

Level Control Probe (4-20 mA Current Transmitter)

SD-AY 420A

Installation and Operating Instructions

EN

English

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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 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 INFORMATIONS

2.1 Description

As steam is generated, the water in the boiler evaporates and water must be added with a feedwater pump to maintain the level of the boiler. Water should be kept at the right level to avoid damaging the boiler and to ensure efficient operation.

For this reason, a level control system that monitors and controls the water level detects whether the water level is low and gives an alarm, performs the necessary actions to shut off the feedwater pump or burner.

It is recommended to have an external indicator, such as level gauges, to see the water level step by step. Another suggestion is to have a secondary level control system in case of damage to the former.

SD-AY420 Level Transmitter operates according to the capacitance measurement principle.

Proportional to the water level in water tanks and boilers, a standard analog signal for automation systems generate 4-20mA DC current. It provides a current of 4 mA for the set minimum level and 20 mA DC for the set maximum value. The level transmitter helps to indicate the level of the liquid in the tank or boiler both as a percentage and 4-20 mA analog signal.

There are 3 buttons which are 2 red and 1 green LEDs on the device that are used for adjustment during commissioning.

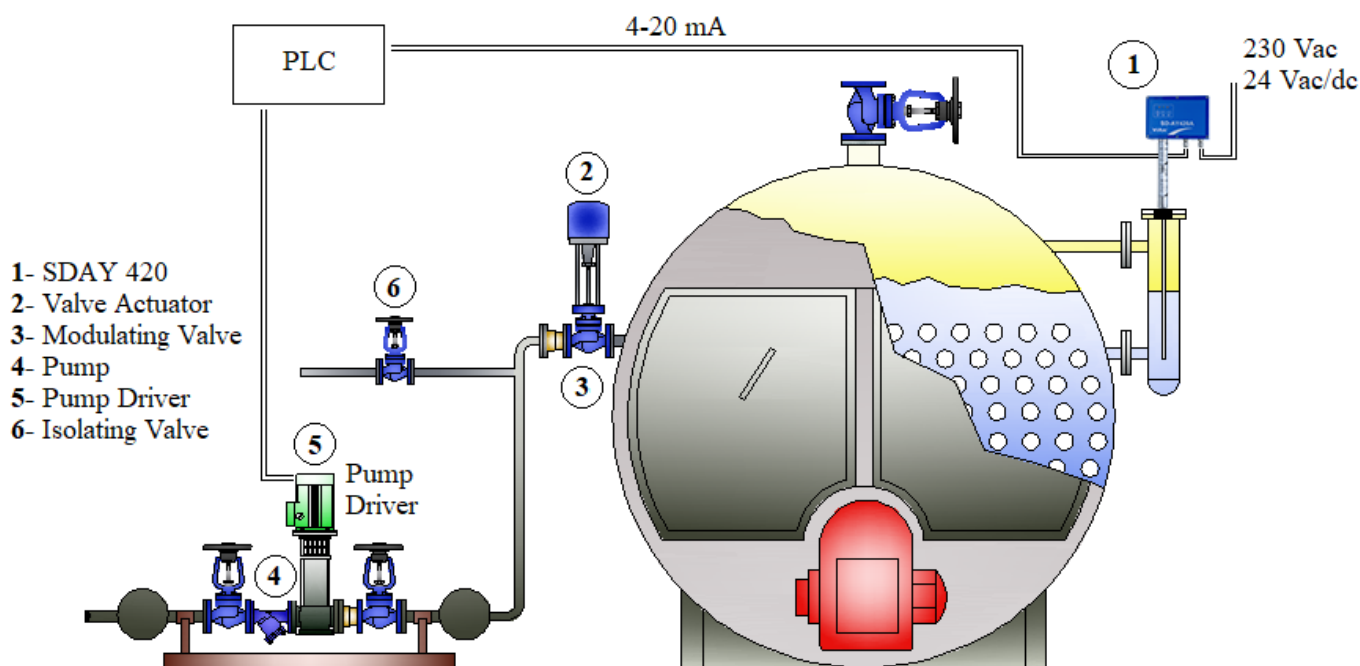


Figure 1: Connection of a Modulating Level Probe (SDAY 420) to a Steam Boiler

3. TECHNICAL SPECIFICATIONS

Connection	: ½" BSP Screwed
Probe Length	: 300 – 1500 mm
Nominal Pressure	: PN 40
Max. Operating Pressure	: 32 bar g
Max. Operating Temperature	: 239°C
Sensor Type	: Capacitive
Output	: 4-20 mA Analog Modulating
Main Supply	: 230 VAC (+5% /- 10%), (Optional:24Vdc)
Frequency	: 50/60Hz
Ambient Temperature	: 0-70 °C

Note: Probe length and supply voltage must be specified in order.

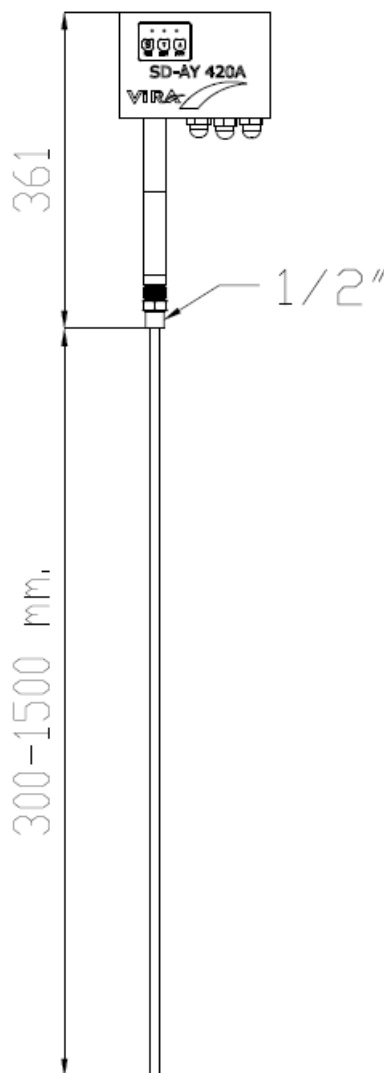


Figure 2: SD-AY420A Level Probe Dimensions

4. INSTALLATION AND WIRING

4.1 Installation

4.1.1 Installation with Level Tube

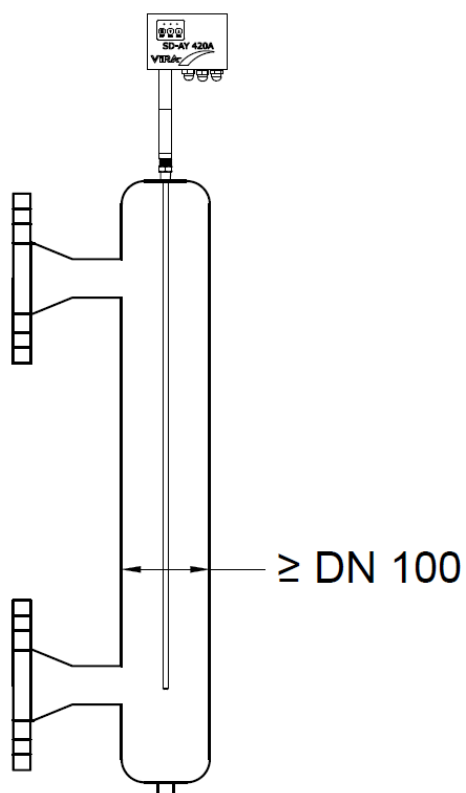


Figure 3: Installation of Level Tube.

