



Condensation Monitor

QXA2000
QXA2001

The QXA2000 condensation monitor is used to avoid damage due to condensation on chilled ceilings and in HVAC plant. It operates on AC/DC 24 V and has a potential free AC/DC 1...48 V changeover contact. Suited for use with extension module AQX2000 (AC 230 V) equipped with a potential free AC 12...250 V changeover contact.

Use

For monitoring condensation in buildings with chilled ceilings or in ventilation, air conditioning or heating plant.

The condensation monitor is used

- to prevent condensation on chilled ceilings
- to prevent condensation at critical spots of HVAC plant or buildings (in air ducts, near fans, etc.)
- as a condensation switch

In general, the condensation monitor is for use on all kinds of surfaces where condensation must be avoided.

Ordering and delivery

When ordering the condensation monitor, please give name and type reference. It is supplied complete with a strap-on band for pipe diameters from 10 to 100 mm and thermal conductive paste.

The AQX2000 extension module, which is offered as an accessory item, must be ordered separately.

Equipment combinations

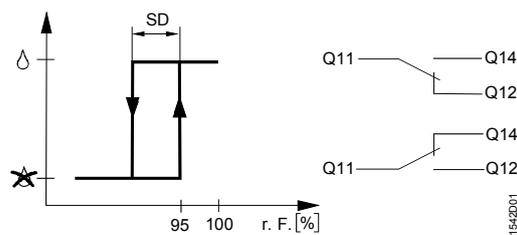
Suited for use with all types of devices

- that operate on AC/DC 24 V and that can handle the condensation signal delivered by the monitor's potential free AC/DC 1...48 V relay changeover contact, or
- that, in connection with the AQX2000 extension module, operate on AC 230 V and that can handle the condensation signal delivered by the module's potential free AC/DC 12...250 V relay changeover contact

Mode of operation

With its sensing element, the condensation monitor acquires the relative humidity close to the dew point (= 100 % r. h.). The resistance of the sensing element raises sharply in the range of 90...100 % r. h. Before the dew point is reached, the electronics energizes the relay. When, for instance, in the case of chilled ceiling applications, the relay contact switches over (2-position output), the following actions are triggered:

1. Cooling will be shut down via the valve or by a controller until the condensation signal is no longer present.
2. The water flow temperature will immediately be raised by an adjustable value (typically 1 to 2 K) and slowly reduced again after the signal has disappeared. This application requires a specific function in the controller.



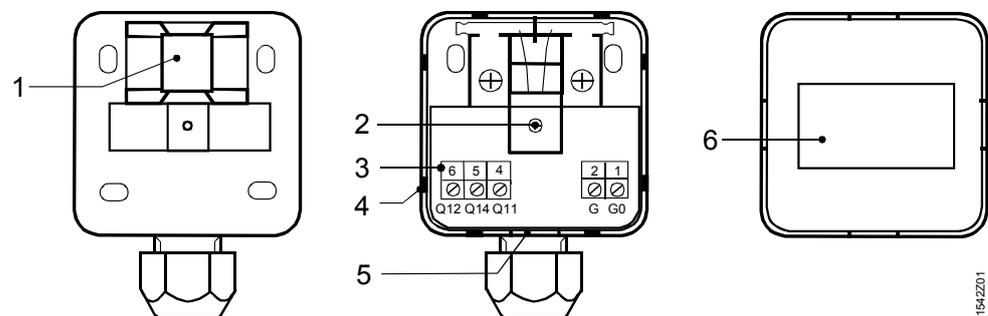
Legend

SD Switching differential
Q... Relay contact output

Mechanical design

QXA2000

Housing with snap-on cover made of pure-white, flame-retarding thermoplastics with spring-loaded humidity sensing element, holding relay with changeover contact, connection terminals and Pg 11 cable entry glands made of plastics.



Legend

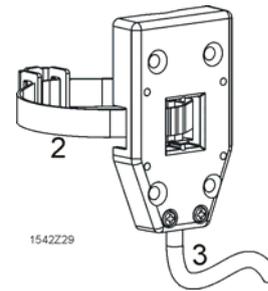
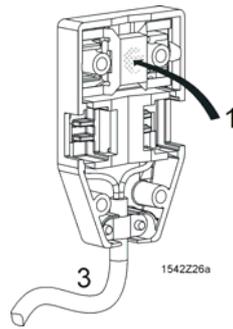
- 1 Sensing element
- 2 Fixing screw with strap-on band
- 3 Terminal block
- 4 Nose of snap-on facility
- 5 Slot, for lifting the cover with the help of a screwdriver

QXA2001

Versions such as QXA2000 have, however, offset sensor heads (fixed cable connection of 1.5 meters) rather than a directly integrated sensor.

