

Description

EC3-D13 receives an input signal from an existing system controller (0...10V, 1...6V or 4...20mA) and activates Copeland Scroll Digital™ solenoid valves for capacity control of the Digital Scroll.

An input allows to monitor the discharge temperature or the compressors DLT signal and to send an Alarm signal if the specified temperature is exceeded.



⚠ Safety instructions:

- Read installation instructions thoroughly. Failure to comply can result in device failure, system damage or personal injury.
- The product is intended for use by persons having the appropriate knowledge and skills.
- Disconnect all voltages from system before installation.
- Do not operate system before all cable connections are completed.
- Do not exceed the specified voltage and current limits
- Comply with local electrical regulations when wiring.

Technical data

Power supply	24VAC ±10%; 50/60Hz; 1A
Power consumption	5VA max.
Plug-in connector	Removable screw terminals wire size 0.14 ... 1.5 mm ²
Grounding	6.3 mm spade earth connector
Protection class	IP20
Connection to ECD-002	ECC-Nxx or CAT5 cable with RJ45 connectors
Digital Input	I: 0/24VAC/DC for stop/start function
Analog Inputs	O: 4...20 mA, 0...10V, 1 ... 6V N: Copeland NTC temperature sensor (86K at 25°C) or Discharge Line Thermostat (DLT)
Digital Outputs (2):	H: Alarm L: Compressor relay for compressor contactor SPDT; I _{max} = 8A res (2A), VAC max = 250V Activated: During normal operation (no alarm condition) Deactivated: During alarm condition or power supply is OFF
⚠ If the alarm relay is not utilized, the user must ensure appropriate safety precautions are in place to protect the system against damage caused by a power failure.	
Digital Scroll valve output	SPST contact, Solid State Relay (SSR) I _{max} = 1A res (1A), VAC max = 250V
Ambient temperature range	0 ... 50°C

Mounting

The EC3-D13 is designed to be mounted onto a standard DIN rail.

Electrical installation

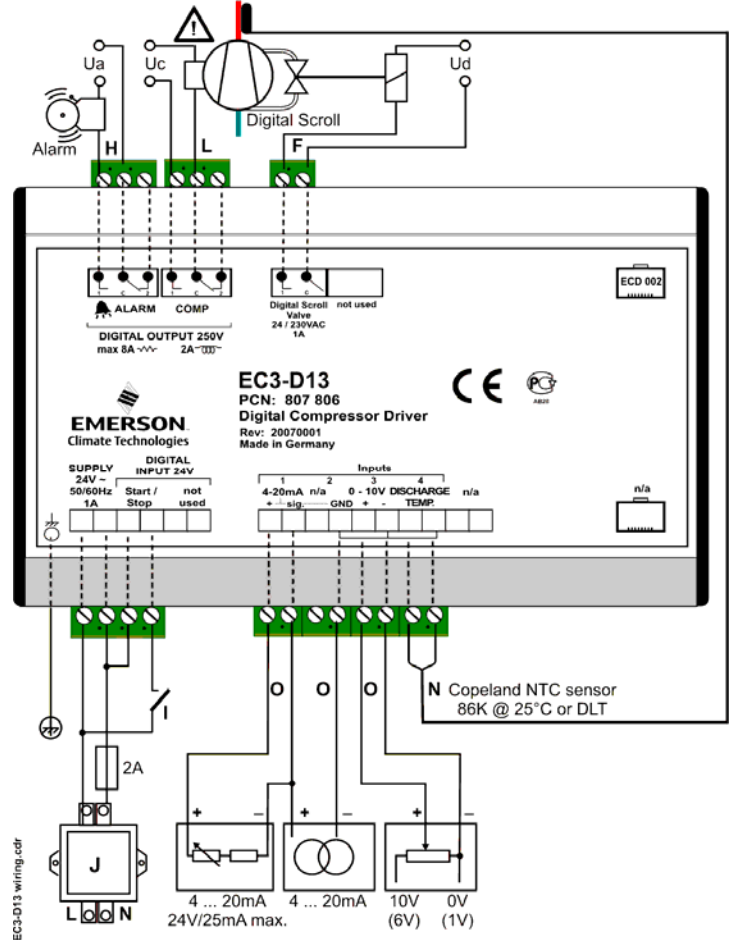
- Refer to the electrical wiring diagram for electrical connections.
- Do not apply voltage to the controller before completion of wiring.
- Ground the metal housing with a 6.3mm spade connector.
- **Important:** Keep controller and sensor wiring well separated from mains wiring. Minimum recommended distance 30mm.

