

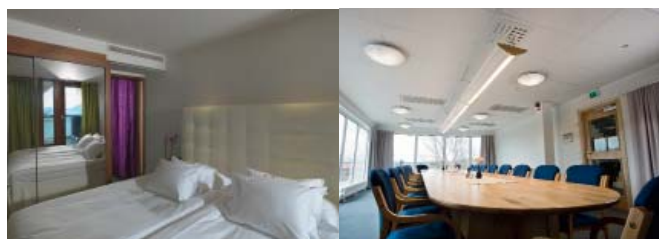
CONDUCTOR

Network-connectable automatic control system for controlling the air temperature and air quality in a room



Quick Facts

- ▶ Automatic control of the air volume, cooling and heating
- ▶ The set points for temperature and airflow can be set via the room thermostat.
- ▶ Occupancy control via key card/sensor
- ▶ Simple configuration of settings keyed in the room thermostat
- ▶ Wireless communication between room thermostat and controller
- ▶ Inputs for condensation sensor, window contact and other normally-closed contacts
- ▶ Up to twelve pairs of actuators can be wired to each controller.
- ▶ Possible connection up to main control system via ModBus RTU
- ▶ Optional cooling sequence - air/water or water/air.
- ▶ Air quality control via CO₂ sensor.



ROOM CONTROL

General

The CONDUCTOR Room control equipment, versions W1, W3 and W4, for controlling both the room temperature and the air volume, is especially designed for controlling the waterborne climate in offices, hotel rooms, hospitals and conference rooms. CONDUCTOR contains a number of adaptable energy saving functions.

Swegon

Technical Description

Our new CONDUCTOR in-house developed room control equipment is a natural result of our efforts to provide the user with a healthy indoor climate. Different rooms have different requirements, and this has motivated us to develop various applications. These applications are principally developed for the climate control of waterborne climate systems in offices, hotels, hospitals and conference rooms.

This is more clearly described under the different applications: W1 (office with constant airflow), W3 (Hotel with occupancy-controlled airflow), and W4 (conference room with air quality-controlled airflow and temperature control).

Another important building services engineering advantage is that internal communication between room unit (RU) and controller unit (RE) normally is wireless. This makes visible cabling between air conditioning unit (normally one or several comfort modules, chilled beams or periphery climate units) unnecessary. All cable connections are hidden above the false ceiling and all wiring is done with detachable standard connections, i.e. screw wiring terminals.

The room thermostat has a pure design and is equipped with a digital display that clearly shows the room setpoint and other usual indicating symbols.

All settings can be keyed directly in the room thermostat; however it is also possible to read the current room temperature for example. The user can change the room temperature setpoint simply by pressing buttons and the result is immediately visible in the display.

The CONDUCTOR always offers an underlying advantage in that you can connect it up to ModBus RTU. It will also be possible to operate it connected up to other Swegon ModBus units. For further particulars, get in touch with your nearest Swegon representative.

Flexibility

- The user can easily configure the controller functions and parameters by means of the room thermostat.
- Wireless communication offers flexibility when deciding where to place the room thermostat.
- You can connect up to twelve pairs of actuators (twelve for cooling + twelve for heating) to each controller, or up to four complete units per controller for controlling both the airflow (supply air and central extract air, 5 damper actuators) and cooling and heating (cooling and heating circuit, valve actuators)

User Friendliness

- Simple and clear room thermostat design with digital display that also shows cooling or heating load readings
- The actuator's "first open" function simplifies pressure testing and venting the water system
- The actuators indicate the position of the valve by means of a clearly visible cylinder body (up – open position, down – closed position).

Reliability and Minimal Maintenance

- Input for condensation sensor that immediately cuts off the cooling water in the event of condensate precipitation
- Regular exercising of the valves prevents the valve spindles from becoming jammed
- The controller is designed for minimizing the risk of faulty wiring; it features quick contacts with screw wiring terminals
- Low heat generation in incorporated components

Operation

Regulation

The controller provides proportional and integral (PI) control. The I section senses both the size and the duration of the control deviation and adjusts the actuator opening time accordingly. This type of control is called pulse-width modulation (PWM). Compared with on/off control, for instance, PWM control offers more uniform room temperature which enhances room comfort. It is possible to adjust from PWM control to 0-10V control.

Valve actuators and valves

The actuator is of NC type (Normally-closed) but is equipped with a so-called "first open" function which means that the actuator is open when it is installed. This facilitates pressure testing and venting the water system.

The "First open" function of the actuator is automatically disabled after approx. 6 minutes while energized. A clicking noise will be heard after which the actuator will change over to the NC mode and the normal regulation function will begin.

The valves are exercised every second 24-hour period. On these occasions, all the actuators wired to the controller are opened fully for 3 minutes, which prevents the valve spindles from jamming.

