

# MasterCase





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- ➔ **What MasterCase is**
- ➔ **Main Features**
- ➔ **Codes, models and options**
- ➔ **Installation**
- ➔ **Setting**
- ➔ **Trouble shooting**
- ➔ **Compared with competitors (Danfoss)**



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# What MasterCase is



- ➔ It's a new controller for cabinet and cold room in **centralized plant** applications (e.g. supermarket)
- ➔ It's a controller "two in one": electric power and electronic brain in the same plastic case



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# Main Features



- ➔ **Very compact solution**
- ➔ **220V outputs (direct control of electrical charge)**
- ➔ **Standard user interfaces**
- ➔ **Master-Slave configuration (LAN connection)**
- ➔ **Connection to supervisory system**
- ➔ **EEV direct control**



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# Codes, models and options

## CODES

**MGE0000010**  
**MGE0000020**

**MasterCase standard**  
**MasterCase with EEV Driver built-in**



## USER INTERFACES

**PST00VR100**  
**PST00SR300**  
**digits)**  
**PST00LR200**  
**digits)**

**Remote display**  
**Small user interface (3 back lit buttons, 3**  
**Large user interface (8 back lit buttons, 4**



# Codes, models and options

## OPTIONS

**MGECON0010**  
**MGECON0020**  
**Driver**



**Kit connectors for MasterCase standard**  
**Kit connectors for MasterCase with EEV**

**MGEOPZSER0**  
**Board**

**RS485 Serial**



**MGEOPZCLK0**

**RTC Clock Board**



**PSOPZKEY00**

**Hardware Key**





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# Contents

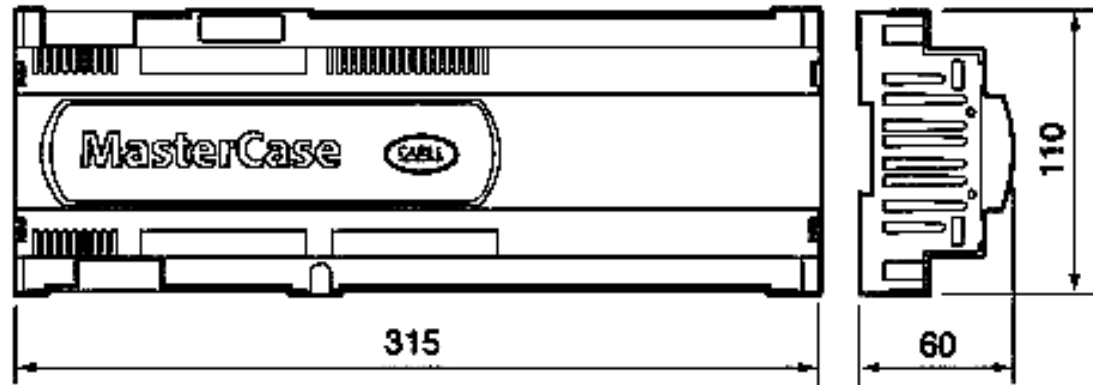
- ➔ What MasterCase is
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# Installation

**Very compact solution**

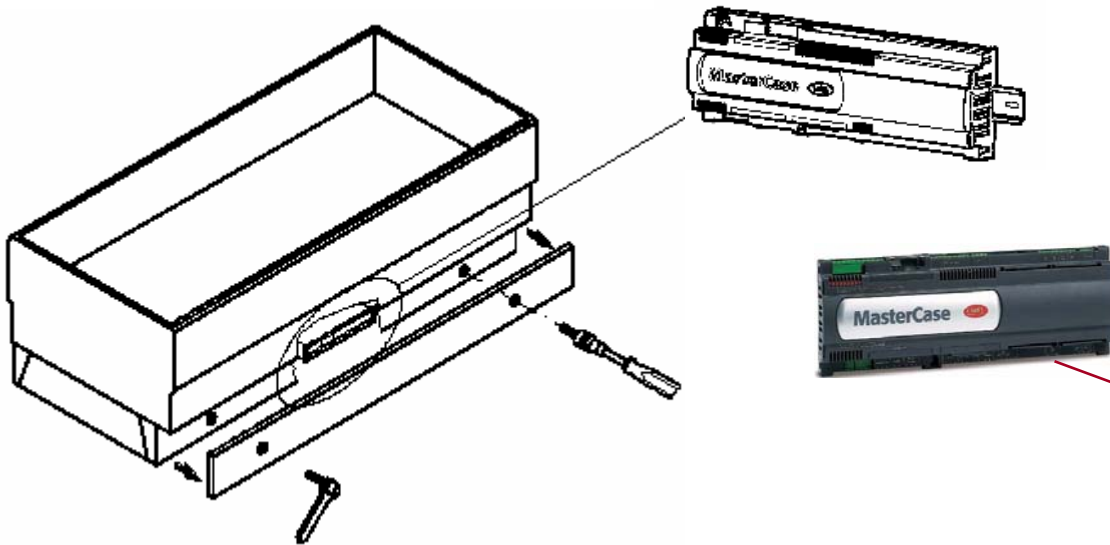


Montaggio su guida DIN



# Installation

Thanks to the dark-coloured plastic case, the narrow and long shape and the DIN mounting brackets, MasterCase is especially good for supermarket environments to be mounted in the low part of the cabinet



