Corrigo E - User Manual

Ventilation

REGIN

THE CHALLENGER IN BUILDING AUTOMATION

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TRADEMARKS

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Chapter 1 About the manual

This manual covers all the models in the Corrigo E series of ventilation controllers. This revision covers program revision 1.7-1-01.

More information

More information about Corrigo E can be found in:

- ***Manual E-tool*** – Manual of how to configure the controllers
- ***Lon-interface variable list*** – Variable list for the Corrigo E series
- ***Network variables for EXOline and Modbus*** – Variable list for EXOline and Modbus communication
- ***CE - Declaration of conformity, Corrigo E***

The information is available for download from Regin's homepage, www.regin.se.

Chapter 2 About Corrigo E

Corrigo E for ventilation is a complete new range of programmable controllers for control of building facility systems as air handling units.

Corrigo E series for ventilation comprises three model sizes: 8, 15 or 28 in-/outputs. Available with or without front panel display and buttons. For units without front panel display and buttons a separate, cable-connected terminal E-DSP with display and buttons is available.

All programming and normal handling can be done using the display and buttons or from a connected computer running Corrigo E-tool and using EXOline for communication.

The temperature controller is based on a supply air PI-controller for heating control with a pre-programmed set of control modes. To this controller can be bound a number of different control functions and analogue and digital input and output functions. The choice of which functions are to be used is free, the only restriction lying in the physical number of inputs and outputs that the different models have.

The Corrigo is designed for DIN-rail mounting.

The program for an air handling unit contains, apart from other things, the following functions:

Different temperature control modes

Supply air temperature control, with or without outdoor temperature compensation

Room temperature control (cascade controller)

Exhaust air temperature control (cascade controller).

With control of:

Heat exchanger (Liquid connected- , plate- or rotating) or mixing dampers.

Heater battery; Water with frost protection or electric.

Chiller

Supply air and exhaust air fans (single-speed, two-speed, pressure controlled or flow controlled).

Fire dampers.

Circulation pumps heating, cooling, exchanger.

Humidity control

Either Humidification or Dehumidification or both Humidification and Dehumidification.

Timer control

For starting and stopping the unit.

Demand controlled ventilation

In buildings with strongly varying occupancy the fan speeds or mixing dampers can be controlled by the air quality measured by a CO_2/VOC sensor.

Support control

When using the control function Room control or exhaust air temperature control with a room sensor connected it is possible to utilise support-heating and/or support-cooling. Minimum running time is settable 0…720 minutes (factory setting 20 minutes).

Free cooling

The function is used during the summer to cool the building during the night using cool outdoor air thereby reducing the need to run chillers during the day.

Step controllers Heating/Cooling

As an alternative to the analogue control of ”Actuator heating Y1” or ”Actuator cooling Y3” step controllers can be used for controlling heating or cooling in steps using digital control.

Corrigo E hardware overview

Model	8	8D	15	15D	28	28D
Analogue Inputs	2	2	4	4	4	4
Digital Inputs	3	3	4	4	8	8
Universal Inputs	-	-	-	-	4	4
Analogue Outputs	1	1	3	3	5	5
Digital Outputs	2	2	4	4	7	7
RS485	Yes	Yes	Yes	Yes	Yes	Yes
LON	Option	Option	Option	Option	Option	Option
TCP/IP	Option	Option	Option	Option	Option	Option
Display	No	Yes	No	Yes	Nej	Yes
Ext. display	Option	No	Option	No	Option	No

Technical data

Protection class IP20
Display..... 4 rows of 20 characters. Background illumination.
LEDs
  Yellow ..... Settable parameter
  Red..... Alarm
Clock ..... Year base 24 hour clock with battery backup. Automatic summer-/winter-time changeover.
Operating system ..... EXOreal
Supply voltage ..... 24 V AC, 6 VA
Dimensions ..... 148x123x60 (WxHxD incl. terminals)
Casing ..... Standard Euronorm
Mounting ..... On DIN-rail
Operation
  Climatic conditions according to IEC 721-3-3 ..... Class 3k5
  Ambient temperature ..... 0...50°C
  Ambient humidity..... Max 95% RH
  Mechanical requirements according to IEC721-3-3 ..... Class 3M3
  Vibration..... IEC60068-2-6, Test FC, vibration Sinusoidal
  Shock ..... IEC60068-2-27, Test Ea
Transport
  Climatic conditions according to IEC 721-3-2 ..... Class 2k3
  Ambient temperature ..... -20...70°C
  Air humidity ..... Max 95% RH
  Mechanical requirements according to IEC721-3-2 ..... Class 2M2
  Vibration..... IEC60068-2-6, Test FC, vibration Sinusoidal
  Shock ..... IEC60068-2-27, Test Ea
  Free fall..... IEC60068-2-27, Test Ed
Storage
  Climatic conditions according to IEC 721-3-1 ..... Class 1k3
  Ambient temperature ..... -20...70°C
  Air humidity ..... Max 95% RH

Battery

Type ..... Replaceable Lithium cell
Battery life ..... Better than 5 years
Warning ..... Low battery warning
Battery backup ..... Memory and real time clock

Communication

EXOline Port 1, insulated via a built-in RS485 contact.
The basic version of Corrigo E can communicate with Modbus. You do not need an activation code.
Corrigo E can be ordered with a communication port for TCP/IP or LON.

CE-marking

Conforms with the EMC standards: CENELEC EN61000-6-3:2001, CENELEC EN61000-6-1:2001.

Inputs

Analogue inputs AI ..... Settable 0…10 V DC or PT1000, 12 bit A/D
Digital inputs DI ..... Potential free closure
Universal inputs UI ..... Can be set to act as either an analogue input or a digital input with specifications as above

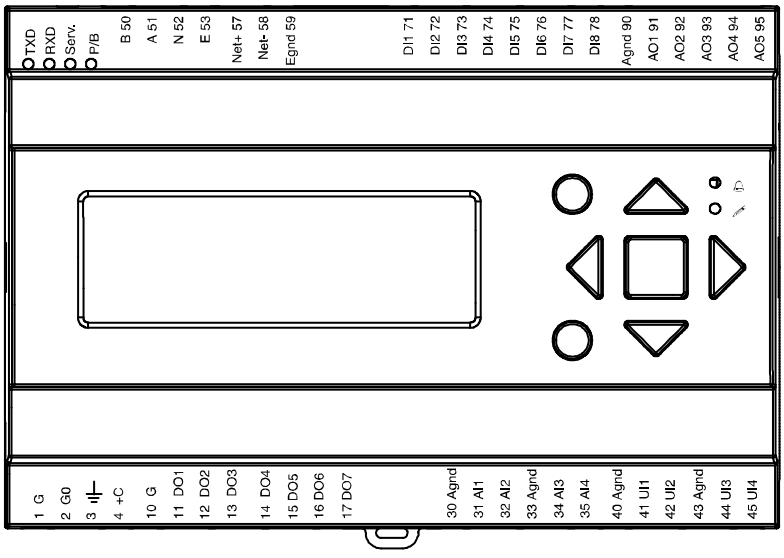
Outputs

Analogue outputs AO ..... Settable 0…10 V DC; 2…10 V DC; 10…0 V DC or 10…2 V DC
8 bit D/A short-circuit protected
Digital outputs DO ..... Triac outputs, 24 V AC, 0.5 A continuous

Options

LON ..... FT3150, gives a second communication route
TCP/IP ..... Replaces RS485 for EXOline (Port 1) communication
External hand terminal, E-DSP ..... For use with Corrigo E units without display

Position of the terminals on Corrigo E



Chapter 3 Installation and wiring

3.1 Installation

Corrigo E can be mounted in a DIN-standard casing (minimum 9 modules), on a DIN-rail in a cabinet or, using a suitable front-mounting kit, in a cabinet door or other control panel.

Ambient temperature: 0…50°C.

Ambient humidity: max. 95 %RH, non-condensing.

3.2 Wiring

At the end of this chapter there are wiring diagrams showing the factory set configuration. We have also included blank diagrams. Since the function of most of the inputs and outputs depends on the programming of the unit the final wiring diagram cannot be filled in until the installer has decided how to use the inputs/outputs. It is important to make sure that the wiring is correctly done and in accordance with the instructions given in this manual.

3.2.1 Supply voltage

24 V AC ±15%, 50/60 Hz. 6 VA

If the Corrigo E and the actuators connected to it share the same transformer it is essential that the same transformer-pole is used as reference for all the equipment. Failure to do so will prevent the equipment from functioning as intended and may also lead to damages.

3.2.2 Inputs and outputs

The list of input and output functions in section 3.2.3 is a handy instrument to help you keep track of which inputs and outputs you will need to configure.

Analogue inputs

Analogue inputs must refer to an A-gnd terminal placed in the same terminal block as the input being wired.

Analogue inputs can, depending on the configuration, be used for either PT1000 temperature sensors or for 0…10 V DC analogue input signals, for example from a pressure transmitter.

Digital inputs

Digital inputs must refer to C+ on terminal 4. Digital inputs may only be wired to voltage-free contacts. Any external voltage applied to a digital input may harm the unit.

Universal inputs

A universal input can be configured to act as either an analogue input or as a digital input.

A universal inputs configured as an analogue input can, depending on the configuration, be used for either PT1000 temperature sensors or for 0…10 V DC analogue input signals, for example from a pressure transmitter.

Universal inputs configured as an analogue input must refer to an A-gnd terminal placed in the same terminal block as the input being wired.

A universal input configured as a digital input must, just like other digital inputs refer to C+ on terminal 4. It may only be wired to voltage-free contacts.

Analogue outputs

Analogue outputs must refer to the A-gnd terminal placed in the AO terminal block.

All analogue outputs can be individually set to any one of the following signals:

0…10 V DC

2…10 V DC

10…0 V DC

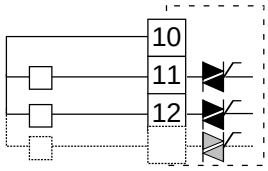
10…2 V DC

If the Corrigo E and the actuators connected to it share the same transformer it is essential that the same transformer-pole is used as reference for all the equipment. Failure to do so will prevent the equipment from functioning as intended and may also lead to damages.

Digital outputs

Digital outputs must refer to G_{DO} on terminal 10.

All the digital outputs are triac controlled. The outputs will deliver 24 V AC, 0.5 A continuous. The outputs cannot be used to drive DC relays.



3.2.3 Input and output lists

Use these lists during commissioning to help you keep track of which input and output functions you wish to use.

Analogue inputs

✓	Analogue input signal
	Outdoor temperature sensor
	Supply air temperature sensor
	Exhaust air temperature sensor
	Extract air temperature sensor
	Room temperature sensor 1
	Room temperature sensor 2
	CO_2/VOC sensor. 0…10 V DC
	Extra sensor / Setpoint potentiometer
	Pressure transmitter, supply air 0…10 V DC
	Pressure transmitter, exhaust air 0…10 V DC
	De-icing sensor, heat exchanger
	Frost protection sensor

Digital inputs

✓	Digital input signal
	Filter guard, supply air and exhaust air
	Run-indication/alarm circulation pump, heating
	Run-indication/alarm circulation pump, cooling
	Run-indication/alarm circulation pump, exchanger
	Fire alarm
	Fire damper end-switch monitoring
	Extended running 1/1-speed
	Extended running 1/2-speed
	External stop
	External alarm
	Flow-switch
	Rotation sentinel, exchanger
	Run-indication/alarm supply air fan
	Run-indication/alarm exhaust air fan
	De-icing, exchanger
	High temp limit switch/Frost prot. thermostat

The universal inputs on Corrigo E28 can, individually, be configured as either analogue inputs using any of the analogue input signals above or as digital inputs using any of the digital inputs above.

Analogue outputs

✓	Analogue output signal
	Y1 Actuator Heating
	Y2 Actuator Exchanger
	Y3 Actuator Cooling
	Y4 Frequency converter, supply air fan
	Y5 Frequency converter, exhaust air fan
	Y6 Actuator Humidity control
	Split of any one of temp outputs Y1, Y2 or Y3

Digital outputs

✓	Digital output signal
	Start/stop supply air fan (SAF) 1/1-speed
	Start/stop exhaust air fan (EAF) 1/1-speed
	Start/stop supply air fan (SAF) 1/2-speed
	Start/stop exhaust air fan (EAF) 1/2-speed
	Start/stop circulation pump, heating
	Fire dampers
	Sum alarm A- and B-alarm
	Sum alarm A-alarm
	Sum alarm B-alarm
	Start/stop circulation pump, cooling
	Start/stop circulation pump, liquid exchanger
	Activation-signal SAF frequency converter
	Activation-signal EAF frequency converter
	Activation heating
	Activation cooling
	Activation heat exchanger
	Extract air close-off damper
	Fresh air close-off damper
	Recirculation damper
	Heating 3-pos. actuator, increase
	Heating 3-pos. actuator, decrease
	Exchanger 3-pos. actuator, increase
	Exchanger 3-pos. actuator, decrease
	Cooling 3-pos. actuator, increase
	Cooling 3-pos. actuator, decrease
	Step controller heating, step 1
	Step controller heating, step 2
	Step controller heating, step 3
	Step controller heating, step 4
	Step controller cooling, step 1
	Step controller cooling, step 2
	Step controller cooling, step 3
	Extra Timer channel 1
	Extra Timer channel 2
	Extra Timer channel 3
	Extra Timer channel 4
	Extra Timer channel 5
	Humidity

Wiring diagram Corrigo E28V factory configuration

(See also picture of the position of the terminals on page 7)

1	G	Supply voltage 24 V AC, ±15%. 50/60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC. Reference for digital inputs DI.

