AMELEC SIGNAL CONDITIONING

APM489-5-F Frequency / Pulse input Panel Meter / Controller

■ DESCRIPTION

- **5 Digit Red LED high-brightness Display.**
- **4 relays can be programmed individually to be Hi / Lo / Hi Latch / Lo Latch / Go energised with Start Delay / Hysteresis / Energised & De-energised Delay functions, or to be remote control.**
- **Analogue output fitted as standard with optional 1 RS485 (Modbus RTU Mode) interface with versatile functions such as control, alarm, re-transmission and communication for a wide range of industrial applications.**
- **3 external control inputs can be programmed individually to be Relative PV (Tare) / PV Hold / Maximum or Minimum Hold / DI (remote monitoring) / Reset for Relay Energised Latch….**
- **Standard 115 / 230Vac supply (24Vdc supply option available).**

■ TECHNICAL SPECIFICATION

Input

Input Frequency	Input Mode	Input Level
0.01Hz ~ 50 Hz 0.01Hz ~ 100KHz 0.01Hz ~ 140KHz (option)	Voltage Pulse Sine Wave	High Level: over 2/3 of input level Low Level: under 1/3 of input level

Calibration: Doesn't need calibration
A/D converter: **16 bits resolution**
Accuracy: ≤± 0.04% of FS ± 1C;
Sampling rate: 15 cycles/sec
Response time: ≤100 msec.(when the AvG = "1") standard
Input range: **Auto-range:** 0.01Hz-100kHz
Voltage Pulse (5V/12V/24Vdc) or Sine wave (30-500Vac)

To be specified

Display & Functions

LED: **Numeric:** 5 digits, 0.8"(20.0mm)H red high-brightness LED
Relay output indication: 4 square red LED
RS 485 communication: 1 square orange LED
E.C.I. function indication: 3 square green LED
Max/Mini Hold indication: 2 square orange LED
Display range: 0.0000-99999, with auto moving decimal point
Resolution: Decimal point will auto-change according to input
(Decimal point Auto / Semi-Auto / Fixed – programmable)
Decimal point: Programmable from 0 / 0.0 / 0.00 / 0.000 / 0.0000

Over range indication: **ovFL,** when input is over 120% of input range Hi
Under range indication: **-ovFL,** when input is under -20% of input range Lo
Max / Mini recording: Maximum and Minimum value storage during power on.
Display functions: ***PV / Max(Mini) Hold / RS 485 Programmable***
Front key functions: ***Up and down key can be set to be a function as ECI.***

Digital fine adjust: **Pv.Zro:** Settable range: 000~+19999
Pv.SPn: Settable range: 000~+19999

Reading Stable Function

Average: Settable range: 1~99 times
Moving average: Settable range: None / 1~10 times
Digital filter: Settable range: None /1~99 times

Control Functions(option)

Set-points: Four set-points

Control relay: Four relays
Relay 2 & Relay 3: SPCO, 5A/230Vac, 10A/115V
Relay 1 & Relay 4: SPST, 1A/230Vac, 3A/115V
Relay energised mode: Energised levels compare with set-points:
Hi / Lo / Go.12 / Go.23 / ***Hi.HLd*** */* ***Lo.HLd****; programmable*
DO function: Energised by RS485 command of master.
Energising functions: Start delay / Energised & De-energised delay / Hysteresis / Energised Latch
Start band(Minimum level for Energising): 0~9999counts
Start delay time: *0:00.0~9(Minutes):59.9(Second)*
Energised delay time: *0.00.0~9(Minutes):59.9(Second)*
De-energised delay time: *0.00.0~9(Minutes):59.9(Second)*
Hysteresis: 0~5000 counts

External Control Inputs(ECI)

Input mode: 3 ECI points, Contact or open collect input, Level trigger
Functions: *Relative PV(Tare) / PV Hold / Reset for Max or Mini. Hold /* ***DI*** */ Reset for Relay Energised latch*
Debouncing time: Settable range 5 ~255 x (8m seconds)

Analogue output(option)

Accuracy: ***≤± 0.1% of F.S.; 16 bits DA converter***
Ripple: ≤± 0.1% of F.S.
Response time: ≤100 msec. (10~90% of input)
Isolation: AC 2.0 KV between input and output
Output range: Specify either Voltage or Current output in ordering
Voltage: 0~5V / 0~10V / 1~5V programmable
Current: 0~10mA / 0~20mA / 4~20mA programmable
Output capability: **Voltage: 0~10V: ≥ 1000Ω;**
Current: 4(0)~20mA: ≤ 600Ω max

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Issue 2.2021

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Functions: ***Ao.HS****(output range high): Settable range: -19999~29999*
Ao.LS*(output range Low): Settable range: -19999~29999*
Ao.LMt*(output High Limit): 0.00~110.00% of output High*

Digital fine adjust: **Ao.Zro:** Settable range: -38011~+27524
Ao.SPn: Settable range: -38011~+27524

RS 485 Communication(option)

Protocol:	Modbus RTU mode
Baud rate:	1200/2400/4800/9600/19200/38400 programmable
Data bits:	8 bits
Parity:	Even, odd or none (with 1 or 2 stop bit) programmable
Address:	1 ~ 255 programmable
Remote display:	***to show the value from RS485 command of master***
Distance:	1200M
Terminate resistor:	150Ω at last unit.

