



Data Sheet

Refrigeration Controller ETC 1H



Introduction

The ETC 1H is introducing a flexible platform due to onboard micro-controller and software dedicated product configuration, perfect for light commercial refrigeration applications. Standard versions with similar functionality as the traditional electro-mechanical thermostats as well as several customized high performance software versions for various applications are available.

The ETC 1H is developed for applications such as:

- Refrigerators
- Bottle coolers
- Ice banks
- FreezersStreet coolers
- No-frost freezers with heating element
- Medicine coolers
- Wine, cake and chocolate coolers

Features

- ETC 1H can control the cabinet temperature directly
- ETC 1H has low energy consumption
- 1 or 2 sensors (Air, evaporator) and optional remote display can be connected
 - Using NTC temperature sensors
- Temperature control independent of barometric pressure
- High accuracy combined with close differentials and narrow tolerances ensures improved control
- Built in timers enhances functionality
- Optional alarm for over or under temperature in both cold and warm
- Auxiliary relays: 5 Amp for heater, fan, light etc. Eventually with delayed start or/and stop

- Under voltage and over voltage compressor protection (brown-out protection)
- Pressure equalisation protection on starting the device or when voltage drops out (blackout protection)
- Diagnostics and self check of sensors and potentiometer
- Several defrosting methods can be handled:
 Time controlled defrosting
 - Time controlled defrosting with evaporator sensor
 - Temperature controlled defrosting
- Dual band control of outdoor bottle coolers



Approvals

Technical data

Image: Constraint of the second state of th

Operating conditions Ambient temp. 32°F to +122°F 0°C to 50°C Humidity Max 90% RH, Non-condensing Max 90% RH, Non-condensing Measuring range NTC sensor -40°F to 185°F -40°C to 85°C Relay output 1 Compressor UL 60730: LRA96, FLA16 IEC/EN 60730: 16(16) A UL 60730: LRA 60/ FLA 10 Relay output 2 Heater 5 A 5 A Relay output 3 Fan UL 60730: LRA 6/ FLA1 IEC/EN 60730: 5 A UL 60730: 1RA 6/ FLA 1	
HumidityMax 90% RH, Non-condensingMax 90% RH, Non-condensingMeasuring rangeNTC sensor-40°F to 185°F-40°C to 85°CRelay output 1CompressorUL 60730: LRA96, FLA16IEC/EN 60730: 16(16) A UL 60730: LRA 60/ FLA 10Relay output 2Heater5 A5 ARelay output 3FanUL 60730: LRA 6/ FLA1IEC/EN 60730: 5 A UL 60730: 1 RA 6/ FLA 1	
Measuring range NTC sensor -40°F to 185°F -40°C to 85°C Relay output 1 Compressor UL 60730: LRA96, FLA16 IEC/EN 60730: 16(16) A Relay output 2 Heater 5 A 5 A Relay output 3 Fan UL 60730: LRA 6/ FLA1 IEC/EN 60730: 5 A	
Relay output 1CompressorUL 60730: LRA96, FLA16IEC/EN 60730: 16(16) A UL 60730: LRA 60/ FLA 10Relay output 2Heater5 A5 ARelay output 3FanUL 60730: LRA 6/ FLA1IEC/EN 60730: 5 A UL 60730: 1 RA 6/ FLA 1	
Relay output 2 Heater 5 A 5 A Relay output 3 Fan UL 60730: LRA 6/ FLA1 IEC/EN 60730: 5 A UL 60730: IRA 6/ FLA1 UL 60730: 1 RA 6/ FLA1 IEC/EN 60730: 1 RA 6/ FLA1	
Relay output 2 Heater 5 A Relay output 3 Fan UL 60730: LRA 6/ FLA1 IEC/EN 60730: 5 A UL 60730: I RA 6/ FLA1 UL 60730: 1 RA 6/ FLA 1	
Relay output 3 Fan UL 60730: LRA 6/ FLA1 IEC/EN 60730: 5 A UL 60730: I RA 6/ FL A 1	
UL 60730: I RA 6/ FLA 1	
Accuracy NTC sensor +/- 1 K +/- 1 K	
ETC1H +/- 0.5 K +/- 0.5 K	
Temperature sensors NTC- 5K NTC- 5K	
Life time Relay 1 +350,000 cycles +350,000 cycles	
Relay 2 +30,000 cycles +30,000 cycles	
Relay 3 +30,000 cycles +30,000 cycles	
Connections Power 6.3 mm × 0.8 mm tabs, RAST 5 6.3 mm × 0.8 mm tabs, RAST 5	
Signal/remote 3-pole RAST 2,5 edge connector 3-pole RAST 2,5 edge connecto	r
2-Pole RAST 2,5 edge connector 2-Pole RAST 2,5 edge connector	r
Temperature indication Through optional remote display Through optional remote displ	ay
Approvals UL-C, NSF Semko, CE, CQC, EAC	
EMC Category Category-1	
P class IP 00 IP 00	
Remote control Optional remote display with Optional remote display with	
Control. 1-wire protocol Control. 1-wire protocol	
Number of sensors2 (optional 3)2 (optional 3)	
Start-up-time < 2 seconds < 2 seconds	