View: Sensor head on the mounting side

View: Sensor head front side



- 1 Sensing element
- 2 Tensioning strap
- 3 Connector cable 1.5 m to base housing

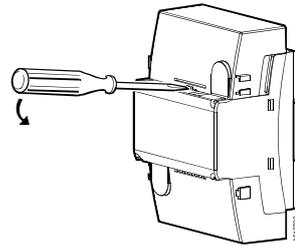
AQX2000

The AQX2000 extension module consists of base, top section and printed circuit board with the lateral connection terminals.

RXZ40.1

The RXZ40.1 terminal cover is available as an optional item for use with the AQX2000 extension module. It provides protection against electric shock hazard and keeps the terminals free from dust and dirt.

When fitting the terminal cover, it must be ensured that it engages correctly.



Removal of terminal cover

Accessories

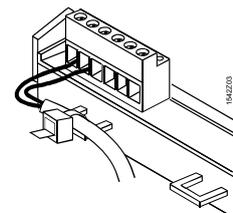
Name	Type reference
Extension module AC 230 V	AQX2000
Terminal cover	RXZ40.1

Engineering notes

The AQX2000 extension module operates on AC 230 V mains voltage. It feeds AC 24 V to the condensation monitor and delivers the condensation signal via its potential-free AC/DC 12...250 V relay changeover contact.

 Caution!

Cable strain relief for the AC 230 V terminals is mandatory. The cables must be attached to the lugs on the base using cable ties (see illustration).



 Caution!

The AQX2000 extension module may only be accessed by authorized staff.

Disposal



Dispose of the device as electronic waste in compliance with European directive 2002/96/EEC (WEEE) and not as municipal waste. Observe all relevant national regulations and dispose of the unit correctly. Observe all local and applicable laws.

Mounting notes

QXA2000 condensation monitor

Mounting choices:

- Pipe-mounting with strap-on band (pipe diameter 10...100 mm)
- Surface-mounting on walls or ceilings with the help of 4 screws

The condensation monitor performs its function only if the humidity sensing element assumes the same temperature as the surface to be protected against condensation.

Following is to be noted:

- Apply a thin layer of thermal conductive paste on the mounting surface
- Mount the condensation monitor at the coldest spot of the chilled ceiling (plant)
- In the case of water-cooled chilled ceilings, mount the monitor on the water inlet pipe
- Protect the sensing element against aggressive chemicals and dirt (both can adversely affect the correct operation of the monitor and drastically shorten its life)

QXA2001

Mounting choices of sensor head like QXA2000.

Note

The monitor must not be continuously exposed to condensation. It is supplied complete with Mounting Instructions.

AQX2000 extension module AC 230 V

Mounting choices:

- On top hat rails conforming to EN 60 715–TH 35-7.5
- On walls (with the help of screws)

The cable length to the condensation monitor must not exceed 20 m.

Commissioning notes

No special commissioning procedure is required. A functional test can be made by exhaling slowly onto the sensing element several times, thus simulating condensation.



Caution!

Do not expose the sensing element to tap water as this can cause electrolytic corrosion.

Power lines AC 230 V

Local regulations regulate sizing and fusing of power lines. Power lines must be fused in the extension module AQX2000 with strain relief.

Potential-free Relay output

The potential-free relay output permits switching loads of up to AC 250 V, 6 A. Line sizing is oriented to connected load and local regulations. The switching circuits are externally fused (≤ 10 A), there is not internal protection. The relay output is not suitable for connecting to SELV or PELV electric circuit. The lines must be fused with strain relief on the extension module AQX2000.

Technical data

QXA2000, QXA2001

Power supply G (G+), G0 (G-)	Operating voltage	SELV/PELV AC/DC 24 V \pm 20 %
	Rated voltage	AC/DC 24 V
	Frequency	50/60 Hz
	Power consumption	max. 1 VA
Functional data	Switching point on increase of humidity	95 \pm 4 % r. h.
	Switching differential (fixed)	approx. 5 % r. h.
	Response time in static air	
	From 80 auf 99 % r. h.	max. 3 min
From 99 auf 80 % r. h.	max. 3 min	
	Condensation	max. 30 min
Output Q11, Q12, Q14	Relay output	potentialfree changeover contact
	Current range at AC/DC 24 V	0.02...1 (1) A
	Starting current at AC/DC 24 V	\leq 10 A for \leq 20 ms
	Switching capacity	min. AC/DC 1 V, 1 mA max. AC/DC 48 V, 0.5 A
Protection data	Degree of protection of housing	IP 40 to EN 60 529
	Safety class	III to EN 60 730
Connections	Mechanically	strap-on band for pipe dia. 10...100 mm
	Electrical connections	
	Screw terminals for	1.5 mm ²
Environmental conditions	Operation to	IEC 60 721-3-3
	Climatic conditions	class 3K5
	Temperature (housing with electronics)	-5...+50 °C
	Humidity	5...95 % r. h. (noncondensing)
	Mechanical conditions	class 3M2
	Transport to	IEC 60 721-3-2
	Climatic conditions	class 2K2
	Temperature	-25...+60 °C
	Humidity	<95 % r. h.
	Mechanical conditions	class 2M2
Materials and colors	Housing	thermoplastics, pure-white
Industry standards	Product standard	
	Automatic electrical controls for domestic use and similar applications	EN 60 730-1
	Electromagnetic compatibility	
	Immunity	EN 61 000-6-2
	Emissions	EN 61 000-6-3
	CE conformity	
Electromagnetic compatibility	2004/108/EG	
 conformity		
Australian EMC Framework	AS/NZS 61000-6-3	
Radio Interference Emission Standard		
Weight	Including packaging	0.126 kg

