CE

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 types IA..., IR... are equipped with a gauze filter as standard (type ZE17). Types IV... and IT... are supplied with a sintered filter made of high-grade steel (type ZE13). 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 / ... 94 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 with plug in connection using our calibration and adjustment kit. It consists of an alignment cable (see p. 2) and our ***User-Calib-Wizard*** software (see descripion p. 7)

Technical Data

Humidity

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

Temperature

output ranges		
aktive		-40...+60°C
		-30...+70°C
		-20...+80°C
		0...+100°C
accuracy (active) at 23°C		±0.2 K
influence of temperature (ref. to 23°C)		< ±0.005 K/K
passive		Pt100 or Pt1000
measuring elements	(ref. DIN EN 60751:2009 class AA)	

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 (0...10 V, 0...1 V)	≥ 10 kΩ/≥ 2 kΩ
consumption of electronics	< 1.95 mA
Directive about electromagnetic compatibility 2014/30/EU	
DIN EN 61326-1	issue 07/13
DIN EN 61326-2-3	issue 07/13

• **Two designs**	rod-shaped sensor Ø 20mm or Ø 15mm with permanently attached cable 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 3

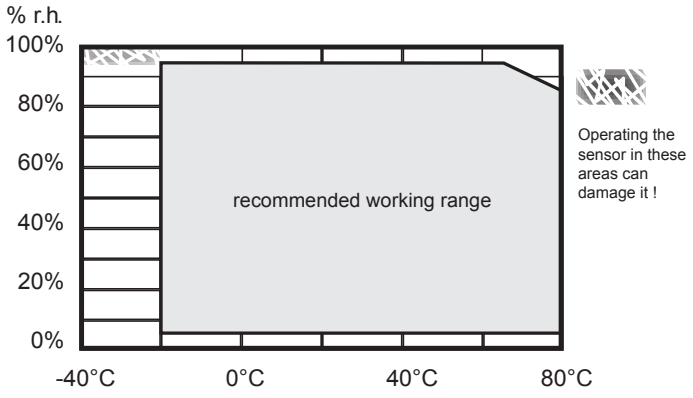
General data

measuring medium	air, pressureless, non-aggressive
min. air speed	0.5 m/s
operating temperature	-40...+85°C
storage temperature	-40...+85°C
degree of protection of measuring head	see product key
degree of protection connector	IP67
housing material	
aluminium coated type IA..., IR...	
stainless steel 1.4301 type IV..., IT...	

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 *recommended for protection against rain and sun in case of outdoor applications*
connecting cable for plug-in version 12 pin	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) *for wiring diagram see connection diagrams !*
connecting cable for plug-in version 8 pin	IVK1.02-67-xx.x		connecting cable with 8 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) *for wiring diagram see connection diagrams !*
setup cable sensor --> calibration adapter for sensors with voltage output	IAK1.02.AK-01.8	-	cable to connect sensors with a 12 pin plug-in connection and a PC to calibrate/ adjust the sensor using the UserCalibWizard software. One cable is required for each sensor to be connected.
setup cable sensor --> calibration adapter for sensors with voltage output	IVK1.02.AK-01.8		cable to connect sensors with a 8 pin plug-in connection and a PC to calibrate/adjust the sensor using the UserCalibWizard software. One cable is required for each sensor to be connected.
ZE33	as designation	F5.2	adapter for humidiy 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
ZE70/C	as designation		Cabel adapter for sensors #IAC... with a 12 pin plug-in connection and 7pin female cable connector of the PC.S series with passive temperature output
ZE70/K	as designation		Cabel adapter for sensors #IAC... with a 12 pin plug-in connection and 7pin female cable connector of the PC.S series with active temperature output

