

Compact Cryomech Compressor 15-Pin Electrical Interface Specification.

Rev 1.3

Revision	Description
..	Initial document
1.0	Changed all pin numbers as per new numbering inherited for REV A 502-247 boards. This revision of the document applies to REV A+ 502-247 and version 1.4+ of the firmware.
1.1	New behavior of pin 15, RMT_ON, as per Cryomech/Bruker requirement
1.2	See points 4.1, 4.2 and 4.4
1.3	Updated relay contact rating specification Minor reformatting Applies only to version 1.7+ of the firmware

The connector described here is the DB15 female (socket) on the Compact Cryomech compressor.

1.0 INPUTS --- Four input circuits are provided in the design. Three of which are assigned in standard implementation of the design. (Consult factory for custom firmware to assign or reassign input functions)

1.1 For INPUTS, a low or false is a voltage differential of less than 3VDC between the input pin and IN_RET (the input pin being - and IN_RET being +). An open circuit (nothing connected to the input pin) is also low (false). High or true is a voltage differential between the input pin and IN_RET that exceeds 12VDC (the input pin being - and IN_RET being +). Rising edge is a change in the pin state from false to true. Falling edge is a change in pin state from true to false. All inputs reference to pin 9 for high(+) voltage.

1.2 The minimum pulse width (high or low) for an input signal to be recognized is 200ms. It is possible for a signal to be recognized sooner, but due to the asynchronous nature of the design, a 200ms pulse width is necessary to guarantee signal is recognized.

1.3 Maximum input voltage without damage to the hardware is +- 50V, indefinite time.

Minimum guaranteed "TRUE" voltage is +12VDC.
Negative voltages are considered FALSE.
Input "impedance" is about 10K.
Inputs are ESD protected.

2.0 OUTPUTS

2.1 four standard outputs are provided. Two of which are assigned in the standard implementation of the design. (Consult factory for custom firmware to assign or reassign output functions)

2.2 All outputs are contact closures (rating 24VDC MAX, 2A MAX)

3.0 ISOLATED VOLTAGE SUPPLY

3.1 Pin 11 is a isolated (1000VDC) +24VDC referenced to pin 10. Max current available is 40mA. This supply can be used to power the inputs for interfacing the input system to a contact-closure type system. This supply may also be used for other purposes provided the current limit is not exceeded.

4.0 INPUTS

4.1 RMT_ON, pin 15: Issues START compressor command on RISING edge.

Furthermore, if RMT_SLVL (see below) is TRUE:

- Issues STOP command on falling edge.
- Compressor cannot be started while this pin is FALSE. If start is attempted, message is **"RMT START INTERLOCK"**, however error will NOT be logged.
- On power up, the state of this pin determines whether the compressor runs or not.

4.2 RMT_OFF, pin 14: Issues STOP compressor command on RISING edge.

Compressor cannot be started while this pin is TRUE. If start is attempted, message is **"RMT STOP INTERLOCK"**, however error will NOT be logged.

4.3 RMT_INTERLOCK, pin 13: Disables operation of compressor while TRUE.

Compressor cannot be started while this pin is TRUE. **If start is attempted while this pin is TRUE, or this line goes true while the compressor is running, the compressor goes into an error state and the error is logged** (message is **"REMOTE INTERLOCK 1"**).

4.4 RMT_SLVL, pin 12: While TRUE changes the behavior of RMT_ON pin to level sensitive. This pin is itself level sensitive.

