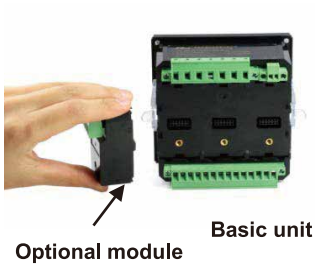
## Different Installation Method

➢ PMAC770 : Panel Mount

Front View




Back View

➢ PMAC770-DR : 35mm DIN Rail Mount

Front View

Back View

## Feature

➢ **Suit for LV/ HV voltage system**

For low voltage system, direct connect up to 690 V (L-L) AC

For high voltage system, support connect up to 65kV

➢ **True-RMS measuring parameter**

True-RMS measuring parameters includes:

U, I, P, Q, S, PF, F, kWh, kvarh, kVAh

➢ **Demand calculation**

2 kinds of demand modes: fixed block and rolling block

➢ **Power quality analysis**

31st Harmonic analysis, K factor, unbalance etc.

➢ *** TOU (Multi-tariff billing), historical data of 31 days and 12 months**

TOU, 4 tariffs, 8 time period in 24 hours

➢ **Max./ Min. Record (U, I, P, Q*)**

➢ **Under/ over limit alarm**

➢ **64M bit Memory, Build-in Web**

Real-time data inquiry by Web

Save monitoring data (Time interval settable 1min, 5 min, 10min,15min, 30min)

Support FTP for download memory data

➢ **CO2 (carbon dioxide) calculation for kWh**


➢ **Multiple Communication**

BACnet MS/TP Protocol (RS485 port)

MODBUS-RTU Protocol (RS485 Port)

MODBUS-TCP/IP Protocol (Ethernet port)

BACnet Ethernet MODBUS

➢ **DI / DO**

➢ **High accuracy**

Active energy: according to IEC62053-22, class 0.5s

Reactive energy: according to IEC62053-23, class 2

| Basic Function （For both PMAC770 & PMAC770-DR ） | | |
|---|---|---|
| Real time metering | Voltage | Ua, Ub, Uc, Uab, Ubc, Uca, UL-L avg, UL-N avg |
| | Current | Ia, Ib, Ic, In, Iavg |
| | Power | Pa, Pb, Pc, ∑P, Qa, Qb, Qc, ∑Q, Sa, Sb,Sc, ∑S |
| | Power factor | PFa, PFb, PFc, ∑PF |
| | Energy | kWh, kvarh, kVAh * |
| | CO2 (carbon dioxide) | kWh(import /export) |
| | Frequency | F |
| | Demand & Max. demand | Dmd_I, Dmd_P, Dmd_Q ,Dmd_S |
| | Max. / min. value | Max. / min. (U, I, P, Q*,S*) |
| | Multi-tariff energy * | |
| | Phase angle * | |
| Power quality analysis | Unbalance | U_unbl*, I_unbl* |
| | Harmonic (31st ) | THDu, THDi, TOHDu, TOHDi, TEHDu, TEHDi, HRU*, RHI* |
| | Harmonic RMS (0-31st ) | Harmonic RMS-U*, Harmonic RMS-I*, Harmonic RMS-P * |
| | Harmonic energy (1st -13th ) | |
| | Voltage crest factor, current K factor, Load rate, Voltage deviation, Frequency deviation<br>Running time record for power-on period and qualified voltage & current * | |
| Setpoint alarm | Over / under limit alarm | |
| 3DI +2 DO | 3 status inputs ( wet contact ) + 2 relay outputs | |
| RS485 | Modbus-RTU protocol | |
| Record function | SOE (event log), Real-time clock ( yyyy-mm-dd hh:mm:ss)* | |
| | Voltage / frequency deviation, Voltage unbalance record | |

## Optional Module (Only for PMAC770)

| | | | |
|---|---|---|---|
| SW | 4 status input (Wet contact) | LAN | 64M bit memory + Ethernet TCP/IP |
| SD | 4 status input (Dry contact) | AI | 2 analog input (4-20mA) |
| C* | The 2nd RS485 | AO | 2 analog output (4-20mA) |
| Ep* | 2 pulse output | BA | BACnet MS/TP protocol |
| R | 2 relay output | | |