Recommended working range of humidity



Product Key

Series	I Series	I
Design	tube Ø 20 mm alu	A
	tube Ø 20 mm alu with robust connecting head	R
	tube Ø 15 mm stainless steel	V
	tube Ø 15 mm stainless steel with robust connecting head of alu	T
Physical output	humidity and temperature, 2 x active	K
	humidity only, active	F
	humidity active / temperature passive (not design V and T)	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
	no temperature measurement	00
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 Ø 20 mm	ZE16 protective plastic basket, open, IP30	16
	ZE17 protective plastic basket with gauze, IP30	17
	ZE18 sintered filter of fine-pored PTFE, IP65	18
	ZE20 protective basket with membrane filter, IP54	20
	ZE21 fine-pored sintered filter of stainless steel, IP65	21
	ZE22 coarse-pored sintered filter of stainless steel, IP65	22
	PTFE filter for humidity sensing element and protective basket, non-metallised	97
	PTFE filter for humidity sensing element and protective basket ZE16, IP30	9G
Filter Ø 15 mm	ZE04 stainless steel filter, open, IP00	04
	ZE13 stainless steel sintered filter (standard), IP65	13
	ZE26 stainless steel filter with PTFE membrane, IP54	26
	ZE29 sintered filter of fine-pored PTFE, IP65	29
	PTFE filter for humidity sensing element and protective basket ZE04, IP00	94
Type of connection and characteristics of the design [1]	8 pin plug-in connection M12x1	8Sx
	12 pin plug-in connection M16x0.75	CSx
	robust connecting head	00x
	rod-shaped sensor with permanently attached cable, 1.5 m	1Kx

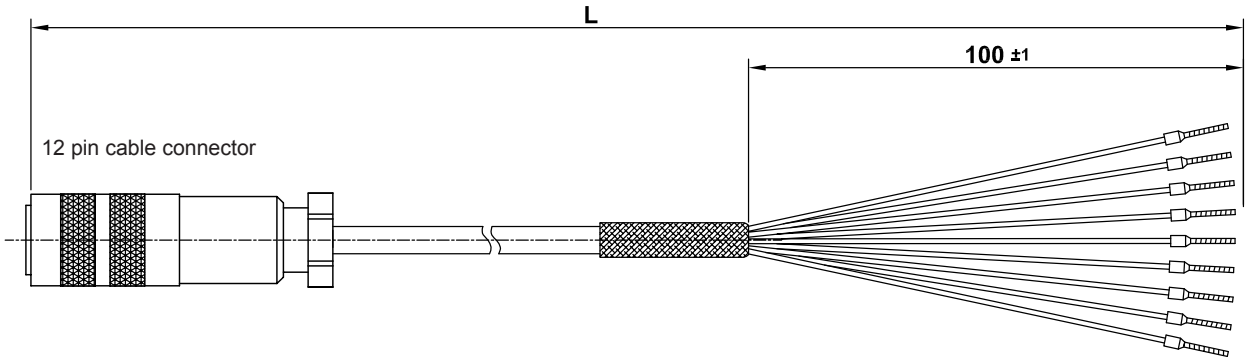
[1] Further versions on request

Ordering Example

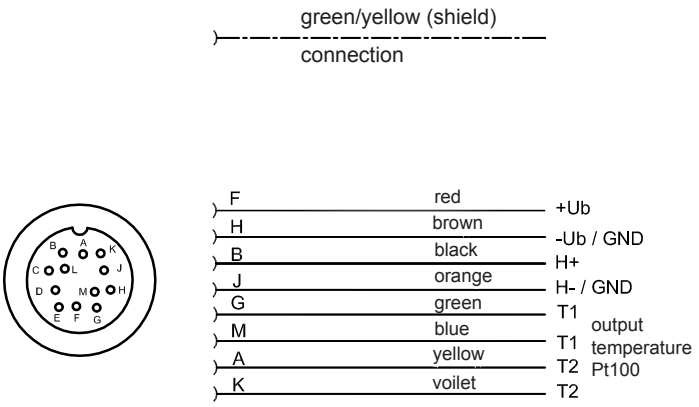
IAK1.0V.F146.517.CS8

I Series (I), aluminium tube (A), 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),
ZE17 protective plastic basket, open (17), 12 pin plug-in connection (CS8)

