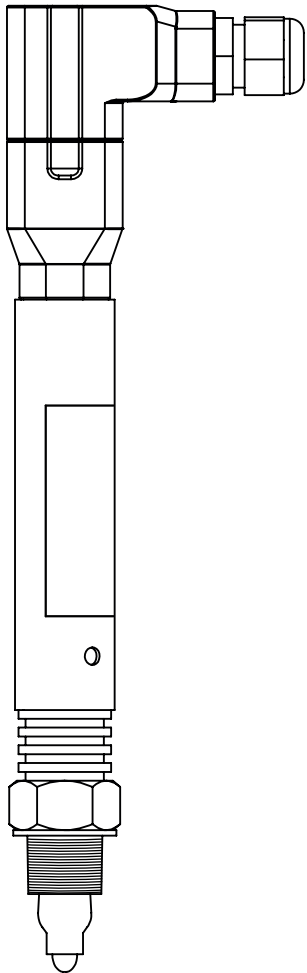




BD 5300-T Conductivity Probe

Installation, Operating and Maintenance Instructions



Safety Notes

General Information

Installation

Wiring

Maintenance

Spare Parts

Tecnical Assistance

Local regulations may restrict the use of this product to below the conditions quoted.
In the interests of development and improvement of the product, we reserve the right to change
the specification without notice.

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1. Safety Notes

The product is designed and constructed to withstand the forces encountered during normal use. Use of the product for any other purpose, or failure to install the product in accordance with these Installation and Maintenance Instructions, could cause damage to the product and may cause injury or fatality to personnel.

BD 5300-T Conductivity probe and the BK 5000-T comply with the requirements of the pressure equipment directive and carry the CE mark.

If this product is not used in the manner specified by this user manual, then the protection provided may be impaired.

1.1 Intended Use

The conductivity probe BD 5300-T is designed for use in conjunction with the Vira conductivity controller BK 5000-T. The conductivity probe BD 5300-T is designed to measure conductivity of water, usually in steam generators and in condensate line for purpose of monitoring and controlling the contamination.

Use this installation and operating instructions and the technical data sheet to check whether the device is suitable for the intended use/application. The device complies with the European Pressure Equipment Directive 2014/68/EU requirements.

The maximum values of the pressure and temperature range of the device must be checked before installation. If the maximum allowable operating values of the device are lower than those of the system on which it is to be installed, protective instruments for the device, such as pressure reducers or similar, must be provided to avoid limit situations.

Vira products are not designed to withstand the external stresses they may be exposed to in any system in which they are installed. It is the installer's responsibility to consider these stresses and take adequate measures to minimize them.

The operator of the facility is obliged to familiarise himself with the compatibility of the medium and the device. In case of doubt, contact the relevant installation manager or site manager. The correct installation position, alignment and flow direction of the device must be observed! Before installing the VIRA product on boilers or containers, it is essential to remove all protective covers.

Safe operation of this product can only be guaranteed if these conditions are satisfied. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment, must also be complied with.

Danger!



When loosening the level electrode steam or hot water might escape. This presents the danger of severe scalds to the whole body.
 Do NOT remove the level probe unless the boiler pressure is verified to be 0 bar.
 The level switch becomes hot during operation.
 Risk of severe burns to face, hands and arms.
 Before carrying out installation and maintenance work make sure that the equipment is cold.



Tools

Before starting work, make sure that you have suitable tools and consumables available.
 Use only genuine Vira replacement parts.



Temperature

After isolation, let the temperature to cool down to avoid danger of burns.



Freezing

Required precautions must be taken to protect products in environments where they may be exposed to temperatures below freezing point.



Pressure

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Do not assume that the system has depressurized even when the pressure gauge indicates zero.
 exposed to temperatures below freezing point.



Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.



Residual Hazards

The external surface of the product may be very hot. Take essential care when removing the product from an installation.



Hazardous Environment

Plant rooms are explosion-risk areas. There may be a lack of oxygen, dangerous gases, extremes of temperature, hot surfaces, fire hazards excessive noise, and moving machinery.



