

User Manual

Electrical Equipment FluidInspectIR®_PLUS

Serial Number:

Year of Construction: 2024



Please read these operating instructions completely and carefully.
These operating instructions are part of the FluidInspectIR®_PLUS and contain important information on commissioning and handling. Always observe all safety instructions.
Before commissioning, check that the correct voltage is present and that all parts are correctly fitted.
If you have any questions or are unsure about how to use the electrical equipment, please contact your dealer or the service centre.
Please keep these operating instructions in a safe place and pass them on to third parties if necessary.

Document name of these operating instructions: MAN_FI_PLUS_02

Revision

Revision	Description of the changes	Datum	Authors
1	First Version	30/04/25	G Hantos
2	Updated protective earth guidelines	10/05/26	G Hantos

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2. Notes and Explanations

	Hazards due to dangerous electrical voltages. Failure to do so may result in serious injury or death. Access only permitted for qualified electricians or EUP.
	Risk of crushing hands. Failure to do so may result in minor injuries to the hands. (During installation/assembly).
	Warning of hot surface (> 40°C). Failure to do so may result in serious injury. (In case of direct contact with the heating cable).
	WARNING - warns of dangerous situations. Avoid these dangerous situations. Failure to do so may result in serious injury or death.
	How to act correctly. Follow the recommended actions to avoid property damage and problems.
	Read instructions. Follow the recommended actions to avoid property damage and problems.
	Eco-label identifies environmental protection measures (warning against environmental pollution, in the chapter on disposal). Failure to do so will result in damage to the environment. Incorrect disposal can lead to major environmental damage.

3. Safety Instructions

3.1 Scope of Application



This documentation applies to all persons who carry out work on the FluidInspectIR®_PLUS. Before carrying out any work on the electrical equipment, the documentation must be read in full and followed exactly.

The documentation must be kept in the vicinity of the FluidInspectIR®_PLUS and must be accessible to personnel at all times.

The documentation is part of the electrical equipment and must be kept fully available and updated throughout the entire period of use

3.2 Applicable Regulations

The FluidInspectIR®_PLUS was developed, designed and manufactured in accordance with German and European technical regulations.

The FluidInspectIR®_PLUS may only be operated in compliance with the technical rules and safety regulations applicable at the place of use.

- Applicable health, labour and fire protection regulations
- Laws, regulations and safety rules

3.3 Staff Deployment and Responsibilities

In the documentation, personnel deployment and responsibilities are defined before each activity is described. A distinction is made between the following groups of people:

Expert

- Qualified for managerial tasks.
- Interdisciplinary supervision for all activities.
- Authorised by the operator.
- Know and understand functional sequences and their interaction with the environment.

Operating personnel

- Qualified for operation.
- Authorised by the operator.
- Knows and understands functional sequences and their interaction with the environment.

Maintenance personnel

- Qualified for maintenance activities.
- Authorised by the operator.
- Knows and understands functional sequences and their interaction with the environment.

Qualified electricians

- Authorised by the operator.
- Are demonstrably qualified to work on electrical systems through recognised training.
- Know and understand the technology and functional sequences of the electrical equipment and their interaction.

Operator

- Any natural or legal person who uses the electrical equipment or makes it available to third parties for use and is responsible for the safety of the user, personnel or third parties during use.

External persons

- All persons who do not belong to the above-mentioned groups.
- It is forbidden for unauthorised persons to remain in the working area of the electrical equipment.

3.4 Obligations of the Operator

The FluidInspectIR®_PLUS is used in the commercial sector. The operator of the electrical equipment is therefore subject to the legal obligations regarding occupational safety. In addition to the warnings and safety instructions in this manual, the safety, accident prevention and environmental protection regulations applicable to the area of use of the electrical equipment must be observed.

