



I Series Humidity/-temperature sensors with analogue output signals

The I Series are compact sensors in a rod-type design with plug-in connection or robust connecting head to measure relative humidity and temperature with high precision in air and other non-aggressive gases. They can be used for a wide range of applications.

Sensors in the I Series are equipped with a gauze filter as standard (type ZE17). For higher requirements we recommend to use a version with other filters and a higher degree of protection (filter programme see product info sheet no. F 5.1), e.g. if the sensor is used in meteorology, at high wind speeds or if the sensor is exposed to salt mist, sand or dust (near the sea, industrial estates etc.).

In the ...9G series the humidity sensing element is directly protected by a PTFE filter. The advantage of this is the improved temperature dynamics, in particular at low air speeds.

The user can independently calibrate sensors in the I Series using the calibration and adjustment kit I-BOX (see description p. 6 and separate data sheet I-BOX).



Technical Data

Humidity

sensing element	capacitive MELA FE09		
output range	0...100 %rh		
accuracy	at 23°C		
10...90 %rh			±1.5 %rh
< 10 %rh or > 90 %rh			±2 %rh
influence of temperature (ref. to 23°C)	<±0.02 %rh/K		

Temperature

output ranges	active	-40...+60°C
		-30...+70°C
		-20...+80°C
		0...+100°C
	passive	Pt100 1/3 DIN cl. B
		Pt1000 1/3 DIN cl. B
accuracy (active) at 23°C	±0.2 K	
influence of temperature (ref. to 23°C)	<±0.005 K/K	

- **Two designs**
 - rod-shaped sensor Ø 20mm with plug-in connection
 - with robust connecting head
- **Different physical outputs**
 - humidity and temp., 2 x active
 - humidity only, active
 - humidity active / temp. passive
 - temperature only, active
- **Output signals**
 - 0...1 V
 - 0...10 V
 - 0...2,5 V
- **Special versions**
 - sealing against vibrations
- **Different filters**
 - see page 2

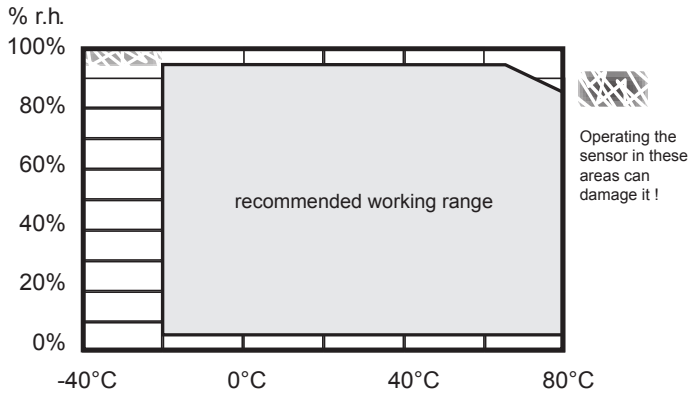
Electrical data

Voltage supply	
output 0...1 V	5...30 V DC
output 0...2,5 V	4,5...30 V DC
output 0...10 V	12...30 V DC
load resistance	
output signal 0...1 V	± 2 kOhm
output signal 0...10 V	± 10 kOhm
consumption of electronics	< 3 mA
electromagnetic compatibility	ref. EN 61326-1 ref. EN 61326-2-3

General data

measuring medium	air, pressureless, non-aggressive, non-condensing
min. air speed	0,5 m/s
operating temperature	-30...+80°C
storage temperature	-40...+80°C
degree of protection of measuring head with filter	
ZE16 (protective basket open)	IP20
ZE17 (protective basket w. filter gauze)	IP30
ZE20 (protective basket w. membrane filter)	IP54
ZE21 (fine-pored stainless steel sintered filter)	IP65
ZE22 (coarse-pored stainless steel sintered filter)	IP65
PTFE for humidity sensing element and protective basket ZE16	IP20
degree of protection connector	IP67

