

EGH 111, 112: Duct transducer for relative humidity and temperature

How energy efficiency is improved

Precise and reliable data acquisition for optimised regulation of HVAC installations

Features

- Active measurement of relative and absolute humidity, enthalpy, dew point and air temperature
- EGH111F032: Also with Ni1000 passive temperature sensor
- Measurement by means of fast capacitive measuring element
- Sensor immersion length 140 mm
- Cable inlet via a removable cable gland
- Mounting set and mounting flange included
- Can be used in damp and dusty environments (type of protection IP65)

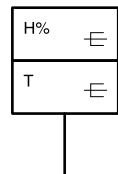
Technical data

Power supply		
	Power supply	15...24 VDC (±10%) or 24 VAC (±10%) SELV
	Power consumption	Typ. 0.4 W (24 VDC) or 0.8 VA (24 VAC)
Parameters		
Relative humidity	Measuring range	0...100% rh, no condensation
	Measuring accuracy	±2% between 10...90% rh (typ. at 21 °C)
Absolute humidity	Measuring range	0...50 g/m³ (factory setting) switchable to 0...80 g/m³
Enthalpy	Measuring range	0...85 kJ/kg
Dew point	Measuring range	0...50 °C (factory setting) switchable to -20...+80 °C
Temperature	Measuring range	-20...80 °C (factory setting) switchable to 0...50 °C, -15...35 °C or -40...60 °C
	Measuring accuracy ¹⁾	±0.3 K, typ. at 21 °C (factory setting)
	Time constant in moving air (3 m/s)	2 minutes (t ₆₃)
	Flow speed	Min: 0 m/s Max: 12 m/s
Ambient conditions		
	Ambient temperature	-20...70 °C
	Humidity (non-condensing)	85% rh
Outputs		
	Output signal	2 × 0...10 V (factory setting), min. load 10 kΩ, switchable to 2 × 0...5 V
Construction		
	Colour	Black/yellow
	Housing material	Polycarbonate (PC) UL94-V0
	Filter unit material	Stainless steel, wire mesh (1.4401)
	Cable inlet	M20 for cables with Ø 4.5...9 mm, re- movable
	Connection terminals	Plug-in connector, removable, max. 2.5 mm²
	Dimensions W × H × D	65 × 41 × 70 mm (without sensor tube and cable gland)
	Sensor tube length	140 mm
	Sensor tube diameter	19.5 mm

¹⁾ The specified measuring accuracy only applies to the measuring element. The actual accuracy also depends on the cable length



EGH111F032



Weight	164 g
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Standards, directives

	Type of protection ²⁾	IP65 (EN 60529)
CE conformity according to	EMC Directive 2014/30/EU	EN 60730-1, EN 61000-6-1, EN 61000-6-3
	RoHS-D 2011/65/EU & 2015/863/EU	EN IEC 63000

Overview of types

Type	Description
EGH111F032	Duct transducer for relative and absolute humidity, enthalpy, dew point, temperature, 2 × 0...10 V, Ni1000
EGH112F032	Duct transducer for relative and absolute humidity, enthalpy, dew point, temperature, 2 × 0...10 V

Description of operation

The duct transducer is designed for measurement in the supply and return air of ventilation ducts. In addition to the air temperature, the transmitter outputs either the relative humidity, absolute humidity, enthalpy or dew point. The configuration is carried out using jumpers in the device.

Humidity measurement: An electronic measuring element measures the value and a measuring amplifier converts it to a 0...10 V standard signal. The signal can be picked up at output «rH».

Enthalpy measurement: The heat energy per kg of air is calculated from the air humidity and the temperature.

Dew point measurement: The dew point temperature is also calculated from the relative air humidity (rh) and the temperature.

Temperature measurement: Four measuring ranges are available. The configuration is carried out using jumpers in the device. The measured value is converted into the 0...10 V standard signal and can be picked up at the output «Temp».

The EGH111F032 also includes a passive temperature sensor. The resistance of the measuring element (Ni1000) increases in a linear manner as the temperature increases. The temperature coefficient is therefore positive. Characteristic according to DIN 43760. The signal can be picked up at the S+/S- terminals.

