OP10

Preprogrammed, configurable controller for simple applications

Optigo OP10 is a new preprogrammed, configurable controllers intended for DIN-mounting that can be set to handle everything within temperature control in ventilation- and heating applications.

- **Language independent**
- **Simple configuration via the backlit display**
- **Input for an external setpoint device**

Optigo OP10 is a new pre-programmed, configurable controller. It has been designed with the main intention of replacing a number of Regin's Aqualine controllers.

From July 2010, it is possible to connect an external setpoint device. This applies to OP10 models with revision number R20.

Optigo

Optigo Regin´s newest controller series intended to control temperature, CO_2 pressure, humidity in HVAC and heating applications. A simple stand-alone controller for smaller applications. The optigo is extremely easy to install, set-up and control and is mainly intended for smaller applications.

Optigo has a knob with an encoder which makes the menu system very easy to use. You can read and set values shown in the back-lit display. A value is approved by pressing the knob.

Models

The Optigo series comprises two different types, OP5 and OP10.

OP5 has 5 in-/outputs and OP10 has 10 in-/outputs. OP10 is available in two versions:

- OP10 with 24 V AC supply voltage
- OP10-230 with 230 V AC supply voltage.

- **Pre-loaded with several application modes**
- **Available for 24 V or 230 V supply voltage**
- **Week-based real time clock/scheduler**

Applications OP10 and OP10-230

Optigo OP10 is preprogrammed with a choice of five different control modes:

- Supply air temperature control
- Supply air temperature control with outdoor compensation
- Exhaust air/room temperature control with cascade function
- Radiator control with outdoor compensation
- Domestic Hot Water control

Inputs and outputs

Optigo OP10 has

- 2 analogue inputs, PT1000
- 1 SPI input for an external setpoint device
- 1 universal input, PT1000 or digital
- 2 digital inputs
- 3 digital outputs
- 2 analogue outputs, 0…10 V DC

Internal clock

Optigo OP10 has a built-in week-base real time clock with a number of different scheduler alternatives.

Easy to install

Optigo is suitable for DIN-rail or cabinet mounting. Since the terminals are detachable all connections can be made before Optigo is installed.

Optigo has been developed according to our Ready-Steady-Go concept, which simplifies every step from installation to management.
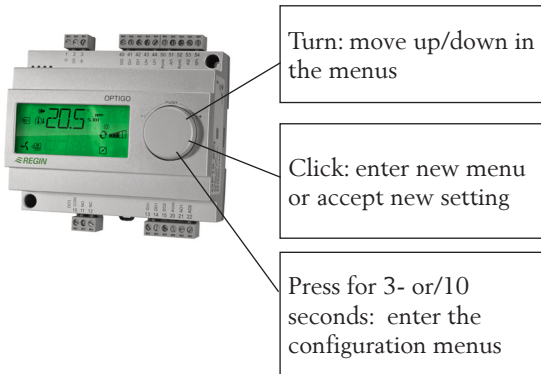
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THE CHALLENGER IN BUILDING AUTOMATION

Display handling

On the display the following indications/information can be displayed. All setting and configuration is done using the display and encoder.

The menu information on the display is organised in a tree fashion. Using the encoder you can move between menus, set values and actual values.

In any of the configuration menus, a click on the encoder will activate change mode. You can then turn the encoder button to move between choices or set values. A second click of the button will accept the choice.

Turn: move up/down in the menus

Click: enter new menu or accept new setting

Press for 3- or 10 seconds: enter the configuration menus

The menu system is divided into three levels:

- Base level - view mode
- 3-second level - clock and scheduler settings
- 10-second level - configuration area

Base Display

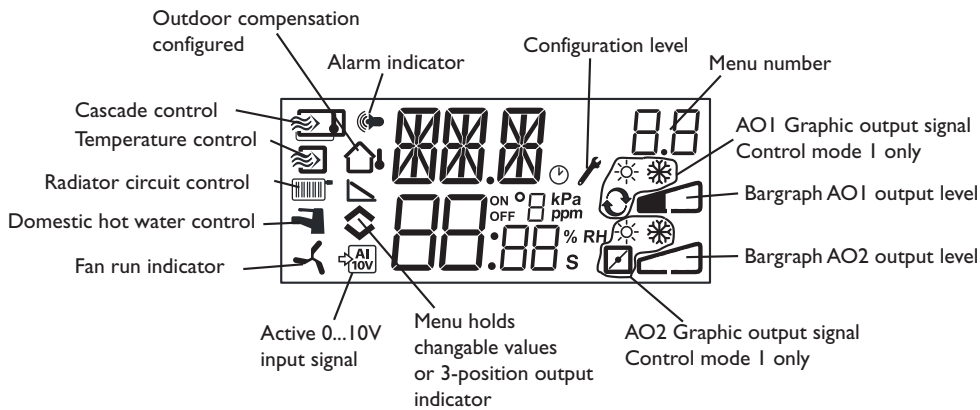This is an example of the Base Display, the display that is normally shown when there is no operator activity.

