Notices

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POWER MEASUREMENT

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Danger



This symbol indicates the presence of dangerous voltage within and outside the product enclosure that may constitute a risk of electric shock, serious injury or death to persons if proper precautions are not followed.

Caution



This symbol alerts the user to the presence of hazards that may cause minor or moderate injury to persons, damage to property or damage to the device itself, if proper precautions are not followed.

Note



This symbol directs the user's attention to important installation, operating and maintenance instructions.

Installation Considerations

Installation and maintenance of the 3720 ACM meter should only be performed by qualified, competent personnel that have appropriate training and experience with high voltage and current devices. The meter must be installed in accordance with all Local and National Electrical Codes.

DANGER

Failure to observe the following instructions may result in severe injury or death.

- During normal operation of the 3720 ACM meter, hazardous voltages are present on its terminal strips, and throughout the connected potential transformer (PT), current transformer (CT), digital (status) input, control power and external I/O circuits. PT and CT secondary circuits are capable of generating lethal voltages and currents with their primary circuit energized. Follow standard safety precautions while performing any installation or service work (i.e. removing PT fuses, shorting CT secondaries, etc).
- The terminal strips on the meter base should not be user-accessible after installation.
- Do not use digital output devices for primary protection functions. These include applications where the devices perform energy limiting functions or provide protection of people from injury. Do not use the 3720 ACM in situations where failure of the devices can cause injury or death, or cause sufficient energy to be released that can start a fire. The meter can be used for secondary protection functions.
- Do not HIPOT/Dielectric test the digital (status) inputs, digital outputs, or communications terminals. Refer to the label on the 3720 ACM meter for the maximum voltage level the device can withstand.

1 INTRODUCTION

High Performance Power Instrumentation

The 3720 ACM is a microprocessor-based, digital 3-phase "Smart Power Monitor/Meter" designed for use in industrial, commercial, and utility power distribution switchboards and substations. The 3720 ACM answers the ever-increasing concern for 'clean', reliable power by integrating the many critical aspects of power monitoring, analysis, and control into one simple and economical instrument. It is a state of the art alternative to traditional analog electromechanical metering devices, replacing numerous individual transducers and meters, and offering many features previously unavailable in power instrumentation.

The 3720 ACM offers the high accuracy, reliability, and ruggedness of its companion product, the successful 3710 ACM, while adding many new measurements and advanced features (see Figure 1.1.1). The 3720 ACM also matches the 3710 ACM in its mounting dimensions, installation requirements, and in its straightforward and flexible user interface.

The unit is based around a 13.5 MHz, 16 bit microcontroller chip. This provides very high computational throughput, allowing the unit's sophisticated software to process information in real time. The unit is self-contained and its readings and set up parameters are maintained in nonvolatile memory. An internal 16-bit CPU gives the 3720 ACM the processing capability to be used as a stand-alone power monitoring and control station or as a *smart RTU* in a large energy monitoring network.

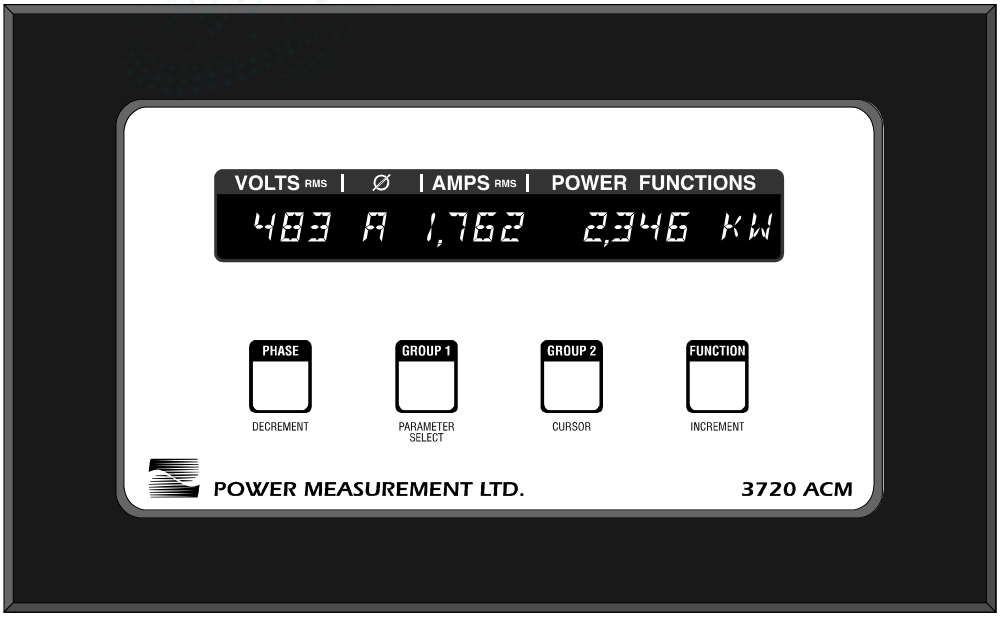
Easy Installation and Exceptional Ruggedness

