

Partial discharge inductor

tracy



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Table of contents



1	About this manual	5
1.1	Structure of safety instructions	5
1.2	View settings	6
1.3	Note on the screenshots and graphics used	6
2	For your safety	7
2.1	Intended use	7
2.2	Instructions for the operator	7
2.3	Avoiding dangers, taking safety measures	8
2.3.1	Operation of the device only if it is in a technically safe condition	8
2.3.2	No operation during condensation	8
2.3.3	No operation in areas with risk of explosion and fire	8
2.4	Special personal protective equipment	8
3	Product information	9
3.1	Device overview	9
3.2	Rating plate	10
4	Commissioning	11
4.1	Checking the battery charge status	11
4.2	Connecting tracy for PD pin-pointing	11
4.3	Setting the signal strength	12
4.4	Setting the pulse rate of the signal	12
4.5	Induce signal	13
5	Pin-pointing of partial discharge source locations	14
5.1	Procedure	14
5.2	Example of the signal sequence of tracy	16
5.3	Evaluation in the BAUR Software 4	17
6	Decommissioning	18
7	Maintenance	19
7.1	Cleaning	19
7.2	Charging the rechargeable battery	20
7.3	Replacing the battery	21
8	Transportation and storage	22
9	Warranty and After Sales	22
10	Disposal	23

11	Declaration of conformity	24
12	Index.....	25
13	Data sheet.....	26

1 ABOUT THIS MANUAL

1.1 Structure of safety instructions

The safety instructions in this user manual are presented as follows:

Danger symbol 	 SIGNAL WORD
	Type of danger and its source Possible consequences of violation. ▶ Measure to prevent the danger.

If a dangerous situation could arise at a specific step, the safety instruction is displayed immediately before this dangerous step and is shown as follows:




 **SIGNAL WORD**

Type of danger and its source. Possible consequences of violation.



1. Measure to prevent the danger.

Danger levels





Signal words in the safety instructions specify the danger levels.

 DANGER	Will lead to severe injuries or death.
 WARNING	May lead to severe injuries or death.
 CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

Danger symbols

	Warning about general danger
	Warning about electric voltage

1.2 View settings

Symbol	Meaning
▶	You are requested to perform an action.
1. 2. ...	Perform the actions in this sequence.
a. b. ...	If an operation consists of several operating steps, specify these with "a, b, c". Perform the operating steps in this sequence.
1 2 ...	Numbering in the legend
▪	List
	Indicates further information on the topic.
	Indicates tools required for the subsequent tasks.
	Indicates spare parts required for the subsequent tasks.
	Indicates required cleaning agents.

1.3 Note on the screenshots and graphics used

The screenshots and graphics used are intended to illustrate the procedure and may differ from the actual state.

2 FOR YOUR SAFETY

All BAUR devices and systems are manufactured according to the latest technology and are safe to operate. The individual parts and the finished devices are subject to continuous testing by our qualified personnel as part of our quality assurance system. Each device and system is tested before delivery.

However, the operational safety and reliability in practice can be achieved only when all necessary measures have been taken. The responsible body¹ and operator² of the device or system are responsible for planning these measures and monitoring their implementation.

Make sure that the responsible body and persons working with the device or system have carefully read through and understood the user manual for the device or system, as well as the user manuals for all associated devices, before starting work.

The responsible body and operator of the device or system are responsible for any injuries or damage resulting from non-compliance with this user manual.

2.1 Intended use

The tracy partial discharge inductor is used for the precise location of partial discharge source locations in cables and cable accessories (partial discharge pin-pointing).

If the device is not used in accordance with this stipulation, safe operation cannot be guaranteed. The manufacturer cannot be held liable for any damage to persons and property resulting from incorrect operation.

- ▶ To ensure safe use as intended, follow the instructions in this user manual.

2.2 Instructions for the operator

The product may be operated only by authorised and trained electrical engineers. An electrical engineer is a person who, owing to his professional education (electrical engineering), knowledge, experience and familiarity with the applicable standards and regulations, can assess the tasks assigned to him and detect possible dangers.

