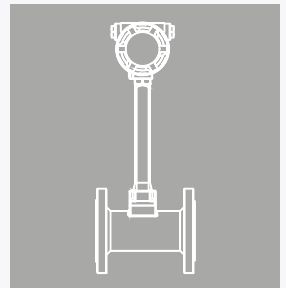
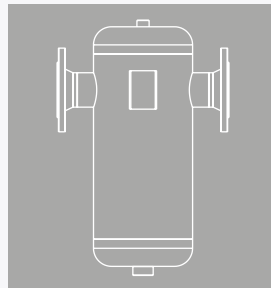
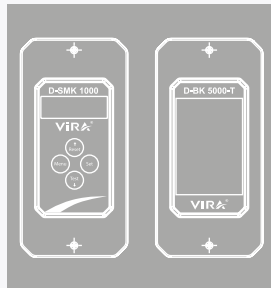
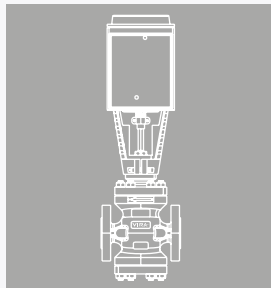
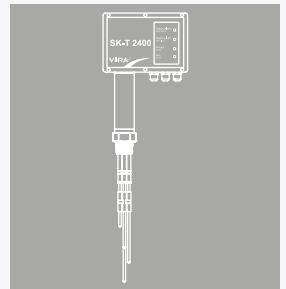
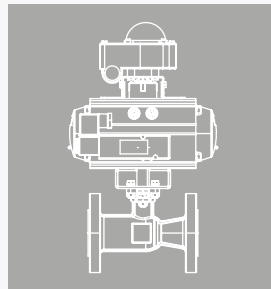
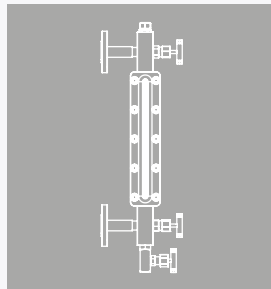
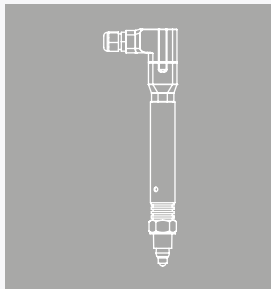


# Steam Boiler Control Systems & Steam Equipments Catalogue



- ✓ Level Control & Alarm Systems
- ✓ Level Alarm & Limiting Systems
- ✓ TDS Blowdown Systems
- ✓ Bottom Blowdown Systems
- ✓ Condensate Contamination Control Systems
- ✓ Reflex Level Gauges
- ✓ Magnetic Level Gauges

- ✓ Steam Dryers/Seperators
- ✓ Vortex Flow Meters
- ✓ Magnetic Flow Meters
- ✓ Resistance Thermometer
- ✓ Pressure Transmitter
- ✓ Pressure Switch
- ✓ Boiler Control Cabinet
- ✓ Sample Cooler







“Boiler Control Engineered for Steam Excellence”



## ABOUT US

Vira is a dynamic and experienced company specializing in the design and production of boiler control systems and steam equipment. We deliver a wide range of products, complete systems, and smart solutions that combine our extensive application expertise with superior technical support, proper installation, and commissioning services to ensure maximum reliability.

Our durable, high-quality boiler control systems and steam equipment are trusted across diverse industries, including petrochemistry, food and beverage, textile, hospitality, healthcare, pulp and paper, and pharmaceuticals. Wherever steam is generated, distributed, or used, Vira solutions contribute to energy savings and system efficiency while playing a key role in environmental protection.

As a company, we aim and pledge to:

- ✓ Be a trusted and experienced partner for our stakeholders.
- ✓ Enhance productivity, production efficiency, and overall profitability.
- ✓ Attract, develop, and retain skilled, versatile, and highly qualified employees.
- ✓ Minimize maintenance expenses and optimize energy efficiency.
- ✓ Provide innovative, industry-leading products, services, and solutions.
- ✓ Accelerate service processes and reduce production downtime.
- ✓ Cut down on spare parts and inventory costs.

Throughout our value-added and supply chain, we ensure that our products are manufactured with a commitment to preserving resources, promoting environmental sustainability, and saving energy during their use. We also adhere to the highest standards of legal compliance, treating them as the minimum benchmark for our operations.

With a focus on energy efficiency, system reliability, and sustainability, Vira continues to build a global network of representatives, expanding our presence in over 35 countries. We are proud to be a leading name in boiler control systems and steam accessories, empowering industries with innovative and reliable technologies.

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# VIRA Electronic Steam Boiler Controls

Vira designs modern boiler systems that meet the diverse needs of industries worldwide, ensuring optimal performance for a wide range of processes. Our engineers have developed a specialized line of boiler control systems and steam equipment that cater to the specific demands of modern boilerhouses, offering the ideal balance between efficiency, safety, and reliability.

Vira's electronic boiler control systems are designed for easy installation, straightforward commissioning, and seamless, trouble-free operation. Investing in one of our advanced systems means you can rest assured that potential boiler accidents will be minimized, thanks to our rigorous safety protocols.

Our solutions are fully compliant with national standards, industry regulations, and local safety codes, ensuring reliable performance in any environment. Vira's innovative sensing probes are built with no moving parts, ensuring maximum durability and accuracy. These probes can be mounted either directly into the boiler shell or within probe chambers for enhanced flexibility.

With a focus on low-maintenance requirements, our systems are designed to operate efficiently and cost-effectively over the long term. Whether you're located in Europe, Asia, or beyond, Vira's global network of representatives is ready to assist in selecting the ideal system for your needs, such as:

- Level Control
- Level Limiting
- TDS (Total Dissolved Solids) Continuous Blowdown Control
- Bottom (Intermittent ) Blowdown Control
- Condensate Contamination (Conductivity) Control

Let Vira be your trusted partner in optimizing your steam system's performance and reliability.



## Certifications & Compliance

At Vira, all products are designed and manufactured in accordance with European directives and international standards to ensure maximum safety, reliability, and performance. Our product portfolio covers both electronic control systems and pressure-bearing steam equipment, all of which are developed, tested, and certified to meet the rigorous requirements of industrial boiler applications.

Vira products fully comply with the European steam boiler standards EN 12952 and EN 12953, guaranteeing safe and efficient operation across various boiler configurations. The Self-Monitoring Level Limiter Systems are designed in accordance with IEC 61508 and certified to achieve SIL 2 and SIL 3 functional safety levels. These devices incorporate fail-safe, redundant, and self-monitoring architectures, providing continuous protection and reliability for critical safety functions in boiler operation.

All pressure-bearing components are certified under the Pressure Equipment Directive 2014/68/EU (PED), while every electronic product undergoes testing and approval in compliance with the Low Voltage Directive 2014/35/EU (LVD) and the Electromagnetic Compatibility Directive 2014/30/EU (EMC). These certifications ensure both mechanical integrity and electrical stability under demanding operating conditions.

In addition to CE and European directives, Vira products also meet regional certification requirements such as EAC (Eurasian Conformity) for the CIS region and other local conformity standards where applicable. This enables our solutions to be seamlessly used across multiple international markets.





All manufacturing and testing processes are carried out under strict quality control and full traceability. Through continuous verification, documentation, and calibration, Vira guarantees that every product leaving its production facilities represents the highest standard of safety, performance, and reliability in modern steam boiler technology.

Every step of our production process — from initial concept and hardware design to software development, testing, and final assembly — is carried out entirely in-house by our expert team. This full vertical integration allows us to maintain complete control over quality, preserve critical know-how, and respond rapidly to evolving industry needs. We do not outsource innovation; we engineer it from the ground up.

Our certifications are not just badges — they are a reflection of our commitment to technical excellence and global compliance. We work in accordance with standards such as EN 12952, EN 12953, PED TS 2025 and IEC guidelines, delivering solutions that are trusted in more than 50 countries around the world.

Vira is not a company that stands still. We are driven by progress — always seeking to improve, adapt, and create value through technological innovation and customer-focused engineering. The D Series Controllers is a testament to this vision: modern, intelligent, and future-ready.



## Panel Mounting

Vira's controller range is designed to meet diverse installation requirements with both DIN rail mounting and panel mounting options. DIN rail mounting offers quick and flexible installation in electrical cabinets, ensuring efficient space use and easy maintenance. Panel mounting, on the other hand, provides a clean, integrated front display for operator panels, enabling intuitive access and streamlined control in industrial environments.



## Din Rail Mounting

Vira's 1st generation products are designed exclusively for panel mounting, making them ideal for control panels where a dedicated front-facing interface is required. In contrast, the 2nd generation controllers are engineered for dual compatibility, supporting both DIN rail and panel mounting configurations. This versatility allows seamless integration into existing systems and greater flexibility for new installations.



By offering both mounting types in the 2nd generation range, Vira ensures that its controllers can adapt to various project specifications and cabinet designs. Whether retrofitting existing equipment or designing new systems, users benefit from simplified installation, enhanced accessibility, and reliable operation. Vira's commitment to flexible, installer-friendly design helps reduce setup time while ensuring safe and robust performance in demanding industrial settings.

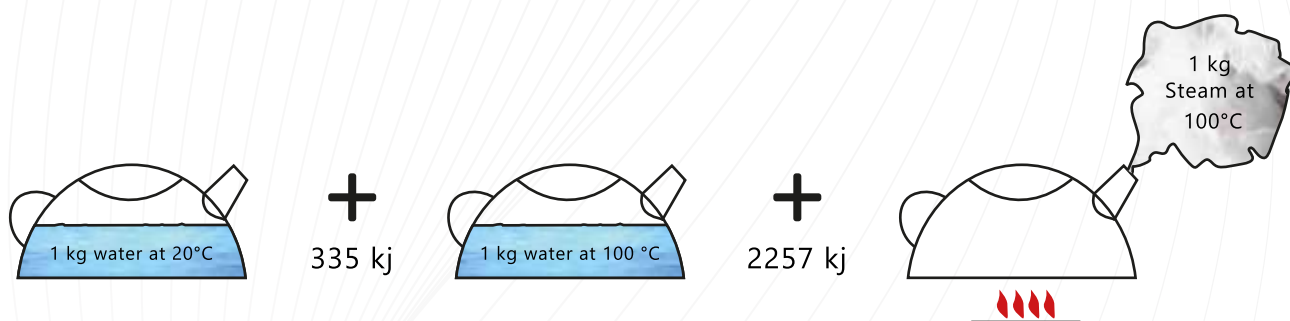
## WHAT IS STEAM?

Steam is the gaseous phase of water produced when water is heated beyond its boiling point. It plays a central role in industrial energy systems due to its high thermal energy content and ease of transport and control.

At 1 bar absolute pressure, the saturation temperature of water is 100°C. When heat is added to water at this pressure, its temperature remains constant at 100°C — the added heat is used to change the phase of the water into steam. The steam produced under these conditions is called saturated steam.

If additional heat is supplied after all the water has been converted to steam, the temperature of the steam begins to rise. This higher-temperature steam is known as superheated steam, which contains more energy and is often used in turbines and high-temperature industrial processes.

Understanding the properties and behavior of steam is fundamental to the design of efficient and safe steam systems.



Steam is an ideal medium for transferring energy, thanks to its high heat content, controllability, and ease of distribution. For this reason, it is extensively used across a wide range of industries and applications.

The primary areas where steam is utilized include industrial facilities such as textile, paper, chemical, pharmaceutical, food and beverage processing (including tea and dairy plants), as well as power generation plants and central heating systems.

Its versatility, efficiency, and clean energy transfer capabilities make steam an indispensable part of modern industrial infrastructure.

### Why Steam?

Steam remains one of the most efficient and reliable methods of transferring thermal energy in industrial processes. Its ability to carry large amounts of heat with precise control makes it indispensable in applications that demand consistency, safety, and energy efficiency.

One of steam's key advantages is its ease of generation and distribution. It can be produced from various fuel sources and transported through insulated piping systems with minimal energy loss. Steam is also clean and non-toxic, making it ideal for use in food, pharmaceutical, and chemical industries.

In addition, steam systems are highly scalable and flexible, suitable for both small and large-scale operations. With proper control and recovery systems, steam offers high energy efficiency and can contribute significantly to sustainable production goals through waste heat recovery and condensate return.

Whether used for heating, sterilization, processing, or power generation, steam remains a proven and trusted energy carrier across the industrial world.



## Steam Generation

Steam is generated by applying heat to water under controlled conditions, typically within a pressure vessel known as a boiler. As heat is transferred to the water, its temperature rises until it reaches the boiling point corresponding to the system pressure. At this point, further heat input causes a phase change from liquid to vapor—producing saturated steam.

If heating continues beyond this point without additional water, the steam becomes superheated, increasing in temperature and energy content without increasing pressure. This is especially useful in applications requiring dry, high-energy steam, such as turbines or high-temperature processes.

The heat source for steam generation may include natural gas, diesel, coal, biomass, or electricity. The choice of fuel and boiler design depends on the application, available energy resources, and efficiency requirements.

Modern steam generation systems are engineered for optimal energy use, safety, and environmental compliance, often incorporating features such as economizers, condensate recovery, and blowdown control to maximize efficiency and minimize losses.

## Boiler Types

Boilers are classified based on their design, operating pressure, fuel type, and application. Selecting the right boiler type is essential for ensuring safety, efficiency, and reliable performance in steam systems. The most common types include:

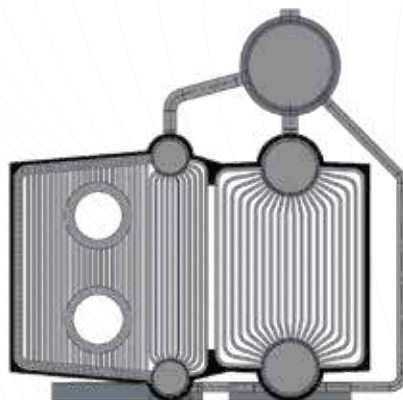
### 1. Fire-Tube Boilers

In fire-tube boilers, hot gases pass through tubes that are surrounded by water. These boilers are typically used for low to medium pressure applications and are known for their simplicity, ease of maintenance, and cost-effectiveness. They are widely used in small to mid-sized industrial facilities and heating systems.



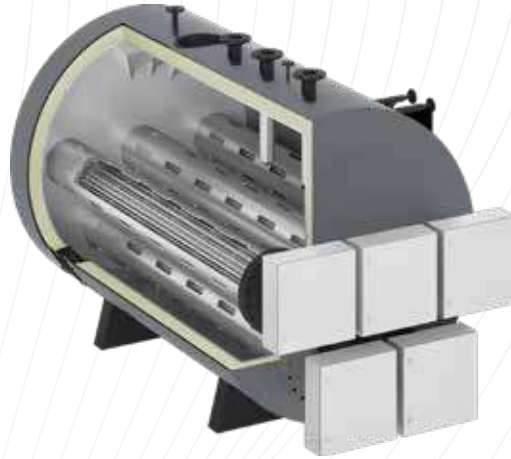
### 2. Water-Tube Boilers

Water-tube boilers operate with water flowing through the tubes, while the hot combustion gases surround the tubes externally. This design supports higher pressures and greater steam capacities, making it ideal for large-scale industrial operations and power generation. Water-tube boilers offer fast response times and better heat transfer efficiency.



### 3. Electric Boilers

Electric boilers use electrical resistance to generate steam without combustion. They are clean, compact, and quiet, and are often used in environments with strict emission limits or where space is limited. Electric boilers require minimal maintenance and are suitable for low-capacity or specialty applications.



### 4. Waste Heat Boilers

Waste heat boilers recover thermal energy from exhaust gases of industrial processes or engines, converting it into steam. These systems improve overall energy efficiency and are often used in combined heat and power (CHP) applications or process plants where excess heat would otherwise be wasted.

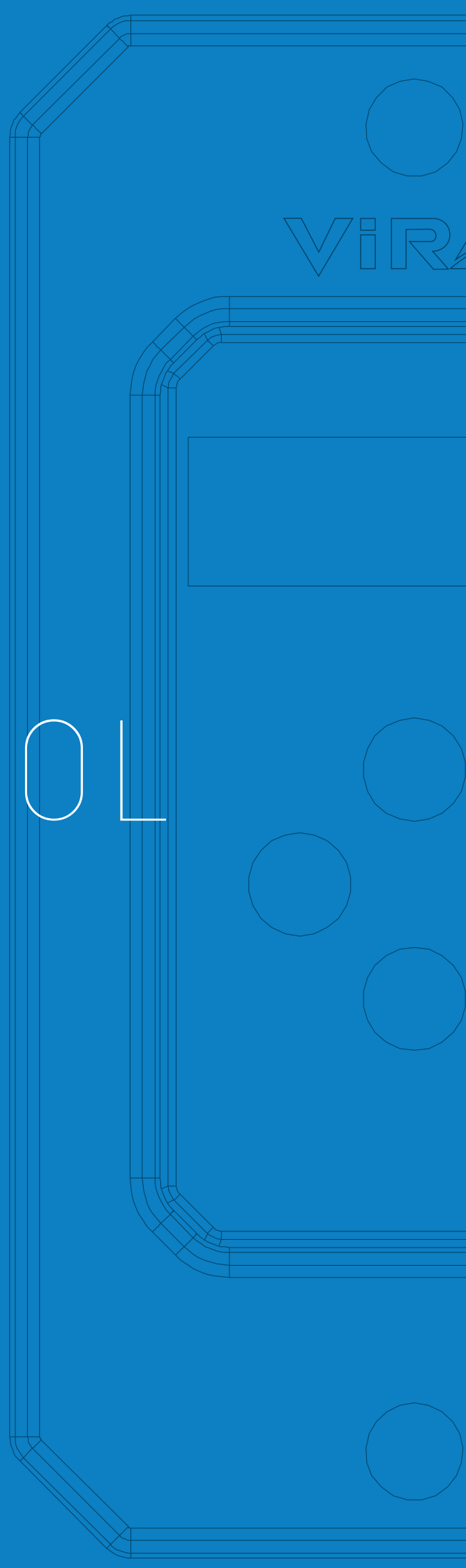


Each boiler type serves specific operational needs. The selection depends on factors such as required steam output, pressure, fuel availability, space constraints, and regulatory compliance.



LEVEL

CONTROL

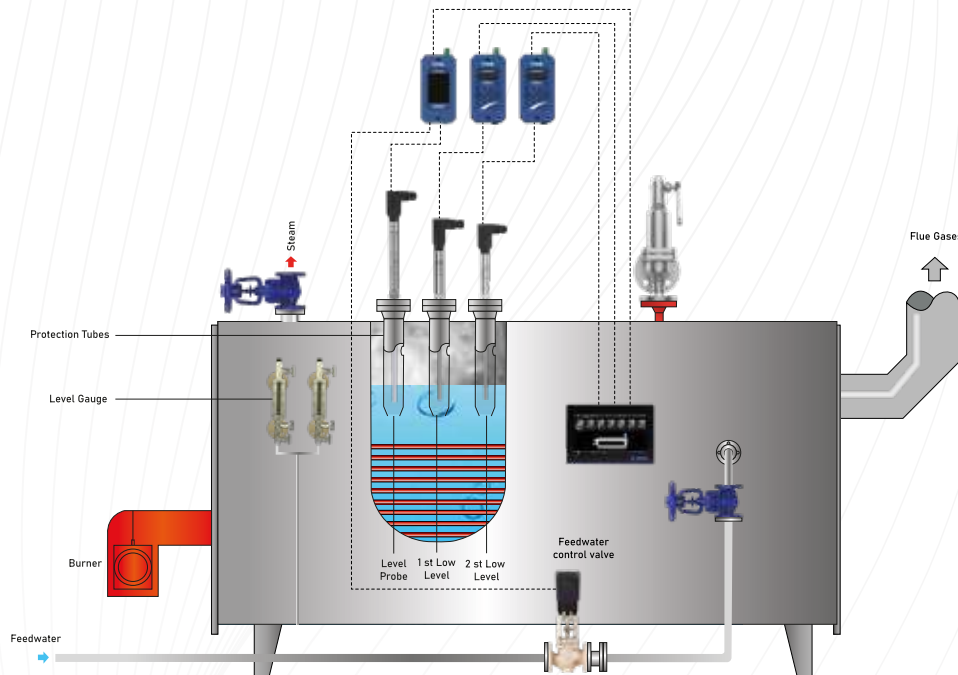




“Boiler Control Engineered for Steam Excellence”

## Boiler Level Control and Safety

In steam boilers, the water level decreases with the convert of the water into steam and the decreasing water is completed by the operation of the boiler feedwater pump. Depending on the amount of steam produced in the steam boiler, since the water temperature entering the boiler is lower than the boiler temperature and due to changes in steam pressure, a constant fluctuation in the water level occurs. For the efficient and safe operation of boilers, the water level must always be checked. This check may include a sound or light alarm, shutting down the feedwater supply, and shutting down the burner. It is also essential to provide an outside drum level indicator such as magnetic or reflex level gauges.



**Note:** Level probes can be both installed in a protection tube or a level tube. It is undesirable for the water to drop below the desired level in steam boilers. If it does, it can cause costly damage to the boilers and even fatal accidents. In case of low water level, check the following reasons.

### Causes of Low Level

- Lack of feedwater
- Sudden load changes
- Feedwater pump failure
- Safety valve leaks
- Control valve malfunction
- Malfunction of boiler water level controller

To ensure the safe operation of the boiler, all elements that affect the level control must be monitored and make sure they are working. In case of failure, the boiler operator must understand the cause of the problem and should take action most appropriately.

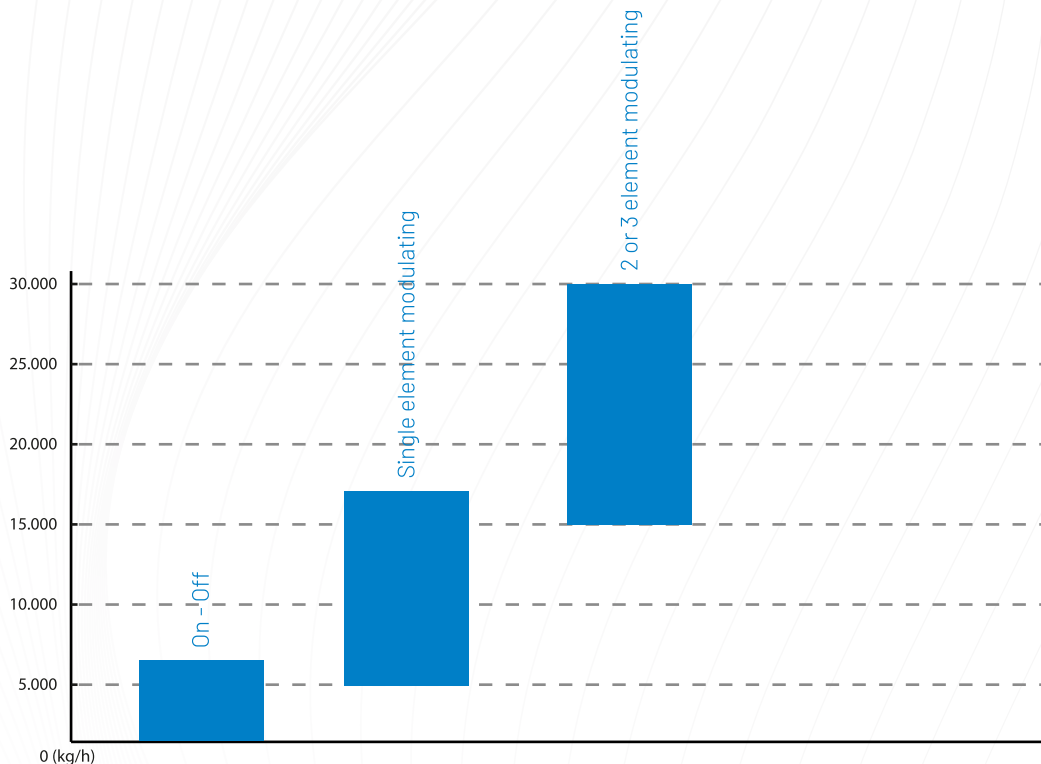


## Boiler Water Level Control Systems

In steam boilers, feed water should be supplied to replace the water lost during steam production. Automatic level control systems are applied in steam boilers produced with modern technology. Automatic feedwater control systems have two different applications: On/Off Level control and modulating level control.

Depending on the boiler capacity; On-Off level control system should be used for the boilers with the capacity up to 5000 kg/h. for the boiler with the capacity up to 15.000 kg/h single element modulating control and higher capacity than 15.000 kg/h 2 or 3 element modulating level control systems should be used.

- **Single Element Modulating** : Modulating level control system only
- **2 Element Modulating** : Modulating level control system, steam production amount measurement with modulating level control system and steam flow meter
- **3 Element Modulating** : Modulating level control system, steam production amount measurement with steam flow meter and feed water amount measurement for the boiler with water flow meter

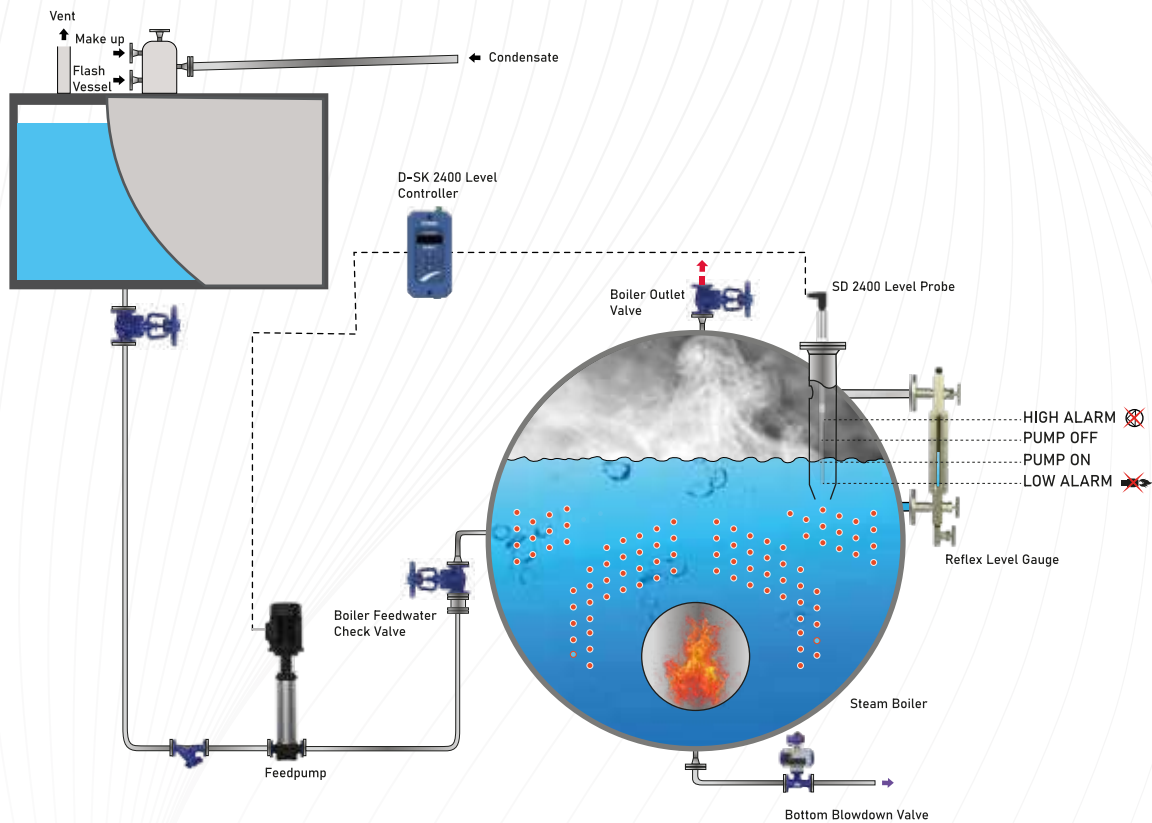


It is not sufficient to decide which level control system to use only by considering the boiler capacity. In practice, factors such as the steam consumption behavior of the plant, the variability of process loads, and the feedwater conditions are equally important. For example, an on-off level control system may not be adequate even in a low-capacity boiler if there are sudden or frequent load fluctuations. In such cases, modulating level control is preferred to ensure stable operation.

Another major reason to use a modulating level control system is energy efficiency. At higher flow rates, adding large amounts of cooler water instead of evaporated water can lead to both energy loss and thermal stress on the boiler. By adding water proportionally to the steam consumption, the boiler can operate more smoothly, reducing thermal shocks and improving fuel efficiency. Therefore, modulating control systems are often selected not only for larger capacity boilers but also for medium or even smaller boilers where load variations are significant or energy efficiency is a priority.

## On-Off Level Control & Alarm System

On-Off Automatic Level control system consists of a level probe and a controller. The feed water pump is started when the water level in the boiler reaches the specified lower level and is stopped when the water reaches the specified upper level. The working principle of the system is conductivity. The pump is allowed to start or stop depending on whether the electrodes are in contact with water.



For a safe operation, all steam boilers should have low and high level alarm systems. Additional high and low level alarms can be received from the on-off level control and alarm system.

On-Off Level control and alarm system is used;

- In boilers with a capacity of 5,000 kg/h and less
- Where constant steam load and pressure are not critical
- In backup boilers
- Feed water tanks
- In condensate tanks

## SK 2000 On-Off Level Control and Alarm System



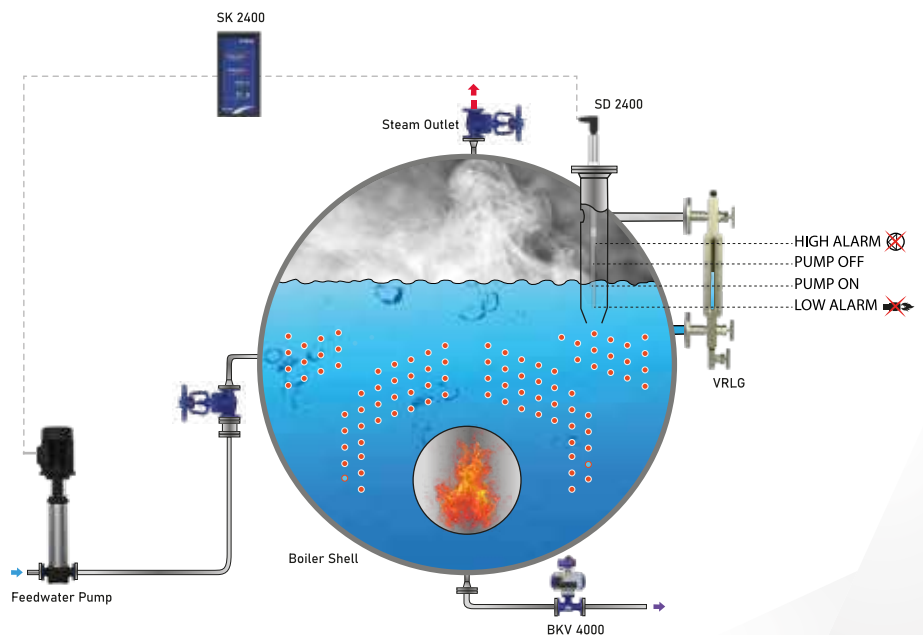
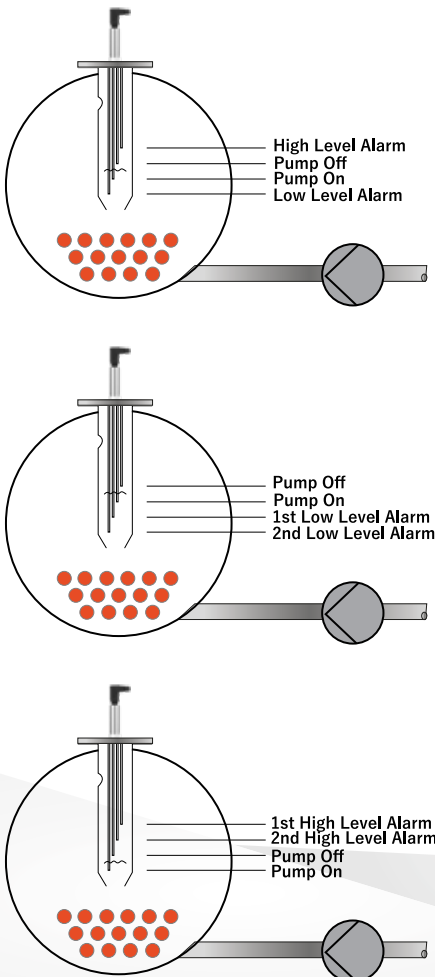
### On-Off Level Control and Alarm Controller

|                   |                                                                                          |
|-------------------|------------------------------------------------------------------------------------------|
| Type              | : SK 2400                                                                                |
| Supply Voltage    | : 230 VAC (+5% / -10%), 50/60Hz                                                          |
| Enclosure         | : Panel-mount Type                                                                       |
| Functions         | : Pump On-Off Control, High & Low Level Alarms                                           |
| Outputs           | : 1 Pump On-Off Relay, 2 Alarm Relays                                                    |
| Max. Ambient Temp | : 55 °C                                                                                  |
| Compliance        | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |

### On-Off Level Control and Alarm Probe

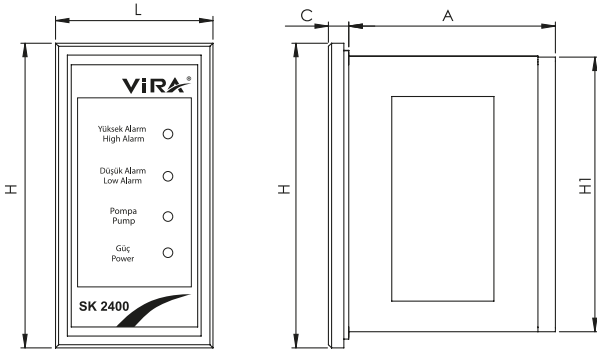
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : SD 2400                                                                |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1" BSPT (Optional NPT)                                               |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                       |
| Max. Ambient Temp   | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |

## SK 2000 Typical Installation



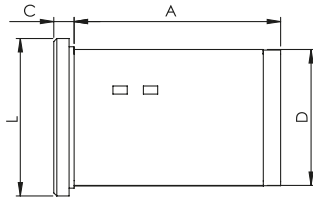
## TECHNICAL SPECIFICATION

### SK 2400 On-Off Level Control & Alarm Controller



#### Technical Data

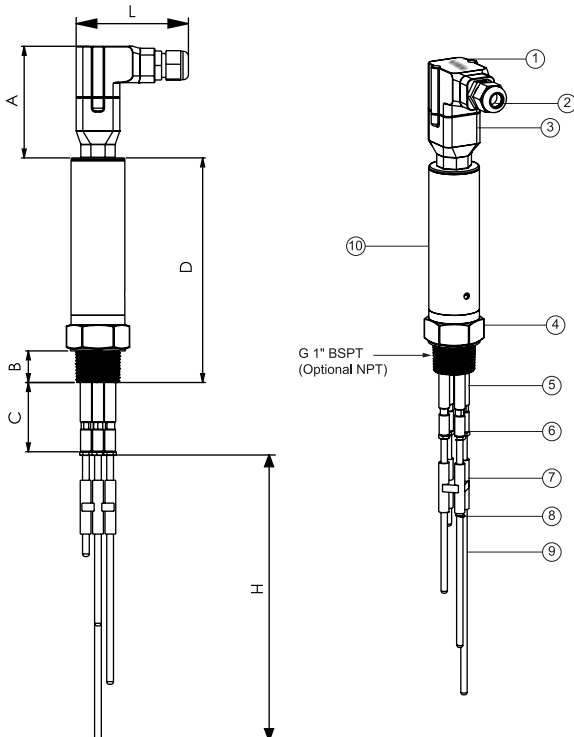
|                    |                                              |
|--------------------|----------------------------------------------|
| Type               | SK 2400                                      |
| Supply Voltage     | 230VAC (+5% / -10%), 50/60Hz                 |
| Functions          | Pump On-Off Control, High & Low Level Alarms |
| Inputs             | Level probe input (4 level), Ground          |
| Outputs            | 1 Pump Relay, 2 Alarm Relays                 |
| Display            | Led                                          |
| Label              | Lexan                                        |
| Max. Ambient Temp. | 55°C                                         |
| Enclosure          | PA (Polyamide)                               |
| Type               | Panel-mount                                  |
| Protection Class   | IP40                                         |



#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### SD 2400 On-Off Level Control & Alarm Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Probe Body              | Austenitic Stainless Steel 304               |
| 5  | Tip Insulation (Sleeve) | PTFE (Polytetrafluoroethylene)               |
| 6  | Lock Nuts               | Austenitic Stainless Steel 304               |
| 7  | Tip Steady              | Polytetrafluoroethylene (PTFE)               |
| 8  | Snap Ring               | C75 Spring Steel                             |
| 9  | Probe Tips              | Austenitic Stainless Steel 316L              |
| 10 | Label                   | Laser Marking                                |

#### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 83,5   | 83     | 23,5   | 51,5   | 167    |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

# D-SK 2000 On-Off Level Control and Alarm System

NEW



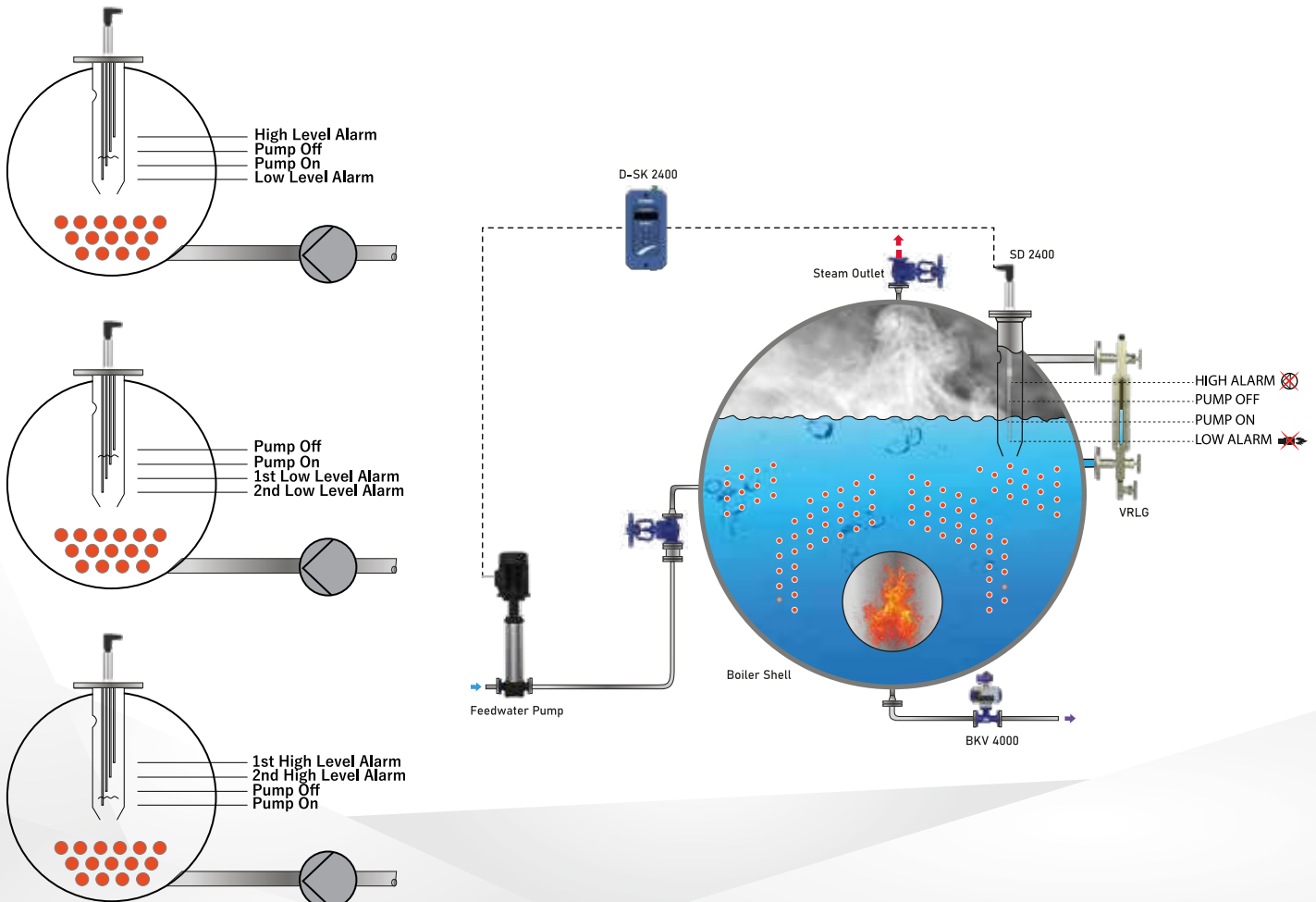
## On-Off Level Control and Alarm Controller

|                    |                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------|
| Type               | : D-SK 2400                                                                               |
| Supply Voltage     | : 24VDC                                                                                   |
| Enclosure          | : Panel-mount and Din Rail Type                                                           |
| Functions          | : Pump On-Off Control, High & Low Level Alarms, Test, Reset, 7 Segment Display, 4 buttons |
| Outputs            | : 1 Pump On-Off Relay, 2 Alarm Relays, RS485 Modbus                                       |
| Max. Ambient Temp. | : 55 °C                                                                                   |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & EN 12953, Type Approval (Module B + D)  |

## On-Off Level Control and Alarm Probe

|                     |                                                                                          |
|---------------------|------------------------------------------------------------------------------------------|
| Type                | : SD 2400                                                                                |
| Nominal Pressure    | : PN 40                                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                                               |
| Connection          | : G 1" BSPT (Optional NPT)                                                               |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                                       |
| Max. Ambient Temp   | : 75 °C                                                                                  |
| Compliance          | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |

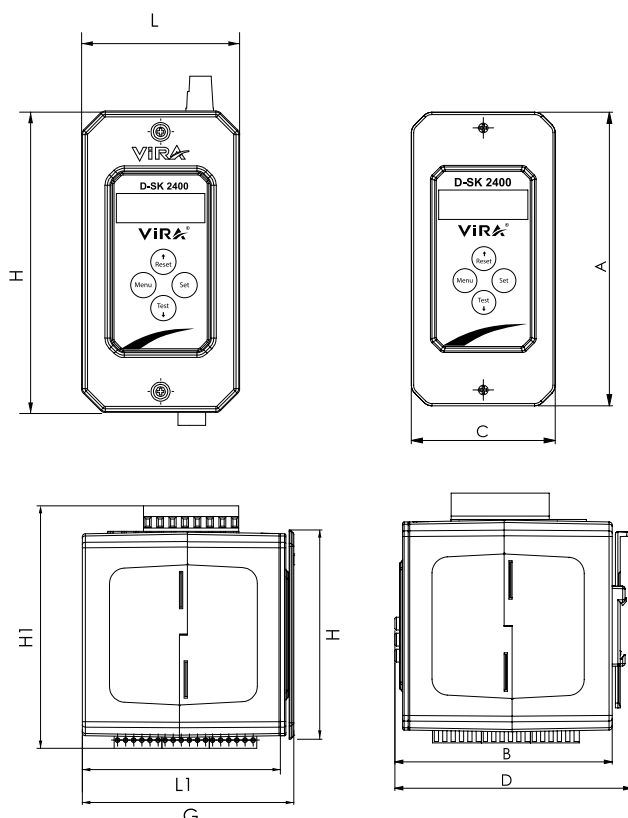
## D-SK 2000 Typical Installation





## TECHNICAL SPECIFICATION

### D-SK 2400 On-Off Level Control & Alarm Controller



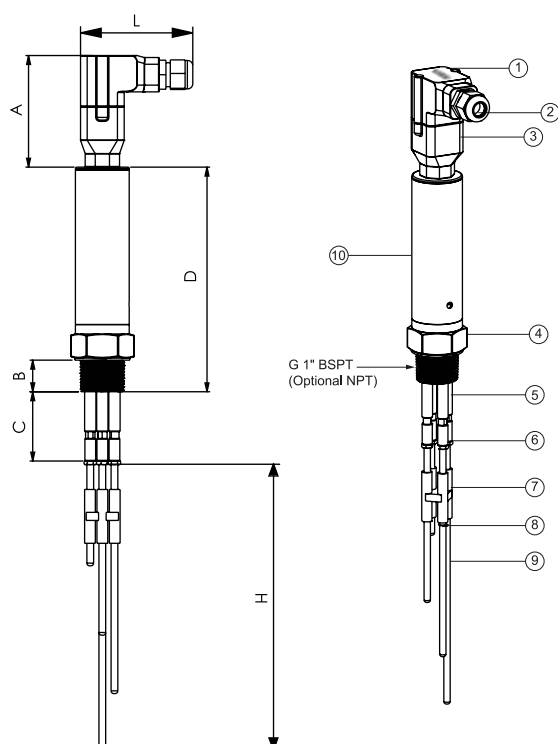
#### Technical Data

|                    |                                                                       |
|--------------------|-----------------------------------------------------------------------|
| Type               | D-SK 2400                                                             |
| Supply Voltage     | 24VDC                                                                 |
| Functions          | Pump On-Off Control, High & Low Level Alarms, Alarm Test, Alarm Reset |
| Inputs             | Level probe input (4 level), Ground                                   |
| Outputs            | 1 Pump Relay, 2 Alarm Relays, RS485 Modbus                            |
| Display            | 7 Segment                                                             |
| Label              | Silicone Rubber                                                       |
| Control            | 4 Buttons                                                             |
| Max. Ambient Temp. | 55°C                                                                  |
| Enclosure          | PC (Polycarbonate)                                                    |
| Type               | Panel-mount and Din Rail                                              |
| Protection Class   | IP40                                                                  |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

