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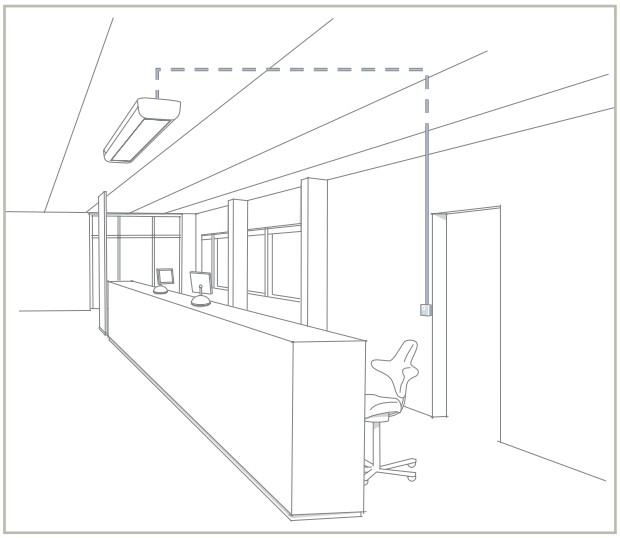
ROOM CONTROLLER STRA-24

TECHNICAL CATALOUGE AND INSTALLATION

STRA-24 ROOM CONTROLLER FOR CHILLED BEAMS



DESCRIPTION

STRA-24 is a pre-programmed room controller intended to control the temperature and the CO_2 level in rooms. It is pre-programmed with communication and is intended for use in premises with high comfort and low energy demands, e.g. offices, schools, shopping centres, airports, hotels and hospitals.

The STRA-24 is able to optimise energy consumption in rooms depending on different parameters: occupancy, CO_2 level, outside conditions (free cooling feature) and timetable.

The thermal actuator of the water coils (heating and cooling) are controlled by the STRA-24 through 24 V PWM signal or 0-10 V outputs. The linear actuator of the outlet induction system (WEGA and NOVA chilled beams equipped with Pi Energy Control) is controlled through a 0-10 V output.

The room controller STRA-24 will manage the risks of condensation in the room thanks to a condensation sensor located over the piping or a windows contact.

KEY FEATURES

- Temperature control
- CO_2 level control
- Free cooling feature
- Occupancy detection
- Condensation risk detection
- Modbus RTU or BACnet MS/TP
- Mode selection (normal, boost or energy saving mode)

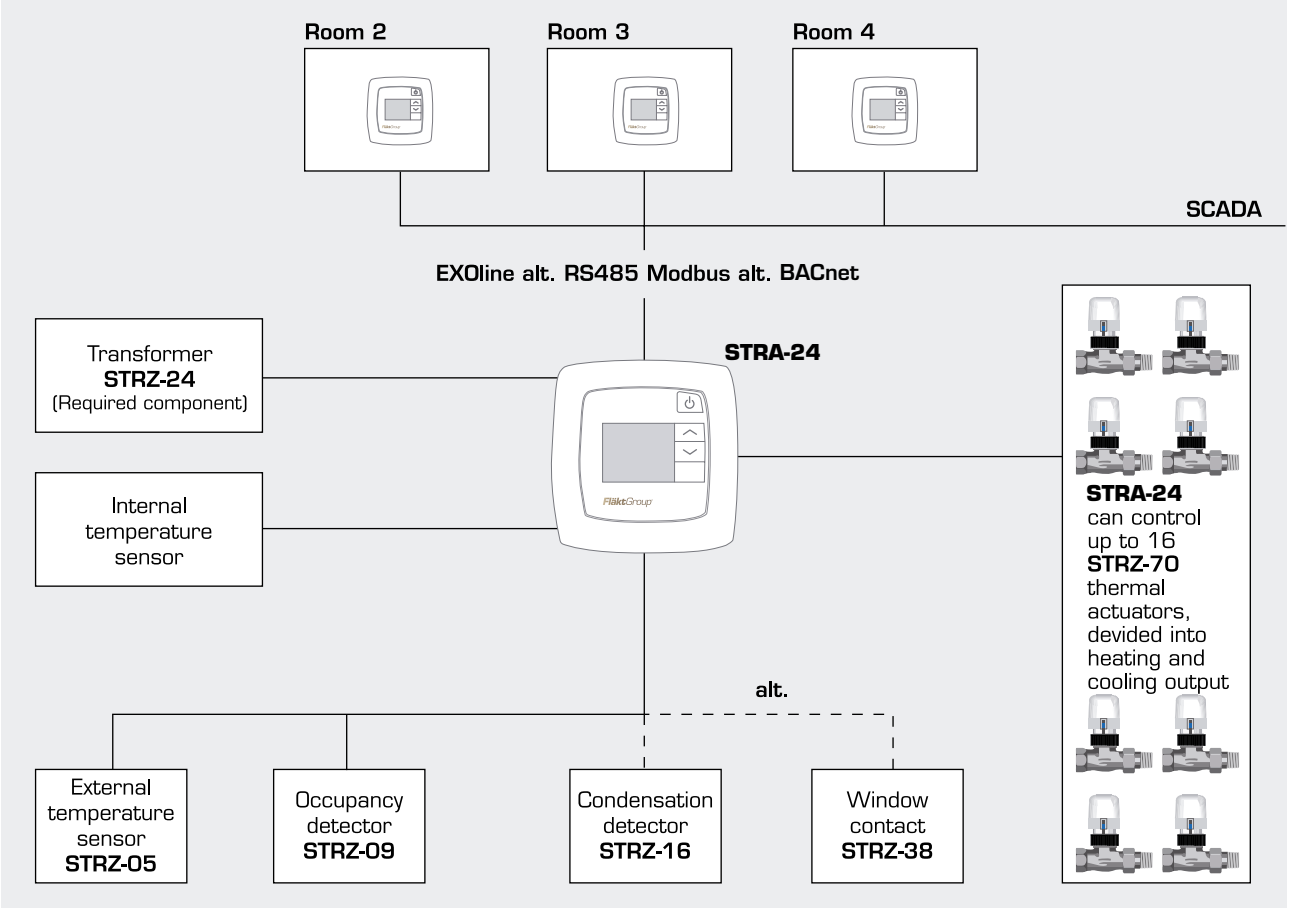
SPECIFICATIONS

- Supply voltage, 18-30 V AC, 50-60 Hz
- Built-in temperature sensor
- Display
- Linear control for nozzle configuration
- 5 different pre-programmed control sequences for chilled beam applications
- Inputs: external room sensor, CO_2 sensor, occupancy sensor, condensation detector alt. windows contact
- Outputs for thermal actuator: 24V AC or 0 - 10 V
- Communication via RS485: Modbus RTU, BACnet MS/TP or Exoline
- Easy installation thanks to separate basic plate for cable connections

