Series = Vigilante AQS™ Air Quality Station

1 to 7 = I/O Slots

Total of Seven I/O slots available

NR = Not required.
DR = Universal drift, tunnel, heater house or shaft type airflow installation; complete with airflow sensors, cables and junction box.
LR = Long range tunnel or drift type airflow installation; complete with airflow sensors, cables and junction box.
DM = Duct mount airflow installation; c/w airflow sensors, cables and junction box.
PF = Primary fan airflow installation; c/w airflow sensors, cables and junction box.
Gxxx or RGxxx = Integral or remote gas sensor, where xxx is three digit code from Table 2. Maximum of six (6) gas sensors per Vigilante AQS™.
RRH = Remote mounted pressure compensated humidity sensor; relative humidity, wet and dry bulb temperature, worker heat stress & thermal work limit.
ADO = 1 analog output, 3 discrete output relays.
ADOLH = ADO board complete with light and horn alarm (mounted on an integral or remote plate).
AD4 = 4 isolated analog inputs & 4 isolated analog outputs, two or three wire devices; 4 discrete inputs and 4 discrete relay outputs; includes an IP65/NEMA 4X enclosure & mounting plate.
Two single loop controllers for louver, fan or door controls.
AD4PS = Same as above - includes a 100-240 VAC /24 VDC power supply.
PT = Digital pressure transmitter, 1-1/2" NPT flush mounted stainless steel transmitter. Include full part number with this option. See pages 20-22 for order details.
DPT = Digital differential pressure transmitter, 1-1/2" NPT flush mounted stainless steel transmitter. Include full part number with this option. See pages 20-22 for order details.
RTD12 = Twelve (12) 2 or 3-wire, PT100 ohm RTD temperature input module; includes an IP65/NEMA 4X junction box and mounting plate.
DTM = DustMon™ drift dust monitor. Also requires DR option.

Note 1: See airflow sensor types.
Note 2: Maximum of four (4) airflow sets per VAQS.
Note 3: Maximum of two (2) - AD4 and/or two (2) - RTD12 modules per VAQS.
Note 4: Select NR if slot position is not used.

8 = Communications

MB-AB = Ethernet Modbus TCP/IP & Allen Bradley EtherNet/IP™; Standard RJ45 copper connection; All values, inputs and outputs and diagnostics are available through the digital registers.
EZN-E = Wireless Ethernet 802.11.

Note 5: See EZ Node™ wireless details.

9+ = Options

NR = Options not required.
BP = Bumper protection (One required for each drift mounted airflow system).
IM = VAQS and gas sensors mounted on a single aluminum checker plate, c/w stainless steel mounting hardware.
RM = VAQS mounted on an aluminum checker plate and gas sensors are mounted on a second checker plate for remote mounting, c/w stainless steel mounting hardware.

Note 1: See airflow sensor types.
Note 2: Maximum of four (4) airflow sets per VAQS.
Note 3: Maximum of two (2) - AD4 and/or two (2) - RTD12 modules per VAQS.
Note 4: Select NR if slot position is not used.
Airflow sensor arrangement types

**DR – Universal airflow sensor mounting**
- Universal airflow sensor mounting for drift, tunnel, heater house and shaft mounting installations for applications with a maximum width of 10 m (33 feet).
- Easy airflow sensor alignment with built-in optical alignment lasers.
- Includes two ultrasonic airflow sensors; two mounting brackets; two sensor cord sets both 25 metres (82') & one junction box on an aluminum mounting plate.
- Heavy duty 316L Stainless Steel tilt and swivel mounting bracket with 18-8 SS hardware. Built in 1/2" (13 mm) mounting holes.

**LR – Long range tunnel or drift airflow sensor mounting**
- Long range airflow sensor mounting for wide drift or tunnel installations normally found in potash or salt mines and road or railway tunnels with a maximum width of 20 m (66 ft.)
- Easy airflow sensor alignment with built-in optical alignment lasers.
- Includes two ultrasonic airflow sensors; two mounting brackets; two mounting brackets; two sensor cord sets both 25 metres (82') & one junction box on an aluminum mounting plate.
- Heavy duty 316L Stainless Steel tilt and swivel mounting bracket with 18-8 SS hardware. Built in 1/2" (13 mm) mounting holes.
Airflow sensor arrangement types