4.1.2 Installation with Protection Tube

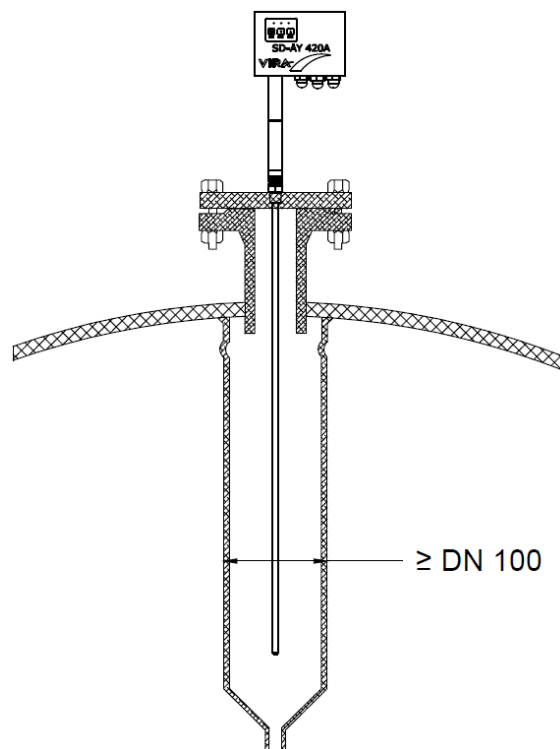
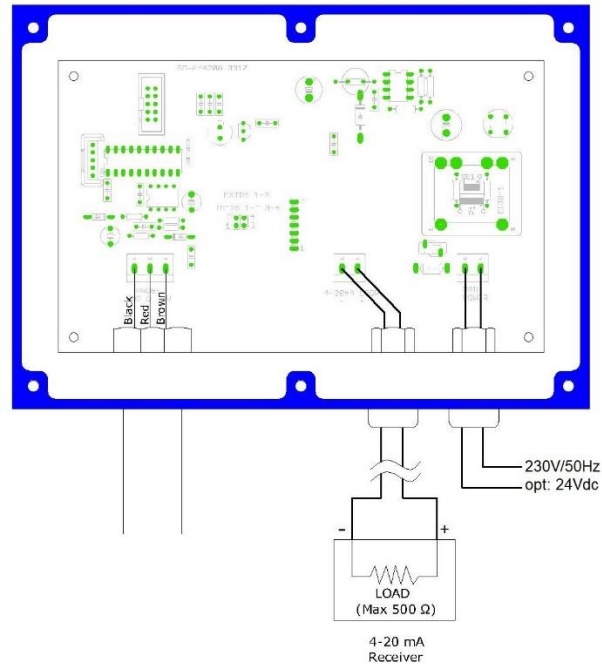


Figure 4: Installation of Protection Tube.

4.3 Wiring

4.3.1. ANSI/ISA Akim Transmitter Type IV – 2 Wire Circuit

In this circuit, there is no need for an external 24Vdc supply for the 4-20mA current loop. The circuit power supply is internal.



Şekil 5: Electrical Wiring Diagram

4.3.2. ANSI/ISA Akim Transmitter Type II – 2 Wire Circuit

In this circuit, 4-20mA current circuit should be supplied with 24Vac / dc.

