

# **ACC/ACT**

## ***Agriculture software version 11***

(Instructions for use version 11.01 English)

ACC-20

ACC-25

ACT-20

ACT-40

Omnivent Techniek B.V.  
Morseweg 1  
3899 BP Zeewolde  
The Netherlands



Telephone: +31-36-522 2177  
Fax: +31-36-522 1867  
Internet: [www.omnivent.com](http://www.omnivent.com)  
Email: [info@omnivent.nl](mailto:info@omnivent.nl)

Instructions for use version : version 11.01  
For software version : version ACC20\_11-01

## PREFACE

---

The manual is intended for the user of the ACT/ACC-system AGRICULTURE. For the installation and maintenance, other than cleaning the installation, a special installer's manual is available.

The basic principle is that the user himself knows what the best conditions are for drying or storing the product. Hence the manual only explains how to set the controller. Experience of automation is not required. Prior to commissioning the ACT/ACC-system, this manual should be read carefully.

The ACT/ACC-system AGRICULTURE is designed for the agricultural sector, for heating/cooling and storing various agricultural products in the appropriate spaces and for controlling the CO<sub>2</sub> concentration.

The controller may only be used for the purpose for which the ACT/ACC-system was designed. The ACT may only be operated by the persons responsible for drying/storing the product.

Never open the housing of the controller.

In spite of the fact that every attention was paid to this manual, imperfections may occur. Any information that may assist in making this manual more useful, will be welcome. Nevertheless, no rights whatsoever may be derived from this manual, neither from any damage caused by errors in the text and/or in the automation process, nor through inexperienced use of the systems and/or the connected equipment. On account of changes made in the software, the manual may differ from the software without any prior announcement.

*All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Omnivent Techniek B.V., The Netherlands.*



Attention!

**The person that uses/operates the installation has to know the safety regulations, as described in chapter 1 !**

### Description of the symbols



Remark!

After this heading, remarks, comments or information, which require extra attention, are mentioned.



Attention!

The information mentioned under this heading warns you about the possible damage to the product if the information that is given is ignored.



Warning!

After this heading you will find an instruction which, if being ignored, may lead to serious injuries to persons and/or serious damage to the product.

## CONTENTS

<b>PREFACE</b>	<b>1</b>
<b>CONTENTS</b>	<b>2</b>
<b>INTRODUCTION</b>	<b>3</b>
<b>1 SAFETY REGULATIONS / PRECAUTIONS</b>	<b>4</b>
1.1 Explanation of symbols	4
1.2 Safety precautions	5
1.3 Safety regulations	6
1.4 Maintenance of the installation	6
<b>2 DESCRIPTION OF THE ACT/ACC SYSTEM</b>	<b>7</b>
2.1 ACC software (Agricultural)	7
2.2 Setup of the ACT/ACC system	8
2.3 Cross section ventilation system	8
<b>3 ACT-40</b>	<b>9</b>
3.1 Navigation	9
3.2 Shortcuts	10
3.3 Status display	11
3.4 Overview used icons	12
3.5 Settings ACT-40	13
3.6 ACC menu structure	15
<b>4 OPERATING THE ACT/ACC COMPUTER</b>	<b>19</b>
4.1 Switch between departments	20
4.2 Switch between programs	20
4.3 Switch between program lines	20
4.4 Change settings	20
4.5 The Info (F1) key	20
4.6 The ↔ (F4) and 'LINE' key combination	20
<b>5 THE ACT-20 PROGRAM</b>	<b>21</b>
5.1 Description of the ACT-20 program	22
<b>6 DESCRIPTION OF THE AGRICULTURE PROGRAM SECTIONS (ACC)</b>	<b>25</b>
6.1 Program section index	25
6.2 Description program sections	29
<b>7 DESCRIPTION OF TSC-20 CONTROL UNIT</b>	<b>76</b>
7.1 Shortened list of pages	76
7.2 Extended list of pages	77
7.3 Alarm messages	79
7.4 TECHNICAL DATA TSC-20	80
<b>8 DESCRIPTION OF DVR-20 CONTROL UNIT</b>	<b>81</b>
8.1 Basic settings (P-settings)	81
8.2 Installer settings (C-settings)	82
8.3 OPERATING THE DVR-20 VIA THE ACT	83
8.3.1 Condensed list	83
8.3.2 List of pages	84
8.3.3 Alarm messages	88
8.4 TECHNICAL DATA DVR-20	89
<b>9 TIPS</b>	<b>90</b>
<b>10 ALARMS</b>	<b>91</b>
10.1 Check alarm messages	91
10.2 Reset alarm messages	91
<b>ALARM</b>	<b>91</b>
10.3 Alarm messages (Page 19 Line 1)	92
<b>11 TROUBLESHOOTING</b>	<b>95</b>

## INTRODUCTION

---

The Omnivent ACC-Agriculture software is a measuring and controlling program, meant for the ventilated storage of agricultural products like potatoes, onions, grains and seeds. Also to a limited extent applicable to vegetables and flower bulbs. For drying and storing of flower bulbs, a special program is available.

The Omnivent ACC software is designed to work on the ACT/ACC computers. The ACT is the so-called terminal, equipped with operating keys and a 4-line, green vacuum - fluorescent display.

The ACC software contains several programs. Each program contains a number of lines. Such a line shows a measurement or registration or enables the user to set a desired value or position.

In each program the measurements and controlling are integrated. There will be an introduction at the beginning of each program about the operation and functions of that program. Followed by an explanation of each line of the program.

There are 6 main-programs:

- Manual Program
- Warming-up
- Drying / Healing
- After Drying
- Cooling / Storage
- Dehumidification

To some of these main-programs a sub-program can be added. The sub-programs are:

- Refrigeration
- CO<sub>2</sub> Control
- Condensation Control
- Switch Program
- Dose Program

The various program parts are numbered from 1 to 30. (Sometimes called program pages)

A very extensive ALARM program has been incorporated.

## 1 SAFETY REGULATIONS / PRECAUTIONS



Warning!

This chapter has to be read by any person that will operate / enter / use / maintain the installation.

### 1.1 Explanation of symbols



#### Warning about automatically starting machines!

The person that enters the pressure room runs the risk that the fans/heaters etc. will go on suddenly, or that the hatches are to move when the installation is not turned off the automatic position.



#### Attention! hand injuries!

Wherever you see this symbol, there is a risk that your hand gets jammed or that other injuries might occur to your hands.



#### Risk of injuries!

Wherever you see this symbol there is a risk that parts of the body get jammed or that other injuries to your body might occur.



#### Attention, danger!

Wherever you see this symbol you are warned that there are dangerous situations/locations.



#### Danger, hot!

Wherever you see this symbol you are warned against hot objects/surfaces.



#### Danger, high voltage!

Wherever you see this symbol there is possibility of a voltage higher than 24V AC/DC.



#### Rotating machines!

Wherever you see this symbol you are warned against rotating machines such as a fan or a rack-and-pinion drive.



#### Obligatory ear mufflers

Before you enter the pressure room while the installation has not been switched off you have to wear ear protectors.

PAS OP	!	U BETREEDT EEN GEVAARLIJKE ZONE	!
ATTENTION	!	YOU ARE ENTERING A DANGER ZONE	!
ACHTUNG !	!	SIE BETRETEN EIN GEFAHRBEREICH	!
ATTENTION	!	VOUS ENTREZ UNE ZONE DANGEREUSE	!

Figure 1: Warning sign on the access door of the pressure room

The sign of figure 1 is on the access door of the pressure room and warns you about entering the pressure room. The pressure room is regarded as a 'danger zone'. This means that the access to the pressure room is not free and that a key is required to open the door to enter this room. The person that enters the pressure room has to be informed about the safety regulations and the meaning of the symbols as mentioned in this chapter. Under the sign, you find the symbols that apply to your installation.

## 1.2 Safety precautions

The danger zone includes the suction room + pressure room (see chapter 3 for the definition of these).

- The pressure room can only be entered with a key. The access door to this room also has a handle on the inside.



With the horizontal position of the fans (rotor blades are mounted horizontally) the fan does not have a grid on the outlet side (= bottom side). This room can only be entered with a key. It is also possible that the outlet side of these fans are equipped with non-return flaps. These flap will fold down when the fan is started.

- The danger in the suction room comes from unexpectedly moving hatches and rotating racks. You are informed about this by the stickers. The fans are equipped with platform grids.
- If necessary, you can use the emergency stop switch of the installation. This can be a push button near the access door of the pressure room, or this can be in the form of the main switch of the switchboard. In both cases these can be recognized by the red/yellow colour combination. When the emergency stop is used, all controls are stopped immediately and the red light 'emergency stop in' will be lit. The installation can only be started after pressing the 'reset emergency stop' button.



The installation cannot be started automatically after a power failure. The installation has to be reset first by means of the 'reset emergency stop' button. Only the hatches are closed after a power failure.

- The installation is equipped with operating switches wherever required. This can be a switch within reach from the machine involved, or this can be the main switch of the switchboard which can be locked in the 'O' position with a lock. In the latter case, the key has to be carried by the person who is in the danger zone.
- When a directly fired heater is controlled, this is safeguarded by a maximum thermostat. The thermostat will switch off the gas supply as soon as the temperature is above a preset value. Before the heater is used again, the heater has to be reset on the switchboard first. For more information, see the electrical circuit diagram and the manual of the switchboard.
- The fans have grids on the inlet side. These grids can only be removed with the proper tools.
- When the hatch operation is within reach from the outside, it is equipped with wire netting.
- When the hatch operation can be reached from the suction room, the suction room is blocked with a chain. By means of various warning symbols on the hatch operation, you are also warned against possible danger.
- The switchboard can only be opened with a special key.
- When the function select switch is on 'O' (off) on the switchboard, the complete installation is switched off. No controls are possible and the power supply to the machines is disconnected (this applies to the machines that get their power supply via the switchboard involved. It does not always apply to a mechanical cooling installation).
- When heaters are used, fire-resistant material has to be applied in the immediate surroundings of the heaters. This material shall not be removed.

### 1.3 Safety regulations

The following safety measures have to be complied with in the following situations:

#### 1. Entering the pressure room

In the case of entering the pressure room, the person entering the room has to be informed about the risks. When the installation does not have to be operational, switch it off by putting the function select switch on 'O' (off) and by pressing the emergency stop. If it is necessary to enter the pressure room while the installation is operational, this will be at your own risk.

#### 2. Maintenance to a machine (for instance a fan, heater, hatch control, etc.)

Always switch off the power supply double. You can do this by putting the operating switch on 'O' and the relevant operational position switch on the switchboard on 'O'. When there is no operating switch, press the emergency stop or lock the main switch in the 'O' position.

#### 3. Starting the installation

Before you start the installation, you have to be sure that there is no person in the pressure room and that the access door to the pressure room is locked.

#### 4. Switching of the operations of the installation

- Switch off all programs in 07 SELECTION OF PROGRAMS.
- Switch the function select switch to 'O' (off).



Attention!

It is recommended to let the computer (ACT/ACC) run continuously and off-season as well, in view of the life span of the back-up battery and to avoid condensation in the machines.

### 1.4 Maintenance of the installation

This chapter contains information about the maintenance that may be performed by the user.

- You may wipe the automation with a damp cloth (only water). No further maintenance required.
- At least every six months, the safeguards have to be tested and checked. By this, the measures that are mentioned in chapter 2.2 'SAFETY PRECAUTIONS' are meant. special attention has to be paid to the proper functioning of the emergency stop. When you are testing the safeguards, you also have to check whether the alarm light that is part of the safeguard is still functioning properly.
- The fans shall only be cleaned when the main switch and operating switch are switched to 'O'.
- The grids of the fans shall only be removed when the power supply to the fans is double blocked (for instance: operating switch is on 'O' and the function select switch is on 'O').



Warning !

**When it is necessary to be in the pressure room without the installation being switched off, you have to be aware of the risks. These risks are a high noise-level, unexpected movements of the non-return flaps and a fan that is not covered.**

## 2 DESCRIPTION OF THE ACT/ACC SYSTEM

---

The Omnivent ACC-Agriculture software is a measuring and controlling program, meant for the ventilated storage of agricultural products like potatoes, onions, grains and seeds. Also to a limited extent applicable to vegetables and flower bulbs. For drying and storing of flower bulbs, a special program is available.

The Omnivent ACC software is designed to work on the ACT/ACC computers. The ACT is the so-called terminal, equipped with operating keys and a 4-line, green vacuum - fluorescent display.

Most of the measurements are related to temperature and humidity. At the same time universal analogue sensor signals from CO<sub>2</sub>, airspeed, wind direction, air-pressure -meters etc. can be measured as well. Or even potentiometers and feedback signals. Also blocking-hour-signals used by electricity suppliers and external alarm-signals can well be detected. (status)

The controlling concerns two groups of fans (blowing or sucking), inlet flaps, outlet flaps, heaters on/off, gas or fuel valves, refrigerators, backup fans with or without heating elements and an extra flap. Depending on the activated program.

### 2.1 ACC software (Agricultural)

Depending on the program-software and the ACC, either one or two departments can be controlled and monitored. At present there are three different agriculture programs available:

- 1 department AGRICULTURE extended
- 1 departments AGRICULTURE basic
- 2 departments AGRICULTURE basic

The 2 departments AGRICULTURE basic, with 1 ACC-in and 1 ACC-out, can measure and control two departments simultaneously. At the same time, it is possible to connect a personal computer, directly or by means of a modem.

The differences between the three versions are the possibilities of the programs. The extended version can handle more controls than the basic versions.

The differences are, for instance:

- The extended version can control the fans both by suction and by pressing
- The extended version has two fan groups, so that, for instance, when the cooling is on, ventilation can take place at half capacity.
- The extended version can control an outlet hatch, so that this is never opened more than necessary.
- The extended version has a follow-up by means of potentiometers of all flaps and valves (inlet flap, outlet flap, heating valve). With the basic version this functions by means of an operating period.



## 2.2 Setup of the ACT/ACC system

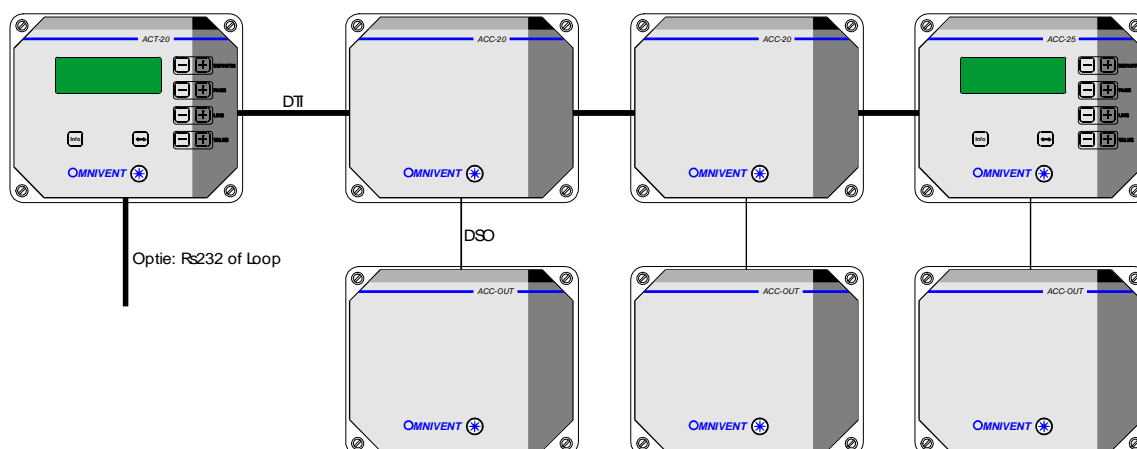


Figure 2: ACT/ACC system

There is a possibility to connect the ACT to a Personal Computer (PC); directly or by means of a modem.

Furthermore, the ACT controls the operation of and the communication between the ACCs.

The ACC contains the actual measuring and control program. The ACC is divided into the ACC-IN and the ACC-OUT. The ACC-IN is the computer. All sensors are also connected to this. The ACC-OUT operates the controls and will be positioned near the switchboard, most of the times.

See figure 2 for a diagram of the ACT/ACC-system.

## 2.3 Cross section ventilation system

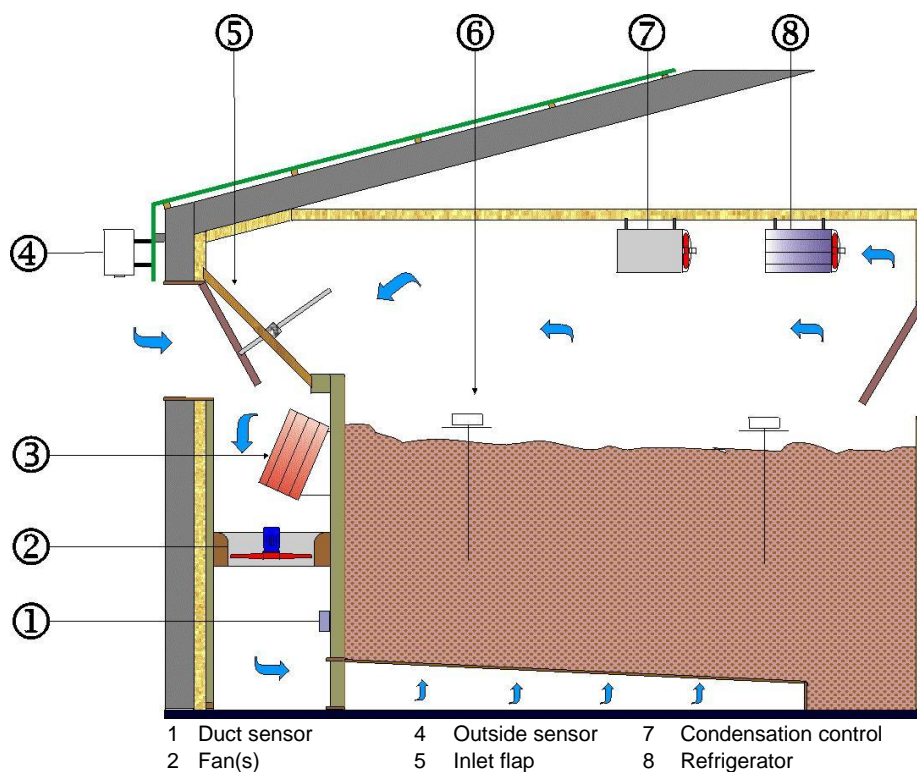


Figure 3: Cross section from a dry/store room

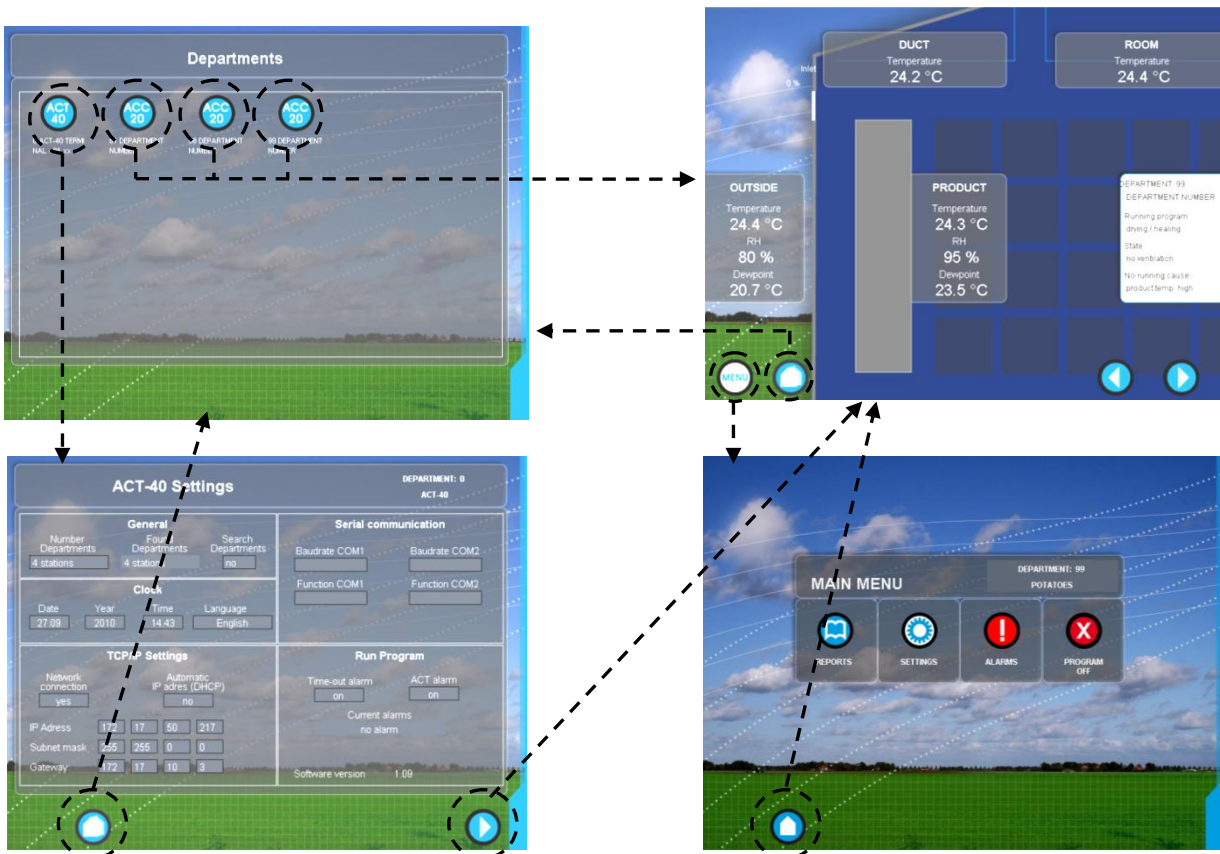
### 3 ACT-40



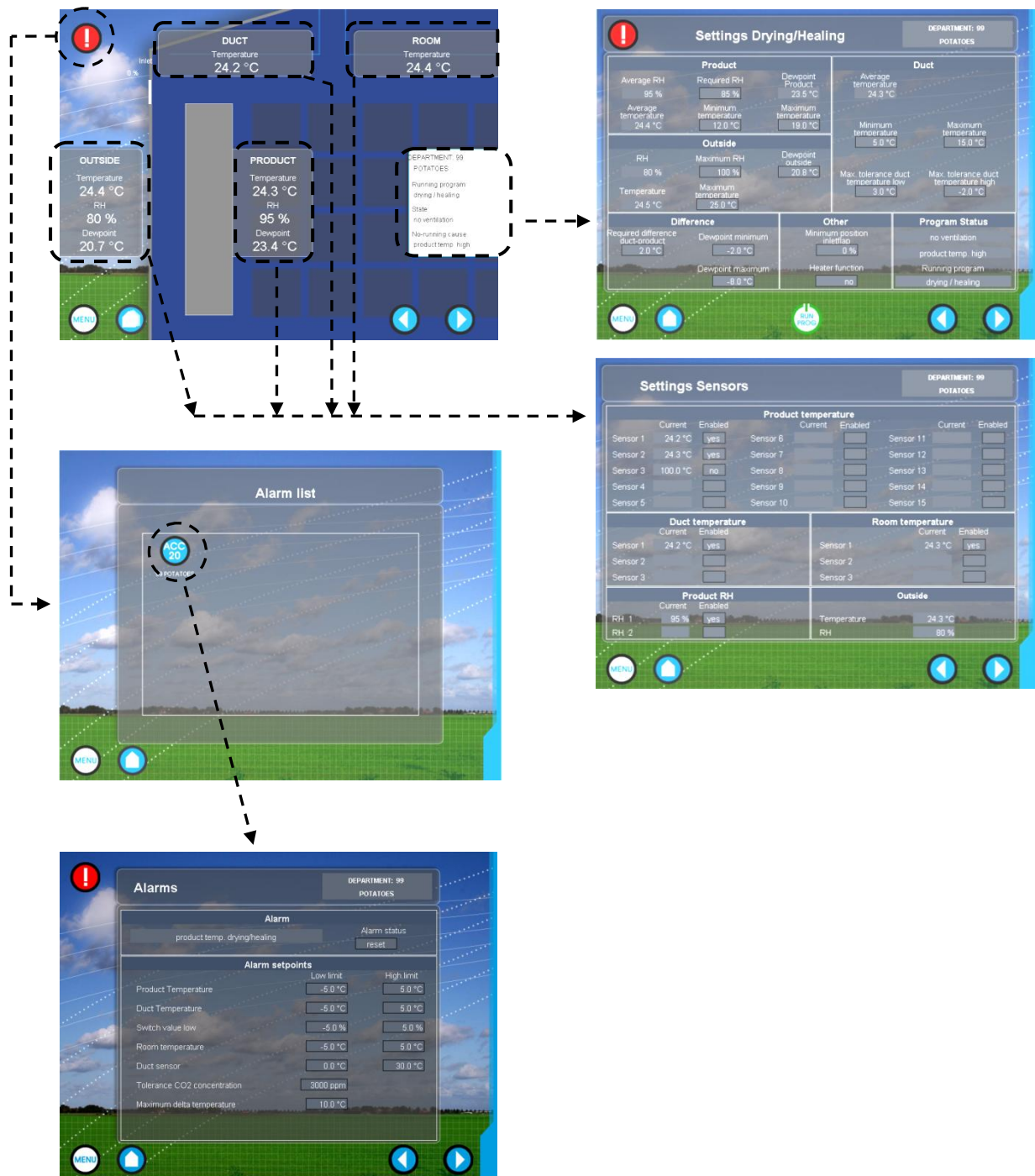
Figure 4: Front ACT-40 (control unit)

#### 3.1 Navigation

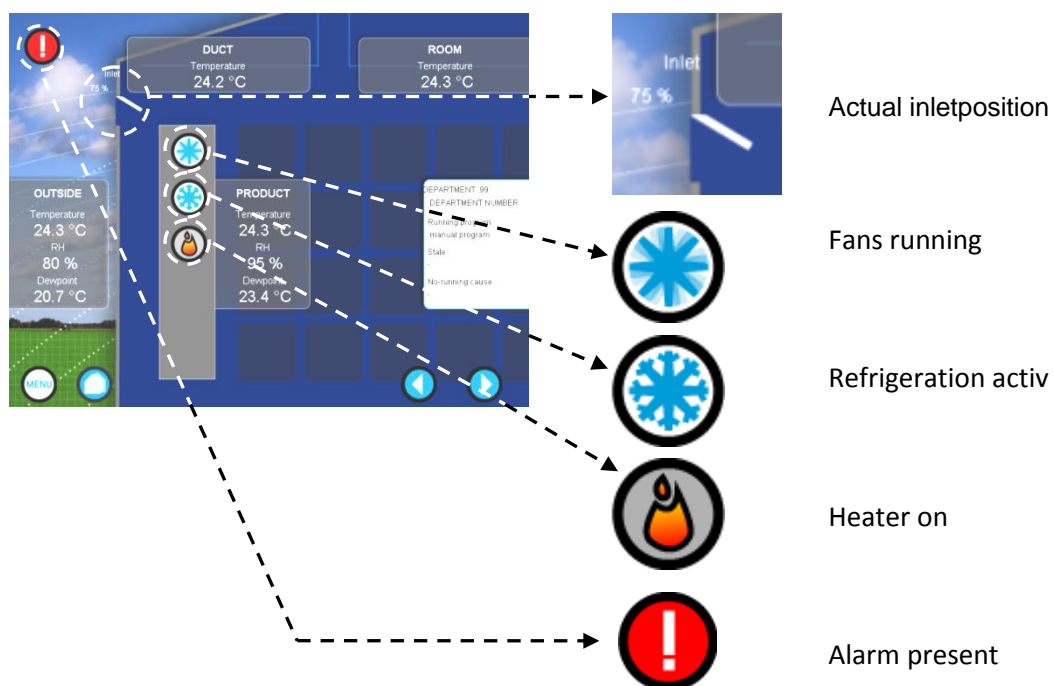
When the ACT-40 is started up, the department overview screen (see below) becomes visible. All settings for all connected departments can be accessed from this screen.














## 3.2 Shortcuts



### 3.3 Status display



### 3.4 Overview used icons

	Department overview
	Overview (main screen) of current department
	Previous department
	Next department
	More settings
	Menu
	Alarm present in a department. Touch icon to show departments with active alarms.
	Start program
	Fans running
	Refrigerator active
	Heater on



### 3.5 Settings ACT-40

**ACT-40 Settings** DEPARTMENT: 0  
ACT-40

General			Serial communication	
Number Departments	Found Departments	Search Departments	Baudrate COM1	Baudrate COM2
4 stations	4 stations	no		
Clock			Function COM1	Function COM2
Date	Year	Time	Language	
27.09	2010	16.28	English	
TCP/IP Settings			Run Program	
Network connection	Automatic IP adres (DHCP)		Time-out alarm	ACT alarm
yes	no		on	on
IP Address	172	17	50	217
Subnet mask	255	255	0	0
Gateway	172	17	10	3
			Current alarms	
			no alarm	
			Software version 1.09	

1

#### SETTINGS (Department 00 ACT20 Terminal)

##### STATIONS CONNECTED

1.....99 You have to fill in the number of units.

NOTE: the ACT is also regarded as a unit. One ACT and one ACC installed, means you have to fill in the figure 2. The 2 dep.AGRI.basic ACC consists of two departments, so using a 2 department ACC plus an ACT amounts to 3 departments.

##### STATIONS FOUND

1...99 This shows the number of units (including the ACT) that are found by the ACT during its communication-search for units.

##### NEW SCAN STATIONS (Off/On)

On this line one can activate the ACT to do a second search for connected units. Switching to 'on' the Set-up of the ACT will be started. When the ACT has finished searching the display goes back to 'off'. This procedure might be necessary after a time-out alarm. **Attention! A restart of the ACT-40 is necessary to get access to the found departments.**

##### DATE

##### YEAR

##### TIME

Set current date, year and time.

##### LANGUAGE (Dutch/German/English/Polish/French/Spanish/Danish/Finnish / Slovenian / Russian)

This line is to select the language for the ACT. The language on the ACC changes in accordance with the selection of language on the ACT.