10	G_{DO}	Reference for digital outputs DO.
11	DO1	Start/stop supply air fan (SAF) 1/1-speed
12	DO2	Start/stop exhaust air fan (EAF) 1/1 speed
13	DO3	Start/stop supply air fan (SAF) 1/2-speed
14	DO4	Start/stop exhaust air fan (EAF) 1/2 speed
15	DO5	Start/stop Circulation pump, Heating
16	DO6	Fire dampers
17	DO7	Sum alarm A + B

30	Agnd	Reference pole for analogue inputs AI
31	AI1	Outdoor temperature sensor
32	AI2	Supply air temperature sensor
33	Agnd	Reference pole for analogue inputs AI
34	AI3	Exhaust air temperature sensor
35	AI4	Room temperature sensor 1

40	Agnd	Reference pole for universal inputs UI
41	UI1	DI Run indication / Motor protection SAF
42	UI2	DI Run indication / Motor protection EAF
43	Agnd	Reference pole for universal inputs UI
44	UI3	Exchanger de-icing sensor
45	UI4	Frost protection sensor

50	B	RS485 EXOline / Modbus
51	A	
52	N	
53	E	

57	Net+	LON-connection (LON-versions only)
58	Net-	
59	Egnd	

71	DI1	Filter guard, supply air and exhaust air
72	DI2	Run indication /alarm, Circ. pump Heating
73	DI3	Run indication /alarm, Circ. pump Cooling
74	DI4	Fire alarm
75	DI5	Fire damper end-switch monitoring
76	DI6	Extended running 1/1-speed
77	DI7	External alarm
78	DI8	External stop

90	Agnd	Reference pole for analogue outputs AO
91	AO1	Y1 Actuator Heating
92	AO2	Y2 Actuator Exchanger
93	AO3	Y3 Actuator Cooling
94	AO4	Y4 SAF frequency converter
95	AO5	Y5 EAF frequency converter

Wiring diagram Corrigo E15V factory configuration

1	G	Supply voltage 24 V AC, ±15%. 50/60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC. Reference for digital inputs DI.

10	G_{DO}	Reference for digital outputs DO.
11	DO1	Start/stop supply air fan 1/1-speed
12	DO2	Start/stop exhaust air fan (EAF) 1/1 speed
13	DO3	Start/stop Circulation pump, Heating
14	DO4	Sum alarm A + B

30	Agnd	Reference pole for analogue inputs AI
31	AI1	Outdoor temperature sensor
32	AI2	Supply air temperature sensor
33	Agnd	Reference pole for analogue inputs AI
34	AI3	Frost protection sensor
35	AI4	Room temperature sensor 1

50	B	RS485 EXOline / Modbus
51	A	
52	N	
53	E	

57	Net+	LON-connection (LON-versions only)
58	Net-	
59	Egnd	

71	DI1	Run indication / Motor protection SAF
72	DI2	Run indication / Motor protection EAF
73	DI3	Run indication /alarm, Circ. pump Heating
74	DI4	Extended running

90	Agnd	Reference pole for analogue outputs AO
91	AO1	Y1 Actuator Heating
92	AO2	Y2 Actuator Exchanger
93	AO3	Y3 Actuator Cooling

Wiring diagram Corrigo E8V factory configuration

1	G	Supply voltage 24 V AC, ±15%. 50/60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC. Reference for digital inputs DI.

50	B	RS485 EXOline / Modbus
51	A	
52	N	
53	E	

10	G_{DO}	Reference for digital outputs DO.
11	DO1	Start/stop supply air fan (SAF) 1/1-speed
12	DO2	Start/stop Circulation pump, Heating

57	Net+	LON-connection (LON-versions only)
58	Net-	
59	Egnd	

30	Agnd	Reference pole for analogue inputs AI
31	AI1	Outdoor temperature sensor
32	AI2	Supply air temperature sensor

71	DI1	Run indication / Motor protection SAF
72	DI2	Run indication /alarm, Circ. pump Heating
73	DI3	High temp. limit switch / Frost prot. thermostat

90	Agnd	Reference pole for analogue outputs AO
91	AO1	Y1 Actuator Heating

Empty wiring diagram Corrigo E28V

1	G	Supply voltage 24 V AC, ±15%. 50/60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC. Reference for digital inputs DI.

50	B	RS485 EXOline / Modbus
51	A	
52	N	
53	E	

10	G_{DO}	Reference for digital outputs DO.
11	DO1	
12	DO2	
13	DO3	
14	DO4	
15	DO5	
16	DO6	
17	DO7	

57	Net+	LON-connection (LON-versions only)
58	Net-	
59	Egnd	

30	Agnd	Reference pole for analogue inputs AI
31	AI1	
32	AI2	
33	Agnd	Reference pole for analogue inputs AI
34	AI3	
35	AI4	

71	DI1	
72	DI2	
73	DI3	
74	DI4	
75	DI5	
76	DI6	
77	DI7	
78	DI8	

40	Agnd	Reference pole for universal inputs UI
41	UI1	
42	UI2	
43	Agnd	Reference pole for universal inputs UI
44	UI3	
45	UI4	

90	Agnd	Reference pole for analogue outputs AO
91	AO1	
92	AO2	
93	AO3	
94	AO4	
95	AO5	

Empty wiring diagram Corrigo E15V

1	G	Supply voltage 24 V AC, ±15%. 50/60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC. Reference for digital inputs DI.

50	B	RS485 EXOline / Modbus
51	A	
52	N	
53	E	

10	G_{DO}	Reference for digital outputs DO.
11	DO1	
12	DO2	
13	DO3	
14	DO4	

57	Net+	LON-connection (LON-versions only)
58	Net-	
59	Egnd	

71	DI1	
72	DI2	
73	DI3	
74	DI4	

30	Agnd	Reference pole for analogue inputs AI
31	AI1	
32	AI2	
33	Agnd	Reference pole for analogue inputs AI
34	AI3	
35	AI4	

90	Agnd	Reference pole for analogue outputs AO
91	AO1	
92	AO2	
93	AO3	

Empty wiring diagram Corrigo E8V

1	G	Supply voltage 24 V AC, ±15%. 50/60 Hz
2	G0	
3		Protective earth
4	+C	+24 V DC. Reference for digital inputs DI.

50	B	RS485 EXOline / Modbus
51	A	
52	N	
53	E	

10	G_{DO}	Reference for digital outputs DO.
11	DO1	
12	DO2	

57	Net+	LON-connection (LON-versions only)
58	Net-	
59	Egnd	

30	Agnd	Reference pole for analogue inputs AI
31	AI1	
32	AI2	

71	DI1	
72	DI2	
73	DI3	

90	Agnd	Reference pole for analogue outputs AO
91	AO1	

Chapter 4 **Commissioning**

General

Before the Corrigo can be used it must be configured, inputs and outputs must be assigned and all relevant parameters must be set.

All commissioning can be done using the Corrigo front panel display and buttons or using the display unit E-DSP.

Corrigo E-tool

The best way however, is to configure the Corrigo E by using Corrigo E-tool.

Corrigo E-tool is a PC-based configuration program specially developed to simplify the commissioning of the Corrigo E-series.

When using E-tool the whole configuration and all settings can be done on the computer and then be downloaded to the Corrigo. An infinite number of different configurations can be saved in computer memory for later use.

3.1. How to do it

For configuration using E-tool, see the E-tool manual.

For configuration using the front panel there are two ways to go depending on how much help you need.

Option 1:

- Jump straight to chapter 7 and 8 *Display, LEDs and buttons* and *Access rights.*
- After mastering the button and menu system, connect power to your Corrigo, log on at System level and go to the menu *Configuration.*
- For the time being, skip the configuration menu *Inputs/Outputs* and start by configuring *Control functions.*
- Run through the configuration menus in order and set whatever functions and parameters you wish to include. Use chapter 6 of this manual for reference. Keep track of which inputs and outputs you will need. To help you, there is a list of input and output functions provided in chapter 3, (3*.2.3 Input / Output list*.)
- Finally, configure *Inputs/Outputs*.
- Exit *Configuration* and go to *Settings*
- Set the control values in *Settings*
- Set the clock and scheduler functions in *Time Settings.*
- Set the control setpoints in *Actual/Setpoint.*

Your Corrigo should now be ready to run.

Option 2:

Read this manual in the order given below: The manual has been designed to act as a guide through the commissioning. The last chapters of the manual, not listed below, cover menus and functions that are not used during commissioning.

Functional description

Start by reading chapter 5. *Functional description* below. Some functions are essential to the working of the unit and must be included. Others are more of the nature of optional extras which can be excluded.

At the end of each function description there is a table of the necessary inputs and outputs to implement the function. At the end of the manual there is a list of all the analogue and digital inputs and outputs. As you read, mark in the list the inputs and outputs you will be using for the application you are building. Note that the universal inputs in Corrigo E28 can, individually, be configured as either analogue or digital inputs.

Display, buttons and LEDs

Read chapter 7 on how to use the front panel buttons to navigate the Corrigo E menu system.

Access rights

Chapter 8. Learn how to log on to the Corrigo E

Configuration

Chapter 9. Configuration.

Connect power to the Corrigo. Using the buttons and menu system, go through the configuration menus covering the functions you wish to use.

On delivery the units already have the inputs and outputs assigned to various functions. These can, of course, be changed. In chapter 3 *Installation and wiring* there are two sets of wiring diagrams, one set showing the pre-configured input / output configuration and one set where you can fill your own configuration choices.

Settings

Set the control parameters, P-band, I-time for the temperature control.

Set the control parameters for the pressure control if you have pressure- or flow- controlled fans.

Set the control parameters for the humidity control if activated.

Set the alarm parameters; alarm levels and delay times.

Time Settings

Set the clock and calendar functions.

Setpoints

Set all the setpoints for all active control loops.

Hand/Auto

Learn to use manual control. Very useful for testing out your system.

Chapter 5 Functional description

5.1 Temperature control

General

Corrigo E has a choice of the following control modes:

1. Supply air control
2. Outdoor temperature compensated supply air control
3. Cascaded room temperature control
4. Outdoor temperature dependent switching between room control and supply air control
5. Outdoor temperature dependent switching between exhaust air control and supply air control
6. Exhaust air control

The supply air temperature controller is reverse acting, i. e. the output will increase for decreasing temperature. The controller is a PI-controller with settable P-band and I-time.

In the first two modes the supply air temperature will be controlled using the supply air temperature and the user setpoint values as control inputs.

In modes 3 and 6 the supply air is controlled as part of a cascade controller together with the room/exhaust temperature controller. The room/exhaust temperature offset will dictate the supply air temperature setpoint.

Mode 4 and 5 vary according to the outdoor temperature: Supply air control in winter and cascaded room control or cascaded exhaust air control in summer.

In applications with mixing dampers instead of heat exchanger the signal for the damper control will be reversed compared to the signal for heat exchanger control i. e. decreasing signal on increasing heat demand. This is done automatically on configuring the exchanger output = dampers.

The heater can be either a hot water heater battery or an electric heater.

Outputs

The supply air controller output is split between one or more of the output blocks Y1, Y2 and Y3 for heating, heat exchanger and cooling. The output blocks can be bound to either analogue 0…10 V DC outputs or to 3-position increase/decrease outputs.

Each output block has two parameters for setting the control range:

Controller signal at which the output should be 0%

Controller signal at which the output should be 100%

These settings are used to establish the output activation order and to split the P-band between the outputs.

For example:

0% Cooling at HCout = 30%

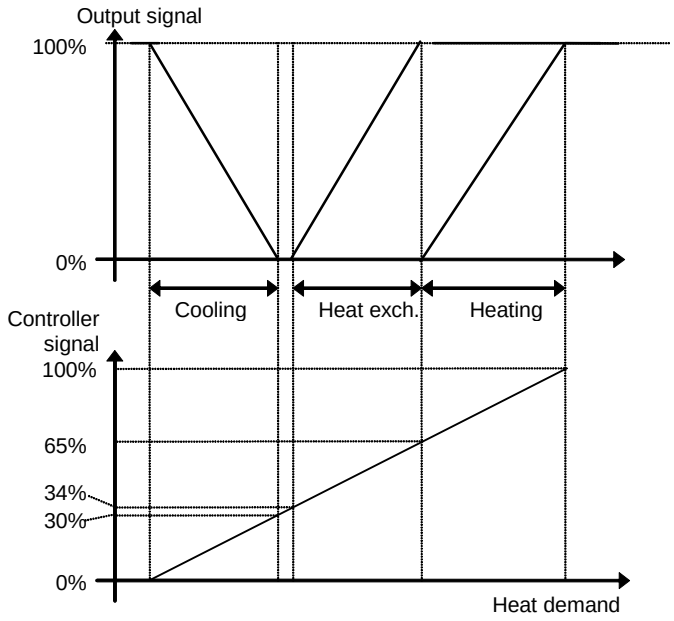
100% Cooling at HCout = 0%

0% Heat exch. at HCout =34%

100% Heat exch. at HCout = 65%

0% Heating at HCout = 65%

100% Heating at HCout = 100%



It is also possible to split one of the three analogue outputs into two equal parts to give a fourth output sequence for temperature control.

5.1.1 Control modes

1. Supply air control

The supply air temperature is kept at the setpoint value by controlling the output signals for Heating, Heat exchanger and Cooling. A single PI control loop is used.

The setpoint value is set using the front panel or alternatively using an external setpoint device.

Alarms for high and low supply air temperature are active.

Alarm for control offset of the supply air temperature is active.

2. Outdoor temperature compensated supply air control

The supply air temperature setpoint is outdoor temperature compensated using a control curve with 6 node points. The supply air temperature is kept at the setpoint value by controlling the output signals for Heating, Heat exchanger and Cooling. A single PI control loop is used.

Alarms for high and low supply air temperature are active.

Alarm for control offset of the supply air temperature is active.

3. Room control with cascade function

Cascade control of room temperature and supply air temperature to achieve a constant, settable room temperature. The room controller output signal generates the supply air controller's setpoint value.

One or two room sensors can be connected. If two sensors are connected the average of their values will be used. The number of room sensors is detected automatically. The room temperature is kept at the setpoint value by controlling the output signals for Heating, Heat exchanger and Cooling. Two PI loops are used.

4. Outdoor temperature dependent switching between supply air temperature control and room temperature control

When the outdoor temperature is lower than a settable limit (winter), outdoor compensated supply air temperature control will be active, otherwise (summer) cascaded room temperature control.

5. Outdoor temperature dependent switching between supply air temperature control and exhaust air temperature control

When the outdoor temperature is lower than a settable limit, outdoor compensated supply air temperature control will be active, otherwise cascaded exhaust air temperature control.

