On-Off Level Control Probe

SD 2400

Installation and Operating Instructions

EN

English

NOTES

CONTENT

1. SAFETY INFORMATION

Installation, commissioning and maintenance of this device must be done by a qualified personnel in compliance with the operating instructions. Otherwise device and related equipments may be damaged and personnel may be injured. 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.

National and local regulations must be taken into consideration.

Warning!

Please make sure to remove the main supply before installation. Otherwise this may cause damage to the product, personal injuries or even death

1.1 Tools

Before starting work, make sure that you have suitable tools and and consumables available.

1.2 Temperature

Let the temperature to cool down after isolation to avoid danger of burns.

1.3 Freezing

Required precautions must be taken at the places where they may be exposed to temperatures below freezing point.

1.4 Lighting

Make sure there is enough lighting, particularly where detailed or tough work is required.

1.5 Pressure

Make sure that any pressure is isolated and safely vented to atmospheric pressure. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.6 Access

Before attempting to work on the product, safe Access must be ensured. If necessary, lifting gear should be used.

1.7 Residual hazards

The external surface of the product may be very hot. If used at the maximum operating conditions according to the specs, the surface temperature of some products may reach temperatures of 239°C.

1.8 Hazardous environment

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

1.9 Suitable 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.

1.10 Hazardous liquids or gases

Be aware of that it cannot be known what may have been in the pipeline at previous usage. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.11 Supervision

All work must be carried out or be 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.

1.12 Disposal

Unless otherwise stated in the Installation and Operation Instructions, this product is recyclable and no ecological hazard.

1.13 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

As steam is generated, the water in the boiler evaporates, and the boiler must be recharged by a supply water to maintain the level by a feed pump. Not to harm the boiler and to make it work efficiently, water must be maintained at the correct level.

Safety has also vital importance. If the boiler operates with insufficient water, there is always the risk of explosion, more severe than a bomb.

For this reason, a level control system is required which monitors and controls the water level, detect if a low water level point is reached, and take required action like sounding an alarm, shutting down the feedwater pump or burner.

For sure, it is recommended to have an external indication like level gauges to see water level by eyes to step in. Another recommendation is to have a secondary level control system in case of any damages on the first one.

An On-Off signal for level control is the most common method of level controlling which is simply to start the feed pump at the low level and let it run until the high water level is reached within the boiler drum.

The SK 2400 Level Controller operates on the conductivity principle for controlling the level in conductive liquids. The Level Controller with Probes are suitable for use with different qualities of liquids such as water, condensate, and boiler water. On-Off Level Control Systems can be used in water with an electrical conductivity as low as 10 µS/cm at 25 ˚C.

With On-Off Level Control System, Level Probes detects the water level of the boiler and therefore, the integrated level controller starts or stops the feedwater pump (Figure 1). Besides, two alarm relay outputs can be provided.

