

STATUS SCIENTIFIC CONTROLS



Issue: 5

Date: 21/1/19

**Dual I.S. Supply/Barrier
Module, Stock No. SS359,
for FGD3 Infrared Gas
Detectors Stock No's.
SS412 and SS413**

Installation Manual

STATUS SCIENTIFIC CONTROLS LTD.
Hermitage Lane Industrial Estate,
Kings Mill Way,
Mansfield,
Nottinghamshire.
NG18 5ER
England
Tel : 01623 651381
Fax : 01623 421063

Declaration of Conformity

We declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the directives listed below.

Description of Equipment:

Dual Barrier & Power Supply Stock No. SS359
(Incorporating Type FGDI O Intrinsically Safe Output Module - ATEX Certified for use in Group IIC hazardous locations).


Directive 2014/34/EU ATEX

The following harmonised standards were used in support of this declaration:

Harmonised Standards:

EN60079-0:2012+A11:2013 Explosive atmospheres - Part 0: Equipment - General requirements.
(The product was originally certified to EN50014:1997+A1 & A2 but a review against the above harmonised standard, shows no significant changes relevant to this equipment).

EN60079-11:2012 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "I".
(The product was originally certified to EN50020:2002 but a review against the above harmonised standard, shows no significant changes relevant to this equipment).

Notified Body for Hazardous Area Certification: Baseefa Rockhead Business Park Staden Lane, Buxton SK17 9RZ, UK Notified Body Number : 1180	Notified Body for ATEX Quality Assurance Notification: Baseefa Rockhead Business Park Staden Lane, Buxton SK17 9RZ, UK Notified Body Number : 1180
Hazardous Area Certificate Number:  Baseefa 03ATEX0590X II (1) G [EEx ia] IIC	ATEX Quality Assurance Notification Number: 2056
Place of Manufacture: Mansfield, Nottinghamshire, UK. Date mark applied – see product	ISO 9001:2015 Quality Management System: Certificate No. GB93/1938

Authorised Signatory to this declaration, on behalf of the manufacturer:

Name: David Stuttard Title: Managing Director

Address: Status Scientific Controls Ltd, Hermitage Lane Industrial Estate, Kings Mill Way
Mansfield, Nottinghamshire, NG18 5ER, United Kingdom

Signature



Date: 21/11/19

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Dual I.S. Supply/Barrier Module



Introduction

The Dual I.S. Supply/Barrier Module has been specifically designed to provide a variable, intrinsically safe power supply for powering Status Scientific Controls type FGD2 or FGD3 Gas Detectors fitted with either infrared or pellistor type sensors. The module can accept a D.C. input in the range of 12 to 24 Volts and its output is factory set so that the optimum operating conditions are achieved. The barrier part of the unit is ATEX certified intrinsically safe and is referred to as the FGDI0 barrier.

The barrier provides an intrinsically safe supply to power intrinsically safe certified equipment sited in a potentially explosive atmosphere. The power supply input to the barrier is not intrinsically safe; the barrier must therefore be located within a non-hazardous area unless it is housed in a suitably certified flameproof (Ex 'd') enclosure.

Installation

Special Conditions for Safe Use

The hazardous area terminals of the apparatus are not protected against unauthorised interference as required by clause 6.1 of EN 50020:2002. The apparatus must be installed such that the input terminals are protected to at least the requirements of IP20.

The module is designed to mount upon *standard top hat* or *G-section* DIN rail. All connections are made into large removable connectors providing ease of termination.

Once correctly installed the module requires no operator intervention to continue to operate normally. Access to the unit need only be made in the event of one of the internal fuses blowing.

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Although the unit is designed for the FGD series of gas detectors incorporating infrared type sensors, it may also be used to provide an intrinsically safe supply to loop powered equipment. In this case no connection should be made to the 0V and +Vin terminals.