6. Exhaust air control with cascade function

Cascade control of exhaust air temperature and supply air temperature to achieve a constant, settable room temperature. The exhaust air controller output signal generates the supply air controller's setpoint value. The exhaust air temperature is kept at the setpoint value by controlling the output signals for Heating, Heat exchanger and Cooling. Two PI loops are used.

Inputs and outputs

1	2	3	4	5	6	Control modes
AI	**AI**	**AI**	**AI**	**AI**	**AI**	Supply air sensor
	AI		**AI**	**AI**		Outdoor temperature sensor
		AI	**AI**			Room temperature sensor(s)
				AI	**AI**	Exhaust air sensor
AI	**AI**	**AI**	**AI**	**AI**	**AI**	Frost protection sensor (water heating, optional)
DI	**DI**	**DI**	**DI**	**DI**	**DI**	Frost protection thermostat (water heating, optional)
AO	**AO**	**AO**	**AO**	**AO**	**AO**	Y1 Heating 0…10 V DC
AO	**AO**	**AO**	**AO**	**AO**	**AO**	Y2 Exchanger 0…10 V DC
AO	**AO**	**AO**	**AO**	**AO**	**AO**	Y3 Cooling 0…10 V DC
AO	**AO**	**AO**	**AO**	**AO**	**AO**	Extra split Y1, Y2 or Y3 0…10 V DC (optional)
DO	**DO**	**DO**	**DO**	**DO**	**DO**	Heating 3-pos. increase
DO	**DO**	**DO**	**DO**	**DO**	**DO**	Heating 3-pos. decrease
DO	**DO**	**DO**	**DO**	**DO**	**DO**	Exch. 3-pos. increase
DO	**DO**	**DO**	**DO**	**DO**	**DO**	Exch. 3-pos. decrease
DO	**DO**	**DO**	**DO**	**DO**	**DO**	Cooling 3-pos. increase
DO	**DO**	**DO**	**DO**	**DO**	**DO**	Cooling 3-pos. decrease

5.1.2 Heater types

5.1.2.1 Water heating

Control

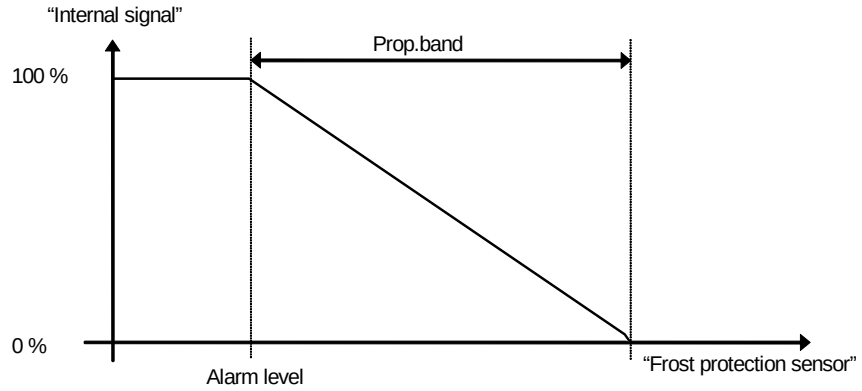
When the unit is in running mode the heating valve is controlled by the analogue output "Y1 Heating" or by two digital outputs "Heating 3-pos. actuator, increase" and "Heating, 3-pos. actuator, decrease".

Frost protection

The heater return water temperature is measured using the analogue input ”Frost protection sensor”. Low temperatures will generate an internal, proportional signal that is used to force the heating valve open thereby preventing freeze-up of the heater.

The internal signal (“Internal signal”) is 100 % when the signal ”Frost protection sensor” is equal to or lower than “Alarm level”. When ”Frost protection sensor” is higher than ”Alarm level” the signal declines linearly to 0 for ”Frost protection sensor” equal to or higher than “Alarm level” + “Prop. Band”.

When ”Internal signal” reaches 100% or the digital input ”High temp limit/Frost protection” is activated, the unit is shut down, the heating output is set to completely open mode and an alarm is activated. The unit will restart after the alarm has been acknowledged and the value at ”Frost protection sensor” has returned to normal.



Shutdown mode

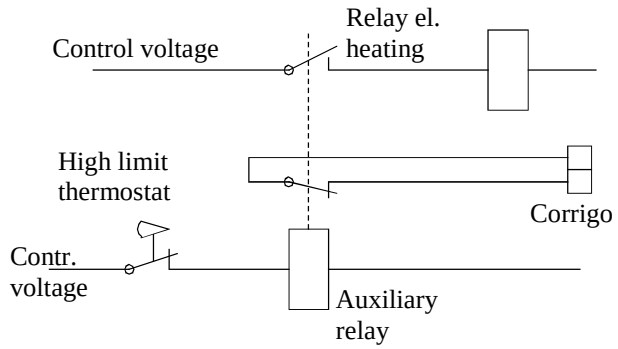
If frost protection is activated the controller will go into ”Shutdown mode” when the running mode switches to ”Off”. The shutdown controller will control the heating output to maintain a constant settable temperature at the frost protection sensor.

The frost protection alarm level is set in the menu *Actual/Setpoint.*

5.1.2.2 Electric heating

Control

The heating is controlled using the analogue output ”Y1 Heating”. On activation of the digital input “High temp limit/Frost protection” the unit will be shut down, either according to the stop sequence described in section *Start/stop of unit* or as an emergency shut down. The unit will restart after the alarm has been acknowledged and “High temp limit/Frost protection” has reset. Note that activation of the input signal “Flow switch” will also stop the unit.



Wiring suggestion high temp limit when using electric heating. Contacts drawn inactivated.

N.B. It is important that the high temperature thermostat is hardwired to disconnect the power to the heater to ensure that the heating is shut down when the thermostat is activated even if the Corrigo should be faulty.

5.1.2.3 Water heating and electric heating

The water heating is controlled by Y1 Heating, and the electric heating is controlled by the sequence Split. Split (see 9.20.10) must always be set to Heating. On increasing heat demand, the water heating is first activated and then, if needed, the electric heating.

Frost protection and overheating protection are both active. If step controller heating is used, the function is tied to the output signal Split.

5.1.2.4 Fast stop on overheating

If this function is active, the fans will be immediately stopped when there is an overheating alarm, regardless of the set cool-down time.

Inputs and outputs

Water heating	Electric heating	
AI		Frost protection sensor (optional)
DI**		Frost protection thermostat (optional)
	DI	High temp. limit switch
	DI	Flow switch (optional)

**Frost protection can also be created using the digital input “Frost protection thermostat”. Activation of the input will force the running mode to Off and an alarm will be activated. Frost protection thermostat cannot be combined with shutdown mode.

5.1.3 Heat exchanger types

The heat exchanger unit can be set to one of the following alternatives:

- Plate exchanger
- Rotating exchanger
- Liquid connected exchanger
- Mixing dampers

Plate exchanger

Control

The airflow through the exchanger is controlled by a shut-off damper and a by-pass damper. Both dampers are controlled by the same analogue output ”Y2 Heat exchanger” or by two digital outputs “Exchanger 3-pos. actuator, increase” and “Exchanger, 3-pos. actuator, decrease”, and are wired so that one opens as the other closes.

De-icing

De-icing is activated either when the digital input signal ”De-icing” is activated or when the value on the analogue input ”De-icing Exchanger” falls below the de-icing limit (-3°C). It is deactivated when the digital input is reset or the analogue input rises above the limit value plus a settable differential.

On de-icing:

A PI-controller compares the de-icing setpoint with the signal ”De-icing Exchanger”. The lesser of the output signal from this controller and the output from the ordinary controller is used as output to the dampers.

Rotating exchanger

Control

Rotational speed is controlled by the analogue signal ”Y2 Heat exchanger” or by two digital outputs “Exchanger 3-pos. actuator, increase” and “Exchanger, 3-pos. actuator, decrease”. A rotation sentinel can be connected to the digital input ”Rotation sentinel Exchanger”. An alarm is generated if this input is activated at the same time as the analogue output signal is higher than 1.0V.

Liquid connected heat exchanger

Control

A mixing valve in the exchanger circulation system is controlled by the analogue signal ”Y2 Heat exchanger” or by two digital outputs “Exchanger 3-pos. actuator, increase” and “Exchanger, 3-pos. actuator, decrease”.

The circulation pump (digital input ”start/stop CP Exchanger”) is started as soon as the actuator control signal is higher than 0.1V and is stopped when the valve has been closed for more than 30 minutes.

De-icing

De-icing is activated when the value on the analogue input ”De-icing Exchanger” falls below the de-icing limit (-3°C). It is deactivated when the analogue input rises above the limit value plus a settable differential.

On de-icing:

A PI-controller compares the de-icing setpoint with the signal ”De-icing Exchanger”. The lesser of the output signal from this controller and the output from the ordinary controller is used as output to the actuator.

Outdoor temp control of exchanger

Instead of using Y2 for analogue control of the heat exchanger it can be set to run on-off against outdoor temperature. The function controls a digital output “Exch control”, which is activated when the outdoor temperature falls below a set value. A heat exchanger alarm is activated if the input ”Rotation sentinel Exchanger” is activated when the output “Exch control” is active.

Mixing dampers

Control

The analogue output ”Y2 Heat exchanger” controls two dampers for gradual mixing of fresh air and recirculated air. In this mode the output signal decreases with increasing heat demand.

CO_2/VOC

If demand controlled ventilation (see 5.3.2) is activated in combination with mixing dampers and the CO_2-value increases above setpoint the dampers will move to permit more fresh air utilizing a P-function.

Minimum limit

A fresh air minimum limit for can be set using the front panel. The limit value is settable between 0 and 100%.

Inputs and outputs

Plate	Rota-ting	Liquid	Dam-pers	
AI	**AI**	**AI**	**AI**	Outdoor temp sensor (optional, outd. temp start)
DO	**DO**	**DO**	**DO**	Activation exchanger (optional, outd. temp start)
AI		**AI**		De-icing sensor (optional)
DI		**DI**		De-icing signal (optional)
	DI			Rotation sentinel, exchanger (optional)

5.1.4 Step controller Heating/ DX cooling

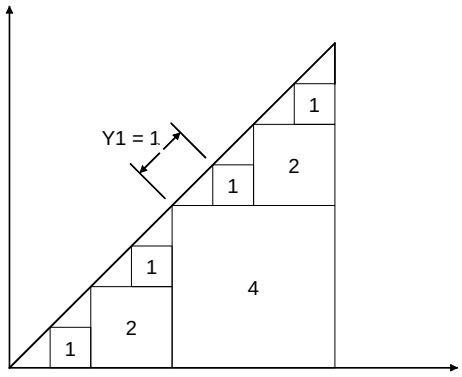
As alternative or complement to the above mentioned analogue control, heating and cooling can be activated in steps. The internal signal is then used to activate digital outputs for control of the heaters/chillers. Up to four heater outputs and three cooler outputs can be configured. There are two possible modes:

Sequential

Each output step has individually settable on- and off-values in % of the control signal. The number of steps is equal to the number of heater/chiller groups. Min on and off times can be set.

Binary

The heater power outputs should be binary weighted (1:2:4:8 for heating, 1:2:4 for cooling). The number of loads to be controlled is set. Thereafter the program will automatically calculate the individual activation levels. Switching differential and minimum on/off times can be set. The number of heating steps will be: $2^{\text{no. of groups}}$. In binary mode the analogue output signal may be used to fill out between the steps. The signal will go 0…100 % between the activation of each step. The load connected to the analogue signal should have the same size as the smallest of the binary groups. In the example below there are 4 heater groups (1:1:2:4) and the total number of heating steps is 8.



DX cooling with supply or exhaust air control

If DX cooling is used in conjunction with room temperature control or exhaust air temperature control, there are two configuration alternatives, DX cooling or DX cooling with exchanger control.

DX cooling without exchanger control

When running cascade control, the supply air controller setpoint is normally controlled by the room/exhaust air controller output signal.

When DX cooling is activated, the cooling controller setpoint is lowered to 5 degrees (settable) below the setpoint given by the room/exhaust air controller. This prevents the DX cooling from being activated/deactivated too often.

DX cooling with exchanger control

When running cascade control, the supply air controller setpoint is normally controlled by the room/exhaust air controller output signal.

When DX cooling is activated, the cooling controller setpoint is lowered to 5 degrees (settable) below the setpoint given by the room/exhaust air controller. This prevents the DX cooling from being activated/deactivated too often. If the supply air temperature falls below the setpoint given by the room/exhaust air controller, the heat exchanger output will be activated in order to try to maintain the supply air setpoint given by the room/exhaust air controller. The output uses P-control with a P-band of half the setpoint lowering (settable, 2.5°C as default). The setpoint given by the room/exhaust air controller cannot drop below the set min limit. When there is no longer a cooling demand, the cooling controller setpoint will return to the value given by the room/exhaust air controller.

Note: The function cannot be used if the exchanger signal controls a mixing damper.

Example:

The room controller gives a supply air setpoint of 16°C. If there is a cooling demand, the cooling controller setpoint is lowered to 11°C (16 – 5) and DX cooling is activated. Should the supply air temperature sink below 16°C, the exchanger output will be activated and reach 100% output when the supply air temperature has fallen to 13.5°C (16 – 2.5).

Blocking of DX cooling at low outdoor temperature

DX cooling can be blocked when the outdoor temperature is low. The temperature limit is settable (+13°C default) and has a fixed 1 degree hysteresis.

Blocking of DX cooling at low supply air fan speed

When DX cooling is used in conjunction with pressure controlled or flow controlled fans it is possible to block DX cooling if the supply air fan control signal falls below a preset values. The blocking level is individually settable for each DX cooling step.

Blocking of DX cooling on cooling pump alarm

Corrigo can be configured to block DX cooling on cooling pump alarm.

