On-Off Level Control Controller

SK 2400

Installation and Operating Instructions

EN

English

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 feedpump. Not to harm boiler and to make it working 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, 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 secondary level control system in case of any damages on first one.

An On - Off signal for level control is the most common method of level controlling which is simply to start the feedpump 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 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 boiler and therefore, the integrated level controller starts or stops the feedwater pump (Figure 1). Besides, two alarm relay outputs can be provided.

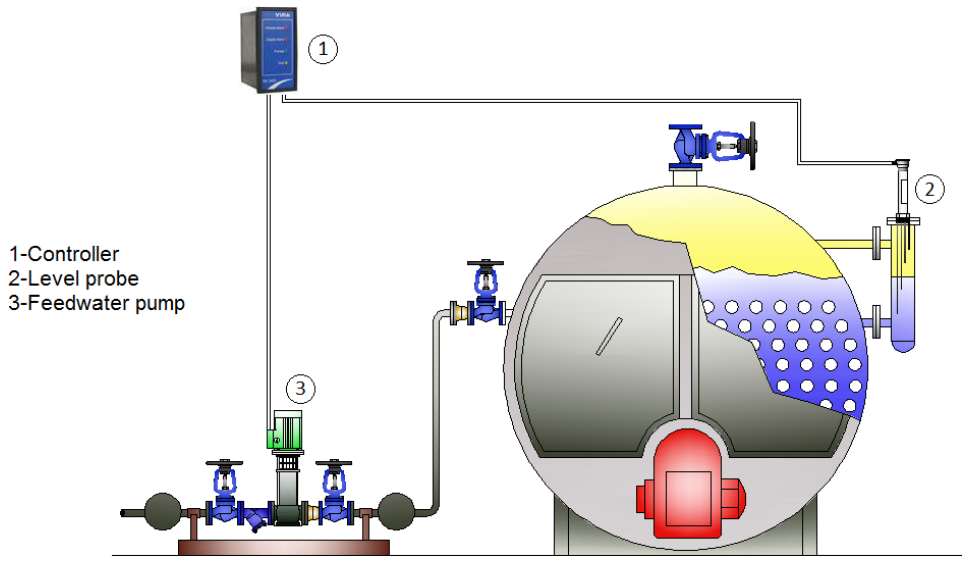


Figure 1: On-Off Level Control System Application to a Steam Boiler

2.2 Approvals

The SK2400 complies with Electromagnetic Compatibility Directive and all its requirements. This product is suitable for industrial environments. A fully detailed EMC assessment has been made and has the reference number A 0442 21140 00 EY.

The SK2400 complies with the Low Voltage Directive (2014/35/EU) by meeting the standards of:

- EN 61010-1: 2010 safety requirements for electrical equipment for measurement, control, and laboratory use.

3.TECHNICAL SPESIFICATIONS

Enclosure	: IP 54
Maximum ambient temperature	: 55 °C
Maximum wire length	: 100 m (Controller to probe)
Main supply voltage	: 220/230 V
Frequency	: 50/60 Hz
Maximum power consumption	: 1 VA
Dimensions (height x depth x width)	: 144 x 110 x 72 mm
Weight	: 0.5 kg

