

# ABB

## The Company

We are an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology.

The UKAS Calibration Laboratory No. 0255 is just one of the ten flow calibration plants operated by the Company, and is indicative of our dedication to quality and accuracy.

EN ISO 9001:2000



Cert. No. Q05907

EN 29001 (ISO 9001)



Lenno, Italy – Cert. No. 9/90A

Stonehouse, U.K.



0255

## Electrical Safety

This equipment complies with the requirements of CEI/IEC 61010-1:2001-2 'Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use'. If the equipment is used in a manner NOT specified by the Company, the protection provided by the equipment may be impaired.

## Symbols

One or more of the following symbols may appear on the equipment labelling:

	<b>Warning</b> – Refer to the manual for instructions
	<b>Caution</b> – Risk of electric shock
	Protective earth (ground) terminal
	Earth (ground) terminal

	Direct current supply only
	Alternating current supply only
	Both direct and alternating current supply
	The equipment is protected through double insulation

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of the Technical Publications Department.

### Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

# CONTENTS

1	INTRODUCTION .....	1
2	PREPARATION .....	2
2.1	Checking the Electronic Analysis Unit Code Number .....	2
3	MECHANICAL INSTALLATION .....	2
3.1	System Siting Requirements .....	2
3.1.1	Sensor Siting .....	2
3.2	Overall Dimensions .....	3
3.2.1	Electronic Analysis Unit .....	3
3.2.2	Sensor .....	3
3.3	Mounting .....	4
3.4	Cleaning the Sensor .....	4
4	ELECTRICAL CONNECTIONS .....	5
4.1	Connections – General .....	5
4.1.1	Electronic Analysis Unit to Power Supply Unit Connections .....	5
4.1.2	Electronic Analysis Unit to Sensor Connection .....	6
5	SPECIFICATION .....	7
5.1	Electronic Analysis Unit .....	7
5.2	Sensor .....	7
	NOTES .....	8

# 1 INTRODUCTION

The electronic analysis system described in this manual comprises a type 5999/900 electronic analysis unit and a type 2998/010 sensor. The system is designed for the continuous monitoring of low level conductivity in coolant water and is powered by a separate power supply unit.

The electronic analysis unit is surface-mounted and provides a single retransmission output signal of between 4 and 20mA (this corresponds to conductivity in the range of 0 to 50 $\mu$ S/cm). The sensor is a screw-in type for measuring coolant flow only and operates at a maximum distance of 50m from the electronic analysis unit.

Connections between the transmitter/cell and transmitter/power supply unit are via two plug-in sockets. The separate power supply unit (not supplied) provides a 24V d.c. ( $\pm$ 10%) supply for the electronic analysis unit.

