

# MAN-00119 R 2.0 EasyTest II User Guide





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Units of measurement in this document conform to SI standards and practices

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# **2 Product Certification**

### 2.1 **CE Information**

Electronic test equipment is subject to the EMC Directive in the European Union. The EN61326 standard prescribes both emission and immunity requirements for laboratory, measurement, and control equipment.



This unit has been tested and found to comply with the limits for a Class A digital device. Please refer to the Declaration of Conformity.

## 2.2 Independent Laboratory Testing

This unit has undergone extensive testing according to the European Union Directive and Standards.

Tests were performed externally, at an independent, accredited laboratory. This guarantees the unerring objectivity and authoritative compliance of all test results.



# 2.3 Declaration of conformity

FISO Technologies Inc., located at 500, Saint-Jean-Baptiste Ave., Suite 195, Quebec, QC, Canada G2E 5R9

Product description: Fiber optic thermometer

Model number(s): EasyTest II

Product category: Electrical equipment for measurement, control and laboratory use.

Complies with the essential requirements of the following applicable European Directive:

2014/30/EU Electromagnetic Compatibility (EMC) Directive,

2011/65/EU Restriction of the use of certain Hazardous Substances (RoHS) Directive

Conformity is assessed in accordance to the following standards:

#### **EMC Standards:**

EN61326-1 : (2013)	Emissions/Immunity requirements for laboratory E	quinmont
EN01320-1 . (2013)	Emissions/Immunity requirements for laboratory E	quipment I
CISPR 11: (2015) A1(2016)	Conducted Emissions	Group 1, class A
CISPR 11: (2015) A1(2016)	Radiated emission	Group 1, class A
IEC 61000-4-2 : (2008)	Electrostatic discharge immunity	Contact: ±4kV Air: ±2kV, ±4kV, ±8kV
IEC 61000-4-3 : (2006) A1(2007) A2(2010)	Radiated electromagnetic field immunity	80-1000MHz: 3V/m 1.4-2GHz: 3V/m 2-2.7GHz: 1V/m
IEC 61000-4-4 : (2012)	Electrical fast transient immunity	Power: ±1kV / 5kHz I/O Ports: N/A Communication Ports: N/A
IEC 61000-4-5 : (2014)	Surge immunity	Power: ±1kV L-PE / ±0.5kV L-L I/O Ports: N/A Communication Ports: N/A
IEC 61000-4-6 : (2013)	Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields	Power: 3V I/O Ports: N/A Communication Ports: N/A
IEC 61000-4-8 : (2009)	Power Frequency Magnetic Field Immunity	Continuous Field: 3A/m / 50Hz & 60Hz
IEC61000-4-11 : (2004)	Voltage Dips, Short Interruptions and Voltage Variation Immunity on AC Input	Voltage dips: 0%Un during half cycle 0%Un during 1 cycle 70%Un during 25 cycles (at 50Hz) 70%Un during 30 cycles (at 60Hz)
		Short interruptions: 0%Un during 250 cycles(at 50Hz) 0%Un during 300 cycles (at 60Hz)

#### **Environmental Affairs:**

EN50581 : 2012	Articles manufactured on or after the Date of Issue of this declaration of Conformity do not contain any of the restricted substances in concentration/applications not permitted by the RoHS Directive
	Notice Birective

#### Supplementary information:

Conducted Emissions FCC part 15 (2018) subpart B	Class A 150kHz-30MHz
Radiated Emissions FCC part 15 (2018) subpart B	Class A 30MHz-2GHz
Conducted Emissions ICES-003 (2016)	Class A 150kHz-30MHz
Radiated Emissions ICES-003 (2016)	Class A 30MHz-2GHz

Signed for and on behalf of FISO Technologies Inc.

Issued in : Quebec, Qc, Canada Date: Thursday, March 07, 2019

Frederic Borne, General Manager, FISO Technologies Inc.