Data Communication

The controller has a built-in communication port that enables connection to an RS 485 network with ModBus for supervising and override control via a main system, such as a computer.

CONDUCTOR W1 – Office with constant airflow

The CONDUCTOR W1 room control equipment is designed for controlling the indoor climate in offices. Since the room environment should be invigorating, and offer the highest degree of comfort possible, uniform temperature and a healthy indoor climate are significant necessities, regardless of the outdoor temperature and season. Individual variations in room level are also significant necessities.

CONDUCTOR W1 in a nutshell

The CONDUCTOR consists of:	Digital controller, room unit, hand-held terminal, thermo-electrical actuators, valves, cables and accessories
Control function:	PI
Power supply:	24 V AC
Inputs:	Condensation sensor External temperature sensor
Outputs:	Valve actuator (max 72 VA) Signal to external relay
Communication:	Room unit (wireless or via RJ12 cable) ModBus RTU)(RJ12)

Table 1. CONDUCTOR W1 Operating Mode

Mode	Condensation	Cooling	Heating
A	Yes	Off	Normal
B	No	Normal	Normal

Operating mode

The various operating conditions of the controller are shown in Table 1. The operation modes are based on the status of the condensation sensor. Each given operating mode controls cooling and heating until the user manually sets the temperature.

The normal case is described in Case B: No condensation. Control is then completely normal and controls heating or cooling in order to maintain the right temperature in the room.

The cooling circuit valve closes if condensation is likely to form.

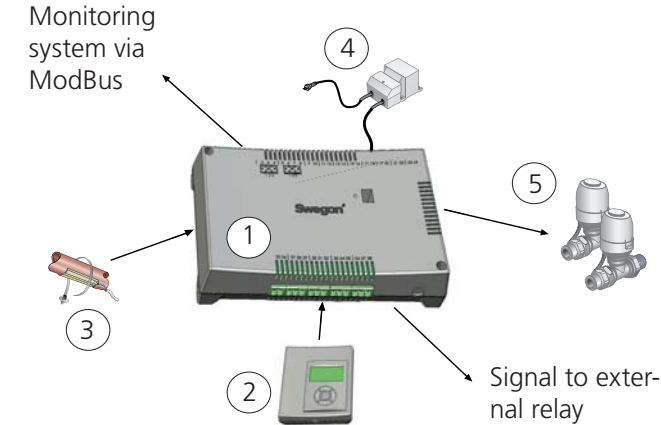


Figure 1. CONDUCTOR W1: Integral Components

- | | | |
|---|---------------------|--------------|
| 1 | Controller | Conductor RE |
| 2 | Room unit | Conductor RU |
| 3 | Condensation sensor | SYST CG |
| 4 | Transformer | SYST TS-1 |
| 5 | Valve actuator | LUNA a AT-2 |

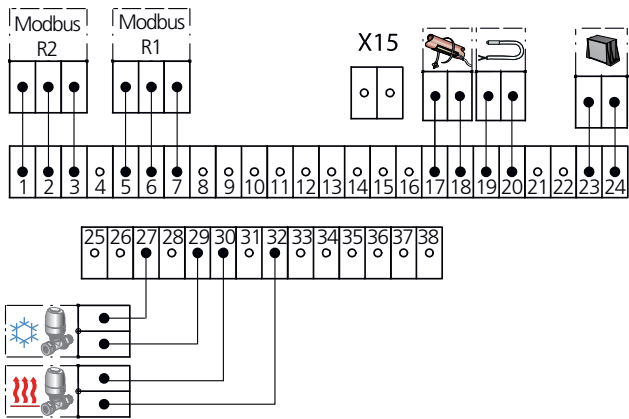


Figure 2. CONDUCTOR W1 - Wiring Diagram

MODBUS RS2	1	Data (B)
	2	Data (A)
	3	Earth
MODBUS RS1	5	Data (B)
	6	Data (A)
	7	Earth
Condensation sensor	17	Resistance
	18	
Temperature detector	19	KTY
	20	
Transformer	23	+ 24V AC
	24	-G0
Valve actuator, cooling	27	-G0
	29	+24V
Valve actuator, heating	30	-G0
	32	+24V

Technical Description

CONDUCTOR W3 – Hotels or hospitals with occupancy-controlled airflow in fixed steps.

The CONDUCTOR W3 is an application specially designed for controlling the indoor climate in hotel rooms and hospitals. Since the room environment should be peaceful, quiet and offer the highest degree of comfort possible, uniform temperature and a healthy indoor climate are significant necessities, regardless of the outdoor temperature and season. Individual variations in room level are also significant necessities. During certain times of the year, high humidity may also involve risk of condensation.

