HC45 VENTILATION

POLA®

TABLE OF CONTENTS

The symbol placed at top of every paragraph indicates:

 : Settings to be performed only at plant start-up they determine working mode suited for the kind of plant existent (heating, equipments, flap tipology, etc.).

 : User common settings normally used during operation procedures (temperature, settings, speed, etc.).

 : View only operations (temperature, speed, etc.) without changing settings.

The setting mode is the same for the various programs you want to run:

Select function desired pushing appropriate ideogram key

after push for start-up settings or for common settings.

At this point the message related to the parameter to be set will appear on display in alternance with the parameter value: use to increase, or to decrease the value to be set, when required value has been reached, push for entering data.

In the case of sequential settings at this point the next parameter message will appear; act as already explained.

At the last settings the system will return in normal operating mode.

To escape from operation setting push the specific flashing key.

HEAT SETTING 👉

Press **HEAT** and then **ENTER**:
this message will be displayed instead of the
°C Heat temperature value.
Press **+** or **-** to modify, press **ENTER** to exit.

$$\boxed{\text{E.HEA}}$$

HEAT PARAMETERS PROGRAMMING 🔧

Press **HEAT** together with **SERVICE**:
this message will be displayed.

Press [ENTER ⬆] to go forward, press [⬆ +] or [⬇ -] to modify.

$$\boxed{\text{S.E.r.u.}}$$

$\boxed{\text{d.HEA}}$ *°C heating differential.*

At this point pressing **ENTER** you can return at the beginning of the programming list
(message ***S.E.r.v.*** will be displayed).
You can press **SERVICE** at any time to exit and return to the run mode.

HEATING OPERATIVE DIAGRAMS

Heating

ON

d.HEA

HEAT

1/2 d.HEA 1/2 d.HEA

OFF

t.HEA

Ambient temperature probe reading
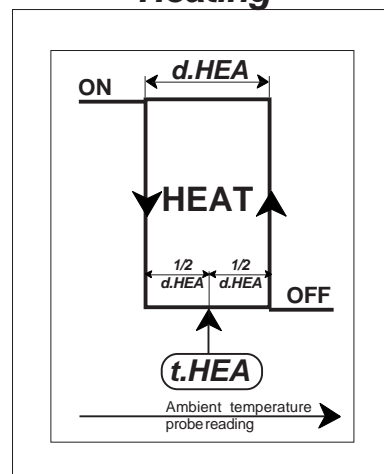
VENTILATION SETTINGS 👈
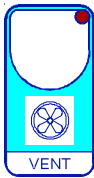
Press **VENT** and then **ENTER**:
this message will be displayed instead of the
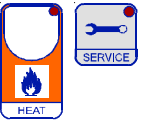*°C Ventilation temperature value.*
Press **+** or **-** to modify, press **ENTER** to confirm.

`t.uEn`

At this point this message will be displayed instead of the
Minimum step.
Press **+** or **-** to modify , press **ENTER** to confirm.

`SP.__`

If the Minimum step is set to **=0** at this point this message will
be displayed instead of the *Set shutter running time (in minutes).*
Press **+** or **-** to modify , press **ENTER** to confirm.

`t.on.P`

At this point this message will be displayed instead of the
Set shutter dwell time (in minutes).
Press **+** or **-** to modify , press **ENTER** to confirm.

`t.oF.P`

At this point this message will be displayed instead of the
Set shutter step number.
Press **+** or **-** to modify , press **ENTER** to exit.

`PArt`

VENTILATION PARAMETERS PROGRAMMING 🔧
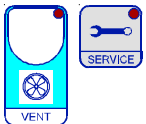
Press **VENT** together with **SERVICE**:
this message will be displayed.
Press 🔼 to go forward, press 🔼 or 🔽 to modify.

`S.E.r.u.`

`ProP` *°C Ventilation proportional band [1].*

`StAr` *Start ventilation action mode [2].*
   =0 ; 0 to 1 step becomes in normal mode
   =1 ; 0 to 1 step becomes with a momentary 10 seconds at speed 2.
   =2 ; 0 to 1 step becomes with a momentary 5 seconds at speed 3.

`ri.F.F` *Speed step on delay seconds.*

At this point pressing **ENTER** you can return at the beginning of the programming list
(message **S.E.r.v.** will be displayed).
You can press **SERVICE** at any time to exit and return to the run mode.