# **3 Safety Information**

# 3.1 Safety Conventions

Before using the product described in this guide, you should understand the following conventions:

<b>⚠</b> DANGER	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Do not proceed unless you understand and meet the required conditions.
<b>⚠</b> WARNING	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Do not proceed unless you understand and meet the required conditions.
A CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in component damage. Do not proceed unless you understand and meet the required conditions.
⚠ IMPORTANT	Refers to information about this product you should not overlook.



## 3.2 Safety Information

The level of radiation is below the level known to cause eye injury through accidental short-term exposure. However, avoid prolonged exposure to light emitted from the fiber and do not stare directly at a light beam, visible or not.

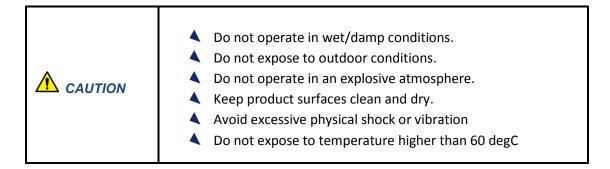
The following safety instructions must be observed whenever the EasyTest II is operated. Failure to comply with any of these instructions or with any precaution or warning contained in the Fiber Optic Thermometer user's guide is in direct violation of the standards of design, manufacture and intended uses of the EasyTest II. FISO assumes no liability for the customer failure to comply with these safety requirements.

#### THIS PRODUCT IS NOT DESIGNED FOR USE IN LIFE SUPPORT OR CRITICAL APPLICATIONS.

In no case will FISO be liable to the buyer, or to any third parties, for any consequential damage or indirect damage which is caused by product failure, malfunction, or any other problem.

When using any electrical appliance, basic safety precautions should be followed, including the following:

You should only use the power supply that came with your EasyTest II and verify that the voltage specifications indicated on the power supply are compatible with the AC voltage and frequency delivered at the power outlet.





This equipment must be used as specified or the protection provided by the equipment may be compromised. You must use this product in a normal mode and should not deviate from the written instructions provided.



#### **Unpacking and Inspection** 3.3

The EasyTest II Tester is shipped inside a carton designed to give maximum protection during shipment.



#### **L** CAUTION

If the outside of the shipping carton is damaged, notify your shipping department immediately. Your shipping department may want to notify the carrier.

Carefully remove the carring case from the carton and open-it, identify all of the components listed below.

Contact FISO or your local representative if any of the components are missing. We recommend you save the shipping carton for future storage or transportation.

The EasyTest II toolbox includes the following components:

- ▲ 1X EasyTest II unit
- 1X EasyClean, Optical Connector Cleaner (attached to the EasyTest II unit)
- ▲ 1X CFO-ET, a short optical extension / optical port saver (attached to the EasyTest II unit)
- ▲ 1X USB interface cable
- ▲ 1X Power Adapter
- ▲ 1X EasyCheck, a small validation probe
- ▲ 1X ST-ST mating
- ▲ 1X Calibration Certificate
- ▲ 1X Carrying case



## 3.4 Handling Optical Cable



#### CAUTION

The core of any fiber optic cable is glass. For this reason it should be handled with care and should not be viewed like a standard conventional electrical cable. If it is pinched, twisted, over bent or crushed, the glass core will break and the light attenuation will occur at this point.

#### Fiber optic sensors are pretty robust but...

- Avoid sharp bend
- Avoid kinking, twisting
- Avoid putting any tension on the cable
- Avoid dropping connector on hard surfaces









Like your car Windshield or your glasses, the optical connector must stay clean to gives good results.

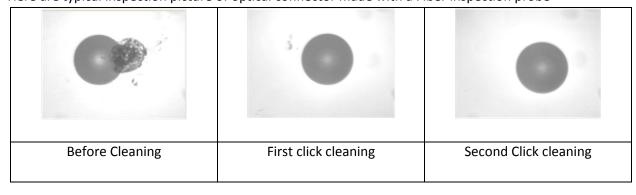
Always keep the protective cap on, to protect them when they are not connected





Clean both connectors <u>each time</u> you connect them, because a small particle of dust on one connector could scratch both connectors.