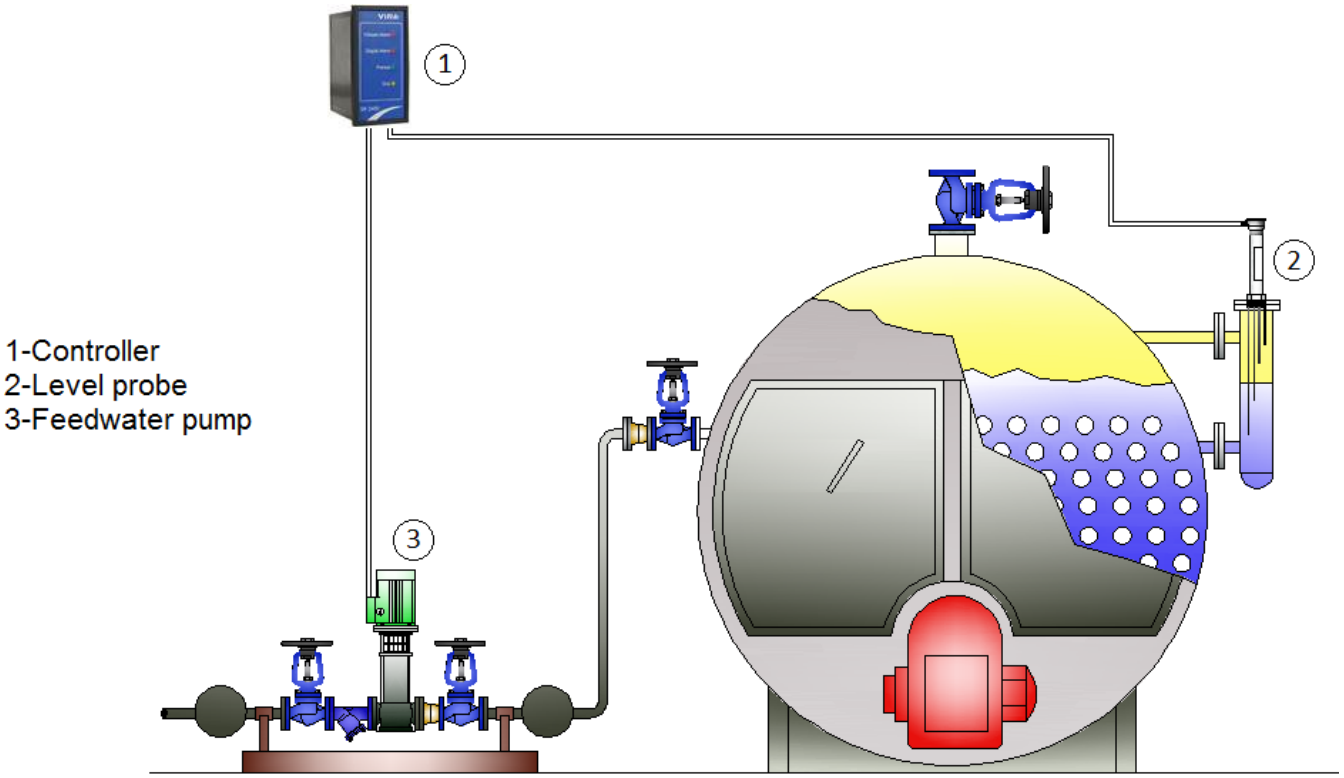


Figure 1: On-Off Level Control System Application

3.TECHNICAL SPESIFICATIONS

SD 2400 Level Probe has 4 electrodes. Each electrode can be cut out at desired lengths to give alarm and pump control signals at desired water levels.

Max. operating pressure : 32 bar g

Nominal pressure : PN 40

Max. operating temp. : 239 °C

Max. ambient temp. : 70 °C

Min. conductivity value : 10 µS/cm (at 25 °C)