In particular, the operator must:

- inform themselves about the applicable health and safety regulations;
- identify possible additional hazards arising from the specific application conditions at the place of use of the electrical equipment by means of a risk assessment and minimise these by taking appropriate measures;
- implement the necessary behavioural requirements for operating the electrical equipment at the place of use in operating instructions;
- regularly check during the entire period of use of the electrical equipment whether the operating instructions drawn up by him correspond to the current status of the regulations;
- adapt the operating instructions to new regulations, standards and operating conditions where necessary;
- clearly and unambiguously regulate the responsibilities for the installation, operation, maintenance and cleaning of the electrical equipment;
- Ensure that all employees working with the electrical equipment are familiar with the protective measures for safe operation;
- Ensure that all employees working with the electrical equipment have read and understood the operating instructions and the general safety instructions.

In addition, the operator must train the personnel in handling the electrical equipment at regular intervals and inform them of the potential hazards. Furthermore, the operator is responsible for ensuring that the electrical equipment is always in perfect technical condition.

3.5 General safety Instructions

Fundamentally

- Always carry out all activities responsibly and safely.
- Faults that impair safe operation must be rectified immediately.
- The electrical equipment must be taken out of operation until the fault has been rectified.
- All markings and labelling on the electrical equipment must be legible and complete.
- The housing of the electrical equipment may only be opened by authorised personnel of the manufacturer.

Hazards in normal operation

- Only operate the electrical equipment if it is parked on a level surface whose dimensions are greater than or equal to the base area of the electrical equipment.
- Before switching on the electrical equipment, ensure that the appliance cannot fall from the work surface.

Dangers due to electrical energy

- Work on electrically operated assemblies may only be carried out by qualified electricians.
- The equipment must be connected to protective earth (PE) during installation and operation.
- Check the electrical equipment regularly, including the PE bonding conductor and its connection point. Loose connections and damaged cables must be repaired or replaced immediately.
- Do not open the housing.
- When working on live equipment, it must be de-energised beforehand.

Dangers during maintenance and assembly

- Switch off the electrical equipment and disconnect it from the mains before carrying out any work.
- If the housing is opened, observe the hazard warnings inside the appliance.

3.6 Damage

Damage caused by non-compliance with these operating instructions will invalidate the warranty. No liability is accepted for consequential damage. No liability is accepted for damage to property or personal injury caused by improper handling or non-compliance with the safety instructions / intended use.

This appliance is intended for industrial / commercial use only. Operation and maintenance is only to be carried out by trained personnel.



Avoid danger to life due to electric shock. Have the electrical installation carried out by a qualified electrician or a person trained in electrical installations. No liability is accepted for damage to property or personal injury caused by improper handling or non-compliance with the safety instructions!

Ensure that no cables are damaged during installation and operation. Make sure beforehand that the existing mains voltage matches the required operating voltage. Avoid cleaning with water or other liquids at all costs. If there is visible damage to the electrical supply, inform a qualified electrician. Do not continue

working without obtaining authorisation.

Check the FluidInspectIR®_PLUS for electrical safety (DGUV V3) before initial commissioning and then at regular intervals.



Even though the FluidInspectIR®_PLUS has an IP67 rating where possible install the electrical equipment in such a way that it is protected from moisture, dirt and excessive heat.

Always be attentive. Always pay attention to what you are doing and always proceed sensibly. Never use the electrical equipment if you are not focused or feel unwell. Before use, familiarise yourself with all instructions and illustrations in these operating instructions and with the electrical equipment itself.

4. Intended Use

4.1 Intended Use criteria

- The FluidInspectIR®_PLUS is used to monitor the status parameters of liquids.
- The FluidInspectIR®_PLUS may only be installed by qualified personnel who have the necessary qualifications for the installation of electronic measuring devices.
- The lid of the FluidInspectIR®_PLUS may only be removed by qualified personnel after consultation with Spectrolytic.
- If the lid has been removed, the valve may be hot and could potentially cause burns.

4.2 Reasonably Foreseeable Misuse

The FluidInspectIR®_PLUS is intended for use in industry / trade and is only suitable for operation in dry / heated indoor areas (in compliance with the technical data). No operation outside the IP rating of the enclosure (IP67), in EX zones or in areas with fire hazards, no operation underground. No operation outside industrial environments (EMC Directive, interference emission).