### SD 2400 On-Off Level Control & Alarm Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Probe Body              | Austenitic Stainless Steel 304               |
| 5  | Tip Insulation (Sleeve) | PTFE (Polytetrafluoroethylene)               |
| 6  | Lock Nuts               | Austenitic Stainless Steel 304               |
| 7  | Tip Steady              | Polytetrafluoroethylene (PTFE)               |
| 8  | Snap Ring               | C75 Spring Steel                             |
| 9  | Probe Tips              | Austenitic Stainless Steel 316L              |
| 10 | Label                   | Laser Marking                                |

#### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 83,5   | 83     | 23,5   | 51,5   | 167    |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

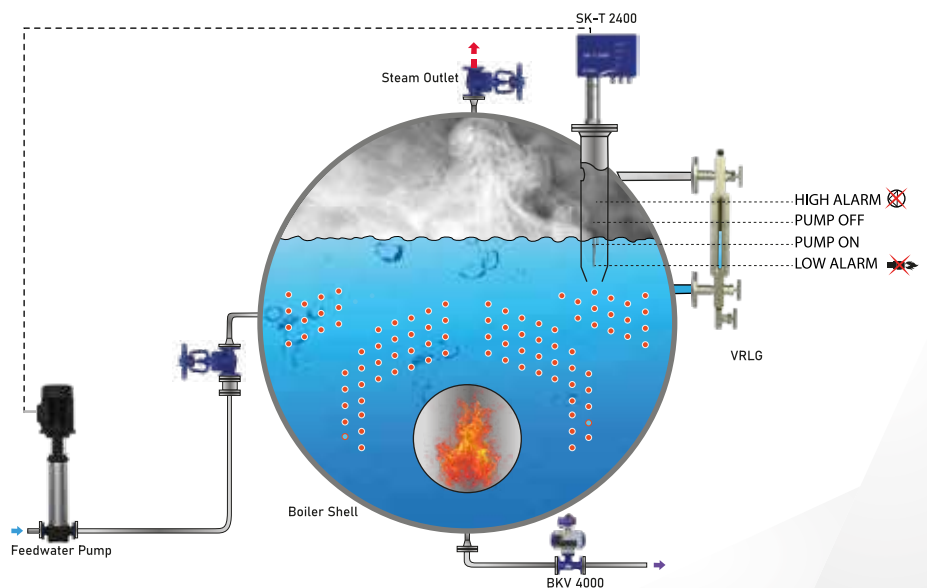
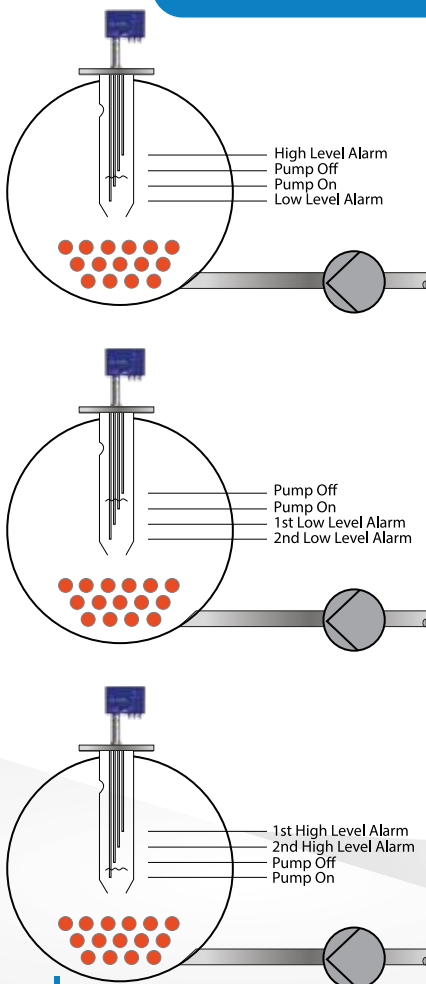
## SK-T 2400 Compact On-Off Level Control and Alarm System



### Compact On-Off Level Control and Alarm System

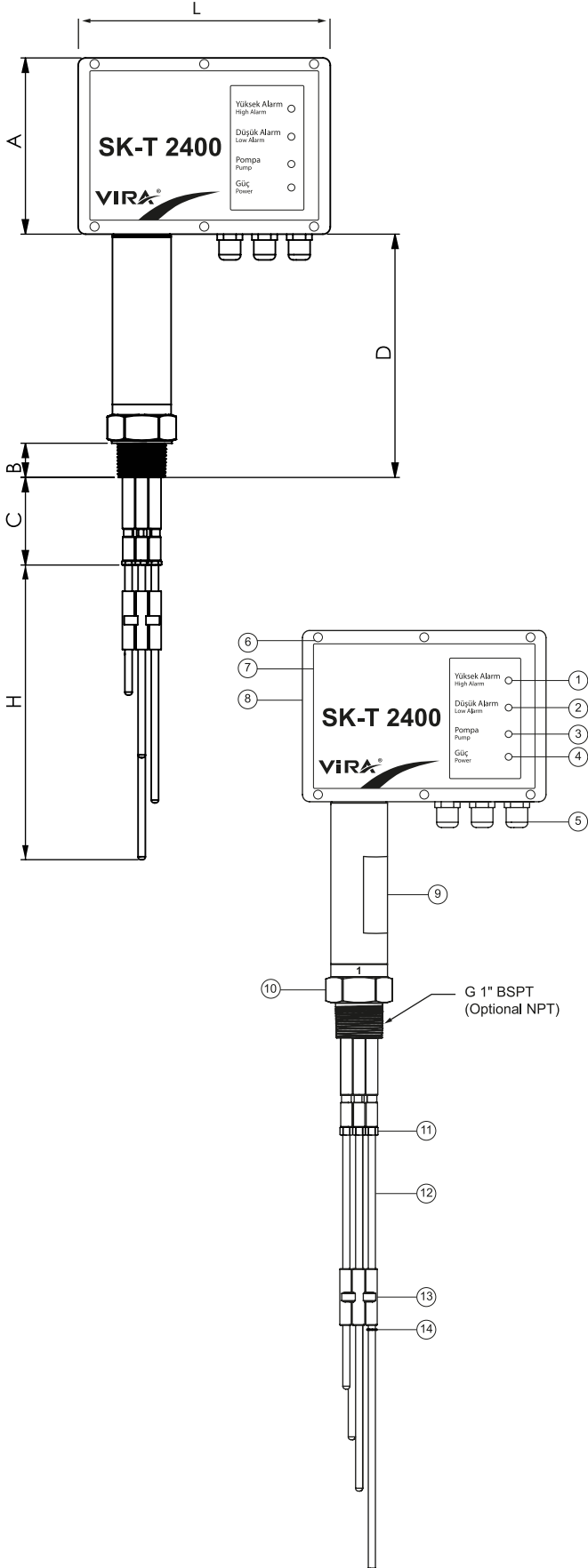
|                     |                                                                                                          |
|---------------------|----------------------------------------------------------------------------------------------------------|
| Type                | : SK-T 2400                                                                                              |
| Supply Voltage      | : 230 VAC (+5% / -10%), 50/60Hz                                                                          |
| Functions           | : Pump On-Off Control, High & Low Level Alarms                                                           |
| Outputs             | : 1 Pump On-Off Relay, 2 Alarm Relays                                                                    |
| Nominal Pressure    | : PN 40                                                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                                                               |
| Connection          | : G 1" BSPT (Optional NPT)                                                                               |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                                                       |
| Max. Ambient Temp.  | : 75 °C                                                                                                  |
| Compliance          | : CE (EMC 2014/30/EU, LVD 2014/35/EU, PED 2014/68/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |

## SK-T 2400 Typical Installation



# TECHNICAL SPECIFICATION

## SK-T 2400 Compact On-Off Level Control & Alarm System



### Technical Data

|                      |                                                  |
|----------------------|--------------------------------------------------|
| Type                 | SK-T 2400                                        |
| Supply Voltage       | 230VAC (+5% / -10%), 50/60Hz                     |
| Functions            | Pump On-Off Control, High & Low Level Alarms     |
| Inputs               | Level probe input (4 level), Ground              |
| Outputs              | 1 Pump Relay, 2 Alarm Relays                     |
| Display              | Led                                              |
| Label                | Lexan                                            |
| Max. Ambient Temp.   | 75°C                                             |
| Enclosure            | Aluminum                                         |
| Installation Type    | Boiler top mounted                               |
| Protection Class     | IP 65                                            |
| Nominal Pressure     | PN 40                                            |
| Max. Operating Temp. | 239 °C                                           |
| Max. Operating Pres. | 32 Bar g                                         |
| Connection           | G 1" BSPT (Optional NPT)                         |
| Length               | 500, 1000, 1500 mm (can be cut to desired level) |

### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|--------|
| 500    | 170    | 121    | 23,5   | 60     | 167    |
| 1000   |        |        |        |        |        |
| 1500   |        |        |        |        |        |

| No | Part              | Material                        |
|----|-------------------|---------------------------------|
| 1  | Led "High Alarm"  | Lexan Label                     |
| 2  | Led "Low Alarm"   | Lexan Label                     |
| 3  | Led "Pump"        | Lexan Label                     |
| 4  | Led "Power"       | Lexan Label                     |
| 5  | PG 9 Cable Gland  | Brass (Nickel Coated)           |
| 6  | Housing Screws M4 | Austenitic Stainless Steel 304  |
| 7  | Housing Cover     | Aluminum                        |
| 8  | Housing           | Aluminum                        |
| 9  | Label             | Laser Marking                   |
| 10 | Probe Body        | Austenitic Stainless Steel 304  |
| 11 | Lock Nuts         | Austenitic Stainless Steel 304  |
| 12 | Probe Tips        | Austenitic Stainless Steel 316L |
| 13 | Tip Steady        | Polytetrafluoroethylene (PTFE)  |
| 14 | Snap Ring         | C75 Spring Steel                |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

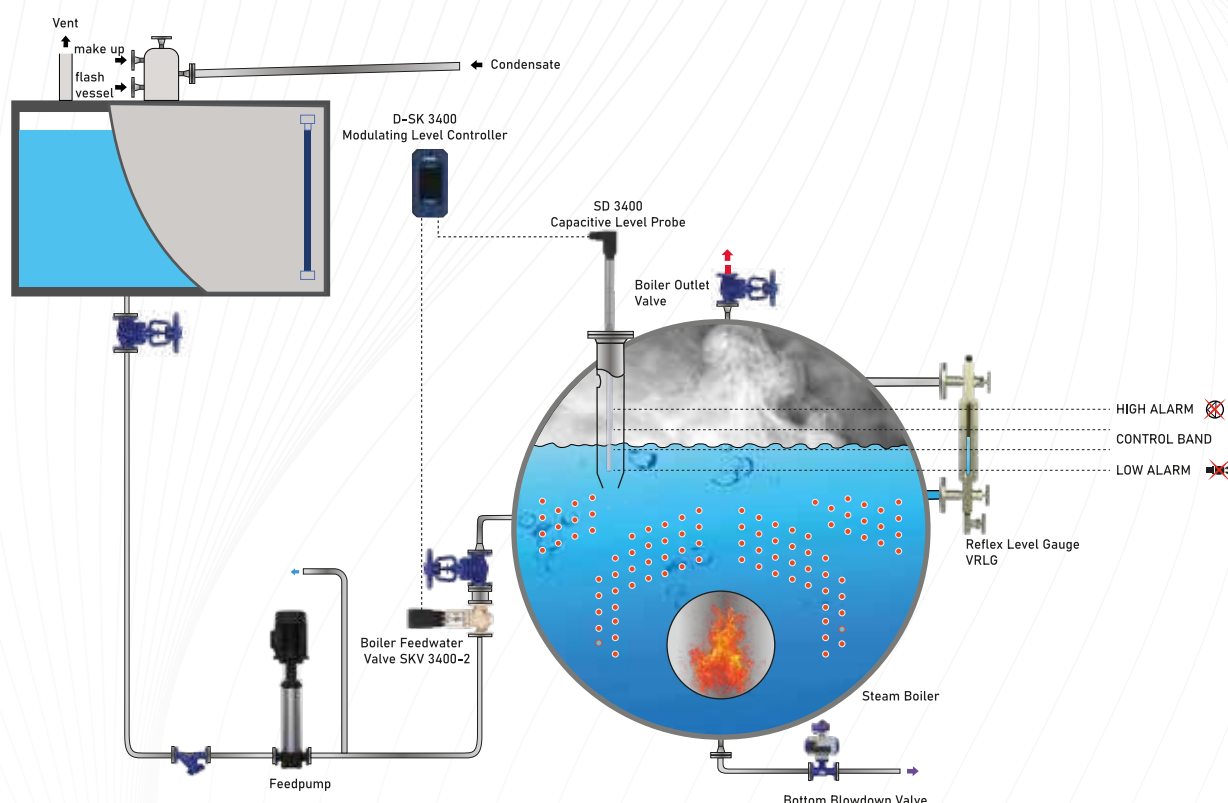


“Boiler Control Engineered for Steam Excellence”

## MODULATING LEVEL CONTROL & ALARM SYSTEM

Modulating level control system consists of a capacitive probe, a level controller and a 2 or 3-way valve. The water level, which varies with the phase change of the water in the boiler, is determined by the capacitive level probe and is continuously compared with the previously set value by the level controller. In any determined deviation, it sends a signal to the feedwater valve in order to take the required feedwater amount into the boiler.

The probe used in the modulating level control system works according to the capacitance principle. Capacitance value is measured according to the amount of water. The controller opens and closes the proportional control valve through signals from the capacitive probe and the water level is kept at the desired level. Thus, the flow rate and pressure of the steam obtained are constant. It also has a low moisture content.



**Note:** The control valve can be either a 2-way or a 3-way valve, depending on the boiler feedwater system design.

For safe operation, all steam boilers must be equipped with independent low and high level limiting devices. The modulating level control system is designed for water level regulation only and should not be considered a substitute for safety-related level limiting systems.

Modulating level control and alarm system can be used;

- Boilers with a capacity above 5,000 kg/h
- Applications with frequent steam load or pressure fluctuations
- Installations where energy efficiency and fuel savings are important
- Processes requiring stable and continuous steam supply



## SK 3000-2 Modulating Level Control and Alarm System



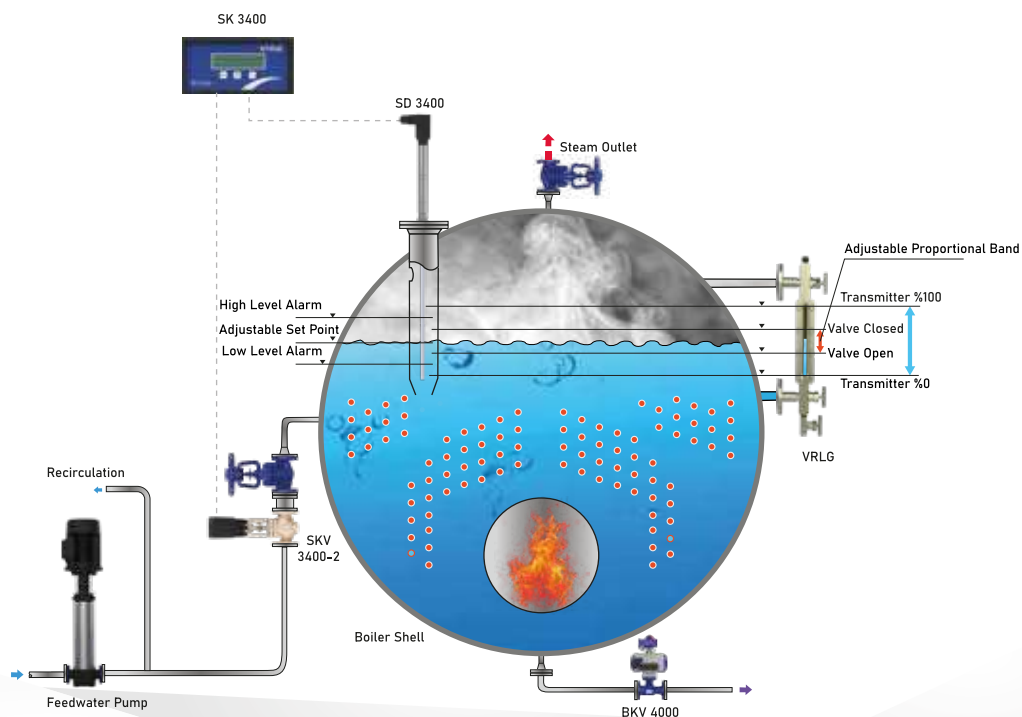
### Modulating Level Controller

|                    |                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | : SK 3400                                                                                                                                    |
| Supply Voltage     | : 230 VAC (+5% / -10%), 50/60Hz                                                                                                              |
| Enclosure          | : Panel-mount Type                                                                                                                           |
| Functions          | : Modulating / On-Off Level Control, High & Low Level Alarms, Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Outputs            | : 4-20 mA Analog Level Signal, Valve Control Relay, 2 Alarm Relays                                                                           |
| Max. Ambient Temp. | : 55 °C                                                                                                                                      |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & EN 12953, Type Approval (Module B + D)                                                     |

### Modulating Level Control Probe (Capacitive Level Probe)

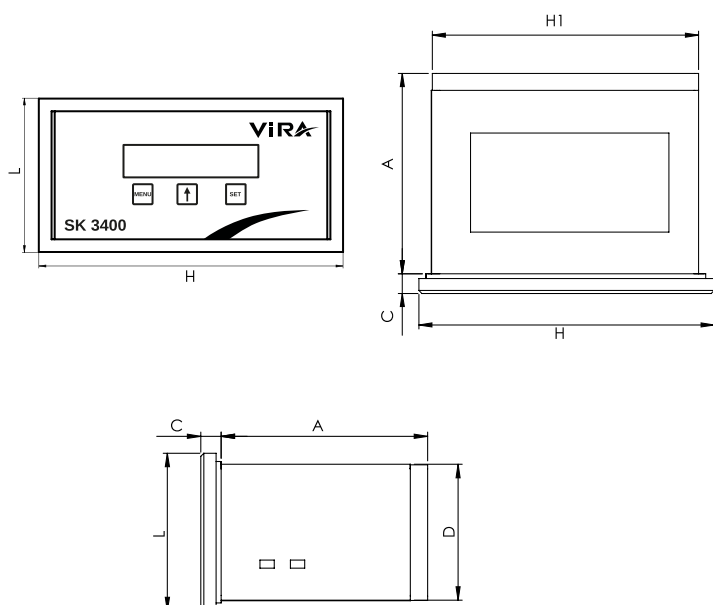
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : SD 3400                                                                |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Length              | : 300-1500 mm                                                            |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |

## SK 3000-2 Typical Installation



# TECHNICAL SPECIFICATION

## SK 3400 Modulating Level Controller



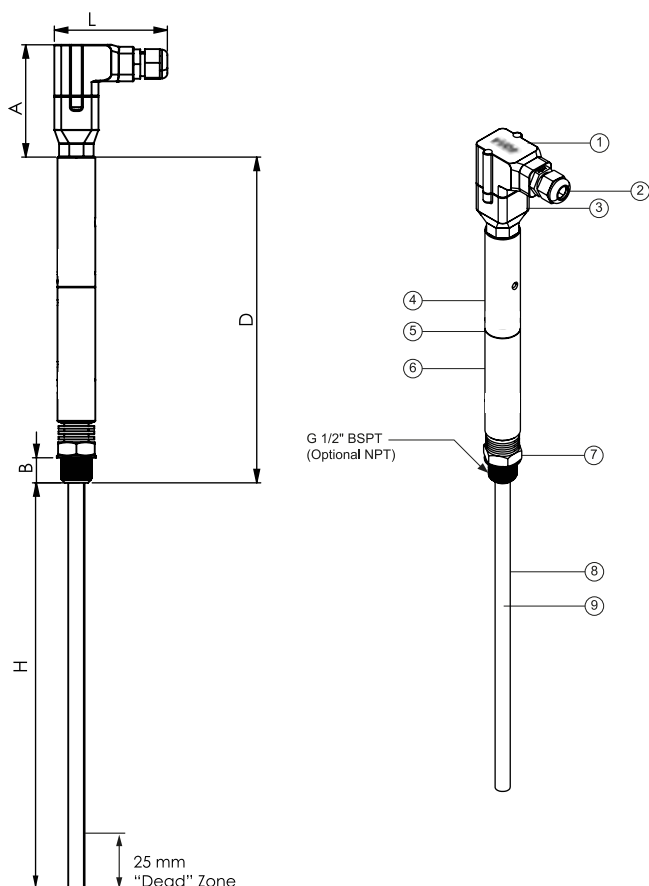
### Technical Data

|                    |                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | SK 3400                                                                                                                                    |
| Supply Voltage     | 230 VAC (+5% / -10%), 50/60Hz                                                                                                              |
| Functions          | Modulating / On-Off Level Control, High & Low Level Alarms, Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Inputs             | Level Probe Input, Ground, 0-1k Ohm Potentiometer, Control Valve                                                                           |
| Outputs            | 1 Valve Modulation Relay, 2 Alarm Relays, 4-20 mA Analog Level Signal                                                                      |
| Display            | LCD                                                                                                                                        |
| Max. Ambient Temp. | 55°C                                                                                                                                       |
| Enclosure          | PA (Polyamide)                                                                                                                             |
| Label              | Lexan                                                                                                                                      |
| Type               | Panel-mount                                                                                                                                |
| Protection Class   | IP40                                                                                                                                       |

### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

## SD 3400 Capacitive Level Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Preamplifier Body       | Austenitic Stainless Steel 304               |
| 5  | Preamplifier Connector  | Austenitic Stainless Steel 316L              |
| 6  | Cover Assembly          | Austenitic Stainless Steel 304               |
| 7  | Probe Body              | Austenitic Stainless Steel 316L              |
| 8  | Probe Sheathing         | Polytetrafluoroethylene (PTFE)               |
| 9  | Probe (Sheathed)        | Austenitic Stainless Steel 316L              |

### Dimensions

| H (mm)   | L (mm) | A (mm) | B (mm) | D (mm) | Dead zone (mm) |
|----------|--------|--------|--------|--------|----------------|
| 300-1500 | 83,5   | 83     | 18,5   | 240,5  | 25             |

**Note:** The capacitive level probe is manufactured to the specified length and cannot be shortened afterwards. The required probe length must be clearly stated at the time of order.

# D-SK 3000-2 Modulating Level Control and Alarm System

## Modulating Level Controller

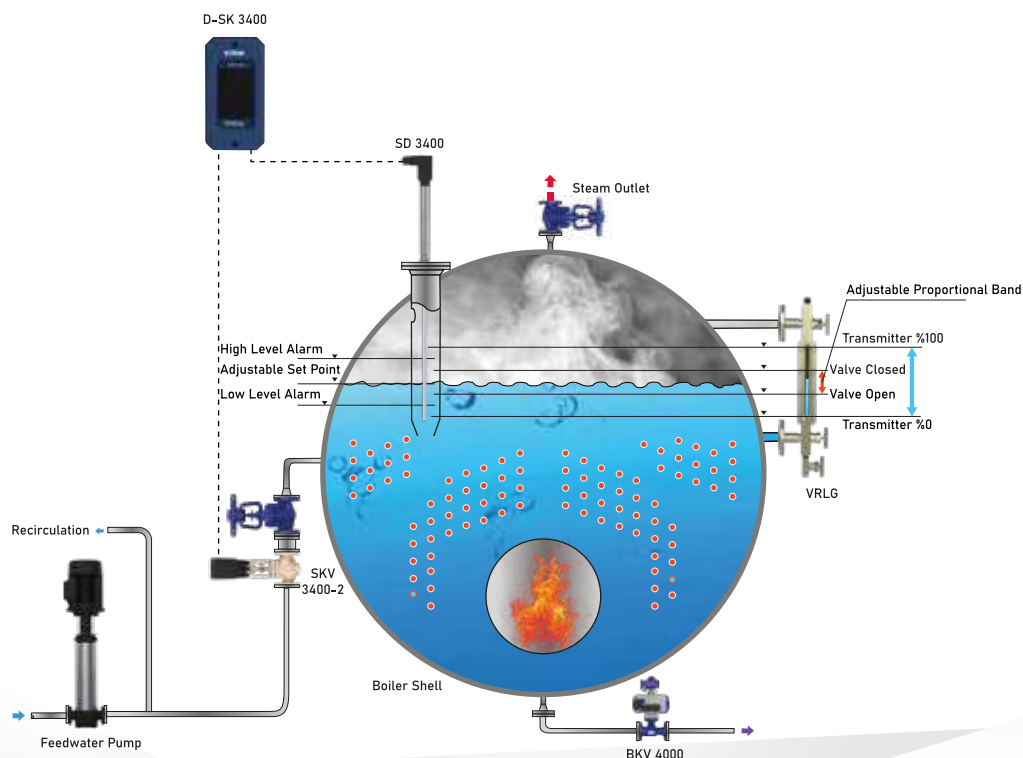
|                    |                                                                                                                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | : D-SK 3400                                                                                                                                                                                              |
| Supply Voltage     | : 24VDC                                                                                                                                                                                                  |
| Enclosure          | : Panel-mount and Din Rail Type                                                                                                                                                                          |
| Functions          | : Modulating / On-Off Level Control, On-Off Level Control, High & Low Level Alarms, 4-20 mA Analogue Input, Touch Screen, Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Outputs            | : 4-20 mA Analog Level Signal, 4-20 mA Output (Control/Drive), Valve Control Relay, 2 Alarm Relays, RS 485 Modbus, 0-1K Ohm Potentiometer Feedback                                                       |
| Max. Ambient Temp. | : 55 °C                                                                                                                                                                                                  |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & EN 12953, Type Approval (Module B + D)                                                                                                                 |

## Modulating Level Control Probe (Capacitive Level Probe)

|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : SD 3400                                                                |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Length              | : 300-1500 mm                                                            |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |



## D-SK 3000-2 Typical Installation



# TECHNICAL SPECIFICATION

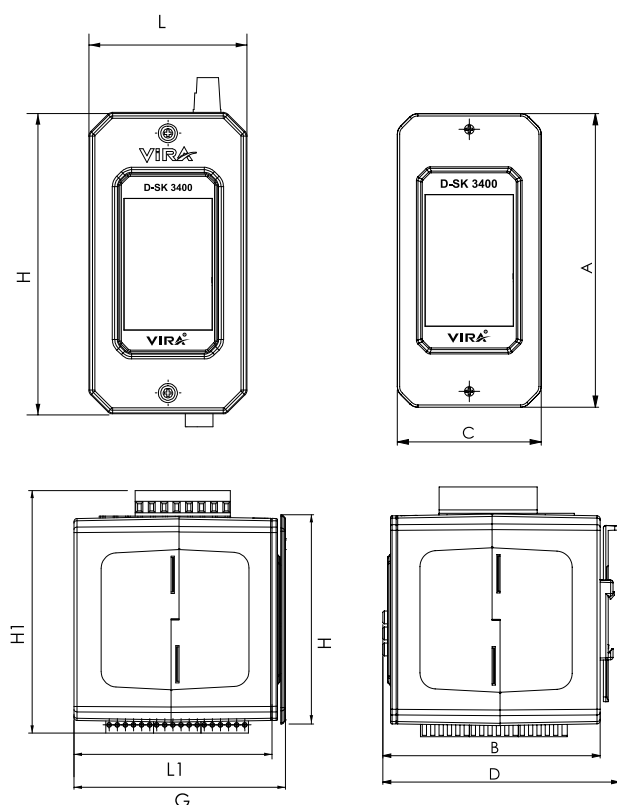
## D-SK 3400 Modulating Level Controller

### Technical Data

|                    |                                                                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | D-SK 3400                                                                                                                                                |
| Supply Voltage     | 24VDC                                                                                                                                                    |
| Functions          | Modulating / On-Off Level Control, High & Low Level Alarms, Touch Screen, Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Inputs             | Level Probe Input, Ground, 0-1k Ohm Potentiometer Feedback, 4-20 mA Analogue Input                                                                       |
| Outputs            | 1 Valve Modulation Relay, 2 Alarm Relays, 4-20 mA Analog Level Signal, 4-20 mA Analog Control Output                                                     |
| Display            | Touch Screen                                                                                                                                             |
| Label              | Silicone Rubber                                                                                                                                          |
| Max. Ambient Temp. | 55°C                                                                                                                                                     |
| Enclosure          | PC (Polycarbonate)                                                                                                                                       |
| Type               | Panel-mount and Din Rail                                                                                                                                 |
| Protection Class   | IP40                                                                                                                                                     |

### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

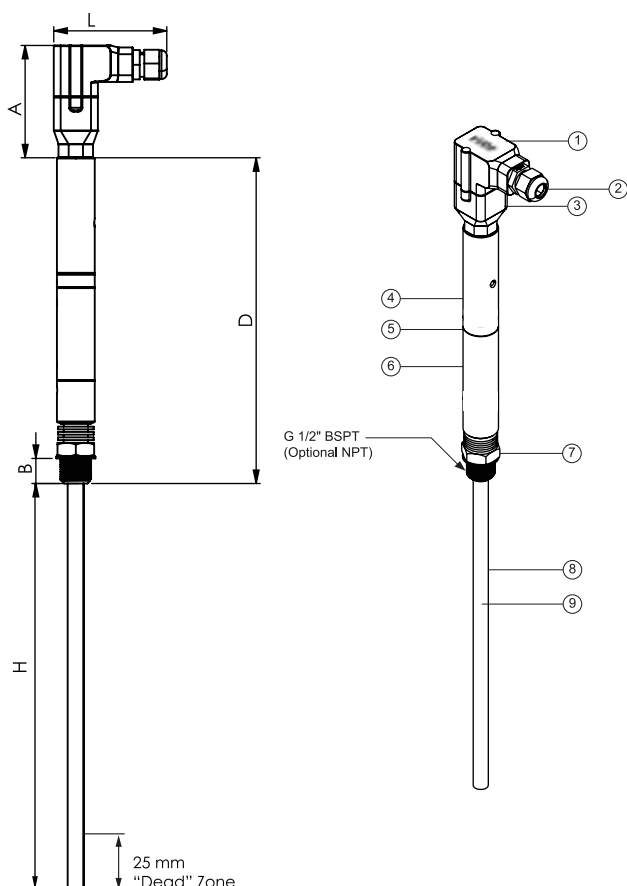


## SD 3400 Capacitive Level Probe

| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Preamplifier Body       | Austenitic Stainless Steel 304               |
| 5  | Preamplifier Connector  | Austenitic Stainless Steel 316L              |
| 6  | Cover Assembly          | Austenitic Stainless Steel 304               |
| 7  | Probe Body              | Austenitic Stainless Steel 316L              |
| 8  | Probe Sheathing         | Polytetrafluoroethylene (PTFE)               |
| 9  | Probe (Sheathed)        | Austenitic Stainless Steel 316L              |

### Dimensions

| H (mm)      | L (mm) | A (mm) | B (mm) | D (mm) | Dead zone (mm) |
|-------------|--------|--------|--------|--------|----------------|
| 300<br>1500 | 83,5   | 83     | 18,5   | 240,5  | 25             |



**Note:** The capacitive level probe is manufactured to the specified length and cannot be shortened afterwards. The required probe length must be clearly stated at the time of order.

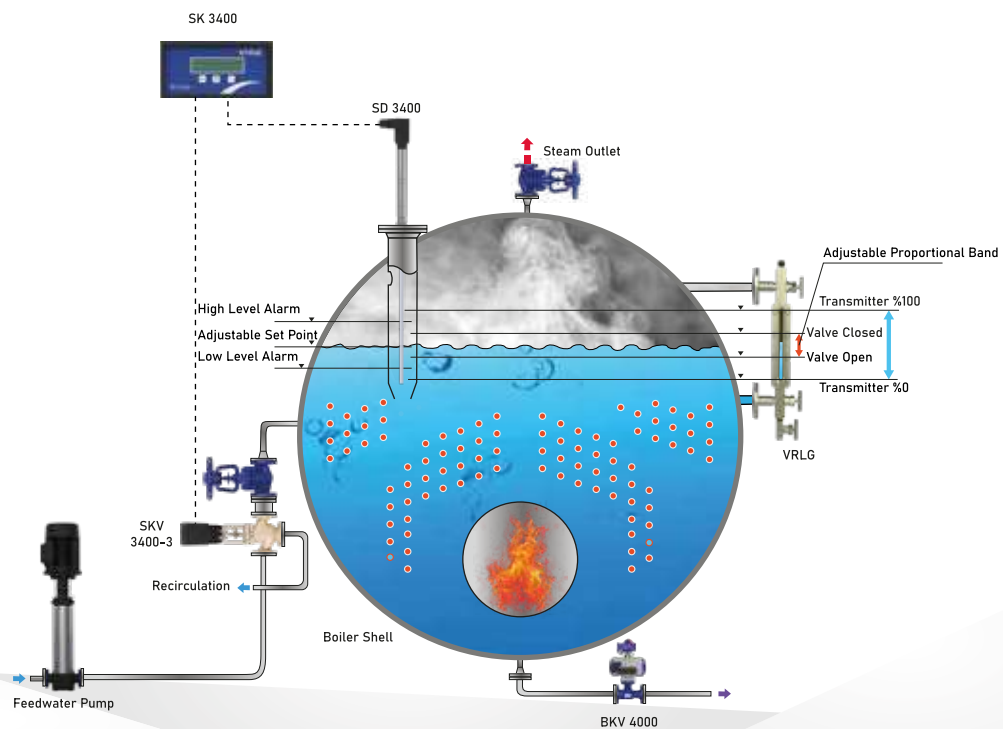
## SK 3000-3 Modulating Level Control and Alarm System



### Modulating Level Controller

|                    |                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | : SK 3400                                                                                                                                    |
| Supply Voltage     | : 230 VAC (+5% / -10%), 50/60Hz                                                                                                              |
| Enclosure          | : Panel-mount Type                                                                                                                           |
| Functions          | : Modulating / On-Off Level Control, High & Low Level Alarms, Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Outputs            | : 4–20 mA Analog Level Signal, 1 Valve Control Relay, 2 Alarm Relays                                                                         |
| Max. Ambient Temp. | : 55 °C                                                                                                                                      |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & EN 12953, Type Approval (Module B + D)                                                     |

## SK 3000-3 Typical Installation



## TECHNICAL SPECIFICATION

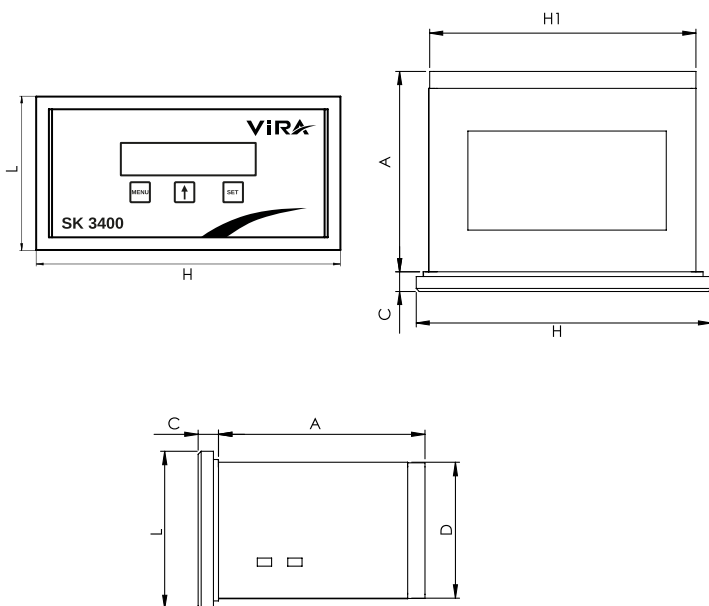
### SK 3400 Modulating Level Controller

#### Technical Data

|                    |                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | SK 3400                                                                                                                                    |
| Supply Voltage     | 230 VAC (+5% / -10%), 50/60Hz                                                                                                              |
| Functions          | Modulating / On-Off Level Control, High & Low Level Alarms, Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Inputs             | Level Probe Input, Ground, 0-1k Ohm Potentiometer, Control Valve                                                                           |
| Outputs            | 1 Valve Modulation Relay, 2 Alarm Relays, 4-20 mA Analog Level Signal                                                                      |
| Display            | LCD                                                                                                                                        |
| Max. Ambient Temp. | 55°C                                                                                                                                       |
| Enclosure          | PA (Polyamide)                                                                                                                             |
| Label              | Lexan                                                                                                                                      |
| Type               | Panel-mount                                                                                                                                |
| Protection Class   | IP40                                                                                                                                       |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

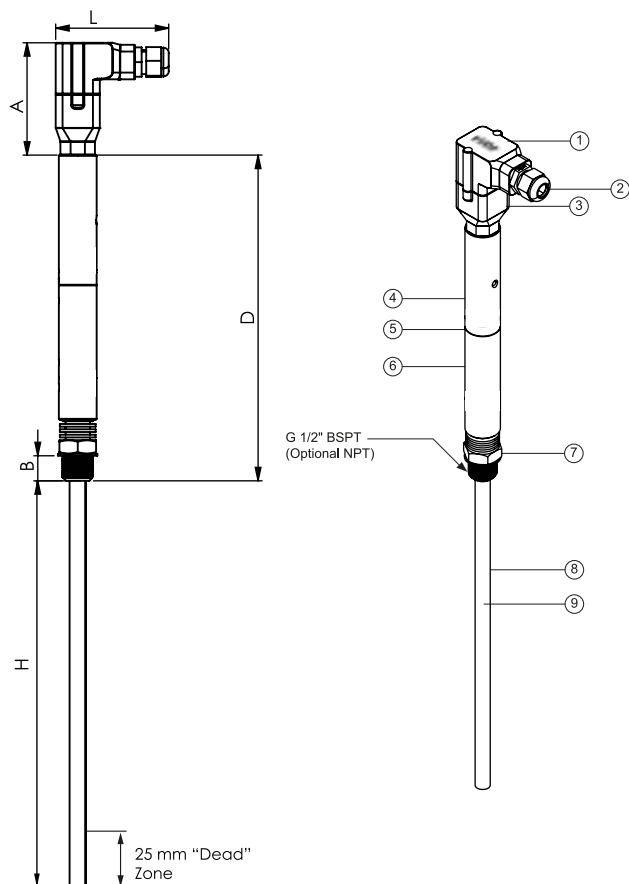


### SD 3400 Capacitive Level Probe

| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Preamplifier Body       | Austenitic Stainless Steel 304               |
| 5  | Preamplifier Connector  | Austenitic Stainless Steel 316L              |
| 6  | Cover Assembly          | Austenitic Stainless Steel 304               |
| 7  | Probe Body              | Austenitic Stainless Steel 316L              |
| 8  | Probe Sheathing         | Polytetrafluoroethylene (PTFE)               |
| 9  | Probe (Sheathed)        | Austenitic Stainless Steel 316L              |

#### Dimensions

| H (mm)   | L (mm) | A (mm) | B (mm) | D (mm) | Dead zone (mm) |
|----------|--------|--------|--------|--------|----------------|
| 300-1500 | 83,5   | 83     | 18,5   | 240,5  | 25             |



**Note:** The capacitive level probe is manufactured to the specified length and cannot be shortened afterwards. The required probe length must be clearly stated at the time of order.



## D-SK 3000-3 Modulating Level Control and Alarm System



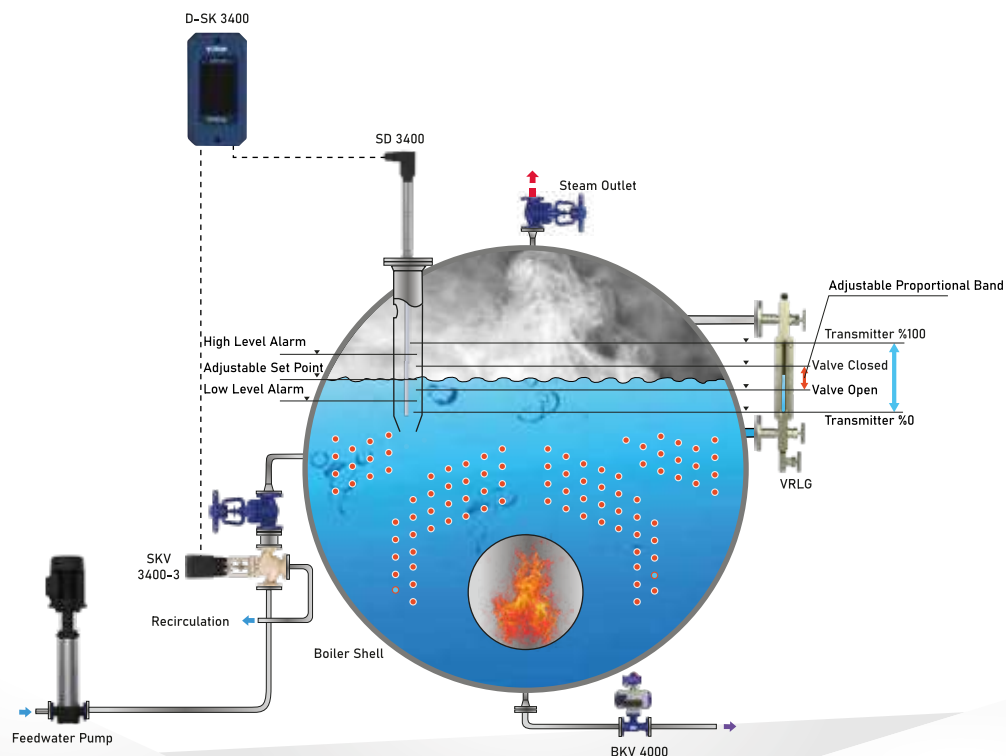
### Modulating Level Controller

|                    |                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | : D-SK 3400                                                                                                                                                                       |
| Supply Voltage     | : 24VDC                                                                                                                                                                           |
| Enclosure          | : Panel-mount and Din Rail Type                                                                                                                                                   |
| Functions          | : Modulating / On-Off Level Control, High & Low Level Alarms, 4-20 mA Analogue Input, Touch Screen Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Outputs            | : 4-20 mA Analog Level Signal, 4-20 mA Analog Control Output (Control/Drive), 1 Valve Control Relay, 2 Alarm Relays, RS 485 Modbus, 0-1k Ohm Potentiometer Feedback               |
| Max. Ambient Temp. | : 55 °C                                                                                                                                                                           |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & EN 12953, Type Approval (Module B + D)                                                                                          |

### Modulating Level Control Probe (Capacitive Level Probe)

|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : SD 3400                                                                |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Length              | : 300-1500 mm                                                            |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |

## D-SK 3000-3 Typical Installation



# TECHNICAL SPECIFICATION

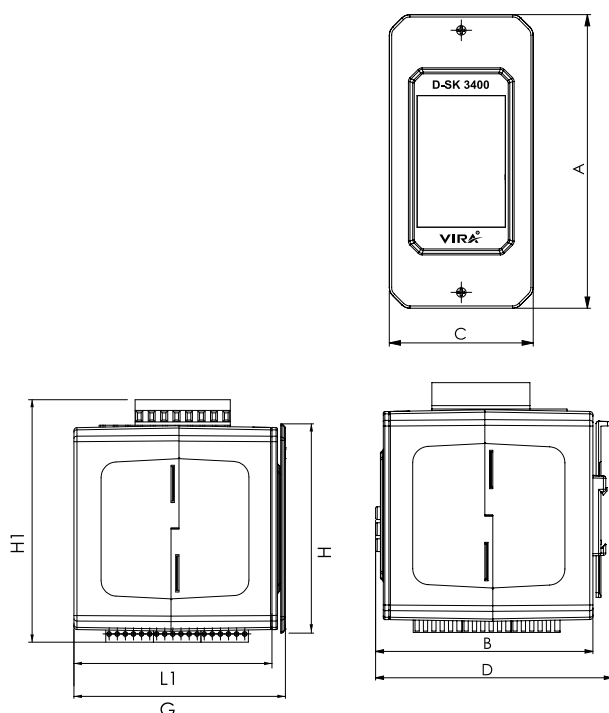
## D-SK 3400 Modulating Level Controller

### Technical Data

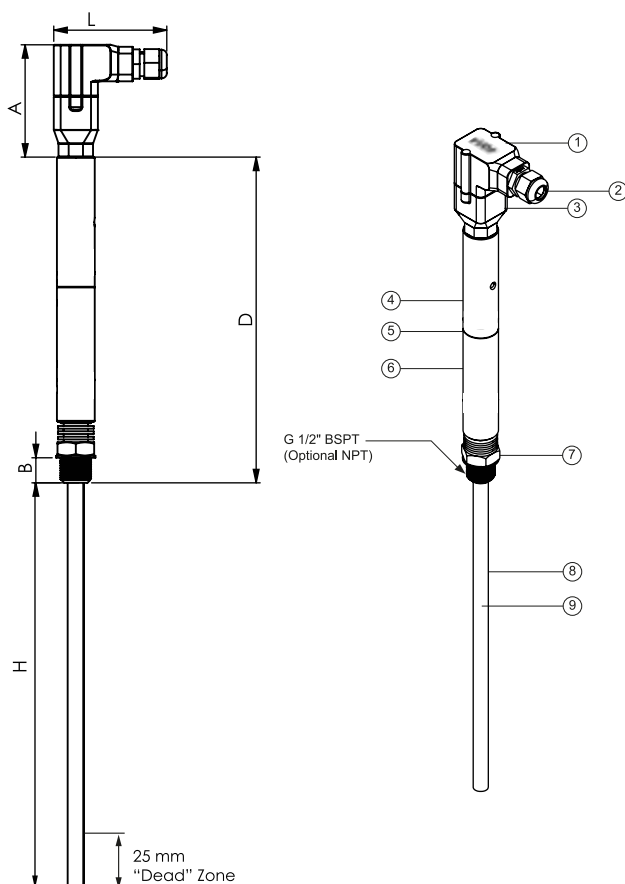
|                    |                                                                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | D-SK 3400                                                                                                                                                |
| Supply Voltage     | 24VDC                                                                                                                                                    |
| Functions          | Modulating / On-Off Level Control, High & Low Level Alarms, Touch Screen, Adjustable Control Parameters (e.g. proportional band, set point, alarm delay) |
| Inputs             | Level Probe Input, Ground, 0-1k Ohm Potentiometer Feedback, 4-20 mA Analogue Input                                                                       |
| Outputs            | 1 Valve Modulation Relay, 2 Alarm Relays, RS 485 Modbus, 4-20 mA Analog Level Signal, 4-20 mA Analog Control Output                                      |
| Display            | Touch Screen                                                                                                                                             |
| Label              | Silicone Rubber                                                                                                                                          |
| Max. Ambient Temp. | 55°C                                                                                                                                                     |
| Enclosure          | PC (Polycarbonate)                                                                                                                                       |
| Type               | Panel-mount and Din Rail                                                                                                                                 |
| Protection Class   | IP40                                                                                                                                                     |

### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |



## SD 3400 Capacitive Level Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Preamplifier Body       | Austenitic Stainless Steel 304               |
| 5  | Preamplifier Connector  | Austenitic Stainless Steel 316L              |
| 6  | Cover Assembly          | Austenitic Stainless Steel 304               |
| 7  | Probe Body              | Austenitic Stainless Steel 316L              |
| 8  | Probe Sheathing         | Polytetrafluoroethylene (PTFE)               |
| 9  | Probe (Sheathed)        | Austenitic Stainless Steel 316L              |

### Dimensions

| H (mm)   | L (mm) | A (mm) | B (mm) | D (mm) | Dead zone (mm) |
|----------|--------|--------|--------|--------|----------------|
| 300-1500 | 83,5   | 83     | 18,5   | 240,5  | 25             |

**Note:** The capacitive level probe is manufactured to the specified length and cannot be shortened afterwards. The required probe length must be clearly stated at the time of order.