Recommended working range of humidity



Accessories

Designation	Order reference	Info sheet	Description
ZA 20	as designation	F5.1	mounting plate, for mounting sensors Ø 20 mm in ventilation ducts
20.009	as designation		wall console, plastic, for mounting sensors Ø 20 mm
ZA 161/1	as designation	F5.1	weather guard for rod-shaped sensors <i>recommended for protection against rain and sun in case of outdoor applications</i>
connecting cable for plug-in version	IA...02-67-xx.x	-	connecting cable with 12 pin „Binder“ coupling, open, with ferrules. max. admissible ambient temperatures: „Binder“ coupling and cable -40...+85°C / IP67 xx.x = cable length in meter (example: 01.5 = 1.5m) <i>for wiring diagram see connection diagrams !</i>
alignment cable sensor --> calibration adapter for sensors with voltage output	IAC1.02.AK-01.5	-	cable to connect sensors with analogue voltage output to the 8 x adjustment and calibration adapter I-BOX. One cable is required for each sensor to be connected.
adjustment- and calibration adapter	I-BOX		8 x adjustment and calibration adapter I-BOX, suitable for all sensors in the I Series. Sensors with different output signals can be connected simultaneously.
ZE33	as designation	F5.2	adapter for humidity standard ZE 31/1 - necessary for sensor tubes Ø 20 mm
ZE 31/1-12 ZE 31/1-33 ZE 31/1-75 ZE 31/1-84	as designation	F5.2	Standard humidity to check the accuracy of the sensors 12 %rh and 25°C Standard humidity to check the accuracy of the sensors 33 %rh and 25°C Standard humidity to check the accuracy of the sensors 75 %rh and 25°C Standard humidity to check the accuracy of the sensors 84 %rh and 25°C

Product Key

Series	I Series	I
Design	tube Ø 20 mm alu with plug-in connection	A
	tube Ø 20 mm alu with robust head	R
Physical output	humidity and temperature, 2 x active	K
	humidity only, active	F
	Humidity active / temperature passive	C
	Temperature only, active	T
Output signal ¹⁾	0...1 V	1
	0...10 V	2
	0...2.5 V	7
Special edition	none	00
	Sealing against vibrations	0V
Measuring range F	0...100% rh	F1
	no humidity measurement	00
Measuring range T ¹⁾	-40...60 °C	46
	-30...70 °C	37
	-20...80 °C	28
	Pt100 1/3 DIN cl.B (FMC2103)	CF
	Pt1000 1/3 DIN cl. B	C6
Operating voltage	(at 0...1 V output): 5...30 V DC	5
	(at 0...2.5 V output): 4.5...30 V DC	7
	(at 0...10 V output): 12...30 V DC	C
Filter	ZE16 protective plastic basket, open	16
	ZE17 protective plastic basket with gauze	17
	ZE20 protective basket with membrane filter	20
	ZE21 fine-pored sintered filter of stainless steel	21
	ZE22 coarse-pored sintered filter of stainless steel	22
	PTFE filter for humidity sensing element and protective basket	9G
Type of connection and characteristics of the design	12 pin plug-in connection	CS8
	robust connecting head	007
¹⁾ Further output signals and/or output ranges on request		