* means some of function can't be read through BACnet communication port

| Parameter | Accuracy | Resolution | Measuring Range |
|---|---|---|---|
| Voltage | 0.2% | 0.01V | Direct: 690Vph-ph |
| | | | PT primary: 0.001kV~65kV (settable)<br>PT secondary: 1~398V (settable) |
| Current | 0.2% | 0.001A | CT primary: 0 ~ 9,999A<br>CT secondary: 1 A or 5A |
| Power | 0.5% | 0.1W / var / VA | each phase: 0 ~ 649.9MW / Mvar / MVA |
| | | | Total: 0 ~ 1949.8MW / Mvar / MVA |
| Power factor | 0.5% | 0.001 | -1.000 ~ +1.000 |
| Frequency | 0.01 | 0.01Hz | 45~ 65 Hz |
| Active energy | 0.5% | 0.1kWh | 0 ~ 99,999,999.9 kWh |
| Reactive energy | 2.0% | 0.1kvarh | 0 ~ 99,999,999.9 kvarh |
| Apparent energy | 1.0% | 0.1kVAh | 0 ~ 99,999,999.9 kVAh |
| THD | 1.0% | 0.001 | 0 ~ 100.0% |
| Individual harmonic | 1.0% | 0.001 | 0 ~ 100.0% |
| Un-balance | 1.0% | 0.001 | 0 ~ 100.0% |

## Technical Specification

| | |
|---|---|
| **Connection mode** | 3-phase 3-wire, 3-phase 4-wire, 1-phase 2-wire |
| **Metering** | True RMS, 1 sec refresh time |
| **Input** | Rate current: 1A or 5A<br>Rate voltage:<br>Direct 120V, 220V, 240V, 277V, 398Vph-N (optional)<br>PT secondary: 1~398V (settable)<br>Frequency: 50/ 60Hz |
| **Overload** | 120% of rated, continuously<br>Instantaneous current: 10 times/ sec<br>Instantaneous voltage: 2 times/ sec |
| **Status input** | Wet contact, external power supply |
| **Relay output** | Node capacity: 250VAC/5A |
| **Pulse output** | Pulse constant: 1000~9999 programmable<br>Pulse width: 60~100ms programmable<br>Formula: 1 pulse = (1 ÷ pulse constant × PT × CT) kWh |
| **Power supply** | 85 ~265VAC，85~265VDC (When select P1)<br>100~420VAC, 100~400VDC (When select P2) |
| **Power loss** | ＜5VA |
| **IP index** | IP52 (front panel) and IP30 (case) |
| **Power frequency withstand voltage** | AC 2KV/minute |
| **Insulation resistance** | ≥50MΩ |
| **Impulse withstand voltage** | 4kV (peak), 1.2/50*uS* |

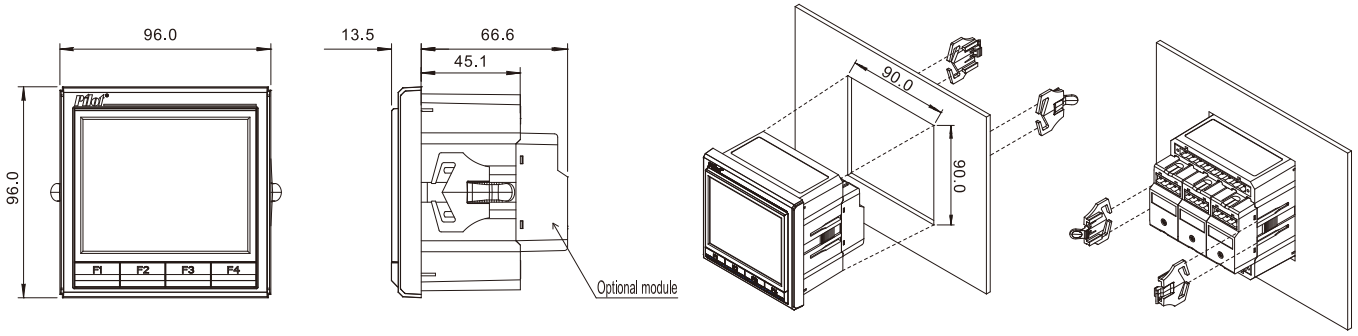
| | | |
|---|---|---|
| **Communication** | Modbus-RTU Protocol | RS485 serial<br>Baud rate: 2400, 4800, 9600, 19200, 38400bps<br>Address: 1~247 |
| | Modbus-TCP/ IP | Ethernet communication port<br>Support connect 10M/100M ethernet, Modbus TCP/IP, Web, FTP |
| | BACnet MS/TP protocol | RS485 serial<br>Baud rate: 2400, 4800, 9600, 19200, 38400, 57600, 76800bps<br>Address: 1…127, excluding 99 |
| **Dimension (L x W x H)** | **PMAC770:**<br>Panel: 96 x 96 x 13.5 mm<br>Cut-out: 90 x 90 x 58.6 mm (basic)<br>90 x 90 x 80.1 mm (optional module)<br>**PMAC770-DR**:<br>Panel: 96 x 96 x 12 mm<br>Cut-out: 90 x 90 x 58.6 mm (basic) | |
| **Weight** | Basic unit: approx 550gr.<br>Optional module: 50gr. | |
| **Environment** | Main Module & and other Modules | Operating temperature: -10℃~+55 ℃<br>Storage temperature: -40℃~+70 ℃<br>Humidity: 5%~95% non-condensing |
| | BACnet Module | Operating temperature: 0℃~+50 ℃<br>Storage temperature: -5℃~+75 ℃<br>Humidity: 10%~95% non-condensing |