## 2-Way Feedwater Control Valve



|                     |                                                  |
|---------------------|--------------------------------------------------|
| Type                | : SKV 3400-2                                     |
| Body Material       | : ENJL 1040 PN 16, ENJS 1049 PN 25, 1.0619 PN 40 |
| Leakage Class       | : Class IV (Optional V)                          |
| Flow Characteristic | : Linear (Equal Percentage)                      |
| Operating Temp.     | : -10 - + 220°C (High Temp. on Request)          |
| Supply              | : 220VAC (optional 24VDC)                        |
| Control Signal      | : 3 Step (4-20 mA Optional)                      |
| Protection Class    | : IP 54                                          |
| Protection Switch   | : Standard 2 * Safety Limit Switch               |

## 3-Way Feedwater Control Valve

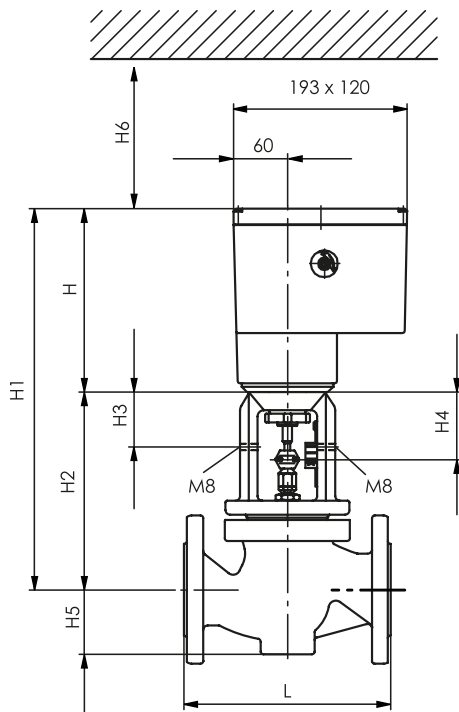


|                     |                                                  |
|---------------------|--------------------------------------------------|
| Type                | : SKV 3400-3                                     |
| Body Material       | : ENJL 1040 PN 16, ENJS 1049 PN 25, 1.0619 PN 40 |
| Leakage Class       | : Class I                                        |
| Flow Characteristic | : Linear (Equal Percentage)                      |
| Operating Temp.     | : -10 - + 220°C (High Temp. on Request)          |
| Supply              | : 220VAC (optional 24VDC)                        |
| Control Signal      | : 3 Step (4-20 mA Optional)                      |
| Protection Class    | : IP 54                                          |
| Protection Switch   | : Standard 2 * Safety Limit Switch               |

## TECHNICAL SPECIFICATION

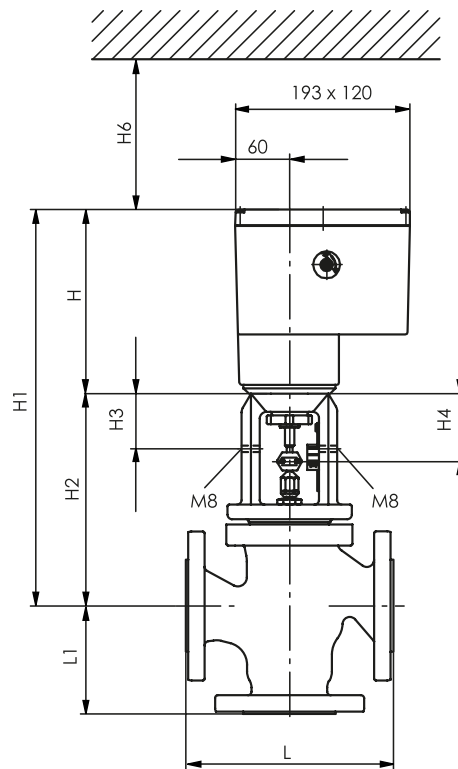
### SKV 3400-2

#### 2 Way Feedwater Control Valve



### SKV 3400-3

#### 3 Way Feedwater Control Valve



#### Technical Data

|                         |                                                       |
|-------------------------|-------------------------------------------------------|
| <b>Model</b>            | SKV 3400-2, SKV 3400-3                                |
| <b>Supply Voltage</b>   | 230 V, 50 Hz                                          |
| <b>Type</b>             | Diverting Valve                                       |
| <b>Pressure Class</b>   | PN 16, PN 25, PN 40                                   |
| <b>Body Material</b>    | EN-JL1040 - PN16<br>EN-JS1049 - PN25<br>1.0619 - PN40 |
| <b>Operat. Temp.</b>    | -10 - +220 °C                                         |
| <b>Sealing</b>          | Metal to Metal                                        |
| <b>Actuator</b>         | Electric (Optional Pneumatic)                         |
| <b>Protection Class</b> | IP54                                                  |
| <b>Control Options</b>  | 3 Step, 4-20 mA (optional)                            |
| <b>Feedback Signal</b>  | 0-1K Potentiometer, 4-20 mA Positioner (Optional)     |

#### Dimensions

| Nominal size (DN) | L (mm) | L1 (mm) | H1 (mm) | H2 (mm) | H3 (mm) | H4 (mm) | Weight (kg) |
|-------------------|--------|---------|---------|---------|---------|---------|-------------|
| 15                | 130    | 70      | H2+H    | 235     | 61      | 75      | 6           |
| 20                | 150    | 80      | H2+H    | 235     | 61      | 75      | 7           |
| 25                | 160    | 85      | H2+H    | 235     | 61      | 75      | 8           |
| 32                | 180    | 100     | H2+H    | 235     | 61      | 75      | 13          |
| 40                | 200    | 105     | H2+H    | 235     | 61      | 75      | 15          |
| 50                | 230    | 120     | H2+H    | 235     | 61      | 75      | 17          |
| 65                | 290    | 130     | H2+H    | 270     | 61      | 75      | 31          |
| 80                | 310    | 140     | H2+H    | 270     | 61      | 75      | 37          |
| 100               | 350    | 150     | H2+H    | 360     | 75      | 90      | 49          |
| 125               | 400    | 200     | H2+H    | 375     | 75      | 90      | 95          |
| 150               | 480    | 210     | H2+H    | 375     | 75      | 90      | 135         |

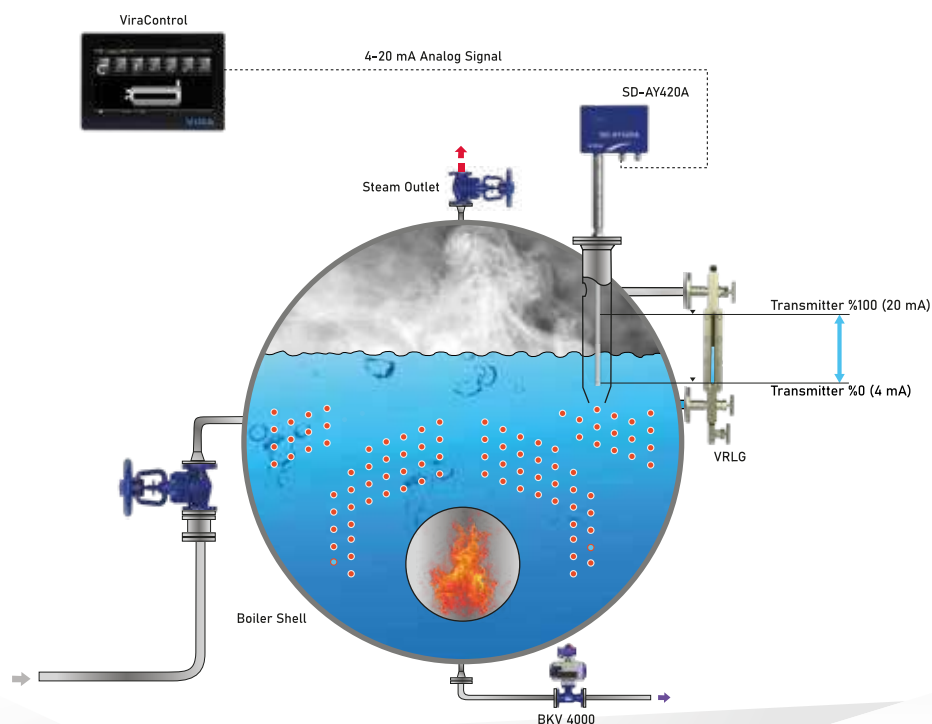
## SD-AY 420A Capacitive Level Transmitter



### SD-AY 420A Capacitive Level Transmitter

|                     |                                                                                                          |
|---------------------|----------------------------------------------------------------------------------------------------------|
| Type                | : SD-AY 420A                                                                                             |
| Supply Voltage      | : 24 VDC (Optional 230 VAC)                                                                              |
| Functions           | : Minimum & Maximum Level Set                                                                            |
| Outputs             | : 4–20 mA Analog Level Signal / Active (Optional Passive)                                                |
| Nominal Pressure    | : PN 40                                                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                                                             |
| Length              | : 300–1500 mm                                                                                            |
| Max. Ambient Temp.  | : 75 °C                                                                                                  |
| Compliance          | : CE (EMC 2014/30/EU, LVD 2014/35/EU, PED 2014/68/EU), EN 12952 & EN 12953, Type Approval (Module B + D) |

## SD-AY 420A Typical Installation



# TECHNICAL SPECIFICATION

## SD-AY 420A Capacitive Level Transmitter

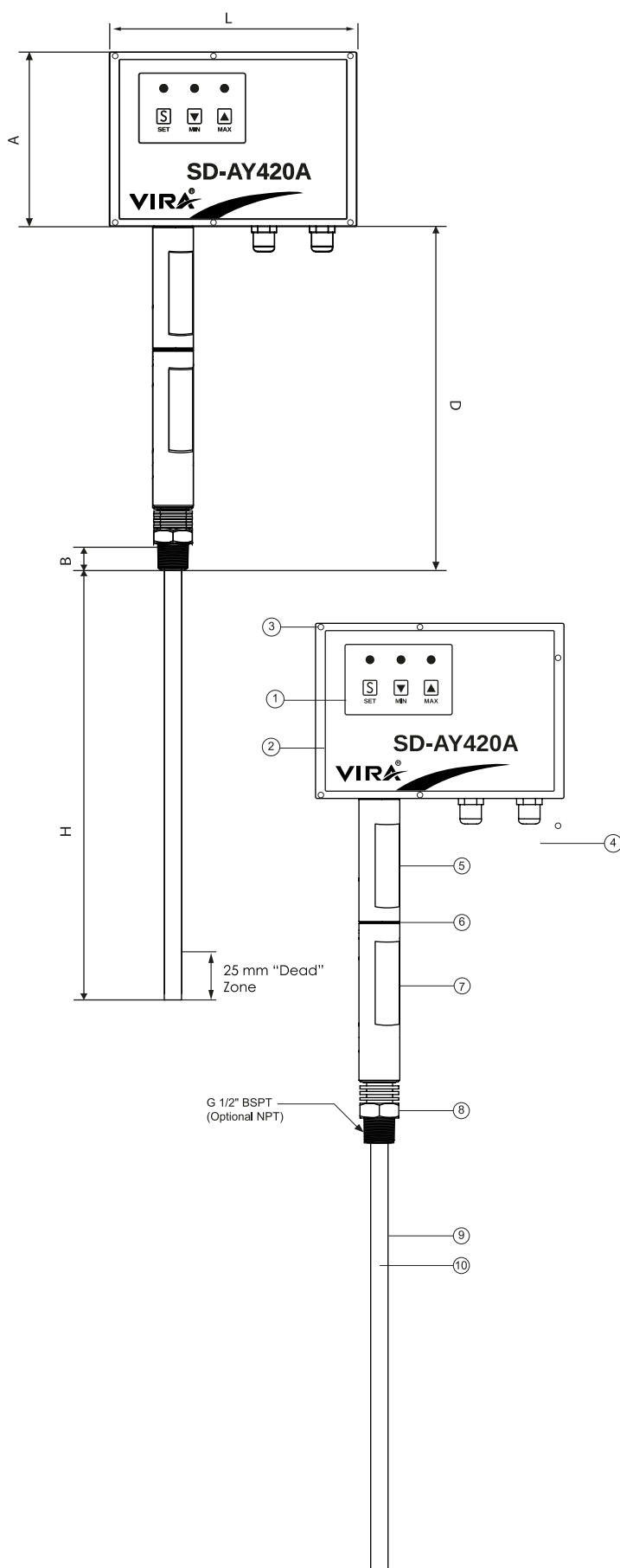
### Technical Data

|                      |                              |
|----------------------|------------------------------|
| Type                 | SD-AY 420A                   |
| Supply Voltage       | 24VDC (Optional 230VAC)      |
| Functions            | Min Level Set, Max Level Set |
| Inputs               | Level Probe Input            |
| Outputs              | 4–20 mA Analog Level Signal  |
| Display              | Led                          |
| Max. Ambient Temp.   | 75 °C                        |
| Enclosure            | Aluminum                     |
| Label                | Lexan                        |
| Control              | 3 Buttons                    |
| Installation Type    | Boiler top mounted           |
| Protection Class     | IP 65                        |
| Nominal Pressure     | PN 40                        |
| Max. Operating Temp. | 239 °C                       |
| Max. Operating Pres. | 32 Bar g                     |
| Connection           | G 1/2" BSPT (Optional NPT)   |
| Length               | 300–1500 mm                  |

### Dimensions

| H (mm)   | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|----------|--------|--------|--------|--------|--------|
| 300–1500 | 170    | 121    | 23,5   | 60     | 241    |

| No | Part                   | Material                        |
|----|------------------------|---------------------------------|
| 1  | Display                | Leds                            |
| 2  | Label                  | Lexan                           |
| 3  | Housing Screws M4      | Austenitic Stainless Steel 304  |
| 4  | PG7 Cable Gland        | Brass (Nickel Coated)           |
| 5  | Preamplifier Body      | Austenitic Stainless Steel 304  |
| 6  | Preamplifier Connector | Austenitic Stainless Steel 316L |
| 7  | Cover Assembly         | Austenitic Stainless Steel 304  |
| 8  | Probe Body             | Austenitic Stainless Steel 316L |
| 9  | Probe Sheathing        | Polytetrafluoroethylene (PTFE)  |
| 10 | Probe (Sheathed)       | Austenitic Stainless Steel 316L |



**Note:** The capacitive level probe is manufactured to the specified length and cannot be shortened afterwards. The required probe length must be clearly stated at the time of order.





LEVEL  
LIMITING  
& ALARM



## LEVEL LIMITING & ALARM

Reliable water level monitoring is one of the most critical safety requirements in steam boiler operation. For this reason, two different types of systems are used in compliance with EN 12952 and EN 12953:

### Level Alarm Systems

Level alarm systems continuously monitor the water level inside the boiler and generate an alarm signal when the defined high or low level limits are reached. These systems are primarily used to warn operators of abnormal operating conditions and allow timely intervention. Vira's SK 1000 and SK-T 1200 series provide dependable alarm functions for both high and low water levels.

### Level Limiter Systems

Unlike alarm systems, level limiters are designed as safety devices that automatically shut down the burner or stop fuel supply when a critical water level is reached. Vira's SMH 1000, D-SMH 1000 (high level) and SML 1000, D-SML 1000 (low level) self-monitoring limiters incorporate advanced diagnostic functions such as:

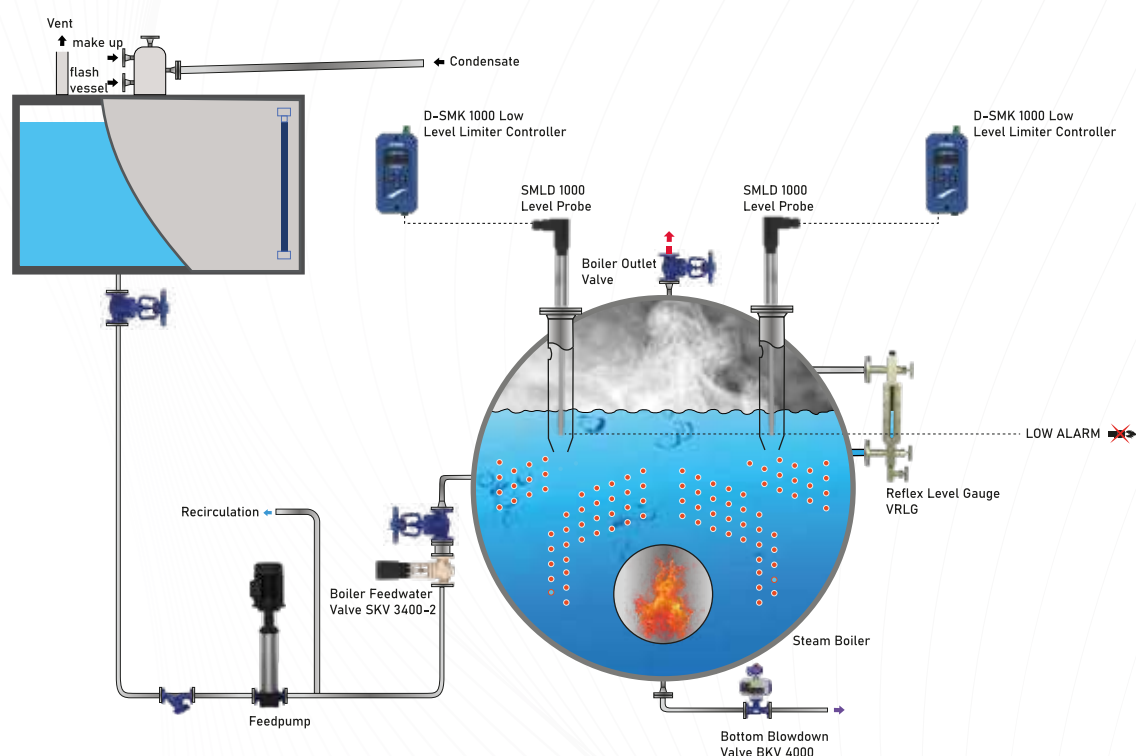
- Detection of open circuit (cable break) or short circuit in the connection lines
- Verification of probe contact with the boiler body
- Monitoring for probe leakage and contamination
- Periodic internal circuit self-checks
- Automatic fault alarm in case of any irregularity

### Difference Between Alarm and Limiter Systems

A Level Alarm system provides warnings to the operator when the water level in the boiler reaches a pre-defined high or low point. The alarm signal is transmitted via relays, but the device itself is not self-monitoring and not redundant.

A Level Limiter, on the other hand, is a certified safety device designed to automatically shut down and lockout the boiler in case of dangerous low or high water level conditions. Unlike alarms, limiters fulfill mandatory safety requirements in accordance with EN 12952 and EN 12953 standards.

**Note:** SMH 1000, D-SMH 1000 and SML 1000, D-SML 1000 self-monitoring level limiter systems are certified for use in unattended boiler operation in line with EN 12952 and EN 12953 requirements.



## SMH 1000 Self Monitoring High Level Limiter System



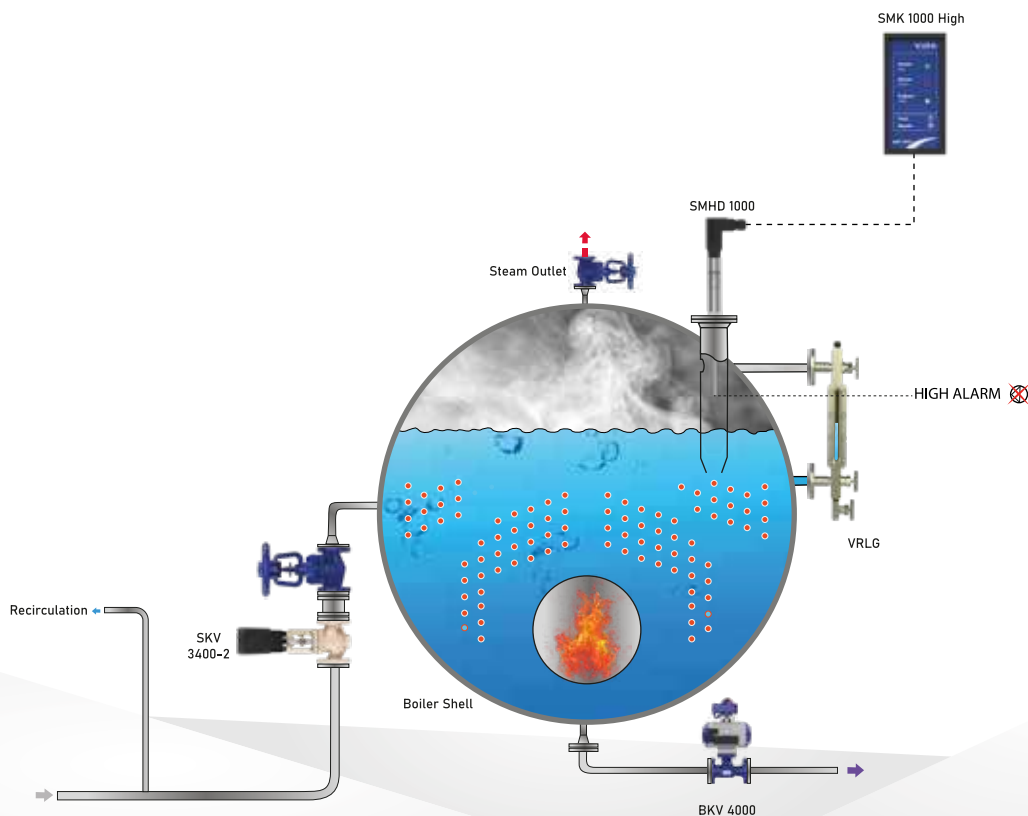
### Self Monitoring High Level Limiter Controller

|                    |                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Type               | : SMK 1000 High                                                                                                                 |
| Enclosure          | : Panel-mount Type                                                                                                              |
| Supply Voltage     | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                  |
| Functions          | : Self Monitoring High Level Alarm, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Outputs            | : 2 Safety Relays                                                                                                               |
| Max. Ambient Temp. | : 55°C                                                                                                                          |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), PED 2014/68/EU, SIL (IEC 61508), EN 12952 & 12953, Type Approval (Module B + D)          |

### Self Monitoring High Level Limiter Probe

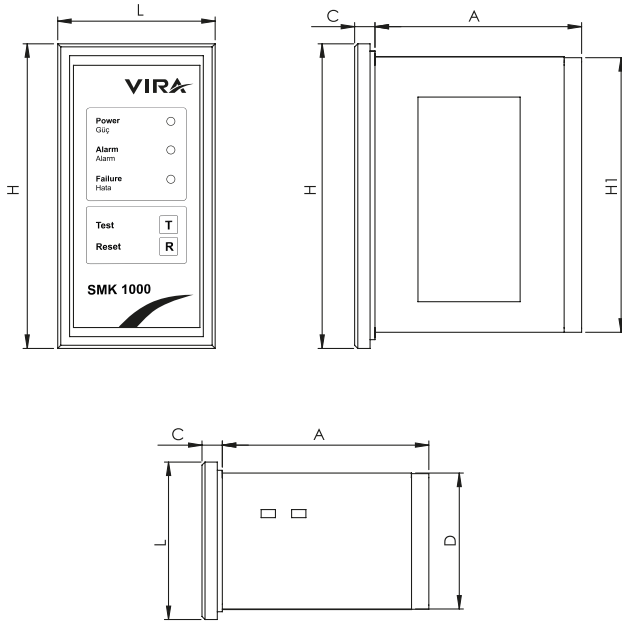
|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Type                | : SMHD 1000                                                           |
| Nominal Pressure    | : PN 40                                                               |
| Max. Operat. Temp.  | : 239 °C                                                              |
| Max. Operat. Press. | : 32 Bar g                                                            |
| Connection          | : G 1/2" BSPT (Optional NPT)                                          |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                    |
| Max. Ambient Temp   | : 75 °C                                                               |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & 12953, Type Approval (Module B + D) |

## SMH 1000 Typical Installation



## TECHNICAL SPECIFICATION

### SMK 1000 Self Monitoring High Level Limiter Controller



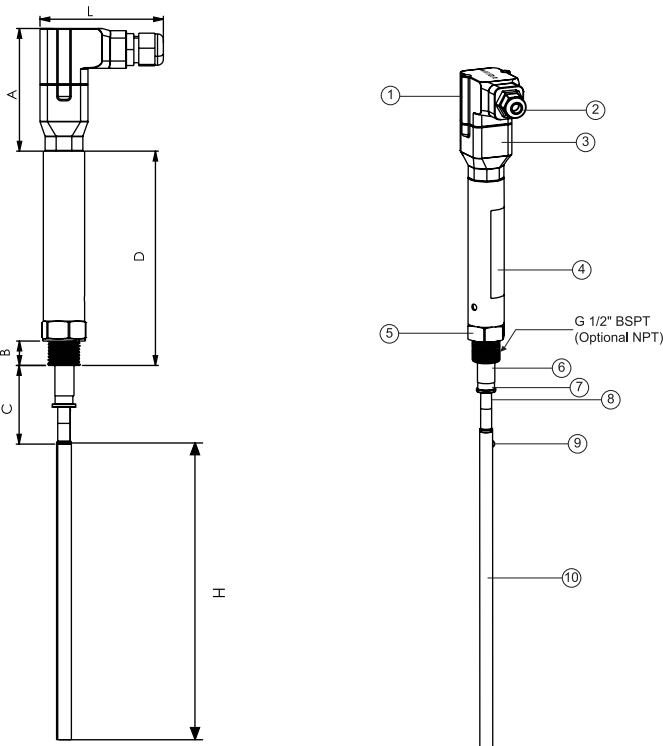
#### Technical Data

|                    |                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Type               | SMK 1000 High                                                                                                                       |
| Supply Voltage     | 230 VAC (+5% / -10%) 50/60Hz                                                                                                        |
| Functions          | Self Monitoring High Level Limiting, Test, Reset, Cable Break Check, Short Circuiting Check, Probe Scale Check, Periodic Self Check |
| Inputs             | Level Probe Input, Ground                                                                                                           |
| Outputs            | 2 Safety Relays                                                                                                                     |
| Display            | Led                                                                                                                                 |
| Label              | Lexan                                                                                                                               |
| Max. Ambient Temp. | 55°C                                                                                                                                |
| Enclosure          | PA (Polyamide)                                                                                                                      |
| Type               | Panel-mount                                                                                                                         |
| Protection Class   | IP40                                                                                                                                |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### SMHD 1000 Self Monitoring High Level Limiter Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Probe Body              | Austenitic Stainless Steel 304               |
| 6  | Primary Insulator       | Polytetrafluoroethylene (PTFE)               |
| 7  | Comparator Tip          | Austenitic Stainless Steel 316L              |
| 8  | Secondary Insulator     | Polytetrafluoroethylene (PTFE)               |
| 9  | Retaining Bolt          | Austenitic Stainless Steel 304               |
| 10 | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 83,5   | 83     | 16,5   | 53     | 145    |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

# D-SMH 1000 Self Monitoring High Level Limiter System



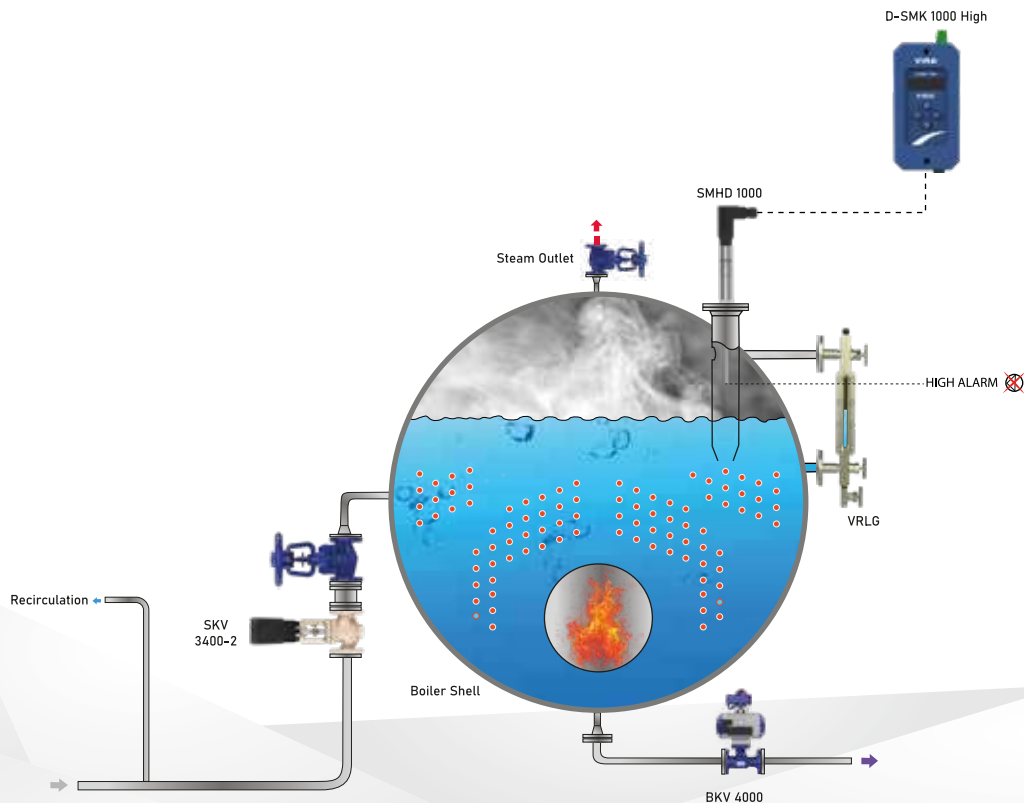
## Self Monitoring High Level Limiter Controller

|                    |                                                                                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | : D-SMK 1000 High                                                                                                                                             |
| Supply Voltage     | : 24VDC                                                                                                                                                       |
| Enclosure          | : Panel-mount and Din Rail Type                                                                                                                               |
| Functions          | : Self Monitoring High Level Alarm, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check, 7 Segment Display, 4 buttons |
| Outputs            | : 2 Safety Relays                                                                                                                                             |
| Max. Ambient Temp. | : 55 °C                                                                                                                                                       |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), PED 2014/68/EU, SIL (IEC 61508), EN 12952 & 12953, Type Approval (Module B + D)                                        |

## Self Monitoring High Level Limiter Probe

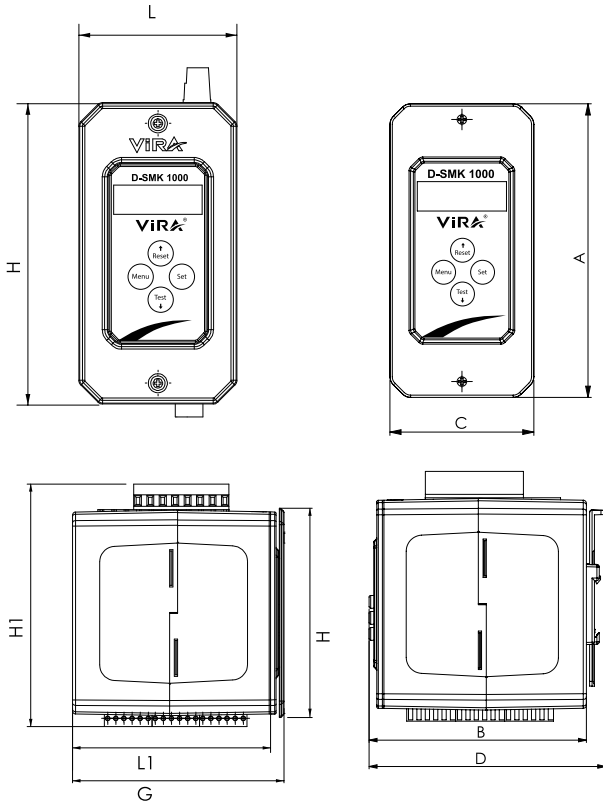
|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Type                | : SMHD 1000                                                           |
| Nominal Pressure    | : PN 40                                                               |
| Max. Operat. Temp.  | : 239 °C                                                              |
| Max. Operat. Press. | : 32 Bar g                                                            |
| Connection          | : G 1/2" BSPT (Optional NPT)                                          |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                    |
| Max. Ambient Temp   | : 75 °C                                                               |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & 12953, Type Approval (Module B + D) |

## D-SMH 1000 Typical Installation



## TECHNICAL SPECIFICATION

### D-SMK 1000 Self Monitoring High Level Limiter Controller



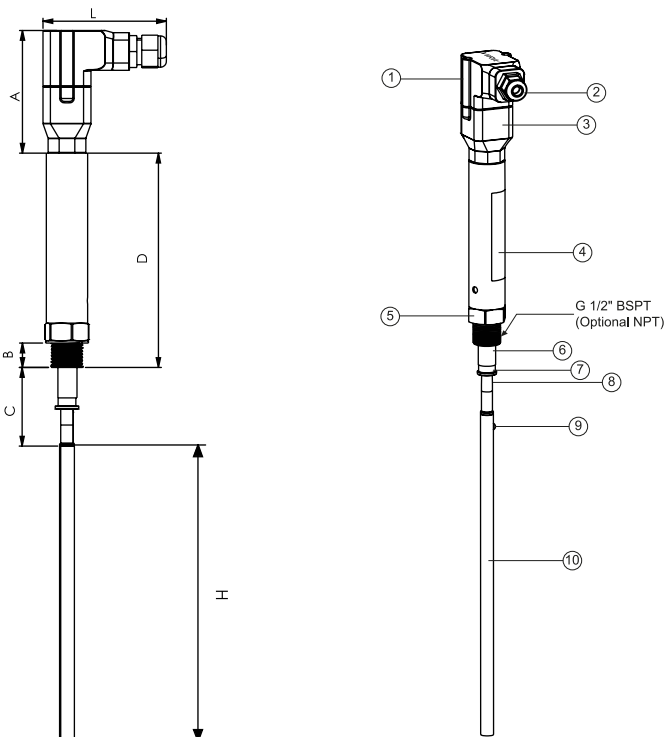
#### Technical Data

|                    |                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Type               | D-SMK 1000 High                                                                                                                  |
| Supply Voltage     | 24VDC                                                                                                                            |
| Functions          | Self Monitoring High Level Limiting, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Inputs             | Level Probe Input, Ground                                                                                                        |
| Outputs            | 2 Safety Relays                                                                                                                  |
| Display            | 7 Segment                                                                                                                        |
| Label              | Silicone Rubber                                                                                                                  |
| Max. Ambient Temp. | 55°C                                                                                                                             |
| Enclosure          | PC (Polycarbonate)                                                                                                               |
| Type               | Panel-mount and Din Rail                                                                                                         |
| Protection Class   | IP40                                                                                                                             |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

### SMHD 1000 Self Monitoring High Level Limiter Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Probe Body              | Austenitic Stainless Steel 304               |
| 6  | Primary Insulator       | Polytetrafluoroethylene (PTFE)               |
| 7  | Comparator Tip          | Austenitic Stainless Steel 316L              |
| 8  | Secondary Insulator     | Polytetrafluoroethylene (PTFE)               |
| 9  | Retaining Bolt          | Austenitic Stainless Steel 304               |
| 10 | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 83,5   | 83     | 16,5   | 53     | 145    |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.