Dimensional drawing connecting cable IAC1.02.67-xx.x / IAK1.02.67-xx.x

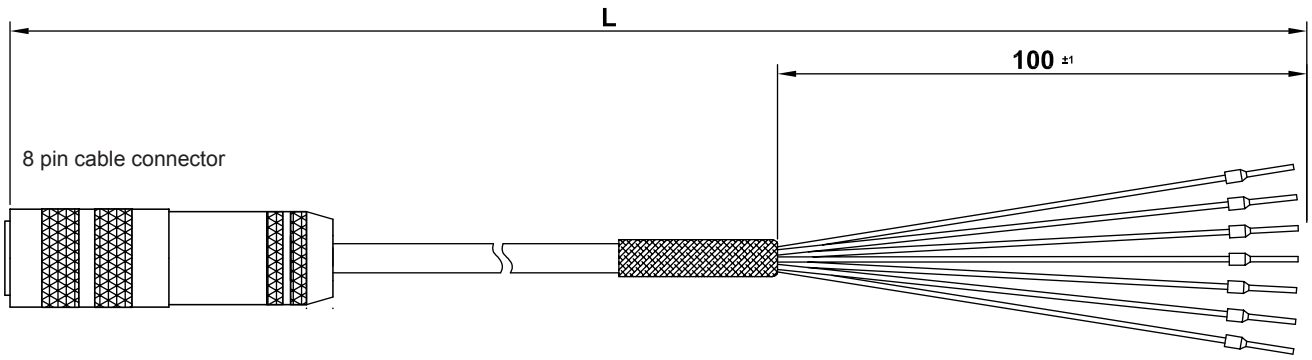


Pin assignments cable IAC1.02.67-xx.x

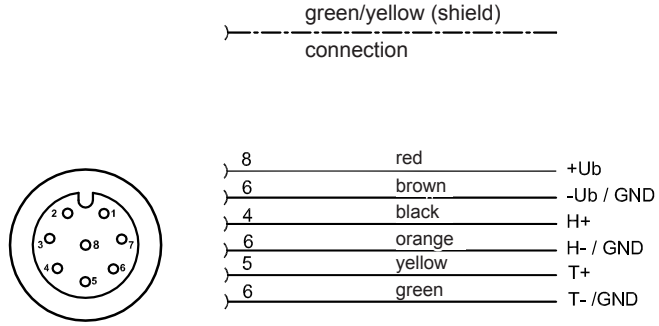


Pin assignments cable IAK1.02.67-xx.x

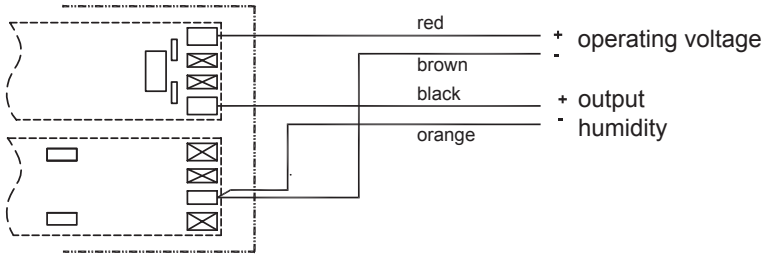
Dimensional drawing connecting cable IVK1.02.67-xx.x



Pin assignments cable IVK1.02.67-xx.x



Connection diagrams for sensors with permanently attached cable - IAF..., IV...

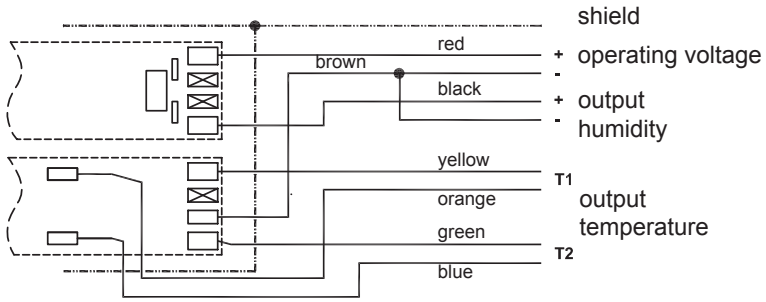


Pin assignments sensors with connecting head IR..., IT...