# Installation

**LAN Connection**

**User Interface Connection**

**Supervisor Connection**

**Ratiometric Press. Transducer**

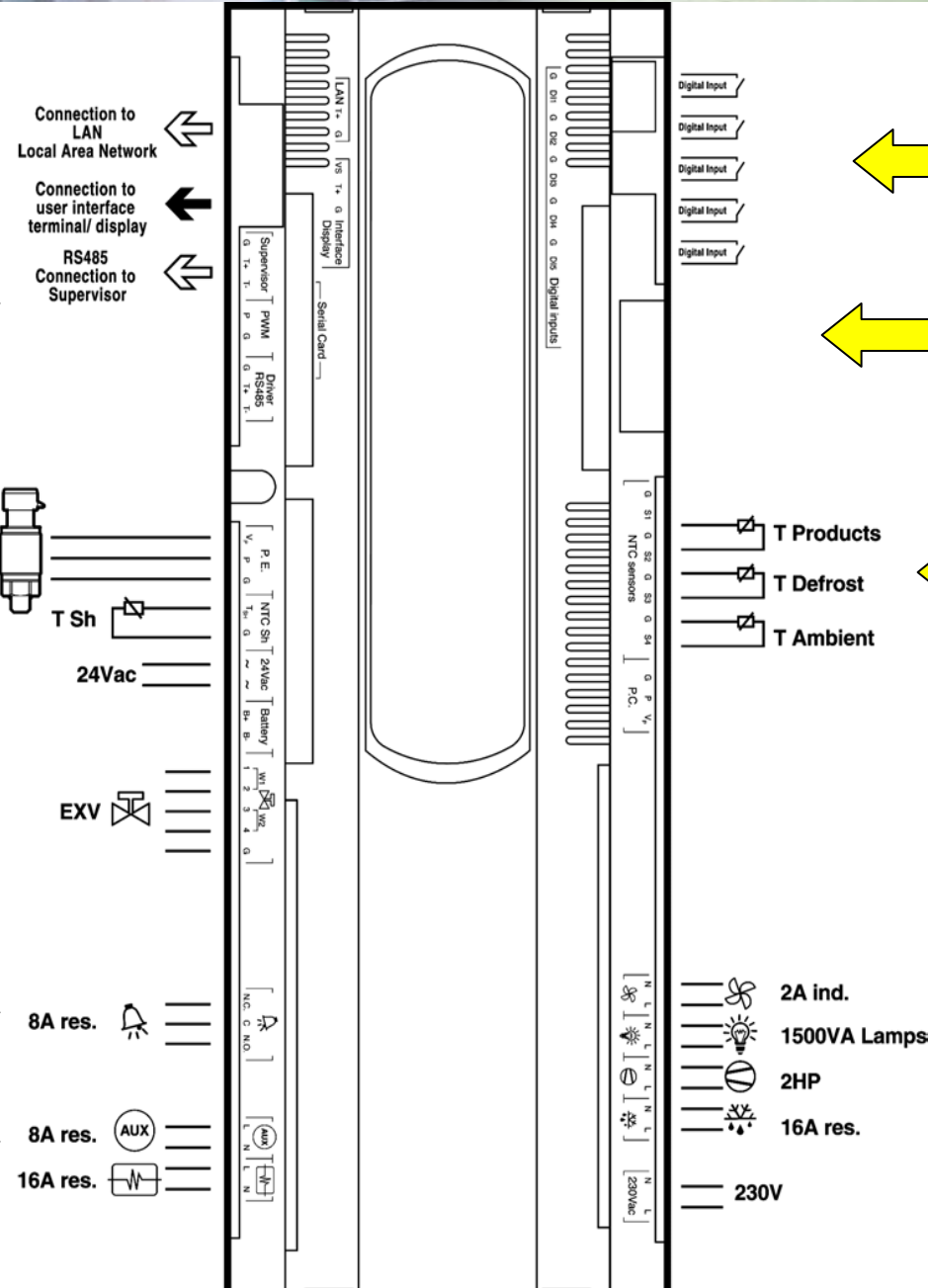
**Superheat Temp. Probe**

**Valve Driver Supply**

**EEV**

**Output Alarm Relay**

**Outputs Aux Relay**



**Digital inputs**

**Programming Key**

**Probes**

**Outputs Loads**

Cont.



# NTC standard probes

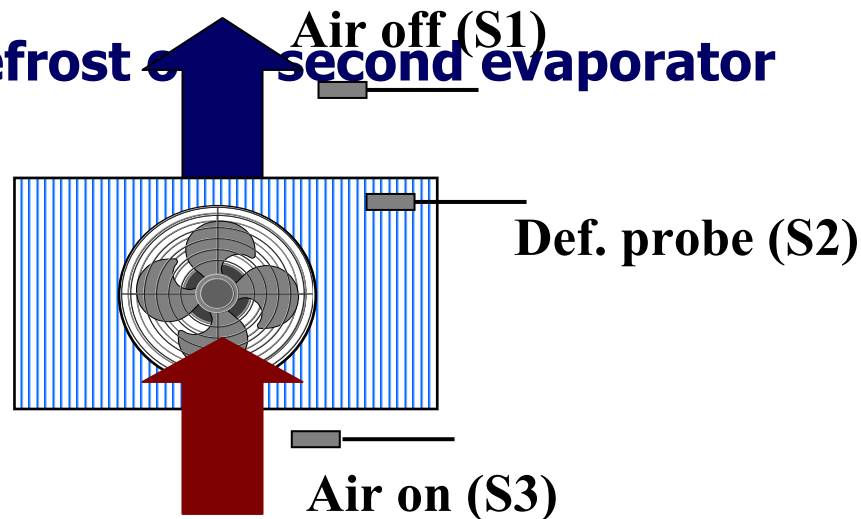
- **NTC\*WP00:**  
range  $-50 \div 105^{\circ}\text{C}$   
IP67  
dim. 6 x 40 mm
- **NTC\*HP00:**  
range  $-50 \div 50^{\circ}\text{C}$   
IP68  
Dim. 6 x 15 mm

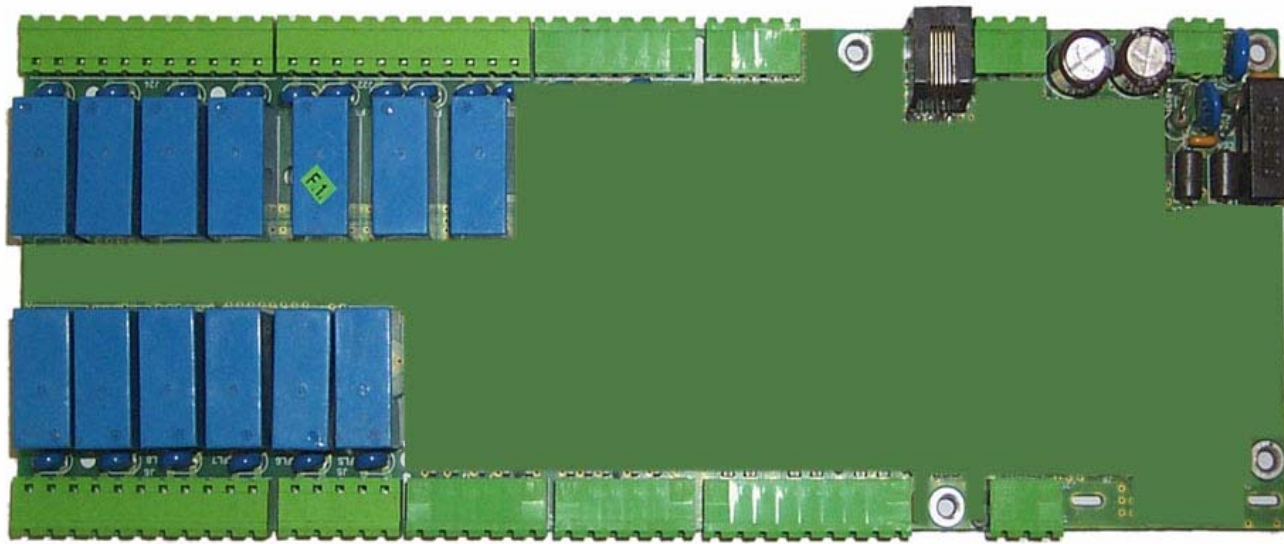


*(\* ) 0,8 - 1,5 - 3 - 6 m  
cable*

# Why three probes?

- The first one is for the usual thermostat regulation (S1)
- The second one is the defrost-end probe (S2)
- The third one (S3) is used for:
  - measuring the temperature in the hot point (EN441)
  - calculating the value of the Virtual regulation Probe
  - managing the defrost of the second evaporator