## SML 1000 Self Monitoring Low Level Limiter System



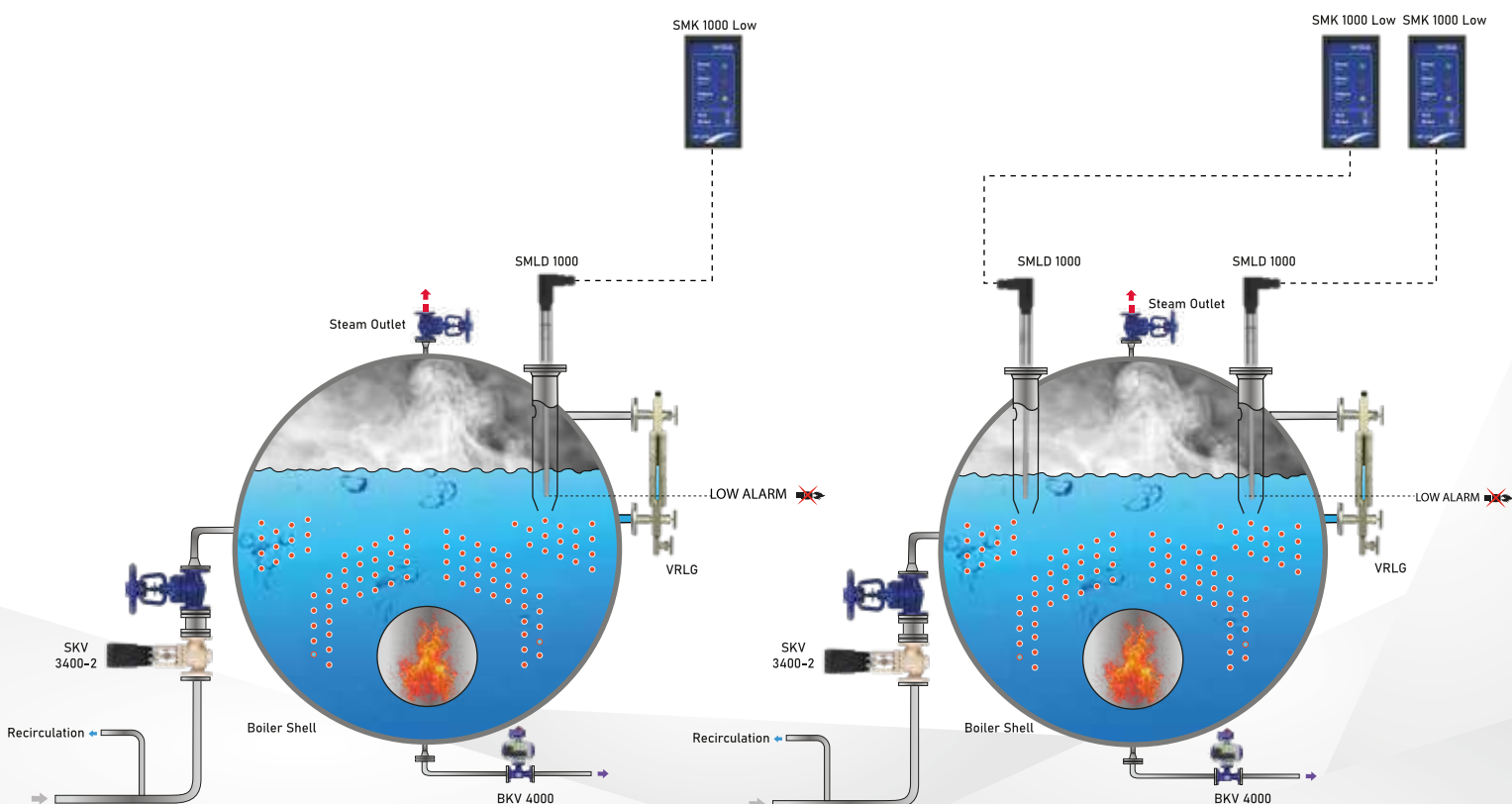
### Self Monitoring Low Level Limiter Controller

|                    |                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Type               | : SMK 1000 Low                                                                                                                 |
| Enclosure          | : Panel-mount Type                                                                                                             |
| Supply Voltage     | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                 |
| Functions          | : Self Monitoring Low Level Alarm, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Outputs            | : 2 Safety Relays                                                                                                              |
| Max. Ambient Temp. | : 55°C                                                                                                                         |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), PED 2014/68/EU, SIL (IEC 61508), EN 12952 & 12953, Type Approval (Module B + D)         |

### Self Monitoring Low Level Limiter Probe

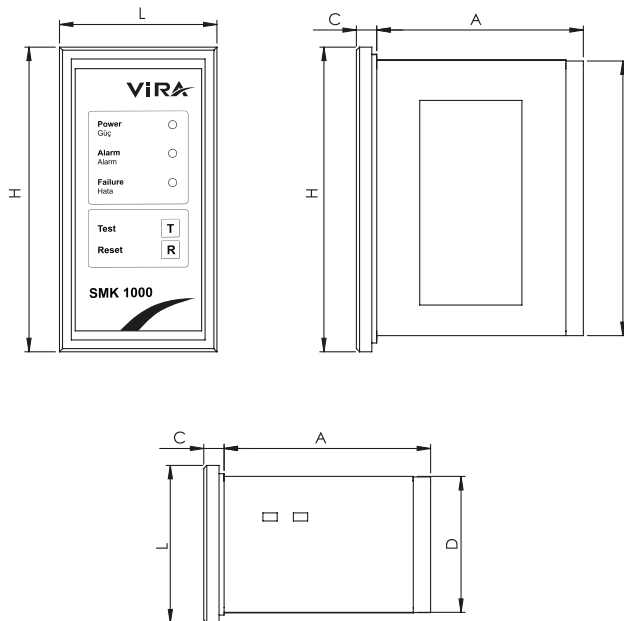
|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Type                | : SMLD 1000                                                           |
| Nominal Pressure    | : PN 40                                                               |
| Max. Operat. Temp.  | : 239 °C                                                              |
| Max. Operat. Press. | : 32 Bar g                                                            |
| Connection          | : G 1/2" BSPT (Optional NPT)                                          |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                    |
| Max. Ambient Temp   | : 75 °C                                                               |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & 12953, Type Approval (Module B + D) |

## SML 1000 Typical Installation



## TECHNICAL SPECIFICATION

### SMK 1000 Self Monitoring Low Level Limiter Controller



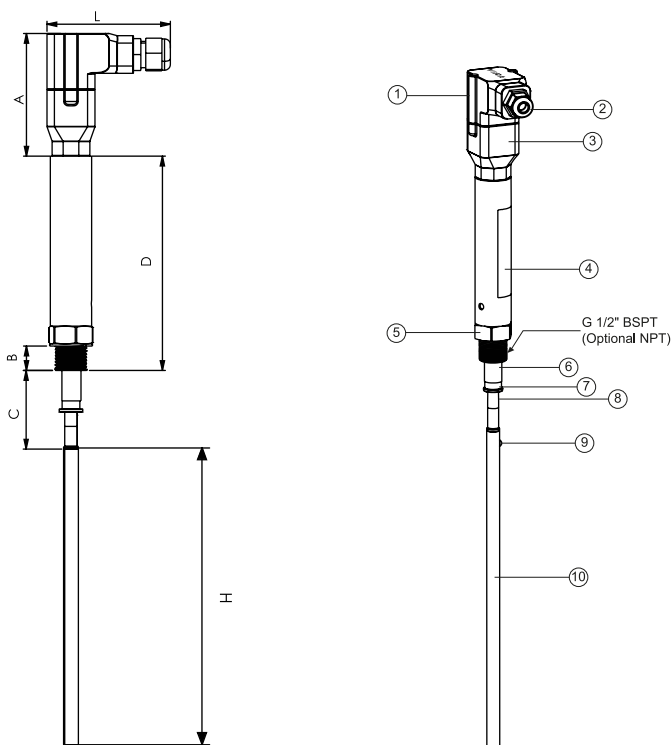
#### Technical Data

|                    |                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Type               | SMK 1000 Low                                                                                                                    |
| Supply Voltage     | 230 VAC (+5% / -10%) 50/60Hz                                                                                                    |
| Functions          | Self Monitoring Low Level Limiting, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Inputs             | Level Probe Input, Ground                                                                                                       |
| Outputs            | 2 Safety Relays                                                                                                                 |
| Display            | Led                                                                                                                             |
| Label              | Lexan                                                                                                                           |
| Max. Ambient Temp. | 55°C                                                                                                                            |
| Enclosure          | PA (Polyamide)                                                                                                                  |
| Type               | Panel-mount                                                                                                                     |
| Protection Class   | IP40                                                                                                                            |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### SMLD 1000 Self Monitoring Low Level Limiter Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Probe Body              | Austenitic Stainless Steel 304               |
| 6  | Primary Insulator       | Polytetrafluoroethylene (PTFE)               |
| 7  | Comparator Tip          | Austenitic Stainless Steel 316L              |
| 8  | Secondary Insulator     | Polytetrafluoroethylene (PTFE)               |
| 9  | Retaining Bolt          | Austenitic Stainless Steel 304               |
| 10 | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 83,5   | 83     | 16,5   | 53     | 145    |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

# D-SML 1000 Self Monitoring Low Level Limiter System



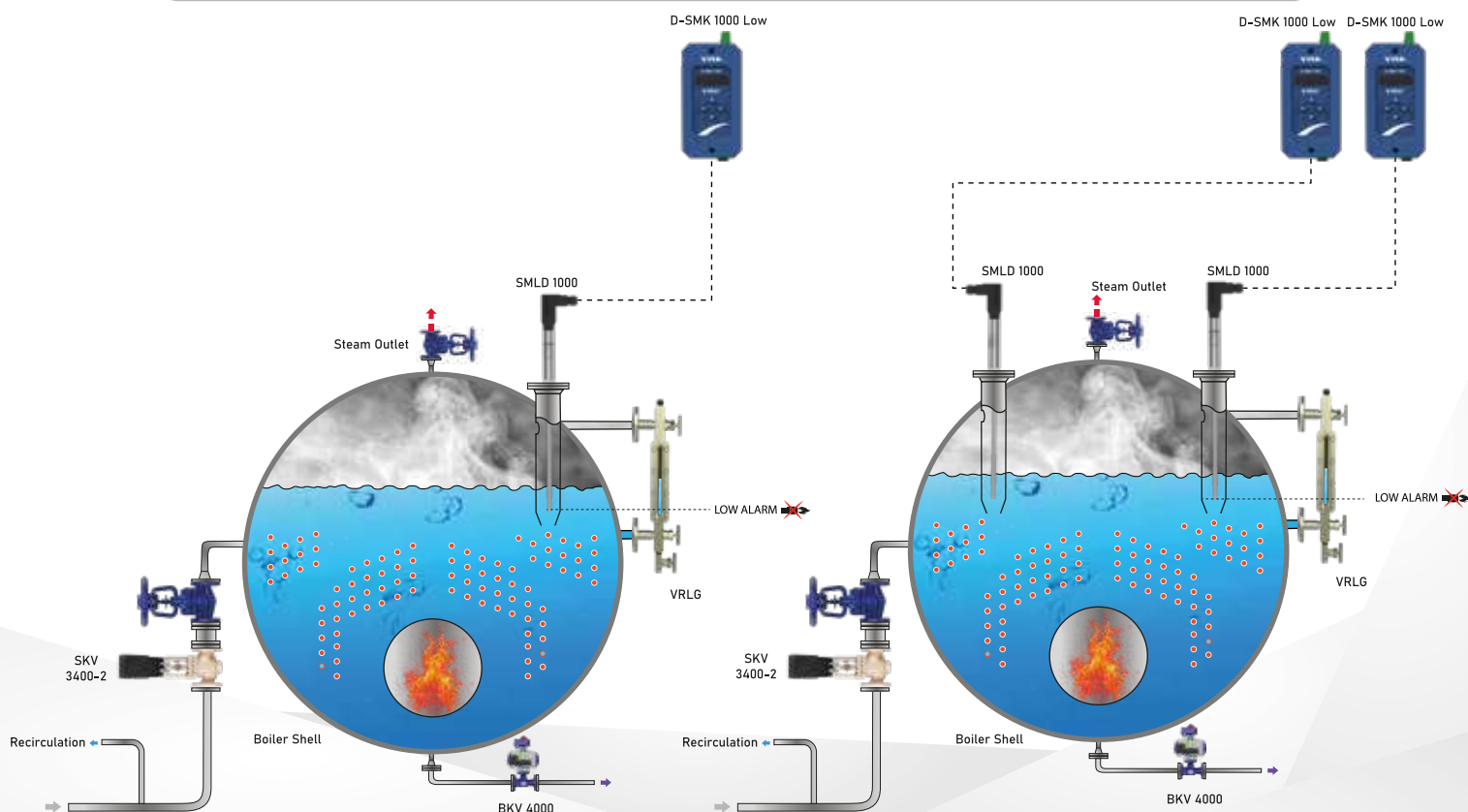
## Self Monitoring Low Level Limiter Controller

|                    |                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Type               | : D-SMK 1000 Low                                                                                                               |
| Enclosure          | : Panel-mount and Din Rail Type                                                                                                |
| Supply Voltage     | : 24VDC                                                                                                                        |
| Functions          | : Self Monitoring Low Level Alarm, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Outputs            | : 2 Safety Relays                                                                                                              |
| Max. Ambient Temp. | : 55°C                                                                                                                         |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), PED 2014/68/EU, SIL (IEC 61508), EN 12952 & 12953, Type Approval (Module B + D)         |

## Self Monitoring Low Level Limiter Probe

|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Type                | : SMLD 1000                                                           |
| Nominal Pressure    | : PN 40                                                               |
| Max. Operat. Temp.  | : 239 °C                                                              |
| Max. Operat. Press. | : 32 Bar g                                                            |
| Connection          | : G 1/2" BSPT (Optional NPT)                                          |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                    |
| Max. Ambient Temp   | : 75 °C                                                               |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & 12953, Type Approval (Module B + D) |

## D-SML 1000 Typical Installation



## TECHNICAL SPECIFICATION

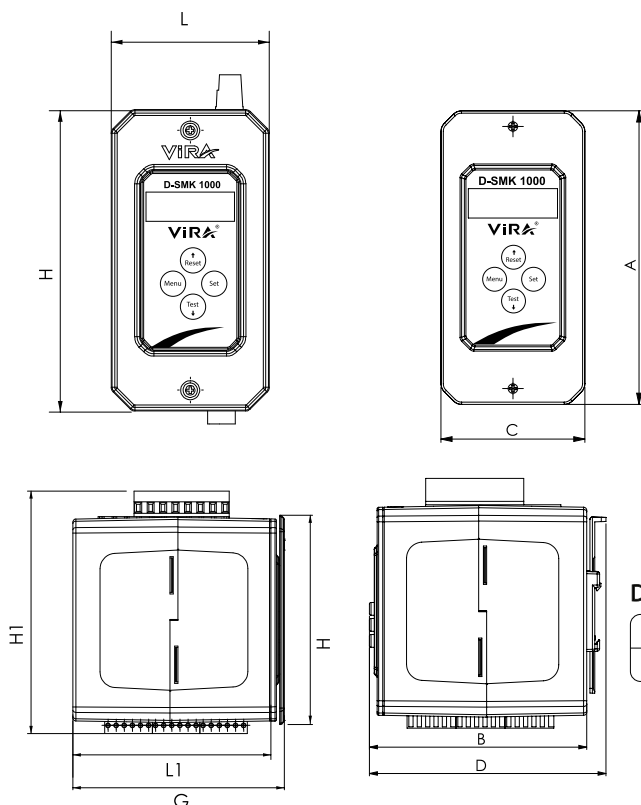
### D-SMK 1000 Self Monitoring Low Level Limiter Controller

#### Technical Data

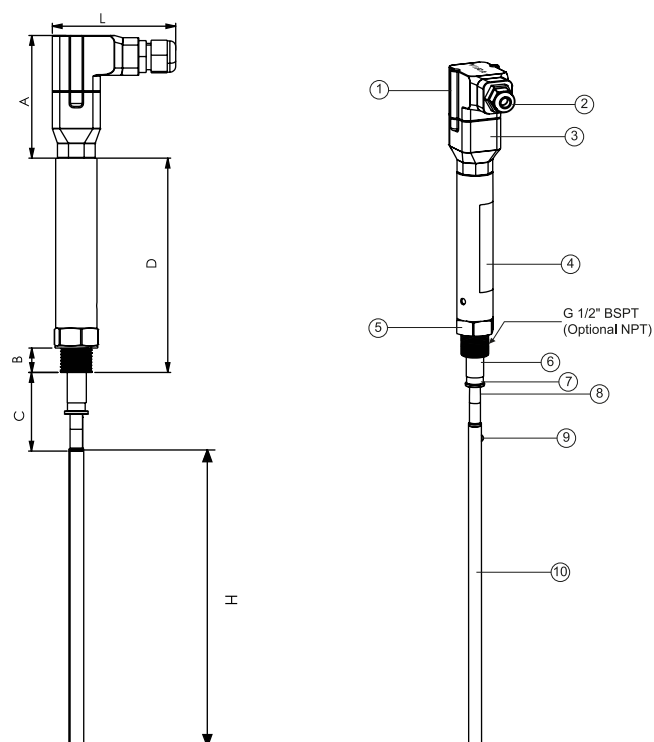
|                    |                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Type               | D-SMK 1000 Low                                                                                                                  |
| Supply Voltage     | 24VDC                                                                                                                           |
| Functions          | Self Monitoring Low Level Limiting, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Inputs             | Level Probe Input, Ground                                                                                                       |
| Outputs            | 2 Safety Relays                                                                                                                 |
| Display            | 7 Segment                                                                                                                       |
| Label              | Silicone Rubber                                                                                                                 |
| Max. Ambient Temp. | 55°C                                                                                                                            |
| Enclosure          | PC (Polycarbonate)                                                                                                              |
| Type               | Panel-mount and Din Rail                                                                                                        |
| Protection Class   | IP40                                                                                                                            |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |



### SMLD 1000 Self Monitoring Low Level Limiter Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Probe Body              | Austenitic Stainless Steel 304               |
| 6  | Primary Insulator       | Polytetrafluoroethylene (PTFE)               |
| 7  | Comparator Tip          | Austenitic Stainless Steel 316L              |
| 8  | Secondary Insulator     | Polytetrafluoroethylene (PTFE)               |
| 9  | Retaining Bolt          | Austenitic Stainless Steel 304               |
| 10 | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 83,5   | 83     | 16,5   | 53     | 145    |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

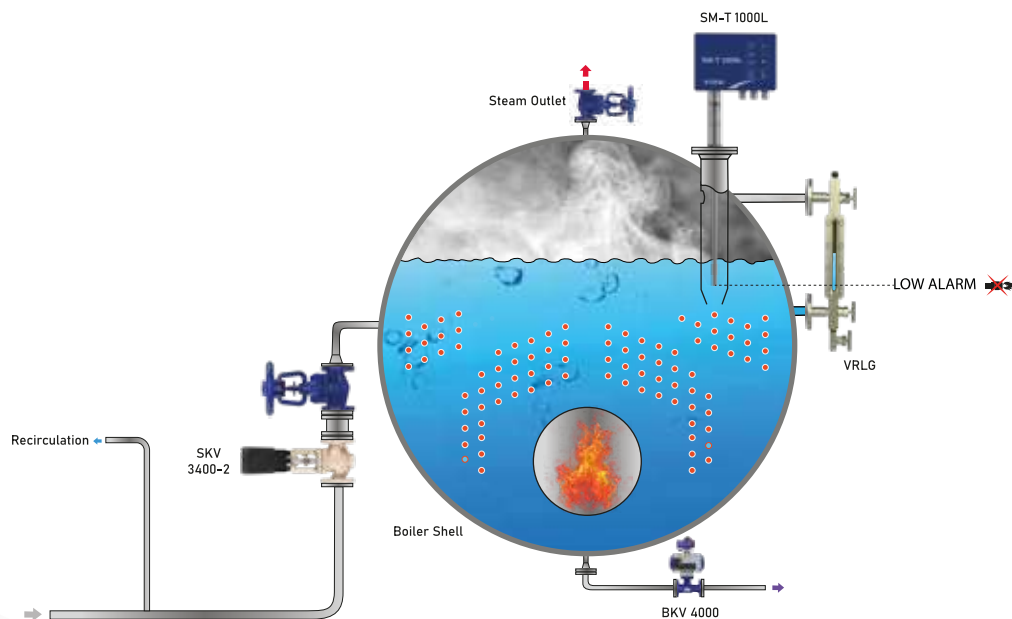
# SM-T 1000L Compact Self Monitoring Low Level Limiter System



## Compact Self Monitoring Low Level Limiter

|                  |                                                                                                                                |
|------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Type             | : SM-T 1000L                                                                                                                   |
| Supply Voltage   | : 230 VAC (+5% / -10%), 50/60Hz                                                                                                |
| Functions        | : Self Monitoring Low Level Alarm, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Outputs          | : 2 Safety Relays                                                                                                              |
| Nominal Pressure | : PN 40                                                                                                                        |
| Operat. Temp.    | : 239 °C                                                                                                                       |
| Operat. Press.   | : 32 Bar g                                                                                                                     |
| Connection       | : G 1/2" BSPT (Optional NPT)                                                                                                   |
| Length           | : 500, 1000, 1500 mm (can be cut to desired level)                                                                             |
| Ambient Temp.    | : 75 °C                                                                                                                        |
| Compliance       | : CE (EMC 2014/30/EU, LVD 2014/35/EU), PED 2014/68/EU, SIL (IEC 61508), EN 12952 & 12953                                       |

## SM-T 1000L Typical Installation



# TECHNICAL SPECIFICATION

## SM-T 1000L Compact Self Monitoring Low Level Limiter

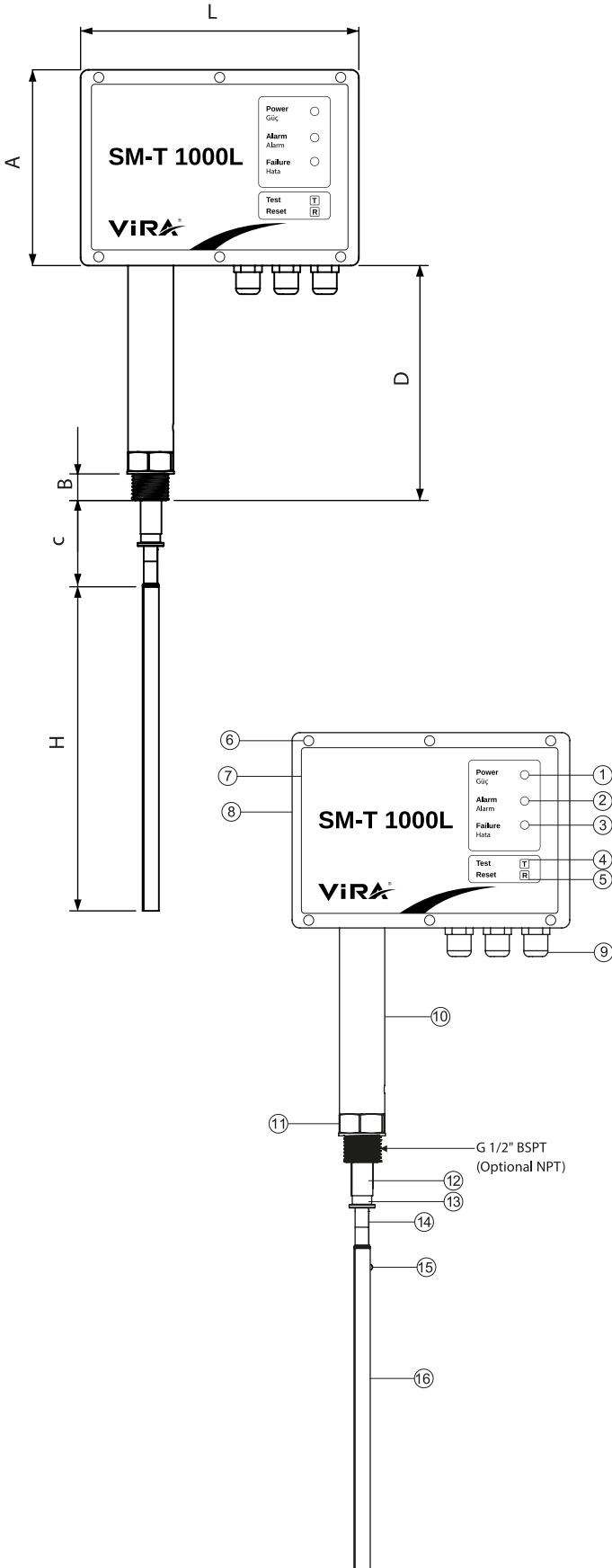
### Technical Data

|                    |                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Type               | SM-T 1000L                                                                                                                      |
| Supply Voltage     | 230 VAC (+5% / -10%), 50/60Hz                                                                                                   |
| Functions          | Self Monitoring Low Level Limiting, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Input              | Level Probe Input, Ground                                                                                                       |
| Outputs            | 2 Safety Relays                                                                                                                 |
| Display            | Led                                                                                                                             |
| Max. Ambient Temp. | 75°C                                                                                                                            |
| Enclosure          | Aluminum                                                                                                                        |
| Installation Type  | Boiler top mounted                                                                                                              |
| Protection Class   | IP 65                                                                                                                           |

| No | Part                | Material                        |
|----|---------------------|---------------------------------|
| 1  | Led " High Alarm"   | Lexan Label                     |
| 2  | Led " Low Alarm"    | Lexan Label                     |
| 3  | Led "Power"         | Lexan Label                     |
| 4  | Test Button         | Lexan Label                     |
| 5  | Reset Button        | Lexan Label                     |
| 6  | Housing screws M4   | Austenitic Stainless Steel 304  |
| 7  | Housing Cover       | Aluminum                        |
| 8  | Housing             | Aluminum                        |
| 9  | Cable Gland PG9     | Brass (Nickel Coated)           |
| 10 | Label               | Laser Marking                   |
| 11 | Probe Body          | Austenitic Stainless Steel 304  |
| 12 | Primary Insulator   | Polytetrafluoroethylene (PTFE)  |
| 13 | Comparator Tip      | Austenitic Stainless Steel 316L |
| 14 | Secondary Insulator | Polytetrafluoroethylene (PTFE)  |
| 15 | Retaining Pin       | Austenitic Stainless Steel 304  |
| 16 | Probe Tip           | Austenitic Stainless Steel 316L |

### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 170    | 121    | 16,5   | 53,2   | 145    |



**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.



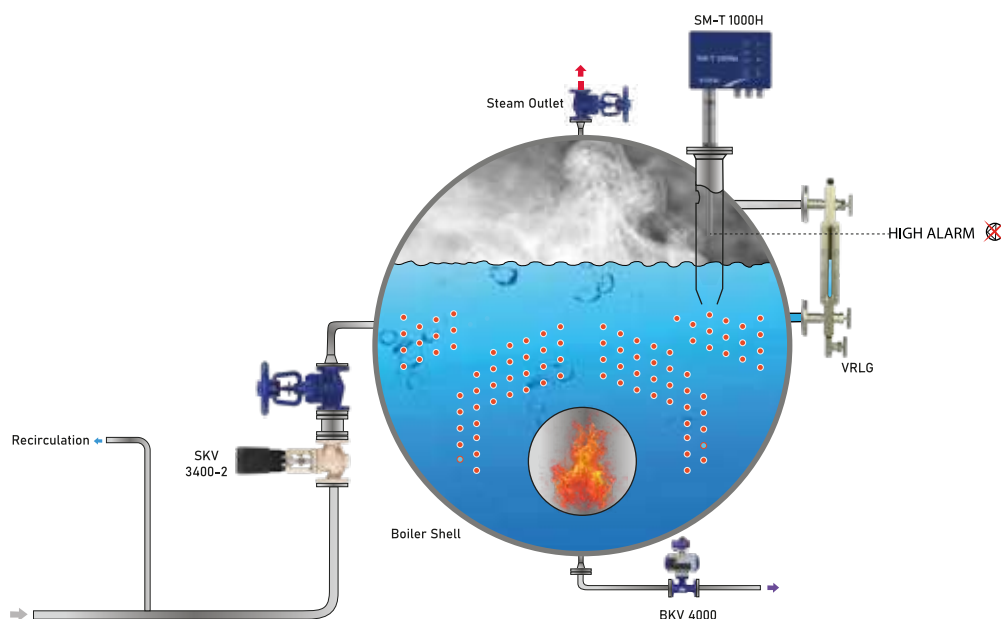
## SM-T 1000H Compact Self Monitoring High Level Limiter System



### Compact Self Monitoring High Level Limiter

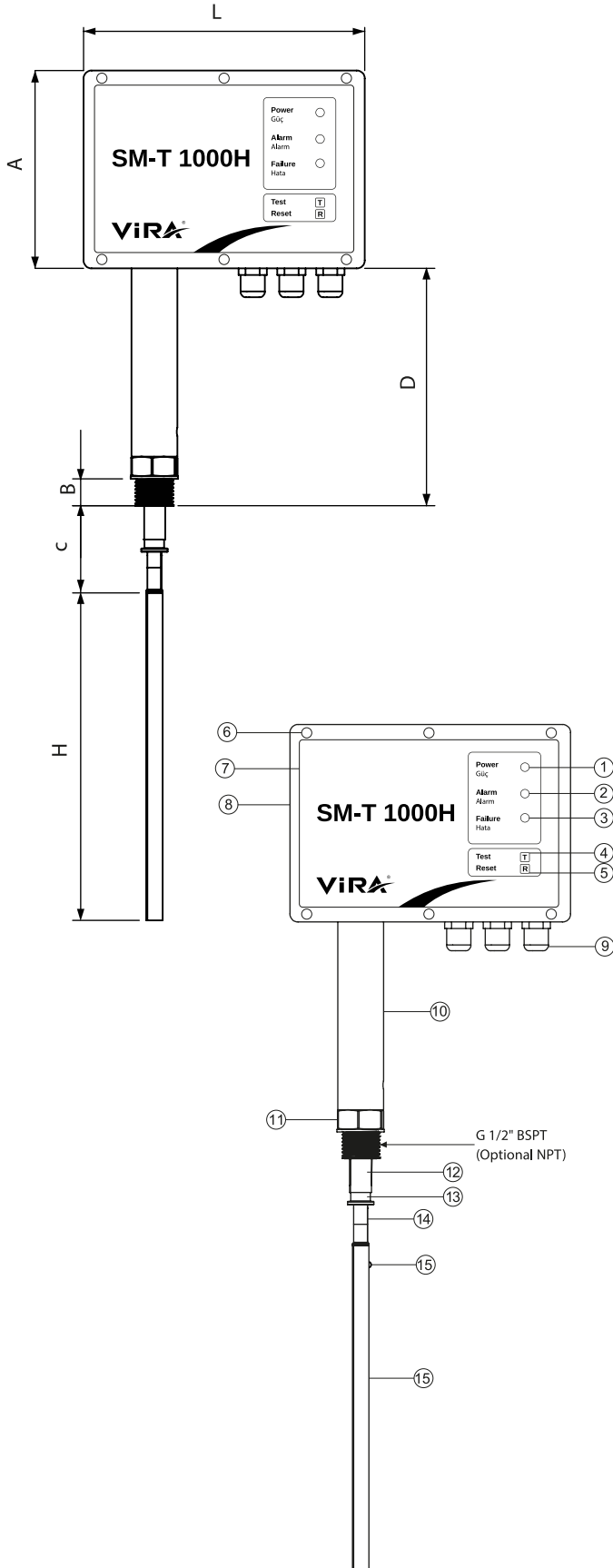
|                  |                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Type             | : SM-T 1000H                                                                                                                    |
| Supply Voltage   | : 230 VAC (+5% / -10%), 50/60Hz                                                                                                 |
| Functions        | : Self Monitoring High Level Alarm, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Outputs          | : 2 Safety Relays                                                                                                               |
| Nominal Pressure | : PN 40                                                                                                                         |
| Operat. Temp.    | : 239 °C                                                                                                                        |
| Operat. Press.   | : 32 Bar g                                                                                                                      |
| Connection       | : G 1/2" BSPT (Optional NPT)                                                                                                    |
| Length           | : 500, 1000, 1500 mm (can be cut to desired level)                                                                              |
| Ambient Temp.    | : 75 °C                                                                                                                         |
| Compliance       | : CE (EMC 2014/30/EU, LVD 2014/35/EU), PED 2014/68/EU, SIL (IEC 61508), EN 12952 & 12953                                        |

## SM-T 1000H Typical Installation



## TECHNICAL SPECIFICATION

### SM-T 1000H Compact Self Monitoring High Level Limiter



#### Technical Data

|                    |                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Type               | SM-T 1000H                                                                                                                       |
| Supply Voltage     | 230 VAC (+5% / -10%), 50/60Hz                                                                                                    |
| Functions          | Self Monitoring High Level Limiting, Test, Reset, Cable Break Check, Short Circuit Check, Probe Scale Check, Periodic Self Check |
| Inputs             | Level Probe Input, Ground                                                                                                        |
| Outputs            | 2 Safety Relays                                                                                                                  |
| Display            | Led                                                                                                                              |
| Max. Ambient Temp. | 75 °C                                                                                                                            |
| Enclosure          | Aluminum                                                                                                                         |
| Installation Type  | Boiler top mounted                                                                                                               |
| Protection Class   | IP 65                                                                                                                            |

| No | Part                | Material                        |
|----|---------------------|---------------------------------|
| 1  | Led " High Alarm"   | Lexan Label                     |
| 2  | Led " Low Alarm"    | Lexan Label                     |
| 3  | Led "Power"         | Lexan Label                     |
| 4  | Test Button         | Lexan Label                     |
| 5  | Reset Button        | Lexan Label                     |
| 6  | Housing screws M4   | Austenitic Stainless Steel 304  |
| 7  | Housing Cover       | Aluminum                        |
| 8  | Housing             | Aluminum                        |
| 9  | Cable Gland PG9     | Brass (Nickel Coated)           |
| 10 | Label               | Laser Marking                   |
| 11 | Probe Body          | Austenitic Stainless Steel 304  |
| 12 | Primary Insulator   | Polytetrafluoroethylene (PTFE)  |
| 13 | Comparator Tip      | Austenitic Stainless Steel 316L |
| 14 | Secondary Insulator | Polytetrafluoroethylene (PTFE)  |
| 15 | Retaining Pin       | Austenitic Stainless Steel 304  |
| 16 | Probe Tip           | Austenitic Stainless Steel 316L |

#### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|--------|
| 500    | 170    | 121    | 16,5   | 53,2   | 145    |
| 1000   |        |        |        |        |        |
| 1500   |        |        |        |        |        |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

## SK 1000 Level Alarm System



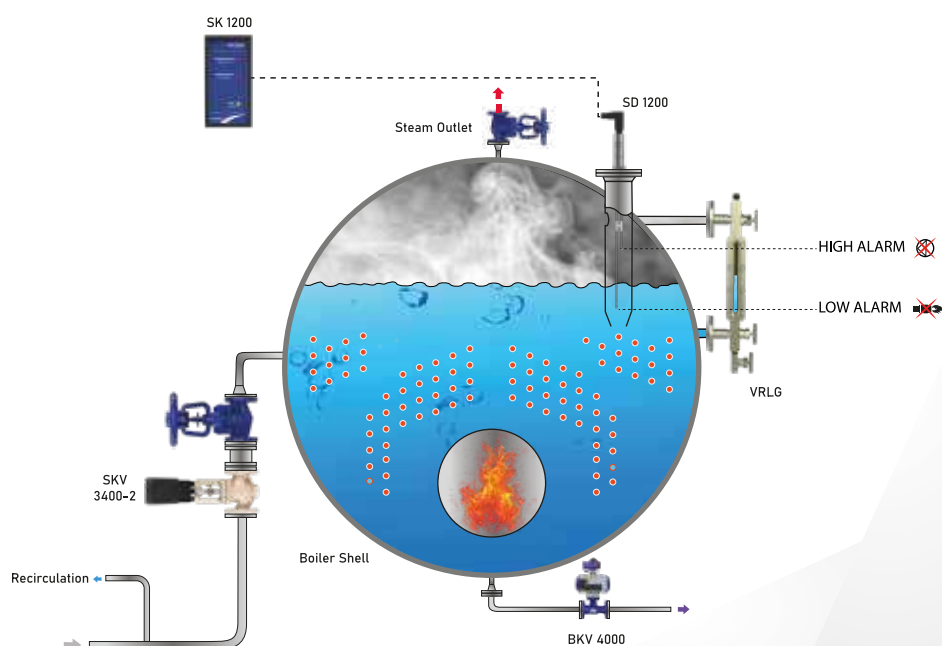
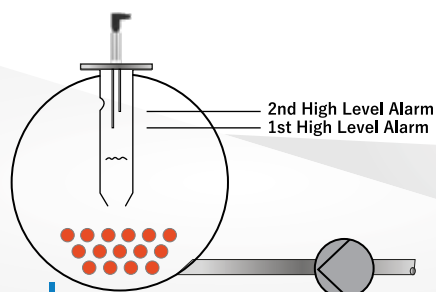
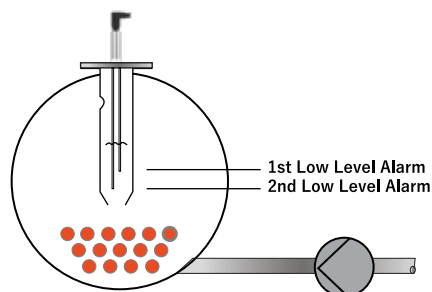
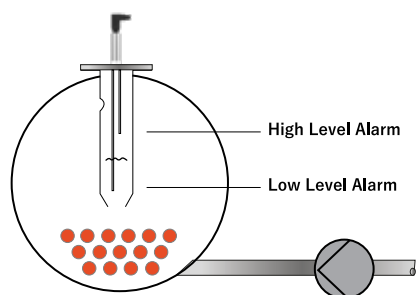
### Level Alarm Controller

|                    |                                                                                       |
|--------------------|---------------------------------------------------------------------------------------|
| Type               | : SK 1200                                                                             |
| Supply Voltage     | : 230 VAC (+5% / -10%), 50/60Hz                                                       |
| Enclosure          | : Panel-mount Type                                                                    |
| Functions          | : High Level Alarm, Low Level Alarm                                                   |
| Outputs            | : 2 Alarm Relays                                                                      |
| Max. Ambient Temp. | : 55 °C                                                                               |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & 12953, Type Approval (Module B + D) |

### Level Alarm Probe

|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Type                | : SD 1200                                                             |
| Nominal Pressure    | : PN 40                                                               |
| Max. Operat. Temp.  | : 239 °C                                                              |
| Max. Operat. Press. | : 32 Bar g                                                            |
| Connection          | : G 1" BSPT (Optional NPT)                                            |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                    |
| Max. Ambient Temp   | : 75 °C                                                               |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & 12953, Type Approval (Module B + D) |

## SK 1000 Typical Installation



## TECHNICAL SPECIFICATION

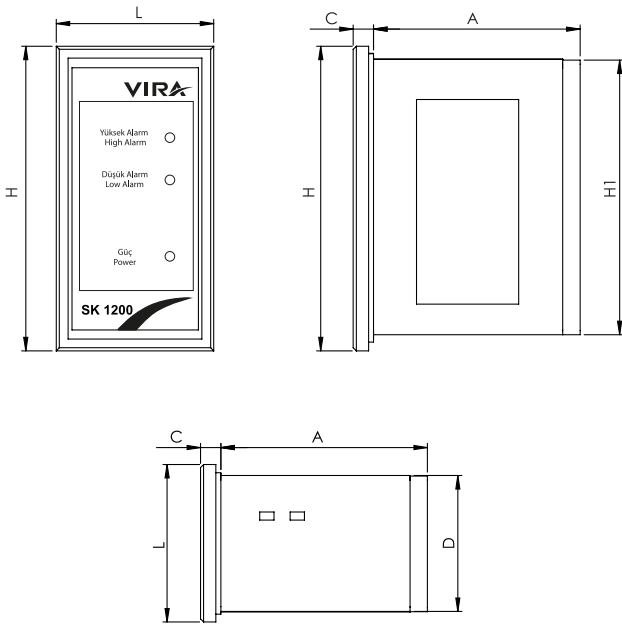
### SK 1200 Level Alarm Controller

#### Technical Data

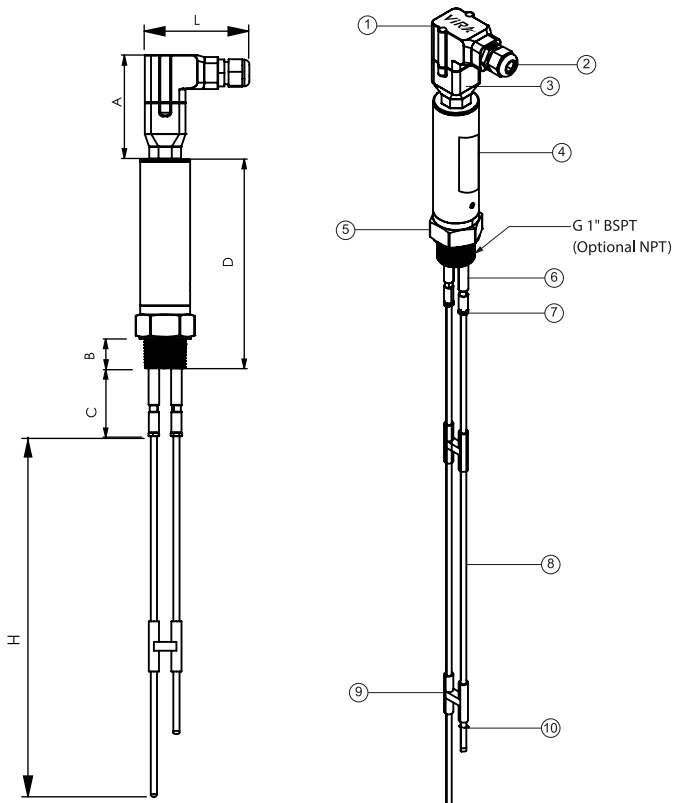
|                    |                                      |
|--------------------|--------------------------------------|
| Type               | SK 1200                              |
| Supply Voltage     | 230 VAC (+5% / -10%), 50/60Hz        |
| Functions          | High Level Alarm, Low Level Alarm    |
| Inputs             | Level Probe Input (2 Level ), Ground |
| Outputs            | 2 Alarm Relays                       |
| Display            | Led                                  |
| Label              | Lexan                                |
| Max. Ambient Temp. | 55°C                                 |
| Enclosure          | PA (Polyamide)                       |
| Type               | Panel-mount                          |
| Protection Class   | IP 40                                |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |



### SD 1200 Level Alarm Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Probe Body              | Austenitic Stainless Steel 304               |
| 6  | Tip Insulation (Sleeve) | Polytetrafluoroethylene (PTFE)               |
| 7  | Lock Nuts               | Austenitic Stainless Steel 304               |
| 8  | Probe Tips              | Austenitic Stainless Steel 316L              |
| 9  | Tip Steady              | Polytetrafluoroethylene (PTFE)               |
| 10 | Snap Ring               | C75 Spring Steel                             |

#### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|--------|
| 500    | 83,5   | 83     | 16,5   | 53     | 145    |
| 1000   |        |        |        |        |        |
| 1500   |        |        |        |        |        |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.

# D-SK 1000 Level Alarm System



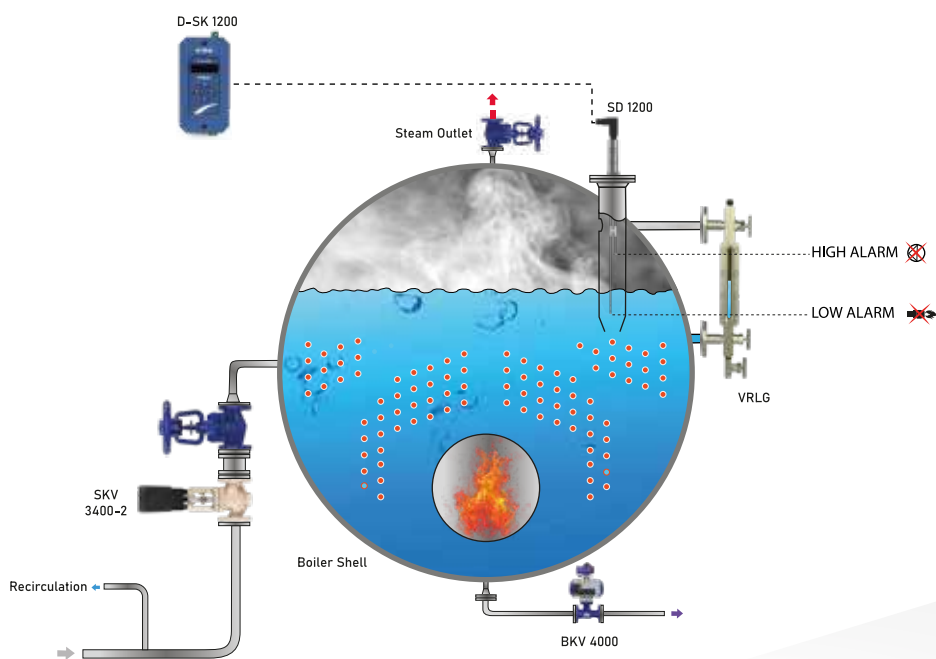
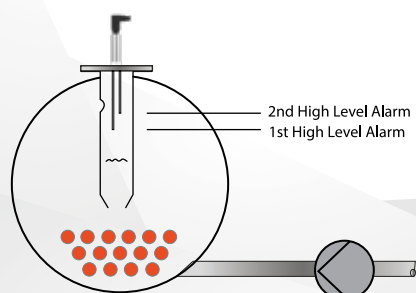
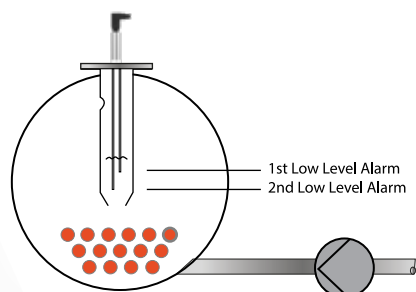
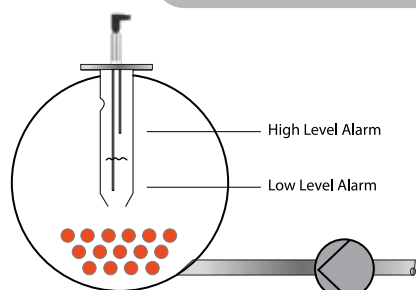
## Level Alarm Controller

|                    |                                                                                       |
|--------------------|---------------------------------------------------------------------------------------|
| Type               | : D-SK 1200                                                                           |
| Supply Voltage     | : 24VDC                                                                               |
| Enclosure          | : Panel-mount and Din Rail Type                                                       |
| Functions          | : High Level Alarm, Low Level Alarm, Test, Reset, 7 Segment Display, 4 buttons        |
| Outputs            | : 2 Alarm Relays, RS 485 Modbus                                                       |
| Max. Ambient Temp. | : 55 °C                                                                               |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), EN 12952 & 12953, Type Approval (Module B + D) |

## Level Alarm Probe

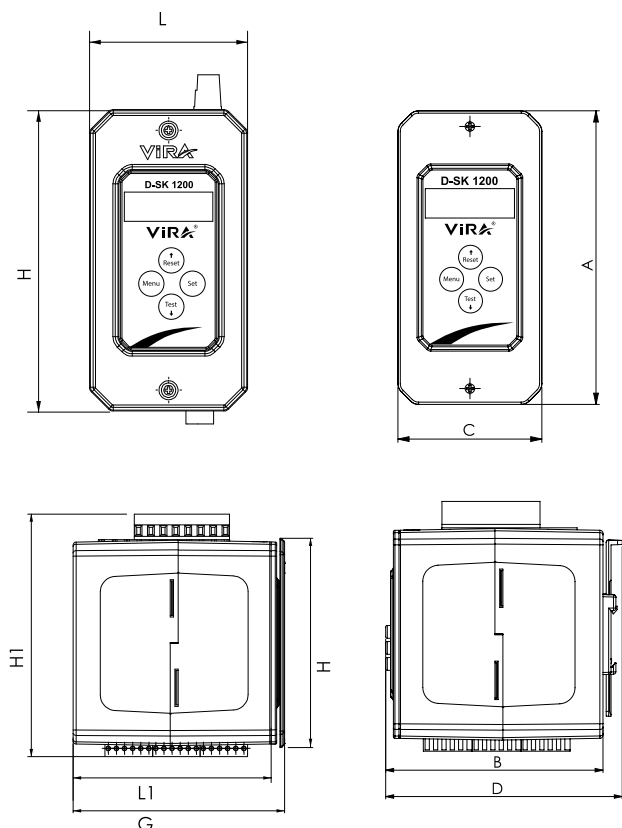
|                     |                                                                       |
|---------------------|-----------------------------------------------------------------------|
| Type                | : SD 1200                                                             |
| Nominal Pressure    | : PN 40                                                               |
| Max. Operat. Temp.  | : 239 °C                                                              |
| Max. Operat. Press. | : 32 Bar g                                                            |
| Connection          | : G 1" BSPT (Optional NPT)                                            |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                    |
| Max. Ambient Temp   | : 75 °C                                                               |
| Compliance          | : CE (PED 2014/68/EU), EN 12952 & 12953, Type Approval (Module B + D) |

# D-SK 1000 Typical Installation



# TECHNICAL SPECIFICATION

## D-SK 1200 Level Alarm Controller



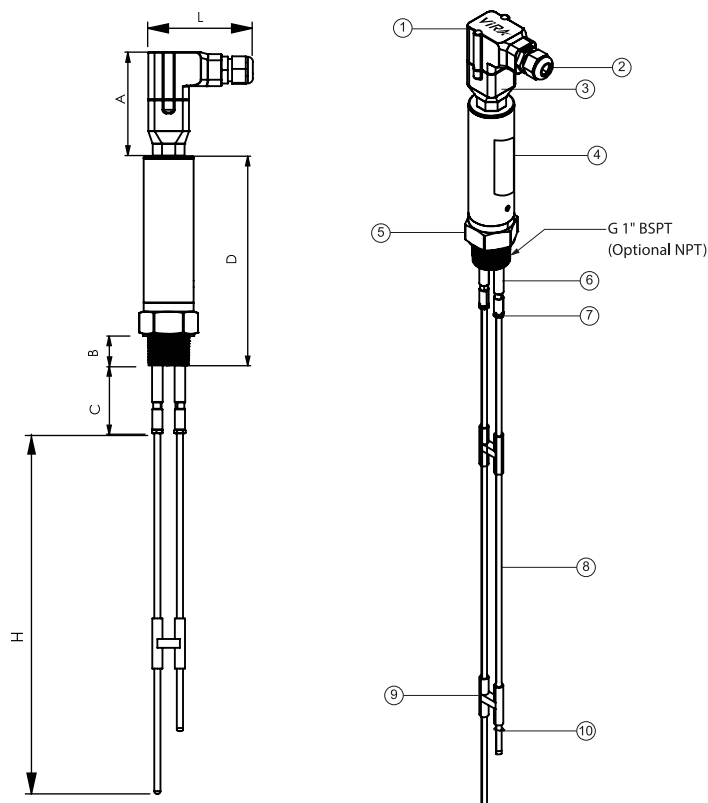
### Technical Data

|                    |                                                            |
|--------------------|------------------------------------------------------------|
| Type               | D-SK 1200                                                  |
| Supply Voltage     | 24VDC                                                      |
| Functions          | High Level Alarm, Low Level Alarm, Alarm Test, Alarm Reset |
| Inputs             | Level Probe Input (2 Level ), Ground                       |
| Outputs            | 2 Alarm Relays, RS485 Modbus                               |
| Display            | 7 Segment                                                  |
| Label              | Silicone Rubber                                            |
| Control            | 4 Buttons                                                  |
| Max. Ambient Temp. | 55°C                                                       |
| Enclosure          | PC (Polycarbonate)                                         |
| Type               | Panel-mount and Din Rail                                   |
| Protection Class   | IP 40                                                      |

### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

## SD 1200 Level Alarm Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | PG 11 Cable Gland       | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Probe Body              | Austenitic Stainless Steel 304               |
| 6  | Tip Insulation (Sleeve) | Polytetrafluoroethylene (PTFE)               |
| 7  | Lock Nuts               | Austenitic Stainless Steel 304               |
| 8  | Probe Tips              | Austenitic Stainless Steel 316L              |
| 9  | Tip Steady              | Polytetrafluoroethylene (PTFE)               |
| 10 | Snap Ring               | C75 Spring Steel                             |

### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 83,5   | 83     | 16,5   | 53     | 145    |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.