Pin assignment sensors IRF..., ITF..
Humidity active

H+	U_B+	GND	GND

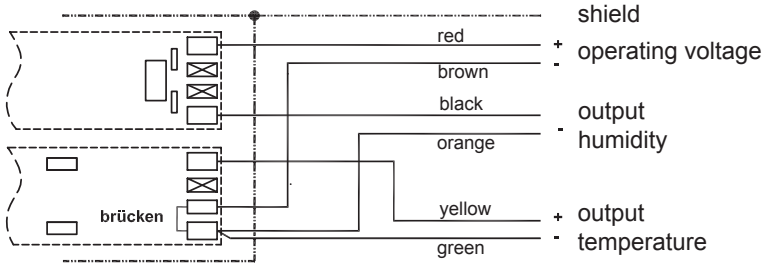
IAC..., IVC...



Pin assignment sensors IRC..., ITC..
Humidity active, temperature passive

T_1	H+	U_B+	GND	T_2

IAK..., IVK...



Pin assignment sensors IRK..., ITK..
Humidity active, temperature active

T+	H+	U_B+	GND	GND

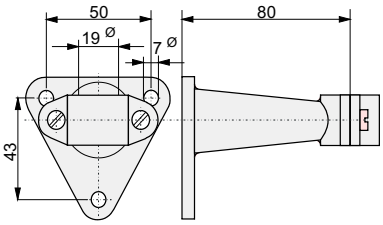
ESD protection advice

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:

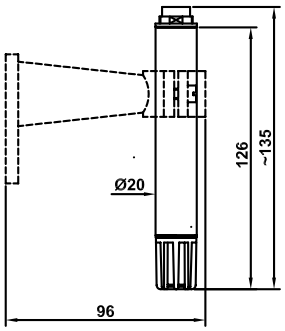
- Before opening the housing of the sensor, ensure electrical potential equalisation between you and your environment.
- Pay particular attention to ensure that this potential equalisation is maintained while you are working with the opened housing.

Dimensions

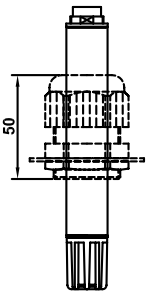


Console for wall mounting
20.009
(please order seperately)

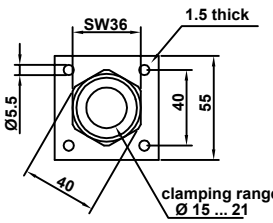
IA..S8



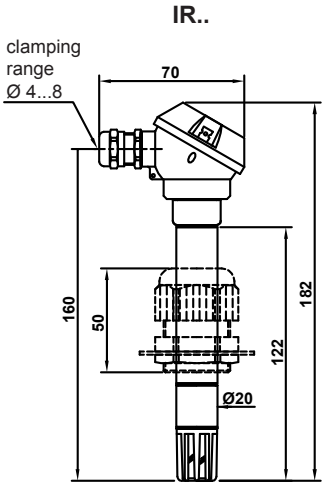
IA..S8



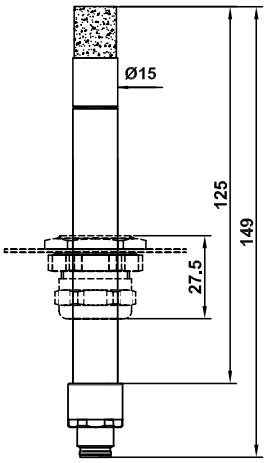
Attachment plate
ZA 20
(please order seperately)



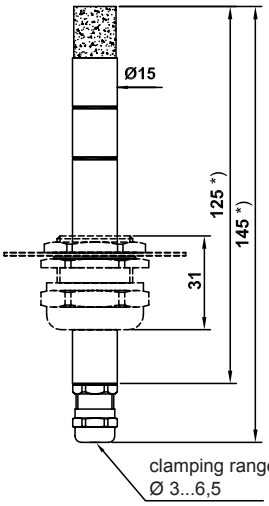
IR..