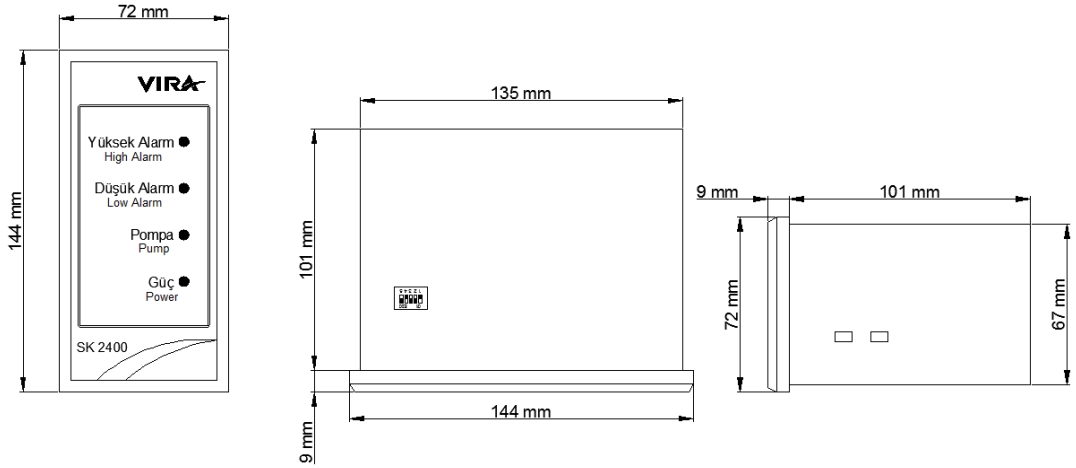


Figure 2: On-Off Level Controller SK 2400 Case Dimensions

4. INSTALLATION AND WIRING

4.1 Installation

SK 2400 On-Off Level Controller is front panel mounting enclosure type and can be applied to the front panel with two screw clamps supplied. Allow 20 mm minimum clearance all round the unit for air circulation.

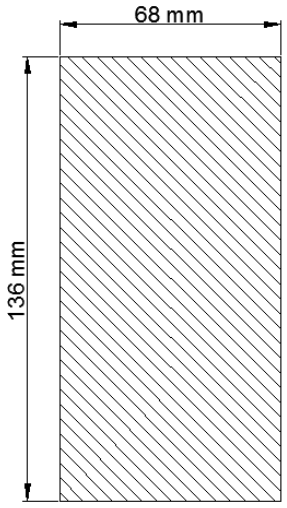


Figure 3: Panel Cut Out Dimensions of SK 2400 On-Off Level Controller

4.2 Wiring

For wiring of probe 5x1 mm2 screened (shielded) cable, for other wirings 1 mm2 normal cable can be used.

Avoid changing terminal blocks places.

There are phase inputs between 6th and 16th terminal connections of the controller. So, from 1st to 8th terminal connections must not connect to from 9th to 16th terminal connections or vice versa. Otherwise, device can be damaged even it causes personal injuries.

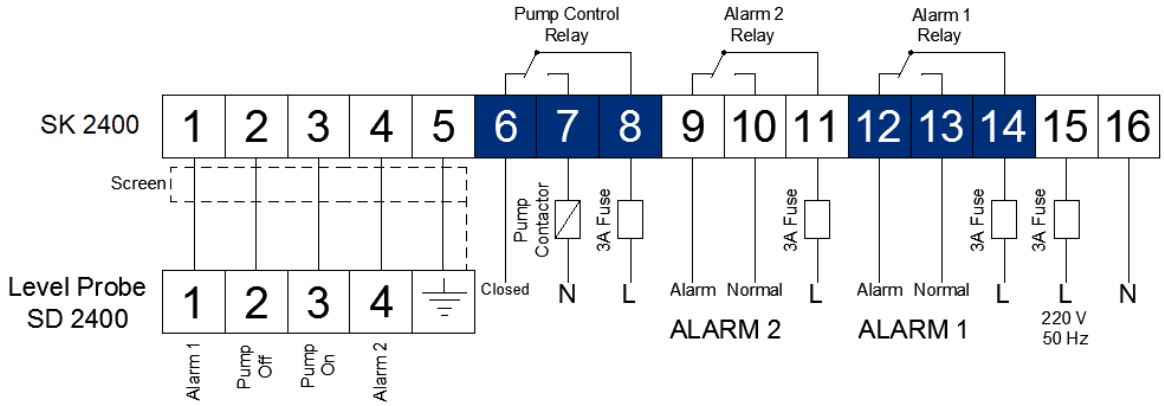


Figure 4: SK 2400 On-Off Level Controller Electrical Wiring Diagram

Warning!

At the all phase inputs of the controller, must be used 3A fuse (non-delay type).

Probe cable screen (shield) must be connected to GROUND terminal only. (Figure 4) Controller side of the screen must be left unconnected.

Avoid connecting any other earth to 5th terminal input and must not connected with the other earth on the clipboard.