Inputs and outputs

Heating	Cooling	
DO	**DO**	Step controller, step 1 (optional)
DO	**DO**	Step controller, step 2 (optional)
DO	**DO**	Step controller, step 3 (optional)
DO		Step controller, step 4 (optional)

5.1.5 Support control

Support control is normally used when room temperature control or exhaust air control has been configured. When exhaust air control is configured a room sensor must be installed. “Support control Heating” or “Support control Cooling” will run if Support control is configured, the running mode is in Off-state (timer control OFF and not in extended running) and if conditions call for support control (see below). Minimum run time is settable 0 to 720 minutes (FS= 20 minutes).

Support control heating

Demand for support control heating is when the room temperature is lower than the start value which is settable 0 to 30°C. The fans will run at the preset speed, the heater and the heat exchanger are controlled by the supply air temperature controller with the configured max limitation for the supply air (FS=30°C) as setpoint and the cooling is shut off (0%). Support control heating stops when the room temperature rises 1K over the start value and the minimum run time has been exceeded or the running mode changes to ”On”.

Support control cooling

Demand for support control cooling is when the room temperature is higher than the start value which is settable 20 to 50°C. The fans will run at the preset speed, the heater and the heat exchanger are shut down (0%) and the cooling is controlled by the supply air temperature controller with the configured minimum limitation (FS=15°C) as setpoint. Support control cooling stops when the temperature falls 1K below the start value and the minimum run time has been exceeded or the running mode changes to ”On”.

Support control can also be configured when supply air temperature control is used, if a room sensor is installed. The controller uses the configured min (FS=15°C) and max (FS=30°C) limitation values as support control setpoints. However, in this case the min and max limitation values cannot be changed. To change the values, temporarily configure room control, change the min and max values and then change back to supply air control.

5.1.6 Free cooling

This function is used during the summer to cool the building night-time using cool outdoor air, thereby reducing the need for cooling during the day and saving energy.

Free cooling is started at 12.00 p.m. if all timer channels are OFF and the daytime outdoor temperature has been higher than a settable value (22°C).

The fans are started and run for at least 3 minutes.

However, the fans are not started if the unit is not set on normal speed according to the timer channel for the following day. (No running time set during the next 24 hours.)

Stop conditions:

Free cooling stops at 06.00 a.m. *or* if the outdoor temperature rises above a settable value (+15°C) *or* if the outdoor temperature falls below a settable value (+5°C, condensation risk) *or* if the room temperature falls below a settable value (+18°C).

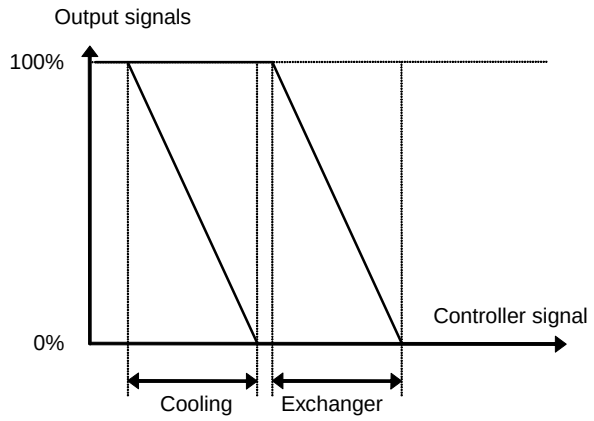
When free cooling is active the fans run at normal speed but the outputs Y1- Heating, Y2- Heat exchanger and Y3-Cooling are shut down.

Inputs and outputs

AI	Outdoor temperature sensor
AI	Room temperature sensor(s)

5.1.7 Cooling recovery

If the exhaust air temperature is a settable amount lower than the outdoor temperature, cooling recovery can be activated. When cooling recovery is activated the heat exchanger signal will be reversed to give increasing recovery on increasing cooling demand.



Inputs and outputs

AI	Outdoor temperature sensor
AI	Exhaust air temperature sensor

5.1.8 Heat exchanger efficiency monitoring

General

The function calculates the heat exchangers temperature efficiency in % when the output signal to the exchanger is higher than 98% and the outdoor temperature is lower than 10°C.

When the control signal is lower than 98% or the outdoor temperature is higher than 10°C the display will show 0%.

The heat exchanger efficiency is calculated using the following formula:

$$Efficiency = \frac{Exhaustairtemp - Extractairtemp}{Exhaustairtemp - Outdoortemp} * 100$$

Alarm

An alarm is activated if the efficiency falls below the set alarm level (50%).

Inputs and outputs

AI	Outdoor temperature sensor
AI	Exhaust air temperature sensor
AI	Extract air temperature sensor

5.1.9 External setpoint

An external setpoint device, for example TBI-PT1000 or TG-R4/PT1000 can be connected. The setpoint device must follow the PT1000 resistance curve.

The input must be configured as “Extra sensor” and the function “External setpoint” must be activated. The setting range can be min/max limited. See 9.14.

Inputs and outputs

AI	Extra sensor

5.2 Humidity control

General

Humidity control can be configured as Humidification, Dehumidification or both Humidification and Dehumidification.

Two humidity sensors can be connected, a room sensor for control and a duct sensor for maximum limiting.

The humidity sensors must give 0…10 V DC for 0…100% RH.

Humidification

An analogue output is used to control a humidifier. The output will increase on decreasing humidity.

Dehumidification

An analogue output is used to control a dehumidifier. The output will increase on increasing humidity.

Humidification/Dehumidification

An analogue output is used to control a humidifier. The output will increase on decreasing humidity.

The cooling output Y3 will be activated for dehumidification through condensation. The output will increase on increasing humidity. This signal overrides the cooling signal from the temperature controller so the output can be activated for dehumidification even if the temperature controller demand is zero.

For good temperature control when using cooling for dehumidification it is important that the cooler is placed first in the air stream so that the exchanger and heater can be used to reheat the air after dehumidification.

There is also a digital output signal for humidity control. The output has settable activation and deactivation levels.

Inputs and outputs

AI	Room humidity sensor
AI	Duct humidity sensor
AO	Humidity control output 0…10 V DC
DO	Humidity

5.3 Fan control

General

Fans can be single speed, 2 speed or pressure control via frequency converter.

Single speed fans are controlled using the digital outputs 1/1-speed supply air fan (SAF) and 1/1-speed exhaust air fan (EAF).

2-speed fans are controlled using the digital outputs 1/1-speed SAF, 1/1-speed EAF, 1/2-speed SAF and 1/2-speed EAF giving normal speed and reduced speed.

Frequency control uses one analogue output per fan for constant pressure control. There are two setpoints for each fan. When in this document reference is made to timer channels for normal speed and reduced speed it is understood that in the case of pressure control it implies changing between the two setpoint values.

Frequency controlled fans can also be configured to be run with fixed output values.

Outdoor compensation

When running pressure control, it is also possible to outdoor compensate the pressure.

Crosswise interlock

Via the display it is possible to configure crosswise interlocking between the supply air and exhaust air fans.

Timer control, interlock

The fans are normally controlled by the timer channels for normal and reduced speed. At very low outdoor temperature 2-speed and pressure/flow controlled fans can be forced to low speed. The limit temperature is settable and the function has a differential of 2K.

Normal, reduced speed

Units with 2-speed or pressure control fans are always started at reduced speed. After a settable time, Corrigo switches to normal speed if normal speed is valid at start-up. When 2-speed fans are switched from Reduced to Normal speed, Reduced speed is first disengaged. About 2 sec later, Normal speed is activated.

When Corrigo switches from Normal to Reduced speed, there is a settable retardation time from the disengagement of Normal speed to the activation of Reduced speed. See 9.20.2

The exhaust air fan and the supply air fan have individual start and stop delays which are normally set so that the exhaust air fan is started before the supply air fan. If there are not enough digital outputs for individual control, both fans will have to be started using the signal for the supply air fan, and the delay be created using an external time relay.

5.3.1 Pressure control

When running pressure control, two analogue output signals are used for supply and exhaust air respectively. The signals control the fan speeds via frequency converters, thereby maintaining constant pressure. A digital activation signal is normally used for each fan (SAF ½ speed and EAF ½ speed), for sending a start signal to the frequency converters. There are also digital activation signals (SAF frequency and EAF frequency) which can be used as start signals for the frequency converters. These are activated when the output signal sent to each respective frequency converter rises above 0.1 V (Demand controlled run-signal).

For the supply and exhaust air fans, there are two individually settable setpoint values, one corresponding to normal speed and one corresponding to reduced speed. Changing between the two setpoint values is done using the timer channels for normal and reduced speed.

Outdoor compensation

When running pressure control, it is also possible to outdoor compensate the pressure setpoint value.

The outdoor compensation is linear and is set using two parameter pairs which give the value of the compensation at two different outdoor temperatures. The compensation can be positive or negative.

The outdoor compensation is set in the menu Actual/Setpoint.

Using E-tool, you can also choose to only outdoor compensate the pressure value of the supply air fan. In that case, the exhaust air fan is controlled with constant flow, independent of the outdoor temperature.

Air flow

Instead of giving a pressure setpoint value it is possible to use an airflow volume value in m^3/sec instead. The value from the pressure transmitter is recalculated to a volume flow using the formula below and the fans will be controlled to give a constant flow.

$$Flow = K * \Delta P^X$$

Where K and ^{X} are settable constants dependent on the fan size and ΔP is the differential pressure, measured in Pa, over the fan.

^{x} is normally 0.5 indicating that the flow is proportional to the square root of the differential pressure.

Outdoor compensation

Also when running flow control, it is possible to outdoor compensate the setpoint value.

The outdoor compensation is linear and is set using two parameter pairs which give the value of the compensation at two different outdoor temperatures. The compensation can be positive or negative.

The outdoor compensation is set in the menu Actual/Setpoint.

Using E-tool, you can also choose to only outdoor compensate the flow of the supply air fan. In that case, the exhaust air fan is controlled using constant flow, independent of the outdoor temperature.

Fixed output signal

Frequency controlled fans can be controlled at a fixed rotational speed. The rotational speed is selected by setting a fixed output signal (0 – 100%). Values for normal and reduced speed can be configured for each fan.

Fans that are run with a fixed output signal can also be outdoor compensated (see the section above). In this mode, pressure sensors are not needed.

Minimum limit

For frequency controlled fans an adjustable minimum limit can be set individually on the supply air and exhaust air fan control signals.

Inputs and outputs

1-speed	2-speed	Pres-sure/ Flow	
DO	**DO**		1/1 speed start/stop SAF
DO	**DO**		1/1 speed start/stop EAF
	DO	**DO**	1/2 speed start/stop SAF
	DO	**DO**	1/2 speed start/stop EAF
		DO	SAF frequency start
		DO	EAF frequency start
DI	**DI**		Indication/alarm SAF

1-speed	2-speed	Pres-sure/ Flow	
DI	**DI**		Indication/alarm EAF
		AI	Pressure transmitter SAF
		AI	Pressure transmitter EAF
		AO	Frequency converter SAF
		AO	Frequency converter EAF

5.3.2 Demand controlled ventilation

In applications with varying occupancy the fan speeds or mixing dampers can be controlled by the air quality as measured by a CO_2/VOC-sensor.

Via the display the function can be activated/deactivated and also there is the possibility of choosing fan control or mixing dampers.

When the function is activated and combined with pressure controlled fans and the CO_2/VOC-value rises above control value 1 the fans will start at low speed. Should CO_2/VOC-value continue to rise the fan speed will also increase until the CO_2/VOC-value reaches control value 2 at which the fans will be running at normal speed. The fans will stop when the CO_2/VOC-value falls 160 ppm below control value 1.

When used with two-speed fans they will start using low speed when the CO_2/VOC-value rises above control value 1 and switch to normal speed when the CO_2/VOC-value reaches control value 2. The fans will stop when the CO_2/VOC-value falls 160 ppm below control value 1.

If demand controlled ventilation is activated in combination with mixing dampers, and the CO_2-value rises above the setpoint value, the dampers will let in more fresh air. The function is controlled by a P-controller.

Inputs and outputs

AI	CO_2/VOC sensor input

5.4 Pump control

Digital inputs and outputs can be configured for pump control.

5.4.1 Heating circuit

The circulation pump for the heating circuit will always run when the outdoor temperature is lower than a settable value (+10°C). At higher outdoor temperatures the pump will run when the heating output is larger than 0V.

The pump has a settable, shortest running time.

The pump will be exercised once daily at 3 p.m. for 1 minute or the set shortest running time, whichever is the longest.

5.4.2 Exchanger circuit, liquid connected exchangers

The circulation pump for the exchanger circuit will run when the output to the exchanger valve is larger than 0V.

The pump will be exercised once daily at 3 p.m. for 1 minute or the set shortest running time, whichever is the longest.

5.4.3 Cooling circuit

The circulation pump for the cooling circuit will run when the output to the cooling valve is larger than 0V.

The pump will be exercised once daily at 3 p.m. for 1 minute or the set shortest running time, whichever is the longest.

Inputs and outputs

Heat-ing	Exch	Cool-ing	
AI			Outdoor temp sensor
DO	**DO**	**DO**	Start/stop circulation pump
DI	**DI**	**DI**	Run ind/alarm, circ. pump

5.5 Damper control

5.5.1 Close-off dampers

The fresh air and extract air ducts close-off dampers can be controlled by digital outputs or be hard-wired to the supply air fan relays for normal and reduced speed in such a fashion that the damper is open when the supply air fan is running. When using pressure controlled fans the digital activation signal is activated as soon as the fan control signal is greater than 0.1V. This signal can be used to open the close-off damper.

5.5.2 Fire dampers

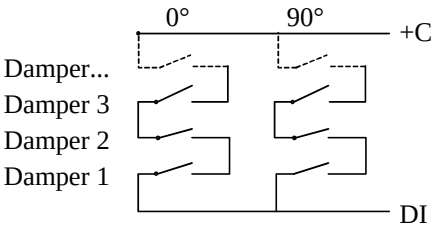
Normally fire dampers are configured to open on fire alarm. Using the display it is however possible to reconfigure them to be normally open instead.

There is a digital input for detection of open and closed position of the fire dampers.

Fire damper exercising

A function can be activated which enables scheduled damper testing with a settable number of days between runs. To be able to use this function, all the dampers must have end-position switches.