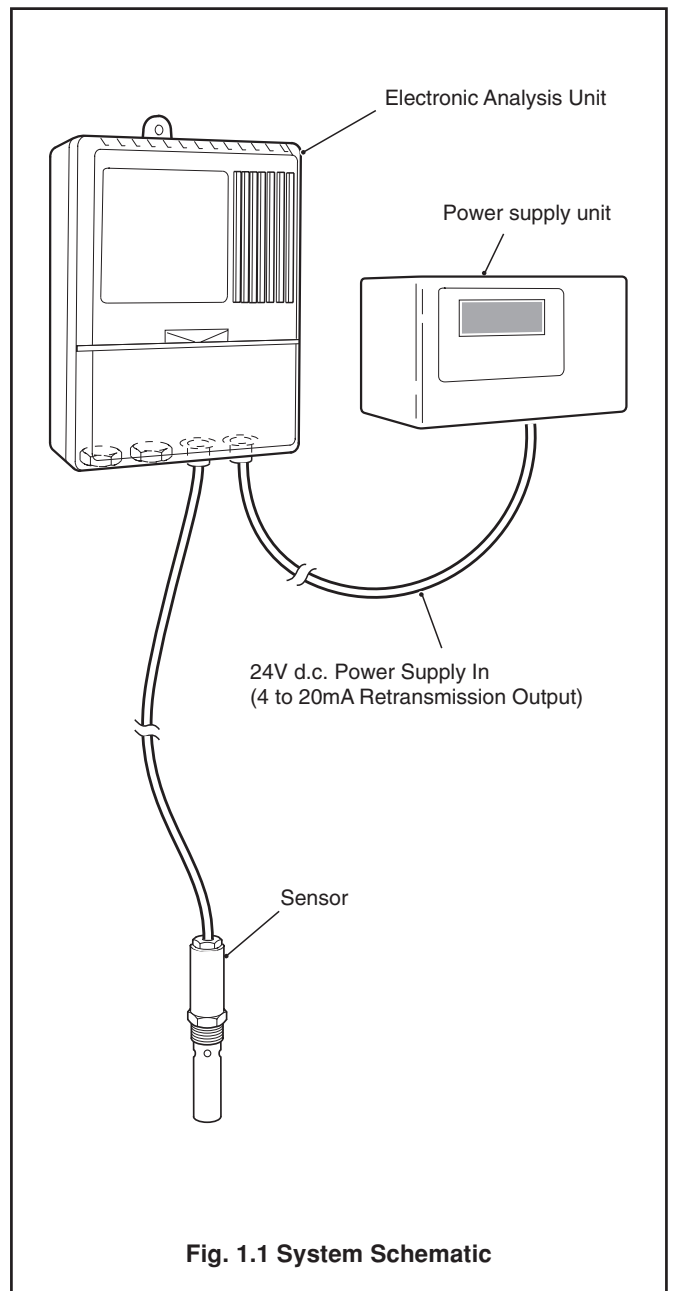
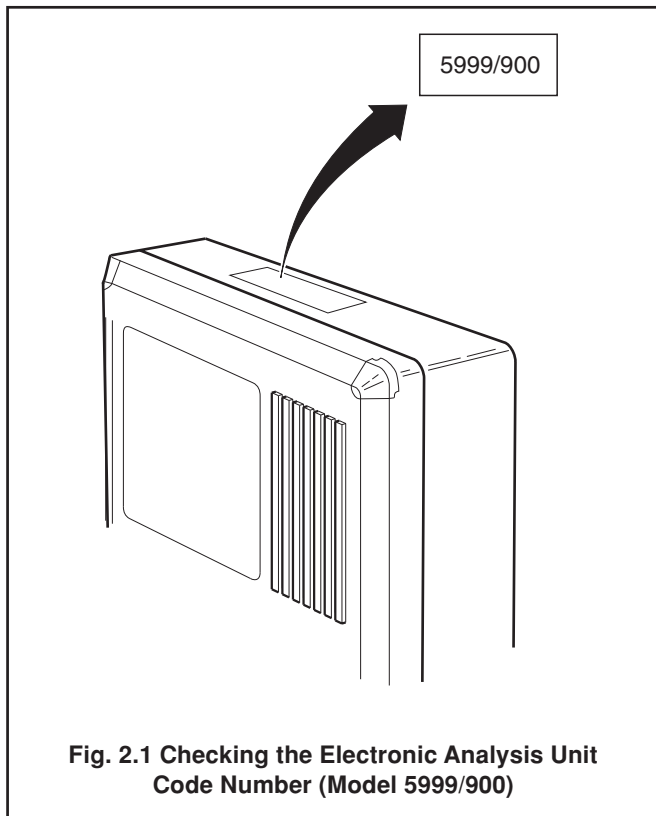


Fig. 1.1 System Schematic


## 2 PREPARATION

### 2.1 Checking the Electronic Analysis Unit Code Number – Fig. 2.1



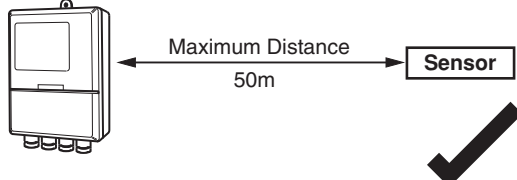
## 3 MECHANICAL INSTALLATION

### 3.1 System Siting Requirements – Fig. 3.1

 **Caution.**

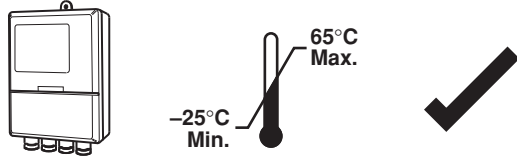
- Mount away from harmful vapors and/or dripping fluids.