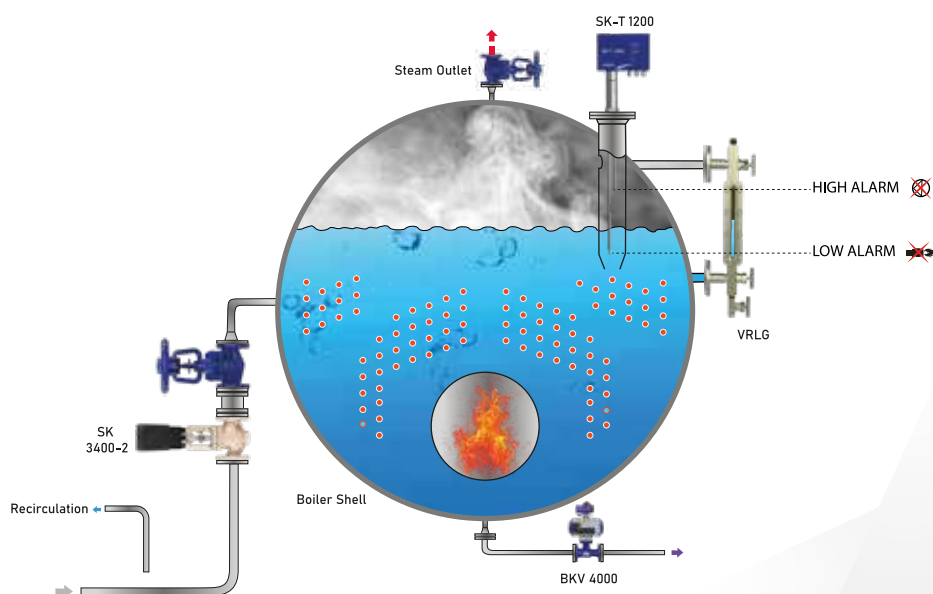
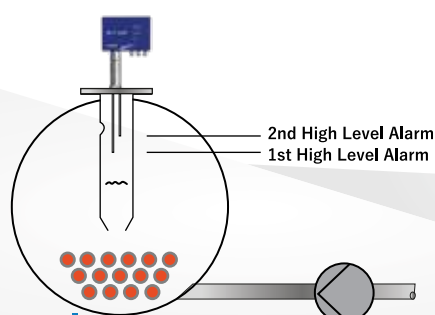
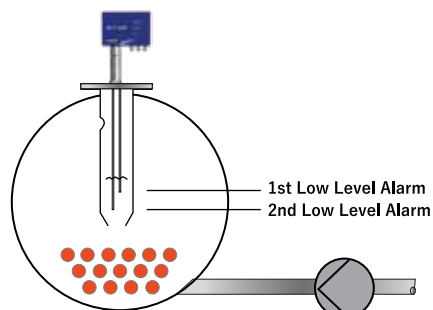
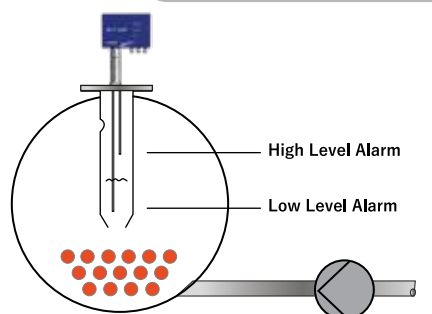
## SK-T 1200 Compact Level Alarm System



### Compact Level Alarm System

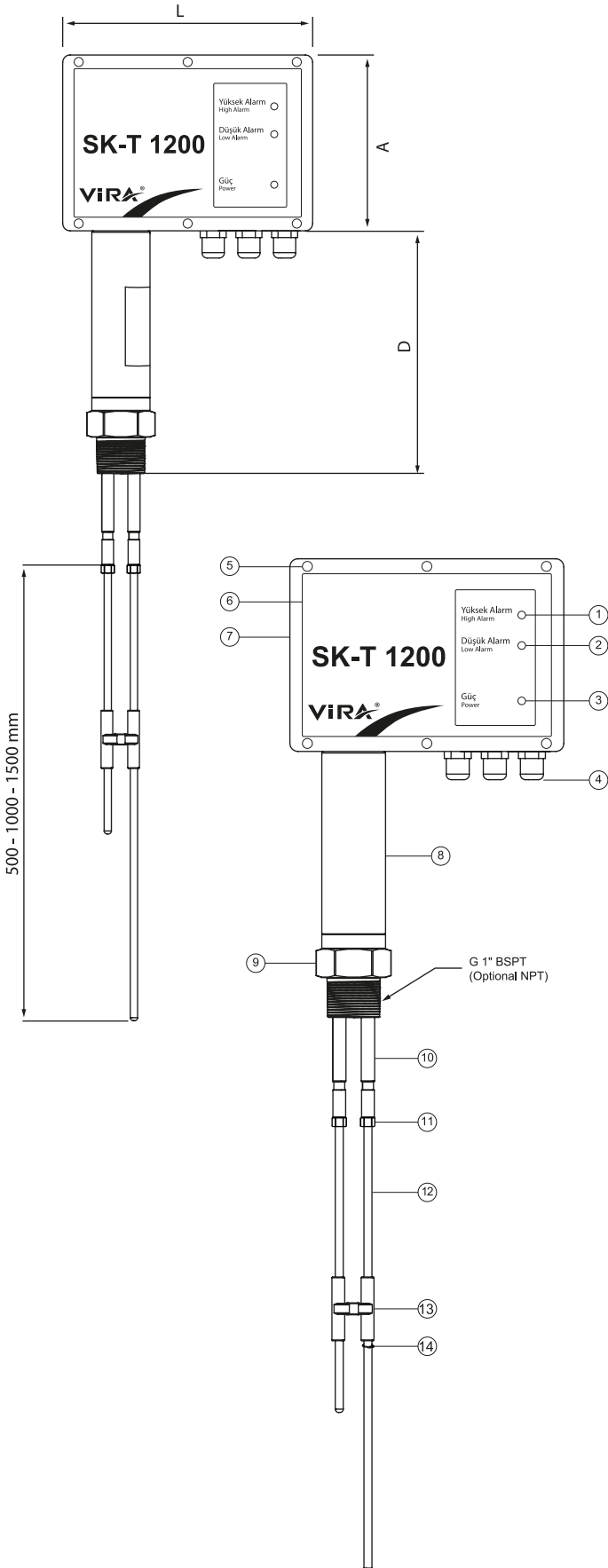
|                     |                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------|
| Type                | : SK-T 1200                                                                                           |
| Supply Voltage      | : 230 VAC (+5% / -10%), 50/60Hz                                                                       |
| Function            | : High Level Alarm, Low Level Alarm                                                                   |
| Outputs             | : 2 Alarm Relays                                                                                      |
| Nominal Pressure    | : PN 40                                                                                               |
| Max. Operat. Temp.  | : 239 °C                                                                                              |
| Max. Operat. Press. | : 32 Bar g                                                                                            |
| Connection          | : G 1" BSPT (Optional NPT)                                                                            |
| Length              | : 500, 1000, 1500 mm (can be cut to desired level)                                                    |
| Max. Ambient Temp.  | : 75 °C                                                                                               |
| Compliance          | : CE (EMC 2014/30/EU, LVD 2014/35/EU), PED 2014/68/EU, EN 12952 & 12953, Type Approval (Module B + D) |

## SK-T 1200 Typical Installation



# TECHNICAL SPECIFICATION

## SK-T 1200 Compact Level Alarm System



### Technical Data

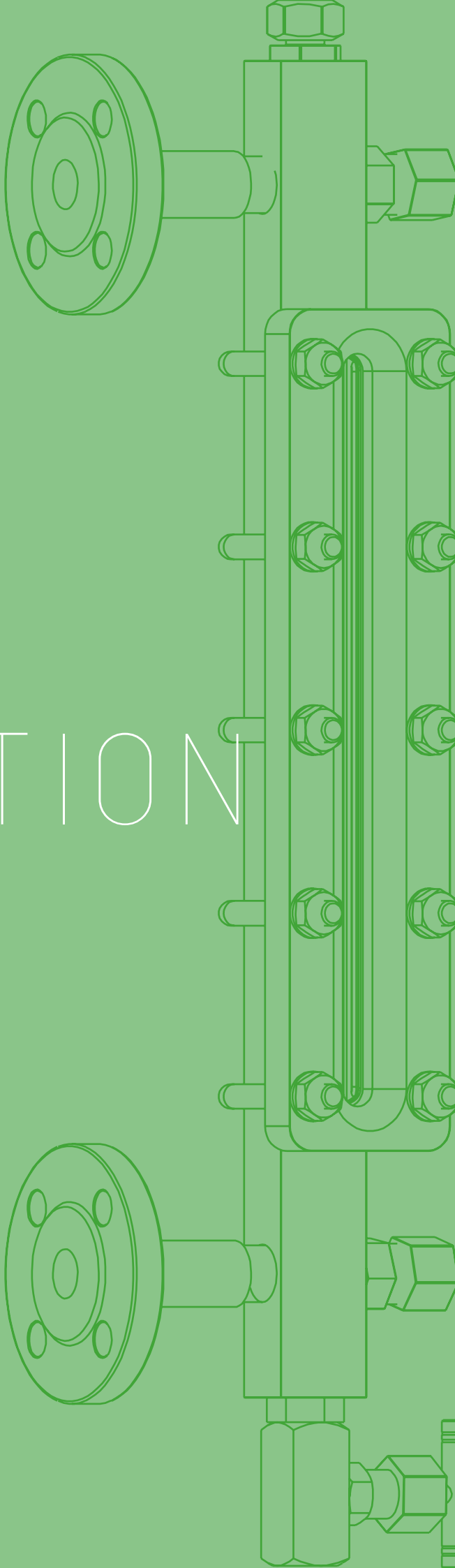
|                    |                                                  |
|--------------------|--------------------------------------------------|
| Type               | SK-T 1200                                        |
| Supply Voltage     | 230VAC (+5% / -10%), 50/60Hz                     |
| Functions          | High Level Alarm, Low Level Alarm                |
| Inputs             | Level Probe Input (2 Level), Ground              |
| Outputs            | 2 Alarm Relays                                   |
| Display            | Led                                              |
| Label              | Lexan                                            |
| Max. Ambient Temp. | 75 °C                                            |
| Enclosure          | Aluminum                                         |
| Installation Type  | Boiler top mounted                               |
| Protection Class   | IP 65                                            |
| Nominal Pressure   | PN 40                                            |
| Max. Ambient Temp. | 239 °C                                           |
| Max. Operat. Pres. | 32 Bar g                                         |
| Connection         | G 1" BSPT (Optional NPT)                         |
| Length             | 500, 1000, 1500 mm (can be cut to desired level) |

### Dimensions

| H (mm)              | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|--------|
| 500<br>1000<br>1500 | 170    | 121    | 23,5   | 60     | 241    |

| No | Part                    | Material                        |
|----|-------------------------|---------------------------------|
| 1  | Led " High Alarm"       | Lexan Label                     |
| 2  | Led " Low Alarm"        | Lexan Label                     |
| 3  | Led "Power"             | Lexan Label                     |
| 4  | PG 9 Cable Gland        | Brass (Nickel Coated)           |
| 5  | Housing screws M4       | Austenitic Stainless Steel 304  |
| 6  | Housing Cover           | Aluminum                        |
| 7  | Housing                 | Aluminum                        |
| 8  | Label                   | Laser Marking                   |
| 9  | Probe Body              | Austenitic Stainless Steel 304  |
| 10 | Tip Insulation (Sleeve) | Polytetrafluoroethylene (PTFE)  |
| 11 | Lock Nuts               | Austenitic Stainless Steel 304  |
| 12 | Probe Tips              | Austenitic Stainless Steel 316L |
| 13 | Tip Steady              | Polytetrafluoroethylene ( PTFE) |
| 14 | Snap Ring               | C75 Spring Steel                |

**Note:** The probe tips are supplied in uniform lengths according to the ordered size. The lengths must be cut and adjusted on site to suit the specific application. If 500 mm is ordered, all probe tips will be delivered with a dimension 'H' of 500 mm.



# LEVEL INDICATION

## VMLG

### Magnetic Level Gauge

The Magnetic Level Gauge offers a safe, leak-proof, and maintenance-friendly solution for continuous liquid level monitoring in pressurized or hazardous environments. Using the principle of magnetic coupling, the system allows for clear external level indication without direct contact between the indicator and process fluid.

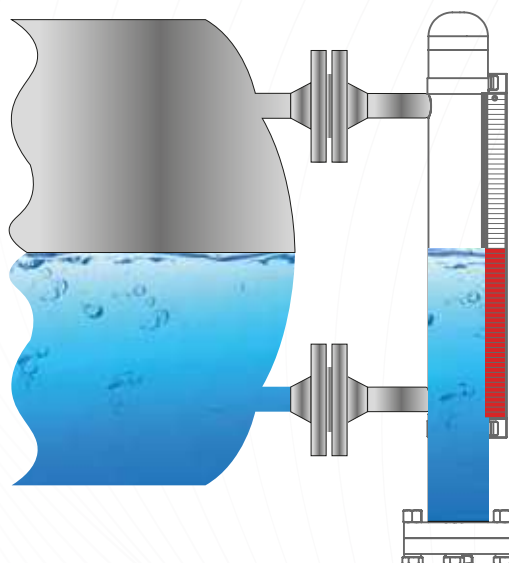
Inside the chamber, a float with an embedded magnet rises and falls with the liquid level. Outside the chamber, a magnetic indicator rail—consisting of colored flags or a follower—moves in response, providing a highly visible and accurate level reading even from a distance.

Magnetic level gauges are ideal for applications involving toxic, corrosive, or high-pressure fluids, and are commonly used in the chemical, petrochemical, power generation, and water treatment industries.

#### Key Features:

- Non-invasive level indication with no direct contact between the indicator and the process fluid
- Operates reliably in high-pressure and high-temperature conditions
- Suitable for horizontal or vertical tank installations
- Available with stainless steel, PVC, or special alloy chambers depending on the application
- Optional switches and transmitters for remote level monitoring and control integration
- Customizable float designs for wide density and interface level ranges
- Conforms to international pressure equipment and safety standards (e.g. PED, ASME, EN)

Vira's Magnetic Level Gauges are engineered for long service life, high accuracy, and process safety, especially where conventional glass level gauges are not suitable.



## Magnetic Level Gauge for Tanks



### Magnetic Level Gauge for Tanks

|                  |                                           |
|------------------|-------------------------------------------|
| Type             | : VMLG-T                                  |
| Pressure         | : PN 6                                    |
| Temperature      | : 110 °C                                  |
| Body             | : Stainless Steel                         |
| Connection Types | : Flanged (Optional Threaded)             |
| Flanges          | : Carbon Steel (Optional Stainless Steel) |
| Float            | : Stainless Steel                         |
| Indicator        | : Aluminum                                |
| Flaps            | : Nylon (PA6)                             |

The VMLG-T Magnetic Level Gauge is specially designed for low-pressure tank and storage applications. With a PN 6 pressure rating, this model ensures reliable and clear monitoring of process liquids. Its compact construction makes it particularly suitable for auxiliary tanks, condensate collection vessels, and installations operating close to atmospheric pressure. A robust body, precise level indication, and a maintenance-free magnetic system provide long-lasting and safe operation.

## Magnetic Level Gauge for Boilers



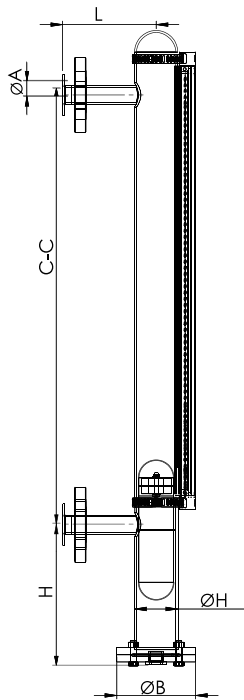
### Magnetic Level Gauge for Boiler

|                  |                                           |
|------------------|-------------------------------------------|
| Type             | : VMLG-B                                  |
| Pressure         | : PN 16                                   |
| Temperature      | : 180 - 200 °C                            |
| Body             | : Stainless Steel                         |
| Connection Types | : Flanged (Optional Threaded)             |
| Flanges          | : Carbon Steel (Optional Stainless Steel) |
| Float            | : Stainless Steel                         |
| Indicator        | : Aluminum                                |
| Flaps            | : Nylon (PA6)                             |

The VMLG-B Magnetic Level Gauge is designed for steam boiler and other high-pressure process applications. With a PN 16 pressure rating, it is engineered to withstand continuous high temperature and pressure conditions. Its durable stainless steel body, dual-sided magnetic indication system, and boiler connection flanges ensure safe and reliable level monitoring. As an indirect magnetic level indicator, it is suitable for use in combination with the direct level gauges required by EN 12952 and EN 12953 standards, providing operators with enhanced visibility and operational safety.

# TECHNICAL SPECIFICATION

## Magnetic Level Gauge

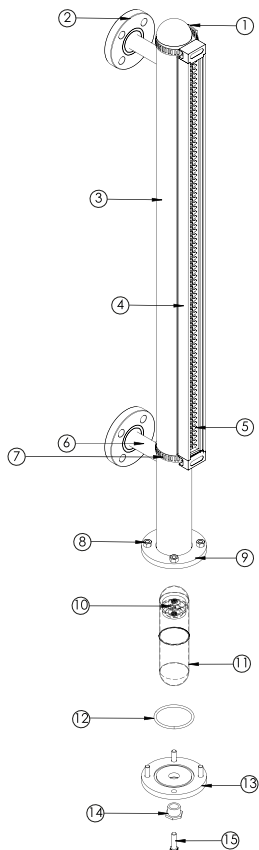


### Technical Data

|                 |                                                 |
|-----------------|-------------------------------------------------|
| Type            | VMLG                                            |
| Body            | AISI 304 / AISI 316 Stainless Steel, PN16 rated |
| Flap            | Nylon (PA6)                                     |
| Float           | AISI 316L Stainless Steel                       |
| Connection      | Flanged                                         |
| Size            | DN20, DN 25                                     |
| Indicator Frame | Aluminum                                        |
| Flanges         | Carbon Steel                                    |

### Dimensions

| C-C (mm) | L (mm) | ØA (mm) | ØB (mm) | H (mm) | ØD (mm) |
|----------|--------|---------|---------|--------|---------|
| 300-3000 | 130,5  | 26,9    | 110     | 87,6   | 60,3    |



| No | Part                                         | Material                                        |
|----|----------------------------------------------|-------------------------------------------------|
| 1  | Indicator top cover / cap                    | AISI 304 / AISI 316 Stainless Steel             |
| 2  | Process connection flange                    | AISI 304 / AISI 316 Stainless Steel             |
| 3  | Chamber / body (main tube)                   | AISI 304 / AISI 316 Stainless Steel, PN16 rated |
| 4  | Magnetic flaps (bicolor indicators)          | Nylon (PA6) - (Red/White)                       |
| 5  | Indicator housing / frame                    | Aluminum                                        |
| 6  | Process nozzle / connection pipe             | AISI 304 / AISI 316 Stainless Steel             |
| 7  | Mounting clamp / bracket (indicator-to-body) | AISI 304 Stainless Steel                        |
| 8  | Bolt (body-to-bottom flange)                 | AISI 304 / AISI 316 Stainless Steel             |
| 9  | Bottom end flange / drain flange             | AISI 304 / AISI 316 Stainless Steel             |
| 10 | Magnetic disc (inside float)                 | NdFeB Magnet (encapsulated)                     |
| 11 | Float                                        | AISI 316L Stainless Steel (non-magnetic)        |
| 12 | O-ring (cover seal)                          | FKM (Viton) / NBR depending on medium           |
| 13 | Drain cover / bottom cover flange            | AISI 304 / AISI 316 Stainless Steel             |
| 14 | Drain plug                                   | AISI 304 / AISI 316 Stainless Steel             |
| 15 | Cap nut (for cover studs)                    | AISI 304 / AISI 316 Stainless Steel             |

## VRLG

### Reflex Level Gauges

The Reflex Level Gauge is a robust and highly reliable instrument used for direct visual indication of liquid levels in steam boilers, tanks, and industrial vessels. It operates using a reflex glass mounted within a precision-engineered body, which utilizes the difference in light reflection between liquid and gas phases to provide a clear and unambiguous reading.

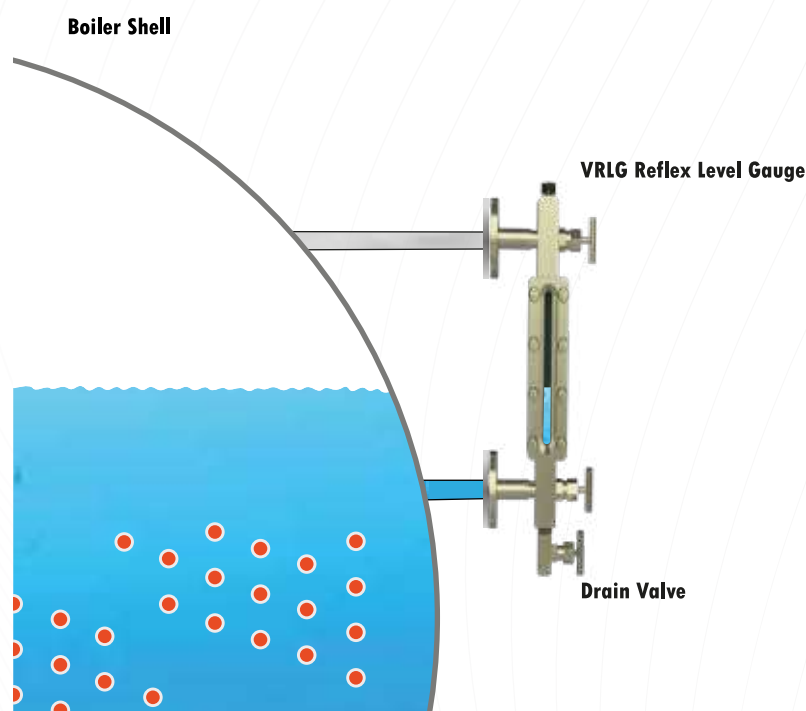
Reflex gauges are ideal for applications where high visibility, durability, and pressure resistance are critical. Their simple yet effective design eliminates the need for external power or complex instrumentation, making them perfect for both continuous monitoring and quick visual checks.

#### Key Features:

- Clear level indication based on light refraction and reflection through borosilicate reflex glass
- Suitable for saturated steam applications up to 32 bar and liquid service under high temperature and pressure
- Constructed from carbon steel or stainless steel bodies with corrosion-resistant internals
- Standard sizes available with center-to-center connections from 290 mm to 1500 mm
- Optional mica shields for protection in high-pressure steam service
- Conforms to EN 12953, and other relevant pressure equipment standards

Reflex level gauges are essential for ensuring safe operation and maintaining water level compliance in steam boiler systems.

Vira also offers high-quality borosilicate reflex glass, ensuring optimal clarity and long service life under demanding operating conditions.





## Reflex Level Gauges



### Reflex Level Gauges

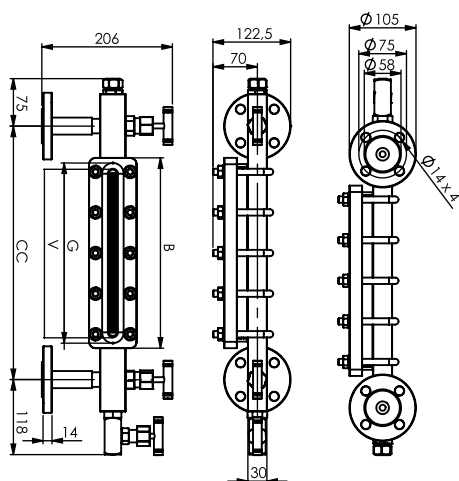
|                  |                |
|------------------|----------------|
| Type             | : VRLG         |
| Pressure         | : PN 40        |
| Temperature      | : 250 °C       |
| Body             | : Carbon Steel |
| Connection Types | : Flanged      |
| Flanges          | : Carbon Steel |

### Technical Data

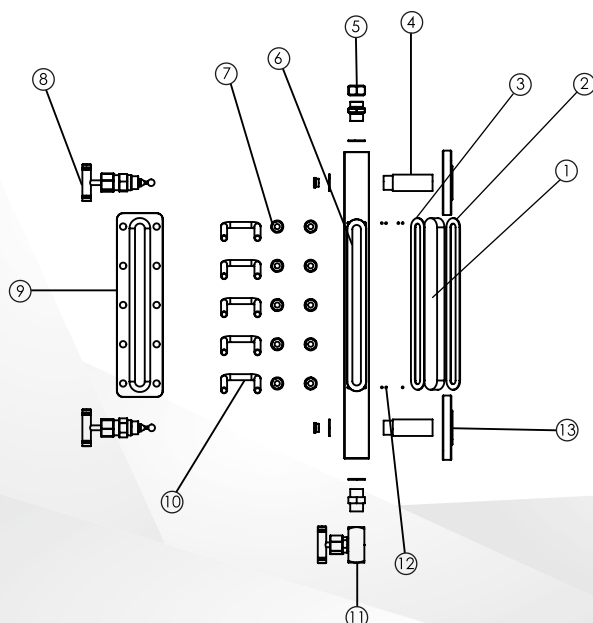
|            |              |
|------------|--------------|
| Type       | VRLG         |
| Body       | Carbon Steel |
| Cover      | Carbon Steel |
| Glass      | Borosilicat  |
| Connection | Flanged      |
| Size       | DN 20,DN 25  |

### Dimensions

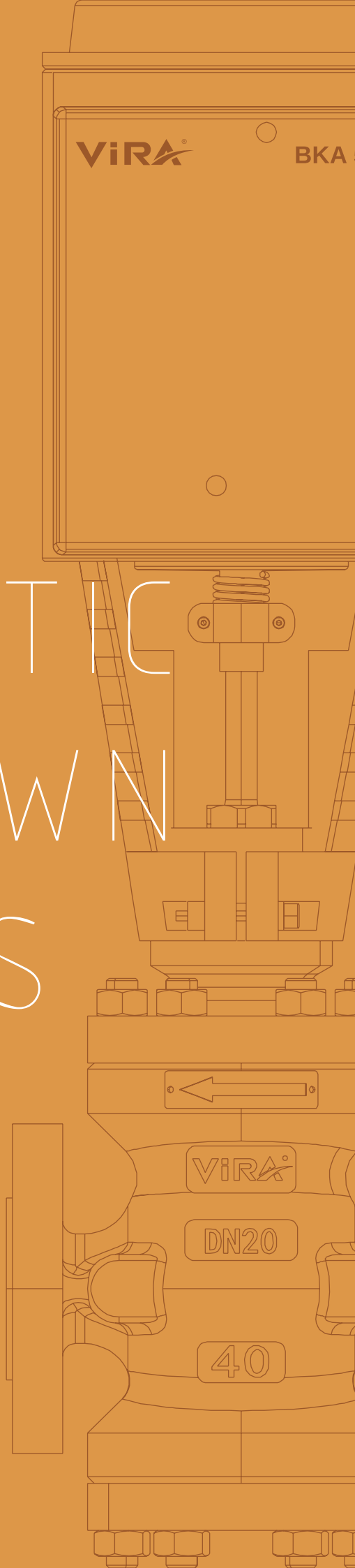
| Model      | C-C (mm) | B (mm) | V (mm) | G (mm) | Weight kg |
|------------|----------|--------|--------|--------|-----------|
| VRLG - 310 | 310      | 210    | 176    | 194    | 9,3       |
| VRLG - 340 | 340      | 240    | 206    | 224    | 9,8       |
| VRLG - 370 | 370      | 270    | 236    | 254    | 10,3      |
| VRLG - 400 | 400      | 300    | 266    | 284    | 10,5      |
| VRLG - 440 | 440      | 340    | 306    | 324    | 11,5      |
| VRLG - 500 | 500      | 360    | 326    | 344    | 12,5      |



**Note:** Dimensions other than the standard sizes are available upon request.



| No | Part                   | Material                   |
|----|------------------------|----------------------------|
| 1  | Glass                  | Borosilicate glass         |
| 2  | Gasket (upper)         | Graphite                   |
| 3  | Gasket (lower)         | Klingerit                  |
| 4  | Flange connection pipe | P265GH Carbon Steel        |
| 5  | Vent plug              | P265GH Carbon Steel        |
| 6  | Body                   | P265GH Carbon Steel        |
| 7  | Washer-faced nut       | Carbon Steel (zinc plated) |
| 8  | Valve                  | AISI 316 Stainless Steel   |
| 9  | Cover                  | P265GH Carbon Steel        |
| 10 | U bolt                 | Carbon Steel (zinc plated) |
| 11 | Drain Valve            | AISI 316 Stainless Steel   |
| 12 | Retaining pin          | Carbon Steel               |
| 13 | Flange                 | P265GH Carbon Steel        |



A technical line drawing of a ViRA automatic blowdown system. The drawing shows a vertical assembly. At the top is a rectangular control box with the 'ViRA' logo and 'BKA' text. Below the box is a vertical rod with a spring at the top. This rod is connected to a valve mechanism. Below the valve is a horizontal pipe section with a left-pointing arrow. Further down is another valve body with 'ViRA', 'DN20', and '40' markings. The bottom of the drawing shows more piping and connection points.

# AUTOMATIC BLOWDOWN SYSTEMS



“Boiler Control Engineered for Steam Excellence”

## AUTOMATIC BLOWDOWN

### Boiler Blowdown

#### Why is it necessary to blowdown in steam boilers?

Many industries use boilers to generate steam for their energy needs. The water used to feed the boilers contains varying levels of impurities:

- Dissolved solids - Scale forming substances
- Suspended solids - Sludge forming substances
- Dissolved gasses - Corrosive gasses such as oxygen and carbon dioxide.

Boiler feedwater could contain a high level of dissolved salts and minerals, even if there is a feedwater treatment. When steam evaporates, the concentration of the salt and minerals in the boiler water increases. This causes TDS increase in the boiler water and high TDS may cause;

- Carryover of the boiler water
- Formation of sludge
- Scaling of the boiler tubes

Carryover of the water in steam lines may cause water hammer, corrosion, and deposits. Deposits on the heat transfer surfaces decrease the efficiency and cause control valves and steam traps to malfunction.



**Water Carryover**

Suspended solids accumulate at the bottom of the boiler and if they are not removed those solids prevent heat transfer from the boiler fire tube which will overheat and may even fail. Sludge formation can lead to malfunction of level control devices.

Scaling on the heating surfaces in the boiler will increase fuel cost, reduce heat transfer, and efficiency. 1 mm calcium carbonate scale increases %3 or 1mm Silicate scale increases %8 in fuel cost.

#### Why Automatic Blowdown?

The blowdown rate can be controlled manually or automatically.

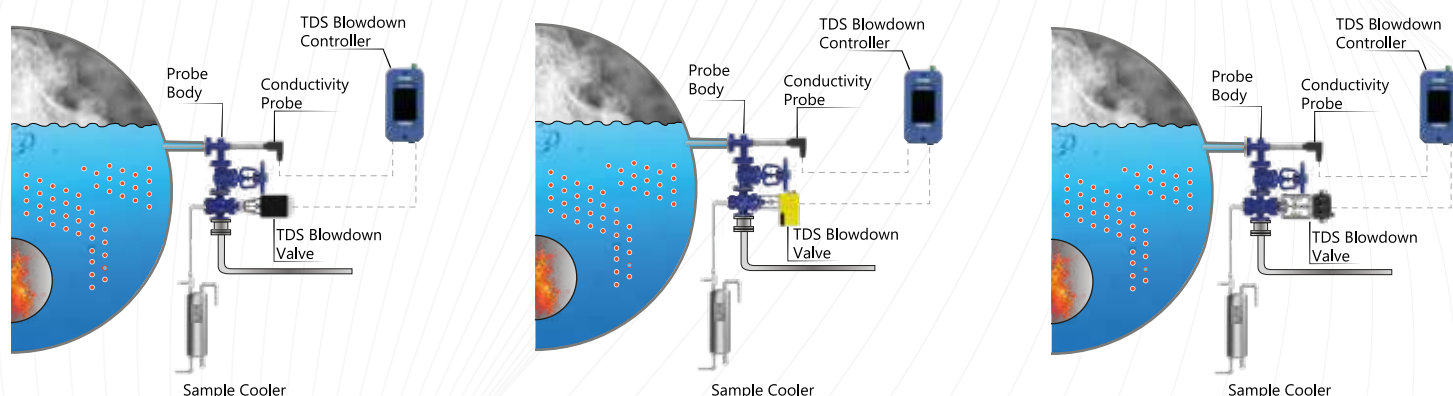
**With manual blowdown control**, if the level of TDS is higher than the allowed level, it may cause loss of water, heat and chemicals from the boiler. Boiler blowdown automation helps to reduce fuel, water, chemical and manpower costs.

**Automatic blowdown** system ensures a maximum of dissolved solids and suspended solids are removed with a minimal loss of water and heat from the boiler.

## Automatic Surface Blowdown (TDS) Control

As water in the boiler drum turns into steam, the concentration of dissolved solids in the boiler water rises. These dissolved substances are carried into the system with the steam and water, causing malfunctions and leading to deposits on the heat transfer surfaces. Such deposits reduce efficiency by impairing heat transfer. Since blowdown alone cannot prevent scaling, dosing and degassing of boiler feedwater are also essential to maintain the boiler water at the desired TDS level.

The conductivity probe where located in the boiler shell continuously monitors the conductivity of the boiler water. The measured conductivity value is compared with the "Set Point" in the controller. If the water conductivity is higher than the set value the blowdown valve will be continuously working until the conductivity value drops below the set value by hysteresis value. If it is lower than the set point the blowdown valve will remain its closed position.



Vira offers two advanced surface blowdown solutions: the BS4 system and the BS4-T system. While both systems are designed for precise TDS (Total Dissolved Solids) control, the BS4-T provides an additional advantage with its integrated temperature compensation feature. This ensures reliable measurement accuracy even under fluctuating boiler conditions, whereas the standard BS4 system operates without this feature.

In steam boilers, an increase in water temperature leads to a corresponding rise in conductivity — approximately 2% for every 1 °C. If not compensated, this variation can result in inaccurate readings, improper blowdown cycles, and reduced boiler efficiency.

Building on this proven technology, Vira now introduces the new generation D-BS4 and D-BS4-T systems. These systems incorporate the latest D-Series controllers, offering enhanced user interfaces, improved diagnostics, and more compact designs.

D-BS4 system consists of 4 main components: the D-BK 5000-T Controller, BD 5400 Conductivity Probe, and BKV 5400 Continuous Blowdown Valve, and DG 5400 Probe Body.

D-BS4-T system consists of 4 main components: the D-BK 5000-T Controller, BD 5600-T Conductivity Probe (with integrated temperature compensation), BKV 5400 Continuous Blowdown Valve, and DG 5400 Probe Body.

With din rail and panel type application, touch screen, user friendly interface, and advanced monitoring functions, the new D-Series systems deliver higher reliability, reduced commissioning effort, and long-term operational savings.

### Advantages of Automatic TDS Blowdown:

- Reduced maintenance and repair costs (minimized carryover and deposits)
- Cleaner and more efficient steam
- Energy saving
- Reduced operating cost (less feedwater consumption; chemical treatment and higher heating efficiency)
- Potential savings from a blowdown heat recovery system (where installed).
- The labor-saving advantages of automation.

## BS4-T Temperature Compensation Type Automatic TDS Blowdown System



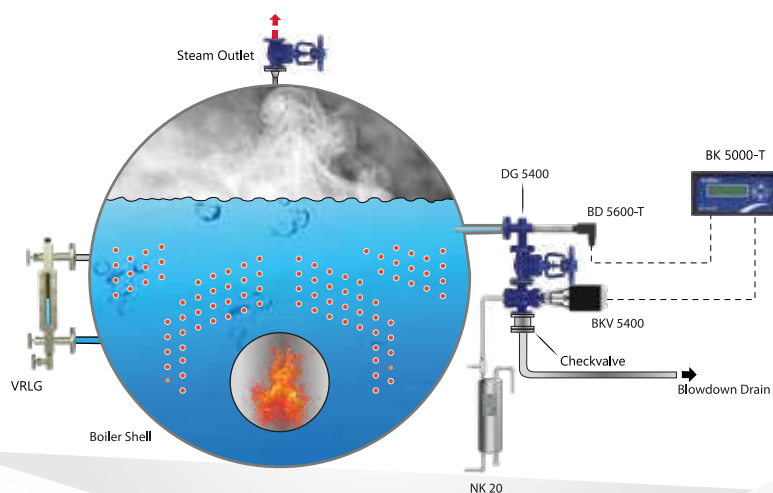
### Temp. Comp. Type Conductivity Controller

|                |                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : BK 5000-T                                                                                                                                                 |
| Supply Voltage | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                                              |
| Enclosure      | : Panel-mount Type                                                                                                                                          |
| Functions      | : Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons        |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                           |
| Features       | : Conductivity and Alarm Set Values, Temperature Compensation, Valve & Alarm Relay Test Functions, LCD Display, User-friendly Parameter Setting (4 Buttons) |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                    |

### Temperature Compensation Type Conductivity Probe

|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5600-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

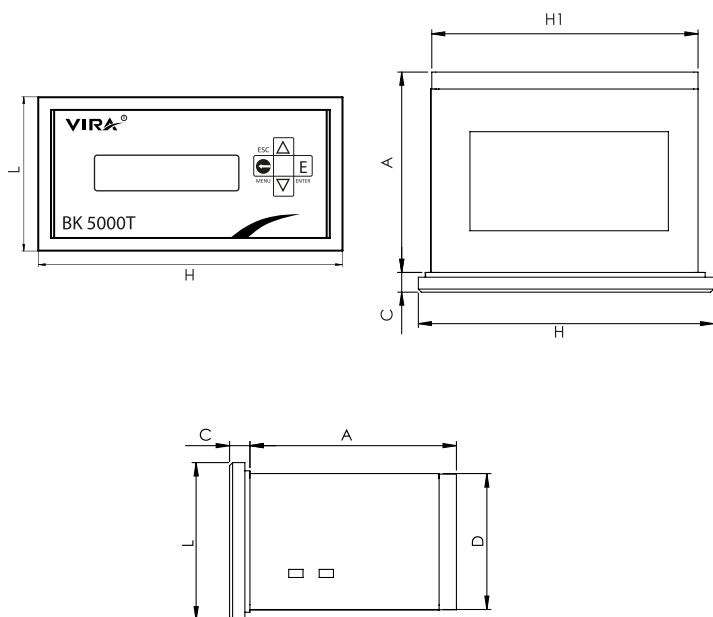
## BS4-T Typical Installation





## TECHNICAL SPECIFICATION

### BK 5000-T Conductivity Controller



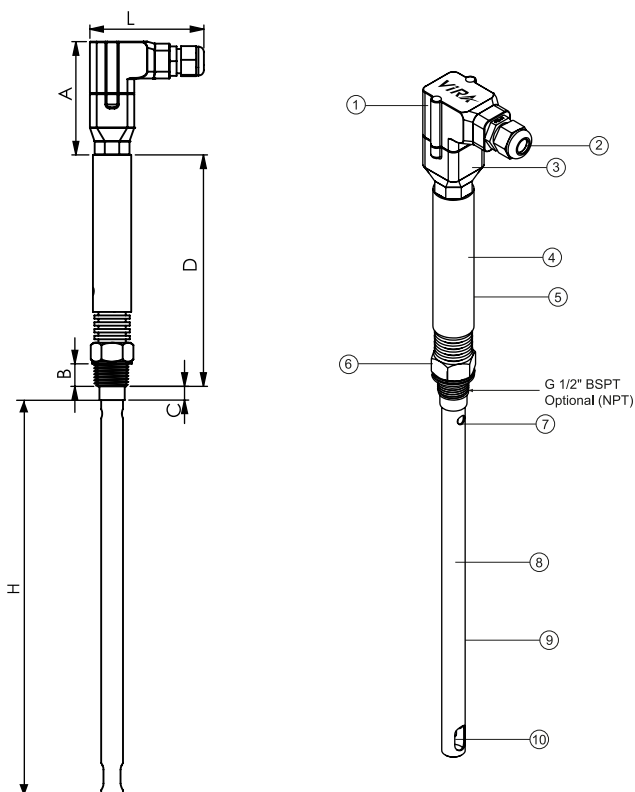
#### Technical Data

|                    |                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | BK 5000-T                                                                                                                                          |
| Supply Voltage     | 230VAC (+5%/-10%) 50/60Hz                                                                                                                          |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Input (Pt100, via Probe), Ground Connection                                                        |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus                                                    |
| Range              | 0-10.000 $\mu\text{S/cm}$ (default)                                                                                                                |
| Display            | LCD                                                                                                                                                |
| Label              | Lexan                                                                                                                                              |
| Max. Ambient Temp. | 55°C                                                                                                                                               |
| Enclosure          | PA (Polyamide)                                                                                                                                     |
| Type               | Panel-mount                                                                                                                                        |
| Protection Class   | IP40                                                                                                                                               |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### BD 5600-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |
| 9  | Rod                     | Austenitic Stainless Steel 316L              |
| 10 | Sensor Tip              | Austenitic Stainless Steel 316Ti             |

#### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|--------|
| 500    | 83,5   | 83     | 16,5   | 10     | 169,5  |

**Note:** Standard probe length is 500 mm. Alternative lengths are available upon request.



## D-BS4-T Temperature Compensation Type Automatic TDS Blowdown System



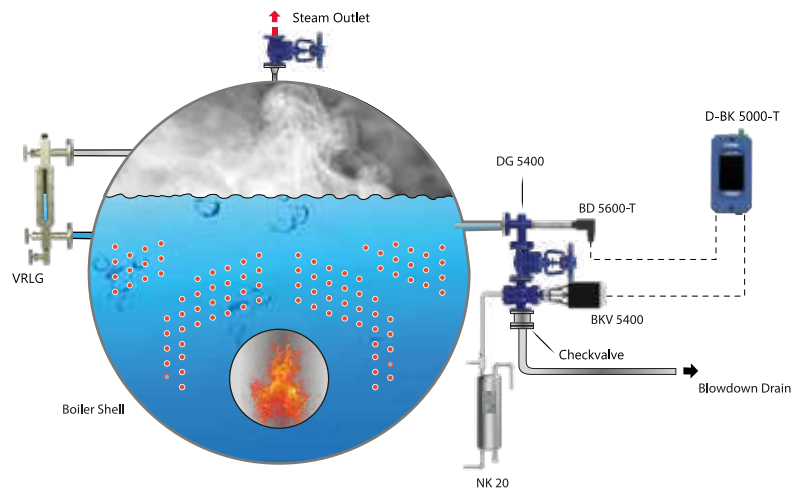
### Temp. Comp. Type Conductivity Controller

|                |                                                                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : D-BK 5000-T                                                                                                                                                                                 |
| Supply Voltage | : 24VDC                                                                                                                                                                                       |
| Enclosure      | : Panel-mount and Din Rail Type                                                                                                                                                               |
| Functions      | : Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                                                             |
| Features       | : Conductivity and Alarm Set Values, Temperature Compensation, Valve & Alarm Relay Test Functions, Touchscreen Display, User-Friendly Parameter Setting, Multi-Language Support               |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                      |

