

# OSI 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	<b>5 YEAR WARRANTY</b>					
		4	RS-485 Modbus/RTU + RS-485 Modbus/RTU			*				*Data logger cannot be combined with Profibus DP interface.			
		5	RS-485 Modbus/RTU + Ethernet Modbus/TCP			*				*			
UL US LISTED		CE		RoHS compliant									

## 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 (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.....	$\leq 7VA$

### COMMUNICATION INTERFACE

Modbus/RTU.....	RS-485 (max. 32 devices)
Physical.....	max. 4000 ft (1200m), via plug-in terminals
Baud Rate .....	1.2 to 115.2kBaud
Profibus DP.....	RS-485, (max. 32 devices)
Physical.....	max. 4000 ft (1200m), via 9-pin D-Sub socket
Baud Rate .....	automatically detected (9.6-12M 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 .....	$\leq 500\Omega$
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.

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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.. $\pm 2$ 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 ... <u>15</u> ... 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 60 688)
Relative Humidity .....	< 95% non-condensing
Altitude .....	≤ 2000m max.
Orientation .....	Any

### APPLIED STANDARDS, REGULATIONS & DIRECTIVES

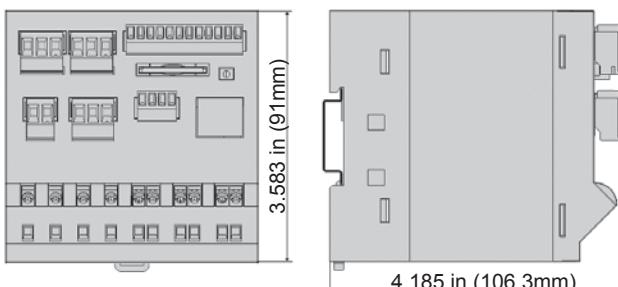
<u>IEC/EN 61010-1</u>	Safety of electric measuring, control & laboratory equipment
<u>IEC/EN 60 688</u>	Transducers for converting AC variables into analog or digital signals
<u>DIN 40 110</u>	AC quantities
<u>IEC/EN 60 068-2-1/-2/-3/-6/-27</u>	ambient tests: -1 Cold, -2 Dry heat, -3 Damp heat, -6 Vibration, -27 Shock
<u>IEC/EN 60 529</u>	Protection type by case
<u>2002/95/EG (RoHS)</u>	EC directive on the restriction of the use of certain hazardous substances
<u>IEC/EN 61 000-6-2/6-4</u>	Electromagnetic compatibility (EMC) standards for industrial environments
<u>IEC/EN 61 131-2</u>	Programmable controllers - equipment, requirements and tests (digital I/O 12/24Vdc)
<u>IEC/EN 61 326</u>	EMC requirements for electrical equipment for measurement, control & laboratory use
<u>IEC/EN 62 053-31</u>	Pulse output devices for electronic and electromechanical meters (SO output)
<u>UL94V-0</u>	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 .....
Protection Rating .....
Measurement Category .....

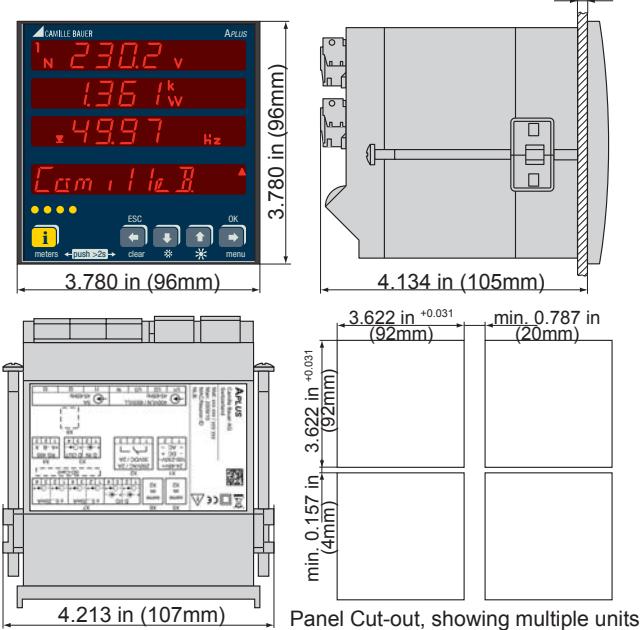
## CASE DIMENSIONS & CONNECTIONS

### 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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