In addition, the operator must have:

- Knowledge of the technical configuration and operation of tracy
- Knowledge of plant engineering (cable types, switchgear, etc.).

¹ Responsible body is the person or group that is responsible for the safe operation of the device and its maintenance (EN 61010-1, 3.5.12).

² Operator is the person who uses the device for its intended purpose (according to the definition of user in compliance with EN 61010-1, 3.5.11).

2.3 Avoiding dangers, taking safety measures

- ▶ When erecting the test installations and operating tracy, adhere to the latest applicable version of the following regulations and guidelines:
 - Accident prevention and environmental protection regulations applicable for your country
 - Safety instructions and regulations of the country where tracy is being used
 - EU/CENELEC countries: EN 50110 *Operation of electrical installations*
Other countries: The standards for operating electrical installations applicable in your country
 - Any other relevant national and international standards and guidelines
 - Local safety and accident prevention regulations
 - Employers' liability insurance association regulations (if any)

2.3.1 Operation of the device only if it is in a technically safe condition

Safety, function and availability depend on the proper condition of the device.

- ▶ Operate the device only in a technically perfect condition.
- ▶ In case of damage and malfunction, immediately stop the device, mark it accordingly and have the faults rectified by appropriately qualified and authorised personnel without delay.
- ▶ Comply with the inspection and maintenance conditions.
- ▶ Use only accessories and original spare parts recommended by BAUR. The use of spare parts, accessories and special fittings that have not been tested and approved by BAUR could adversely affect the safety, function and characteristics of the device.

2.3.2 No operation during condensation

Condensation can form in devices and systems due to temperature fluctuations and high air humidity, which in some components can result in leakage currents, flashovers and short-circuits.

- ▶ Always prevent condensation in devices. Temper the device and system before and during the measurements so that no condensation occurs.

2.3.3 No operation in areas with risk of explosion and fire

Measurements in direct contact with water, in environments with explosive gases and in areas with fire risks are not permitted. Possible danger areas include e.g. chemical factories, refineries, paint factories, paint shops, cleaning plants, mills and stores of milled products, tank and loading plants for combustible gases, liquids and solid matter.

2.4 Special personal protective equipment

Personal protective equipment based on the risk assessment for the relevant working conditions is part of the tracy safety concept.

- ▶ Observe the internal operating instructions and the safety instructions applicable in your country.

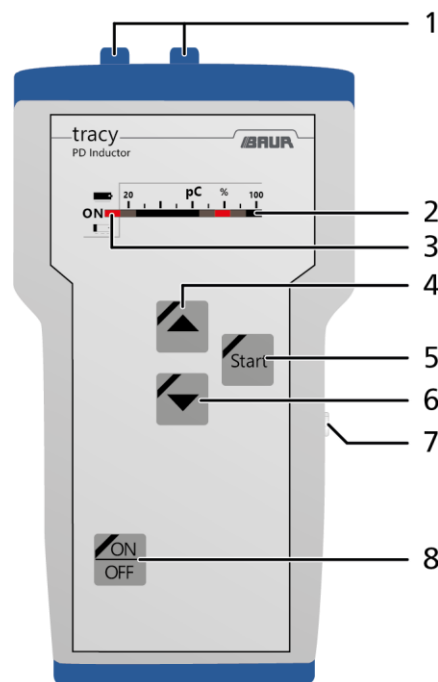
3 PRODUCT INFORMATION



The tracy partial discharge inductor is used for the precise location of partial discharge source locations in cables and cable accessories (partial discharge pin-pointing).





Information on the technical data as well as standard delivery, accessories and options can be found in Chapter *Data sheet* (on page 26).