The electrical equipment is used exclusively for the above-mentioned intended purpose. Any other use or modification beyond this is not permitted without written agreement with the manufacturer.

Mechanical and electrical modifications may only be carried out after consultation with the manufacturer and only by certified specialists. All modifications to the electrical operating equipment must fulfil the safety requirements. The manufacturer accepts no liability for damage caused by improper use.

- No measurement/monitoring of highly flammable liquids (petrol, paraffin, etc.)
- No operation under water

5. Overview and Operation

5.1 Overview



Figure 5.1 Electrical Equipment FluidInspectIR®_PLUS

5.2 Interfaces & Display



Figure 5.2 Overview of Electrical Equipment FluidInspectIR®_PLUS_BP – Front Panel

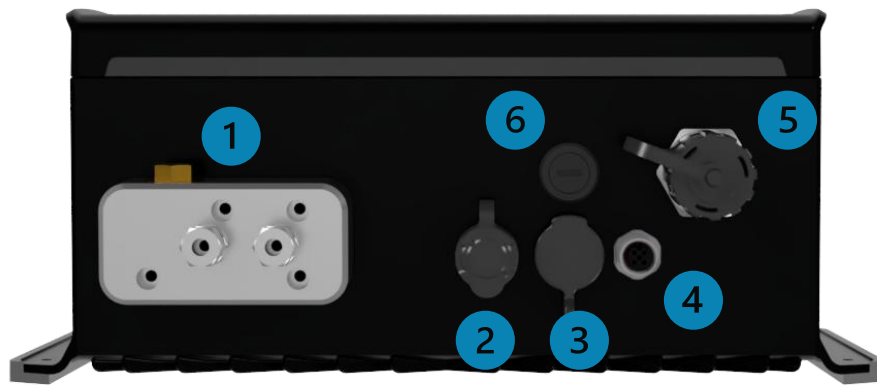


Figure 5.3 Overview of Electrical Equipment FluidInspectIR®_PLUS – Interfaces and connections

1. Manifold connection block (inlet port -left/outlet port-right)
2. Power Connection
3. Fuse
4. RS485
5. RJ45 (ethernet)
6. USB
7. Control buttons for Display control
8. Display Panel

5.3 Overview of Safety Devices

- The power input has an overvoltage protection.
- The power input is protected by a 5A 250V fast-blow glass fuse.
- The system has an optical leakage detection with a photo sensor.
- The stepper motor driver has an over current protection (OCP) and over temperature shutdown (OTSD)
- Every FET (heater, valve, ...) has an over current and over temperature protection
- The digital inputs have ESD and over voltage protection
- The maximum current output to the temperature sensors is limited
- The RS485 pins have an ESD protection.
- The 5V voltage output on RS485 and flow sensor has a current limiter (~650-1050mA).
- The USB socket has ESD protection
- The USB socket has overcurrent protection
- The RJ45 jack has ESD protection

5.4 Overview of Warnings

	Hazards due to dangerous electrical voltages. Failure to do so may result in serious injury or death. Access only permitted for qualified electricians or EUP.
	Risk of crushing hands. Failure to do so may result in minor injuries to the hands. (During installation/assembly).
	Warning of hot surface (> 40°C). Failure to do so may result in serious injury. (In case of direct contact with the heating cable).

The FluidInspectIR®_PLUS was developed in accordance with the safety requirements of the International Electrotechnical Commission (IEC). All components of the FluidInspectIR®_PLUS comply with IEC / EN publication 61010-1 (Safety requirements for electrical equipment for measurement, control and laboratory use). If the device is used in a manner not specified by the manufacturer, the protective effect of the device may be impaired.

Whenever it is likely that the FluidInspectIR®_PLUS is unsafe, please switch it off immediately and contact Spectrolytic. The following list contains examples of reasons that may cause the device to function unsafely:

5.5 Functional Description

The FluidInspectIR®_PLUS is a highly developed multi-sensor system for monitoring the oil condition in any system. The sensor comprises an oil condition sensor and a viscosity sensor which are fully integrated into an IP67 housing as shown below in figure 5.5.