CONDUCTOR W3 has what it takes to be the optimal control and regulation equipment for hotel rooms as well as for hospitals. CONDUCTOR W3 makes control of the supply airflow, extract airflow and temperature possible, in order to provide the best possible comfort in the room.

Takes prevailing circumstances into account

- The controller input for the presence detector (or a key card reader) makes it possible to adjust the airflow and temperature on the basis of occupancy in the room.
- In response to signals indicating an open window, the controller regulates the valves and damper to reduce the heating water flow and air flow respectively to a minimum, in order to save energy.

Timed Airing

When occupancy is detected (presence detector or key card reader) the controller sets the air dampers to the high airflow setting to air out the room. After 5 min. the controller returns to the auto mode and an operating condition according to the status of the sensors, see Table 2. The user can easily change or deactivate the airing period from the room thermostat, or from a building supervising system.

Manual control

Whenever the CONDUCTOR W3 registers occupancy in the room (in response to signals from a presence detector or a key card reader) the user can regulate the airflow and temperature by entering settings in the room thermostat.

When the controller is set to the auto mode, the airflow is determined on the basis of the status of the sensors. See Table 2. The user can also manually control the airflow in three steps. The controller controls the supply air and extract air damper motors by means of three voltage levels that open the pivotal dampers to different settings. If the system is set for a high rate of airflow, the controller increases the flow of fresh supply air, not just the flow of recirculated air as in many other room climate systems.

The output signals from the controller to the supply air and extract air dampers respectively are individually adjustable. To achieve balance in the room when the duct pressures in the supply air and extract air ducts are not the same, the user can easily adjust the flows via the room thermostat.

Automatic Control

When the user leaves the room or withdraws the key card from the card reader, the controller automatically decreases the supply air and the extract air to a low rate of airflow and the system returns to the auto mode. The valve actuators for the cooling and heating water circuits respectively are controlled in this position in response to the status of the other sensors in the room, but with a greater permissible differential, so-called energy saving mode. See Table 2 for possible operating conditions.

Flow boost in the event of rapid changes in temperature

When the difference between the present value of the temperature and the setpoint exceeds 2 K, the controller sets the air dampers to the high airflow setting to increase heating or cooling capacity. When the difference has dropped to a level below the preset default value, the air dampers return to the normal flow setting.

The temperature difference can be set to another value via the room thermostat. The user can completely disable the flow boost function, if required.

Operating Mode

The various operating conditions of the controller are shown in Table 2. The various operating conditions are based on occupant presence in the room and the status of the window contact and condensation sensor. According to each operating condition, the controller controls the airflow, cooling and heating until the user manually sets the airflow or temperature. The airing function or flow boosting function in progress (see below) are exceptions from the operating conditions specified in Table 2.

Data Communication

The control unit has a built-in communication port that enables connection to an RS 485 network with ModBus for supervising and override control via a building supervision system..

CONDUCTOR W1 in a Nutshell

The CONDUCTOR consists of:	Digital controller, Room unit, thermo-electrical actuators, valves, cables and accessories
Control function:	PI
Power supply:	24 V AC
Inputs:	Condensation sensor Presence detector Window contact External temperature sensor
Outputs:	Valve actuator (max 72 VA) Damper actuator (max. 25 VA) Signal to external relay
Communication:	Room unit (wireless or via RJ12 cable) ModBus RTU (RJ12)

Operating Mode

The various operating conditions of the controller are shown in Table 2. The operating modes are based from status of occupancy, window contact and condensation sensor. According to each operating condition, the controller controls the airflow, cooling and heating until the user manually sets the temperature and/or the airflow.

The normal case is described in Case C: Occupancy, no condensation or open window. Control is then completely normal and controls the airflow, heating or cooling in order to maintain the right temperature in the room.

The airflow is controlled to decrease when there is no occupant in the room and the temperature control function switches to the economy mode. In the economy mode, the dead band is increased to $\pm 2K$ (it is normally $\pm 0.5K$).

If the controller receives a signal indicating that condensation has formed, the cooling valve closes and if the window contact indicates an open window, the heating control function switches over to the frost protection mode. In the frost protection mode, the setpoint is set to a lower value (normally 10°).