**MGE:**  
**the**  
**Concept**



**A standard module with**  
**all the electronics and the**  
**software inside.**

# Outputs / Loads

	<u>Sol. Valve:</u>	2HP 12(12)A-250Vac
	<u>Defrost:</u>	1HP 12(4)A-250Vac
	<u>Fan:</u>	1HP 12(4)A-250Vac
	<u>Light:</u>	2HP 12(12)A-250Vac fluorescent Lamp 1000VA-110uF
	<u>Rail Heat (Aux2):</u>	1HP 12(4)A-250Vac
	<u>Aux1:</u>	1HP 12(4)A-250Vac
	<u>Alarm:</u>	SPDT contact, 1HP 12(4)A-250Vac

***Connections: max. continuous current for all the activated relays 12A***



**SIEMENS**

**Settore  
COMPONENTI ELETTROMECCANICI**

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 E-Mail: Pierluigi.Terruzzi@siemens.it

Per FAX, pagine in totale (1)

**CERTIFIED:**

**2HP 12(12)A-250Vac**



**OGGETTO: COMPRESSOR LOAD**

application 1: load compressor, 2 hp, Inrush current 70Apeak, I non. 9A, T = 40°C,  
 duty cycle 6 op./hour.

application 2: load compressor, 2 hp, Inrush current 36Apeak, I non. 9A, T = 40°C,  
 duty cycle 6 op./hour.

We estimated as follow:

The max. duration of the 70Apeak inrush current is 1 sec.  
 The max. duration of the 36Apeak inrush current is approx. 3 sec.

power	Iin	Ioff	relay type	expected contact life
2 hp	70A	9A	RP3SL	250.000 - 300.000 ops.
2 hp	36A	9A	RP3SL	300.000 - 350.000 ops.

Terruzzi Pier Luigi

Siemens S.p.A.  
 Settore EC



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# *Power relays: plus given*

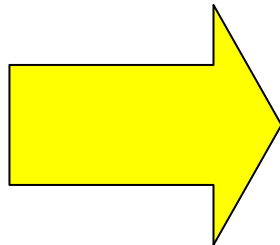
**With *MasterCase* no additional electrical panel is required**



## Yesterday

- CONTROLLER
- POWER RELAYS
- ADDITIONAL CONNECTORS
- FUSES
- WIRING

**TODAY**



# Digital inputs

***Each digital input can be simply configured through a parameter***

A1..5 Digital input configuration

C 0 10 - 0

0= disabled

1= immediate external alarm

2= delayed external alarm

3= enable defrost from external contact

4= start defrost from external contact

5= door switch

6= Remote ON/OFF

7= curtain switch

8= duty setting activation

9= door switch with compressor ON

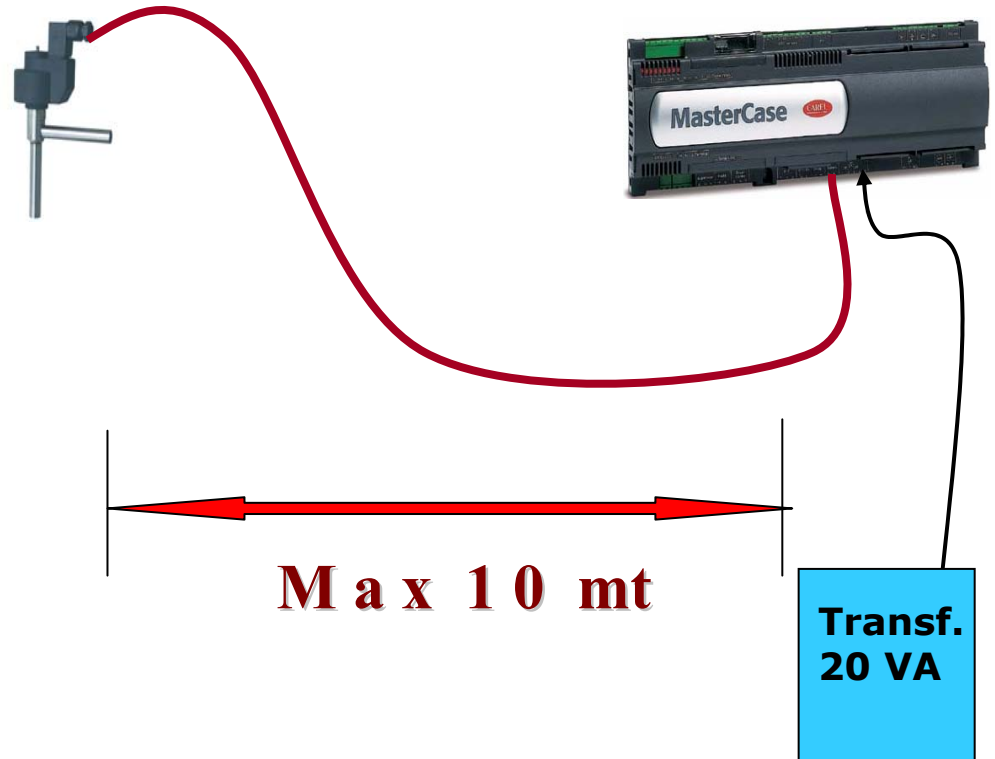
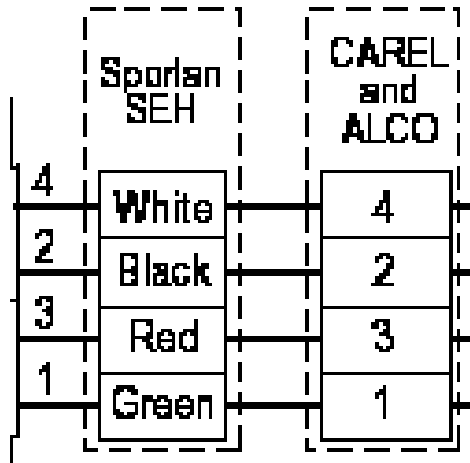
10= periodical cabinet cleaning