It shows the current time and the actual setpoint. There are bar-graphs showing the current output levels together with symbols showing how the outputs have been configured (Heating, Cooling or Damper etc).

Also a symbol showing which of the five control modes is configured and an alarm symbol that is displayed in the event of an alarm condition. The fan symbol (control modes 1, 2 and 3 only) is lit as long as the fan indication input is activated.

When the base Display is shown, by turning the knob counter clockwise until the text I/O is displayed and then clicking on it, you can gain access to a menu where you can look at the values and states of all inputs and outputs.

To exit this menu again, click on the knob and then turn the knob clockwise and you will be returned to the Base display.

Display information

Outdoor compensation configured
Alarm indicator
Configuration level
Menu number

Cascade control
Temperature control
Radiator circuit control
Domestic hot water control
Fan run indicator

AO1 Graphic output signal Control mode 1 only
Bargraph AO1 output level
Bargraph AO2 output level
AO2 Graphic output signal Control mode 1 only

Active 0...10V input signal
Menu holds changable values or 3-position output indicator

Configuration

All the configuration menus lie in the 10-seconds level. This level is accessed from the Base Display by clicking and holding the encoder knob for 10 seconds.

There are numerous configuration menus covering all available options and combinations.

In some cases, making a certain choice in one menu will mean that you will only see certain other menus. For example, the menu for setting the damper minimum limit is only shown if you have configured AO2 to be a damper control output.

Control modes

Selectable control modes

1. Supply air temperature control
2. Supply air temperature control with outdoor compensation
3. Exhaust air/room temperature control with cascade function
4. Radiator control with outdoor compensation
5. Domestic Hot Water control

The following control modes can be handled by Optigo.

Ventilation
According to no. 1,2 and 3 above

- P or PI-control
- Two analogue outputs can be controlled in seqence, or one three-point output
- Damper control with adjustable minimum supply air volume
- Frost protection with manual reset
- Overheating protection (electric heating)
- Cool-down function (electric heating)
- Built-in week based scheduler
- Start/stop of fan via built-in 230 V AC relay
- Input for extended running via timer
- Input for an external setpoint device
- Alarm handling via the display and sum alarm

Heating circuits
According to no. 4 above

- P or PI-control
- 0...10 V output or three-point 24 V AC
- Settable curve for out-door compensation
- Boost function for outdoor compensation (increasing at 0 C° outdoor temperature)
- Room sensor can be connected for adaption of outdoor compensation curve
- The room setpoint can be set via an external setpoint device
- Pump-stop/Pump exercise
- Alarm handling via the display and sum alarm output

Domestic hot water
According to no. 5 above

- PID-control
- 0...10 V output
- Periodical over heating. reduces the risk for legionella
- Alarm handling via the display and sum alarm output

Application examples

Optigo OP10 can be configured to any one of the following control modes.
The three modes at this page have a lot in common and will therefore be treated in a single section.
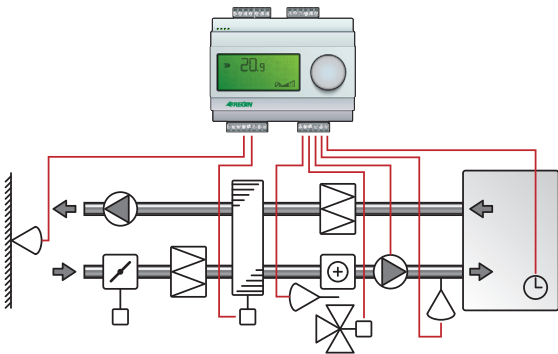
Supply air temperature control