Intended use

This product is only allowed to be used in HVAC building systems for control and regulation purposes. Other uses require the prior consent of the manufacturer.

The "Description of operation" section and all product instructions in this data sheet must be observed.

Modifying or converting the product is not permitted.

Improper use

The product is not suitable for security applications, for example for use in fire protection systems or in medical facilities.

The product must not be used if a malfunction could cause direct or indirect dangers to people, animals, and material goods, for example, in ventilation systems in livestock farming or in food cooling systems.

Engineering and fitting notes

Note



Only qualified electricians and HVAC specialists are permitted to fit and connect the device.

²⁾ IP65 protection is also guaranteed without screwing on the housing cover. The screw supplied serves as additional protection against manipulation of the device

**NOTICE!**

Damage to device!

► The device may only be connected when the power cable is disconnected from the electrical supply.

The transmitter can be connected to controller and display systems. The device types are interchangeable within the specified measuring accuracy.

It is advisable to select the measuring ranges for absolute humidity, dew point and temperature measurement so that the transmitter operates in the middle of those measuring ranges.

The line resistance of the signal cable must be taken into account during planning and commissioning. When there are long cables, the line resistance may have to be compensated in the downstream electronics.

The measurement current heats up the measuring element and thus affects the accuracy of the measurement. The measurement current should therefore not be higher than specified in the technical data.

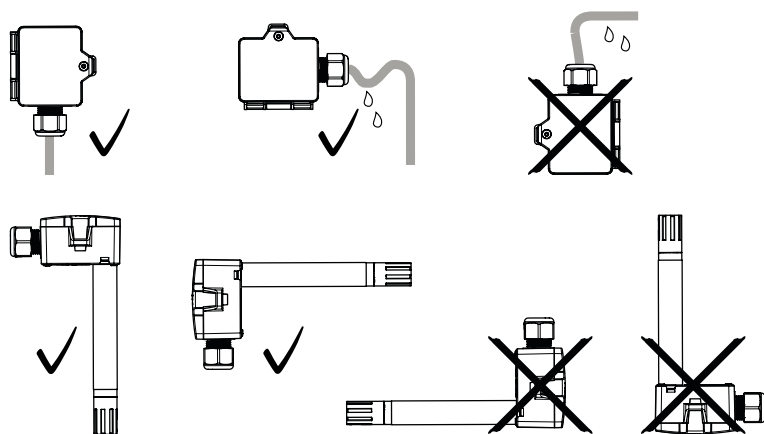
The housing can be opened and closed without tools using a hinged cover. Optionally, the cover can be secured with the supplied screw and screw cover. IP65 protection is also guaranteed without screwing on the cover.

Scope of delivery

- Duct transducer with M20×1.5 cable gland and connection terminal (removable)
- 7 jumpers (already plugged in)
- Mounting flange Ø 19.6 mm
- Mounting set: 2 dowels, 2 countersunk head and 2 raised head screws, cover screw and suitable screw cover
- Fitting instructions

Fitting position

Do not mount the duct transducer with the cable gland facing upwards. The transmitter could be damaged by the ingress of condensate or dripping water.

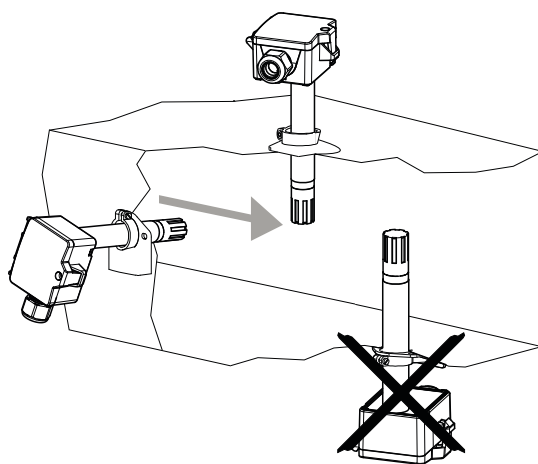
**Place of installation**

Draughts and strong ambient temperature fluctuations must be avoided, as they can cause measurement deviations.