Warning: Use a class II category transformer for 24VAC power supply. Do not ground the 24VAC lines. We recommend to use individual transformers for EC3 controller(s) and for 3rd party controllers to avoid possible interference or grounding problems in the power supply. Connecting any EC3 inputs to mains voltage will permanently damage the EC3.

Digital input status is dependant to operation of compressor/thermostat

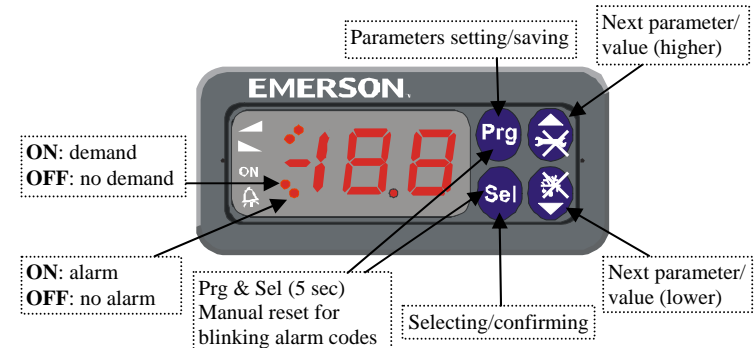
Commander	Operating condition	Digital input (I)
Start / Stop	Compressor starts	Closed / 24V (Start)
	Compressor stops	Open / 0V (Stop)

Wiring



- F:** 24V/230V Triac output to PWM Digital Scroll valve
- H:** Alarm relay, dry contact. Relay coil is not energised at Alarm or power off
- J:** class II cat. transformer for 24VAC
- L:** Compressor relay, dry contact. Relay is energized during normal operation.
- ⚠ The use of the relay is essential to protect the system in case of power failure, if communication interface or the ECD-002 are not utilized!
- ⚠ Not for direct compressor connection. Use contactor.
- N:** Discharge Temp. Sensor or Discharge Line Thermostat (DLT)
- O:** One of 4...20 mA, 0...10V, 1...6V Digital Scroll capacity demand signal from system controller

ECD-002 display/keypad unit (LEDs and button functions)



Setup and Parameter Modification Using the Keypad

All parameters can be accessed via the 4-button keypad. The configuration parameters are protected by a numerical password. The default password is "12".

Select the parameter configuration:

- Press the **PRG** button for more than 5 seconds, a flashing "0" is displayed
 - Press or until "12" is displayed (password)
 - Press **SEL** to confirm password, the first modifiable parameter code is displayed (/1)
- To modify parameters see Parameter modification below.

Parameter Modification: Procedure

- Press or to show the code of the parameter that has to be changed;
- Press **SEL** to display the selected parameter value;
- Press or to increase or decrease the value;
- Press **SEL** to temporarily confirm the new value and display its code;
- Repeat the procedure from the beginning "press or to show..."

To exit and save the new settings:

- Press **PRG** to confirm the new values and exit the parameters modification procedure.

Reset all parameters to factory setting:

- Make shure that digital input is 0V (open).
- Press and together for more than 5 seconds.
- A flashing "0" is displayed.
- Press or until the password is displayed (Factory setting = "12").
- If password was changed, select the new password.
- Press **SEL** to confirm password, "0" is displayed.
- Press **SEL** to reset all parameters to factory setting
- Press **PRG** to activate the function and leave the special function mode.