**DM – Universal Duct Mounting**
- Includes two ultrasonic airflow sensors; two flexible, gasket-less, corrosion resistant polyurethane mounting brackets for rigid duct installations from 36" to 60" (900 to 1500 mm) diameters; two sensor cord sets both 25 metres (82') & one junction box on an aluminum mounting plate

**PF – Primary or Booster Fan (inlet cone) Mounting**
- Includes two ultrasonic airflow sensors; two corrosion resistant polyurethane adjustable, ball & socket mounting brackets & two gaskets for the mounting to the inlet duct work of a primary fan; two sensor cord sets both 25 metres (82') & one junction box on an aluminum mounting plate
- NOTE: If the sensors are to be installed on the discharge side of the fan, the flow profile will need to be fully developed for all variable speed or variable pitch applications
Gas Sensor Option Codes

Table 2 - Gas sensor option codes

<table>
<thead>
<tr>
<th>INTEGRAL GAS SENSOR CODE</th>
<th>REMOTE GAS SENSOR CODE</th>
<th>GAS, TYPE &amp; RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• G000</td>
<td>• RG000</td>
<td>• CO; EC; 25 PPM</td>
</tr>
<tr>
<td>• G001</td>
<td>• RG001</td>
<td>• CO; EC; 100 PPM</td>
</tr>
<tr>
<td>• G002</td>
<td>• RG002</td>
<td>• CO; EC; 500 PPM</td>
</tr>
<tr>
<td>• G003</td>
<td>• RG003</td>
<td>• CO; EC; 1000 PPM</td>
</tr>
<tr>
<td>• G004</td>
<td>• RG004</td>
<td>• NO2; EC; 10 PPM</td>
</tr>
<tr>
<td>• G005</td>
<td>• RG005</td>
<td>• NO; EC; 100 PPM</td>
</tr>
<tr>
<td>• G006</td>
<td>• RG006</td>
<td>• NO; EC; 500 PPM</td>
</tr>
<tr>
<td>• G007</td>
<td>• RG007</td>
<td>• NO; EC; 1000 PPM</td>
</tr>
<tr>
<td>• G008</td>
<td>• RG008</td>
<td>• O2; EC; 0-25%</td>
</tr>
<tr>
<td>• G009</td>
<td>• RG009</td>
<td>• H2S; EC; 50 PPM</td>
</tr>
<tr>
<td>• G010</td>
<td>• RG010</td>
<td>• H2S; EC; 100 PPM</td>
</tr>
<tr>
<td>• G011</td>
<td>• RG011</td>
<td>• SO2; EC; 10 PPM</td>
</tr>
<tr>
<td>• G012</td>
<td>• RG012</td>
<td>• SO2; EC; 1000 PPM</td>
</tr>
<tr>
<td>• G013</td>
<td>• RG013</td>
<td>• ClO2; EC; 0.5 PPM</td>
</tr>
<tr>
<td>• G014</td>
<td>• RG014</td>
<td>• Cl2; EC; 4 PPM</td>
</tr>
<tr>
<td>• G015</td>
<td>• RG015</td>
<td>• NH3; EC; 100 PPM</td>
</tr>
<tr>
<td>• G016</td>
<td>• RG016</td>
<td>• CO2; IR; 0.5%</td>
</tr>
<tr>
<td>• G017</td>
<td>• RG017</td>
<td>• CO2; IR; 2%</td>
</tr>
<tr>
<td>• G018</td>
<td>• RG018</td>
<td>• CO2; IR; 5%</td>
</tr>
<tr>
<td>• G019</td>
<td>• RG019</td>
<td>• LEL Methane; IR; 0-100%</td>
</tr>
<tr>
<td>• G020</td>
<td>• RG020</td>
<td>• LEL Propane; IR; 0-100%</td>
</tr>
<tr>
<td>• G021</td>
<td>• RG021</td>
<td>• HCN; EC; 10 PPM</td>
</tr>
</tbody>
</table>

EC = Electrochemical sensor (approximate 1 year sensor life)
IR = Infrared sensor (approximate 5 year sensor life)
Remote I/O Modules & Integral Output Card

