

SETUP AND CALIBRATION

Note: All setup and calibration information for the GM-17 is stored in non-volatile memory. This eliminates the need for backup battery replacement.

Setting a high acting process switch

To set the relay to a high acting process switch, place a jumper on the HI/LO pins located near the center of the board on the extreme right side.

Setting a low acting process switch

To set the relay to a low acting process switch, remove the jumper from the HI/LO pins located near the center of the board on the extreme right side.

Rotary switches

Two rotary switches, identified as S1 and S2, are used to setup and configure the GM-17. Switch S1 is located next to the terminal block receptacle. Switch S2 is located below S1. The function starts five seconds after changing the rotary switches. Refer to the GM-17 Installation and Operation guide for full descriptions of the rotary switch functions.

Note: In order to monitor the process and activate the process relay, both rotary switches (S1 and S2) must be set to position 0.

Calibrating the level switch

The calibration calculates an operating time for relay operation based on the low and high process radiation fields. See the GM-17 Installation and Operation Guide for further information on calibration requirements and graphs displaying the operating times of various configurations.

Two point calibration (preferred method)

You must provide high and low process conditions when performing a two point calibration.

- Establish low process condition
- Set S2 switch to position 2
- Within 5 seconds, set S1 switch to position 1 (Red LED repeats 2 flashes for 2 minutes, Red LED turns off and Green LED flashes when complete)
- Establish high process condition
- Set S1 switch to position 2 (Red LED repeats 3 flashes for 2 minutes, Red LED turns off and Green LED flashes when complete)
- Set S1 switch to position 3 (Green LED flashes when complete)
- If Red LED flashes 8 times, calibration failed – repeats steps 2 thru 6
- Set both switches to position 0 to return to operating mode.

Two point calibration reference table				
Process Level	S1	S2	Red LED	Green LED
Low	1	2	2 flashes for 2 minutes	Off
Low calibration complete			Off	Flash
High	2	2	3 flashes for 2 minutes	Off
High calibration complete			Off	Flash
Calculate calibration	3	2		
Successful calibration			Off	Flash
Failed calibration			Flash	Off
Return to operating mode	0	0		

Note: The order of performing the high and low level calibrations does not matter when performing a 2-point calibration.

Single point calibration (requires % Delta I)

When performing a single point calibration method, all you need is the low process condition. The high process field is calculated based on the application's percent Delta I (% ΔI). The % ΔI is based on the vessel geometry, construction, and process information. Have this information ready before contacting VEGA.

- Obtain process % Delta I (refer to GM-17 Installation and Operation Guide for instructions or contact VEGA for assistance)
- Establish low process condition
- Set S1 switch for % Delta I (1=10%, 2=20%...9=90%, 0=100%)
- Within 5 seconds, set S2 switch to position 1 (Red LED repeats 5 flashes for 2 minutes, RED LED turns off and Green LED flashes to indicated completion)
- If Red LED flashes 8 times, calibration failed – repeat steps 2 thru 4
- Set both switches to position 0 to return to operating mode.

Single point calibration reference table				
Process Level	S1	S2	Red LED	Green LED
Low	*	1	5 flashes for 2 minutes	Off
Successful calibration			Off	Flash
Failed calibration			8 flashes	Off
Return to operating mode	0	0		

*Set the rotary switch S1 for % Delta I (1=10%, 2=20%...9=90%, 0=100%)

GM-17 calibration table

After performing a successful calibration, verify and record the calibration information for future reference in the calibration table. Set the rotary switches and count the flashes in the sequence. For example, the red and green LEDs flash 5 times, the red LED flashes 2 times, and finally the Green LED flashes 4 times, which equals 524 counts. There is a pause between each sequence.

Test	S1	S2	Red LED	Green LED	1 Flash equals	Value	Units
Low Cal counts	6	5	Flash	Flash	100		CPS
			Flash	Off	10		
			Off	Flash	1		
High Cal counts	7	5	Flash	Flash	100		CPS
			Flash	Off	10		
			Off	Flash	1		
Operating time interval	8	5	Flash	Flash	100		Seconds
			Flash	Off	10		
			Off	Flash	1		

VEGA Customer Service information

To request field service within the United States and Canada, call 513-272-0131.