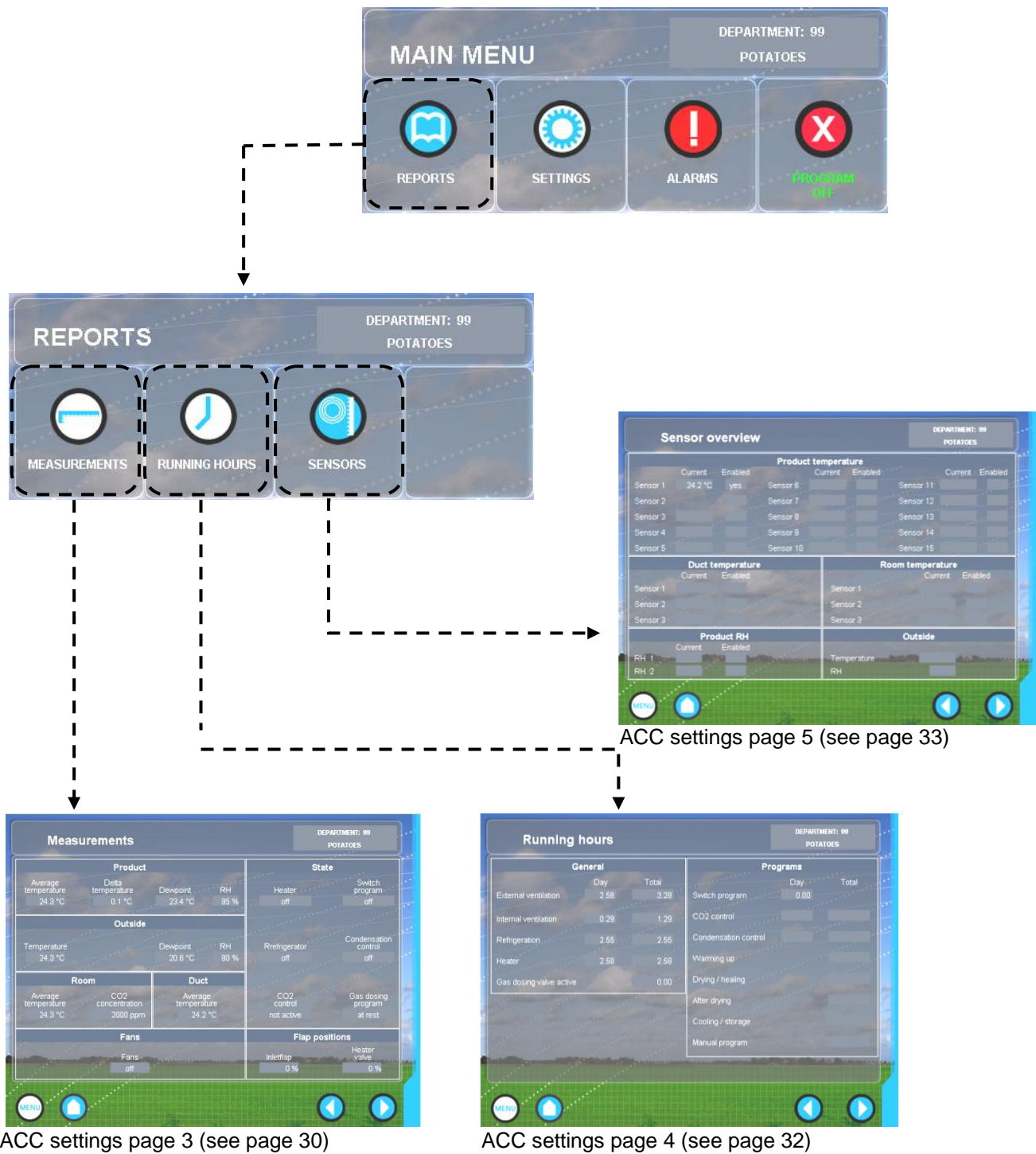
##### INTERNET CONNECTION (No/Yes)

Select here if an internet or direct LAN connection is active.

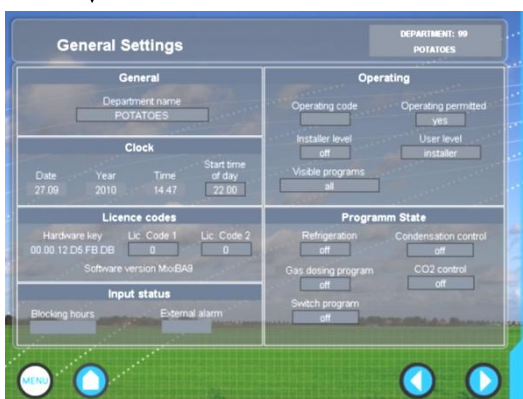
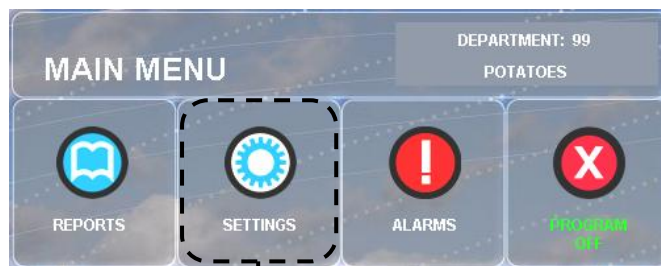
##### IP-ADDRESS AUTOMATIC (No/Yes)

<p>If the local network supports DHCP the COM-60 can get an IP address automatically. If you do not use DHCP, the IP-address, the subnet mask and the gateway address must be entered.</p>
<p><b>IP-ADDRESS</b> Enter the desired IP address if IP-ADDRESS AUTOMATIC is set to No. If IP-ADRES AUTOMATIC is set to Yes, no IP-address is shown.</p>
<p><b>SUBNET MASK</b> Enter the subnet mask if IP-ADDRESS AUTOMATIC is set to No. If IP-ADRES AUTOMATIC is set to Yes, no subnet mask is shown.</p>
<p><b>GATEWAY</b> Enter the gateway address if IP-ADDRESS AUTOMATIC is set to No. If IP-ADRES AUTOMATIC is set to Yes, no gateway address is shown.</p>
<p><b>BAUDRATE COM 1 (9600/ 19200/38400/57600/115200/230400/460800)</b> Speed of communications can be set. Meant for installer.</p>
<p><b>FUNCTION COM 1</b> The type of communication software can be set.</p>
<p><b>BAUDRATE COM 2 (9600/ 19200/38400/57600/115200/230400/60800)</b> Speed of communications can be set. Meant for installer.</p>
<p><b>FUNCTIE COM 2 (Optilink/Remote/Optilink hdx/Optilink GSM)</b> The type of communication software can be set.</p>
<p><b>SET TIME-OUT ALARM (Reset/Off/On)</b> In case of a time-out alarm, the display starts to flash and will show "on". The time-out alarm (communication fault between ACT and ACCs) can be reset only when the problem is solved. Set the alarm on 'reset'. Set the alarm 'off', to switch off an activated horn or light signal (in case of a time-out alarm) while the alarm-state is still on the display.</p>
<p><b>SET ACT ALARM (Reset/Off/On/Test)</b> One can reset the alarm in this line if an alarm occurs in the ACT itself. In the first place you have to solve the problem which causes the alarm. In this case set to "reset". The horn-function is switched off by setting the value to "off". If you set this value to "on", the horn function is activated. If you set this value to "test", the alarm system is tested.</p>
<p><b>TYPE OF ALARM</b> Shows which type of alarm has been activated.</p>

3.6 ACC menu structure







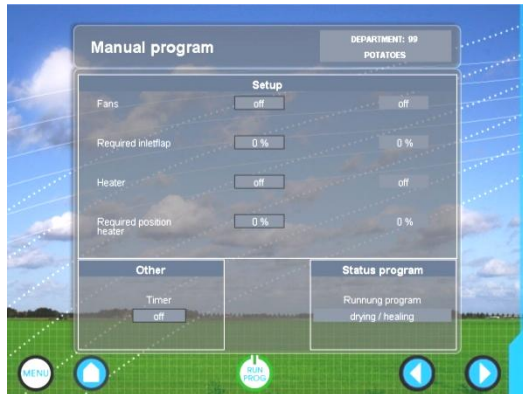
ACC settings pages 1, 7, 20  
(see pages 28, 35 en 63)



ACC settings page 2 (see page 29)



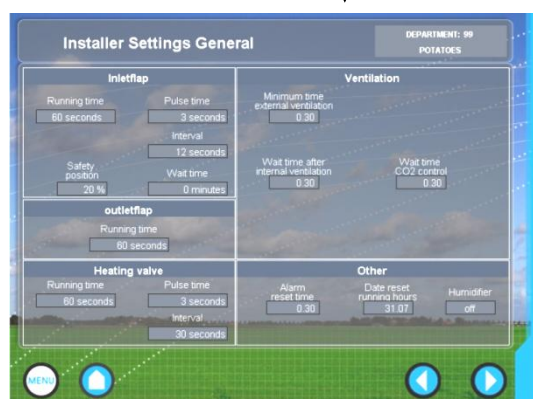
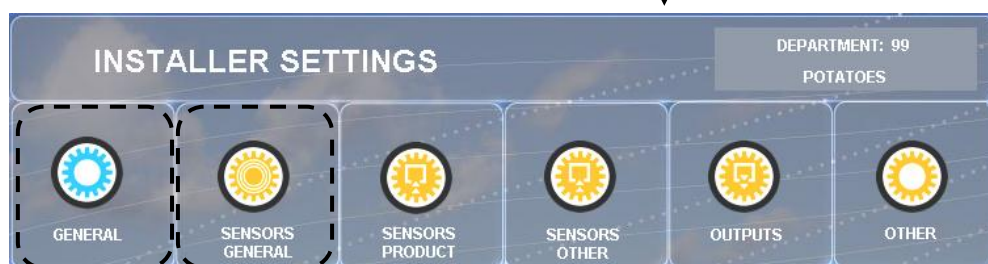
ACC settings page 6 (zie page 34)



ACC settings page 8 (see page 37)  
Other programs are explained starting on page 38



ACC settings page 19 (see page 62)



ACC settings page 21 (see page 63)



ACC settings page 22 (see page 65)

4 OPERATING THE ACT/ACC COMPUTER

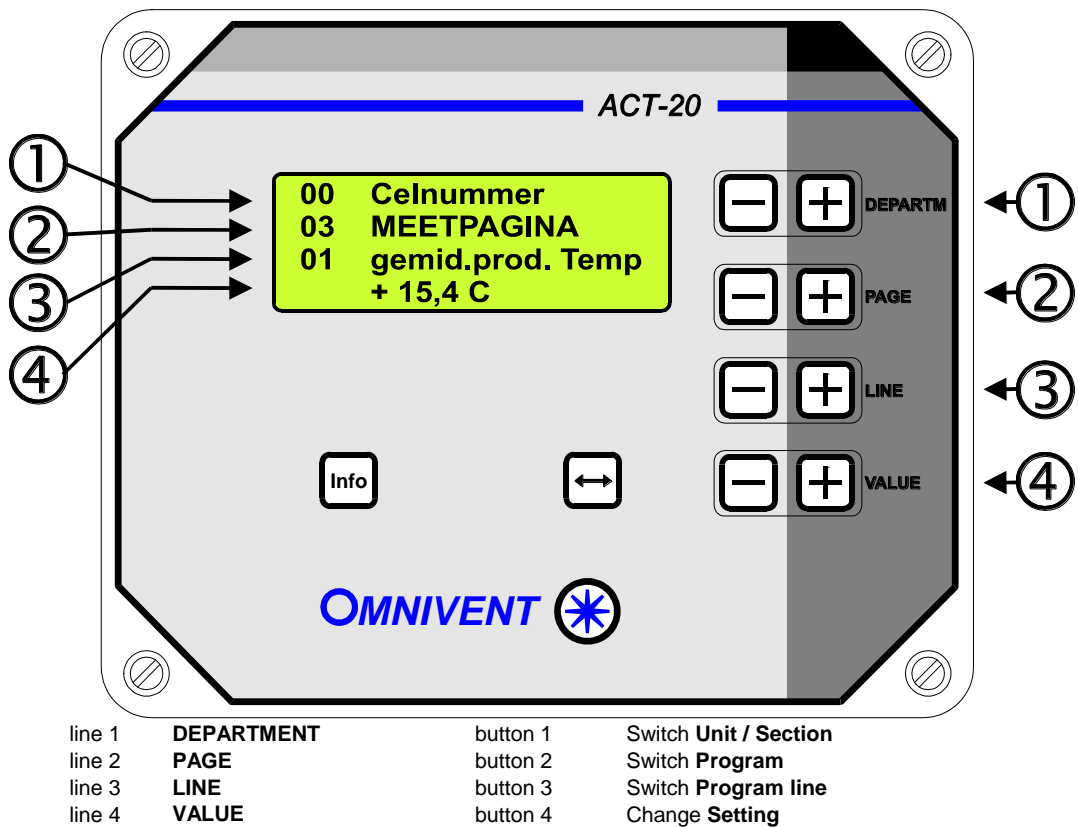


Figure 5: Front ACT-20 (control unit)

The operation is done in 4 times 2 keys, which corresponds with the 4 lines on the display.

00 department number	→	Department
03 MEASUREMENTS	→	Program
01 average prod. temp.	→	Program line
+15,4 °C	→	Value / Setting

Each department is given a number. 01, 02, 03,...etc.  
The programs (or pages) are numbered from 01 to 30. (Depending on user level of display 20-01).  
The lines that are part of the programs are also numbered. (Max. 30)

#### 4.1 Switch between departments

It is possible to connect several ACC's to one ACT. One ACC for one or two department(s). The top line on the display of the ACT shows the department number and desired product name.

Using the keys 1- and 1+, one can retrieve another department (another ACC ).



Figure 6: Keys to switch between departments.

#### 4.2 Switch between programs

The heading of a program will be shown on the second line of the display. Retrieving another program is done by pressing the keys 2- and 2+ (Like leafing through a book ).



Figure 7: Keys to switch between programs.

#### 4.3 Switch between program lines

Each program consists of several lines. These lines appear on the third line of the display. When you are in a particular program (see second line of display), it is possible to retrieve the various program lines with keys 3- and 3+.

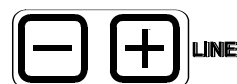


Figure 8: Keys to switch between lines.

#### 4.4 Change settings

The fourth line of the display shows the measured values, states, and settings. The settings can be changed by pressing the keys 4- and 4+.



Figure 9: Keys change settings.

#### 4.5 The Info (F1) key

By pressing **INFO** (F1), the display will show an identification number of the software (version).

```
00  ACT20 Terminal
XA: 00.00
BR : 00.00 C1 : DTI
C2 :      C3 :
```

#### 4.6 The ↔ (F4) and 'LINE' key combination

An extra facility is provided by key ↔ (F4) and the 'LINE -' and 'LINE +' keys.

One can 'jump' from one department into the other, remaining on the same page and line.

If the ↔ (F4) key is pressed together with the 'LINE +' key, the next department appears on the screen with the same page and line. Using the combination ↔ (F4) en 'LINE -' key shows the previous department with same page and line.



## 5 THE ACT-20 PROGRAM

---

The Omnivent **ACT** program consists of the next two parts:

1	SETTINGS	2	INSTALLATION
01-01	TIME	02-01	DEPARTMENT NUMBER
01-02	DATE	02-02	BAUDRATE COM 1
01-03	YEAR	02-03	FUNCTION COM 1
01-04	DISPLAY	02-04	BAUDRATE COM 2
01-05	SET TIME-O T ALARM	02-05	FUNCTION COM 2
01-06	SET ACT ALARM	02-06	LANGUAGE
01-07	TYPE OF ALARM	02-07	STATIONS CONNECTED
		02-08	STATIONS FOUND
		02-09	NEW SCAN STATIONS
		02-10	OPERATING PERMITTED
		02-11	DELAY ALARM-2
		02-12	REAL TIME CLOCK
		02-13	PINCODE COM 1
		02-14	PINCODE COM 2
		02-15	AUTOMATIC RESET TIMEOUT

3	TCP/IP SETTINGS
03-01	INTERNET CONN
03-02	IP-ADRES AUTOM. 1
03-03	IP-ADRES[OCT.1] 1
03-04	IP-ADRES[OCT.2] 1
03-05	IP-ADRES[OCT.3] 1
03-06	IP-ADRES[OCT.4] 1
03-07	SUB.MASK[OCT.1] 1
03-08	SUB.MASK[OCT.2] 1
03-09	SUB.MASK[OCT.3] 1
03-10	SUB.MASK[OCT.4] 1
03-11	GATEWAY [OCT.1] 1
03-12	GATEWAY [OCT.2] 1
03-13	GATEWAY [OCT.3] 1
03-14	GATEWAY [OCT.4] 1

## 5.1 Description of the ACT-20 program

1	SETTINGS (Department 00 ACT20 Terminal)
01-01	<b>TIME</b>
01-02	<b>DATE</b>
01-03	<b>YEAR</b> <i>These lines are to set the time, date and year. The ACT is equipped with a real-time clock. The linked ACC clocks are not real-timers and are controlled by the clock of the ACT.</i>
01-04	<b>DISPLAY</b> <span style="float: right;">[2&gt; maximum]</span> <i>The user CAN choose which program parts and lines of the ACT will be shown on the display.</i> <i>The meaning of the settings</i> 0> basic                      entry limited to 01-00 SETTINGS including all it's lines. 1> extended                Entry to 01-00 SETTINGS and 02-06 "Operating permitted". 2 > maximum              Entry to all the lines of 01-00 and 02-00. This should be set by the installer.
01-05	<b>SET TIME-OUT ALARM</b> <span style="float: right;">[2&gt; on]</span> 0> reset / 1> off / 2> on <i>In case of a time-out alarm, the display starts to flash and will show "2&gt; on" .</i> <i>The time-out alarm (communication fault between ACT and ACCs) can be reset only when the problem is solved. Set the alarm on 'reset'.</i> <i>Set the alarm 'off', to switch off an activated horn or light signal (in case of a time-out alarm) while the alarm-state is still on the display.</i>
01-06	<b>SET ACT ALARM</b> <span style="float: right;">[2&gt; on]</span> 0> reset / 1> off / 2> on / 3> test <i>One can reset the alarm in this line if an alarm occurs in the ACT itself. In the first place you have to solve the problem which causes the alarm. In this case set to "reset".</i> <i>The horn-function is switched off by setting the value to "off". If you set this value to "on", the horn function is activated. If you set this value to "test", the alarm system is tested.</i>
01-07	<b>TYPE OF ALARM</b> <i>Shows which type of alarm has been activated.</i>

2	INSTALLATION
02-01	<b>DEPARTMENT NUMBER</b> [0]
	<i>This is the "address" number of the ACT. This number must be set on 0 when PC communication is needed. If the DTI-line is in use (communication with the ACC's) the ACT's department number is always 0 and cannot be changed.</i>
02-02	<b>BAUD RATE COM 1</b> [9> 38400 bps]
	<i>0&gt; 110 1&gt; 150 2&gt; 300 3&gt; 600 4&gt; 1200 5&gt; 2400 6&gt; 4800 7&gt; 9600 8&gt; 19200 9&gt; 38400 Speed of communications can be set. Meant for installer.</i>
02-03	<b>FUNCTION COM 1</b> [Optilink]
	<i>0&gt; Optilink 1&gt; Remote The type of communication software can be set.</i>
02-04	<b>BAUD RATE COM 2</b> [9> 38400 bps]
	<i>See 02-02.</i>
02-05	<b>FUNCTION COM 2</b> [Optilink]
	<i>See 02-03</i>
02-06	<b>LANGUAGE</b> [0> Dutch]
	<i>0&gt; Dutch / 1&gt; German / 2&gt; English / 3&gt; Polish / 4&gt; Francais / 5&gt; Espanol / 6&gt; Dansk / 7&gt; Suomi / 8&gt; Slovensky This line is to select the language for the ACT. The language on the ACC changes in accordance with the selection of language on the ACT.</i>
02-07	<b>STATIONS CONNECTED</b> [0]
	<i>1.....99 You have to fill in the number of units. NOTE: the ACT is also regarded as a unit. One ACT and one ACC installed, means you have to fill in the figure 2. The 2 dep.AGRI.basic ACC consists of two departments, so using a 2 department ACC plus an ACT amounts to 3 departments.</i>
02-08	<b>STATIONS FOUND</b>
	<i>1...99 This shows the number of units (including the ACT) that are found by the ACT during its communication-search for units.</i>
02-09	<b>NEW SCAN STATIONS</b> [0> off]
	<i>0&gt; off 1&gt; on. On this line one can activate the ACT to do a second search for connected units. Switching to '1&gt; on' the Set-up of the ACT will be started. When the ACT has finished searching the display goes back to '0&gt; off'. This procedure might be necessary after a time-out alarm.</i>
02-10	<b>OPERATING PERMITTED</b> [1> on]
	<i>0&gt; off 1&gt; on. This line enables you to block the "value" keys on the ACT. Against unauthorized use. If 'OFF' it is not possible to alter the settings in the ACC and ACT. Reading the display remains possible, and resetting the alarm remains possible. To put the operating permitted 'ON' one should switch the display level of the ACT on 'maximum' (01-04). The idea of this system is to avoid non-desirable changes by unauthorized people.</i>
02-11	<b>DELAY ALARM-2</b> [60 seconds]
	<i>Delay of alarm relay 2.</i>
02-12	<b>REAL TIME CLOCK</b> [1> on]
	<i>0&gt; off 1&gt; on. This line is to activate the real-time clock of the ACT. It might be wise to switch off the clock when the ACT is not plugged into the wall socket, for a longer period of time. Otherwise the clock would run the battery flat.</i>
02-13	<b>PINCODE COM 1</b> [0000]
	<i>this setting is related to a com-50 print, if this is not present, this line will never be shown. In addition, this line will only be visible when a PIN code is prompted for and the entered code is incorrect.</i>
02-14	<b>PINCODE COM 2</b> [0000]
	<i>Refer to 02-13.</i>
02-15	<b>AUTOMATIC RESET TIMEOUT ALARM</b> [0> off]
	<i>0&gt; off 1&gt; on; Here you can enter whether a time-out alarm (section 00, page 01, line 05) may be deleted automatically. A screen saver will be activated when this line is set to 1&gt;on.</i>



<b>3 TCP/IP SETTINGS</b> (Software version: Txx10003-01.01 and above)		
03-01	<b>INTERNET CONNECTION 1</b> <i>0&gt;no / 1&gt;yes</i> <i>Select here if an internet or direct connection with a COM-60 is active.</i>	[0> no]
03-02	<b>IP-ADDRESS AUTOMATIC 1</b> <i>0&gt;no / 1&gt;yes</i> <i>If the local network supports DHCP the COM-60 can get an IP address automatically.</i> <i>If you do not use DHCP, the IP-address, the subnet mask and the gateway address must be entered.</i>	[0> no]
03-03	<b>IP- ADDRESS OCTET 1</b> <i>0&gt; 10 1&gt;172 2&gt;192</i> <i>First IP address octet. A complete IP address has 4 octets (i.e. 192.168.0.123).</i>	[0> 10]
03-04	<b>IP- ADDRESS OCTET 2</b> <i>Second IP address octet.</i>	[0]
03-05	<b>IP- ADDRESS OCTET 3</b> <i>Third IP address octet.</i>	[0]
03-06	<b>IP- ADDRESS OCTET 4</b> <i>Fourth IP address octet.</i>	[0]
03-07	<b>SUBNET MASK OCTET 1</b> <i>First subnet mask octet. A complete subnet mask also has 4 octets (i.e. 255.255.255.0).</i>	[255]
03-08	<b>SUBNET MASK OCTET 2</b> <i>Second subnet mask octet</i>	[255]
03-09	<b>SUBNET MASK OCTET 3</b> <i>Third subnet mask octet</i>	[255]
03-10	<b>SUBNET MASK OCTET 4</b> <i>Fourth subnet mask octet</i>	[0]
03-11	<b>GATEWAY OCTET 1</b> <i>0&gt; 10 1&gt;172 2&gt;192</i> <i>First gateway address octet. Gateway address also has 4 octets (i.e. 255.255.255.0).</i>	[0> 10]
03-12	<b>GATEWAY OCTET 2</b> <i>Second gateway address octet.</i>	[0]
03-13	<b>GATEWAY OCTET 3</b> <i>Third gateway address octet.</i>	[0]
03-14	<b>GATEWAY OCTET 4</b> <i>Fourth gateway address octet.</i>	[0]

## 6 DESCRIPTION OF THE AGRICULTURE PROGRAM SECTIONS (ACC)

The Omnivent ACC-agriculture contains 22 program-sections.

Every single program section will be explained on the following pages.

The codes, or number-combinations used in this manual are a combination of the program section number (second line on display) and the number of the line (third line on display).

### 6.1 Program section index



<b>1</b> <b>GENERAL SETTINGS</b> 01-01 DEPARTMENT NAME 01-02 OPERATING CODE ? 01-03 OPERATING PERMITTED 01-04 STARTING TIME OF DAY 01-05 AFTER VENTILATION BLOWING / SUCKING 01-06 LEVEL OF INSTALLER SETTINGS 01-07 TIME 01-08 DATE 01-09 YEAR	<b>2</b> <b>TIMER SETTINGS</b> 02-01 STARTING TIME 1 02-02 STOPPING TIME 1 02-03 STARTING TIME 2 02-04 STOPPING TIME 2 02-05 STARTING TIME 3 02-06 STOPPING TIME 3 02-07 STARTING TIME 4 02-08 STOPPING TIME 4 02-09 STARTING TIME 5 02-10 STOPPING TIME 5 02-11 STARTING TIME 6 02-12 STOPPING TIME 6 02-13 STARTING TIME 7 02-14 STOPPING TIME 7 02-15 SELECTION DAY / WEEK 02-16 ACTUAL DAY 02-17 MAXIMUM PERIOD FAN OFF 02-18 AUTOMATIC RECIRCULATION TIME 02-19 AFTER VENTILATION TIME 02-20 MAX. TIME EXTERNAL VENTILATION / DAY	<b>3</b> <b>MEASUREMENTS</b> 03-01 AVERAGE PRODUCT TEMPERATURE 03-02 DELTA PRODUCT TEMPERATURE 03-03 AVERAGE PRODUCT RELATIVE HUMIDITY 03-04 DEWPOINT PRODUCT 03-05 AVERAGE DUCT TEMPERATURE 03-06 OUTSIDE TEMPERATURE 03-07 OUTSIDE RELATIVE HUMIDITY 03-08 DEWPOINT OUTSIDE 03-09 AVERAGE STORE ROOM TEMPERATURE 03-10 CO <sub>2</sub> -CONCENTRATION 03-11 STATE OF FANS 1 03-12 STATE OF FANS 2 03-13 STATE OF HEATER 03-14 STATE OF BLOWING / SUCKING 03-15 STATE OF FLAP LEFT / RIGHT 03-16 STATE OF SWITCH 03-17 STATE OF REFRIGERATOR 03-18 STATE OF CO <sub>2</sub> CONTROL 03-19 STATE OF CONDENSATION CONTROL 03-20 STATE OF DOSE PROGRAM 03-21 POSITION INLETFLAP 03-22 POSITION OUTLETFLAP 03-23 HEATING LEVEL 03-24 POSITION COOLING VALVE
<b>7</b> <b>SELECTION OF PROGRAMS</b> 07-01 PROGRAM 07-02 SET REFRIGERATION 07-03 SET CO <sub>2</sub> CONTROL 07-04 SET CONDENSATION CONTROL 07-05 SET SWITCH PROGRAM 07-06 SET DOSE PROGRAM 07-10 STATE OF ACTIVE PROGRAM 07-11 NOT RUNNING CAUSE ACTIVE PROGRAM 07-30 FIXED CAPACITY DVR-20 07-31 MINIMUM CAPACITY DVR-20 07-32 MAXIMUM CAPACITY DVR-20 07-33 SET POINT DELTA TEMPERATURE DVR-20 07-34 MIN. CAPACITY AFTER VENTILATION DVR-20 07-35 MAX. CAPACITY AFTER VENTILATION DVR-20	<b>5</b> <b>SENSOR MEASUREMENTS</b> 05-01 DUCT TEMPERATURE 1 05-02 DUCT TEMPERATURE 2 05-03 DUCT TEMPERATURE 3 05-04 PRODUCT TEMPERATURE 1 05-05 PRODUCT TEMPERATURE 2 05-06 PRODUCT TEMPERATURE 3 05-07 PRODUCT TEMPERATURE 4 05-08 PRODUCT TEMPERATURE 5 05-09 PRODUCT TEMPERATURE 6 05-10 PRODUCT TEMPERATURE 7 05-11 PRODUCT TEMPERATURE 8 05-12 PRODUCT TEMPERATURE 9 05-13 PRODUCT TEMPERATURE 10 05-14 PRODUCT TEMPERATURE 11 05-15 PRODUCT TEMPERATURE 12 05-16 PRODUCT TEMPERATURE 13 05-17 PRODUCT TEMPERATURE 14 05-18 PRODUCT TEMPERATURE 15 05-19 PRODUCT RH 1 05-20 PRODUCT RH 2 05-21 STORE ROOM TEMPERATURE 1 05-22 STORE ROOM TEMPERATURE 2 05-23 STORE ROOM TEMPERATURE 3	<b>6</b> <b>SELECTION OF SENSORS</b> 06-01 DUCT TEMPERATURE 1 (no/yes) 06-02 DUCT TEMPERATURE 2 (no/yes) 06-03 DUCT TEMPERATURE 3 (no/yes) 06-04 PRODUCT TEMPERATURE 1 (no/yes) 06-05 PRODUCT TEMPERATURE 2 (no/yes) 06-06 PRODUCT TEMPERATURE 3 (no/yes) 06-07 PRODUCT TEMPERATURE 4 (no/yes) 06-08 PRODUCT TEMPERATURE 5 (no/yes) 06-09 PRODUCT TEMPERATURE 6 (no/yes) 06-10 PRODUCT TEMPERATURE 7 (no/yes) 06-11 PRODUCT TEMPERATURE 8 (no/yes) 06-12 PRODUCT TEMPERATURE 9 (no/yes) 06-13 PRODUCT TEMPERATURE 10 (no/yes) 06-14 PRODUCT TEMPERATURE 11 (no/yes) 06-15 PRODUCT TEMPERATURE 12 (no/yes) 06-16 PRODUCT TEMPERATURE 13 (no/yes) 06-17 PRODUCT TEMPERATURE 14 (no/yes) 06-18 PRODUCT TEMPERATURE 15 (no/yes) 06-19 PRODUCT RH 1 (no/yes) 06-20 PRODUCT RH 2 (no/yes) 06-21 STORE ROOM TEMPERATURE 1 (no/yes) 06-22 STORE ROOM TEMPERATURE 2 (no/yes) 06-23 STORE ROOM TEMPERATURE 3 (no/yes)
<b>4</b> <b>RUNNING HOURS</b> 04-01 EXTERNAL VENTILATION / day 04-02 INTERNAL VENTILATION / day 04-03 REFRIGERATING / day 04-04 CO <sub>2</sub> CONTROL / day 04-05 CONDENSATION CONTROL / day 04-06 HEATER / day 04-07 SWITCH PROGRAM / day 04-08 EXTERNAL VENTILATION 04-09 INTERNAL VENTILATION 04-10 MANUAL PROGRAM 04-11 WARMING-UP 04-12 DRYING / HEALING 04-13 AFTER DRYING 04-14 COOLING / STORAGE 04-15 DEHUMIDIFICATION 04-16 REFRIGERATION 04-17 CO <sub>2</sub> CONTROL 04-18 CONDENSATION CONTROL 04-19 HEATER 04-20 ELECTRO HEATER 04-21 SWITCH PROGRAM 04-22 DOSE VALVE ACTIVE 04-23 RESET RUNNING HOURS		