IV..S8

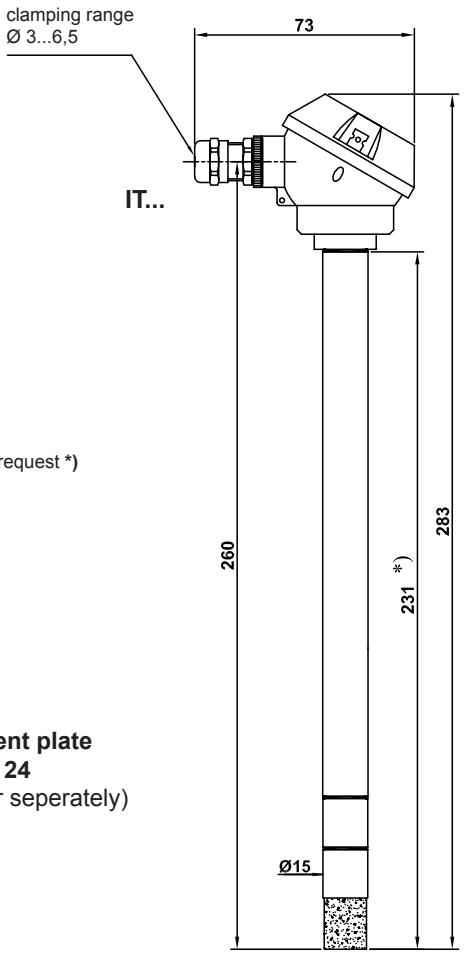


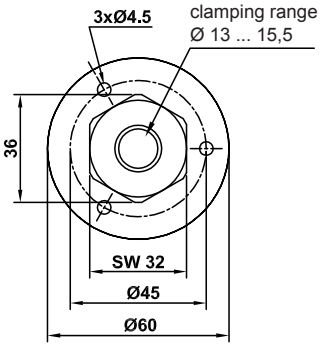
IV..1K8



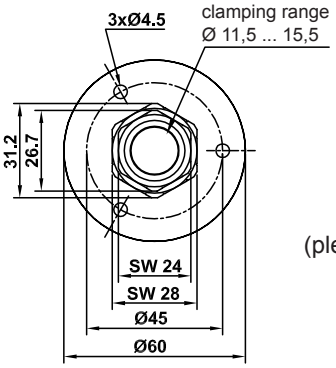
other dimensions available on request ***)**

IT...





Attachment plate
ZA 25
(please order seperately)



Attachment plate
ZA 24
(please order seperately)

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

„UserCalibWizzard“ calibration and adjustment software

	This software is a PC application for Windows which can be used to calibrate and adjust I series sensors easily. The program is designed as a wizard with simple navigation to guide users through the required steps to adjust sensors, verify measurements digitally, save data and print results. Required reference values can be obtained from a sensor used as reference, or entered directly at all measurement points. Connecting the sensors to the PC requires a suitable setup cable (IA(V)K1.02.AK-01.8) which is available from Galltec+Mela (see accessories). The program is available as a download from www.galltec-mela.de/download and requires hardware-specific activation 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 wil not measure accurately until filters are completely dry. Please do not touch the highly sensitive humidity sensing element in the process.
Cleaning of capacitive sensing element	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 in the process.
Damaging influences	Depending on their type and concentration, aggressive media containing solvents can cause incorrect readings or cause the sensor to fail. Substances deposited on the sensor element (e.g. resin aerosols, paint aerosols, smoke deposits etc.) are harmful as they eventually form a water-repellent film.