The digital input: *Fire damper end-switch monitoring* should be wired to all the fire damper end position switches.



When the test cycle is initiated, the output *Fire dampers* will be activated and the dampers will begin to move. Within the set time (90 sec) the signal on the *input Fire damper end-switch monitoring* must change to indicate that the dampers have left their normal positions. If not an alarm will be triggered.

Then, within the set time, the signal on the input *Fire damper end-switch monitoring* must change again to indicate that all the dampers have reached the other end position. If not an alarm will be triggered.

When all dampers have reached the end position the output *Fire dampers* will be reset to drive the dampers back to normal position. Again, within the set time (90 sec) the signal on the input *Fire damper end-switch monitoring* must change to indicate that the dampers have left the end positions. If not an alarm will be triggered.

Then, within the set time, the signal on the input *Fire damper end-switch* monitoring must change again to indicate that all the dampers are back to their normal positions. If not an alarm will be triggered

The controller can be configured to stop the air handling unit during the damper testing.

All dampers must be wired to the same output in order to get correct results.

The fire alarm input can be configured as normally closed or normally open.

Inputs and outputs

DO	Fresh air damper control
DO	Extract air damper control
DO	Fire dampers
DI	Fire alarm
DI	Fire damper end switch monitoring

5.6 Extended running

The digital inputs for extended running can be used to force the unit to start although the timer says the running mode should be “Off”. These input signals have higher priority than the internal timer channels.

For 2-speed fans and pressure/flow controlled fans there are inputs for normal speed and reduced speed.

The unit will run for the set time. If the running time is set to 0 the unit will only run as long as the digital input is closed.

The signal ”External stop” will stop the unit, even if the timer says it should stay in running mode.

Inputs and outputs

DI	Extended running normal
DI	Extended running reduced
DI	External stop

5.7 Time-switch outputs

Up to 5 digital time-switch outputs can be configured. Each timer channel has a separate scheduler with two periods per week-day.

Inputs and outputs

DO	Extra Timer channel 1
DO	Extra Timer channel 2
DO	Extra Timer channel 3
DO	Extra Timer channel 4
DO	Extra Timer channel 5

5.8 Alarms

Alarm handling

Alarms are indicated by the alarm LED on the front.

All alarms can be monitored, acknowledged and blocked using the display and buttons.

Alarm priorities

Alarms can be given different priority levels, A-alarm, B-alarm, C-alarm or not active.

Digital outputs can be bound to act as alarm outputs for A-alarms or B-alarms or both A- and B alarms. C-alarms are internal alarms which are not forwarded. A- and B-alarms must be acknowledged to reset. C-alarms automatically reset as soon as there is no longer a cause for alarm.

Using the front panel it is possible to change the alarm priority level (A-/B-/C-alarm/Not active) of any alarm**.**

Stop function

For each alarm there is the possibility of choosing whether activated alarm should stop control or not. Automatic restart will take place after removal of the alarm cause and the alarm has been acknowledged.

For some alarm types such as electric heating high temperature limit and water heating frost protection it would be dangerous to not stop the unit on alarm. Therefore, for such alarm types, the program will always reset the stop function to Active even if the operator should choose Inactive.

Unfortunately it is not possible to remove the display text concerning the stop function for these alarm types. This since the available program space demands that all alarms are treated in the same way in the display.

Note: For alarms that have been set to Inactive, the extra stop function should also be set to Inactive, or unexpected malfunctions may occur.

Inputs and outputs

DO	Sum alarm A + B
DO	Sum alarm A
DO	Sum alarm B

Chapter 6 **Starting and stopping the unit**

6.1 Start conditions

The unit will be started and will run when any one of the following conditions is met:

1. Timer output for normal speed or timer output for reduced speed is ON (normal running)
2. The unit is started manually using the Corrigo E front panel
3. Digital input for extended running is activated (normal running)
4. Support control is activated and the current room temperature is higher/lower than the preset starting value (Support heating/cooling)
5. Demand controlled ventilation is activated and the value at the CO_2 sensor is higher than the preset start condition

6.2 Stop conditions

The unit will be stopped when any of the following conditions are met:

1. Timer output for normal speed or timer output for reduced speed are OFF, and the signal for extended running is OFF.
2. Activated frost protection alarm. The unit will restart on resetting of the alarm.
3. Activated fire detector if the function has been configured. The unit will restart on resetting of the alarm.
4. If the unit has electric heating and the supply fan flow switch alarm or the high temperature limit alarm is activated.
5. Activation of external stop switch.
6. The unit is stopped manually using the Corrigo E front panel.
7. Support control is activated and the current room temperature is higher/lower than the pre-set stop value (support heating/cooling)
8. Demand controlled ventilation is activated and the value at the CO_2 sensor falls below the pre-set start condition less the set differential.
9. At an activated alarm configured with the extra function of stopping the unit on activation. The unit will restart after resetting of the alarm.

6.3 Start sequence

Start of the unit will run according to the following sequence:

1. If the controller is configured for water heating and has an outdoor temperature sensor and the outdoor temperature is below +3ºC the heating valve is opened and the heating circulation pump is started.
2. If the controller is configured with a heat exchanger and has an outdoor temperature sensor and the outdoor temperature is below +15ºC the heat exchanger will be run at 100% capacity for a pre-set time.
3. The supply air fan or the control of the supply air pressure will be started after a preset time.
4. The exhaust air fan or the control of the exhaust air pressure will be started after a preset time.
5. Thereafter temperature control according to the configured control mode is started. And not yet activated pumps will be started.

6. After a pre-set delay the alarm handling system is activated; the unit is in normal running mode.

6.4 Stop sequence

Stopping of the unit will run according to the following sequence:

1. Deactivation of the alarm handling system.
2. Electric heating, if configured, is shut down.
3. After individually set delay times the fans are stopped.
4. Actuator signals are set to 0 and the pumps are stopped.

Chapter 7 **Display, LEDs and buttons**

This section is applicable to Corrigo E units with display and buttons but also to the hand terminal E-DSP which can be connected to Corrigo E units without display and buttons.

7.1 Display

The display has 4 rows of 20 characters.

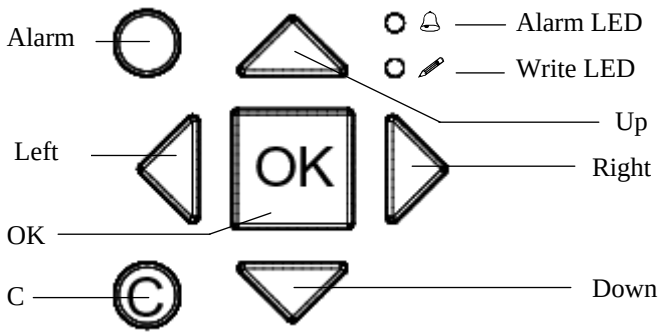
It has background illumination. The illumination will normally be off but will activated as soon as any button is pressed. The illumination will be turned off again after a period of inactivity.

7.2 LEDs

There are two LEDs on the front: The alarm LED marked with the 🔔 symbol. The “write enable” LED marked with the ✎ symbol.

The four LEDs placed next to the upper terminal strip will be described later.

7.3 Buttons



There are seven buttons: 4 arrow buttons which will be called UP, DOWN, RIGHT and LEFT. The menus in the Corrigo E are organized in a horizontal tree structure. The UP / DOWN-buttons are used to move between menus at the present menu level. The RIGHT / LEFT buttons are used to move between menu levels. When changing parameters the UP / DOWN buttons are used to increase / decrease the value of the parameter and the RIGHT / LEFT buttons to move between digits within the parameter.

- The OK button is used to confirm the choice of a parameter setting.
- The C button is used to abort an initiated parameter change and restore the original value.
- The ALARM button, marked with a red button top, is used to access the alarm list.

7.4 Navigating the menus

The start display, the display normally shown, is at the root of the menu tree.

Pressing DOWN ⬇ will move you through the menu choices at this, the lowest level. UP ⬆ will move you back through the choices.

To enter a higher menu level, use UP or DOWN to place the display marker opposite the menu you wish to access and press RIGHT ➡ . If you have sufficient log on privileges the display will change to the menu you have chosen.

At each level there may be several new menus through which you may move using the UP / DOWN buttons.

Sometimes there are further submenus linked to a menu or menu item. This is indicated by an arrow symbol at the right-hand edge of the display. To choose one, use RIGHT again. To back down to a lower menu level, use LEFT.

Change parameters

In some menus there are parameters that can be set. This will be indicated by the LED ✎ flashing. To change a parameter, first press the OK button. If you need higher authority than you have to change the parameter, a log on menu will be displayed, see chapter 8 below. Otherwise, a cursor will appear at the first settable value. If you wish to change the value, do so by pressing the UP / DOWN buttons.

In numbers containing several digits you can move between the digits using the LEFT / RIGHT-buttons.

When the desired value is displayed press OK.

If there are further settable values displayed the cursor will automatically move to the next one.

To pass a value without changing it, press RIGHT.

To abort a change and return to the initial setting, press and hold the C-button until the cursor disappears.

Chapter 8 **Access rights**

There are 3 different log on levels, System level which has the highest authority, Operator level and the basic “no-log on” level. System level gives full read / write access to all settings and parameters in all menus. Operator level gives read-only access to all settings and parameters and write access to all settings and parameters in all menus except *Configuration*. The basic level permits read-only access to all settings and parameters.

Repeatedly press down-arrow when the start-up display is shown until the arrow-marker to the left of the text-list points to Log on. Press right-arrow.

```
Log on
Log off
Change password
```

8.1 Log on

```
Log on
Enter password:****
Present level:None
```

In this menu it is possible to log on to any level by entering the appropriate 4-digit code. The log on menu will also be displayed should you try to gain access to a menu or try to do an operation requiring higher authority than you have.

Press the OK-button and a cursor marker will appear at the first digit position. Repeatedly press the up-arrow until the correct digit is displayed. Press the right-arrow to move to the next position. Repeat the procedure until all four digits are displayed. Then press OK to confirm. After a short while the text on the line: Present level will change to display the new log on level. Press left-arrow to leave the menu.

8.2 Log off

Use this menu to log off from the present level to the basic "no-log on" level.

```
Log off?
No
Present level:System
```

8.3 Change password

As default Corrigo comes with the following passwords for the different levels:

System	1111
Operator	3333
Basic	5555

You can only change the password for log on levels lower or equal to the presently active level, i. e. if you are logged in as System you can change all passwords, but as Operator you can only change the Operator and Basic passwords. There is no point in changing the Basic password since access to that level is granted automatically to all users.

```
Change password for
level:Operator
New password: ****
```

Forgotten your password?

If the password for System has been changed and then lost, a temporary password can be obtained from Regin. This code is date dependent and only valid for one day.

Chapter 9 **Configuration**

Start by logging in at log on level 1. See section Log on above.

Using DOWN, set the display marker opposite the menu-title **Configuration** and press RIGHT.

The main configuration menu will be shown.

```
Inputs/Outputs
Control functions
Objects
Pump control
Free cooling
Support control
CO2/VOC
Firedampers
Frost protection
Humidity control
Exch deicing
Cooling recovery
Min lim. dampers
Ext. setpoint
Run ind/Motor prot.
Type of actuator
Actuator run time
Step controllers
Alarm config.
Other params
System
```

9.1 Inputs and outputs

```
Analogue inputs
Analogue outputs
Universal inputs
Digital inputs
Digital outputs
```

General

Free configuration

Any control signal can be bound to any input/output, the only restriction being that digital signals cannot be bound to analogue inputs and vice versa. It is up to the user doing the binding to make sure that activated functions are bound to appropriate signals.

Delivery setting

On delivery all the physical inputs and outputs have already been bound to a signal. The delivery settings are suggestions only and can easily be changed.

9.1.1 Analogue inputs AI

```
Analogue input 1
Sign: Outdoor temp
Raw value: 1023
Compensation:0,0°C
```

All analogue inputs are for PT1000 or 0-10 Volts.

Input signals can be compensated for example for wiring resistance.

The Raw value will show the actual uncompensated input value.

If inputs have been assigned to pressure or flow controlled fans the following menus will appear:

```
SAF Pressure at
 0V:  0.0 Pa
10V:500.0 Pa
Filter factor: 0.2
```

```
EAF Pressure at
 0V:  0.0 Pa
10V:500.0 Pa
Filter factor: 0.2
```

If an input has been assigned to CO2 control the following menu appears:

```
CO2 at
0V: 0.0 ppm
10V: 1000 ppm
Filter factor: 0.2
```

9.1.2 Digital inputs DI

```
Digital input 1
NO/NC: NO Signal:
Filter alarm
Status: Off
```

To simplify adaptation to external functions, all digital inputs can be configured to be either normally open, NO, or normally closed, NC.

The inputs are as standard normally open, i. e. if the input is closed, the function connected to the input in Corrigo is activated.

Be careful when changing the input from NO to NC since some digital functions can be configured to either NO or NC themselves. For example, you can choose if the Fire alarm input should be activated when it is closed or opened. Therefore, there is a risk that the signal is changed twice and the result is the opposite of the desired.

9.1.3 Universal inputs UI

On the largest hardware version, E28 there are universal inputs. These can individually be configured as either analogue inputs or as digital inputs. When configured as analogue inputs they can be bound to any of the analogue signals described under Analogue signals.

When configured as digital inputs they can be bound to any of the digital signals described under Digital signals.

```
Universal input 1 →
Choose AI or DI sign
AI sign: Press. SAF
DI sign: Not active
```

After choosing AI or DI signal (the unused alternative must be set to *Not active*) there are sub-menus with settings. These menus are accessed by pressing RIGHT.

```
Universal DI1
NO/NC: NO Signal:
Filter alarm
Status: Off
```

To simplify adaptation to external functions, all universal inputs configured as digital inputs can be set to be either normally open, NO, or normally closed, NC.

The inputs are as standard normally open, i. e. if the input is closed, the function connected to the input in Corrigo is activated.

Be careful when changing the input from NO to NC since some digital functions can be configured to either NO or NC themselves. For example, you can choose if the Fire alarm input should be activated when it is closed or opened. Therefore, there is a risk that the signal is changed twice and the result is the opposite of the desired.