[1] It is the complete ventilation proportional band (from lower value ventilation it starts at 1st step at
temperature set on VENT key **(t.vEn)** and reaches last step at temperature **t.vEn+Prop**).
[2] These settings permit to make an easier opening of shutters on ventilators.

Ventilation

The connection of ventilation steps can be:
- Speed regulation (each step start turns off the former step)
- Progressive order (9-10 terminals closed); each step start
  maintains the former step.

If Minimum speed is programmed to 0 *(SP._ _=0)*, when the ventilation is off it is possible to insert a cyclical operation of minimum speed, compound with a time of ventilators turn on *(t.on.P)*, with a time of ventilators turn off *(t.oF.P)*, and with selected speed number during fan's shuttering operation *(Part)*.

Step from **0** to **1** speed works according to selected mode in **VENT-SERVICE**, *StAr* function.

t.vEn

0.2^t

OFF V1 ON | t.on.P | t.oF.P
OFF V1 ON | t.on.P | t.oF.P
OFF V1 ON | t.on.P | t.oF.P
OFF V1 ON

V2 ON 0.2^t
V3 ON 0.2^t
V4 ON 0.2^t
V5 ON 0.2^t

1/4 ProP | 1/4 ProP | 1/4 ProP | 1/4 ProP

ProP *1

V5 ON

TEMPERATURE
Ambient temperature probe reading
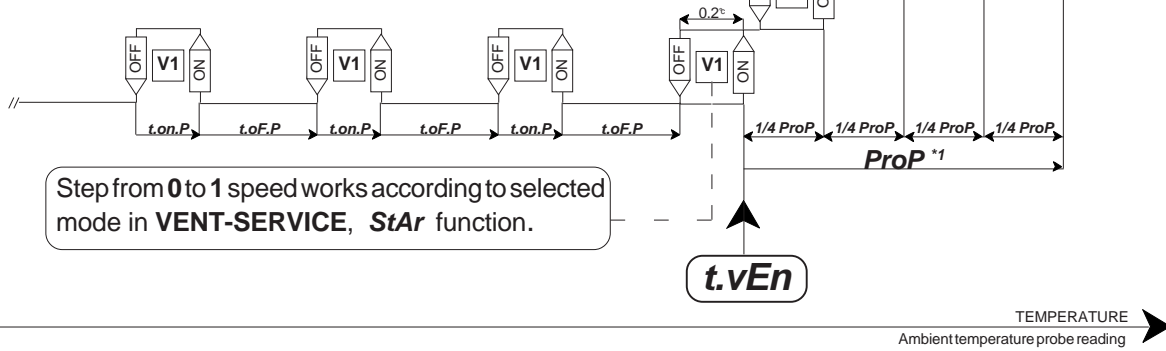
COOLING SETTING 👉

Press **COOL** and then **ENTER**:
this message will be displayed instead of the
°C Cooling temperature value.
Press **+** or **-** to modify , press **ENTER** to confirm.

```
t.COL
```

COOL PARAMETERS PROGRAMMING 🔧
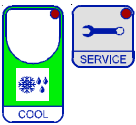
Press **COOL** together with **SERVICE**:

this message will be displayed.

Press 🔼 to go forward, press 🔼 or 🔽 to modify.

```
S.E.r.u.
```

```
d.COL
```
°C Cool temperature differential.

At this point pressing **ENTER** you can return at the beginning of the programming list
(message **S.E.r.v.** will be displayed).
You can press **SERVICE** at any time to exit and return to the run mode.

COOLING OPERATIVE DIAGRAMS

Cooling

d.COL

ON

COOL

1/2 d.COL 1/2 d.COL

OFF

t.COL

Ambient temperature probe reading
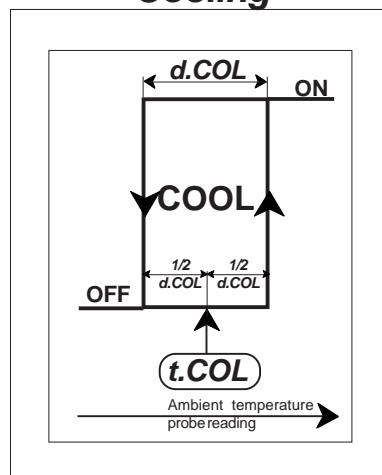
ALARM SETTING 👉

Press **ALARM** and then **ENTER**:
this message will be displayed instead of the
°C Minimum alarm value.
Press **+** or **-** to modify, press **ENTER** to confirm.