PRODUCT CODE EXAMPLE

Room controller for chilled beams STRA-24-00-0-00

APPLICATION EXAMPLE - TEMPERATURE CONTROL



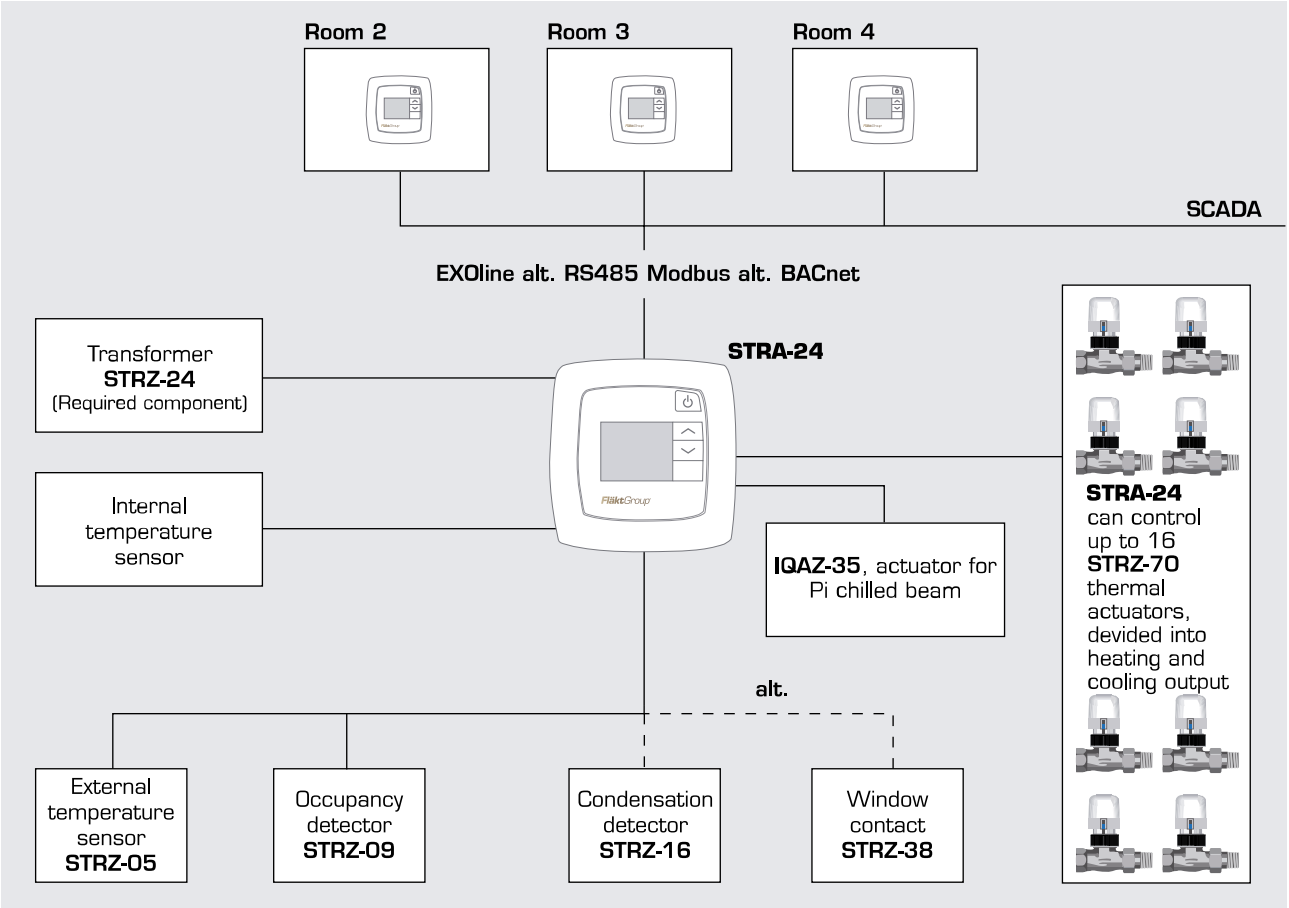
PURPOSE

- Control the temperature in the room thanks to the thermal actuators.

NOTE

- External sensor STRZ-05 may be used when the internal temperature sensor doesn't measure the average room temperature (because of STRA-24 location).
- Condensation sensor and window contact cannot be connected together.
- Adapter may be required, if another thermal actuator than STRZ-70 is used.

APPLICATION EXAMPLE - TEMPERATURE CONTROL WITH ENERGY SAVING MODE



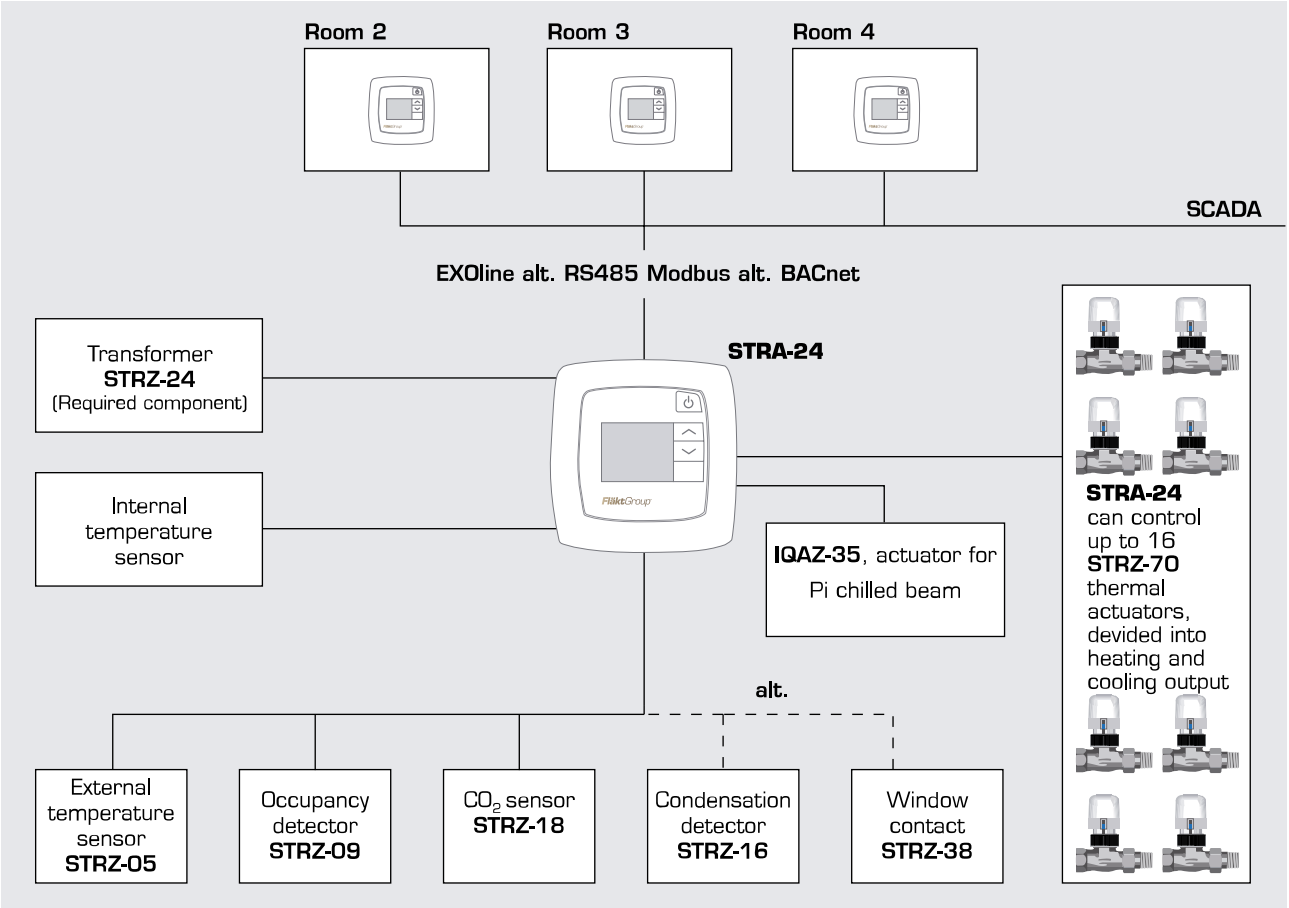
PURPOSE

- Control the temperature in a closed room thanks to the thermal actuators and/or motorized nozzles of primary air (if free - cooling is configured).
- Save the energy when in unoccupied mode thanks to the occupancy detector reducing the primary air

NOTE

- External sensor STRZ-05 may be used when the internal temperature sensor doesn't measure the average room temperature (because of STRA-24 location).
- Condensation sensor and window contact can't be connected together.
- Adapter may be required, if another thermal actuator than STRZ-70 is used.

APPLICATION EXAMPLE - CO_2 LEVEL AND TEMPERATURE CONTROL WITH ENERGY SAVING MODE



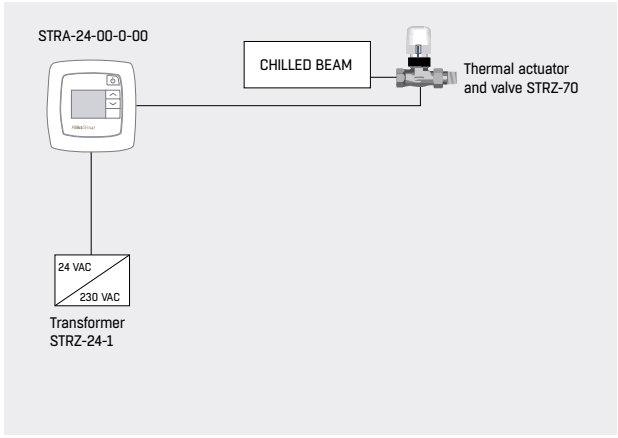
PURPOSE

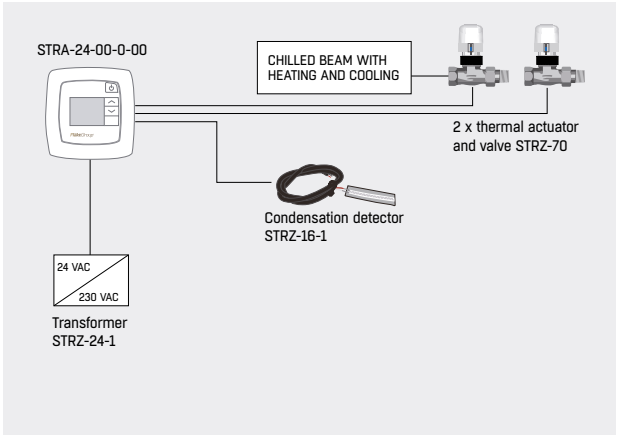
- Control the CO_2 level in a landscape office or in a meeting room thanks to motorized nozzles of primary air
- Control the temperature in a closed room thanks to the thermal actuators and/or motorized nozzles of primary air (if free - cooling is configured).
- Save the energy when in unoccupied mode thanks to the occupancy detector reducing the primary air

