



DEEP SEA ELECTRONICS PLC DSE103 MK II Speed Switch Operators Manual

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DSE Model 103 MKII Speed Switch Operators Manual.

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Amendments since last publication

| Issue no. | Comments |
|-----------|---------------|
| 1 | First Release |
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| | |

Clarification of notation used within this publication.




| | |
|--|---|
|  NOTE: | Highlights an essential element of a procedure to ensure correctness. |
|  CAUTION! | Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment. |
|  WARNING! | Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly. |

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1 BIBLIOGRAPHY

This document refers to and is referred to by the following DSE publications which can be obtained from the DSE website www.deepseapl.com

1.1 INSTALLATION INSTRUCTIONS

Installation instructions are supplied with the product in the box and are intended as a 'quick start' guide only.

| DSE PART | DESCRIPTION |
|----------|---------------------------------------|
| 053-124 | DSE103 MKII Installation Instructions |

1.2 MANUALS

| DSE PART | DESCRIPTION |
|----------|--|
| 057-136 | DSE103 MKII Speed Switch Software (using DSE configuration Suite Lite) |

1.3 CONFIGURATION SOFTWARE

| DESCRIPTION |
|------------------------------|
| DSE Configuration Suite Lite |

2 INTRODUCTION

This document details the installation and operation requirements of the DSE103 MKII Series Speed Switch, part of the DSE range of products.

The manual forms part of the product and should be kept for the entire life of the product. If the product is passed or supplied to another party, ensure that this document is passed to them for reference purposes.

This is not a *controlled document*. You will not be automatically informed of updates. Any future updates of this document will be included on the DSE website at www.deepseapl.com

The DSE103 MKII Series Speed Switch is designed to monitor the speed of an engine or piece of rotating machinery by detecting a magnetic pickup pulse or frequency. Should these exceed the configured trip points, the appropriate relay contact will change state.

The electronics are housed in a robust case encapsulated in resin for environmental protection which is designed for bolt on mounting. Electrical connections are via ¼" spade connectors.

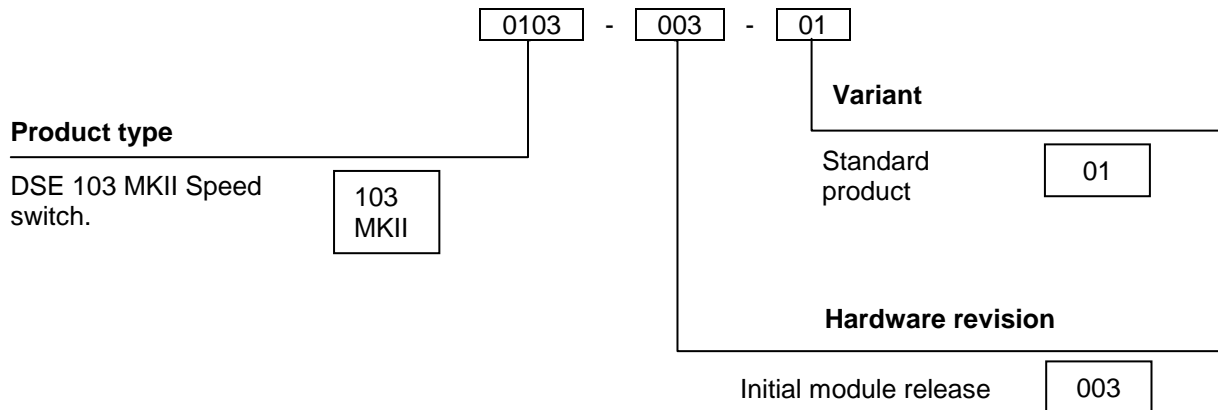
The modules flexibility allows it to be used for many different applications including under speed and over speed protection or crank disconnect facilities.

The DSE Configuration Suite Lite software allows configuration of selected operational sequences, timers and latches.

.

3 SPECIFICATIONS

3.1 PART NUMBERING



At the time of this document production, there are no variants of this product.