Here are typical inspection picture of optical connector made with a Fiber inspection probe





## 3.5 Cleaning Fiber Optic Connectors

The unit comes with an EasyClean tool. This high-performance device is designed to ease connector ferule end faces cleaning. Read carefully the below instruction before using the device.





#### Important

The EasyClean is designed to clean the fiber optic connectors.

FISO is not liable for any damage caused in attempts to apply this device to other applications.

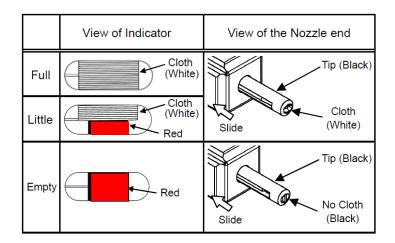
Always keep the protection cap on when not in use to avoid contamination.

## 3.5.1 EasyClean Tool General Operation

The EasyClean cleaner is easy to use, but you need to be careful not to do the following:

- Do not use this tool to clean oily connector, as this will cause contamination of the cleaning cloth
- Do not touch the cleaning cloth as this will cause contamination.
- Do not use this cleaner when the cloth is empty. This may cause damage to the connector.
- Do not pull the cleaning cloth, use only the device body.
- Do not attempt to dissemble as this can cause damage to the device and void the warranty.
- Do not try to re-use the cleaning cloth as this will eliminate the cleaner's effectiveness and void the warranty.

The amount of cloth left in the tool is shown in the window located in the body.







## 3.5.2 Cleaning the Male ST Connector



Step 2: Insert the Connector Ferule into the Guide Cap



**Step 3:** Push the Cleaner body against the connector ferrule, the black neck of the cleaner will enter into the blue body of the cleaner and you will ear a Click this will wipe the cleaning cloth against the connector face and clean it.



Step 4: Turn the Cleaner body by 90°



Step 5: Push the Cleaner body against the ferrule connector for a second time





# 3.5.3 Cleaning the ST Mating

Step 1: Remove the Guide Cap from the Device





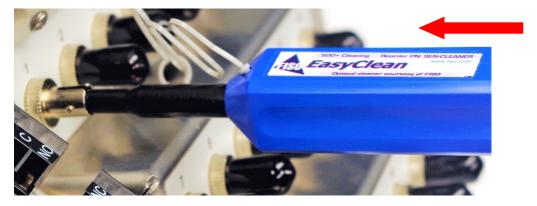
Step 2: Insert the cleaner tip in the mating, and Push the outer shell to clean the connector face



**Step 3:** Turn the cleaner body by 90°



Step 4: Push the outer shell a second time to clean the connector face





# **4 Hardware Configuration**

# 4.1 Introducing the EasyTest II

The EasyTest-II-**A**- is compatible with all FISO TPT-62\_-**R1**-\_ sensors, no calibration factor or calibration procedure is required to get accurate temperature measurements.

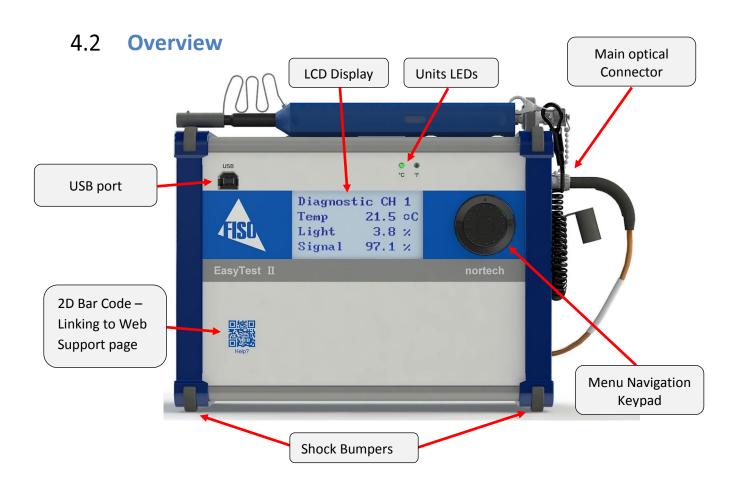
This single channel battery operated portable temperature has an autonomy of 16h. It came in a "Toolbox" with all the tools to assist you at each step of the transformer assembly to validate the installation of Fiber optic temperature sensors or to perform on site testing.