### Temperature Compensation Type Conductivity Probe

|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5600-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## D-BS4-T Typical Installation

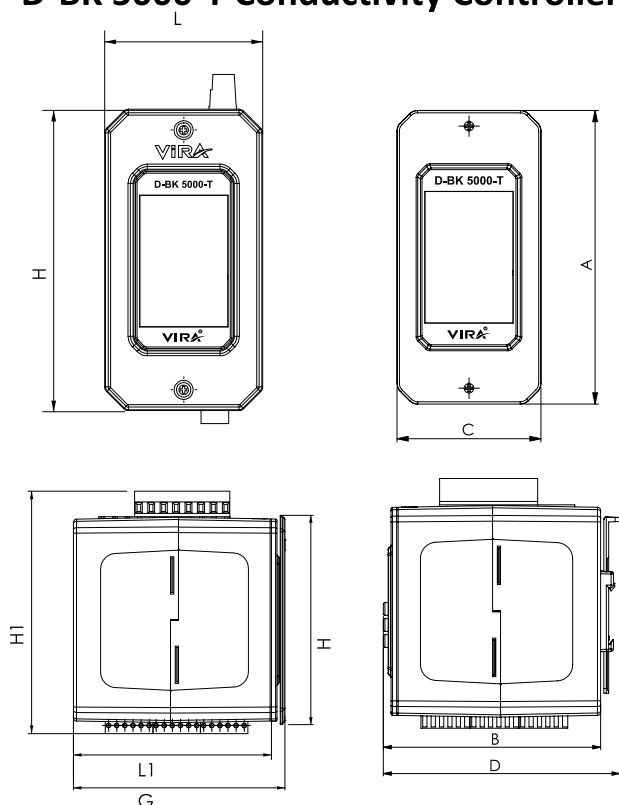


# TECHNICAL SPECIFICATION

## D-BK 5000-T Conductivity Controller

### Technical Data

|                    |                                                                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | D-BK 5000-T                                                                                                                                                                                 |
| Supply Voltage     | 24VDC                                                                                                                                                                                       |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Sensor Input (Pt100, via Probe), Ground Connection                                                                                          |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                                                             |
| Range              | 0-10.000 µS/cm (default)                                                                                                                                                                    |
| Display & Control  | Touch Screen                                                                                                                                                                                |
| Label              | Silicone Rubber                                                                                                                                                                             |
| Max. Ambient Temp. | 55°C                                                                                                                                                                                        |
| Enclosure          | PC (Polycarbonate)                                                                                                                                                                          |
| Type               | Panel-mount and Din Rail                                                                                                                                                                    |
| Protection Class   | IP 40                                                                                                                                                                                       |



### Dimensions

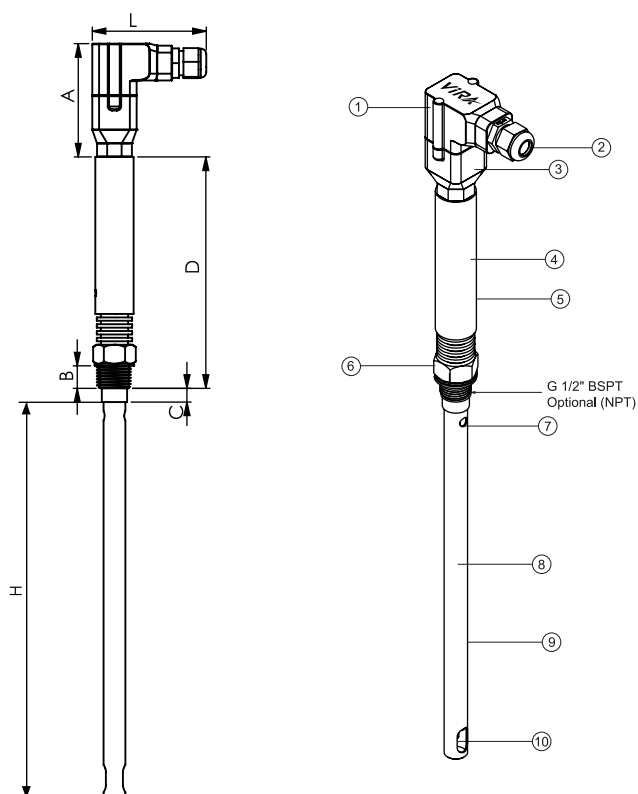
| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

## BD 5600-T Conductivity Probe

| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |
| 9  | Rod                     | Austenitic Stainless Steel 316L              |
| 10 | Sensor Tip              | Austenitic Stainless Steel 316Ti             |

### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|--------|
| 500    | 83,5   | 83     | 16,5   | 10     | 169,5  |



**Note:** Standard probe length is 500 mm. Alternative lengths are available upon request.

## BS4 Automatic TDS Blowdown System



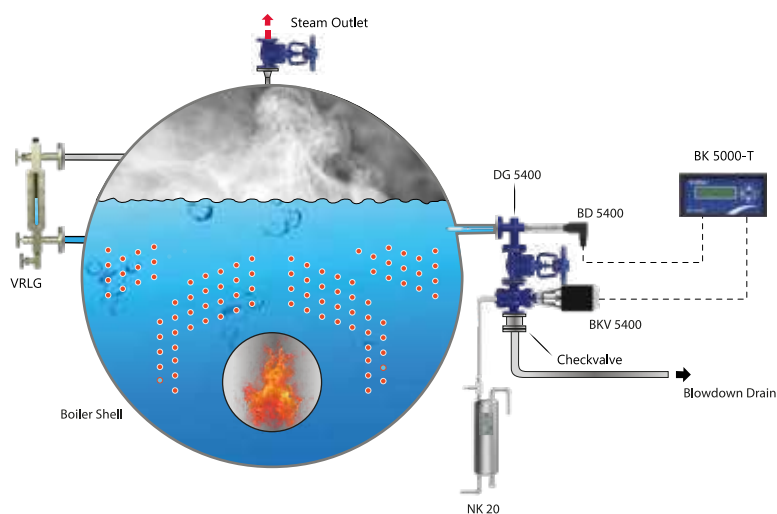
### Conductivity Controller

|                |                                                                                                                                                      |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : BK 5000-T                                                                                                                                          |
| Supply Voltage | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                                       |
| Enclosure      | : Panel-mount Type                                                                                                                                   |
| Functions      | : Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                    |
| Features       | : Conductivity and Alarm Set Values, Valve & Alarm Relay Test Functions, LCD Display, User-friendly Parameter Setting (4 Buttons)                    |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                             |

### Conductivity Probe

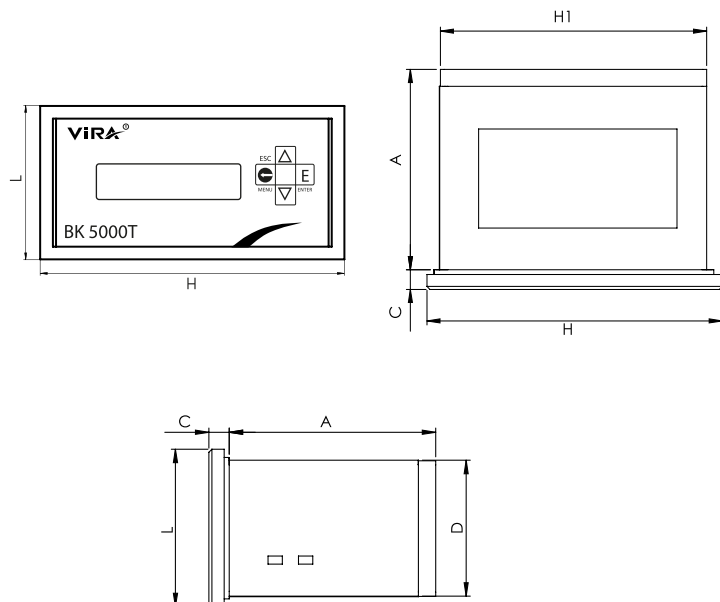
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5400                                                                |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## BS4 Typical Installation



## TECHNICAL SPECIFICATION

### BK 5000-T Conductivity Controller



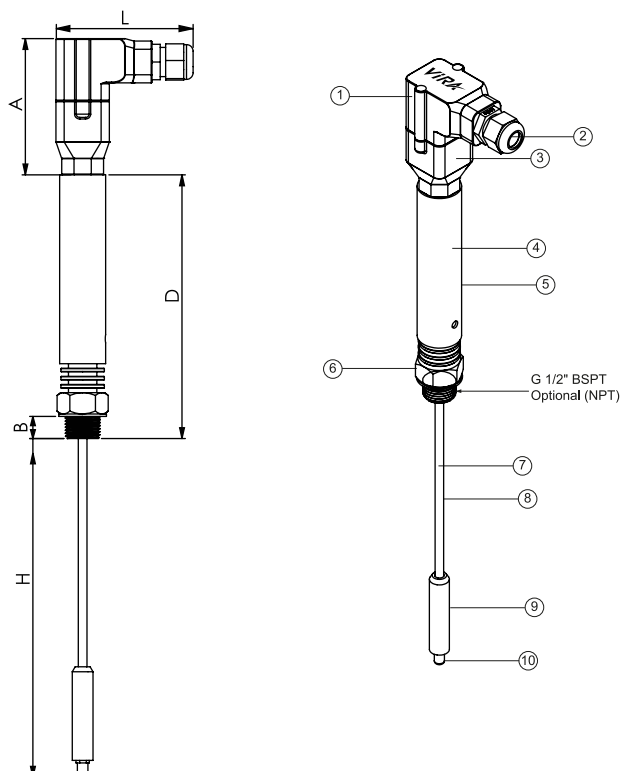
#### Technical Data

|                           |                                                                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Controller</b>         | BK 5000-T                                                                                                                                          |
| <b>Supply Voltage</b>     | 230VAC (+5%/-10%), 50/60Hz                                                                                                                         |
| <b>Functions</b>          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons |
| <b>Inputs</b>             | 1 Conductivity Input (via Probe), Ground Connection                                                                                                |
| <b>Outputs</b>            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus Communication                                      |
| <b>Range</b>              | 0-10.000 $\mu\text{S/cm}$ (default)                                                                                                                |
| <b>Display</b>            | LCD                                                                                                                                                |
| <b>Label</b>              | Lexan                                                                                                                                              |
| <b>Max. Ambient Temp.</b> | 55°C                                                                                                                                               |
| <b>Enclosure</b>          | PA (Polyamide)                                                                                                                                     |
| <b>Type</b>               | Panel-mount                                                                                                                                        |
| <b>Protection Class</b>   | IP40                                                                                                                                               |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### BD 5400 Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip               | Austenitic Stainless Steel 316L              |
| 8  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 9  | Insulator               | Politetrafluoroetilen (PTFE)                 |
| 10 | Sensor Tip              | Austenitic Stainless Steel 316Ti             |

#### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 500    | 83,5   | 83     | 13,5   | 160,6  |

**Note:** Standard probe length is 500 mm. Alternative lengths are available upon request.

## D-BS4 Automatic TDS Blowdown System



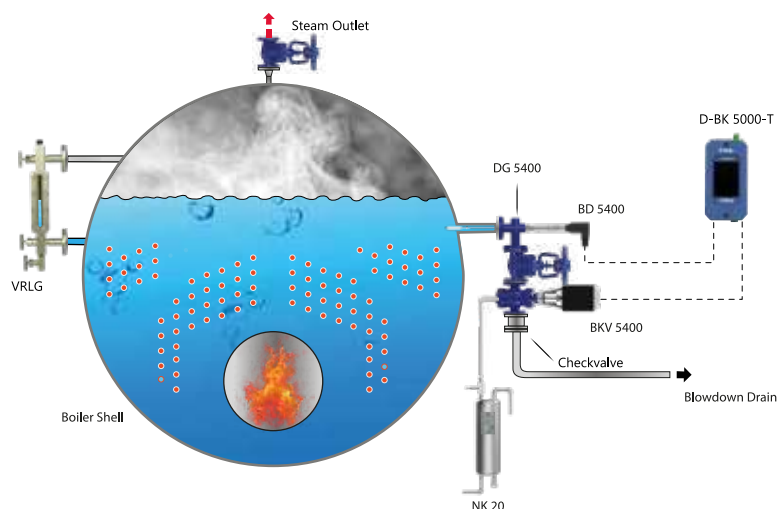
### Conductivity Controller

|                |                                                                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : D-BK 5000-T                                                                                                                                                                                 |
| Supply Voltage | : 24VDC                                                                                                                                                                                       |
| Enclosure      | : Panel-mount and Din Rail Type                                                                                                                                                               |
| Functions      | : Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Output         | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                                                             |
| Features       | : Conductivity and Alarm Set Values, Valve & Alarm Relay Test Functions, Touchscreen Display, User-Friendly Parameter Setting, Multi-Language Support                                         |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                      |

### Conductivity Probe

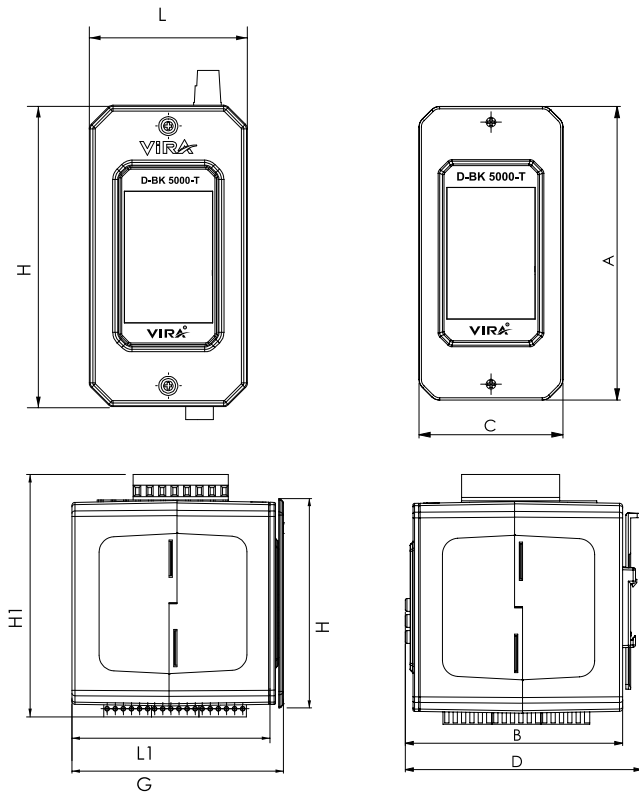
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5400                                                                |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## D-BS4 Typical Installation



## TECHNICAL SPECIFICATION

### D-BK 5000-T Conductivity Controller



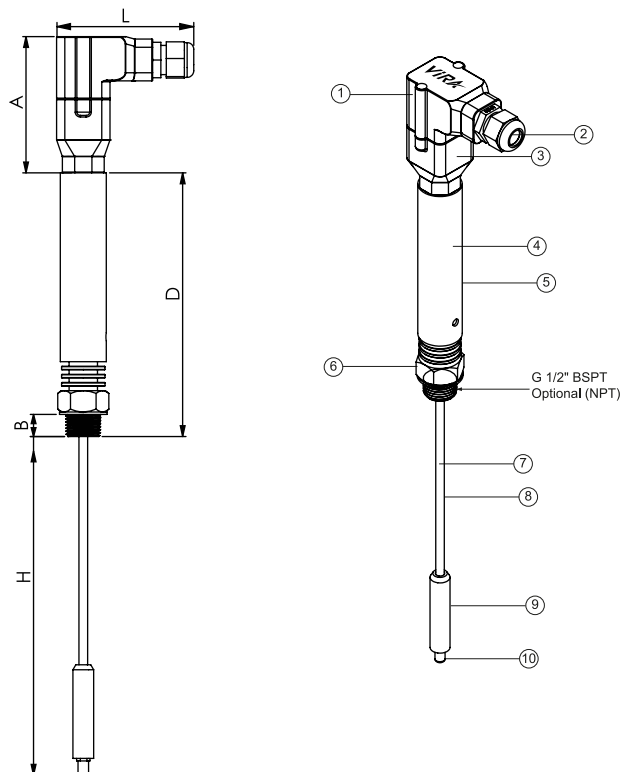
#### Technical Data

|                              |                                                                                                                                                                                             |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Controller</b>            | D-BK 5000-T                                                                                                                                                                                 |
| <b>Supply Voltage</b>        | 24VDC                                                                                                                                                                                       |
| <b>Functions</b>             | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| <b>Inputs</b>                | 1 Conductivity Input (via Probe), Ground Connection                                                                                                                                         |
| <b>Outputs</b>               | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                                                             |
| <b>Range</b>                 | 0-10.000 $\mu\text{S/cm}$ (default)                                                                                                                                                         |
| <b>Display &amp; Control</b> | Touch Screen                                                                                                                                                                                |
| <b>Label</b>                 | Silicone Rubber                                                                                                                                                                             |
| <b>Max. Ambient Temp.</b>    | 55°C                                                                                                                                                                                        |
| <b>Enclosure</b>             | PC (Polycarbonate)                                                                                                                                                                          |
| <b>Type</b>                  | Panel-mount and Din Rail                                                                                                                                                                    |
| <b>Protection Class</b>      | IP 40                                                                                                                                                                                       |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

### BD 5400 Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip               | Austenitic Stainless Steel 316L              |
| 8  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 9  | Insulator               | Politetrafluoroetilen (PTFE)                 |
| 10 | Sensor Tip              | Austenitic Stainless Steel 316Ti             |

#### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 500    | 83,5   | 83     | 13,5   | 160,6  |

**Note:** Standard probe length is 500 mm. Alternative lengths are available upon request.

## BS5-T Automatic TDS Blowdown Control System



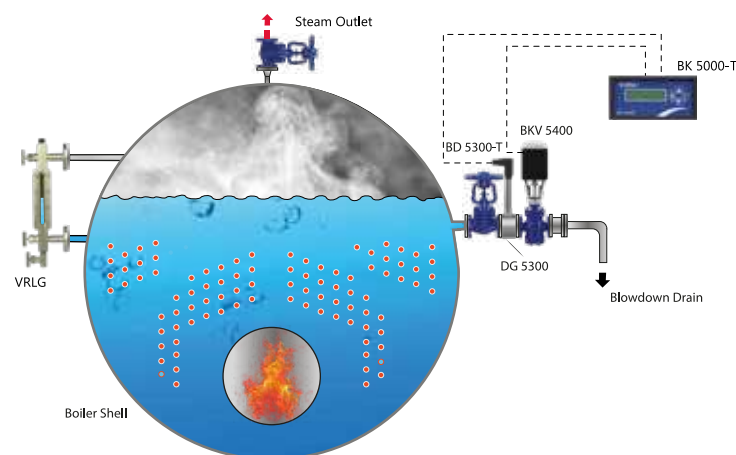
### Temp. Compensation Type Conductivity Controller

|                |                                                                                                                                                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : BK 5000-T                                                                                                                                                         |
| Supply Voltage | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                                                      |
| Enclosure      | : Panel-mount Type                                                                                                                                                  |
| Functions      | : Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons                |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                                   |
| Features       | : Conductivity and Alarm Set Values, Temperature Compensation, Valve & Alarm Relay Test Functions, Digital LED Display, User-friendly Parameter Setting (4 Buttons) |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                            |

### Temp. Compensation Type Conductivity Probe

|                     |                                                                                          |
|---------------------|------------------------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                                              |
| Nominal Pressure    | : PN 40                                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                                               |
| Max. Ambient Temp.  | : 75 °C                                                                                  |
| Compliance          | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

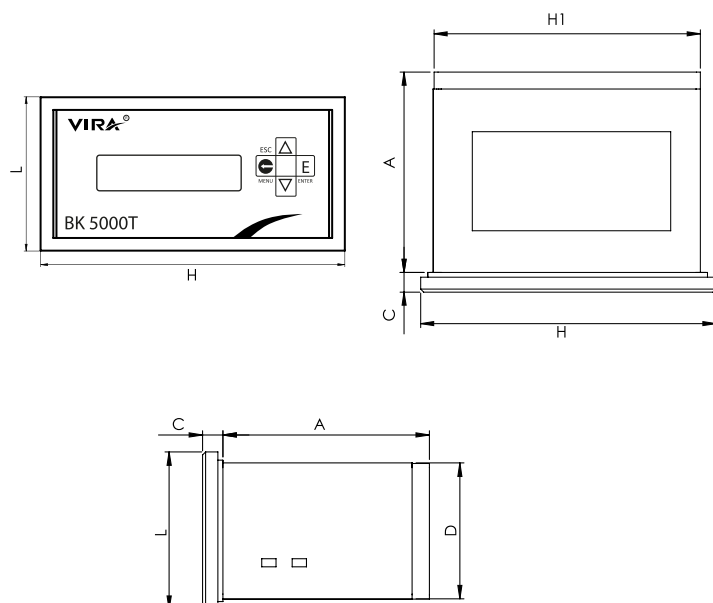
## BS5-T Typical Installation





## TECHNICAL SPECIFICATION

### BK 5000-T Conductivity Controller



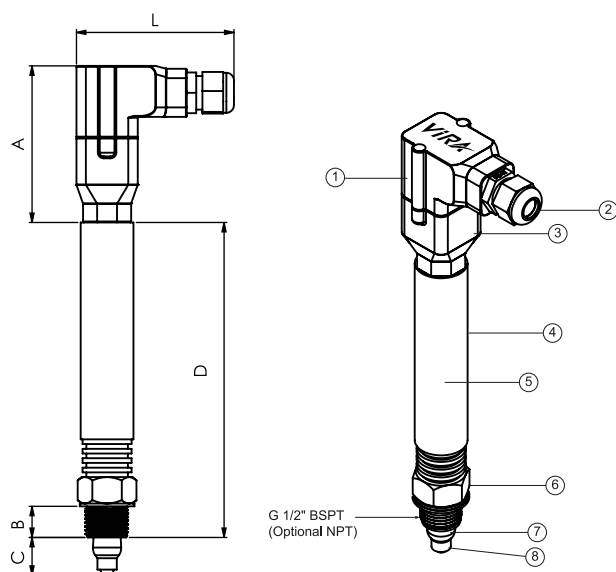
#### Technical Data

|                           |                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Controller</b>         | BK 5000-T                                                                                                                                  |
| <b>Supply Voltage</b>     | 230VAC (+5%/-10%), 50/60Hz                                                                                                                 |
| <b>Functions</b>          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, LCD Display, 4-Button |
| <b>Inputs</b>             | 1 Conductivity Input (via Probe), 1 Temperature Input (Pt100 via Probe), Ground Connection                                                 |
| <b>Outputs</b>            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus                                            |
| <b>Range</b>              | 0-10.000 $\mu\text{S/cm}$ (default)                                                                                                        |
| <b>Display</b>            | LCD                                                                                                                                        |
| <b>Label</b>              | Lexan                                                                                                                                      |
| <b>Max. Ambient Temp.</b> | 55°C                                                                                                                                       |
| <b>Enclosure</b>          | PA (Polyamide)                                                                                                                             |
| <b>Type</b>               | Panel-mount                                                                                                                                |
| <b>Protection Class</b>   | IP40                                                                                                                                       |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |

## D-BS5-T Automatic TDS Blowdown Control System



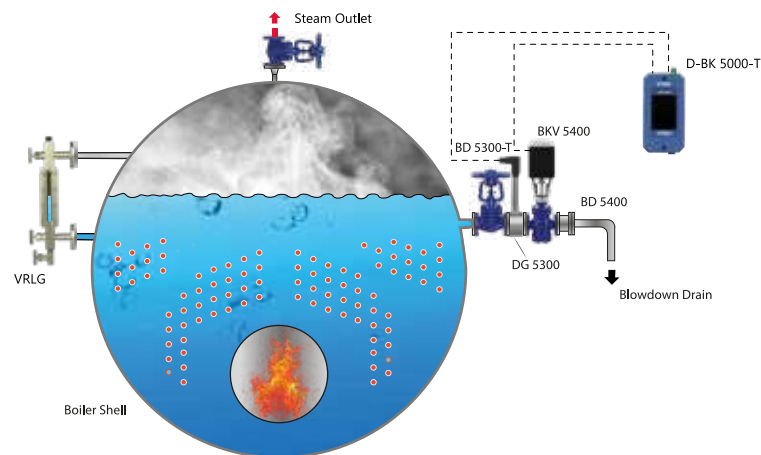
### Temp. Comp. Type Conductivity Controller

|                |                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : D-BK 5000-T                                                                                                                                                                                   |
| Supply Voltage | : 24VDC                                                                                                                                                                                         |
| Enclosure      | : Panel-mount and Din Rail Type                                                                                                                                                                 |
| Functions      | : Conductivity Measurement and Continuous Blowdown Control, Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                                 |
| Features       | : Conductivity and Alarm Set Values, Valve & Alarm Relay Test Functions, Touchscreen Display, User-Friendly Parameter Setting, Multi-Language Support, Temperature Compensation.                |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                        |

### Temp. Compensation Type Conductivity Probe

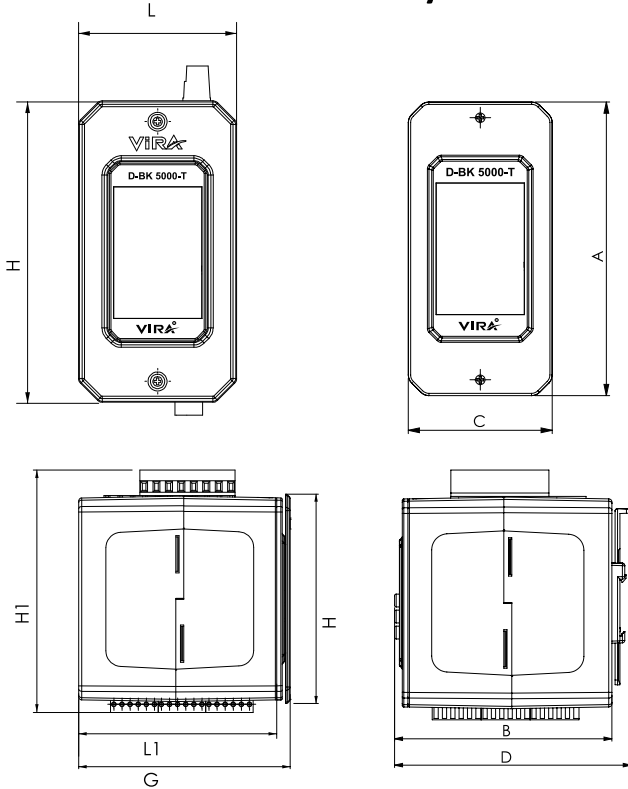
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                               |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## D-BS5-T Typical Installation



## TECHNICAL SPECIFICATION

### D-BK 5000-T Conductivity Controller



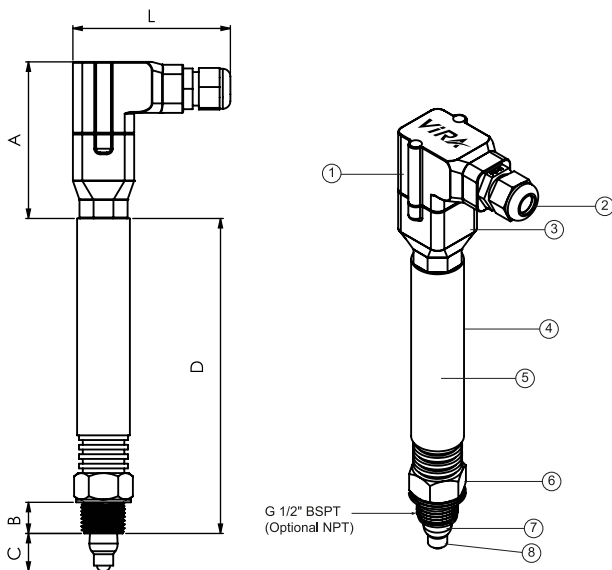
#### Technical Data

|                    |                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | D-BK 5000-T                                                                                                                                                                          |
| Supply Voltage     | 24VDC                                                                                                                                                                                |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Sensor Input (Pt100 via Probe), Ground Connection                                                                                    |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                        |
| Range              | 0-10.000 $\mu\text{S}/\text{cm}$ (default)                                                                                                                                           |
| Display & Control  | Touch Screen                                                                                                                                                                         |
| Label              | Silicone Rubber                                                                                                                                                                      |
| Max. Ambient Temp. | 55°C                                                                                                                                                                                 |
| Enclosure          | PC (Polycarbonate)                                                                                                                                                                   |
| Type               | Panel-mount and Din Rail                                                                                                                                                             |
| Protection Class   | IP 40                                                                                                                                                                                |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |



#### Continuous (TDS) Blowdown Valve (Electric Actuated)

|                      |                       |
|----------------------|-----------------------|
| Type                 | : BKV 5400- E         |
| Nominal Pressure     | : PN 40               |
| Sizes                | : DN 20, DN 25, DN 40 |
| Actuator Type        | : Electric            |
| Max. Operat. Temp.   | : 230 °C              |
| Body                 | : WCB                 |
| Sample Cooler Outlet | : 1/4" BSP Threaded   |
| Compliance           | : CE (PED 2014/68/EU) |



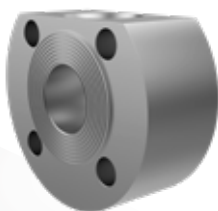
#### Continuous (TDS) Blowdown Valve (Pneumatic Actuated)

|                      |                       |
|----------------------|-----------------------|
| Type                 | : BKV 5400- P         |
| Nominal Pressure     | : PN 40               |
| Sizes                | : DN 20, DN 25, DN 40 |
| Actuator Type        | : Pneumatic           |
| Max. Operat. Temp.   | : 230 °C              |
| Body                 | : WCB                 |
| Sample Cooler Outlet | : 1/4" BSP Threaded   |
| Compliance           | : CE (PED 2014/68/EU) |



#### Conductivity Probe Body

|                     |                                   |
|---------------------|-----------------------------------|
| Type                | : DG 5400                         |
| Nominal Pressure    | : PN 40                           |
| Sizes               | : DN 20, DN 25, DN 40             |
| Max. Operat. Temp.  | : 239 °C                          |
| Max. Operat. Press. | : 32 Bar g                        |
| Body                | : Nodular Cast Iron, Carbon Steel |

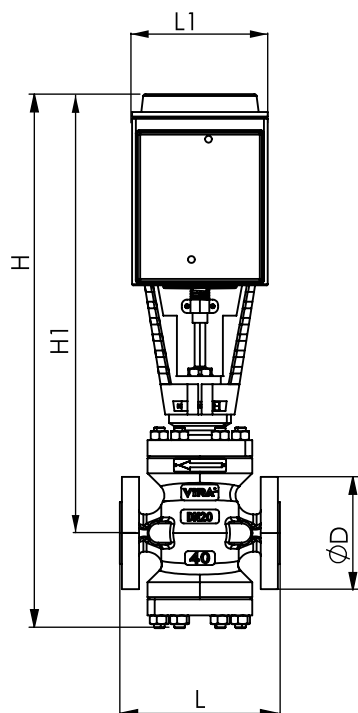


#### Conductivity Probe Body

|                     |                                    |
|---------------------|------------------------------------|
| Type                | : DG 5300                          |
| Nominal Pressure    | : PN 40                            |
| Sizes               | : DN 20, DN 25, DN32, DN 40, DN 50 |
| Max. Operat. Temp.  | : 239 °C                           |
| Max. Operat. Press. | : 32 Bar g                         |
| Body                | : Carbon Steel, Stainless Steel    |

## TECHNICAL SPECIFICATION

### BKV 5400 Blowdown Valves



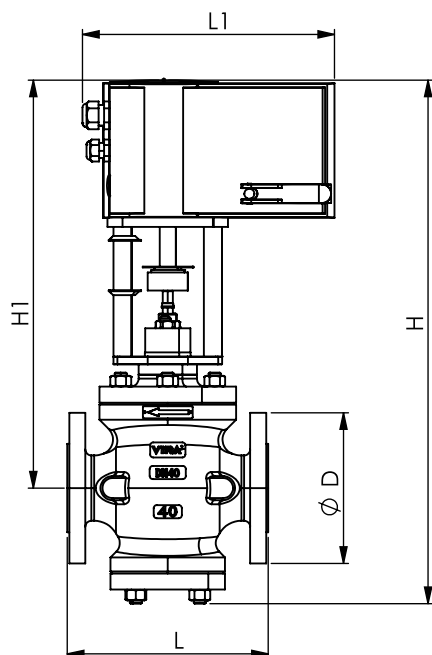
#### Technical Data

|                |                                   |
|----------------|-----------------------------------|
| Type           | BKV 5400-E                        |
| Body           | WCB                               |
| Pressure Class | PN 40                             |
| Operat. Temp.  | -10 - +230 °C                     |
| Sealing        | Metal to Metal                    |
| Actuator       | Electric                          |
| Control        | On-Off, Spring Return (Fail-Safe) |
| Connection     | Flanged                           |

#### Dimensions

| Type       | DN | D (mm) | H (mm) | H1 (mm) | L1 (mm) | L (mm) |
|------------|----|--------|--------|---------|---------|--------|
| BKV 5420-E | 20 | 105    | 483    | 394     | 127     | 150    |
| BKV 5425-E | 25 | 115    | 483    | 394     | 127     | 160    |

### BKV 5400 Blowdown Valves



#### Technical Data

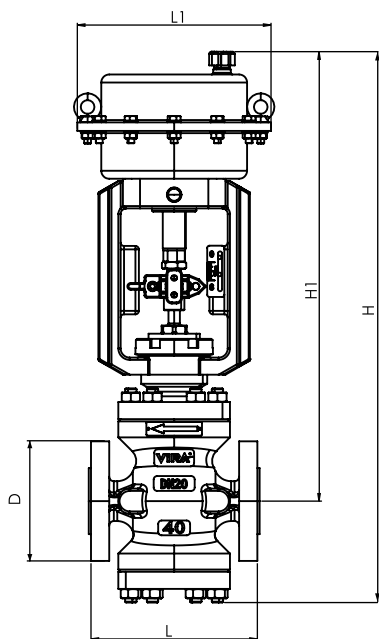
|                |                                   |
|----------------|-----------------------------------|
| Type           | BKV 5400-E                        |
| Body           | WCB                               |
| Pressure Class | PN 40                             |
| Operat. Temp.  | -10 - +230 °C                     |
| Sealing        | Metal to Metal                    |
| Actuator       | Electric                          |
| Control        | On-Off, Spring Return (Fail-Safe) |
| Connection     | Flanged                           |

#### Dimensions

| Type       | DN | D (mm) | H (mm) | H1 (mm) | L1 (mm) | L (mm) |
|------------|----|--------|--------|---------|---------|--------|
| BKV 5440-E | 40 | 150    | 521    | 406     | 223     | 196    |

## TECHNICAL SPECIFICATION

### BKV 5400 Blowdown Valves



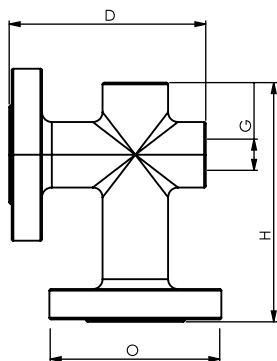
#### Technical Data

|                |                                              |
|----------------|----------------------------------------------|
| Type           | BKV 5400-P                                   |
| Body           | WCB                                          |
| Pressure Class | PN 40                                        |
| Operat. Temp.  | -10 - +230 °C                                |
| Sealing        | Metal to Metal                               |
| Actuator       | Pneumatic (Diaphragm)                        |
| Control        | On-Off, Spring Return (Fail-Safe)            |
| Accessories    | Switch Box, Namur Solenoid Valve, Air Filter |
| Connection     | Flanged                                      |

#### Dimensions

| Type       | DN | D (mm) | H (mm) | H1 (mm) | L1 (mm) | L (mm) |
|------------|----|--------|--------|---------|---------|--------|
| BKV 5420-P | 20 | 105    | 483,5  | 394,5   | 170     | 146    |
| BKV 5425-P | 25 | 115    | 483,5  | 394,5   | 170     | 156    |
| BKV 5440-P | 40 | 150    | 522    | 407     | 170     | 200    |

### DG 5400 Probe Housing



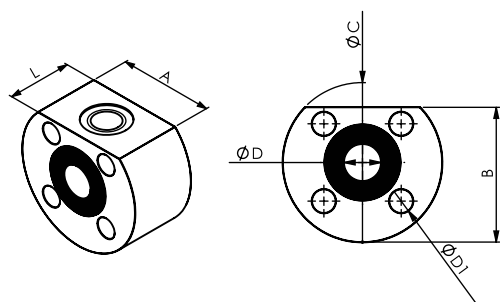
#### Technical Data

|                    |                                 |
|--------------------|---------------------------------|
| Type               | DG 5400                         |
| Body               | Nodular Cast Iron, Carbon Steel |
| Pressure Class     | PN 40                           |
| Process Connection | Flanged                         |
| Probe Connection   | Threaded                        |

#### Dimensions

| Type    | Size  | D (mm) | G (inch) | H (mm) | O (DN) |
|---------|-------|--------|----------|--------|--------|
| DG 5420 | DN 20 | 120    | 1/2"     | 146    | 105    |
| DG 5425 | DN 25 | 150    | 1/2"     | 150    | 115    |
| DG 5440 | DN 40 | 188    | 1/2"     | 188    | 150    |

### DG 5300 Probe Housing



#### Technical Data

|                    |                               |
|--------------------|-------------------------------|
| Type               | DG 5300                       |
| Body               | Carbon Steel, Stainless Steel |
| Pressure Class     | PN 40                         |
| Process Connection | Threaded                      |
| Probe Connection   | Threaded                      |

#### Dimensions

| Type    | Size  | L (mm) | A (mm) | B (mm) | Ø C (mm) | Ø D (mm) | Ø D1 (mm) |
|---------|-------|--------|--------|--------|----------|----------|-----------|
| DG 5320 | DN 20 | 47     | 68     | 92,5   | 105      | 27,6     | 14 x 4    |
| DG 5325 | DN 25 | 47     | 82,5   | 97,5   | 115      | 34,5     | 14 x 4    |
| DG 5332 | DN 32 | 47     | 104    | 117    | 140      | 43       | 18 x 4    |
| DG 5340 | DN 40 | 47     | 112    | 125    | 150      | 49       | 18 x 4    |



“Boiler Control Engineered for Steam Excellence”



## BS1-T Automatic TDS Blowdown Control System for Low Capacity Boilers



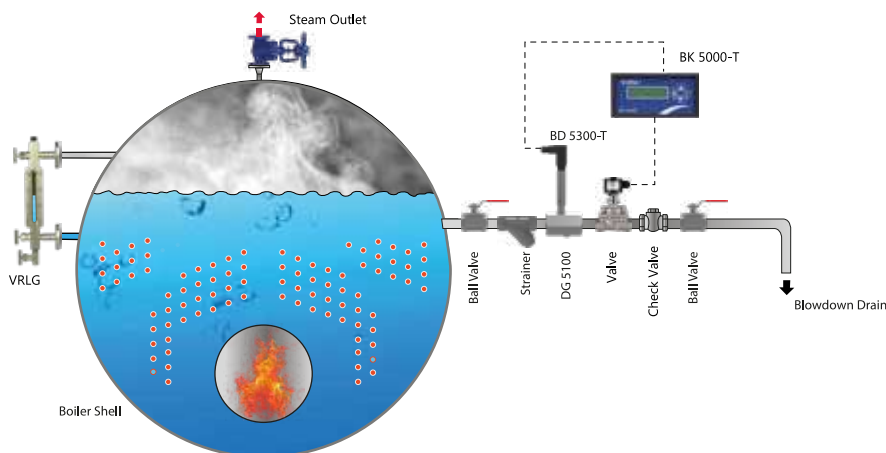
### Temp. Compensation Type Conductivity Controller

|                |                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : BK 5000-T                                                                                                                                                 |
| Supply Voltage | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                                              |
| Enclosure      | : Panel-mount Type                                                                                                                                          |
| Functions      | : Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons        |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                           |
| Features       | : Conductivity and Alarm Set Values, Temperature Compensation, Valve & Alarm Relay Test Functions, LCD Display, User-friendly Parameter Setting (4 Buttons) |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                    |

### Temp. Compensation Type Conductivity Probe

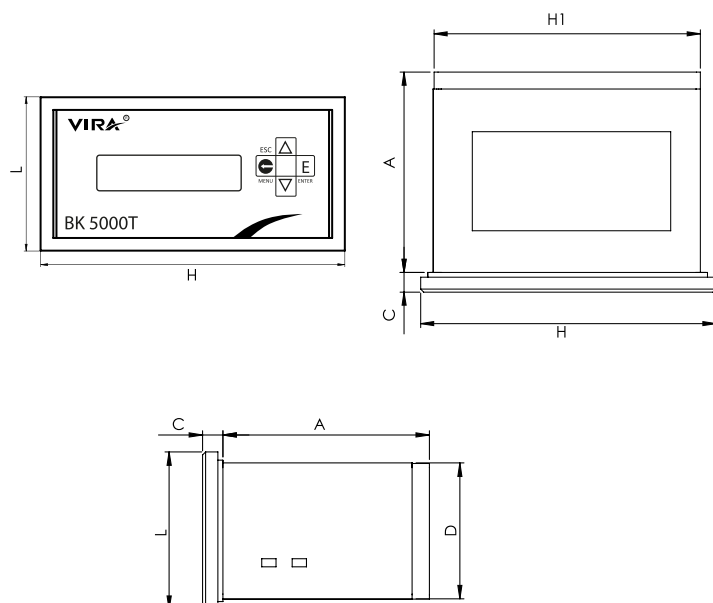
|                     |                                                                                          |
|---------------------|------------------------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                                              |
| Nominal Pressure    | : PN 40                                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                                               |
| Max. Ambient Temp.  | : 75 °C                                                                                  |
| Compliance          | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## BS1-T Typical Installation



## TECHNICAL SPECIFICATION

### BK 5000-T Conductivity Controller



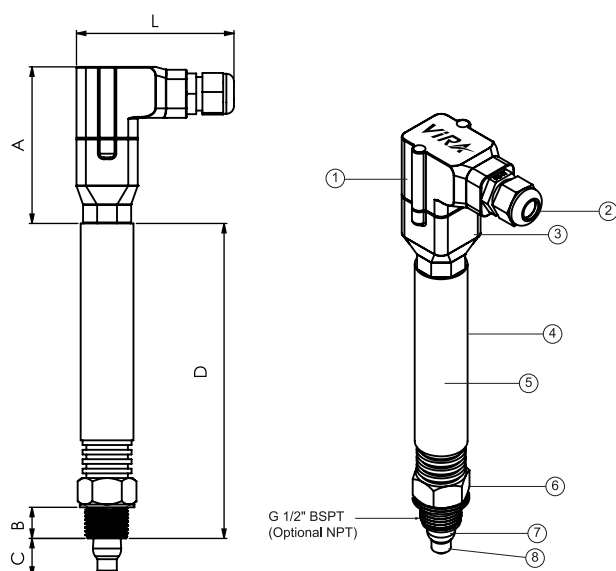
#### Technical Data

|                    |                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | BK 5000-T                                                                                                                                  |
| Supply Voltage     | 230VAC (+5%/-10%), 50/60Hz                                                                                                                 |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, LCD Display, 4-Button |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Input (Pt100 via Probe), Ground Connection                                                 |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus                                            |
| Range              | 0-10.000 $\mu$ S/cm (default)                                                                                                              |
| Display            | LCD                                                                                                                                        |
| Label              | Lexan                                                                                                                                      |
| Max. Ambient Temp. | 55°C                                                                                                                                       |
| Enclosure          | PA (Polyamide)                                                                                                                             |
| Type               | Panel-mount                                                                                                                                |
| Protection Class   | IP40                                                                                                                                       |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |

## D-BS1-T Automatic TDS Blowdown Control System for Low Capacity Boilers



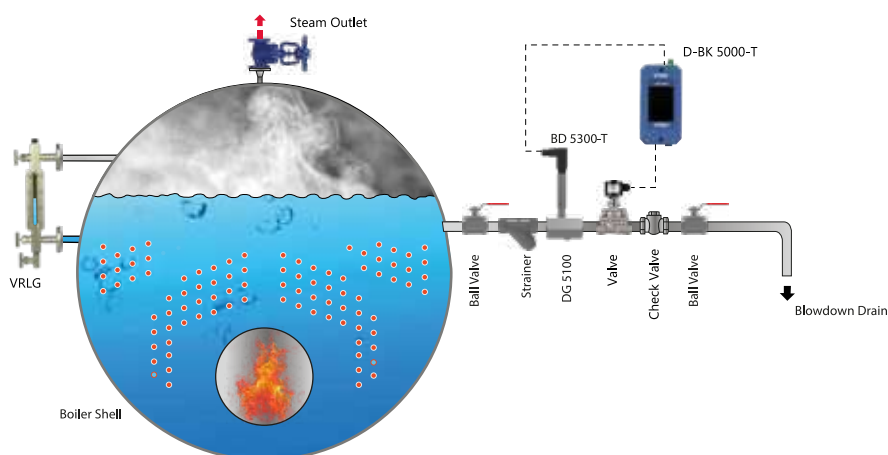
### Temp. Comp. Type Conductivity Controller

|                |                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : D-BK 5000-T                                                                                                                                                                                   |
| Supply Voltage | : 24VDC                                                                                                                                                                                         |
| Enclosure      | : Panel-mount and Din Rail Type                                                                                                                                                                 |
| Functions      | : Conductivity Measurement and Continuous Blowdown Control, Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                                 |
| Features       | : Conductivity and Alarm Set Values, Valve & Alarm Relay Test Functions, Touchscreen Display, User-Friendly Parameter Setting, Temperature Compensation, Multi-Language Support                 |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                        |

### Temp. Compensation Type Conductivity Probe

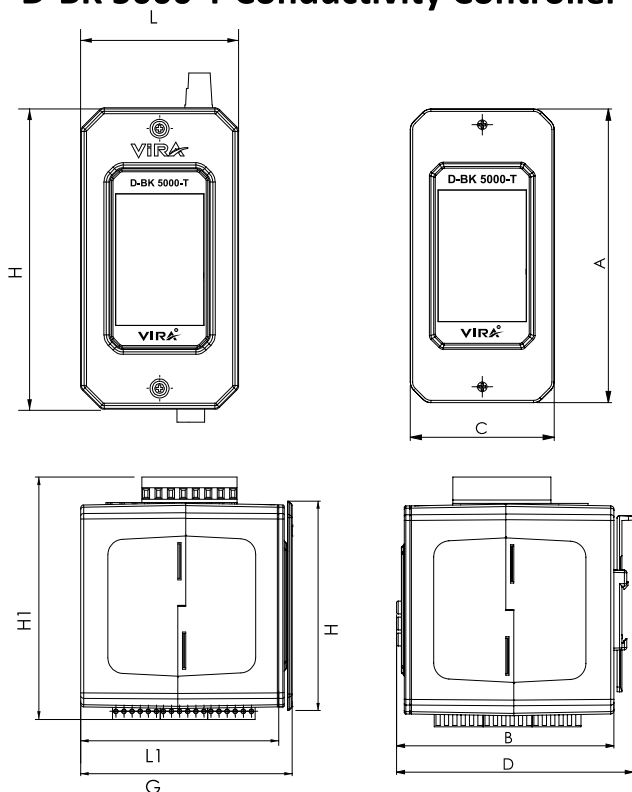
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                               |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## D-BS1-T Typical Installation



## TECHNICAL SPECIFICATION

### D-BK 5000-T Conductivity Controller



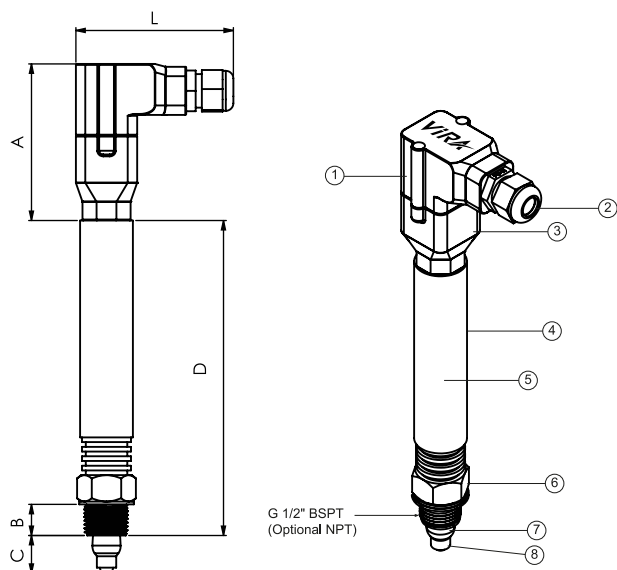
#### Technical Data

|                    |                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | D-BK 5000-T                                                                                                                                                                          |
| Supply Voltage     | 24VDC                                                                                                                                                                                |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Sensor Input (Pt100 via Probe), Ground Connection                                                                                    |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                        |
| Range              | 0-10.000 $\mu\text{S}/\text{cm}$ (default)                                                                                                                                           |
| Display & Control  | Touch Screen                                                                                                                                                                         |
| Label              | Silicone Rubber                                                                                                                                                                      |
| Max. Ambient Temp. | 55°C                                                                                                                                                                                 |
| Enclosure          | PC (Polycarbonate)                                                                                                                                                                   |
| Type               | Panel-mount and Din Rail                                                                                                                                                             |
| Protection Class   | IP 40                                                                                                                                                                                |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafloroetilen (PTFE)                  |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |

## BS2-T Automatic TDS Blowdown Control System for Coil Type Steam Generators



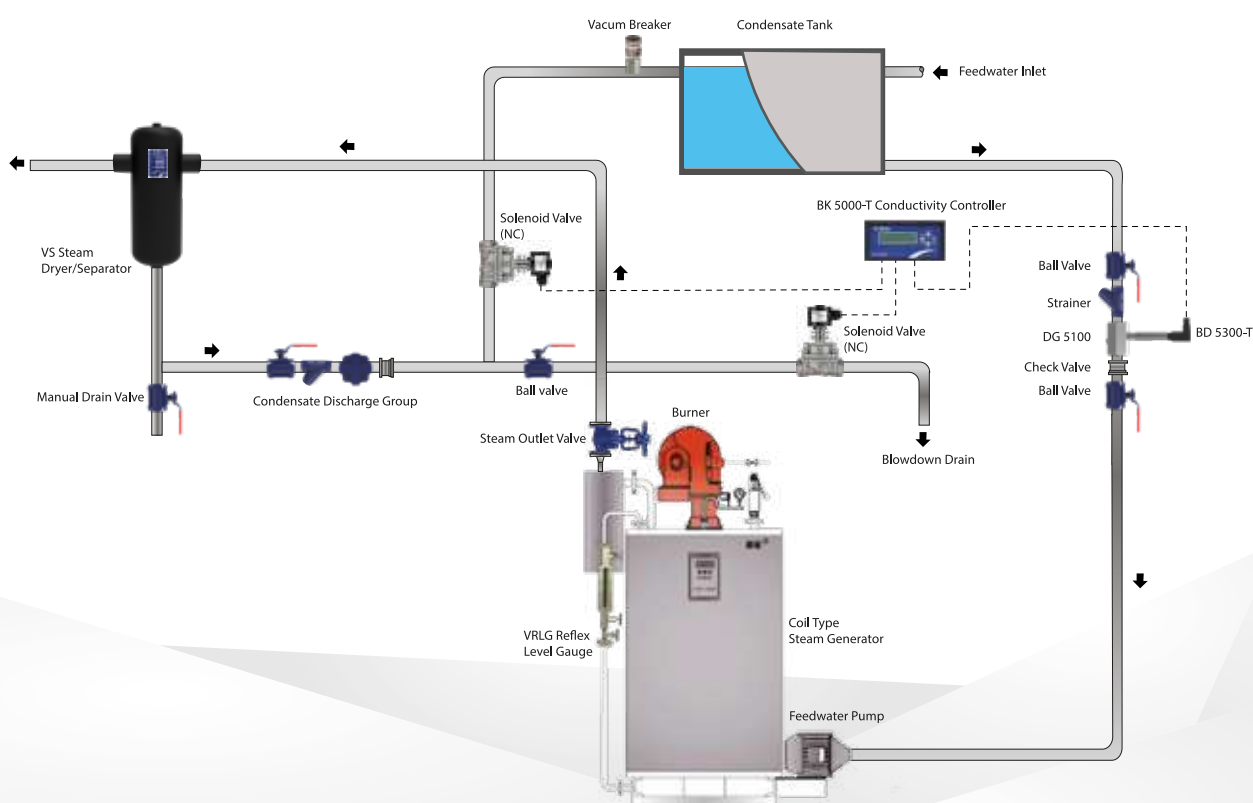
### Temp. Compensation Type Conductivity Controller

|                |                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : BK 5000-T                                                                                                                                                 |
| Supply Voltage | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                                              |
| Enclosure      | : Panel-mount Type                                                                                                                                          |
| Functions      | : Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons        |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                           |
| Features       | : Conductivity and Alarm Set Values, Temperature Compensation, Valve & Alarm Relay Test Functions, LCD Display, User-friendly Parameter Setting (4 Buttons) |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                    |

### Temp. Compensation Type Conductivity Probe

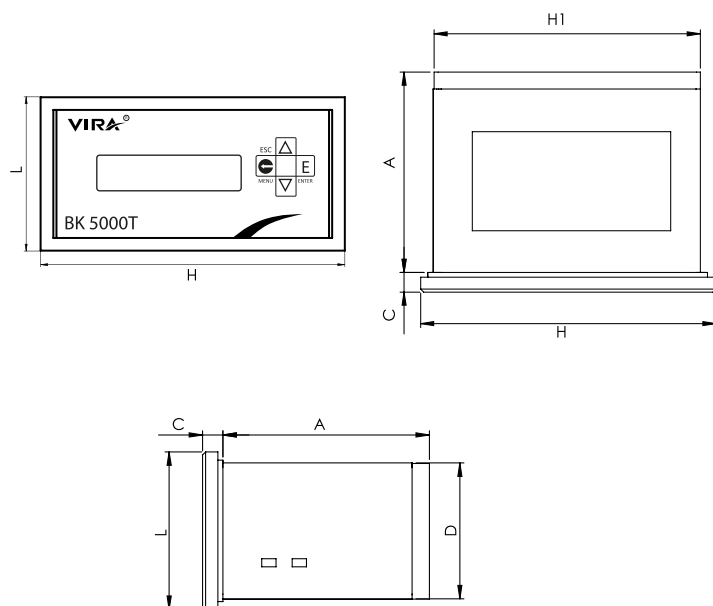
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                               |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## BS2-T Typical Installation



## TECHNICAL SPECIFICATION

### BK 5000-T Conductivity Controller



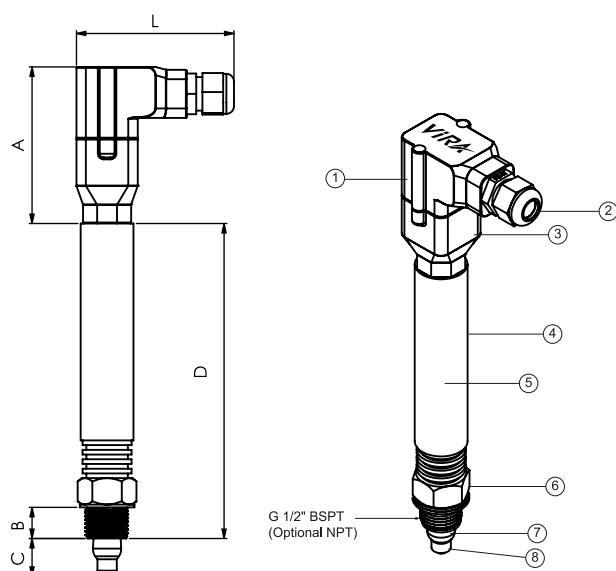
#### Technical Data

|                    |                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | BK 5000-T                                                                                                                                   |
| Supply Voltage     | 230VAC (+5%/-10%), 50/60Hz                                                                                                                  |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, LCD Display, 4-Buttons |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Input (Pt100 via Probe), Ground Connection                                                  |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus                                             |
| Range              | 0-10.000 $\mu$ S/cm (default)                                                                                                               |
| Display            | LCD                                                                                                                                         |
| Label              | Lexan                                                                                                                                       |
| Max. Ambient Temp. | 55°C                                                                                                                                        |
| Enclosure          | PA (Polyamide)                                                                                                                              |
| Type               | Panel-mount                                                                                                                                 |
| Protection Class   | IP40                                                                                                                                        |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Slewing       | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |

## D-BS2-T Automatic TDS Blowdown Control System for Coil Type Steam Generators

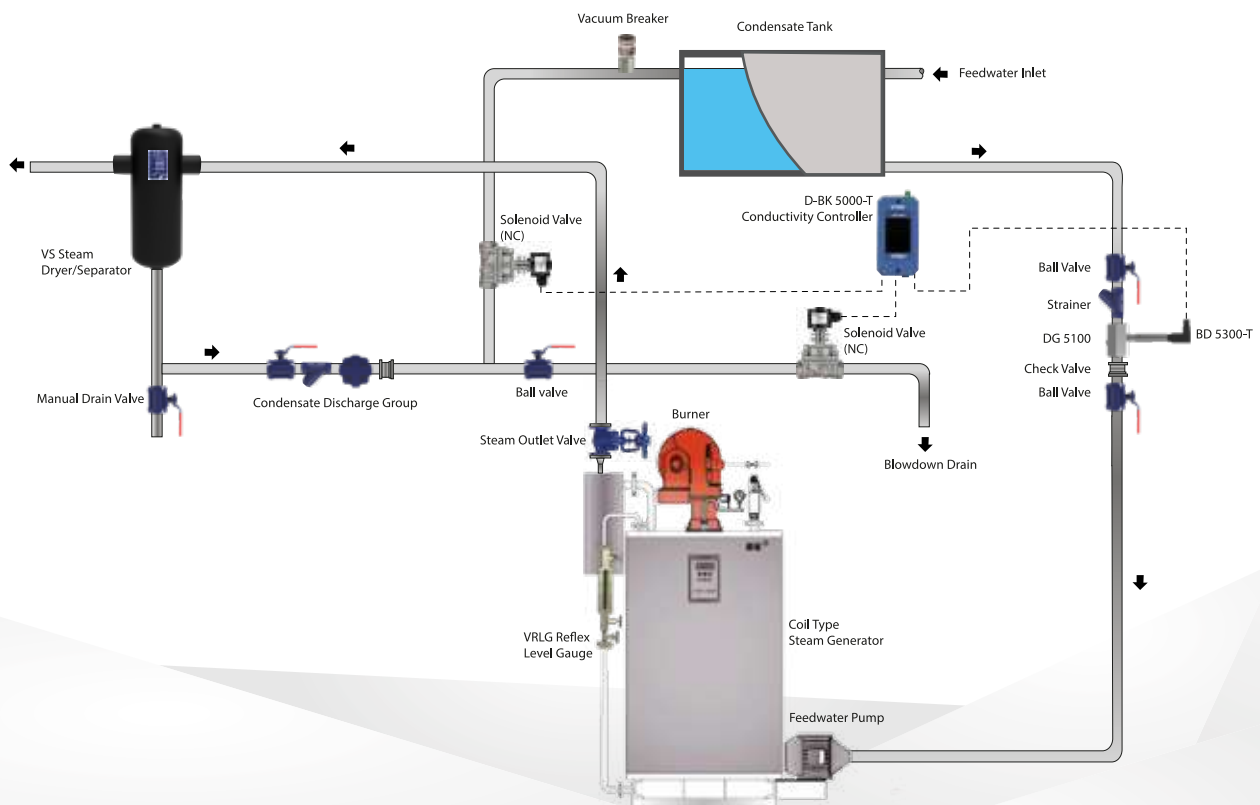
### Temp. Comp. Type Conductivity Controller

|                |                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : D-BK 5000-T                                                                                                                                                                                   |
| Supply Voltage | : 24VDC                                                                                                                                                                                         |
| Enclosure      | : Panel-mount and Din Rail Type                                                                                                                                                                 |
| Functions      | : Conductivity Measurement and Continuous Blowdown Control, Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                                 |
| Features       | : Conductivity and Alarm Set Values, Valve & Alarm Relay Test Functions, Touchscreen Display, User-Friendly Parameter Setting, Temperature Compensation, Multi-Language Support                 |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                        |

### Temp. Compensation Type Conductivity Probe

|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                               |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

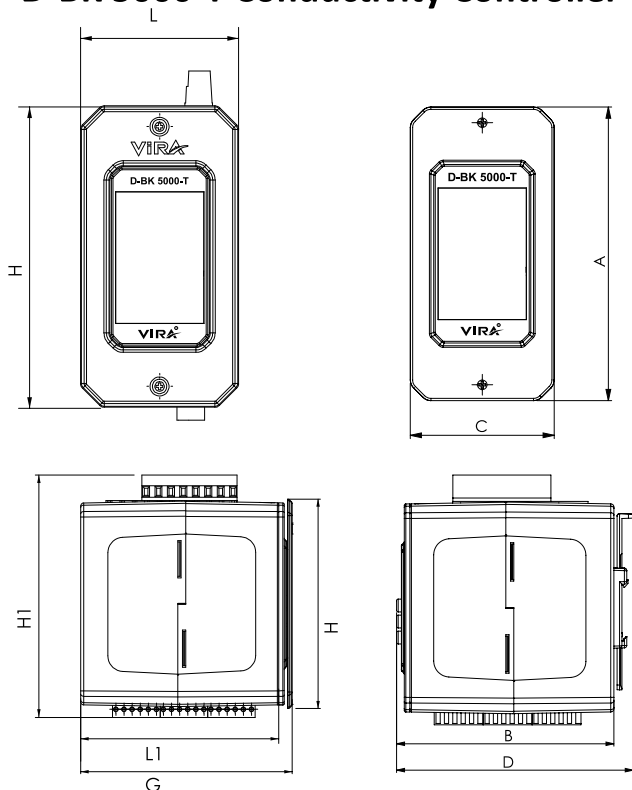
## D-BS2-T Typical Installation





## TECHNICAL SPECIFICATION

### D-BK 5000-T Conductivity Controller



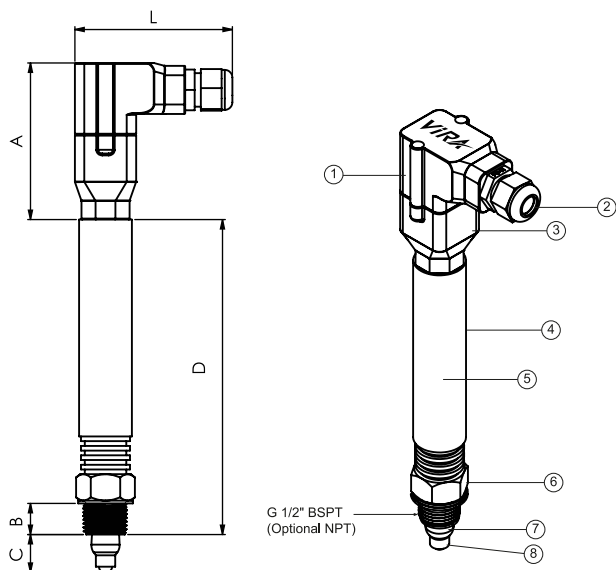
#### Technical Data

|                    |                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | D-BK 5000-T                                                                                                                                                                          |
| Supply Voltage     | 24VDC                                                                                                                                                                                |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Sensor Input (Pt100 via Probe), Ground Connection                                                                                    |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                        |
| Range              | 0-10.000 $\mu\text{S}/\text{cm}$ (default)                                                                                                                                           |
| Display & Control  | Touch Screen                                                                                                                                                                         |
| Label              | Silicone Rubber                                                                                                                                                                      |
| Max. Ambient Temp. | 55°C                                                                                                                                                                                 |
| Enclosure          | PC (Polycarbonate)                                                                                                                                                                   |
| Type               | Panel-mount and Din Rail                                                                                                                                                             |
| Protection Class   | IP 40                                                                                                                                                                                |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

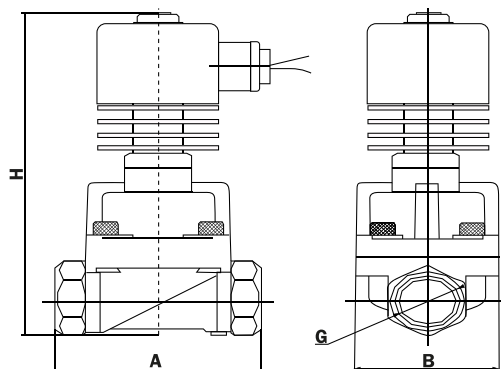
| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |



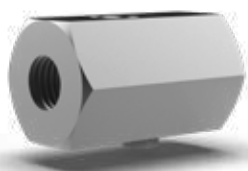
### Solenoid Valve (NC)

|                     |                   |
|---------------------|-------------------|
| Type                | : BKV 5100        |
| Nominal Pressure    | : PN 40           |
| Max. Operat. Temp.  | : 225 °C          |
| Max. Operat. Press. | : 25 Bar g        |
| Size                | : 3/4"-1/2"       |
| Body                | : Stainless Steel |

### Dimensions



| Type     | Connection Thread | Orifice (mm) | CV factor | Operating Pressure differential kgf/cm |                     |       | Max. Temperature °C | External Dimensions              | Weight Kg |
|----------|-------------------|--------------|-----------|----------------------------------------|---------------------|-------|---------------------|----------------------------------|-----------|
|          |                   |              |           | Min Pressure                           | Max Pressure        |       |                     |                                  |           |
|          |                   |              |           |                                        | Heat-conducting oil | Steam |                     | Length A x Width<br>B x Height H |           |
| BKV 5120 | 3/4"              | 20           | 8.0       | 0.5                                    | 25                  | 25    | 225                 | 85x60x171                        | 1.66      |
| BKV 5115 | 1/2"              | 15           | 4.5       | 0.5                                    | 25                  | 25    | 225                 | 75x52x159                        | 1.36      |



### Conductivity Probe Body

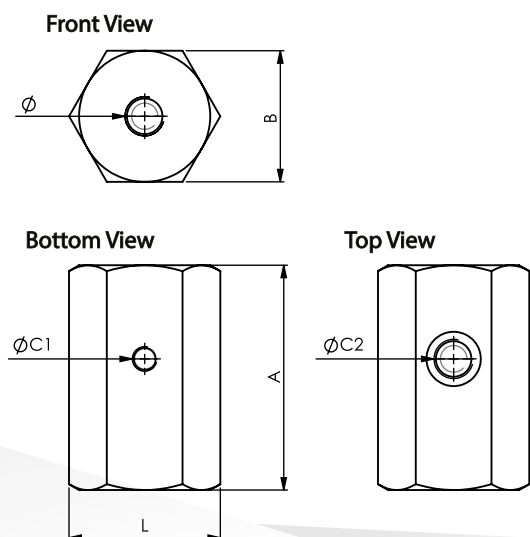
|                     |                |
|---------------------|----------------|
| Type                | : DG 5100      |
| Nominal Pressure    | : PN 40        |
| Size                | : 1/2", 3/4"   |
| Max. Operat. Press. | : 32 Bar g     |
| Max. Operat. Temp.  | : 239 °C       |
| Body                | : Carbon Steel |

### Technical Data

|                    |              |
|--------------------|--------------|
| Type               | DG 5100      |
| Body               | Carbon Steel |
| Pressure Class     | PN 40        |
| Process Connection | Threaded     |
| Probe Connection   | Threaded     |

### Dimensions

| Type    | Size (Ø) | L (mm) | A (mm) | B (mm) | Ø C2 | Ø C1 |
|---------|----------|--------|--------|--------|------|------|
| DG 5115 | 1/2"     | 81     | 120    | 70     | 1/2" | 1/4" |
| DG 5120 | 3/4"     | 81     | 120    | 70     | 1/2" | 1/4" |



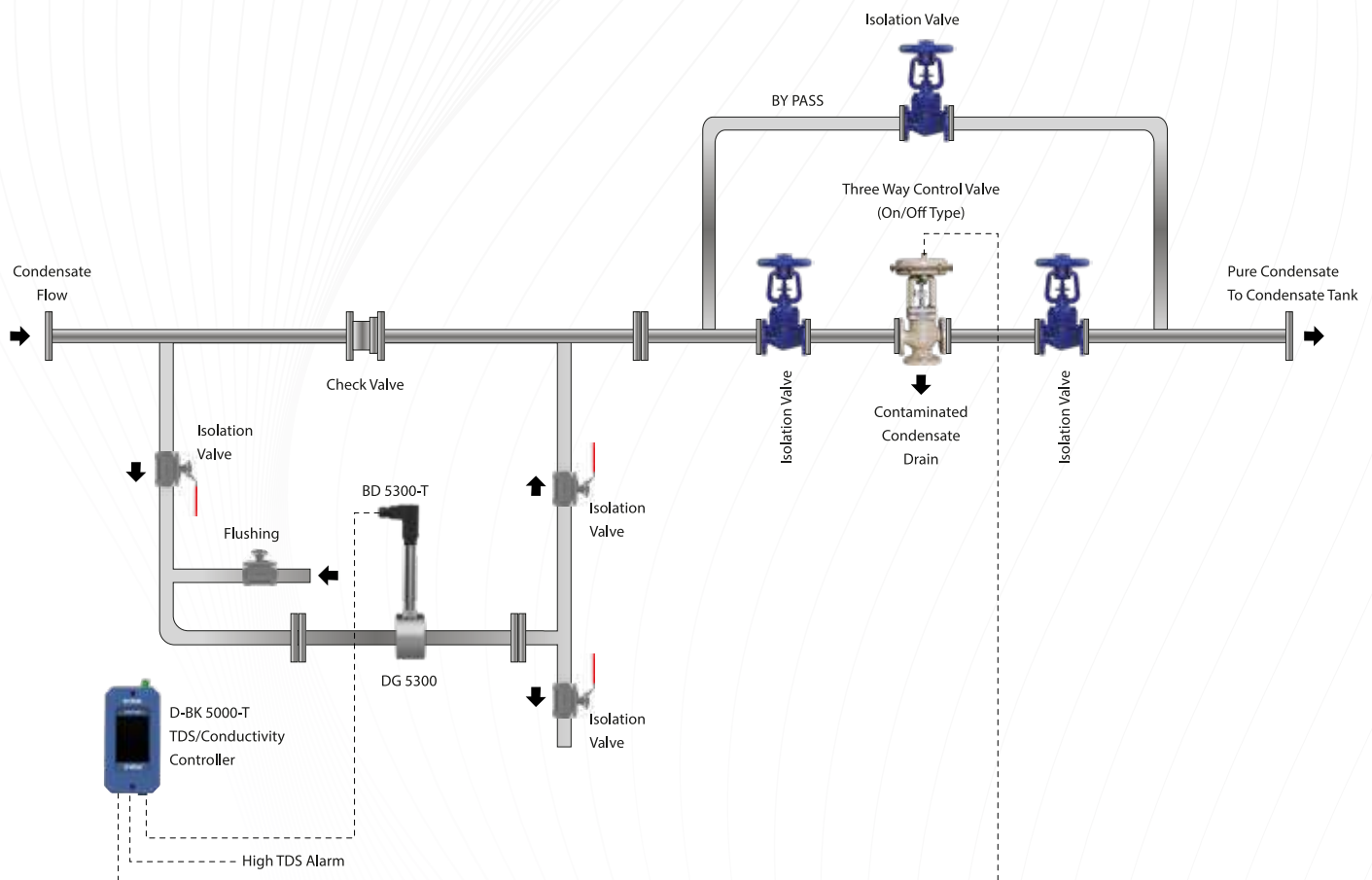
## Condensate Contamination Control System

Condensate is very valuable for steam producing plants and needs to be recycled. It must be ensured that the returned condensate is clean. Leakage in one of the devices used for heat transfer may cause the heated fluid to mix into the condensate water.

The condensate contamination control system monitors and displays the conductivity of the condensate. It automatically diverts the condensate to drain by a 3 way valve instead of back to the boiler system.

When the conductivity drops to the desired level, the condensate is allowed to return to the boiler system, thus minimizing heat and water wastage, as well as avoiding the possibility of contaminating the feedwater.

**Note:** BS3-T and D-BS3-T Vira Condensate Contamination Control system performs contamination control with electrical conductivity measurement.



## BS3-T Condensate Conductivity Control System



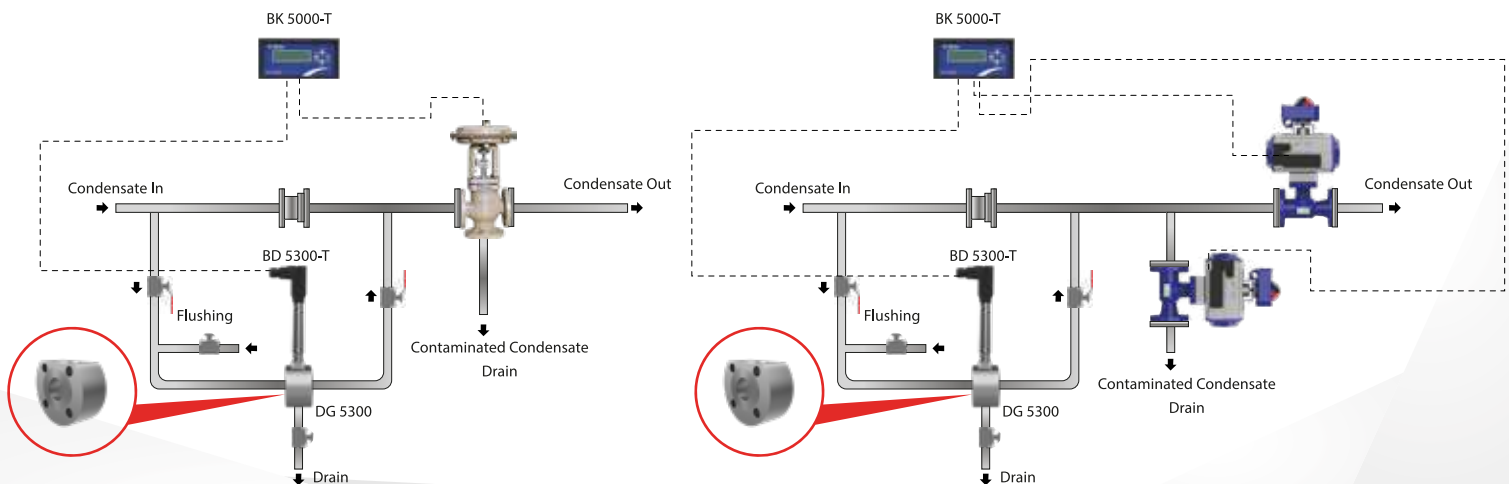
### Temp. Compensation Type Conductivity Controller

|                |                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| Type           | : BK 5000-T                                                                                                                      |
| Supply Voltage | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                   |
| Enclosure      | : Panel-mount Type                                                                                                               |
| Functions      | : Conductivity Measurement and Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                |
| Features       | : Conductivity Set Value, Alarm Set Value, Valve Relay Test, Alarm Relay Test, Temp. Compensation                                |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                         |

### Temp. Compensation Type Conductivity Probe

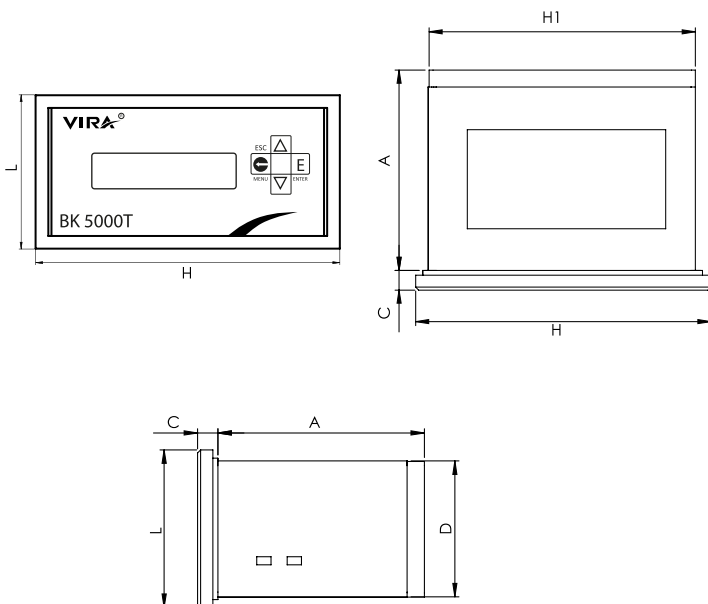
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                               |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## BS3-T Typical Installations



## TECHNICAL SPECIFICATION

### BK 5000-T Conductivity Controller



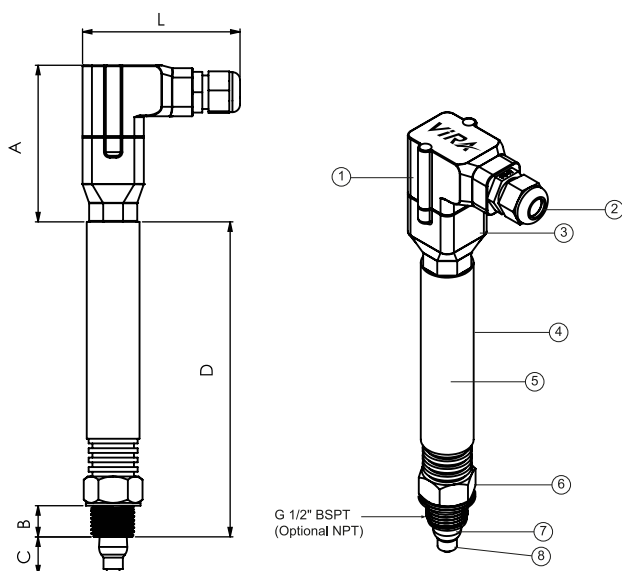
#### Technical Data

|                           |                                                                                                                                |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Controller</b>         | BK 5000-T                                                                                                                      |
| <b>Supply Voltage</b>     | 230VAC (+5%/-10%), 50/60Hz                                                                                                     |
| <b>Functions</b>          | Conductivity Measurement and Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis Points, LCD Display, 4 Buttons |
| <b>Inputs</b>             | Level Probe Input, Ground, 0-1k Ohm Potentiometer, Control Valve                                                               |
| <b>Outputs</b>            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus                                |
| <b>Range</b>              | 0-1.000 $\mu\text{S}/\text{cm}$ (default)                                                                                      |
| <b>Display</b>            | LCD                                                                                                                            |
| <b>Label</b>              | Lexan                                                                                                                          |
| <b>Max. Ambient Temp.</b> | 55°C                                                                                                                           |
| <b>Enclosure</b>          | PA (Polyamide)                                                                                                                 |
| <b>Type</b>               | Panel-mount                                                                                                                    |
| <b>Protection Class</b>   | IP40                                                                                                                           |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |

## D-BS3-T Condensate Conductivity Control System



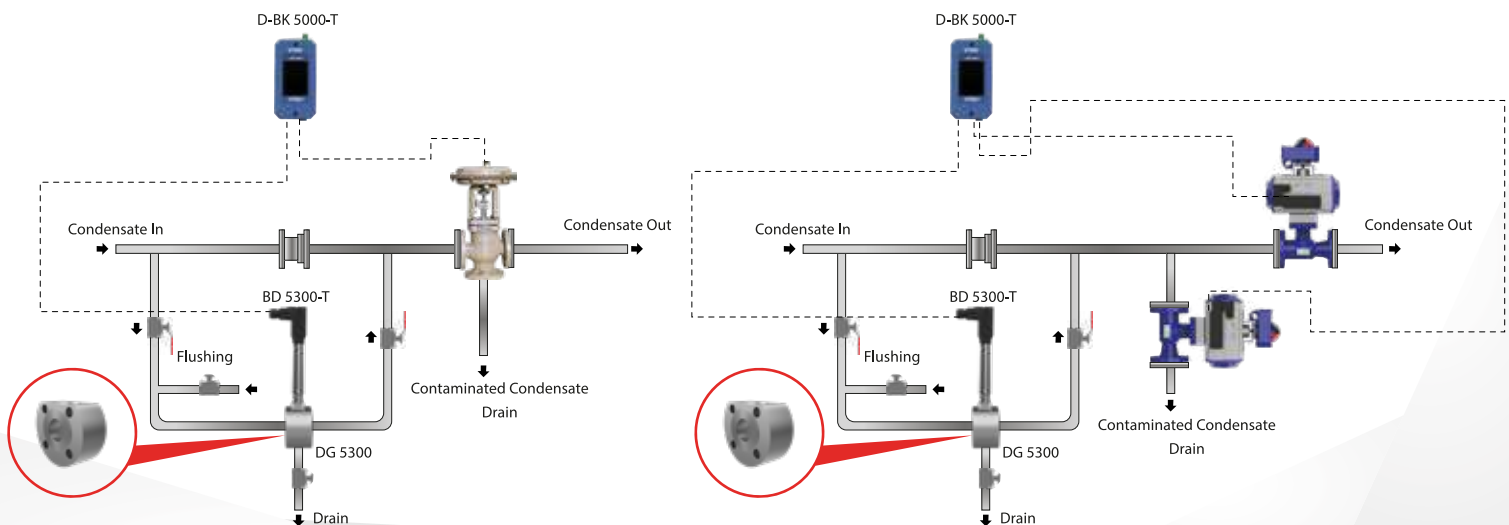
### Temp. Comp. Type Conductivity Controller

|                |                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : D-BK 5000-T                                                                                                                                                                                   |
| Supply Voltage | : 24VDC                                                                                                                                                                                         |
| Enclosure      | : Panel-mount and Din Rail Type                                                                                                                                                                 |
| Functions      | : Conductivity Measurement and Continuous Blowdown Control, Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Outputs        | : 1 Valve Control Relay, 1 High TDS Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                                 |
| Features       | : Conductivity and Alarm Set Values, Valve & Alarm Relay Test Functions, Touchscreen Display, User-Friendly Parameter Setting, Multi-Language Support                                           |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                        |

### Temp. Compensation Type Conductivity Probe

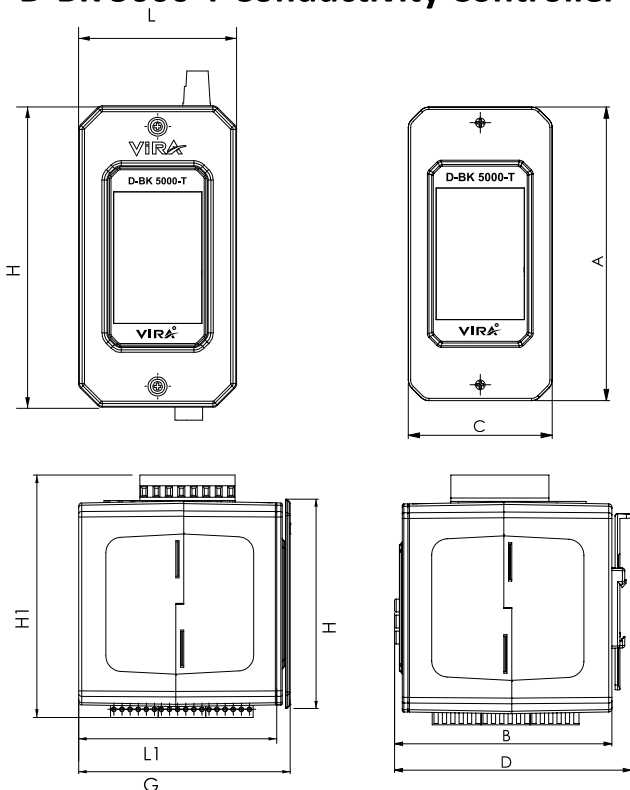
|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5300-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : 1/2" BSPT (Optional NPT)                                               |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

## D-BS3-T Typical Installations



## TECHNICAL SPECIFICATION

### D-BK 5000-T Conductivity Controller



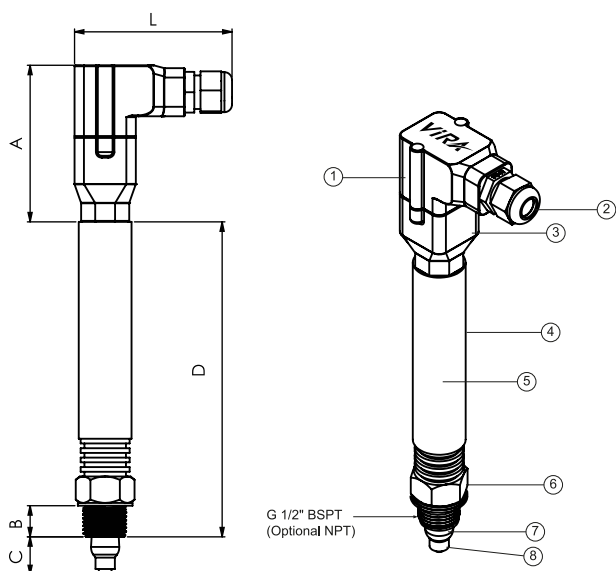
#### Technical Data

|                    |                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | D-BK 5000-T                                                                                                                                                                          |
| Supply Voltage     | 24VDC                                                                                                                                                                                |
| Functions          | Conductivity Measurement and Continuous Blowdown Valve Control, High TDS Alarm, Adjustable Setpoints and Hysteresis, Touchscreen Display, Multi-Language User Interface, Alarm Reset |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Sensor Input (Pt100 via Probe), Ground Connection                                                                                    |
| Outputs            | 1 Valve Control Relay, 1 High TDS Alarm Relay, 4-20 mA Analog Conductivity Output, RS485 Modbus Communication                                                                        |
| Range              | 0-1.000 $\mu\text{S}/\text{cm}$ (default)                                                                                                                                            |
| Display & Control  | Touch Screen                                                                                                                                                                         |
| Label              | Silicone Rubber                                                                                                                                                                      |
| Max. Ambient Temp. | 55°C                                                                                                                                                                                 |
| Enclosure          | PC (Polycarbonate)                                                                                                                                                                   |
| Type               | Panel-mount and Din Rail                                                                                                                                                             |
| Protection Class   | IP 40                                                                                                                                                                                |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

### BD 5300-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |

#### Dimensions

| L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|
| 83,5   | 83     | 16,5   | 20     | 167    |



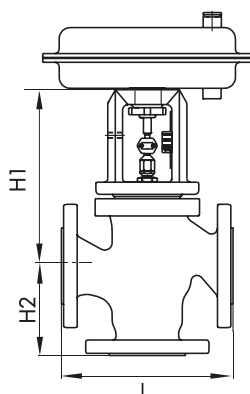


### Control Valve for Condensate Conductivity Control

|                     |                                                  |
|---------------------|--------------------------------------------------|
| Type                | : SKV 3300-3                                     |
| Body Material       | : ENJL 1040 PN 16, ENJS 1049 PN 25, 1.0619 PN 40 |
| Leakage Class       | : Class I                                        |
| Flow Characteristic | : Linear                                         |
| Operating Temp.     | : -10 - + 220°C (High Temp. on Request)          |
| Sealing             | : Metal to Metal                                 |
| Actuator            | : Pneumatic                                      |

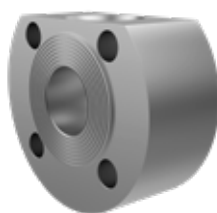
### Technical Data

|                |                                                       |
|----------------|-------------------------------------------------------|
| Model          | SKV 3300-3                                            |
| Type           | Diverting Valve                                       |
| Pressure Class | PN 16, PN 25, PN 40                                   |
| Body Material  | EN-JL1040 - PN16<br>EN-JS1049 - PN25<br>1.0619 - PN40 |
| Operat. Temp.  | -10 - +220 °C                                         |
| Sealing        | Metal to Metal                                        |
| Actuator       | Pneumatic                                             |



### Dimensions

| Valve | DN | 15  | 20  | 25  | 32  | 40  | 50  | 65  | 80  | 100 | 125 | 150 |
|-------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| L     | -  | 130 | 150 | 160 | 180 | 200 | 230 | 290 | 310 | 350 | 400 | 480 |
| H1    | -  | 235 | 235 | 235 | 235 | 235 | 235 | 270 | 270 | 360 | 375 | 375 |
| H2    | -  | 70  | 80  | 85  | 100 | 105 | 120 | 130 | 140 | 150 | 200 | 210 |



### Conductivity Probe Body

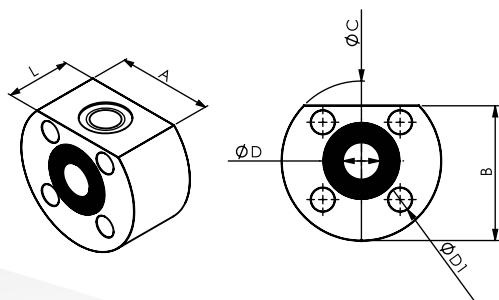
|                     |                                    |
|---------------------|------------------------------------|
| Type                | : DG 5300                          |
| Nominal Pressure    | : PN 40                            |
| Sizes               | : DN 20, DN 25, DN32, DN 40, DN 50 |
| Max. Operat. Temp.  | : 239 °C                           |
| Max. Operat. Press. | : 32 Bar g                         |
| Body                | : Stainless Steel                  |

### Technical Data

|                    |                               |
|--------------------|-------------------------------|
| Type               | DG 5300                       |
| Body               | Carbon Steel, Stainless Steel |
| Pressure Class     | PN 40                         |
| Process Connection | Threaded                      |
| Probe Connection   | Threaded                      |

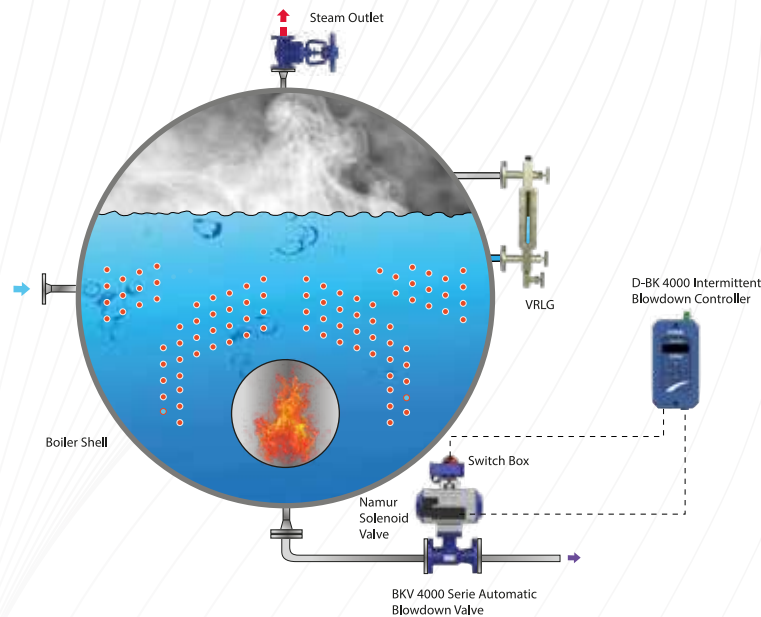
### Dimensions

| Type    | Size  | L (mm) | A (mm) | B (mm) | ø C (mm) | ø D (mm) | ø D1 (mm) |
|---------|-------|--------|--------|--------|----------|----------|-----------|
| DG 5320 | DN 20 | 47     | 68     | 92,5   | 105      | 27,6     | 14 x 4    |
| DG 5325 | DN 25 | 47     | 82,5   | 97,5   | 115      | 34,5     | 14 x 4    |
| DG 5332 | DN 32 | 47     | 104    | 117    | 140      | 43       | 18 x 4    |
| DG 5340 | DN 40 | 47     | 112    | 125    | 150      | 49       | 18 x 4    |



## Automatic Bottom Blowdown System

Some impurities, and salts (rust, oil and dirt that may come from the installation) precipitate to the bottom of the boiler to form a sludge layer. By an actuated valve, at least four-second blowdown is performed in every eight hours (once in a shift). As a result of this process, the sludge and sediment accumulated at the bottom of the boiler are moved out of the boiler. Thus blowdown is made on time and enough by an automatic blowdown valve. By this way, both over blowdown and forgetting of blowdown is avoided.