**Note: it is not possible to configure two DI  
with the same value  
A1 ≠ A2 ≠ ... ≠ A5**



# EEV connection

## Connections:



*Note: for models MGE0000020, where a series of units are installed in the same electrical panel, do not supply the 24Vac power using one transformer, but use a separate transformer for each MasterCase.*





# The NTC fast

- NTC015WF00:  
–50 ÷ 105°C with 1,5m cable
- NTC030WF00  
–50 ÷ 105°C with 3m cable
- NTC060WF00  
–50 ÷ 105°C with 6m cable





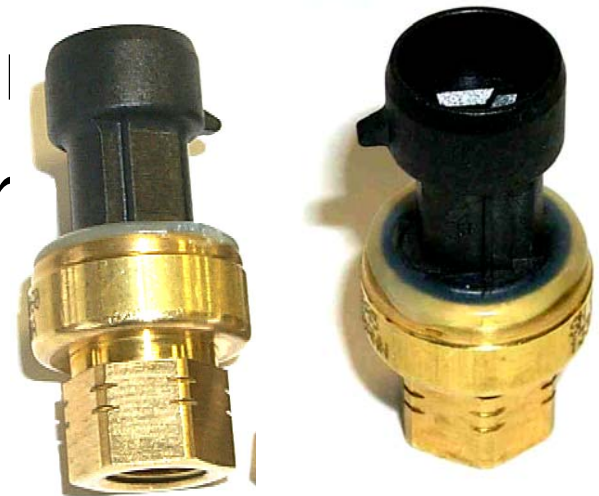
# NTC fast advantages

- Suitable for antifreeze operation
- Suitable for advanced temperature control algorithm with feedback
- Suitable when a quick response is needed



# Ratiometric pressure sensor

- **Brass Female Ratiometric with Packard connection:**
- 0 ÷ 75psi (0 ÷ 5,17Bar)
- 0 ÷ 150psi (0 ÷ 10,34Bar)
- 0 ÷ 500psi (0 ÷ 34,5Bar)

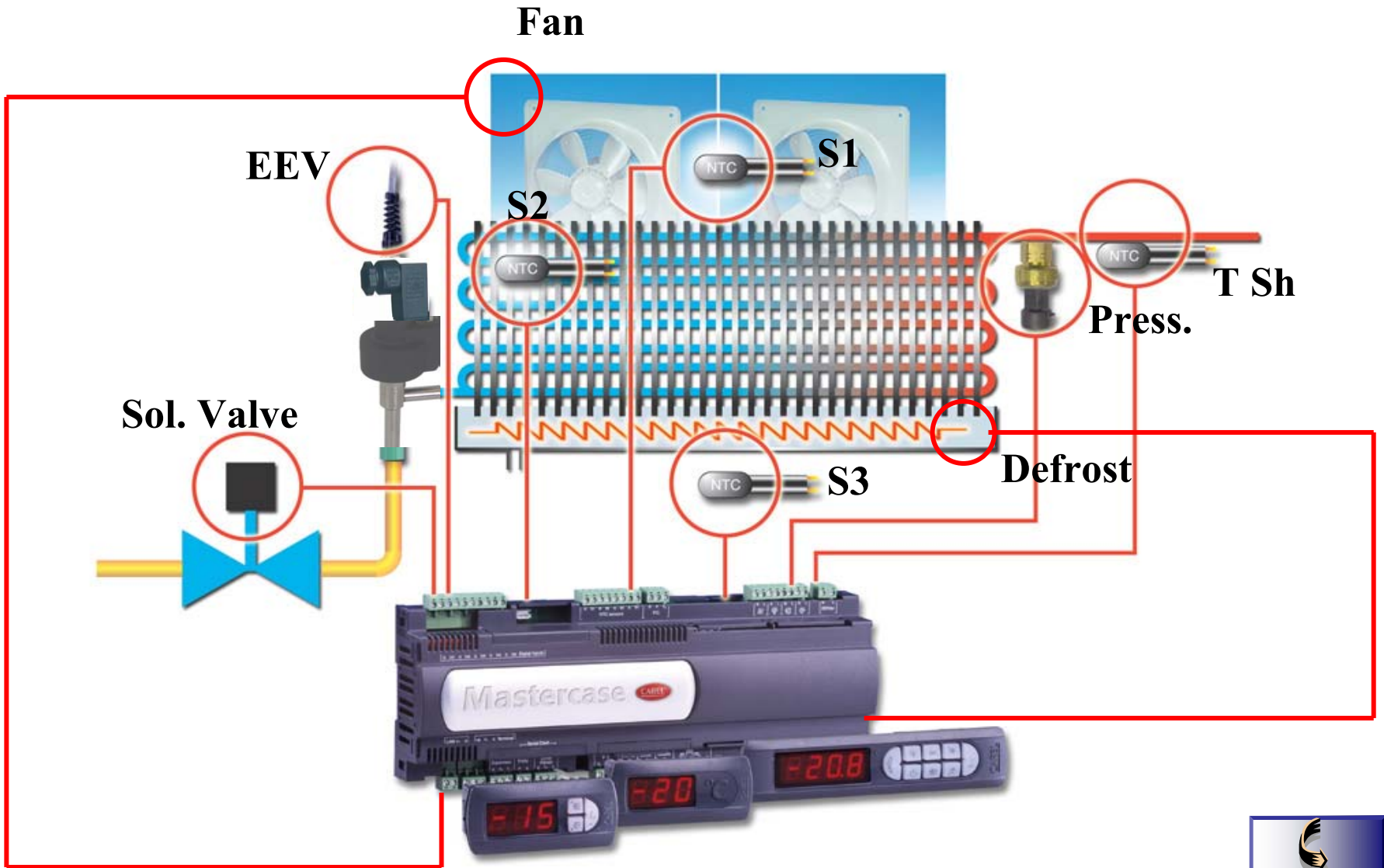


# Ratiometric advantages

- Small dimensions
- Automotive electrical Packard connection (new world standard)
- IP65 index of protection
- New standard signal  $0 \div 5\text{Vdc}$  ( $0,5 \div 4,5\text{Vdc}$ )
- Low price

