

## VQ600 Datasheet

### Pellistor Gas Sensor for Hazardous Areas (Fixed Systems)

The VQ600 Series is designed to detect and monitor various gases in the range 0 to 100% LEL for combustible gases and 0 to 100% volume in thermal conductivity mode when using the SGX range of pellistor gas sensors.

The VQ600 Series is designed for use as an integral part of a fixed gas detection system. The head comprises a stainless steel flameproof enclosure constructed with an integral stainless steel sinter which allows the safe entry of the atmosphere being tested.

There are three types of mounting thread available to allow easy fixing to the junction box of the fixed system and the facility to attach accessories to the sensor via an external M46 thread.

### FEATURES

- Designed for fixed gas detection systems
- For detection of the following:
  - Combustible gases (Catalytic Sensors)
  - Light gases (e.g. hydrogen and helium). (Thermal Conductivity Sensors)
- LEL and % Volume Monitoring
- Diffused gas sampling via sinter
- Three thread options available
- Operational in varying temperature, pressure and humidity
- Fast response
- Rugged stainless steel construction
- No moving parts
- Resistance to corrosion
- Low maintenance
- Accessories available for field applications
- ATEX certified
- CSA certified (Canada and US)



### OPERATION

The pellistor used in the head should be operated in the manner recommended in the appropriate data sheet. In general it is recommended that the detector and compensator be run in a Wheatstone Bridge circuit so that a difference signal may be obtained. A suitable circuit is shown in Fig. 1.

In use, the bridge supply voltage should not be allowed to vary by more than the specified +0.1 V, or the output in clean air may change in sympathy.



The head must be mounted so that the cable is protected. This is normally achieved by mounting it into a port in a suitable junction box.

Although SGX generally recommends that pellistors should be run with a constant voltage supply to the bridge, it is possible to use a constant current supply provided that the voltage across the bridge in clean air remains within the recommended limits.

It is essential that the head be efficiently earthed (grounded). This may be achieved by mounting it either into an earthed metal junction box, or into a non-metallic junction box fitted with an earth continuity plate used in accordance with the box manufacturer's instructions. There are no internal connections to the sensing head body.

### TECHNICAL SPECIFICATION

#### Mechanical

|                      |                       |
|----------------------|-----------------------|
| <b>Dimensions</b>    | See Outline on Page 4 |
| <b>Body material</b> | Stainless Steel       |
| <b>Weight</b>        | 435g                  |

#### Environmental

|  |                               |
|--|-------------------------------|
| <b>Ambient temperature range for operation (ATEX):</b> | -20°C to +60°C                |
| <b>for operation (CSA):</b>                            | -20°C to +65°C                |
| <b>storage:</b>  | -20°C to +60°C                |
| <b>Operational pressure range</b>                      | 700kPa to 1300kPa             |
| <b>Humidity range for operation and storage</b>        | 0 to 100% RH (Non-condensing) |
| <b>Gases Detected</b>                                  | Combustible, Light Gases      |

#### Electrical

|                               |                                    |
|-------------------------------|------------------------------------|
| <b>DC supply to detectors</b> | See Configurations Table on Page 2 |
| <b>Typical power</b>          | Refer to Pellistor Type Datasheet  |