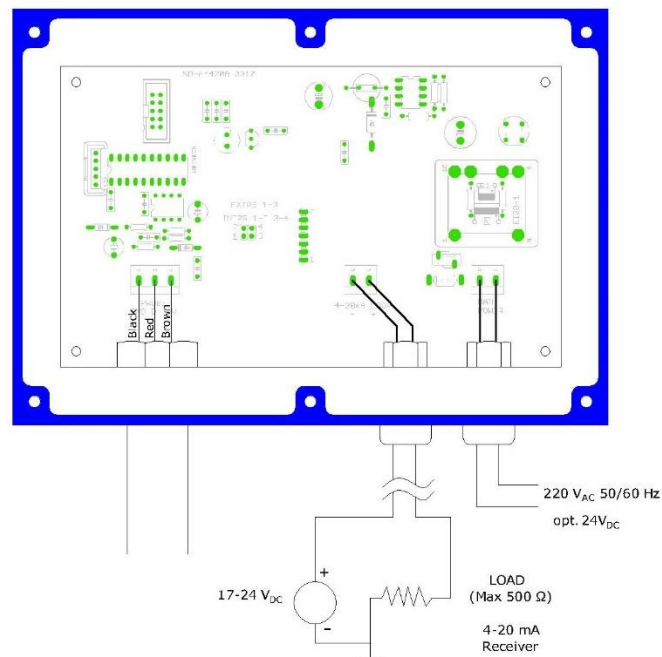
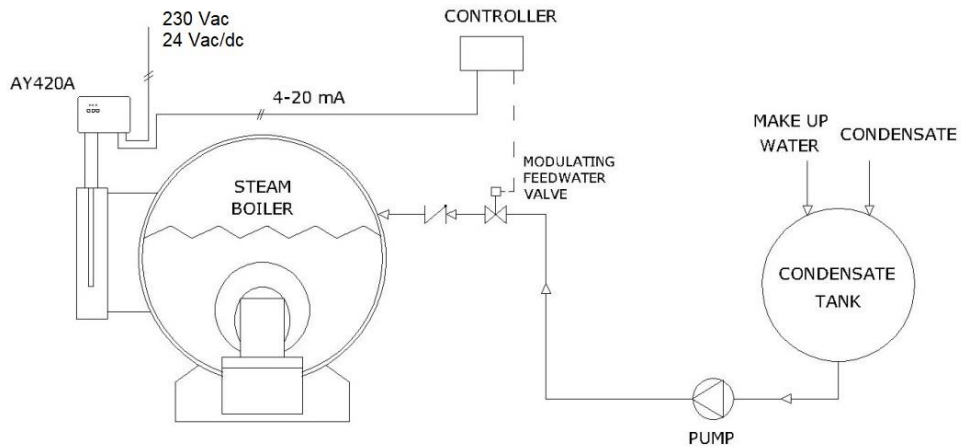


