On-Off Level Controller

SK-T 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-T-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.

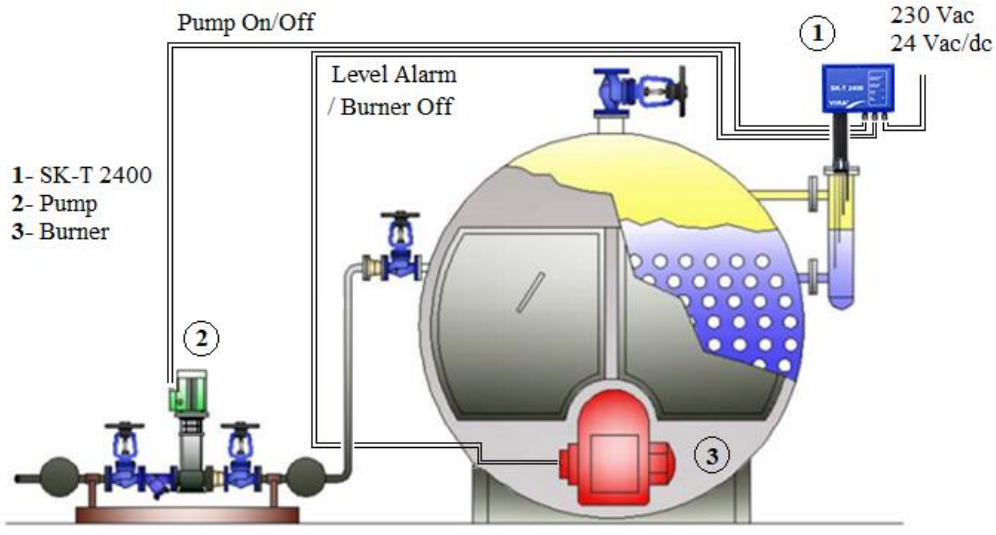

Figure 1: On-Off Level Control System Application

3.TECHNICAL SPESIFICATIONS

Protection Class	: IP 65	**Socket**	: Polyamid
Maximum Ambient Temp.	: 70 °C	**Probe Body**	: Stainless Steel
Operating Frequency	: 50/60 Hz	**Insulation**	: PTFE
Max. Power Supply	: 2 VA	**Nominal Pressure**	: PN 40
Max. Operating Press.	: 32 bar g	**Connection**	: 1'' BSP Screwed
Max. Operating Temp.	: 239 °C	**Installation**	: Vertical
Max. Ambient Temp.	: 70 °C		
Min. Conductivity Value	: 10 µS/cm (at 25 °C)		
Wiring	: 5x1 mm^2 screened cable		
Prob Length	: 500, 1000, 1500 mm		
Main Supply	: 230 VAC (+5% /- 10%)		

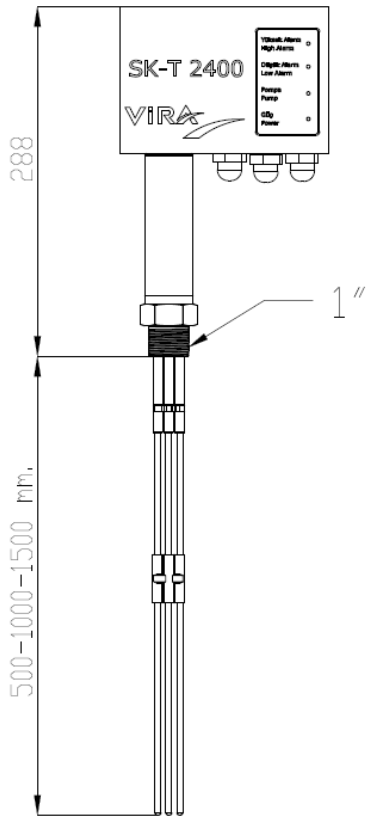

Figure 2: SK-T 2400 Sizes

4. INSTALLATION AND WIRING

4.1 Installation

The On-Off Level Control System can be used in the following different applications.

High Alarm	Pump Off	1. High Alarm
Pump Off	Pompa On	2. High Alarm
Pump On	1. Low Alarm	Pump Off
Low Alarm	2. Low Alarm	Pump On

The function of each of the probe sticks should be determined as desired above and the levels at which it will be cut must be carefully identified and marked.