<b>8</b>	<b>MANUAL PROGRAM</b> 08-01 RUNNING PROGRAM 08-02 SET FANS  08-04 SET HEATER 08-05 SET BLOWING / SUCKING 08-06 SET FLAP LEFT / RIGHT 08-07 TIMER 08-08 REQUIRED POSITION INLETFLAP 08-09 REQUIRED POSITION OUTLETFLAP 08-10 REQUIRED HEATING LEVEL 08-11 STATE OF FANS  08-13 STATE OF HEATER 08-14 STATE BLOWING / SUCKING 08-15 STATE OF FLAP LEFT / RIGHT 08-16 POSITION INLETFLAP 08-17 POSITION OUTLETFLAP 08-18 HEATING LEVEL 08-19 POSITION COOLING VALVE
<b>9</b>	<b>WARMING UP</b> 09-01 RUNNING PROGRAM 09-02 OUTSIDE TEMPERATURE 09-03 OUTSIDE RELATIVE HUMIDITY 09-04 AVERAGE DUCT TEMPERATURE 09-05 AVERAGE PRODUCT TEMPERATURE 09-06 REQ. DIFFERENCE DUCT-PRODUCT TEMP. 09-07 MAXIMUM DUCT TEMPERATURE 09-08 CURRENT REQUIRED PRODUCT TEMP. 09-09 TERMINAL PRODUCT TEMPERATURE 09-10 WARMING UP PERIOD 09-11 WARMING UP IN PROCESS 09-12 MIN. DIFF. OUTSIDE TEMP. PROD. TEMP. 09-13 MAXIMUM OUTSIDE TEMPERATURE 09-14 MINIMUM OUTSIDE TEMPERATURE 09-15 MAX. OUTSIDE RELATIVE TEMPERATURE 09-16 MAXIMUM POSITION INLETFLAP 09-17 MINIMUM POSITION INLETFLAP 09-18 HEATER no / yes 09-19 STATE OF HEATER 09-20 HEATING LEVEL 09-21 POSITION INLETFLAP 09-22 STATE OF PROGRAM 09-23 NOT RUNNING CAUSE 09-24 RESET PROGRAM 09-30 FIXED CAPACITY DVR-20 09-31 MINIMUM CAPACITY DVR-20 09-32 MAXIMUM CAPACITY DVR-20 09-33 SET POINT DELTA TEMPERATURE DVR-20
<b>10</b>	<b>DRYING / HEALING</b> 10-01 RUNNING PROGRAM 10-02 OUTSIDE TEMPERATURE 10-03 OUTSIDE RELATIVE HUMIDITY 10-04 DEWPOINT OUTSIDE 10-05 AVERAGE DUCT TEMPERATURE 10-06 AVERAGE PRODUCT TEMPERATURE 10-07 AVERAGE PROD. RELATIVE HUMIDITY 10-08 DEWPOINT PRODUCT 10-09 REQUIRED PRODUCT RH 10-10 MAXIMUM DIFFERENCE DEWPOINT 10-11 MINIMUM DIFFERENCE DEWPOINT 10-12 MAXIMUM OUTSIDE TEMPERATURE 10-13 MINIMUM OUTSIDE TEMPERATURE 10-14 MAXIMUM OUTSIDE RELATIVE HUMIDITY 10-15 MAXIMUM PRODUCT TEMPERATURE 10-16 MINIMUM PRODUCT TEMPERATURE 10-17 MAXIMUM DUCT TEMPERATURE 10-18 MINIMUM DUCT TEMPERATURE 10-19 REQ. DIFFERENCE DUCT-PRODUCT TEMP. 10-20 MAX. DIFF. DUCT TEMP- PRODUCT TEMP. HIGH 10-21 MAX. DIFF. DUCT TEMP – PRODUCT TEMP. LOW 10-22 HEATER no / yes 10-23 MINIMUM POSITION INLETFLAP 10-24 STATE OF PROGRAM 10-25 NOT RUNNING CAUSE 10-26 RESET PROGRAM 10-30 FIXED CAPACITY DVR-20 10-31 MINIMUM CAPACITY DVR-20 10-32 MAXIMUM CAPACITY DVR-20 10-33 SET POINT DELTA TEMPERATURE DVR-20
<b>11</b>	<b>AFTER DRYING</b> 11-01 RUNNING PROGRAM 11-02 OUTSIDE TEMPERATURE 11-03 AVERAGE PRODUCT TEMPERATURE 11-04 AVERAGE DUCT TEMPERATURE 11-05 STATE OF HEATER 11-06 HEATING LEVEL 11-07 POSITION INLETFLAP 11-08 MAXIMUM POSITION INLETFLAP 11-09 MINIMUM POSITION INLETFLAP 11-10 INITIAL DUCT TEMPERATURE 11-11 TERMINAL DUCT TEMPERATURE 11-12 AFTER DRYING PERIOD 11-13 AFTER DRYING IN PROCESS 11-14 CURRENT REQUIRED DUCT TEMPERATURE 11-15 DEWPOINT OUTSIDE 11-16 DEWPOINT PRODUCT 11-17 MINIMUM DIFFERENCE DEWPOINT 11-18 ACTION PERIOD AFTER DRYING 11-19 INTERVAL PERIOD AFTER DRYING 11-20 STATE OF PROGRAM 11-21 NOT RUNNING CAUSE 11-22 RESET PROGRAM 11-30 FIXED CAPACITY DVR-20 11-31 MINIMUM CAPACITY DVR-20 11-32 MAXIMUM CAPACITY DVR-20 11-33 SET POINT DELTA TEMPERATURE DVR-20
<b>12</b>	<b>COOLING / STORAGE</b> 12-01 RUNNING PROGRAM 12-02 OUTSIDE TEMPERATURE 12-03 CALCULATED OUTSIDE TEMPERATURE 12-04 AVERAGE DUCT TEMPERATURE 12-05 AVERAGE PRODUCT TEMPERATURE 12-06 DELTA PRODUCT TEMPERATURE 12-07 OUTSIDE HUMIDITY 12-08 POSITION INLETFLAP 12-09 CURRENT REQUIRED PRODUCT TEMP. 12-10 TERMINAL PRODUCT TEMPERATURE 12-11 COOLING DOWN PERIOD 12-12 COOLING IN PROCESS 12-13 MIN. DIF. OUTSIDE TEMP – PRODUCT TEMP. 12-14 MAXIMUM DIFF DUCT – PRODUCT TEMP 12-15 MIN. OUTSIDE TEMPERATURE 12-16 MIN. DUCT TEMPERATURE 12-17 MAX. RELATIVE HUMIDITY OUTSIDE 12-18 MAX. DIFFERENCE DEWPOINT 12-19 MIN. DIFFERENCE DEWPOINT 12-20 HYSTERESIS PRODUCT COOLING/STORAGE 12-21 MAXIMUM TEMPERATURE DROP / DAY 12-22 MAXIMUM DELTA PROD. TEMP. 12-23 STATE OF PROGRAM 12-24 NOT RUNNING CAUSE 12-25 RESET PROGRAM 12-30 FIXED CAPACITY DVR-20 12-31 MINIMUM CAPACITY DVR-20 12-32 MAXIMUM CAPACITY DVR-20 12-33 SET POINT DELTA TEMPERATURE DVR-20 12-40 REQUIRED PRODUCT RH 12-41 MAX RH DIFFERENCE / DAY 12-42 WAITIME EXTERN VENT TEMPERATURE 12-43 LOW LIMIT TEMPERATURE DIFF RH 12-44 HIGH LIMIT TEMPERATURE DIFF RH 12-45 MIN. DIFFERENCE DEWPOINT HUMIDIFICAT. 12-46 MAX DIFFERENCE DEWPOINT HUMIDIFICAT. 12-47 MIN. DIFFERENCE DEWPOINT DRYING 12-48 MAX. DIFFERENCE DEWPUNT DRYING 12-50 DEWPOINT CHECK 12-51 DEWPOINT DUCT 12-52 MIN. POSITION INLETFLAP 12-90 NOT RUNNING CAUSE TEMP REGULATION 12-91 NOT RUNNING CAUSE RH REGULATION
<b>13</b>	<b>REFRIGERATION</b> 13-01 STATE OF REFRIGERATOR PROGRAM 13-02 AVERAGE DUCT TEMPERATURE 13-03 AVERAGE PRODUCT TEMPERATURE 13-04 AVERAGE STORE ROOM TEMPERATURE 13-05 CURRENT REQUIRED STORE ROOM TEMP. 13-06 REQUIRED DIFF. ROOM – PRODUCT TEMP. 13-07 HYSTERESIS ROOM TEMPERATURE 13-08 CURRENT REQUIRED PRODUCT TEMPERATURE 13-09 HYSTERESIS PRODUCT TEMP. REFRIGERATION 13-10 FANS 1 STARTING DIFFERENCE 13-11 FANS 1 STOPPING DIFFERENCE 13-12 MINIMUM DUCT TEMP. REFRIGERATION 13-13 MINIMUM STORE ROOM TEMP. REFRIGERATION 13-14 SET EVAPORATOR FANS 13-15 AFTER-VENTILATION TIME EVAPORATOR FANS 13-16 DEFROST INTERVAL 13-17 MAXIMUM DEFROST PERIOD 13-18 TIMER off/on 13-19 START TIME REFRIGERATION 13-20 STOP TIME REFRIGERATION 13-21 STATE OF FANS 1 13-22 STATE OF EVAPORATOR FANS 13-23 STATE OF REFRIGERATION 13-24 NOT RUNNING CAUSE 13-25 RESET PROGRAM 13-26 SUCKED AIR TEMPERATURE 13-27 BLOWN AIR TEMPERATURE 13-28 REQUIRED DIFFERENCE AIR TEMPERATURE 13-29 HYSTERESES AIR TEMPERATURE



<b>14</b>	<b>CO<sub>2</sub> CONTROL</b>	<b>15</b>	<b>CONDENSATION CONTROL</b>	<b>16</b>	<b>DEHUMIDIFICATION</b>
14-01	STATE OF CO <sub>2</sub> CONTROL	15-01	STATE OF PROGRAM	16-01	RUNNING PROGRAM
14-02	MAXIMUM POSITION INLETFLAP	15-02	OUTSIDE TEMPERATURE	16-02	AVERAGE DUCT TEMPERATURE
14-03	MINIMUM POSITION INLETFLAP	15-03	STORE ROOM TEMPERATURE	16-03	REQUIRED DUCT TEMPERATURE
14-04	MAXIMUM TIME CO <sub>2</sub> CONTROL	15-04	REQUIRED STORE ROOM TEMPERATURE	16-04	MINIMUM DUCT TEMPERATURE
14-05	MINIMUM TIME CO <sub>2</sub> CONTROL	15-05	MAXIMUM OUTSIDE TEMPERATURE	16-05	STORE ROOM TEMPERATURE
14-06	MAXIMUM TIME NO FRESH AIR	15-06	MINIMUM OUTSIDE TEMPERATURE	16-06	AVERAGE PRODUCT TEMPERATURE
14-07	OUTSIDE TEMPERATURE	15-07	PERIOD ON	16-07	REQUIRED PRODUCT TEMPERATURE
14-08	CALCULATED OUTSIDE TEMPERATURE	15-08	PERIOD OFF	16-08	AVERAGE PRODUCT RELATIVE HUMIDITY
14-09	MAXIMUM OUTSIDE TEMPERATURE	15-09	TIMER	16-09	REQUIRED PRODUCT RELATIVE HUMIDITY
14-10	MINIMUM OUTSIDE TEMPERATURE	15-10	STATE OF ELECTRO HEATER	16-10	STATE OF FANS 1
14-11	AVERAGE DUCT TEMPERATURE	15-11	STATE OF CONDENSATION CONTROL	16-11	STATE OF HEATER
14-12	MAXIMUM DUCT TEMPERATURE	15-12	NOT RUNNING CAUSE	16-12	STATE OF REFRIGERATOR
14-13	MINIMUM DUCT TEMPERATURE	15-13	RESET PROGRAM	16-13	STATE OF PROGRAM
14-14	CURRENT CO <sub>2</sub> CONCENTRATION	15-30	FIXED CAPACITY DVR-20	16-14	NOT RUNNING CAUSE
14-15	REQUIRED CO <sub>2</sub> CONCENTRATION			16-15	RESET PROGRAM
14-16	SET FANS 1				
14-17	SET FANS 2				
14-18	TIMER				
14-19	MECHANICAL COOLING (no/yes)				
14-20	STATE OF FANS 1				
14-21	STATE OF FANS 2				
14-22	POSITION INLETFLAP				
14-23	STATE OF CO <sub>2</sub> CONTROL				
14-24	NOT RUNNING CAUSE				
14-25	RESET PROGRAM				
14-30	FIXED CAPACITY DVR-20				
<b>17</b>	<b>SWITCH PROGRAM</b>	<b>18</b>	<b>GAS SUPPLY PROGRAM</b>	<b>19</b>	<b>ALARM</b>
17-01	STATE OF SWITCH PROGRAM	18-01	STATE OF GAS SUPPLY PROGRAM	19-01	TYPE OF ALARM
17-02	STARTING TIME SWITCH PROGRAM	18-02	BEFORE VENTILATION TIME	19-02	SET ALARM
17-03	STOP TIME SWITCH PROGRAM	18-03	SUPPLY TIME	19-03	TOLERANCE PRODUCT TEMP. HIGH
17-04	MAXIMUM RUNNING HOURS PROGRAM	18-04	AFTER VENTILATION TIME	19-04	TOLERANCE PRODUCT TEMP. LOW
17-05	MEASURED SWITCH VALUE	18-05	WAITING TIME	19-05	TOLERANCE DUCT TEMPERATURE HIGH
17-06	SETPOINT SWITCH VALUE	18-06	TOTAL CYCLE TIME	19-06	TOLERANCE DUCT TEMPERATURE LOW
17-07	MAXIMUM OUTSIDE TEMPERATURE	18-07	TIME FROM LAST SUPPLY	19-07	TOLERANCE STORE ROOM TEMP. HIGH
17-08	MINIMUM OUTSIDE TEMPERATURE	18-08	TIME UNTILL NEXT SUPPLY	19-08	TOLERANCE STORE ROOM TEMP. LOW
17-09	PERIOD ON SWITCH PROGRAM	18-09	POSITION INLETFLAP DURING BEFORE VENT.	19-09	TOLERANCE SWITCH VALUE HIGH
17-10	PERIOD OFF SWITCH PROGRAM	18-10	STATE OF FANS DURING SUPPLY	19-10	TOLERANCE SWITCH VALUE LOW
17-11	CONDITION FOR FANS	18-11	POSITION INLET FLAP DURING SUPPLY	19-11	MAXIMUM DELTA TEMPERATURE
17-12	SWITCH PROGRAM FUNCTION	18-12	STATE OF FANS DURING WAITING TIME	19-12	LIMIT DUCT SENSOR HIGH
17-13	STATE OF SWITCH OUTPUT	18-13	POSITION INLET FLAP DURING WAIT. TIME	19-13	LIMIT DUCT SENSOR LOW
17-14	NOT RUNNING CAUSE	18-14	TIMER ON/OFF	19-14	TOLERANCE CO <sub>2</sub> CONCENTRATION
17-15	RESET PROGRAM	18-15	STATE OF VENTILATION GROUP	19-15	TOLERANCE INLET – OUTLET FLAP
		18-16	MEASURED POSITION INLET FLAP		
		18-17	STATE OF DOSE VALVE		
		18-18	STATE OF PROGRAM		
		18-19	NOT RUNNING CAUSE		
		18-20	RESET PROGRAM		
		18-30	FIXED CAPACITY DVR-20 BEFORE VENTIL.		
		18-31	FIXED CAPACITY DVR-20 DURING SUPPLY		
		18-32	FIXED CAPACITY DVR-20 AFTER SUPPLY		

20	ACC SYSTEM	21	INSTALLER SETTINGS GENERAL	22	INSTALLER SETTINGS SENSORS
20-01	USER LEVEL	21-01	ALARM RESET TIME	22-01	HYSTERESIS PRODUCT TEMPERATURE
20-02	BLOCKING HOURS INPUT	21-02	INITIALIZATION INLETFLAP	22-02	HYSTERESIS PROD. RELATIVE HUMIDITY
20-03	EXTERNAL ALARM INPUT	21-03	RUNNING TIME INLETFLAP	22-03	HYSTERESIS OUTSIDE TEMPERATURE
20-05	VISIBLE PROGRAMS	21-04	INITIALIZATION OUTLETFLAP	22-04	EXTRA HYSTERESIS PROD. TEMP. COOLING
20-06	LICENCE CODE 1	21-05	RUNNING TIME OUTLETFLAP	22-05	HYSTERESIS DUCT TEMPERATURE
20-07	LICENCE CODE 2	21-06	INITIALIZATION HEATING VALVE	22-06	EXTRA HYSTERESIS DUCT TEMPERATURE
20-08	GAS SUPPLY PROGRAM START INPUT	21-07	RUNNING TIME HEATING VALVE	22-07	HYSTERESIS DEWPOINT
		21-08	INITIALIZATION COOLING VALVE	22-08	HYSTERESIS STORE ROOM TEMPERATURE
		21-09	RUNNING TIME COOLING VALVE	22-09	HYSTERESIS SWITCH VALUE
		21-10	PULSE INLETFLAP	22-10	HYSTERESIS CO <sub>2</sub> CONCENTRATION
		21-11	INTERVAL INLETFLAP	22-11	SET PRODUCT RELATIVE HUMIDITY 1
		21-12	PULSE HEATING VALVE	22-12	SET PRODUCT RELATIVE HUMIDITY 2
		21-13	INTERVAL HEATING VALVE	22-13	SET OUTSIDE RELATIVE HUMIDITY
		21-14	PULSE COOLING VALVE	22-14	SET / RANGE CO <sub>2</sub> SENSOR
		21-15	INTERVAL COOLING VALVE	22-15	TYPE CO <sub>2</sub> SENSOR
		21-16	SAFETY POSITION INLETFLAP		
		21-17	MINIMUM TIME EXTERNAL VENTILATION		
		21-18	WAIT DELTA RECIRCULATION		
		21-19	WAIT TIME CO <sub>2</sub> CONTROL		
		21-20	DATE RESET RUNNING HOURS		
		21-21	SWITCH TIME BLOWING / SUCKING		
		21-22	WAIT FANS		
		21-23	WAIT INLETFLAP		
		21-24	HUMIDIFIER		
		21-25	CO <sub>2</sub> REFRESHMENT METHOD		
		21-26	DVR SETTINGS VISIBLE		

## 6.2 Description program sections


1	GENERAL SETTINGS
01-01	<b>DEPARTMENT NAME</b> <span style="float: right;">[department number]</span> <i>The user is free to choose a name. This department name is to recognize the different departments. The number (of the department) in front of the name on the first line of the display, is set by the installer.</i>
01-02	<b>OPERATING CODE</b> <span style="float: right;">[0]</span> <i>When an operating code is set it must be filled in here. This line is only visible when operation is not permitted.</i>
01-03	<b>OPERATING PERMITTED</b> <span style="float: right;">[yes]</span> <i>When operation is not permitted none of the settings can be changed.</i>  <i>The setting 'YES' or 'NO' remain possible if the user's level is on 'maximum'(20-01).</i>
01-04	<b>STARTING TIME OF DAY</b> <span style="float: right;">[22.00]</span> <i>In a number of cases the running hours per 24 hours will be recorded. This means that the counters are reset once every 24 hours. The resetting time is determined by indicating the starting time of day.</i>
01-05	<b>AFTER-VENTILATION BLOWING/SUCKING (only in extended program)</b> <span style="float: right;">[blowing]</span> <i>One can choose for blowing or sucking in this after-ventilation action. The normal fan's action is blowing. After-ventilation means an automatic internal ventilation, following the period of ventilating with outside air (external ventilation). When the air (during after-ventilation) is sucked through the product instead of blown, a better spreading of temperature and humidity in top- and bottom layer of the product storage is realized.</i>  <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">             Remark!         </div> <div> <p>1) in case of fans equipped with non-return flaps, built in a ventilation system, these non-return flaps should be set out of order during the sucking of the fans.</p> <p>2) switching from blowing to sucking is done automatically, taking into account a time-delay and waiting times for the groups of fans.</p> </div> </div>
01-06	<b>LEVEL OF INSTALLER SETTINGS</b> <span style="float: right;">[off]</span> <i>An auxiliary setting for the installer. Not applicable to the user.</i>
01-07	<b>TIME</b>
01-08	<b>DATE</b>
01-09	<b>YEAR</b> <i>These lines are to set the time, date and year.</i>  <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">             Attention!         </div> <div> <p>The ACT is equipped with a real-time clock. The linked ACC clocks are not real-timers and are controlled by the clock of the ACT.</p> </div> </div>


2	TIMER SETTINGS
	<p>It is possible to have the programs run and stop on time automatically. In several time-units per day, or different starting times and stops on weekdays. After the fixed stop and before the next starting time, there will be no ventilation, cooling, heating or drying. Not even automatic internal ventilation. Settings of starts and stops may overlap. If the starting time is the same as the stop, there is no activity in the time unit involved. If the stop is one minute earlier than the starting time, the regulator is running full-time.</p> <p> <b>Attention!</b> The lines 02-01 up to and including 02-14 may block the automatic programs ( provided that the 'clock function' is on 'yes', if applicable).</p>
02-01	<b>STARTING TIME 1</b> [0.00] <i>Starting time block 1</i>
02-02	<b>STOPPING TIME 1</b> [24.00] <i>Stopping time block 1</i>
02-03	<b>STARTING TIME 2</b> [0.00]
02-04	<b>STOPPING TIME 2</b> [0.00]
02-05	<b>STARTING TIME 3</b> [0.00]
02-06	<b>STOPPING TIME 3</b> [0.00]
02-07	<b>STARTING TIME 4</b> [0.00]
02-08	<b>STOPPING TIME 4</b> [0.00]
02-09	<b>STARTING TIME 5</b> [0.00]
02-10	<b>STOPPING TIME 5</b> [0.00]
02-11	<b>STARTING TIME 6</b> [0.00]
02-12	<b>STOPPING TIME 6</b> [0.00]
02-13	<b>STARTING TIME 7</b> [0.00]
02-14	<b>STOPPING TIME 7</b> [0.00] <i>There are maximally 7 time-units per 24 hours. If "WEEK" in line 02-15 is selected, the time units correspond with the 7 days of the week.</i>
02-15	<b>SELECTION DAY / WEEK</b> [day] <i>Select whether the time units refer to units per day or units per week.          If "week" is chosen, unit 1 refers to Monday and unit 7 refers to Sunday.</i>
02-16	<b>ACTUAL DAY</b> [mondatt] <i>Both a registration and setting-possibility for the user. For instance, when one wishes to use the time program of a particular day (for instance the start and stop of Thursday) on another day (for instance Wednesday). This only refers to "week" in line 02-15, therefore it will not be visible if "day" is chosen.</i>
02-17	<b>MAXIMUM PERIOD FAN OFF</b> [24.00] <i>In order to maintain a homogeneous spread of temperature and humidity in the stored product, it is better to ventilate internally if the fans did not run for a long period. For instance once per 48 hours, for a period of twenty minutes. The maximally allowed stop can be set optionally.</i>
02-18	<b>AUTOMATIC RECIRCULATION TIME</b> [0.20] <i>This is the period to be set for automatic internal ventilation activities (recirculation). As a result of a stand-still of the fan that lasted too long or as a result of differences in temperature in the product that were too large (delta temperature).</i>
02-19	<b>AFTER VENTILATION TIME</b> [0.20] <i>The period of after-ventilation, following the external ventilation, can be set optionally. For instance 20 to 30 minutes.</i>
02-20	<b>MAXIMUM TIME EXTERNAL VENTILATION / DAY</b> [24.00] <i>If there is automatic, external ventilation in a program, it is possible to limit the number of "external" hours. If a program is switched off and on again, this counter starts again. Does not apply to "Manual operation".</i> <p> <b>Attention!</b> Line 02-20 may stop the ventilation (does not apply to 'manual program', 'after drying' and 'CO<sub>2</sub> control').</p>


3	MEASUREMENTS
	In this program section there are only measuring records. It is not possible to change, to set or reset any setting.
03-01	<p><b>AVERAGE PRODUCT TEMPERATURE</b></p> <p><i>The user is free in choosing the product sensors that help to determine the average product temperature. The product sensors which are not selected keep giving a reading.</i></p> <div data-bbox="256 477 347 544">  <p>Attention!</p> </div> <p><b>In the event of wire damage or short-cut, the selected sensor will immediately be taken out of the average temperature. In that case the reading will be 100°C. Sensor can be selected in page 06-00 (Selection Of Sensors).</b></p>
03-02	<p><b>DELTA PRODUCT TEMPERATURE</b></p> <p><i>This is the difference between the highest and the lowest, current product temperatures. Measured by the active (i.e. selected) product sensors.</i></p>
03-03	<p><b>AVERAGE PRODUCT RELATIVE HUMIDITY</b></p> <p><i>Is active, but not visible at the simplest user's level. If there are no product RH-sensors connected, a fixed (simulated) value can be set in "Installers Settings". In this way a simulated dew-point will be calculated (03-04).</i></p>
03-04	<p><b>DEWPOINT PRODUCT</b></p> <p><i>Is active, but not visible at the simplest user's level. The readings of the average product temp. and the average product RH are taken to calculate the dewpoint of the air in the product-storage. In the programs Drying/Heating and After-Drying the difference between the dew points of the outside air and the product is used to determine whether to ventilate or not.</i></p>
03-05	<p><b>AVERAGE DUCT TEMPERATURE</b></p> <p><i>It is possible to connect max. three duct-sensors. Selectable. The upper- and lower limits are set.</i></p> <div data-bbox="256 1081 347 1149">  <p>Attention!</p> </div> <p><b>In the event of a temperature below or above these limits, or wire damage or short-cut, the selected sensor will immediately be taken out of the average duct-temperature. In these cases, the reading will be 100°C. In the program Cooling/Storage the reading will be -30°C. Moreover a duct sensor alarm will be generated.</b></p>
03-06	<p><b>OUTSIDE TEMPERATURE</b></p>
03-07	<p><b>OUTSIDE RELATIVE HUMIDITY</b></p>
03-08	<p><b>DEWPOINT OUTSIDE</b></p> <p><i>Calculated from the outside temperature and the outside RH.</i></p>
03-09	<p><b>AVERAGE STORE ROOM TEMPERATURE</b></p> <p><i>Can be measured by a room sensor, "somewhere" between the stored product and the ceiling of the storage department. The room temperature might influence the automatic control of refrigeration and the control of the heating elements in the condensation fans.</i></p> <p><i>The user is free in choosing the store room sensors that help to determine the average product temperature. The product sensors which are not selected keep giving a reading.</i></p>
03-10	<p><b>CO<sub>2</sub> –CONCENTRATION</b></p> <p><i>The CO<sub>2</sub>-concentration is measured in the duct where CO<sub>2</sub> accumulates.</i></p> <p><i>In the CO<sub>2</sub> Control program external ventilation can take place based on the measured CO<sub>2</sub>-concentration.</i></p>
03-11	<p><b>STATE OF FANS 1</b></p>
03-12	<p><b>STATE OF FANS 2 (only in extended program)</b></p>
03-13	<p><b>STATE OF HEATER</b></p> <p><i>Are the heaters switched on, yes or no? Does not give any information about the position of the gas or hot water valve.</i></p>
03-14	<p><b>STATE OF BLOWING / SUCKING (only in extended program)</b></p>





03-15	<b>STATE OF FLAP LEFT / RIGHT (only in extended program)</b> <i>A measured position of the extra flap. Has nothing to do with inlet flap or outlet flaps. In normal installations, there will not be an extra flap. Can also be used to control special, peripheral equipment. When the stop of a particular time unit has been reached, the flap is switched (provided that this stop is not overlapped by the following starting time). Except during manual operation.</i>
03-16	<b>STATE OF SWITCH</b> <i>"on" when the switch of the switch program is active.</i>
03-17	<b>STATE OF REFRIGERATOR</b> <i>"on" when refrigeration is active.</i>
03-18	<b>STATE OF CO<sub>2</sub> CONTROL</b> <i>Indicates whether the department air is ventilated. I.e. the fan(s) operate(s) with the inlet flaps opened at a small percentage.</i>
03-19	<b>STATE OF CONDENSATION CONTROL</b> <i>"On" during activities of the circulation- or anti-condensation-fans.</i>
03-20	<b>STATE OF DOSE PROGRAM</b> <i>Indicates whether the dose program is active or not. If the dose program is in one of the next states all the other programs are blocked: before ventilation, supply, after ventilation or waiting time.</i>
03-21	<b>POSITION INLETFLAP</b>
03-22	<b>POSITION OUTLETFLAP (only in extended program)</b> <i>During automatic programs, the outlet flap has to follow the inlet flap. If the deviation becomes too large, an alarm will be activated.</i>
03-23	<b>HEATING LEVEL</b> <i>Refers to position of gas valve or hot water tap, etc. Indicated in percentages.</i>
03-24	<b>POSITION COOLING VALVE</b> <i>Refers to position of the cooling valve. Indicated in percentages.</i>


4	RUNNING HOURS
	<p>For various controlled departments, the running hours per day are recorded. For each program a cumulative count is recorded. Counting takes place when a control and/or program is really in action.</p> <p> <b>Once per year, the total-counters are automatically reset to zero. This reset date can be found in line 21-14.</b></p> <p>Remark!</p>
04-01	<p><b>EXTERNAL VENTILATION / day</b></p> <p>These kind of counters / day are reset to zero, every 24 hours. The start and end of a day is set in " General Settings " line 01-03. The recorded number of running hours is related to the current day. Ventilation with mixed air is a form of external ventilation as well.</p>
04-02	<p><b>INTERNAL VENTILATION / day</b></p> <p>During internal ventilation the inlet flaps remain closed. Also called recirculation. This is done either manually, or automatically as a recirculation activity or in the form of after-ventilation. It follows the various programs. Every twenty-four hours this counter is reset to zero.</p>
04-03	<b>REFRIGERATING / day</b>
04-04	<b>CO<sub>2</sub> CONTROL / day</b>
04-05	<b>CONDENSATION CONTROL / day</b>
04-06	<b>HEATER / day</b>
04-07	<b>SWITCH PROGRAM / day</b>
04-08	<b>EXTERNAL VENTILATION</b>
04-09	<b>INTERNAL VENTILATION</b>
04-10	<b>MANUAL PROGRAM</b>
04-11	<b>WARMING-UP</b>
04-12	<b>DRYING / HEALING</b>
04-13	<b>AFTER DRYING</b>
04-14	<b>COOLING / STORAGE</b>
04-15	<b>DEHUMIDIFICATION (only in extended program)</b>
04-16	<b>REFRIGERATION</b>
04-17	<b>CO<sub>2</sub> CONTROL</b>
04-18	<b>CONDENSATION CONTROL</b>
04-19	<b>HEATER</b>
04-20	<b>ELECTRO HEATER (only in extended program)</b>
04-21	<b>SWITCH PROGRAM</b>
04-22	<p><b>DOSE VALVE</b></p> <p><i>Lines 04-08 to 04-20 refer to cumulative counts per season.</i></p>
04-23	<p><b>RESET RUNNING HOURS</b></p> <p><i>Reset all day and cumulative totals.</i></p>

5	SENSOR MEASUREMENTS
	<p>A reading of the different sensors. It makes no difference whether they are selected for averaging or not. The not connected sensors (product sensor, duct sensor, relative humidity sensor) do not have a read-out.</p> <div data-bbox="256 376 336 443">  <p>Remark!</p> </div> <p>A reading of 100°C indicates a wire damage or short-cut, and the measurement will immediately be taken out of the average.</p>
05-01	DUCT TEMPERATURE 1
05-02	DUCT TEMPERATURE 2
05-03	DUCT TEMPERATURE 3
05-04	PRODUCT TEMPERATURE 1
05-05	PRODUCT TEMPERATURE 2
05-06	PRODUCT TEMPERATURE 3
05-07	PRODUCT TEMPERATURE 4
05-08	PRODUCT TEMPERATURE 5
05-09	PRODUCT TEMPERATURE 6
05-10	PRODUCT TEMPERATURE 7
05-11	PRODUCT TEMPERATURE 8
05-12	PRODUCT TEMPERATURE 9
05-13	PRODUCT TEMPERATURE 10
05-14	PRODUCT TEMPERATURE 11
05-15	PRODUCT TEMPERATURE 12
05-16	PRODUCT TEMPERATURE 13
05-17	PRODUCT TEMPERATURE 14
05-18	PRODUCT TEMPERATURE 15
05-19	PRODUCT RH SENSOR 1
05-20	PRODUCT RH SENSOR 2
05-21	STORE ROOM TEMPERATURE 1
05-22	STORE ROOM TEMPERATURE 2
05-23	STORE ROOM TEMPERATURE 3