3.2 TERMINAL SPECIFICATION

| | |
|--------------------|---|
| Connection type | Two part connector. <ul style="list-style-type: none"> Male part fitted to module Female part is via ¼" Crimp Connectors (not supplied) |
| Minimum cable size | 0.5mm ² (AWG 24) (check crimp specification) |
| Maximum cable size | 2.5mm ² (AWG 10) (check crimp specification) |

3.3 POWER SUPPLY REQUIREMENTS

| | |
|-----------------------------|--|
| Minimum supply voltage | 8V continuous |
| Cranking dropouts | Able to survive 0V for 50mS providing the supply was at least 10V before the dropout and recovers to 5V afterwards. This is more than sufficient to allow the module to operate during engine cranking where the battery supply often falls as low as 4V (on a 12V system!) This is achieved without the need for internal batteries or other external requirements. |
| Maximum supply voltage | 35V continuous (60V protection for surges) |
| Reverse polarity protection | -35V continuous |
| Maximum operating current | 100mA at 24V 95mA at 12V |
| Maximum standby current | 20mA at 24V 20mA at 12V |

3.4 INPUTS

| | |
|-------------------------|---|
| Number | Pins 5, 13 |
| Arrangement | Contact between terminal and ground |
| Low level threshold | 2.1V minimum |
| High level threshold | 6.6V maximum |
| Maximum input voltage | +50V DC with respect to plant supply negative |
| Minimum input voltage | -24V DC with respect to plant supply negative |
| Contact wetting current | 2.5mA typical |
| Open circuit voltage | 12V typical |

3.4.1.1 FREQUENCY SENSING INPUT HZ , RPM

| | |
|----------------------|----------------------|
| Measurement type | Frequency |
| Input Impedance | 900K Ω ph-N |
| Phase to Neutral | 15V to 333V AC (max) |
| Minimum frequency | 3.5Hz |
| Maximum frequency | 75.0Hz |
| Frequency resolution | 0.1Hz |
| Frequency accuracy | ± 0.2 Hz |

3.4.1.2 MAGNETIC PICKUP

| | |
|-------------------------|--------------------|
| Type | Differential input |
| Minimum voltage | 0.6V RMS |
| Max common mode voltage | ± 2 V |
| Maximum frequency | 10,000Hz |
| Resolution | 6.25 RPM |
| Accuracy | ± 25 RPM |



NOTE : DSE can supply a suitable magnetic pickup device, available in two body thread lengths :
DSE Part number 020-012 - Magnetic Pickup probe 5/8 UNF 2½" thread length
DSE Part number 020-013 - Magnetic Pickup probe 5/8 UNF 4" thread length

Magnetic Pickup devices can often be 'shared' between two or more devices. For example, one device can often supply the signal to both the DSE103 MKII speed switch and the engine governor. The possibility of this depends upon the amount of current that the magnetic pickup can supply.

3.5 OUTPUTS

3.5.1.1 TACHOMETER

| | |
|------------|--------------------------------------|
| Rating | 0mA-1mA Full scale deflection output |
| Protection | Current limited by design |

3.5.1.2 CONFIGURABLE OUTPUTS R1, R2

| | |
|------------|--|
| Protection | Protected against over current & over temperature. Built in load dump feature. |
| Type | Voltage free relays. |
| Rating | 15A DC |

3.6 COMMUNICATION

| | |
|----------------|--|
| P813 Interface | USB2.0 Device for connection to PC running DSE configuration suite only Max distance 6m (yards) |
|----------------|--|

3.6.1.1 USB P813 INTERFACE CONNECTION

The USB P813 is available to connect a PC to DSE103 MKII Speed Switch. Using the DSE Configuration Suite Lite software, the operator is then able to configure the DSE103 MKII Speed Switch.

To connect a DSE103 MKII module to a PC by USB, the following items are required:-