4.1.1. Installation to Level Tube

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

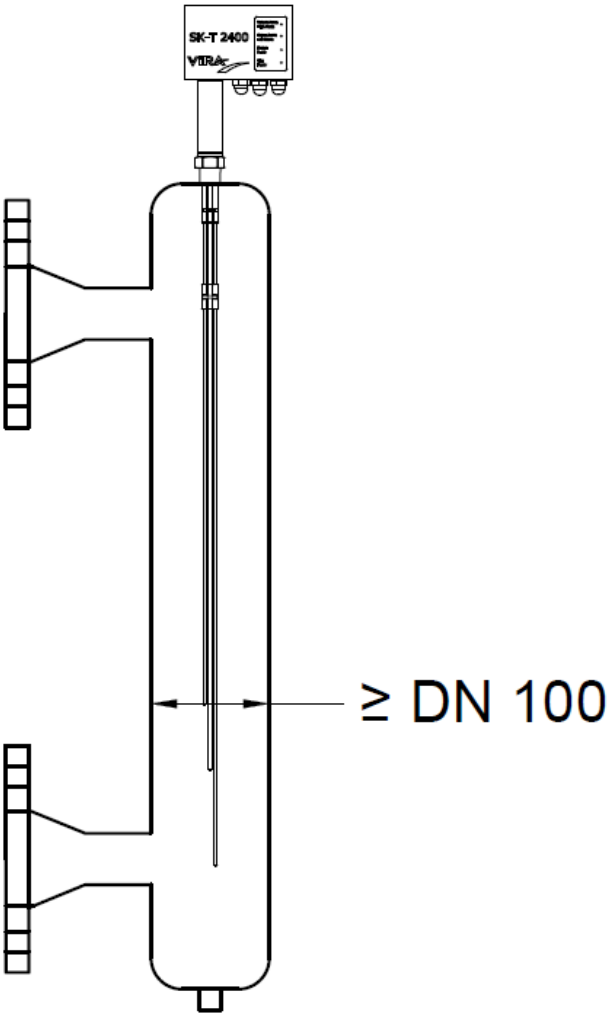

Figure 3: Installation of SK-T 2400 to Level Tube

4.1.2. Installation to Protection Tube

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

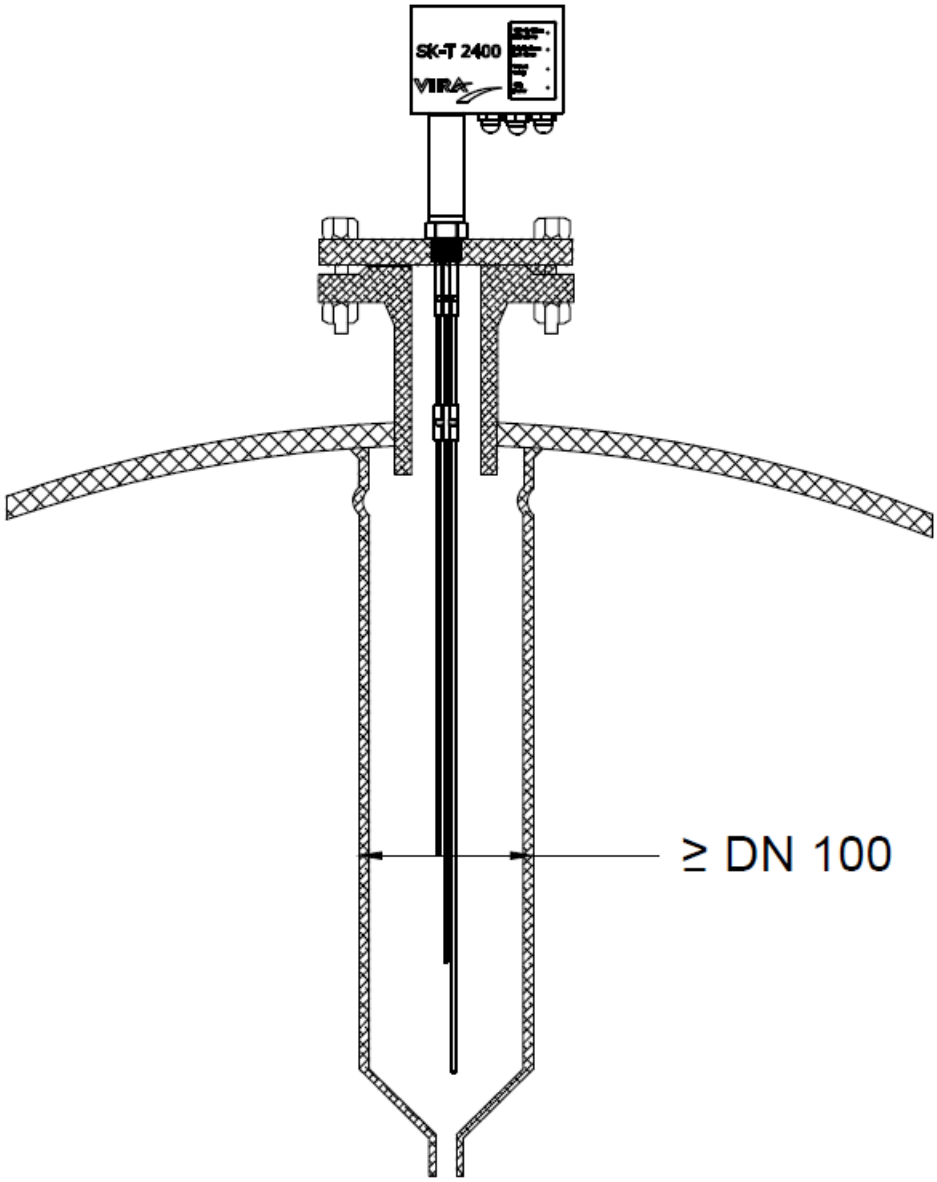

Figure 4: Installation of SK-T 2400 to Protection Tube

4.2 Cutting the Electrodes

Probe rods whose lengths are fixed can be cut by grinding machine or iron cutting scissors. After cutting, the burrs on the rod ends should be removed and corrected. Rods should not be cut by bending or twisting.

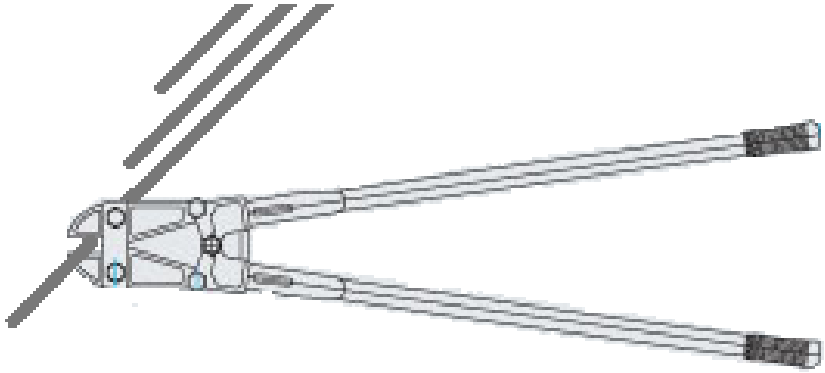

Figure 5: Cutting the Electrodes by Iron Cutting Scissor

The functions of the electrodes according to the numbers on the bottom of the probe body, should be noted in the table below.

Information on which function will perform which wiring in later wiring can be obtained from this table.

Functions	Selected Function	Electrode Number
Alarm 1		1
Pompa Off		2
Pompa On		3
Alarm 2		4

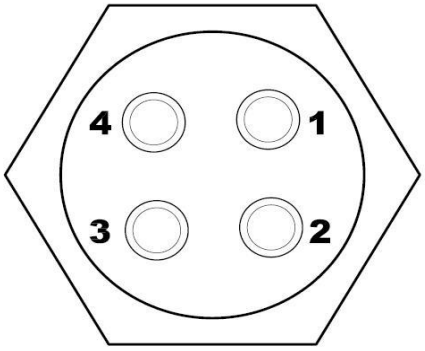

Figure 6: Electrode Numbers on the Body

Level Probe the SD 2400 has 4 level detection electrodes. Each electrode is cut to lengths to signal at the desired levels.

4.3. Wiring

Device front cover screws (6 pcs) are removed.

