PAC3120
power meter

Basic monitoring of electrical power systems
usa.siemens.com.pds

The PAC3120 is a powerful compact power monitoring device that is suitable for use in industrial, government and commercial applications, where basic metering and energy monitoring is required. The meter may be used as a stand alone device monitoring over 100+ parameters or as part of an industrial control, building automation or global power monitoring system.

Metering and monitoring applications range from simple analog volt and amp meter replacements to stand-alone sub-billing or cost allocation installations.

The PAC3120 has many features not usually found in this price class of meters. A large graphical display supports multiple languages and easy to use menus that can be used to set up the meter as well as a PC based program, SENTRON powerconfig, that can be used to pre-configure one or multiple units. The meter also has built in Modbus RTU communications via a RS485 interface. The meter comes standard with four digital inputs and outputs. Two output is suitable for pulse output for export/import real and reactive energy. The other two output is controllable from an outside source by way of a Modbus register. The PAC3120 meets or exceeds ANSI C12.20 (0.5%) & IEC 61557-12 (0.5%).

The PAC3120 can also be used to support LEED certification and provide the needed energy metering data for federal or local government energy reduction programs.

The PAC3120 provides open communications using Modbus RTU and digital I/O for easy integration into any local or remote monitoring system to indicate values and status. Simple configuration of the meter can be done from the front display or by using a PC with SENTRON powerconfig setup software, free download from Siemens website.

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96 mm
3.78 in.

96 mm 3.78 in.

Full graphic LCD display to indicate: Display title or designation of the displayed measurements, phase, measured value unit and labeling of function keys

Example of operating menu: With an easy-to-read adjustable back lit LCD display, the PAC3120 can be commissioned in only two steps. After selecting the language and setting two parameters (voltage and current inputs), the meter is ready for use.[1]

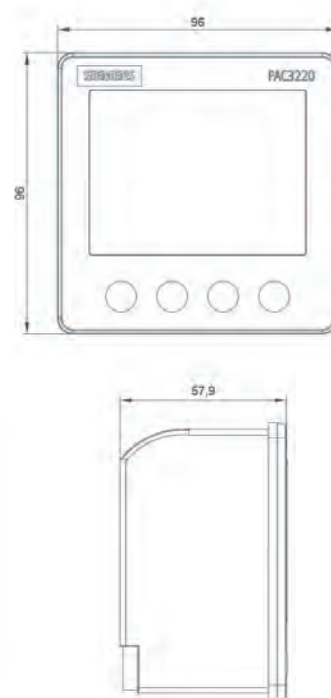**When, where and how much power is consumed?**

PAC3120 makes consumption apparent. To accomplish a sustainable reduction of power costs, you must first analyze the electrical system's current consumption and power flows. The PAC3120 power meter precisely and reliably delivers the required information of power values to put you on the path to reduce your power cost.
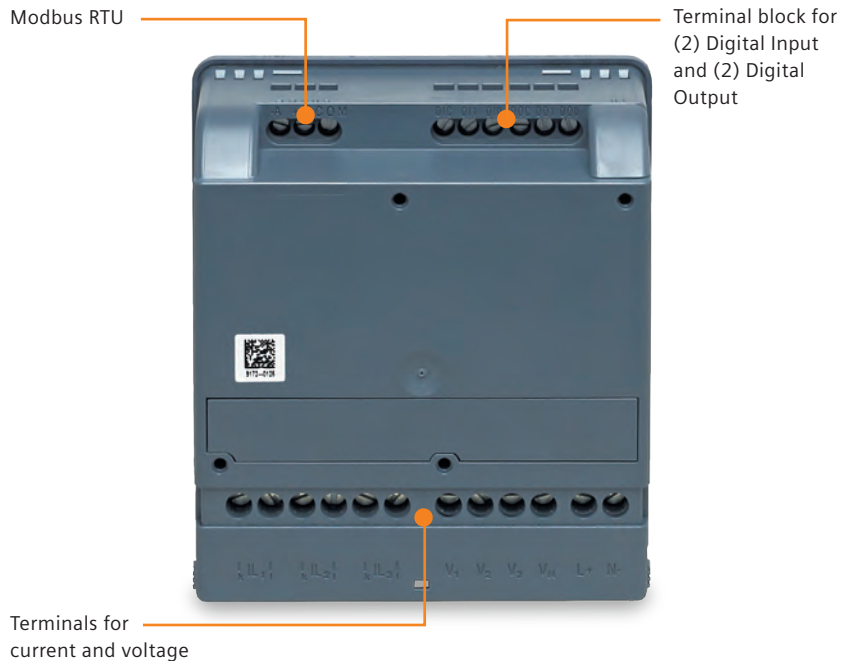
Applications summary

Replace multiple analog meters. An ideal replacement for analog meters. Use it for stand-alone metering in custom panels, switchboards, switchgear, gensets, motor control center and UPS systems, PDU, RPPs, etc.