Note: For wiring of SD 2400 Level Probe, please refer to "**SD 2400 Level Probe Installation and Operating Instructions**".

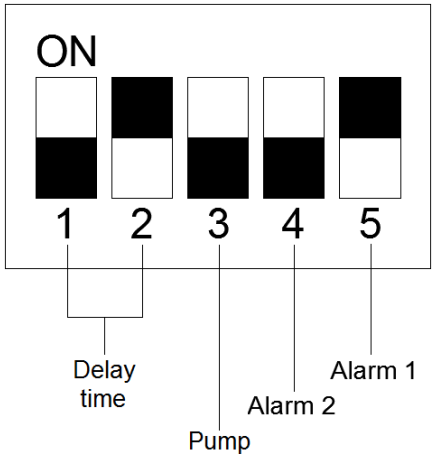
5. COMMISIONING

- Be sure that all function values are adjusted with DIP switches correctly.
- Be sure that all phase and neutral ends are connected to the right terminals.
- Boiler water must be taken into determined levels then it must be checked that alarm, pump in and pump out functions are working correctly.

6. FUNCTIONS and CONFIGURATIONS

With the DIPSWITCH, the following functions can be selected

- Turbulence filter time (Alarm Delay Time)
- Pump functions
- Alarm functions



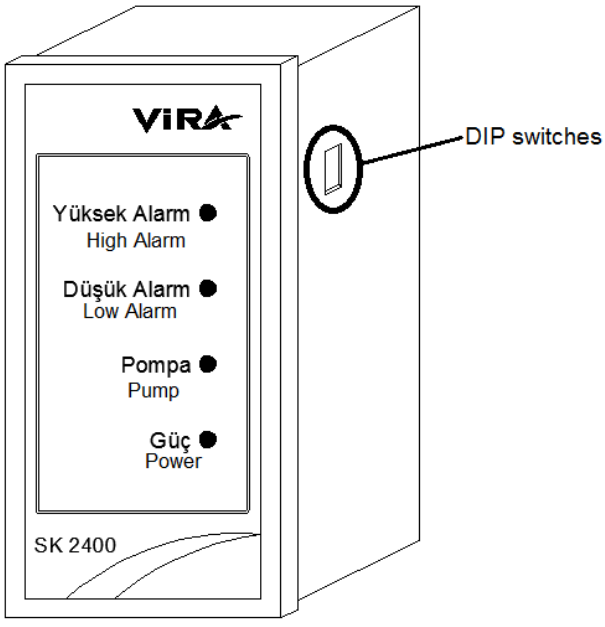


Figure 5: Functions Selection DIP Switches of SK 2400 On-Off Level Controller

6.1 Turbulence Filter Time (Alarm Delay Time)

Inside the boilers and tanks, water fluctuates. Therefore, level controller probe cannot detect water level properly. To prevent this, turbulence delay time must be adjusted before commissioning. In Figure 6, DIP switch positions and related delay times are shown. After the adjustment, controller's supply power must be cut and on again.

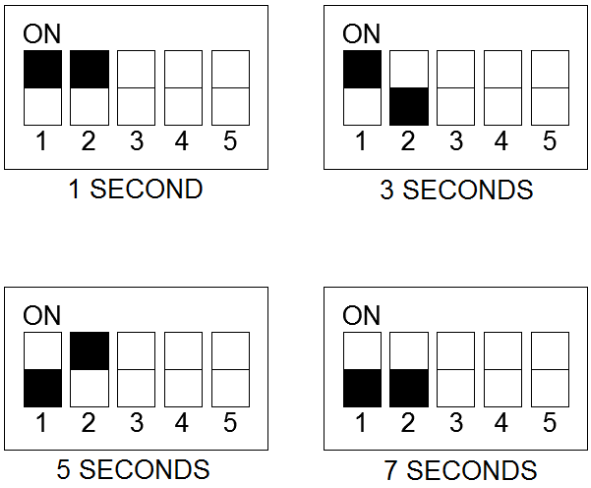


Figure 6: Turbulence Delay Time DIP Switch Positions

6.2 Pump In and Out

Pump in and out function of the boiler and tank can be adjusted like the following Figure 7.