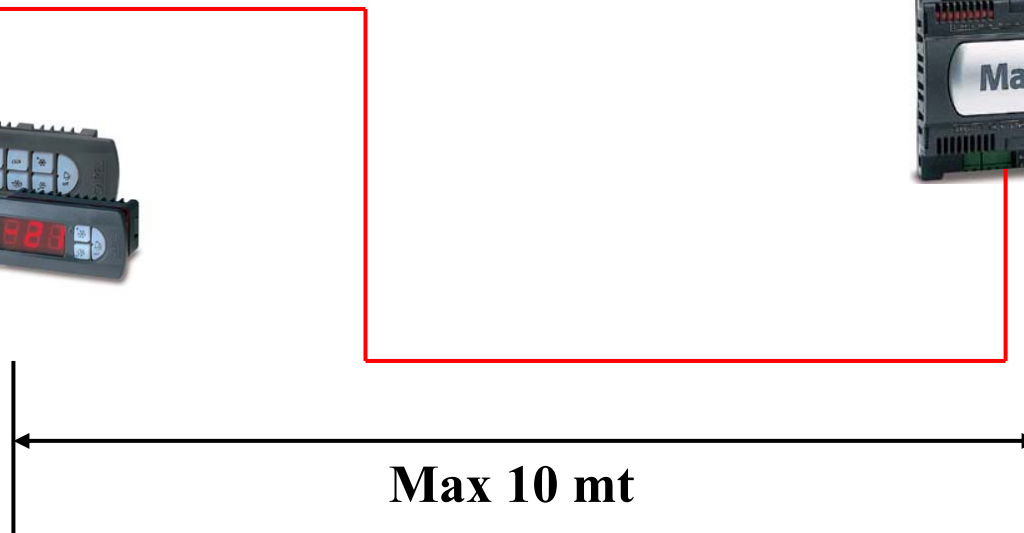


# Plant connections

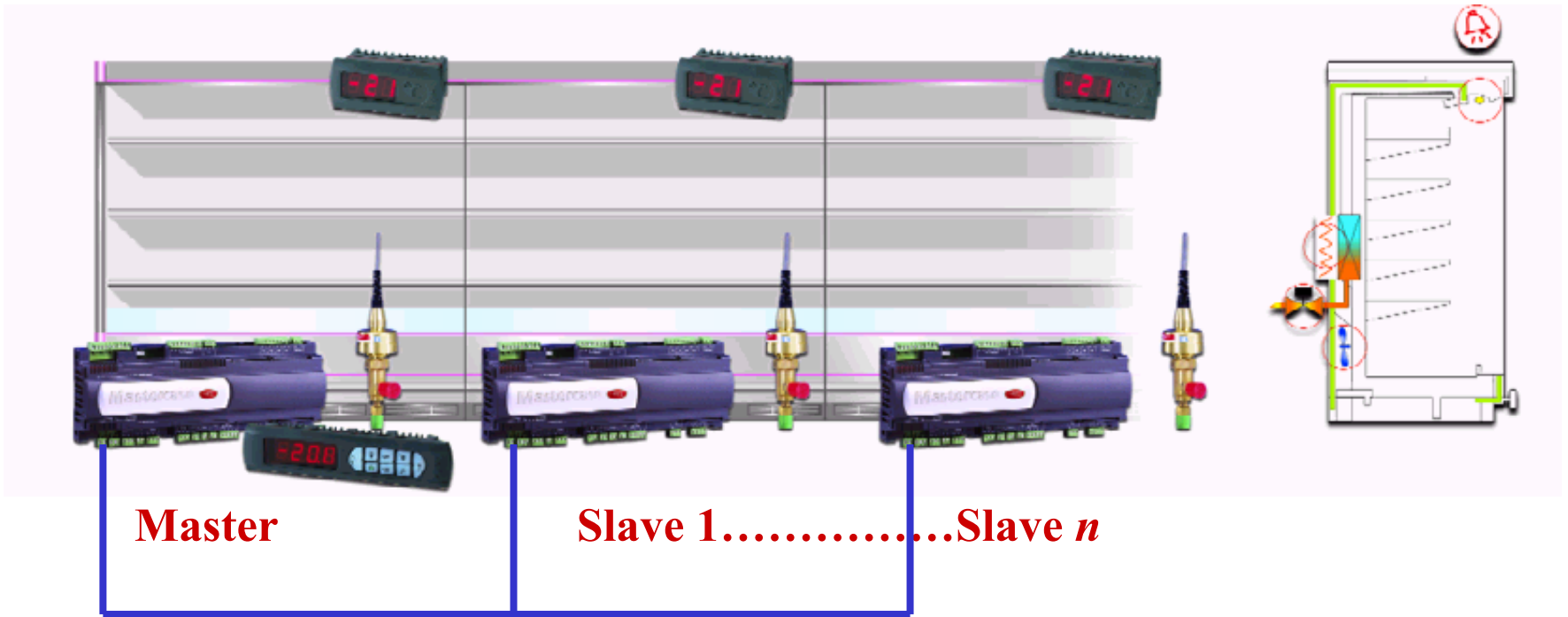


# User Interfaces

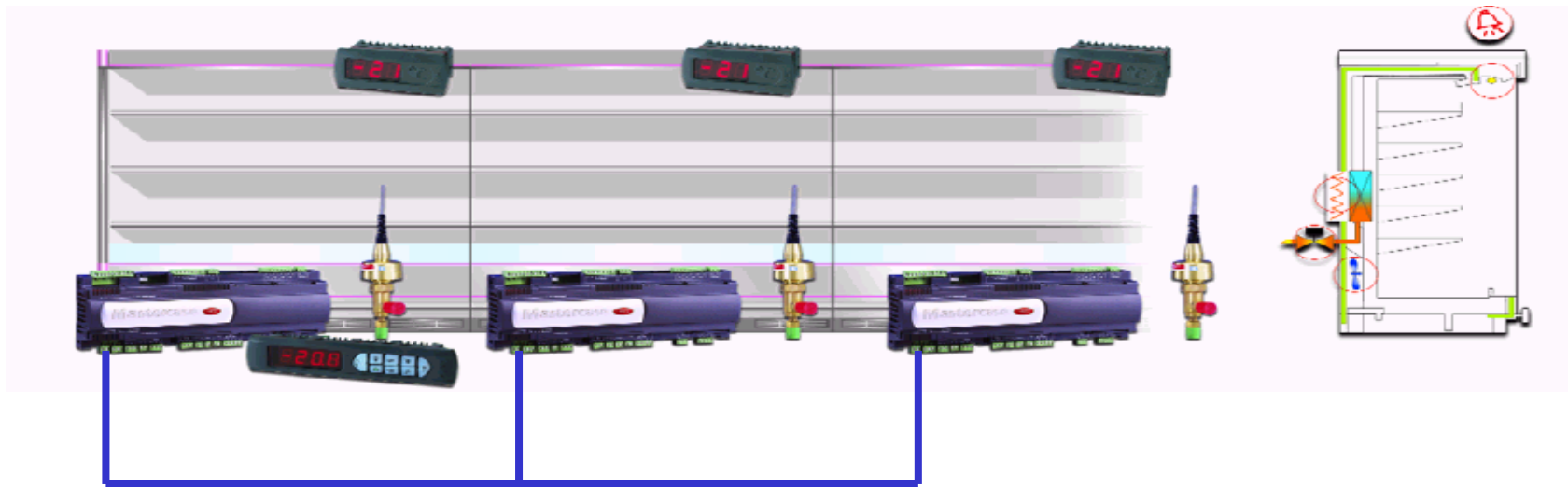
- Standard User Interfaces (fewer codes)
- They are not required for the working, but only for the setting
- They can be connected and disconnected during the running (hot connection)