Beside the ability to measure energy data, the device can also track the status of a breaker due to the two built-in digital inputs. This makes the meter a cost effective solution to monitor the energy consumption in a branch as well as the status of the protective device.

1) Languages included as standard in the meter are English, German, French, Spanish, Italian, Portuguese, Polish, Turkish, Russian and Chinese.

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Modbus RTU

Terminal block for
(2) Digital Input
and (2) Digital
Output

Terminals for
current and voltage

Basic metering

The PAC3120 offers high-accuracy power, energy and demand measurements. These revenue accurate values can be used for bill verification, monitoring backup power on critical systems and offering cost-effective energy solutions.

Cost allocation / Energy monitoring

Perfect for monitoring right down to the tool level, the meter can help monitor cost centers, identify opportunities for demand control and check energy consumption patterns.

Automation integration

Monitor critical equipment processes and tie directly to the Siemens family of PLCs and automation networks.

Sub-metering

Low cost, high accuracy and simple retrofit installation enables economical measurement of commercial and residential tenant space.

Integrate the PAC3120 with existing energy management systems and RTUs. Reduce energy consumption by eliminating previously uncontrolled expenses.

Power management and PAC3120

The PAC3120 can easily be integrated into a power management system using Modbus RTU. With communication, the PAC3120 transmits measured values to the supervisory systems, where the data can be further processed for display and control.

Siemens offers a low cost Powermanager or enterprise level WinPM.Net power monitoring software which can provide easy integration to the PAC3120 meter. Powermanager or WinPM.Net provide standard overview displays allowing detailed analysis of the electrical power, which allows for easy allocation of power consumption and cost. Additionally, unexpected operating conditions can be detected on a timely basis.

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Functional features

Instantaneous values

Voltage	Phase-phase / phase-neutral	✓
Currents	Per phase including neutral current total	✓
Apparent, active and reactive power (kW, kVAR, kVA)	Per phase and total	✓
Power factor	Total	✓
Frequency	45…65 Hz	✓
Min. / max. values	Voltage – phase-phase, phase-neutral Current / Power / Power factor Frequency Three phase average voltage and current	✓
Average values (2 configurable periods)	Voltage – phase-phase, phase-neutral Voltage min. / max. for phase-phase-phase-neutral Current Current min. / max.	✓

Energy measurement

Real (active) energy (kWh)	Import / export	✓ / ✓
Reactive energy (KVArh)	Positive / negative; high / low tariff	✓ / ✓
Energy demand per measuring period	Three phase average rating for active and reactive power	1 to 60 min.
Min. / max. rating values within the measuring period		✓
Logging	Active energy history Daily consumption values for last 64 days Monthly consumption values for last 24 months	✓

Measurement accuracy

Voltages		± 0.2%
Currents		± 0.2%
Active Power		± 0.5%
Reactive Power		± 1.0%
Active energy		Class 0.5 according to IEC 61557-12 and IEC62053-22
Reactive energy		Class 2 according to IEC61557-12 and IEC62053-23

Communication

Modbus RTU	Standard • Parameterization via device front or with SENTRON powerconfig software • Transition of data via MODBUS register based points	• Support of all baud rates from minimum 4800 to maximum 115.2 kBPS (4.8 to 115.2 kB/ sec)

Standard Inputs / Outputs

Integrated digital input	30 Vdc max. / 7 mA	2: wet, no external power needed
Integrated digital output	30 Vdc max. / 10-27mA; 130 mA max.	2

General

Password protection		✓

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Functional features (continued)