The 3720 ACM is panel-mountable and provides rear-mounted, utility approved terminal strips rated at 600V. The 3720 ACM is exceptionally rugged, with a high tolerance to electrical disturbances and temperature extremes. Many special design features guarantee performance in electrically harsh environments. The voltage, current, status (digital), relay, supply power, and communications inputs are designed to withstand hipot, C37.90A SWC, and fast transient tests. The 3720 ACM transformer-coupled current inputs are fully isolated with respect to the chassis of the unit, and provide 300 Amp surge protection.

Inputs and Outputs

The 3720 ACM supports a variety of power distribution configurations, including 4-wire Wye, 3-wire Delta, and Single Phase systems. 3 phase voltage and 3 phase current inputs are provided, as well as an additional current input. In installations with non-linear loads, where odd harmonics can fail to cancel, significant currents in the neutral conductor can be produced. The 3720 ACM fourth current input can be used optionally for monitoring current in the neutral conductor, or for ground current monitoring. Used in conjunction with its high-speed setpoint system, the 3720 ACM can provide reliable ground fault protection.

No intermediate transducers are required on phase voltage and current inputs. When equipped with the appropriate voltage input option, no PTs are required for Wye systems up to 347 VAC line-to-neutral / 600 VAC line-to-line. For higher voltage Wye systems, and all Delta systems, PTs can be used. The transformer-coupled current inputs accept CTs with 5 Amp full scale outputs. Overrange measurement options include 125% to 200%.