9.1.4 Analogue outputs

Analogue outputs are 0…10 V DC.

```
Analogue output 1
Sign: Y1-Heating
Auto
Value: 0.0 V
```

Analogue outputs can be set in run mode Auto, Manual or Off.

9.1.5 Digital outputs

```
Digital output 1
Signal: SAF 1/1-speed
Auto
Status: On
```

Digital outputs can be set in run mode Auto, Manual-On or Manual-Off.

9.2 Control function

Enter the configuration menu **Control functions**

```
Control function
Supply air control
```

There are 6 different functions to choose from:

1. Supply air control.
2. Outdoor-temperature compensated supply air control.
3. Cascade connected room temperature control.
4. Cascade connected exhaust air temperature control.
5. Outdoor-temperature controlled switching between Outdoor-temperature compensated supply air control and Cascade connected room temperature control.
6. Outdoor-temperature controlled switching between Outdoor-temperature compensated supply air control and Cascade connected exhaust air temperature control.

For detailed description of the control modes, see section 5.1.1 Control modes.

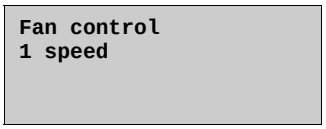
In the submenu, min/max supply setpoints if cascade connected room temperature control can be set.

```
If cascade control
max/min supply setp.
Max: 12°C
Min: 30°C
```

9.3 Objects

The menu *Objects* covers fan type, heater-, exchanger- and cooler types.

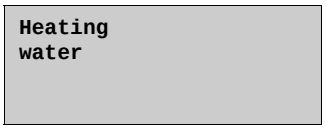
9.3.1 Fan control



Choose between single-speed, two-speed, pressure control, flow control or Frequency manual (fixed output).

For detailed description of fan control alternatives, see section 5.3 Fan control.

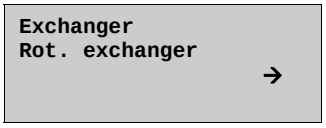
9.3.2 Heater type



The heater can be set to Water, Electric or Not used.

For detailed description of heater alternatives, see section 5.1.2 Heater types.

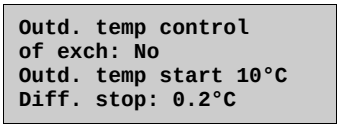
9.3.3 Heat exchanger output



The heat exchanger unit can be set to one of the following alternatives:

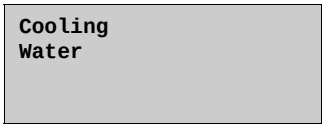
- Plate exchanger
- Rotating exchanger
- Liquid connected exchanger
- Mixing dampers
- Not connected
- Damper limiting for minimum fresh air percentage is settable 0…100%.

In the submenu parameters for outdoor temperature control of exchanger can be set.



For detailed description of exchanger alternatives, see section 5.1.3 Heat exchanger.

9.3.4 Cooling



Select cooler type: Water, DX, DX with exchanger control or Not used.

For detailed description of DX-cooling, se section 5.1.4 Step controllers.

9.4 Pump control

```
P1-Heating          →
P1-Exchanger        →
P1-Cooling          →
```

In these menus the parameters for pump control are set.

If, for any of the control circuits, no output is configured for pump control these settings will be ignored.

P1 Heating

```
Pump stop: No
Stop delay: 5 min
Outd. Temp stop: 6°C
Differential: 1.0°C
```

P1 Exchanger

```
P1-Exchanger
Stop delay: 5 min
```

P1 Cooling

```
P1-Cooling
Stop delay: 5 min
```

For detailed description, see section 5.4 Pump control.

9.5 Free cooling

```
Free cool active:Yes
Outd.temp activation
25.0°C
```

```
Outd.temp night
        High: 15.0°C
         Low: 10.0°C
Room temp min 18.0°C
```

For detailed description, see section 5.1.6 Free cooling.

9.6 Support control

```
Support control
Active: Yes
EAF running during
support control: Yes
```

Support cooling

```
Support cooling
Room temp for
Start: 30.0°C
 Stop: 28.0°C
```

Support heating

```
Support heating
Room temp for
Start: 15.0°C
 Stop: 21.0°C
```

Minimum running time

```
Min. run time for
 supp. ctrl: 20 min
```

For detailed description, see section 5.1.5 Support control.

9.7 CO2/VOC Demand control

```
CO2/VOC active
Timer channel On
Type: Fans
Min. time: 20 min
```

```
Activation level
1/2-speed: 1000 ppm
1/1-speed: 1200 ppm
     diff: 160  ppm
```

For detailed description, see section 5.3.2 Demand control.

9.8 Fire function

The fire damper control can be configured to either opening or closing the fire dampers on fire alarm.

The controller can be configured to stop the fans when there is a fire or let them run as normal for excavation.

For accurate results, all dampers must be connected to the same output.

```
Fire damper function
Normally open
Excavation on alarm
Yes
```

Select if fire alarm should be normally closed or normally open and activation of and time for damper exercising: No, Yes unit running-->, Yes unit stopped-->,

```
Fire alarm input
Normally open
Damper exercise
Yes unit stopped  →
```

Set the parameters for damper exercise in the submenu.

```
Damper exercise
Running time: 90 sec
Interval in days: 1
 Hour for exerc.: 00
```

For detailed description of damper exercising, see section 5.5 Damper control.

9.9 Frost protection

```
Frost protection
Active
Setpoint shutdown:
25.0C
P-band active: 5.0°C
```

The frost protection alarm level is set in the menu *Actual/Setpoint*

For detailed description, see section 5.1.2.1 Water heater.

9.10 Humidity control

Humidity control can be configured as either humidification or dehumidification or as combined humidification / dehumidification.

```
Humidity control
Humid/Dehumid
Start limit: 45%
Stop limit: 40%
```

The start and stop limits control the function of the digital humidity control output.

For detailed description, see section 5.2 Humidity control.

9.11 Exchanger de-icing

```
Exchanger de-icing
Yes              →
```

De-icing parameters

```
Setp.De-icing:-3.0°C
  Hysteresis: 1.0°C
Stoptemp SAF:-10.0°C
Min. run time: 5 min
```

For detailed description, see section 5.1.3 Heat exchangers.

9.12 Cooling recovery

```
Cooling recovery
No
Cooling limit: 2°C
```

For details, see section 5.1.7 Cooling recovery.

9.13 Minimum limit dampers

```
Min limit dampers
Active
Min limit.: 5.0 %
```

For detailed description, see 5.1.3 Heat exchanger types.

9.14 External setpoint

An external setpoint device, for example TBI-PT1000 or TG-R4/PT1000 can be connected. The setpoint device must follow the PT1000 resistance curve. The setting range can be restricted

```
External setpoint
Not active
Min setp.: 12.0 °C
Max setp.: 30.0 °C
```

For details, see section 5.1.9 External setpoint.

9.15 Run indication / Motor protection

Digital input signals are used to supervise fans and pumps. They can be configured either for indication of the motor running or for monitoring of motor protection contacts.

An input configured for run indication should normally be closed.

Open input when the motor is running, i.e. motor

control output is activated, will generate an alarm.

For supply air fans and exhaust air fans, there is also a conflict alarm, i. e. an alarm if the run indication input is closed even though the motor control output is not activated. See alarm 33 External activ. SAF and alarm 34 External activ. EAF in section 9.19 Alarm configuration.

An input configured as motor protection should be normally open, i. e. closed contact when the motor is running, i.e. motor control output is activated, will generate an alarm.

```
Run ind./Motor prot
SAF: Run ind
EAF: Run ind
```

```
Run ind./Motor prot
P1 Heat: Run ind
P1 Cool: Run ind
P1 Exch: Run ind
```

When running frequency controlled fans, the pressure signal from each respective fan's pressure transmitter is normally used as run indication signal. If the pressure falls below the set value during normal operation, a malfunction alarm is activated.

```
Min pressure for
run indication
SAF:  25.0 Pa
EAF:  25.0 Pa
```

Alarm from frequency converter

When running frequency controlled fans, you sometimes want to use both a pressure signal from a pressure transmitter and a digital alarm signal from a frequency converter. An analogue input for a pressure transmitter *and* a digital input for SAF or EAF indication must then be configured. The setting Run indication/Motor protection SAF or EAF must be set to Motor protection. A fan alarm will be activated both when there is no pressure signal from the pressure transmitter, and when the digital signal Indication SAF or EAF is activated.

9.16 Actuator type

Choose output signals to the actuators connected to the analogue control outputs: 0…10 V DC, 2…10 V DC, 10…0 V DC or 10…2 V DC.

```
Actuator type
Y1 Heating: 0-10V
Y2 Exchan.: 0-10V
Y3 Cooling: 0-10V
```

```
Actuator type
      SAF: 0-10V
      EAF: 0-10V
    Split: 0-10V
```

```
Actuator type
Y6 Humidity: 0-10V
```

Note that although many manufacturers state 0…10 V DC as control signal, for many actuators the actual control signal is more often than not 2…10V DC. Check the actuator documentation carefully. If uncertain, choose 0…10V DC. Although control might be less accurate, it will ensure that the valve always can be driven to its fully opened and fully closed positions.

9.17 Running time, 3-pos. actuators

These parameters have no function if analogue actuators are configured.

The values are used to determine the control parameters for 3-position actuators.

It is important to set correct values since incorrect values lead to sloppy control.

```
Actuator run time
  Heating: 255 sec
  Cooling: 255 sec
Exchanger: 255 sec
```

9.18 Step controllers

```
Step contr. Heat →
Step contr. Cool →
```

Step controller Heating can be set to sequential or binary.

```
Step contr. heating
Activation level     →
```

Step controller Heating activation levels for sequential control.

For binary control the activation levels are calculated by the controller depending on the number of steps involved

```
Start step 1: 10  %
 Stop step 1:  5  %
Start step 2: 45  %
 Stop step 2: 40  %
```

```
Start step 3: 70  %
 Stop step 3: 65  %
Start step 4: 95  %
 Stop step 4: 90  %
```

Control parameters. Number of groups is used to calculate activation levels for binary control. Hyst is the switching differential used for each step when running binary control.

```
Heater groups: 4
Minimum on/off-
 time: 60 sec
Hyst: 0.5 %
```

Step controller Cooling can be set to sequential or binary.

```
Step contr. cooling
Activation level     →
```

Step controller Cooling activation levels for sequential control.

For binary control the activation levels are calculated by the controller depending on the number of steps involved.

```
Start step 1: 20  %
 Stop step 1:  5  %
Start step 2: 60  %
 Stop step 2: 40  %
```

```
Start step 3: 90  %
 Stop step 3: 65  %
```

Control parameters. Number of groups is used to calculate activation levels for binary control. Hyst is the switching differential used for each step when running binary control.

```
Chiller groups: 3
Minimum on/off-
 time: 60 sec
Hyst: 0.5 %
```

When DX cooling is used in conjunction with pressure controlled or flow controlled fans it is possible to block DX cooling if the supply air fan control signal falls below a preset values. The blocking level is individually settable for each DX cooling step.

```
At lower SAF-output
block step 1:  0 %
block step 2:  0 %
block step 3:  0 %
```

For more detailed description, see section 5.1.4 Step controllers.

9.19 Alarm configuration

Permits configuration of all alarms.

Select the appropriate alarm number (from the alarm list). The alarm text for the alarm will be displayed and the alarm priority can be set: A-alarm, B-alarm, C-alarm, D-alarm or not active. The extra stop function gives, for each alarm, the option to stop or not stop the unit on alarm activation.

```
Malf. SAF
Priority: B-alarm
Extra stop function
Active
```

Alarm list

Values in the Priority column show the factory set values.

	Alarm text	Pri	Description
1	Malf. SAF	B	Malfunction Supply air fan
2	Malf. EAF	B	Malfunction Exhaust air fan
3	Malf. P1-Heat	B	Malfunction pump, Heating circuit
4	Malf. P1-Cool	B	Malfunction pump, Cooling circuit
5	Malf. P1-Exch.	B	Malfunction pump, Liquid connected exchanger

	Alarm text	Pri	Description
6	Filter guard	B	Filter guard pressure switch activated
7	Flow guard	B	Flow switch activated
8	Ext. Frost prot.	A	External Frost protection thermostat activated
9	De-ice pressostat	-	Exchanger de-icing pressure switch activated
10	Fire alarm	A	Fire alarm activated
11	External switch	C	External switch activated
12	External alarm	B	External alarm activated
13	Deviation supply temp	B	Supply air temp deviates too much from the setpoint for too long
14	Deviation Humidity control	-	The room humidity deviates too much from the setpoint.
15	High supply temp	B	Supply air temp too high
16	Low supply temp	B	Supply air temp too low
17	SA max limit	-	Maximum limiting of supply air temp active
18	SA min limit	-	Minimum limiting of supply air temp active
19	High room temp	B	Room temp too high during room temp control
20	Low room temp	B	Room temp too low during room temp control
21	High exhaust temp	B	High exhaust air temp during exhaust air control
22	Low exhaust temp	B	Low exhaust air temp during exhaust air control
23	High temp limit Electric heating	A	Heater high temperature limit switch activated
24	Frost risk	B	Frost protection function is overriding the control of the heater output
25	Low frostprot. temp	A	Frost protection temperature below frost limit value
26	Low efficiency	B	Heat exchanger efficiency below limit value
27	Sensor error	B	Malfunction of a connected sensor
28	De-ice analogue	-	Exchanger de-icing activated by de-icing sensor
29	Malf. Rot. Exch.	B	Exchanger rotation sentinel alarm activated
30	Malf. Fire dampers	B	Fire damper exercise test failed
31	Dev. Pressure SAF	-	Supply air pressure deviates too much from the setpoint for too long.
32	Dev. Pressure EAF	-	Exhaust air pressure deviates too much from the setpoint for too long.
33	External activ. SAF	C	SAF run-signal received when unit is stopped
34	External activ. EAF	C	EAF run-signal received when unit is stopped
35	Run mode OFF	C	The unit is shut down
36	Supply air Manual	C	Supply air temp controller in manual control
37	SAF Manual	C	Supply air fan in manual control
38	Freq. SAF Manual	C	Signal to SAF frequency converter in manual control
39	EAF Manual	C	Exhaust air fan in manual control
40	Freq. EAF Manual	C	Signal to SAF frequency converter in manual control
41	Heating Manual	C	Heating output in manual control
42	Cooling Manual	C	Cooling output in manual control
43	Exchanger Manual	C	Heat exchanger output in manual control
44	P1-Heating Manual	C	Heating circulation pump in manual control
45	P1-Cooling Manual	C	Cooling circulation pump in manual control

	Alarm text	Pri	Description
46	P1-Exch. Manual	C	Exchanger circulation pump in manual control
47	Fire damp. Manual	C	Fire dampers in manual control
48	Internal battery error	B	Internal battery needs replacing

9.20 Other parameters

A collection of different parameters that did not fit into any of the other menus.