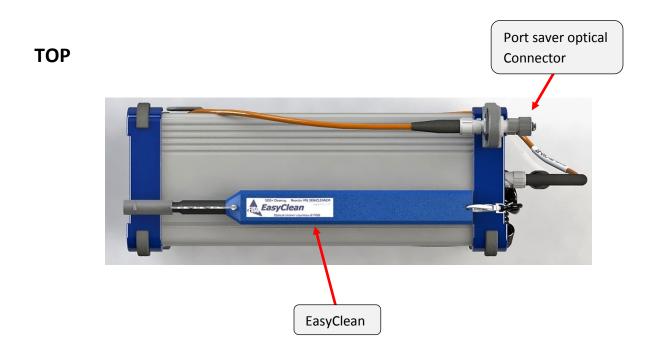
Please have a look at the EasyTest II video, it show how to use-it.

You will find others informative videos on our web site: <a href="https://fiso.com/en/support/?ca=videos">https://fiso.com/en/support/?ca=videos</a>



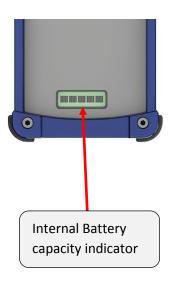




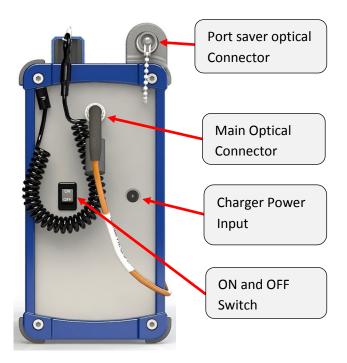




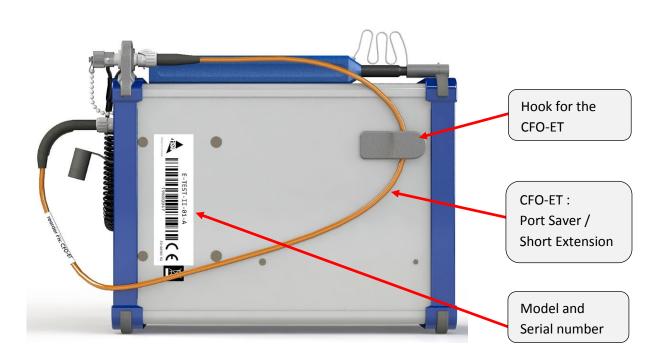
## **Left Side**



# **Right Side**



## Rear





#### 4.3 Powering the EasyTest II



## **WARNING**

To avoid damaging to the unit, make sure to use ONLY the provided power supply. Using different power inputs may damage the unit. No other voltage level or range is accepted.

### 4.3.1 Power supply

The external power supply of EasyTest II has the following output characteristics:

24VDC / 60W,

### **4.3.2** Battery

The EasyTest II has a built-in 49Wh rechargeable Lithium Ion battery.

With its internal battery, the system can operate on its own for as long as 16 hours of continuous operations.

The battery capacity indicator on the left side tells you the remaining capacity in the battery.

Each LCD segment represent 20% of the full charge capacity.