Figure 5.5 FluidInspectIR®_PLUS

5.5.1 Switch ON Procedure

Refer to sections in installation Guide (Section 7).

5.5.2 Switch OFF Procedure

Refer to sections in Installation Guide (section 7)

5.6 Technical data

5.6.1 System Overview

Item	Values
Dimensions and Weight	
Width	32 cm
Depth	24 cm
Height	13 cm
Weight (main unit)	6.5 kg
Energy / Media:	
Rated voltage, frequency	100-240V AC 50-60Hz / 24V DC depending on version
Rated power	120W
Network connections (Ethernet)	1x RJ45
Power connection	LP-16 3-pin (AC) / 2-pin (DC), unterminated
Earthing	Protective Earth (PE) required
Protection against overcurrent and short circuit	Fuse - 5A 5X20
Hydraulics - Bypass Maximum pressure	10Bar

5.6.2 Environment / Emissions / Hazardous

Environment / Emissions / Hazardous	Value	Remarks
Rated temperature - Operation	0°C to +55°C / - 10°C to +75°C	Valve / Pump
Rated temperature - Storage	-10°C to +65°C / - 10°C to +85°C	Valve / Pump
Rated humidity - Operation	max. 50 % at 40°C or 90 % at 20°C.	non-condensing
Altitude	up to 2000 m above sea	
Electromagnetic environment (EMC Directive): - Interference emission - Interference influence	DIN EN 61326- 1	

Low Voltage Directive (LVD):		
Lightning protection	Yes	Protective earth
Emissions	Yes	EMC
Solder (RoHS)	Yes	Compliant
Maximum heating	≤ 80°C	
IP protection class	IP67	

6. Declaration Of Conformity

Spectrolytic Ltd. hereby declares that the electrical equipment complies with the requirements of the applicable European and national directives:

- Electrical Equipment 2014/35/EU (& DIN EN61010-1),
- Electromagnetic compatibility 2014/30/EU (& DIN EN61000-6-2,-4),
- Electrical and electronic equipment 2011/65/EU (RoHS Directive)

Conformity has been verified. Corresponding declarations and documents have been deposited with the manufacturer.

Note on the application of EU Directive EMC 2014/30/EU:

According to DIN EN 61000-6-4 (generic standard for emitted interference, industrial area), the electrical equipment must not be operated in residential, commercial and industrial areas or in small businesses.

EU Declaration of Conformity

- EU Directive - Low Voltage Directive 2014/35/EU
- EU Directive - EMC Directive 2014/30/EU
- EU Directive - RoHS 2011/65/EU

The manufacturer bears sole responsibility for issuing this declaration of conformity.

Guideline	Title
2014/35/EU	Low Voltage Directive for electrical equipment
2014/30/EU	on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
2011/65/EU	on the restriction of the use of certain hazardous substances in electrical and electronic equipment
DIN EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

DIN EN 61010-2-201	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-201: Particular requirements for control equipment
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The object of the declaration described above complies with the relevant Union harmonisation legislation.

The harmonised standards listed above were used as a basis.

- Authorised person for compiling the technical documentation:
- Name: Mr Carsten Giebeler
- Address: Spectrolytic Ltd, 1.6 Techcube, Summerhall Pl., Newington, Edinburgh, UK

Signature of the person responsible (Mr Carsten Giebeler).....

7. Installation



When connecting to the mains supply, observe the connected loads and the technical specifications. Data. The electrical equipment has been handed over to the operator by the manufacturer in fully functional condition. Assembly and disassembly must be carried out in consultation with and according to the manufacturer's specifications.

- Lay the connecting cable so that nobody can fall over it.
- Nothing should be placed on the line.
- If the appliance is not to be used for a longer period of time, it should be disconnected from the power supply. This will prevent damage or worse in the event of an overvoltage or short circuit.
- Do not open the device.
- In the event of faults or malfunctions, contact the manufacturer or call in specialised personnel.