- DSE103 MKII Speed Switch



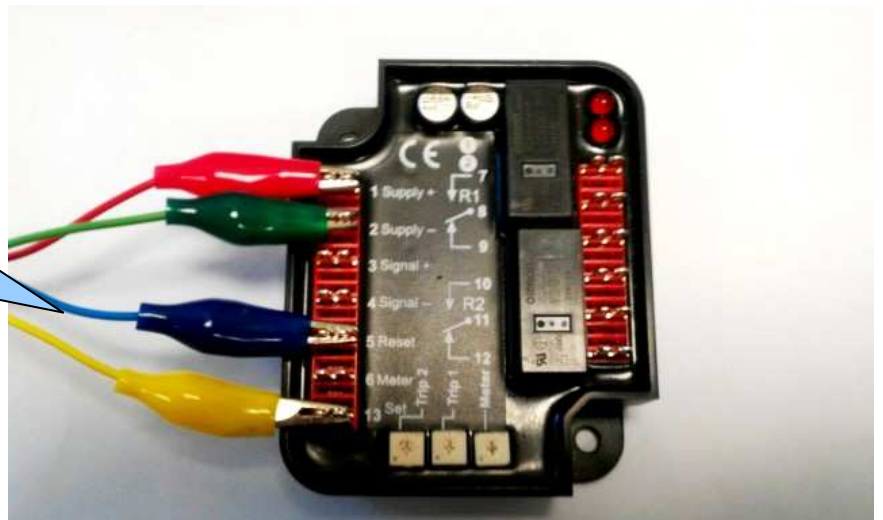
- DSE Configuration Suite Lite
(Available from our website
www.deepseapl.com)

- P813 PC Configuration interface and leads



Connecting the P813 PC Configuration interface to the DS103 MKII speed switch

Red lead - Pin 1 Supply+
Green lead - Pin 2 Supply -
Blue lead - Pin 5 Reset
Yellow lead - Pin 13 Set



NOTE:- Refer to DSE103MKII Configuration Suite Lite Manual (DSE part 057-136) for further details on configuring and control

3.7 DIMENSIONS AND MOUNTING

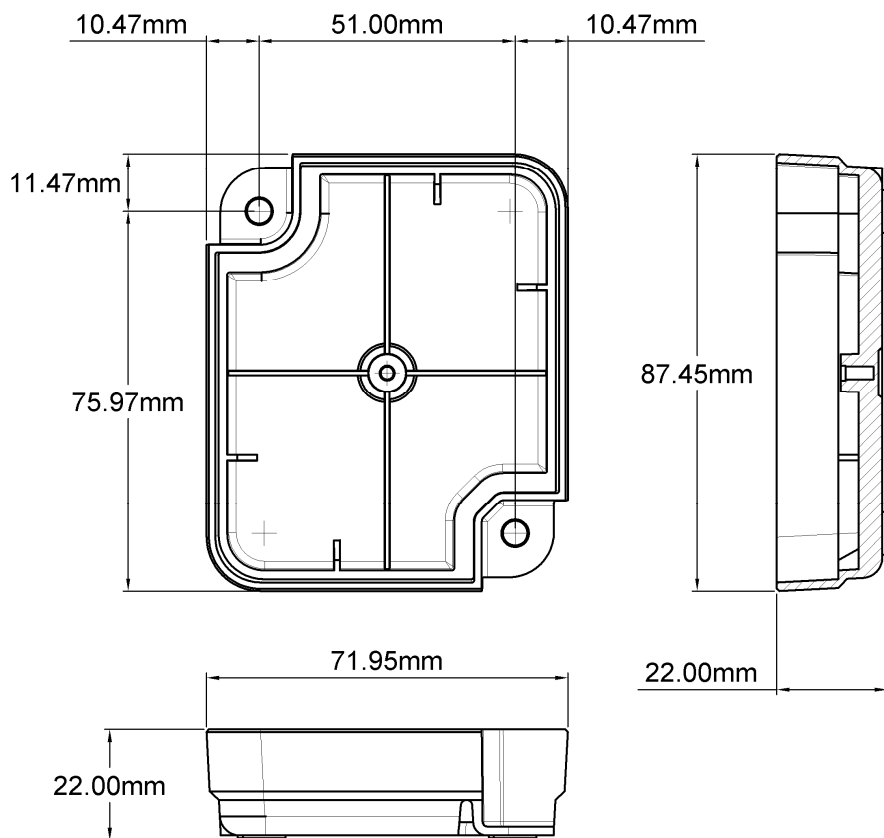
3.7.1.1 DIMENSIONS

87.5 mm x 72.0 mm x 26.0 mm
(3.4" x 2.8" x 1.0")