# Master-Slave configuration



# Master-Slave configuration



## LAN features

- synchronized defrosts
  - slaves alarms visualized on the Master
  - transmission of pressure probe value and/or regulation temperature from Master to Slaves
- (reducing wiring time and saving probes and money)





# Programming Key

**It works without any power supply**

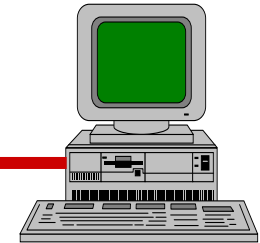
- **...download from the key**
- **... or upload on the key**
- **a LED turns from red to green to confirm correct functioning**
- **the same key of others Carel**

***NOTE: If the hardware key (code PSOPZKEY00) is used to program the instrument, the operation must be performed only when the MasterCase is not powered (230Vac terminals disconnected) and, for models MGE0000020, when the driver board for electronic valves is powered (24Vac terminals).***

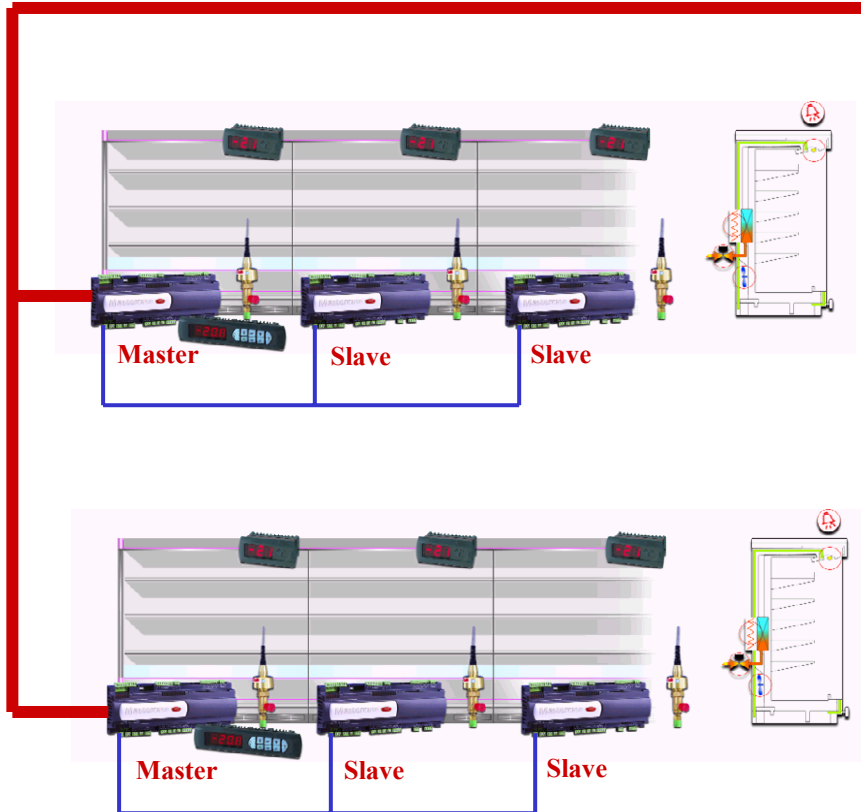


# Supervisory system

RS485



*PlantVisor*®



**Master works  
as a gateway  
for Slaves**





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# Setting

## Probes and regulation

<i>p</i>	<i>/7</i>	Remote Display management 0 = absent 1 = ambient probe (S1) 2 = defrost probe (S2) 3 = product probe (S3) 4 = regulation probe [virtual] 5 = interface module probe	C	0	5	flag	0	•
	<i>/9</i>	Defrost with probe 3 as well: 1 = the defrost in temperature ends when the temperature detected by probe 2 and also probe 3 are $\geq$ the temperature set with the "dt" parameter	C	0	1	flag	0	•
	<i>/A</i>	Probe present 0 = defrost probe and third probe: absent 1 = defrost probe absent and probe 3: present 2 = defrost probe present and probe 3: absent 3 = both defrost probe and probe 3: present 4 = control probe "set" by the master	C	0	4	flag	0	•
	<i>/t</i>	User interface management 0 = absent 1 = ambient probe (S1) 2 = defrost probe (S2) 3 = product probe (S3) 4 = regulation probe [virtual] 5 = interface module probe	C	0	5	flag	4	•
	<i>rd</i>	Regulator differential (hysteresis)	F	0	19.9	°C/°F	20	

 It's important to set the right correspondence to the existing probes. */A* = 4 allows Slaves to use the regulation probe of the Master

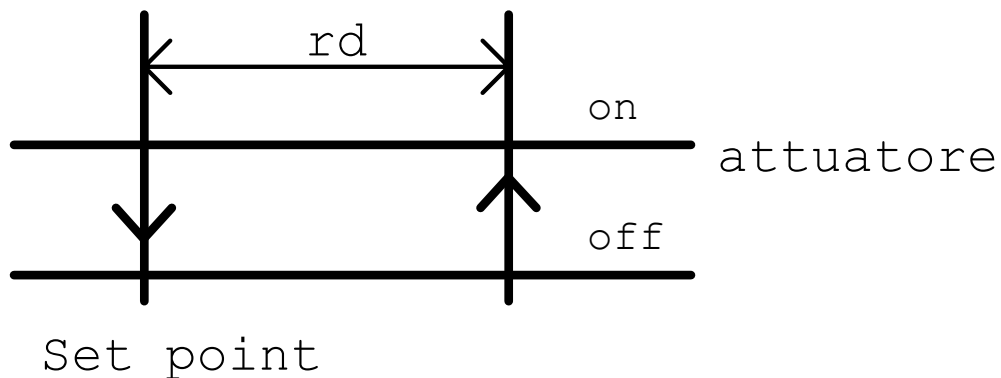
# Setting

## *Probes and regulation parameters*

→	St	Temperature set-point	F	r1	r2	°C/°F	-100	•
→	/4	virtual probe between 1 probe and 3 probe	C	0	100	%	0	•
	/6	Decimal point enabling (0 = No, 1 = Yes)	C	0	1	flag	1	•