Table 2. CONDUCTOR W3 Operating Mode

Mode	Condensation	Occupancy	Window	Airflow	Cooling	Heating
A	No	No	Closed	Low	Economy	Economy
B	Yes	No	Closed	Low	Off	Economy
C	No	Yes	Closed	Normal	Normal	Normal
D	No	No	Open	Low	Off	Frost protection
E	Yes	Yes	Closed	High	Off	Normal
F	Yes	No	Open	Low	Off	Frost protection
G	No	Yes	Open	Low	Off	Frost protection
H	Yes	Yes	Open	Low	Off	Frost protection

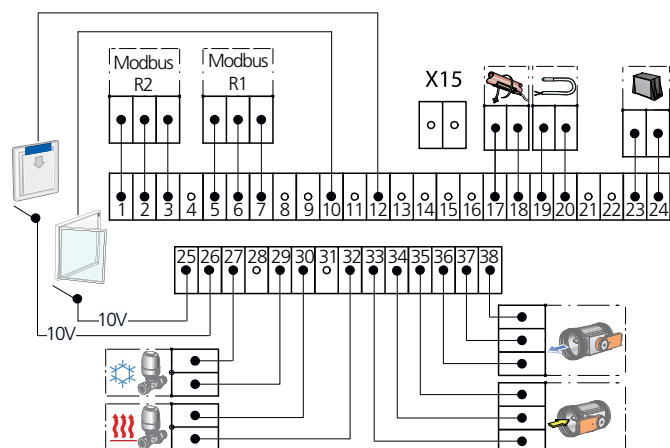


Figure 3. CONDUCTOR W3 Wiring Diagram.

MODBUS RS2	1	Data (B)
	2	Data (A)
	3	Earth
MODBUS RS1	5	Data (B)
	6	Data (A)
	7	Earth
Condensation sensor	17	Resistance
	18	
Temperature detector	19	KTY
	20	
Transformer	23	+ 24V AC
	24	-G0
Window contact	25	10V
	10	10V
Card reader	26	10V
	12	10V
Valve actuator, cooling	27	-G0
	29	+24V
Valve actuator, heating	30	-G0
	32	+24V
Damper, supply air	33	-G0
	34	0-10V
	35	+24V
Damper, extract air	36	-G0
	37	0-10V
	38	+24V

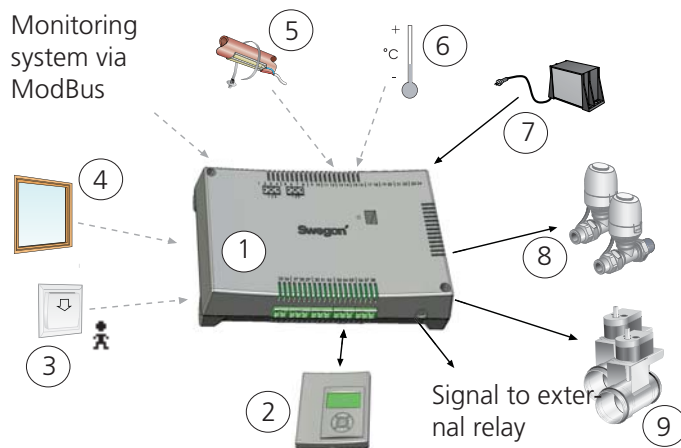


Figure 4. CONDUCTOR W3: Integral Components

- | | |
|--|-----------------|
| 1 Controller | Conductor RE |
| 2 Room unit | Conductor RU |
| 3 Key card/presence detector | SYST SENSO/KSOB |
| 4 Window contact | |
| 5 Condensation sensor | SYST CG |
| 6 External temp. sensor | CONDUCTOR T-TG |
| 7 Transformer | SYST TS-1 |
| 8 Valve actuator | LUNA a AT-2 |
| 9 Ventilation damper incl. damper actuator | CRTc 100-2 |

Technical Description

CONDUCTOR W4 – Situation-adapted, demand control of air, cooling energy and heating for maximum energy saving.

CONDUCTOR W4 is an optimized application for controlling waterborne cooling and heating in combination with supply air. The application is foremost developed for conference rooms however it can also be used for other types of rooms such as offices and hotel rooms. Since the percentage of occupancy in conference rooms is relatively low while the number of persons who attend meetings varies from meeting to meeting, a situation-adapted climate system is required for providing a healthy room climate while minimizing the consumption of energy. Since needs differ from case to case, CONDUCTOR W4 offers optional cooling step sequences. The user has the option of first using air to cool the room and then adding waterborne cooling if the need arises. The user can also opt to let chilled water cool the air first and then increase the airflow if the need arises.