Functionallity

(All functions are optional)

Temperature	Settings	Differential: -1-10 K , Range: 0-30 K, Defrost: 0°C-10°C		
	Adjustment	Knob with stop 210° +/-5°. Stop 45°+/-5° o Knob angle without		
		stop 255°+/-5°		
Diagnostics	Visual indication	On-board LED (Red)		
	Function	Self check of sensors and potentiometer		
	Sensor fault	Air sensor		
Compressor protection	Brown-out	Under-voltage and over-voltage protection		
	Black-out	Based on temperature at cabinet sensor		
Defrost	Mode 1	Start by Time- Stop by Cabinet Temperature (1 sensor)		
	Mode 2	Start by Time- Stop by Defrost Sensor (2 sensors) Start and Stop		
	Mode 3	by Defrost Sensor (2 sensors)		
Alarm	Types	Over or/and under temperature in cold or warm		
	Indication	Flashing LED on the ETC 1H or by an external connected remote		
Blocked condenser	Function	Monitor the condenser temperature and stop the compressor		
On customer request	l'unction	until		
only		the temperature goes below the condenser warning temperature		
	Indication	Flashing LED on the ETC 1H or by an external connected remote		
		module or optionally to one of the relays to control a buzzer		

Parameters

For customized ETC 1H versions to suit individual application needs, it is possible to adjust the following parameters in software.



