PolyGard® Refrigerant Gas Transmitter
ADT43 20XX with Semi-conductor Sensor

DESCRIPTION

Refrigerant gas transmitter with semi-conductor sensor for monitoring leakages of cooling agents like HFC (hydrofluorocarbon) or HCFC (hydrochlorofluorocarbon). The semi-conductor typical, non-linear signal is translated into a linear, temperature-compensated output signal. A comfortable calibration routine is integrated in the transmitter. The ADT-43 possesses a standard analog output (0) 4–20 mA or (0) 2–10 V DC, and an RS-485 interface. 2 relays with adjustable switching thresholds are available as an option.

APPLICATION

For leak detection in cooling systems with refrigerant gases as cooling agents (HCFC and HFC), such as cold-storage depots, ventilation systems, breweries, ice rinks etc. to assure the compliance with the requirements according to EN 378-3. Due to the standard output signal and the RS-485 interface, the refrigerant gas transmitter is compatible to the PolyGard Gas Controller series by MSR-E as well as to any other electronic control or automation system.

FEATURES

- Digital measurement value processing incl. temperature compensation.
- Linear output signal
- Continuous monitoring
- Low zero point drift
- Good stability to poisoning
- Semi-conductor sensor with long life-time
- Modular plug-in technology
- Comfortable calibration
- Reverse polarity protected, overload and short-circuit proof
- (0) 4 - 20 mA / (0) 2 – 10V analog signal output, selectable
- Serial interface RS-485
- IP65 protected
- Manual calibration via potentiometer (option)
- Manual addressing for RS-485 mode (option)
- 4 – 20 mA analog input for external AT transmitter (optional)
- Approved according to EN 61010-1; ANSI/UL 61010 1; CAN/CSA-C22.2 No. 61010-1
- Relay output (optional)
- Integrated buzzer (optional)
- LED flashlight (optional)
- LCD display (optional)
- LED status display (optional)
- Heating (optional)
- Duct mounting (optional)
# SPECIFICATIONS

## General sensor performance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detected gas</td>
<td>Refrigerant gases</td>
</tr>
<tr>
<td>Sensor element</td>
<td>Semi-conductor sensor</td>
</tr>
<tr>
<td>Measuring range</td>
<td>20 - 300 ppm/ 20 - 2000 ppm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>± 20 %</td>
</tr>
<tr>
<td>Response time</td>
<td>t&lt;sub&gt;90&lt;/sub&gt; &lt; 40 sec.</td>
</tr>
<tr>
<td>Oxygen concentration</td>
<td>21 % (standard) 18 % minimum level</td>
</tr>
<tr>
<td>Humidity</td>
<td>5 – 95 % RH non-condensing</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10 °C to 50 °C (14 °F to 122 °F) w/o heating</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>0 °C to 50 °C (32 °F to 122 °F)</td>
</tr>
<tr>
<td>Pressure range</td>
<td>800 – 1100 hPa</td>
</tr>
<tr>
<td>Storage time</td>
<td>Max. 12 months</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>&gt; 5 years/ normal operating environment</td>
</tr>
<tr>
<td>Recommended mounting height</td>
<td>Depending on gas type</td>
</tr>
</tbody>
</table>

## Electrical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>16 - 28 VDC/AC, (reverse polarity protected)</td>
</tr>
<tr>
<td>Power consumption (without options)</td>
<td>60 mA, max. (1.45 VA)</td>
</tr>
</tbody>
</table>

### Analog output signal

- Selectable: Current / tension
- Starting point 0 / 20 %
  - (0) 4 – 20 mA, load ≤ 500 Ω,
  - (0) 2 - 10 V, load ≥ 50 kΩ
- proportional, overload and short-circuit proof

## Serial interface

- Transceiver: RS 485 / 19200 Baud (9600 at Mod_Bus)

## Physical characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enclosure Plastic Type A*</td>
<td>Polycarbonate</td>
</tr>
<tr>
<td>Flammability</td>
<td>UL 94 V2</td>
</tr>
<tr>
<td>Enclosure color*</td>
<td>RAL 7032 (light grey)</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>94 x 130 x 57 mm (3.7 x 5.12 x 2.24 inch.)</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 0.5 kg (1.1 lbs.)</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 65</td>
</tr>
<tr>
<td>Installation</td>
<td>Wall mounting</td>
</tr>
<tr>
<td>Cable entry</td>
<td>Standard 1 x M 20</td>
</tr>
<tr>
<td>Wire connection</td>
<td>Screw type terminal, min. 0.25 mm&lt;sup&gt;2&lt;/sup&gt; (24 AWG) max. 2.5 mm&lt;sup&gt;2&lt;/sup&gt; (14 AWG)</td>
</tr>
<tr>
<td>Wire distance</td>
<td>Current signal: ca. 500 m (1500 ft)</td>
</tr>
<tr>
<td></td>
<td>Voltage signal: ca. 200 m (600 ft.)</td>
</tr>
</tbody>
</table>

