

User Guide

# Refrigeration controller

EETc 11, 12 and EETc 21, 22  
EETa 2W and EETa 3W



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## Introduction

The EET Series is the next generation of Electronic Thermostats which is a direct replacement of the Mechanical Thermostat (and timer) and Danfoss ETC series. It comes in two variants: EETc (Enhanced Electronic Thermostat, compact) which has one and two output model options for controlling compressor and fan/defrost heater and EETa (Enhanced Electronic Thermostat,

advanced) which has two and three output model options for controlling compressor, fan, defrost heater or light. With the EETc and the EETa, we continue building on the electronification legacy by bringing a high number of new features and capabilities to increase performance and flexibility, while keeping the familiar form factor and installation method.

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## Applications

Applications supported by the EETc:

- Glass door merchandisers
- Beverage coolers
- Commercial freezers and refrigerators
- Preparation tables

Applications supported by the EETa:

- Glass door merchandisers
- Commercial freezers and refrigerators
- Preparation tables
- Dual compressor refrigerators
- Anti-freeze applications requiring auto heat control
- Applications requiring dual defrost control

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## Key features

- Moisture protected design for installability inside the cold space area
  - Similar dimensions and installation method as ETC series and Mech Thermostat for easy transition (applicable for EETc)
  - Wide Voltage Power Support (110 – 230 V) (applicable for EETa)
  - Configurable auxiliary inputs and outputs to control fan, defrost heater and light
  - Alarms, fan & light control, compressor management using door sensor
  - Supports multiple sensor types: NTC 5K, NTC 10K, PTC 990
  - Zero cross technology for longer relay life
  - Mass programmable at production site with direct programming key access
  - Compressor protection from voltage fluctuations, spikes and surges
  - Advanced fan control
  - Multiple defrost methods to choose from
  - Condenser overheat protection
  - Economy mode (Eco mode) to give more energy saving potential during night and long hours of no use. EETa also supports Holiday mode, which allows longer than a day period of auto temperature offset
  - Dual defrost control (only EETa)
  - Quick factory test mode to check if inputs/outputs are functioning
  - High and low temperature alarm indication
  - Safety/Emergency mode in case of sensor and potentiometer failure
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## Variants

### EETc:

- EETc 11: 1 output, 120 V
- EETc 12: 1 output, 230 V
- EETc 21: 2 outputs, 120 V
- EETc 22: 2 outputs, 230 V

### EETa:

- EETa 2W: 2 outputs, wide voltage (120 – 230 V)
- EETa 3W: 3 outputs, wide voltage (120 – 230 V)

## Variant differences

HW differences between EETc and EETa:

Features	EETc	EETa
Sensor inputs	2	3
Wide voltage power module	No	Yes
Visible LED indication	Power	Power, Error
Temperature sensors supported	NTC 5K, NTC 10K	NTC 5K, NTC 10K, PTC
Output options	1 & 2 Relay	2 & 3 Relay

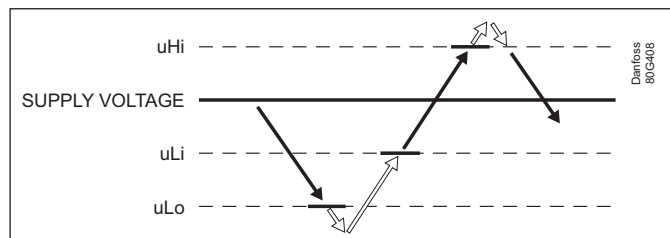
SW differences between EETc and EETa:

Features	EETc	EETa
Onsite Parameter Programming/ Production Programming capability	Koolkey with external power	Koolkey with powered controller
Onsite firmware update capability	No	Yes
Eco mode	Yes	Yes
Holiday mode	No	Yes
Light Control	No	Yes
Dual defrost	No	Yes
Dual compressor control	No	Yes
Anti-freeze function	No	Yes

## Key features

### Voltage Protection:

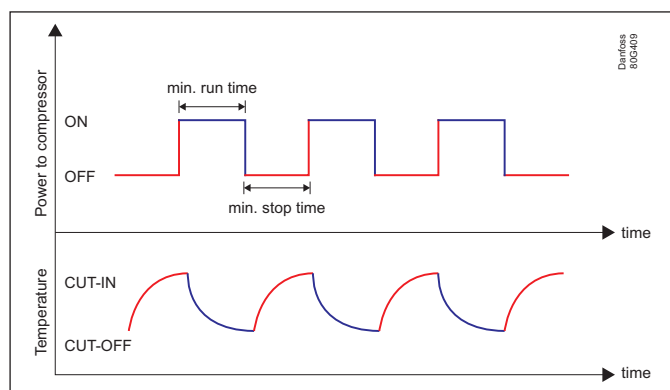
The voltage protection feature protects the compressor against high and low voltage fluctuations by limiting the compressor operation within specified voltage limits. Whenever the supply voltage goes beyond the defined voltage limits set in the controller, it will switch the compressor OFF, and resume the operation when the voltage falls under the operating range.



- “uLi”: Minimum voltage limit above which the compressor can start
- “uLo”: Minimum voltage limit below which the compressor is switched off
- “uHi”: Maximum voltage limit above which the compressor is switched off

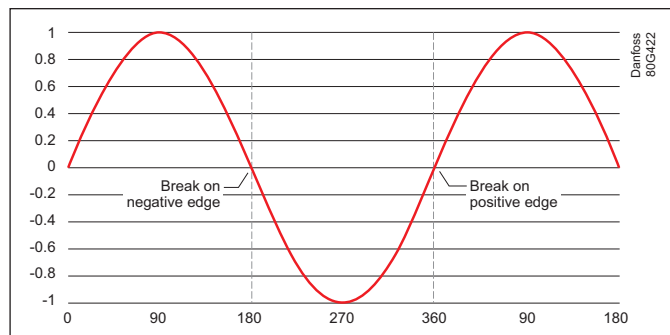
### Compressor Protection against short cycling:

This feature protects the compressor from short ON-OFF cycles. The EET controller ensures that the compressor is switched ON and OFF for a minimum time specified under Minimum run time (Crt) and Minimum stop time (cSt) except during voltage and condenser protection.



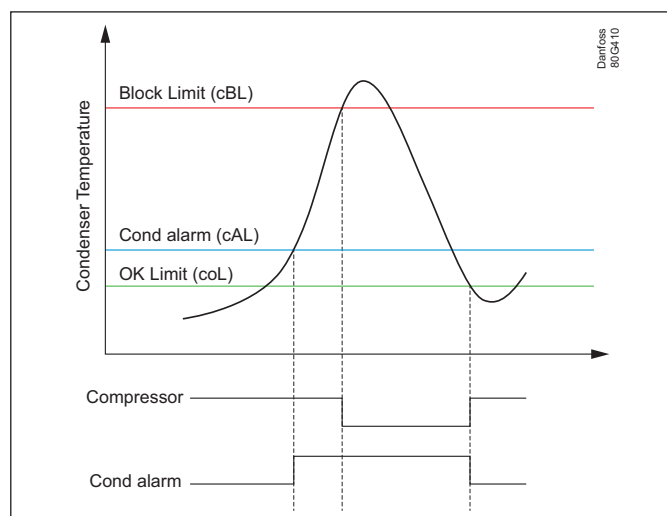
### Zero Cross Technology:

The Zero Cross Technology controls the relay's switching time by ensuring that the relays switch ON or OFF close to the 0th position of the voltage curve. This ensures reduced relay contact welding, increased relay life and reduced switching noise. This feature should only be used when the compressor is directly driven by the EET relay and no external contactor is used.



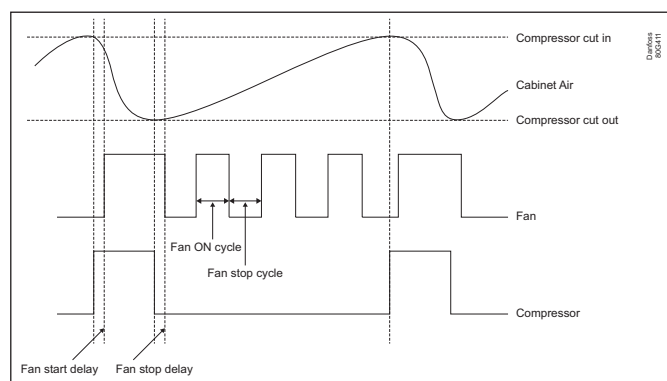
### Compressor protection against high condensing temperature

If the condenser is blocked due to dirt / dust and the condenser is unable to cool down the refrigerant properly due to lack of proper heat exchange, it will affect its performance and greatly reduces system life. This feature will protect the system and compressor via a two-step protection mechanism. The controller can be configured to set an early warning temperature by the user, when the compressor can keep running, and then a second level of condenser temperature beyond which the compressor is switched off until the temperature comes down to an acceptable limit. This would help to improve the compressor life by running within the allowed operating envelope of the compressor.



### Advanced Fan control:

Advanced Fan control helps maintain a uniform cooling by switching fan ON and OFF during the compressor OFF cycle. This feature reduces the overall energy consumption while maintaining a uniform temperature in the cabinet.