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## CONFIGURATIONS

| Base Sensor Type | Pellistor Type<br>(See Note 1) | Operating Voltage (V)<br>(See Note 3) | Typical Current (mA) | Type                 | Thread Code<br>(See Table Below) |                               |                               | Gas Types   |
|------------------|--------------------------------|---------------------------------------|----------------------|----------------------|----------------------------------|-------------------------------|-------------------------------|---|
|                  |                                |                                       |                      |                      | 1                                | 2                             | 3                             |   |
| 601              | VQ1B                           | 2.0                                   | 300                  | Catalytic            | Yes                              | Yes                           | Yes                           | All Flammable Gases                                     |
| 603              | VQ3B                           | 2.5                                   | 330                  | Catalytic            | Yes                              | Yes                           | Not Available<br>(See Note 2) | All Flammable Gases                                     |
| 605M             | VQ5MB                          | 2.0                                   | 175                  | Thermal Conductivity | Yes                              | Not Available<br>(See Note 2) | Not Available<br>(See Note 2) | Light Gases<br>(e.g. H <sub>2</sub> , He <sub>2</sub> ) |
| 606M             | VQ6MB                          | 2.0                                   | 300                  | Thermal Conductivity | Yes                              | Not Available<br>(See Note 2) | Yes                           | Light Gases<br>(e.g. H <sub>2</sub> , He <sub>2</sub> ) |
| 621T             | VQ21TB                         | 2.0                                   | 300                  | Catalytic            | Yes                              | Yes                           | Yes                           | All Flammable Gases                                     |
| 621TS            | VQ21TSB                        | 2.0                                   | 300                  | Catalytic            | Yes                              | Not Available<br>(See Note 2) | Yes                           | All Flammable Gases                                     |
| 622T             | VQ22TB                         | 2.0                                   | 175                  | Catalytic            | Yes                              | Yes                           | Yes                           | All Flammable Gases                                     |
| 623              | VQ23TB                         | 2.5                                   | 335                  | Catalytic            | Yes                              | Not Available<br>(See Note 2) | Not Available<br>(See Note 2) | All Flammable Gases                                     |
| 625              | VQ25B                          | 2.0                                   | 300                  | Catalytic            | Yes                              | Yes                           | Yes                           | Most Flammable Gases<br>(Not including Methane)         |
| 631M             | VQ31MB                         | 3.5                                   | 90                   | Thermal Conductivity | Yes                              | Yes                           | Yes                           | Light Gases<br>(e.g. H <sub>2</sub> , He <sub>2</sub> ) |
| 635M             | VQ35MB                         | 4.2                                   | 55                   | Thermal Conductivity | Yes                              | Yes                           | Yes                           | Light Gases<br>(e.g. H <sub>2</sub> , He <sub>2</sub> ) |
| 641TS            | VQ41TSB                        | 2.0                                   | 100                  | Catalytic            | Yes                              | Not Available<br>(See Note 2) | Yes                           | Most Flammable Gases<br>(Not including Methane)         |

Note 1: Refer to the datasheet for each Pellistor Type for more information.

Note 2: If the desired Thread Type is listed as "Not Available" please contact SGX.

Note 3: Thermal Conductivity sensors can be operated at voltages different to stated above depending upon target gas type.

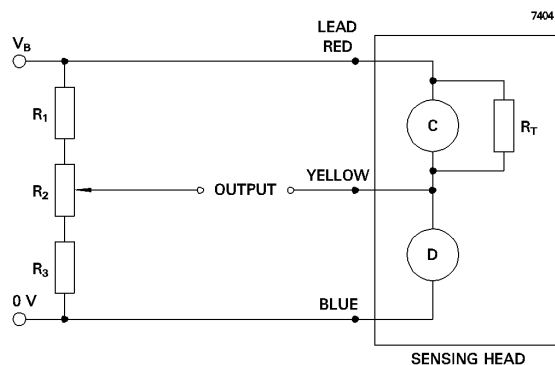
## THREAD CODES

The sensing head is supplied with one of three different mounting threads at the user's choice (see outline on Page 4).

| Thread code | Thread                    | Dimension X (mm) |
|-------------|---------------------------|------------------|
| 1           | Metric 20 x 1.5 mm        | 16.00            |
| 2           | ANP (Taper) 1/2" - 14 NPT | 19.85            |
| 3           | ANP (Taper) 3/4" - 14 NPT | 20.16            |

Taper threads are manufactured in accordance with ANSI/ASME B1.20.1.



## OPERATING CIRCUIT



$$R_1 = R_3 = 500 \text{ to } 5000 \Omega, R_2 \cong R_1/5$$

R<sub>2</sub> provides zero adjustment and may be omitted if not required.

## CERTIFICATION

|   | ATEX  | CSA  |
|---|---|--|
| <b>Certificate / File:</b>                | BAS 01ATEX2110X   | 2589678  |
| <b>Standards:</b>                         | EN 60079-0:2012<br>IEC 60079-1:2014 Ed.7  | CSA C22.2 No.30 (M1986)<br>CSA C22.2 No.142 (M1987)<br>FM 3600 (Nov 1998)<br>FM 3615 (Feb 2006)            |
| <b>Product Marking:</b>                   |  II 2G Ex db IIC T5 Gb |  Class I<br>Groups B,C&D |
| <b>Certified Manufacturing Locations:</b> | SGX Europe Sp. z o.o., Ligocka St. 103, 40-568 Katowice, Poland   |  |
| <b>Certificate Address:</b>               | SGX Europe Sp. z o.o., Ligocka St. 103, 40-568 Katowice, Poland   |  |