Capacity		LCD Segments				
	1	2	3	4	5	
Below 1%						
1% - 20%		1				
21% - 40%			1			
41% - 60%				]		
61% - 80%					]	
81% - 100%						

A complete charge with the unit Off will take about 3h at a room temperature of 23degC.

You can also recharge the unit while using it, but it could take more time.

Note: During the charge, the most significant segment will blink.

Recharge Temperature limits: OdegC to 40degC <= 80%RH Operating Temperature limits: OdegC to 50degC <= 80%RH Storage Temperature limits: -20degC to 60degC <= 80%RH

Extended exposure to temperatures above 45degC could degrade battery performance and life.

#### Battery Life expectancy:

Given normal storage & usage, user can expect the battery to deliver at least 8 hours capacity after 300 charge/discharge cycles at 25degC.



## 4.4 **Optical Connector**

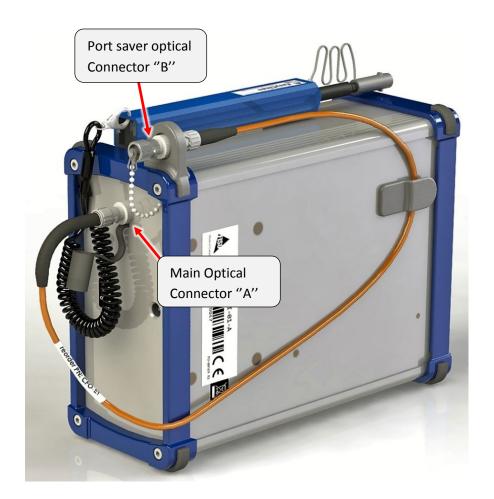
The mechanical life of the optical connector is about 500 mating cycles in a relatively clean environment.

To keep your EasyTest II in good operating condition, we have installed a short optical extension that act as an optical **Port Saver**, the CFO-ET.

To protect your EasyTest II optical connector, always keep the CFO-ET connected to the main optical port of your EasyTest II "A" and connect the sensors to the Port Saver optical connector "B".

You could also use it as an optical extension to test directly at the tank wall feedthrough.

When the optical connector of the CFO-ET worn out, simply order a new one by contacting info@fiso.com .





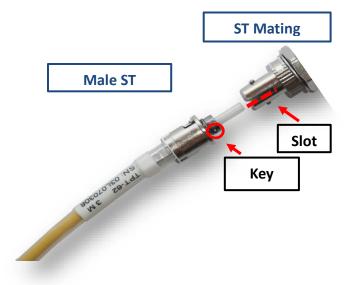


Use care in handling fiber optic connectors.

Always clean the fiber tip prior to insertion into the connector for optimum performance. For details on connector cleaning, please refer to 3.5 Cleaning Fiber Optic Connectors

To connect a ST connector, follow these 5 steps:

- 1. Remove the protective cap from the Male ST Connector and ST Mating.
- 2. Use the EasyClean tool to clean the Male ST connector and the ST Mating.
- 3. Align the male connector key with the mating slot.
- 4. Insert the connector in the mating.
- 5. Twist to lock.





## 4.5 LCD Display

The LCD display allows visualization of the key information directly on the unit.

The main display is showing the real-time temperature and the diagnostic values.

Diagnostic CH 1
Temp 21.5 oC
Light 3.8 %
Signal 97.1 %

### 4.6 **LED Indicators**

#### **Temperature Units LEDs**

The Temperature LED indicates which units the EasyTest II is displaying temperature, either °C or °F.