→ **Basic parameters for the good functioning of the plant**

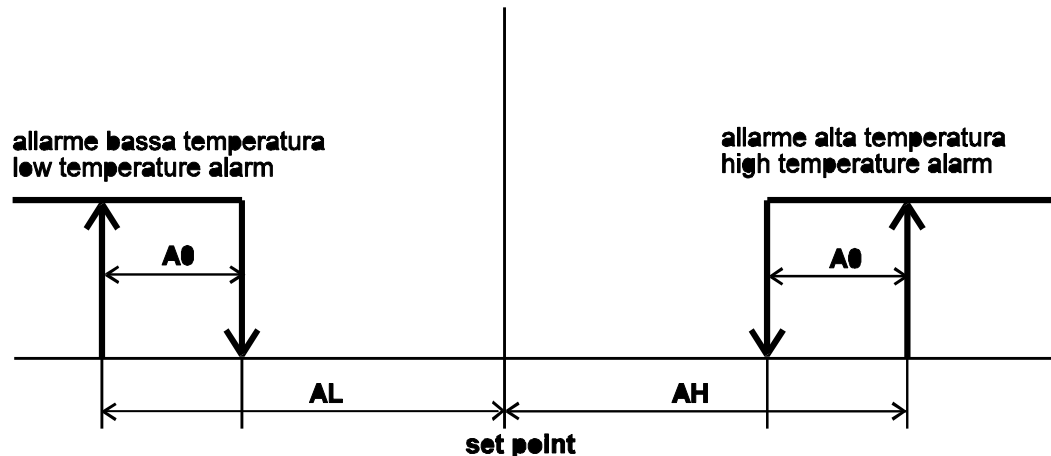
Direct (freddo/cooling)



# Setting

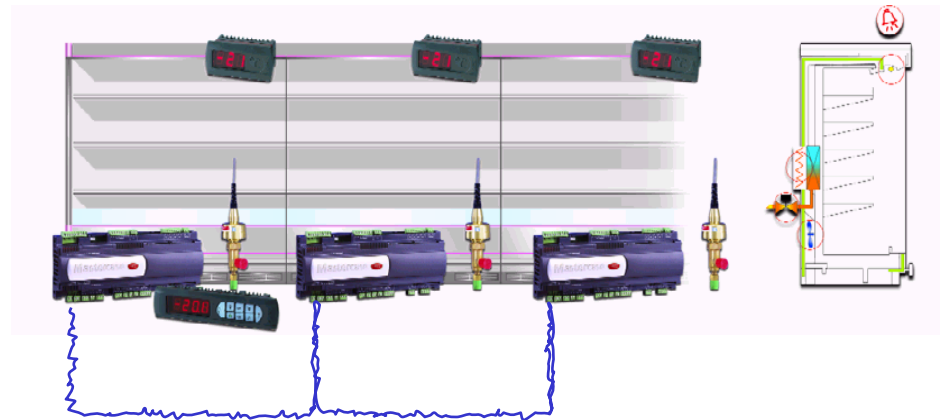
## Alarm parameters

A ALARM PARAMETERS						
AH	High temperature alarm: indicates the max. variation with respect to the set-point.					
	AH = 0 excludes the high temperature alarm	F	0	20.0	°C/°F	0.0 •
AL	Low temperature alarm: indicates the max. variation with respect to the set-point.					
	AL = 0 excludes the low temperature alarm	F	0	20.0	°C/°F	0.0 •
A0	Alarm return and fan activation differential	C	0	199	°C/°F	0,2 •
Ad	Temperature alarm delay	C	0	19.9	min	120 •



# Setting

## *LAN Parameters*



<b>Sn</b>	<b>Number of Slaves (0= LAN not present)</b>	<b>C</b>	<b>0</b>	<b>5</b>	<b>-</b>	<b>0</b>
<b>H0</b>	<b>Serial address</b>	<b>C</b>	<b>0</b>	<b>199</b>	<b>-</b>	<b>1</b>
<b>In</b>	<b>Configuration parameter of the single unit as Master (In = 1) or Slave (In = 0)</b>	<b>C</b>	<b>0</b>	<b>1</b>	<b>flag</b>	<b>0</b>



# Setting

## *Supervisory*



<b>H0</b>	<b>Serial address</b>	<b>C</b>	<b>0</b>	<b>199</b>	<b>-</b>	<b>1</b>
-----------	-----------------------	----------	----------	------------	----------	----------

### Serial address in the Masters:

$$H0 = H0\_Master\_prec + Sn\_Master\_prec + 1$$

# Setting

## *EEV Parameters*

VALVE PARAMETERS						
P1	Valve model	C	0	1	-	0
P3	Superheat setpoint	C	0.0	30.0	°C	3.0
→ PA	Enable transmission Master to slave probe	C	0	1	flag	0
→ Pb	Pressure probe from Master	C	0	1	flag	0
Pc	Delay pressure probe alarm	C	0	255	min	5
PE	Superheat (read only parameter)	C	-	-	°C	-
PH	Gas type: 0 = R134a; 1 = R22; 2 = R404a 3 = R410a; 4 = R407c	C	0	4	-	3
PI	Evap. Probe pressure range	C	0	2	-	0

→ **Setting “PA” = 1 in the Master and “Pb” = 1 in the Slave, the pressure sensor value is transmitted from Master to Slaves**

# Setting

## Defrost

### Parameters

<b>d DEFROST PARAMETERS</b>							
d0	Type of defrost 0= heater: it ends for temperature and/or time out 1= hot gas: it ends for temperature and/or time out 2= heater: it ends for time out 3= hot gas: it ends for time out	C	0	3	flag	0	
dd	Dripping time	F	0	15	min	2	•
dl	Interval between two defrosts (activated for defrosts without RTC)	F	0	192	hours	8	•
dP	Max. defrost duration	F	1	19.9	min	30	•
dt	End defrost temperature	F	-50.0	19.9	°C/°F	4,0	•