Connections : 1'' BSP Screwed

Wiring : 5x1 mm^2 screened cable

Electrode lengths : 500, 1000, 1500 mm

Weight : 1.5 kg

Installation : Vertical

Materials

Socket : Polyamid

Probe Body : Stainless Steel

Electrodes : Stainless Steel

Insulation : PTFE

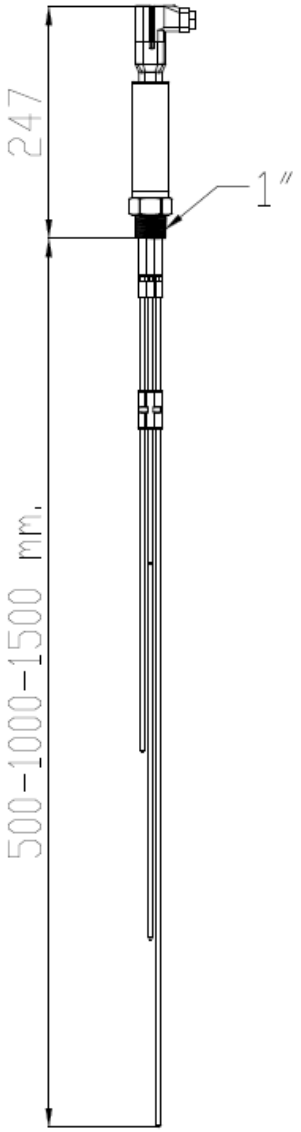
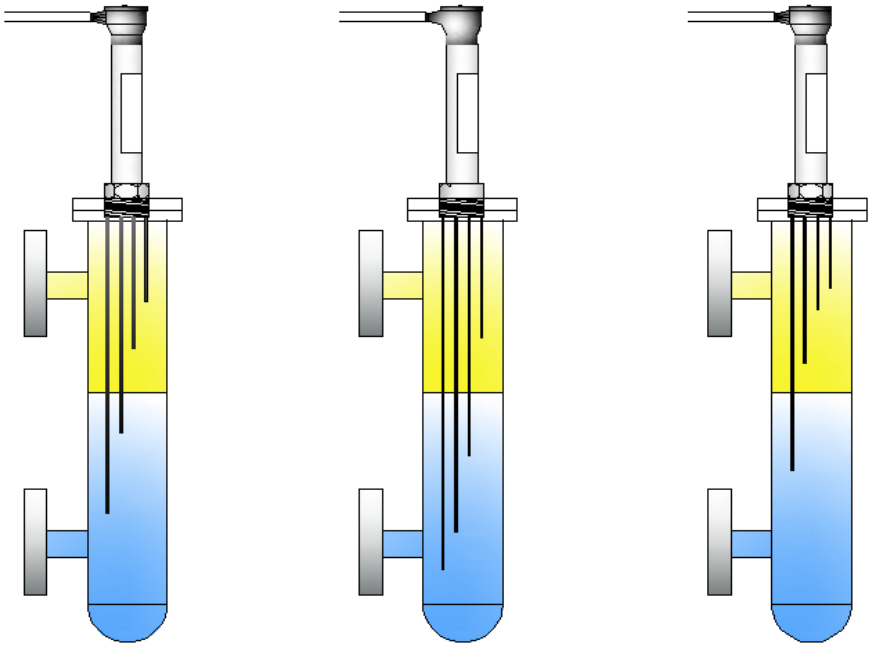


Figure 2: SD 2400 Level Probe

4. INSTALLATION AND WIRING

4.1 Cutting the Electrodes

Each electrode's function must be determined and electrode lengths must be measured carefully.



High Alarm	Pump Off	1st High Alarm
Pump Off	Pump On	2st High Alarm
Pump On	1st Low Alarm	Pump Off
Low Alarm	2st Low Alarm	Pump On

Figure 3: Various Alarm and Pump On-Off Levels that can be Applied by Cutting Electrodes

Electrodes can be cut by using bar shears or grinder machine. After cutting, burrs that occur while cutting should be cleaned.

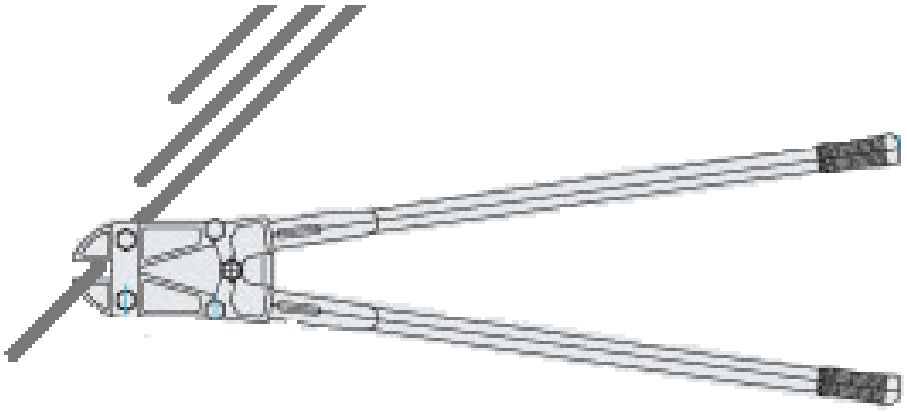


Figure 4: Cutting of electrodes by using bar shears

There are numbers where electrodes are joined to probe body. Please note the numbers and related functions (alarm and pump functions) to the table below.