Protective Clothing

In order to be protected against the hazards of chemicals, high temperature, radiation, noise, falling objects, and dangers to eyes and face, anyone around requires protective clothing suitable in the plant room.



Supervision

All work must be carried out or supervised by a suitably competent person. Installation and operating personnel should be trained in the correct use of the product according to the Installation and Operation Instructions.



Disposal

Unless otherwise stated in the Installation and Operation Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken.



Returning Products

When returning products to “Vira Isı ve Endüstriyel Ürünler A.Ş” the customers must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk.

2. General Information

2.1 Description

The Vira BD 5300-T conductivity probe is used in conjunction with BK 5000-T conductivity controller to measure the conductivity (closely related to TDS) of water, usually in a steam boiler, for the purpose of monitoring and controlling blowdown.

The BD 5300-T is supplied in nominal tip length 20 mm, and has a 1/2" BSP thread for connecting to a Vira DG 5300 probe housing a screwed flange, or directly into a boiler connection. The BD 5300-T conductivity probe cannot be cut to length. Different dimensions should be specified at the order phase.

2.2 Technical Data

Service Pressure and Temperature

PN 40, 32 Bar g at 239°C

Mechanical Connection

BSPT 1/2"

Materials

Screw-in Body	: Stainless Steel
Electrode Rods	: Stainless Steel
Insulation of Electrode	: PTFE
Connector Housing	: PA

See controller installation, operating and maintenance instructions for wiring diagram.