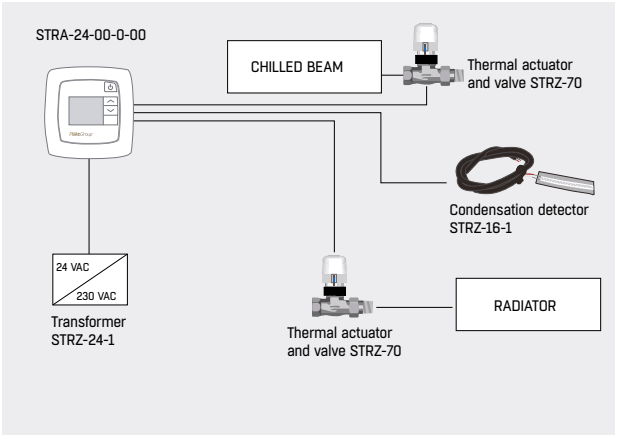
NOTE

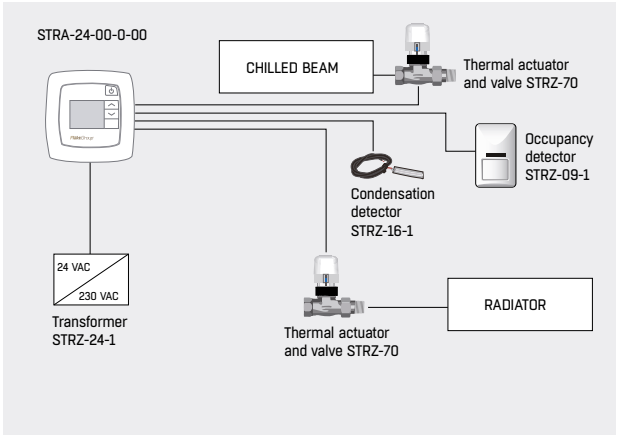
- External sensor STRZ-05 may be used when the internal temperature sensor doesn't measure the average room temperature (because of STRA-24 location).
- Condensation sensor and window contact can't be connected together.
- Adapter may be required, if another thermal actuator than STRZ-70 is used.

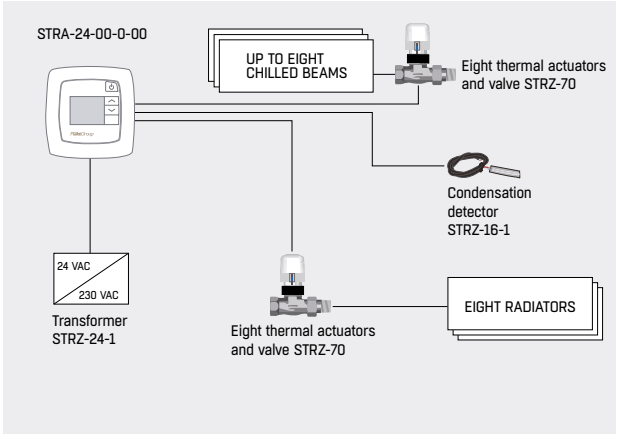
APPLICATION EXAMPLES - MISCELLANEOUS











TECHNICAL DATA

Supply voltage	18 - 30 V AC, 50 - 60 Hz
Internal consumption	2.5 VA
Ambient temperature	0 - 50°C
Storage temperature	–20 - +70 °C
Ambient humidity	Max 90% RH
Protection class	IP20
Communication over RS485	Modbus RTU BACnet MS/TP EXOline
Communication settings	8-bit, 1 or 2 stop bits. Odd, even (FS) or no parity.
Communication speed	9600 19200 38400 76800 (only BACnet)
Built-in temperature sensor	NTC type, measuring range, 0 - 50 °C, measurement accuracy ±0.5 °C at 15 - 30 °C
Material casing	Polycarbonate, PC
Weight	110 g
Cabel dimension less than	0.75 mm^2 shall not be used for connection of components to room controller STRA

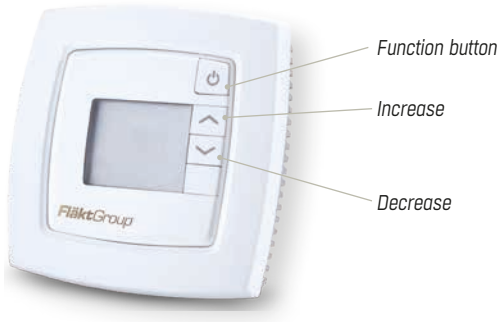
INPUTS

External room sensor	PT1000 sensor, 0 - 50 °C. A suitable sensor is Fläkt Woods STRZ-05.
Occupancy detector	Closing potential-free contact. A suitable occupancy detector is Fläkt Woods STRZ-09.
CO_2 sensor	STRZ-18-1-1 CO_2 sensor (0 - 10V).
Condensation detector alt. Window contact	Fläkt Woods condensation detector STRZ-16 alt. window contact STRZ-38 resp. potential-free contact

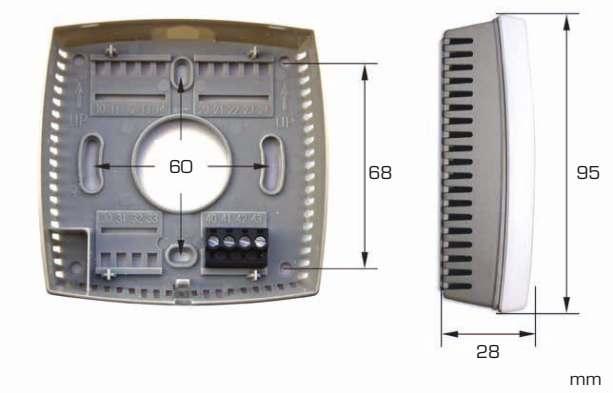
OUTPUTS

Forced ventilation	24 V AC actuator, max. 0.5 A
Valve actuator alt. themaL actuatoror	2 outputs
Valve actuator	0 - 10 V DC, max. 5 mA
Thermal actuator	24 V AC, max. 2.0 A
Control	Heating or cooling
Exercise	FS = 23 hour intervals
Terminal blockS	Lift-type for max. cable cross-section 2.1 mm^2

DISPLAY



DIMENSIONS



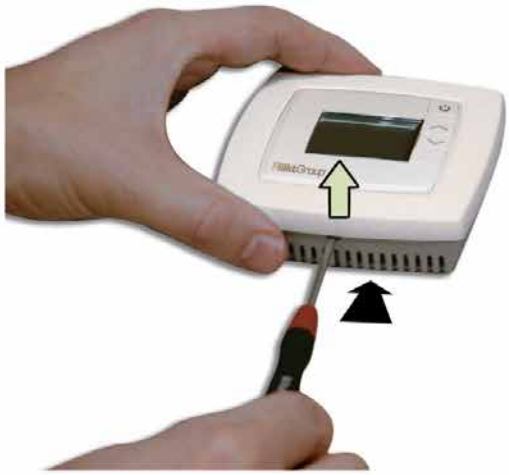
This product conforms with the requirements of European EMC standards CENELEC EN 61000-6-1 and EN 61000-6-3, and the requirements of European LVD standard IEC 60 730-1. It carries the CE mark.

INSTALLATION

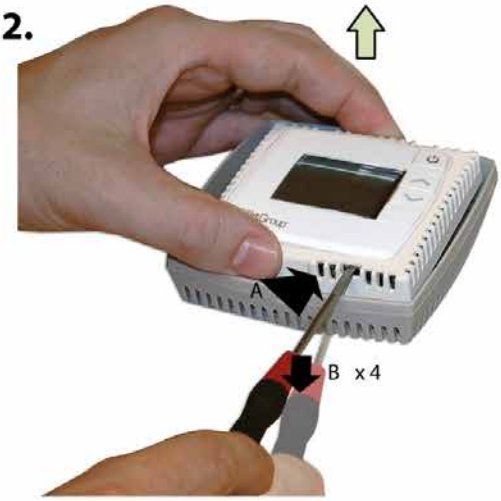
INSTALLATION INSTRUCTIONS

Follow local safety regulations when installing the product.

1.

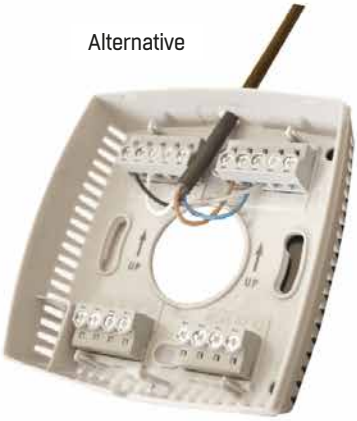


2.



3.

