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UMSITEC
Umwelt- und Sicherheitstechnik

OPERATING INSTRUCTION BUS SENSOR GMF 730 IR for refrigerants

GMF 730 IR for refrigerants

IMPORTANT!

The device may only be operated if this operating instruction has been understood and is applied.
The annex "Safety for installers and operators" must be observed! If it is not available, please ask for it.

Sensoric

The sensor GMF 730 IR is operated with an infrared sensor long lifetime.
The signal is converted within the measuring range of the signal power range 4-20mA.

The sensor provides a corresponding output signal that can generate at an evaluation device over a load resistor to ground, an analyzable voltage signal.

Assembly

The sensor is designed for wall mounting.
Please note the relative gas density to air for proper mounting height.

Sensor connection

To supply the gas sensor 730 IR GMF, a DC voltage of 12 - 35V is needed.

As sensor-feed a shielded cable, such as JY(St) is to be used.
At the sensor, the shield wire should be connected to the device.
The bare shield wire must not come into contact with the circuit.

The other wire colors can be assigned as follows:

red => +24V (terminal V+), white => 4-20mA (terminal I), black => 0 V (terminal GND)

The shield wire is drilled to the evaluation unit with the yellow wire and to connect to the protective conductor (terminal 4 to the evaluation unit). This should only be done when the sensor housing is not already grounded by the assembly itself.

Equipment

Zero gas (synthetic air)
Calibration gas (40% .. 100% of range)
Gas feeding valves (flow controllers, flow meters, 0-1 liters / min)
suitable gas feed adaptor

Acceleration

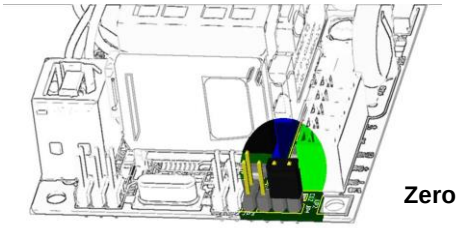
The output current is initially 2 mA, then a jump of 4 mA take place.
During the warm-up time, the sensor signal can vary around the value of 4 mA.

After 2 minutes the stable measuring operation is achieved.

Setting instruction

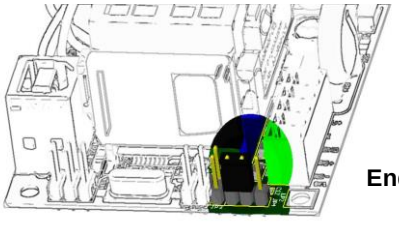
Before setting, the sensor must be in operation for 30 minutes.
The test gas must have ambient temperature, viz. the same temperature as the sensor.

1. - Pressurize zero gas and rinse the measuring cuvette completely with it.
   - Plug a jumper JP4 to position 1-2 and wait about 20 seconds.
     The output current should fall to 4 mA.
   - By removing the plug are stored the current values and the zero point calibration is completed..



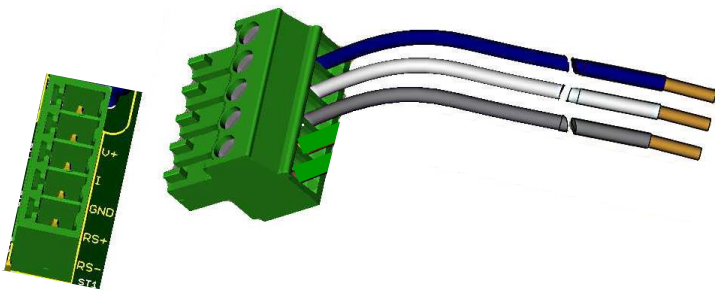
Zero point calibration: Jumper to JP4, Pin 1-2

2. End-point calibration:
   - Supply test gas with the value of the full scale value of the sensor and rinse the measuring cuvette completely with it.
   - Plug a jumper to position 2-3 and wait about 20 seconds.
     The output current should rise to 4 mA.
   - By removing the plug the current values are stored and the end-point calibration is completed.



End-point calibration: Jumper to JP4, Pin 2-3

Terminals for GMF 730 IR for refrigerants



V+
4-20mA
GND

Commissioning

The adjustment of the sensor must be checked by suppling test gas during commissioning.

Maintenance

In order to up-keeping the functional reliability a maintenance at predetermined intervals is required. The maintenance interval is taken from the inspection sticker at the evaluation device.
It is no longer than 1 year.

Decommissioning

If the sensor is longer than 4 weeks out of service, it must be checked with test gas and recalibrate if necessary.

Technical details:

Measuring principle:	infrared light absorption, 2 wavelength
Gas type:	various refrigerants
Measuring area:	0..2000 ppm, factory set
Accuracy:	+-2% of measuring area
Starting time:	< 120 sec
Response time T90:	< 30 sec
Temperature range:	-10..+40°C
Humidity range:	0..95% RH
Pressure range:	800-1200 hPa
Housing:	aluminium l/w/h: 100x100x80mm
Protection type:	IP44
Gas entry:	diffusion
Output signal:	digital via RS 485 BUS
Max. load:	125 R
CE-conformity:	emission: residential, immunity: industrial environment
Weight:	450g
Supply:	12-28V DC / approx. 70mA average, max. 140 mA
Connecting cable:	bis 500 m: JY (ST) Y 2x2x0,8 mm²,

Status: October 2015

Subject to technical change

General features

Measurement principle: Non Dispersive Infra-Red (NDIR), dual wavelength
Measurement range: dependent on model - see list (1)
Gas supply: by diffusion (atmospheric pressure)
Dimensions: 72 mm x 55 mm x 34 mm (L x W x H)
Warm-up time: < 2 minutes (start up time)
< 30 minutes (full specification)

Measuring response (2)

Response time (t_{90}): Appr. 30 s
Digital resolution (@ zero): 1 ppm / 0.1 % LEL / 0.01 Vol.-% (1)
Detection Limit (3 σ): ≤ 1 % FS(3) (typically)
Repeatability: ≤ •} 1 % FS(3)
Linearity error (4): ≤ •} 2 % FS(3)
Long term stability (zero) (5): ≤ •} 2 % FS(3) over 12 month period
Long term stability (span) (5): ≤ •} 2 % FS(3) over 12 month period

Influencing variable (6)

Temp. dependence (zero): ≤ •} 0.1 % FS(3) per °C
Temp. dependence (span): ≤ •} 0.2 % FS(3) per °C
Pressure dependence (zero): -
Pressure dependence (span): 0.1 % to 0.2 % value per hPa (1)

Electrical inputs and outputs

Supply voltage: 12 to 28 V DC •} 5 %
Supply current: 70 mA average, max. 140 mA
Power consumption: < 1 Watt
Analogue output signal: 0 - 20 mA linear
4 - 20 mA linear
0 - 1 V linear (with 50 Ω)
0 - 2 V linear (with 100 Ω)
Maximum load: 125 Ω
Digital output signal: Modbus ASCII via RS485
Calibration: zero and span by jumper or SW

Climatic conditions

Operating temperature: -10 ° C to 40 °C
Storage temperature: -20 °C to 60 °C
Air pressure: 800 to 1200 hPa
Humidity: 0 % to 95 % rel. humidity (not condensing)