**A – Maximum Distance of Electronics Unit to Sensor**

Maximum Distance 50m



**B – Within Temperature Limits**

65°C Max.  
-25°C Min.




**C – Within Environmental Limits**


# IP53

**Fig. 3.1 System Siting Requirements**

#### 3.1.1 Sensor Siting

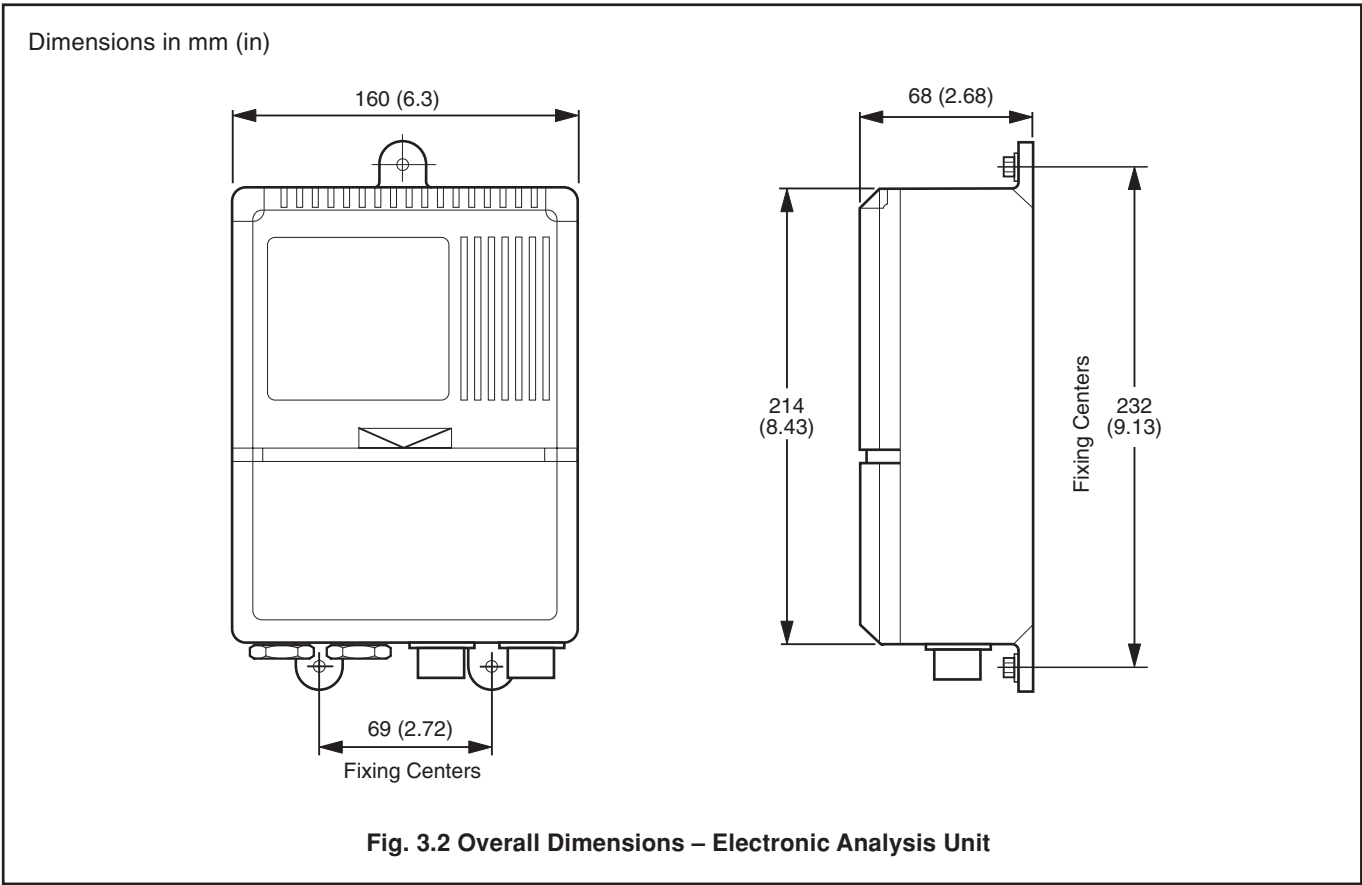
 **Caution.**

- The sensor must be located in the coolant flow only.