Introduction

Parameter		Min	Max	Default	Unit
Thermostat	Cold cut-out	-65.00	+50.00	0.00	°C
	Warm cut-out	-65.00	+50.00	10.00	°C
Default temp set also used as remote se		0	1023	512	0: cold 1023: warm
	Cold differential	-1.00	+20.00	1.00	К
	Warm differential	-1.00	+20.00	1.00	К
Compressor	Min runtime	0	1800	300	Sec
	Min stoptime	0	1800	300	Sec
	Max runtime	0	10800	3600	Sec
	Max stontime	0	10800	5400	Sec
	Fror runtime	0	1800	600	Sec
	Error Stantime	0	1800	000	Sec
		0	1000	900	Sec
	Do: Max ston time	0	1	0	
Alarm on relav	Cold overtemp alarm	-65.00	+50.00	15.00	°C
,	Warm overtemp alarm	-65.00	+50.00	15.00	°C
	Cold undertemp alarm	-65.00	+50.00	2.00	°C
	Warm undertemp alarm	-65.00	+50.00	2.00	°C
	Alarm delay	0	120	60	Min
	Function flag: D0: Alarm undertemporature	0	120	00	
	D1: Alarm overtemperature	0	1	0	
Defrost	Defrost method:	0	3	0	Num
	0: No defrost 1: Time start, Control T stop 2: Time start, Evap T stop 3: Evap T start, Evap T stop				
	Defrost terminate temperature	0	+50.00	5.00	°C
	Defrost start temperature	-25.00	0.00	-10.00	°C
	Drip-off time	0	1800	0	Sec
	Minimum defrost time	0	3600	900	Sec
	Maximum defrost time	0	7200	1800	Sec
	Minimum defrost interval	0	720	360	Min
	Maximum defrost interval	0	2160	720	Min
	Function flag: D2: Ean on during defrost	0	1	0	
	D3: Hot-gas defrost	0	1	0	
	D11: Timer reset on cutout	0	1	0	
Fan	Fan start delav	0	1800	0	Sec
		-		-	-
	Fan stop delay	0	1800	0	Sec
	Fan stop delay Function flag: D4: Fan stop on cutout	0	1800	0	Sec
Blocked condenser	Fan stop delay Function flag: D4: Fan stop on cutout	0	1800 1 +85.00	0 0 70.00	Sec
Blocked condenser	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature	0 0 +50.00	1800 1 +85.00 +85.00	0 0 70.00 80.00	Sec °C
Blocked condenser	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature	0 0 +50.00 +50.00	1800 1 +85.00 +85.00	0 0 70.00 80.00	Sec °C °C
Blocked condenser	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut in voltage	0 0 +50.00 +50.00 0	1800 1 +85.00 +85.00 1	0 0 70.00 80.00 0	°C °C
Blocked condenser Voltage protection	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage	0 0 +50.00 +50.00 0 80	1800 1 +85.00 +85.00 1 210 20	0 0 70.00 80.00 0 185	°C °C °C Vrms
Blocked condenser Voltage protection	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold	0 +50.00 +50.00 0 80 0	1800 1 +85.00 +85.00 1 210 20 20	0 0 70.00 80.00 0 185 15	Sec °C °C Vrms Vrms
Blocked condenser Voltage protection	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage	0 +50.00 +50.00 0 80 0 130	1800 1 +85.00 +85.00 1 210 20 264	0 0 70.00 80.00 0 185 15 260	Sec °C °C Vrms Vrms Vrms Vrms
Blocked condenser Voltage protection	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect	0 0 +50.00 +50.00 0 80 0 130 0	1800 1 +85.00 +85.00 1 210 20 264 1	0 0 70.00 80.00 0 185 15 260 0	Sec °C °C Vrms Vrms Vrms
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section)	0 0 +50.00 +50.00 0 80 0 130 0	1800 1 +85.00 +85.00 1 210 20 264 1	0 0 70.00 80.00 0 185 15 260 0	Sec °C °C Vrms Vrms Vrms Num
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flag: See def in each section) Factory test	0 0 +50.00 +50.00 0 80 0 130 0 130 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535	0 0 70.00 80.00 0 185 15 260 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay	0 0 +50.00 +50.00 0 80 0 130 0 130 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535	0 0 70.00 80.00 0 185 15 260 0 0 0	Sec C C Vrms Vrms Vrms Num Boolean
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D2: Heater relay D6: LED 1/10 blinking D7: LED _ blinking D15: Factory test	0 0 +50.00 0 80 0 130 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535	0 0 70.00 80.00 0 185 15 260 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D6: LED 1/10 blinking D7: LED _ blinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross cruiterbing	0 0 +50.00 0 80 0 130 0 0 -100	1800 1 +85.00 +85.00 1 210 20 264 1 65535 65535	0 0 70.00 80.00 0 185 15 260 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D6: LED 1/10 blinking D7: LEDblinking D15: Factory test Sensor Type 0: Epcos Thermostat ID low D0:32	0 0 +50.00 0 80 0 130 0 0 -100	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232	0 0 70.00 80.00 0 185 15 260 0 0 0 0 Epcos 0	Sec °C °C Vrms Vrms Vrms Num Boolean
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D6: LED 1/10 blinking D7: LED _ blinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber	0 0 +50.00 0 80 0 130 0 0 -100 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000	0 0 70.00 80.00 0 185 15 260 0 0 0 Epcos 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D2: Heater relay D6: LED _/ blinking D7: LED blinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D14-15 group number	0 0 +50.00 +50.00 0 80 0 130 0 0 -100 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000	0 0 70.00 80.00 0 185 15 260 0 0 0 0 Epcos 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D2: Heater relay D6: LED _/ blinking D7: LED blinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D14-15 group number D0. 12 number	0 0 +50.00 0 80 0 130 0 0 0 -100 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 Epcos 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D2: Heater relay D6: LED _/ blinking D7: LED _/ blinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D14-15 group number D0-13 number SWugrion	0 0 +50.00 0 80 0 130 0 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 Epcos 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean % of 1/4 period Num Num
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flag: D6: LED 1/10 blinking D1: Fan relay D2: Heater relay D5: Epcors 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D14-15 group number D14-15 group number D10: Ture minter SW version Ture minter	0 0 +50.00 0 80 0 130 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000 999 1	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean % of 1/4 period Num Num
