Outdoor Controller and Sensor SOC2

The SOC2 is a programmable controller and sensor with communication capabilities. It is for outdoor sensing with rain protection (IP63). Each control loop may use 2 PI sequences and 2 binary stages. The SOC2 comes with a built in RS485 communication interface that allows peer-to-peer communication with an operation terminal such as OPT1-(2TH)-VC. Complete parameter sets may be copied by use of an accessory called AEC-PM2 or exchanged with a PC using an RS485-USB converter and the Easyset program. The SOC2 uses the universal X2 operating system.

Applications

- Ventilation control
- Air measurement
- Zone control
- VAV control

Functions

- Two universally configurable control loops:
  - Functions for dehumidifying, set point shift and cascade control
  - Multiple auxiliary functions: heat-cool auto changeover, automatic enable, set point compensation
  - Free heating and cooling with economizer function based on enthalpy or temperature
  - Differential, averaging, min and max functions, enthalpy and dew point calculations
  - Transmitter function for sensors and set points
- Universal analog outputs (VDC, mA) and one relay with a normally open and a normally closed contact (SPDT)
- 8 freely assigned alarm conditions, selectable state of outputs on alarm condition
- Password protected programmable user and control parameters
- Measures temperature and humidity

Ordering

Model	Item	Loop	UI	DO	AO	Functions	AO1	AO2
SOC2-TH-210.102U-1	40-300181	2	1	1	2	Temperature- and humidity sensor	Temp.	RH
SOC2-TH-210.102U-OP-1	40-300184	2	1	1	2		Temp.	RH

AO1 and AO2 are the analog outputs of the controller/sensor. The device is pre-programmed ex works as a transmitter. The sensors are assigned to the analog outputs according to the table.

Model	Item	Description
OPC2-S	40-500109	Display option for SDC2 and SOC2 devices
AEC-PM2	40-500130	Plug-In memory module

A large range of remote operation terminals may be found on our website. All -VC operation terminals work with this controller.

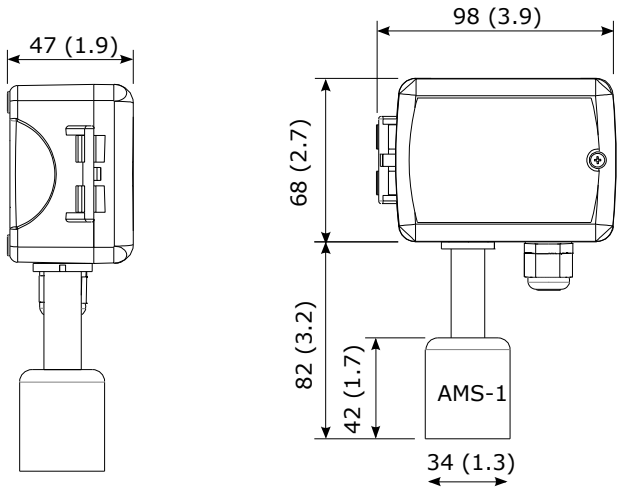
Technical specifications

Important notice and safety advice

This device is for use as an operating controller or sensor. It is not a safety device. Where a device failure could endanger human life and property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent such a device failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