Customers outside of the United States and Canada should contact their local VEGA representative for parts and service.

Copyright 2011 VEGA Americas, Inc., Cincinnati, Ohio. All rights reserved. This document contains proprietary information of VEGA Americas, Inc. It shall not be reproduced in whole or in part, in any form, without the expressed written permission of VEGA Americas, Inc. The material in this document is provided for informational purposes and is subject to change without notice.

VEGA

GM-17 QUICK REFERENCE STARTUP GUIDE

Version 1.2

SAFETY INSTRUCTIONS



Refer to the Radiation Safety Manual and Reference CD that came with your source holder.

Always refer to the safety instructions in this guide and the country specific installation standards. Follow the prevailing safety regulations and accident prevention rules of your company and country.

General

There are no restrictions on the use of this instrument on the outside of closed metal vessels. The GM-17 should not be used in temperatures less than -40 °C (-40 °F) or greater than +70 °C (+158 °F).

CE conformity

The GM-17 level switch is in compliance with CE requirements for EMI/EMC per EN61000-4 and EN-50011.

Safety information for EX areas

This equipment is suitable for use in the following environment:

- CSA Class I, Div 1, Groups B, C, & D
- CSA Class I, Div 2, Groups B, C, & D
- CSA Class II, Div 1 Groups E, F, & G
- CSA Class II, Div 2, Groups F & G
- CSA Class III Ta = -40 °C to +70 °C
- ATEX Certificate # FM06ATEX0007 II 2 G EExd IIB + H2 T6 Ta = -40 °C to +70 °C, ATEX II D T80C IP66
- NEMA Type 4X IP66
- Non-hazardous locations

Special installation, maintenance, or operating instructions

If it is necessary to open the sensor, the following warning applies:

EXPLOSION HAZARD - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Caution! Open circuits before removing cover. An explosion-proof seal shall be installed within 450 mm (18") of the enclosure (including division 2 installations).

Warning! To avoid electrostatic discharge, wipe enclosure with a damp cloth.

Warning! Explosion hazard – Substitution of components may impair stability for Class I, Division 2.

Unpacking the equipment

- Unpack the unit in a clean, dry area.
- Inspect the shipment for completeness by checking against the packing slip.
- Inspect the shipment for damage during shipment or storage.
- If the detector is included as a separate package in the shipment, inspect the assembly for damage. If damaged, file a claim against the carrier and report the damage in detail. Any claim on VEGA for shortages, errors in shipment, or other problems must be made within 30 days of receipt of the shipment.
- If you need to return the equipment, refer to the GM-17 Installation and Operation guide for information concerning returning equipment for repair.
- After you unpack the equipment, inspect each source holder in the shipment to assure that the source holder is locked.