9.20.1 Start and stop delays for the fans

Use start delay if you wish one of the fans to start before the other and for example if you wish to give the close-off dampers time to open before starting the fans. Use stop delay for example to create a cool-down period when using electric heating.

```
Delay SAF
Start:  30 sec
 Stop: 180 sec
```

```
Delay EAF
Start:  30 sec
 Stop:  30 sec
```

9.20.2 Retardation time

When switching two-speed fans from 1/1-speed to 1/2-speed there is a settable retardation time. The same time applies to both fans.

```
Retardation time
1/1-1/2speed: 10 sec
```

9.20.3 Heating at start-up and high speed blocking

At outdoor temperatures below the set value, the heating output will be forced to 100% before start-up.

Two speed fans and pressure controlled fans can be blocked from using high speed at outdoor temperatures lower than the set value. This function should not be combined with the function ”Outdoor compensation of pressure setpoint”. See chapter 12.

Both functions need an outdoor temperature sensor.

```
Outd.temperature for
heat start:  3.0°C
Blocking of
  1/1-speed: -10°C
```

9.20.4 Crosswise interlock between fans

Crosswise interlock means that if one of the fans stops running, the other fan will automatically stop as well.

```
Crosswise interlock
between SAF and EAF
No
```

9.20.5 Exchanger to 100% at start and alarm delay at start

To minimise the risk of freeze-up problems, the heat exchanger can be forced to maximum capacity for the set time at start-up.

To eliminate the risk of, for example, fan pressure alarms at start-up, all alarm functions can be suppressed for the set time.

```
Exch 100% at start
60 sec
Alarm delay at start
60 sec
```

9.20.6 Split settings

Splits the Controller output (HCOut) between the analogue temperature control output signals Y1, Y2 and Y3 for Heating, Heat exchanger and Cooling.

To create a neutral zone, leave a percentage gap between sequences.

The set P-band for the supply air controller is for the whole Controller output. This means that the P-band for each sequence is proportionate to the split percentage values given to sequences.

Example:
P-band for the supply air controller is set to 25°C. The split is set so that cooling gets 0…20% = 20%, the exchanger gets 30…50% = 20% and the heater gets 50…100% = 50%. The individual P-bands will then be:

Cooling: 20% of 25°C = 5°C

Exchanger: 20% of 25°C = 5°C

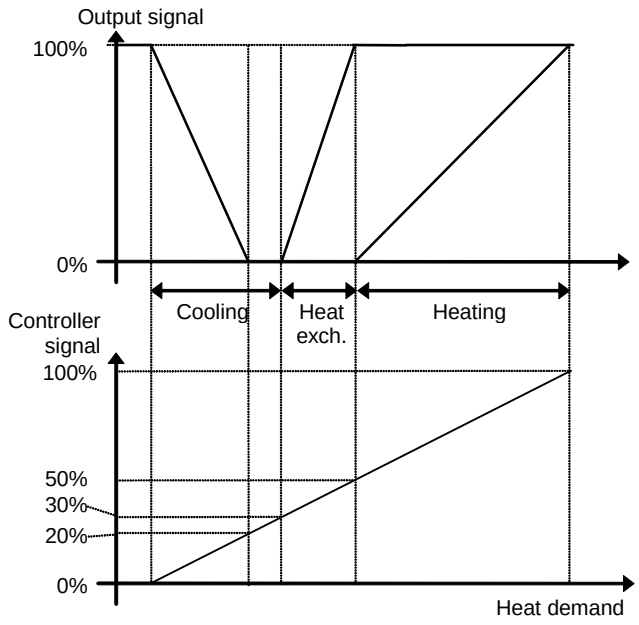
Heater: 50% of 25°C = 12.5°C

The remaining 2.5°C are the neutral zone between cooling and exchanger.

```
Split settings
Cooling
  0% at HCOut= 20%
100% at HCOut=  0%
```

```
Split settings
Exchanger
  0% at HCOut= 50%
100% at HCOut= 30%
```

```
Split settings
Heating
  0% at HCOut= 50%
100% at HCOut=100%
```



9.20.7 Extended running

Digital inputs can be used to force the unit to start although the timer says the running mode should be “Off”.

For 2-speed fans and pressure/flow controlled fans there are inputs for normal speed and reduced speed.

The unit will run for the set time. If the running time is set to 0 the unit will only run as long as the digital input is closed.

```
Extended running
60 min
Time in ext. Running
0 min
```

9.20.8 Outdoor temp for control mode change

If the unit is configured for combined Supply air/Room control this menu permits the setting of the change-over outdoor temperature.

```
Outdoor temp for
control mode change
13.0°C
```

9.20.9 Min limit lowering

If DX cooling is used configured in combination with room or exhaust air control, the supply air temperature minimum limit value can be lowered to give smoother (more continuous) running of the chillers. The set lowering of the limit value is activated when the DX cooling is running.

```
Lowering of min
limit for supply air
control on active
DX cooling: 5.0°C
```

This parameter is also used for setting the lowering of the cooling setpoint when running DX cooling with exchanger control.

See 5.1.4.

9.20.10 Split of optional temp sequence

Any one of the temperature control output sequences Y1, Y2 and Y3 can be split, for example to control two heating valves in sequence. The split is always even 50/50 which means that each part of the split will have half the part of the P-band assigned to the output. An analogue output must be assigned to the output signal “Split”. On increasing output demand, the regular output is always run first and then the split output.

```
Split optional
temperature sequence
Y1 Y2 Y3
No split
```

9.20.11 Flow control

```
Flow control
factors
K-constant: 0.28
X-constant: 0.50
```

For more detailed description, see section 5.3.1 Pressure control.

9.20.12 Blocking the DX cooling on low outdoor temp

At outdoor temperatures below the set value, DX cooling will not be activated. The function has a 1 K hysteresis, i.e. if DX cooling is blocked, the outdoor temperature must rise to 1K above the set value for the cooling to be activated again.

```
Blocking the DX-cooling
at lower outdoor
temperature  13.0 °C
```

9.20.13 Blocking the DX cooling on cooling pump alarm

DX cooling can be blocked on activation of the cooling pump alarm.

```
Blocking the DX-
cooling if alarm
”Run error P1-
cooler”:No
```

9.20.14 Fast stop on overheating

If this function is active, the fans will immediately be stopped when there is an overheating alarm, regardless of the set cool-down time.

```
Fast stop if alarm
Electric heating is
overheated: No
```

9.21 System

9.21.1 Change language

Use this menu to change the display language.

```
Choose language
English
```

9.21.2 Choose start display; the text normally shown on the display

There are 5 different to choose from.

Type 1

The text on the first line can be changed using Corrigo E-tool.

The second line shows date and time.

The third line shows the present running status.

The fourth line shows the present temperature setpoint and actual values.

```
Vent unit 18 PX
2004-03-15 11:28
System: Running
Sp:22.0°C Act:21.8°C
```

Type 2

The first line shows date and time.

The second line shows the present running status.

The third line shows the present temperature setpoint and actual values.

The fourth line shows present temperature control output values.

```
2004-03-15 11:28
System: Running
Sp:22.0°C Act:21.8°C
Y1:0%  Y2:93% Y3:0%
```

Type 3

The first line shows date and time.

The second line shows the present running status.

The third line shows the present temperature setpoint and actual values.

The fourth line shows present SAF and EAF pressures.

```
2004-03-15 11:28
System: Running
Sp:22.0°C Act:21.8°C
SAF:1100PaEAF:1050Pa
```

Type 4

The text on the first line can be changed using Corrigo E-tool.

The second line shows date and time.

The third line shows the present running status.

```
Vent unit 18 PX
2004-03-15 11:28
System: Running
```

Type 5

The text on the first line can be changed using Corrigo E-tool.

The second line shows date and time.

```
Vent unit 18 PX
2004-03-15 11:28
```

9.21.3 Automatic summer/winter time changeover

When Corrigo is set on automatic summer/winter time changeover, the timer will automatically change between summer and winter time according to European standard.

```
Automatic summer/
winter time change
over
Yes
```

9.21.4 Address

Corrigo E uses the addresses below when connecting to Corrigo E-tool, and when multiple controllers are connected in a network. E-tool normally uses the addresses below, so if an address is changed, the new address must also be entered in E-tool. If several Corrigo are connected in a network, all the units must have the same ELA address, but each unit must have a unique PLA address.

```
Address
PLA: 254
ELA: 254
```

9.21.5 Display anywhere (Remote control)

If multiple Corrigo units are connected in a network, it is possible to remote control a unit in the network from a unit with display. You do this by entering the address of the unit you wish to remote control in the unit with display. The function is aborted by pressing the buttons UP, OK and DOWN simultaneously.

```
Address for
remote communication
(PLA:ELA) 00:00
```

9.21.6 Modbus communication

Corrigo E can be connected to a network for Modbus communication. An activation code is not needed.

```
Modbus Address: 1
Speed: 9600 bps
Two stop bits:Yes
Parity:No
```

9.21.7 Dial-up modem

With the help of a dial-up modem, Corrigo can be connected to a supervisor Exo-system. We recommend the modem Westermo TD-32-B. The default password is exo.

```
DialUpModem: No
Number:
Password:
exo
```

9.21.8 Alarm forwarding via SMS

Via a connected GSM modem, Corrigo can send an alarm message to up to 3 different recipients. You do not need an activation code to use this function. When there is an alarm, Corrigo sends an alarm message to the first number on the list. The message consists of an alarm text, the unit name (the same text that is shown in the first row of the start display) and the time when the alarm occurred. If the recipient does not send an SMS within 5 minutes to confirm that the message has been received, Corrigo will send the message to the next number on the list.

```
SMS: Not Active
Nbr1:
Nbr2:
Nbr3:
```

Chapter 10 **Settings**

In this menu group all settings for all activated functions should be available. Depending on what choices have been made during configuration, some of the alternatives in this menu group may not be shown.

Settings

```
Control temp       →
Control pressure   →
Control humidity   →
Alarm settings
```

10.1 Control temp

Supply air controller

```
Supply air control
P-band:  33.0 °C
I-time: 100.0 sec
```

The set P-band for the supply air controller is for the whole Heating Controller output. This means that the P-band for each sequence is proportionate to the split percentage values given to sequences.

For example:

P-band for the supply air controller is set to 25°C. The split is set so that cooling gets 0…20% = 20%, the exchanger gets 30…50% = 20% and the heater gets 50…100% = 50%.

The individual P-bands will then be:

Cooling: 20% of 25°C = 5°C

Exchanger: 20% of 25°C = 5°C

Heater: 50% of 25°C = 12.5°C

The remaining 2.5°C are the neutral zone between cooling and exchanger.

The split values are set in the configuration submenu *Other parameters.* See section 9.19.5.

Room controller

```
Room control
P-band:  50.0 °C
I-time: 600.0 sec
```

Exhaust air controller

```
Exhaust air control
P-band:  50.0 °C
I-time: 600.0 sec
```

Shutdown mode

```
Shutdown mode
P-band: 100.0 °C
I-time: 150 sec
```

Exchanger de-icing

```
De-iceing
P-band: 100.0 °C
I-time: 150 sec
```

Exchanger de-icing

```
De-iceing
P-band:  20 °C
I-time: 120 sec
```

10.2 Control pressure

Pressure control SAF

```
Pressure control SAF
P-band:  300 Pa
I-time:  20 sec
Min Output: 0   %
```

Pressure control EAF

```
Pressure control EAF
P-band:  300 Pa
I-time:  20 sec
Min Output: 0   %
```

10.3 Control flow

Control flow SAF

```
Control flow SAF
P-band:  1000 m3/h
I-time:  60 sec
Min Output: 0   %
```

Control flow EAF

```
Control flow EAF
P-band:  1000 m3/h
I-time:  60 sec
Min Output: 0   %
```

10.4 Control humidity

```
Control humidity
P-band: 20.0 %RH
I-time: 120.0 sec
```

10.5 Alarm settings

Alarm settings

```
Alarm limits      →
Alarm delay       →
```

10.5.1 Alarm limits

Alarm limits, supply air

```
Al. lim. supply air
Control dev: 10.0 °C
High temp:   30.0 °C
Low temp:    10.0
```

Alarm limits, exhaust air

```
Al. lim. exhaust air
High temp:   30.0 °C
Low temp:    10.0 °C
```

Alarm limits, room

```
Al. lim. room air
High temp:   30.0 °C
Low temp:    10.0 °C
```

Alarm limit, frost protection

```
Alarm limit frost
protection
 7.0 °C
```

Alarm limit, exchanger efficiency

```
Low efficiency
50.0 %
```

10.5.2 Alarm delays

Alarm delay, supply air

```
Al. del. supply air
Control dev: 30 min
High temp:   5  sec
Low temp:    5  sec
```

Alarm delay, exhaust air

```
Al. del. exhaust air
High temp:  30.0 min
Low temp:   30.0 min
```

Alarm delay, room

```
Al. del. room air
High temp:  30.0 min
Low temp:   30.0 min
```

Alarm delay, frost protection

```
Alarm delay frost
protection
 0 sec
```

Alarm limit Humidity

```
Control deviation
humidity: 10 %
```

Alarm delay Humidity

```
Alarm delay control
deviation humidity: 30
min
```

Alarm delay, exchanger efficiency

```
Low efficiency
30 min
```

Alarm delay, fan malfunction

```
Alarm delay malfunc.
SAF:  120 sec
EAF:  120 sec
```

Alarm delay, pump malfunction

```
Alarm delay malfunc.
P1-Heating:    5 sec
P1-Cooling:    5 sec
P1-Exchanger:  5 sec
```

Alarm delay, misc. 1

```
Alarm delay
Filter mon.: 180 sec
Flow switch:   5 sec
Frost prot.:   0 sec
```

Frost prot. refers to the analogue input: Frost protection sensor.