3.7.1.2 MOUNTING

Bolt & Nut Size: M4



Torque Rating: 0.60 Nm to 0.70 Nm



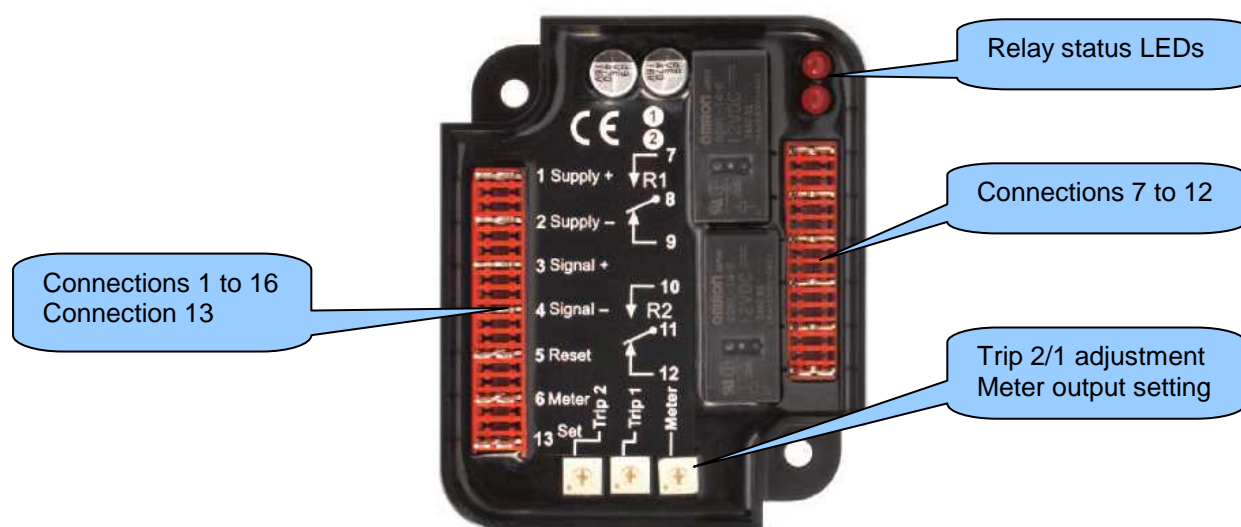
4 INSTALLATION

The DSE103 MKII module is designed to be mounted with two x M4 bolt and nut. For dimension and mounting details, see the section entitled *Specification, Dimension and mounting* elsewhere in this document.

