QUICK START GUIDE

High Pressure CO_2 Controller

COPELAND

High Pressure CO_2 Controller

The High Pressure CO_2 controller (P/N 818-9010) application is a standalone controller that operates the High Pressure Valve (HPV) and the Bypass Gas Valve (BGV) in a Transcritical CO_2 system. The controller has a heat reclaim feature, safety parameter operation for the flash gas receiver tank and calibration feature for the HPV and BGV. For E2 setup information, click **here**:

⚠ CAUTION **GND** is Common, not earth ground. Do not earth ground this device.

Locating the Firmware Version for ADF/DSC Ordering

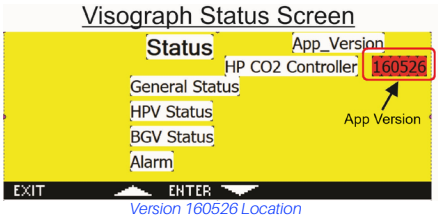
The iPro firmware version is needed to order the corresponding ADF/DSC and can be found on the Visograph Display.

Folow the Compatibility Matrix below to ensure you have the most recent integration files.

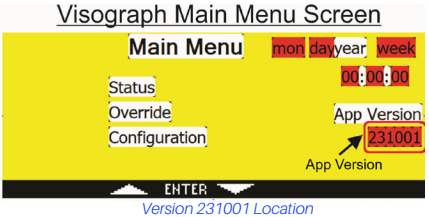
iPro HPV App (FW Version)	ADF Number E3/Supervisor	ADF Version	DSC Number E2	DSC Version
160526 (FW 2.00F01)	531-0274	v1002.9	527-0396	v23.0
231001 (FW 4.00F01/F02)	531-0363	v1002.4	527-0995	v8.0
240731 (FW 4.00F03)	531-0363	v1002.4	527-0995	v8.0

The previous App version 160526 is located on the Status screen of the Visograph in the upper right corner.

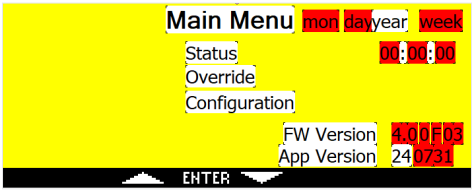
The latest App version 231001 and 240731 are located on the Main Menu of the Visograph in the lower right corner (and also on the Status screen).



Version 160526 Location



Version 231001 Location



Version 240731 Location

The High Pressure CO_2 Controller I/O Points

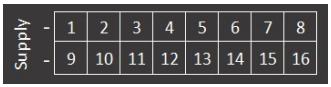
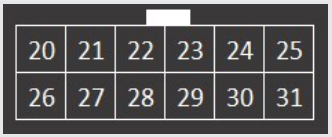
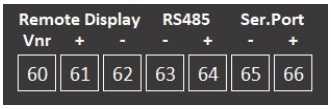
The board has 6 analog inputs and 11 digital inputs, with default configurations pre-loaded for quick connection to for gas cooler pressure outlet, gas cooler temperature, flash gas receiver pressure and enable digital input. Its 8 relay outputs, rated 2.0 amps max, are used for activating and deactivating alarms. Its 4 analog outputs may be used for a 0-10 volt signal for external valve driver for either the HPV or BGV.

Independent System Control

The High Pressure CO_2 controller can control the HPV and BGV in a refrigeration Transcritical CO_2 System. However, the High Pressure CO_2 controller is designed to interface with a Supervisory Controller. Networking the High Pressure CO_2 controller to a central controller also allows you to view status at the Supervisory Controller (for example, Copeland E2, E3, or Site Supervisor) report alarms, and log point values.

The High Pressure CO_2 controller configuration can be programmed through the Supervisory Controller user interface.

Hardware Connections

Connector	Description
	Connector for 24VAC/DC power supply. Analog inputs (Pb1 - Pb6, PbC). Additional power: +5VDC, +12VDC, Common (-). Analog outputs (Out1 - Out4, Common).
	24VAC/DC digital inputs: DI1 - DI11, Common (-).
	Remote Display terminals to connect a Visograph, (maximum of one Visograph per controller). RS485 connector Serial port connector (LAN or RS485)
	USB port for downloads (BIOS, ISaGRAF® application, parameter mappings, remote display applications, network configuration, and websites) and downloads (log files). Connection with the computer via a USB-ETH converter.
	Digital relay outputs 4 NO relays, 2 Common.
	Digital relay outputs 4 NO relays, 2 Common.

Technical Specifications

Analog Inputs

Analog Conversion Type	10-bit A/D converter
Number of Inputs	6
Type of Analog Input: (configurable via software parameter)	NTC Copeland (-50T110°C; 10KΩ±1% at 25°C) PTC Copeland (-55T115°C; 990Ω±1% at 25°C) Digital input (potential free contact) Voltage: 0 - V, 0 - 5V, 0 - 10V (input resistance 3.7KΩ) Current: 0 - 20mA, 4 - 20mA (input resistance 100Ω)
Accuracy	NTC, PTC: ±1 0-1V: ±20mV 0-5V: ±100mV 0-10V:±200mV 2-20mA, 4-20mA: ±0.30mA
Additional Power	+12V: 200mA in total (between +12V and analog outputs) +5V: 100mA

⚠ CAUTION	Any analog inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) to prevent the inputs from malfunctioning or being damaged.