6	SELECTION OF SENSORS
	<p>The user is free in deciding which product sensors help to determine the average product temperature. The product sensors which are not selected keep giving a reading. It is possible to connect max. three duct-sensors. The upper- and lower limits are set. In the event of a temperature below or above these limits, or wire damage or short-cut, the selected sensor will immediately be taken out of the average duct-temperature. The reading will be 100°C. In the program Cooling/Storage the reading will be -30°C and a duct sensor alarm will be generated.</p>
06-01	DUCT TEMPERATURE 1 [yes]
06-02	DUCT TEMPERATURE 2 [no]
06-03	DUCT TEMPERATURE 3 [no]
06-04	PRODUCT TEMPERATURE 1 [yes]
06-05	PRODUCT TEMPERATURE 2 [no]
06-06	PRODUCT TEMPERATURE 3 [no]
06-07	PRODUCT TEMPERATURE 4 [no]
06-08	PRODUCT TEMPERATURE 5 [no]
06-09	PRODUCT TEMPERATURE 6 [no]
06-10	PRODUCT TEMPERATURE 7 [no]
06-11	PRODUCT TEMPERATURE 8 [no]
06-12	PRODUCT TEMPERATURE 9 [no]
06-13	PRODUCT TEMPERATURE 10 [no]
06-14	PRODUCT TEMPERATURE 11 [no]
06-15	PRODUCT TEMPERATURE 12 [no]
06-16	PRODUCT TEMPERATURE 13 [no]
06-17	PRODUCT TEMPERATURE 14 [no]
06-18	PRODUCT TEMPERATURE 15 [no]
06-19	PRODUCT RH 1 [yes]
06-20	PRODUCT RH 2 [no]
06-21	STORE ROOM TEMPERATURE 1 [yes]
06-22	STORE ROOM TEMPERATURE 2 [no]
06-23	STORE ROOM TEMPERATURE 3 [no]
	<div data-bbox="252 1301 349 1368">  <p>Attention!</p> </div> <p>If a product sensor is not inserted into the product the sensor has to be switched 'off' so that the average is not influenced by the sensor involved.</p>

7	SELECTION OF PROGRAMS
	<div data-bbox="268 331 359 398">  <p>Attention!</p> </div> <p>Before a program is activated you have to be sure that the switchboard is on automatic (function select switch on '2') and that all select switches are on '1' or '2' (for instance fan on/off). If the switchboard is switched from '1'= manual or '0'= off to '2'=automatic, make sure that the hatches are closed. The ACC assumes all hatches are closed at the start of the program!</p>
07-01	<p><b>PROGRAM</b> [off]</p> <p>Select the required program. Only one program can be active at the same time. Only after five seconds, the program is activated. When the programs are deactivated, it will also take five seconds. In 'off'-position, all programs are deactivated, the inlet and outlet flaps are closed. The left/right flap will turn to the left, the resting position. The options are:</p> <ul style="list-style-type: none"> <li>0&gt; Off</li> <li>1&gt; Manual</li> <li>2&gt; Warming up</li> <li>3&gt; Drying-Healing</li> <li>4&gt; After Drying</li> <li>5&gt; Cooling-Storage</li> <li>6&gt; After Drying + Cooling-Storage</li> <li>7&gt; * Dehumidification</li> <li>8&gt; Reset temperature curves</li> </ul> <div data-bbox="268 943 359 1010">  <p>Attention!</p> </div> <p>Some programs use temperature curves. Select 'reset temperature curves' to recalculate the temperature curves.</p>
07-02	<p><b>SET REFRIGERATION</b> [off]</p> <p>There are three options:</p> <ul style="list-style-type: none"> <li>0&gt; off</li> <li>1&gt; automatic</li> <li>2&gt; on</li> </ul> <p>In the 'automatic' position, refrigeration is only combined with the Cooling/Storage program. In the 'on'-position, refrigeration can be combined with both Manual program and Cooling/Storage. In the 'on' position, the temperature is not controlled. The temperature safeguards are out of order as well. The refrigeration can only be blocked by the time-units when the 'clock function' is in the 'yes' position. AGRI.BASIC: The refrigerator cannot be switched "on" if the multi-function output is not selected for the refrigerator (21-19).</p>
07-03	<p><b>SET CO<sub>2</sub> CONTROL</b> [off]</p> <ul style="list-style-type: none"> <li>0&gt; off</li> <li>1&gt; automatic</li> </ul> <p>Can be added to various programs or can be activated as a stand-alone program. This auxiliary program means that there will be a periodical short ventilation-cycle. The department air will be ventilated. As a result of this the CO<sub>2</sub> will not accumulate.</p>
07-04	<p><b>SET CONDENSATION CONTROL</b> [off]</p> <ul style="list-style-type: none"> <li>0&gt; off</li> <li>1&gt; automatic</li> <li>2&gt; on.</li> </ul> <p>Can be added to various programs or can be activated as a stand-alone program. If 'automatic' is chosen, the outside- and inside temperatures are taken into account. See program 15-00. If 'on' is chosen, this program is activated immediately, inclusive of the electro heating elements, if installed.</p>
07-05	<p><b>SET SWITCH PROGRAM</b> [off]</p> <p>0&gt;off 1&gt;automatic</p> <p>Can be added to various programs or can be activated as a stand-alone program. This is to activate the entirely independent switching program with an own start- and stopping time. See program 17-00.</p>

07-06	<b>SET DOSE PROGRAM</b> <span style="float: right;">[off]</span>  0> off 1> adjust 2> on  <i>Can be added to various programs or can be activated as a stand-alone program. This is to activate the entirely independent dose program. When this program is active all the other running programs will be paused. See program 18-00.</i>
07-10	<b>STATE OF ACTIVE PROGRAM</b> <i>State of the active program, see also lines 09-22, 10-24, 11-20, 12-23, 13-23</i>
07-11	<b>NOT RUNNING CAUSE ACTIVE PROGRAM</b> <i>If the program state is 'no ventilation', the reason of not running is shown here. see also lines 09-23, 10-25, 11-21, 12-24, 13-24</i>
07-30	<b>FIXED CAPACITY DVR-20</b> <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at external ventilation.</i>
07-31	<b>MINIMUM CAPACITY DVR-20</b>
07-32	<b>MAXIMUM CAPACITY DVR-20</b> <i>Here you set the minimum and maximum capacity of 0-10V output 1 during internal ventilation. The capacity is in percentage. These values are equal to lines 02-01 en 02-02 of the DVR-20. The settings are used when internal ventilation is active.</i>
07-33	<b>SET POINT DELTA TEMPERATURE</b> <i>Set the required delta temperature here. This value is equal to line 01-02 of the DVR-20</i>
07-34	<b>MINIMUM CAPACITY DVR-20 AFTER VENTILATION</b>
07-35	<b>MAXIMUM CAPACITY DVR-20 AFTER VENTILATION</b> <i>Here you set the minimum and maximum capacity of 0-10V output 1 during after ventilation. The capacity is in percentage. These values are equal to lines 02-01 en 02-02 of the DVR-20. The settings are used when after ventilation is active.</i>


8	MANUAL PROGRAM
	<p>"MANUAL" is used for testing. Sometimes one can use manual when the automatic program can not be used for a specific situation.</p> <p><b>In the Manual program nothing is controlled automatically. One can only start fans, flaps, heaters and instruct a flap-position. There is no response to changing temperatures or humidity's. There are, except for the flap (*alarm 18-01 nr. 19), no alarm functions !!</b></p> <p>There are only responses to the clock settings when 'TIMER' is 'ON' (08-07). Some safeguards are installed by software.</p>
08-01	<p><b>RUNNING PROGRAM</b></p> <p><i>This line shows which program is active.</i></p> <p><i>Start and stop of a program is done in 07-00 Selection Of Programs, line 07-01 Program.</i></p>
08-02	<p><b>SET FANS</b> [off]</p> <p><i>One can choose "on" or "off". The fans actually start after starting the "Manual Program". If blowing/sucking (08-05) will be switched, a delay of 30 sec is taken into account to switch over. A built-in safeguard.</i></p>
08-04	<p><b>SET HEATER</b> [off]</p> <p><i>Switch the heater(s) "on" or "off". The heater starts when the inlet flap is open further than the safety minimum (21-09). This minimal position of the inlet flap can be set. A second precaution is that the heater will not switch "on" before the fan is running.</i></p> <p> <b>Attention!</b> The heater is only switched on if the inlet flap is more opened than the "safety position inlet flap" (line 21-10) and fans are on.</p>
08-05	<p><b>SET BLOWING / SUCKING (only in extended program)</b> [blowing]</p> <p><i>The fans, group 1 plus group 2, can be set to both blowing and sucking. (NOTE: do not use non-return flaps under the fans). For safety reasons, there is a delay of 30 seconds before switching over, in order to let the fans come to a standstill. Moreover, there are two different waiting periods to be set for group 1 and group 2, before the fans are activated again.</i></p>
08-06	<p><b>SET FLAP LEFT / RIGHT (only in extended program)</b> [left]</p> <p><i>It is possible to set a separate flap (engine) to a particular position. For instance a selection flap at the bottom of a central pressure room. In this way, you can choose to ventilate the left or the right department. Or a humidifier that can be switched on in turns. In automatic programs, this flap changes position at the end of each time-unit, this does not apply to Manual program, or to the program where the timer is active (08-07).</i></p>
08-07	<p><b>TIMER (yes / no)</b> [no]</p> <p><i>Instructed with "no", an immediate start follows after switching "on" the Manual program. There is no need to think about any time setting. Instructed with "yes", actions are started at certain times and periods, defined in program 02-00 Timer Settings.</i></p>
08-08	<p><b>REQUIRED POSITION INLETFLAP</b></p> <p><i>The user chooses a flap-position, in terms of a percentage. 100% means all outside air ventilation. 0% keeps the inlet flap closed. If the fan starts now, it is called internal ventilation (flap position 0%) or recirculation.</i></p> <p><i>All the other positions ranging between 0% -- 100% are possible: Mixed Air. If the inletflaps are opened, the outlet flaps open up automatically. It is possible to give the outlet-flap a larger opening than the inlet-flap (08-09).</i></p>
08-09	<p><b>REQUIRED POSITION OUTLETFLAP (only in extended program)</b></p> <p><i>When group 1 or group 2 of the fans are active, the position (opening) of the outletflaps cannot be smaller than the measured position of the inletflap. Bigger opening is possible. This is a precaution.</i></p>
08-10	<p><b>REQUIRED HEATING LEVEL</b></p> <p><i>This could apply either to a water valve or gas-pressure-regulator. In case of gas regulating 0% means that the heaters still burn on an minimum of about 30% of their max. capacity. One can only instruct the required position when the heater is really switched on. (See line 08-13).</i></p>
08-11	<p><b>STATE OF FANS</b></p>
08-13	<p><b>STATE OF HEATER</b></p>
08-14	<p><b>STATE BLOWING / SUCKING</b></p>
08-15	<p><b>STATE OF FLAP LEFT / RIGHT</b></p>
08-16	<p><b>POSITION INLETFLAP</b></p>
08-17	<p><b>POSITION OUTLETFLAP</b></p>

08-18	HEATING LEVEL
08-19	POSITION COOLING VALVE
	<i>08-11 until 08-19 are registrations to inform the user. Also displayed in 03-00 Measurements.</i>

**REMARK:**


Manual operation can only be blocked by the time-units (chapter 02) when the 'clock function' is on 'yes' or when the controller is blocked (20-02).



9	WARMING UP
	<p>The Drying/Warming up program can run both with and without heaters.</p> <p>In the second case, the outside air has to be warmer than the product to be warmed up.</p> <p>The most common application with heaters is drying and warming up onions and grains. Sometimes warming up potatoes. Warming up with outside air is usually applied to potatoes; at the end of the storage period, in order to prevent "blackening sensitivity" during transport and processing.</p> <p>The heater control consists of an on/off switch and a modulating flap control for a gas-pressure regulator or a hot water tap etc.</p> <p>Each time the Drying/Warming up process is started (with heaters), the inlet flap is opened to the set minimum (set in 21-10). Only after that the controls become active.</p>
09-01	<b>RUNNING PROGRAM</b>
09-02	<b>OUTSIDE TEMPERATURE</b>
09-03	<b>OUTSIDE RELATIVE HUMIDITY</b>
09-04	<b>AVERAGE DUCT TEMPERATURE</b>
09-05	<b>AVERAGE PRODUCT TEMPERATURE</b>
09-06	<b>REQUIRED DIFFERENCE DUCT-PRODUCT TEMPERATURE</b> [5.0]
09-07	<b>MAXIMUM DUCT TEMPERATURE</b> [22.0] <p><i>With the maximum 'difference duct-product temperature, the target duct temperature is determined, which is the temperature that is blown into the duct. The target duct temperature is the 'measured product temperature' + the 'maximum difference duct-product temperature', still it can never be higher than the 'maximum duct temperature'. Always set the 'maximum duct temperature' (09-07) higher than the 'required product temperature' (09-08), otherwise the product can never reach the required temperature.</i></p> <p><i>The target duct temperature is automatically achieved by switching on a heater and by either controlling the gas pressure in the case of gas heaters, or by controlling a hot water valve that regulates the hot water flow. The modulating part of the heater-control doesn't starts until the inlet-flap reaches it's minimum position or beyond.</i></p> <p><i>If the temp. of the ventilated air remains too high even when the level of heating is reduced to 0%, the heater will be shut off entirely. This is controlled by the "extra hysteresis duct temp." (22-05). If the situation is the other way around the deviation of the duct temp. should be large enough before the heaters are automatically started again. If the measured duct temp. is different from the required temp. for longer than 5 min., the alarm will be activated. If the "Alarm Reset Time" has elapsed and the cause of the alarm is still present, the heaters will be switched off. The fans continue to run and the inlet flaps will be closed. The upper deviation and the lower deviation can be set in program section "18-00 Alarm".</i></p> <p><i>If no heaters are connected, make your choice at 09-14 Heater, the required duct temperature will be achieved by regulating the position of the inlet flap. (More or less mixed air).</i></p>
09-08	<b>CURRENT REQUIRED PRODUCT TEMPERATURE</b> [20.0] <p><i>It is possible to plan the average product temperature. The product temperature will move from the initial temperature up to the required temperature at the end of a preset warming up period. The temperature changes along a straight curve. The ACC calculates at any moment the required value for the required product temperature. This value is aimed for. At this way the warming up process goes step by step.</i></p>
09-09	<b>TERMINAL PRODUCT TEMPERATURE</b> [20.0] <p><i>This average product temperature is aimed for at the end of the warming up period. Therefore it determines the interim required product temp.</i></p> <p><i>Note: it is all "aiming for" a temperature, because, even though it is automated, the whole process depends on the outside air conditions. If there is a delay, there will be an automatic catch up. (These remarks are less relevant if the store is equipped with heaters.)</i></p>
09-10	<b>WARMING UP PERIOD</b> [20.0] <p><i>Registered in days. The end of the warming up period is also the end of the increasing warming curve. It keeps the temperature at the terminal product temperature.</i></p> <div data-bbox="300 1722 379 1792">         Remark     </div> <p><b>The warming up period starts at the moment the temperature curve is reset (07-01) or if you change a setting of the curve.</b></p>
09-11	<b>WARMING UP IN PROCESS</b> <p><i>The number of days indicates the period the warming up program has already been active. This is to inform the user about the progress of the temperature curve of the required product temperature. If the temperature curve is reset, this measurement is set to 0 days.</i></p>

09-12	<b>MINIMUM DIFFERENCE OUTSIDE-PRODUCT TEMPERATURE (0=IGNORE)</b> [2.0] <i>If there is warming up with outside air (without heaters), the outside temperature has to be higher than the product temperature. In the case of a minimum difference, the program can be activated. If the difference in temperature is too small ( or the outside temperature is lower than the product temperature) the program will be deactivated. If necessary, followed by After-ventilation. This line is not visible if the Heater (09-14) is selected 'yes'.</i>  <i>If heater function is 'yes' than this setting applies to switch to heating with external air.</i>
09-13	<b>MAXIMUM OUTSIDE TEMPERATURE</b> [25.0]
09-14	<b>MINIMUM OUTSIDE TEMPERATURE</b> [5.0]
09-15	<b>MAXIMUM OUTSIDE RELATIVE HUMIDITY</b> [100] <i>The set max. flap position will apply as long as the Drying/Warming-up process is running. To be used for example when one wants to warm-up rapidly by using partially air.</i>
09-16	<b>MAXIMUM POSITION INLETFLAP</b> [100]
09-17	<b>MINIMUM POSITION INLETFLAP</b> [0] <i>To limit the percentage of recirculation air. For example to avoid a shortage of oxygen. The min. position cannot be set lower than the so called "Safety Min Position" (21-10) fixed in the 21-00 Installer Settings General. The inlet flap should always be more open than the safety minimum. The heaters are not allowed to start until the position of the inlet flap has reached the safety minimum. This is an automatic safeguard.</i>
09-18	<b>HEATER no / yes</b> [no] <i>The inlet air will be warmed up by heaters, if heater function is 'yes'. When the minimum difference outside – product temperature is not ignored than heating with external air only takes place when the outside air is warm enough. If heater function is 'no' than only warming up with outside air (if warmer than product) take place.</i>
09-19	<b>STATE OF HEATER</b>
09-20	<b>HEATING LEVEL</b>
09-21	<b>POSITION OF INLETFLAP</b>
09-22	<b>STATE OF PROGRAM</b> <i>0&gt; no ventilation / 1&gt; external ventilation / 2&gt; after-ventilation / 3&gt; internal ventilation</i>
09-23	<b>NOT RUNNING CAUSE</b> <i>If the program state is 'no ventilation', the reason of not running is shown here.</i> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> <li>• 4&gt; max.run-time → maximum running time inlet flap reached</li> <li>• 5&gt; t-prod ok → product temperature ok</li> <li>• 6&gt; t-diff. small → temperature difference too small</li> <li>• 7&gt; t-outs. low → outside temperature too low</li> <li>• 8&gt; t-outs. high → outside temperature too high</li> <li>• 9&gt; rh-outs. high → outside RH too high</li> </ul>
09-24	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the warming up program will be reset to factory defaults.</i>  <i>Use this function if the program is not running correctly and you do not know what values to enter.</i>
09-30	<b>FIXED CAPACITY DVR-20</b> <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at external ventilation.</i>
09-31	<b>MINIMUM CAPACITY DVR-20</b>
09-32	<b>MAXIMUM CAPACITY DVR-20</b> <i>Here you set the minimum and maximum capacity of 0-10V output 1. The capacity is in percentages. These values are equal to lines 02-01 en 02-02 of the DVR-20. The DVR-20 regulation is used at internal ventilation.</i>
09-33	<b>SET POINT DELTA TEMPERATURE</b> <i>Set the required delta temperature here.</i> <i>This value is equal to line 01-02 of the DVR-20</i>

Starting WARMING UP		Row number
1.	Set <b>terminal product temperature</b> .	09-09
2.	Set <b>Warming up period</b> .	09-10
3.	Set <b>required difference duct-product temperature</b> .	09-06
4.	Set <b>maximum duct temperature</b> .	09-07
5.	Set <b>minimum difference outside temp / product temp</b> . <i>If this setting is not '0' (0 = ignore), the outside temperature must be higher than the product temperature.</i> <i>In the case of a minimum difference, the program can be activated.</i> <i>If heaters are used they will be switched off when the set difference is reached.</i>	09-12
6.	Set <b>minimum and maximum outside temperature</b> .	09-13 09-14
7.	Set <b>maximum outside relative humidity</b> .	09-15
8.	Set program to <b>RESET TEMPERATURE CURVE</b>	07-01
9.	Set program to <b>WARMING UP</b> .	07-01
Explanation of the status ( Row 09-22 )		
<b>0&gt; no ventilation</b>		
-	The required product temperature is reached.	09-08
-	The heater function is 'no' and the outside air is too cold.	09-15 and 09-09
-	The outside air conditions are exceeding the boundaries.	09-10 till 09-12
-	Program is blocked by the start- and stopping time.	02-01 till 02-14
-	Max. external ventilation is reached.	02-20
-	Program is off.	07-01
-	The controller is blocked	20-02
-	At the beginning of warming up the curve needs to be reset.	07-01
<b>1&gt; external ventilation</b>		09-08
-	The required product temperature is not reached yet.	
<b>2&gt; after ventilation</b>		
-	External ventilation is stopped and the duration of external ventilation was greater as 'min. time external ventilation'.	21-11
<b>3&gt; internal ventilation</b>		02-17
-	The 'maximum period fan off' is reached.	

10	DRYING / HEALING
	<p>The calculated dew points of the outside air and the department air (air between the stored products) are compared automatically. If the dewpoint of the outside air is lower than that of the product, automatic drying with outside air is possible. Moreover, a mixed air regulation is installed. Also thanks to automatic internal ventilation (after a certain period the fans did not run), the program can also be used for the so-called healing period for recently harvested potatoes. (High product-RH, careful cooling/drying, ventilate the air on a regular basis because of oxygen consumption for healing). The program can run with and without heaters.</p>
10-01	<p><b>RUNNING PROGRAM</b>  <i>A registration, which indicates which program is active. Start and end of a program is selected in line 07-01 Selection of Program.</i></p>
10-02	<p><b>OUTSIDE TEMPERATURE</b></p>
10-03	<p><b>OUTSIDE RELATIVE HUMIDITY</b></p>
10-04	<p><b>DEWPOINT OUTSIDE</b>  <i>Calculated on the basis of outside temp and RH outside.</i></p>
10-05	<p><b>AVERAGE DUCT TEMPERATURE</b></p>
10-06	<p><b>AVERAGE PRODUCT TEMPERATURE</b></p>
10-07	<p><b>AVERAGE PRODUCT RELATIVE HUMIDITY</b>  <i>Reading. If the ventilation is off, this reading gives the equilibrium humidity. (grains)</i></p>
10-08	<p><b>DEWPOINT PRODUCT</b>  <i>Is calculated on the basis of the measured product temperature and the measured product RH. If the humidity sensors are not installed, a fictitious RH-value is used, the so-called set value in order to reach a dewpoint. (See 22-10 and 22-11).</i></p>
10-09	<p><b>REQUIRED PRODUCT RELATIVE HUMIDITY</b> [85]  <i>When the product has reached its required humidity, outside ventilation is stopped. There is still ventilation for the 'maximum idle' period, during the 'internal ventilation period'.</i></p>
10-10	<p><b>MAXIMUM DIFFERENCE DEWPOINT</b> [-8.0]  <i>With this you can prevent that drying takes place too fast. Too fast drying will mainly take place when the outside temperature is considerably lower than the product temperature. For instance, when the product is 15°C, and outside it is 10°C with a RH of 80%, the dewpoint difference will be as high as -8°C.</i></p> <p> <b>Do not set this limit too tight, for when this limit is reached, the outside air ventilation is stopped.</b>  Attention!</p>
10-11	<p><b>MINIMUM DIFFERENCE DEWPOINT</b> [-2.0]  <i>The outside air is suitable for ventilation if its dewpoint is lower than the product's dewpoint. A certain difference, for example 2 or 3 degrees Centigrade is needed for effective drying. If one wants to dry with an outside air dewpoint 3°C lower than the product's dew point one should fill in a negative value. Like in this example - 3°C. Filling in 0°C the difference in dewpoint will be ignored by the automatic control and only the following conditions are taken into account. If a positive figure is filled in on "Minimum diff. Dewpoint" ventilation will only be started automatically if the outside air is "wetter" than the product. Condensation will take place on the product. This effect might be necessary when stored potatoes are drying out too much.</i></p>
10-12	<p><b>MAXIMUM OUTSIDE TEMPERATURE</b> [25.0]</p>
10-13	<p><b>MINIMUM OUTSIDE TEMPERATURE</b> [5.0]  <i>If the outside temperature is above the set maximum temperature, there will be no ventilation.</i></p>
10-14	<p><b>MAXIMUM OUTSIDE RH</b> [100]  <i>When the humidity outside is too high, even when the dewpoint difference is all right, the outside air ventilation will still be blocked. This may be necessary, for instance in foggy weather.</i></p>
10-15	<p><b>MAXIMUM PRODUCT TEMPERATURE</b> [20.0]</p>
10-16	<p><b>MINIMUM PRODUCT TEMPERATURE</b> [12.0]</p>
10-17	<p><b>MAXIMUM DUCT TEMPERATURE</b> [20.0]</p>
10-18	<p><b>MINIMUM DUCT TEMPERATURE</b> [5.0]  <i>If the target duct temperature becomes higher than the maximum duct temperature, the target duct temperature will be the maximum duct temperature. If lower than the minimum, than the target will be the minimum duct temperature.</i></p>
10-19	<p><b>REQUIRED DIFFERENCE DUCT TEMP - PRODUCT TEMP</b> [2.0]</p>

10-20	<b>MAXIMUM DIFFERENCE DUCT TEMP - PRODUCT TEMP HIGH</b>	[3.0]
10-21	<b>MAXIMUM DIFFERENCE DUCT TEMP - PRODUCT TEMP LOW</b> <i>To avoid a temperature shock for the product the maximum difference between duct- and product temperature is taken into account. To control the temperature, mixed air is used for ventilation if needed. As stated before, the starting signal for ventilation in Drying/Healing is activated the difference in dew points. This means that the outside air could well be warmer than the product or a lot colder than the product. The max. difference between air duct temp and product temp can be set in two parts: a difference above and a difference under the product temp.</i>	[-2.0]
10-22	<b>HEATER (yes / no)</b>	[no]
10-23	<b>MINIMUM POSITION INLETFLAP</b> <i>To limit the percentage of recirculated air. The min. position cannot be set lower than the so called "Safety Min Position" (21-10).</i>	
10-24	<b>STATE OF PROGRAM</b> <i>0&gt; no ventilation / 1&gt; external ventilation / 2&gt; after ventilation / 3&gt; internal ventilation</i>	
10-25	<b>NOT RUNNING CAUSE</b> <i>If the program state is 'no ventilation', the reason of not running is shown here.</i>  <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> <li>• 4&gt; max.run-time → maximum running time inlet flap reached</li> <li>• 5&gt; rh-prod. ok → product RH ok</li> <li>• 6&gt; t-prod. high → product temperature too high</li> <li>• 7&gt; t-prod. low → product temperature too low</li> <li>• 8&gt; dp-diff. big → dewpoint difference too big</li> <li>• 9&gt; dp-diff. small → dewpoint difference too small</li> <li>• 10&gt; t-outs. low → outside temperature too low</li> <li>• 11&gt; t-outs. high → outside temperature too high</li> <li>• 12&gt; rh-outs. high → outside RH too high</li> </ul>	
10-26	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the drying healing program will be reset to factory defaults.  Use this function if the program is not running correctly and you do not know what values to enter.</i>	
10-30	<b>FIXED CAPACITY DVR-20</b> <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at external ventilation.</i>	
10-31	<b>MINIMUM CAPACITY DVR-20</b>	
10-32	<b>MAXIMUM CAPACITY DVR-20</b> <i>Here you set the minimum and maximum capacity of 0-10V output 1. The capacity is in percentages. These values are equal to lines 02-01 en 02-02 of the DVR-20. The DVR-20 regulation is used at internal ventilation.</i>	
10-33	<b>SET POINT DELTA TEMPERATURE</b> <i>Set the required delta temperature here. This value is equal to line 01-02 of the DVR-20</i>	

Starting DRYING / HEALING	Row number
1. Set required product RH.	10-09
2. Set maximum and minimum difference dewpoint.	10-10 and 10-11
3. Set boundaries of the outside air conditions.	10-12 till 10-14
4. Set minimum product temperature.	10-15
5. Set required difference duct – product temperature and duct temperature boundaries for the mixed air regulation.	10-16 till 10-20
6. Set program is DRYING / HEALING	07-01

## Explanation of the status ( line 10-24 )

### 0> no ventilation

- |   |                  |
|---|------------------|
| - The product RH is reached.                          | 10-09            |
| - The max. difference dewpoint is reached.            | 10-10            |
| - The min. difference dewpoint is not reached.        | 10-11            |
| - The outside humidity is too high.                   | 10-14            |
| - The product is too warm.                            | 10-15            |
| - The product is too cold.                            | 10-16            |
| - It's too warm/cold outside.                         | 10-12 & 10-13    |
| - Program is blocked by the start- and stopping time. | 02-01 till 02-14 |
| - Max. external ventilation is reached.               | 02-20            |
| - Program is off.                                     | 07-01            |
| - The controller is blocked                           | 20-02            |

### 1> external ventilation

- |  |       |
|--|-------|
| - The dewpoint difference is bigger as the 'min diff. dewpoint'. | 10-11 |
|--|-------|

### 2> after ventilation

- |   |       |
|---|-------|
| - External ventilation is stopped and the duration of external ventilation was greater then 'min. time external ventilation'. | 21-11 |
|---|-------|

### 3> internal ventilation

- |  |       |
|--|-------|
| The 'maximum period fan off' is reached. | 02-17 |
|--|-------|

## **Extra comments to the “Drying / Healing” program**

### **Drying /healing without heaters (10-22):**

#### Action inlet:

When the measured duct temperature is higher than the required duct temperature + max diff duct temp high, the program will look at the outside temperature to determine whether the inlet has to be opened or closed to reach the required duct temperature.

When the measured duct temperature is lower than the required duct temperature - max diff duct temp low, the program will look at the outside temperature to determine whether the inlet has to be opened or closed to reach the required duct temperature.

When the measured duct temperature is between the required duct temperature + max diff duct temp high and - max diff duct temp low, the program will try to use as much outside air as possible to dry more efficiently.

### **Drying /healing with heaters (10-22):**

#### Action heater:

The heater will go on when the measured duct temperature is lower than the required duct temperature – extra hysteresis duct temperature.

The heater will go off when the measured duct temperature is higher than the required duct temperature + extra hysteresis duct temperature.

#### Action heater valve:

The heater valve will open when the measured duct temperature is lower than the required duct temperature – hysteresis duct temperature.

The heater valve will close when the measured duct temperature is higher than the required duct temperature + hysteresis duct temperature.

#### Action inlet at the moment the heaters are **not** on:

When the measured duct temperature is lower than the required duct temperature - max difference duct - product low:

- When the outside temperature is higher than the required duct temperature the inlet will open p/p.
- When the outside temperature is lower than the required duct temperature the inlet will close p/p.

When the measured duct temperature is higher than the required duct temperature + max deviation duct - product high:



- When the outside temperature is lower than the required duct temperature the inlet p/p will open.
- When the outside temperature is higher than the required duct temperature the inlet p/p will close.

#### Action inlet at the moment the heaters are **on**:

- When the measured duct temperature is lower than the required duct temperature, first the heater valve will have to be open 100% for more than one minute before the inlet will be closed p/p.
- When the measured duct temperature is the same as the required duct temperature, but the heater is not burning maximally, the inlet will be further opened.
- When the measured duct temperature is the same as the required duct temperature and the heater valve is open 100% for more than one minute, the inlet will not be opened or closed.
- When the measured duct temperature is higher than the required duct temperature, the inlet will be opened p/p.