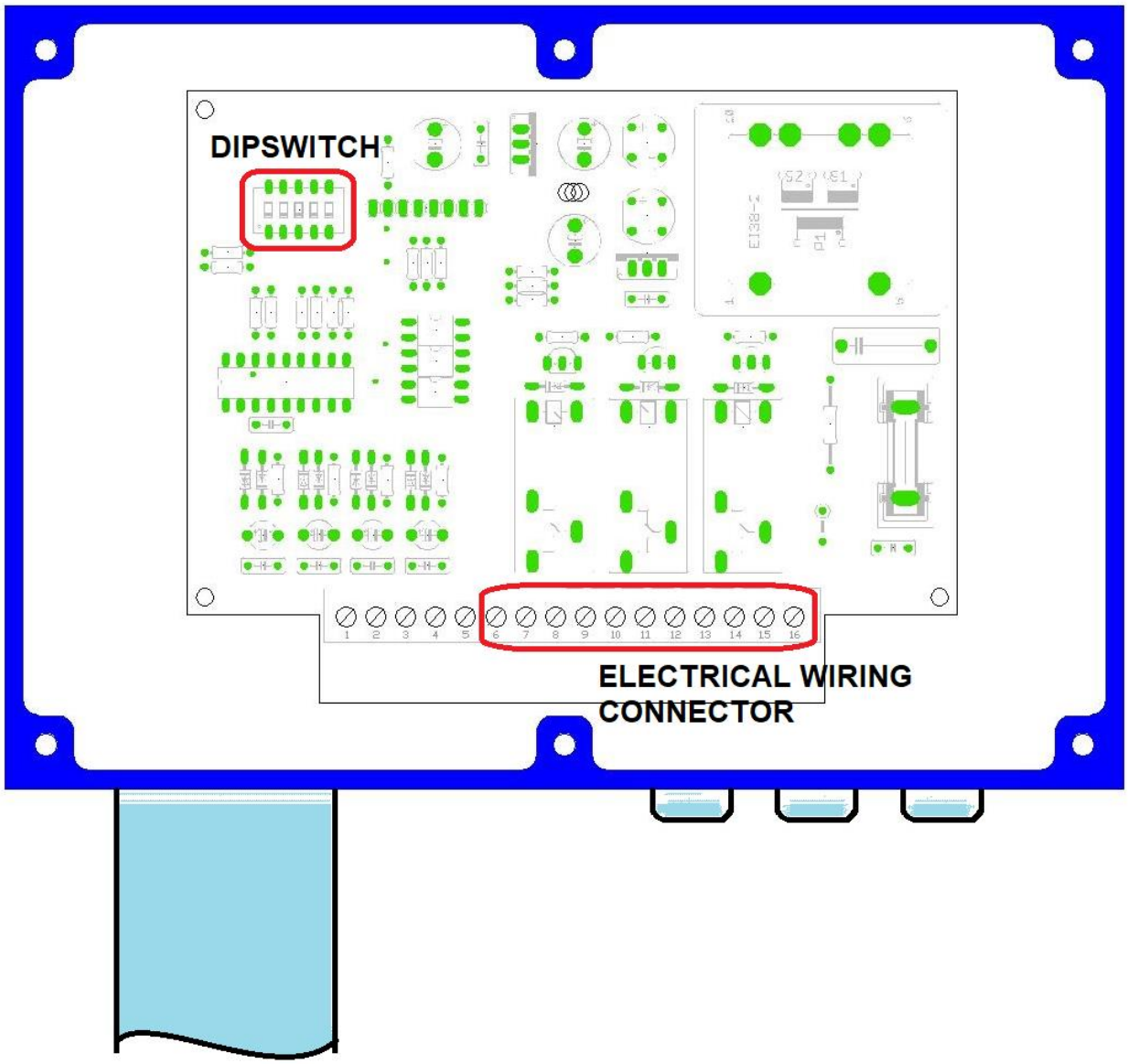

Figure 7: SK-T 2400 Electrical Wiring Connectors and Dipswitch for Function Selection

For electrical wiring of SK-T 2400 controller, 1 mm^2 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 5th terminal connections must not connect to from 9th to 16th terminal connections or vice versa. Otherwise, device can be damaged even it may cause personal injuries.

