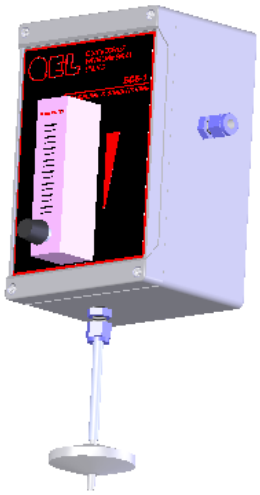
SCS-1

ONE CHANNEL
SAMPLING & CONDITIONING SYSTEM



INSTALLATION
OPERATION AND MAINTENANCE
MANUAL

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READ BEFORE OPERATING

All individuals who have or will have the responsibility of using, maintaining, or servicing this product must carefully read this manual. The product will perform as designed only if it is used, maintained, and serviced in accordance with the manufacturer's instructions.

1. General Information

1.1 Description

SCS-1 one channel Sampling and Conditioning System provides the ability to check for the presence of potentially hazardous atmospheres in a remote area or confined space. SCS-1 is composed of a motorized pump with ON/OFF control circuit, a precise flowmeter with direct reading scales and a replaceable in-line disk air filter. The entire electronic circuits including pump and power supply are housed in NEMA 4X enclosure to enable the SCS-1 to work in harsh environments.

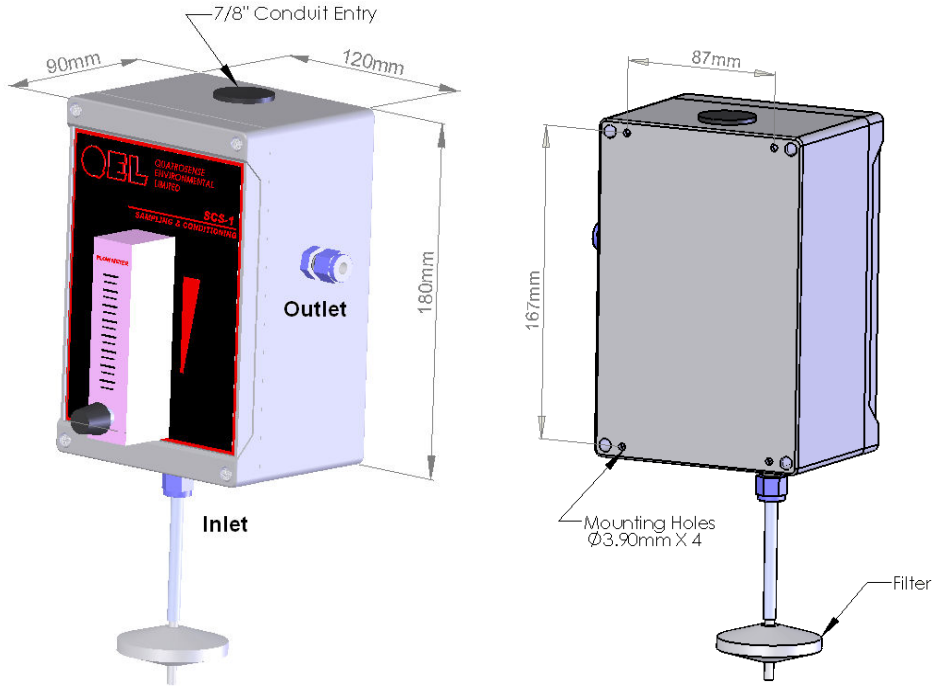
SCS-1 is suitable for variable, discontinuous use as well as for continuous operation. The components built into the SCS-1 unit can be used for standard applications. If you have special problems please ask us for other solutions.