`┠.AL._`

At this point this message will be displayed instead of the
°C Maximum alarm value
Press **+** or **-** to modify , press **ENTER** to exit.

`┠.AL.¯`

ALARM EXCLUSION 👉

Press **ALARM** key for more than 2 seconds to switch-off alarm:
to confirm exclusion **ALARM** lamp flash.
Press **ALARM** key to switch-on alarm.

VIEWING TEMPERATURE RECORDING
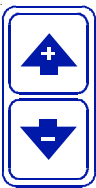
Press **+** `┠.¯¯¯` : will be displayed followed by
°Maximum Temperature Recording.

Press **-** : `┠._ _ _` will be displayed followed by
°Minimum Temperature Recording.

Values recorder are memory permanent stored: for memory clear keep pushed **+** keys
for more than 3 seconds:
CLEA messagge will be composed on display before clearing operation.

ALARM OPERATIVE DIAGRAMS

Alarm

MINIMUM ALARM   **MAXIMUM ALARM**

ON   ON

OFF   OFF

`t.AL._`   `t.AL.¯`

Ambient temperature probe reading
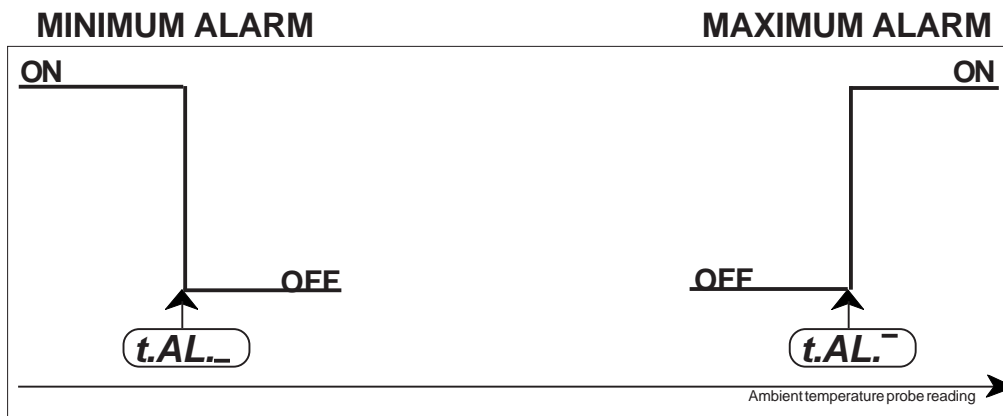
INSt PARAMETERS SETTING

Press **+** , **-** , **SERVICE** together for at least 1 second: this message will be displayed.

Press ENTER to go forward, press ▲+ or ▼- to modify.

`I.n.S.t.`

Ad.uE *°C Ventilation temperature probe correction* *1.

tEnP *Temperature representation*:
=1 ; °C (0,1° resolution).
=2 ; °F (0,1° resolution).

`25.0°C` Example temperature representation with **tEnP = 1**
`92.0°F` Example temperature representation with **tEnP = 2**

At this point pressing **ENTER** you can return at the beginning of the programming list (message *I.n.S.t.* will be displayed).

You can press **SERVICE** at any time to exit and return to the run mode.

*1 You can correct the readings on the various temperature sensor (**+** or **-**).
Attention: temperature probe is specified with a precision of 0.2°C (typically is better than 0.1°C) so to adjust them is required almost a certified thermometer with a precision of 0.05°C .

SPECIAL MESSAGGES ON DISPLAY

In normal condition on display appears ambient temperature.
Some special conditions can cause following messages:

`- O.C. -`
*1 When ambient probe has an open circuit wire failure.

`- S.C. -`
*1 When ambient probe has a short circuit wire failure.

*1 In this case alarm output relay is on.

STATE INDICATION LAMPS

The lights situated at the bottom of the display show the state of the various relay of actioning.