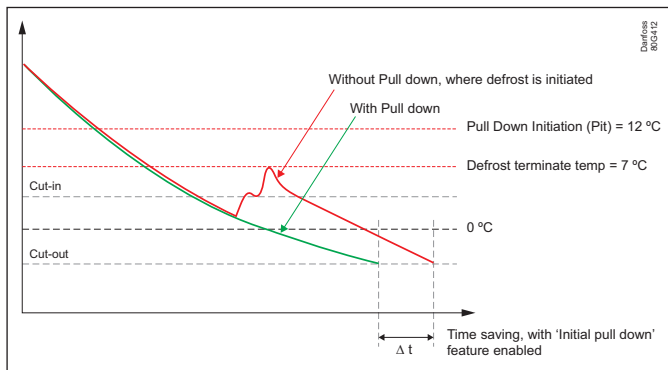


### Smart/Special cooling modes:

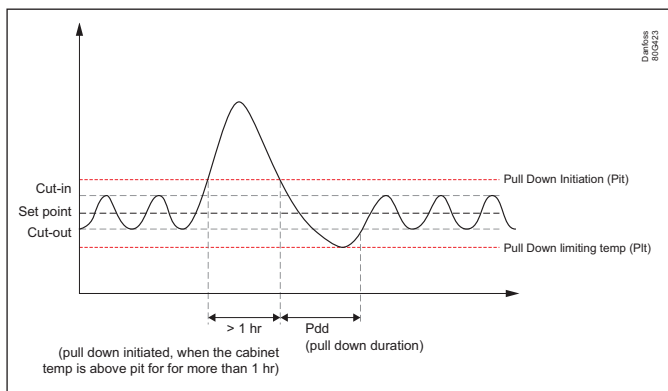
There are different cooling modes available in the EET controller in order to meet the varying cooling needs due to usage and operating conditions of the cabinets. The special cooling modes available in the EET controllers are:

**Initial pull down:** If the cabinet temperature is very high at power up, the controller detects the need for faster cooling and enters into initial pull down mode. In this mode, the controller adjusts the defrost interval by skipping it to a later time than its scheduled intervals until the desired cabinet temperature is achieved.

This ensures faster cooling by achieving the required cabinet temperature in the shortest period possible.



**Pull down/Super cool mode:** This feature helps to achieve faster and extra cooling when there is an increase in the cabinet temperature due to frequent door opening or fresh food products being placed in the cabinet. The faster and extra cooling is achieved by adjusting the temperature set point and defrost intervals until the desired setpoint range is achieved again. The controller detects this mode by monitoring the cabinet temperature behaviour, and it is possible to trigger this mode manually via a digital input switch.

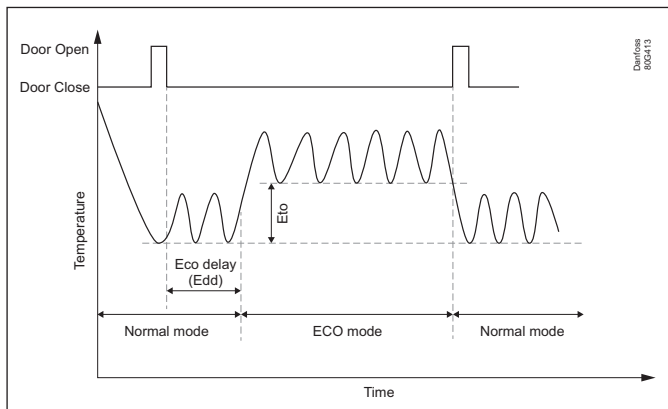


**Eco mode:**

This feature helps save energy by increasing the setpoint when the normal cooling demand is not required.

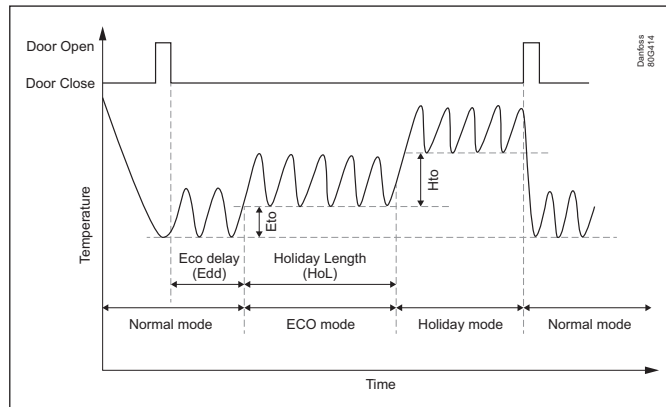
ECO mode is triggered when the door is closed for more than the time specified by the parameter 'Edd'. ECO mode can also be triggered manually via Di input.

In some cases, this feature is meant to decrease the setpoint and thereby enabling extra cooling when the power is cheaper at night time.



**Holiday mode (applicable for EETa 2W/3W only):**

This feature allows for more energy savings during vacation/ Holiday period by off-setting the setpoint when there is no usage for a prolonged period. If there is no door activity detected after entering ECO mode for the period that has been configured under parameter "Holiday length", it enters into Holiday mode. The entry into Holiday mode happens by time passing by and is exited by door action. Holiday mode can also be triggered manually via digital input.



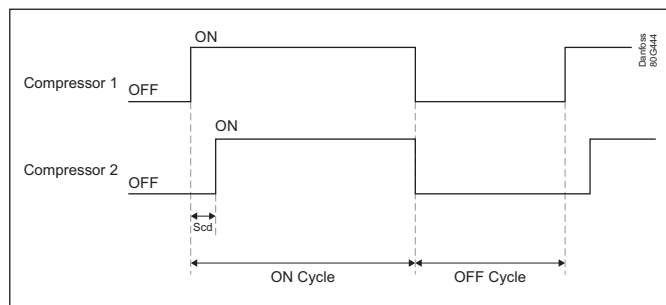
**Dual defrost (applicable for EETa 2W/3W only)**

The EETa can control refrigeration cabinets with two defrost heaters and two evaporator sensors in combination. This feature provides more flexibility to the refrigeration system design and provides the most efficient defrost handling. The controller can control defrost with both a single heater and two evaporator sensor inputs as well as two heaters with two evaporator sensor inputs.

**Dual compressor support (applicable for EETa 2W/3W only)**

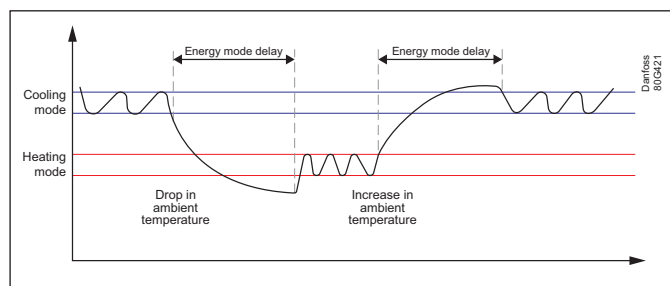
Certain refrigeration systems need more than one refrigeration circuit to handle the cooling requirements of the cabinet while meeting other statutory requirements (for ex: Flammable Refrigerant qty). The EETa controller comes with a feature that can handle two compressors which can be operated with time delay (Scd).

**Note:** The second compressor can be configured to any of the auxiliary relays and might require an external relay, if the rated current of the second compressor is more than the auxiliary relay ratings.



**Automatic heater control for Anti Freezing applications (applicable for EETa 2W/3W only)**

This feature protects the bottle coolers from freezing, if they are installed outdoor with low ambient temperature. The controller automatically switches between cooling and heating mode if the cabinet air temperature goes below the allowed limit, thus preventing the freezing of stored products. This feature can be activated only when the defrost type used is electrical.



**Quick Test mode**

This feature helps test all the outputs of the controller instantly when connected to an actual application in the OEM Production line or during field service. The feature can be used when connected to KoolProg or by using MODBUS commands (please contact the Danfoss support team for info about MODBUS commands).

**Sensor Error handling:**

In the event of cabinet sensor error/ failure, cabinet temperature can be controlled in EET controller using two methods to avoid food spoilage until the failed sensor is replaced

1. Manual Error handling: Run the compressor for fixed ON and OFF time by defining error run time and error stop time.
2. Auto Error handling: Smart self-learning feature of EET controller, controls the compressor cycle based on past compressor cycles.

**Potentiometer Error handling:**

Potentiometer error handling automatically sets the cabinet temperature to smart default setting to avoid food spoilage in the event of a potentiometer failure.

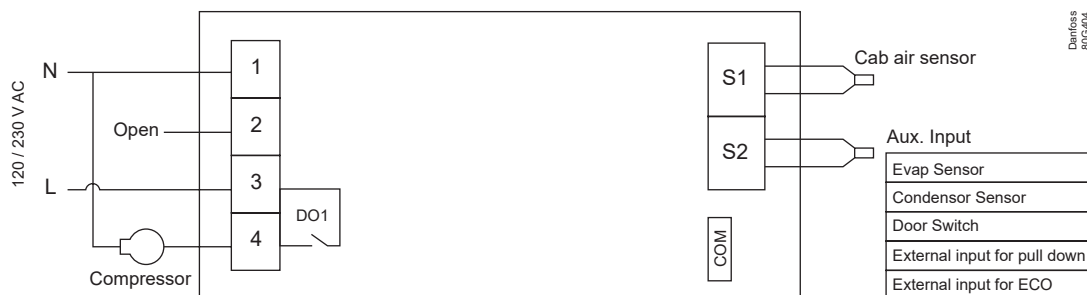
### Connections

**⚠ Warnings:**

1. Do not fit power supply wiring and signal wiring (probes/sensors and digital inputs) in the same raceways or ducts.
2. Separate as much as possible the probe and digital input signal cables from the cables carrying inductive loads and power cables to avoid possible electromagnetic disturbance.

3. Suitably fasten the output connection cables to avoid any unintentional contact.
4. The electrical connections must only be completed by a qualified electrician.
5. The customer must only use the product in the manner described in the documentation relating to the installation and product application.