To change the unit,

press the center button to enter the menu, press 3 times the down arrow to navigate to the setting press the center button to enter the setting press the right arrow to change the units make an off-on



## 4.7 Informations

#### **System Info**

Description

Model: Device model

Serial: Device serial number (UID)

Version: Device current firmware version

System Info Model E-TEST Serial 19NR0223 Version 5.0.6.0

#### To visualize the Information:

press the center button to enter the menu, press 4 times the down arrow to navigate to Information press the center button to enter the Information make an off-on



# 4.8 Language

#### The EasyTest II LCD supports two languages:

English Chinese

To change the language:

press the center button to enter the menu, press 5 times the down arrow to navigate to Language press the center button to change the language make an off-on





# 4.9 USB Communication Port

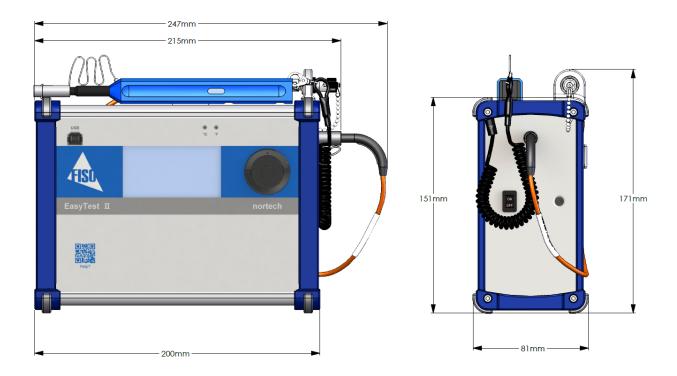
The USB configuration port is accessible directly from the front panel.

The USB port is used to link the EasyTest II to a PC for data/logs retrieval, parameter configurations, as well as firmware update using FISO Nortech Client Software.





# 4.10 Physical dimensions



The "toolbox" carrying case have the following dimensions: 451mm x 394mm x 114mm

# 4.11 Weight

The EasyTest II weight 1.5Kg (Inclusive the battery).

The "toolbox" carrying case with the EasyTest II and all the accessories weight 3.5Kg.



# **5 Nortech Client Software**

You can download the Nortech Client software and the software user guide here:

https://fiso.com/monitor/easytest-ii/



# **6 Troubleshooting**

# **6.1 Solving Common Problems**

The following troubleshooting guide was designed to help you solve technical problems. If the unit has to be returned for repair, or if you need any assistance, please contact FISO Customer Support: <a href="mailto:support@fiso.com">support@fiso.com</a>

Symptom	Possible cause	Possible solution
	Not powered up	Turn on the ON/OFF switch, located on the right side of the unit.
	' '	Verify the internal battery life indicator on the left side of the unit.
	Battery empty	Verify the internal battery life indicator on the left side of the unit. Connect the EasyTest II power supply to the EasyTest II for at least 3h.
No power	Battery not recharging	When connected to charge, the most significant segment of the battery life indicator will blink. Try another main outlet for the power supply.
	Power supply	Verify the power supply connection. If possible, try another power supply (with the same power requirements). If the power supply is faulty, call FISO to get a replacement.
	Dirty connectors	Clean the connectors using the EasyClean (if they are oily, use optic wipe and 99% Isopropyl alcohol)
Bad diagnostic values	Sharp bend along the fiber	Correct the installation, respecting the long term minimum bending radius of 17mm
baa alagnostic values	Sensor Pitted connector	Replace the sensor
	CFO-ET worn-out	Validate your CFO-ET, by connecting the EasyCheck to the Port Saver optical connector, if the Light is higher than 10% or the signal lower than 90% you should probably change your CFO-ET.



## 6.2 Diagnostics values

The **Light** and **Signal** are the two diagnostics values that give an indication of the sensor health.

**The "Light %"** is related to the strength of the light required to make an accurate reading on a sensor. The lower the better, typically under 20%, in the best case under 10%.

- For a sensor connected directly to the EasyTest II a light value up to 40% is a good value, if the light is higher than that you should investigate; check for dirty connector, sharp bent along the fiber, broken sensor or damaged sensor tip.
- For a sensor connected with a patch cord and an EasyThrough to the EasyTest II, a light value up to 80% is a good value, if the light is higher than that you should investigate; check for dirty connector, sharp bent along the fiber, broken sensor or extension cable, damaged sensor tip.