Alternative

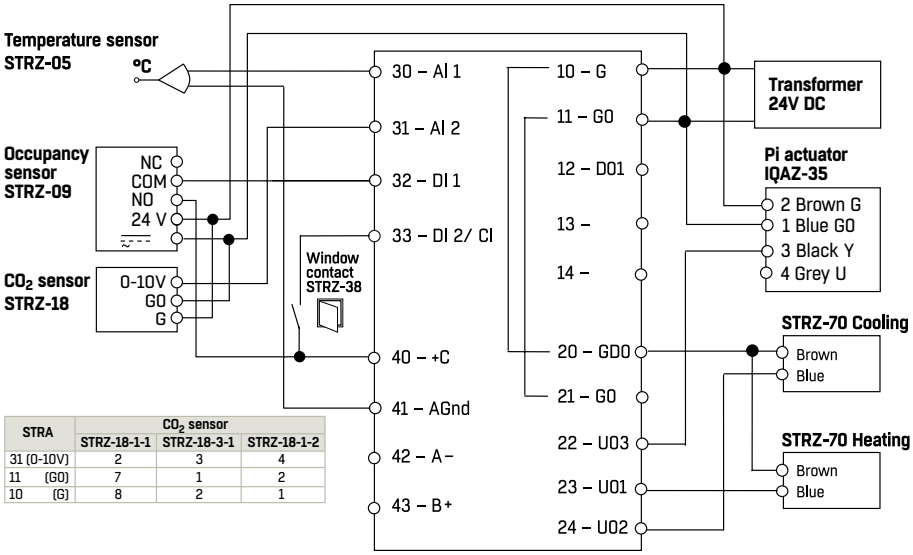


4.

5.

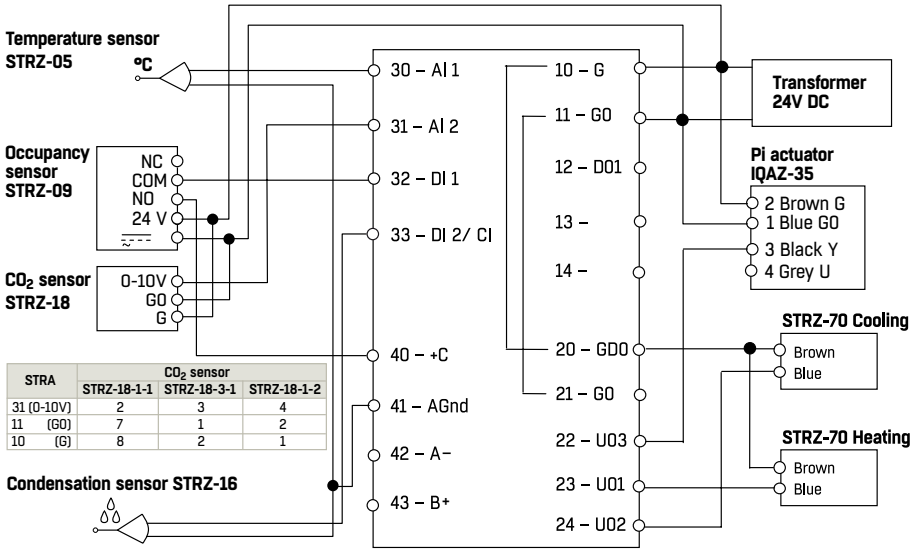
WIRING DIAGRAMS

CONNECTION DIAGRAM FOR STRZ-05, STRZ-18, STRZ-09, STRZ-70, IQAZ-23 AND WINDOW CONTACT STRZ-38

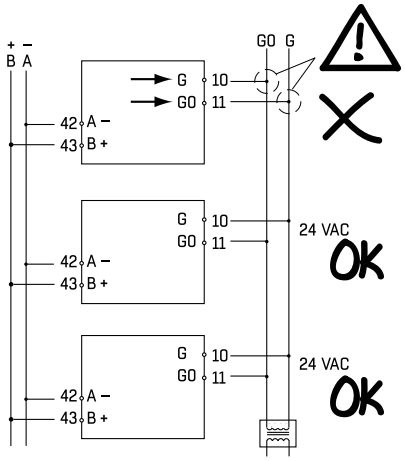


STRA	CO_2 sensor		
	STRZ-18-1-1	STRZ-18-3-1	STRZ-18-1-2
31 (0-10V)	2	3	4
11 (GO)	7	1	2
10 (G)	8	2	1

CONNECTION DIAGRAM FOR STRZ-05, STRZ-18, STRZ-09, STRZ-70, IQAZ-23 AND CONDENSATION SENSOR STRZ-16



STRA	CO_2 sensor		
	STRZ-18-1-1	STRZ-18-3-1	STRZ-18-1-2
31 (0-10V)	2	3	4
11 (GO)	7	1	2
10 (G)	8	2	1



CONTROLLER HANDLING, DISPLAY, FUNCTION BUTTON

CONTROLLER HANDLING

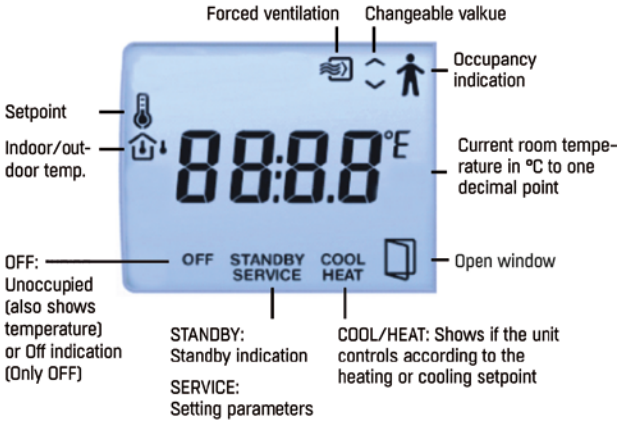
In Occupied mode, the controller operates from a heating setpoint (FS = 22°C), or a cooling setpoint (FS = 24°C) that can be changed using the INCREASE and DECREASE buttons.

Pressing on INCREASE increases the current setpoint by 0.5°C with each press up to the max. limit (FS = +3°C). Pressing on DECREASE decreases the current setpoint by 0.5°C with each press down to the min. limit (FS = -3°C).

Switching between heating and cooling setpoints is done automatically in the controller depending on the heating and cooling requirement.

DISPLAY

The display has the following indications:



FUNCTION BUTTON

By pressing the Function button for less than 5 seconds when the controller STRA-24 is in the preset operating mode (parameter 45, FS = 3 = Occupied), the controller changes the operating mode to Boost. If you press the button for less than 5 seconds when the controller is in Boost, it changes operating mode to the preset operating mode.

When the Function button is held pressed down for more than 5 seconds, the controller changes operating mode to "Unoccupied", regardless of the current operating mode. If you press the button for less than 5 seconds in Unoccupied mode, the controller returns to Boost (for 60 minutes, which is a preset time that can be changed though adjusting parameter 12).

OPERATING MODES FOR WEGA AND NOVA CHILLED BEAMS

- Bypass = Boost mode
- Occupied = Normal mode
- Unoccupied = Energy saving mode

WIRING

STRA-24 has been constructed to be as compact as possible. Therefore, the controller's communication input is not galvanically separated from the supply voltage. This means that it is important to keep G and G0 in order, as well as the communication input's A and B.
All units that share the same transformer and communication loop must use the same transformer-pole for G (terminal 10) and G0 (terminal 11).

On the communication loop the A-terminal (terminal 42) should only be connected to another A-terminal and the B-terminal (terminal 43) to another B-terminal. Otherwise, there is great danger of short-circuit with damaged components as a result.

Terminal	Designation	Function
10	G	Supply voltage 24 V AC
11	G0	Supply voltage 0 V
12 - 14		No function
20	GDO	24 V AC out common for DO. Internally connected to terminal 10, G.
21	G0	0 V common for UO. Internally connected to terminal 11, G0.
22	UO3	**Control output ventilation.** 3 put analog (FS). The valve actuator's 0 - 10 V control signal terminal is connected to terminal 22 and its supply terminals to terminals 10 and 11. Make sure that the reference pole G0 is connected to the correct terminal onthe actuator.
23	UO1	**Control of heating** For 0 - 10 V DC valve actuator, max 5 mA. The valve actuator's 0 - 10 V control signal terminal is connected to terminal 23 and its supplyterminals to terminals 10 and 11. Make sure that the reference pole G0 is connected to the correct terminal on the actuator. *alternatively* For 24 V AC thermal actuator, max 2,0 A (FS). The thermal actuator is connected between terminals 23 and 20, GDO.
24	UO2	**Control output cooling** For 0 - 10 V DC valve actuator, max 5 mA. The valve actuator's 0 - 10 V control signal terminal is connected to terminal 24 and its supply terminals to terminals 10 and 11. Make sure that the reference pole G0 is connected to the correct terminal on the actuator. *alternatively* For 24 V AC thermal actuator, max 2,0 A (FS). The thermal actuator is connected between terminals 24 and 20, GDO.
30	AI1	For external room sensor PT1000. Measuring range 0 - 50 °C. Connect sensor between terminal 30 and 41, AGnd.
31	AI2	For 0 - 10V CO_2 sensor, input signal.
32	DI1	Occupancy detector. Potential free contact is connected between terminal 32 and 40, +C. Closed contact indicates occupancy. Also see Occupancy detector section.
33	DI2/CI	Fläkt Woods STRZ-16 (FS) condensation detector. Connect the sensor between terminal 33 and 41, AGnd. *alternatively* Window contact DI). Connect potential free contact between terminal 33 and 40, +C. Closed contact indicates closed window.
40	+C	24 V DC out common for DI and UI (with digital function)
41	AGnd	Analogue earth, reference for AI and UI with analogue function)
42	A	RS485 communication A–
43	B	RS485 communication B+

OPERATING MODES

STRA-24 has five different operating modes. Through the Function button you are able to switch between three of them. These are set through the parameter menu (parameter 45) in the display. Occupied is the preset mode.