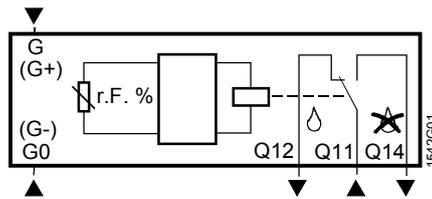
AQX2000

Power supply (L, N)	Operating voltage	AC 230 V ± 10 %
	Rated voltage	AC 230 V
	Frequency	50/60 Hz
	Power consumption	max. 4 VA
Inputs	Status signal input (D, GND)	
	Contact voltage Contact current	DC 37 V (SELV/PELV) 13 mA
Outputs	Voltage output (G, G0)	
	Operating voltage Frequency at AC 24 V Load	AC 24 V ± 20 % (SELV/PELV) 50/60 Hz max. 1 VA
	Relay output (Q11, Q12, Q14)	potential free changeover contact Not suitable for connect to SELV/PELV electric circuits
	Operating voltage range Operating current range Switching capacity	AC/DC 12...250 V 0.01...6 A min. AC/DC 12 V, 10 mA max. AC/DC 250 V, 6 A
Protective data	Electrical insulation (L, N)	1500 V
	Degree of protection of housing With terminal cover and wall-mounting without top hat rail	IP 30 to EN 60 529
	Safety class to EN 60 730	device suited for use with equipment of safety class I or II
Connections	Electrical connections	
	Screw terminals for Cable length to the QXA2000, QXA2001	max. 2 x 1.5 mm ² or 1 x 2.5 mm ² max. 20 m
Environmental conditions	Operation to	IEC 60 721-3-3
	Climatic conditions	class 3K5
	Temperature (housing with electronics) Humidity	-5...+50 °C <85 % r. h.
	Mechanical conditions	class 3M2
Transport to	Transport to	IEC 60 721-3-2
	Climatic conditions	class 2K3
	Temperature Humidity	-25...+70 °C <95 % r. h.
	Mechanical conditions	class 2M2
Materials	Housing	ABS + PC
	Terminal cover	ABS + PC
Industry standards	Product standard	
	Automatic electrical controls for domestic use and similar applications	EN 60 730-1
	Electromagnetic compatibility	
	Immunity (Industry) Emissions (Residential)	EN 60 730-1 EN 60 730-1
	CE conformity	
	Electromagnetic compatibility Low-voltage directive	2004/108/EG 2006/95/EG
Weight	✔ Conformity Australian EMC Framework Radio Interference Emission Standard	AS/NZS 61000-6-3
	Including packaging	0.2 kg

Diagrams

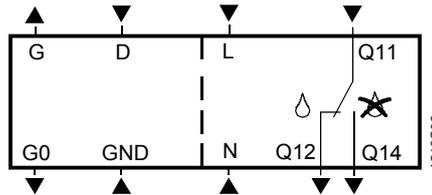
Internal diagrams

QXA2000, QXA2001



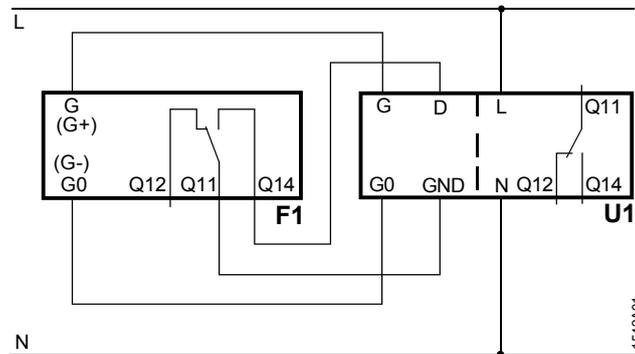
G (G+) Operating voltage AC 24 V (DC 24 V)
 G0 (G-) System neutral
 Q... Potential free changeover contact
 AC/DC 1... 48 V