Blocked condenser Voltage protection Miscellaneous	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D6: LED 1/10 blinking D7: LEDblinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D0-13 number SW version Function flag: D10: Zero switch D5: Stop function	0 0 +50.00 +50.00 0 80 0 130 0 130 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000 9999 1 1 1	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delayFunction flag:D4: Fan stop on cutoutCondenser warning temperatureCondenser stop temperatureFunction flag:D7: Condenser watchMinimum cut-in voltageVoltage thresholdMaximum cut-in voltageFunction flag:D6: Voltage protectFunction flags (see def in each section)Factory testD0: Comp relayD1: Fan relayD6: LED 1/10 blinkingD7: LED blinkingD15: Factory testSensor Type 0: Epcos 1: Shibuara Zero-crossswitchingThermostat ID low D0-32TypenumberD0-13 numberSW versionFunction flag:D10: Zero switchD5: Stop functionRemote Function Flag:	0 0 +50.00 0 80 0 130 0 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000 9999 1 1 1	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 Epcos 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num Num Boolean
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delayFunction flag:D4: Fan stop on cutoutCondenser warning temperatureCondenser stop temperatureFunction flag:D7: Condenser watchMinimum cut-in voltageVoltage thresholdMaximum cut-in voltageFunction flag:D6: Voltage protectFunction flag:D6: Voltage protectFunction flags (see def in each section)Factory testD0: Comp relayD1: Fan relayD2: Heater relayD6: LED 1/10 blinkingD15: Factory testSensor Type 0: Epcos 1: Shibuara Zero-crossswitchingThermostat ID low D0-32TypenumberD14-15 group numberD0: 3 numberSW versionFunction flag:D0: Stop functionRemote Function Flag: D0: Fahrenheit in display	0 0 +50.00 0 80 0 130 0 130 0 130 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000 9999 1 1 1 1	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec C C C Vrms Vrms Vrms Num Boolean Num Num Boolean Num Num Boolean
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delayFunction flag:D4: Fan stop on cutoutCondenser warning temperatureCondenser stop temperatureFunction flag:D7: Condenser watchMinimum cut-in voltageVoltage thresholdMaximum cut-in voltageFunction flag:D6: Voltage protectFunction flag:D6: Comp relayD1: Fan relayD1: Fan relayD2: Heater relayD6: LED 1/10 blinkingD7: LED _ blinkingD1: Factory testSensor Type 0: Epcos 1: Shibuara Zero-crossswitchingThermostat ID low D0-32TypenumberD14-15 group numberD0-13 numberSW versionFunction flag:D10: Zero switchD5: Stop functionFactoryRemote Function Flag: D0: Fahrenheit in displayD1: DecimalpointD6	0 0 +50.00 0 80 0 130 0 130 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 65535 100 232 10000 999 1 1 1 1 1	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num Boolean
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flag: D6: LCD 1/10 blinking D7: LED _ blinking D1: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D0-13 number D0-13 number SW version Function flag: D10: Zero switch D5: Stop function Fag: Remote Function Flag: D0: Carlow bet the form D0: Fahrenheit in display D1: Decimalpoint D2: Show setpoint D2: Show setpoi	0 0 +50.00 0 80 0 130 0 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 20 264 1 65535 100 232 10000 232 10000 232 10000 11 1 1 1 1	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num Boolean
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delayFunction flag:D4: Fan stop on cutoutCondenser warning temperatureCondenser stop temperatureFunction flag:D7: Condenser watchMinimum cut-in voltageVoltage thresholdMaximum cut-in voltageFunction flag:D6: Voltage protectFunction flag:D6: Voltage protectFunction flag:D6: Voltage protectFunction flag:See def in each section)Factory testD0: Comp relayD1: Fan relayD2: Heater relayD6: LED 1/10 blinkingD7: LED _ blinkingD7: LED _ blinkingD15: Factory testSensor Type 0: Epcos 1: Shibuara Zero-crossswitchingThermostat ID low D0-32TypenumberD14-15 group numberD0-13 numberD0: Zero switchD5: Stop function Flag:D0: Zero switchD0: Stop function Flag:D0: Fahrenheit in displayD1: DecimalpointD2: Show setpointD3: Display lock at defrostBemote sensor offect	0 0 +50.00 -50.00 0 80 0 130 0 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 20 264 1 65535 100 232 10000 232 10000 232 10000 11 1 1 1 1 1 1 1 1 1 1 10 10	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num Boolean
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flag: See def in each section) Factory test D0: Comp relay D1: Fan relay D2: Heater relay D6: LED 1/10 blinking D7: LED _ blinking D7: LED _ blinking D1: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D0-13 number D0-13 number SW version Function flag: Function flag: D10: Zero switch	0 0 +50.00 -50.00 0 80 0 130 0 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean % of 1/4 period Num Num Boolean
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D2: Heater relay D6: LED 1/10 blinking D7: LED _ blinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D0-13 number SW version Function flag: D0: Fahrenheit in display D1: Decimalpoint D2: Show setpoint D3: Display lock at defrost Remote sensor offset Remote sensor ofeviation	0 0 +50.00 +50.00 0 80 0 130 0 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 20 264 1 65535 1000 232 10000 232 10000 10 232 10000 11 1 1 1 1 1 1 1 1 1 1 1 1	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num Soolean Num Boolean Boolean
Blocked condenser Voltage protection Miscellaneous Remote parameter	Fan stop delay Function flag: D4: Fan stop on cutout Condenser warning temperature Condenser stop temperature Function flag: D7: Condenser watch Minimum cut-in voltage Voltage threshold Maximum cut-in voltage Function flag: D6: Voltage protect Function flag: D6: Voltage protect Function flags (see def in each section) Factory test D0: Comp relay D1: Fan relay D2: Heater relay D6: LED 1/10 blinking D7: LED _ blinking D15: Factory test Sensor Type 0: Epcos 1: Shibuara Zero-cross switching Thermostat ID low D0-32 Typenumber D14-15 group number D0-13 number SW version Function flag: D0: Fahrenheit in display D1: Decimalpoint D2: Show setpoint D3: Display lock at defrost Remote sensor offset Remote sensor offset Remote sensor deviation Remote sensor deviation	0 0 +50.00 +50.00 0 80 0 130 0 0 0 -100 0 0 0 0 0 0 0 0 0 0 0 0	1800 1 +85.00 +85.00 1 210 20 264 1 	0 0 70.00 80.00 0 185 15 260 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sec °C °C Vrms Vrms Vrms Num Boolean Num % of 1/4 period Num Num Boolean Boolean





