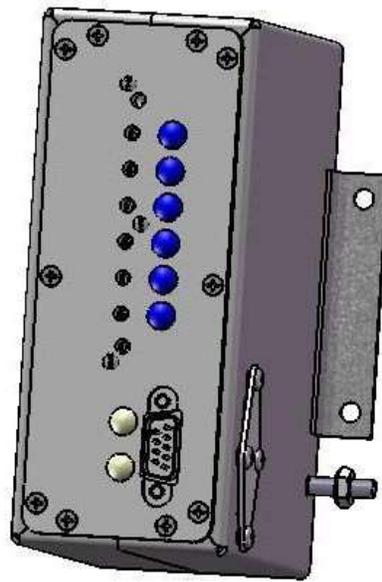


Valve Control Module (VCM) Instructions



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Ordering Information

The Swagelok→ Valve Control Module (VCM) is a computer controlled valve control and monitoring System. The VCM employs intrinsically safe technology and incorporates up to six (6) solenoid pilot valves to control pneumatic stream selecting valves and other discrete valves by means of a sophisticated control system that minimizes overall power consumption.

Features

- Certified for use in Class I, Division 1 and Zone 0 hazardous areas.
- Siemens Maxum™ Gas Chromatograph sample system network interface.
- 316 Stainless steel construction.
- Ultra-low power consumption: less than 180 mW per valve.
- Multiple valve actuation
- Indicator LEDs for pilot valve state, network status, and module status.
- Ported exhaust.

Ordering Number

7KQ4150-0DC00-0AA0

Description

Six-port VCM

Certification and Safety

Certifications

U.S.

UL Class I, Division 1 intrinsic safety

Groups A, B, C, and D, T4

-5°C (23°F) $\leq T_{\text{amb}} \leq 70^{\circ}\text{C}$ (158°F)

UL 913, Eighth Edition

UL Class I, Division 2, Groups A, B, C, and D, T4

ANSI/ISA-12.12.01, Ninth Edition,
Rev. 2019-08-26

Canada

cUL Class I, Division 1 intrinsic
safety

Groups A, B, C, and D, T4

-5°C (23°F) $\leq T_{\text{amb}} \leq 70^{\circ}\text{C}$ (158°F)

CAN/CSA C22.2 No. 157-92

cUL Class I, Division 2, Groups A, B, C, and D, T4

CAN/CSA C22.2 No. 213-17, 3rd
Ed., Rev. 2019-08-26

Unclassified Locations

U.S.

UL 61010-1 Ed. 3 Rev. 2016-04-29

Canada

CSA C22.2 No. 61010 ed. 3, Rev
2016-04-01

Europe

ATEX Ex ia IIC T4

-5°C (23°F) $\leq T_{\text{amb}} \leq 70^{\circ}\text{C}$ (158°F)

EN 60079-0: Edition 7

EN 60079-11:2007

Ingress Protection

IP 64

ATEX Zone 2:



II 3G Ex ec IIC T4 Gc

DEMKO 17 ATEX 1804X

-5°C to $+70^{\circ}\text{C}$

EN 60079-0:2012+A11:2013

EN 60079-7: Edition 5.1

IECEX Zone 2:

IECEX UL 17.0078X

IEC 60079-0, 2018

IEC 60079-7, 2015 +A1:2018

Additional Standards**RF Emissions**

EN 55011

ESD Immunity

EN 61000-4-2

RF Immunity

EN 61000-4-3

EFT Immunity

EN 61000-4-4

Conducted Immunity

EN 61000-4-6

Vibration

Sinusoidal: 9 to 200 Hz, 5g

Random: 20 to 500 Hz, 15.5g

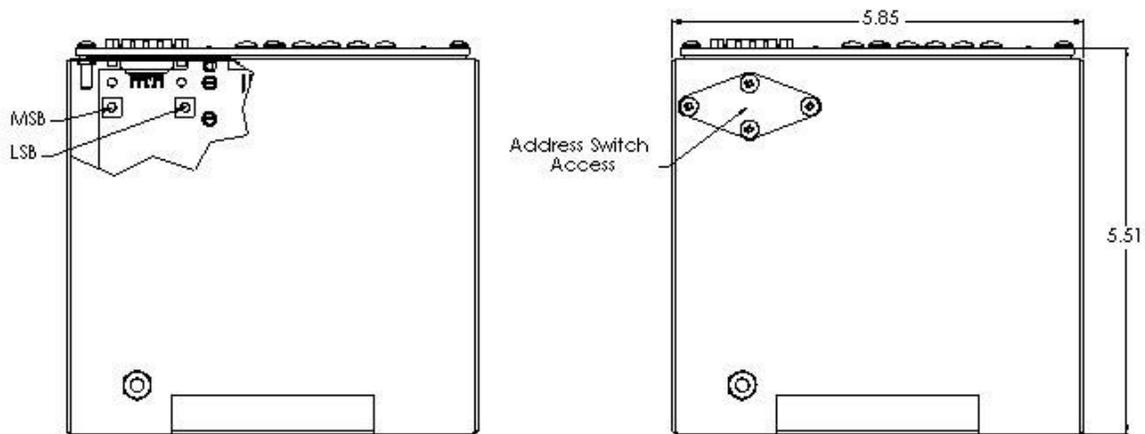
average

ShockPulse 70 m/sec² (7.2g)**Entity Parameters (see Special Conditions for Safe Use, Page 11)**

	Power	Signal
Ii	1A	1A
Ui	9.5 Vdc	9.5 Vdc
Li	3 uH	0 uH
Ci	0 uF	0 uF
Pi	9.5 W	0.57 W

Commissioning

Swagelok valve control modules (VCM) shall be commissioned in a non-hazardous environment, and must not be commissioned while connected to a network or to a power supply. To set the network address of a Swagelok VCM, remove the address switch access plate, and rotate the DIP switches to the desired address. The network address can be represented as the hex address 0x[MSB][LSB]. **Ensure that the address switch access plate and the associated gasket are replaced before putting the VCM into operation, by tightening the address plate screws to 40-60 in-oz. Warning: Not following these steps will negate ingress protection and intrinsic safety certifications.**



Maintenance

The Swagelok Valve Control Module is not field-maintainable.

For any and all maintenance concerns, please return to your authorized Swagelok sales and service center. For a complete listing of Swagelok sales and service centers, please visit www.swagelok.com

Installation

Note: All installations require that the enclosure of the Swagelok VCM have a $< 1 \Omega$ connection to ground. A ground lug is installed on the enclosure for convenience. It is recommended to use a crimping ring terminal for a #10 stud to connect the ground stud via 18AWG wire to ground. **Warning: Not grounding the Swagelok VCM may negate compliance with listed EMC standards.**

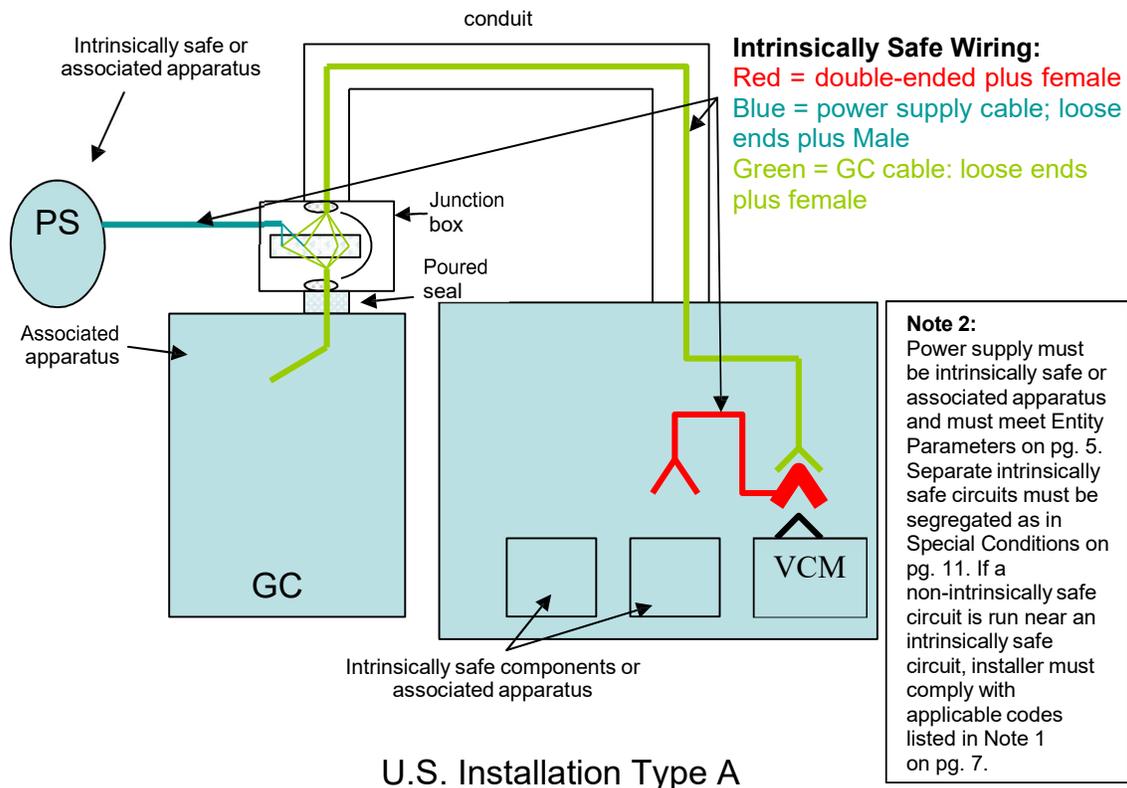
Note 1 (North America):