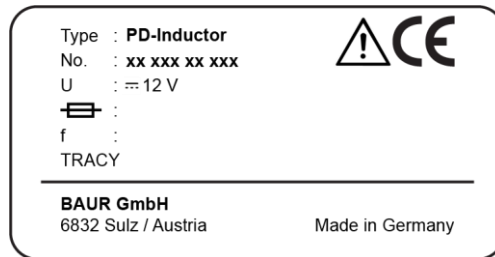
3.1 Device overview






No.	Element	Function
1	Ports for the induction cable	
2	Signal display	Shows the signal strength of the signal to be induced When the device is switched on, the charge status of the device is also displayed for approx. 2 seconds.
3	Operation lamp	Lights up when the device is switched on
4	 key	Increases the signal strength of the signal to be induced
5	 key	Starts or ends the induction of the signal

No.	Element	Function
6	 key	Reduces the signal strength of the signal to be induced
7	Charger socket	
8	 key	Switches the device on and off

3.2 Rating plate




Element	Description
Type	Device designation
No.	Serial number
U	Supply voltage If several supply voltages are possible, these are given consecutively one after another.
	Not applicable here
f	Not applicable here
VA	Not applicable here
TRACY	Product name of the partial discharge inductor
	General warning sign Indicates that there is a potential risk of danger when using the product and hence the user manual must be observed
	CE mark Indicates that the device or system conforms to CE.
BAUR GmbH 6832 Sulz / Austria	Name and address of the manufacturer
Made in Germany	Indicates the country in which the device was manufactured.

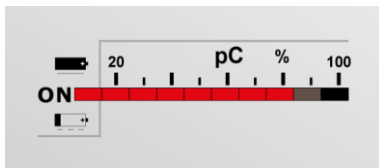
4 COMMISSIONING

- ▶ Observe the safety instructions in chapter *For your safety* (on page 7).

4.1 Checking the battery charge status

The battery charge status is displayed immediately when the device is switched on.

- ▶ Press the  key to switch the device on.
The operation lamp lights up and the signal display shows the battery charge status for approx. 2 seconds.



4.2 Connecting tracy for PD pin-pointing



1. Wind the induction cable around the test object at least five times.


When inserting the induction cable, ensure that:

- the windings are laid **parallel** to the test object,
- the windings are **close together**, and
- the windings **do not cross**.



Notes:

- We recommend fixing the windings in place with adhesive tape so that they do not slip.
 - To increase the signal strength, the induction cable can be wound around the test object up to ten times. However, in doing so, the slew rate of the induced signal may be reduced.
2. Connect the induction cable to tracy.

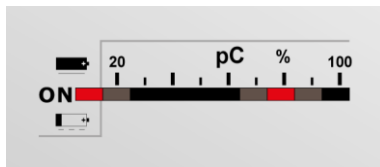
4.3 Setting the signal strength

1. Switch on tracy with the  key.


The operation lamp lights up and the signal display shows the battery charge status for approx. 2 seconds.

2. Set the desired signal strength: Press the  key to increase the signal strength; press the  key to decrease the signal strength.



The signal strength is displayed for approx. 1 second.



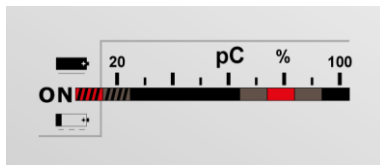
4.4 Setting the pulse rate of the signal





1. Switch on tracy with the  key.

The operation lamp lights up and the signal display shows the battery charge status for approx. 2 seconds.

2. Simultaneously press the  and  keys.

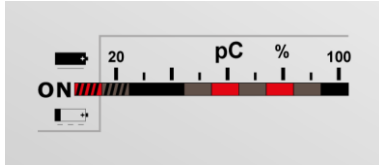
The operation lamp flashes at the set pulse rate. The signal display shows the set pulse rate in binary code (see examples below).



- Set the pulse rate of the signal using the  and  keys: Press the  key to increase the pulse rate; press the  key to decrease the pulse rate.






Possible settings: 20 ms – 5.1 s (in steps of 20 ms)

The operation lamp flashes at the set pulse rate. The signal display shows the set pulse rate in binary code (see examples below).




The setting is automatically accepted after approx. 2 seconds. The device switches back to the normal operating mode.