| Standard (EMC) | | | |
|---|---|---|---|
| Electrostatic discharge immunity test | IEC 61000-4-2,Level 4 | Surge immunity test (1, 2/50μs～8/20μs) | IEC 61000-4-5,Level 3 |
| Radiated immunity test | IEC 61000-4-3,Level 3 | Conducted emissions | EN 55022,Class B |
| Electrical fast transient/burst immunity test | IEC 61000-4-4,Level 4 | Radiated emissions | EN 55022,Class B |

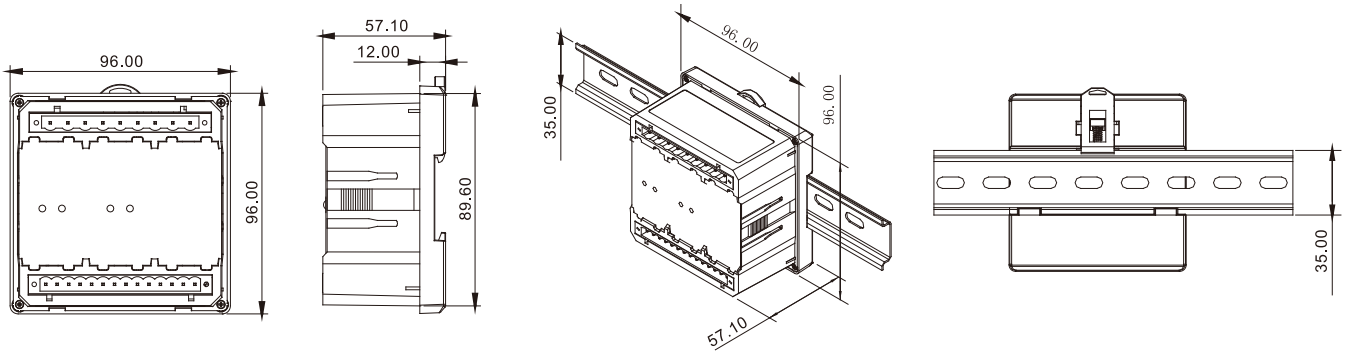
## Dimension & Installation

Unit: mm

**PMAC770** : Panel Mount

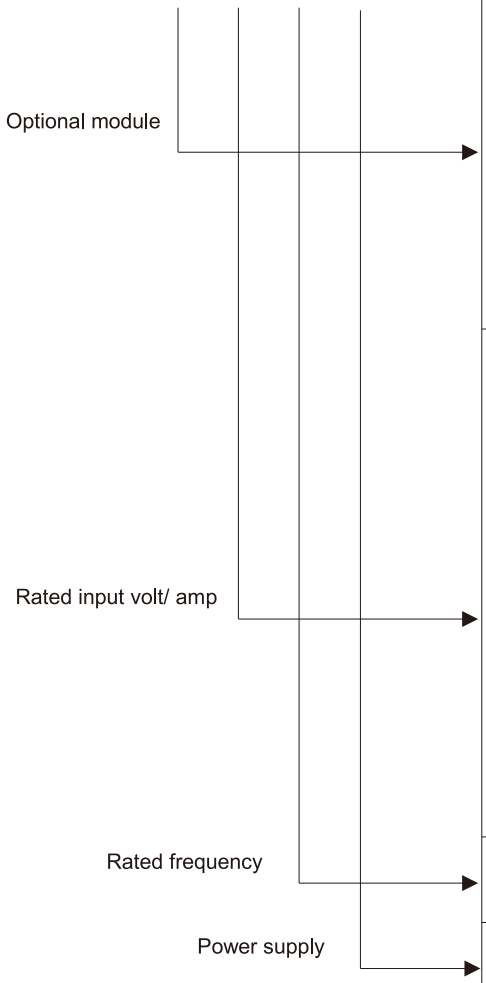



**PMAC770 - DR** : DIN Rail Mount



# Order Information

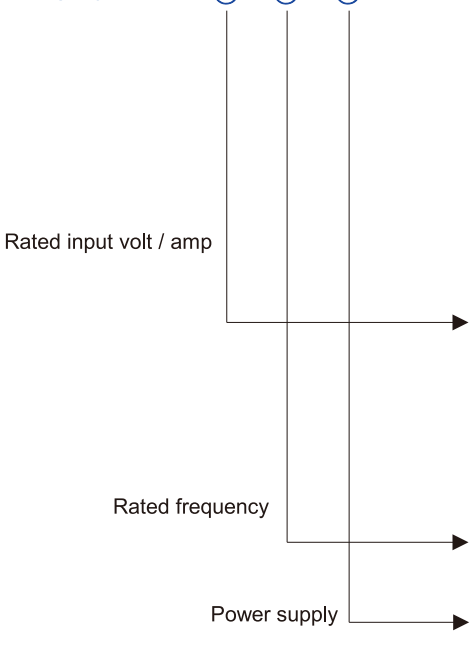
**PMAC770 - E -- ① -- ② -- ③ -- ④**




| | |
|---|---|
| **SW** | DI Module: 4 Status Input (wet contact) |
| **SD** | DI Module: 4 Status Input (dry contact ) |
| **R** | DO Module: 2 Relay Ouput |
| **C** | RS485 Module: The 2nd RS485 communication |
| **LAN** | 64M bit memory + Ethernet TCP/IP |
| **AO** | AO Module: 2 Analog output (4 ~ 20mA) |
| **AI** | AI Module: 2 Analog input (4 ~ 20mA) |
| **Ep** | PO Module: 2 Pulse Output |