Alarm Codes

E3 Discharge temperature sensor failure

No sensor connected, sensor cable is broken or short circuited
Not applicable if sensor type is DLT (A5=1)

dA High discharge temperature

Er Data error display - out of range: Data send to the display is out of range.

Messages

--- No data to display

At node start up and when no data is send to the display.

In Configuration data initialization

Configuration data are initialized with the factory default values.

Note: When multiple alarms occur, the highest priority alarm is displayed until being cleared, then the next highest alarm is displayed until all alarms are cleared. Only then will parameters be shown again.

Parameter list (must be checked and modified if necessary)

H OTHER PARAMETERS

H5	Password	0	199	-	12	
/	DISPLAY PARAMETERS	Min	Max	Unit	Def.	Custom
/1	Value to show 0 = Compressor capacity in % 1 = Discharge temperature / DLT input state	0	1	-	0	
/5	Temperature Unit 0 = °C, 1 = °F Note: This affects only data display. All configuration parameters must be entered in °C / °K !	0	1	-	0	

A ALARM PARAMETERS

A5	Discharge sensor type 0 = NTC, 1 = DLT	0	1	-	0	
A6	Maximum discharge temperature	100	140	°C	130	
A7	Discharge temperature alarm delay	0	199	sec	30	

F COMPRESSOR PARAMETERS

F2	Minimum capacity	10	100	%	10	
F3	Maximum capacity	10	100	%	100	
F6	PWM Scroll Valve cycle time Match cycle rate to system controller. Reducing F6 will increase number of solenoid pulses over lifetime and will reduce life expectancy.	10	20	sec	20	

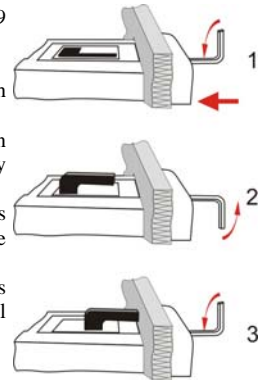
r SENSOR PARAMETERS

ru	Analog input filtering 0 = off, to be used in applications where the analog input signal is not affected by pressure variations caused by digital scroll operation 1 = on, to be used in applications where the analog input signal is affected by pressure variations caused by digital scroll operation and may cause control instability. The filtering eliminates this effect.	0	1	-	1	
r1	Analog input type 0 = 0...10V, 1 = 1...6V, 2 = 4...20mA	0	2	-	0	

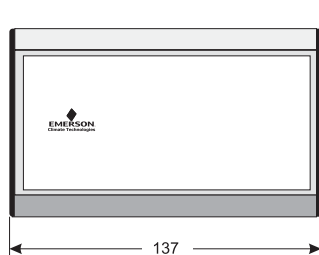
Mounting of ECD-002

ECD-002 can be installed at any time also during operation.

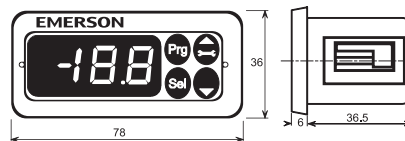
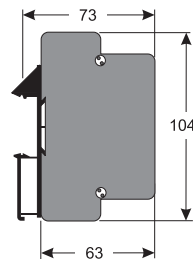
- ECD-002 can be mounted in panels with 71x29 mm cutout
- Push controller into panel cut-out.(1)
- Make sure that mounting lugs are flush with outside of controller housing
- Insert Allen key into front panel holes and turn clockwise. Mounting lugs will turn and gradually move towards panel (2)
- Turn Allen key until mounting lug barely touches panel. Then move other mounting lug to the same position (3)
- Tighten both sides very carefully until keypad is secured. Do not over tighten as mounting lugs will break easily.



Dimensions



EC3-D13



ECD-002