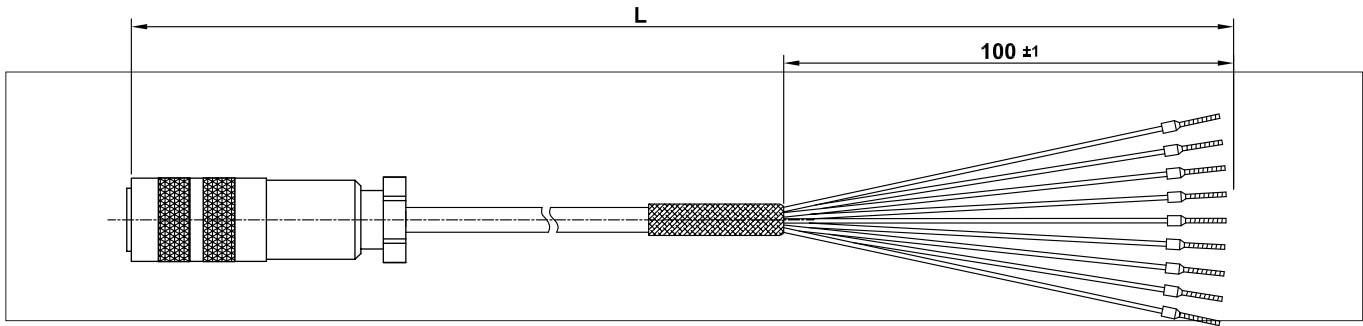
Ordering Example

IRK1 0V F1 46 5 16 CS8

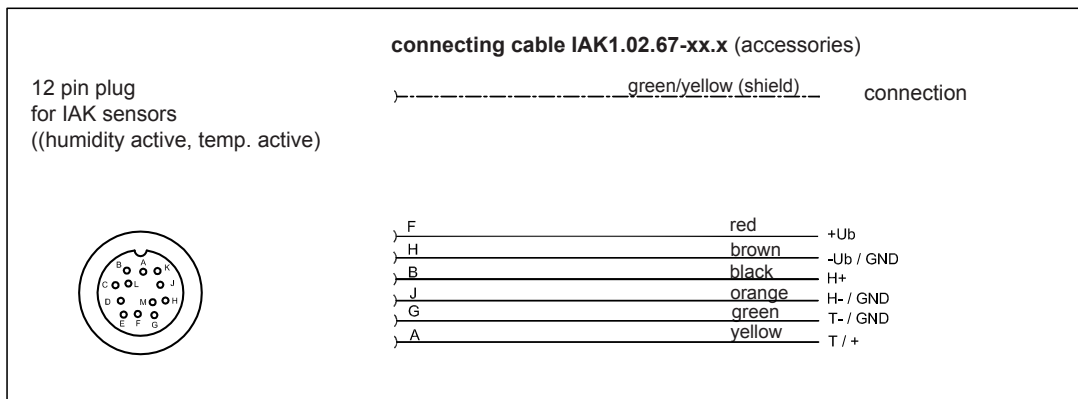
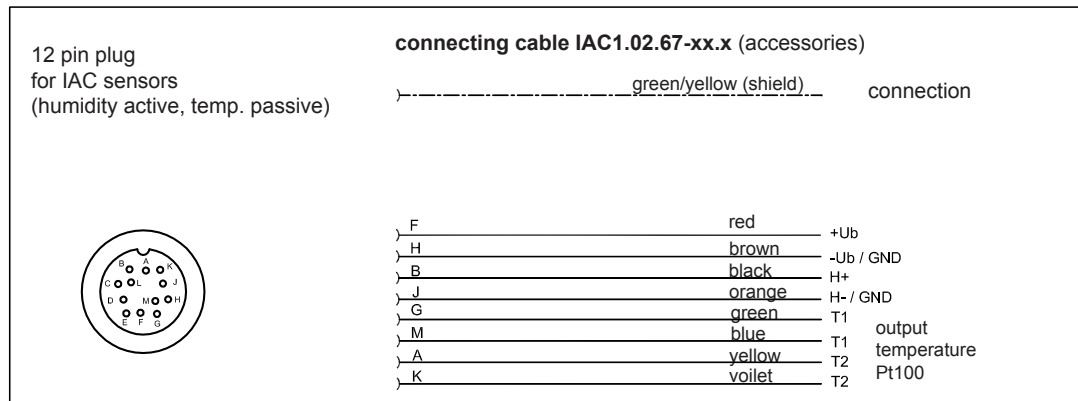
I Series (I), aluminium tube with robust connecting head (R), 2 active outputs humidity + temperature (K), 0...1 V output (1), sealing against vibrations (0V)
 0...100% rh (F1), -40...60°C (46),
 operating voltage: 5...30 V DC (5),
 ZE16 protective plastic basket, open (16), 12 pin plug-in connection (CS8)

