



HPAC series COP Analyzer

Description

The C.O.P. analyzer is presented for the coefficient of the performance on the chiller. It built in energy calculation program with relying on a higher lever processor. The device provides monitoring of supply and return temperature, flow, cooling load, power consumption and the chiller. C.O.P. The analyzer is networked with web management station or BACnet communication for presenting of the performance of chiller in the remote access. The low limit warning indication of the analyzer is for the plant maintenance to enhance the inspection and the chiller's improvement work. This is a tool of measuring the COP in the implementation of the Building Energy Code

Standard Features

- Modular hardware components allow completed flexibility in matching equipment
- Integration platform for access parameters through local device or remote network communication
- LCD displays the parameters as temperature, cooling loading, flow, electric kW, current C.O.P.
- Build-in flashing LED indication on low level alarm of COP
- BACnet MS/TP Communication network
- Support MODBUS communication protocol
- 2 Universal input(UI) fixed 10k NTC and 1 Universal input(UI) fixed 4 to 20mA
- Built-in calculation program for cooling loading
- Data logging stored in EEPROM memory
- Self-diagnostics

Measurement

Each HPAC COP analyzer is used to deeply understanding the performance of each chiller. The data measurement is through cooling or heating load from HPAC series energy meter, and power consumption from electrical power analyzer in the individual or group chiller. All data is

accessed through network communication.. It can be displayed against interested values as cooling/heating loading, electrical power consumption, and supply/return temperature etc.

Principal formula

The coefficient of performance, or COP (sometimes CP) is the ratio of the change in heat at the "output to the supplied work

$COP = \text{heat removed} / \text{work input}$

$COP = HE / WI$

where

COP = coefficient of performance

HE = useful energy acquired (loading from energy meter)

WI = energy applied (electrical power consumption)

Equipment combination

The received HPAC energy meter loading consumption and electrical power consumption are networked with HPAC C.O.P analyzer It is real time data to calculate the COP value.

Optional feature for signal adapter device


Signal adapter device access all parameters from the COP analyzer to connect the other external devices as touch screen, network computer. This is for trend collection to make analyze interested parameters as COP, cooling load and electric loading under dynamic graphic function

- Create the text file format for data access
- RS232 port to collect the thirty devices as touch screen panel and network panel.
- Communicated with other building management system under BACnet communication. The speed communication is 10M or 100M under Ethernet network level. It can be exported with the interested parameter through high level interface.
- Create external network function through web access

Communication

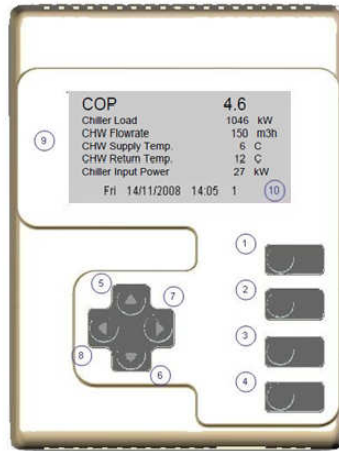
RS485 communication mode, baud rate can be allowed the range as 4,800, 9600, and 19200 Protocol: open MODBUS communication protocol.

Technical data

Processor	: ATMEGA1284P-20PU
Input Communication	: Modbus RTU, RS485
Output Communication	: BACnet MSTP (RS485)
4 UI, Local user interface	: UI1:-Local °C (10kΩ NTC internal temperature sensor) : UI2-Digital Input (DI) or 10kΩ NTC thermistor : UI3 & UI4 - 10kΩ NTC thermistor (UI3 default), 20kΩ, 100kΩ - 0-5Vdc, 0-10Vdc (UI4 default), 0-20Vdc, 0.01 Volt resolution - 0...20mA, 4...20mA, 0.016mA resolution (requires external 18...28Vdc loop power supply)
External common port	: RJ11 engineering port for connection to PC
Protection class	: IP40
Sensor/Transmitter Wiring	: Shielded twisted pair (shield grounded)
Network Wiring	: Megalink MGS228761-LS low capacitance twisted pair for RS485 networks (braided +foil shield, shield continuous throughout the network and grounded at network origin)
Comms Speed	: RS485 - 2400, 4800, 9600, 19200, 38400, 57600, 76800 baud
Network Capacity	: 256 nodes over max. 1.2km without repeater
Power Supply	: 24Vac, 50/60 Hz
Operating Temperature Range	: 0...50°C (32...122°F)
Storage Temperature Range	: -5...75°C (-40...167°F)
Humidity Range	: 10...95%rH (non-condensing)
Conformity	: 
Dimensions	: 122mm H x 92mm L x 29mm D
LCD	: 8 line dot matrix 62mm x 29mm visible 54mm x 24mm usable