Function	Selected Function	Electrode Number
1st Alarm		**1**
Pump Off		**2**
Pump On		**3**
2nd Alarm		**4**

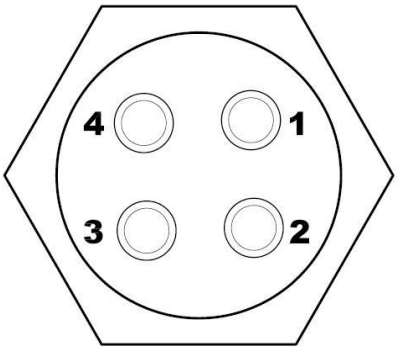


Figure 5: Electrode numbers on the probe body

4.2. Installation

It is possible to mount SD 2400 Level Probe to the boiler with two different ways.

4.2.1. Installation to Level Tube

While installation, teflon band or sealing gasket must be used on screwed part to provide impermeability.

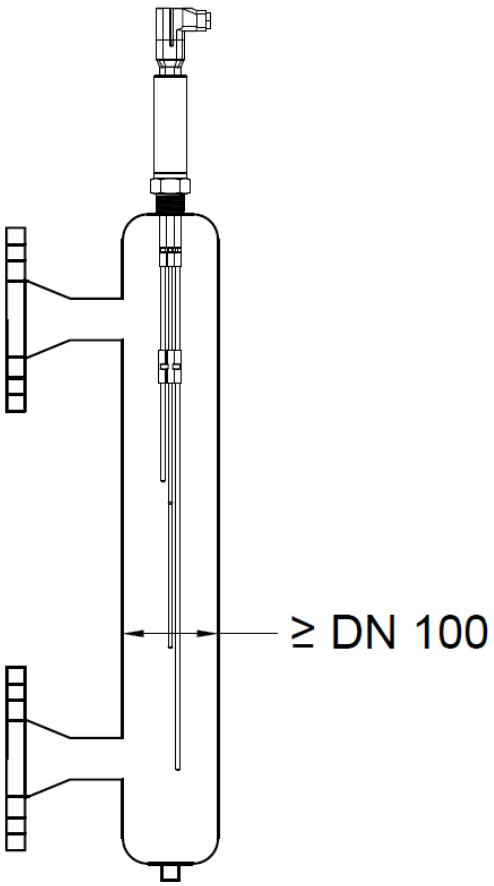


Figure 6: Installation of SD 2400 Level Probe to Level Tube

4.2.2. Installation to Protection Tube

While installation, teflon band or sealing gasket must be used to provide impermeability.