Variants

In order to optimize the efficiency and ensure the reliability of the Danfoss products in your specific applications and systems, always contact Danfoss prior to initiating the use of any Danfoss products.

- You can have the ETC1H with optional 2 or 3 relays, for controlling heaters, fans etc.
- You can have the ETC1H with standard soft- ware or optionally with special customized software for optimized functionality. Please contact Danfoss regarding this..

Danfoss does not accept any responsibility for ETCs placed in environments outside our design specifications. Use of the ETCs in such cases must be verified via relevant field-tests, and always remains the responsibility of the buyer.



Dual band control of compressor and cabinet heater for outdoor bottle coolers placed in cold environment.



The controls can be mounted using the nut shown or it can be mounted using 2 screws type EJOT DURO-PT dia. 3×7 mm.

Warning:

By using screw types different than the above mentioned, there is a risk of short circuiting the line potential.

Please note: All Danfoss knobs have been designed to sit flush against the housing, relieving the load on the spindle arm. Maximum mounting force of knob: 80 Newton. Whenever using non-Danfoss knobs, please ensure that they are mounted as described above and that the maximum mounting force of knob: 80 Newton is not exceeded.

Danfoss Appliance Controls, DK-6430 Nordborg, Denmark, Phone: +45 7488 2222, Telefax: +45 7488 6995, www.danfoss.com

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.