- Do not use the sensor to measure purified water from the mixed bed filter.
- Ensure that the integral cable (where applicable) does not hang against hot or abrasive objects when the plug is connected to the bulkhead socket.

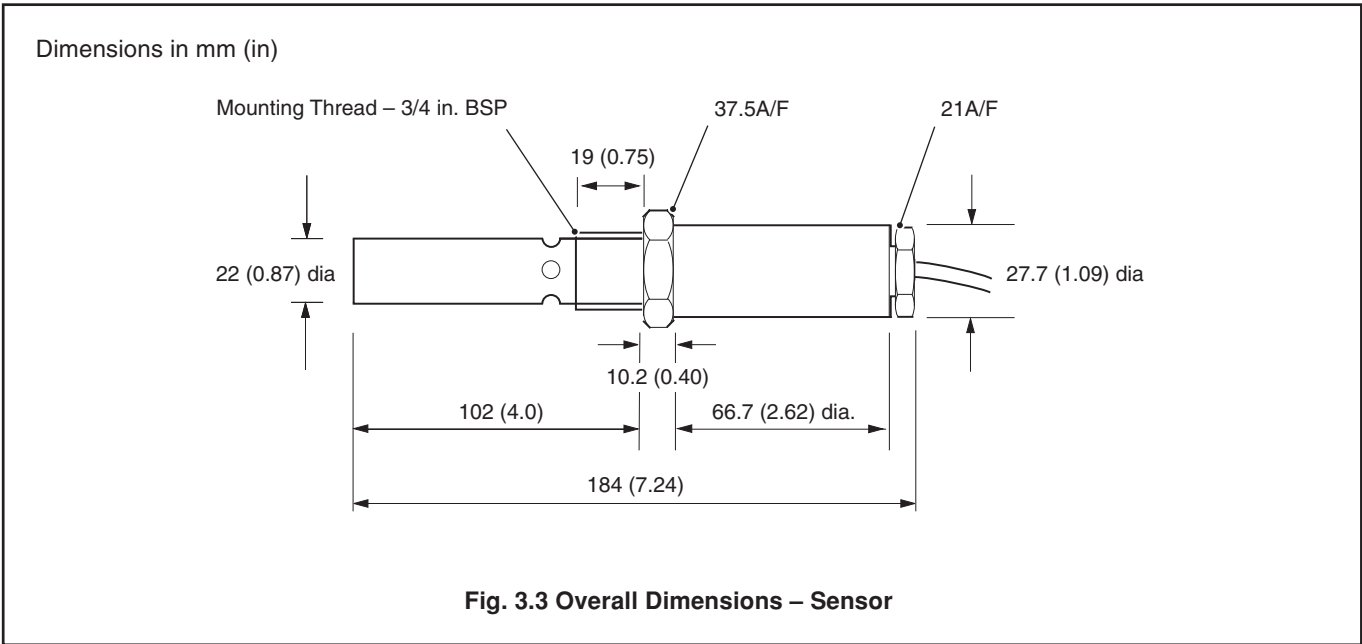
 **Note.** Allow sufficient clearance for easy removal of sensor for cleaning – see Section 3.2.2 for sensor overall dimensions.