Examples of the binary display of the pulse rate

Signal display	Binary code	Pulse rate
 (Maximum pulse rate)	-000000001	20 ms
	-000000101	100 ms
	-000001011	220 ms
	-000010100	400 ms
 (Minimum pulse rate)	-011111111	5.1 s

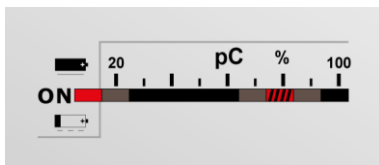
4.5 Induce signal

- Switch on tracy with the  key.

The operation lamp lights up and the signal display shows the battery charge status for approx. 2 seconds.

- Press the  key.

The signal display flashes at the selected signal strength; the signal is induced.



5 PIN-POINTING OF PARTIAL DISCHARGE SOURCE LOCATIONS

You can pin-point pre-located partial discharge source locations precisely using the tracy partial discharge inductor. To do this, first perform a PD measurement, expose the cable at the pre-located PD source location, and connect the partial discharge inductor there. The partial discharge inductor induces a signal that you can detect and record using the BAUR Software 4. To manage the PD measurement in combination with the pin-pointing of the PD source location in the BAUR Software, use the **Carry out further measurements** function.

Note: The detection and recording of signals from tracy is available as of version 4.11 of the BAUR Software.



Detailed information on working with the BAUR Software 4 is provided in the user manual for the BAUR Software 4.



- ▶ To open the user manual, press the F1 key in the open BAUR software.

5.1 Procedure

On the system





- ▶ For the following steps, refer to the user manual for the system that is used to perform the measurement.

1. Secure the test area and connect the test object properly.
2. Make sure that the test object screen is earthed at both ends.
3. Make sure that the test object has been exposed at the pre-located partial discharge source location.
4. Connect tracy to the exposed point on the test object.
Further information: Chapter *Connecting tracy for PD pin-pointing* (on page 11)
5. Switch on tracy with the  key.
The operation lamp lights up and the signal display shows the battery charge status for approx. 2 seconds.
6. If necessary, set the signal strength and the pulse rate of the signal.
Further information:
 - Chapter *Setting the signal strength* (on page 12)
 - Chapter *Setting the pulse rate of the signal* (on page 12)
7. Start the induction of the signal: Press the  key.
The signal display flashes at the selected signal strength; the signal is induced.

Notes:

- Adjust the signal strength to improve the display on the PD measuring system.
- To increase the signal strength further, the induction cable can be wound around the test object up to ten times. However, in doing so, the slew rate of the induced signal may be reduced.

In the BAUR Software

1. Select the cable route on which you have performed the PD measurement.
2. Select **TESTING AND DIAGNOSTICS > Measurement**.
3. Click the **Historic** button.
4. In the sequence overview, right-click on the sequence and select the **Carry out further measurements** context menu item.
The **Actual** view is enabled.
5. Click the  button.
6. Click the **tracy recording** button in the diagram.
The signal is displayed.
7. Click the **Record** button.
A dialog appears showing how long the recording takes as standard. If required, you can change the duration.
8. Click the **Record** button in the dialog.
The signal is recorded and the recording is terminated automatically when the set duration has elapsed.
9. Click the  button.
The signals recorded by tracy are depicted as vertical lines. If they are close to the pre-located partial discharges, this is confirmation of the PD source location. If they are far apart, observe the distance information in the software and connect tracy accordingly at a closer point.

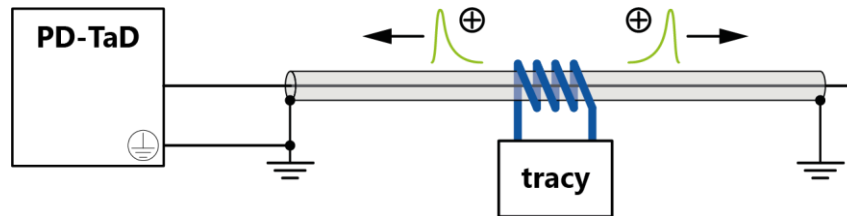


Further information is given in the user manual for the BAUR Software.