Led	State	N° Relay	Contact
HEAT	Heat On	6	21-22
VENTILATION **1** *1	Ventilation step 1 On	1	11-12
VENTILATION **2** *1	Ventilation step 2 On	2	13-14
VENTILATION **3** *1	Ventilation step 3 On	3	15-16
VENTILATION **4** *1	Ventilation step 4 On	4	17-18
VENTILATION **5** *1	Ventilation step 5 On	5	19-20
COOL	Cool On	7	23-24
ALARM *2	Minimum or Naximum Alarm on	10	29-30

*1 Flashing during winter fan shuttering operation (flashing step selected ventilation), and during delay ventilation time (*rit.F*).

*2 Flashing when alarm is disabled.

HC45 MANUAL MODE

In some start-up condition may be useful to work in "hand" mode
Press **+** / **-** / **ALARM** keys together for at least one second:
HAnd message will be displayed (release now keys).
Press **+** keys until is displayed number required to be hand (see table).
Press **ENTER** key to activate the output.
Pressing again **+** to increase relay number previous relay is disactivated.
Press **ALARM** key to exit and return to the run mode.

HC45 output	State	Note
1	Ventilation step 1	
2	Ventilation step 2	
3	Ventilation step 3	
4	Ventilation step 4	
5	Ventilation step 5	
6	Heat	
7	Cooling	
10	Main alarm	

HC45 installation.
Place the module in a clean and dry site.
Connect electric wires such as shown in diagram.

How to connect the power line.
Connect power line on **L-N** terminals; protect supply with adequate fuse.

How to connect the auxiliary contacts:
Connect **11-22......29-30** terminals on the terminals block (contacts up to **4AMP.AC1**) to the loads as shown in the diagram.
Protect contacts with a **4AMP.F** fuses.

How to connect probes and control signals.
Connect the provided sensor (**SX**) as shown in the diagram: **for remote connections use a standard 0,5-square millimetre two-pole wire for each sensor**, taking great care over the connection, by insulating and sealing carefully the joints.
In case of strong radio-interference insert a ferrite sleeve in the cable near regulator.

POLA

HC45

CE EMC LVD

MICROCOMPUTER

EXPANSION

40	39	38	37	36	35	34	33	32	31
in.K		in.8		in.7		in.6		in.5	

3,8 VA   3,8 VA

LINE				in.1		in.2		in.3		in.4	
N	L	1	2	3	4	5	6	7	8	9	10

LINEA 230 Va.c. 50-60Hz

SX Abient temperature sensor

Contact closed for alarm intervent or black-out

4A AC1	no.A		30 29	Temperature alarm N.0. contact
4A AC1	no.9		28 27	
4A AC1	no.8		26 25	
4A AC1	no.7		24 23	Cooling N.0. contact
4A AC1	no.6		22 21	Heating N.0. contact
4A AC1	no.5		20 19	Ventilation 5 step N.0. contact
4A AC1	no.4		18 17	Ventilation 4 step N.0. contact
4A AC1	no.3		16 15	Ventilation 3 step N.0. contact
4A AC1	no.2		14 13	Ventilation 2 step N.0. contact
4A AC1	no.1		12 11	Ventilation 1 step N.0. contact

Warning: bridging here (9-10) outputs ventilation are progressive (On-Off regulation type).

Sensors connection
Use a standard 0.5-square mm two poles wire for each sensor (don't use unipolar wire or multipolar cable).

IMPORTANT:

in order to avoid that **HC45** malfunction causes damage to animal's health we suggest to install an indipendent minimum-maximum alarm system (example our **HP13/W** model).

Solution 1: **AP01** alarm receives the signal in parallel of all alarms and it provides to control a 12V d.c. output (with alarm buffer battery 1.1 Ah) to connect siren, telephone dialer, etc. Furthermore when there is a black-out the alarm operates.