**AD4 – Analog/Digital remote I/O module**
- Four (4) analog inputs, 4-20 mA or 0-10 VDC, jumper selectable, loop powered or four wire devices
- Four (4) analog outputs, 4-20 mA, fully isolated
- Four (4) discrete inputs, two and three wire (24 VDC and 120 VAC)
- Four (4) discrete outputs, 120-240 VAC or 24 VDC, Form C, SPDT relay, 8 AMP@ 250 VAC, 5 AMP@ 30 VDC
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection
- IP65, IP66, NEMA 1,2,4,4X,12,13 enclosure rating; ABS/PBT Blend, UL94 5VA flammability rating
- Complete with aluminum mounting plate and four (4) ½” mounting holes
- Total envelope size, 10” wide x 12” high x 7” deep, 5 lbs. (2.2 kg) weight

**RTD12 – RTD remote I/O module**
- 12 RTD input signals, two or three wire, jumper selectable
- PT 100 ohm, $\alpha = 0.00385$ ohms/ohm/^\circ C or PT 1000 ohm
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection
- IP65, IP66, NEMA 1,2,4,4X,12,13 enclosure rating; ABS/PBT Blend, UL94 5VA flammability rating
- Complete with aluminum mounting plate and four (4) ½” mounting holes;
- Total envelope size, 10” wide x 12” high x 7” deep, 5 lbs. (2.2 kg) weight

**ADO – Analog/Discrete output card**
- One (1) 4-20 mA analog output with 2.5 kV optical isolation
- Three (3) discrete outputs, 120-240 VAC or 24 VDC, Form C, SPDT relay, 8 AMP@ 250 VAC, 5 AMP@ 30 VDC
- Card is integral to the Vigilante AQS™ enclosure
Digital Pressure Transmitter Model # PT-A-B-NR
- 0 to 0.1 Bar (0 to +40” W.C); ≤0.5% of full scale accuracy; ±0.5% repeatability; 0.5 Bar (200” W.C.) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 1-½” NPT (male) 316L SS process connection; FKM (Viton) seal
- -25 to +85°C (-13 to +185°F) temperature range

Digital Pressure Transmitter Model # PT-B-B-NR
- -0.1 to 0 Bar (-40 to 0” W.C); ≤0.5% of full scale accuracy; ±0.5% repeatability; 0.5 Bar (200” W.C.) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 1-½” NPT (male) 316L SS process connection; FKM (Viton) seal
- -25 to +85°C (-13 to +185°F) temperature range

Digital Pressure Transmitter Model # PT-C-B-NR
- 0 to 1 Bar (0 to 14.5 psig); ≤0.35% of full scale accuracy; ±0.5% repeatability; 5 Bar (72 psig) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 1-½” NPT (male) 316L SS process connection; FKM (Viton) seal
- -25 to +85°C (-13 to +185°F) temperature range
Digital Pressure Transmitter Model # PT-D-B-NR

- 0 to 10 Bar (0 to 145 psig); ≤0.35% of full scale accuracy; ±0.5% repeatability; 40 Bar (580 psig) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 1-½” NPT (male) 316L SS process connection; FKM (Viton) seal
- -25 to +85°C (-13 to +185°F) temperature range

Digital Pressure Transmitter Model # PT-E-B-NR

- 0 to 100 Bar (0 to 1450 psig); ≤0.35% of full scale accuracy; ±0.5% repeatability; 600 Bar (8700 psig) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 1-½” NPT (male) 316L SS process connection; FKM (Viton) seal
- -25 to +85°C (-13 to +185°F) temperature range

Digital Paste Fill & Back Fill Pressure Transmitter Model # PT-E-C-NR

- 0 to 100 Bar (0 to 1450 psig); ≤1.0% of full scale accuracy; ±0.5% repeatability; 600 Bar (8700 psig) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 2” NPT (male) 316L SS process connection; FKM (Viton) seal; silicon oil fill; heavy duty ½” thick plate seal for abrasive applications
- -25 to +85°C (-13 to +185°F) temperature range
Pressure and DP Transmitters

**Digital Paste Fill & Back Fill Pressure Transmitter Model # PT-F-C-NR**

- 0 to 400 Bar (0 to 5800 psig); ≤1.0% of full scale accuracy; ±0.5% repeatability; 1000 Bar (14500 psig) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 2” NPT (male) 316L SS process connection; FKM (Viton) seal; silicon oil fill; heavy duty ½” thick plate seal for abrasive applications
- -25 to +85°C (-13 to +185°F) temperature range