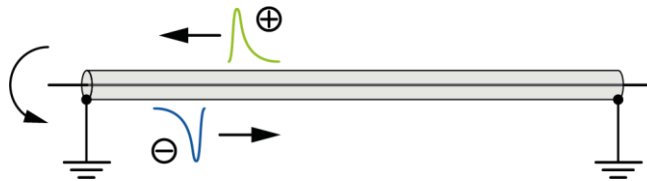
- ▶ To open the user manual, press the F1 key in the open BAUR Software.
-

5.2 Example of the signal sequence of tracy

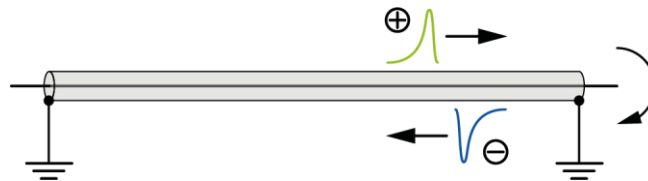
In the following example, the test object is connected to a PD-TaD PD diagnostics system. The induction cable is wound clockwise around the test object, so the signal from tracy has positive polarity:



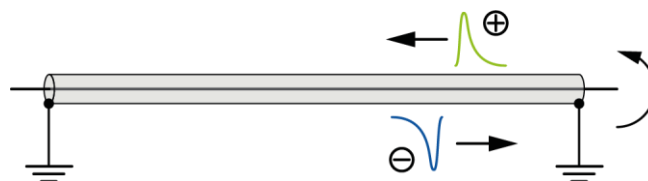
At the near end: The PD measuring system detects the positive signal peak. As the test object screen is earthed, the signal is then reflected negatively:



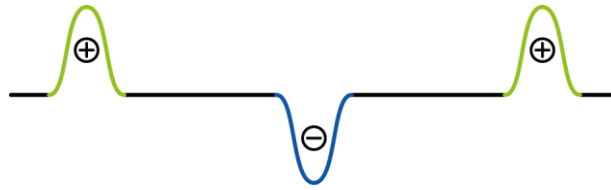
At the far end: As the test object screen is earthed, the signal is reflected negatively. The signal travels with this polarity to the near end, where the PD measuring system detects the negative signal peak:



The first signal, which was detected as the positive signal peak and then reflected negatively, travels to the far end and is reflected negatively again. It travels with positive polarity to the near end and is recorded there again accordingly:



This results in the following schematic signal sequence:



The point at which tracy is connected is indicated by a negative signal peak.

Note: The polarity of the reflections depends on which way the induction cable is wound around the test object. The reflections at the near end and far end have the same polarity, while the reflected signal from tracy has the opposite polarity.

5.3 Evaluation in the BAUR Software 4

As of version 4.11 of the BAUR Software, there are various views available for evaluating the signals. In the **LOC** view, you can see at a glance whether the signals from the tracy are located near the pre-located PD source location: They are depicted as vertical lines.

A direct comparison of the recordings of individual signals can be performed in the **PD** view. To do this, define one of the signals recorded by the tracy as a reference and then compare this with the PD measurement recordings.

Example of a signal comparison

In the example, the green trace is the recorded partial discharge; the cursor flag shows the distance from the near end (107 m) and the distance from the far end (218 m).

The white trace is the signal from the tracy that is defined as the reference; the second peak is the point at which the tracy is connected. Based on the trace progression and the cursor position, it is clear that the tracy is located near the pre-located PD source location. The pre-located PD source location is thus confirmed.

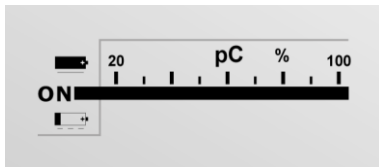


Further information is given in the user manual for the BAUR Software.

- ▶ To open the user manual, press the F1 key in the open BAUR Software.

6 DECOMMISSIONING

1. End the induction of the signal: Press the **Start** key.
2. Switch off the tracy via the **ON/OFF** key.
The operation lamp goes off.



