

# Quantum Series

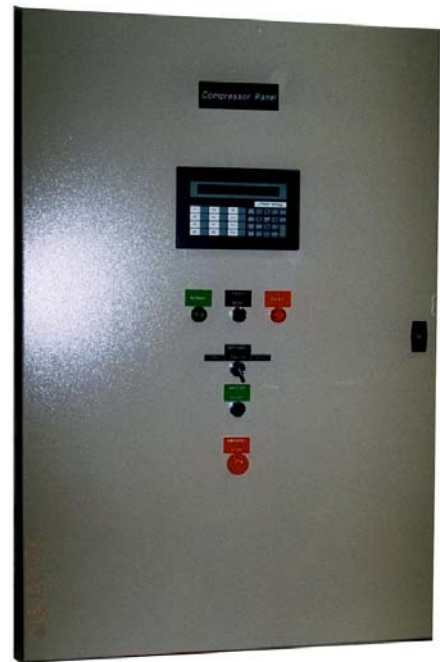
## Type OPC1E-PLC Compressor Controller

The QPC1E-PLC is a stand-alone microprocessor based controller for a **Single Compressor with Engine Drive**. It is designed for Compressed Natural Gas (CNG) applications in the Alternate Fuels market and is programmed for compressor automatic start/stop control and fault monitoring. Twenty-three analog and sixteen user defined dry contact input channels monitor compressor/engine performance along with gas leak and fire detection. Additional 5 dry contact inputs are available for gas drier and control air compressor motor fault monitoring. Fourteen 120 VAC, 3amp outputs are provided for compressor start/stop operation and one independent control output for control air compressor start/stop operation. Separate relays for incoming and outgoing Emergency Shutdown (ESD) operation and compressor fault indication are also provided.

These controllers use GE 90-30 PLC components. Ladder Logic or State Logic programming can be specified. Micro-Design's PLC based controllers are the equivalent of Micro-Design's standard CNG controllers.

Phone modem option includes full remote, pass word protected access to the controller and a 4 number auto-dialer. Live operation of all the monitoring and control functions of the controller can viewed remotely using a standard PC or laptop. All system set points, phone numbers, id numbers can also be changed remotely. Any system fault indication or ESD can initiate an auto-dialer dialout sequence. Controller I.D. codes and fault numbers can be selectively transmitted to a pager/beeper. The auto-dialer continuously dials up to 4 phone numbers until a callback ring is detected between dialouts. In addition to the modem option, the controller can be upgraded for network operation using the MODBUS RTU protocol. It can be linked to a CNG System Master Controller (MDi SCADA) for data access and historical data trending.

Analog set points, monitoring pressures, temperatures, gas leak level, start/stop sequence set points, etc. are accessible using the built-in keypad and LCD display. The LCD display is 2 line 20 characters, back lit, which can be scrolled up or down to view multiple screens. This allows the user to view diagnostic information and change parameters to optimize the system without changing the basic program operation logic.



