1899P01

Transducer for absolute Humidity and Enthalpy AQF61.1

Microprocessor-based converter to calculate absolute humidity, enthalpy and enthalpy differential.

Application

- In ventilating and air conditioning plants.
- To measure, regulate, control and display absolute humidity, enthalpy or enthalpy differential.
- Can be linked to building management systems.

Ordering

When ordering, please give type reference **AQF61.1**.
Terminal covers (sets of pairs): Type reference **ARG81.1**. To cover all terminals and switches, three pairs of ARG81.1 are required.

Technical design

With the help of a temperature detector and a relative humidity detector, the AQF61.1 transducer calculates **absolute humidity** (x) in g/kg and **enthalpy** (h) in kJ/kg. The respective signals (DC 0...10 V) are continually present at two different outputs.
When using an **additional** temperature detector and relative humidity detector, the AQF61.1 is able to calculate a **second enthalpy value**, which is made available as a separate output signal (DC 0...10 V).
In this case, the AQF61.1 determines the **enthalpy differential**, which is provided at another terminal in the form of a DC 0...10 V signal.

The **temperature detectors** used may be either passive (Pt 1000 or LG-Ni 1000) or active (DC 0...10 V) having a measuring range −35 °C...+35 °C and/or 0...50 °C.
The **humidity detectors** required for the AQF61.1 are active detectors (DC 0...10 V) with a measuring range of 0...100 % r.h.
A switch with four positions is provided to permit adaptation of the unit to the required **elevation above sea level**.
This allows precise calculation of both absolute humidity and enthalpy.

Design features

The AQF61.1 is **snapped** onto standard mounting rails or **screwed** onto a flat surface. The plastic casing cannot be opened. It accommodates the electronic circuit in the form of a printed circuit board. The **connecting terminals** are located on the base and are easily accessible. Terminal covers are available as accessory items, if required.
Printed on the **front cover** are:

- The terminal diagram
- The setting choices for the characteristics and the temperature ranges (LG-Ni 1000 / Pt 1000 and −35 °C...+35 °C/0...50 °C)
- The adaptation to elevations above sea level

The associated switches are located on the outer part of the printed circuit board at bottom left.

Engineering notes

To generate the **operating voltage of AC 24 V**, a **transformer** is required. When sizing the transformer, the power consumption of the AQF61.1 must be taken into consideration.
The **transducer**, the **active temperature and humidity detectors** as well as the **associated controllers** must all be connected to the same G0 or M (system neutral). This is important when using separate transformers. Data Sheet 3401 contains basic system data on POLYGYR. All hints and explanations given in this sheet must be observed.
For the terminal designations and their meaning, refer to **"Internal diagram".** Only **one** temperature detector may be connected to terminals B1 and B2 or B4 and B5. The other terminals are not used.
When using **enthalpy differential control** between the recirculated air and the outside air (maximum economy changeover) the recirculated air detectors must be connected to terminals B1 or B2 and B3, the outside detectors to terminals B4 or B5 and B6.
The **duct humidity detector type** QFM64 is suitable for temperatures as low as −35 °C.
The **transducer** is safe against incorrect wiring against own voltages of AC 24 V, but does not operate if wired incorrectly.

Mounting and installation notes

Mounting location: Usually in a control panel together with the associated controllers. When installing the AQF61.1 in the plant (e.g. near the detectors), it is recommended to use the terminal covers (risk of contamination). The permissible ambient temperature and humidity must always be observed (refer to "Technical data").
Mounting mode: On standard mounting rails (AQF61.1 snaps on), or on a flat surface (by means of screws).
Mounting orientation: Optional, if it is not possible to use the standard horizontal fixing.
The unit is supplied complete with Mounting Instruction.

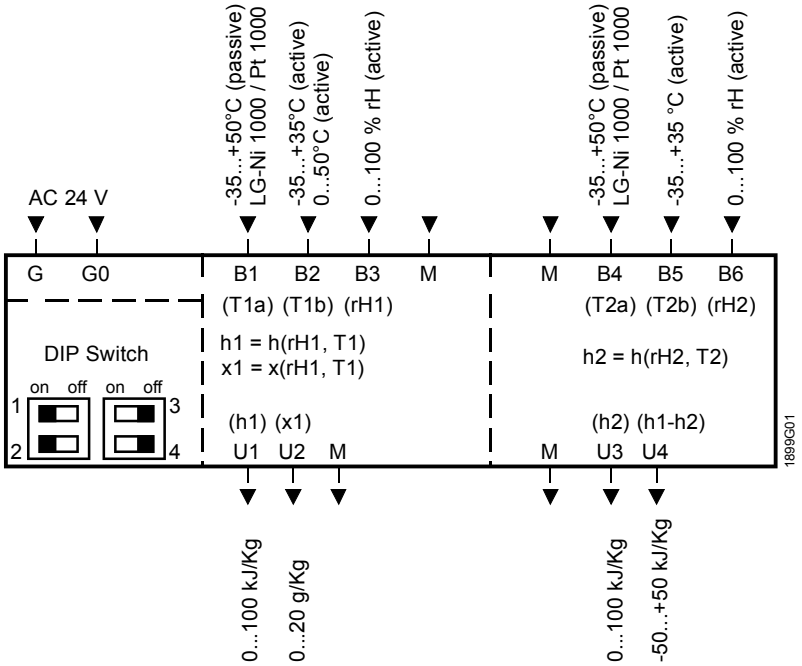
Commissioning notes

When commissioning the plant, the wiring and function of the unit must be checked.
The electronic circuit is not accessible.
The only settings to be made are those described under "Technical design" and "Design Features".
The other settings required are made at the controllers to which the transducer is linked.