The VCM is powered by two separate intrinsically safe circuits as noted above. Cable and wiring for these two circuits must maintain the separations for different intrinsically safe circuits required by Article 504 of the National Electrical Code (ANSI/NFPA 70), Section 18 of the Canadian Electrical Code, ISA RP12.6 for installing intrinsically safe circuits, or other local codes, as applicable.

North America, Class I Division 1 Installations

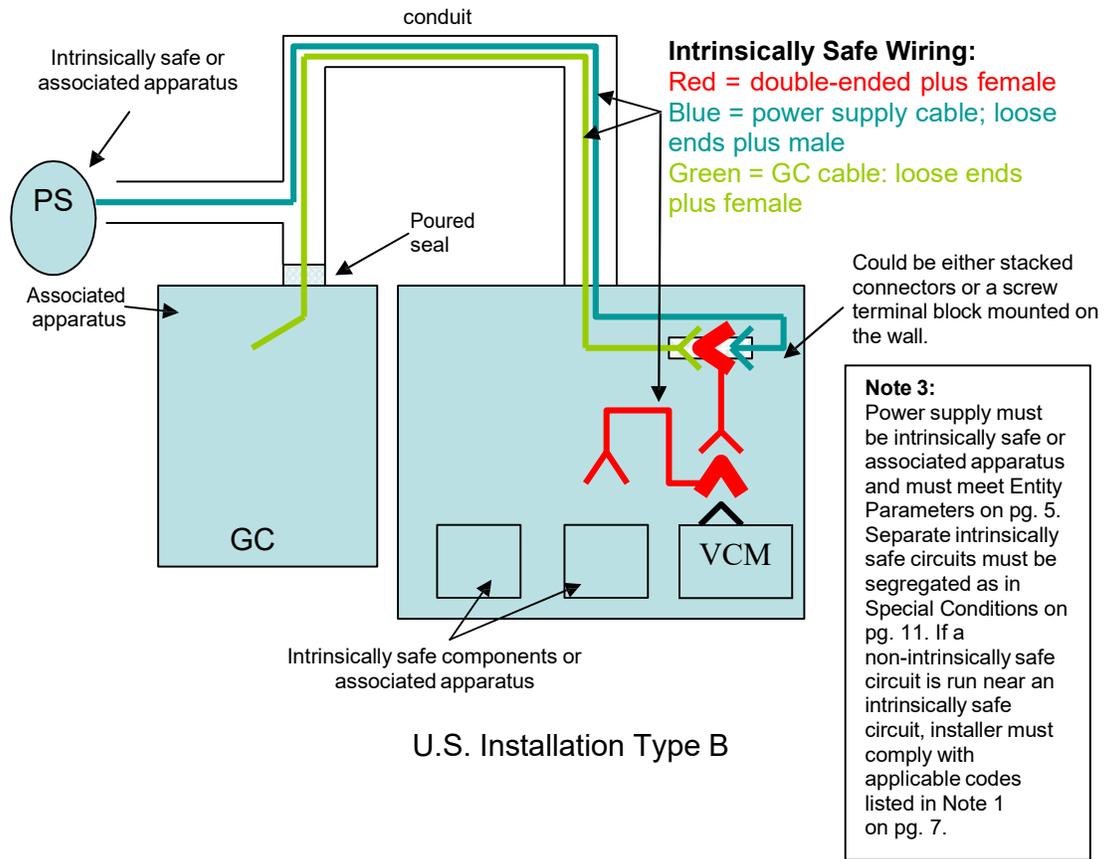
U.S. Installation Type A

Attach a junction box to the gas chromatograph with a poured seal, as depicted below. Run intrinsically safe power to the sample system through the gas chromatograph network cable. Power is distributed through the intrinsically safe components by pass-through pigtail cables with an extra female connection. Cabling runs through conduit to the intrinsically safe components at the sample system.