**The "Signal %"** is related to the signal to noise ratio of the optical signal returned by the sensor. The higher the better, typically higher than 90%, in the best case higher than 95%.

- For a sensor connected directly to the EasyTest II, a signal value higher than 80% is a good value, if the signal is lower than that you should investigate; check for dirty connector, sharp bent along the fiber, broken sensor or damaged sensor tip.
- For a sensor connected with a patch cord and an EasyThrough to the EasyTest II, a signal value higher than 40% is a good value, if the signal is lower than that you should investigate; check for dirty connector, sharp bent along the fiber, broken sensor or extension cable, damaged sensor tip.

	Sensor conne at EasyTest I	•	Sensors with and pat	, .	
	Good value	Cleaning / investigate	Good value Cleaning investiga		
Light	< 40%	> 40%	< 80%	> 80%	
Signal	> 80%	< 80%	> 40%	< 40%	

The Light and Signal values give an indication of the sensor health.

If they are in the yellow area, you should investigate, clean the connectors and check for sharp bend.



# 7 Spare parts

Some of the tools that came in your EasyTest II "toolbox" are consumables and you will probably want to keep a minimum stock of theses:

The EasyClean: Reorder PN: SEN-CLEANER

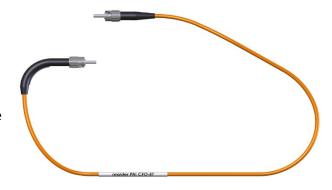


Is good for 500 clicks, since you have to clean both optical connectors before making connections, it gives 250 connections cleaning.

Under some circumstances: dusty environment, low humidity (static charge) etc, we recommend clicking twice, so under these circumstances it will give 125 connections cleaning.

**The CFO-ET:** Reorder PN: CFO-ET

Is good for about 500 connections, depending of the cleanliness of the environment where it is used. You could use the EasyCheck to test-it, if the Light is higher than 10% or the signal lower than 90% you should probably change your CFO-ET.



The EasyCheck: Reorder PN: SEN-CRP



If you loose the EasyCheck, break-it or just want to have a spare one.

Simply contact-us at: <a href="mailto:info@fiso.com">info@fiso.com</a>



# 8 Warranty and Service

### 8.1 General Information

FISO warrants this equipment against defects in material and workmanship for a period of five years and its fiber optic transducers and sensors for ninety (90) days from the date of original shipment.

FISO also warrants that this equipment will meet applicable specifications under normal use.

Product battery is covered only during the initial one-year period of this warranty.

During the warranty period, FISO will, at its discretion, repair, replace, or issue credit for any defective product, as well as recalibrate the product free of charge should the equipment need to be repaired or if the original calibration is erroneous.



#### ! IMPORTANT

The warranty can become null and void if:

- ▲ The equipment has been tampered with, repaired, or worked upon by unauthorized individuals or non-FISO personnel.
- **▲** The warranty sticker has been removed.
- **▲** Case screws, other than those specified in this guide, have been removed.
- **▲** The case has been opened.
- **▲** The equipment serial number has been altered, erased, or removed.
- ▲ The equipment has been misused, neglected, or damaged by accident.

## 8.2 Liability

FISO shall not be liable for damages resulting from the use of the purchased product, nor shall be responsible for any failure in the performance of other items to which the purchased product is connected or the operation of any system of which the purchased product may be a part of.

FISO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

## 8.3 Exclusions

FISO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes on units previously purchased.

Accessories, including but not limited to: EasyClean, CFO-ET and EasyCheck, used with FISO products are not covered by this warranty.

## 8.4 Certification

FISO certifies that this equipment has met its published specifications at the time of shipment from the factory.



## 8.5 Transportation

Maintain a temperature and humidity range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- A Pack the unit in its original packing material when shipping.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shock and vibration.