Adapting to the Situation

- The presence detector continuously checks whether someone is in the room and adjusts the airflow between the preset min. flow and the occupancy flow.
- The CO₂ sensor continuously measures the air quality in the room. When the room is occupied, the controller variably adjusts the airflow between the preset occupancy flow and the max. permissible flow in order to supply a sufficiently high airflow for the current number of occupants.
- The pressure sensor measures the static air pressure on the supply and extract air sides. The pressure reading is used both for balancing the supply and extract air and for controlling the damper blade positions.
- The condensation sensor located on the chilled water supply pipe senses any actual condensation precipitation. If any condensation has formed on surfaces, all the cooling valve actuators wired to the controller are closed in order to stop the precipitation of condensate. As this occurs, the controller increases the flow of supply air in order to compensate the loss of capacity until condensation precipitation has ceased and waterborne cooling can be resumed.
- Window contacts can be wired to the system for sensing whether a window is open or closed. If a window should prove to be open, the controller adapts the system so that cooling, heating and ventilation is switched off in order to avoid unnecessary energy losses. If someone leaves a window open during a cold winter night, for instance, the system has a built-in frost protection function that causes the heating to start up if the room temperature drops below 10°C.

Energy Saving Control

CONDUCTOR W4 can be optimized for the relevant room by configuring desired airflows while the system is operating in the min. airflow, occupancy flow and max. airflow mode. These settings are based on the climate and energy usage of the room.

- The min. flow is set to the desired airflow when there is no occupant present in the room. The setting range is between 0 l/s and at most the value required as the normal airflow rate when the premises are occupied. As standard, this value is set to 20% of the occupancy airflow.
- Set the occupancy airflow to the initial position desirable when an occupant is detected. This flow should be set to suffice for relatively few persons. As an example, airflow sufficient for 2 persons can be selected in a room for 10 persons.
- Set the max. permissible airflow to the design airflow required when the room is full.

The control principle for Application W4 is that if no one is present, only a small volume of supply air is discharged so that the air will feel fresh when someone first enters the room. When the system detects occupancy, the airflow is increased to the preset occupancy airflow rate. The CO₂ sensor continuously measures the air quality. If the CO₂ level remains below the preset max. permissible value (800 ppm as standard) the airflow will be kept constant at the occupancy flow setting. If the occupancy flow is not sufficient for keeping the CO₂ level below the max. permissible value, the airflow will be variably increased and will adjust to the flow that is sufficient for ensuring the required air quality. Since a conference room most often is not occupied to capacity, there is seldom any need for the system to reach the max. permissible airflow. This control principle makes it possible to save energy both when the premises are occupied and when they are unoccupied.

Optional Sequences

Since needs differ from case to case, CONDUCTOR W4 has been developed with optional cooling step sequences.

Water first/then air

When the room is occupied, the room temperature is first regulated mainly by means of waterborne cooling. If waterborne cooling is not enough, the air volume is variably increased until the room air reaches the required room temperature. The air volume is regulated at the same time according to the CO₂ level. If the CO₂ level should exceed the preset max. permissible value, the controller will increase the airflow regardless of whether this is needed for regulating the room temperature for the purpose of ensuring proper air quality. If the required room temperature is achieved, the waterborne cooling circuit is closed until a new need for cooling arises.

Air first/then water

When the room is occupied, the room temperature is first regulated mainly by increasing the airflow. The airflow is variably increased until the room air reaches the required room temperature. If the max. permissible airflow is reached and the room temperature still does not reach the required level, the waterborne cooling system is started up in order to increase the cooling capacity. When the required room temperature is reached, the waterborne cooling system is switched off and the temperature is again solely controlled by the supply air. The air volume is regulated at the same time according to the CO₂ level. If the CO₂ level should exceed the preset max. permissible value, the controller will increase the airflow regardless of whether this is needed for regulating the room temperature for the purpose of ensuring proper air quality.

Manual Control

Although the CONDUCTOR W4 is an intelligent and to a great extent automatic room control equipment, it is possible to manually control the room climate. This can be done by means of the room thermostat which wirelessly (or via a wired connection) communicates with the controller. The clear display in combination with a clear and user friendly key pad enables the user to easily change the room temperature and airflow.

Adaptable commissioning

CONDUCTOR W4 does not require commissioning other than the setting of a few parameters entered from the hand-held micro terminal. The adaptive commissioning feature is made possible by the pressure sensor which is part of the system. By measuring the static pressure at appropriate reference points the controller is continuously updated with readings of the current pressure in the comfort modules and the duct pressure downstream of the extract air register. Only the transmission of current pressure drop constants via the room thermostat to the controller is required in order to find out which airflow is being distributed to the room. The controller computes which pressure represents the right airflow and accordingly adjusts the damper blade angle settings until the correct pressure and thus the airflow to the room is achieved.

Simplified commissioning is an obvious advantage, but there are also other benefits. One important benefit is that possible pressure variations in the duct system will not affect the preset airflows since the damper blade angle settings are independent and are only controlled in response to the values transmitted by the pressure sensors.

Data Communication

The control unit has a built-in communication port that enables connection to an RS 485 network with Modbus RTU for supervision and override control via a building supervision system.