### Standard Features

- 23 analog input channels
- 16 user defined dry contact shutdown inputs for compressor/engine
- 3 dry contact gas drier fault inputs
- 2 dry contact Control Air compressor motor fault inputs
- 14 control outputs for compressor/engine
- 1 control output for control air motor
- All set points/parameters stored in non-volatile memory
- First Fault out indication with time and date stamp
- Automatic or manual compressor start/stop operation
- Automatic compressor load/unload feature
- Automatic start/stop control air compressor
- Built-in compressor pre-lube sequence
- Temp. controlled on/off output for engine oil heater
- Temperature controlled on/off output for skid heater
- Temperature controlled on/off output for skid fan
- Multiple screen LCD display
- On screen help for compressor start/stop sequences
- Password protection
- Multiple compressor Lead/Lag control interface
- Built-in **Year 2000** compliant real time clock
- 1 built-in RS232 serial port for direct PC connection
- Built-in menu driven PC interface software
- Engine speed governor control output option
- Compressor capacity control option
- Large 20 character x 2 line, back lit LCD display
- 16 button, tactile, membrane keypad
- Meets or exceeds NFPA 52 requirements
- Factory Mutual and CSA approved
- Designed for C1D2, groups C&D hazardous locations
- Optically isolated dry contact inputs
- Dry contact inputs can be set for NO or NC operation
- All outputs can be manually turned on or off via keypad
- Solid-state 120 VAC, 3amp, fused control outputs
- Built-in 120 VAC relays for ESD control circuitry
- Built-in 120 VAC relay compressor fault indication
- Built-in 120 VAC surge and lightning protection
- Rugged NEMA 4 steel enclosure
- Built-in temperature controlled cooling fan
- FCC part 68 approved 2400 BAUD modem option
- 4 number auto-dialer with modem option
- Optional MODBUS interface to SCADA systems
- Cooler tower Louver Control output option
- Front panel LED's for compressor fault and ESD
- Front panel compressor on/off switch and reset PB
- Optional Exhaust Gas Temperature (EGT) input
- Additional Gas Leak Level channels add-on option

# QPC1E-PLC

## 23 Analog Channels

Ambient Temperature  
Skid Temperature  
Gas Leak Level  
Suction (Inlet) Gas Temperature  
1<sup>st</sup> Interstage Temperature  
2<sup>nd</sup> Interstage Temperature  
3<sup>rd</sup> Interstage Temperature  
Discharge Gas Temperature  
Compressor Oil Temperature  
Engine Oil Temperature  
Engine Jacket Water Temperature  
Suction Pressure  
1<sup>st</sup> Interstage pressure  
2<sup>nd</sup> Interstage pressure  
3<sup>rd</sup> Interstage pressure  
Discharge Pressure  
Compressor Control Pressure  
Compressor Oil Pressure  
Engine Oil Pressure  
Control Air Pressure  
Engine RPM  
O2 Oxygen sensor (optional)  
Exhaust Gas Temperature EGT (optional)

## Control Outputs

Skid Fan  
Skid Heater  
Compressor Cooler Fan  
Engine Oil Heater  
Pre-lube Pump Motor  
Suction Valve  
Bypass/Blowdown #1  
Bypass/Blowdown #2  
Engine Starter  
Engine Ignition  
Fuel Valve  
Clutch  
Throttle  
Control Air Compressor Motor  
Emergency Shutdown  
Compressor Fault Shutdown

## Dry Contact Inputs

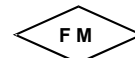
1 to 16 User defined.  
Gas dryer regenerate warning input  
Gas dryer fault shutdown input  
Auxiliary Input Warning  
Air Compressor Motor Overload  
Air Compressor Motor Overheat

## Optional Features

Phone Modem \_ FCC part 68 approved 2400 Baud for remote access, four line auto-dialer for remote paging and reporting. Voice communication option to modem.  
MOD-BUS RTU Protocol interface to site controller or SCADA  
Compressor Capacity Control  
Engine Speed Governor Control  
Cooling Tower Louver Opening Control  
Exhaust Gas Temperature Input  
Additional Gas Detection for two independent sensor locations  
Temperature compensated discharge set-point  
Engine RPM governor control 4 –20 ma (optional)  
Lead/Lag control of duplex compressors to balance run time  
Lubricator no flow module  
Controller integral heater  
Air Purge for Class 1 Div. 1

## Specifications:

Power supply – 120 VAC standard, 0.5 Amps  
Pressure Transducer – Signal 0.1 to 5 VDC  
Thermocouple – Signal 0 to 5 VDC  
Digital shutdown inputs optically isolated - NO or NC  
Default NO  
Solid Sate Relay Output – 120 VAC, 3 AMP output to solenoids  
Operating Temperature – 0 to 55 °C  
Enclosure – Steel NEMA 4, 24” H X 24” W X 12” D



Approved



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