HP13/W (option)

HP13/W (option)

HP13/W (option)

In the example are connected N.3 **HC45** and N.3 **HP13/W**, obviously it is possible to connect them with unlimited number.
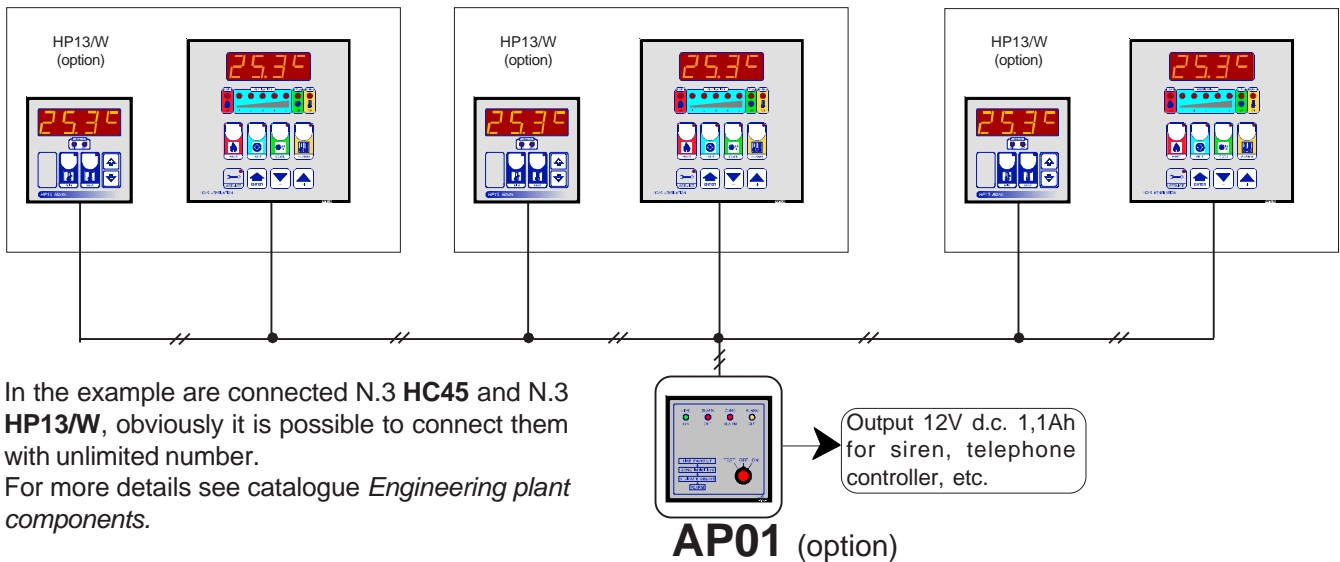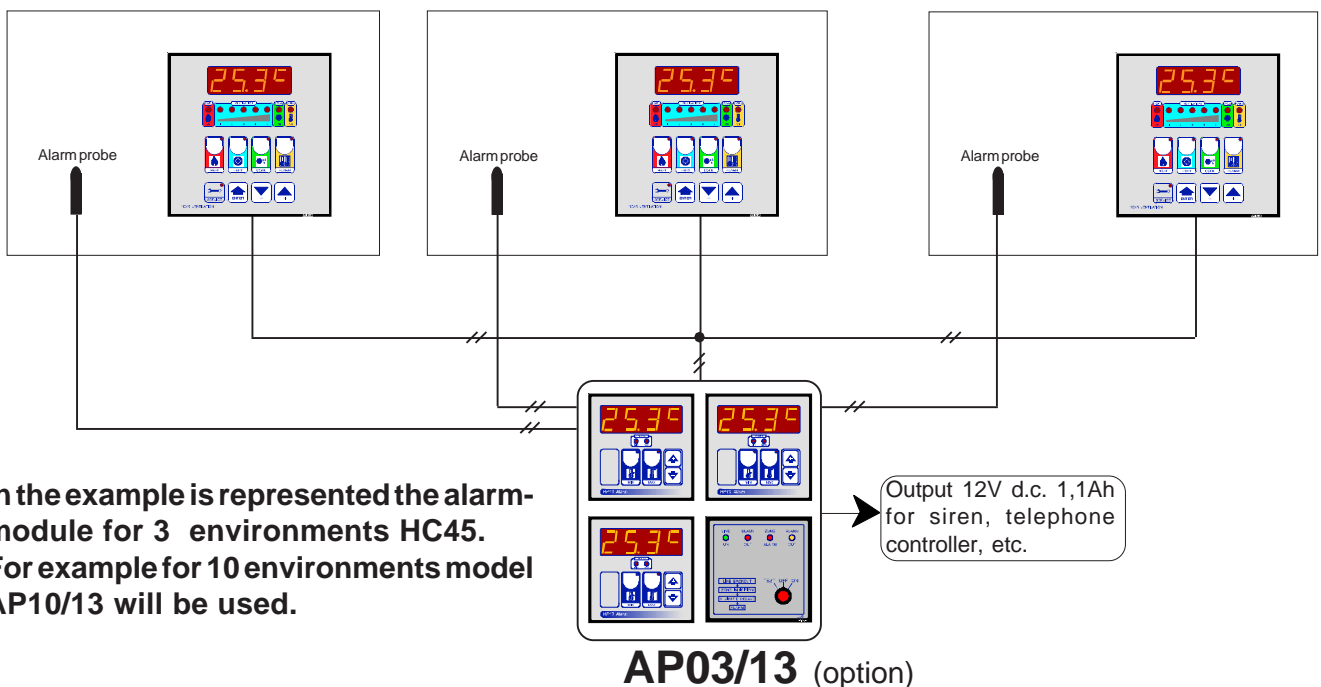For more details see catalogue *Engineering plant components.*