### **Terms used:**



measured duct temperature	= read out on page 10, line 05
required duct temperature	= add up page 10, line 06 + page 10, line 19
max diff duct – product temp high	= adjustable on page 10, line 20
max diff duct – product temp low	= adjustable on page 10, line 21
hysteresis duct temperature	= adjustable on page 22, line 04
extra hysteresis duct temperature	= adjustable on page 22, line 05

<b>11</b>	<b>AFTER DRYING</b>
	<p>After drying is drying with mainly warmed-up outside air during several periods per day.  The user chooses a minimum position of the inlet flap for a number of action periods.  The temperature of the inlet air is controlled automatically.  This means that the temperature drops according to a decreasing curve.  Every day, the inlet air is, for instance, 0.5 °C lower than the day before.  The difference in dewpoint of the outside air and the product determines whether the inlet flap is opened or not.  If not, there is at least automatic, internal ventilation during the programmed action periods (11-18/19).  If the outside air is such that the heaters are not switched on automatically, the duct temperature no longer controls the heater, but the inlet flap between the set minimum and maximum.  This will be case the when the outside temperature is equal to or higher than the required duct temperature.</p>
	<p> <b>Remark!</b></p> <p><b>There is a possibility to switch to and from After drying and Cooling/Storage, so that both the temperature can be maintained at the right level and drying takes place at certain intervals. For this purpose, at the program selection (07-01), the 'After drying + Cooling/Storage' has to be selected. When After drying is in its interval period, Cooling/Storage can be activated. For more information, see line 11-19.</b></p>
11-01	<b>RUNNING PROGRAM</b>
11-02	<b>OUTSIDE TEMPERATURE</b>
11-03	<b>AVERAGE PRODUCT TEMPERATURE</b>
11-04	<b>AVERAGE DUCT TEMPERATURE</b>
11-05	<b>STATE OF HEATER</b>
11-06	<b>HEATING LEVEL</b>
11-07	<p><b>POSITION INLETFLAP</b></p> <p><i>Reading. It is essential that the position of the inlet flap is at least the same or over the instructed safety limit, before the heater starts. Provided that the fan is running.</i></p>
11-08	<b>MAXIMUM POSITION INLETFLAP</b> [100]
11-09	<p><b>MINIMUM POSITION INLETFLAP</b> [20]</p> <p><i>The user chooses an inlet flap position (11-09). In the beginning of each period, the program starts with the inlet flap in minimum position. The more mixed air one uses, the more is saved on heating costs. On the other hand the drying process will take more time, compared with using 100% warmed outside air. Note, that it is an after-drying program. The product has been pre-dried already so the moist is not easily available. The moist has to come from inside the product. That is why after-drying is done in (short) periods. The flap position will remain fixed during the ventilation and is not automatically varied, unless the outside air has enough heat and the heater is not automatically activated. In this case the inlet will be activated by the duct-temperature until the current required duct-temperature has been reached.</i></p>
11-10	<b>INITIAL DUCT TEMPERATURE</b> [20.0]
11-11	<p><b>TERMINAL DUCT TEMPERATURE</b> [10.0]</p> <p><i>By means of the initial and terminal duct temperature, a linear temperature curve can be programmed. The aforementioned temperature curve starts at the 'initial temperature' and goes down to the 'terminal temperature' during the 'after-drying period'.  For instance, when the initial temperature is 20°C, the terminal temperature is 10°C, and the after-drying period is 20 days, air is blown in at 20°C at the start.  The temperature is lowered by 0.5°C each day, so that after 20 days, the air is blown in at 10°C.  In actual practice, the terminal temperature will be lower than the initial temperature. In the after drying of onions it could usually be: initial temperature 25°C and terminal temperature 12°C. Going down over a period of 2 to 3 weeks. The current required duct temperature will then go down by approximately 0.5 to 1°C per 24 hours. It is also possible to select a terminal temperature that is higher than the initial temperature. Then a rising temperature curve will be aimed at.</i></p>
	<p> <b>Attention!</b></p> <p><b>To start the curve again, the curve has to be reset first (the current required duct temperature will then be the initial duct temperature). This takes place at the program selection (07-01) by selecting 'reset temperature curve' (last option) or if you change a setting of the curve</b></p>
11-12	<b>AFTER DRYING PERIOD</b> [30]
	<p>The end of the After-Drying period determines (together with the terminal duct temp.) the end- point of the temp. curve which calculates the current required duct temp. at any moment. The terminal duct temperature is maintained as required duct temperature after passing the After-Drying period (line 11-14).</p>
11-13	<p><b>AFTER DRYING IN PROCESS</b></p> <p>Here the number of days the program has already been active, is indicated. This is an aid to see the progress of the curve of the duct temperature. The temperature curve can be reset by 07-01 'reset temperature curves' or if you change a setting of the curve.</p>



11-14	<b>CURRENT REQUIRED DUCT TEMPERATURE</b> <i>The ACC calculates at any moment the required value for the required duct-temperature. If the fan is running and the inlet flap is opened, the required duct temp. shall be achieved by controlling the heaters automatically. If the outside-air temperature is approximately at the level of the required duct temperature, the After-Drying will take place with outside air, without making use of the heaters.</i>
11-15	<b>DEWPOINT OUTSIDE</b>
11-16	<b>DEWPOINT PRODUCT</b>
11-17	<b>MINIMUM DIFFERENCE DEWPOINT</b> [ -2.0 ] <i>The humidity of the outside air determines whether drying can take place. The heaters will take care to maintain the product temp or to prevent cooling down too quickly. A warmer product enables the outside air to absorb moisture from the product during ventilation, more than a cooled-down product. The min.dif.dew point ensures automatically that ventilation shall not take place with outside air with a higher dewpoint than the dewpoint of the product. In this case it is necessary to measure and compare the RH of the outside air, and the product's RH. If no RH-sensor is connected, one can set a simulated value in the Installers Settings.</i> <i>If the min.dif.dew point is not available, the inlet flap will be closed and the heaters will not be activated. The fan(s) are periodically active (Recirculation = internal ventilation) (11-18/19).</i> <i>To ventilate with drying air, one should define a negative value for the min.diff.dewpoint. The outside dewpoint should be lower than the dewpoint of the air between the stored products.</i> <i>A positive value of the min.diff.dewpoint means that the inlet-flap will be opened if the outside-air contains more moisture than the product-air. This is called "humidifying" which is not recommended for onions and grains.</i> <i>It is possible to set the min.diff.dewpoint to zero (0.0). Which means that the differences in dew points are ignored in the program. There is a chance that one will ventilate with outside air which is not able to dry.</i>
11-18	<b>ACTION PERIOD AFTER DRYING</b> [0.30]
11-19	<b>INTERVAL PERIOD AFTER DRYING</b> [3.30] <i>By means of the action and interval period, the after drying can be switched on/off in a pulse/interval rhythm (within the starting and ending time). This will mainly be useful when the product releases the moisture only slowly and continuous ventilation is no longer useful. Example: Every 8 hours, 30 minutes of drying is required. Set the action period to 0.30 and the interval period to 8.00 hrs.</i> <i>When the starting time is reached, the action period will be started at all times.</i>  <b>REMARK:</b> When 'After drying + Cooling/Storage' is selected at the program selection (07-01), Cooling/Storage will be activated when After drying is in its interval period (see also the status of after drying, 11-20). The after drying period has to be over, however.
11-20	<b>STATE OF PROGRAM</b> <i>0&gt; no ventilation / 1&gt; action / 2&gt; interval</i>
11-21	<b>NOT RUNNING CAUSE</b> <i>If the program status is 'no ventilation', the reason of not running is shown here.</i> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> </ul>
11-22	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the after drying program will be reset to factory defaults.</i>  <i>Use this function if the program is not running correctly and you do not know what values to enter.</i>
11-30	<b>FIXED CAPACITY DVR-20</b> <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at external ventilation.</i>
11-31	<b>MINIMUM CAPACITY DVR-20</b>
11-32	<b>MAXIMUM CAPACITY DVR-20</b> <i>Here you set the minimum and maximum capacity of 0-10V output 1. The capacity is in percentages.</i> <i>These values are equal to lines 02-01 en 02-02 of the DVR-20.</i> <i>The DVR-20 regulation is used at internal ventilation.</i>
11-33	<b>SET POINT DELTA TEMPERATURE</b> <i>Set the required delta temperature here.</i> <i>This value is equal to line 01-02 of the DVR-20</i>

Starting AFTER DRYING	Row number
1. Set <b>initial duct temperature</b> .	11-10
2. Set <b>terminal duct temperature</b> .	11-11
3. Set <b>after drying period</b> .	11-12
4. Set <b>minimum difference dewpoint</b> .	11-17
5. Set <b>action and interval period</b> .	11-18 and 11-19
6. Set <b>program is RESET TEMPERATURE CURVE</b> .	07-01
7. Set <b>program is AFTER DRYING</b>	07-01
Explanation of the status ( Row 11-20 )	
<b>0&gt; no ventilation</b> <ul style="list-style-type: none"> <li>- Program is blocked by the start- and stopping time.</li> <li>- Program is off.</li> <li>- The controller is blocked</li> </ul>	02-01 till 02-14 07-01 20-02
<b>1&gt; action</b> <ul style="list-style-type: none"> <li>- After drying is in its action period.</li> </ul>	
<b>2&gt; interval</b> <ul style="list-style-type: none"> <li>- After drying is in its interval period</li> </ul>	

12	COOLING / STORAGE
	<p>Cooling takes place entirely automatic by means of ventilation with outside air that has a lower temperature than the product. The minimum difference can be set. A required, average product temperature is aimed at. When this temperature is reached, the ventilation stops.</p> <p>It is possible to program the average product temperature according to a time-schedule with a decreasing straight curve. There is also an automatic mixed-air control. The required inlet (or duct) temperature is reached by using less or more recirculation air. As one of the conditions for outside air ventilation, a maximum RH of the outside air can be set. Under certain conditions, the product temperature has priority to the requirements set to the RH of the outside air.</p> <p>If, for a certain period, the outside air is not suitable for ventilation, there will be automatic, internal ventilation for some time.</p> <p>This may also take place if the product temperatures show differences that are too big (Delta temperature).</p> <div data-bbox="268 645 352 712">  <p>Remark!</p> </div> <p><b>There is a possibility to switch to and from Cooling/Storage and After drying, so that both the temperature can be maintained at the right level and drying takes place at certain intervals. For this purpose, at the program selection (07-01), the 'After drying + Cooling/Storage' has to be selected. When After drying is in its interval period, Cooling/Storage can be activated. For more information, see line 11-19, chapter 7.11 AFTER DRYING.</b></p>
12-01	<b>RUNNING PROGRAM</b>
12-02	<b>OUTSIDE TEMPERATURE</b>
12-03	<p><b>CALCULATED OUTSIDE TEMPERATURE</b></p> <p><i>If the humidifier is switched on the cooling effect of the humidifier will be taken into account by using the calculated outside temperature. The calculated outside temperature is compensated for the cooling effect. This value is only visible when a humidifier is selected (21-19).</i></p>
12-04	<b>AVERAGE DUCT TEMPERATURE</b>
12-05	<b>AVERAGE PRODUCT TEMPERATURE</b>
12-06	<p><b>DELTA PRODUCT TEMPERATURE</b></p> <p><i>The registered difference between the highest and the lowest, selected product temperature.</i></p>
12-07	<b>OUTSIDE RELATIVE HUMIDITY</b>
12-08	<b>POSITION INLETFLAP</b>
12-09	<p><b>CURRENT REQUIRED PRODUCT TEMPERATURE</b></p> <p><i>It is possible to plan the average product temperature. The product temperature shall move along from the initial temperature up to the required temperature at the end of a preset cooling-down period. The temperature changes along a straight curve. The ACC calculates at any moment the required value for the required product temperature. This value is aimed for. At this way the cooling process goes step by step.</i></p>
12-10	<p><b>TERMINAL PRODUCT TEMPERATURE</b> [7.0]</p> <p><i>This average product temperature is aimed for at the end of the cooling period. (Which is the beginning of the storage period.) Therefore it determines the interim required product temp.</i></p> <p><i>Note: it is all "aiming for" a temperature, because, even though it is automated, the whole process depends on the outside air conditions. If there is a delay, there will be an automatic catch up. (These remarks are less relevant if the store is equipped with a refrigerator.)</i></p>
12-11	<p><b>COOLING DOWN PERIOD</b> [40]</p> <p><i>Registered in days. The end of the cooling down period is also the end of the decreasing cooling curve. It is also the start of the storage-period with a constant storage temperature.</i></p> <div data-bbox="268 1697 352 1765">  <p>Remark!</p> </div> <p><b>The cooling down period start at the moment the temperature curve is reset (07-01) or if you change a setting of the curve.</b></p>
12-12	<p><b>COOLING IN PROCESS</b></p> <p><i>The number of days indicates the period the Cooling/Storage program has already been active. This is to inform the user about the progress of the temperature curve of the required product temperature. If the temperature curve is reset, this measurement is set to 0 days.</i></p>
12-13	<p><b>MINIMUM DIFFERENCE OUTSIDE TEMP – PRODUCT TEMP</b> [-2.0]</p> <p><i>For effective cooling with outside air, the air has to be colder than the product temp. A difference of 2 or 3 °C is advisable. One needs to fill in a negative value (-2°C or -3°C). So if the outside air is in fact below the product temp., the cooling will automatically take place.</i></p>

12-14	<b>MAXIMUM DIFFERENCE DUCT TEMP. PRODUCT TEMP.</b> [3.5] <i>The automatic air-mixing system aims to ventilate with as much outside air as possible, within certain limits. The difference in temperature between the taken-in air in the duct and the product is limited. If the difference exceeds the set value, the inlet flap is automatically adjusted. Consequently the taken-in air is mixed with recirculated air so that the required duct-temperature is achieved. As the set max.difference is a relative temperature, the duct temp. will change along with the product temp. So, once the (max) difference between the two is set, there is no need to re-adjust the required duct temperature.</i>
12-15	<b>MINIMUM OUTSIDE TEMPERATURE</b> [0.0] <i>This setting is to be regarded as a safety device. For example in a period of severe frost one may define a minimum temp. If the outside temp. is below this minimum outside temp. setting, there will not be any ventilation with outside air.</i>
12-16	<b>MINIMUM DUCT TEMPERATURE</b> [4.0] <i>Apart from the restricted temp. difference between the intake air in the duct and the product temperature, there is also the possibility of setting a (absolute) minimum temperature. By automatic regulation of the inlet flap's position, the duct temp. will never be colder than the set minimum. The fans will continue to rotate.</i>
12-17	<b>MAXIMUM RELATIVE HUMIDITY OUTSIDE</b> [100] <i>External ventilation will only take place if the measured outside RH is between the set maximum and minimum. If the outside RH is beyond these limits there is no ventilation allowed. If the product has not been cooled down sufficiently, in other words the required product temp. has not been achieved yet, (temperature deviation larger than the extra hyst. product temperature C/S(22-03) + hyst. product temperature C/S (12-19)) the temperature signal will have priority compared with the RH restrictions: the max. and min. outside RH limitations will be ignored. This goes on until the measured product temp. has reached the (current) required product temperature. Once external ventilation is active, the cooling process can only be stopped by the outside RH limits when the difference between the measured and required product temp. is less as the hyst. product temperature.</i>
12-18	<b>MAXIMUM DIFFERENCE DEWPOINT</b> [-8.0]
12-19	<b>MINIMUM DIFFERENCE DEWPOINT</b> [-2.0] <i>The outside air is suitable for ventilation if its dewpoint is lower than the product's dewpoint. A certain difference is needed for effective drying. These settings prevent the product against condensation and too fast drying.</i>
12-20	<b>HYSTERESE PRODUCT COOLING / STORAGE</b> [0.3] <i>This hysteresis applies to product cooling with outside air. Example: the required product temperature = 5 °C and the hysteresis outside air cooling = 0.3 °C. The cooling will be started (provided that the external circumstances are right) when the product temperature is to be higher as 5.3 °C and the cooling is stopped again when the product temperature is to be lower as 5,0 °C.</i>
12-21	<b>MAXIMUM TEMPERATURE DROP / day</b> [2.0] <i>The maximum drop in temperature limits the current required product temperature</i>
12-22	<b>MAXIMUM DELTA PRODUCT TEMPERATURE</b> [2.0] <i>If the registered difference between the active product sensors is larger than this maximum, automatic internal ventilation is possible.</i>
12-23	<b>STATE OF PROGRAM</b> 0> no ventilation 1> external ventilation 2> after-ventilation 3> internal ventilation 4> room cooling with refrigerator 5> product cooling with refrigerator
12-24	<b>NOT RUNNING CAUSE</b> <i>If the program state is 'no ventilation', the reason of not running is shown here.</i> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> <li>• 4&gt; max.run-time → maximum running time inlet flap reached</li> <li>• 5&gt; t-prod. ok → product temperature ok</li> <li>• 6&gt; t-outs. low → outside temperature too low</li> <li>• 7&gt; t-diff. small → temperature difference too small</li> <li>• 8&gt; rh-outs. high → outside RH too high</li> <li>• 9&gt; dp-diff. big → dewpoint difference too big</li> <li>• 10&gt; dp-diff. small → dewpoint difference too small</li> </ul>

12-25	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the cooling storage program will be reset to factory defaults.</i>  <i>Use this function if the program is not running correctly and you do not know what values to enter.</i>	
12-30	<b>FIXED CAPACITY DVR-20</b> <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at external ventilation.</i>	
12-31	<b>MINIMUM CAPACITY DVR-20</b>	
12-32	<b>MAXIMUM CAPACITY DVR-20</b> <i>Here you set the minimum and maximum capacity of 0-10V output 1. The capacity is in percentages. These values are equal to lines 02-01 en 02-02 of the DVR-20. The DVR-20 regulation is used at internal ventilation.</i>	
12-33	<b>SET POINT DELTA TEMPERATURE</b> <i>Set the required delta temperature here.</i> <i>This value is equal to line 01-02 of the DVR-20</i>	
12-40	<b>REQUIRED PRODUCT RH</b> <i>Required product RH during storage stage. If the difference between the measured and required product temperature is within the limits set at lines 12-43 en 12-44, then external ventilation can be used to improve the product RH. If the difference of the measured product temperature and the desired product temperature goes outside the set limits of lines 12-43 and 12-44 then the temperature control again prevails.</i>	[90]
12-41	<b>MAXIMUM RH DIFFERENCE / DAY</b> <i>The maximum allowable RH difference a day makes sure that the product is not too aggressively humidified or dried.</i>	[1.0]
12-42	<b>WAIT TIME AFTER EXTERNAL VENTILATION CAUSED BY TEMPERATURE</b> <i>The time the system waits after external ventilation has taken place caused by temperature control before RH control can become active.</i>	[0.00]
12-43	<b>LOW LIMIT TEMPERATURE DIFFERENCE RH CONTROL</b>	[-0.5]
12-44	<b>HIGH LIMIT TEMPERATURE DIFFERENCE RH CONTROL</b> <i>If the difference between the measured product temperature and the desired product temperature is within limits, external ventilation can be used to improve the RH.</i>	[0.5]
12-45	<b>MINIMUM DIFFERENCE DEWPOINT HUMIDIFICATION</b>	[2.0]
12-46	<b>MAXIMUM DIFFERENCE DEWPOINT HUMIDIFICATION</b> <i>The outside air is suitable for ventilation if its dewpoint is higher than the product's dewpoint. A certain difference is needed for effective humidification. These settings prevent the product against drying and too fast humidification.</i>	[8.0]
12-47	<b>MINIMUM DIFFERENCE DEWPOINT DRYING</b>	[-2.0]
12-48	<b>MAXIMUM DIFFERENCE DEWPOINT DRYING</b> <i>The outside air is suitable for ventilation if its dewpoint is lower than the product's dewpoint. A certain difference is needed for effective drying. These settings prevent the product against condensation and too fast drying.</i>	[-8.0]
12-50	<b>DEWPOINT CHECK</b>  <div style="margin-left: 40px;"> 0&gt;     outside-product  1&gt;     calculated duct-product </div> <i>For the minimum en maximum difference dewpoint settings a selection can be made for a check between outside dewpoint- product dewpoint or calculated duct dewpoint-product dewpoint.</i> <i>First selection was up to version 10 the only setting.</i> <i>The second selection is used in situations where the outside dewpoint is much higher or lower than the product temperature. Normally the system would block external ventilation because of this.</i> <i>With the use of the calculated duct-product selection, it is now possible to check the real dewpoint of the refreshing air going through the product.</i>	
12-51	<b>DEWPOINT DUCT</b> <i>If the dewpoint check is set to 1&gt; calculated duct-product, here the calculated dewpoint is shown.</i> <i>The duct dewpoint is calculated using product dewpoint, the outside dewpoint and the position of the inlet flap.</i> <i>If the inlet flap is closed, then not the real position of the inlet flap is used in the calculation, but the minimum calc position inlet flap setting 12-52 is used.</i>	
12-52	<b>MINIMUM CALC POSITION INLETFLAP</b> <i>The minimum calc position setting is only used for the calculation of dew point when the inlet is closed.</i> <i>The minimum inlet flap position cannot be set with this setting.</i>	

## 12-90 NO RUNNING CAUSE TEMPERATURE CONTROL

*If the program state is 'no ventilation', the reason of temperature control not running is shown here.*

- 0> - → no cause, system running
- 1> block.hrs.inp → blocking hours input active
- 2> dose-program → dose program active
- 3> timer sett. → outside timer settings
- 4> max.run-time → maximum running time inlet flap reached
- 5> t-prod. ok → product temperature ok
- 6> t-outs. low → outside temperature too low
- 7> t-diff. small → temperature difference too small
- 8> rh-outs. high → outside RH too high
- 9> dp-diff. big → dewpoint difference too big
- 10> dp-diff. small → dewpoint difference too small

## 12-91 NO RUNNING CAUSE RH CONTROL

*If the program state is 'no ventilation', the reason of RH control not running is shown here.*

- 0> - → no cause, system running
- 1> block.hrs.inp → blocking hours input active
- 2> dose-program → dose program active
- 3> timer sett. → outside timer settings
- 4> max.run-time → maximum running time inlet flap reached
- 5> cool.in proc.. → cooling down in progress (RH control not allowed)
- 6> max.dRH/day → maximum delta RH per day reached
- 7> w-tm.ext.vent → wait time after external ventilation of temperature control not over
- 8> tp-diff.small → difference required and measured product temperature below low limit
- 9> tp-diff.large → difference required and measured product temperature above high limit
- 10> rh-outs. high → outside RH too high
- 11> rh-prod. ok → Product RH ok
- 12> dp-dif.bev.gr → dewpoint difference too big
- 13> dp-dif.bev.kl → dewpoint difference too small
- 14> dp-dif.drg.gr → dewpoint difference too big
- 15> dp-dif.drg.kl → dewpoint difference too small

Starting COOLING / STORAGE	Row number
1. Set terminal product temperature.	12-09
2. Set cooling down period.	12-11
3. Set minimum difference outside - product temperature in.	12-13
4. Set maximum difference duct – product temperature in.	12-14
5. Set program is RESET TEMPERATURE CURVE.	07-01
6. Set program is COOLING / STORAGE.	07-01
Explanation of the status ( line 12-23 )	
<b>0&gt; no ventilation</b>	
- The 'current req. product temperature' is reached.	12-09
- The difference between the outside en product temperature isn't big enough.	12-13
- It's too cold outside.	12-15
- The outside RH is too high.	12-17
- Program is block by the start- and stopping time.	02-01 till 02-14
- Maximum external ventilation is reached.	02-20
- After drying is active (After drying + Cooling / Storage).	
- Program is off.	07-01
- The controller is blocked.	20-02
<b>1&gt; external ventilation</b>	
- The product requires cooling.	12-08
<b>2&gt; after ventilation</b>	
- External ventilation is stopped and the duration of external ventilation was greater as 'min. time external ventilation'.	21-11
<b>3&gt; internal ventilation</b>	
- The 'maximum period fan off' is reached or the delta T is to large.	02-17 & 12-22
<b>4&gt; room cooling with MK</b>	
- The refrigerator is cooling the room.	
<b>5&gt; product cooling with MK</b>	
- The refrigerator is cooling the product.	

## REFRIGERATION

The refrigeration program controls a cooling compressor. The cooler (evaporator) is mounted in the storage room, above the stored product. With the help of a room sensor, the space above the product is kept at a certain temperature (cool). Heat that comes in from outside will be exhausted in this way. If the product temperature rises, the refrigeration is automatically started, together with (some of ) the main fans (according to the starts and stops that are programmed).



The refrigeration program consists of two processes, namely room cooling and product cooling. If it is possible to cool with outside air or CO<sub>2</sub> ventilation is necessary during refrigeration, the CO<sub>2</sub> ventilation becomes priority and the refrigeration is switched off. The program can operate automatically, but also knows the state "On". In the state "On" there is not being regulated on temperature (the temperature alarms and safeguard do not operate either). The cooling can only be blocked by the time blocks if the clock function is set on "Yes". Usually, only a few of the fans are used in combination with refrigeration. The ACC activates only fan group 1\* during refrigeration then. This is in order to save (cool) energy.

13-01 STATE OF REFRIGERATOR PROGRAM off / automatic / on

*This indicates the operation state, adjusted in 07-02.*

13-02 AVERAGE DUCT TEMPERATURE

### 13-03 AVERAGE PRODUCT TEMPERATURE

### 13-04 AVERAGE STORE ROOM TEMPERATURE

13-05 CURRENT REQUIRED STORE ROOM TEMPERATURE

*Calculated value. The 'required room temperature' = 'required product temperature' + 'required difference room - product temperature'.*

13-06 REQUIRED DIFFERENCE ROOM - PRODUCT TEMPERATURE

[0.0 = room cooling off]

A positive setting indicates that the room is allowed to be warmer than the product temperature. A negative setting indicates that the room must be colder than the product temperature. For example: if for this setting -1.0°C is adjusted, the room temperature is always kept colder than 1°C with regard to the average product temperature. Set '0,0' if room cooling is not required.

13-07 HYSTERESE ROOM TEMPERATURE FOR REFRIGERATION

**[1.0]**

Switch tolerance for refrigeration if the room is being cooled. This hysteresis is one-sided. For example: current required room temperature = 4°C, hysteresis room temp. for refrigeration = 1°C. The cooling starts at a room temperature of higher as 5°C and stops at lower as 4°C.



Lines 13-05 until 13-07 are settings for room cooling. If room cooling is not required, set "required difference room - product temperature" on "0,0". The store room cooling is switched off then. Store room cooling always takes place without the system fans are switched on.

13-08 CURRENT REQUIRED PRODUCT TEMPERATURE

*Calculated value, descended from the Cooling/Storage program.*



13-09	<b>HYSTERESIS PRODUCT TEMPERATURE FOR REFRIGERATION</b> <p>The allowable deviation of the product temperature, above which the refrigeration is activated. This (one-sided) hysteresis refrigeration product can be set at a somewhat higher level than the normal product temperature hysteresis C/S (12-19). The outside air cooling will then have priority to the refrigeration. If this is not required (because of dehydration in the storage phase) the hysteresis refrigeration has to be set at a lower level, in this case refrigeration has priority to cooling with outside air.</p> <p>When refrigeration is activated by a product temperature that is too high, the fans of group 1 are also activated. However, the starting difference (13-10) has to be reached first. In other words: the store room temperature has to have dropped below product temperature. If the product is cooled, the refrigeration will be deactivated as soon as the measured product temperature is lower as the current required product temperature.</p> <p><u>Example:</u></p> <ul style="list-style-type: none"> <li>- Measured product temperature</li> <li>- Current required product temperature</li> <li>- Hysteresis product cooling / storage</li> <li>- Hysteresis product temp. for refrigeration</li> </ul> <p>If the outside air is suitable, the Cooling/Storage program will cool the product to 6.0°C (stops if colder as 6.0°C). For the measured product temperature has exceeded the 'hysteresis product cooling / storage' of 0.2°C. Should outside air cooling not be sufficient (outside too warm), and the product temperature rise to higher as 6.4°C, refrigeration will be activated until the product temperature has reached lower as 6.0°C. Refrigeration might be interrupted, because the Cooling/Storage program can use outside air automatically to save energy. Refrigeration is only active with the inletflap closed (in automatic position).</p>	
13-10	<b>FANS 1 STARTING DIFFERENCE ROOM - PRODUCT TEMPERATURE</b>	<b>[-2.0]</b>
13-11	<b>FANS 1 STOPPING DIFFERENCE ROOM - PRODUCT TEMPERATURE</b> <p>If the cooling is activated because the product requires it, the fans will only switch on if they meet their "start difference". In other words: if the "start difference" is set on -2.0°C the fans will only switch on if the measured store room temperature is 2°C colder than the average product temperature. The fans stop if the "stop difference" has been reached.</p> <p>Example: "start difference" = -2.0°C, "stop difference" = -0.5°C, the average product temperature = 5.0°C. The product requires cooling. The fans will now switch on at a store room temperature of 3.0°C and will switch off at 4.5°C.</p>	<b>[-0.5]</b>
13-12	<b>MINIMUM DUCT TEMPERATURE REFRIGERATOR</b> <p>A safeguard of the duct temperature when the refrigeration is active. If the duct temperature drops below this setting, the refrigeration is switched off. This safety works only when the state is &gt;product cooling= (if the fans were rotating, they keep rotating).</p> <p>Example: "minimum duct temperature" = 4.0°C, "hysteresis duct temperature" = 0.3°C. Cooling is switched off at a duct temperature of lower as 4.0°C and is allowed to switch on at a duct temperature of higher as 4.3°C.</p>	<b>[4.0]</b>
13-13	<b>MINIMUM STORE ROOM TEMPERATURE REFRIGERATOR</b> <p>A safeguard of the store room temperature when the refrigeration is active. If the store room temperature drops below this setting, the refrigeration is switched off (if the fans were rotating, they keep rotating).</p>	<b>[2.0]</b>
13-14	<b>SET EVAPORATOR FANS automatic / continue</b> <p>In the 'automatic' position the evaporator fan only run when cooling is required. In the 'continuous' position the evaporator fans are always running except during defrosting.</p>	<b>[automatic]</b>
13-15	<b>AFTER VENTILATION TIME EVAPORATOR FANS</b> <p>The period of after-ventilation of the evaporator fans, following cooling, can be set here.</p>	<b>[00.05]</b>
13-16	<b>DEFROST INTERVAL</b>	<b>[08.00]</b>
13-17	<b>MAXIMUM DEFROST PERIOD</b> <p>The cooling-element will be defrosted on set defrost interval. A defrost period is limited by the maximum defrost period. With a feed-back input the defrost period can be ended directly when the cooling-element is defrosted.</p>	<b>[00.00]</b>
13-18	<b>TIMER off/on</b> <p>If the "timer" stands "on", the start and end times of "02-00 timer settings" are being watched at. When the "timer" stands "off" the program is allowed to be active for 24 hours. The "timer" counts for "on" and also for "automatic" (07-02).</p>	<b>[on]</b>
13-19	<b>START TIME REFRIGERATION</b>	
13-20	<b>STOP TIME REFRIGERATION</b> <p>Apart from the normal "timer settings" on page 02, an extra time unit for the refrigerator can be set here. This can be used, for instance, to block the refrigerator only during the day for a while during peak hours, or in the evening because of the noise. The other parts of the installation can continue to run then. Also see page 13, line 18. These times are only active when the Timer (13-18) is set to off.</p>	

13-21	<b>STATE OF FANS 1 off/on</b>
13-22	<b>STATE OF EVAPORATOR FANS</b>
13-23	<b>STATE OF REFRIGERATION</b> <i>State of the refrigerator, there are 5 possibilities:</i> <ul style="list-style-type: none"> <li>▪ <b>off</b> → no action</li> <li>▪ <b>on</b> → refrigerator is active</li> <li>▪ <b>room cooling</b> → refrigerator is cooling the room</li> <li>▪ <b>product cooling</b> → refrigerator is cooling the product</li> <li>▪ <b>defrosting</b> → cooling element is being defrosted</li> </ul>
13-24	<b>NOT RUNNING CAUSE</b> <i>If the program state is 'no ventilation', the reason of not running is shown here.</i> <ul style="list-style-type: none"> <li>• <b>0&gt; -</b> → no cause, system running</li> <li>• <b>1&gt; block.hrs.inp</b> → blocking hours input active</li> <li>• <b>2&gt; dose-program</b> → dose program active</li> <li>• <b>3&gt; timer sett.</b> → outside timer settings</li> <li>• <b>4&gt; s-time=e-time</b> → start time equals end time</li> <li>• <b>5&gt; outs. period</b> → outside start and end time</li> </ul>
13-25	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the refrigerator program will be reset to factory defaults.</i>  <i>Use this function if the program is not running correctly and you do not know what values to enter.</i>
13-26	<b>SUCKED AIR TEMERATURE</b> <i>Temperature of air going in the evaporator.</i>
13-27	<b>BLOWN AIR TEMPERATURE</b> <i>Temperature of air coming out of the evaporator.</i>
13-28	<b>REQUIRED DIFFERENCE AIR TEMPERATURE</b> <i>Required temperature difference between incoming and outgoing air.</i>
13-29	<b>HYSTERESES AIR TEMPERATURE</b>