3. Remove the induction cable from the test object.

7 MAINTENANCE

7.1 Cleaning

NOTICE**Damage to the device may be caused by using the wrong cleaning agents**

- ▶ Do not use any abrasive, corrosive cleaning agents or strong solvents.
- ▶ Ensure material compatibility.
- ▶ Do not clean the product with acetone or thinner.
- ▶ Never clean electrical devices with water.

NOTICE**Damage to device due to leaking fluids.**

- ▶ Do not allow liquids to leak into devices.
- ▶ Do not expose the device to rain or moisture.

Cleaning the display

- ▶ Do not use anything other than a dry or slightly damp, lint-free cloth to clean the display.



Cleaning the housing

- ▶ Clean the housing with a mild detergent and a lint-free cloth.

Cleaning the induction cable

- ▶ Clean the induction cable with a mild detergent and a lint-free cloth.

7.2 Charging the rechargeable battery

	 CAUTION
	<p>Dangerous electric voltage on the charger</p> <p>Risk of injury due to electric shock.</p> <p>The charger is an electrical equipment that feeds voltages and currents that are dangerous for humans.</p> <ul style="list-style-type: none">▶ Only use the supplied charger for tracy.▶ Protect the charger against humidity.▶ Use the charger only in dry spaces.

1. Make sure that tracy is switched off.
2. Connect the charger to tracy and the mains voltage. If necessary, use one of the supplied adapters.
The charging process starts. tracy cannot be used during the charging process.
When the battery is fully charged, the charger automatically switches to float charge mode.
3. Once the tracy battery is charged, disconnect the charger from the mains and from tracy.

7.3 Replacing the battery

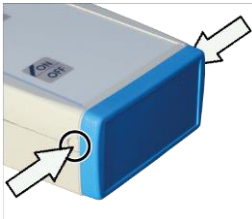
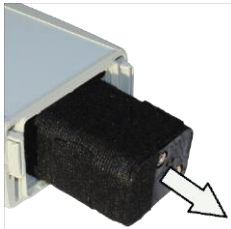



Required equipment



Ni-MH rechargeable battery pack

- ▶ For information on the rechargeable battery pack, contact your BAUR representative.

Procedure

1. Make sure that tracy is switched off.
2.  To open the battery compartment, press the two mounts to the left and right on the lower part of the housing. If necessary, use a blunt object to do this.
When the battery compartment cover has been released, take it off.
3.  Pull the battery pack out of the battery compartment.
4.  Disconnect the connector and remove the old battery pack.
5.  Connect the new battery pack and push it back into the battery compartment.
6.  Press the battery compartment cover onto the housing until the mounts engage.

8 TRANSPORTATION AND STORAGE

NOTICE**Damage to device due to incorrect transportation and improper storage**

- ▶ Always transport and store the device in the transport case intended for this purpose.
- ▶ Protect the device against strong vibrations, moisture, and unauthorised access.
- ▶ Comply with the ambient conditions specified in the technical data.

Further information: Chapter *Data sheet* (on page 26)

9 WARRANTY AND AFTER SALES

Warranty

For warranty claims, please contact BAUR GmbH or your local BAUR representative. Improper use will render the warranty null and void. Wear parts are excluded from the warranty.

After Sales

For questions contact BAUR GmbH or your BAUR representative.



BAUR GmbH

Raiffeisenstraße 8
6832 Sulz / Austria
service@baur.eu
<https://www.baur.eu>

10 DISPOSAL

The final decommissioning and disposal of the device must be carried out in compliance with country-specific laws, regulations and standards.

Device components do not belong in the domestic waste.

- ▶ Dispose of electrical device components in accordance with the applicable national regulations.
- ▶ Dispose of the various device components in an environmentally friendly manner and in accordance with the applicable national regulations.