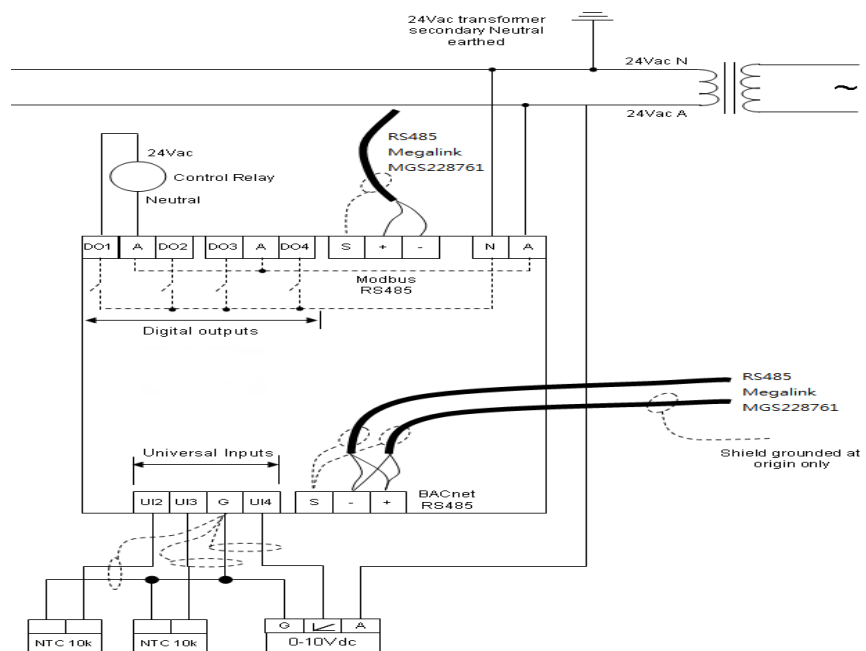
User Interface

The illustration below shows a factory default HPAC-COP

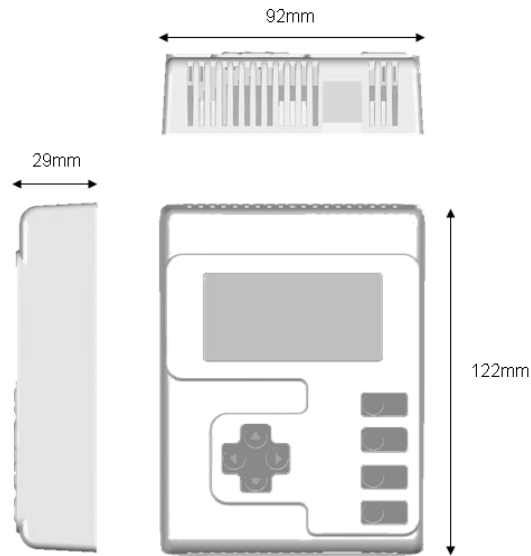


- 1 – Button 1: Display min. COP since last reset
- 2 – Button 2: Display max. COP since last reset
- 3 – Button 3: Reset min. / max. record (press on power up and whenever reset required thereafter)
- 4 – LED 4: COP min. breach alarm
- 5 – LCD scroll UP / adjust value UP
- 6 – LCD scroll DOWN / adjust value DOWN (hold continuous to access clock setting)
- 7 – LCD select value for adjustment / Write value
- 8 – LCD release manualled value to AUTO (hold to exit/write clock setting)
- 9 – LCD user display
- 10 – Calendar/Clock/Time Switch channels status