Operating mode

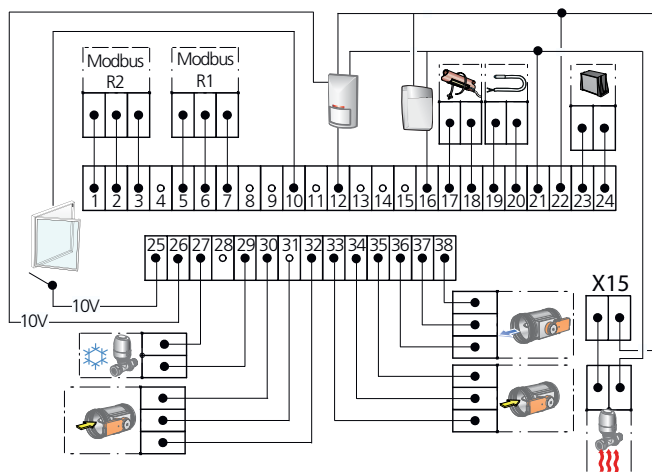
The various controller operating conditions are shown in Table 3. The operating conditions are based on the status on the presence sensor, window contact and condensation sensor and CO₂ sensor. According to each operating condition, the controller controls the airflow, cooling and heating until the user manually sets the temperature and/or the airflow. The airflow is controlled to a lower setting if there is no occupant in the room and the temperature is controlled for regulation in the economy mode. If the system is operating in the economy mode, the dead band is increased to +2K (in the normal mode, it is +0.5K). If the controller receives a signal indicating that condensation has formed, the cooling valve closes and if the window contact indicates an open window, the heating control function switches over to the anti-frost protection mode. The setpoint is set to a lower value (normally 10°) if the anti-frost protection function is enabled.

CONDUCTOR W4 in a Nutshell

The CONDUCTOR consists of:	Digital controller, Room unit, thermo-electrical actuators, valves, motor-driven dampers, sensors, cables and accessories
Control function:	PI
Power supply:	24 V AC
Inputs:	Condensation sensor, presence detector Window contact, CO ₂ sensor. Pressure sensor, External temperature sensors
Outputs:	Valve actuator, cooling (max. 72 VA) Valve actuator, heating (max. 72 VA) Damper actuator (max. 25 VA)

Table 3. CONDUCTOR W4 operating mode

Mode	Kondens	Occupancy	Window	Carbon dioxide	Airflow	Cooling	Heating
A	No	Yes	Closed	Under	Normal	Normal	Normal
B	No	No	Closed	Under	Low	Economy	Economy
C	No	Yes	Open	Under	Closed	Closed	Frost protection
D	Noj	No	Open	Under	Closed	Closed	Frost protection
E	Yes	Yes	Closed	Under	High	Closed	Normal
F	Yes	No	Closed	Under	Low	Closed	Economy
G	Yes	Yes	Open	Under	Closed	Closed	Frost protection
H	Yes	No	Open	Under	Closed	Closed	Frost protection
I	No	Yes	Closed	Over	High	Normal	Normal
J	No	No	Closed	Over	Low	Economy	Economy
K	No	Yes	Open	Over	Closed	Closed	Frost protection
L	No	No	Open	Over	Closed	Closed	Frost protection
M	Yes	Yes	Closed	Over	High	Normal	Normal
N	Yes	No	Closed	Over	Low	Economy	Economy
O	Yes	Yes	Open	Over	Closed	Closed	Frost protection
P	Yes	No	Open	Over	Closed	Closed	Frost protection



Figur 5. CONDUCTOR W4 Wiring Diagram.

MODBUS RS2	1	Data (B)
	2	Data (A)
	3	Earth
MODBUS RS1	5	Data (B)
	6	Data (A)
	7	Earth
Condensation sensor	17	Resistance
	18	
Temperature detector	19	KTY
	20	
Valve actuator, heating	21	+24V
	22	X15 -G0
Transformer	23	+ 24V AC
	24	-G0
Window contact	25	10V
	10	10V
Presence detector	26	10V
	12	0-10V
	21	+24V AC
	22	-G0
Valve actuator, cooling	27	-G0
	29	+24V
	30	-G0
Damper 2, supply air	31	0-10V
	32	+24 V
	33	-G0
Damper 1, supply air	34	0-10V
	35	+24V
	36	-G0
Damper, extract air	37	0-10V
	38	+24V
	16	0-10V Signal
CO ₂ sensor	21	+24V AC
	22	-G0