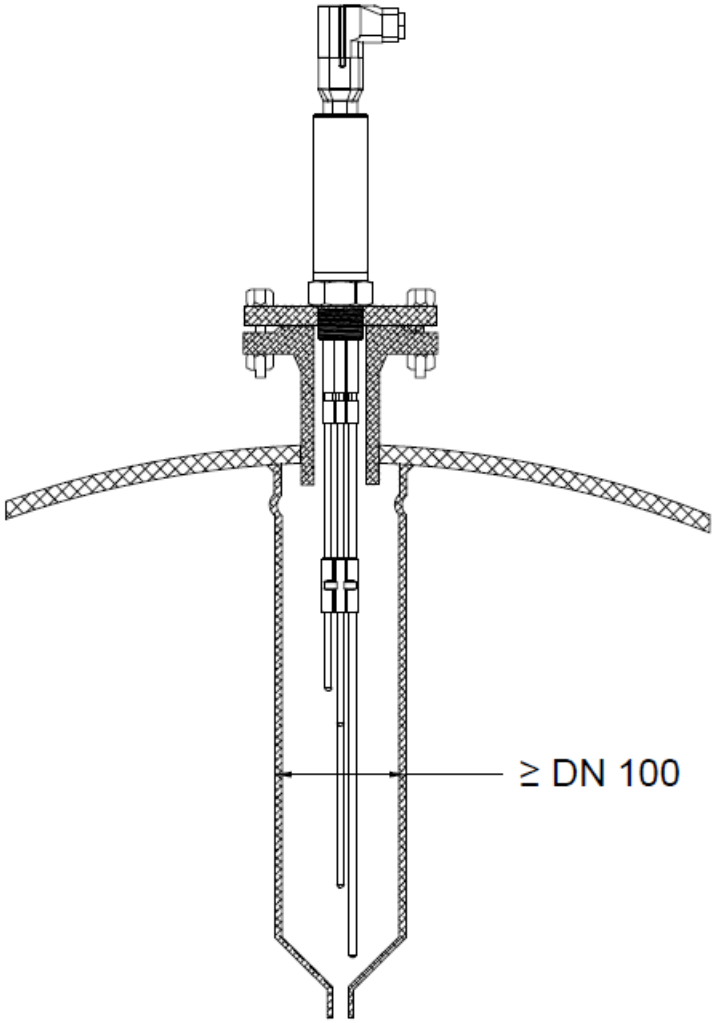


Figure 7: Installation of SD 2400 Level Probe to Protection Tube

If necessary, two probes can be installed to same protection tube with sufficient clearance between the electrodes.

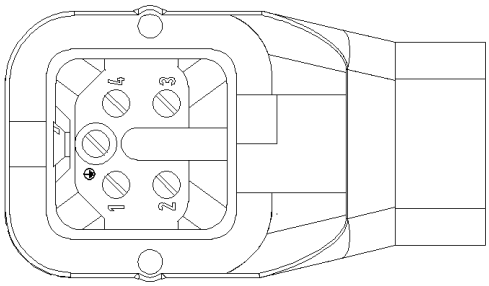
4.3 Wiring

Important!

Make cable connections after installation. Otherwise it is impossible to do installation because of connected cables.

5x1 mm2 screened (shielded) cable can be used for wiring.

Cables between controller and probe must not be spanned with high voltage cables and must not be placed to same cable conduit.



Remove the screw on the cable connection socket and open the cover. Make cable connections like in Figure 9. Connect cable screen (shield) to only probe side using 5th terminal. **Left the controller side of the screen unconnected.**

Figure 8: Cable connection socket of SD2400 Level Probe

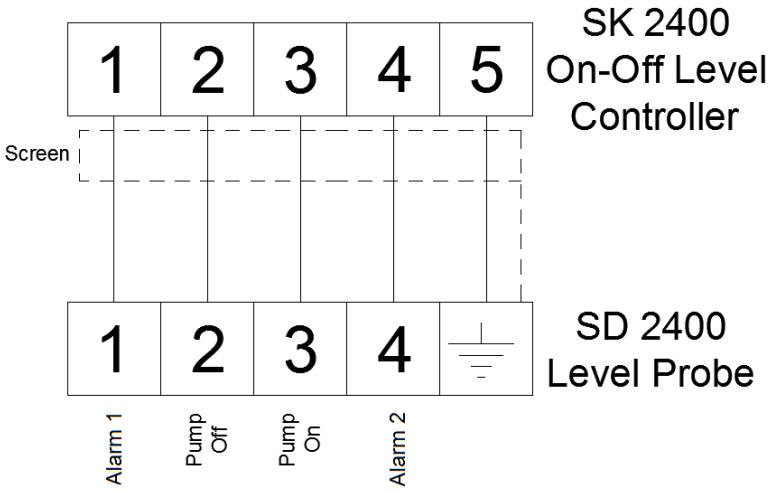


Figure 9: Cable connections between SD 2400 Level Probe and SK 2400 On-Off Level Controller

5. COMMISSIONING

- Check impermeability of probe after installation.
- Be sure that phase and neutral ends are connected to right terminals on both probe and controller.
- Take boiler water level into determined levels and check that alarm relay outputs and pump on-off functions are working properly.

6. MAINTENANCE

Warning!

Before unmount the level probe, boiler pressure must be reduced to atmospheric pressure (0 bar g) and boiler temperature must be at a safe level.

Do not unmount the probe before disconnect the cables. Otherwise cables may be damaged.

Level probe must be unmounted approximately 6 month periods and the probe must be checked. If necessary, electrodes must be cleaned gently.

It is recommended to make function tests regularly.

When any fault situation occurs or maintenance is necessary, please contact with "**Vira Isı Service Department**".

Vira Isı ve Endüstriyel Ürünler A.Ş.

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