7.1 Packing List

The Main system is provided with a bracket and anti-vibration mounts with M6 thread for easy mounting in desired location



1	System (FI_PLUS_SL)
2	G 1/8 Connectors (including G1/8 washers)
3	Optional quick release connectors
4	Anti vibration mounts
5	Power Cable
6	Mounting Brackets
7	Modem
8	Ethernet cable

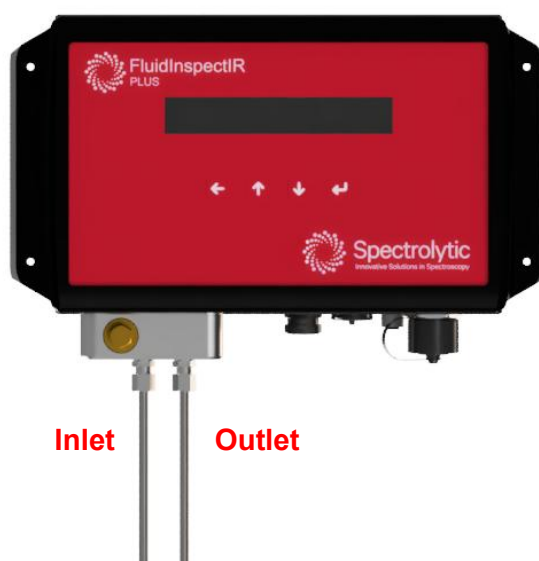
7.2 Network Connectivity

The System either comes with a provided LTE modem or can connect to existing network.

- Default configuration is as a DHCP client, so a valid DHCP server is required on the network if not using the LTE modem. In this case it is recommended to have ports 8883 and 9993 open (TCP and UDP) to allow data upload to the cloud
- Standard RJ45 Ethernet cable required. IP67 cover provided upon prior agreement.

7.3 Main System Installation

- Before mounting system visually check system for damage.
- At the bottom-right mounting hole, attach a protective earth (PE) bonding conductor using an M6 ring crimp terminal. Connect the other end to the installation's protective earth terminal.
- Add metal brackets to device frame on both sides with the screw holes aligned.
- Mounting the unit: For mounting instructions refer to Section 8. Mounting
- Add the provided hydraulic fittings, making sure to include the provided sealing washers.
- Attach the hydraulic supplies to the quick connectors and attach to system making sure sample supply is in the left side INLET and sample return is on right side OUTLET.



- Connect the power supply wiring to the supplied power cable in accordance with the system variant and local wiring regulations. For the 100–230V AC variant, ensure Live (L), Neutral (N), and Earth (PE) are connected correctly. For the 24V DC variant, ensure positive (+24V) and negative (GND) are connected correctly.
- Provide power to the system.
- Screen will turn on showing welcome message, and the system will default, ready in its safe mode.

7.4 System User Notification

The system notifies the user of its current status by displaying the relevant status message on the display during operation.

In addition, the user is notified directly as the system can send any status messages and error codes either via cloud connections or via MODBUS / alternative digital communication protocol (available on request) to the end user.

- The screen starting page shows the current state of the system and the latest data results from the sensors.
- Using the navigational buttons, it is possible to change states, see information of the system and change configurations.

7.5 System Initialisation

By default, the system comes in safe mode, where no captures take place, and the valve is closed or pump is off.

- Using the screen and buttons, the user can manually prime the system by entering a circulation mode or start the runtime operation routine.

7.6 Circulation mode

- From the home screen enter the menu by pressing the enter button

```
+-----+
| Status : Safe Mode |
| Menu :             |
| -> Operating Mode  |
|     System Settings|
+-----+
```

- Select "Operating Modes" using the up and down buttons and the enter button.

```
+-----+
| Status : Safe Mode |
| Operating Modes :   |
| -> Normal Runtime   |
|     Safe Mode       |
+-----+
```

- Select "Circulation Mode using the up and down buttons and the enter button

```
+-----+
| Status : Safe Mode |
| Operating Modes :   |
|     Safe Mode       |
| -> Circulate        |
+-----+
```