5.0 OUTPUT PIN DESCRIPTIONS

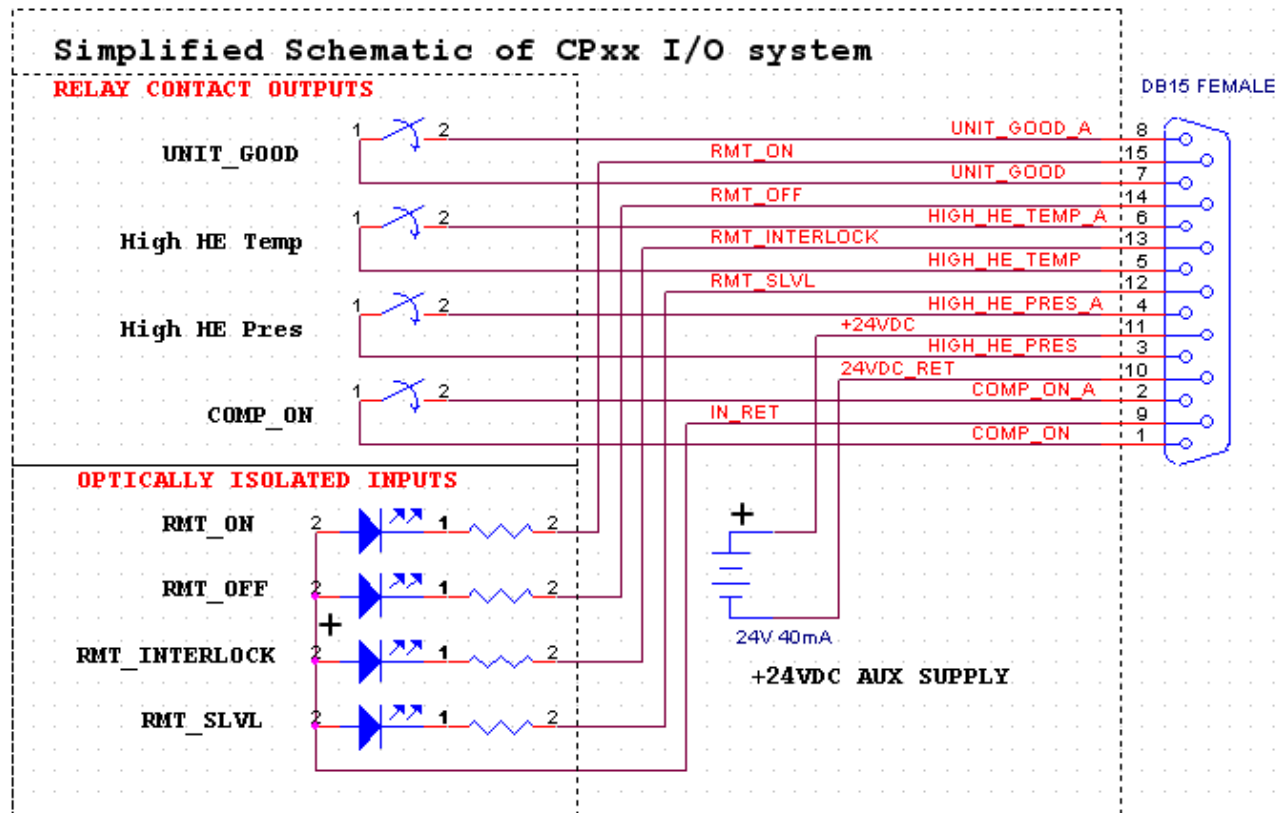
5.1: UNIT_GOOD (7,8). Contact closed when all sensed parameter are within limits. Contact is open when operational error in compressor package is detected or warnings appear. Also open when line power is not on or either circuit breaker is off. All error type indications are latched and must be reset by front panel button or a start compressor request. Warnings are self-clearing if and when condition ceases to exist.

5.2: COMP ON (1,2): Contact closed while compressor motor on, Open otherwise.

5.3: High HE Temp (5,6) Contacts closed when High HE temp error condition is latched. Contacts open when the helium temperature drops to a certain level (see operating manual for set points) AND a compressor START or STOP event is issued.

5.4: High HE Pres (3,4) High HE pressure. Contacts closed when High HE pressure error condition is latched. Contacts open when the helium pressure drops to a certain level (see operating manual for set points) AND a compressor START or STOP event is issued.

6.0 Connector Diagram:



7.0 Typical application (LM-500 Liquid level controller)

Wiring the CPxx to be controlled by open-collector (or relay)