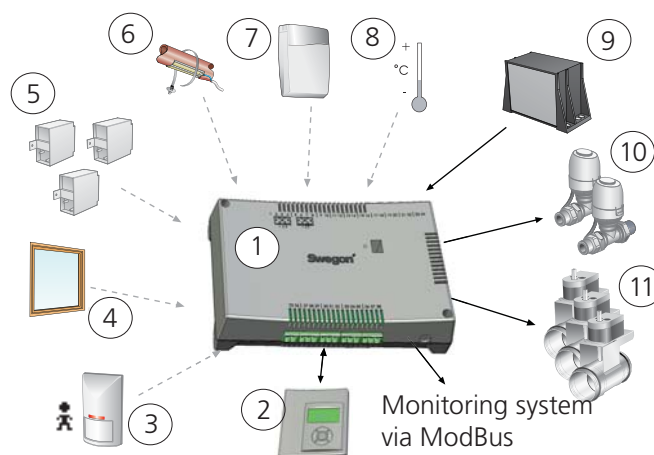


Figure 6. Conductor W4: Integral Components

- | | | |
|----|---|-----------------------------------|
| 1 | Controller | Conductor RE |
| 2 | Room unit | Conductor RU |
| 3 | Presence sensor | DETECT Occupancy |
| 4 | Window contact | |
| 5 | Pressure sensor | SYST PS |
| 6 | Condensation sensor | SYST CG |
| 7 | CO ₂ sensor | DETECT Quality |
| 8 | External temp. sensor | CONDUCTOR T-TG |
| 9 | Transformer | SYST TS-1 |
| 10 | Valve actuator | LUNA a AT-2 |
| 11 | Ventilation damper
incl. damper actuator | CRTc (aaa)-2
(aaa = dimension) |

Technical Data

CONDUCTOR RE Controller

Designation:	CONDUCTOR RE (W1, W3 alt. W4)
Storage temperature:	-40 to +80 °C
Operating temperature:	-20 to + 50 °C
Degree of protection:	IP 32
Dimensions:	121 × 193 × 44 mm
Power supply:	24 V AC ±10 %
Power consumption:	1 VA
Control function:	PI
P-band, cooling/heating increments:	1 K
Dead band, room occupancy:	1 K
Dead band, no occupancy:	4 K (W3 and W4 only)
Anti-frost protection:	10 °C
Valve exercising:	Once/48 h period (fully open for 6 min.)
Mounting:	Mounting hole in enclosure or against DIN rail
Connections:	Wiring terminal for 2.5 mm ² multi-wire cable
Data Communication:	Modbus RTU
Wireless Communication:	433 MHz band radio modem with room thermostat
Inputs:	
Condensation sensor:	Resistance
Temperature sensor:	Resistance
Presence detector/Key card (W3 and W4 only):	No occupancy/NO/NC (optional), default = NC for occupancy
Window contact: (W3 and W4 only)	No occupancy/NO/NC (optional), default = NC for closed window
The CO ₂ sensor: (W4 only)	NP / Enabled
Modular contact:	RJ12-6pole for connecting up to the room thermostat RJ12-6pole for connecting up to the ModBus pressure sensor (max. 3 sensors)

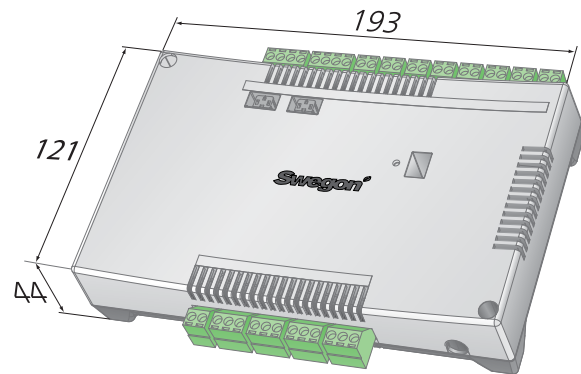







Figure 7. CONDUCTOR RE controller

Outputs:

Actuator, heating: (W1 and W3)	24 V AC, PWM (on/off or 0-10V) max load: 72 VA = 12 actuators
Actuator, heating: (W4 only)	24 V AC (on/off) Max load 72 VA = 12 actuators
Actuator, cooling:	24 V AC, PWM (on/off or 0-10V) max load: 72 VA = 12 actuators
Supply air damper 1: (W3 and W4 only)	0–10 V DC max load 25 VA = 5 actuators.
Supply air damper 2: (W4 only)	0–10 V DC max load 25 VA = 5 actuators.
Extract air damper: (W3 and W4 only)	0–10 V DC max load 25 VA = 5 actuators.
Relay output:	W3: Signal for occupancy W4: Output signal, heating