3.2 Overall Dimensions

3.2.1 Electronic Analysis Unit – Fig. 3.2

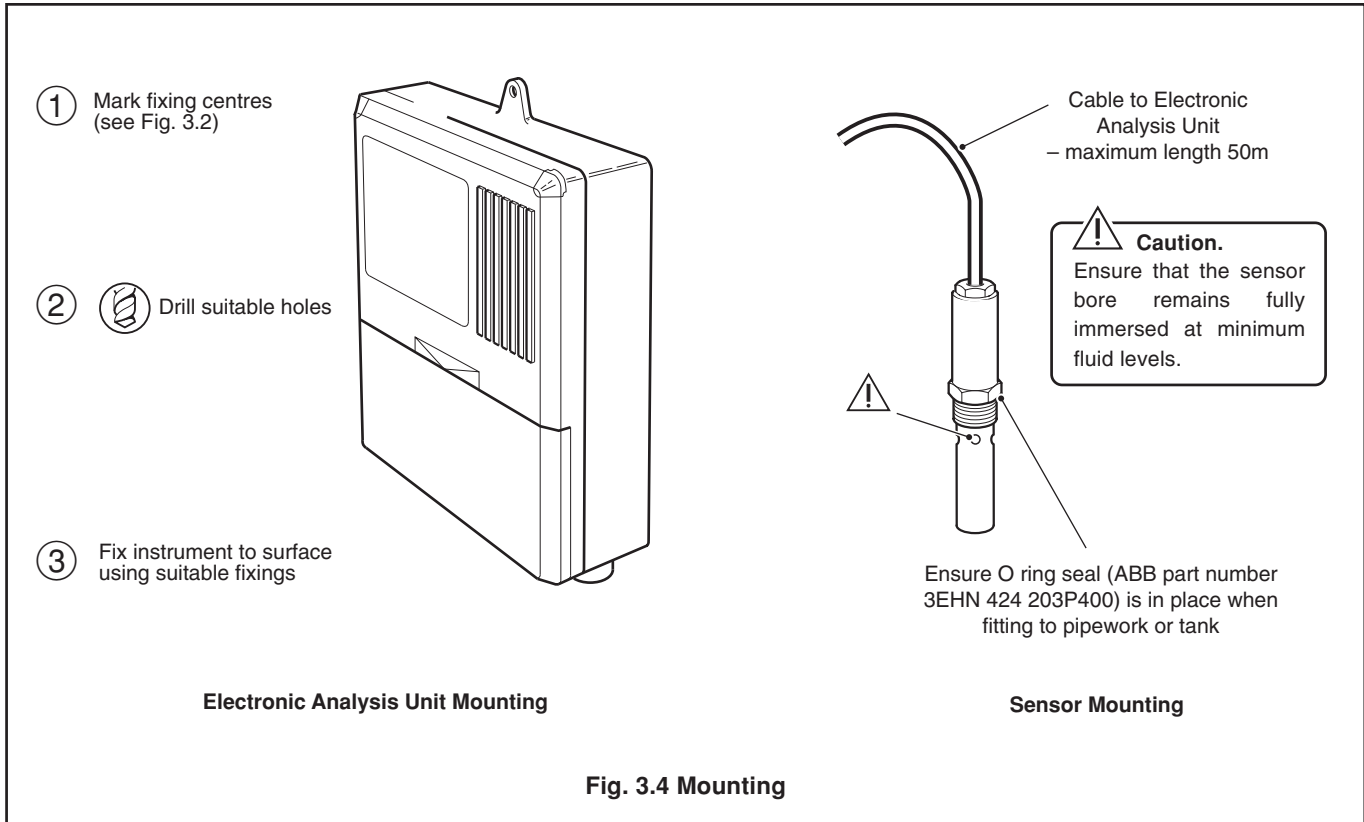


3.2.2 Sensor – Fig. 3.3



## ...3 MECHANICAL INSTALLATION

### 3.3 Mounting – Fig. 3.4



### 3.4 Cleaning the Sensor

Before installing the sensor, clean the electrodes as follows.

Thoroughly clean the electrode bore with a nylon-bristle brush and a warm detergent solution. For more tenacious deposits a 2% hydrochloric acid solution may be used. After cleaning, thoroughly rinse the cell with distilled water and view the bore against a bright light to ensure that the interior surfaces are evenly wetted, i.e. free from grease deposits. Avoid wetting the electrical connection terminals.

