Thermal Management 4.0 in enclosures

FROM DESIGN TO MAINTENANCE

Enclosure: main thermal problems

Complex environmental conditions

INDOOR & OUTDOOR
POLLUTION
HUMIDITY

Insufficient thermal balance

SIZING SOFTWARE

Inaccurate or variable input data

IIoT APPROACH

BREAKDOWN OR MALFUNCTION

Integrated management of electrical enclosure

REGULATE

Regulates the climatic conditions inside the enclosure by detecting the ventilation efficiency, humidity level and temperature through sensors in different areas

CONTROL

Records measured data and detects useful events to prevent component-related risks (alarms and peak values) for diagnostic purposes **(predictive manintenance)**

MANAGE

Simultaneously correlates the climate parameters measured with the ambient conditions, supervising the efficiency of the actuators

INTERFACE

Interacts with the main field buses and is accessible from the network

WHICH IS THE FANDIS' SOLUTION?

Sensis

New IIOT device for the thermal management of electrical enclosures that satisfies alone the need for climate control, predictive maintenance and interconnectivity

Video

Why Sensis

- IIoT connectivity
- Predictive maintenance
- Monitoring
- Accuracy of measurements
- Recording of events and Bigdata
- Simple wiring
- Optimized consumption

Rated Voltage: 24Vd.c
Internat temperature sensor and external UR probe(+ 2 adding temperature sensors)
Digitalinput (door limit switch) and 2 relay outputs (dry contacts SPDT)

Sensis: models

- Stand alone
- Modbus RTU
- Profinet
- ASI
- CAN-OPEN
- CC-Link
- EtherCat
- Modbus/TCP
- Profibus
- SERCOS III
- 10 Link
- Ethernet/! P
- VARAN
- Powerlink
- MQTT/OPCUA

Product Kit

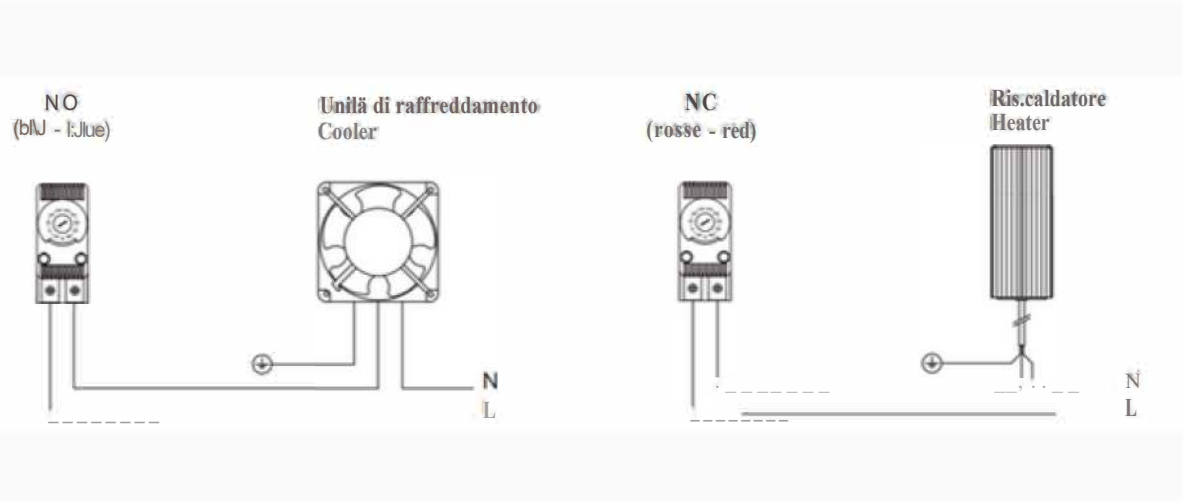
TUTTO L'OCCORRENTE INCLUSO

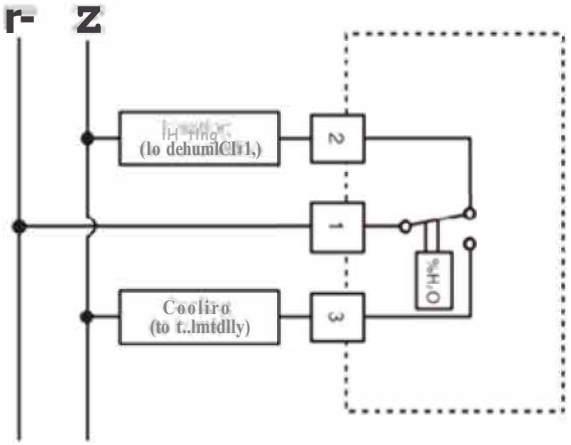
Device *(includes a temperature and a humidity sensor),* mounting instructions and accessories: air flow probe, 2 temperature sensors, fixing supports for fan guard and filter base

A single device. Many functions

In the space of a traditional thermostat and hygrostat, Sensis measures the temperature and humidity inside the enclosure, registers the exceeding of critical thresholds or the opening of the cabinet door

Traditional controls





- Complex wiring operation
- No possibility of monitoring
- No data for diagnostic purposes
- Not too much accurate adjustment

What Sensis measures

Sensis detects and controls the tem peratu re in the electrica l panel, through **sensors that can be easily placed in the most critical points,** measures the air flow and monitors the efficiency of the ventilation system, signaling the obstruction of the filters or the presence of leaks.

Temperature Control

- Differential+/- lK
- Programmable differential
- Sensor length l,Sm
- Relay outputs SPDT

What Sensis measures

Sensis autonomously **manages the climatic parameters with temperature and humidity controls,** through programmable hysteresis relay outputs and floating contacts, to adapt to any type of actuator and cabinet size.

Humidity Control

- Standard differential+/- 2%
- Programmable differential
- Integrated sensor
- Relay outputs SPOT
- Simple wiring

Data storage (monitoring)

Value	Period	Details
Temperature	Every 60s	Array last 30 samples (30min.)
Working time	Hour counter	Total working time
Average daily temperature	Every 60min	Avarage last 30h
Average RH	Every 60min	Avarage last 30h
Average monthly temperature	Every 24h	Avarage last 30 samples (30 days)

Sensis records **the time, date and duration of events detected.**

Event data format

- Max Absolute Temperature
- Min. Absolute Temperature
- Last Opening Door
- Max. RH
- Min. RH
- Time of last Overheating

Day	Month	Year	H	M	Value	
8 bit	8 bit	8 bit	8 bit	8 bit	8 bit	=48 bit

Operating modes

Mode	T1	T2	T3	Humidity	Ventilation	Rll	RL2
1	Measured	N/A	N/A	Measured	Remote Alarm	N/A	N/A
2	Regulated	N/A	N/A	Regulated	Remote Alarm	T l > Setpoint T	Rh> Setpoint RH
3	Regulated	N/A	N/A	Regulated	Remote Alarm	T2 > Setpoint T	Rh> Setpoint RH
4	Regulated	N/A	N/A	Regulated	Remote Alarm	T3 > Setpoint T	Rh> Setpoint RH
5	Regulated	Regulated	N/A	Regulated	Remote Alarm	T l orT2>SPT	Rh> Setpoint RH
6	Regulated	Regulated	Est. Quadro	Regulated	Remote Alarm	T l orT2 >SPT T l and T2 > EXT	Rh> Setpoint RH
7	Regulated	Regulated	Regulated	Regulated	Remote Alarm	T l orT2 orT3	Rh> Setpoint RH

Interface

Pre-configures dashboard that allows to monitor the main values, fix setpoints and other setup data in local mode before the device is connected to the network or to another master unit

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