### INSTRUCTIONS SPECIFIC TO HAZARDOUS AREA INSTALLATIONS (Ref : EU ATEX Directive 2014/34/EU)

- The head is classified as flameproof equipment and is marked:

**BAS01ATEX2110X**  
**II 2G Ex db IIC T5 Gb**  
**T<sub>amb</sub> = -20°C to +60°C**  
**2W/5V MAX**

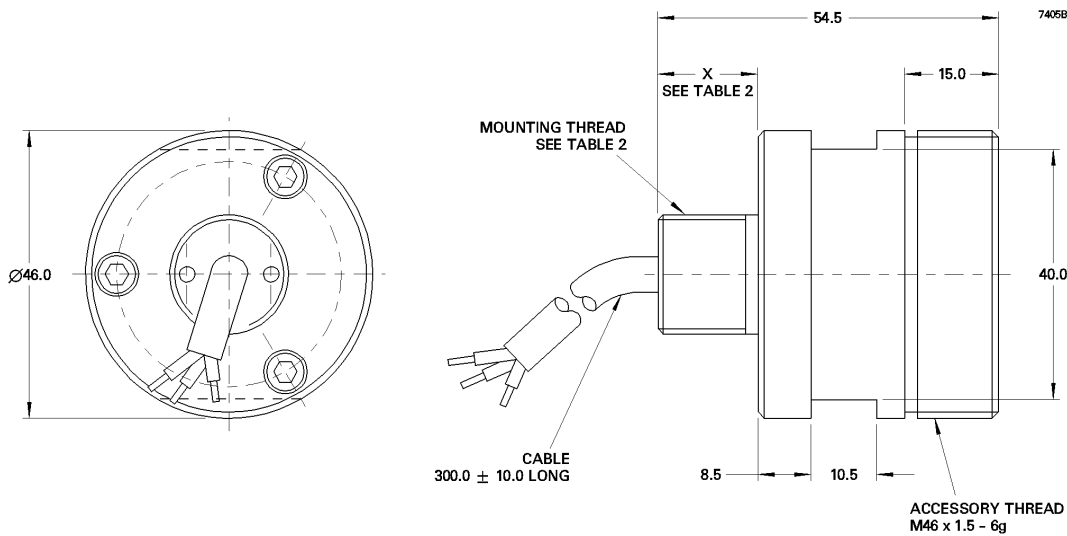
The head should only be used within the limits imposed by this certification and by these conditions of use.

- The head may be used in a hazardous area without further mechanical protection. However, the cable requires mechanical protection and must be terminated in a suitable enclosure.
- The head must be efficiently earthed (grounded). This may be achieved by mounting it into an appropriate earthed metal junction box or into a non-metallic junction box fitted with an earth continuity plate used in accordance with the box manufacturer's instructions. There are no internal connections to the sensing head body.
- In the event that the head becomes embedded in a junction box by over-tightening or corrosion, it may be released by the use of a spanner or wrench on the two flat surfaces on the sides of the body.
- There are no user serviceable parts inside the body of the sensing head, and no attempt should be made to open the body for any purpose. The unit is non-repairable.
- The head has not been assessed as a safety device (EHSR 1.5).
- When installed in outdoor locations where rain or spray could interfere with the safe working of the head, or in indoor locations where water jets, sprays, or hoses are used routinely for cleaning purposes, the head should be fitted with the Weather Cap that is available as an accessory.
- The end-user/installer should be aware that the certification of the head relies in its construction on the use of the following materials, which are suitable for most common applications:

Enclosure .....Stainless Steel  
 Sinter.....Stainless Steel  
 Bushing .....Epoxy resin

In accordance with the Note in EN60079-0:2006 Clause 6.1, the end-user/installer shall inform the manufacturer of any adverse conditions that the head may encounter. This is to ensure that the head is not subject to conditions that may cause degradation of these materials.