The supply air temperature is kept at the setpoint value by controlling the output signals on AO1 and AO2. A single PI control loop is used.
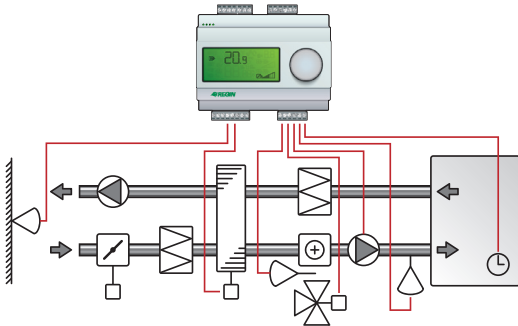
For control mode "Supply air temperature control" you need only one sensor,"Supply air sensor" on AI1

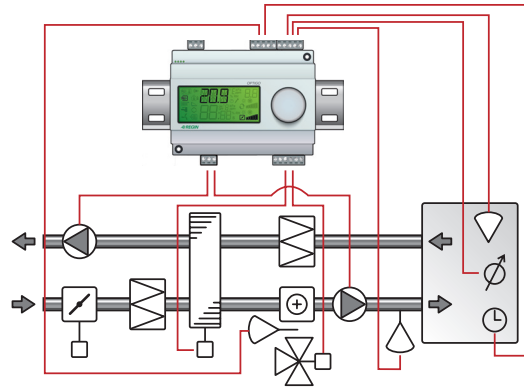**Supply air temperature control with outdoor compensation**

The supply air temperature is kept at the setpoint value by controlling the output signals on AO1 and AO2. A single PI control loop is used. The setpoint is automatically adjusted according to the outdoor temperature.

For control mode "Supply air temperature control with outdoor compensation" you need two sensors, "Supply air sensor" on AI1 and "Outdoor sensor" on AI2.

Cascade connected room / Exhaust air temperature control

An offset in room temperature, which if desired can be set via the external setpoint device, will adjust the supply air temperature setpoint so as to eliminate the room temperature offset. One PI and one P control loop are used. The supply air temperature can be minimum and maximum limited.

For control mode 3, "Cascade connected room / Exhaust air temperature control" you also need 2 sensors, "Supply air sensor" on AI1 and either "Room sensor" or "Exhaust sensor" on AI2.

Analogue outputs

The analogue outputs can be configured to the following combinations (valid for all three examples on this page):

| AO1	AO2
1. Heating	**/** -
2. Cooling	**/** -
3. Heating	**/** Cooling
4. Heating	**/** Heating
5. Cooling	**/** Cooling
6. Heating	**/** Damper
7. Cooling	**/** Damper

3-position control

Instead of an analogue output you can configure a single 3-position (increase / decrease) output. You will then only have the following output choices:

- Heating
- Cooling

DO1 is used for increase signal and DO2 for decrease. This option cannot be combined with alarm output.

Radiator circuit control with outdoor compensation

The water temperature setpoint is changed according to the outdoor temperature. A single PI control loop is used. A room temperature sensor can be added to give corrective action if the room temperature differs from the setpoint.
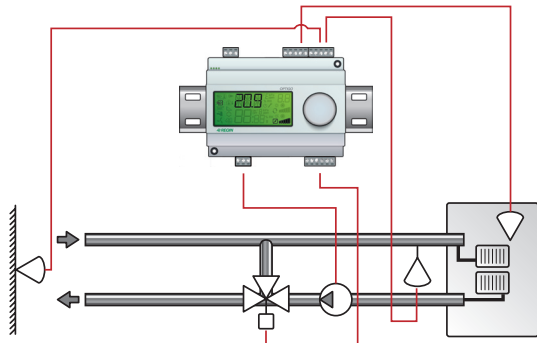
For this control mode you need two sensors, GT1 "Supply temperature" on AI1 and GT2 "Outdoor sensor" on AI2.

You can also have a room temperature sensor on UI1 to let the room temperature offset give correction to the supply temperature. Wire UI1 as an analogue input.

3-Position control

Instead of an analogue 0...10 V output you can configure a single 3-position (increase / decrease) output using DO1 and DO2.