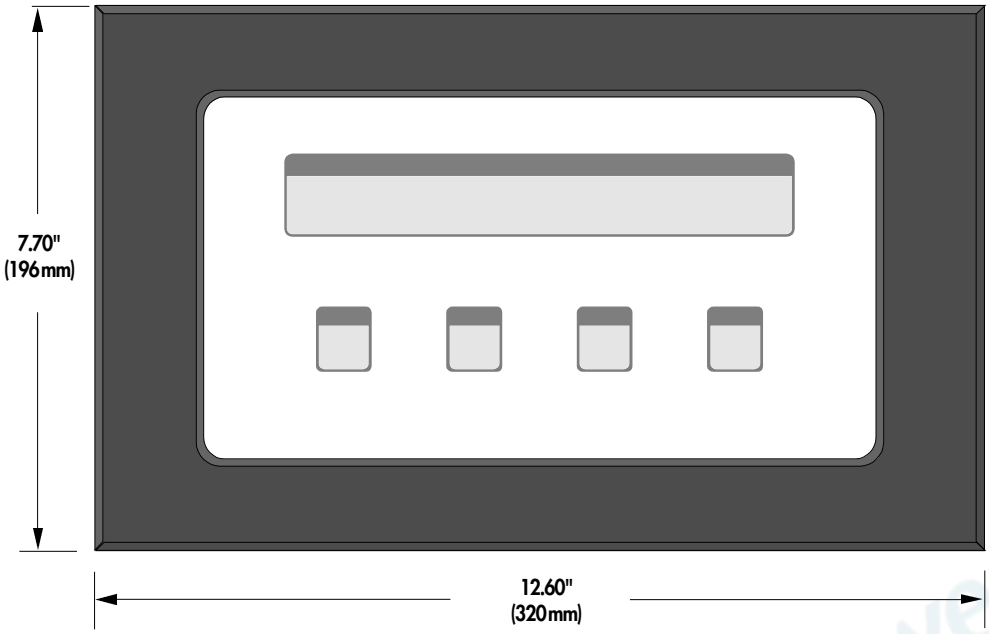


APPENDIX A

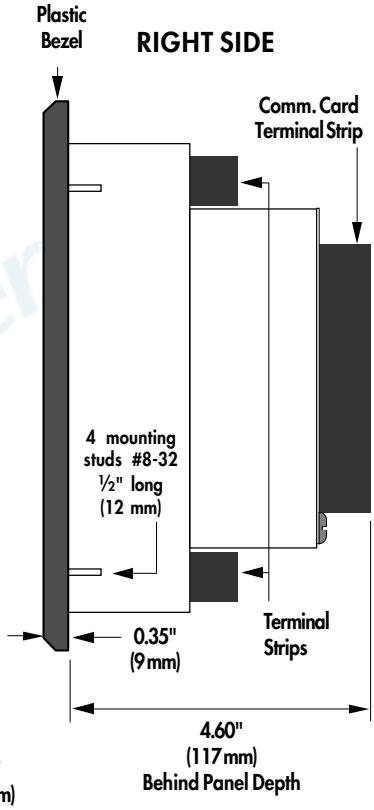
MECHANICAL & MOUNTING DIMENSIONS

BASIC MODEL

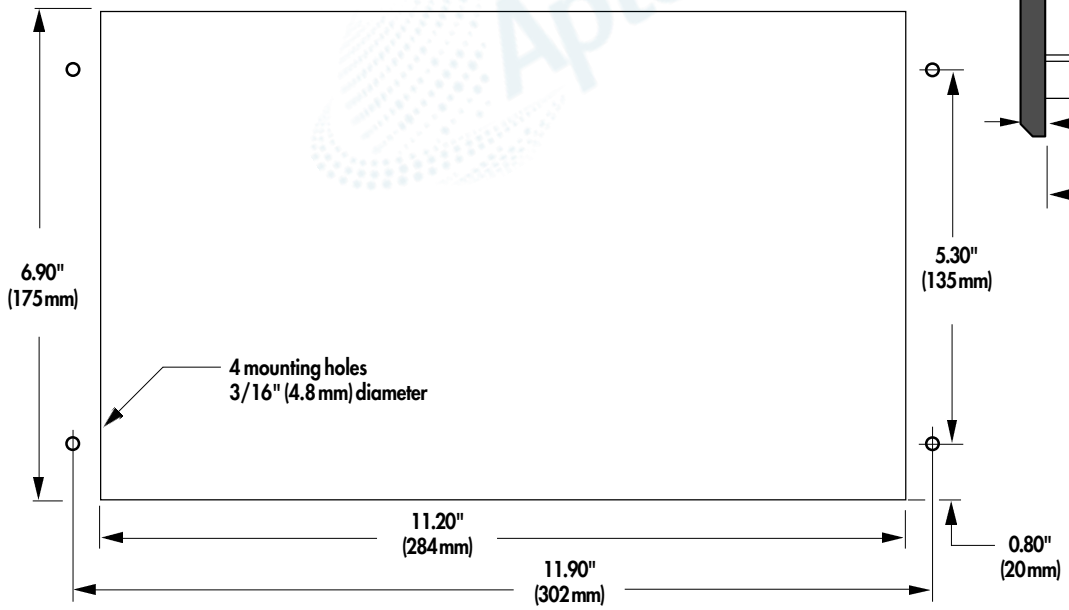
FRONT PANEL



RIGHT SIDE



PANEL CUTOUT



APPENDIX D

TECHNICAL SPECIFICATIONS

PARAMETER	ACCURACY[3] (% of full scale)				FRONT PANEL DISPLAY	
	Basic	XAMPS			Resolution	Range
Current	0.2 %	0.3 %			0.1 %	0 - 30,000
Current Unbalance	1.0 %	1.0 %			1.0 %	0 - 100 %
kW	0.4 %	0.5 %			0.1 %	0 - 999,999[2]
kVAR	0.4 %	0.5 %			0.1 %	0 - 999,999[2]
kVA	0.4 %	0.5 %			0.1 %	0 - 999,999[2]
kWh	0.4 %	0.5 %			1 KWH	0 - 999,999,999
kVARh	0.4 %	0.5 %			1 KVARH	0 - 999,999,999
kVAh	0.4 %	0.5 %			1 KVAH	0 - 999,999,999
Voltage	0.2 %				0.1 %	0 - 999,999[1]
Voltage Unbalance	1.0 %				1.0 %	0 - 100 %
Power Factor	1.0 %				1.0 %	-0.6 to 1.0 to +0.6
Frequency	0.05 Hz				0.01 Hz	20.00 to 75.00 Hz
Harmonic Distortion	1.0 %				0.1 %	0.0 to 1000.0 %
K-Factor	10.0 %				0.1	1.0 to 9999.9
I4	0.2%	0.3%	0.8%	2.0%	0.1%	0 - 9,999
Vaux	0.25 %				0.1 %	0 - 999,999

1. Reads in kV for voltages over 9,999
2. Reads in MVA, MW, MVAR for readings over 9,999k
3. @50.0 Hz or @60.0 Hz @ 25°C (77°F)

CURRENT OVERRANGE OPTIONS					
Option	Accuracy		Current Input Overrange		
	Amps	Power	% Full Scale	Amps	
				Basic	
Basic	0.2 %	0.4 %	125%	6.25	
XAMPS	0.3 %	0.5 %	200%	10.00	

WAVEFORM CAPTURE & RECORDING

Waveform Capture
Sampling Rate: approximately 128 times per cycle
Sampling Accuracy: 2% of full scale
Resolution: 10 bits (0.1 %)

Waveform Recording
Sampling Rate: approximately 16 times per cycle
Sampling Accuracy: 2% of full scale
Resolution: 10 bits (0.1 %)

APPENDIX D TECHNICAL SPECIFICATIONS

INPUT & OUTPUT RATINGS