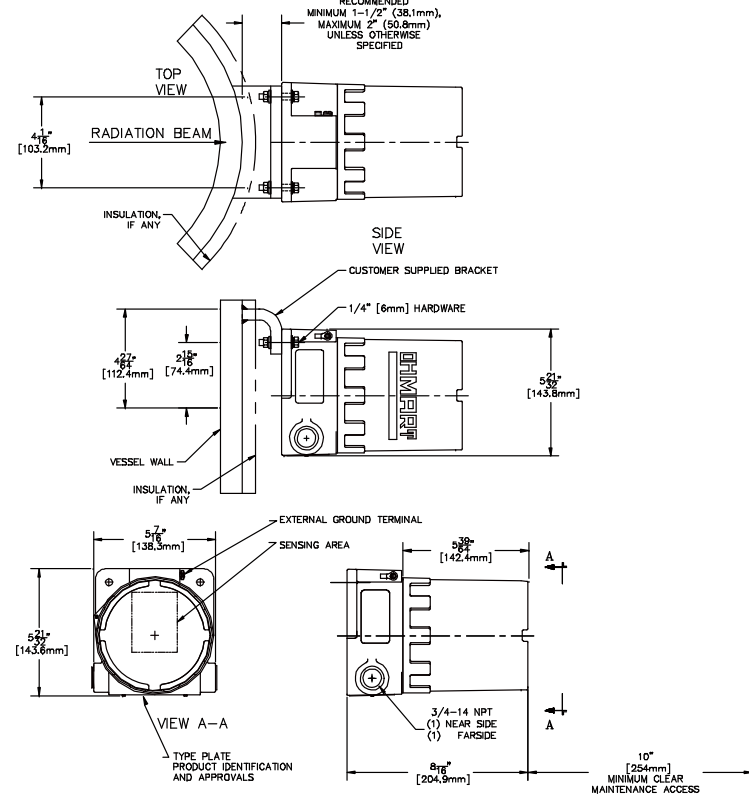
Storing the equipment

- Store the source holder in a clean, dry area.
- Verify that the source holder is locked in the off position.
- Store the detectors in an area that has temperature-control between 10 °C and 35 °C (50° F and 95 °F) and less than 50% relative humidity.

Mounting Instructions

Your source was sized for optimal performance at the time you ordered your system. Contact us prior to installation if the location of the equipment is different from the original order location.

- √ Follow the site specific installation drawings.



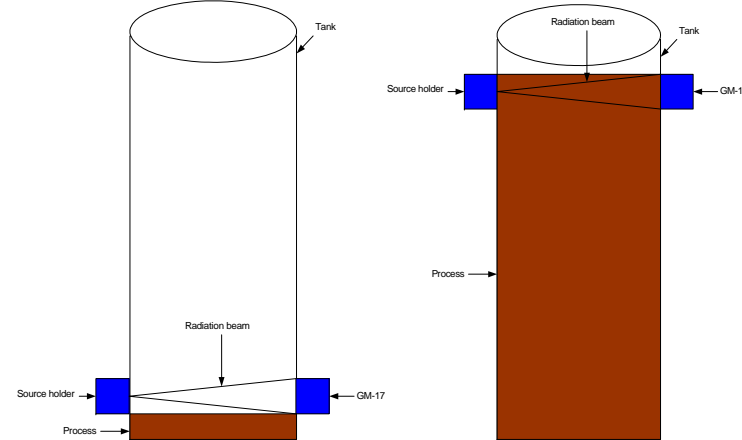
- √ Mount where process material cannot:
 - Coat the source holder
 - Build up between the vessel wall and the detector housing.
- √ Mount where the temperature of the process material is relatively stable.
- √ Mount the housing as close to the vessel as possible, but outside of any insulation.

Note: Protect any insulation from liquids.

- √ Verify that there is nothing to absorb radiation between the vessel wall and detector housing.
- √ If there are internal obstructions, mount the source holder and switch on an arc other than a diameter so that the beam of radiation does not cross the obstruction.
- √ Allow 254 mm (10 inch) minimum clearance from cap end of housing for cap removal.

Mounting Instructions (continued)

- √ Mount the GM-17 on the vessel where level monitoring is required.



- √ Avoid source cross-talk when there are multiple adjacent pipes or vessel that have source holders and detectors. The best orientation, in this case, is for the source holders to be on the inside with the radiation beams pointing away from each other.
- √ Use the holes to secure the unit to the vessel.

Disconnect switch

Install a power line switch no more than one meter from the operator control station.

Conduit

- Conduit runs must be continuous and protected so that moisture condensation does not drip into any of the housings or junction boxes. Use sealant in the conduit, or arrange the runs so that they are below the entries to the housings and use weep holes where permitted.
- Use a conduit explosion-proof seal in the proximity of the housing when the location is in a hazardous area. Requirements for the actual distance must be in accordance with local code.
- If you use only one conduit hub, plug the other conduit hub to prevent the entry of dirt and moisture.

Note: For European ATEX hazardous area applications, all cable glands or hubs must be EExd rated.

Checklist for field service commissioning

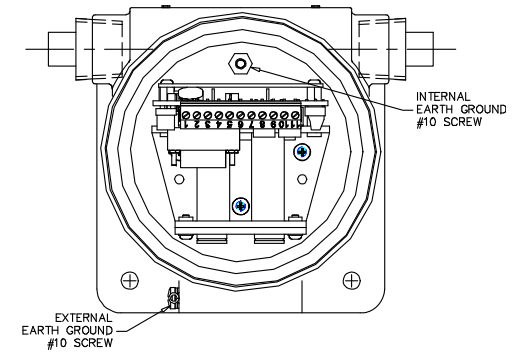
- Mount the source holder and level switch per the drawings (allow access for future maintenance).
- Make all wiring connections using the certified drawings and the instructions in this guide.
- If using AC power, ensure that the AC input voltage matches the requirements found on the nameplate of the unit.
- Ensure that the AC power to the transmitter is a regulated transient-free power source (UPS type power is best).
- If using DC power, verify that the ripple is less than 100mV.
- Have process ready for calibration. When possible, it is best to be able to completely fill and empty the vessel at the high and low levels.
- Do not remove the source holder lock until the unit is ready for calibration.
- Apply power to the gauge one hour before starting calibration.