AQX2000



G Operating voltage AC 24 V
 G0 System neutral
 D, GND Status signal input DC 37 V for
 potential free changeover contact of the
 QXA2000, QXA2001
 L, N Mains voltage AC 230 V
 Q... Potential free changeover contact
 AC/DC 12...250 V

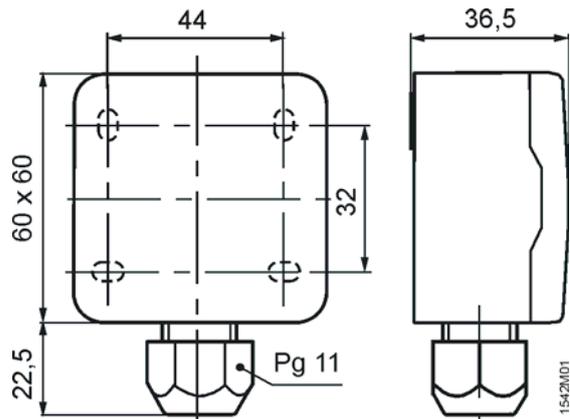
Connection diagram



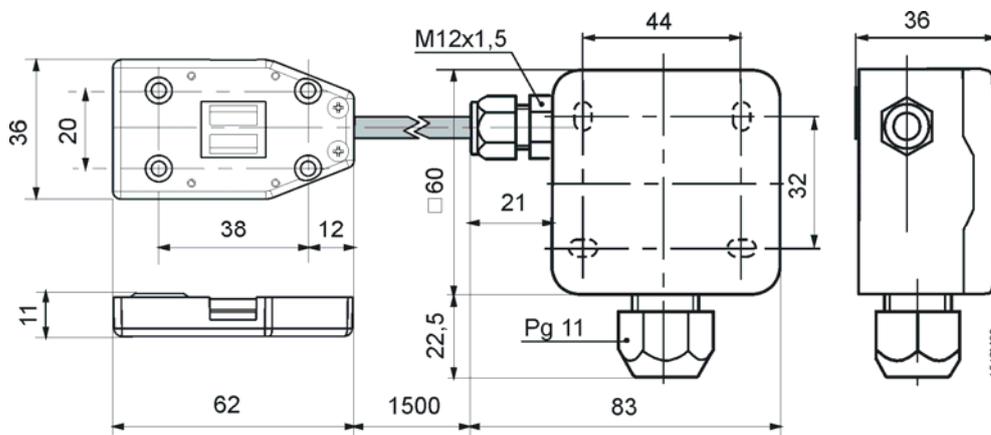
F1 Condensation monitor QXA2000, QXA2001
U1 Extension module AQX2000 (AC 230 V)

Dimensions

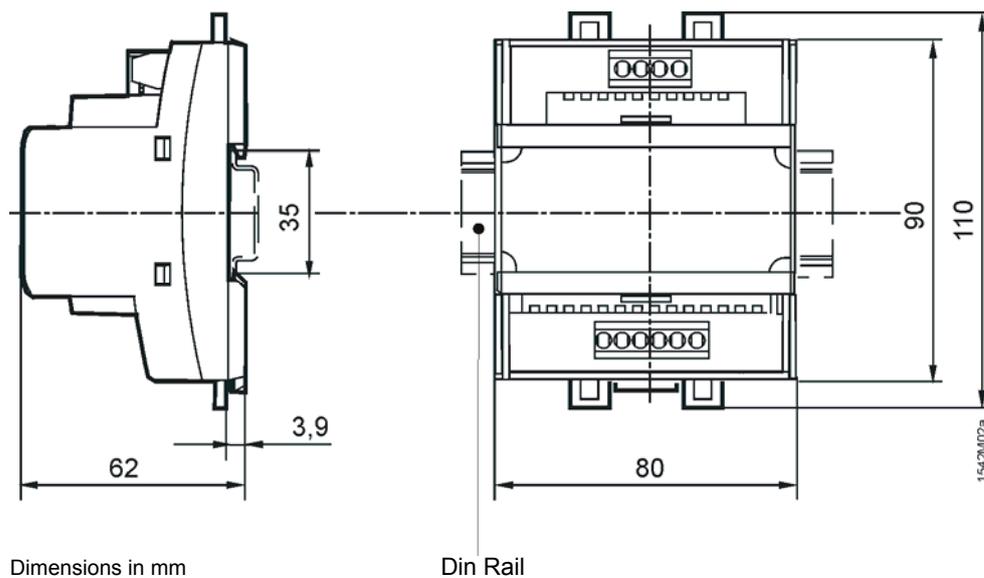
QXA2000



QXA2001



AQX2000



Dimensions in mm

Din Rail