Output 12V d.c. 1,1Ah for siren, telephone controller, etc.

AP01 (option)

Solution 2 : **AP03/13** alarm receives the signal in parallel of all alarms of **HC45** and it controls the indipendent alarm of every single zone (through N.3 **HP13**).
It also provides the management of a 12V d.c. output (with alarm buffer battery 1.1 Ah) for the connection of any siren, dialer etc..
Also in case of power failure the alarm is activated (after one minute).

Alarm probe

Alarm probe

Alarm probe

**In the example is represented the alarm-module for 3 environments HC45.
For example for 10 environments model AP10/13 will be used.**

Output 12V d.c. 1,1Ah for siren, telephone controller, etc.

AP03/13 (option)

Power supply	
Line voltage	220-240Vac
Frequency	50/60Hz
Cabinet	
Material	PVC
Dimensions	144x144x77mm
Weight	KG 1
Protection degree	IP20
Outputs	
Maximum relay contacts load	4A AC1
Serial output	TTL 2400 baud
Inputs	
Probe measuring range	$-50.0...+115.0^{\circ C}$
Instrument precision	$0.2^{\circ C}$
Temperature probe reading precision	$0.2^{\circ C}$
Temperature setting range	$-50.0...+115.0^{\circ C}$
Probe connection	2 wire without screen
Temperature range	
Operatibility	$-10...+40^{\circ C}$
Storage	$-40...+85^{\circ C}$

CE DECLARATION OF CONFORMITY

POLA® declares that your **HC45** model is conform to following European normatives:

EN 50081-1 (1992) (Emission)

EN 50082-2 (1995) (Immunity)

referred to directive **EE 89/336** and subsequent **92/31** about electro-magnetic compatibility (**EMC**)

and it is conform to directive **EEC 72/23** and subsequent **EEC 93/68** about low voltage safety (**LVD**).

Measure was performed by an
ACCREDITATED COMPETENT BODY.

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PRESET PROGRAMS

This processor is already programmed with the following (variable) settings.
To return to these settings at any time, press **+** / **-** and **ENTER** together for at least 1 second *boot* message is displayed:

On this table are shown setting values at delivery, you are advised to record all the settings made in table below such as to have an immediate reference for the Programming and run modes.

HEAT

Parameter	Value on delivery	Value on customer
t.HEA	21.0°ᶜ	
SERVICE		
d.HEA	0.2°ᶜ	

ALARM

Parameter	Value on delivery	Value on customer
t.AL._	15.0°ᶜ	
t.AL.-	35.0°ᶜ	

VENT

Parameter	Value on delivery	Value on customer
t.vEn	25.0°ᶜ	
SP._ _	=0	
t.on.P	0'	
t.oF.P	10'	
PArt	=1	
SERVICE		
ProP	4.0°ᶜ	
Star	=0	
rit.F	0"	

COOL

Parameter	Value on delivery	Value on customer
t.COL	32.0°ᶜ	
SERVICE		
d.COL	0.2°ᶜ	

Parametri INSt

Parameter	Value on delivery	Value on customer
Ad.vE	0.0°ᶜ	
tEnP	=1	