CONDUCTOR RU room thermostat

Designation:	CONDUCTOR RU
Temperature, storage:	-40 to +80 °C
Operating temperature:	0 to +50 °C
Degree of protection:	IP 20
Dimensions:	86 × 100 × 32 mm
Power supply:	12 V DC, 4 size AAA batteries, alt. Voltage from a modular cable via controller
Actual value, range:	+10 till +32 °C (on delivery set to +22°C)
Mounting:	Against a wall or 70 mm standard electrical box, not exposed to direct sunlight
In-operation LED, temp.:	Cooling load:  Heating load: 
In-operation LED, air:	Low flow:  1 LED lit (W3 and W4 only) Normal flow:  2 LEDs lit (W3 and W4 only) High flow:  3 LED lit (W3 and W4 only)

Inputs:

RJ12-6pole modular contact for connecting up to the controller

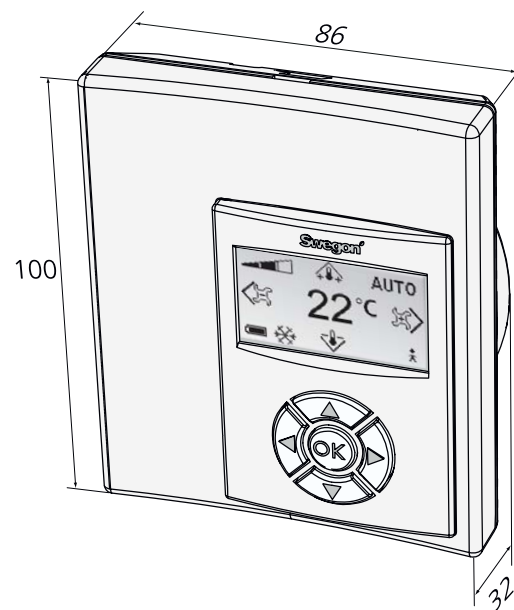


Figure 8. CONDUCTOR RU room unit

Ordering Key

Ordering key, Control equipment

Controller	CONDUCTOR RE	aa
W1, W3 or W4		

Room unit	CONDUCTOR RU
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Ordering Key, Accessories

Valve actuator	LUNA a AT-2
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Valve	SYST VD 115-CLC
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Ventilation damper incl. damper actuator (W3 and W4 only)	CRTc	aaa-	2
Dim. 125 and 160			

Condensation sensor	SYST CG
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Presence detector	DETECT Occupancy
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CO₂ sensor	DETECT Quality
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Pressure sensor	SYST PS
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Transformer	SYST TS-1
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External temperature sensors	CONDUCTOR T-TG
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Adapter, actuator/valve	LUNA a T-VA-	aa
To valve type:		
32 = Tour & Andersson		
39 = Oventrop		
50 = Honeywell, Reich, MNG, Böhnisch (H), Cazzaniga		
54 = Certain MMA valves		
59 = Danfoss RAV/L		
72 = Danfoss RAV		
78 = Danfoss RA		
80 = Siemens, etc.		

Specification Text

Example of a specification text conforming to VVS AMA Standard.

Swegon's control equipment for waterborne climate units, type CONDUCTOR W1, W3 or W4, with the following functions:

- Designed for room control via ModBus
- Wireless room thermostat with digital display
- Programmable controller
- Individual temperature control
- Indication of the present airflow (W3 and W4 only) and heating/cooling load
- PWM Control function (24 V AC) or 0–10 V DC
- Controls heating and cooling in sequence
- Controls supply and extract airflow (W3 and W4 only)
- Automatic conditioning of valves
- Electro-thermal actuator, two-position (on/off) with clear position indicator
- "First open" function for simple filling, pressure testing and venting the water system
- Inputs for condensation sensor, external window contact and external temperature sensor.
- Inputs for presence detector or key card reader (W3 and W4 only)
- Inputs for CO₂ sensor and pressure sensor (W4 only)
- Occupancy control by external relay (W3 only)

Delivery

- The valves are delivered to the plumbing contractor for installation in the system.
- The room controller is delivered to the electrical contractor, systems contractor or other contractor for installation to the unit junction box.
- All electrical installation, including wiring the actuators, motorised dampers and various sensors is to be carried out by the electrical contractor or the systems contractor.
- The electrical contractor or the systems contractor provides a 230V outlet for the transformer and a fitted mounting box for the temperature sensor and possible external cables.

Accessories

- LUNA AT-2 Valve actuator, xx pcs
- SYST VD 115-CLC Valve, xx pcs
- Ventilation damper incl. CRTc 100-2 damper actuator, xx pcs
- SYST CG Condensation sensor, xx pcs
- SYST TS-1 Transformer, xx pcs
- LUNA a T-VA-aa Adapter, actuator/valve, xx pcs
- CONDUCTOR T-TG external temperature sensor
- DETECT Occupancy presence detector, xx pcs
- DETECT Quality CO₂ sensor, xx pcs
- SYST PS Pressure sensor, xx pcs

Specify the quantity separately or with reference to the drawing.