Digital Inputs

Type: (configurable via software parameter)	Opto-insulated live contact (24VAC/DC) External power 24VAC/DC ±20%
Number of Inputs	11
Digital Input Status Variation Detection Time	100ms (in any case depends on the cycle time set by the user in the given application)

⚠ CAUTION	Use another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged. Use of a DC power supply is PREFERRED.

Analog Outputs

Type	Non opto-insulated internal power
Number of Outputs	4
Type of Analog Output: (configurable via software parameter)	4 configurable outputs 0-10VDC 4-20mA (Out1 - Out4)
Maximum Load	40mA (Out1 - Out4) max with configured outputs 0-10VDC 400Ω max with configured outputs 4-20mA 22Ω per live analog output
Accuracy	Out1 - Out4: ±2% full scale
Resolution	8-bit

⚠ CAUTION	The electrical devices controlled by these analog outputs must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the outputs from malfunctioning or being damaged.

Digital Outputs

Type	Relays with NO contacts
Number of Outputs	8
Type of Analog Output: (configurable via software parameter)	Relays with normally open contact
Maximum Load	5A(250VAC) SPST 5(2)A

⚠ CAUTION	Verify the capacity of the output used. There is double insulation between the digital outputs and the low voltage of the rest of the circuit. Do not use different voltages for the various groups of relays or within each group.

Electrical Specifications

Power Supply	24VAC +10/-15%, 50/60Hz, 20 - 36VDC.
Consumption	From 30VA (VAC), From 25W (VDC)
Connectors	Phoenix quick coupling connectors for low voltage (for IPG208D). STELVIO 90° screw connectors for digital outputs (250VAC, 6A max).
Microprocessor	AT91SAM9260 32-bit 200Mhz
Permanent FLASH Memory	16Mb, in 8-bit chunks
RAM	2x128Kb, in 16-bit chunks
Internal Clock	Standard

Choosing Transformer Sizes

The transformer used to power the High Pressure CO_2 controller should have a minimum rating of 30VA. The High Pressure CO_2 controller should not share a transformer with any other devices.

Compatible Transformers with CO_2 Controller

Transformer P/N	VA Rating	Primary Voltage
640-0041	50 VA	110 VAC
640-0042	50 VA	220 VAC

Neither side of the secondary should be connected to ground. Also, do not connect the center tap (if provided on the transformer) to ground. The entire secondary of the transformer should be isolated from any ground.

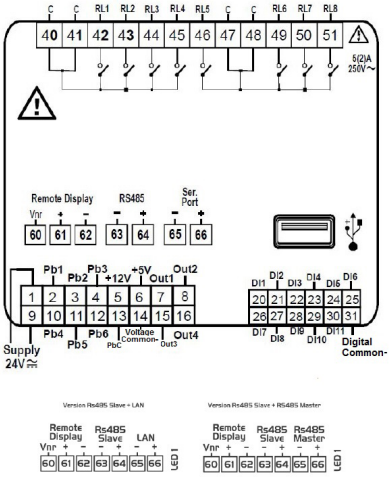
Wire Types

For powering I/O boards, use only the listed wire type below. Two-conductor non-shielded cables are the recommended wire for connecting the transformer to the High Pressure CO_2 controller. Shielded cable should not be used for power wiring. The center tap should be left disconnected if present on the transformer.

Power Wiring Types	
14 AWG	Belden 9495
18 AWG	Belden 9495

Wiring

Non-Center Tapped Transformer Wiring

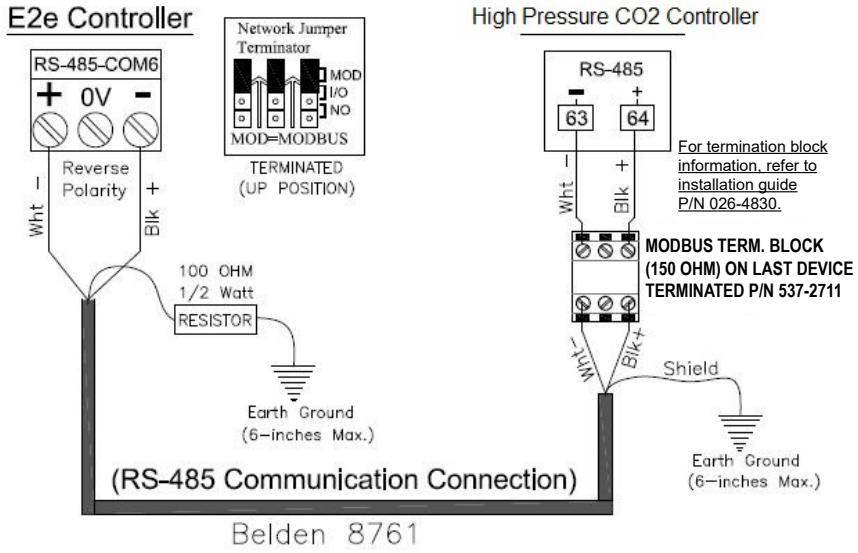


Wiring Connections

NOTE

To ensure control in case of a power failure, it is recommended that an uninterruptible power supply (UPS) be used on the High Pressure CO_2 controller.

Modbus



Modbus Network Connections

For more information on the 160526 app version guide, click **here** or scan the QR code:

For more information on the 231001 / 240731 app version guide, click **here** or scan the QR code:

NOTES

Visit our website at copeland.com/en-us/products/controls-monitoring-systems for the latest technical documentation and updates.
For Technical Support call **833-409-7505** or email **ColdChain.TechnicalServices@Copeland.com**

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