Dimensional drawing

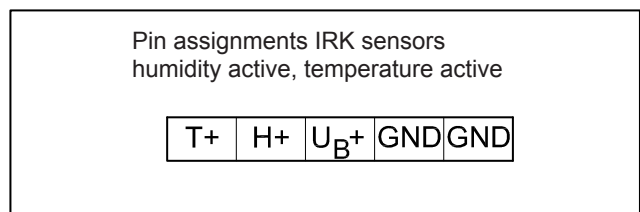
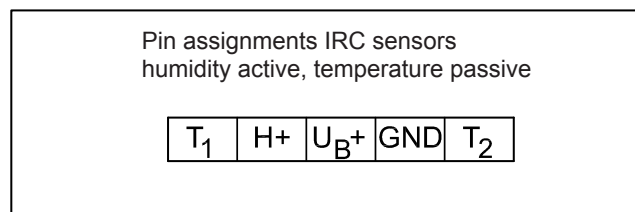
Rod-shaped sensor IA... with plug-in connection and connecting cable IAC1.02.67-xx.x



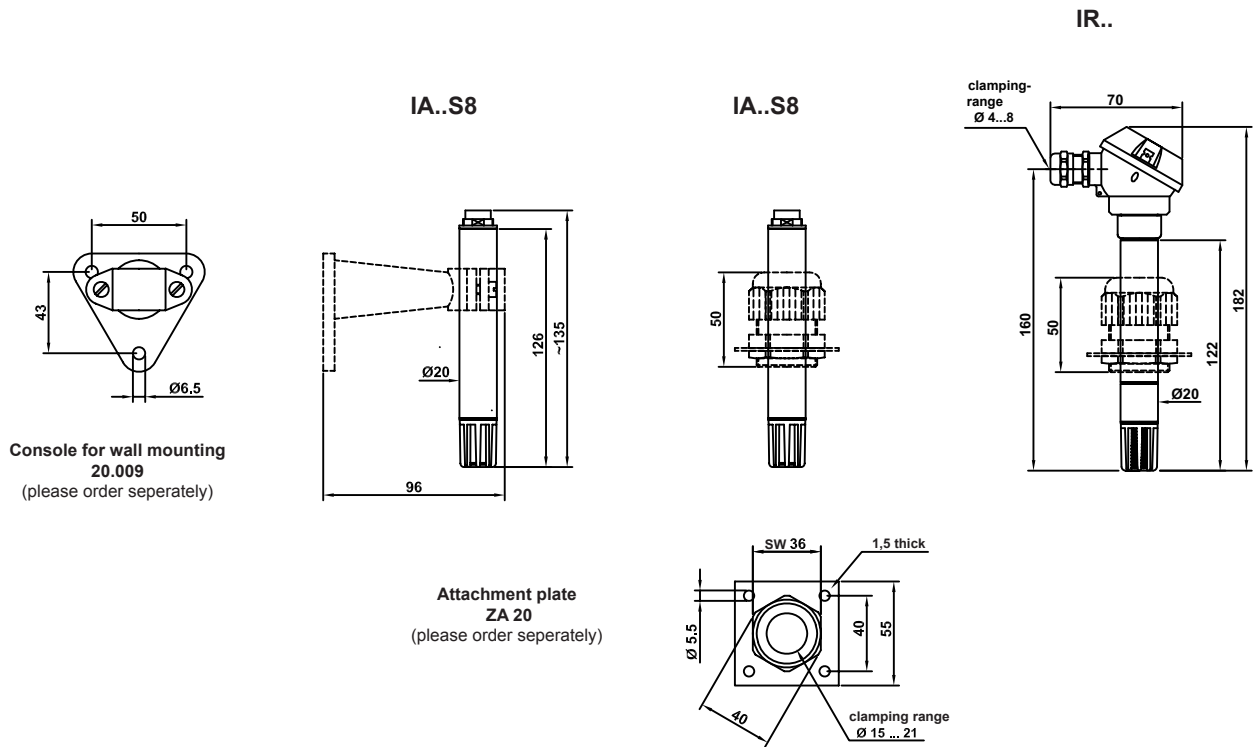
Pin assignments sensors IA...