# Setting

## *HACCP Parameters*

<i>t</i>	<b>HACCP PARAMETERS</b>					
<i>tr</i>	<i>HACCP alarm delay (0 = disabled)</i>	<i>C</i>	<i>0</i>	<i>199</i>	<i>min.</i>	<i>0</i>
<i>tA</i>	<i>HACCP alarms type: 0 no alarms; 1 HA alarm; 2 HF alarm</i>	<i>C</i>	<i>0</i>	<i>2</i>		<i>0</i>
<i>tO</i>	<i>Last HACCP alarm: day</i>	<i>C</i>	<i>0</i>	<i>7</i>	<i>day</i>	<i>0</i>
<i>tH</i>	<i>Last HACCP alarm: hour</i>	<i>C</i>	<i>0</i>	<i>23</i>	<i>hours</i>	<i>0</i>
<i>tM</i>	<i>Last HACCP alarm: minute</i>	<i>C</i>	<i>0</i>	<i>59</i>	<i>min</i>	<i>0</i>
<i>tt</i>	<i>Max. temperature sensed during HACCP alarm</i>	<i>C</i>	<i>-50.0</i>	<i>90.0</i>	<i>°C/°F</i>	<i>-50.0</i>
<i>tE</i>	<i>HACCP alarm duration</i>	<i>C</i>	<i>0</i>	<i>199</i>	<i>hours</i>	<i>0</i>
<i>to</i>	<i>HACCP alarms reset</i>	<i>C</i>	<i>0</i>	<i>1</i>	<i>flag</i>	<i>0</i>



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# Trouble shooting

<b>ALARM CODE</b>	<b>BUZZER and AUX relay</b>	<b>DESCRIPTION</b>	<b>MODELS featured</b>
<i>rE</i>	<i>active</i>	<i>control probe error</i>	<i>ALL</i>
<i>E1</i>	<i>not active</i>	<i>room probe error</i>	<i>ALL</i>
<i>E2</i>	<i>not active</i>	<i>defrost probe error</i>	<i>ALL</i>
<i>E3</i>	<i>not active</i>	<i>probe 3 error</i>	<i>ALL</i>
<i>E0</i>	<i>not active</i>	<i>Display Interface probe error (being displayed)</i>	<i>ALL</i>
<i>IA</i>	<i>active</i>	<i>immediate external alarm</i>	<i>ALL</i>
<i>dA</i>	<i>active</i>	<i>delayed external alarm</i>	<i>ALL</i>
<i>L0</i>	<i>active</i>	<i>low temperature alarm</i>	<i>ALL</i>
<i>HI</i>	<i>active</i>	<i>high temperature alarm</i>	<i>ALL</i>
<i>EE</i>	<i>not active</i>	<i>data saving error</i>	<i>ALL</i>
<i>HA</i>	<i>active</i>	<i>HA HACCP alarm</i>	<i>ALL</i>
<i>HF</i>	<i>active</i>	<i>HF HACCP alarm</i>	<i>ALL</i>
<i>Ed</i>	<i>not active</i>	<i>defrost ended for timeout</i>	<i>ALL</i>
<i>dr</i>	<i>not active</i>	<i>door switch error (door open timeout)</i>	<i>ALL</i>
<i>Id</i>	<i>active</i>	<i>duty setting alarm from digital input</i>	<i>ALL</i>
<i>CCM</i>	<i>active</i>	<i>case clean management</i>	<i>ALL</i>
<i>PEC</i>	<i>active</i>	<i>communication alarm with driver board</i>	<i>only MGE0000020</i>
<i>PES</i>	<i>active</i>	<i>driver board probe alarm</i>	<i>only MGE0000020</i>
<i>L01</i>	<i>active</i>	<i>minimum temperature probe S1 alarm</i>	<i>ALL</i>
<i>dF</i>	<i>not active</i>	<i>defrost running</i>	<i>ALL</i>
<i>tC</i>	<i>not active</i>	<i>RTC invalid</i>	<i>Master with RTC</i>
<i>MA</i>	<i>not active</i>	<i>Lost contact with the Master</i>	<i>Slave units</i>
<i>uX (X= 1,...5)</i>	<i>not active</i>	<i>Slave X not communicating</i>	<i>Master unit</i>
<i>nX (X= 1,...5)</i>	<i>active</i>	<i>Slave X in alarm</i>	<i>Master unit</i>
<i>dX (X= 1,...5)</i>	<i>not active</i>	<i>Download to Slave X failed</i>	<i>Master unit</i>



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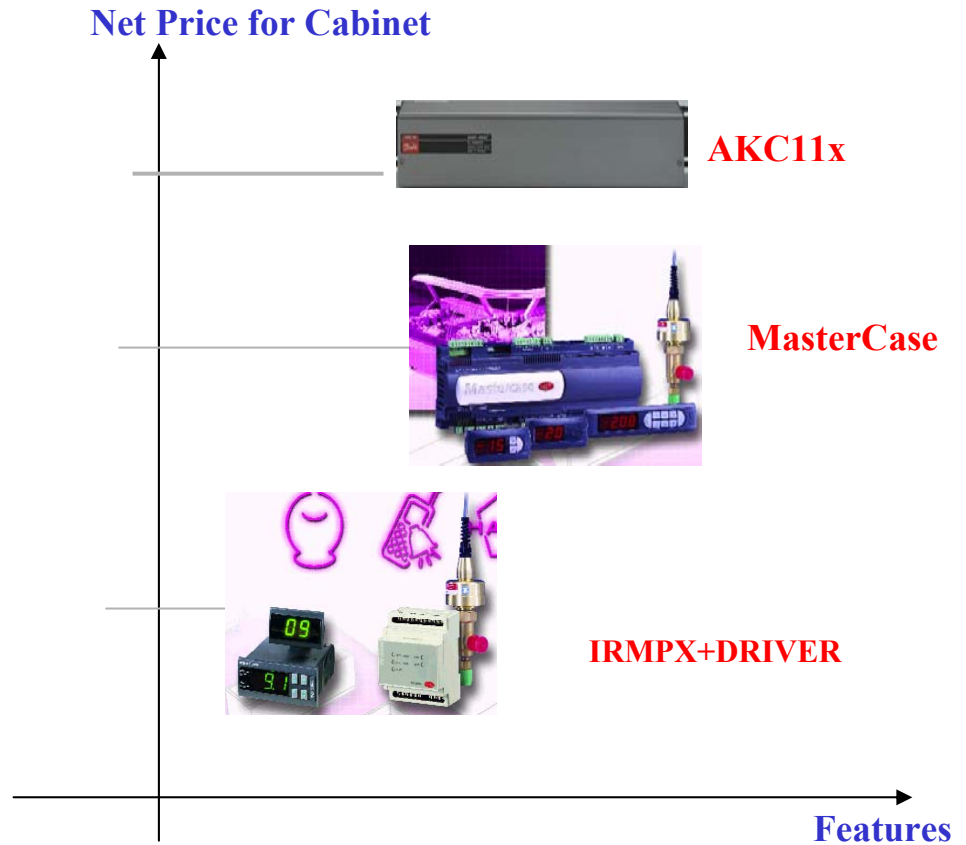


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(Danfoss)**

# Carel vs Danfoss

- *Lower price for case controller (average -15/20%)*
- *proportional valve*
- *programming via Key*
- *powerful relays*
- *LAN configuration (up to 6 evap.)*





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