Power supply	Power requirements	24 VAC ±10%, 50/60 Hz, 15..34 VDC SELV to HD 384, Class II, 48VA max
	Power consumption	Max. 5 VA
	Electrical connection	Screw terminal connectors for wire 0.75…1.5 mm² (AWG 20…16)
Signal inputs	Temperature sensor Range Measuring accuracy Repeatability	Bandgap sensor -40…70 °C (-40…158 °F) See Figure 1 ± 0.1 °C, ± 0.2 °F
	Humidity sensor Range Measuring accuracy Hysteresis Repeatability Stability	Capacity sensor element 0…100% RH See Figure 2 ± 1% ± 0.1% < 0.5% / year
	Passive input Type: Range	UI6, Passive Temperature NTC or open contact NTC (Sxx-Tn10) 10kΩ, Type 2 -40…100 °C (-40…212 °F)
Signal outputs	Analog outputs Output signal Resolution Maximum load	AO1 to AO2 DC 0...10 V or 0...20 mA 9.76 mV or 0.019 mA (10 bit) Voltage: ≥1kΩ Current: ≤250Ω
	Relay outputs: AC Voltage DC Voltage Insulation strength between relays contacts and system electronics: between neighbouring contacts:	0…48 VAC, full-load current 2A. 0…30 VDC, full-load current 2A 1500V AC to EN 60 730-1 800V AC to EN 60 730-1
Connection to remote terminal	Hardware interface Cabling	RS485 in accordance with EIA/TIA 485 Twisted pair (STP) cable
Environment	Operation Climatic conditions Temperature Humidity	To IEC 721-3-3 class 3K5 0…50 °C (32…122 °F) <85 % RH non-condensing
	Transport & storage Climatic conditions Temperature Humidity Mechanical conditions	To IEC 721-3-2 and IEC 721-3-1 class 3K3 and class 1K3 -25…70 °C (-13…158 °F) <95 % RH non-condensing class 2M2
Standards	CE conformity EMC directive Low voltage directive	 2014/30/EU 2014/35/EU
	Product standards: Automatic electrical controls for household and similar use	EN 60 730 –1
	Electromagnetic compatibility for industrial and domestic sector	Emissions: EN 60 730-1 Immunity: EN 60 730-1
	Degree of protection	IP63 to EN 60 529
	Pollution class	II (EN 60 730-1)
	Safety class:	III (IEC 60536)
	Overvoltage category	II (EN 60 730-1)
General	Material	Fire proof ABS plastic (UL94 class V-0)
	Dimensions: (H x W x D)	150 x 98 x 47 mm (5.9 x 3.9 x 1.9 in)
	Weight (including package)	380g (13.4 oz)

Dimensions, mm (inch)



Selection of actuators and sensors

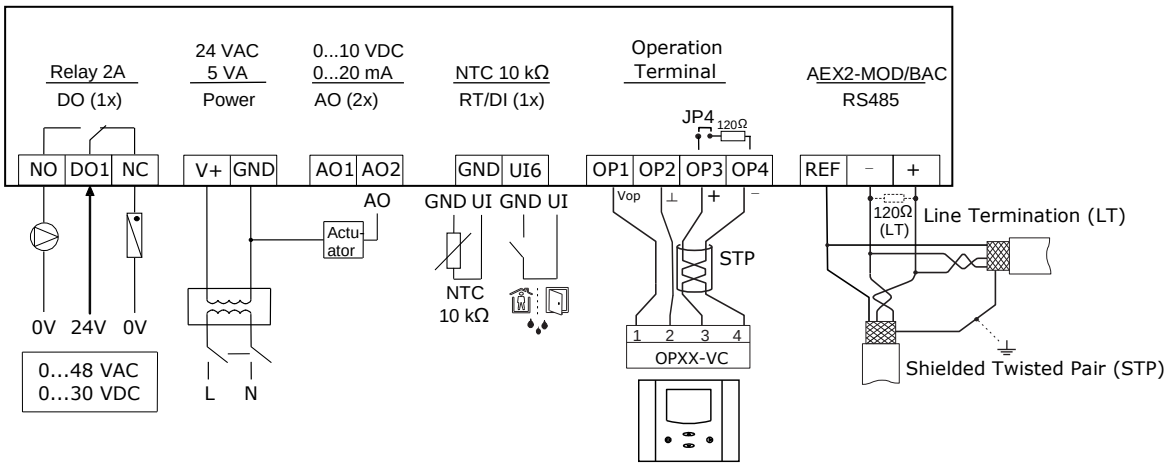
Temperature sensors
Use Vector Controls NTC sensors to achieve maximum accuracy: SDB-Tn10-20 (duct), SRA-Tn10 (room), SDB-Tn10-20 + AMI-S10 as immersion sensor.

Actuators
Choose modulating actuators with an input signal type of 0/2-10 VDC.

3-point actuators with constant running time are recommended.