### 8.6 FISO Service Center

If your product requires servicing, contact your local FISO supplier or FISO Headquarters.

FISO Headquarters Service Center 500 St-Jean-Baptiste Avenue, Suite 195 Quebec City (Quebec) CANADA G2E 5R9 Telephone: (418) 688-8065

Email: <a href="mailto:support@fiso.com">support@fiso.com</a>

Fax: (418) 688-8067

EDO.

# 8.7 Product disposal

Please refer to your local authorities or send back the device to your local FISO distributor.



# **Annexe A LOG Sheet**

We recommend you to keep a record of the diagnostic values of the HotSpot sensors after each critical step of the transformer assembly:

- 1- The installation in the winding
- 2- The compression/drying, of the winding
- 3- The installation of the windings on the core
- 4- The drying of the winding / core assembly
- 5- The tanking
- 6- After the connection to the monitor (FAT)

To help you in this, we enclose at the next pages a LOG sheet (MC-00284). You can download the PDF of this LOG sheet at <a href="https://fiso.com/monitor/easytest-ii/">https://fiso.com/monitor/easytest-ii/</a>

You can also request the excel file to customize-it according to your needs. Simply write us at info@fiso.com requesting the MC-00284 LOG sheet in excel format.





# Installation Log Sheet for Fiber Optic Hot Spot Temperature Sensors

Work order information:			After installation in winding	After the compression / drying, of the winding	After the winding is installed on core (just prior the final drying)	After the final drying	After the tanking and connection to the EasyThrough	After connection to the monitor / FAT	Other
	SN:	Temp			<u> </u>		7 0 11		
СН1	Position:	Light							
C		Signal							
-	SN:	Temp							
СН2	Position:	Light							
0		Signal							
~	SN:	Temp							
СНЗ	Position:	Light							
		Signal							
4	SN:	Temp							
СН4	Position:	Light							
_		Signal							
5	SN:	Temp							
СН5	Position:	Light							
		Signal							
9	SN:	Temp							
СН6	Position:	Light							
		Signal							
1	SN:	Temp							
СН7	Position:	Light							
	CNI.	Signal							
	SN: Position:	Temp							
Ċ	Position.	Light Signal							
	SN:	Temp							
СНЭ	Position:	Light							
$\Box$	r osicion.	Signal							
	SN:	Temp							
CH10	Position:	Light							
Ċ		Signal							
1	SN:	Temp							
CH11	Position:	Light							
J		Signal							
2	SN:	Temp							
CH12	Position:	Light							
C		Signal							





# Installation Log Sheet for Fiber Optic Hot Spot Temperature Sensors

Work order information:		After installation in winding	After the compression / drying, of the winding	After the winding is installed on core (just prior the final drying)	After the final drying	After the tanking and connection to the EasyThrough	After connection to the monitor / FAT	Other	
8	SN:	Temp							
CH13	Position:	Light							
O		Signal							
4	SN:	Temp							
CH14	Position:	Light							
ြ		Signal							
7.	SN:	Temp							
CH15	Position:	Light							
ြ		Signal							
9	SN:	Temp							
CH16	Position:	Light							
ပ		Signal							
7	SN:	Temp							
CH17	Position:	Light							
ட		Signal							
∞	SN:	Temp							
CH18	Position:	Light							
0		Signal							

These are recommendations, manufacturers should test accordingly to their procedures / policies. You may customize this log sheet to suit your specific needs.

This log sheet could be downloaded on the EasyTest II resource page: http://fiso.com/2DScans/

		Sensor co		Sensors with EasyThrough and patch cord		
		Good value	Cleaning / investigate	Good value	Cleaning / investigate	
١	Light	< 40%	> 40%	< 80%	> 80%	
	Signal > 80%		< 80%	> 40%	< 40%	

The Light and Signal values give an indication of the sensor health. If they are in the yellow area, you should investigate, clean the connectors and check for sharp bend.

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