- System now opens the valve or starts the pump until mode exits.
- Current flow of sample is shown on the display. If flow shows 0 it indicates no sample through the system yet.

```

+-----+
| Status : Circulating |
| Circulation Mode:    |
|   Current Flow = 82.75ml/min |
|   Exit with Enter or Back key |
+-----+

```

- Exit the circulation mode by pressing back or enter button.
- System returns to Operating Modes menu and in Safe Mode

7.7 Runtime mode

- From the home screen enter the menu by pressing the enter button

```

+-----+
| Status : Safe Mode   |
| Menu :              |
| -> Operating Mode    |
|   System Settings    |
+-----+

```

- Select “Operating Modes” using the up and down buttons and the enter button

```

+-----+
| Status : Safe Mode   |
| Operating Modes :    |
| -> Normal Runtime    |
|   Safe Mode          |
+-----+

```

- Select “Normal Runtime” using the up and down buttons and the enter button

```

+-----+
| Status : Initialise  |
| Runtime :           |
|   Started Runtime Operation |
+-----+

```

- System now starts the normal runtime operation.
- Returning to home screen will show the latest data results and system information

7.8 Power off procedure

- Shut down the power supply
 - Turn off the main power supply to ensure the system is completely de-energised
- Disconnect the power connector
 - Locate the LP-16 power connector on the system.

- Press and hold the push button on the connector to release the locking mechanism.
- While holding the push button, carefully unplug the connector from the system.
- Avoid pulling or yanking the connector without pressing the push button, as this may damage the power cable.

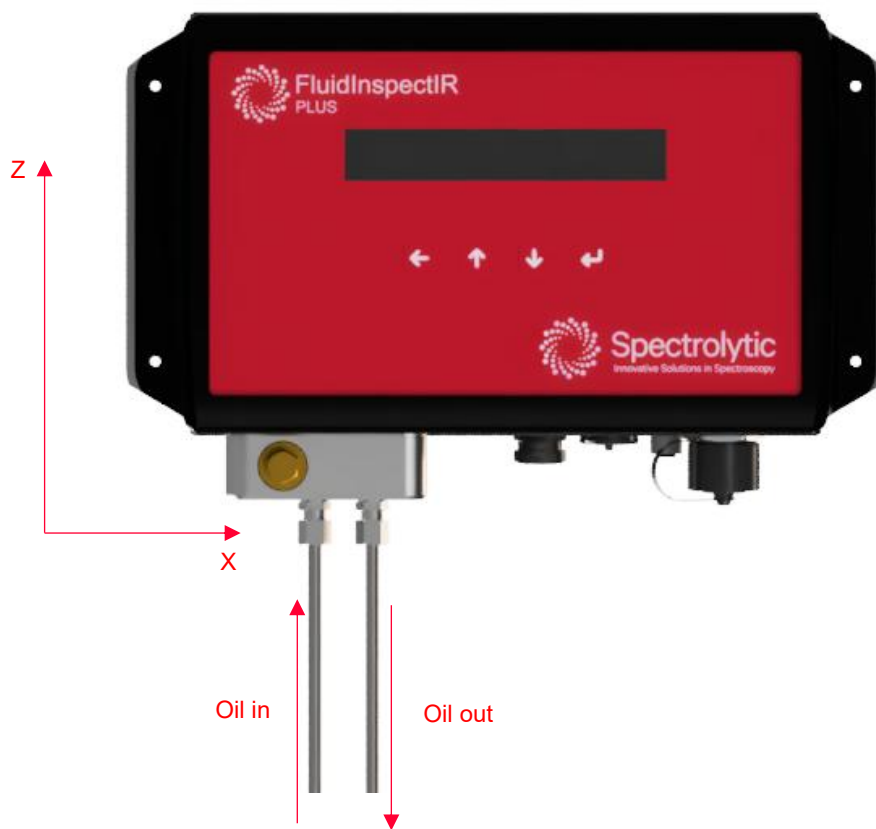
8. Mounting

8.1 Mounting Options

- Unit can be affixed to a backing plate with M6 anti-vibration mounts as provided in the packing list and should be wall mounted orientation as default.
- Secure the anti-vibration mounts to the frame, and mount system in desired location. Orientation of the unit should be:
 - A) Standing vertically with the oil inlet and outlet facing downwards
 - B) Resting horizontally with the top side facing up and the oil inlet and outlet facing forward

Do not place the box on its side or in any rotated position that shifts the top away from the up or forward direction.