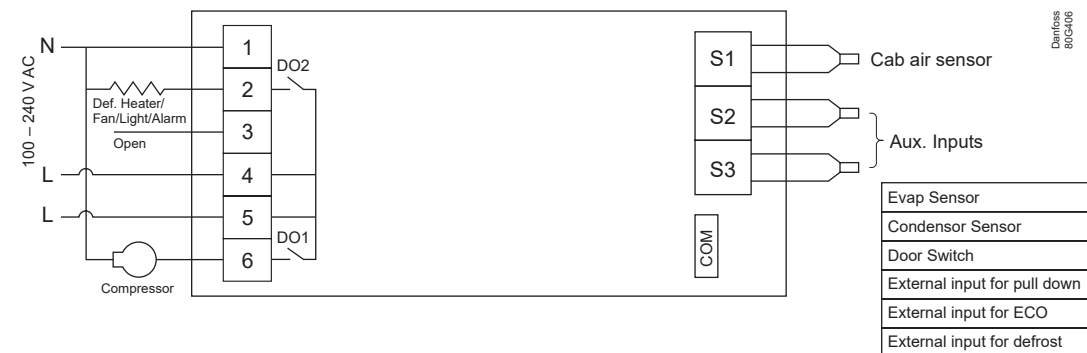
#### EETc11, EETc12



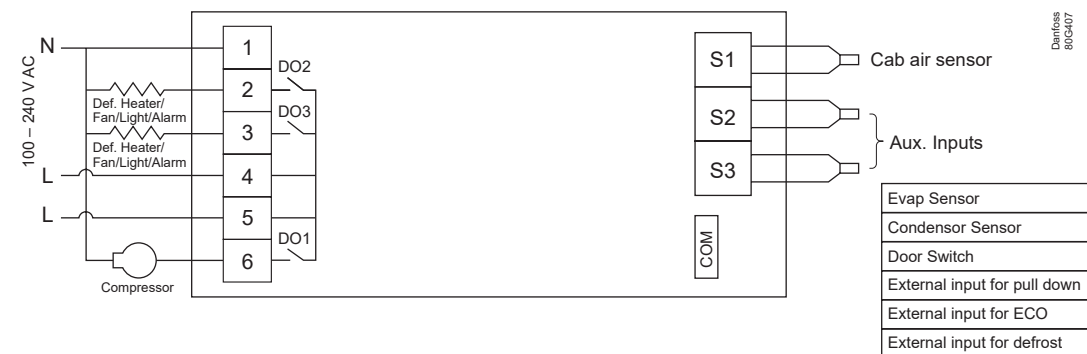
#### EETc21, EETc22



#### EETa 2W



#### EETa 3W





## Technical Specifications

Electronic temperature control, type EETc 11, 12, 21 and 22:

Product specification	EETc 11, EETc 21	EETc 12, EETc 22
Purpose of control	Operating temperature sensing control suitable for incorporation into commercial air-conditioning and refrigeration applications	
Construction of control	Incorporated control	
Voltage	120 V, 50/60 Hz	230 V, 50/60 Hz
Types/Models	EETc 11 (One relay 120 V) EETc 21 (Two relay 120 V)	EETc 12 (One relay 230 V) EETc 22 (Two relay 230 V)
Power supply	120 V AC +10%/-15%, 50/60 Hz	230 V AC +10%/-15%, 50/60 Hz
Relay ratings	DO1 (Compressor relay) 16 A (16 FLA / 72 LRA)	DO1 (Compressor relay) 16 A (10 FLA / 60 LRA)
	DO2 (Defrost heater / Evaporator fan) 5 A (2 FLA / 12 LRA)	DO2 (Defrost heater / Evaporator fan) 5 A (2 FLA / 12 LRA)
Product dimension	Length: 79 mm Width: 37.5 mm Height: 30.5 mm	
Temperature control	Potentiometer with Spindle	
Number of inputs	2 (1 Analogue + 1 Analogue / Digital)	
Supported sensor types	NTC 5K (Beta value 3980 @ 25/100 °C) NTC 10K (Beta Value 3980 @ 25/100 °C)	
Measuring accuracy	±1 K below -35 °C ±0.5 K between -35 – +25 °C ±1 K above 25 °C	
Measurement range	-40 – +80 °C	
Number of outputs	One relay version: Compressor relay Two relay version: Compressor relay + Aux relay (Defrost heater / Evaporator fan)	
Input connector type	Plug & Header type	
Output connector type	Tab connector	
Communication	TTL (MODBUS)	
Operating temperature range	-25 – +55 °C	
Humidity range	93% RH, Condensing	
Installation	Spindle mounted Cold Space Installability	
Relay switching	Zero cross technology (All relays)	
Overvoltage category	II - 230 V supply version - (ENEC, UL recognized) III - 115 V supply version - (UL recognized)	
Surge Protection	4 KV	
Approvals	R290/R600a end-use applications employing in accordance to EN/IEC 60335-2-24, annex CC and EN/IEC 60335-2-89, annex BB Glow wire according to EN/IEC 60335-1 IEC/EN 60730 UL60730 NSF CQC EAC Ukraine	

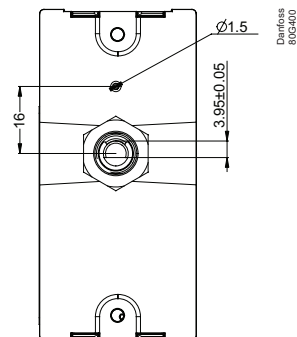
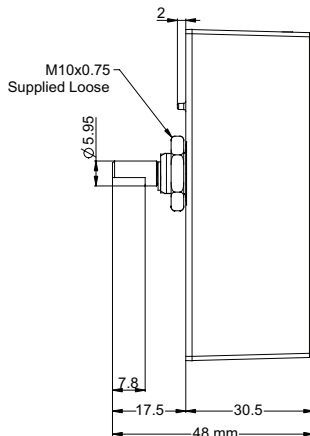
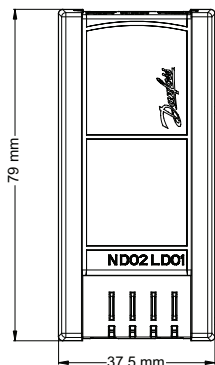
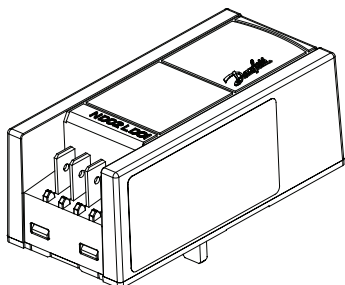
Electronic temperature control, type EETa 2W and EETa 3W:

Product specification	EETa 2W	EETa 3W
Purpose of control	Operating temperature sensing control suitable for incorporation into commercial air-conditioning and refrigeration applications	
Construction of control	Incorporated control	
Power supply	100 – 240 V AC +/- 10%, 50/60 Hz, Non isolated	
Relay ratings	DO1: 16 A (16 FLA / 72LRA) DO2: 8 A (2FLA /12LRA)	DO1: 16 A (16 FLA / 72LRA) DO2: 8 A (2FLA /12LRA) DO3: 5 A (2FLA /12 LRA)
Product dimension	Length: 83.5 mm Width: 43.5 mm Height: 30.5 mm	
Temperature control	Potentiometer with spindle	
Number of inputs	3 (1 Analogue, 2 Analogue / Digital)	
Supported sensor types	NTC 5K (Beta value 3980 @ 25/100 °C) NTC 10K (Beta value 3980 @25/100 °C) PTC 990 ohms @ 25 °C (EKS111)	
Measuring accuracy	±1 K below -35 °C ±0.5 K between -35 – +25 °C ±1 K above +25 °C	
Measurement range	NTC 5K: -40 – +80 °C NTC 10K: -40 – +80 °C PTC 990: -55 – +100 °C	
Output configuration	DO1: Compressor DO2: Def. Heater/Fan/Light/Second comp/Alarm	DO1: Compressor DO2 and DO3: Def. Heater/Fan/Light/Second comp/ Alarm
Input connector type	Plug and header type	
Output connector type	Tab Connector	
Communication	TTL (MODBUS)	
Operating temperature range	-25 – +50 °C	
Humidity range	93% RH, Condensing	
Installation	Spindle mounted Cold space installability	
Relay switching	Zero cross technology (all relays)	
Surge protection	4 KV	
Approvals	R290/R600a end-use applications employing in accordance to EN/IEC 60335-2-24, annex CC and EN/IEC 60335-2-89, annex BB Glow wire according to EN/IEC 60335-1 IEC/EN 60730 UL60730 NSF CQC EAC Ukraine	

## Installation

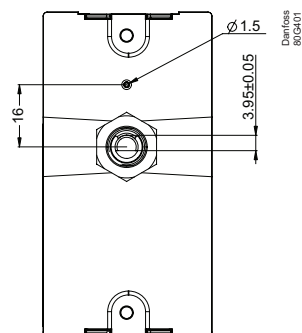
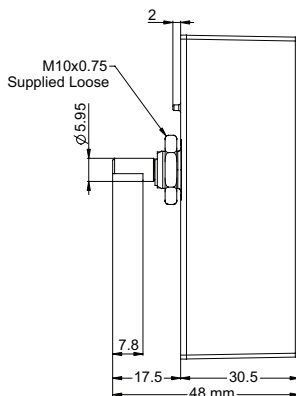
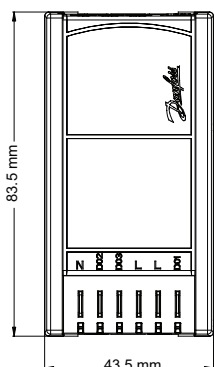
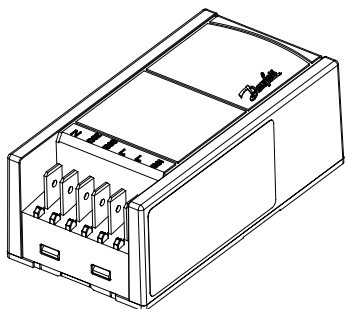
### Dimensions