Domestic hot water control

The water temperature is kept constant by controlling the output signal on AO1. A single PID control loop is used.
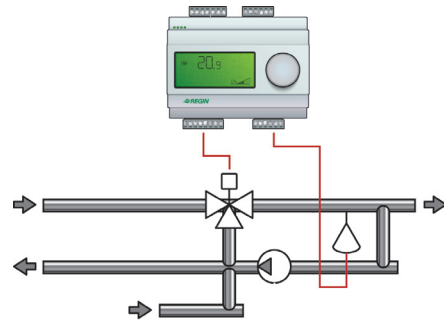
For this control mode you need a single sensor, "Supply water temperature" on AI1

Technical data

Supply voltage	OP10: 24 V AC ±15%, 50...60 Hz; OP10-230: 230 V AC +10%, -15%, 50...60 Hz
Internal consumption	4 VA
Ambient temperature	0...50°C
Storage temperature	-20...70°C
Ambient humidity	Max 90% RH
Display	Numeric / graphic. Background illumination
Protection class	
OP10	IP20
OP10-230	IP00
Material casing	Polycarbonate, PC
Terminal blocks	Disconnectable, so-called lift type for cable cross-section 2.5 mm2
Weight	OP10-230: 370g; OP10:215 g incl. terminals
Colour	Cover: Silver
	Bottom part: Dark gray

$C\epsilon$ This product conforms with the requirements of European EMC standards CENELEC EN 61000-6-1 and EN 61000-6-3, as well as the requirements of European LVD standard EN 61010-1 and carries the CE mark

Inputs

|	
Analogue Inputs	Three
AI1	PT1000-sensor, range 0…+84°C, accuracy +/- 0.5°C
AI2	PT1000-sensor, range -30…+54°C, accuracy +/- 0.5°C
SPI	PT1000 setpoint device, measuring range 0...40°C, accuracy +/- 0.5°C
Universal Input	One analogue- or digital input
AI	PT1000, range 0…+84°C, accuracy +/- 0.5°C
or DI	Closing potential-free contact
A_{GND}	Reference for AI and for UI when used as an analogue input
UI+	Reference for UI
Digital Inputs	Closing potential-free contact
DI+	Reference for DI
Outputs	Two analogue and three digital outputs
AO	0…10 V DC; 8 bit D/A short-circuit protected
DO1 and DO2	Triac, 24 V AC, 0.5 A continuous
DO3	Change-over (SPDT) relay 230 V AC, 5 A

Settings

Setpoints

Temperature	Supply air 10..40°C
	Room 10…40°C
	Domestic hot water 10…80°C
Via external setpoint device	0....40°C
P-band	0…99°C
I-time	0…990 s
D-factor	0…99
Cascade factor	0…99
Min. at cascade	0…99°C
Max. at cascade	0…99°C
Damper min. limit	0…99
Start ,outdoor compensation	-30…50°C
Outdoor comp. at -20°C	-10…10°C
Supply temp. at -20°C outdoor temp.	0…99°C
Supply temp. at 20°C outdoor temp.	0…99°C

Setpoints (fixed)

Frost protection	7°C
Shutdown mode	25°C
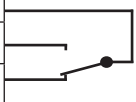
Wiring

OP10

Terminal	Designation	Operation
0	G	24 V AC
1	G0	Optigo 10
2	⏚	only

OP10-230V

Terminal	Designation	Operation
0	L	230 V AC
1	N	Optigo 10-230
2	⏚	only

Terminal	Designation	Operation
10	Common	Change over relay, 5A
11	NO	
12	NC	
13	G	Reference for DO1 and DO2
14	DO1	Digital output
15	DO2	Digital output
20	AGND	Reference for AO1 and AO2
21	AO1	0...10 V DC output
22	AO2	0...10 V DC output
40	DI2	Digital input
41	DI+	Reference for DI1 and DI2
42	DI1	Digital input
43	UI+	Reference for UI1
44	UI1	Universal input PT1000 or Digital
50	AGND	Ref. for AI1
51	AI1	PT1000 temp.erature sensor input
52	AGND	Ref. for AI2
53	AI2	PT1000 temp.erature sensor input
54	SPI	Input PT1000 setpoint device

Dimensions
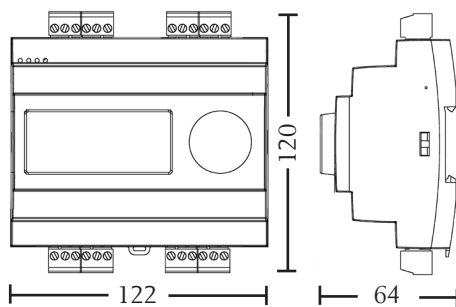
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Product documentation

Document	Type
Optigo Manual	Manual for the Optigo OP10

The product information is available for download from www.regin.se.

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