OFF

Operating mode OFF means that the controller is switched off, i.e. heating and cooling are disabled. However, the temperature may not drop below the set minimum temperature (parameter 6, FS = 8 °C). If it does, the controller will start heating. The background lighting on the display is not lit, and only OFF is shown in the display.

Airflow will be a non-presences airflow, V_0, which is set on the actuator.

UNOCCUPIED (ENERGY SAVING MODE)

Operating mode Unoccupied is an energy saving mode. It means that the room where the controller is placed is not used for an extended period of time, for example during evenings, nights or weekends. The controller is prepared to change the operating mode to Occupied if someone enters the room (occupancy detector is needed to use this feature). Both heating and cooling are disabled within a temperature interval with configurable min/max temperatures (parameter 4 respectively 5, FS min = 19 °C, max = 27 °C).

Airflow will be a non-presences airflow, V0, which is set on the actuator. However if the cooling water valve is fully open and there is still a need for more cooling, the airflow will increase to Vmin and then linearly up to V_{max} if required.

The background lighting on the display is not lit, but the current room temperature (or setpoint value depending on the configuration) is shown in the display. OFF is shown in the display for this operating mode as well.

STANDBY (ENERGY SAVING MODE)

Operating mode Standby means that the room is in an energy saving mode and is not used at the moment. This can be during evenings, nights, weekends etc. The room temperature is controlled around the applicable heating and cooling setpoint values, with an extended temperature interval (FS = ±3 °C).

Airflow will be a non-presences airflow, V_0, which is set on the actuator. However if the cooling water valve is fully open and there is still a need for more cooling, the airflow will increase to Vmin and then linearly up to Vmax if required.

For example, if the heating setpoint value is 22 °C and the cooling setpoint value is 24°C, the controller will allow the temperature in the room to be between 19 °C and 27 °C. Local adjustment of setpoint value via the display on STRA-24.

The background lighting on the display is lit (dimmed) and STAND-BY with the current room temperature (or setpoint value depending on the configuration) are shown in the display.

OCCUPIED (NORMAL MODE)

Operating mode Occupied means that the room is in use and is therefore in a comfort mode. The controller regulates the room temperature around a heating setpoint value and a cooling setpoint value (parameter 1 respectively 2, FS heating setpoint value = 22 °C, cooling setpoint value = 24 °C). Airflow will be on a presences airflow, V_{min}, which is set on the actuator. However if the cooling water valve is fully open and there is still a need for more cooling, the airflow will increase linearly from Vmin up to Vmax if required. The setpoint values can also be adjusted ±3 °C locally via the display, or via a central command.

The background lighting on the display is lit (dimmed), and the occupancy indication is shown (see the Display handling section). The current room temperature (or setpoint value depending on the configuration) is shown in the display.

BYPASS (BOOST MODE)

Operating mode Bypass means that the controller controls the room temperature in the same way as in operating mode Occupied. For the chilled beam this activates the output for forced ventilation and the air flow goes to Vmax airflow which is set on the actuator. After a configurable time (parameter 12, FS = 60 minutes) the controller automatically returns to the preset operating mode. Boost is normally activated when the Occupancy button is pressed or a central command. The operating mode is useful for example in conference rooms where many people are present at the same time during a limited period of time.

The background lighting on the display is lit (dimmed). The occupancy indication and the symbol for forced ventilation are shown. The current room temperature (or setpoint value depending on the configuration) is shown in the display.

ACTIVATION OF OPERATING MODES

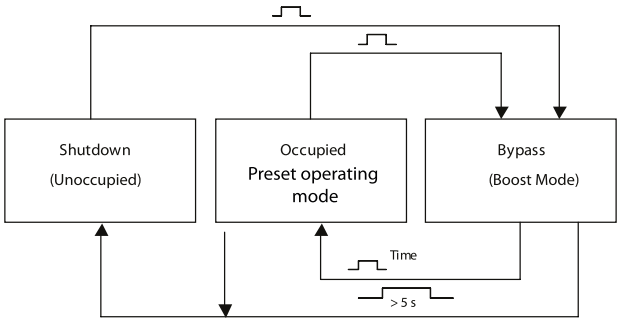
PRESET OPERATING MODE

Occupied is the preset operating mode. Configuration of desired operating mode is done in the parameter menu on the display (parameter 45). The operating mode is changed at following events:

- When the Occupancy button is pressed.
- Activation/deactivation of an occupancy detector.
- Via central control, for example central time control, central booking system etc.

FUNCTIONS

FUNCTION BUTTON



SHUTDOWN (OFF OR UNOCCUPIED)

When the Function button is held pressed down for more than 5 seconds, the controller changes operating mode to "Shutdown" that can be "Off" or "Unoccupied", regardless of the current operating mode. The activation of operating modes, Off or unoccupied can be configured via display. The factory setting is activating "Unoccupied".

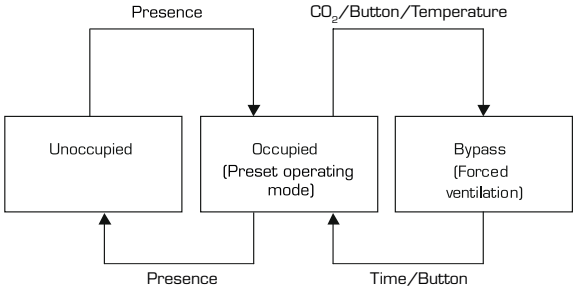
If you press the Function button for less than 5 seconds when the controller is in Shutdown or preset operating mode, the controller changes to Boost operating mode. If you press the button for less than 5 seconds when the controller is in Boost, it changes operating mode to the preset operating mode.

After a configurable time in Boost (FS = 60 minutes), the controller returns to the preset operating mode.

OCCUPANCY DETECTOR

For local control of the operating mode regarding presence in the room, an STRZ-09-1 occupancy detector is connected.

At occupancy control, parameter 45 should be changed from preset operating mode to 1 = Unoccupied and parameter 17 changed to 3. Then the function in illustration below is attained where the controller at activated occupancy detector shifts to the Occupied operating mode. When the occupancy detector is deactivated, the controller returns to Unoccupied operating mode (to attain energy efficiency).



PRIMARY AIRFLOW CONTROL

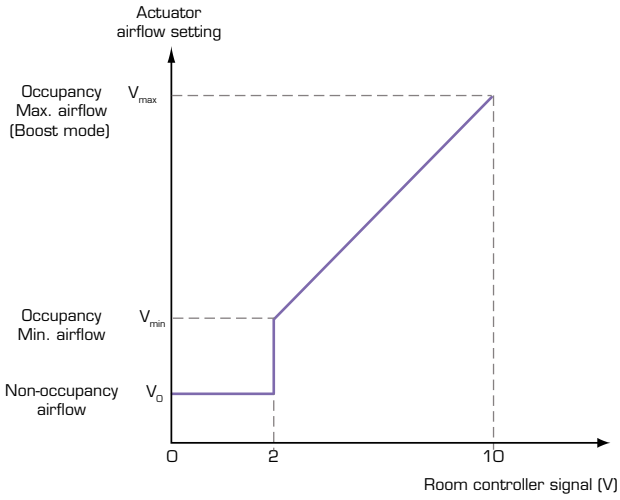
The room controller (STRA-24) uses 3 different airflow levels:

1. Energy Saving mode airflow – Used when the room controller is operating in Unoccupied mode or Off.
2. Normal airflow – Used when the room controller is operating in Occupied mode.
3. Boost airflow – Used when the room controller is operating in Standby mode or Boost mode.

Airflow setpoint values are set on the chilled beam actuator during the commissioning, corresponding to unoccupied room, minimum and maximum airflow levels for occupied room.

If presence detector is available, when the room controller detects no occupancy in the room, it sets the airflow on V_0. As soon as occupancy is detected in the room by the controller, chilled beam sets the airflow value on V_{min}.

Figure 1: Pi Function actuator



CONTROL STATES

The controllers can be configured for different control states/control sequences (Parameter 11, factory setting (FS) = 8 = Heating/Cooling with VAV-control and forced ventilation):

- Heating (U01)
- Heating/Heating (U01/U02)
- Heating/Cooling with change-over (U01)
- Heating/Cooling (U01/U02)
- Heating/Cooling with VAV-control and forced supply air function (U01/U02/U03)
- Heating/Cooling with VAV-control (U01/U02/U03)
- Cooling (U01)
- Cooling/Cooling (U01/U02)

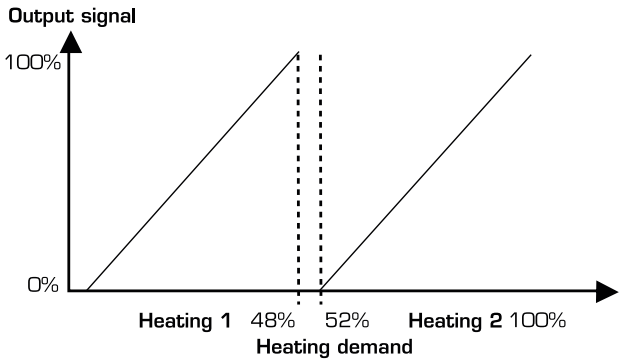
HEATING

In control state Heating, the unit is always a heating controller and controls according to the heating setpoint plus/minus the setpoint displacement. The setpoint can be adjusted in the display.

