENT POWER

Nominal ... 100-230Vac ±15%, 50-400Hz or 24-230Vdc ±15%
Burden ..... ≤ 7VA

COMMUNICATION INTERFACE

Modbus/RTU ..... RS-485 (max. 32 devices)
Physical ..... max. 4000 ft (1200m), via plug-in terminals
Baud Rate ..... 1.2 to 115.2kBaud
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
I/O Extension 2 ..... 2 relay outputs, SPDT
6 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 400Ω-1MΩ

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 ..... ±20mA (24mA max.)
Uncertainty ..... ±0.2% F.S.
Burden ..... ≤ 500Ω
Burden Influence ..... ≤ 0.2%
Residual Ripple ..... ≤ 0.4%

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

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MULTIFUNCTION POWER METER WITH I/O *MODEL* APLUS

SPECIFICATIONS (Continued)

MEASUREMENT UNCERTAINTY

Ref. Cond.: 15-30°C, sinusoidal, meas. over 8 cycles, PF=1, 50-60Hz

Voltage, Current ..... ± (0.08% Rdg. + 0.02% F.S.)**
Power ..... ± (0.16% Rdg. + 0.04% F.S.) **
Power Factor ..... ± 0.1° **
**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 ..... ± 0.01Hz
Voltage & Current Imbalance ..... ± 0.5%
Harmonics ..... ± 0.5%
THD Voltage, TDD Current ..... ± 0.5%
Active Energy ..... Class 0.5S, EN 62053-22
Reactive Energy ..... Class 2, EN 62053-23

REAL-TIME CLOCK

Uncertainty.. ±2 min./mo. (15-30°C), trimmable via software
Synchronization .....via sync pulse or NTP server
Battery Life.....> 10 years

PHYSICAL AND ENVIRONMENTAL

NOTE: Intended for indoor use only!
Enclosure Material .....Polycarbonate (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 ..... ≤ 2000m max.
Orientation .....Any

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)

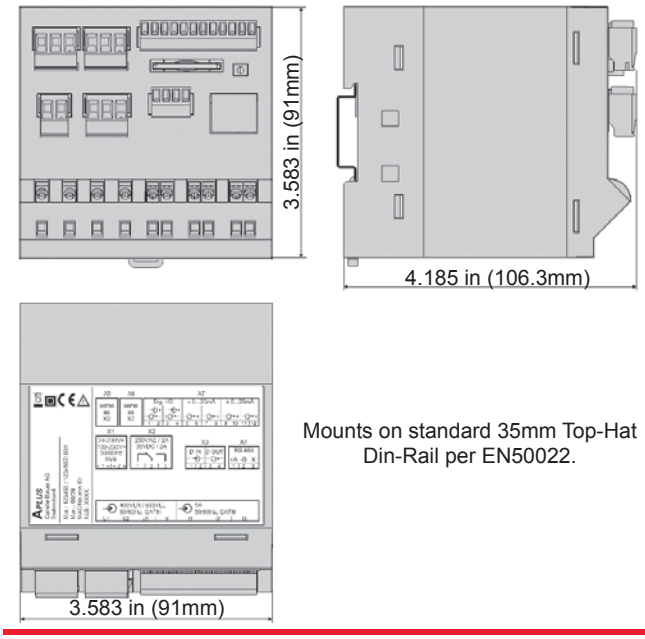
UL94V-0 Test for flammability of plastic materials for parts in devices and appliances

SAFETY & ENVIRONMENTAL

Current inputs are galvanically isolated from each other.
Protection class.....II (protective insulation, voltage inputs via protective impedance)
Pollution degree 2
Protection Rating .....IP64 (front), IP40 (housing), IP20 (terminals)
Measurement Category ..... CAT III, CAT II (relays)

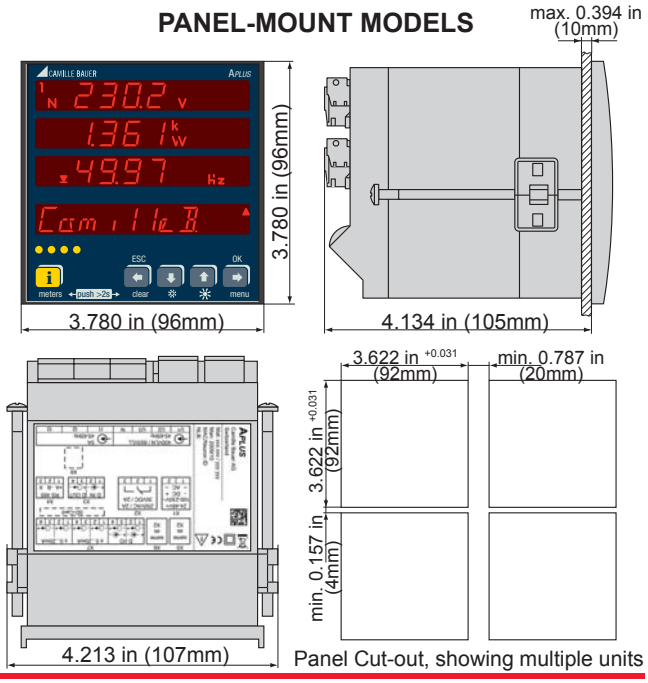
CASE DIMENSIONS & CONNECTIONS

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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