## OUTLINE (All dimensions in millimetres; dimensions without limits are nominal)



### Terminal Connections

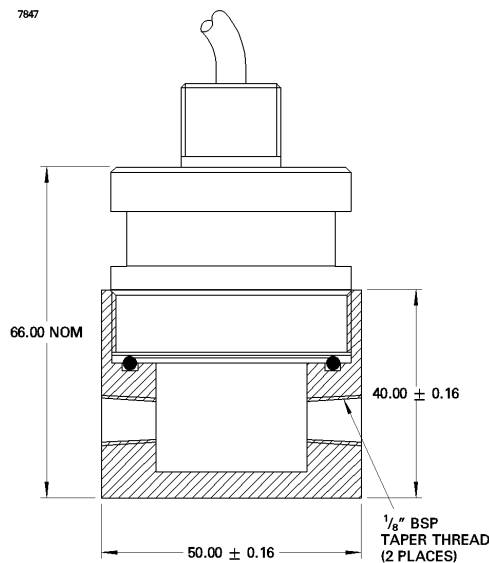
| Lead Colour | Element     |
|-------------|-------------|
| Blue        | Detector    |
| Red         | Compensator |
| Yellow      | Common      |

## ACCESSORIES

(All dimensions in millimetres)

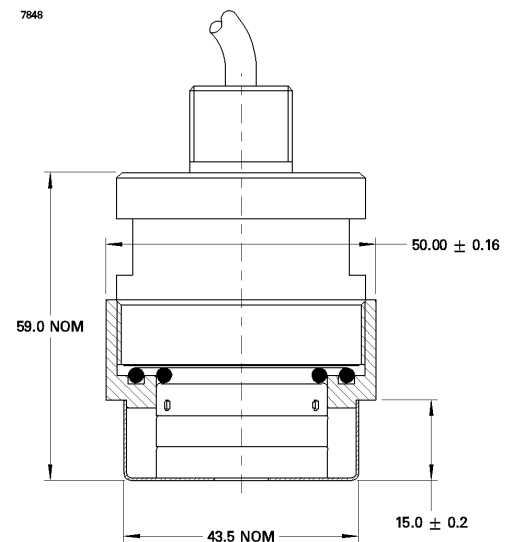
Three accessories are available to complement the VQ600 Series gas detection head.

### Flow Cap DAS546633AA



The Flow Cap allows the VQ600 to be used in applications where it is to be aspirated permanently with a pumped or pressurised sample. The cap is made of 316 stainless steel and can be used in a variety of applications involving pumped sampling analysis or detection systems.

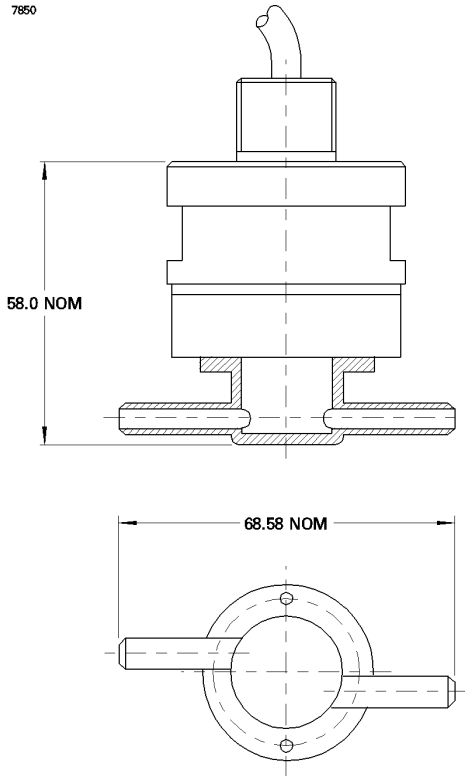
### Weather Cap DAS546632AA



The Weather Cap protects the VQ600 from water when used in external locations, where rain or spray could interfere with the safe working of the head, or in internal locations where water jets, sprays or hoses are used routinely for cleaning purposes, etc. The cap is made of 316 stainless steel and has been tested to IP64 for effectiveness, and also to ensure that it does not significantly affect the VQ600's performance.

**Quick Calibration Hood DPP546618DA**

7850



The Quick Calibration Hood is constructed from polypropylene, and provides a convenient means of supplying test gases to the VQ600 in the field, for calibration and checking purposes. The assembly push-fits into the central gas access recess of the head, and is designed to accommodate 6 mm ID or ¼" flexible tubing.

**ORDERING INFORMATION (VQ600)**

**VQbase/n**

**BASE SENSOR TYPE**

Refer to Configurations Table on Page 2

**THREAD CODE**

Refer to Thread Codes Table on Page 2

**Examples**

**VQ621T/1**

VQ600 series head fitted with VQ21TB pellistor and supplied with 20 x 1.5 mm metric thread cap.

**VQ603/2**

VQ600 series head fitted with VQ3B pellistor and supplied with ½" - 14 NPT American National Pipe Taper thread.

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