| **BA** | BACnet Module: BACnet protocol |
| **V1** | 57.7 / 100V (via PT), 5A |
| **V2** | 57.7 / 100V (via PT), 1A |
| **V3** | 220 / 380V (direct), 5A |
| **V4** | 220 / 380V (direct), 1A |
| **V5** | 120 / 208V (direct), 5A |
| **V6** | 240 / 415V (direct), 5A |
| **V7** | 277 / 480V (direct), 5A |
| **V8** | 63.5 / 110V (via PT), 5A |
| **V9** | 120 / 208V (direct), 1A |
| **V10** | 240 / 415V (direct), 1A |
| **V11** | 277 / 480V (direct), 1A |
| **V12** | 63.5 / 110V (via PT), 1A |
| **V13** | 398 / 690V (direct), 5A |
| **F1** | 50Hz |
| **F2** | 60Hz |
| **P1** | 85 ~ 265VAC, or 85 ~ 265 VDC, 45 ~ 65Hz |
| **P2** | 100 ~ 420VAC, or 100 ~ 400VDC, 45 ~ 60Hz |

**Note:** 1. PMAC770 supports Max. 3 optional module
2. PMAC770 supports Max. 2 **S** optional module, others optional function can only by chosen once.
3. **AI & AO** module can only be select once.
4. **64M** bit memory data can only be read by MODBUS TCP/IP.
5. **BA** module and **LAN** module can't be select together

**PMAC770 - DR - E -- ① -- ② -- ③**




| | |
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