Starting REFRIGERATION	Row number
1. Activate program <b>cooling / storage</b> .	
2. Activate <b>refrigeration</b>	07-02
3. Set <b>required difference room – product temperature</b> .	13-06
4. Set <b>hysteresis product temperature</b> .	13-09
Explanation of the status ( Line 13-23 )	
<b>0&gt; off</b>	
- The room- and product temperature are not requiring cooling.	13-05 & 13-08
- Cooling can with outside air	
- The duct temperature is too low.	13-12
- The room temperature is too low.	13-13
- The 'max. period fans off' is reached.	02-17
- The Delta T is bigger than the max. Delta T.	12-22
- Program is blocked by the start- and stopping time.	02-01 till 02-14
- Refrigerator is blocked by the start and stopping time.	03-19 & 03-20
- Program is off.	07-01
- The controller is blocked.	20-02
<b>1&gt; on</b>	
- The program is active.	07-02
<b>2&gt; room cooling</b>	
- The deviation of the room temperature is bigger than the hysteresis room temp. for refrigeration and the product don't need cooling.	
<b>3&gt; product cooling</b>	
- The deviation of the product temperature is bigger than the hysteresis product temperature for refrigeration.	
<b>4&gt; defrost</b>	
The cooling-element is defrosting. The defrost period will be ended after maximum defrost period or through a feed-back.	13-17

14	CO2 CONTROL
	<p>In order to avoid CO<sub>2</sub> accumulation, especially in chips potatoes, the air in the cell can be automatically ventilated by air from outside (because this air has a very low concentration of CO<sub>2</sub> ; 300-450 ppm).</p> <p>The inlet is steered to its maximum CO<sub>2</sub> inlet flap position.</p> <p>The fans are started when the inlet reaches its maximum position and the outlet is opened.</p> <p>Should the duct temperature come below the minimum duct temperature during ventilation, the inlet closes with steps of 10% until the duct temperature comes above the minimum limit.</p> <p>The inlet will not be closed further than its minimum CO<sub>2</sub> inlet flap position. The ventilation of CO<sub>2</sub> can only take place when the outside temperature is within its limits. After each time the CO<sub>2</sub> has been ventilated, a waiting (interval) time is being observed. This can be adjusted in 21-13.</p>
14-01	<b>STATE OF CO<sub>2</sub> CONTROL PROGRAM off / automatic</b> <i>Can be set in '07-03 Set CO2 control'</i>
14-02	<b>MAXIMUM POSITION INLETFLAP</b> [100] <i>This is the inlet flap position from which the CO<sub>2</sub> ventilation action will start. When this position has been reached and the running time of the outlet has passed, the fans will start and the ventilation time starts to count.</i>
14-03	<b>MINIMUM POSITION INLETFLAP</b> [15] <i>If the duct temperature is too cold, the inlet will close slowly with steps of 10%; however never further than the 'minimum position inlet flap'.</i>
14-04	<b>MAXIMUM TIME CO<sub>2</sub> CONTROL</b> [0.15] <i>This is a time limitation on the CO<sub>2</sub> ventilation in consideration of safety. If this time has been reached the CO<sub>2</sub> ventilation stops, in spite of the concentration of CO<sub>2</sub>. When the 'maximum time no fresh air' is reached, there will be ventilation during the 'maximum time CO<sub>2</sub> control'.</i>
14-05	<b>MINIMUM TIME CO<sub>2</sub> CONTROL</b> [0.02] <i>As the CO<sub>2</sub> measurement can drop during the ventilation, there is a minimum time that may be ventilated. If this time has been reached and the CO<sub>2</sub> concentration is right, it is stopped. When the concentration is still too high, there will be ventilation until it is below the required CO<sub>2</sub> concentration or until the 'maximum time CO<sub>2</sub> control' has been reached. This time starts to count as soon as the fans start.</i>
14-06	<b>MAXIMUM TIME NO FRESH AIR</b> [24.00] <i>By means of this adjustments there can be a periodical ventilation independent from the presence of a CO<sub>2</sub> sensor. During the 'maximum time no fresh air' there will be ventilation.</i>
14-07	<b>OUTSIDE TEMPERATURE</b>
14-08	<b>CALCULATED OUTSIDE TEMPERATURE</b> <i>If the humidifier is switched on the cooling effect of the humidifier will be taken into account by using the calculated outside temperature. The calculated outside temperature is compensated for the cooling effect.</i>
14-09	<b>MAXIMUM OUTSIDE TEMPERATURE</b> [20]
14-10	<b>MINIMUM OUTSIDE TEMPERATURE</b> [0.0] <i>If the outside temperature comes below the minimum or above the maximum outside temperature, CO<sub>2</sub> ventilation cannot take place.</i>
14-11	<b>AVERAGE DUCT TEMPERATURE</b>
14-12	<b>MAXIMUM DUCT TEMPERATURE</b> [25.0]
14-13	<b>MINIMUM DUCT TEMPERATURE</b> [4.0] <i>If the duct temperature becomes higher or lower than maximum or minimum the inlet will be closed with steps of 10% until the duct temperature returns in the limits.</i>
14-14	<b>CURRENT CO<sub>2</sub> CONCENTRATION</b>
14-15	<b>REQUIRED CO<sub>2</sub> CONCENTRATION</b> [4000] <i>When the CO<sub>2</sub> concentration comes above the required concentration, a ventilating action is started. Example: 'required CO<sub>2</sub> concentration' = 4000 ppm, 'hysteresis CO<sub>2</sub> concentration' = 3000 ppm. CO<sub>2</sub> ventilation starts if the measured CO<sub>2</sub> concentration is higher as 4000 ppm and stops at lower as 1000 ppm.</i>
14-16	<b>SET FANS 1</b> [on]
14-17	<b>SET FANS 2</b> [on] <i>If one chooses for state of operation 'Off' natural ventilation is possible.</i>

14-18	<b>TIMER yes/no</b> [on] <i>When the timer is set 'on', the start- and end times of the '02-00 timer settings' are affected. If the clock function is set 'off', the program may be active for 24 hours.</i>
14-19	<b>MECHANICAL COOLING yes/no</b> [no] <i>Here you can set if the mechanical cooling should run when the max. duct. Temperature, line 14-12, is exceeded.</i>
14-20	<b>STATE OF FANS 1</b>
14-21	<b>STATE OF FANS 2 (only in extended program)</b>
14-22	<b>POSITION Inlet flap</b>
14-23	<b>STATE OF CO<sub>2</sub> CONTROL</b> <i>Here you can see if the CO<sub>2</sub> program ventilates or not. 0&gt; not active / 1&gt; active</i>
14-24	<b>NOT RUNNING CAUSE</b> <i>If the program state is 'no ventilation', the reason of not running is shown here.</i> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> <li>• 4&gt; outs. period → outside start and end time</li> <li>• 5&gt; main program → main program active</li> <li>• 6&gt; waiting time → waiting time not finished</li> </ul>
14-25	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the CO<sub>2</sub> control program will be reset to factory defaults.</i>  <i>Use this function if the program is not running correctly and you do not know what values to enter.</i>
14-30	<b>FIXED CAPACITY DVR-20</b> <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at external ventilation.</i>

Starting CO <sub>2</sub> CONTROL	Row number
1. Set required CO <sub>2</sub> concentration.	14-15
2. Set minimum en maximum time CO <sub>2</sub> control.	14-05 and 14-04
3. Set maximum time no fresh air.	14-06
4. Activate program CO <sub>2</sub> CONTROL.	07-03

Explanation of the status ( line 14-23 )	
<b>0&gt; not active</b>	
- The CO <sub>2</sub> concentration is below the required concentration.	14-14
- 'max time no fresh air' is not yet reached.	14-06
- It's too warm/cold outside.	14-09 and 14-10
- The selected main program is active.	
- The CO <sub>2</sub> program is in the 'wait time CO <sub>2</sub> control'.	21-13
- Program is block by the start- and stopping time.	02-01 till 02-14
- Program is off.	07-01
- The controller is blocked.	20-02
<b>1&gt; active</b>	
- The CO <sub>2</sub> concentration is higher than the required CO <sub>2</sub> concentration.	14-14 and 14-15
- The 'max. time no fresh air' is reached.	14-06

15	CONDENSATION CONTROL
	<p>Condensation control may consist of circulation fans with or without heating (electro heater), an automatic, small-sized mixed-air system, a dryer etc. etc.</p> <p>The basis of automatic control is the outside air temperature. Condensation only occurs when the temperature outside drops. It is possible to work full-time at low outside temperatures, but usually it is sufficient to have the condensation control active with intervals. One can preset the time of action and the time of interval.</p> <div data-bbox="268 465 352 539">  <p>Remark!</p> </div> <p><b>In the AGRI.BASIC program version Condensation Control cannot be shown in the display if 21-19 'function multifunctional output is not selected to 'Condensation control'. Only in this setting you will be able to activate the Condensation Control Program. If you have chosen 'CONDENSATIONCONTROL', the REFRIGERATION and SWITCHING programs cannot be used.</b></p>
15-01	<p><b>STATE OF CONDENSATION CONTROL PROGRAM</b></p> <p><i>off / automatic / on</i></p>
15-02	<p><b>OUTSIDE TEMPERATURE</b></p>
15-03	<p><b>STORE ROOM TEMPERATURE (only in extended program)</b></p>
15-04	<p><b>REQUIRED STORE ROOM TEMPERATURE (only in extended program)</b> [2.0]</p> <p><i>If the store room temperature drops below the required temp., the electro heater is switched on. Electro heater means the electrical elements that are installed <u>sometimes</u> in the condensation fans. This is an extra facility to prevent condensation. Or even a way to prevent that the air above the product cools down too fast. (in extremely cold climates)</i></p>
15-05	<p><b>MAXIMUM OUTSIDE TEMPERATURE</b> [5.0]</p> <p><i>If set on automatic (07-04), the system might start as long as the measured outside temperature does not exceed the pre-set maximum outside temperature. A practical value could be: 0.0 °C. Which means that the system will only be activated in periods of frost.</i></p>
15-06	<p><b>MINIMUM OUTSIDE TEMPERATURE</b> [-20.0]</p> <p><i>In automatic position, condensation control will be activated as long as the registered outside temperature is above the preset minimum. For condensation control it might be useful to set the minimum at an extreme low value, for instance -10 °C or -20 °C.</i></p>
15-07	<p><b>PERIOD ON</b> [0.30]</p> <p><i>Condensation control does not necessarily have to run full-time when the outside temperature switches on the condensation control. In the case of circulation fans, it will be sufficient when they run with intervals (periods). For instance 30 minutes action, followed by a one-hour interval. Even when the electro heater and condensation fan are switched on by the store room temperature, this will take place in this action/interval rhythm.</i></p>
15-08	<p><b>PERIOD OFF</b> [2.00]</p> <p><i>Following the period of activity, one can preset the interval as one wishes to. When the interval time is preset to 0, the condensation control will be running full-time. (Provided that the outside temperature or outside temperature require this).</i></p>
15-09	<p><b>TIMER</b> [on]</p> <p><i>When the timer is set 'on', the start- and end times of the '02-00 timer settings' are affected. If the clock function is set 'off', the program may be active for 24 hours.</i></p>
15-10	<p><b>STATE OF ELECTRO HEATER (only in extended program)</b></p> <p><i>Indicated whether the electro elements are switched on yes or no. When switched on, the condensation fans are also switched on automatically.</i></p>
15-11	<p><b>STATE OF CONDENSATION CONTROL</b></p> <p><i>0&gt; off / 1&gt; on</i></p>
15-12	<p><b>NOT RUNNING CAUSE</b></p> <p><i>If the program state is 'no ventilation', the reason of not running is shown here.</i></p> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> </ul>
15-13	<p><b>RESET PROGRAM</b></p> <p><i>By selecting 'yes', all parameters in the condensation control program will be reset to factory defaults.</i></p> <p><i>Use this function if the program is not running correctly and you do not know what values to enter.</i></p>

15-30	<b>FIXED CAPACITY DVR-20</b> <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at external ventilation.</i>
-------	---


Starting CONDENSATION CONTROL	Row number
1. Set <b>minimum and maximum outside temperature</b> .	15-05 and 15-06
2. Set <b>period on and period off</b> .	15-07 and 15-08
3. Set <b>required store room temperature</b> .	15-04
4. Active <b>program CONDENSATION CONTROL</b> .	07-04

Explanation of the status of the electro heater ( line 15-10 )	
<b>0&gt; off</b> <ul style="list-style-type: none"> <li>- The room is at the right temperature.</li> <li>- The program is in 'period off' time.</li> <li>- Program is block by the start- and stopping time.</li> <li>- Program is off.</li> <li>- The controller is blocked..</li> </ul>	15-04 15-08 02-01 till 02-14 07-01 20-02
<b>1&gt; on</b> <ul style="list-style-type: none"> <li>- The room temperature is too low.</li> </ul>	15-04


Explanation of the status of condensation control ( line 15-11 )	
<b>0&gt; off</b> <ul style="list-style-type: none"> <li>- It's outside too warm/cold.</li> <li>- The program is in 'period off' time.</li> <li>- Program is block by the start- and stopping time.</li> <li>- Program is off.</li> <li>- The controller is blocked.</li> </ul>	15-05 and 15-06 15-08 02-01 till 02-14 07-01 20-02
<b>1&gt; on</b> <ul style="list-style-type: none"> <li>- The outside temperature is between minimum and maximum.</li> <li>- The room temperature is too low.</li> </ul>	15-05 and 15-06 15-04

16	DEHUMIDIFICATION
	<p>Application: In closed department, equipped with coolers (above the stored product) and main fans (group 1 is controlled) and heaters (on/off control): no inlet engine control. In warm, moist climate. To dry onions, potatoes and grains.</p> <p>The product RH can start the dehumidification process. The department air is cooled down considerably, namely below dewpoint, and this causes condensation which removes the moist from the department air. To prevent a dramatic drop in temperature in the department, a heater is switched on automatically. The dehumidification process takes place with an activated fan (group 1) in the ventilation system.</p> <p>Since there is no external ventilation, "After-ventilation" does not apply to this Dehumidification program. All other pre settings of 02-00 are applicable.</p>
16-01	<b>RUNNING PROGRAM (DEHUMIDIFICATION only available in extended program)</b>
16-02	<b>AVERAGE DUCT TEMPERATURE</b>
16-03	<b>REQUIRED DUCT TEMPERATURE</b> [18.0] <i>When the duct temperature is below the required duct temp., the heater is switched on automatically. For safety reasons, the heater is only switched on when fan group 1 is running. The extra duct hysteresis ( see 22-05) will provide a dead zone during the on/off/on switching of the heater.</i>
16-04	<b>MINIMUM DUCT TEMPERATURE</b> [17.0] <i>A lower limit to be preset for the duct temp. To protect the stored product against temperatures that are too low. When the registered duct temp. is below this minimum, the refrigeration (= the dehumidification) is switched off for some time. Fan 1 and the heater, if necessary, remain active. Here, the extra duct hysteresis creates a dead zone.</i>
16-05	<b>STORE ROOM TEMPERATURE</b> <i>Gives some information about the development of the temp. of the department air above the stored product.</i>
16-06	<b>AVERAGE PRODUCT TEMPERATURE</b>
16-07	<b>REQUIRED PRODUCT TEMPERATURE</b> [18.0] <i>The product temp. is compared with the required product temp. The only purpose of this is that, in the case the product temp. drops too much during this program, an alarm can be generated.</i>
16-08	<b>AVERAGE PRODUCT RELATIVE HUMIDITY</b>
16-09	<b>REQUIRED PRODUCT RELATIVE HUMIDITY</b> [75] <i>This records the major switching criteria of Dehumidification. When the product RH is too high, the refrigerator and fan group 1 are switched on. The operator has to make sure, with the switches on the switchboard, that the right number of refrigerator-fans are also switched on. (The refrigerator fans are part of the refrigerator, these are not the same as fan group 1) When the Product RH is too low, the refrigerator and fan 1 and heater are switched off again.</i>
16-10	<b>STATE OF FANS 1</b>
16-11	<b>STATE OF HEATER</b>
16-12	<b>STATE OF REFRIGERATOR</b> <i>A measurement. Note: The Refrigerator Machine is the Dehumidification Machine.</i>
16-13	<b>STATE OF PROGRAM</b> <i>When the Dehumidification program is active, there are three possibilities:</i>  <i>0&gt; Off / 1&gt; Dehumidification (i.e. the Product RH demands action) / 2&gt; Automatic Internal Ventilation.</i>
16-14	<b>NOT RUNNING CAUSE</b> <i>If the program state is 'no ventilation', the reason of not running is shown here.</i> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> <li>• 4&gt; rh-prod. ok → product RH ok</li> </ul>
16-15	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the dehumidification program will be reset to factory defaults.</i>  <i>Use this function if the program is not running correctly and you do not know what values to enter.</i>




17	SWITCH PROGRAM
	<p>This program is fully independent of other programs. It's an universal program that can be used in a wide range of situations. For example, the program can be a thermostat or a hygrostat. You can use the program for example, to control a cool-unit in a separate room, to control heaters in cascade, to control humidifier or a dryer.</p> <p> <b>Remark!</b> In the AGRI.BASIC version one cannot get this program shown in the display if one did not select "Switch Program" at line 21-19 'function multifunctional output' . When the "Switch Program" has selected, the REFRIGERATION and the CONDENSATION CONTROL program cannot be activated.</p>
17-01	<b>STATE OF SWITCH PROGRAM off / automatic</b> <i>The state is to change in '07-05 Set switch program'</i>
17-02	<b>STARTING TIME SWITCH PROGRAM / day</b> [0.00]
17-03	<b>STOP TIME SWITCH PROGRAM / day</b> [24.00] <i>Time settings. The switch program can only be active between this start- and stopping time.</i>
17-04	<b>MAXIMUM RUNNING HOURS SWITCH PROGRAM / day</b> [24.00] <i>The maximum time / day, the switch-program-output can be active.</i>
17-05	<b>MEASURED SWITCH VALUE</b>
17-06	<b>SETPOINT SWITCH VALUE</b> [5.0] <i>Set your required value.</i>
17-07	<b>MAXIMUM OUTSIDE TEMPERATURE</b> [30]
17-08	<b>MINIMUM OUTSIDE TEMPERATURE</b> [0.0] <i>Outside temperature restriction. When the outside temperature exceeds the max. or min. outside temperature, the output will be switched off.</i>
17-09	<b>PERIOD ON SWITCH PROGRAM</b> [24.00]
17-10	<b>PERIOD OFF SWITCH PROGRAM</b> [0.00] <i>Make your settings to get intermittent actions.</i>
17-11	<b>CONDITION FOR FANS yes/no</b> <i>Here you can set whether the state of the fans has to be considered in the switching program. Set this line to 1&gt; yes, when the switching program can only be active on condition that the fans are activated as well.</i> [yes]
17-12	<b>SWITCH PROGRAM FUNCTION</b> [heating] <i>0&gt; heating / 1&gt; humidification / 2&gt; cooling / 3&gt; drying  Setting. Select the desired function of the switch program</i>
17-13	<b>STATE OF SWITCH OUTPUT off/on</b>
17-14	<b>NOT RUNNING CAUSE</b> <i>If the program state is 'no ventilation', the reason of not running is shown here.</i> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; dose-program → dose program active</li> <li>• 3&gt; timer sett. → outside timer settings</li> <li>• 4&gt; s-time=e-time → start time equals end time</li> <li>• 5&gt; outs. period → outside start and end time</li> <li>• 6&gt; fan(s) off → fans are off</li> <li>• 7&gt; t-prod ok → product temperature ok</li> <li>• 8&gt; t-outside → outside temperature outside limits</li> </ul>
17-15	<b>RESET PROGRAM</b> <i>By selecting 'yes', all parameters in the switch program will be reset to factory defaults.</i> <i>Use this function if the program is not running correctly and you do not know what values to enter.</i>

Starting SWITCH PROGRAM	Row number
1. Set <b>setpoint switch value</b> .	17-06
2. Set <b>period on and period off time</b> .	17-09 and 17-10
3. Set <b>starting time and stopping time</b> .	17-02 and 17-03
4. Active <b>SWITCH PROGRAM</b> .	07-05
Explanation of the status( line 17-13 )	
<b>0&gt; off</b>	
- The switch value is ok.	
- It's too cold/warm outside.	17-07 and 17-08
- Program is block by the start- and stopping time.	17-02 and 17-03
- Program is blocked by the 'max. running hours'.	17-04
- Program is block by the 'period off'.	17-10
- Program is off.	07-05
- The controller is blocked.	20-02
<b>1&gt; on</b>	
- The switch value is demanding.	

18	DOSE PROGRAM
	 <p>The dose program is totally unrelated to all other programs. This program can be used, for instance, for automated supply of "talent" or "gro stop innovator"; these are sprout control suppressants. When this program is active and not "at rest", all the other programs are blocked!</p>
18-01	<b>STATE OF DOSE PROGRAM</b> <i>Display of the operational state of the dose program, which has been selected at program selection.</i>
18-02	<b>BEFORE VENTILATION TIME</b> [0.00] <i>Set the before ventilation time for before supply of the dose to get the air stream moving. Fans on, inlet flap position can be set at line 18-09.</i>
18-03	<b>DOSE SUPPLY TIME</b> [0.00] <i>Set the time during which the metering flap has to be opened.</i>
18-04	<b>AFTER VENTILATION TIME</b> [0.00] <i>Set the after ventilation time for after supply of the dose. Fans on, inlet flap closed.</i>
18-05	<b>WAIT TIME</b> [0.00] <i>Set the waiting time for after supply of the dose. Fans off and inlet closed. When the wait time has passed the other programs are not blocked any more.</i>
18-06	<b>TOTAL CYCLE TIME DOSE PROGRAM</b> [00.01] <i>Set how often the metering flap has to be activated. When dose supply has to take place once every three weeks, set this time to 504 hours.</i>
18-07	<b>TIME FROM LAST SUPPLY</b> <i>Here you can read how long ago the last dose supply took place.</i>
18-08	<b>TIME UNTIL NEXT SUPPLY</b> <i>Here you can read how long it will take until the next dose supply is started.</i>
18-09	<b>POSITION INLET FLAP DURING BEFORE VENTILATION TIME</b> [0%] <i>Set the state of the air fans and the required position of the inlet flap during before ventilation.</i>
18-10	<b>STATE OF AIR FANS DURING SUPPLY on / off</b> [off]
18-11	<b>POSITION INLET FLAP DURING SUPPLY</b> [0%] <i>Set the state of the air fans and the required position of the inlet flap during supply.</i>
18-12	<b>STATE OF AIR FANS DURING WAITING TIME</b> [off]
18-13	<b>POSITION INLET FLAP DURING WAITING TIME</b> [0%] <i>Set the state of the air fans and the required position of the inlet flap during the waiting time after supply.</i>
18-14	<b>CLOCK FUNCTION on / off</b> [off]
18-15	<b>STATE OF VENTILATION GROUP</b>
18-16	<b>MEASURED POSITION INLET FLAP</b>
18-17	<b>STATE OF METERING VALVE</b>
18-18	<b>STATE OF PROGRAM</b> <i>The dose program has 3 state types:</i> <ul style="list-style-type: none"> <li>▪ <b>at rest</b> → program is not active</li> <li>▪ <b>before ventilation</b> → program is in before ventilation time</li> <li>▪ <b>supply</b> → program is active, dose valve open</li> <li>▪ <b>after ventilation</b> → program is in after ventilation after supply</li> <li>▪ <b>waiting time</b> → program is in waiting time after supply</li> </ul> <i>All other programs and controls are blocked during "supply" and "waiting time".</i>

18-19	<p><b>NOT RUNNING CAUSE</b>  <i>If the program state is 'no ventilation' , the reason of not running is shown here.</i></p> <ul style="list-style-type: none"> <li>• 0&gt; - → no cause, system running</li> <li>• 1&gt; block.hrs.inp → blocking hours input active</li> <li>• 2&gt; timer sett. → outside timer settings</li> <li>• 3&gt; cycle time → cycle time not finished</li> <li>• 4&gt; cycle time → maximum running time inlet flap reached</li> </ul>
18-20	<p><b>STATE OF PROGRAM</b>  <i>By selecting 'yes', all parameters in the dose program will be reset to factory defaults.</i></p> <p><i>Use this function if the program is not running correctly and you do not know what values to enter.</i></p>
18-30	<p><b>FIXED CAPACITY DVR-20 BEFORE VENTILATION</b>  <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output at before ventilation stage.</i></p>
18-30	<p><b>FIXED CAPACITY DVR-20 DURING SUPPLY</b>  <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output during gas supply.</i></p>
18-30	<p><b>FIXED CAPACITY DVR-20 AFTER SUPPLY</b>  <i>Fixed capacity DVR-20 is the output percentage of the DVR-20 output after gas supply.</i></p>

Switching on the dose program.	Line number
1. Set the <b>operational state</b> of the dose program to <b>adjust</b> .	07-06
2. Set the <b>dose supply time</b> .	18-03
3. Set the <b>before ventilation time</b> .	18-02
4. Set the <b>after ventilation time</b> .	18-04
5. Set the <b>waiting time after supply</b> .	18-05
6. Set the <b>total cycle time</b> .	18-06
7. Set the <b>required state of air fans &amp; position inlet flap</b> during supply.	18-10 & 18-11
8. Set the <b>required state of air fans &amp; position inlet flap</b> during waiting time.	18-12 & 18-13
9. Set the <b>operational state</b> of the switching program to <b>on</b> .	07-06
The State of dose program on line 18-18	
<b>0&gt; at rest</b>	
- The program is off or is set to adjust.	07-06
- The program is in cycle time.	18-06
<b>1&gt; before ventilation time</b> <i>(Other programs and controls are blocked)</i>	
- The program is active, air fans are on and inlet according to settings.	18-09 & 18-10
<b>2&gt; supply time</b> <i>(Other programs and controls are blocked)</i>	
- The program is active, metering flap is open, air fans & inlet according to settings.	18-11 & 18-12
<b>3&gt; after ventilation time</b> <i>(Other programs and controls are blocked)</i>	
- The program is active, air fans are on and inlet is closed.	
<b>4&gt; waiting time</b> <i>(Other programs and controls are blocked)</i>	
- The program is active, metering flap is closed, air fans & inlet according to settings.	

19	ALARM																											
	<div><div></div><div>Remark!</div></div> <p>An alarm is made visible in the display of the ACT by means of a flashing 'T' or 'A'. The T indicates a time-out alarm, somewhere in the mutual communication. The A indicates an alarm in one of the ACCs or in the ACT. If the alarm involved is a loud alarm, not only the A but A* is displayed. At the ACT or ACC concerned, the first line of the display is also flashing. (Department number and name) In the ACC programs, the alarm is displayed in line 19-01.</p> <p>The monitor of the PC also displays a clear and flashing alarm. If more than one ACC is connected, the ACT will give a central alarm. The alarm is not only visible on the PC but a horn can also be activated. Moreover, each ACC has an alarm relay that could activate - for instance - an automatic horn or an alarm light.</p>																											
19-01	<p><b>TYPE OF ALARM</b></p> <p><i>The following types of alarm are possible:</i></p> <table><tr><td>0) off</td><td>9) Avg. duct temp. Dehumidification</td><td>18) CO2 concentration</td></tr><tr><td>1) memory</td><td>10) Product temp. Drying/healing</td><td>19) Flap</td></tr><tr><td>2) external</td><td>11) Product temp. Cooling/storage</td><td>20) No ID key</td></tr><tr><td>3) duct sensor low</td><td>12) Product temp. dehumidification</td><td>21) No license code 1</td></tr><tr><td>4) duct sensor high</td><td>13) Store room temp. refrigeration</td><td>22) No license code 2</td></tr><tr><td>5) Avg. duct temp. warming up</td><td>14) Store room temp. Condensation control</td><td>23) License expired</td></tr><tr><td>6) Avg. duct temp. Drying/healing</td><td>15) Delta temp. After drying</td><td>24) Inlet flap</td></tr><tr><td>7) Avg. duct temp. After-drying</td><td>16) Delta temp. Cooling/storage</td><td>25) Outlet flap</td></tr><tr><td>8) Avg. duct temp. Cooling/storage</td><td>17) Switch value</td><td>26) Heating valve</td></tr></table> <p><i>See chapter 9 for a detailed description of the alarms.</i></p>	0) off	9) Avg. duct temp. Dehumidification	18) CO2 concentration	1) memory	10) Product temp. Drying/healing	19) Flap	2) external	11) Product temp. Cooling/storage	20) No ID key	3) duct sensor low	12) Product temp. dehumidification	21) No license code 1	4) duct sensor high	13) Store room temp. refrigeration	22) No license code 2	5) Avg. duct temp. warming up	14) Store room temp. Condensation control	23) License expired	6) Avg. duct temp. Drying/healing	15) Delta temp. After drying	24) Inlet flap	7) Avg. duct temp. After-drying	16) Delta temp. Cooling/storage	25) Outlet flap	8) Avg. duct temp. Cooling/storage	17) Switch value	26) Heating valve
0) off	9) Avg. duct temp. Dehumidification	18) CO2 concentration																										
1) memory	10) Product temp. Drying/healing	19) Flap																										
2) external	11) Product temp. Cooling/storage	20) No ID key																										
3) duct sensor low	12) Product temp. dehumidification	21) No license code 1																										
4) duct sensor high	13) Store room temp. refrigeration	22) No license code 2																										
5) Avg. duct temp. warming up	14) Store room temp. Condensation control	23) License expired																										
6) Avg. duct temp. Drying/healing	15) Delta temp. After drying	24) Inlet flap																										
7) Avg. duct temp. After-drying	16) Delta temp. Cooling/storage	25) Outlet flap																										
8) Avg. duct temp. Cooling/storage	17) Switch value	26) Heating valve																										
19-02	<p><b>SET ALARM 0&gt; reset / 1&gt; off / 2&gt; on / 3&gt; test</b></p> <p><i>Either the alarm is "off", "on" or being "tested". Even when all operations are off, and an alarm is activated, the alarm on line 18-02 will be "on" and the alarm is given. If the alarm is switched "off", the acoustic /light/ external alarm, if present, will be switched off. The alarm is still displayed until a "reset" will remove the alarm-signal from the display, unless the cause of the alarm has not been removed. In that case, the alarm will stay visible on display (18-01). The "test" position is to test a connected alarm system: for instance an automatic telephone, hooter, alarm-light etc.</i></p>																											
19-03	<p><b>TOLERANCE PRODUCT TEMPERATURE HIGH</b> [5.0]</p>																											
19-04	<p><b>TOLERANCE PRODUCT TEMPERATURE LOW</b> [-5.0]</p> <p><i>One can set the allowable deviation between the measured product temp. and the required product temp. The alarm will not be activated until the average product temperature deviates more than allowed.</i></p>																											
19-05	<p><b>TOLERANCE DUCT TEMPERATURE HIGH</b> [5.0]</p> <p><i>The upper limit is to be set for the average duct temp. Note: this is about the deviation between the measured value and the required value. Keep in mind that during the Drying/Warming-up and After-Drying programs, certain temp. differences could occur, caused by the heater being switched "on" and "off". Don't set the tolerance too small in that case.</i></p>																											
19-06	<p><b>TOLERANCE DUCT TEMPERATURE LOW</b> [-5.0]</p> <p><i>The lower limit (tolerated deviation) is to be set for the average duct temp. Further information on line 18-05.</i></p>																											
19-07	<p><b>TOLERANCE STORE ROOM TEMPERATURE HIGH</b> [5.0]</p>																											
19-08	<p><b>TOLERANCE STORE ROOM TEMPERATURE LOW</b> [-5.0]</p> <p><i>Allowed tolerances before an alarm occurs.</i></p>																											
19-09	<p><b>TOLERANCE SWITCH VALUE HIGH</b> [5.0]</p>																											
19-10	<p><b>TOLERANCE SWITCH VALUE LOW</b> [-5.0]</p> <p><i>Allowed tolerances before an alarm occurs.</i></p>																											
19-11	<p><b>MAXIMUM DELTA TEMPERATURE</b> [3.0]</p> <p><i>This maximum refers to the programs After-Drying and Cooling/Storage. Exceeding the set maximum for longer than 5 minutes, will trigger the alarm.</i></p>																											