1.2 Specifications

Input Power:	24VDC nominal, range 18 to 30VDC 24VAC nominal, range 15 to 24VAC 50/60HZ
Fuse:	F2 1A Very Fast-Acting Fuse Littelfuse: Axial Lead and Cartridge Fuse Part Number: 0251001 Must be CSA/UL approved.
Power Switching:	Slide Switch on Power Supply Board (SW1).
Flow Rate:	0 – 1.0 LPM
Flowmeter Accuracy:	5% of full scale
Max. Pressure:	850 mbar
Max. Vacuum:	-480 mbar
Inlet and Outlet Tube Fittings:	End Connection Size: 1/4 inch End Connection Type: Swagelok® tube fitting Suitable for 1/4 inch Tube OD
Pump Control:	TTL Input with Isolated Optocoupler Circuit 3.0 to 5.0V: Disable Pump 0V or Open: Enable Pump
Enclosure Rating:	IP66 & NEMA 4, 4X, 12 & 13 ratings UL listed 508 listed (File # E65324)
Operating Temperature:	10°C to 50°C
Ambient Humidity:	95 % for temperatures up to 31 °C Decreasing linearly to 80 % at 40 °C
Storage Temperature:	0°C to 70°C
Enclosure Size:	180mm X 120mm X 90mm
Weight:	Less than 1.5lbs (0.680 kg)

2. Installation

2.1 SCS-1 Physical Dimensions



2.2 Mounting and Wiring

NOTE: The SCS-1 may be mounted any position as long as easy access. Mounting hole size is shown above.

2.2.1 Location Condition

SCS-1 is exceptionally tough and strong. The installation should not be exposed to strong chlorine atmospheres or solvents such as benzene, acetone, carbon tetrachloride, etc. The mounting position should be free of excessive vibration since it may prevent the flowmeter from operating properly.

SCS-1 must be mounted in a vertical position with the inlet connection at the bottom and outlet at the right side.

2.2.2 Inlet Piping Run:

It is good practice to approach the SCS-1 inlet with as few elbows and restrictions as possible. Length of inlet piping makes little difference for normal pressure fed SCS-1. The inlet piping should be as short and open as possible. This will allow operation near atmospheric pressure and thereby insure the accuracy of the device.

2.2.3 Outlet or Discharge Piping:

As on the inlet, discharge piping should be at least as large as the SCS-1 connection. In addition, the piping should be as short and open as possible. This will allow operation of the flow tube at near atmospheric pressure and insure the accuracy of the device.

2.2.4 Cabling

Approved cable conduit and conduit connectors should be used to ensure a safe and reliable installation. Check the local wiring code for more information. Make sure all conduit connectors are screwed in tight and that they are not coming in contact with any bare conductors.

You might drill an additional access hole to bring the wires into the NEMA 4X enclosure. The access hole should be drilled on the side of the enclosure.

Warning: Be sure to look inside the unit prior to drilling so that to make sure there is sufficient clearance for the hole and fitting that you are using. Seal conduit to prevent foreign material from entering the enclosure.

The terminal block TB1 and TB3 (see next page drawing) accept 12 AWG to 24 AWG wire, Use 16 AWG or 18 AWG wire for Power Supply in long wiring runs.

2.2.5 Connectors

Make sure to observe wiring to the correct terminal blocks.

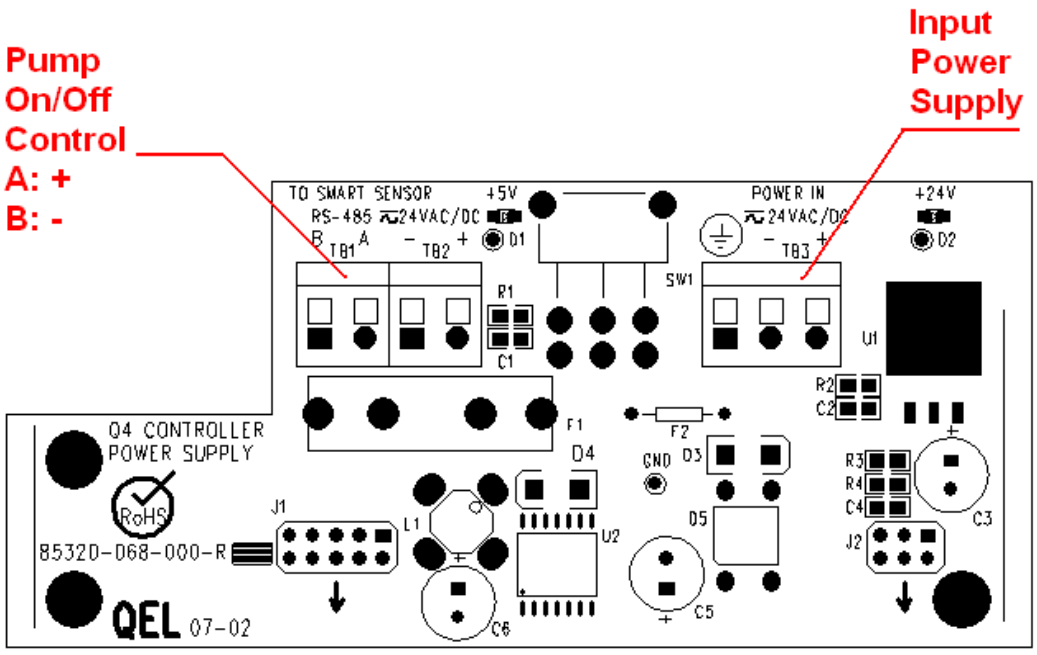
Note: Incorrect wiring to any of the terminals of the SCS-1 could cause permanent damage to the unit, which is not covered by the warranty. Incorrect wiring could also cause fire, electric shock, or bodily injury. Please observe the polarity on all connections.