## Guidelines

- EMC Directives 2004/108/EC
- EN 61010-1:2010
- ANSI/UL 61010-1
- CAN/CSA-C22.2 No. 61010-1
- CE

## Warranty

- One year on material (without sensor)

*For further enclosure types see datasheet ADT Enclosure.*
## Options

**Relay output**
- Alarm relay 1: 30 VAC/DC, 0.5 A, potential-free, SPDT
- Alarm relay 2: 30 VAC/DC, 0.5 A, potential-free, SPNO/SPNC
- Power consumption: 30 mA, (max 0.8 VA)

**Warning buzzer**
- Acoustic pressure: 85 dB (distance 300 mm) (1 ft)
- Frequency: 3.5 kHz
- Power consumption: 30 mA, (max 0.8 VA)

**LCD display**
- LCD: Two lines, each 16 characters
- Power consumption: 10 mA, (max 0.3 VA)

**LED display**
- Green-yellow-red: Supply, low alarm, high alarm
- Power consumption: 10 mA, (max. 0.3 VA)

**Heating**
- Temperature controlled: 3 °C ±2°C (37.5 °F ± 3.6 °F)
- Ambient temperature: -40 °C (-40 °F)
- Power consumption: 0.3 A; 7.5 VA

**Analog input**
- Only for RS-485 mode
- 4 – 20 mA overload and short-circuit proof, input resistance 200 Ω
- Power supply for external transmitter: 24 VDC max. charge 50 mA

### OVERVIEW REFRIGERANT GAS TYPES

<table>
<thead>
<tr>
<th>Gas Type*</th>
<th>Group</th>
<th>Measuring range</th>
<th>Relative gas density (air =1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R 22</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>3</td>
</tr>
<tr>
<td>R 401a</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 401b</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 402a</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 402b</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 408a</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 409a</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 123</td>
<td>HCFC</td>
<td>2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 134a</td>
<td>HFC</td>
<td>300 ppm / 2000 ppm</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>R 404a</td>
<td>HFC</td>
<td>300 ppm / 2000 ppm</td>
<td>3.45</td>
</tr>
<tr>
<td>R 416a</td>
<td>HFC</td>
<td>300 ppm / 2000 ppm</td>
<td>&gt; air</td>
</tr>
<tr>
<td>R 407c</td>
<td>HFC</td>
<td>300 ppm / 2000 ppm</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>R 507</td>
<td>HFC</td>
<td>300 ppm / 2000 ppm</td>
<td>3.45</td>
</tr>
<tr>
<td>R 410a</td>
<td>HFC</td>
<td>300 ppm / 2000 ppm</td>
<td>2.3</td>
</tr>
<tr>
<td>R 411a</td>
<td>HFC</td>
<td>300 ppm / 2000 ppm</td>
<td>&gt; air</td>
</tr>
</tbody>
</table>

* Other refrigerant gases on request

### CONNECTING DIAGRAM

[Diagram showing connections between controller, transmitter, and various terminals including 4-20 mA, 0 VDC, 24 VDC, NO, NC, COM, and option relay.]
ORDERING INFORMATION

ADT-43-20XX–X–XXXXXXXX

**Options**

1XXXXXXXX Relay output
X1XXXXXXXX Buzzer int.
X2XXXXXXXX Flashlight (LED)
X3XXXXXXXX Warning buzzer and flashlight
XX1XXXXXX Heating
XXX1XXXXX RS- 485 protocol for DGC-05 series
XXX2XXXXX RS- 485 protocol ModBUS
XXX3XXXXX RS- 485 protocol customers’ specification
XXXXX2XXXX Manual calibration
XXXXX4XXXX Manual calibration / addressing
XXXXX5XXXX Manual calibration / tool addressing
XXXXXX1XX LCD display
XXXXXX2XX LED status display
XXXXXX1X1 4 – 20 mA analog input
XXXXXX5XX1 Factory calibration 20 - 300 ppm
XXXXXX5XX2 Factory calibration 20 - 2000 ppm

**Enclosure**

A Plastic enclosure
B Duct mounting
5 Stainless steel

**Refrigerant gas type**

- 2070 R 22
- 2071 R 401a
- 2072 R 401b
- 2073 R 402a
- 2074 R 402b
- 2075 R 408a
- 2076 R 409a
- 2077 R 134a
- 2078 R 404a
- 2079 R 416a
- 2080 R 407c
- 2069 R 507
- 2068 R 410a
- 2067 R 411a
- 2064 R 123

1 See Data sheet “PolyGard ADT Enclosure”
2 Please indicate thresholds for low and high alarm when ordering.
3 Not in connection with stainless steel housing, not in connection with option Relay or RS-485 interface

**Example:** Refrigerant gas transmitter, R134a, stainless housing, manual calibration/ tool addressing, factory calibration 20 - 2000 ppm

**Ordering No.:** ADT-43-2077-5–XXXXXXXXX2