## 4 ELECTRICAL CONNECTIONS

### 4.1 Connections – General



#### Information.

- **Earthing (grounding)** – stud terminal(s) is fitted to the transmitter case for bus-bar earth (ground) connection.
- **Cable lengths** – the cable length between the electronic analysis unit and the sensor must not exceed 50m (162.5 ft).
- **Cable routing** – always route the sensor cable lead and power/retransmission cables separately, ideally in earthed metal conduits. Employ twisted pair output leads or use screened cable with the screen connected to the case earth stud.

Ensure that the cables connect to the electronic analysis unit via the correct sockets.

- **Blanked-off cable glands** – do not use the two blanked-off glands.
- **Retransmission output** – do not exceed the maximum load specification for the selected current retransmission range.

#### 4.1.1 Electronic Analysis Unit to Power Supply Unit Connection – Fig. 4.1

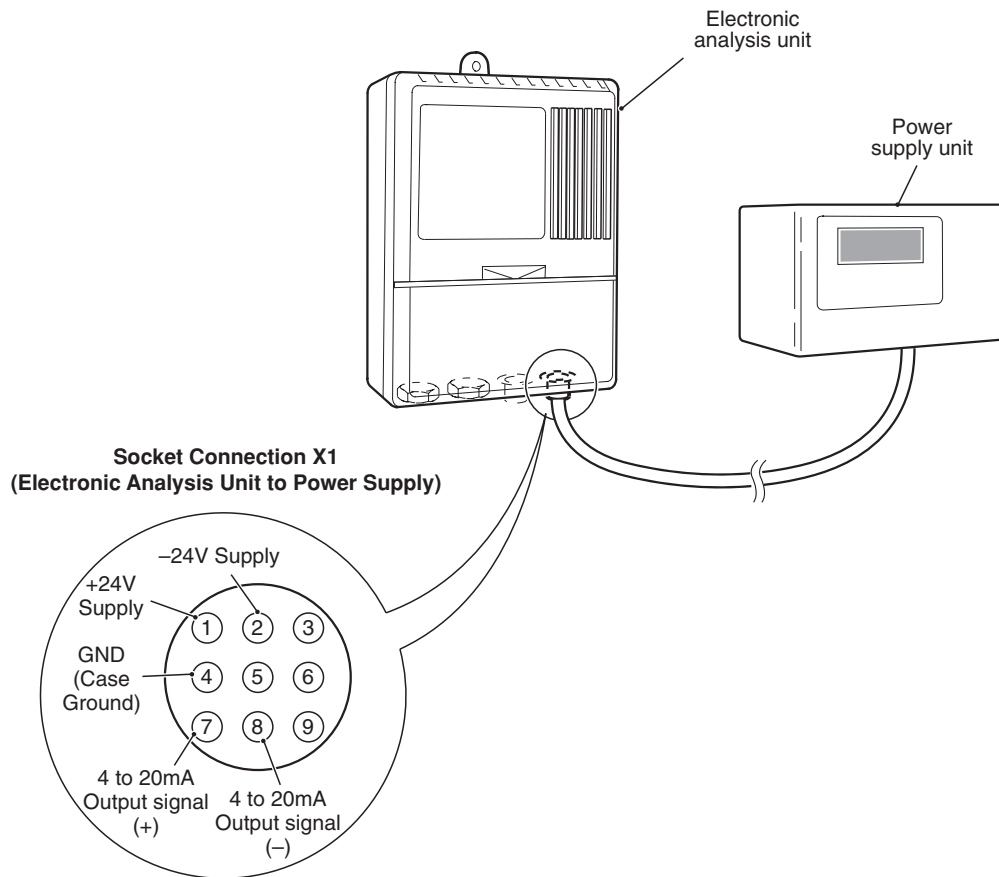
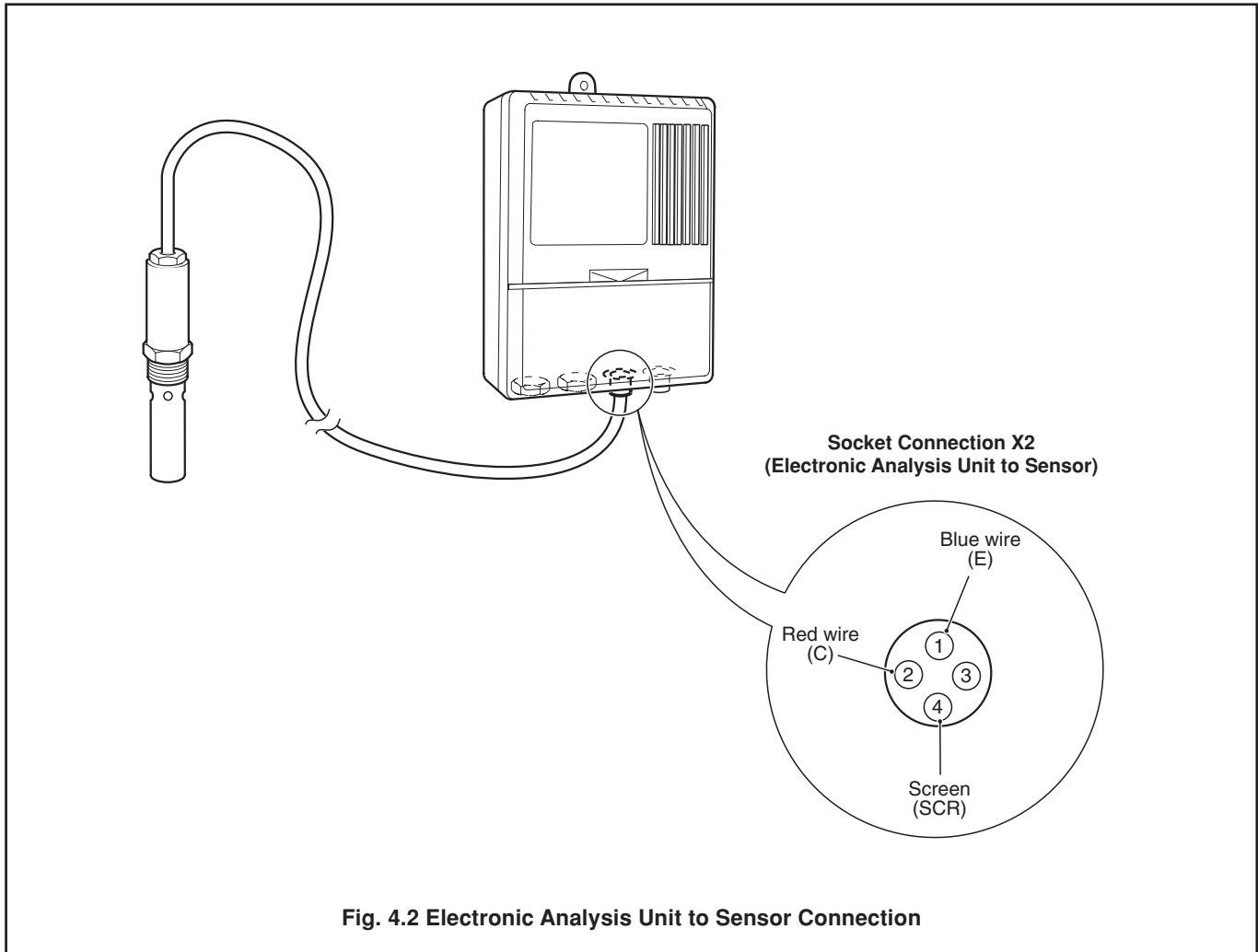