Voltage Inputs:	Basic Model:	120 VAC nominal full scale input.
	277 Option:	277 VAC nominal full scale input.
	347 Option:	347 VAC nominal full scale input.
	Overload withstand for all options: 1500 VAC continuous, 2500 VAC for 1 second. Input impedance for all options: 2 Megohm	
Current Inputs:	Basic Model:	5.000 Amps AC nominal full scale input.
	Overload withstand for all options: 15 Amps continuous, 300 Amps for 1 sec. Input impedance: 0.002 ohm, Burden: 0.05 VA	
Aux. Voltage Input:	1.0 VAC/VDC nominal full scale input (1.25 VAC /VDC max.) Overload withstand: 120 VAC/VDC continuous, 1000 VAC/VDC for 1 second. Input impedance: 10 Kohm	
Control Relays:	Basic Model:	Form C dry contact. 277 VAC / 30 VDC @ 10 Amp resistive
	SSR Option:	SPST solid state. 24 to 280 VAC (use AC only) @ 1 Amp resistive
Aux. Current Output:	0 to 20 mA into max. 250 ohm load. Accuracy: 2%	
Status Inputs:	+30 VDC differential SCOM output to S1, S2, S3, or S4 input. Min. Pulse Width: 40 msec.	
Power Supply:	Basic Model:	100 to 240 VAC ± 10% / 47 to 440 Hz 110 to 300 VDC ± 10%
	P24/48 Option:	20 to 60 VDC @ 15W
	Includes a 250V, 2A time-lag Type T fuse on the L/+ terminal.	
Operating Temperature:	Basic Model:	0°C to 50°C (32°F to 122°F) ambient air.
	XTEMP Option:	-20°C to +70°C (-4°F to +158°F)
Storage Temperature:	-30°C to +70°C (-22°F to +158°F)	
Humidity:	5 to 95 %, non-condensing	
Altitude:	The maximum operating altitude is 2000 m (6100 ft.)	
Shipping:	Weight: 3.9 kg (8lbs. 10 oz.) Carton: 38 x 25 x 18 cm (15" x 9.8" x 7.1").	

Voltage, Current, Status, Relay and Power inputs all pass the ANSI/IEEE C37.90A-1989 surge withstand and fast transient tests.

UL® LISTED
INDUSTRIAL CONTROL EQUIPMENT
1T98

CSA® LR 57329
UL 3111-1
NRTL/C