Warning: Disconnect the main supply and switch off the SCS-1 when changing any of the wiring to the unit. Do not touch sensitive components on the circuit card to prevent static discharge damage to the unit.

2.2.6 Power Supply Connection

The SCS-1 operates on 24VAC 50/60HZ or 24VDC. There are no selections required by the user to select the input power. The input power is connected to the Power Supply Board using the Terminal Block TB3 located inside the unit.

Note: **The power supply for smart sensor is outputted from the TB2 on the Power Supply Board. It's useless for SCS-1 application. Keep TB2 floating.**



SCS-1 Power Supply Board Installation

The SCS-1 must be grounded by connecting a **true earth-ground** to the ground terminal designated by the ⏚ symbol.

Note: **SCS-1 Common/Power Supply Negative is not connected to Chassis Safety Ground.**

Note: **No external over-current protection is required. Over-current protection is provided by means of fuses F2.**

Fuse F2: 1A Very Fast-Acting Fuse and Must be CSA/UL approved

Littelfuse: Axial Lead and Cartridge Fuse, Part Number: 02510001.

2.2.7 Pump On/Off Control

The SCS-1 Pump can be switched ON or OFF by other device through TB1 in the Power Supply Board, so the SCS-1 can be remotely controlled by gas analyzer or transmitters.

TB1 label is redefined as below:

- RS-485 A → Pump Enable +
- RS-485 B → Pump Enable –

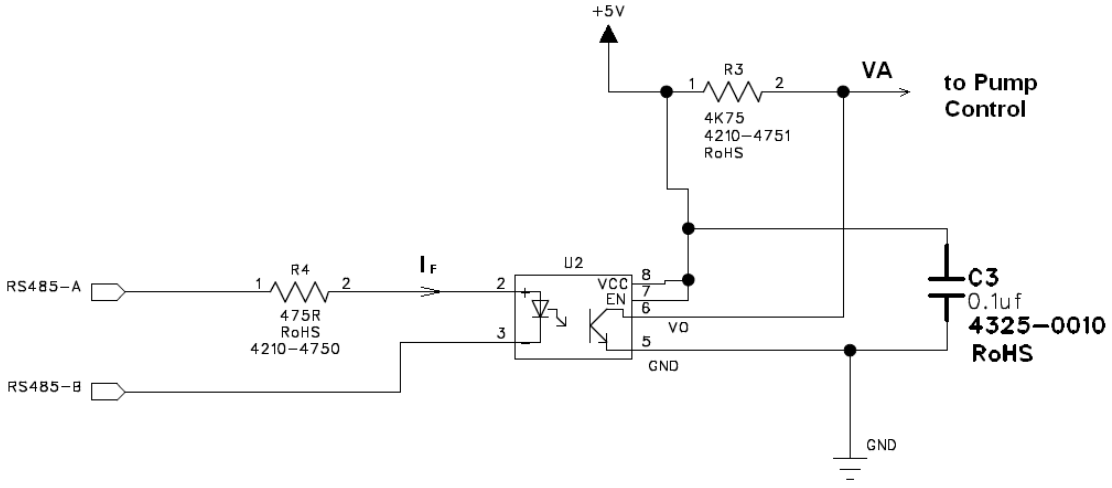
Note: SCS-1 does not support RS-485 communication.