Pin assignments sensors IR...



Dimensions



ESD protection advice

The sensors of the I Series contain components, which can be damaged by the effects of electrical fields or by charge equalisation when touched.

The following protective measures must be taken when the housing of the sensor is to be opened for connection:

- Before opening the housing of the sensor, ensure electrical potential equalisation between you and your environment.
- Pay particular attention to ensure that this potential equalisation is maintained while you are working with the opened housing.

Mounting instructions

Position

Install the sensor at a place where characteristic levels of humidity occur. The measuring head should be exposed to the flow of air. Avoid installation next to heaters, doors or on outer walls. Avoid places exposed to the sun.

The sensor should be mounted in such a way that no water can get into it.

We recommend that you lay the connection lines in a loop so that any water that may be present can run off.

Connection

The electrical connection must be carried out by qualified personnel only.

Lines to and from the sensor must not be installed parallel to strong electromagnetic fields.

In the case of a possible overvoltage please install surge protection devices.

I-BOX with calibration-and adjustment software

I-Box Professional 1.0 for Windows

This software is PC software for Windows which is easy to use to align and calibrate I Series sensors in their climate reference device.

The programme which is designed to act as an assistant, uses simple navigation to take you through the necessary steps to align up to eight sensors in parallel, digitally verify the measured values, save data and print out results. The reference values can come from a different sensor used as a reference, or can be entered directly at all measuring points.

To connect the sensors, you need an appropriate alignment cable for each and if required, a USB adapter to connect the I-BOX to the computer. This cable can be sourced from Galltec+Mela (see accessories).

The programme is available to download or on a CD and needs to be activated by Galltec+mela.

User instructions

Dew formation

Dew formation and splashes do not damage the sensor, although measurement readings are corrupted until all moisture on and around the sensing element has dried up completely.

Contaminated filters

If the PTFE filter for the humidity sensing element (9G) is contaminated with dust, grease and oils, this can have a negative impact on the dynamic behaviour of the sensor.

Cleaning of filters ZE16, 20, 21,22

If necessary, soiled filters and protective baskets can be screwed off and rinsed carefully. Bear in mind the sensors will not measure accurately until filters are completely dry. Please do not touch the highly sensitive sensing element.

Cleaning of sensor chip

Loose dust can be carefully cleaned off the humidity sensing element using distilled water or by blowing the dust carefully off. Please do not touch the highly sensitive humidity sensing element.

Damaging influences

Depending on type and concentration, agents that are corrosive and contain solvents, can result in faulty measurements and can cause the sensor to break down. Substances deposited on the sensor (e.g. resin aerosols, lacquer aerosols, smoke deposits etc.) are damaging as they eventually form a water-repellent film.

This information is based on current knowledge and is intended to provide details of our products and their possible applications. It does not, therefore, act as a guarantee of specific properties of the products described or of their suitability for a particular application. It is our experience that the equipment may be used across a broad spectrum of applications under the most varied conditions and loads. We cannot appraise every individual case. Purchasers and/or users are responsible for checking the equipment for suitability for any particular application. Any existing industrial rights of protection must be observed. The quality of our products is guaranteed under our General Conditions of Sale. Data sheet I-Serie_analog_EN. Issue: July 2013. Subject to modifications.