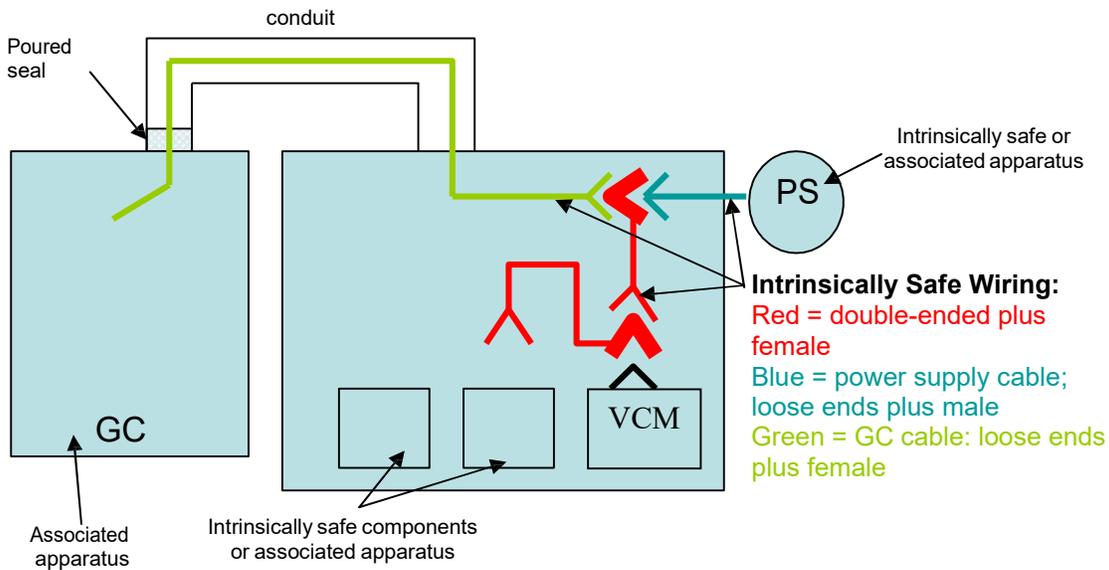
U.S. Installation Type B

Run intrinsically safe power and gas chromatograph network cables through conduit to the sample system. The conduit must have a poured seal at the connection to the gas chromatograph. At the sample system, use pass-through pigtail cables with an extra female connection to distribute power and network connections through the intrinsically safe components.



U.S. Installation Type C

Run intrinsically safe gas chromatograph network cable through conduit to the sample system. The conduit must have a poured seal at the connection to the gas chromatograph. Locate an intrinsically safe power supply near the sample system. At the sample system, use pass-through pigtail cables with an extra female connection to distribute power and network connections through the intrinsically safe components.



U.S. Installation Type C

Note 3:
 Power supply must be intrinsically safe or associated apparatus and must meet Entity Parameters on pg. 5. Separate intrinsically safe circuits must be segregated as in Special Conditions on pg. 11. If a non-intrinsically safe circuit is run near an intrinsically safe circuit, installer must comply with applicable codes listed in Note 1 on pg. 7.

Class I Division 2 Installations:

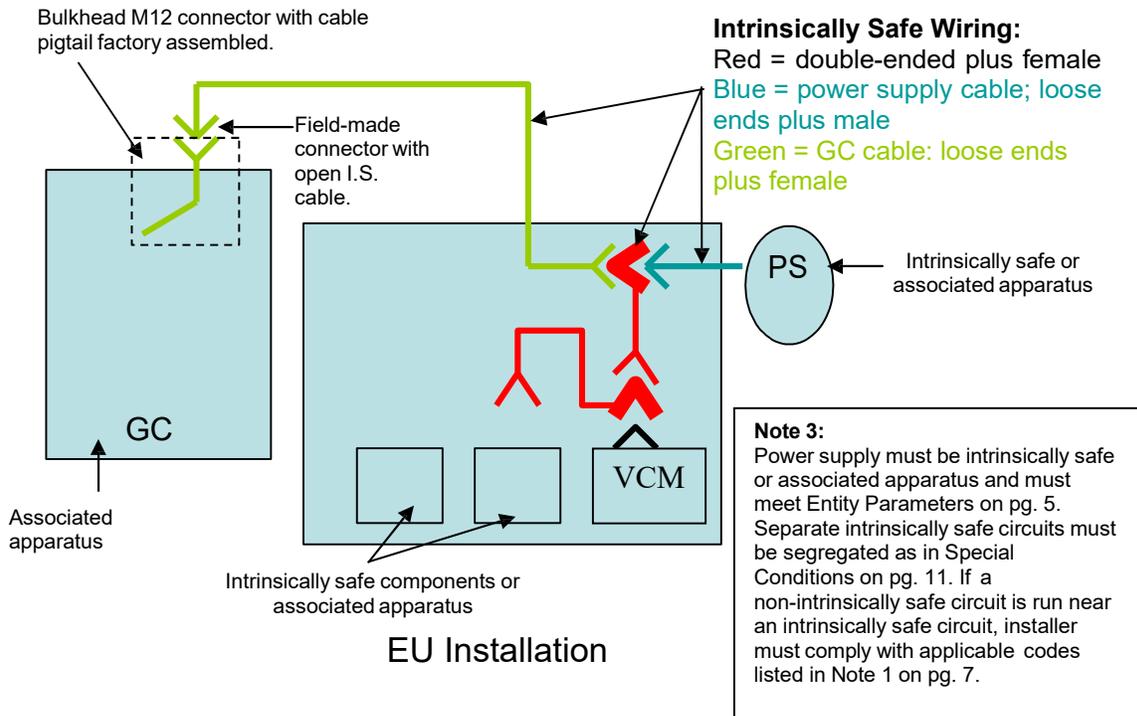
Installation Instructions are provided with each device and shall include the following (or equivalent). For products intended for sale in French-speaking areas of Canada, any warning/caution/safety warning shall be provided in French.

1. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D OR NON-HAZARDOUS LOCATIONS ONLY.
2. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN REMOVED OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
3. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.
4. THIS EQUIPMENT IS AN OPEN-TYPE DEVICE AND IS MEANT TO BE INSTALLED IN AN ENCLOSURE SUITABLE FOR THE ENVIRONMENT SUCH THAT THE EQUIPMENT IS ONLY ACCESSIBLE WITH THE USE OF A TOOL.
5. TEMPERATURE CODE: T4

European ,Zone 0/1 Installations

EU Installation

Use a bulkhead M12 connector on the cable outlet of the gas chromatograph. Run network cabling to the sample system; conduit is not needed. The intrinsically safe power supply can be physically near the sample system. At the sample system, use pass-through pigtail cables with an extra female connection to distribute power and network connections through the smart components.



ATEX/IECEx Zone 2:

Special Conditions of Safe Use:

- The equipment shall only be used in an area of not more than pollution degree 2, as defined in EN 60664-1.
- The equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with IEC/EN 60079-0 and only accessible by the use of a tool.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.

Special Conditions for Safe Use: The VCM is connected to two separate intrinsically safe circuits, Power and Signal, that are segregated at the input connector in accordance with EN 60079-11.

Cable and wiring used between the VCM and associated apparatus must maintain segregation between these two circuits, for example by use of Type A or B cable in accordance with EN 60079-14.

The DB9 pins are grouped as follows (see Table 1 in UL Control Drawing, p. 13):

Signal: Pins 5, 8

Power: Pins 1, 4, 6, 9

Isolated: Pins 2, 3, 7

Specifications

Functional Specification

Parameter	Value
Positions	6
Maximum number of simultaneously energized valves	4
Minimum time between valve actuations	1 second
Instrument Air	
Operating minimum	40 psig (2.8 bar)
Operating maximum	116 psig (8 bar)
Air quality class	3:4:4, according to ISO 8573-1
Position Sensor Input Option	Turck Bi1-EG05-Y1
Power Input	8.5 Vdc minimum, 9.5 Vdc maximum, 125 mA maximum
Typical Power Consumption	
Typical minimum, 0 valves open	70 mWatts
Typical maximum, 4 valves open	900 mWatts
Typical, each actuated valve	< 210 mWatts per valve
Ambient Temperature Range	-5°C (23°F) ≤ Tamb ≤ 70°C (158°F)
Hazardous Location Certifications	Refer to page 4
Indicators	
Valve State/Error Code LEDs	Blue
Network Interface Status LED	Red/Green
Module Status LED	Red/Green

Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