Figure 6: Electrical Wiring Diagram 2

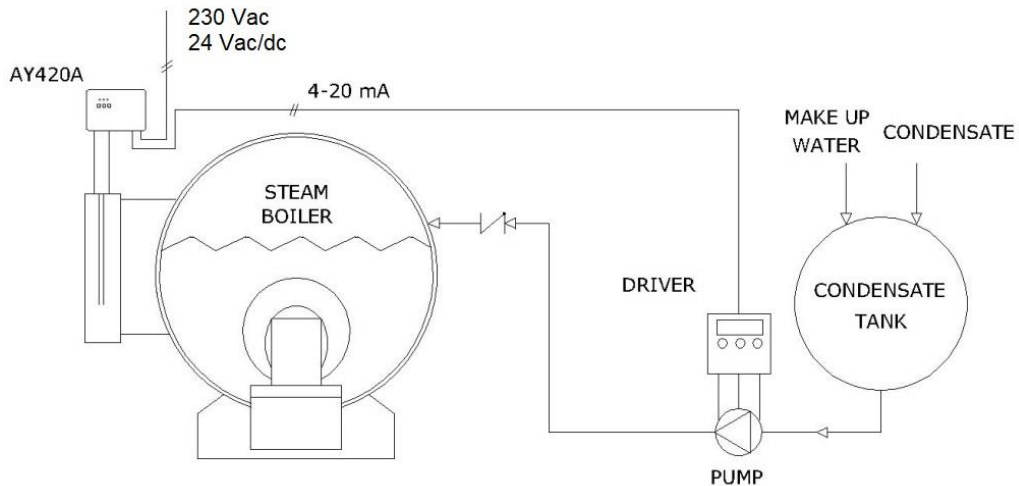
7. MANNER of APPLICATION

7.1 Modulating Valve Control with a Suitable Controller



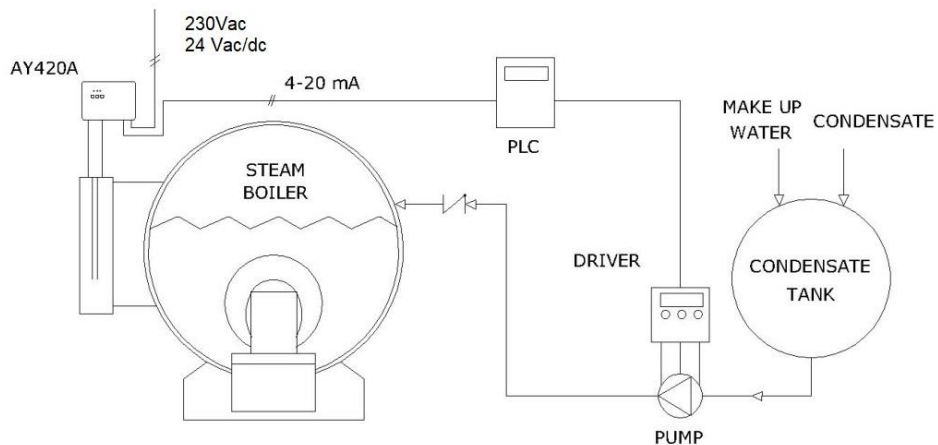
Şekil 7: Modulating Valve Control by a Suitable Controller

7.2 Pump Control Using Direct Drive Inverter



Şekil 8: Pump Control by the Driver

7.3 Pump Control by PLC



Şekil 9: Pump Control by PLC

6. FUNCTIONS AND CONFIGURATIONS

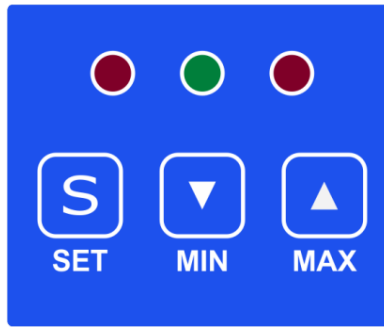


Figure 10: Buttons and LEDs for Settings

The SD-AY420A can be adjusted to output between 4-20 mA for liquid levels easily.

Adjusting Lower Measuring Point (4 mA):

- a. Fill boiler or vessel with liquid until lower measuring point is reached.
- b. Press and hold (**SET- S**) button for 6 second until the left red LED lights up and other 2 LEDs go out.
- c. Press and hold (**Min**) button for 2 seconds.

Adjusting Upper Measuring Point (20 mA):

- a. Fill the boiler or vessel with liquid until upper measuring point is reached.
- b. Press and hold (**SET- S**) button for 6 second until the left red LED lights up and other 2 LEDs go out.
- c. Press and hold (**Max**) button for 2 seconds.

Operational Malfunctions:

- a. If the green LED lights up and the red LEDs go out, the equipment is working normally.
- b. If all three LEDs are blinking, it shows that the equipment does not work accurately. Possible cause is an incorrect setting. A common fault is the changing of the lower and upper set points, set them a wrong point. In this case, the settings are made again.
- d. If the green LED is blinking and the left red LED lights up, the liquid level may be less than the adjusted lower level.
- e. If the green LED is blinking and the right red LED lights up, the liquid level may be more than the adjusted upper level.

5. COMMISSIONING

- Ensure that the function values of the level probe are set.
- Make sure that the electrical supply connections are connected to the correct terminals.
- The boiler water must be brought to the specified levels to check the alarm functions, the operation of the valve or pump and the stop of the valve or pump, and verify that the probe is signaling correctly.

8. MAINTANANCE

Warning!



The level probe should not be dismantled from the boiler without lowering the pressure to atmospheric pressure (0 bar g). Steam or hot water may leak when the probe is dismantled.

The level probe must not be removed before the cable connections are removed. Otherwise, the cables may be damaged.

The level probe should be disassembled at regular intervals of 12 months, the condition of the probe bar should be checked and cleaned only with a cloth or a very soft brush. No chemicals or hard cleaners should be used. Otherwise, the teflon coating on the probe bar may be damaged.

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

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