**Digital Differential Pressure Transmitter Model # DPT-A-B-NR**

- 0 to 0.1 Bar (0 to +40” W.C); ≤0.5% of full scale accuracy; ±0.5% repeatability; 0.5 Bar (200 “ W.C.) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 1-½” NPT (male) 316L SS process connection; FKM (Viton) seal
- -25 to +85°C (-13 to +185°F) temperature range

**Digital Differential Pressure Transmitter Model # DPT-B-B-NR**

- -0.1 to 0 Bar (-40 to 0” W.C); ≤0.5% of full scale accuracy; ±0.5% repeatability; 0.5 Bar (200 “ W.C.) maximum over-load pressure
- Modbus RS-485 communication to Vigilante AQS, 4 wire connection; M12, male, 4 pin connector
- Flush mounted 1-½” NPT (male) 316L SS process connection; FKM (Viton) seal
- -25 to +85°C (-13 to +185°F) temperature range
**DustMon™ – Dust Monitor Option**

- **DTM – DustMon™ dust monitor**
  - The DustMon™ is a dust monitor ideally used to measure dust loading in underground mines. The compact monitor is a direct plug-in into any existing Vigilante AQS Air Quality Monitoring Station with an available communication port.
  
  - Minimum particle size: 0.3 µm particle size
  - Normal working range: 0.5 to 200 µm particle size
  - Measuring Principle: Inductive Electrification
  - Probe materials: Teflon coated stainless steel
  - Measurement Range: From 0.1mg/m3
  - Power Supply: 24VDC from an existing Vigilante AQS™ power supply
  - Communication: Modbus RTU RS485 to an open port in a Vigilante AQS™
  - Calibration: Trend monitoring automatic auto-setup feature
  - mg/m3 calibration
  - Temperature range: -20°C to +40°C
  - Weight: 3 kg (6.6 lbs)
Bumper Protection and Mounting Options

**BP – Lower drift sensor bumper**
- Heavy duty steel, painted alkyd safety orange with reflective tape. Bumper is to be installed slightly lower than sensor. The bumper will help protect the sensor from mobile equipment. 16 kg/35 lbs weight
- *** TOTAL SHIPMENT WEIGHT AND DIMENSIONS INCLUDING PACKAGING IS 45 LBS - 16” X 30” X 10” (20.5 KG - 406 mm X 762 mm X 254 mm)***

**IM – Integral Mounting Option**
- System mounted on an aluminum checker plate, complete with stainless steel mounting hardware and carrying handles

**RM – Remote Mounting Option**
- Remote mounted gas and/or humidity sensors on aluminum checker plate with a junction box, VAQS is mounted on a 2nd checker plate, complete with stainless steel mounting hardware and carrying handles
- The remote gas sensor plate size is dependent on the number of gas sensors required. Maximum of six (6) gas sensors per single Vigilante AQS™.
EZ Node™ Wireless Node - Model Number Matrix

Series = EZ Node™ Wireless Adapter

EZN = EZ Node™ Wireless Adapter
The EZ Node™ Wireless Adapter allows any Maestro product to connect directly to a wireless network.
Enclosure Specifications: NEMA 4X enclosure; ABS construction; Heavy duty aluminum back plate with stainless steel hardware.

1 = Options

E = Ethernet, IEEE 802.11b/g compliant, 2.4 GHz Wireless radio, PoE (Power over Ethernet), 1 X 10/100 BASE-TX (Cat. 5, RJ-45) Ethernet Interface, FCC Part 15.247, IC RS210 & CE Wireless approvals, RoHS Compliance c/w 3 dBi Omni-directional antenna, waterproof RJ45 connector and one 24 VDC power injector to be installed in any Ethernet based Maestro product, discovery tool, The EZ Node™ is configured through a simple web browser and requires no additional software.

LFV = Leaky Feeder, VHF Radio modem, 148 – 174 MHz, c/w unity gain stub VHF antenna, (Customer to provide upstream and downstream frequencies with order).

LFU = Leaky Feeder, UHF Radio modem, 450 – 480 MHz, c/w unity gain stub UHF antenna, (Customer to provide upstream and downstream frequencies with order).

NOTE 1: Leaky Feeder applications will require the Zephyr AQS™, Vigilante AQS™, Ethernet/I™ or SuperBrite™ Marquee Display to be configured with RS485 as the physical layer.

NOTE 2: Leaky Feeder applications will require a EZ Base™ Leaky Feeder Head End chassis and Protocol Converters.