EETc



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EETa

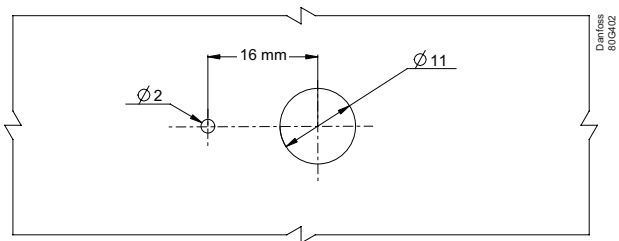


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### Mounting plate dimension

EETc and EETa

Recommended Mounting Plate Hole Center

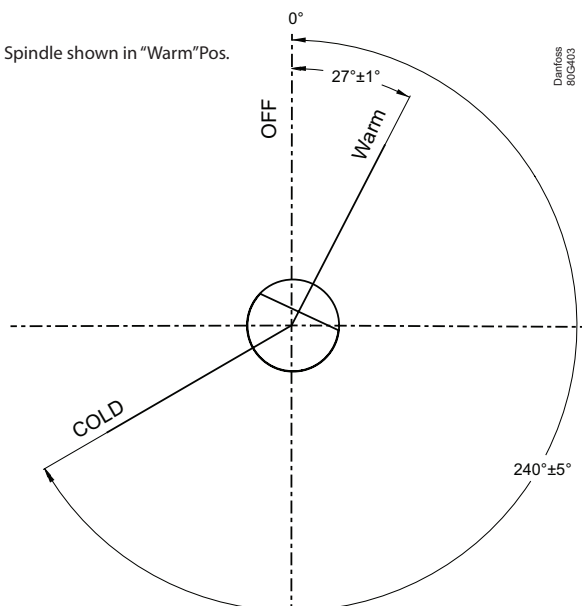


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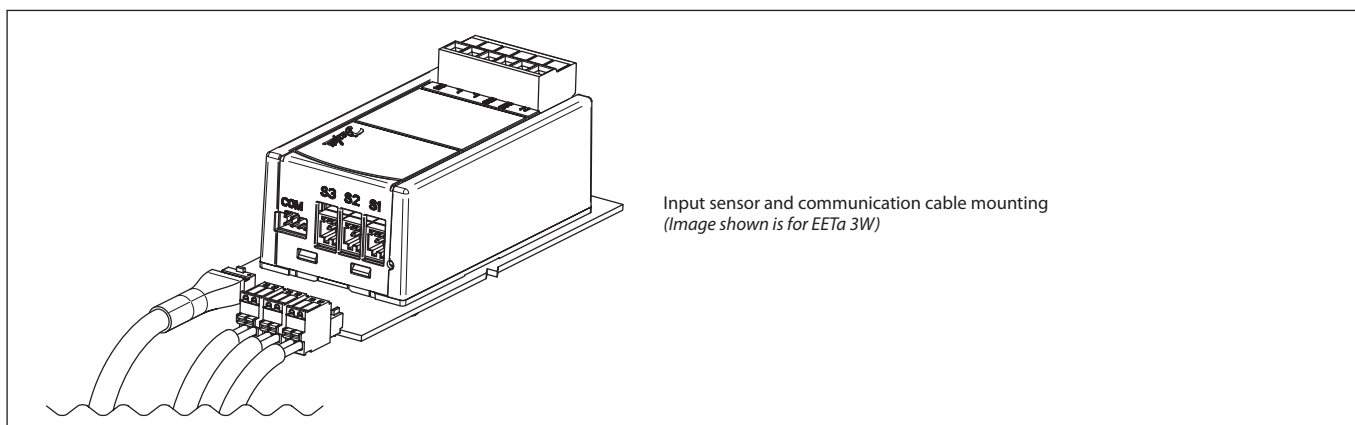
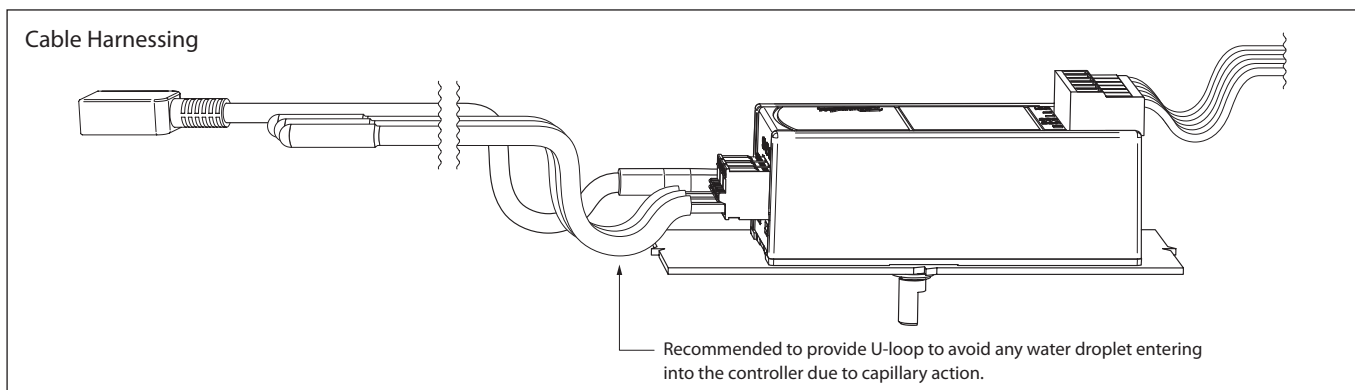
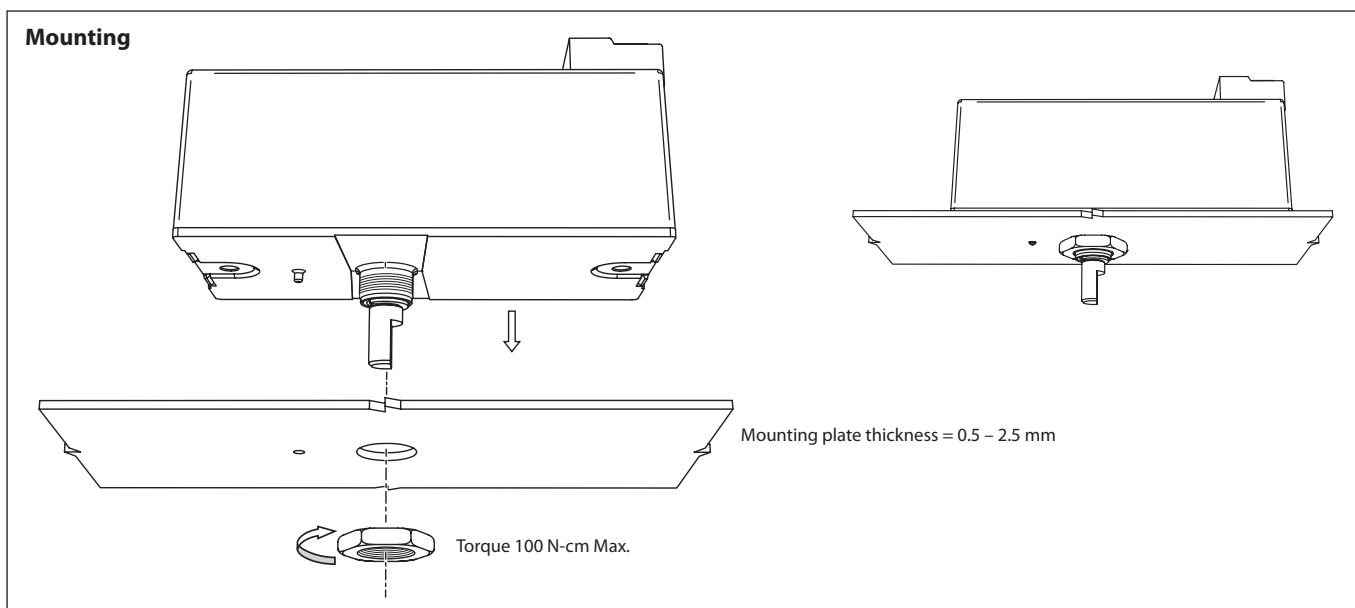
### Operation (Spindle operation)

EETc and EETa

Spindle shown in "Warm"Pos.



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**Programming**

Please contact your local Danfoss sales office for details about programming accessories and parts.