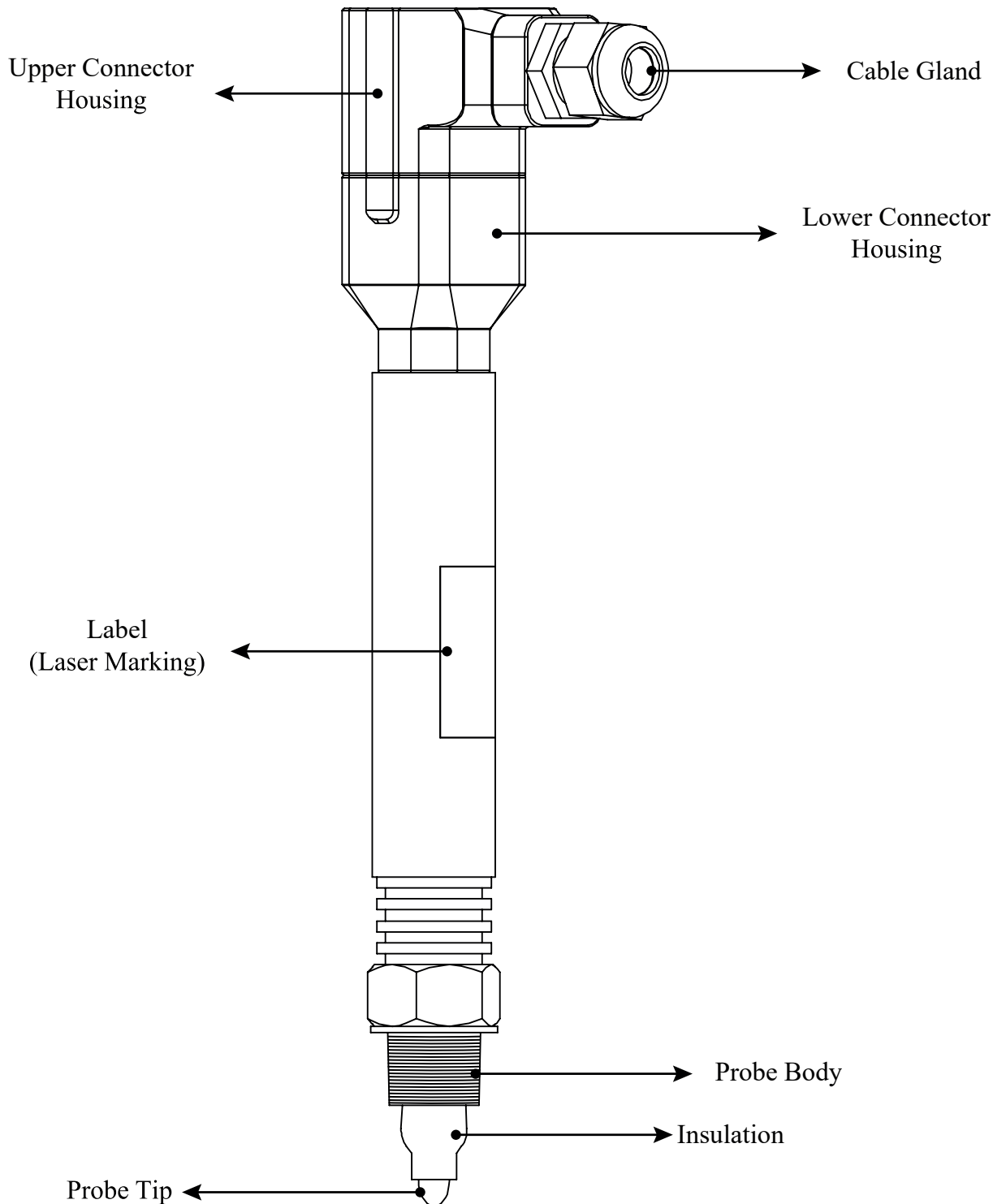


Figure 1 : Material description of BD 5300-T

3. Installation

The BD 5300-T is supplied in nominal tip length of 20 mm as standard and cannot be cut to length.

Note : Make sure that the probe tip is in contact with water during the application. Otherwise, you may receive a conductivity value error or the readings may be incorrect.

Warning !



Do not install probe outdoors without additional weather protection. The boiler or the line where it is installed must be depressurized and vented to atmosphere before installation of the probe. Wherever possible, boiler manufacturer or water treatment specialists must be consulted for advice on the optimum conductivity level.

3.1 General

The Vira Condensate Conductivity Control system actively monitors and displays the conductivity of condensate return. In the event that the conductivity surpasses a predetermined level, the system redirects the flow to the drain. This preventive measure is implemented to avoid the return of contaminated water to the boiler feed tank. It's important to note that the system may not identify contaminants that do not alter conductivity, such as oils, fats, or sugars.

To achieve this monitoring capability, a conductivity sensor including temperature sensor (e.g. BD 5300-T) are installed in a bypass line, as illustrated in Figure 2. A check valve within the main line ensures a continuous flow past the sensor, particularly under low-flow conditions. The incorporation of a 500 mm head serves to impede flash steam flow in the bypass line. We recommend the use of a 3-port diverter valve. Typically, a spring retract pneumatic actuator is employed to ensure valve diversion in case of air supply failure.