HEATING/HEATING

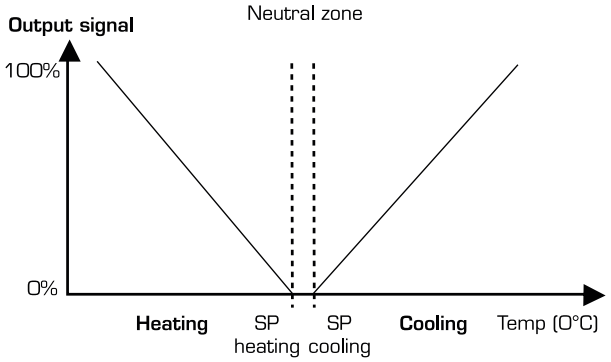
SPLIT OUTPUT SIGNAL

In control state Heating/Heating, the controller is always a heating controller and controls according to the basic heating setpoint plus the setpoint displacement. When the controller output signal reaches 50%, it is divided between two actuators. 0 - 48 % of the signal is sent to actuator 1 and 52 - 100 % of the signal is sent to actuator 2. See the figure below.



HEATING/COOLING

In control state Heating/Cooling, the controller functions as a heating controller when the room temperature is lower than the basic heating setpoint plus half the neutral zone. The neutral zone is the difference in temperature between the heating setpoint and the cooling setpoint. When the room temperature exceeds this limit, the controller becomes a cooling controller. There is a hysteresis of 0.1 °C when the controller changes from heating to cooling controller and vice versa. When the controller is heating, it regulates according to the basic heating setpoint plus the setpoint displacement, and when it is cooling according to the basic cooling setpoint plus the setpoint adjustment.



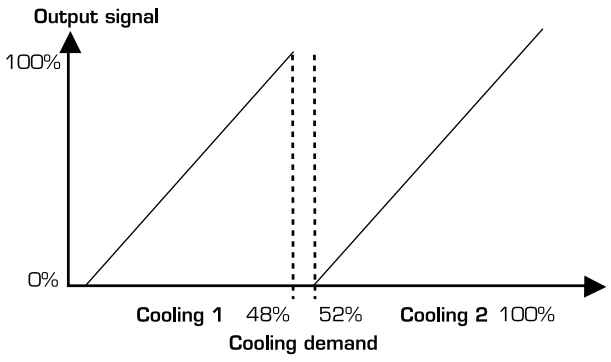
COOLING

In control state Cooling, the unit is always a cooling controller and controls according to the basic cooling setpoint plus the setpoint displacement.

COOLING/COOLING

SPLIT OUTPUT SIGNAL

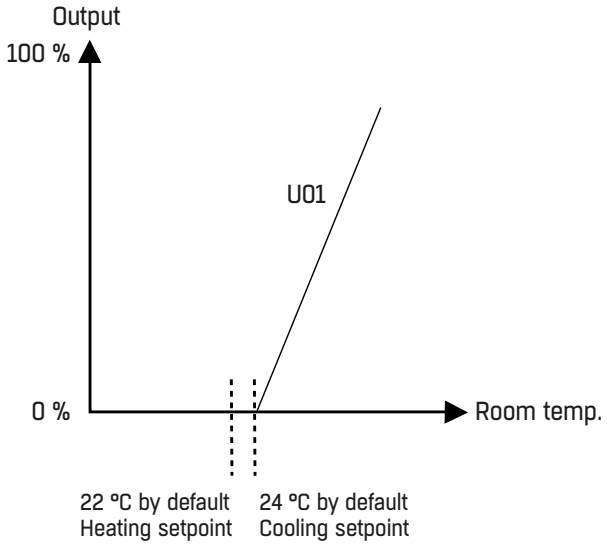
In control mode Cooling/Cooling, the controller always functions as a cooling controller and controls according to the basic cooling setpoint plus the setpoint displacement. When the controller output signal reaches 50%, it is divided between two actuators. 0 - 48% of the signal is sent to actuator 1 and 52 - 100 % of the signal is sent to actuator 2. See the figure below.



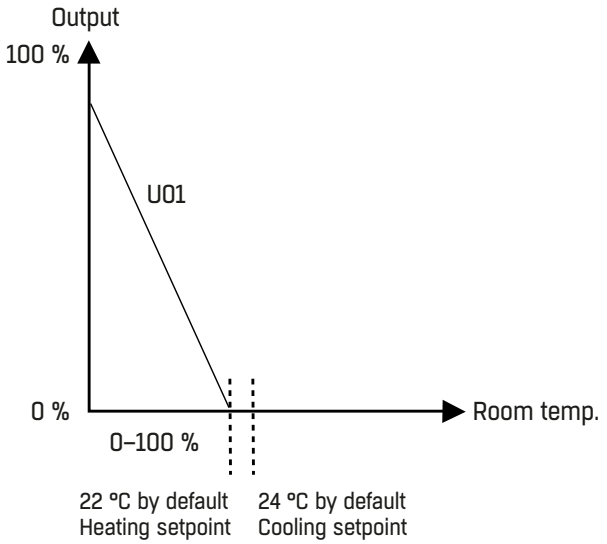
HEATING/COOLING WITH CHANGE-OVER

The control mode Heating/Cooling with change-over is used for 2-pipe systems. It makes it possible to use the same valve for both heating and cooling, depending on requirements during for example the summer (cooling need) and the winter (heating need).

Summer mode activated by change-over input



Winter mode activated by change-over input



To change between heating and cooling in change-over, a digital input or an analog input can be used.

CHANGE OVER USING DIGITAL INPUT

To activate a potential free digital input DI1 or DI2 to control change-over, the parameter 17 or parameter 18 must be configured for Change-over sensor. Closed contact is the change-over set to heating output and at open contact it will be cooling output. In parameter 60 and parameter 61 the contact function of DI1 and DI2 can be changed from Normally open (NO) to Normally closed (NC).

CHANGE OVER USING CLAM ON SENSOR ON PIPE

The temperature sensor should be connected on AI1 and configured on parameter 15 as a change-over sensor.

In this mode, the change-over function will measure the difference between the room and media temperature. The difference will be calculated only if the heat valve is more than 20 % open, or every time a valve exercise is performed. If the media and room temperature difference is more than the configured value in parameter 10, default 4K, the control mode will change to heating. If the room and media temperature difference is more than the configured value in parameter 9, default 3K, the control mode will change to cooling.

CO_2 CONTROL

Fläkt Woods STRZ-18-1-1 is an active CO_2 detector (0 - 10 V). This accessory provides the functionality that the controller changes the airflow linearly between V_{min} and V_{max}. The nozzle setting is increased when the PPM level is in excess of the parameter 112 value (500 ppm) and reaches the maximum nozzle setting (parameter 305) when the ppm level is in excess of paramater 113 (1000 ppm). Heating/cooling control (PI) is preformed simultaneously with the CO_2 control and if a cooling or heating need occurs the signal is directed to respectively output (U01 and U02). Parameter 81 should be set to 5 in order to activate the CO_2 function.

FREE COOLING

In normal operation, the cooling sequence prioritize to use water cooling, i.e. output UO2 where the water cooling valve is connected. If the water cooling is not enough to reach the setpoint, the airflow is increased linearly between Vmin and Vmax. Thus cooling sequence is divided in 2 steps, 0 - 50 % is water cooling and 51 - 100 % is air cooling. Sometimes you get free cooling by air, if outside temperature is cooler than the setpoint room temperature. Then the STRA-24 can shift the sequence so that 0 - 50 % is air cooling and 51-100% is water cooling. This is adjusted by changing the parameter 309.

309 = 0 - Free cooling off – Water cooling 0-50% and 51-100% air cooling

309 = 1 - Free cooling on – Air cooling 0-50% and 51-100% water cooling

Free cooling can also be turned on and off through Modbus communication.