Wire Termination

When connecting wires to the input module, ensure that no stray strands of wire exist between the two intrinsically safe (I.S.) outputs. The use of bootlace ferrules is recommended. To comply with the certification of the module, ensure there is always at least 50mm between exposed intrinsically safe and non-intrinsically safe connections.

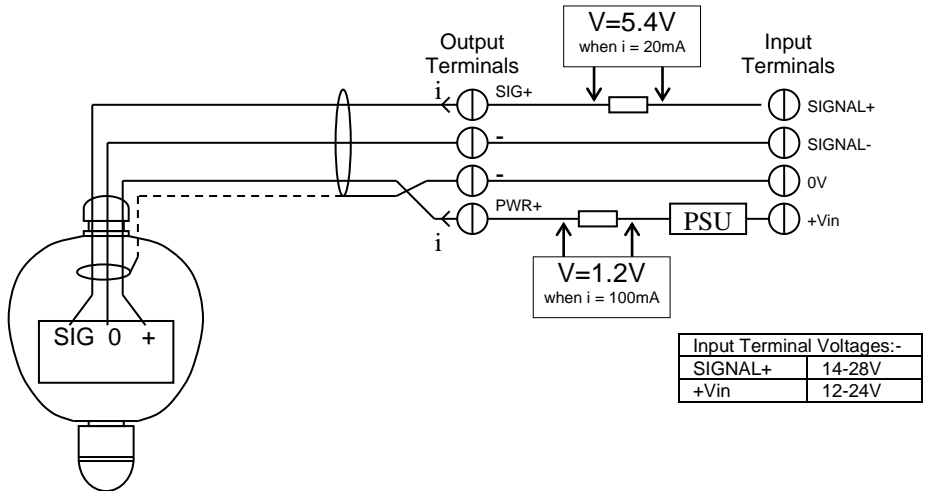
Cable Routing

Due to the low signal levels used in the current loop circuits it is recommended that all wiring to the module be segregated away from AC mains or other high voltage/power lines to avoid interference.

Screening

The use of a screened cable is recommended for the installation of detector heads connected to the output terminals of the module. The cable screen must not be connected at the detector head. Refer to the connection diagram on page 6 for further information.

Cable Selection



Prior to installation, care must be taken in selecting a suitable cable with conductors of adequate cross sectional area. The voltage available at the output terminals of the module is dependent upon the load connected.

Typical cable resistance for 2.5mm² cores is 16.4R/Km loop (equivalent to 0.0164R/metre). For a gas detector working at 5.8V, the voltage drop along the cable must be no greater than 6.8V – 5.8V = 1.0V. This represents a total cable resistance of 1.0V / 0.18A = 5.56R. With 2.5mm² cable this would allow a maximum total cable length of:

$$5.56 / 0.0164 = 339\text{m.}$$

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Intrinsic Safety Considerations

In order to maintain intrinsic safety, the capacitance and Inductance or Inductance to Resistance (L/R) ratio of the loads connected to the terminals of the FGDIO Barrier must not exceed specified values:

The capacitance and Inductance or Inductance to Resistance (L/R) ratio of the load connected to terminals 1 and 2 must not exceed the following values:

GROUP	CAPACITANCE in μF	INDUCTANCE in mH	OR	L/R RATIO in $\mu\text{H}/\text{ohm}$
IIC	0.083	3		44
IIB	0.65	12		177
IIA	2.15	25		355

The capacitance and Inductance or Inductance to Resistance (L/R) ratio of the load connected to terminals 4 and 3 must not exceed the following values:

GROUP	CAPACITANCE in μF	INDUCTANCE in mH	OR	L/R RATIO in $\mu\text{H}/\text{ohm}$
IIC	11.1	0.07		28
IIB	174	0.28		114
IIA	1000	0.56		228

Warning:

When considering the suitability of an installation in terms of the load's capacitance and inductance, account must be taken of the interconnecting cable itself. The figures in the tables must not be exceeded by the combination of the load parameters and the cable parameters. This may restrict the permissible cable length in some applications. If in doubt, consult Status Scientific Controls for assistance.