- Backplates and leg stands can be provided.



9. Faults



The appliance must be disconnected from the power supply in the following situations:

- The mains cable or plug is damaged.
- Smoke development is noticeable.
- Liquid has penetrated the FluidInspectIR®_PLUS unit.
- The FluidInspectIR®_PLUS is exposed to humidity not compatible with IP67 housing
- The FluidInspectIR®_PLUS is not working properly according to these operating instructions.
- The FluidInspectIR®_PLUS has fallen or is damaged or the device shows clear signs of a defect.

An expert determines the cause and defines further measures. Work on the electrical equipment may only be carried out by authorised personnel of the manufacturer.

10. Transport

When moving the device, take the operating instructions with you and keep them close to the device or make them available in an electronically readable format.

Transporting electrical equipment

- Switch off electrical equipment before transport.
- Disconnect the connection cable.
- Power supply
- Network cable
- Connection cable
- Hydraulic connections
- Electrical equipment can be transported to the new location

11. Maintenance

11.1 General Maintenance



- Always disconnect the FluidInspectIR®_PLUS from the power supply before cleaning (disconnect the power supply plug).
- Do not use any liquid or aerosol cleaners. This would damage the electrical equipment.
- Use a dry, lint-free cloth for cleaning. The electrical equipment must be protected from moisture.
- Opening only by a qualified electrician or EUP ("electrically trained person"). Check the housing for damage, cables and plug connections for kinks and chafing, correct insulation and soiling.



Risk of injury from hot surfaces inside the appliance.

- The analyser is designed to be largely maintenance-free and any maintenance required can be carried out as part of normal engine servicing.
- The FluidInspectIR®_PLUS can be serviced remotely by qualified Spectrolytic personnel who log into the system and check the performance of the individual parts. This should be carried out annually.
- If maintenance or servicing work is required on the analyser, this should only be carried out by Spectrolytic personnel or by personnel who have been trained by Spectrolytic to carry out maintenance and servicing work. This should be done annually.

- Any attempt by unauthorised personnel to service or repair the analyser will automatically invalidate the warranty.
- The FluidInspectIR®_PLUS has integrated tamper protection and any unauthorised opening of the system automatically voids the warranty.

No.	Work to be carried out	Frequency	Remark
1	Check the cable for perfect condition and tight fit. • Mains cable • Connection cable	Daily	Remove damaged cables from service immediately and replace with new ones.
2	Inspect PE bonding conductor and ring crimp terminal for tightness, damage, and corrosion	Weekly visual check Yearly detailed inspection	Re-tighten or replace if required. Do not operate the equipment with the PE bond disconnected
3	Clean the outside of the appliance.	Weekly	Remove dust from the housing.
4	Maintenance /Calibration	Yearly	All work inside the appliance may only be carried out by the manufacturer.

11.2 General Operation Considerations

11.2.1 Data Capture Frequency

The default data capture rate is 60 min. Different capture rates can be implemented on requested. There is in principle no upper or lower limit to the capture rates so if there are any specific requirements, please let us know.

11.2.2 Maintenance on the asset

In the event of any system asset (engine, lubrication loop etc.) maintenance the Analyser must be switched off. For switch off instructions please refer to Section 7.8 - Power off procedure.

Please ensure that after the routine maintenance of the asset has been completed, that the FluidInspectIR Analyser is powered on again. For switch on instructions please refer to Section 7.3 - Main System Installation.

11.2.3 Power Cut Recovery

In the event of a power cut or power loss to the Analyser, check the fuse has not tripped and ensure system is powered back on.

12. Installation of Spare Parts



- Only parts of the same type may be used.
- You can purchase all spare and wear parts from Spectrolytic.