19-12	<b>LIMIT DUCT SENSOR HIGH</b>	<b>[35.0]</b>
19-13	<b>LIMIT DUCT SENSOR LOW</b> <i>The limits to be set relate to the individual duct sensors, and not the average duct temp. These limits relate to alarms 3 and 4.</i>	<b>[-5.0]</b>
19-14	<b>TOLERANCE CO<sub>2</sub> CONCENTRATION</b> <i>If the CO<sub>2</sub> concentration is too high and the difference becomes higher than the adjusted tolerance at this point, after 5 minutes there will appear an alarm.</i>	<b>[3000]</b>
19-15	<b>TOLERANCE INLET - OUTLET FLAP (only in extended program)</b> <i>For instance: 10% preset. When the positions differ too much, there will be an alarm after 45 seconds. See alarm no. 18. With systems where the outlet flap is not controlled via the computer, this value should be 100% to prevent a false alarm.</i>	<b>[100]</b>

20	ACC-20 SYSTEM
20-01	<b>USER LEVEL</b> <span style="float: right;">[basic]</span> <p>The user can choose one of the three levels:</p> <p><u>Basic</u>: All lines related to product RH measurements and dew points are made invisible. May be still active. The outside RH measurements plus the minimum and maximum allowable outside RH remain visible in the various programs.</p> <p><u>Extended</u>: No lines are made invisible that relate to RH measurements and dew points.</p> <p><u>Maximum</u>: Program-sections 21-00 and 22-00 are made visible and the user has access to these sections. Furthermore 01-02 OPERATING PERMITTED cannot be set unless the USER LEVEL is set on 'Maximum'.</p>
20-02	<b>BLOCKING HOURS INPUT</b> <p>A registration: blocked/not blocked.</p> <p>If this input-port is connected and 'selected', this line will be visible. In other words: often not visible to the user. This port is used to handle a signal from the electrical power company; a signal which indicates the starts and stops of the blocking hours. During the blocking hours, all actions of the ACC-computer are blocked.</p> <p>The flap-initialization, even after an Ram-reset occurred, will not be executed as long as the input-port is blocked.</p> <p>Alternative: This input-port for the blocking-hours-contact can also be connected to a door switch. The blocking hours contact will block any action. There are no exceptions.</p>
20-03	<b>EXTERNAL ALARM INPUT</b> <p>A registration: off/on.</p> <p>When not in use, this line also remains invisible. However, if this port is used, it is indicated whether the connected external alarm is 'open' or 'closed'. This will be indicated in line 18-01, alarm no. 2.</p> <p>A closed alarm input-contact generates an external alarm. In this way, for example a cable failure can be detected.</p>
20-05	<b>VISIBLE PROGRAMS</b> <span style="float: right;">[only active]</span> <p>Here you can select the following:</p> <ul style="list-style-type: none"> <li>▪ <b>all</b> (All pages are visible)</li> <li>▪ <b>only active</b> (Only activated programs are shown, this makes it more convenient)</li> </ul>
20-06	<b>LICENSE CODE 1</b>
20-07	<b>LICENSE CODE 2</b> <p><i>The license codes have to be entered here. These codes are available at Omnivent Techniek B.V. without this code, the ACT/ACC system will only show pages 01, 19 and 20 after a few days. See also description of alarms 20 to 23. in addition, the alarm message will be shown on page 19. by pressing the keys "F1" + "Value plus", the multiplier for the license code entry is increased, so that the license code entry is less time consuming. When this value is 1, it can be increased/decreased by 1 at the time. When the value is 1000, it can be increased/decrease by a thousand at the time. After the license codes have been accepted, PLEASE NOTE: this may take 30 seconds, but first the alarm messages have to be deleted to remove the blocking.</i></p>
20-08	<b>START GAS SUPPLY PROGRAM INPUT</b> <p>"On" when start gas supply program is active</p>



<b>21</b>	(only visible when uses level is 'maximum'. (line 20-01))
<b>INSTALLER SETTINGS GENERAL</b>	
<b>21-01</b>	<b>ALARM RESET TIME</b> [0.30] A few of the alarms are able to stop a program completely or partly, after an alarm signal. Note 18-01. If an alarm is switched on (occurs), some time may elapse (the alarm reset time) during which the cause of the alarm might disappear. If not, action will follow. Programs using heaters require a shorter alarm reset time (for example 20 minutes) than programs that only use fresh, outside air. The reset time to be set also depends on the tolerated alarm deviation. A small deviation is allowed for a longer period than a big one. A 50 minutes alarm reset time is a practical value for a duct temp. alarm (without heaters) in combination with a tolerated deviation of a few centigrade.
<b>21-02</b>	<b>INITIALISATION INLETFLAP</b> After pressing "yes", the initialization of the inlet flap will occur instantly as long as the blocking-hours contact is not blocked. After finishing, the line automatically returns to "no". During initialization, the potentiometer (position indicator) scans the position of the inlet flap. Open and closed are a 0%- and 100% position respectively. After a RAM reset or a 'Coldstart', the flaps will be initiated automatically, (provided the blocking-hours-contact is open)
<b>21-03</b>	<b>RUNNING TIME INLETFLAP</b> [60] In the AGRI-BASIC version one should put in a running time. This is the time needed by the flap to run from entirely closed to entirely open. The inlet flap doesn't have a feed-back anymore by means of a pot-meter. If the required position is 0% or 100% the flap shall be opened or closed entirely. The system is self-checking in this positions.
<b>21-04</b>	<b>INITIALISATION OUTLETFLAP</b>
<b>21-05</b>	<b>RUNNING TIME OUTLETFLAP</b> [0] The running time of the outlet flap is being used as soon as the ACC does not steer the outlet. Does the ACC steer the outlet, fill in 0 second. The running time is being used by the CO <sub>2</sub> program.
<b>21-06</b>	<b>INITIALISATION HEATING VALVE</b>
<b>21-07</b>	<b>RUNNING TIME HEATING VALVE</b> [60]
<b>21-08</b>	<b>INITIALISATION COOLING VALVE</b>
<b>21-09</b>	<b>RUNNING TIME COOLING VALVE</b> [60]
<b>21-10</b>	<b>PULSE INLETFLAP</b> [3]
<b>21-11</b>	<b>INTERVAL INLETFLAP</b> [12] Flaps are automatically regulated in small (pulse-) steps. This occurs in a steady rhythm with the pulse and interval time
<b>21-12</b>	<b>PULSE HEATING LEVEL</b> [3]
<b>21-13</b>	<b>INTERVAL HEATING LEVEL</b> [30] For a gas-regulator, this has to be preset to 50 seconds, since most gas-regulators run rather fast. Level is automatically regulated in small (pulse-) steps. This occurs in a steady rhythm with the pulse and interval time
<b>21-14</b>	<b>PULSE COOLING VALVE</b> [3]
<b>21-15</b>	<b>INTERVAL COOLING VALVE</b> [30] Valve is automatically regulated in small (pulse-) steps. This occurs in a steady rhythm with the pulse and interval time
<b>21-16</b>	<b>SAFETY POSITION INLETFLAP</b> [20] A built-in precaution. This value indicates the minimum flap position of the inlet, at which the heaters are allowed to be activated. When the heater is placed outside, this value has to be 40 to 50% minimally. The heater cannot be switched "on" until the measured position of the inlet flap is beyond this minimum. When the heaters are inside, a minimum of 20 to 30% is sufficient.
<b>21-17</b>	<b>MINIMUM TIME EXTERNAL VENTILATION</b> [0.30] For some of the programs there will be after-ventilation (recirculation); but not before a minimum period of external ventilation. An ext. ventilation period of, for example, 5 minutes, would not require any after-ventilation.
<b>21-18</b>	<b>WAIT DELTA RECIRCULATION</b> [0.30] Internal ventilation periods (recirculation) should not take place too quickly one after the other. This value presets the interval between two periods. This only refers to recirculation as a result of too high differences in product temperature.
<b>21-19</b>	<b>WAIT TIME CO<sub>2</sub> CONTROL</b> [0.30] For reduction of the ventilation, in spite of a too high concentration of CO <sub>2</sub> , the waiting time can be filled in between two ventilation actions. This also avoids the continuous ventilation with outside air if the sensor is defect. So, when 4 hours have been filled in, CO <sub>2</sub> ventilation cannot take place 4 hours after the CO <sub>2</sub> has been ventilated, even if the CO <sub>2</sub> concentration is too high.

21-20	<b>DATE RESET RUNNING HOURS</b> [31.07] <i>The total running hours are registered accumulatively by the computer for each program section. Only once a year these counters are reset to zero. One can indicate the date for this reset. Suggestion: 1 august.</i>
21-21	<b>SWITCH TIME BLOWING / SUCKING</b> [30] <i>This value presets the interval for changing the direction of the fans: blowing or sucking.</i>
21-22	<b>WAIT FANS</b> [30] <i>This is to preset the waiting period for fan groups, after changing blowing/sucking. A precaution. When a fan is blowing, never change it to sucking immediately, or the other way around. There has to be an interval of at least 30 to 60 seconds ( the sum of the delay and waiting periods).</i>
21-23	<b>WAIT INLETFLAP</b> [0] <i>Normally, preset to 0. If required, there may be a waiting period of maximally 59 minutes. This means that after the fans are activated for external ventilation, there is an interval before the inlet flap is opened. Applicable to the programs: Drying/ Warming up, Drying/Healing, After Drying / Cooling/Storage.</i>
21-24	<b>HUMIDIFIER</b> [off] <i>Here the humidifier can be set. 0&gt; Off / 1&gt; On / 2&gt; Switch program. If switched 'on' the calculated outside temperature is always used in the climate control in the programs Cooling/Storage and CO<sub>2</sub> Control. In the 'switch program' position the outside temperature is only in taken into account when the switch program is active.</i>
21-25	<b>CO2 REFRESHMENT METHODE</b> <i>The CO2 program will operate independent from the main program when exhaust fan is selected.</i> <ul style="list-style-type: none"> <li>▪ <b>System fans/flap</b></li> <li>▪ <b>Exhaust fan</b></li> </ul>
21-26	<b>DVR SETTINGS VISIBLE</b> <i>DVR-20 settings can be hidden if no DVR-20 is connected to the system.</i>

<b>22</b>	(only visible when uses level is 'maximum'. (line 20-01)) <b>INSTALLER SETTINGS SENSORS</b>	
	<p>In this chapter one can, among other things, adjust the hysteresis. A hysteresis can also be read as a tolerance. In order to get a stable adjustment a tolerance between the desired and measured adjustment is necessary. Almost all hysteresis are so-called single sided hysteresis.</p> <p>For example: in cooling/storing is an adjustment max. outside RH. If the outside RH is too high you can/may not ventilate with outside air. Imagine that the RH stands on 90% and the hysteresis is 3%; cooling/storing is blocked if the outside RH is higher than 90%. 90% is also allowed, because this is the maximum allowed. If, however, cooling/storing is already busy to ventilate it will only stop if the outside RH is higher than the maximum + this hysteresis; so at an outside RH of more than 93%.</p> <p>Another example: the desired product temperature in cooling/storing is 5,0°C and the hysteresis is 0,2°C. It will start to cool if the deviation is larger than the hysteresis, so if the product is 5,3°C or higher. It will cool till the product is past it's desired value so it stops at 4,9°C or lower.</p> <p> <b>Remark!</b> The hysteresis for the outside temperature is permanent and is 0,3°C. The hysteresis for outside RH is also permanent and is 3%.</p>	
<b>22-01</b>	<b>HYSTERESIS PRODUCT TEMPERATURE</b> <i>This hysteresis is used by all programs that have settings for the product temperature (Only Cooling / Storage have an one setting for the product hysteresis). Practical set value: 0.3 °C.</i>	<b>[0.3]</b>
<b>22-02</b>	<b>HYSTERESIS PRODUCT RELATIVE HUMIDITY</b> <i>This hysteresis is used by all programs that have settings for the product RH.</i>	<b>[3]</b>
<b>22-03</b>	<b>HYSTERESIS OUTSIDE TEMPERATURE</b> <i>This hysteresis is used by all programs that have settings for the outside temperature.</i>	<b>[0.3]</b>
<b>22-04</b>	<b>EXTRA HYSTERESIS PRODUCT TEMPERATURE COOLING / STORAGE</b> <i>This extra hysteresis is added to the product temp. hysteresis C/S (12-19). When product temp. deviations are larger than extra hysteresis + product temp. hysteresis, temperature control always has priority to the RH control (Cooling/Storage) Practical set value: 0.5 °C. REMARK: To switch off the priority control, so that cooling/storage always watches the min/max. outside RH, set the extra hysteresis outside air cooling at 0.0°C.</i>	<b>[0.5]</b>
<b>22-05</b>	<b>HYSTERESIS DUCT TEMPERATURE</b> <i>This hysteresis is used for controls, based on the duct temp. Practical set value: 0.3 °C</i>	<b>[0.3]</b>
<b>22-06</b>	<b>EXTRA HYSTERESIS DUCT TEMPERATURE</b> <i>This hysteresis is added up with the duct temp. hysteresis. If the duct temperature deviation is exceeding the "hysteresis duct temp" + "extra hysteresis duct temp", the heaters will be switched on or off. Note: gas-heaters will cause temp. lapses of 30% of the max. capacity. This will often amount to 30% of 15 °C warming-up capacity, which is 4 - 5 °C. In that case one is to set the extra hysteresis on +/- 3°C.</i>	<b>[2.0]</b>
<b>22-07</b>	<b>HYSTERESIS DEWPOINT</b> <i>When the control is based on differences in dew points, this hysteresis is applied. Practical value 1 °C.</i>	<b>[1.0]</b>
<b>22-08</b>	<b>HYSTERESIS STORE ROOMTEMPERATURE</b> <i>This hysteresis is used for controls, based on the store room temp. Practical set value:0.3 °C.</i>	<b>[0.3]</b>
<b>22-09</b>	<b>HYSTERESIS SWITCH VALUE</b> <i>This line is to set the dead zone between switching "on" and "off". Example: The selected function of the Switch program is heating ( or humidification ). Required temp. is set to 20°C, the hysteresis is set on 1°C. The heater will start on 19°C (or lower) measured temperature and will stop at 20°C. If "refrigerating is selected" (or drying) the hysteresis works just the other way round. Starting-point at 21°C or higher and stopping at 20°C or lower.</i>	<b>[0.3]</b>
<b>22-10</b>	<b>HYSTERESIS CO<sub>2</sub> CONCENTRATION</b> <i>Single sided hysteresis. Example: required CO<sub>2</sub> concentration = 4000 ppm, hysteresis = 3000 ppm. Ventilation is started at a concentration of higher as 4000 ppm. Ventilation is stopped at a concentration of lower as 1000 ppm.</i>	<b>[3000]</b>
<b>22-11</b>	<b>SET PRODUCT RELATIVE HUMIDITY 1</b>	<b>[95]</b>
<b>22-12</b>	<b>SET PRODUCT RELATIVE HUMIDITY 2</b>	<b>[95]</b>

22-13	<b>SET OUTSIDE RELATIVE HUMIDITY</b> <span style="float: right;">[80]</span> <i>If there is no product RH-sensor connected, a value for the RH can be preset here, so that there is a control on RH and dewpoint.</i>
22-14	<b>SET / RANGE CO<sub>2</sub> SENSOR</b> <span style="float: right;">[2000]</span> <i>Double function:</i> <ul style="list-style-type: none"> <li>• <i>If a CO<sub>2</sub> sensor with a linear way-out signal is being connected, one adjusts at this place the scale range of the sensor, expressed in 'ppm' (0,1 % = 1000 ppm). For example: if we have a 0-10.000 ppm (0-1%) sensor, 10.000 has to be filled in here.</i></li> <li>• <i>If no sensor is connected, it is possible to change the adjust value with this line.</i></li> </ul>
22-15	<b>TYPE CO<sub>2</sub> SENSOR 0&gt;Priva, 1&gt;Siemens, 2&gt;Lineair 0-1 V, 3&gt;Lineair 0,2-1V</b> <span style="float: right;">[linear 0,2 – 1 V]</span> <i>As the Priva or Siemens CO<sub>2</sub> sensor do not have a linear way-out signal, the signal is rewritten by the software. Most sensors do, however, have a linear way-out signal. For a linear sensor there are two possibilities, namely a 0-1 V way-out signal or an 0,2-1V way-out signal. If a 0-20 mA signal has been converted, we will use a 0-1V entrance. If a 4-20 mA signal has been converted, we will use the 0,2-1V entrance. (When we use a sensor with a current-output, it has to be converted to a voltage-signal. Put a 50Ω resistance between the '-' and 'S' of the ACC-IN 0-1V input).</i>

## 7 DESCRIPTION OF TSC-20 CONTROL UNIT

The TSC-20 is a sensor extension set.

The TSC-20 has a “blind” cover on which you cannot take readings or make any settings. Readings and settings are only possible via the DTI network (ACT).

Each section (TSC-20) is made up of pages that are numbered from page 1 to page 5. Each page consists of a number of lines that are related. The language is English and this cannot be adjusted.

Below you will find a list of all pages:

### 7.1 Shortened list of pages

<b>01</b> <b>TEMPERATURES</b> 01-01 Actual temperature 1 01-02 Actual temperature 2 01-03 Actual temperature 3 01-04 Actual temperature 4 01-05 Actual temperature 5 01-06 Average temperature  01-11 Correction temperature 1 01-12 Correction temperature 2 01-13 Correction temperature 3 01-14 Correction temperature 4 01-15 Correction temperature 5	<b>02</b> <b>ANALOG VALUES</b> 02-01 Actual analog value 1 02-02 Actual analog value 2 02-03 Actual analog value 3 02-04 Actual analog value 4 02-05 Average analog value  02-11 Correction analog 1 02-12 Correction analog 2 02-13 Correction analog 3 02-14 Correction analog 4	<b>03</b> <b>PULSE VALUES</b> 03-01 Actual level pulse 1 03-02 Actual level pulse 2 03-03 Actual level pulse 3 03-04 Actual level pulse 4
<b>04</b> <b>INSTALLER SETTINGS</b> 04-01 Function temperature input 1 04-02 Function temperature input 2 04-03 Function temperature input 3 04-04 Function temperature input 4 04-05 Function temperature input 5  04-11 Function analog input 1 04-12 Function analog input 2 04-13 Function analog input 3 04-14 Function analog input 4  04-21 Function pulse input 1 04-22 Function pulse input 2 04-23 Function pulse input 3 04-24 Function pulse input 4  04-30 Temperature scale	<b>05</b> <b>ALARM PAGE</b> 05-01 Alarm status 05-02 Mode alarm 05-03 High limit temperature 1 05-04 Low limit temperature 1 05-05 High limit temperature 2 05-06 Low limit temperature 2 05-07 High limit temperature 3 05-08 Low limit temperature 3 05-09 High limit temperature 4 05-10 Low limit temperature 4 05-11 High limit temperature 5 05-12 Low limit temperature 5 05-13 High limit RH 1 05-14 Low limit RH 1 05-15 High limit RH 2 05-16 Low limit RH 2 05-17 High limit RH 3 05-18 Low limit RH 3 05-19 High limit RH 4 05-20 Low limit RH 4 05-21 High limit average temperature 05-22 Low limit average temperature 05-23 High limit average RH 05-24 Low limit average RH	

## 7.2 Extended list of pages

Below you will find a detailed list of all pages with the lines and a description of each setting. After the lines, the standard settings are mentioned.

01	TEMPERATURES
01-01	ACTUAL TEMPERATURE 1
01-02	ACTUAL TEMPERATURE 2
01-03	ACTUAL TEMPERATURE 3
01-04	ACTUAL TEMPERATURE 4
01-05	ACTUAL TEMPERATURE 5 <i>The measured temperature of the connected PT-100 (temperature) sensors</i>
01-06	AVERAGE TEMPERATURE
01-11	CORRECTION TEMPERATURE 1 [0,0]
01-12	CORRECTION TEMPERATURE 2 [0,0]
01-13	CORRECTION TEMPERATURE 3 [0,0]
01-14	CORRECTION TEMPERATURE 4 [0,0]
01-15	CORRECTION TEMPERATURE 5 [0,0] <i>Set the required correction here.</i>

02	ANALOG VALUES
02-01	ACTUAL ANALOG VALUE 1
02-02	ACTUAL ANALOG VALUE 2
02-03	ACTUAL ANALOG VALUE 3
02-04	ACTUAL ANALOG VALUE 4 <i>The measured value of the connected 0-10V sensors.</i>
02-05	AVERAGE ANALOG VALUE
02-11	CORRECTION ANALOG 1 [0,0]
02-12	CORRECTION ANALOG 2 [0,0]
02-13	CORRECTION ANALOG 3 [0,0]
02-14	CORRECTION ANALOG 4 [0,0] <i>Set the required correction here.</i>

03	PULSE VALUES
03-01	ACTUAL LEVEL PULSE 1
03-02	ACTUAL LEVEL PULSE 2
03-03	ACTUAL LEVEL PULSE 3
03-04	ACTUAL LEVEL PULSE 4 <i>The measured value of the connected sensors.</i>

04	INSTALLER SETTINGS
04-01	FUNCTION TEMPERATURE INPUT 1 [0]
04-02	FUNCTION TEMPERATURE INPUT 2 [0]
04-03	FUNCTION TEMPERATURE INPUT 3 [0]
04-04	FUNCTION TEMPERATURE INPUT 4 [0]
04-05	FUNCTION TEMPERATURE INPUT 5 [0]
	<p>Here you can indicate the function of the input:</p> <p>0 &gt; Not connected</p> <p>1 &gt; Connected</p> <p>2 &gt; Connected + average</p>
04-11	FUNCTION ANALOG INPUT 1 [0]
04-12	FUNCTION ANALOG INPUT 2 [0]
04-13	FUNCTION ANALOG INPUT 3 [0]
04-14	FUNCTION ANALOG INPUT 4 [0]
	<p>Here you can indicate the function of the input:</p> <p>0 &gt; Not connected</p> <p>1 &gt; Voltage</p> <p>2 &gt; Relative humidity 0-10 V</p> <p>3 &gt; CO<sup>2</sup></p> <p>4 &gt; nh<sub>3</sub></p> <p>5 &gt; Potentiometer</p> <p>6 &gt; Relative humidity 0-1 V</p> <p>7 &gt; Relative humidity 0-1 V + average</p>
04-21	FUNCTION PULSE INPUT 1 [0]
04-22	FUNCTION PULSE INPUT 2 [0]
04-23	FUNCTION PULSE INPUT 3 [0]
04-24	FUNCTION PULSE INPUT 4 [0]
	<p>Here you can indicate the function of the input:</p> <p>0 &gt; Not connected</p> <p>1 &gt; Level input</p> <p>2 &gt; Pulse counter</p> <p>3 &gt; Revolve counter</p> <p>4 &gt; Timer</p>
04-30	TEMPERATURESCALE [0]
	Indicate the temperature scale here (0>Celsius, 1> Fahrenheit).

05	ALARM PAGE
05-01	<p><b>ALARM STATUS</b></p> <p>The first line of the alarm page shows any alarm messages.</p> <p>The following alarm messages may appear:</p> <p>27) none</p> <p>28) memory</p>
05-02	<p><b>MODE ALARM</b></p> <p>The operational state has 4 settings:</p> <ul style="list-style-type: none"> <li>▪ delete</li> <li>▪ off</li> <li>▪ on</li> <li>▪ test</li> </ul> <p>As soon as an alarm message appears, the operational state switches to "on". To delete the message, the operational state has to be set to "delete".</p> <p>When an alarm message is still shown after deleting, the cause of the alarm is still present.</p> <p>First try to remove the cause of the alarm.</p>

05-03	HIGH LIMIT TEMPERATURE 1
05-04	LOW LIMIT TEMPERATURE 1
05-05	HIGH LIMIT TEMPERATURE 2
05-06	LOW LIMIT TEMPERATURE 2
05-07	HIGH LIMIT TEMPERATURE 3
05-08	LOW LIMIT TEMPERATURE 3
05-09	HIGH LIMIT TEMPERATURE 4
05-10	LOW LIMIT TEMPERATURE 4
05-11	HIGH LIMIT TEMPERATURE 5
05-12	LOW LIMIT TEMPERATURE 5
	<i>At temperatures higher than HIGH LIMIT temperature or lower than LOW LIMIT temperature an alarm is generated.</i>
05-13	HIGH LIMIT RH 1
05-14	LOW LIMIT RH 1
05-15	HIGH LIMIT RH 2
05-16	LOW LIMIT RH 2
05-17	HIGH LIMIT RH 3
05-18	LOW LIMIT RH 3
05-19	HIGH LIMIT RH 4
05-20	LOW LIMIT RH 4
	<i>At relative humidity's higher than HIGH LIMIT RH or lower than LOW LIMIT RH an alarm is generated.</i>
05-21	HIGH LIMIT AVERAGE TEMPERATURE
	<i>When the average temperature is higher than the HIGH LIMIT AVERAGE TEMPERATURE an alarm is generated.</i>
05-22	LOW LIMIT AVERAGE TEMPERATURE
	<i>When the average temperature is lower than the LOW LIMIT AVERAGE TEMPERATURE an alarm is generated.</i>
05-23	HIGH LIMIT AVERAGE RH
	<i>When the average relative humidity is higher than the HIGH LIMIT AVERAGE RH an alarm is generated.</i>
05-24	LOW LIMIT AVERAGE RH
	<i>When the average relative humidity is lower than the LOW LIMIT AVERAGE RH an alarm is generated.</i>

### 7.3 Alarm messages

Message	Description
0> none	No alarm
1> memory	Memory alarm
	All settings have been deleted from memory. This is an exceptional case, because normally all settings are saved. Even after a power failure.



## 7.4 TECHNICAL DATA TSC-20

### TSC-20

Housing	:	Sarel (IP 55)
Material	:	PVC
Dimensions	:	213 x 180 x 85 mm (wxhxd)
Front	:	PET (Poly Ethylene Terephthalate)
Power supply	:	230 Vac (+/- 10 %); 50 / 60 Hz
Fuse	:	63 mA slow-operating / 250Vac
Power consumption	:	9 VA
Assembly method	:	Surface-mounted
Cable feed-in	:	Swivels PG11
Cable finish	:	Circuit board terminals
Measuring range	:	-30 / +100 °C per 0.1 °C
Accuracy	:	+/- 0.5 % of the range
Operating temperature	:	0 / +40 °C
Storage temperature	:	-20 / +60 °C
Operating humidity	:	40 / +90 %, non condensating
Inputs	:	- 5x temperature input (Pt-100, 3 lead according to DIN/IEC 751) - 4x analogue input (0-10Vdc) - 4x pulse input (0-1000Hz or state of input)
Network	:	3-wire DTI network

## 8 DESCRIPTION OF DVR-20 CONTROL UNIT

The DVR-20 is a differential control unit for, for instance, air fans or heating/cooling flaps.

The display of the DVR-20 has a red display which can show 4 numbers/letters. To the left of the display there are 8 red LED lights to indicate the state. To the right of the display there are three keys. With the following symbols [ ↑ ], [ P ] and [ ↓ ].

The red LED lights may indicate the following states:

- Fan 1 on ⇒ is lit when the first 0...10 Volt output is active
- Fan 2 on ⇒ is lit when the second 0...10 Volt output is active
- Alarm (min temp) ⇒ minimum temperature alarm
- Alarm (max temp) ⇒ maximum temperature alarm
- Temp sensor 1 defective ⇒ temperature sensor 1 defective
- Temp sensor 2 defective ⇒ temperature sensor 2 defective
- Alarm (horn) on ⇒ there is/was an alarm
- Communication ⇒ is lit when a DTI (ACT) connection is present

*To operate the control unit, we have two options, namely operating via the front of the DVR-20 or operating via the ACT or OptiLink (the DTI network). This chapter contains an explanation of the operation via the front. In section 7.3 the operation via the ACT is explained.*

*Section 7.3 contains the detailed explanation per line/setting, because in general the control unit will be operated via the ACT.*

During normal operation, the display shows the measured difference in temperature (Temperature sensor 1 – Temperature sensor 2 = Delta temperature) [-99.9...+150.0 °C]. When the user operates the [ ↑ ] or [ ↓ ] key, the required difference in temperature [-50.0 ...+50.0 °C] will be flashing. This required difference in temperature will be raised or lowered by 0.1 °C after operating the [ ↑ ] or [ ↓ ] key again. After the [ ↑ ] or [ ↓ ] key has not been operated for 5 seconds, the display will return to the measured delta temperature.

### 8.1 Basic settings (P-settings )

By operating the [ P ] key, you go to the “settings” selection menu. On the display [ P01 ] is shown. By means of the [ ↑ ] or [ ↓ ] key you can go to the required setting. By pressing the [ P ] key again, the current value of that setting is shown. This can be adjusted by means of the [ ↑ ] or [ ↓ ] key. By pressing the [ P ] key again, you return to the “user settings” menu.

When the [ P ] key is pressed for 2 seconds, you automatically return to the operational state. When during 30 seconds no keys are operated, the screen will also return to the operational state again.

P	USER SETTINGS	Unit	range	Initial
P-01	0-10V Output 1 minimum value	%	0...100	20
P-02	0-10V Output 1 maximum value	%	0...100	100
P-03	0-10V Output 1 bandwidth	C or F	-10.0...10.0	3.0
P-04	Function 1	0=cooling, 1=heating, 2=delta control	0...2	2
P-05	Offset minimum temperature alarm	C or F	-50.0...0.0	-5.0
P-06	Offset maximum temperature alarm	C or F	0.0...50.0	5.0
P-07	Control unit on/off	0=off, 1=on	0...1	1
P-11	Reading temperature input 1	C or F	-50.0...100.0	-
P-12	Reading temperature input 2	C or F	-50.0...100.0	-

## 8.2 Installer settings ( C-settings )

By pressing the [ P ] key for 5 seconds you go to the installer settings. On the display [ C01 ] is shown. By means of the [ ↑ ] or [ ↓ ] key you can go to the required setting. By pressing the [ P ] key again, the current value of that setting is shown. This can be adjusted by means of the [ ↑ ] or [ ↓ ] key. By pressing the [ P ] key again, you return to the “installer settings” menu.

When the [ P ] key is pressed for 2 seconds, you automatically return to the operational state. When during 30 seconds no keys are operated, the screen will also return to the operational state again.