## Parameters

### Electronic temperature control, type EETc 11, 12, 21 and 22:

Parameter Name	Code	Default value	Min.	Max.	Description
<b>Assignment</b>					
Sensor Type	SEn	NTC10K	NTC5K	NTC10K	Sensor type (all sensors must be of same type) NTC5K - NTC 5000 Ohm at 25 °C (Beta value=3980 @ 25/100 °C) NTC10K - NTC 10000 Ohm at 25 °C (Beta Value 3980 @ 25/100 °C)
S2 Configuration	S2C	EuA	nC	dES	Desired configuration for S2 port nC - Not used/configured Con - Condenser Sensor EuA - Defrost/evaporator Sensor doC - Door Sensor (Normally closed type) doo - Door Sensor (Normally open type) ESP - Eco Switch - Push button type Est - ECO Switch - Toggle type Pud - Pull down switch - Push Button type only dES - Defrost switch - Push Button type only
Relay 2 Configuration <i>(applicable only for EETc 2x series)</i>	o2C	dEF	nC	Fan	Desired configuration for relay 2 nC - Not Connected dEF - Configured for defrost heater or defrost valve Fan - Configured for evaporator fan
<b>Thermostat</b>					
Lowest Temperature Limit (°C)	LSE	0	-100	120	Cut-out temperature at coldest position of the spindle (thermostat knob)
Highest Temperature Limit (°C)	HSE	10	-100	120	Cut-out temperature at warmest position of the spindle (thermostat knob)
Lowest Temperature Differential (K)	Ldi	2	1	50	The difference between the cut-out and the cut-in at coldest position of the thermostat.
Highest Temperature Differential (K)	Hdi	2	1	50	The difference between the cut-out and the cut-in at warmest position of the thermostat.
Initial pull down ON/OFF	IPE	OFF	OFF	ON	Initial Pull down OFF - Disable ON - Enable Initial Pull Down (IPD) provides faster cooling when the cabinet is powered up with warmer inside temperature. During IPD, defrost will be skipped until the cabinet air temperature reaches the cut-out temperature or the IPD duration expires. IPD operates only during power-up and can be enabled/disabled using this parameter.
IPD and Pull down Duration (Hrs)	IPD	0	0	120	Maximum time IPD and Pull down can run. IPD and Pull down will terminate as soon as this time expires regardless of the cabinet air temperature
IPD and Pull down Initiate temperature (°C)	Pit	50	-50	120	It indicates the temperature at which IPD or Pulldown will be initiated. - At Power-up: If the cabinet air temp. > Pit for more than 5 minutes, this will trigger the Initial pull down. - During normal operation: if the cabinet air temp. stays above Pit>1hr this will trigger the Pull down.
Pull Down Limit temperature (°C)	PLt	0	-100	120	It sets the cut-out temperature during Pull-down cycle. The controller will exit the pull down once this temperature is achieved or at expiry of pull down duration (IPD)
<b>Compressor</b>					
Min Run time (Sec.)	Crt	0	0	1800	To prevent the compressor from frequent cut-outs, it ensures that the compressor runs for at least the specified time. It overrides the cut-out temperature. (Tip: Setting it too high could lead to unnecessary deep temperatures)
Min Stop time (Sec.)	CSt	120	0	1800	To prevent the compressor from frequent cut-ins, the parameter ensures that the compressor remains off for at least the specified time under this parameter. It overrides the cut-in temperatures. (Tip: Setting it too high could lead to unnecessary warm temperatures)
Compressor stop delay on door open (Sec.)	Cdd	0	0	999	It sets the delay in stopping the compressor when the door is opened. If set to "0", the compressor stops immediately. If set to 999 it will disable the function and doesnot stop the compressor
System Resume after door open (Mins)	Srt	0	0	60	If the door is kept open for a long time, the compressor and fan will resume after this time if they are switched off due to open door. (Note : 'Srt' must be always greater than 'Cdd' and 'Fdt') If Srt=0, the system resume feature is disabled and the system will resume only when the door is closed.
Power On Delay (Sec.)	Pod	120	0	300	This is the delay in seconds between power-on and the output relays being activated.
<b>Alarm</b>					
Low temp alarm limit (°C)	LAt	-5	-100	120	If the cabinet air temperature goes below this value, a low temperature alarm will be raised (all these alarm statuses can be viewed only in KoolProg)
High temp alarm limit (°C)	HAt	15	-100	120	If the cabinet air temperature goes above this value, a low temperature alarm will be raised
Low temp alarm delay (Mins)	Ltd	0	0	240	Time delay to raise alarm once low temperature alarm limit is reached
High temp alarm delay (Mins)	Htd	30	0	240	Time delay to raise alarm once high temperature alarm limit is reached
Alarm Door open delay (Mins)	dod	2	0	60	Time delay to raise alarm if the door is kept open. If the door is closed before the delay time, no alarm will be raised
Alarm delay during Pull Down/ Power up /defrost (Mins)	Pdd	60	0	960	Time delay to raise high temperature alarm during pull down, power-up and defrost in order to avoid wrong alarm signal during these conditions.

Parameter Name	Code	Default value	Min.	Max.	Description
<b>Defrost</b>					
<b>dEF</b>					
Defrost type	dFt	nAt	no	Hgd	EETc 11, 12 It defines the required type of defrost: "no" : defrost function is disabled. "nAt" : natural defrost (OFF-cycle defrost)
					EETc 21, 22 It defines the required type of defrost: "no" : defrost function is disabled. "nAt" : natural defrost (OFF-cycle defrost) "EL" : electrical defrost. "Hgd" : hot gas defrost
Minimum defrost Interval (Mins)	dii	360	1	4320	Defines the minimum time period between the start of two defrost cycles. If the evaporator temperature goes below the defrost start temperature (dEt), the controller triggers the defrost after this period. If not, it triggers the defrost at the Maximum defrost interval (dAi)
Maximum defrost Interval (Mins)	dAi	420	1	4320	Maximum time period between the start of two defrost cycles.
Minimum defrost time (Mins)	dit	5	0	240	Defines the minimum duration of a defrost cycle. During this period, the controller will not check the temperature. Once the minimum time has expired, the temperature will be checked and if the terminate temperature "dtt" has been reached, the defrost cycle will end. If "dtt" has not been reached, defrost will continue until the maximum defrost time "dAt" is reached
Maximum defrost Time (Mins)	dAt	30	0	480	Maximum duration of a defrost cycle. The controller will terminate the defrost after this time, even if the evaporator sensor is configured and the evaporator temperature is less than terminate temperature (dtt).
Defrost Terminate Temp (°C)	dtt	6	0	50	It defines the evaporator temperature at which defrost must be terminated. The controller will terminate the defrost based on the defrost terminate temperature (dtt) or the Maximum defrost time (dAt). If no evaporator sensor is used, defrost will be terminated based on the maximum defrost time (dAt)
Defrost On accumulated Compressor Run Time	dCt	No	No	Yes	If it is set to "Yes", the defrost interval is calculated based on the total time the compressor has been running. If it is set to "No", then defrost interval is based on the elapsed time, regardless of compressor ON time.
Defrost Start by Evaporator Temp (°C)	dEt	-100	-100	0	Evaporator Temperature at which the defrost will be triggered after a minimum defrost interval to avoid excess frost on the evaporator (only active if the evaporator sensor is configured)
Drip Off time (Mins)	dot	2	0	60	Defines the time delay to start the compressor after terminating defrost. This feature is to ensure no water droplet on the evaporator before starting the cooling cycle
Fan Delay After Defrost (Sec.) <i>(applicable only for EETc 2x series)</i>	Fdd	0	0	960	Defines delay in switching "ON" the fan from compressor start after defrost to avoid warm air circulation
Fan Start Temperature after defrost (°C) <i>(applicable only for EETc 2x series)</i>	Ftd	25	-25	25	It determines at what evaporator temperature the fan will start after a defrost cycle. If the time set in "Fdd" occurs before the temperature set in "Ftd", the fan will start in line with "Fdd". If the temperature set in "Ftd" occurs first, then the fan will start in line with "Ftd"
Fan ON during Defrost <i>(applicable only for EETc 2x series)</i>	dFa	no	no	Yes	Defines the status of the fan during defrost. Set to "Yes", the fan will run during defrost cycles and set to "No", the fan will be kept off during defrost cycles
Initial Defrost Interval (Mins)	idi	180	0	4320	The initial defrost interval determines the time for first defrost after power-up. The initial defrost is mainly intended for factory testing of the defrost functionality and can be set to expire after a number compressor cycles according to the setting of parameter idd.
Initial defrost duration (Cycles)	idd	0	0	999	The initial defrost duration is the number of compressor cycles after which initial defrost is deactivated. "0" : No initial defrost. "1-998" : number of compressor cycles before deactivation. "999" : initial defrost always active.
<b>Fan</b>					
<b>Fan</b>					
Fan Control Method <i>(applicable only for EETc 2x series)</i>	FcT	FAo	FAo	FPL	Defines the fan control method: "FAo" : fan always on "FFc" : fan follows compressor (fan runs only when compressor is ON) "FPL" : fan cycling (fan cycling during compressor off cycle)
Fan ON Delay (Sec.) <i>(applicable only for EETc 2x series)</i>	Fod	0	0	240	Time delay to start the fan after compressor cut-in
Fan Stop Delay (Sec.) <i>(applicable only for EETc 2x series)</i>	FSd	0	0	240	Time delay to stop the fan after compressor cut-out
Fan On Cycle (Sec.) <i>(applicable only for EETc 2x series)</i>	FoC	0	0	960	If fan control method is selected as "FPL", it defines the fan ON time during compressor OFF cycle.
Fan Stop Cycle (Sec.) <i>(applicable only for EETc 2x series)</i>	FSc	0	0	960	If fan control method is selected as "FPL", it defines the fan OFF time during compressor OFF cycle.
Fan stop delay on door open (Sec.) <i>(applicable only for EETc 2x series)</i>	Fdt	0	0	999	The delay to stop the fan after the door has been opened: "0" : fan stop immediately when door opens "1-998" : delay for fan stop after door opens "999" : fan keep running all the time, fan does not stop while door is opened
Fan Minimum Stop Time (Sec.) <i>(applicable only for EETc 2x series)</i>	FSt	10	0	960	Minimum time that the fan must stop whenever it is switched off.