Use in ventilation ducts

For installation in ventilation and air conditioning systems, the duct transducer is mounted on the wall of the ventilation duct using the supplied flange. A variable immersion length is possible with the mounting flange. The mounting flange is made of TPO plastic and is temperature-resistant between -35 and +120 °C (observe ambient conditions of duct transducer).

If there is a risk of condensation in the sensor tube, install the transmitter in such a way that the condensate can drain off.



Electrical connection

The removable cable gland and the removable connection terminal allow the wiring to be carried out away from the sensor. This makes wiring easier, especially in hard-to-reach places and when replacing a faulty sensor.

The cable inlet should be from below. If only a lateral cable inlet is possible, route the cable in a U-shape so that precipitation can drip off the loop and does not get into the sensor housing.

When laying the cables, remember that electromagnetic fields can affect the measuring accuracy. Therefore always use shielded signal cables and avoid laying them parallel to power cables.



Note

The measuring range is changed by reconnecting the jumpers while the device is de-energised; see the fitting instructions.

Offset adjustment

The active components of the sensor electronics have an electrical power loss that affects the ambient temperature measurement. The power loss depends on the operating voltage and must be taken into account in the temperature measurement.

If the operating voltage is fixed and constant (± 0.2 V), fixed offset values can be set using two trim potentiometers (P1/P2) on the PCB.

- P1³⁾: Offset for relative humidity ($\pm 5\%$ rh), absolute humidity (± 3 g/m³), enthalpy (± 3 kJ/kg) and dew point (± 3 K).

The value measured depends on the setting of jumpers 1 and 2 ("ModeA")

- P2⁴⁾: Temperature offset (± 3 K)

If the transmitter is operated with a variable operating voltage, the offset must be set in the system.

The offset is set at the factory for an operating voltage of 24 VDC. The expected measurement error of the output signal is smallest at this voltage. Other operating voltages lead to a larger or smaller offset error due to the different power loss of the sensor electronics.

Notes for users

Under normal operating conditions the duct transducer is very durable. However, humidity sensors are subject to increased ageing if they are used in very contaminated air or aggressive gases and chemicals. The factors affecting the device depend on the concentration of the aggressive media and can lead to permanent drift or damage to the sensor.

The general warranty does not apply if the device stops operating correctly due to very contaminated air.

To avoid losing unused jumpers, it is advisable to plug them into one pin of an open bridge.

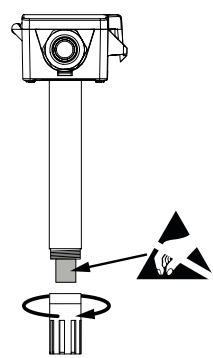
Maintenance and cleaning

Over time, the air flow at the measuring head can cause dirt and dust particles to accumulate on the filter that protects the measuring element, thus impairing the function of the sensor.

Under normal ambient conditions, SAUTER recommends yearly maintenance to retain the specified accuracy.

³⁾ Water drop symbol on the PCB

⁴⁾ Thermometer symbol on the PCB



Cleaning the filter

1. Disconnect the device from the power supply.
2. Unscrew the filter hood from the sensor tube, see figure.
Do not pull the hood or press on the sides.
Make sure that the mesh insert does not fall out and that the measuring element and electronics are not touched or damaged.
3. Blow out the filter with oil-free, filtered compressed air or nitrogen and/or rinse it with distilled water.
Replace very dirty filters.
4. Screw the filter hood with the mesh insert onto the sensor tube without touching or damaging the measuring element.

LED indicator

An LED on the circuit board indicates various operating states.

Status	Indicator sequence	Description
Flashing green		Normal mode LED lights up briefly every 2 seconds
Rapidly flashing green		Sensor error LED lights up briefly 5 times per second