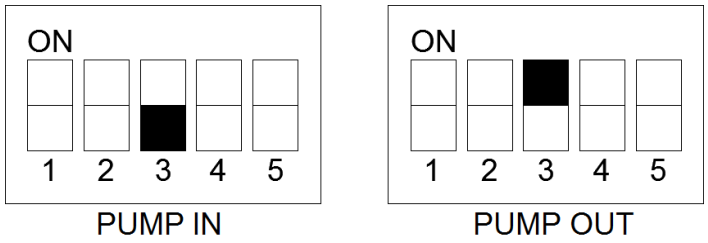


Figure 7: Pump In and Out Function DIP Switch Positions

6.3 2nd Alarm

2nd alarm function can be adjusted with DIP switches as high or low like the following Figure 8.

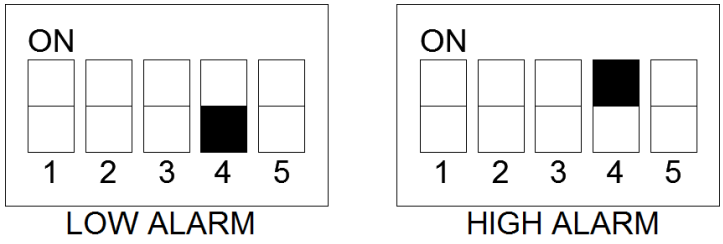


Figure 8: Low and High Alarm Function DIP Switch Positions of 2nd Alarm

6.4 1st Alarm

1st alarm function can be adjusted with DIP switches as high or low like the following Figure 9.

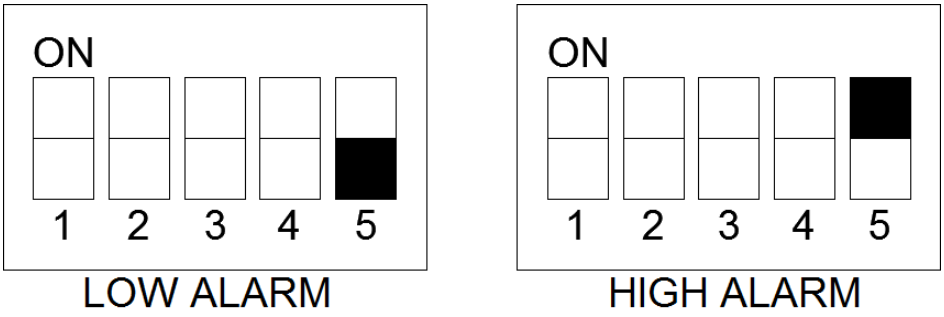


Figure 9: Low and High Alarm Function DIP Switch Positions of 1st Alarm

6.5 Factory Default Settings

Turbulence delay time : 5 seconds

Pump : Pump in

1st Alarm : High Alarm

2nd Alarm : Low Alarm

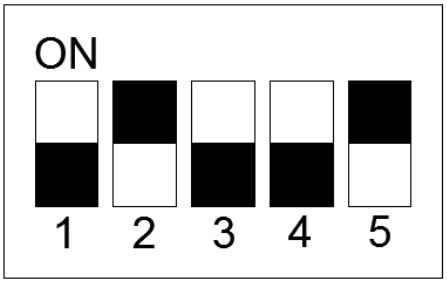


Figure 10: Factory Default Settings DIP Switch Positions of SK 2400 On-Off Level Controller

7. TROUBLESHOOTING

Most faults that occur on commissioning are due to incorrect wiring or setting up. In the case of problems the following checklist may be helpful.

Symptom	Solution
No leds lit.	Check mains power supply.
High or low water alarm lit when water is at normal working level.	Check DIP switch selection for alarm function.
Low water alarm lit, pump continues to run after pump off position.	Check probe screwed connection is correctly earthed.
Pump not operational over normal working range.	Check DIP switch selection for pump function.

8. MAINTENANCE

Warning!

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

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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