Inputs/Outputs

Input voltage / at digital input	
initial value for signal =<1>-recognition	13 V
at DC / rated value	24 V
Full-scale value for signal <0> recognition	8 V
Number of digital outputs	2
Number of digital inputs	2
Digital output version	Switching or pulse output function
Input current / at digital input for signal <1>	7 mA
Output current	
at digital output / with signal <0> / maximum	0.2 mA
at digital output / for signal <1> / minimum	27 mA
at digital output / for signal <1> / maximum	27 mA
at the digital outputs / at DC / maximum	130 mA
Output delay / at digital output	
for signal <0> to <1> / maximum	5 ms
for signal <1> to <0 > / maximum	5 ms
Operating voltage / as output voltage / at DC / maximum permissible	30 V
Property of the output / Short-circuit proof	Yes
Input delay / at digital output	
for signal <0> to <1> / maximum	5 ms
for signal <1> to <0 > / maximum	5 ms
Internal resistance / at the digital outputs	55 Ω
Measuring category / for digital signals	CATII
Switching frequency / at digital output / maximum	17 Hz

Technical data

Two-quadrant (import) / four-quadrant (import and export) measuring		4Q
Measurement types		1 ph, 2 ph or 3 ph
Applicable for network type		TN, TT, IT
Sampling rate	50k samples/cycle, all channels measured simultaneously	
Measured voltage	Direct connection up to max. delta/wye without transformer	690 V / 400 V (CAT III)
Current inputs	Settable on device	1A or 5A nominal
Power supply	AC/DC	100…240V AC (±10%) / 110…250V DC (±10%)
Dimensions	L x W x D in mm Installation depth (mm)	96 x 96 55 mm / 2.0 in.
Degree of protection	Front Rear	IP65, NEMA 12 IP20, NEMA 1
Operating temperature	°C / °F	−10…+55 / +14…+131
Display	Type	Background-illuminated graphic LCD
Resolution (pixels)		128 x 96
Text displays		Multilingual

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Functional features (continued)

Connections

Type of electrical connection	
at the inputs for supply voltage	screw-type terminals
at the measurement inputs for voltage	screw-type terminals
at the measurement inputs for current	screw-type terminals

Mechanical Design

Height	96 mm
Height / of the display	54 mm
Width	96 mm
Width of the display	72 mm
Depth	56 mm
Mounting position	vertical
Installation depth	51 mm
Mounting type / panel mounting	Yes
Material thickness / of the control panel maximum	4 mm
Net weight	469 g

Environmental conditions

Degree of pollution	2
Installation altitude / at height above sea level / maximum	2000 mm

Standard

For EMC for industrial sector	IEC 61000-6-2 respectively IEC 61326-1:2005, table 2
For EMC against unloading	IEC 61000-4-2
For EMC against high frequency fields	IEC 61000-4-3
For EMC against conducted disturbance variables via HF yields	IEC 61000-6-4
For EMC against magnetic fields with power engineering frequencies	IEC 61000-4-8
For EMC against quick, transient electrical disturbances	IEC 61000-4-8
For EMC against voltage drops and interruptions	IEC 61000-4-11
For EMC against surge voltages	IEC 61000-4-5
For pulse emitter	according to IEC62053-31
For cyclic, environmental damp heat check	IEC 60068-2-30
For environmental coldness check	IEC 60068-2-2
Relative humidity / at 25 °C / without condensation / during operation	
minimum	5 %
maximim	95 %

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Functional features (continued)

Ambient temperature

During operation / minimum	-25 °C
During operation / maximum	55 °C
During storage / minimum	-25 °C
During storage / maximum	70 °C

Certificates

Certificate of suitability	
As EC declaration of conformity	IEC 61010-1: 2001 (2nd Ed.) with Corr. 1, EN 61010-1: 2001 (2nd Ed.) and DIN EN 61010-1:2002 with "Berichtigung 1"
As approval for Canada	UL 61010-1, 2nd Ed. CAN/CSA-C22.2 NO. 61010-1-04
As approval for USA	UL 61010-1, 2nd Ed. CAN/CSA-C22.2 NO. 61010-1-04
Approval Australia	Yes
Reference identifier / acc. to DIN EN 61346-2	P

General Product Approval   Declaration of Conformity

C E   (UL)

Order information

Product	Order Number
PAC3120 Power Meter, LCD, AC/DC, 2DI/DO, RS485	7KM31200BA011DA0
PAC3120 Power Meter, LCD, 20-60VDC, 2DI/DO, RS485	7KM31201BA011EA0
Adapter Plate for 4700/4720 meter cutout	93-47ADAPTER
PAC3xxx/4xxx Meter Front Facing DIN Rail adapter	7KM99000XA000AA0

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