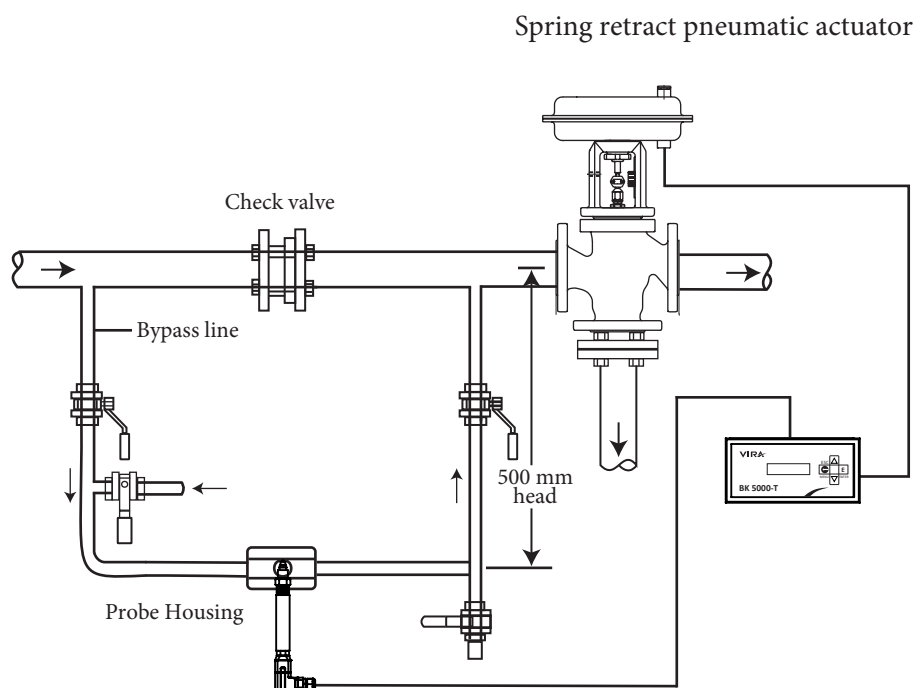


Figure 2 : BS3-T System Application

3.2 Installation Procedure

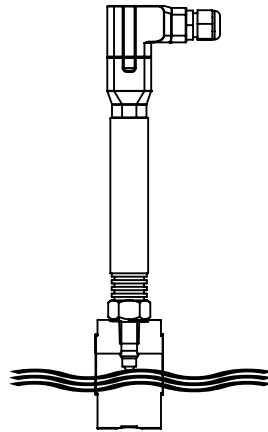


Figure 3 : Installation Procedure

- Make sure threads of connections are in good condition.
- Use up to 3 turns of ptfе thread sealing tape on the probe thread.
- Fit and tighten the probe by hand initially.
- Screw the probe into thread and tighten with an open end spanner.
- Due to nature of tapered joint it is not possible to recommend tightening torque figures.
- Make sure probe insulation sleeve is not damaged when fitting the probe to the boiler body.
- Make sure that the probe touches the water, otherwise the product will not function.

3.3 Replacement Of The Unit



Warning !

Ensure boiler or the line is depressurised and vented to atmosphere before attempting to unscrew or remove the probe.

- Always use the correct size spanner.
- Inspect male and female threads for signs of damage, which may have occurred through overtightening, leading to torn threads or even localised cold welding (galling/picking up).
- If damage has occurred replace the probe.
- Check that the probe insulation is not torn or damaged.

4. Wiring

4.1 Connection

Use 5 core (4 core and earth) minimum 0.5 mm² high temperature cable. The cable must be screened. For detailed cable specification check BK 5000-T Conductivity Controller installation, operating and maintenance instructions. The BD 5300-T is supplied with heavy duty connector with 5 terminal. 2 terminal is used for probe tips, 2 terminal is used for temperature sensor and earth connection.

Note: Please do not use unconnected terminals!

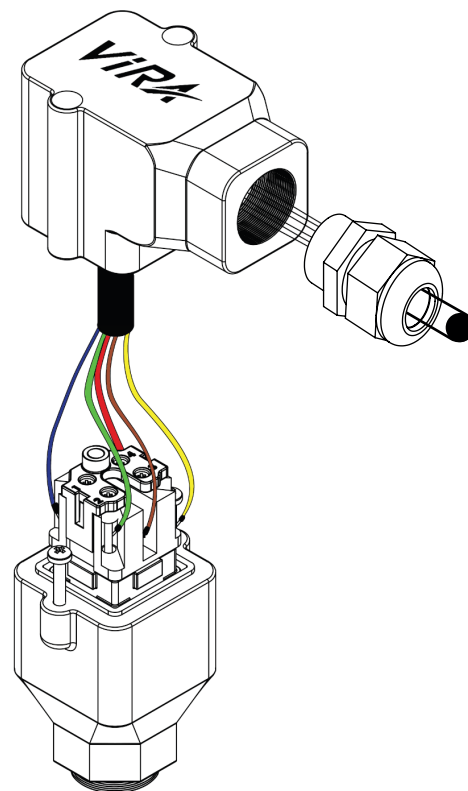
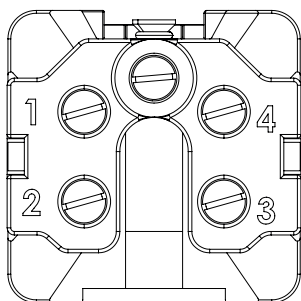


Figure 4 : BD 5300-T Connector

Note: The wire colors are for illustration purposes only. Different colors can be used in the actual application.