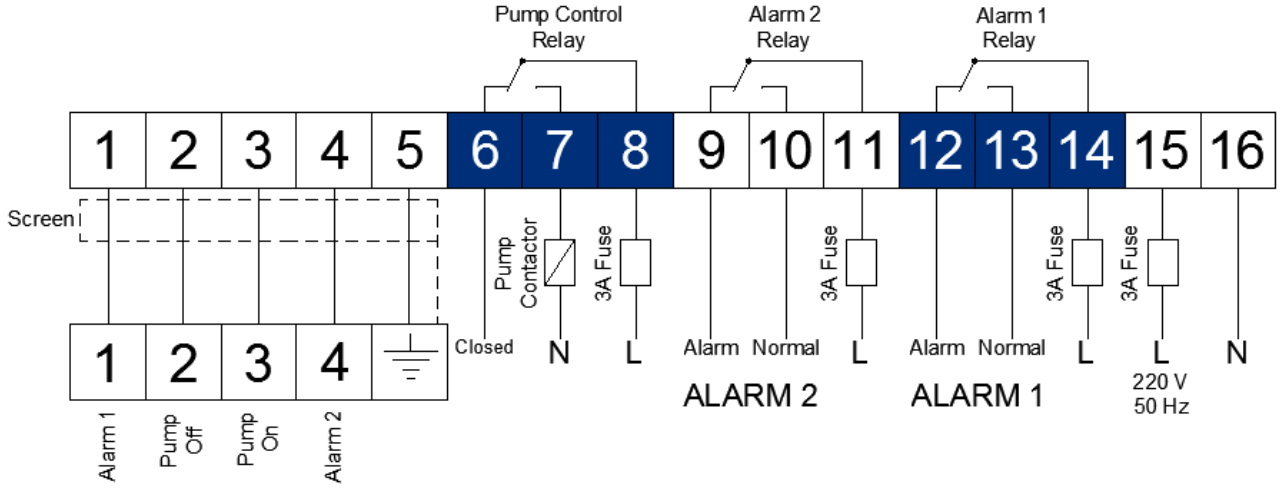

Figure 8: SK-T 2400 On-Off Level Controller Wiring Diagram

Warning!

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

5. COMMISIONING

- Assure that all function values are adjusted with DIP switches correctly.
- Assure 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

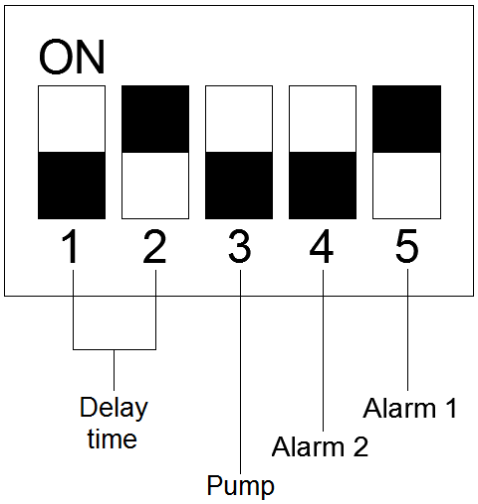

Figure 9: SK-T 2400 DIP Switch Functions

With the DIPSWITCH, the following functions can be selected

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

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 10, DIP switch positions and related delay times are shown. After the adjustment, controller's supply power must be cut and on again.

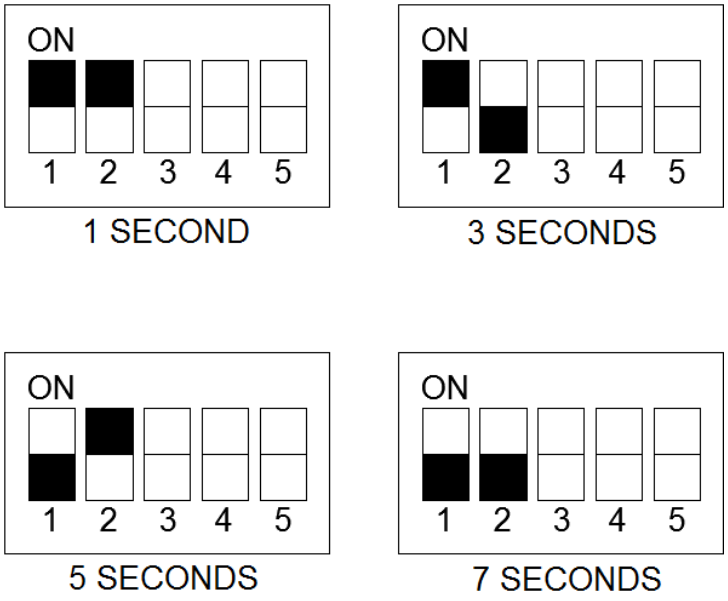

Figure 10: Turbulence Delay Time DIP Switch Positions

6.2. Pump In and Out

Pump in and out function of the boiler and tank can be adjusted like the following Figure 11.