Electrical Safety

Dielectric strength:	AC 2.0 KV for 1 min, Between Power / Input / Output / Case
Insulation resistance:	≥100M ohm at 500Vdc, Between Power / Input / Output
Isolation:	Between Power / Input / Relay / Analogue / RS485 / E.C.I.
EMC:	EN 55011:2002; EN 61326:2003
Safety(LVD):	EN 61010-1:2001

Environmental

Operating temp.:	0~60 ˚C
Operating humidity:	20~95 %RH, Non-condensing
Temp. coefficient:	≤100 PPM/˚C
Storage temp.:	-10~70 ˚C
Enclosure:	Front panel: IEC 549 (IP54); Housing: IP20

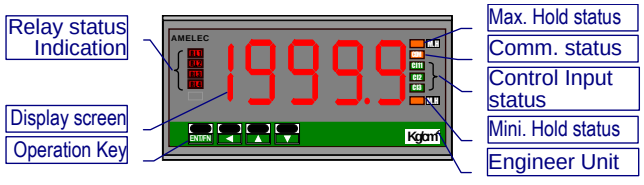
Mechanical

Dimensions:	96mm(W) x 48mm(H) x 120mm(D)
Panel cutout:	92mm(W) x 44mm(H)
Case materiel:	ABS fire-resistance (UL 94V-0)
Mounting:	Panel flush mounting
Terminal block:	Plastic NYLON 66 (UL 94V-0)
	10A 300Vac, M2.6, 1.3~2.0mm²(16~12AWG)
Weight:	550g / 350g(Aux. Power Code: ADH or ADL)

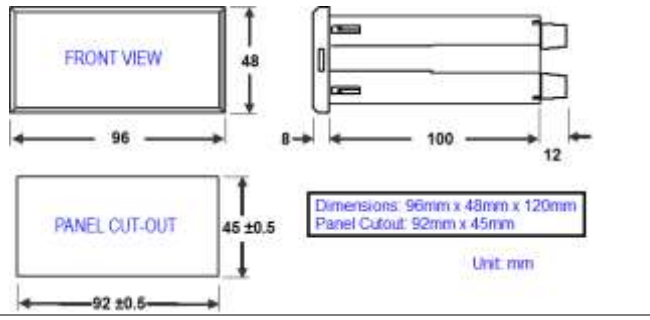
Power

Power supply:	115 / 230Vac,50/60Hz as std
	Optional: 85~264Vac, 24Vdc or 20~90Vdc
Power consumption:	5.0VA maximum
Back up memory:	By EEPROM

■ FRONT PANEL

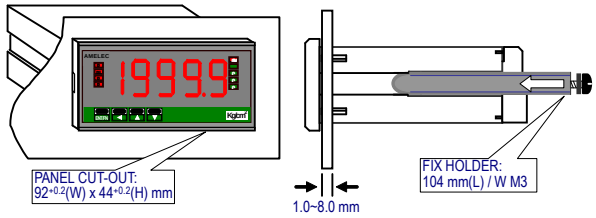


■ DIMENSIONS

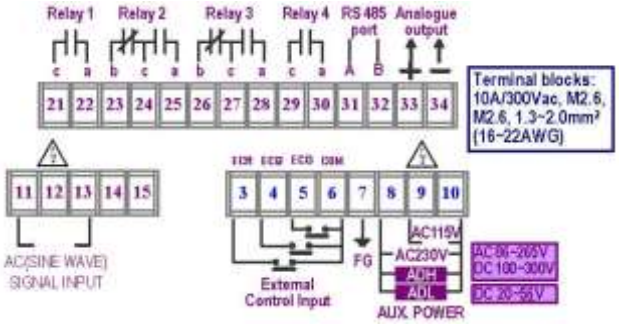


■ INSTALLATION

The meter should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation.

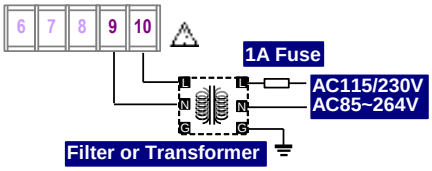


■ CONNECTION DIAGRAM

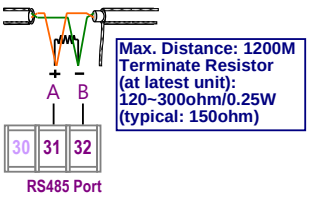


Please check the power supply voltage first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

Power Supply



RS485 Communication Port



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Issue 2.2021