The Pump Control Signal RS-485 A and B are isolated by an Optocoupler.

- When +5VDC is applied to RS-485 A and RS-485 B, VA is low, Pump is Disabled, Pump stops running

- When +0VDC is applied to RS-485 A and RS-485 B, VA is high, Pump is Enabled and Pump keeps running

- When RS-485 A and RS-485 B are floating or open, VA is high, Pump is Enabled and Pump keeps running



Note: Other voltage can be applied to RS-484 A and RS-485 B. Make sure the Current I_F not more than 10mA. When the I_F between 5mA to 10mA, Pump is Disabled. When the I_F is 0mA, Pump is Enabled.

2.3 Flowmeter Operation

To start system, open the valve slowly to avoid possible damage. Control valve is turned clockwise to reduce flow, counter clockwise to increase flow. A nylon insert is provided in the threaded section of the valve stem to give a firm touch to the valve and to prevent change of setting due to vibration.

The performance of low range units used in air or gas applications may be affected by static electricity. Excessive static charge may cause the ball float to behave erratically or provide a false reading. To ensure the proper function of the unit, the application should be designed to minimize or dispel static electricity.

The standard technique for reading a Variable Area Flowmeter is to locate the highest point of greatest diameter on the float, and then align that with the theoretical center of the scale graduation. In the event that the float is not aligned with a grad, an extrapolation of the float location must be made by the operator as to its location between the two closest grads.

2.4 Filter Installation

Installing the in-line filter on the SCS-1 inlet fitting can minimize the possibility of dust contamination. So an external inline filter supplied with the SCS-1 must be installed through a 3-inch tubing and connected to the SCS-1 inlet fitting.

2.5 Maintenance

The material selection for each component has been made with consideration for long-term operation. The electric motors are permanently lubricated. Replace pump if the pump does not work any more. A periodic or annual inspection of the air filter is recommended. Replace filter if filter material appears clogged.

Ask QEL for replacement of Pump Assembly and Air Filter.

Pump Assembly: QEL SKU#: 85830-007-000

Air Filter: QEL SKU#: 5500-0076

WARRANTY STATEMENT

The information contained in this manual is based upon data considered accurate; however, no warranty is expressed or implied regarding the accuracy of this data. All QEL equipment is warranted against defects in material and workmanship for a period of two years from date of shipment with the following exceptions:

Electrochemical Sensors (Toxic)	Six Months
Catalytic Sensors (Combustible)	One Year

During the warranty period we will repair or replace, at our discretion, any components or complete units that prove, in our opinion, to be defective. We are not liable for consequential or incidental damage to auxiliary interfaced equipment.

A returned material authorization number should be obtained from the factory prior to returning any goods. All return shipments must be shipped freight prepaid and a copy of the maintenance records should accompany the unit concerned.

Warranty should be considered F.O.B. the factory. Labour and travel time are chargeable for any field site visits required for warranty work.

LIMITED LIABILITY

All QEL systems shall be installed by a qualified technician/electrician and maintained in strict accordance with data provided for individual systems in the form of installation/maintenance manuals. QEL assumes no responsibility for improper installation, maintenance, etc., and stresses the importance of reading all manuals. QEL shall not be responsible for any liability arising from auxiliary interfaced equipment nor any damage resulting from the installation or operation of this equipment.

QEL's total liability is contained as above with no other liability expressed or implied, as the purchaser is entirely responsible for installation and maintenance of systems.

This warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to represent or assume for QEL any liability in connection with the sales of our products other than that set forth herein.

NOTE: Due to on-going product development, QEL reserves the right to change specifications without notice and will assume no responsibility for any costs as a result of modifications.

For further information or assistance, contact:

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