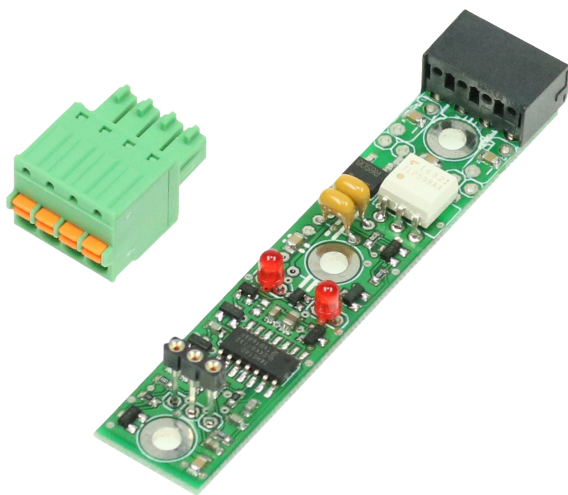


# OPERATION MANUAL

## DEW FORMATION MODULE SHS-MOD-LC



### Description



### Typical areas of applications

- For preventing condensation in cool ceilings
- To detect "sweating" in cold pipelines of industrial plants
- To maintain mist free glaze in swimming halls or display windows.
- To detect high humidity value in switchgear cabinets, pumps and machines.
- To detect condensate formation on cold outside walls or steel doors
- Monitoring insulation in false roofing

### Characteristic features

- SMD-Module as universal evaluation electronics for detection of condensation
- For all dew formation sensors SHS A3 to A5
- Defined response in dew formation and condensation, high system reliability
- Switching point 94% RH surface humidity.
- Static current contact, potential free
- Operating voltage 20-28 V DC/AC~
- 24 months guarantee

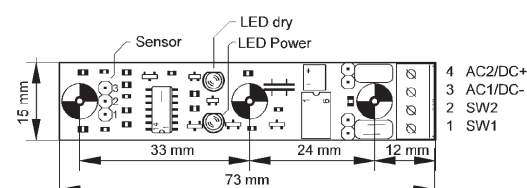
### Technical data

Sensor	
Compatible sensors	SHS-A2, SHS-A5, SHS-A4L
Switching point	94% RH Surface humidity $\pm 4\%$
Operating range	0% RH to 100% RH
Switching hysteresis	ca. 4%
Application temperature	0° to 60° C
Dew formation	Allowable only on sensor side
Measuring medium	Clean atmospheric air
Response time	Approx. 120 sec.
Output stage	
Output	Semi-conductor relay
Switching capacity	max. 36 V AC/DC, max. 400 mA
Contact resistance	Closed: < 30 Ohm Open: > 1 MOhm
Switching status display	LED red with closed contact (Dry condition)
Protection circuit	Transient protection, Varistor 39V and Surge suppression capacitor 10 nF
Other data	
Operating voltage	24 V AC $\pm 20\%$ , 50 Hz or 20-28 V DC, max. 7 mA
Functional control	LED red power
Dimensions LxWxH	approx. 73 mm x 15 mm x 15 mm
Connection	Spring-loaded terminal, clamping range 0.2...1.5 mm <sup>2</sup>
CE-conformance	2014/30/EU
EMV-noise emission	EN 61000-6-3:2011
EMV-noise withstanding	EN 61000-6-2:2007
Scope of supply	Module without sensor element
Article number	SHS-MOD-LC
Rights reserved for change in data due to technological advancements!	

### Attention

Please avoid extreme mechanical and inappropriate exposure. The device/product is not suitable for potential explosive areas and medical-technical applications.

### Module outline



# OPERATION MANUAL

## DEW FORMATION MODULE SHS-MOD-LC



### Functional description

The dew formation module is a universal, resistive evaluation circuit for dew formation sensors SHS A3, A4L, A5. The module has a three pole socket strip for connection of the sensor and a 4-pole clamp terminal for operating voltage and relay output. The scope of supply is without sensor element, please separately order the required sensor element!

In principle, the module together with the sensor is an electronic hygrostat for high humidity range, which is meant for recognising dew formation or beginning of condensate formation on objects. As soon as the measured value of surface humidity exceeds a certain defined limit (approx. 94% RH), the relay contact opens and the static current loop is interrupted (safety function). The signal can be used, for example, for switching ON a dryer or a heater.

In application of SHS A5 as sensor element if a conductance sensor, (integrated on the sensor in addition to the resistive sensor element) is also evaluated, then it recognises already occurred dew formation. With the latest measuring principle and application of SHS-dew formation sensors with logarithmic characteristics, it is possible to capture the dew formation threshold before condensate formation. The module is protected against over voltage, reverse polarity and wrong connection by means of varistor and protection diodes. The connections are done through a 4-pole terminal.

### Application notes

Because of the optimised AC-circuit technology, the sensor survives short-term wetting with condensate, without the sensor getting damaged due to electrolysis effects. Nevertheless, continuous contact with water should be avoided.

A representative climate condition must prevail at the measuring location. Air breeze or heat sources can disturb the functioning.

In the application of module as dew formation monitor, the sensor element must be installed at the coldest location. Perfect functioning is only guaranteed, if there is no air gap between the mounting surface and sensor element. If necessary, mount by using thermal conducting paste or stick together with ceramic filled epoxy resin adhesive. Care should be taken that the electronics of the module is protected against any possible condensate formation. If electronics is installed too close to the cold object, then condensate can develop on the module, resulting into failure. An extension of the connections to the sensor is possible, but because of EMV considerations, the connection length should be kept as short as possible. Shielded cables should be used.

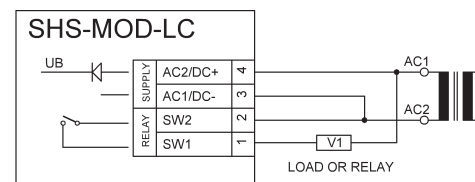
### Connection layout

The power voltage supply is with 24 V~ or 24 V DC, operating current max. 7 mA. The contact output is a galvanically isolated, wear-free semi-conductor relay, which can switch DC or AC, switching voltage

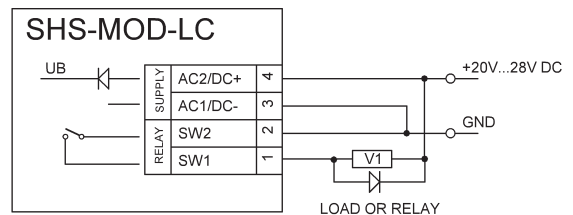
Pin	Name	Function
1	SW1	Switching contact, potential free, closed in dry condition
2	SW2	Switching contact, potential free, closed in dry condition
3	AC1/DC-	Operating voltage 24 V AC or negative operating voltage
4	AC2/DC+	Operating voltage 24 V AC or positive operating voltage

### Connection diagram

Operation with AC



Operation with DC



The power supply and output are potentially isolated and protected against over voltage and transients with the help of a varistor. On operation with DC voltage and triggering inductive loads, a diode should be additionally put in the circuit.

### Sensor element connection

The resistive sensor surface of the dew formation sensor is connected between pin 1 and 3 of the sensor plug. The connections of SHS A3 and SHS A5 fit directly into the contact strip. If SHS A5 is being used, then the common connection of the resistive element and comb structure is at pin 1 (COM).

Pin	Name	Function
1	COM	Resistive sensor element or common connection for SHS A5
2	SEN1	Optional conductance switch for dew formation sensor SHS A5
3	SEN2	Resistive sensor element