Binary auxiliary devices (e.g. pumps, fans, on/off valves, humidifiers, etc.)
Do not directly connect devices that exceed specified limits in technical specifications – observe startup current on inductive loads.

Connection diagram



LED-indicators

A status LED is located in the controller housing. During normal operation the LED blinks briefly once every 5 seconds. If there is an alarm or fault condition it will blink every second. See installation sheet point D.

Installation

See installation sheet no:

- SOC2-TH-210 70-000687 (www.vectorcontrols.com)

Sensors

Temperature sensors on –T- types

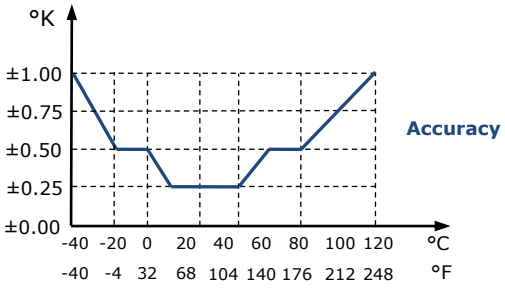


Figure 1: Max T-tolerance by sensor type

Temperature & Humidity from RH sensor on –HT- type

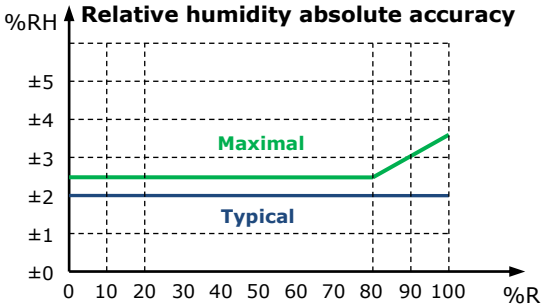


Figure 2: Max RH-tolerance at 25°C (77°F) per sensor type

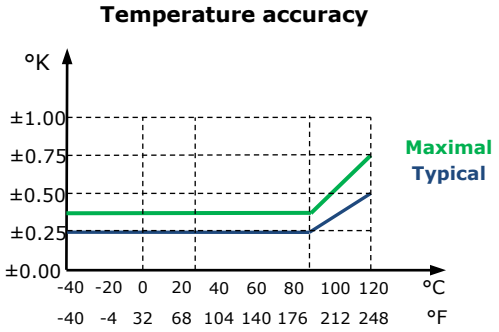


Figure 3: Max T-tolerance by sensor type

X2 Functional Scope

The controller has the following X2 functions and elements:

Group	Modules	QTY	Description
UP			User and display parameters
UI	01U to 05U	5	Sensor inputs for temperature and humidity
	06U	1	Universal input for RT/DI
	07U to 10U	4	Virtual inputs for operation terminals, bus modules or special functions
AL	1AL to 8AL	8	Alarm conditions
LP	1L to 2L	2	Control loops
Ao	1A to 2A	2	Analog outputs for mA, VDC
FAN	1F	1	Fan or lead lag modules, 1 to 3 fan speeds, up to 3 switching lead-lag stages each
do	1d	1	Binary output with a normally open and a normally closed (SPDT) relays contact
FU	1FU	1	**Remote Enable**: Activation of the controller based on signal and alarm conditions
	2FU	1	**Change Operation Mode**: Switching occupied and unoccupied with control signals
	3FU	1	**Heat/Cool Change:** Switching heating and cooling based on a control signal
	4FU	1	**Setpoint Compensation:** Summer/winter compensation of setpoint
	5FU	1	**Economizer** (free heating or cooling due to the condition of outside and room air)
Co			Communication (if a communication module is available)
COPY			Copying complete parameter sets between run, default and external memory with up to 4 memory locations (AEC-PM2)

Operation manual and configuration

This controller uses the latest generation X2 operating system. Detailed operating instructions for all devices equipped with this operating system can be downloaded here
http://www.vectorcontrols.com/products/x2
Also available are programming instructions for technicians and an application database.

The device can be fully configured using EasySet.
EasySet may be downloaded free of charge from www.vectorcontrols.com.

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