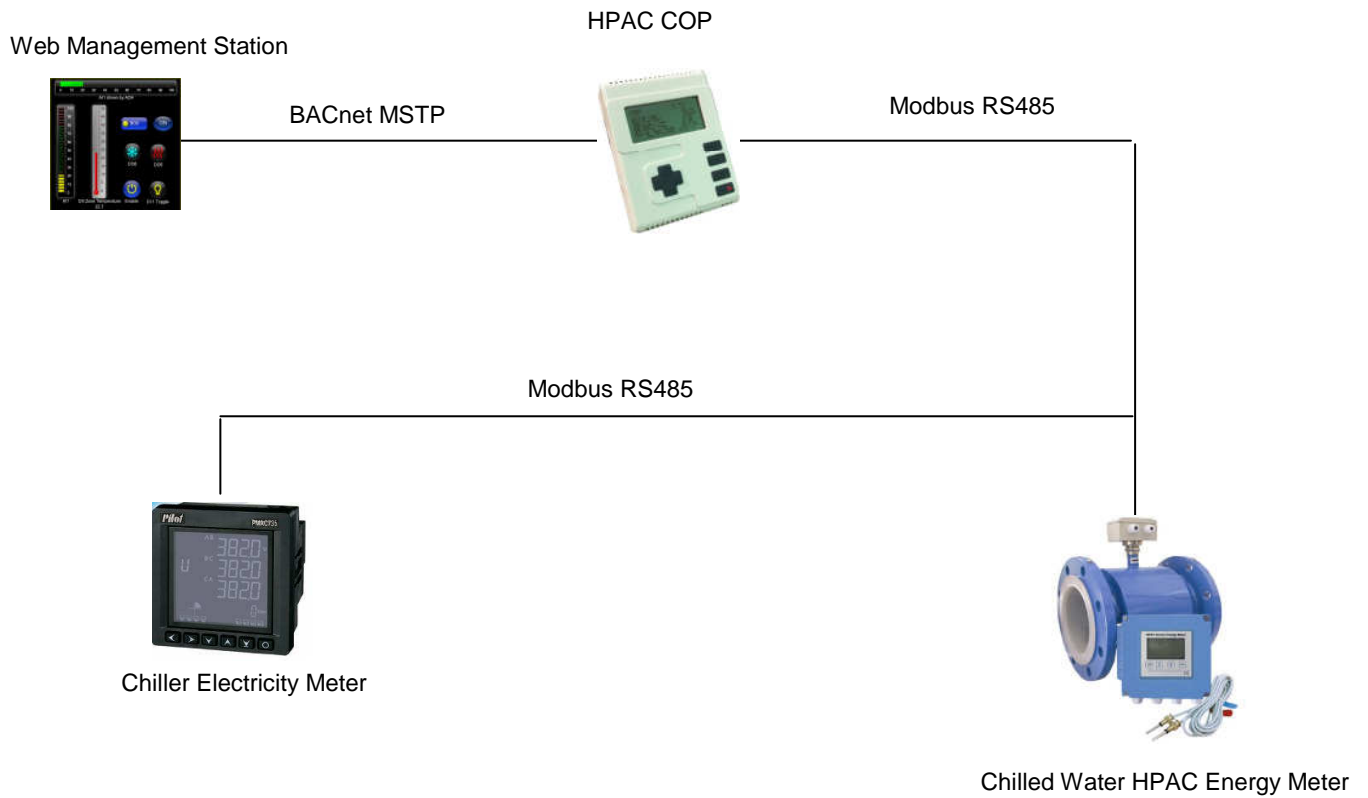
Connections



Dimension



Remote Access Network Configuration



When ordering, please specify the quantity, product name and type code

Code format of COP analyzer: HPAC-440BNCOP

Code format of signal adapter device: HPAC-ATL

Information in this publication is based on current specifications. HPAC reserves the right to make changes in specifications and models as design improvements are introduced.