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Parameter Name	Code	Default value	Min.	Max.	Description
Fan Limit Temperature (°C) <i>(applicable only for EETc 2x series)</i>	FLt	50	0	50	This function prevents the evaporator fan from operating if the evaporator temperature is above the fan limit temperature. If the defrost sensor registers a higher temperature than the one set here, the fan will be stopped to avoid the warm air circulation in the cabinet. The fan will restart when the evaporator temperature goes 2 °C less than FLt (FLt - 2 °C). It is active only when the evaporator sensor is configured.
<b>ECO Management</b>					
ECO Mode enable	ECO	No	No	Yes	ECO mode is active or not. If "No" is selected all other settings related to ECO mode are not active.
ECO Offset (K)	Eto	4	-25	25	Defines offset temperature during ECO mode. Offset can be positive or negative. ECO setpoint = setpoint + Eto
ECO Door Delay (Mins)	Edd	180	0	360	Controller will enter ECO mode, if the door are not opened for a time longer than Edd.
<b>System Protection</b>					
Voltage Protection function	uPt	No	No	Yes	This feature protects the compressor if the line voltage goes beyond the operating range.
Minimum Cut-in Voltage 110 V (230 V)	uLi	100	70	230	The lowest voltage at which the compressor is allowed to cut in.
Minimum Cut out Voltage 110 V (230 V)	uLO	95	70	225	If the voltage goes below this value when the compressor is running, the compressor will be switched off. It is meant to avoid sudden switching on and off of compressor due to voltage fluctuations. This cut-off voltage will override compressor minimum run time.
Maximum cut out Voltage 110V (230V)	uHi	260	110	270	When the compressor is running, it will be switched OFF if the voltage exceeds this value. If the compressor is already stopped, it will remain switched off.
Condenser Alarm Limit (°C)	CAL	80	0	120	It sets the condenser temperature at which an alarm will be generated
Condenser Block Limit (°C)	CbL	85	0	120	It sets the compressor switched off due to high condenser temperature.
Condenser OK Limit (°C)	CoL	60	0	120	It sets the compressor to switch on again after it has been switched off due to high condenser temperature, respecting minimum compressor stop time.
Control sensor error handling type	EHD	Aut	no	Aut	Method to control the cooling cycle in case of cabinet air sensor error: "no" : no sensor error handling. "SEt" : follow configured error run and stop time. "Aut" : control automatically based on past cycles time.
Error Run Time (Mins)	Ert	0	0	60	Cooling cycle ON time in case of cabinet sensor error (active only if EHD=Set)
Error Stop Time (Mins)	Est	0	0	60	Cooling cycle OFF time in case of cabinet sensor error (active only if EHD=Set)
Zero Cross Config	ZC	Yes	No	Yes	It enhances the relay life and avoids relay sparks during relay ON and OFF. If "Yes" is selected, the relays will be switched ON and OFF when the line-voltage is closer to zero.
<b>Test Mode</b>					
Operating mode	tSt	Normal	Manual	Normal	Normal mode - Normal operation mode of the controller Manual mode- In this mode, output relays can be switched ON and OFF irrespective of temperature conditions.
<b>Service</b>					
Parameter Version	Par	0	0	65535	OEM/Customer can use it to assign Parameter version
Software Version	Fir		0	65535	Software /Firmware version of the controller
Code number	onL		0	65535	Last four digits of the FG code number of the controller
OEM low	oEL		0	65535	OEM/customer can use it to assign their code number for their various applications
OEM High	oEH		0	65535	OEM/customer can use it to assign their code number for their various applications
Thermostat cut in temperature (°C)	CTi		-100	200	Thermostat cut-in temperature at current spindle position
Thermostat cut out temperature (°C)	CTO		-100	200	Thermostat cut-out temperature at current spindle position
Cabinet Air Temperature (°C)	Cab		-100	200	Cabinet Air temperature
Evaporator Temperature (°C)	Eva		-100	200	Evaporator Temp
Condenser Temperature (°C)	Con		-100	200	Condenser Temp
Door Status	Dor		Open	Not configured	Status of the door switch Close: door is closed Open: door is open Not Configured: door switch is not configured
Di Switch Status	Di1		Open	Not configured	Status of Digital input: Open: deactivated Close: activated Not Configured: Di switch not configured
Spindle position (%)	uSp		0	100	Current position of the spindle Warm - 0% Cold -100%
Compressor Relay Status	CPS		OFF	ON	Status of relay configured for compressor
Fan Relay Status <i>(applicable only for EETc 2x series)</i>	FFS		OFF	ON	Status of relay configured for fan
Defrost Relay status <i>(applicable only for EETc 2x series)</i>	dfs		OFF	ON	Status of relay configured for defrost heater/defrost bypass valve

Parameter Name	Code	Default value	Min.	Max.	Description
Thermostat status	thS		1	7	Thermostat Operating status: 1 - Initial state 2 - Serving 3 - Eco Mode 4 - Initial Pull Down (IPD) 5 - Pull down /Super cool Mode 6 - Emergency Mode 7 - Main Switch Off
Defrost status (stages)	dES		1	4	Stages during defrost: 1 - Idle 2 - Ice off 3 - Drip off 4 - Cooling Preperation
Defrost interval counter - Comp. run time	InC		0	32767	Defrost interval counter based on accumulated compressor runtime
Defrost Interval counter - Elapsed time	Int		0	32767	Defrost interval counter based on elapsed time
Main Voltage	uAC		1	300	Supply voltage



**Electronic temperature control, type EETa 2W and EETa 3W:**

Parameter Name	Code	Default value	Min.	Max.	Description
<b>Assignment</b>	<b>ASi</b>				
Sensor Type	SEn	NTC10K	NTC5K	PTC	Sensor type (all sensors must be of same type): NTC5K - NTC 5000 Ohm at 25 °C (Beta value=3980 @ 25/100 °C) NTC10K - NTC 10000 Ohm at 25 °C (Beta Value 3980 @ 25/100 °C) PTC - PTC 990
S2 Configuration	S2C	EuA	nC	dES	Desired configuration for S2 port: nC - Not used/configured Con - Condenser sensor EuA - Defrost/evaporator sensor doC - Door sensor (Normally closed type) doo - Door sensor (Normally open type) ESP - Eco switch - Push button type ESt - Eco switch - Toggle type Pud - Pull down switch - Push button type only dES - Defrost switch - Push button type only
S3 Configuration	S3C	nC	nC	dES	Desired configuration for S3 port: nC - Not used/configured Con - Condenser sensor EuA - Defrost/evaporator sensor doC - Door sensor (Normally closed type) doo - Door sensor (Normally open type) ESP - Eco switch - Push button type ESt - Eco switch - Toggle type Pud - Pull down switch - Push button type only dES - Defrost switch - Push button type only
Relay 2 Config	o2C	dEF	nC	Scc	Desired configuration for relay 2: nC - Not Connected dEF - Configured for defrost heater or defrost valve FAn - Configured for evaporator fan Llg - Configured for Cabinet Light ALA - Configured for External Alarm Scc - Second compressor
Relay 3 Config (nC) <i>(applicable only for EETa 3W)</i>	o3C	Fan	nC	Scc	Desired configuration for relay 3: nC - Not Connected dEF - Configured for defrost heater or defrost valve FAn - Configured for evaporator fan Llg - Configured for Cabinet Light ALA - Configured for External Alarm Scc - Second compressor
<b>Thermostat</b>	<b>THE</b>				
Lowest Temperature Limit (°C)	LSE	0	-100	120	Cut-out temperature at coldest position of the spindle (thermostat kNob)
Highest Temperature Limit (°C)	HSE	10	-100	120	Cut-out temperature at warmest position of the spindle (thermostat kNob)
Lowest Temperature Differential (K)	Ldi	2	1	50	It the difference between the cut-out and the cut-in at coldest position of thermostat
Highest Temperature Differential (K)	Hdi	2	1	50	It the difference between the cut-out and the cut-in at warmest position of thermostat
Initial pull down ON/OFF	IPE	OFF	OFF	ON	Initial Pull Down: OFF - Disable ON - Enable Initial Pull Down (IPD) can be used for providing faster cooling when the cabinet is powered up with warmer inside temperature. During IPD, defrost will be skipped until the cabinet air temperature reaches cut-out temperature or the IPD duration expires. IPD operates only during power-up and can be enabled/disabled using it
IPD and Pull down Duration (Hrs)	IPD	0	0	120	Maximum time IPD and Pull Down can run. IPD and Pull Down will terminate as soon as this time expires, regardless of the cabinet air temperature
IPD and Pull down Initiate temperature (°C)	Pit	50	-50	120	It indicates the temperature at which IPD or Pull Down will be initiated: - At Power up: If the cabinet air temp.>Pit for more than 5 minutes it will trigger the Initial Pull Down - During Normal operation: if the cabinet air temp stays above Pit>1hr it will trigger the Pull Down
Pull Down Limit temperature (°C)	PLt	0	-100	120	It sets the cut-out temperature during the Pull Down cycle to achieve more cooling. The controller will exit the Pull Down once this temperature is achieved or at expiry of Pull Down Duration (IPD)
<b>Compressor</b>	<b>COP</b>				
Min Run time (Sec.)	Crt	0	0	1800	To prevent the compressor from frequent cut-outs, it ensures that the compressor runs for at least the specified time. It overrides the cut-out temperature. (Tip: setting it too high could lead to unnecessary deep temperatures)
Min Stop time (Sec.)	CSt	120	0	1800	To prevent the compressor from frequent cut-ins, it ensures that the compressor remains off for at least the specified time under this parameter. It overrides the cut-in temperatures. (Tip: setting it too high could lead to unnecessary warm temperatures)
Compressor stop delay on door open (Sec.)	Cdd	0	0	999	It sets the delay in stopping the compressor when the door is opened. If set to "0", the compressor stops immediately. If set to "999", the function will be disabled and the compressor will not be stopped
System Resume after door open (Mins)	Srt	0	0	60	If the door is kept open for a long time, the compressor and the fan will resume after this time, if they switched off due to an open door. (Note: 'Srt' must be always greater than 'Cdd' and 'Fdt') If Srt=0, the system resume feature is disabled and the system will resume only when the door is closed.