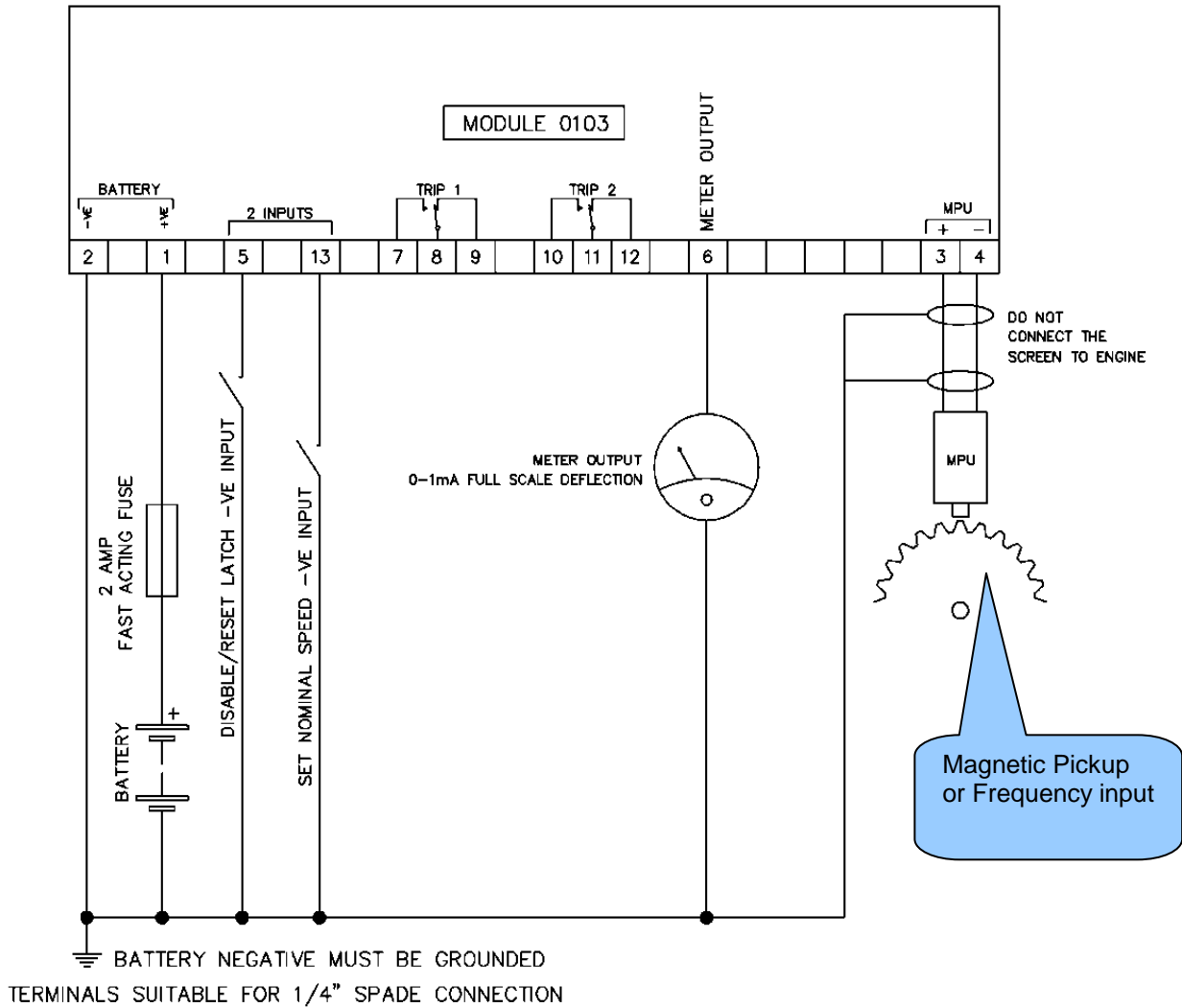
4.1 TERMINAL NUMBER AND DESCRIPTION

| Icon | PIN No | DESCRIPTION | Cable size | NOTES |
|---|--------|----------------------------------|------------------------------|---|
| | 1 | DC Plant Supply Input (Positive) | 2.5mm ² AWG 13 | Recommended Maximum Fuse 2A Fast Acting fuse) |
| | 2 | DC Plant Supply Input (Negative) | 2.5mm ² AWG 13 | |
| | 3 | Signal + | 0.5mm ² AWG 20 | Magnetic pickup Positive / Frequency Sensing |
| | 4 | Signal - | 0.5mm ² AWG 20 | Magnetic pickup Negative / Frequency Sensing |
| | | Magnetic pickup Screen | Shield | Connect to GND DC Plant negative DO NOT CONNECT TO ENGINE connect one side only to stop the screen acting as an aerial picking up noise. |
| | 5 | Reset latch | 1.0mm ² AWG 18 | |
| | 6 | Meter | | Meter output 0mA -1mA full scale deflection |
|  | 7 | Relay (R1) Normally Open | 1.0mm ² AWG 18 | Volts free relay (15A rated) |
| | 8 | Relay (R1) Common | 1.0mm ² AWG 18 | |
| | 9 | Relay (R1) Normally Closed | 1.0mm ² AWG 18 | |
|  | 10 | Relay (R2) Normally Open | 1.0mm ² AWG 18 | Volts free relay (15A rated) |
| | 11 | Relay (R2) Common | 1.0mm ² AWG 18 | |
| | 12 | Relay (R2) Normally Closed | 1.0mm ² AWG 18 | |

NOTE: Screened cable must be used for connecting the Magnetic Pickup, ensuring that the screen is earthed at one end ONLY.



4.2 TYPICAL WIRING DIAGRAM



5 SETTINGS AND ADJUSTMENT

5.1 SETTING OF NOMINAL SPEED

- With the DSE103 connected, run the engine at nominal speed.
- Connect the 'Set Nominal Speed' input to battery negative to set.

5.2 ADJUSTMENT OF TRIP POINTS

- Turn the pre-set potentiometers to set the trip point. The factory setting for Trip 1 is 10% to 50% of nominal engine speed and the default setting for Trip 2 is 90% to 140% of nominal engine speed . The range is adjusted from 0% to 400% of nominal engine speed via the DSE Configuration Suite Lite PC Software.
- Turn the pre-set potentiometers clockwise to increase the appropriate trip point, turn it anti-clockwise to decrease the appropriate trip point.
- The LED illuminate when the trip has been achieved.