Spectrolytic Ltd. and the suppliers of the electrical equipment and components provide a delivery guarantee of 10 years from the date of delivery (in accordance with DIN EN 82079-1, reference from DIN EN ISO 12100, DIN EN 60204-1) for the above parts.

We expressly draw your attention to the fact that spare parts and accessories not supplied by us have not been tested and approved by us. The installation and/or use of such products may therefore adversely affect the design characteristics of the electrical equipment.

Liability is excluded for damage caused by the use of non-original parts and non-original accessories.

13. Service

Servicing and spare parts can be obtained from:

Spectrolytic Ltd.
1-6 Techcube
Summerhall, Edinburgh
EH9 1PL
Phone: +44 1316081230
Email: info@spectrolytic.com

14. Scope Of Delivery

Immediately after unpacking, always check that the scope of delivery is complete, and that the electrical equipment is in perfect condition.

15. Warranty Provisions

The manufacturer's / distributor's statutory warranty is 12 months from the date of delivery or handover on site after commissioning.

The appliance has been carefully produced and subjected to a thorough quality check. All material or manufacturer defects will be rectified free of charge within the warranty period.

The warranty does not cover damage caused by improper handling, non-compliance with the operating instructions or tampering by unauthorised persons or wearing parts.
The warranty service neither extends nor renews the warranty period.

16. Disposal



The FluidInspectIR®_PLUS is made of metal and plastic (except for the electrical equipment) and must be disposed of in accordance with the applicable local environmental regulations. National regulations and laws must be observed. Depending on the nature, existing regulations and in compliance with current regulations, dispose of e.g. as:

- Electronic waste
- Fluorescent / energy-saving lamps (collection points)
- Plastics / Rubber
- Batteries (collection points)

The packaging and packaging materials are made exclusively from environmentally friendly materials. They can be disposed of in the local recycling bins. The product must be taken to a separate waste collection centre in the European Union. Labelled products must not be disposed of with normal household waste but must be handed in at a collection point for the recycling of electrical and electronic equipment. Recycling helps to reduce the consumption of raw materials and the environment.

It is recommended that the appliance be disposed of by the manufacturer.

17. Appendix

17.1 Cable Connector Pin Assignment

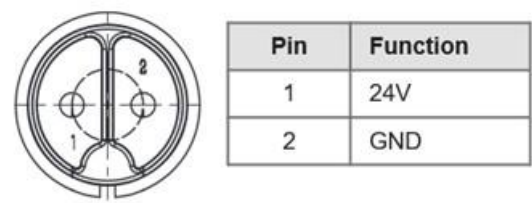
17.1.1 100-230VAC version



Pin	Function
1	Live
2	Neutral
3	Earth

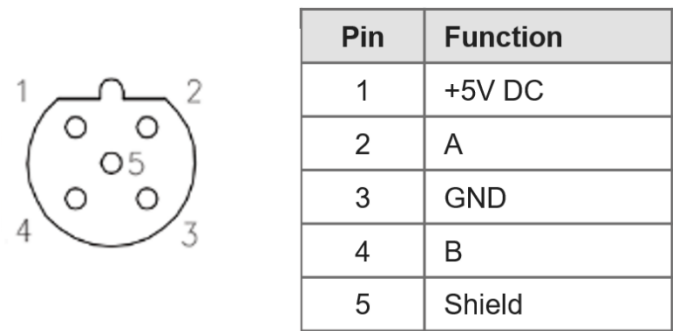
Note: Pin 3 (Earth PE) provides the protective earth connection through the power connector. In addition, a chassis bonding conductor must be connected to the bottom-right mounting hole using an M6 ring crimp terminal as described in Section 7.3. Both earth connections are required for safe and compliant operation.

17.1.2 24VDC version



Note: For the 24V DC variant, the 2-pin connector does not include a PE pin. The chassis bonding conductor connected to the bottom-right mounting hole using an M6 ring crimp terminal therefore provides the protective earth connection for this variant. This connection is required for safe and compliant operation.

17.1.3 RS485 Modbus



17.2 Technical Drawings