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Parameter Name	Code	Default value	Min.	Max.	Description
Second Compressor start delay (Sec.)	Scd	15	0	960	Delay time for starting the second compressor in dual compressor control
Power On Delay (Sec.)	Pod	120	0	300	This is the delay in seconds between power-on and the output relays being activated
<b>Alarm</b>					
<b>ALA</b>					
Low temp Alarm limit (°C)	LAt	-5	-100	120	If the cabinet air temperature goes below this value, a low temperature alarm will be raised (all these alarm statuses can be viewed only in KoolProg)
High temp Alarm limit (°C)	HAt	15	-100	120	If the cabinet air temperature goes above this value, a low temperature alarm will be raised
Low temp Alarm delay (Mins)	Ltd	0	0	240	Time delay to raise alarm once the low temperature alarm limit is reached
High temp Alarm delay (Mins)	Htd	30	0	240	Time delay to raise alarm once the high temperature alarm limit is reached
Alarm Door open delay (Mins)	dod	2	0	60	Time delay to raise alarm if the door is kept open. If the door is closed before the delay time, no alarm will be raised
Alarm delay during Pull Down/ Power up /defrost (Mins)	Pdd	60	0	960	Time delay to raise high temperature alarm during Pull Down, power-up and defrost in order to avoid wrong alarm signal during these conditions
Leakage Alarm Compressor Run Time (Hrs)	LEA	0	0	96	If the compressor operates continuously for more than the time configured in this parameter a leakage alarm will be triggered. Generally this value must be set higher than the Pull down duration "Pdd". "0": disable
<b>Defrost</b>					
<b>dEF</b>					
Defrost type	dFt	nAt	no	Hgd	It defines the required type of defrost: "no" : defrost function is disabled "nAt" : Natural defrost (OFF-cycle defrost) "EL" : electrical defrost "Hgd" : hot gas defrost
Minimum defrost Interval (Mins)	dii	360	1	4320	Defines the minimum time period between the start of two defrost cycles. If the evaporator temperature goes below the defrost start temperature (dEt), the controller triggers the defrost after this period. If not, the defrost will be triggered at Maximum defrost interval (dAi)
Maximum defrost Interval (Mins)	dAi	420	1	4320	Maximum time period between the start of two defrost cycles
Minimum defrost time (Mins)	dit	5	0	240	Defines the minimum duration of a defrost cycle. During this period, the controller will not check the temperature. Once the minimum time has expired, the temperature will be checked and if the terminate temperature "dtt" has been reached, the defrost cycle will end. If "dtt" has not been reached, defrost will continue until maximum defrost time "dAt" is reached
Maximum defrost Time (Mins)	dAt	30	0	480	Maximum duration of a defrost cycle. The controller will terminate the defrost after this time, even if the evaporator sensor is configured and the evaporator temperature is less than the defrost terminate temperature (dtt)
Defrost Terminate Temp (°C)	dtt	6	0	50	It defines the evaporator temperature at which defrost must be terminated. The controller will terminate the defrost based on the defrost terminate temperature (dtt) or Maximum defrost time (dAt). If no evaporator sensor is used, defrost will be terminated based on the maximum defrost time (dAt)
Defrost on accumulated Compressor Run Time	dCt	No	No	Yes	If it is set to "Yes", the defrost interval is calculated based on the total time the compressor has been running. If it is set to "No", then defrost interval is based on the elapsed time, regardless of the compressor ON time
Defrost Start by Evaporator Temp (°C)	dEt	-100	-100	0	Evaporator temperature at which the defrost will be triggered after a minimum defrost interval in order to avoid excess frost on the evaporator (active only if the evaporator sensor is configured)
Drip Off time (Mins)	dot	2	0	60	Defines the time delay before starting the compressor after terminating defrost. This feature is to ensure no water droplet on the evaporator before starting the cooling cycle
Fan Delay After Defrost (Sec.)	Fdd	0	0	960	Defines the delay before switching on the fan from compressor start after defrost to avoid warm air circulation
Fan Start Temperature after defrost (°C)	Ftd	25	-25	25	It determines at what evaporator temperature the fan will start after a defrost cycle. If the time set in "Fdd" occurs before the temperature set in "Ftd", the fan will start in line with "Fdd". If the temperature set in "Ftd" occurs first, then the fan will start in line with "Ftd"
Fan ON during Defrost	dFa	No	No	Yes	Defines the status of the fan during defrost. Set to "Yes", the fan will run during defrost cycles and set to "No", the fan will be kept off during defrost cycles
Initial Defrost Interval (Mins)	idi	180	0	4320	The initial defrost interval determines the time for first defrost after power-up. The initial defrost is mainly intended for factory testing of the defrost functionality and can be set to expire after a number of compressor cycles according to the setting of parameter idd
Initial Defrost duration (Cycles)	idd	0	0	999	The initial defrost duration is the number of compressor cycles after which initial defrost is deactivated: "0" : no initial defrost. "1-998": number of compressor cycles before deactivation. "999" : initial defrost always active
<b>Fan</b>					
<b>FAn</b>					
Fan Control Method	FcT	FAo	FAo	FPL	Defines the Fan Control Method: "FAo" : fan always on "FFc" : fan follows compressor (fan runs only when compressor is "ON") "FPL" : Fan Cycling. (Fan cycling during compressor off cycle)
Fan ON Delay (Sec.)	Fod	0	0	240	Time delay to start the fan after compressor cut-in
Fan Stop Delay (Sec.)	FSd	0	0	240	Time delay to stop the fan after compressor cut-out
Fan On Cycle (Sec.)	Foc	0	0	960	If Fan Control Method is selected as "FPL", it defines the fan "ON" time during compressor OFF cycle
Fan Stop Cycle (Sec.)	FSc	0	0	960	If Fan Control Method is selected as "FPL", it defines the fan "OFF" time during compressor OFF cycle

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Parameter Name	Code	Default value	Min.	Max.	Description
Fan stop delay on door open (Sec.)	Fdt	0	0	999	The delay to stop the fan after the door has been opened: "0" : fan stops immediately when the door opens "1-998" : delay for fan stop after the door opens "999" : fan keeps running all the time, fan does not stop while door is opened
Fan Minimum Stop Time (Sec.)	FSt	10	0	960	Minimum time that the fan must stop whenever it is switched off
Fan Limit Temperature (°C)	FLt	50	0	50	This function prevents the evaporator fan from operating if the evaporator temperature is above the fan limit temperature. If the defrost sensor registers a higher temperature than the one set here, the fan will be stopped to avoid the warm air circulation in the cabinet. The fan will restart when the evaporator temperature goes 2 °C less than FLt (FLt - 2 °C). It is active only when the evaporator sensor is configured
<b>Light</b>		<b>Lig</b>			
Cabinet Light Control (Normal mode)	CLC	ON	ON	dor	ON : always "ON" (this button is default to control light for all these options) OFF : always "OFF" dor : door sensor only
Cabinet Light Control (ECO mode)	ELC	OFF	ON	dor	ON : always "ON" (this button is default to control light for all these options) OFF : always "OFF" dor : door sensor only
Light OFF delay (Sec.)	Lod	0	0	300	Delay to turn off the cabinet light after closing of the door
<b>ECO Strategy</b>		<b>ECO</b>			
ECO Mode Enable	Eco	No	No	Yes	ECO mode is active or not. If "NO" is selected, all other settings related to ECO mode are not active
ECO Offset (K)	Eto	4	-25	25	Defines the offset temperature during ECO mode. Offset can be positive or negative. ECO set point = set point + Eto
ECO Door Delay (Mins)	Edd	180	0	360	Controller will enter ECO mode, if the door are not opened for a time longer than Edd.
Holiday Mode	HLY	No	No	Yes	Holiday mode is active or not. If "NO" is selected, all other settings related to holiday mode are not active
Holiday Length (Hrs)	HoL	72	0	999	Criteria for entering Holiday Mode based on the number of hours of no activity in ECO mode. If the controller does not detect any door opening after entering ECO mode for these many hours, it will trigger the Holiday Mode and set the temperature as per Holiday offset
Holiday Temperature offset (K)	Hto	6	-25	25	Defines the offset temperature during Holiday Mode. Offset can be positive or negative
<b>Automatic Heater Control</b>		<b>AHC</b>			
Automatic Heater Control Mode	AuH	No	No	Yes	Automatic Heater Control / dual mode protects food items stored in cabinets installed outdoors from freezing during winter. Automatic Heater Control uses the defrost heater to increase the cabinet temperature when it goes below the cut-out temperature during Cooling mode. No: this feature is disabled Yes: this feature is active
Heater low set point (°C)	CHI	-100	-100	120	Heater cut-out temperature at coldest position of the spindle (thermostat knob) auto heating
Heater high set point (°C)	WHI	-100	-100	120	Heater cut-out temperature at warmest position of the spindle (thermostat knob) auto heating
Heater low differential (K)	CDH	2	1	50	It the difference between the heater cut-out and cut-in at the coldest position of thermostat for auto heating
Heater high differential (K)	WDH	2	1	50	It the difference between the heater cut-out and cut-in at the warmest position of thermostat for auto heating
Energy mode delay (Mins)	End	60	0	360	This is the delay in minutes between the heater and the compressor operation. The heater is not allowed to start until the number of minutes has expired after the compressor has cut out and vice versa
<b>System Protection</b>		<b>SyP</b>			
Voltage Protection function	uPt	No	No	Yes	This feature protects the compressor if the line voltage goes beyond the operating range
Minimum Cut-in Voltage	uLi	100	70	230	The lowest voltage at which the compressor is allowed to cut-in
Minimum Cut out Voltage	uLO	90	70	225	If the voltage goes below this value when the compressor is running, the compressor will be switched off. It is to avoid sudden switching on and off of the compressor due to voltage fluctuations. This cut-off voltage will override the compressor minimum run time
Maximum cut out Voltage	uHi	260	110	270	When the compressor is running, it will be switched off if the voltage exceeds this value, if the compressor is already stopped, it will remain switched off
Condenser Alarm Limit (°C)	CAL	80	0	120	It sets the condenser temperature at which an alarm will be generated
Condenser Block Limit (°C)	CbL	85	0	120	It sets the compressor switched off due to high condenser temperature
Condenser OK Limit (°C)	CoL	60	0	120	It sets the compressor to switch on again after having been switched off due to high condenser temperature, respecting the minimum compressor stop time
Control sensor error handling type	EHD	Aut	no	Aut	Method to control the cooling cycle in case of cabinet air sensor error: "No" : no sensor error handling "SEt" : follow configured error run and stop time "Aut" : control automatically based on past cycles time
Error Run Time (Mins)	Ert	0	0	60	Cooling cycle ON time in case of cabinet sensor error (active only if EHD=SEt)
Error Stop Time (Mins)	Est	0	0	60	Cooling cycle OFF time in case of cabinet sensor error (active only if EHD=SEt)
Zero Cross Config	ZC	Yes	No	Yes	It enhances the relay life and avoids relay sparks during relay ON and OFF. If "Yes" is selected, relays will be switched ON and OFF when the line voltage is closer to zero