Note: The equipment warranty is void if there is any damage to the level switch due to incorrect wiring that has not been checked by an VEGA Field Service Engineer.

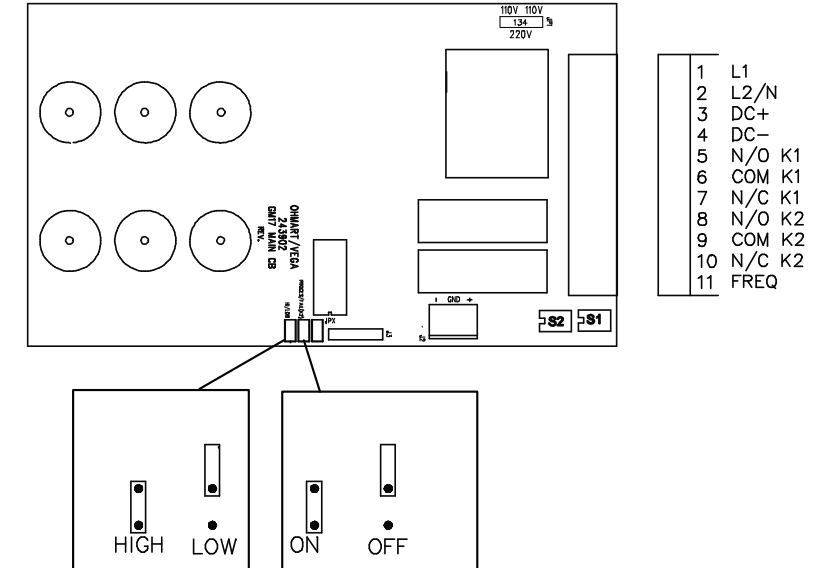
WIRING THE EQUIPMENT

Make the connections at the removable terminal strips mounted on the power board. Access the power board by removing the explosion-proof housing cap.

There is an internal and external ground screw for connection of the power earth ground wire. Remove the top cover to access the ground screws.



Terminal	Name	Description
1	L1	AC power input
2	L2/N	AC power input
3	DC IN	DC power input
4	DC IN	DC power input
5	K1 NO	Process relay - normally open
6	K1 C	Process relay - common
7	K1 NC	Process relay - normally closed
8	K2 NO	Process or Alarm relay - normally open
9	K2 C	Process or Alarm relay - common
10	K2 NC	Process or Alarm relay - normally closed
11		Not used



ON = HIGH ACTING PROCESS ON = K2 - PROCESS MODE
OFF = LOW ACTING PROCESS OFF = K2 - FAIL/SAFE MODE

Caution! Do Not Apply Power until a thorough check of all the wiring is complete.

- For AC operation
 - Verify that the input voltage matches the configuration of the GM-17, which is pre-configured from the factory for either 110VAC or 220VAC operation. This is not jumper selectable. The nameplate indicates the input voltage rating. If the input voltage does not match this rating, contact VEGA Field Service for instructions.
 - The power is input to the top I/O connector. Location: Pin 1 (L1-hot) is next to the fuse F1 and Pin 2 is L2-neutral.
- The input power can be 110VAC±10%, 220VAC±10% or 10—30VDC at 4VA maximum power consumption. Input power must be provided by a 15 or 20A circuit breaker.
- For 10—30VDC operation the power is applied to the I/O connector pins 3 and 4. Pin 3 is marked as DC+; however, the DC input is polarity insensitive.
- Use wire between 1.63 to 0.643mm (#14 to #22AWG) for power wiring and rated for greater than +70 °C. Use insulation suitable for at least 300V. Always comply to local codes and standards.