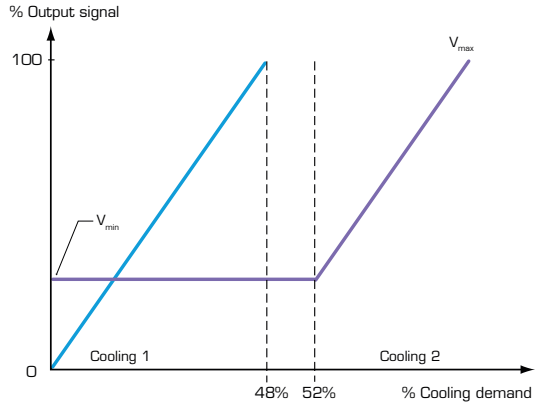


Figure 1: Cooling sequence without free cooling

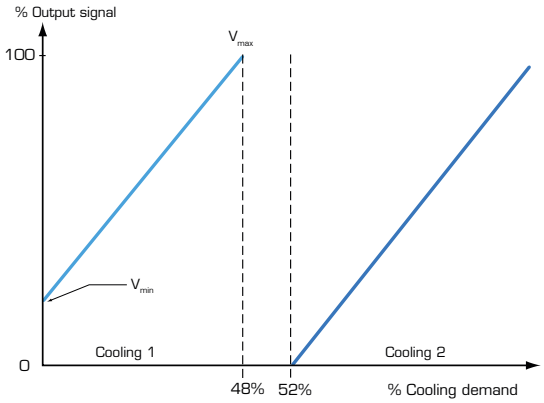


Figure 2: Cooling sequence with free cooling

ACTUATORS

STRA-24 can be used with two types of actuators:

- Analogue 0 - 10 V actuators
- Thermal actuators

The actuator type is set via the parameter menu in the display (parameter 20 and 21). Note that an adapter might be needed if another actuator than Fläkt Woods STRZ-71 is used.

ANALOGUE ACTUATORS

The following output signals can be set for analogue actuators:

- 0 - 10 V (FS)
- 2 - 10 V
- 10 - 2 V
- 10 - 0 V

THERMAL ACTUATORS

When thermal actuator control has been selected, this is controlled digitally with time proportional pulses via universal outputs (UO). By pulsing, the opening degree of the actuator (and its valve) is varied. The period (time in seconds) is the sum of the on and off. The period time is FS=60s. The controller varies the on and off output times proportionally depending on the output signal demand to the actuator.

ACTUATOR EXERCISE

All actuators are exercised. The exercise takes place at set intervals in hours (FS=23 hours interval). An opening signal is sent to the actuator for as long time as the run time has been configured. Then a closing signal is sent for as long time and the exercise is finished.

CONDENSATION DETECTOR

There is a special input (CI) on STRA-24 controllers. This input is intended for Fläkt Woods condensation detector, STRZ-16, and functions internally as a digital input, i.e. condensation or no condensation.

When the condensation detector is activated, the cooling control is blocked and the controller is set in neutral position. When condensation ceases, the controller will start controlling from the neutral position.

PARAMETER SETTINGS

WINDOW CONTACT

When the window contact has been configured, the regulator is set to normal operation when window is closed. If the window is open, the regulator is set in off mode, heating and cooling outputs are set to 0 V and the frost protection function is activated.

FROST PROTECTION

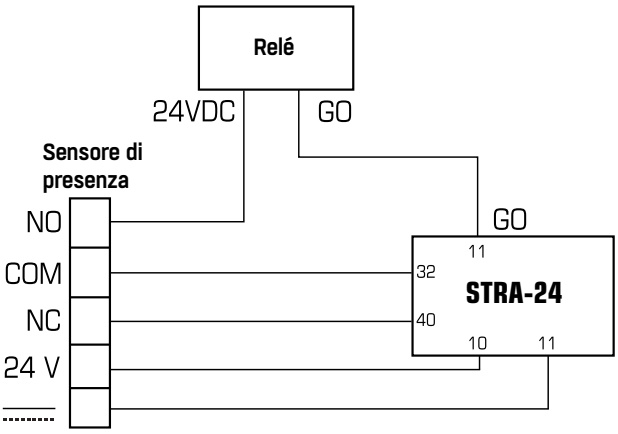
STRA-24 has built-in frost protection, which is activated when the controller is not in use. The frost protection prevents the temperature from dropping below 8 °C. Return to normal fan speed and control occurs automatically when the room temperature exceeds 8 °C.

CONTROL THE LIGHT WITH AN OCCUPANCY SENSOR

It is possible to control the operation of the light with an occupancy sensor through a relay and its socket (STRZ-73-b). The light will switch off when the room is unoccupied. The socket for wiring is screwless quick connection.

Parameter 60 should be changed to 1 when using this function.

WIRING DIAGRAM



PARAMETER SETTINGS

STRA-24 is delivered with a number of factory settings. To acquire the desired function, the controller must be adapted to its specific application. This is done through the parameter menu in the display. Applications may vary and incorrectly set parameters can effect the controller and application negatively. Be sure to set the necessary parameters relevant for your application. If you experience problems, contact Fläkt Woods TSS controls.

PARAMETER MENU

It is possible to set different parameter values in a parameter menu. The parameter menu is accessed by simultaneously holding the INCREASE and DECREASE buttons pressed for about 5 seconds and then pressing the INCREASE button twice. The Service indication will be displayed.

First the display will show the parameter number 1. Scroll between parameters by using the INCREASE and DECREASE buttons.

Press the Function button to select the desired parameter. The parameter number will be replaced by the parameter value. The value can be changed using the INCREASE and DECREASE buttons. If a button is held pressed, the value will start scrolling, first slowly and then with increasing speed in 3 – 4 steps with 2 – 3 seconds between steps.

ACKNOWLEDGE/REGRET

To acknowledge and store a set parameter value, press the Function button again, the display then returns to showing the parameter number. To retrieve the original value, i.e. the value before change, press the INCREASE and DECREASE buttons at the same time. The original value is shown on the display.

RETURN

After a certain time, about 1 minute, or when the INCREASE and DECREASE buttons are pressed at the same time while in the menu, the display returns to the normal view. Exit is shown on the display after the last parameter (or before first parameter). The parameter menu is exited by pressing the Function button on the Exit choice in parameter menu.

PARAMETER LIST

The following parameters are modifiable in the parameter menu FS = factory-set value):

Parameter number	Description	Values	Unit	FS STRA-24
1	Occupied Heating Setpoint		°C	22
2	Occupied Cooling Setpoint		°C	24
3	Standby Neutral Zone		°C	3
4	Unoccupied Heating Setpoint		°C	19
5	Unoccupied Cooling Setpoint		°C	27
6	Frost protection Setpoint		°C	8
7	P-Band		°C	10
8	I-Time		Seconds	300
9	Cooling Changeover difference temperature (Roomand media)		°C	3
10	Heating Changeover difference temperature (Roomand media)		°C	4
11	Heating/Cooling Functions	0 = Heat, 1 = Heat/Heat, 2 = Heat or Cool via changeover, 3 = Heat/Cool, 4 = Heat/Cool with VAV and forced ventilation, 5 = Heat/Cool with VAV, 6 = Cool, 7 = Cool/Cool, 8 = Heat/Cool with UO3, 9 = Heat/Cool with Change-Over		8
12	Boost Mode Timer		Minutes	60
13	P.I.R Delay Off		Minutes	10
14	P.I.R Delay On		Minutes	0
15	Connected sensor on AI1	0 = internal, 1 = external, 2 = Change over sensor		0
16	UI1 Signal	0 = Disabled, 1 = Change over sensor digital, 2 = Change over sensor analogue		2
17	Connected sensor DI1	0 = Disabled, 1 = Window contact, 3 = P.I.R, 4 = Change over sensor		0
18	Connected sensor DI2	0 = Disabled, 1 = Window Contact, 2 = Condensation Sensor, 4 = Change over sensor		0
20	Function of UO1 Signal	0 = None, 1 = Thermal actuator heating, 2 = None, 3 = Heating actuator 0 - 10V, 4 = None, 5 = On/off actuator heating, 6 = None		1
21	Function of UO2 Signal	0 = None, 1 = None, 2 = Thermal actuator Cooling, 3 = None, 4 = Cooling actuator 0 - 10V, 5 = None, 6 = On/off actuator cooling		2

Parameter number	Description	Values	Unit	FS STRA-24
22	Function of UO3 Signal	0 = None, 1 = Forced Vent Digital, 2 = Forced Vent 3 Step Analog, 3 = None, 4 = Ordinary Analog output, 5 = None, 6 = Control of EC-fan		4
24	UO3 output in manual mode		%	0
28	Actuator type for UO3	0 = 0-10v, 1 = 2-10v, 2 = 10-2v, 3 = 10-0v		0
29	Heating Modulating Actuator Control	0 = 0-10v, 1 = 2-10v, 2 = 10-2v, 3 = 10-0v		0
30	Cooling Modulating Actuator Control	0 = 0-10v, 1 = 2-10v, 2 = 10-2v, 3 = 10-0v		0
31	Heating Thermal Actuator Time		Seconds	60
32	Cooling Thermal Actuator Time		Seconds	60
33	Travelling Time for Increase/Decrease Heating Valve (Not in use)		Seconds	120
34	Travelling Time for Increase/Decrease Cooling Valve (Not in use)		Seconds	120
35	Increase/Decrease NZ (Not in use)		%	2
36	Heating Valve Periodic Exercise Interval	0 = Inactive	Hours	23
37	Cooling Valve Periodic Exercise Interval	0 = Inactive	Hours	23
38	Hysteresis for the heating thermostat function		K	2
39	Hysteresis for the cooling thermostat function		K	2
40	The minimum heat output in heating mode		%	0
41	Fan runs on low speed (Not in use)			0
42	Display View	0 = Actual Temp Value, 1 = Heating Setpoint, 2 = Cooling Setpoint, 3 = Average of Heating/Cooling, 4 = Only Setpoint Displacement, 5 = CO_2 6 = Heating Setpoint + Setpoint Displacement, 7 = Cooling Setpoint + Setpoint Displacement, 8 = Average of Heating/Cooling Setpoints + Setpoint Displacement, 9 = Calculated flow in l/S		0
43	Highest Setpoint Offset Increase		°C	3
44	Lowest Setpoint Offset Decrease		°C	3
45	Normal Mode Function	0 = Off, 1 = Unoccupied, 2 = Standby, 3 = Occupied		3
46	Energy Saving Mode Function	0 = Off, 1 = Unoccupied		1