5.3 METER CALIBRATION

- Turn the pre-set potentiometer "METER" to set the meter calibration. PWM output is scaled to match the optional tachometer (0 mA to 1 mA range).
- Turn the potentiometer clockwise to increase the meter reading.
- Turn the potentiometer anti-clockwise to decrease the meter reading.

5.4 PC CONFIGURATION

- PC configuration is achieved using the P813 interface and
- DSE Configuration Suite Lite PC Software.
- For further information on PC Configuration, please refer to DSE publication: **057-136 103 MKII Speed Switch Software Manual**

6 APPLICABLE STANDARDS

| | |
|---|--|
| BS 4884-1 | This document conforms to BS4884-1 1992 Specification for presentation of essential information. |
| BS 4884-2 | This document conforms to BS4884-2 1993 Guide to content |
| BS 4884-3 | This document conforms to BS4884-3 1993 Guide to presentation |
| BS EN 60068-2-1 (Minimum temperature) | -30°C (-22°F) |
| BS EN 60068-2-2 (Maximum temperature) | +70°C (158°F) |
| BS EN 60950 | Safety of information technology equipment, including electrical business equipment |
| BS EN 61000-6-2 | EMC Generic Immunity Standard (Industrial) |
| BS EN 61000-6-4 | EMC Generic Emission Standard (Industrial) |

In line with our policy of continual development, Deep Sea Electronics, reserve the right to change specification without notice.

7 COMMISSIONING

7.1 PRE-COMMISSIONING

Before the system is started, it is recommended that the following checks are made:-

- 10.1. The unit is adequately cooled and all the wiring to the module is of a standard and rating compatible with the system. Check all mechanical parts are fitted correctly and that all electrical connections (including earths) are sound.
- 10.2. The unit **DC** supply is fused and connected to the battery and that it is of the correct polarity.
- 10.3. Make all checks on the engine and alternator as detailed by their respective manufacturer documentation.
- 10.4. Check all other parts in the system according to the manufacturer documentation.
- 10.5. Thoroughly review the configuration of the DSE 103 MKII Speed switch and check that all parameters meet the requirements of your system.
- 10.6. If despite repeated checking of the connections between the **DSE 103 MKII** and the customer's system, satisfactory operation cannot be achieved, then the customer is requested to contact the factory for further advice on:-

INTERNATIONAL TEL: +44 (0) 1723 890099

INTERNATIONAL FAX: +44 (0) 1723 893303

E-mail: Support@Deepseapl.com

Website : www.deepseapl.com

8 FAULT FINDING

| SYMPTOM | POSSIBLE REMEDY |
|--|---|
| Unit is inoperative | Check the battery and wiring to the unit. Check the DC supply. Check the DC fuse. |
| Intermittent Magnetic Pick-up sensor fault | Ensure that Magnetic pick-up screen only connects to earth at one end, if connected at both ends, this enables the screen to act as an aerial and will pick up random interference. Check pickup is correct distance from the flywheel teeth. |

9 MAINTENANCE, SPARES, REPAIR AND SERVICING

The DSE103 MKII Speed switch Series controller is *Fit and Forget*. As such, there are no user serviceable parts within the controller.

In the case of malfunction, you should contact your original equipment manufacturer (OEM).

10 WARRANTY

DSE provides limited warranty to the equipment purchaser at the point of sale. For full details of any applicable warranty, you are referred to your original equipment supplier (OEM).

11 DISPOSAL

11.1 WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT)

Directive 2002/96/EC

If you use electrical and electronic equipment you must store, collect, treat, recycle and dispose of WEEE separately from your other waste.



11.2 ROHS (RESTRICTION OF HAZARDOUS SUBSTANCES)

Directive 2002/95/EC: 2006

To remove specified hazardous substances (Lead, Mercury, Hexavalent Chromium, Cadmium, PBB & PBDE's)

Exemption Note: Category 9. (Monitoring & Control Instruments) as defined in Annex 1B of the WEEE directive will be exempt from the RoHS legislation. This was confirmed in the August 2005 UK's Department of Trade and Industry RoHS REGULATIONS Guide (Para 11).

Despite this exemption, DSE has been carefully removing all non RoHS compliant components from our supply chain and products.

When this is completed, a Lead Free & RoHS compatible manufacturing process will be phased into DSE production.

This process is almost complete and is being phased through different product groups.

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