Fig. 4.1 Electronic Analysis Unit to Power Supply Unit Connection

## 4 ELECTRICAL CONNECTIONS

### 4.1.2 Electronic Analysis Unit to Sensor Connection – Fig. 4.2



**Fig. 4.2 Electronic Analysis Unit to Sensor Connection**



---

## 5 SPECIFICATION

---

### 5.1 Electronic Analysis Unit

#### Power Supply

Supply voltage	+24V d.c. ( $\pm 10\%$ )
Max. power	<5W

#### Retransmission

#### No. of retransmission signals

One fully isolated

#### Output current

4 to 20mA

#### Accuracy

$\pm 1\%$  of full scale signal

#### Environmental Data

##### Temperature

Operating temperature  $-25^{\circ}\text{C}$  to  $65^{\circ}\text{C}$

Storage temperature  $-50^{\circ}\text{C}$  to  $80^{\circ}\text{C}$

#### Mechanical Data

Protection	IP53 min.
Dimensions:	
Height*	214mm (8.43 in.)
Width	160mm (6.3 in.)
Depth	68mm (2.68 in.)

\*Fixing centers 232mm (9.13 in.)

#### Weight

Model 5999/900	1kg (2.2lb)
----------------	-------------

### 5.2 Sensor

#### Measurement Medium

Water	With a conductivity lower than $10\mu\text{S/cm}$
Glycol	Pure ethylene glycol
Combinations	Mixtures up to 60% glycol content
Pressure	<4bar

#### Mechanical Data

Dimensions:	
Overall length	184mm (7.24 in.)
Probe dia.	22mm (0.87 in.)
Mounting thread	$\frac{3}{4}$ in. BSP

#### Weight

Model 2998/010	0.75kg (1.65lb)
----------------	-----------------



# PRODUCTS & CUSTOMER SUPPORT

## Products

### Automation Systems

- *for the following industries:*
  - Chemical & Pharmaceutical
  - Food & Beverage
  - Manufacturing
  - Metals and Minerals
  - Oil, Gas & Petrochemical
  - Pulp and Paper

### Drives and Motors

- *AC and DC Drives, AC and DC Machines, AC Motors to 1kV*
- *Drive Systems*
- *Force Measurement*
- *Servo Drives*

### Controllers & Recorders

- *Single and Multi-loop Controllers*
- *Circular Chart and Strip Chart Recorders*
- *Paperless Recorders*
- *Process Indicators*

### Flexible Automation

- *Industrial Robots and Robot Systems*

### Flow Measurement

- *Electromagnetic Flowmeters*
- *Mass Flow Meters*
- *Turbine Flowmeters*
- *Flow Elements*

### Marine Systems & Turbochargers

- *Electrical Systems*
- *Marine Equipment*
- *Offshore Retrofit and Refurbishment*

### Process Analytics

- *Process Gas Analysis*
- *Systems Integration*

### Transmitters

- *Pressure*
- *Temperature*
- *Level*
- *Interface Modules*

### Valves, Actuators and Positioners

- *Control Valves*
- *Actuators*
- *Positioners*

### Water, Gas & Industrial Analytics Instrumentation

- *pH, Conductivity and Dissolved Oxygen Transmitters and Sensors*
- *Ammonia, Nitrate, Phosphate, Silica, Sodium, Chloride, Fluoride, Dissolved Oxygen and Hydrazine Analyzers*
- *Zirconia Oxygen Analyzers, Katharometers, Hydrogen Purity and Purge-gas Monitors, Thermal Conductivity*

## Customer Support

We provide a comprehensive after sales service via a Worldwide Service Organization. Contact one of the following offices for details on your nearest Service and Repair Centre.

### United Kingdom

ABB Limited  
Tel: +44 (0)1453 826661  
Fax: +44 (0)1453 829671

### United States of America

ABB Inc.  
Tel: +1 (0) 775 850 4800  
Fax: +1 (0) 775 850 4808

#### Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification.

Periodic checks must be made on the equipment's condition. In the event of a failure under warranty, the following documentation must be provided as substantiation:

1. A listing evidencing process operation and alarm logs at time of failure.
2. Copies of all storage, installation, operating and maintenance records relating to the alleged faulty unit.

---

**ABB** has Sales & Customer Support  
expertise in over 100 countries worldwide

[www.abb.com](http://www.abb.com)

The Company's policy is one of continuous product  
improvement and the right is reserved to modify the  
information contained herein without notice.

Printed in UK (06.09)

© ABB 2009



**ABB Limited**  
Oldends Lane, Stonehouse  
Gloucestershire  
GL10 3TA  
UK  
Tel: +44 (0)1453 826661  
Fax: +44 (0)1453 829671

**ABB Inc.**  
125 E. County Line Road  
Warminster  
PA 18974  
USA  
Tel: +1 215 674 6000  
Fax: +1 215 674 7183