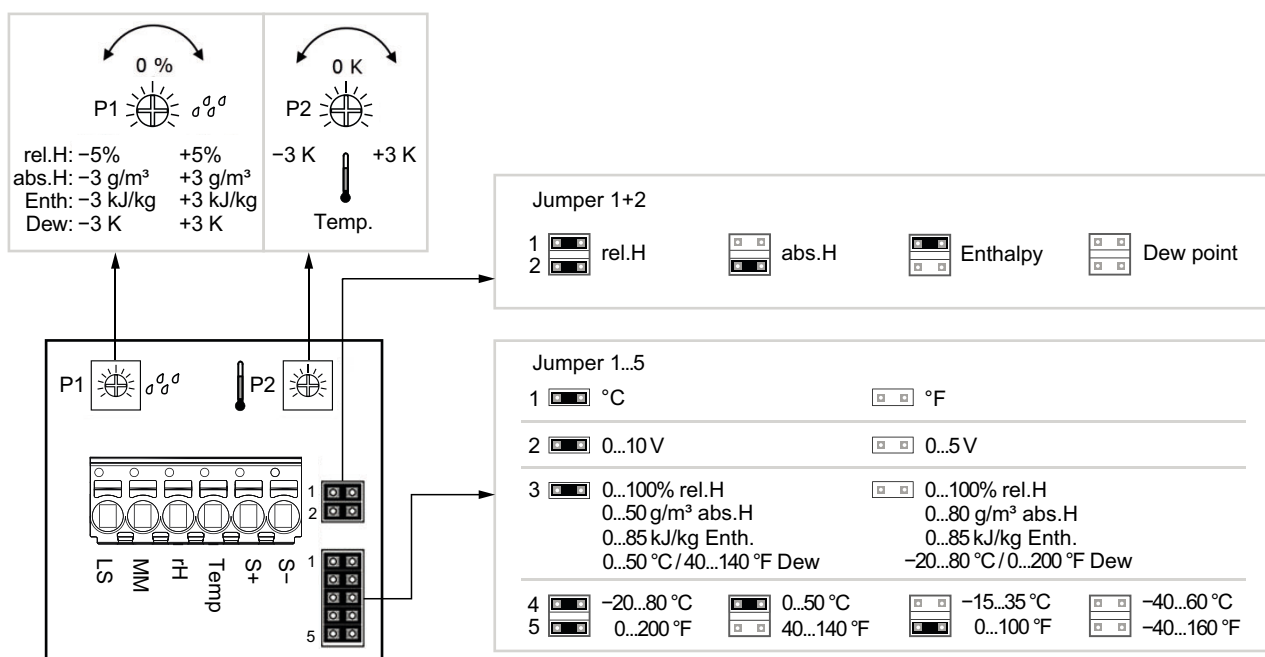
Additional information

Fitting instructions	P100020521
Declaration on materials and the environment	MD 34.111

Disposal

When disposing of the product, observe the currently applicable local laws.
More information on materials can be found in the Declaration on materials and the environment for this product.

Connection diagram



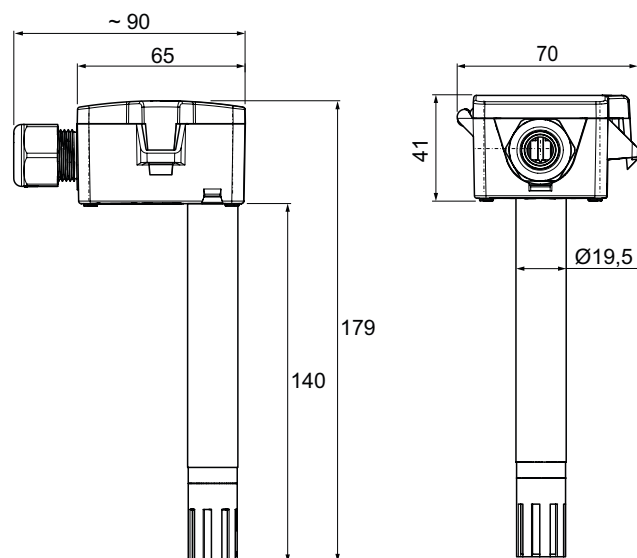
Terminal	Function
LS	15...24 VDC (±10%) or 24 VAC (±10%) SELV
MM	Ground (GND)
rH	Relative humidity 0...10 V (factory setting)
Temp	Temperature 0...10 V (factory setting)
S+	Passive sensor Ni1000 (EGH111F032 only)
S-	

💡 The terminal designations are marked on the PCB.

Dimension drawings

All dimensions in mm.

EGH 111, 112



Mounting flange Ø 19.6 mm