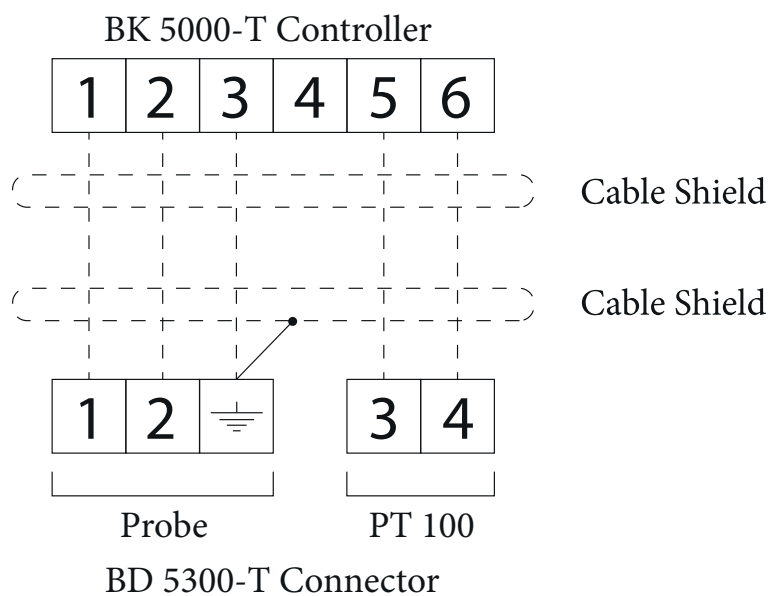


Figure 5 : Wiring diagrams

Attention !

Do not install low-voltage cables near high-voltage cables or switchgear, as this may reduce the performance of, or cause damage to the product. Probe cables must not use the same conduit / wiring trays as power cables or other wiring. Ensure internal wires have not been stressed or damaged during installation.

An earth current loop is created if a wire or screen is connected between two earth points that are at different potential (voltage). If the instructions are followed correctly, then the probe Cable screen will only be connected to earth at one end.

Attention !

- Ensure that the cable shield is only connected to earth terminal of the probe.
- Do not connect the common terminal to earth local to the controller. To do so may induce an earth current loop, which may reduce performance or damage the product.

5. Maintenance

The probe does not normally need regular maintenance. Remove, clean, and check the probe annually.

Where regular tests are carried out properly in a well run boiler house with good water treatment, it may be that only twice or an annual inspection of the probe is required. This inspection programme must be determined by the boiler inspector.

Please follow this procedure during the inspection;

- Depressurise and vent the line.
- Before carrying out installation and maintenance work make sure that the equipment is cold.
- Disconnect the electrical supply to controller.
- Remove probe upper connector.
- Remove probe. When loosening the conductivity electrode steam or hot water might escape. This presents the danger of severe scalds to the whole body.
- Check condition of probe.
- Clean probe tip and insulation if necessary. Use a soft brush or cloth dampened with tap water. Use of other cleaning materials could damage the product and invalidate the warranty. Do not use abrasive or conductive products such as steel wool.
- Inspect the wiring between probe and controller, and the controller supply wiring.
- Check the controller for damage.
- Reassemble and carry out a full functional check of the equipment.

6. Spare Parts

<u>Stock Code</u>		<u>Description</u>
8801 0000 0007	:	Upper Connector
3210 3000 0004	:	Upper Connector Housing

7. Technical Assistance

For technical assistance or service requests, please directly contact Vira service center by making a phone call or sending an e-mail to servis@viraisi.com.

Return faulty or service items to Vira itself or authorized agency in your area. Ensure all items are suitably packed for transit (preferably in the original cartons).

Where regular tests are carried out properly in a well run boiler house with good water treatment, it may be that only twice or an annual inspection of the probe is required. This inspection programme must be determined by the boiler inspector.

Please provide the following information with any equipment being returned:

- Your name, company name, address and telephone number, order number and invoice and return delivery address.
- Description and the serial number of equipment.
- Full description of the fault or repair required.
- If the equipment is being returned under warranty, please indicate the date of purchase.

The manufacturer reserves the right to make change without prior notification.

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