11 DECLARATION OF CONFORMITY

We



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F +43 (0)5522 4941-3
headoffice@baur.eu
<https://www.baur.eu>

declare, under our sole responsibility, that the BAUR product

**BAUR Partial discharge inductor
tracy**

to which this declaration refers, conforms to the following standards or standard documents:

- Low Voltage Directive 2014/35/EC
EN 61010-1:2010
EN 61010-2-030:1:2010
EN 60335-1:2010 modified
EN 60335-2-29:2004 + A2:2010
- EMC Directive 2014/30/EU
EN 55014-1:2006 + A1:2009 + A2:2011
EN 55014-2:1997 + A1:2001 + A2:2008
EN 61000-3-2:2014
EN 61000-3-3:2013
- Environmental testing
EN 60068-2-ff

Signed: Torsten Berth, Technical Director
 Dr. Eberhard Paulus, Director QM/QS

Sulz, 14/12/2015

12 INDEX

A

- About this manual • 5
- Avoiding dangers, taking safety measures • 7

C

- Charging the rechargeable battery • 19
- Checking the battery charge status • 11
- Cleaning • 19
- Commissioning • 11
- Connecting tracy for PD pin-pointing • 11, 14

D

- Data sheet • 9, 21, 25
- Declaration of conformity • 23
- Decommissioning • 18
- Device overview • 9
- Disposal • 22

E

- Evaluation in the BAUR Software 4 • 16
- Example of the signal sequence of tracy • 15

F

- For your safety • 7, 11

I

- Induce signal • 13
- Instructions for the operator • 7
- Intended use • 7

M

- Maintenance • 19

N

- No operation during condensation • 8
- No operation in areas with risk of explosion and fire • 8
- Note on the screenshots and graphics used • 6

O

- Operation of the device only if it is in a technically safe condition • 8

P

- Pin-pointing of partial discharge source locations • 14
- Procedure • 14
- Product information • 9

R

- Rating plate • 10
- Replacing the battery • 20

S

- Setting the pulse rate of the signal • 12, 14
- Setting the signal strength • 12, 14
- Special personal protective equipment • 8
- Structure of safety instructions • 5

T

- Transportation and storage • 21

V

- View settings • 6

W

- Warranty and After Sales • 21

tracy

BAUR partial discharge inductor



Features

- Exact location of the partial discharge positions in the exposed cable segment
- Inductive signal coupling without damaging the cable
- Allows the operator to confirm the fault location pre-located with a PD diagnostics and location system
- Easy to operate
- Robust, splash-proof housing
- Lightweight

Simple and exact pin-pointing of partial discharge positions

- Portable, battery-operated signal coupling device
- Suitable for cables and cable accessories
- Inductive signal coupling
- Avoids costly, unnecessary replacements of PD-free cable accessories

The tracy partial discharge inductor is used for the precise location of partial discharge source locations in cables and cable accessories (partial discharge pin-pointing).

tracy induces a signal at the pre-located partial discharge position in the cable that can be detected with a partial discharge diagnostics and location system, e.g. PD-TaD. This allows the operator to compare the location at which the signal is coupled in with the pre-located fault location and precisely locate the partial discharge source location.

Technical data

General	
Pulse width	Approx. 25 ns
Pulse rate	20 ms – 5.1 s (in 20-ms steps)
Battery type	Ni-MH rechargeable battery pack
Battery life	Approx. 20 h
Charging time	Approx. 4 h
Charger	
Power supply	100 – 240 V, 50/60 Hz
Output voltage	DC 4.8 – 12 V, 800 mA
Ambient temperature (operational)	-10°C to +50°C
Storage temperature	-20°C to +60°C
Relative humidity	Non-condensing
Dimensions (W x H x D)	Approx. 110 x 213 x 42 mm
Weight	Approx. 0.55 kg
Degree of protection	IP54
Safety and EMC	CE-compliant in accordance with Low Voltage Directive (2014/35/EU), EMC Directive (2014/30/EU), EN 60068-2-ff Environmental testing

Standard delivery

tracy partial discharge inductor in transport case incl.:

- Rechargeable battery pack
- Charger incl. country-specific adapter
- Induction cable, blue
- User manual



The figure is illustrative.



Would you like to discover more about this product?
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