Parameter number	Description	Values	Unit	FS STRA-24
47	BMS Operating Mode	0 = Off, 1 = Unoccupied, 2 = Standby, 3 = Occupied, 4 = Not Used, 5 = No Remote control		5
48	Minimum airflow on cooling UO2 in % of 0-10V. Parameter is in use when cooling/heating mode with VAV is selected		%	20
49	Maximum airflow in % of 0-10V in heating mode		%	0
50	Fan Control (Not in use)	0 = No Control, 1 = Heating, 2 = Cooling, 3 = Both		
51	Fan Speed 1 Limit (Not in use)		%	
52	Fan Speed 2 Limit (Not in use)		%	
53	Fan Speed 3 Limit (Not in use)		%	
54	Fan Start/Stop Hyst (Not in use)			
55	Fan Speeds			
56	External Temperature Sensor Calibration Gain AI1		°C	0
57	Sensor Calibration Gain UI1		°C	0
58	Internal Temperature Sensor Calibration Gain		°C	0
59	Filter factor for AI temperature		°C	0,2
60	Normally open/Normally closed DI1	0 = N/O, 1 = N/C		0
61	Normally open/Normally closed DI2	0=N/O, 1=N/C		1
62	Normally open/Normally closed UI1	0 = N/O, 1 = N/C		0
63	Heating Manual Override	0 = Off, 1 = Manual, 2 = Auto		2
64	Cooling Manual Override	0 = Off, 1 = Manual, 2 = Auto		2
65	Forced ventilation Manual Override	0 = Off, 1 = Manual, 2 = Auto		2
66	Changeover Manual Override	0 = Heating, 1 = Cooling, 2 = Auto		2
67	Manual Mode Heating Output		%	0
68	Manual Mode Cooling Output		%	0
69	Modbus Address			Set by production (same as EXOline ELA)
70	Modbus Parity	0 =None, 1 = Odd, 2 = Even		2
71	Modbus Timeout		Milliseconds	3
72	Modbus Response Delay		Milliseconds	5
73	Heating output signal	0 = For N/C-actuator, 1 = For N/O-actuator		0

Parameter number	Description	Values	Unit	FS STRA-24
74	HMI Displacement View	0 = The offset, 1 = The active setpoint + offset, 2 = The heating setpoint + offset, 3 = The cooling setpoint + offset, 4 = Occupied Heating Setpoint+Offset, 5 = Occupied Cooling setpoint+Offset, 6 = Occupied Average + Offset		0
75	Free Cooling	0 = Not Available, 1 = Available		0
76	Forced Ventilation control mode	0 = No Action, 1 = Forced on Heat/Cool output at 100%, 2 = Forced on Cool output at 100%		0
77	P.I.R Activated Operation Mode	3 = Occupied, 4 = Bypass		3
78	The Controller PLA Address. Used in EXOline			Set by Production
79	The Controller ELA Address. Used in EXOline			Set by Production
80	Cool output	0 = For N/C-actuator, 1 = For N/O-actuator		0
81	AI2 Input	0 = Disable 5 = CO_2 7 = 0-100% 8 = Flow calculation 9 = 0-10V		0
82	Flow at 0 volt on AI2 (Not in use)		l/s	
83	Flow at 10 volt at AI2 (Not in use)		l/s	
84	The minimum time the valve is open when thecalculation of change over is made		Seconds	600
86	Alarm triggers when temperature raise above		°C	40
87	Alarm triggers when temperature falls below		°C	15
97	CO_2 Level to Change to Boost Mode		PPM	1200
98	CO_2 Level below "Boost Mode CO_2 Start" value tostart Boost Mode Timer countdown		PPM	160
100	AI CO_2 Filter			0,2
104	CO_2 Sensor PPM for 0v		PPM	0
105	CO_2 Sensor PPM for 10v		PPM	2000
112	VAV CO_2 Minimum Limit		PPM	500
113	VAV CO_2 Maximum Limit		PPM	1000
114	Port Mode	0 = EXOline/Modbus, 1 = BACnet		0
115	BACnet address	Above 127 = Slave		Set by Production (Last 2 Digits of ELA)
116	BACnet device ID low 4 figures			Set by Production ("A" of PLA & ELA)
117	BACnet device ID high 3 figures			Set in Production, uses "PL" of PLA
118	BACnet Max Master			127

Parameter number	Description	Values	Unit	FS STRA-24
119	Com Speed	Com bus speed:0 = 9600, 1 = 19200, 2 = 38400, 3 = 76800 (BACnet)		
120	Reset com to factory default (Modbus 9K6, 8, N, 1)			
121	The lowest output the fan will need to start (Not inuse)		V	
122	The highest speed of the fan (Not in use)		V	
125	The Model in Regin Range	1943 = STRA-04 / STRA-24, 1945 = STRA-14	Read Only	1943
126	Major Version			
127	Minor Version			
128	Branch Version			
129	Revision			
300	Voltage x 10 for nozzle 2 (STRA-14)		%	21
301	Voltage x 10 for nozzle 3 (STRA-14)		%	38
302	Voltage x 10 for nozzle 4 (STRA-14)		%	56
303	Voltage x 10 for nozzle 5 (STRA-14)		%	73
304	Max air level at 100% cooling (STRA-14)			5
305	Max air level at 100% CO_2 (STRA-14)			6
306	Air level at Off, Unoccupied & Standby (STRA-14)			1
307	Air level at Occupied mode (STRA-14)			2
308	Air level Boost mode (Button only) (STRA-14)			6
309	Free Cooling (STRA-14)	0 = Not Available, 1 = Available		0
322	Type of STRA	0 = STRA-04 / STRA-24*, 1 = STRA-14		0
323	The floor the STRA is placed at	9999 = Not Used in IPSUM		0
324	The room the STRA is placed	9999 = Not Used in IPSUM		0
325	High 4 digits of the serial number			
326	Mid 4 digits of the serial number			
327	Low 4 digits of the serial number			
328	Legacy Mode, set to = to use the old wiring terminalorder	0=Air on Pin 24, Boost on Pin 22, 1=Air on Pin 22, Boost on Pin 24		0

QUICK INSTALLATION STRA-24

STRA-24 is a room controller for pressure independent and constant air volume chilled beams. This quick installation guide will guide you through these settings.

1. Press the INCREASE and DECREASE buttons simultaneously for about 5 seconds until Service indication lights up in the display.
2. Double click the INCREASE button to enter the parameter list in which all parameters of the regulator are set.

OCCUPANCY DETECTOR

If you do not have a presence sensor jump to 7.

3. Press INCREASE or DECREASE to parameter 45 and press the FUNCTION button.
4. Change value to "1" (Unoccupied). Confirm with FUNCTION button.
5. Press INCREASE or DECREASE to parameter 17 and press the FUNCTION button.
6. Change value to "3". Confirm with FUNCTION button

EXTERNAL TEMPERATURE SENSOR

If you do not have a external temperature sensor jump to 9.

7. Press INCREASE or DECREASE to parameter 15 and press the FUNCTION button.
8. Change value to "1" (External room sensor). Confirm with FUNCTION button.

WINDOW SENSOR

If you do not have a Window sensor jump to 11.

9. Press INCREASE or DECREASE to parameter 18 and press the FUNCTION button.
10. Change value to "1" (Window sensor). Confirm with FUNCTION button.

CO_2 SENSOR

If you don't have a CO_2 sensor jump to 13.

11. Press INCREASE or DECREASE to parameter 81 press FUNCTION button.
12. Change value to "5". Confirm with FUNCTION button.

CONDENSATE SENSOR

If you don't have condensate sensor jump to 15.

13. Press INCREASE or DECREASE buttons to parameter

18 and press the FUNCTION button.

14. Change value to "2". Confirm with FUNCTION button.

LIGHTING VIA OCCUPANCY SENSOR

15. Press INCREASE or DECREASE button to parameter 60 and press the FUNCTION button.
16. Change value to "1". Confirm with FUNCTION button.

SETPOINTS

Following steps are to adjust setpoint values for the room controller. Room controller has factory settings which are recommended by Fläkt Woods and they do not need to be adjusted.

Setpoint value Heating (default 22°C)

17. Press INCREASE or DECREASE to parameter 1 and press the FUNCTION button.
18. Change value to setpoint temperature. Confirm with FUNCTION button.

Setpoint value Cooling (default 24°C)

19. Press INCREASE or DECREASE to parameter 2 and press the FUNCTION button.
20. Change value to setpoint temperature. Confirm with FUNCTION button.

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