Technical data

Power supply	Operating voltage	AC 24 V ±20 %
	Frequency	50/60 Hz
	Power consumption	4.5 VA
Input signals	Temperature, passive	LG-Ni 1000 or Pt 1000
	Temperature, active	DC 0...10 V
	Rel. humidity, active	DC 0...10 V
	Current	<0,1 mA
	Range	−35...+35 °C, −35...+50 °C, 0...50 °C / 0...100 % r.h.
Output signals	Enthalpy	DC 0...10 V corresponding to the range 0...100 kJ/kg
	Enthalpy differential	DC 0...10 V corresponding to the range −50...+50 kJ/kg
	Absolute humidity	DC 0...10 V corresponding to the range 0...20 g/kg
	Current	max. ±1 mA
Funktionsdaten	Conversion error	max.2.5 % of absolute humidity or enthalpy range (typically approx. 1 %)
	Dead time	≤1 s
	Adaptation to elevation	P1: 0...400 m above sea level P2: 400...800 m above sea level P3: 800...1200 m above sea level P4: >1200 m above sea level
Protection standard of housing	without terminal covers	IP 20 to DIN 40 050
	with terminal covers	IP 40 to DIN 40 050
Electrical connecting	Screw terminals for	2 x 1.5 mm^2 or 1 x 2.5 mm^2
	Perm. cable lengths	
	Sensor-computing unit	refer to the respective Data Sheets
	Computing unit-con troller by	Cu-cable 0.6mm dia.: 25 m
	bei Verwendung von QFM64	Cu-cable 1.0 mm^2: 90 m
		Cu-cable 1.5 mm^2: 130 m
		Cu-cable 2.5 mm^2: 220 m
Environmental conditions	Perm. ambient temperature	
	Operation	0...50 °C
	Transport and storage	−20...+65 °C
	Perm. ambient humidity	Class F to DIN 40 040
Standards	Electromagnetic compatibility	
	Emissions as per	EN 50081-1
	CE comformity as per EMC directives	89/336/EEC
Weight	without packaging	0.20 kg

Integral diagram

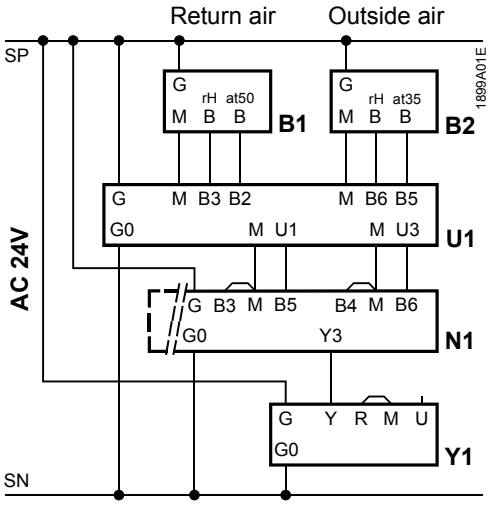


1 on:	LG-Ni 1000
1 off:	Pt 1000
2 on:	T1b = −35...+35 °C
2 off:	T1b = 0...50 °C
3 off and 4 off:	0...400 m over sea level
3 off and 4 on:	400...800 m over sea level
3 on and 4 off:	800...1200 m over sea level
3 on and 4 on:	>1200 m over sea level

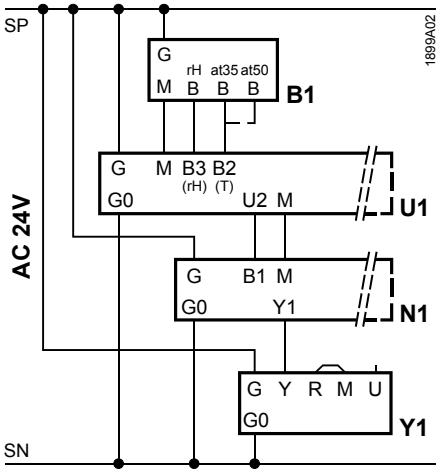
The switch positions shown are the factory-set positions.

Connection diagrams

Connection diagram 1 Δh control



Connection diagram 2 x control



Legend

B1, B2	Combined humidity and temperature detector QFM64
U1	Transducer AQF61.1 for h, Δh and x
N1	Universal controller RWF61...
Y1	Actuator

Dimensions (Dimensions in mm)