Alarm delay, misc. 2

```
Alarm delay
Frost prot.DI: 0 sec
   Fire alarm: 0 sec
   Ext. alarm: 0 sec
```

Frost prot DI refers to the digital input: Frost protection thermostat.

Alarm delay, misc. 3

```
Alarm delay
   Elec. heat: 0 sec
 Sensor error: 5 sec
Rot.sent.exch:20 sec
```

Elec. heat refers to the digital input: High temperature limit switch.

Chapter 11 **Scheduler**

General

Corrigo has a year-base clock function. This means that a week-schedule with holiday periods for a full year can be set. The clock has an automatic summer- winter-time changeover.

Individual schedules for each week-day plus a separate holiday setting. Up to 24 individual holiday periods can be configured. Holiday schedules take precedence over other schedules.

Each day has up to two individual running periods. For two-speed fans and pressure controlled fans there are daily individual schedules for normal speed and reduced speed, each with up to two running periods.

Up to five separate digital timer outputs can be configured. Each with individual week-schedules with two activation periods per day. These outputs can be used to control lighting, doorlocks etc.

```
Time/Date          →
Timer 1/1-speed    →
Timer 1/2-speed    →
Timer output1      →
Timer output2      →
Timer output3      →
Timer output4      →
Timer output5      →
Holidays           →
```

11.1 Time / Date

This menu shows and permits the setting of time and date.

Time is shown in 24 hour format.

Date is shown in the format YY:MM:DD

```
Current time: 18:21
     Date: 04:02:23
  Weekday: Monday
```

11.2 Scheduler 1/1 speed

There are 8 separate setting menus, one for each weekday and one extra for holidays. Holiday schedules take precedence over other schedules.

For 24 hour running, set a period to 0:00 – 24:00.

To disable a period, set it to 0:00 – 0:00. If both periods of a day are set to 0:00 – 0:00, the unit will not run at 1/1-speed that day.

```
1/1-speed
Monday
Per.1: 07:00 – 16:00
Per.2: 00:00 - 00:00
```

11.3 Scheduler 1/2-speed

These settings will be ignored if single speed fans are configured.

Should periods for 1/1-speed and periods for 1/2-speed overlap, 1/1-speed takes precedence.

There are 8 separate setting menus, one for each weekday and one extra for holidays. Holiday schedules take precedence over other schedules.

For 24 hour running, set a period to 00:00 – 24:00.

To disable a period, set it to 00:00 – 00:00.

If both periods of a day are set to 00:00 – 00:00, the unit will not run at 1/2-speed that day.

```
1/2-speed
Holiday
Per.1: 10:00 – 16:00
Per.2: 00:00 - 00:00
```

11.4 Timer outputs 1…5

Up to 5 digital outputs can be configured as timer outputs, each with a separate week-schedule with two activation periods per day. Holiday schedules take precedence over other schedules.

```
Timer output 2
Wednesday
Per.1: 05:30 – 08:00
Per.2: 17:00 – 23:00
```

11.5 Holidays

Up to 24 separate holiday periods for a full year can be set.

A holiday period can be any number of consecutive days from one and upwards. The dates are in the format: MM:DD.

When the current date falls within a holiday period, the scheduler will use the settings for the weekday “Holiday”.

```
Holidays  (mm:dd)
1: 01:01 - 02:01
2: 09:04 – 12:04
3: 01:05 - 01:05
```

Chapter 12 **Setpoint**

In this menu group all actual current values and setpoint values are displayed and, providing a sufficiently high log on level is used, all setpoints can be changed.

The following menus are available providing that the corresponding input is activated:

Setpoint, Control mode 1: Supply air control.

```
Outdoor temp.:18.4°C
Supply air temp
Actual: 19.8°C Setp→
Setp.: 20.0°C
```

Submenu: Setpoint

```
Supply air temp
Setp.: 20.0°C
```

Setpoint. Control mode 2, 4 and 5: Outdoor compensated supply air control.

```
Outdoor temp.:18.4°C
Supply air temp
Actual: 19.8°C Setp→
Setp.: 20.0°C
```

Submenu: Setpoint

Use the eight breakpoints to generate a setpoint / outdoor temperature relationship.

```
Outdoor comp. setp.
-20.0°C = 25.0°C
-15.0°C = 24.0°C
-10.0°C = 23.0°C
```

```
Outdoor comp. setp.
 -5.0°C = 23.0°C
  0.0°C = 22.0°C
  5.0°C = 20.0°C
```

```
Outdoor comp. setp.
 10.0°C = 19.0°C
 20.0°C = 18.0°C
```

In-between-values are calculated using straight lines between breakpoints. Setpoints for temperatures lower than the lowest breakpoint and higher than the highest breakpoint are calculated by extending the line between the two last breakpoints at either end.

Example: At the lower end the setpoint is increasing by 1°C for every 5 °C lowering of the outdoor temperature. So the setpoint at –23°C would be 25°C + .6x 1.0°C = 25.6°C.

Setpoint. Control mode 3 and 4: Cascaded room temperature control.

```
Room temp.1
Actual: 22.0°C
 Setp.: 21.5°C
```

If two room sensors have been configured you will also get the following menu:

```
Room temp.2
Actual: 21.8°C
```

Setpoint. Control mode 5 and 6: Cascade connected exhaust air temperature control.

```
Exhaust air temp.
Actual: 21.0°C
 Setp.: 21.1°C
```

Support control heating

```
Support heating
Room temp for
Start: 15.0°C
 Stop: 21.0°C
```

Support control cooling

```
Support cooling
Room temp for
Start: 30.0°C
 Stop: 28.0°C
```

CO2 / VCO

```
CO2
Actual: 782ppm
  Setp: 850ppm
```

Pressure control SAF

When using pressure or flow controlled fans, the setpoint can be outdoor compensated.

The compensation has the default value 0 Pa, i.e. no compensation is added. The compensation is linear between the setting points. The compensation can be positive or negative.

The same compensation normally applies to both fans. Using E-tool, you can choose to compensate only the supply air fan.

The same compensation is applied to both Normal and Reduced speed. Therefore, you should be careful when you use the function so the pressure does not becomes too low or even negative when running Reduced speed.

```
Pressure contr. SAF
Actual: 480 Pa
 Setp.: 490 Pa    →
```

Submenu Setpoint

```
Pressure contr. SAF
Setp 1/1: 490 Pa
Setp 1/2: 300 Pa
```

Submenu Outdoor compensation

```
Outdoor comp. setp.
-20   °C = -50 Pa
 10   °C =   0 Pa
Act. comp=  -5 Pa
```

Pressure control EAF

```
Pressure contr. EAF
Actual: 480 Pa
 Setp.: 490 Pa    →
```

Submenu Setpoint

```
Pressure contr. EAF
Setp 1/1: 490 Pa
Setp 1/2: 300 Pa
```

Submenu Outdoor compensation

```
Outdoor comp. setp.
-20   °C = -50 Pa
 10   °C =   0 Pa
Act. comp=  -5 Pa
```

Flow control SAF

```
Flow control SAF
Actual: 1800 m3/h
 Setp.: 2000 m3/h    →
```

Submenu Setpoint

```
Flow control SAF
Setp 1/1: 2000 m3/h
Setp 1/2: 1000 m3/h
```

Submenu Outdoor compensation

```
Outdoor comp. setp.
-20   °C = 0.0 m3/h
 10   °C = 0.0 m3/h
Act. comp= 0.0 m3/h
```

Flow control EAF

```
Flow control EAF
Actual: 1800 m3/h
 Setp.: 2000 m3/h    →
```

Submenu Setpoint

```
Flow control EAF
Setp 1/1: 2000 m3/h
Setp 1/2: 1000 m3/h
```

Submenu Outdoor compensation

```
Outdoor comp. setp.
-20   °C = 0.0 m3/h
 10   °C = 0.0 m3/h
Act. comp= 0.0 m3/h
```

Frost protection temperature

```
Frost protection
       Actual: 42.3°C
Setp shutdown: 25.0°C
P-band active: 5.0°C
```

De-icing heat exchanger

```
De-icing exchanger
    Actual: 11.2°C
  Setpoint: -3.0°C
Hysteresis:  1.0°C
```

Humidity sensor room

```
Humidity room
Actual: 51.9% RH
  Setp: 50.0% RH
```

Humidity sensor duct

```
Humidity duct
   Actual: 72.2% RH
Max limit: 80.0% RH
  Hyst.: 20.0% RH
```

Heat exchanger efficiency

```
Efficiency exchanger
Actual 93%
```

Running time SAF and EAF

Shows the accumulated running times for the fans.

```
Running time
SAF: 1382.5h
EAF: 1394.8h
```

Chapter 13 **Manual / Auto**

General

In this menu the running mode of the unit and all the configured outputs can be manually controlled. This is a very handy feature which simplifies the checking of individual functions in the Corrigo.

The supply air controller's output signal can be manually set (Manual/Auto) to any value between 0 and 100%. The temperature output signals will change accordingly if they are in Auto mode.

It is also possible to manually control each of the temperature output signals individually.

All the configured digital outputs can be set to On, Off or Auto.

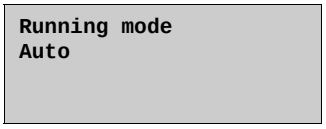
Since leaving any of the outputs in manual control will disrupt the normal control, an alarm will be generated as soon as any output is set to a manual mode.

Since the menus vary according to the configuration of the outputs only the most common ones will be shown here. For the digital signals you can normally choose between Auto and On and Off or similar words indicating the two possible manual states of the digital output.

Hand/Auto

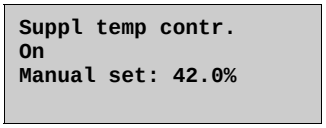
Running mode for the Corrigo.

Can be set to Auto, On or Off.



Supply air controller running mode

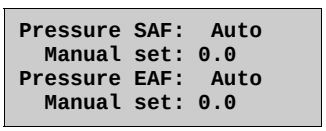
Can be set to Auto, On or Off. In manual mode the output signal can be set 0…100%. The outputs Y1, Y2 and Y3, if in Auto-mode, will follow the signal according to the set split values.



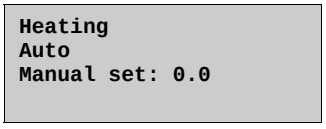
Start signal SAF an EAF

Can be set to Auto, Manual 1/1-speed, Manual 1/2-speed and Off. Manual 1/2-speed is not valid for single speed fans.

With pressure controlled fans you get the following menu: Can be set to Auto, Manual normal, Manual reduced and Off.



Y1 heating output



Y2 heat exchanger

```
Exchanger
Auto
Manual set: 0.0
```

Y3 cooling

```
Cooling
Auto
Manual set: 0.0
```

Chapter 14 In- / Outputs

This is a read-only menu block showing the current values for all configured inputs and outputs. If correction factors have been applied to input values, the corrected values will be shown.

```
Analogue inputs
Digital inputs
Universal inputs
Analogue outputs
Digital outputs
```

Analogue inputs and digital outputs are shown here as examples.

Analogue inputs

```
AI1: 18.5 Outd. temp
AI2: 20.3 Suppl.temp
AI3: 28.2 Frost.temp
AI4: 19.9 Room1.temp
```

Digital outputs

```
DO1:Off SAF 1/1speed
DO2:Off EAF 1/1speed
DO3: On SAF 1/2speed
DO4: On EAF 1/2speed
```

```
DO5: On P1 Heating
DO6: Off Fire dampers
DO7: Off Sum alarm
```

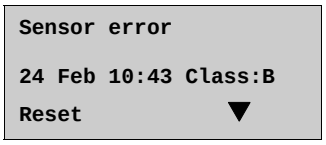
Chapter 15 **Other functions**

15.1 Alarm handling

If an alarm condition occurs the Alarm LED on the front panel on units with display will start flashing. The LED will continue to flash as long as there are unacknowledged alarms.

Alarms are logged in the alarm list. The list shows type of alarm, date and time for the alarm and the alarm class (A, B or C alarm).

To access the alarm list, press the alarm button, the front panel button with the red button-top.



If there are multiple alarms, this is indicated by up / down arrow symbols at the right-hand edge of the display.

Use the UP and DOWN buttons to access the other alarms.

At the left end of the bottom display line the alarm status is shown. For active, unacknowledged alarms the space is blank. For alarms that have reset the text: “Reset” is shown, Acknowledged, still active or blocked alarms are indicated by Acknowledged or Blocked.

Alarms are acknowledged by pressing the OK button. You are then given the choice of acknowledging the alarm or blocking the alarm.

Acknowledged alarms will remain on the alarm list until the alarm input signal resets.

Blocked alarms remain on the alarm list until the alarm has reset and the block has been removed. New alarms of the same type will not be activated as long as the block remains.

Since blocking alarms can be potentially hazardous, you need a high log on authority to block alarms.

Class A and B alarms will activate alarm output(s) if these have been configured.

Class C alarms do not activate the alarm output(s).

Class C alarms are removed from the alarm list when the alarm input resets even if the alarm has not been acknowledged.

15.2 Free text

If RIGHT is pressed once when the start-menu is shown, see section 8.14.2, a menu showing text of your choice is displayed. The text can be used to show information concerning the commissioning company, name and phone number to service personnel etc. The easiest way to enter text is to use E-tool, but the buttons can also be used. Up to 4 lines of 20 characters can be entered.

15.3 Revision number

If RIGHT is pressed twice when the start-menu is shown, see section 9.20.2, a menu showing the program revision number and ID number is displayed.

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