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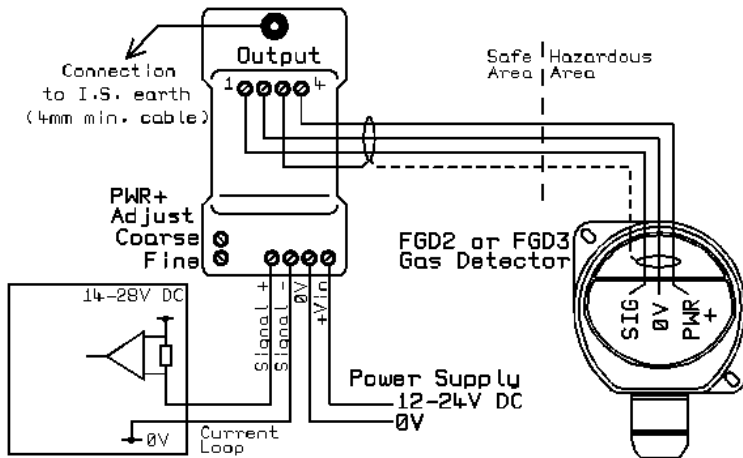


The connection between the system I.S. earth and the control unit I.S. earth must be made using at least one conductor with a minimum of 4mm² copper. Further guidance on the correct installation of I.S. systems is provided by EN60079-14:2003.

Operating Instructions

IMPORTANT – Read and understand this procedure before use. Incorrect operation will blow the internal fuses.

Note: The 4-20mA current loop does not require the internal power supply of the FGDI0 module.



1. Connect the current loop connections to the FGDI0 observing polarity.
2. Connect the power supply to the +Vin and 0V input terminals (12V – 24V D.C.).
3. Connect the gas detector to the output terminals of the FGDI0 module as shown.
4. Monitor the voltage at the 'PWR+' and '0V' terminals of the gas detector. The FGD using an infrared sensor requires the voltage at the PWR+ input terminals of the detector head to be set to a nominal 6V (5.8V minimum). Note that this is an a.c. current drain and voltmeter readings will fluctuate.

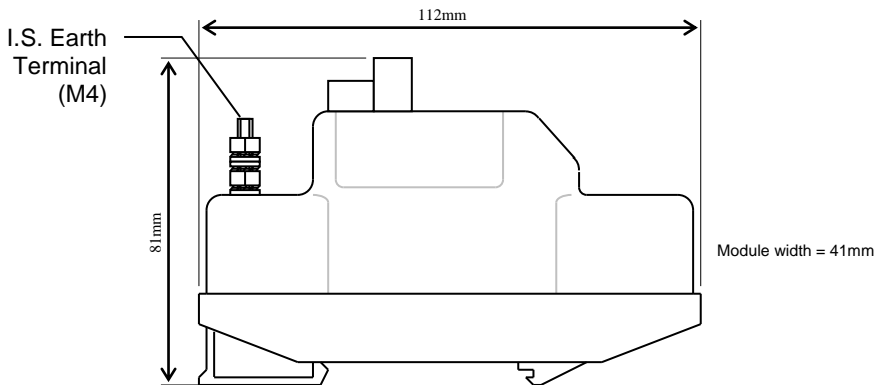
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Specification

Inputs	14-28vDC 12-24V	(Signal+) (+Vin)				
Temperature	-20 - +40°C					
Humidity range	0-95% RH non-condensing					
Operating pressure	Ambient + or – 10%					
Internal Resistance	Current Loop	: 270R ±5%				
Source Resistance	Pellistor Supply	: 12.0R ±5%				
Intrinsically Safe Outputs	Terminals	Uo	Io	Po	Ci	Li
	1 & 2	28V	112mA	0.8W	0	0
	3 & 4	7.5V	660mA	1.24W	0	0
Certificate No.	Baseefa 03ATEX0590X					
Approval code	EEx ia IIC					



Approximate dimensions only (not to scale)