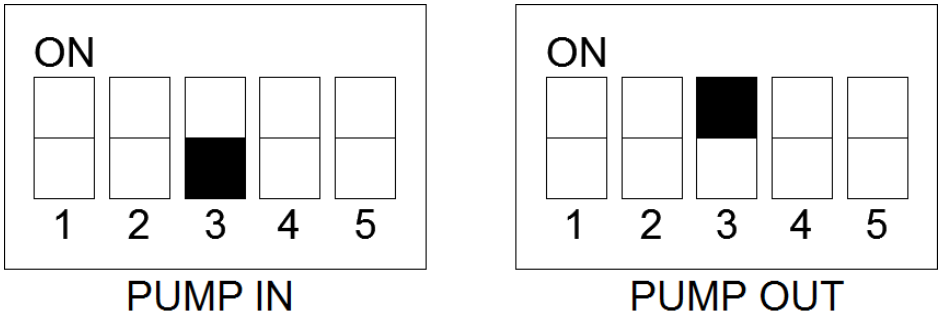

Figure 11: Pump In and Out Function DIP Switch Positions

6.3. 2nd Alarm

2nd alarm function can be adjusted with DIP switches as high or low like the following Figure 12.

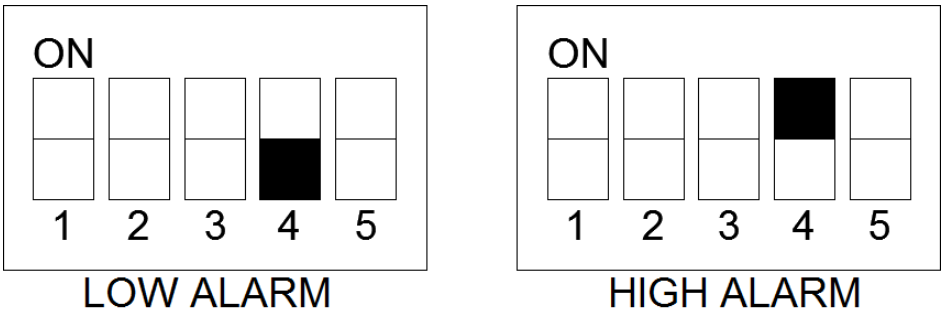

Figure 12: Low and High Alarm Function DIP Switch Positions of 2nd Alarm

6.4. 1st Alarm

1st alarm function can be adjusted with DIP switches as high or low like the following Figure 13.

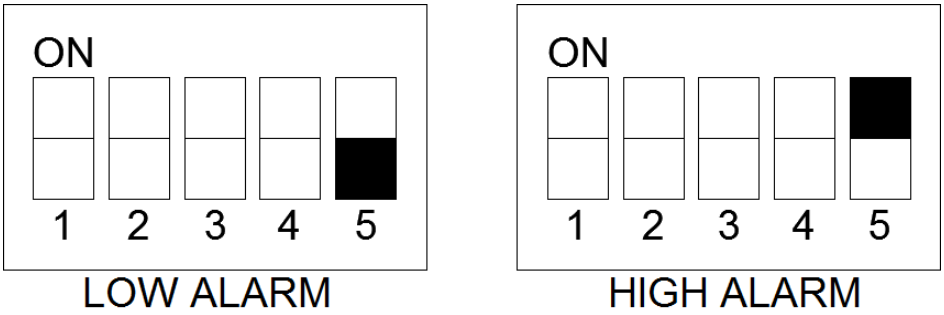

Figure 13: Low and High Alarm Function DIP Switch Positions of 1st Alarm

6.5. Factory Default Settings

Turbulence delay time : 5 seconds

Pump : Pump in

1st Alarm : High Alarm

2nd Alarm : Low Alarm

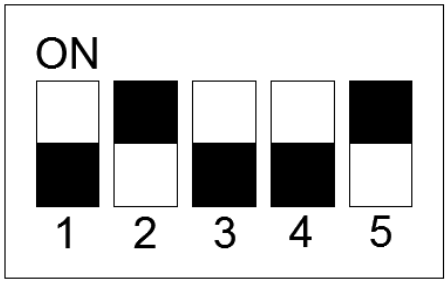

Figure 14: Factory Default Settings DIP Switch positions of SK 2400 On-Off Level Controller

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.

Metal İş Sanayi Sitesi 11. Blok No: 37-39

İkitelli / İSTANBUL

Tel : 0 212 549 57 70

Fax : 0 212 549 48 58

E-mail : info@viraisi.com

: servis@viraisi.com

Web : www.viraisi.com