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Parameter Name	Code	Default value	Min.	Max.	Description
<b>Test mode</b>					
Operating mode	tSt	Normal	Manual	Self test	Normal mode: normal operation mode of the controller Manual mode: in this mode, output relays can be switched ON and OFF irrespective of temperature conditions Self test: self diagnostic test mode, where the controller will run self-diagnostic test to check the connected sensors and refrigeration components configured to the output relays. When this option is selected, the controller will run the test by switching on and off the relay in a certain sequence
Relay 1		OFF	OFF	ON	
Relay 2		OFF	OFF	ON	
Relay 3 <i>(applicable only for EETa 3W)</i>		OFF	OFF	ON	
<b>Service</b>					
Parameter Version	Par	0	0	65535	The OEM/customer can use it to assign Parameter Version
Software Version	Fir		0	65535	Controller Software Version
Code number	onL		0	65535	Danfoss controller code number
OEM code low	oEL	0	0	65535	The OEM/customer can use it to assign their code number for their various applications
OEM code High	oEH	0	0	65535	The OEM/customer can use it to assign their code number for their various applications
Thermostat cut in temperature (°C)	CTi		-100	200	Thermostat cut-in temperature at current spindle position
Thermostat cut out temperature (°C)	CTO		-100	200	Thermostat cut-out temperature at current spindle position
Cabinet Air temperature (°C)	att		-100	200	Temperature of Cabinet Air sensor
Evaporator 1 temperature (°C)	Et1		-100	200	Temperature of Evaporator 1 sensor
Evaporator 2 temperature (°C)	Et2		-100	200	Temperature of Evaporator 2 Sensor
Condenser temperature (°C)	Ct1		-100	200	Temperature of condenser sensor
Door Status on S2	dr1		Close	Not Configured	Status of the door switch configured on S2 Port: Close: Door is closed Open: Door is open Not Configured: Door switch is not configured to this port
Door Status on S3	dr2		Close	Not Configured	Status of the door switch configured on S3 Port: Close: Door is closed Open: Door is open Not Configured: Door switch is not configured to this port
Di Switch Status on S2	Di1		Open	Not Configured	Status of the digital input configured on S2 Port: Open - Deactivated Close - Activated Not Configured- Di switch is not configured to this port
Di Switch Status on S3	Di2		Open	Not Configured	Status of the digital input configured on S3 Port: Open - Deactivated Close - Activated Not Configured- Di switch is not configured to this port
Spindle position (%)	uSp		0	100	Current position of the spindle: Warm- 0% Cold-100%
Relay 1 Status	R1S		OFF	ON	It displays the status of Relay 1 (ON / OFF)
Relay 2 Status	R2S		OFF	ON	It displays the status of Relay 2 (ON / OFF)
Relay 3 Status <i>(applicable only for EETa 3W)</i>	R3S		OFF	ON	It displays the status of Relay 3 (ON / OFF)
Thermostat status	thS		1	10	Controller operating status: 1 - Initial state 2 - Serving 3 - Eco Mode 4 - Initial Pull down (IPD) 5 - Pull down /Super cool Mode 6 - Emergency Mode 7 - Main Switch Off 8 - Holiday mode 9 - Automatic Heater Control mode 10 - Energy mode delay
Defrost status (stages)	dES		1	4	1 - Idle 2 - Ice off 3 - Drip off 4 - Cooling Preparation
Defrost interval counter - Comp. run time (Mins)	InC		0	32767	Defrost interval counter based on accumulated compressor runtime
Defrost Interval counter - Elapsed time (Mins)	Int		0	32767	Defrost interval counter based on elapsed time
Main Voltage	uAC		1	300	Main power supply voltage

## Troubleshooting

Problem	Probable cause	Remedy
Compressor does not start	Spindle is in "OFF" position Waiting for power on delay Cabinet air temperature is less than compressor cut-in temp. Defrost is in progress Line voltage is too low or too high  High condenser temperature	Change spindle position by rotating clockwise Check and wait until "Pod" expires Check cabinet air sensor temp. "att"  Check and wait until dAt and dot expires Check line voltages are within low and high voltage limits specified under uLi, uLo and uHo Check for condenser sensor temp'ct1' and configured condenser block limit'cbl'
Fan does not start	Door is open or door contact is defective	Check "Fdt" and door status. Check that door contact is ok
	Fan stopped due to high evaporator temp.	Check evaporator sensor temp. "Et1/Et2" and FLt.
	Fan start delay and temp. after defrost	Check for 'Fdd' and "Ftd" parameters' configuration
Defrost does not start	Controller in Initial Pull Down or Pull-down mode	Defrost is skipped during pull-down. Check the thermostat status and configured pull-down duration.
Alarm does not sound	Alarm delay	Check alarm delay for temperature 'Ltd /Htd' and door 'dod'
Does not maintain correct cabinet temperature	Cabinet air sensor fault	Check the S1 sensor and sensor alarm status
	Potentiometer fault	Check the controller potentiometer function
Frost is not fully melted during defrost	Evaporator sensor position not proper Too long defrost intervals Configured defrost time is too short	Check the position and fitting of the evaporator sensor Check for configured dii, dAi, dit and dAt values

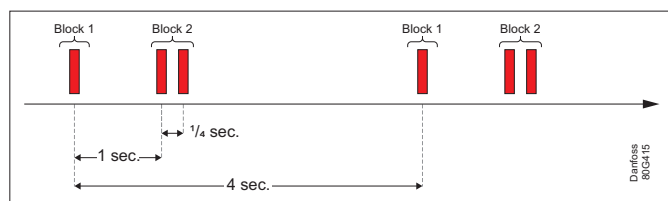
## Alarms

### Alarms (Advanced version only) Indication

The EET controller indicates the fault or failure in the refrigeration system via an LED flashing pattern, sending a message via MODBUS to KoolProg or any other tools. Below the LED blinking pattern for various alarms are stated:

No.	Fault	No. of flashes (Block 1)	No. of flashes (Block 2)
1	Low and High temperature alarm	1	1
2	Line Voltage Alarm	1	2
3	Condenser alarm	1	3
4	Sensor error	2	1
5	Potentiometer error	2	2
6	Leakage alarm	3	1

Ex: Indication of Line Voltage Alarm:



## Ordering

Type	I-Pack	
	Qty.	Code no.
EETc 12 - EET Compact, 1 relay, 230 V, 50/60 Hz	150	080N0010
EETc 22 - EET Compact, 2 relay, 230 V, 50/60 Hz	150	080N0011
EETc 11 - EET Compact, 1 relay, 120 V, 50/60 Hz	150	080N0012
EETc 21 - EET Compact, 2 relay, 120 V, 50/60 Hz	150	080N0013
<b>EETa 2W - EET Advanced, 2 relays, wide voltage (120 – 230 V), 50/60 Hz</b>		
EETa 2W - EET Advanced, 2 relays, wide voltage (120 – 230 V), 50/60 Hz	150	080N0014
<b>EETa 3W - EET Advanced, 3 relays, wide voltage (120 – 230 V), 50/60 Hz</b>		
EETa 3W - EET Advanced, 3 relays, wide voltage (120 – 230 V), 50/60 Hz	150	080N0015
<b>Temperature sensors</b>		
<i>-40 – +80 °C, PVC Standard, NTC 10K, Cabinet Sensor</i>		
S1, 1000 mm	150	080N0300
S1, 1500 mm	150	080N0301
S1, 2000 mm	150	080N0302
S1, 3000 mm	150	080N0303
<i>-40 – +80 °C, PVC Standard NTC 10K, Defrost Sensor</i>		
S2, 1500 mm, 2 Blue Stripes	150	080N0304
S2, 2000 mm, 2 Blue Stripes	150	080N0305
S2, 3000 mm, 2 Blue Stripes	150	080N0306
<i>-40 – +80 °C, PVC Standard, NTC 10K, Condenser Sensor</i>		
S3, 1000 mm, 1 Blue Stripe	150	080N0307
S3, 3000 mm, 1 Blue Stripe	150	080N0308

Type	I-Pack	
	Qty.	Code no.
<b>Magnetic door sensor</b>		
2000 mm	150	080N0311
3000 mm	150	080N0312
<b>Cable door sensor</b>		
2000 mm	150	080N0313
4000 mm	150	080N0314
<b>Hand knob</b>		
Black	480	077F8562
<b>Washer</b>		
Black with white print 0-9	480	077F8577
<b>Power plug*</b>		
4-pole with screw	50	080N0310
6-pole with screw	54	080G3357
<b>Programming</b>		
Please contact your nearest sales representative for more information.		

\* The connectors are rated for 28 Amps max.