C	INSTALLER SETTINGS			
		Unit	range	Initial
	<i>Settings at analogue output 1</i>			
C-01	Running time at minimum ventilation	Seconds	0...999	15
C-02	Interval time at minimum ventilation	Seconds	0...999	0
C-03	Trigger pulse air fan	Seconds	0...999	8
C-04	Absolute minimum capacity ventilation	%	0...100	02
C-05	Function analogue output 1	0=linear, 1=air fan curve	0...1	1
C-06	Minimum voltage analogue output 1	Volt	0,0...10,0	0,0
C-07	Maximum voltage analogue output 1	Volt	0,0...10,0	10,0
	<i>Settings at analogue output 2</i>			
C-10	Offset analogue output 2	C or F	-50,0...50,0	3,0
C-11	0-10V Output 2 minimum value	%	0...100	0
C-12	0-10V Output 2 maximum value	%	0...100	100
C-13	0-10V Output 2 bandwidth	C or F	-10,0...10,0	3,0
C-14	Function 2	0=cooling, 1=heating, 2=delta control	0...2	2
C-21	Running time at minimum ventilation	Seconds	0...999	15
C-22	Interval time at minimum ventilation	Seconds	0...999	0
C-23	Trigger pulse air fan	Seconds	0...999	0
C-24	Absolute minimum capacity ventilation	%	0...100	0
C-25	Function analogue output 2	0=linear, 1=air fan curve	0...1	0
C-26	Minimum voltage analogue output 2	Volt	0,0...10,0	0
C-27	Maximum voltage analogue output 2	Volt	0,0...10,0	10,0
	<i>Settings at analogue off, relay 1 and digital input</i>			
C-30	Switching function	0=off, 1=on	0...1	0
	<i>General installer settings</i>			
C-90	Temperature unit	0=Celsius, 1=Fahrenheit	0...1	0
C-91	Temperature correction sensor 1	C or F	-1,0...1,0	0,0
C-92	Temperature correction sensor 2	C or F	-1,0...1,0	0,0
C-93	Selection temperature input 1	0=internal, 1=external	0...1	0
C-95	Selection temperature input 2	0=internal, 1=external	0...1	0
	<i>General installer settings (for DTI network)</i>			
C-97	Section number	-	1...99	99
C-98*	Language selection	0=NL, 1=DE, 2=ENG, 3=PL, 4=FR	0...4	2

### 8.3 OPERATING THE DVR-20 VIA THE ACT

Each section (DVR-20) is made up of pages numbered 1, 2, 3 & 10. Each page consists of a number of lines that are related.

Below you will find a list of all pages:

#### 8.3.1 Condensed list

01	DELTA TEMPERATURE	02	SETTINGS	03	INSTALLER SETTINGS
01-01	Actual delta temperature 1	02-01	Minimum capacity 1	03-01	ON time minimum capacity 1
01-02	Set point delta temperature 1	02-02	Maximum capacity 1	03-02	OFF time minimum capacity 1
01-01	Actual delta temperature 2	02-03	Bandwidth 0-10V 1	03-03	Start-up time 1
01-02	Set point delta temperature 2	02-04	Function 1	03-04	Absolute minimum capacity 1
		02-05	P factor PID control 1	03-05	Function 0-10V output 1
		02-06	I factor PID control 1	03-06	Voltage at 0% output 1
		02-07	D factor PID control 1	03-07	Voltage at 100% output 1
		02-08	Sample time control 1	03-08	Fixed capacity output 1
				03-09	PID control type output 1
		02-10	Controller on/off	03-10	Time constant low pass filter PID output 1
		02-11	Actual temperature 1	03-21	ON time minimum capacity 2
		02-12	Actual temperature 2	03-22	OFF time minimum capacity 2
		02-13	Actual capacity output 1	03-23	Start-up time 2
		02-14	Actual capacity output 2	03-24	Absolute minimum capacity 2
				03-25	Function 0-10V output 2
		02-21	Minimum capacity 2	03-26	Voltage at 0% output 2
		02-22	Maximum capacity 2	03-27	Voltage at 100% output 2
		02-23	Bandwidth 0-10V 2	03-28	Fixed capacity output 2
		02-24	Function 2	03-29	PID control type output 2
		02-25	P factor PID control 2	03-30	Time constant low pass filter PID output 2
		02-26	I factor PID control 2		
		02-27	D factor PID control 2	03-40	Switch function
		02-28	Sample time control 2		
				03-80	ACC-20 department output1
				03-81	ACC-20 department output 2
				03-85	Process variable output 1
				03-86	Process variable output 2
				03-87	Address temperature extern output 1
				03-88	Address temperature extern output 2
				03-90	Temperature scale
				03-91	Temperature correction sensor 1
				03-92	Temperature correction sensor 2
				03-93	Selection temperature input 1
				03-94	Address temperature input 1
				03-95	Selection temperature input 2
				03-96	Address temperature input 2
				03-97	Department number
				03-98*	Language

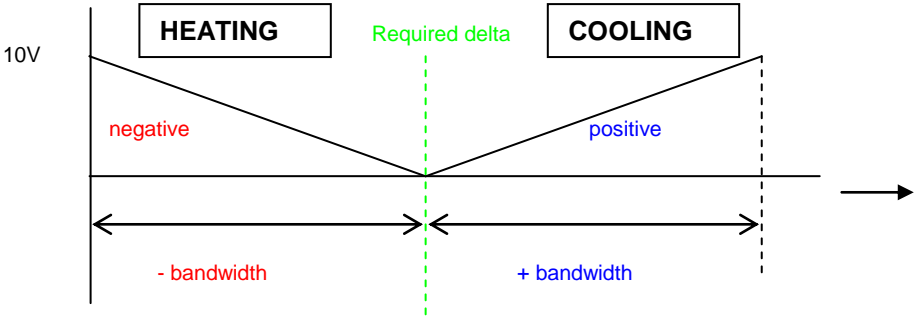
03-98\* Can only be set via DTI network

10	ALARM PAGE
10-01	Alarm status
10-02	Mode alarm

### 8.3.2 List of pages

Below you will find a detailed list of all pages with the lines and a description of each setting. After the lines, the standard settings are mentioned.

<b>1</b>		<b>DELTA TEMPERATURE</b>
01-01	<b>ACTUAL DELTA TEMPERATURE 1</b> <i>The measured delta temperature is the difference in temperature between the two sensors that are connected (Temp sensor 1 – Temp sensor 2 = Measured delta temperature). If "temperature" is selected at setting "Process variable output 1" (03-85) the temperature of sensor 1 is shown.</i>	
01-02	<b>SETPOINT DELTA TEMPERATURE 1</b> <i>Set the required delta temperature here.</i>	[0,0]
01-03	<b>ACTUAL DELTA TEMPERATURE 2</b> <i>The measured delta temperature is the difference in temperature between the two sensors that are connected (Temp sensor 1 – Temp sensor 2 = Measured delta temperature). If "temperature" is selected at setting "Process variable output 2" (03-86) the temperature of sensor 2 is shown.</i>	
01-04	<b>SETPOINT DELTA TEMPERATURE 2</b> <i>Set the required delta temperature here.</i>	[0,0]

<b>2</b>		<b>SETTINGS</b>
02-01	<b>MINIMUM CAPACITY 0-10V OUTPUT 1</b>	[20]
02-02	<b>MAXIMUM CAPACITY 0-10V OUTPUT 1</b> <i>Set the minimum and maximum capacity of 0-10V output 1 here. The capacity is in percentages. Look at the settings of page 03, lines 06 and 07 as well.</i>	[100]
02-03	<b>BANDWIDTH 0-10V OUTPUT 1</b> <i>The larger the bandwidth, the slower the response of the control unit.</i>	[3.0]
02-04	<b>FUNCTION OUTPUT 1</b> <i>With this setting you can select the function. You can select cooling, heating or delta control. With cooling the bandwidth only works positive, with heating only negative, and with delta control both positive and negative</i>	[0]
		
02-05	<b>P factor PID control 1</b> <i>The P-factor setting increases the effect of a difference between set point and process value to the output. The higher the value, the faster the output will react on changes.</i>	[99.9]
02-06	<b>I factor PID control 1</b> <i>The I factor of the PID control integrates the difference between set point and process value and will increase/decrease the output signal until there is no difference between set point and process value. The larger the I factor, the slower but more stable the control operates. If the control is continuously regulating the output up and down, then the setting for the I factor is to low!</i>	[10.0]

02-07	<b>D factor PID control 1</b> <i>Omnivent installations do not use this setting, do not change default setting.</i>	[0.0]
02-08	<b>Sample time control 1</b> <i>Omnivent installations do not use this setting, do not change default setting.</i>	[1.0]
02-10	<b>CONTROLLER ON/OFF</b> <i>The operational state can be set here (0=off, 1=on). This setting can only be set to "off" via the ACT. When the control unit is "off" it can be set to "on" via the control unit itself.</i>	[1]
02-11	<b>ACTUAL TEMPERATURE SENSOR 1</b>	
02-12	<b>ACTUAL TEMPERATURE SENSOR 2</b> <i>Here you can check the actual temperature.</i>	
02-13	<b>ACTUAL CAPACITY OUTPUT 1</b>	
02-14	<b>ACTUAL CAPACITY OUTPUT 2</b> <i>Here you can check the actual output capacity values.</i>	
02-21	<b>MINIMUM CAPACITY 0-10V OUTPUT 2</b>	[20]
02-22	<b>MAXIMUM CAPACITY 0-10V OUTPUT 2</b> <i>Set the minimum and maximum capacity of 0-10V output 1 here. The capacity is in percentages. Look at the settings of page 03, lines 21 and 22 as well.</i>	[100]
02-23	<b>BANDWIDTH 0-10V OUTPUT 2</b> <i>The larger the bandwidth, the slower the response of the control unit.</i>	[3.0]
02-24	<b>FUNCTION OUTPUT 2</b> <i>With this setting you can select the function. You can select cooling, heating or delta control. With cooling the bandwidth only works positive, with heating only negative, and with delta control both positive and negative</i>	[0]
02-25	<b>P factor PID control 2</b> <i>The P-factor setting increases the effect of a difference between set point and process value to the output. The higher the value, the faster the output will react on changes.</i>	[99.9]
02-26	<b>I factor PID control 2</b> <i>The I factor of the PID control integrates the difference between set point and process value and will increase/decrease the output signal until there is no difference between set point and process value. The larger the I factor, the slower but more stable the control operates. If the control is continuously regulating the output up and down, then the setting for the I factor is to low!</i>	[10.0]
02-27	<b>D factor PID control 2</b> <i>Omnivent installations do not use this setting, do not change default setting.</i>	[0.0]
02-28	<b>Sample time control 2</b> <i>Omnivent installations do not use this setting, do not change default setting.</i>	[1.0]

3	INSTALLER SETTINGS
03-01	<b>ON TIME AT MINIMUM CAPACITY 0-10V OUTPUT 1</b> [15]
03-02	<b>OFF TIME AT MINIMUM CAPACITY 0-10V OUTPUT 1</b> [0]
03-03	<b>START-UP TIME 0-10V OUTPUT 1</b> [8] <i>When you switch on the output, the capacity of the output will be 100% during this time. This is done to start up the air fans. After this, the output will go the required position of that moment.</i>
03-04	<b>ABSOLUTE MINIMUM CAPACITY 0-10V OUTPUT 1</b> [20] <i>Here you set the absolute minimum value that can be set. The minimum capacity (page 02, line 01) can never be lower than the value set here. The value is in percentages.</i>
03-05	<b>FUNCTION 0-10V OUTPUT 1</b> [1] <i>Here you set the function of the output (0=linear, 1=air fan).</i>
03-06	<b>VOLTAGE AT 0% CAPACITY 0-10V OUTPUT 1</b> [0]
03-07	<b>VOLTAGE AT 100% CAPACITY 0-10V OUTPUT 1</b> [10] <i>Set the required voltage at 0% and 100%. Also look at the settings of page 02, lines 01 and 02.</i>
03-08	<b>FIXED CAPACITY OUTPUT 1</b> <i>The fixed capacity for the DVR-20 is the percentage at which the DVR-20 output is set during external ventilation by the active ACC program.</i>
03-09	<b>PID CONTROL TYPE OUTPUT 1</b> <div> <div>0&gt;</div> <div>Type A</div> <div>The PID factors are all dependant of the error signal (Tset-Tist).</div> </div> <div> <div>1&gt;</div> <div>Type C</div> <div>The P and D factors are only dependant of Tist, the I factor is dependant of the error signal (Tset-Tist).</div> </div>
03-10	<b>TIME CONSTANT LOW PASS FILTER OUTPUT 1</b> [0,0] <i>Omnivent installations do not use this setting, do not change default setting.</i>
03-21	<b>ON TIME AT MINIMUM CAPACITY 0-10V OUTPUT 2</b> [15]
03-22	<b>OFF TIME AT MINIMUM CAPACITY 0-10V OUTPUT 2</b> [0]
03-23	<b>START-UP TIME 0-10V OUTPUT 2</b> [0] <i>When you switch on the output,, the capacity of the output will be 100% during this time. This is done to start up the air fans. After this, the output will go the required position of that moment..</i>
03-24	<b>ABSOLUTE MINIMUM CAPACITY 0-10V OUTPUT 2</b> [0] <i>Here you set the absolute minimum value that can be set. The minimum capacity (page 03, line11) can never be lower than the value set here. The value is in percentages.</i>
03-25	<b>FUNCTIE 0-10V OUTPUT 2</b> [0] <i>Here you set the function of the output (0=linear, 1=air fan)..</i>
03-26	<b>VOLTAGE BIJ 0% CAPACITY 0-10V OUTPUT 2</b> [0]
03-27	<b>VOLTAGE BIJ 100% CAPACITY 0-10V OUTPUT 2</b> [10] <i>Set the required voltage at 0% and 100%. Also look at the settings of page 03, lines11 and 12.</i>
03-28	<b>FIXED CAPACITY OUTPUT 2</b> <i>The fixed capacity for the DVR-20 is the percentage at which the DVR-20 output is set during external ventilation by the active ACC program.</i>
03-29	<b>PID CONTROL TYPE OUTPUT 2</b> <div> <div>2&gt;</div> <div>Type A</div> <div>The PID factors are all dependant of the error signal (Tset-Tist).</div> </div> <div> <div>3&gt;</div> <div>Type C</div> <div>The P and D factors are only dependant of Tist, the I factor is dependant of the error signal (Tset-Tist).</div> </div>
03-30	<b>TIME CONSTANT LOW PASS FILTER OUTPUT 2</b> [0,0] <i>Omnivent installations do not use this setting, do not change default setting.</i>

03-40	<b>SWITCH FUNCTION</b> <i>With this setting you can influence the switching behavior of relay 1 and the digital input (0=off, 1=on).</i>	[0]
03-80	<b>ACC-20 DEPARTMENT 1</b> <i>Starting from software version 10 the ACC-20 has the possibility to set some parameters of the DVR-20. Set the department number of the ACC-20 where the DVR-20 is connected to.</i>	[0]
03-81	<b>ACC-20 DEPARTMENT 2</b> <i>Starting from software version 10 the ACC-20 has the possibility to set some parameters of the DVR-20. Set the department number of the ACC-20 where the DVR-20 is connected to.</i>	[0]
03-85	<b>PROCESS VARIABLE OUTPUT 1</b> <i>Select the desired sensor signal to control output 1. To measure a single temperature use: 0-Temperature. See also page 03 line 93 for the selection of the temperature input.  To measure a difference between two sensors use: 1- temperature-extern or 2- extern-temperature. See also page 03 line 93 for the selection of the temperature input and page 03 line 87 for the address of the external temperature sensor.</i>	
03-86	<b>PROCESS VARIABLE OUTPUT 2</b> <i>Select the desired sensor signal to control output 2. To measure a single temperature use: 0-Temperature. See also page 03 line 95 for the selection of the temperature input.  To measure a difference between two sensors use: 1- temperature-extern or 2- extern-temperature. See also page 03 line 95 for the selection of the temperature input and page 03 line 88 for the address of the external temperature sensor.</i>	
03-87	<b>ADDRESS TEMPERATURE EXTERN OUTPUT 1</b> <i>Setting of the address of the external sensor if process variable output 1 (page 03 line 85) is set to extern</i>	
03-88	<b>ADDRESS TEMPERATURE EXTERN OUTPUT 2</b> <i>Setting of the address of the external sensor if process variable output 2 (page 03 line 86) is set to extern</i>	
03-90	<b>TEMPERATURE SCALE</b> <i>With this setting you can choose between Celsius and Fahrenheit (0=Celsius, 1=Fahrenheit).</i>	[0]
03-91	<b>TEMPERATURE CORRECTION SENSOR 1</b>	[0,0]
03-92	<b>TEMPERATURE CORRECTION SENSOR 2</b> <i>Here you set the temperature correction for the sensors. Maximum correction –1.0 or +1.0 degree.</i>	[0,0]
03-93	<b>SELECTION TEMPERATURE INPUT 1</b> <i>Here you select whether a sensor is actually connected to input 1 (internal) or an external address is used for a sensor (external) that is connected elsewhere in the DTI network</i>	[0]
03-94	<b>ADDRESS TEMPERATURE INPUT 1</b> <i>When the input selection is set to external, you have to enter the address of the external sensor here.</i>	
03-95	<b>SELECTION TEMPERATURE INPUT 2</b> <i>Here you select whether a sensor is actually connected to input 2 (internal) or an external address is used for a sensor (external) that is connected elsewhere in the DTI network</i>	[0]
03-96	<b>ADDRESS TEMPERATURE INPUT 2</b> <i>When the input selection is set to external, you have to enter the address of the external sensor here..</i>	
03-97	<b>DEPARTMENT NUMBER</b> <i>Here you set the department number for the DVR-20 control unit concerned. Please note that each department number can be used only once, each time it is used in a DTI network.</i>	[99]
03-98*	<b>LANGUAGE</b> <i>Here you set the required language (0=Dutch, 1=German, 2=English, 3=Polish, 4=French).</i>	[2]

\* This setting can only be made (and is useful) via the DTI network.



10	ALARM PAGE
18-01	<p><b>MESSAGES</b></p> <p><i>The first line of the alarm page indicates any alarm messages. The following alarm messages may appear:</i></p> <p>0) none 1) memory</p>
18-02	<p><b>operational state of alarm</b></p> <p><i>The operational state has 4 settings:</i></p> <ul style="list-style-type: none"> <li>▪ delete</li> <li>▪ off</li> <li>▪ on</li> <li>▪ test</li> </ul> <p><i>As soon as an alarm occurs, the operational state switches to “on”. When the alarm is set to “off” after that, any acoustic alarm will disappear. To delete the message, the operational state has to be set to “delete”.</i></p> <p><i>When an alarm message is still shown after deleting, the cause of the alarm is still present. First try to remove the cause of the alarm.</i></p>

### 8.3.3 Alarm messages

Message	Description
0> none	<b>No alarm</b>
1> memory	<b>Memory alarm</b>
	All settings have been deleted from memory. This is an exceptional case, because normally all settings are saved. Even after a power failure.

## 8.4 TECHNICAL DATA DVR-20

### DVR-20

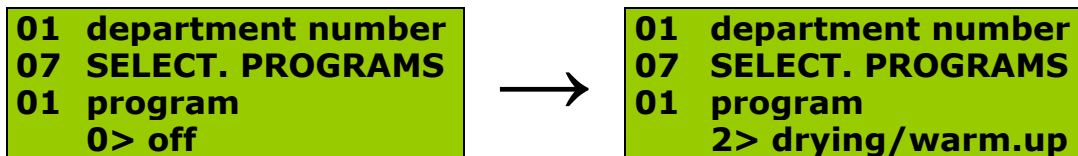
Housing	:	Sarel (IP 55)
Material	:	PVC
Dimensions	:	213 x 180 x 85 mm (wxhxd)
Front	:	PET (Poly Ethylene Terephthalate)
Power supply	:	230 Vac (-15 % / +10 %); 47 t/m 63 Hz
Fuse	:	63 mA slow-operating / 250Vac
Power consumption	:	9 VA
Assembly method	:	Surface-mounted
Cable feed-in	:	Swivels PG11
Cable finish	:	Circuit board terminals
Measuring range	:	-40 / +50 °C per 0.1 °C
Accuracy	:	+/- 0.5 % of the range
Operating temperature	:	0 / +40 °C
Storage temperature	:	-20 / +60 °C
Operating humidity	:	40 / +90 %, non condensating
Inputs	:	- 2x temperature inputs (Pt-100, 3 lead according to DIN/IEC 751) - 1x digital in (potential-free) - 1x potentiometer input (min 1 KOhm up to max 10KOhm potentiometer). Power supply 1 Vdc.
Outputs	:	- 3x potential-free relay - RY1 (C/NO/NC, 250Vac/10A non inductive) RY2 to RY5 have the same common. - RY 2 to 4 (NO, 250Vac/10A non inductive) - RY 5 (NO/NC, 250Vac/10A non inductive) - 2x 0..10Vdc out
Network	:	3-wire DTI network 3-wire DSO network

## 9 TIPS

---

### Activate a dry / store program

---



Navigate to page 07 SELECT. PROGRAMS, line 1. Set the required program. The choices are:

MANUAL, WARMING UP, DRYING-HEALING, AFTER DRYING, COOLING-STORAGE, AFTER DRYING + COOLING-STORAGE, DEHUMIDIFICATION.

### Read measurements

---

Page 03 MEASUREMENTS there are only measuring records. For example outside temperature.

01 department number  
03 MEASUREMENTS  
06 outside temp.  
+ 20,8 °C

Navigate to page 03 MEASUREMENTS

### Check the status of a program

---

All climate programs have a program state. The program state indicates whether the air is ventilated or not. Check the state on the last line of a program section.

01 department number  
12 COOLING/STORAGE  
21 state of program  
0> no ventilation

## 10 ALARMS

During the storage process it is possible that the ACT/ACC system generates alarm messages. This can be a temperature alarm or a communication failure.

An alarm is made visible in the display of the ACT by means of a flashing 'T' or 'A'

**A flashing 'A' indicates an alarm in one of the ACC's or the ACT.**

**A flashing 'T' indicates a time-out alarm somewhere in the mutual communication.**

**If the first line of the ACT display is blinking then an alarm is active in the current selected department.**

### 10.1 Check alarm messages

<b>01</b>	<b>department number</b>
<b>18</b>	<b>ALARM</b>
<b>01</b>	<b>type of alarm</b>
<b>0&gt;</b>	<b>off</b>

If the first line of the ACT display is blinking then an alarm is active in the current selected department. In that case navigate to page 18 ALARMS en check the type of alarm.

### 10.2 Reset alarm messages

Navigate to line 02 SET ALARM to clear all alarm messages. If you cannot reset a messages then the message is still active.

<b>01</b>	<b>department number</b>
<b>18</b>	<b>ALARM</b>
<b>02</b>	<b>set alarm</b>
<b>2&gt;</b>	<b>on</b>



<b>01</b>	<b>department number</b>
<b>18</b>	<b>ALARM</b>
<b>02</b>	<b>set alarm</b>
<b>0&gt;</b>	<b>reset</b>

To reset the messages set "SET ALARM" to "reset".

**10.3 Alarm messages (Page 19 Line 1)**

Type of alarm	Description
<b>0&gt; off</b>	<b>No alarm</b>
<b>1&gt; memory</b>	<b>Memory problem</b>
	If the RAM-memory is deleted for some reason or other, this is made known to the user. By the way, if there is a power failure, all settings are maintained. A memory-alarm is rather an exception, for instance after changing a program-eprom or a stroke of lightning nearby. Moreover, the ACT and ACC equipment have a special memory. This means that even after a RAM-memory alarm, many presettings and program choices are maintained. When a presetting is changed, it will take one minute before this is saved in the special memory.
<b>2&gt; external</b>	<b>External alarm</b>
	In most cases this alarm is used to indicate a thermic failure of the fans (or the position of a safety thermostat). On the switchboard there will also be a red light burning at the fan involved.
<b>3&gt; duct sens.low</b>	<b>Duct sensor low</b>
	When a (selected) duct sensor is higher than the upper limit (alarm high) or lower than the lower limit (alarm low), this will be removed from the average, and after five minutes an alarm is activated. The maximum and minimum are preset in 18-10 and 18-11. The duct sensor alarm will not be activated if the active program (07-01) is in "off" or "manual". In all other programs this alarm may be activated.
<b>4&gt; duct sens.high</b>	<b>Duct sensor high</b>
	See 3.
<b>5&gt; duct t. w.</b>	<b>Average duct temp. Warming up</b>
	This indicates an average duct temperature too high, during external ventilation. It is possible to set a high and low temperature limit, independent from each other. If the duct temp. exceeds these limits for longer than 5 minutes, an alarm is triggered. Only after the so called alarm-reset time (21-01), the heaters are automatically switched off. The inletflap will be closed, the fans keep on running. After resetting the alarm, (18-02) you can switch on, and control the heater again automatically. Naturally, on the condition that the duct temperature is within its limits again.
<b>6&gt; duct t.dry/h.</b>	<b>Average duct temp. Drying / Healing</b>
	Just an alarm signal. If the alarm is activated, it does not stop fans or flaps. The alarm is activated if the measured average duct temp. differs more from the product's temp. than the preset max. values (10-17 and 10-18), during external ventilation. This alarm can only be activated if the fans are running and there is an active flap-control.
<b>7&gt; duct t.aft.dry</b>	<b>Average duct temp. After-Drying</b>
	This alarm is comparable with the duct temp. alarm during Drying/Warming Up. Alarm-high and alarm-low. After five minutes, an alarm is activated, after the alarm-reset-time, the heaters are switched off and the inlet is closed. Periodical ventilation according to the time-units continues. The alarm can only be activated when the fan is running. When the alarm has switched off the heater, the heater will only be switched on automatically after the duct temp. is within the right limits and the alarm has been reset (18-02).

<b>8&gt; duct t.cool/s</b>	<b>Average duct temp. Cooling / Storage</b> This alarm can only be activated during external ventilation when the fan is running and the flap control is in action. This type of alarm doesn't stand by during automatic internal ventilation. If the temperature of the blown-in air (duct temperature) is too low, the alarm is activated after 5 minutes. If the average duct temp. still appears to be below the limits longer than the alarm-reset time, the fan will be switched off and the inletflap will be closed. Move to line 18-02 to switch off the alarm, and the program will continue. Don't forget to find out the reason for alarm.
<b>9&gt; duct dehum.</b>	<b>Average duct temp. Dehumidification</b> Only standby if fan is active. When duct temp. is too low, an alarm is activated, and after alarm reset-time, refrigeration is switched off. When duct temp. is too high, only an alarm is activated, the heater will not be switched because of this alarm.
<b>10&gt; prod.t.dry/w.</b>	<b>Product temp. Drying / Healing</b> After 5 minutes an alarm appears. No actions; just a signal
<b>11&gt; prod.t.cool/s</b>	<b>Product temp. Cooling / Storage</b> If the measured average product temperature deviates too much from the currently required producttemp., there will be an alarm after a deviation longer than 5 minutes. There won't be any action or blocking. It is just a signal to inform the user.
<b>12&gt; prod.dehum.</b>	<b>Product temp. Dehumidification</b> An alarm is activated if the measured product temp. is too high or too low. No actions.
<b>13&gt; roomt.refr.</b>	<b>Store room temperature Refrigeration</b> If the measured store room temp. deviates too much from the required temp. during refrigeration. When the store room temp. is too low, the refrigeration is deactivated after the alarm reset-time.
<b>14&gt; roomt.c.vent</b>	<b>Store room temperature Condensation Control</b> If the store room temp. deviates too much from the required temp. electro heater function. The alarm is only a signal.
<b>15&gt; delta aft.dry</b>	<b>Delta temperature After Drying</b> If the selected product temp. sensors differ too much amongst them, there will be an alarm. Just a signal. No action, no blocking of the program.
<b>16&gt; delta cool/s</b>	<b>Delta temperature Cooling / Storage</b> Equalization of the highest and lowest product temperatures, is done by internal ventilation. (Recirculation). If this action is not successful (delta temp. stays above the set maximum) an alarm is activated. No special actions, no blocking.
<b>17&gt; switch value</b>	<b>Switch value</b> If the measured value (17-05) deviates from the required set-point value, for longer than 5 minutes, there will be an alarm. An alarmsignal without further actions.
<b>18&gt; CO2.conc.high</b>	<b>CO<sub>2</sub> concentration</b> If the CO <sub>2</sub> concentration is during 5 minutes higher than the required CO <sub>2</sub> concentration, this alarm message appears.
<b>19&gt; Flap</b>	<b>Flap</b> The outlet flap should always follow the inlet flap or, in Manual, the opening of the outlet flap may never be smaller (a larger opening is allowed) than the opening of the inlet flap if the fans are switched on. When the deviations become too far, an alarm is activated after 45 seconds. Moreover, the fans are switched off and the flaps are closed. If no fans are active, there can't be an alarm.

<b>20&gt; No ID key</b>	<b>No ID key found</b>
	This ID key is necessary in combination with the licence codes. When this message is shown, please contact Omnivent Techniek B.V.
<b>21&gt; licence code 1</b>	<b>Licence code 1 not entered</b>
	The licence code 1 has not been entered correctly on page 20, line 06. This alarm is shown when you have used the ACT/ACC system for 30 days. After 60 days of use, all programs will be blocked. Only pages 01, 19 and 20 will be visible. Try to delete the alarm (set page 19, line 02 to Delete). When this message is still shown, contact Omnivent Techniek B.V.
<b>22&gt; licence code 2</b>	<b>Licence code 2 not entered</b>
	The licence code 1 has not been entered correctly on page 20, line 07. This alarm is shown 30 days after correct entry of licence code 1. About 44 days after entry of code 1, all programs will be blocked again. Only pages 01, 19 and 20 will be visible. Try to delete the alarm (set page 19, line 02 to Delete). When this message is still shown, contact Omnivent Techniek B.V.
<b>23&gt; licentie exp.</b>	<b>Licence code expired</b>
	See also alarm messages 21 & 22. Try to delete the alarm (set page 19, line 02 to Delete). When this message is still shown, contact Omnivent Techniek B.V.
<b>24&gt; inlet flap</b>	<b>Inlet flap is not responding</b>
	The inlet flap is activated but no position change has occurred during 5 minutes. (Option available in the extended program only).
<b>25&gt; outlet flap</b>	<b>Outlet flap is not responding</b>
	The outlet flap is activated but no position change has occurred during 5 minutes. (Option available in the extended program only).
<b>26&gt; heating valve</b>	<b>Heating valve is not responding</b>
	The heating valve is activated but no position change has occurred during 5 minutes. (Option available in the extended program only).

## 11 TROUBLESHOOTING

Problem	Cause	Solution
No control to any machine.	Switchboard is not on automatic	Switch switchboard to automatic operation.
	Switchboard is place incorrectly.	Test de switchboard manual.
	There is no program.	Go to 07-01 and select the required program.
	The controller is blocked.	Check line 20-02 to see if the controller is blocked.
	The controller is outside starting and stopping time.	Check the timer settings.
	The ACC's involved are dead.	Check the fuse of the ACC involved.
	Fuse of ACT broken.	Replace glass fuses.
Intermitted light on ACT display	There is an alarm.	Clear the alarm.
ACT does not respond to keys	Operation permitted is 'off'	Switch the display level to 'maximal'. Switch the operation to 'on' line (01-04 and 02-08) in department 0.
A temperature measurement indicates 100 °C	No sensors selected.	Check the settings in chapter 6 Sensor selection.
	Sensor defective, or wire damage.	Check sensor measurement to see if a individually sensor indicates 100 °C.
The display reads: "Internal error ....."	An internal error has occurred.	Press "Info" button en test the system.
The display reads: "Internal error memory is cleared"	The backup battery is flat or there has been a high peak in the main voltage.	Press "Info" button en test the system.  <i>Remove the voltage and apply the voltage to the equipment after 15 minutes to check if the battery is flat.</i>
Only page 01, 19 and 20 are visible	The license codes are not correct or not entered on page 20, line 06 and 07	Try to reset the alarm at page 19 line 02 on 0> reset. If this message stays active contact Omnivent Techniek BV.