## Advantages

- Ensures timely and consistent blowdown, preventing excessive energy and water losses.
- Prevents sludge accumulation, improving boiler heat transfer and efficiency.
- Protects boiler tubes and shell from corrosion and scaling.
- Reduces operator dependency – fully automated periodic blowdown.
- Compatible with all boiler types, including shell and fire tube boilers.
- Can be integrated with the boiler's main control panel.

## Difference between Vira Bottom Blowdown Controller and Ordinary Timers

1. It controls the position of the valve. If the valve is in a different position than it should be, it gives an alarm.
  2. It prevents simultaneous blowdown in boilers operating side by side and connected to a single blowdown line.
  3. Before the blowdown process in a boiler is finished, other boilers are prevented from blowdown.
- Before the blowdown process in a boiler is finished, other boilers are prevented from blowdown.

## DB2 Automatic Bottom (Intermittent) Blowdown System

### Bottom Blowdown (Intermittent) Controller

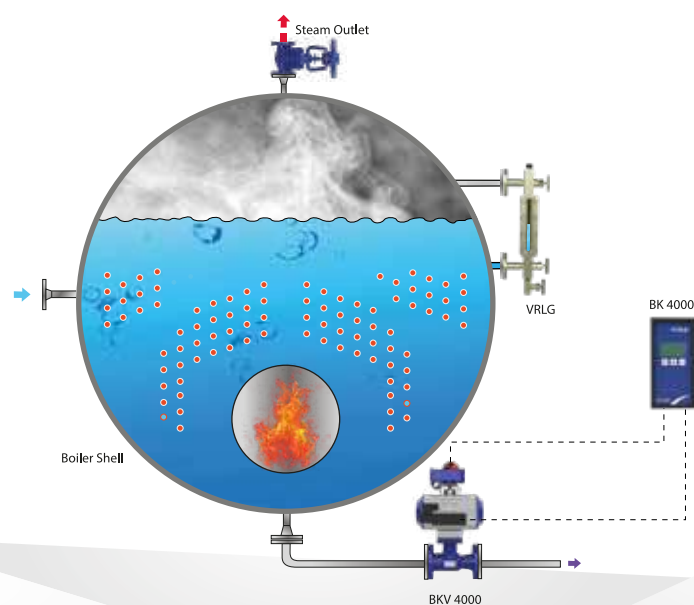
|                   |                                                                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type              | : BK 4000                                                                                                                                                                                                                 |
| Supply Voltage    | : 230 VAC (+5% / -10%) 50/60Hz                                                                                                                                                                                            |
| Enclosure         | : Panel-mount Type                                                                                                                                                                                                        |
| Functions         | : Bottom Blowdown Valve Control, Bottom Blowdown Valve Stuck-Open Alarm, Bottom Blowdown Valve Stuck-Closed Alarm, LCD Display, Alarm Reset, 3 Buttons, Blowdown Timer, Adjustable Bottom Blowdown Interval and Duration. |
| Outputs           | : 1 Bottom Blowdown Valve Control Relay, 1 Alarm Relay.                                                                                                                                                                   |
| Max. Ambient Temp | : 55 °C                                                                                                                                                                                                                   |
| Compliance        | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                                                  |

### Bottom (Intermittent) Blowdown Valve

|                     |                                    |
|---------------------|------------------------------------|
| Type                | : BKV 4000                         |
| Nominal Pressure    | : PN 40                            |
| Max. Operat. Temp.  | : 220 °C                           |
| Max. Operat. Press. | : 27 Bar g                         |
| Size                | : DN 25 - DN 50                    |
| Body                | : WCB, Monoblock                   |
| Accessories         | : Namur Solenoid Valve, Switch Box |
| Compliance          | : CE (PED 2014/68/EU)              |

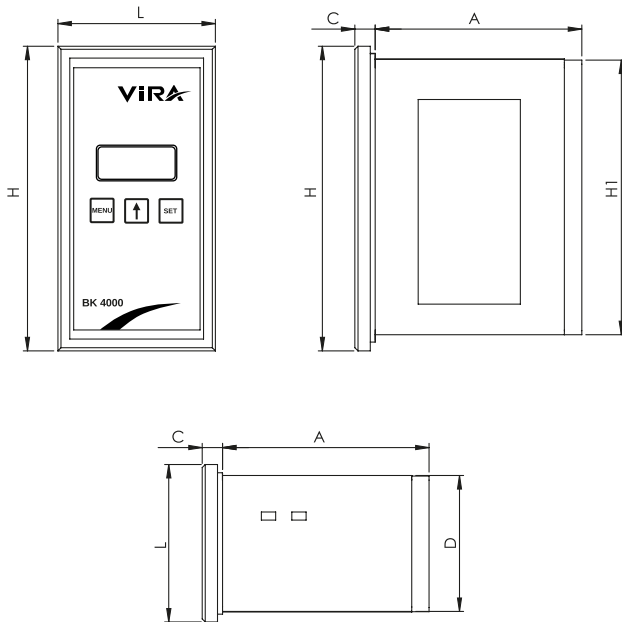


## DB2 Typical Installation



## TECHNICAL SPECIFICATION

### BK 4000 Blowdown Timer Controller



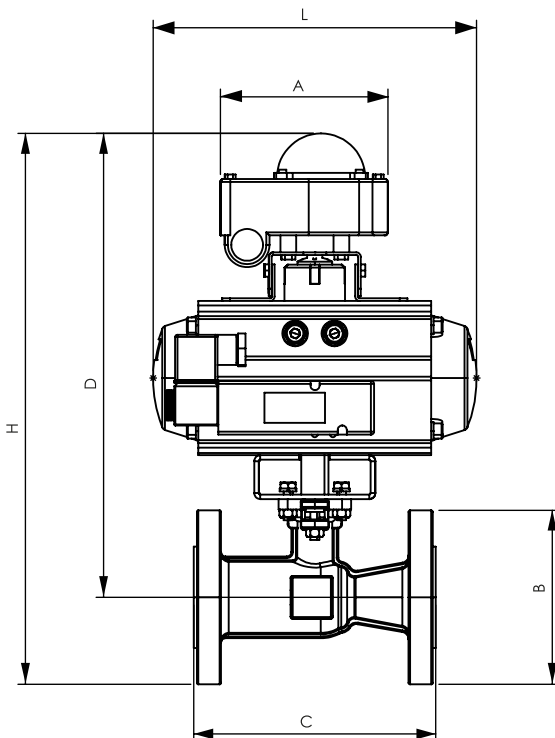
#### Technical Data

|                    |                                                                                                                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | BK 4000                                                                                                                                                                                                                 |
| Supply Voltage     | 230 VAC (+5% / -10%) 50/60Hz                                                                                                                                                                                            |
| Functions          | Bottom Blowdown Valve Control, Bottom Blowdown Valve Stuck-Open Alarm, Bottom Blowdown Valve Stuck-Closed Alarm, LCD Display, Alarm Reset, 3 Buttons, Blowdown Timer, Adjustable Bottom Blowdown Interval and Duration. |
| Inputs             | Limit Switch, Namur Solenoid Valve                                                                                                                                                                                      |
| Outputs            | 1 Bottom Blowdown Valve Control Relay, 1 Alarm Relay                                                                                                                                                                    |
| Display            | LCD                                                                                                                                                                                                                     |
| Max. Ambient Temp. | 55°C                                                                                                                                                                                                                    |
| Enclosure          | PA (Polyamide)                                                                                                                                                                                                          |
| Type               | Panel-mount                                                                                                                                                                                                             |
| Protection Class   | IP 40                                                                                                                                                                                                                   |

#### Dimensions

| H (mm) | H1 (mm) | L (mm) | A (mm) | C (mm) | D (mm) |
|--------|---------|--------|--------|--------|--------|
| 144    | 135     | 72     | 101    | 9      | 67     |

### BKV 4000 Intermittent Blowdown Valve



#### Technical Data

|                |                                   |
|----------------|-----------------------------------|
| Valve          | BKV 4000                          |
| Size           | DN 25, 32, 40, 50                 |
| Actuator       | Pneumatic                         |
| Motor Type     | On-Off, Spring Return (Fail-Safe) |
| Pressure Class | PN 40                             |
| Body           | WCB                               |
| Supply         | 220VAC, 24VDC (please ask)        |
| Operat. Temp.  | -10 - +220 °C                     |
| Structure      | Reduced Bore                      |

#### Dimensions

| Type     | Size  | H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|----------|-------|--------|--------|--------|--------|--------|--------|
| BKV 4025 | DN 25 | 364    | 214    | 111    | 115    | 160    | 307    |
| BKV 4032 | DN 32 | 390    | 251,5  | 111    | 140    | 180    | 320    |
| BKV 4040 | DN 40 | 395    | 251,5  | 111    | 150    | 200    | 320    |
| BKV 4050 | DN 50 | 431,3  | 270    | 111    | 165    | 230    | 349    |

## D-DB2 Automatic Bottom (Intermittent) Blowdown System



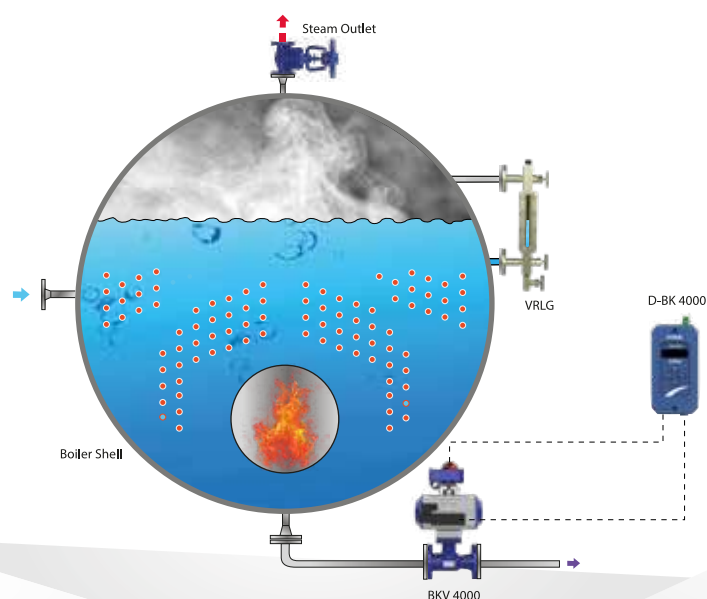
### Bottom Blowdown Controller

|                    |                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | : D-BK 4000                                                                                                                                                                                                                    |
| Supply Voltage     | : 24VDC                                                                                                                                                                                                                        |
| Enclosure          | : Panel-mount and Din Rail Type                                                                                                                                                                                                |
| Functions          | : Bottom Blowdown Valve Control, Bottom Blowdown Valve Stuck-Open Alarm, Bottom Blowdown Valve Stuck-Closed Alarm, 7 Segment Display, Alarm Reset, 4 Buttons, Blowdown Timer, Adjustable Bottom Blowdown Interval and Duration |
| Outputs            | : 1 Bottom Blowdown Valve Control Relay, 1 Alarm Relay, RS485 Modbus                                                                                                                                                           |
| Max. Ambient Temp. | : 55 °C                                                                                                                                                                                                                        |
| Compliance         | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval (Module B + D), EN 12952 & EN 12953                                                                                                                                       |

### Bottom Blowdown Valve

|                     |                                    |
|---------------------|------------------------------------|
| Type                | : BKV 4000                         |
| Nominal Pressure    | : PN 40                            |
| Max. Operat. Temp.  | : 220 °C                           |
| Max. Operat. Press. | : 27 Bar g                         |
| Size                | : DN 25 - DN 50                    |
| Body                | : WCB, Monoblock                   |
| Accessories         | : Namur Solenoid Valve, Switch Box |
| Compliance          | : CE (PED 2014/68/EU)              |

## D-DB2 Typical Installation

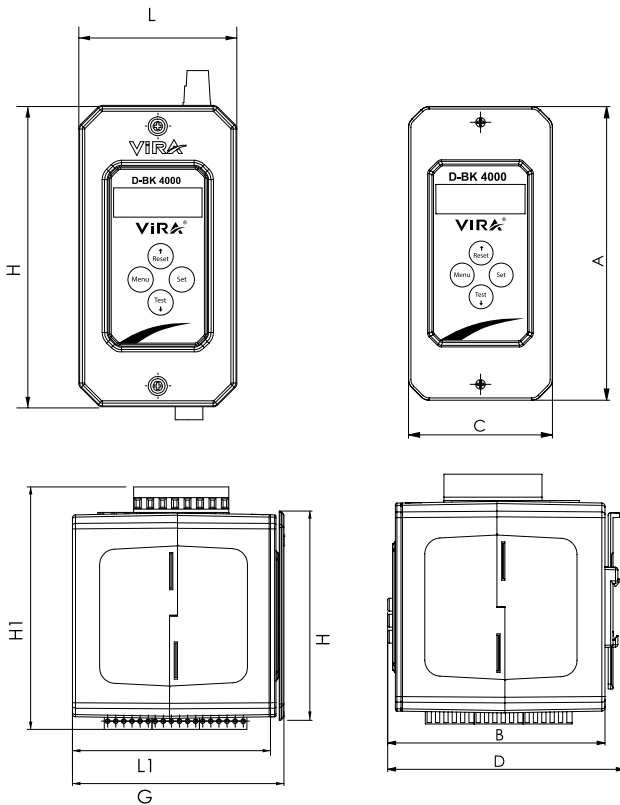


## TECHNICAL SPECIFICATION

### D-BK 4000 Blowdown Timer Controller

#### Technical Data

|                    |                                                                                                                                                                                                                              |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | D-BK 4000                                                                                                                                                                                                                    |
| Supply Voltage     | 24VDC                                                                                                                                                                                                                        |
| Functions          | Bottom Blowdown Valve Control, Bottom Blowdown Valve Stuck-Open Alarm, Bottom Blowdown Valve Stuck-Closed Alarm, 7 Segment Display, Alarm Reset, 4 Buttons, Blowdown Timer, Adjustable Bottom Blowdown Interval and Duration |
| Inputs             | Limit Switch, Namur Solenoid Valve                                                                                                                                                                                           |
| Outputs            | 1 Bottom Blowdown Valve Control Relay, 1 Alarm Relay, RS485 Modbus                                                                                                                                                           |
| Display            | 7 Segment                                                                                                                                                                                                                    |
| Max. Ambient Temp. | 55 °C                                                                                                                                                                                                                        |
| Enclosure          | PC (Polycarbonate)                                                                                                                                                                                                           |
| Type               | Panel-mount and Din Rail                                                                                                                                                                                                     |
| Protection Class   | IP 40                                                                                                                                                                                                                        |



#### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

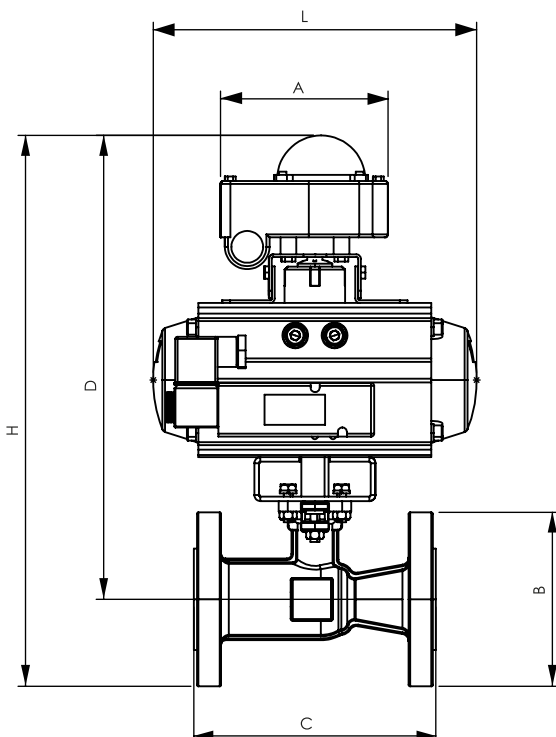
### BKV 4000 Intermittent Blowdown Valve

#### Technical Data

|                |                                   |
|----------------|-----------------------------------|
| Valve          | BKV 4000                          |
| Size           | DN 25, 32, 40, 50                 |
| Actuator       | Pneumatic                         |
| Motor Type     | On-Off, Spring Return (Fail-Safe) |
| Pressure Class | PN 40                             |
| Body           | WCB                               |
| Supply         | 220VAC, 24VDC (please ask)        |
| Operat. Temp.  | -10 - +220 °C                     |
| Structure      | Reduced Bore                      |

#### Dimensions

| Type     | Size  | H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|----------|-------|--------|--------|--------|--------|--------|--------|
| BKV 4025 | DN 25 | 364    | 214    | 111    | 115    | 160    | 307    |
| BKV 4032 | DN 32 | 390    | 251,5  | 111    | 140    | 180    | 320    |
| BKV 4040 | DN 40 | 395    | 251,5  | 111    | 150    | 200    | 320    |
| BKV 4050 | DN 50 | 431,3  | 270    | 111    | 165    | 230    | 349    |



## D-BS6-T Automatic Combined Blowdown System



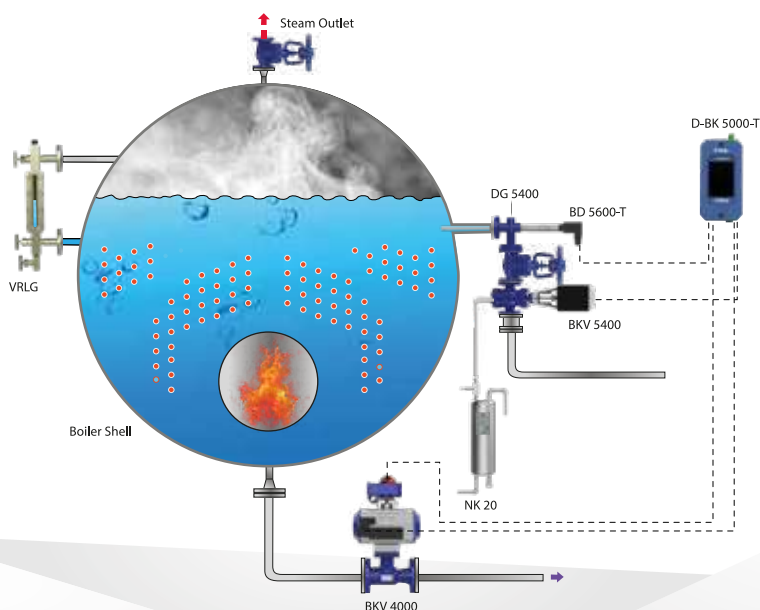
### Combined Blowdown Controller

|                |                                                                                                                                                                                                                                                                                                                                         |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type           | : D-BK 5000-T                                                                                                                                                                                                                                                                                                                           |
| Supply Voltage | : 24VDC                                                                                                                                                                                                                                                                                                                                 |
| Enclosure      | : Panel-mount and Din Rail Type                                                                                                                                                                                                                                                                                                         |
| Functions      | : Cond. Measurement & Cont. Blowdown Valve Control, Bottom Blowd. Valve Control, High TDS Alarm, Bottom Blowd. Valve Stuck Open Alarm, Bottom Blowd. Valve Stuck Closed, Adjustable Setpoints & Hysteresis, Touchscreen Display, Multi-Language Interface, Alarm Reset, Blowdown Timer, Adjustable Bottom Blowd. Interval and Duration. |
| Outputs        | : 1 TDS Blowdown Valve Control Relay, 1 Bottom Blowdown Valve Control Relay, 1 Common Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                                                                                                                                                     |
| Features       | : Conductivity Set Value, Alarm Set Value, Valve Relay Test, Alarm Relay Test, Temperature Compensation                                                                                                                                                                                                                                 |
| Compliance     | : CE (EMC 2014/30/EU, LVD 2014/35/EU), Type Approval, (Module B + D), EN 12952 & EN 12953                                                                                                                                                                                                                                               |

### Temperature Compensation Type Conductivity Probe

|                     |                                                                          |
|---------------------|--------------------------------------------------------------------------|
| Type                | : BD 5600-T                                                              |
| Nominal Pressure    | : PN 40                                                                  |
| Max. Operat. Temp.  | : 239 °C                                                                 |
| Max. Operat. Press. | : 32 Bar g                                                               |
| Connection          | : G 1/2" BSPT (Optional NPT)                                             |
| Max. Ambient Temp.  | : 75 °C                                                                  |
| Compliance          | : CE (PED 2014/68/EU), Type Approval (Module B + D), EN 12952 & EN 12953 |

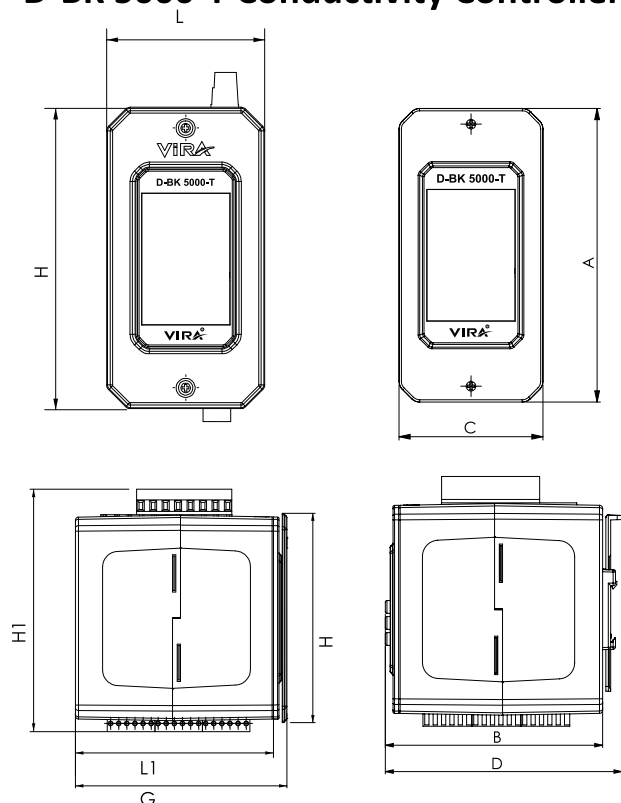
## D-BS6-T Typical Installation





# TECHNICAL SPECIFICATION

## D-BK 5000-T Conductivity Controller



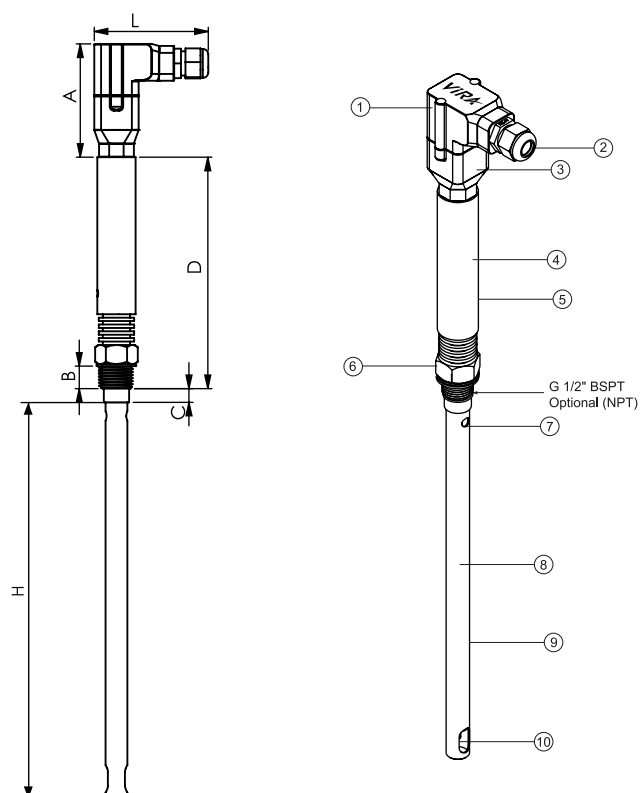
### Technical Data

|                    |                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller         | D-BK 5000-T                                                                                                                                                                                                                                                                                                                          |
| Supply Voltage     | 24VDC                                                                                                                                                                                                                                                                                                                                |
| Functions          | Cond. Measurement & Cont. Blowdown Valve Control, Bottom Blowd. Valve Control, High TDS Alarm, Bottom Blowd. Valve Stuck Open Alarm, Bottom Blowd. Valve Stuck Closed, Adjustable Setpoints & Hysteresis, Touchscreen Display, Multi-Language Interface, Alarm Reset, Blowdown Timer, Adjustable Bottom Blowd. Interval and Duration |
| Inputs             | 1 Conductivity Input (via Probe), 1 Temperature Sensor Input (Pt100, via Probe), Limit Switch, Namur Solenoid Valve, Ground                                                                                                                                                                                                          |
| Outputs            | 1 TDS Blowdown Valve Control Relay, 1 Bottom Blowdown Valve Control Relay, 1 Common Alarm Relay, 4–20 mA Analog Conductivity Output, RS485 Modbus                                                                                                                                                                                    |
| Range              | 0-10.000 $\mu\text{S}/\text{cm}$ (default)                                                                                                                                                                                                                                                                                           |
| Display & Control  | Touch Screen                                                                                                                                                                                                                                                                                                                         |
| Label              | Silicone Rubber                                                                                                                                                                                                                                                                                                                      |
| Max. Ambient Temp. | 55°C                                                                                                                                                                                                                                                                                                                                 |
| Enclosure          | PC (Polycarbonate)                                                                                                                                                                                                                                                                                                                   |
| Type               | Panel-mount and Din Rail                                                                                                                                                                                                                                                                                                             |
| Protection Class   | IP 40                                                                                                                                                                                                                                                                                                                                |

### Dimensions

| H (mm) | H1 (mm) | L (mm) | L1 (mm) | C (mm) | D (mm) | B (mm) | G (mm) | A (mm) |
|--------|---------|--------|---------|--------|--------|--------|--------|--------|
| 134,6  | 156     | 72     | 130     | 64     | 148    | 136    | 136    | 130    |

## BD 5600-T Conductivity Probe



| No | Part                    | Material                                     |
|----|-------------------------|----------------------------------------------|
| 1  | Upper Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 2  | Cable Gland             | PA6 (Polyamide)                              |
| 3  | Lower Connector Housing | GF-PP (Glass Fiber Reinforced Polypropylene) |
| 4  | Label                   | Laser Marking                                |
| 5  | Cover Tube              | Austenitic Stainless Steel 304               |
| 6  | Probe Body              | Austenitic Stainless Steel 316L              |
| 7  | Probe Tip Sleeve        | Politetrafluoroetilen (PTFE)                 |
| 8  | Probe Tip               | Austenitic Stainless Steel 316L              |
| 9  | Rod                     | Austenitic Stainless Steel 316L              |
| 10 | Sensor Tip              | Austenitic Stainless Steel 316Ti             |

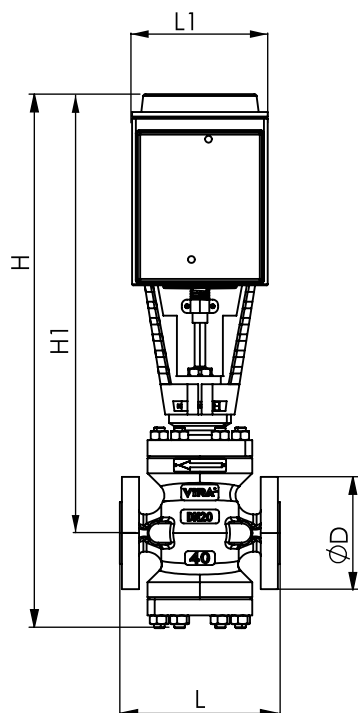
### Dimensions

| H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|--------|--------|--------|--------|--------|--------|
| 500    | 83,5   | 83     | 16,5   | 10     | 169,5  |

**Note:** Standard probe length is 500 mm. Alternative lengths are available upon request.

## TECHNICAL SPECIFICATION

### BKV 5400 Blowdown Valves



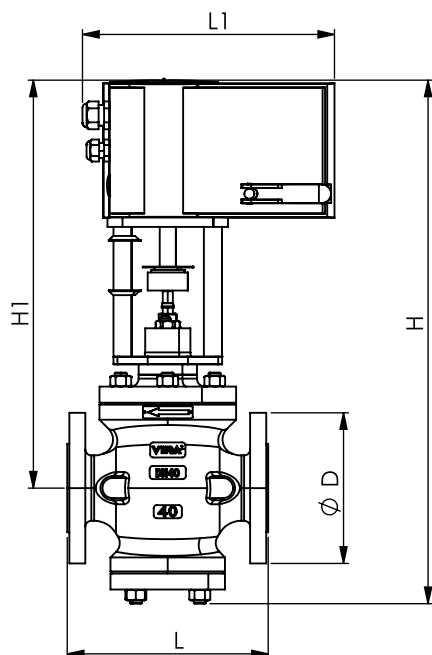
#### Technical Data

|                |                                   |
|----------------|-----------------------------------|
| Type           | BKV 5400-E                        |
| Body           | WCB                               |
| Pressure Class | PN 40                             |
| Operat. Temp.  | -10 - +230 °C                     |
| Sealing        | Metal to Metal                    |
| Actuator       | Electric                          |
| Control        | On-Off, Spring Return (Fail-Safe) |
| Connection     | Flanged                           |

#### Dimensions

| Type       | DN | D (mm) | H (mm) | H1 (mm) | L1 (mm) | L (mm) |
|------------|----|--------|--------|---------|---------|--------|
| BKV 5420-E | 20 | 105    | 483    | 394     | 127     | 150    |
| BKV 5425-E | 25 | 115    | 483    | 394     | 127     | 160    |

### BKV 5400 Blowdown Valves



#### Technical Data

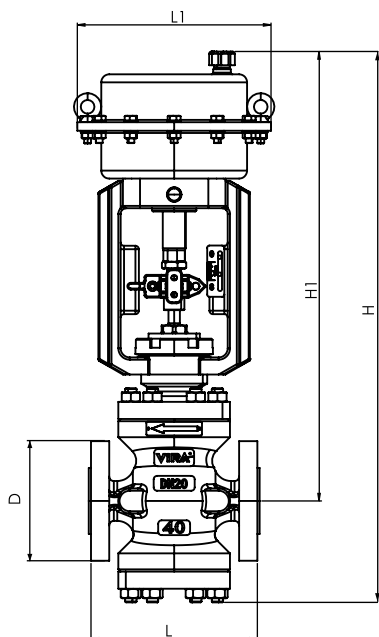
|                |                                   |
|----------------|-----------------------------------|
| Type           | BKV 5400-E                        |
| Body           | WCB                               |
| Pressure Class | PN 40                             |
| Operat. Temp.  | -10 - +230 °C                     |
| Sealing        | Metal to Metal                    |
| Actuator       | Electric                          |
| Control        | On-Off, Spring Return (Fail-Safe) |
| Connection     | Flanged                           |

#### Dimensions

| Type       | DN | D (mm) | H (mm) | H1 (mm) | L1 (mm) | L (mm) |
|------------|----|--------|--------|---------|---------|--------|
| BKV 5440-E | 40 | 150    | 521    | 406     | 223     | 196    |

## TECHNICAL SPECIFICATION

### BKV 5400 Blowdown Valves



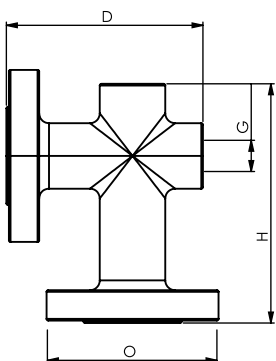
#### Technical Data

|                |                                              |
|----------------|----------------------------------------------|
| Type           | BKV 5400-P                                   |
| Body           | WCB                                          |
| Pressure Class | PN 40                                        |
| Operat. Temp.  | -10 - +230 °C                                |
| Sealing        | Metal to Metal                               |
| Actuator       | Pneumatic (Diaphragm)                        |
| Control        | On-Off, Spring Return (Fail-Safe)            |
| Accessories    | Switch Box, Namur Solenoid Valve, Air Filter |
| Connection     | Flanged                                      |

#### Dimensions

| Type       | DN | D (mm) | H (mm) | H1 (mm) | L1 (mm) | L (mm) |
|------------|----|--------|--------|---------|---------|--------|
| BKV 5420-P | 20 | 105    | 483,5  | 394,5   | 170     | 146    |
| BKV 5425-P | 25 | 115    | 483,5  | 394,5   | 170     | 156    |
| BKV 5440-P | 40 | 150    | 522    | 407     | 170     | 200    |

### DG 5400 Probe Housing



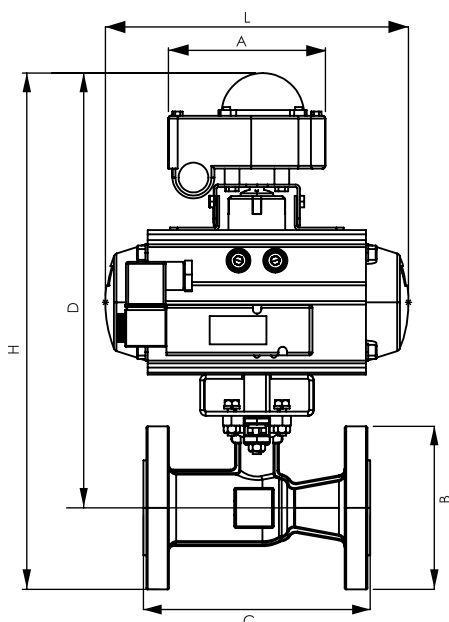
#### Technical Data

|                    |                                 |
|--------------------|---------------------------------|
| Type               | DG 5400                         |
| Body               | Nodular Cast Iron, Carbon Steel |
| Pressure Class     | PN 40                           |
| Process Connection | Flanged                         |
| Probe Connection   | Threaded                        |

#### Dimensions

| Type    | Size  | D (mm) | G (inch) | H (mm) | O (DN) |
|---------|-------|--------|----------|--------|--------|
| DG 5420 | DN 20 | 120    | 1/2"     | 146    | 105    |
| DG 5425 | DN 25 | 150    | 1/2"     | 150    | 115    |
| DG 5440 | DN 40 | 188    | 1/2"     | 188    | 150    |

### BKV 4000 Intermittent Blowdown Valve



#### Technical Data

|                |                                   |
|----------------|-----------------------------------|
| Valve          | BKV 4000                          |
| Size           | DN 25, 32, 40, 50                 |
| Actuator       | Pneumatic                         |
| Motor Type     | On-Off, Spring Return (Fail-Safe) |
| Pressure Class | PN 40                             |
| Body           | WCB                               |
| Supply         | 220VAC, 24VDC (please ask)        |
| Operat. Temp.  | -10 - +220 °C                     |
| Structure      | Reduced Bore                      |

#### Dimensions

| Type     | Size  | H (mm) | L (mm) | A (mm) | B (mm) | C (mm) | D (mm) |
|----------|-------|--------|--------|--------|--------|--------|--------|
| BKV 4025 | DN 25 | 364    | 214    | 111    | 115    | 160    | 307    |
| BKV 4032 | DN 32 | 390    | 251,5  | 111    | 140    | 180    | 320    |
| BKV 4040 | DN 40 | 395    | 251,5  | 111    | 150    | 200    | 320    |
| BKV 4050 | DN 50 | 431,3  | 270    | 111    | 165    | 230    | 349    |



“Boiler Control Engineered for Steam Excellence”

## NK 20

### Sample Cooler

The Vira NK 20 Sample Cooler is designed to provide safe, efficient, and reliable cooling of boiler water and steam samples for chemical analysis. It ensures that high-temperature, high-pressure samples are cooled to safe handling levels without altering their chemical properties, allowing for precise and accurate water quality monitoring.

The NK 20 operates using a stainless steel coil heat exchanger, where the hot sample passes through the coil and is cooled by counter-flowing cooling water. This indirect cooling method protects both personnel and measuring instruments, ensuring compliance with industrial and environmental standards.

#### Key Features:

Designed for continuous or manual sampling from steam boilers and pressurized vessels

Built with high-quality stainless steel for long-term corrosion resistance and durability

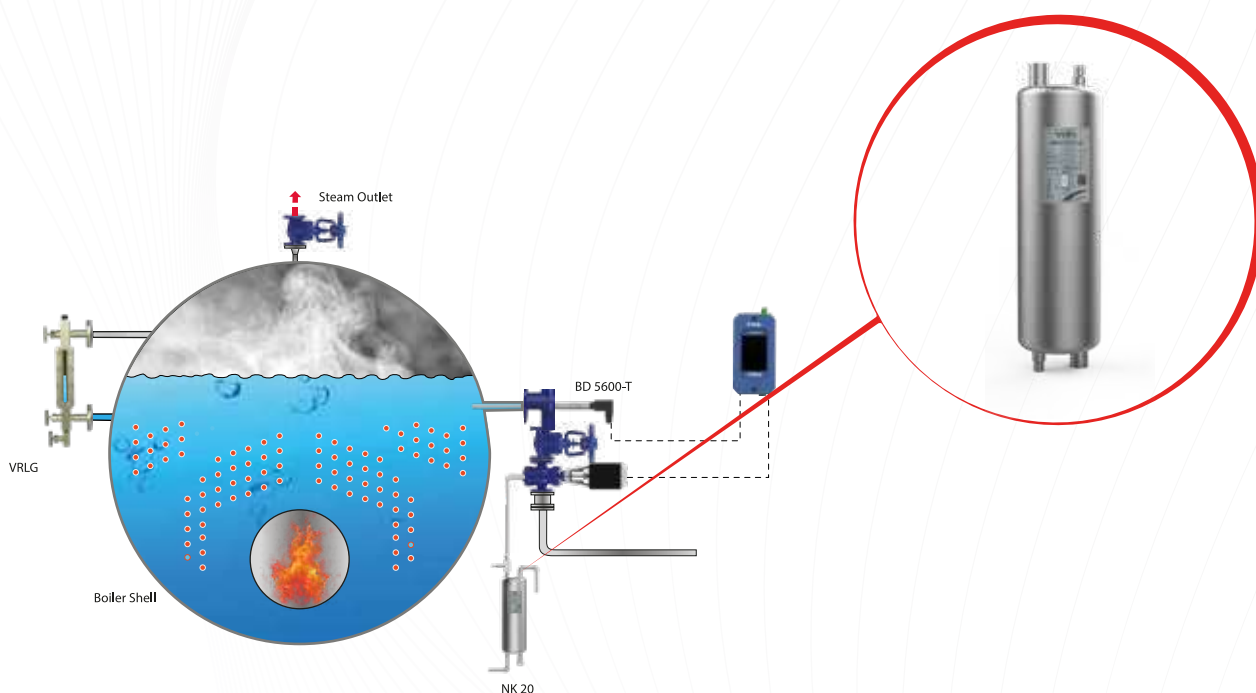
Compact, wall- or panel-mounted design for easy installation and maintenance

Reduces sample temperature to below 50°C, suitable for safe and accurate analysis

Ideal for monitoring conductivity, pH, silica, and other critical water quality parameters

Fully compatible with Vira's boiler control and blowdown systems

The NK 20 Sample Cooler is an essential accessory for maintaining boiler efficiency, extending equipment life, and meeting the strict requirements of EN 12952 and EN 12953 standards.

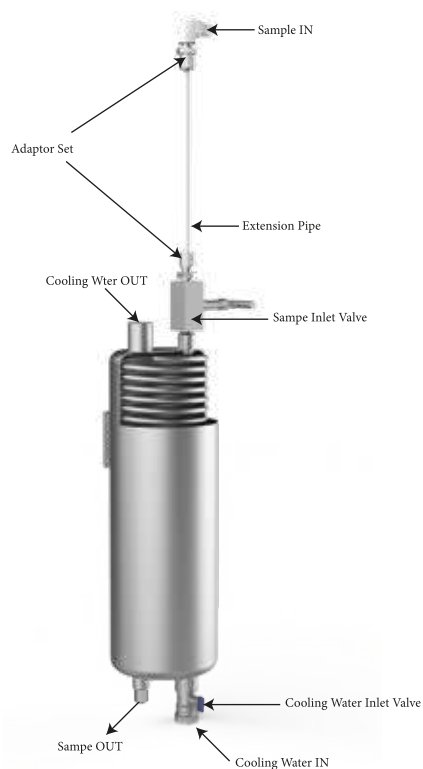


## NK 20 Sample Cooler



### Sample Cooler

|                            |                             |
|----------------------------|-----------------------------|
| Type                       | : NK 20                     |
| Body                       | : AISI 304L Stainless Steel |
| Pipe Coil                  | : AISI 304L Stainless Steel |
| Pipe Coil Nominal Pressure | : PN 40                     |
| Max. Operat. Press.        | : 32 Bar g                  |
| Max. Operat. Temp.         | : 239 °C                    |
| Cooling Water Connection   | : 1/2" BSP Threaded         |
| Sample Connection          | : 1/4" BSP Threaded         |



### Montage Set

|              |                      |
|--------------|----------------------|
| Type         | : NK 20 - MS         |
| Needle Valve | : 1/4"               |
| Street Elbow | : 1/4"               |
| Pipe         | : 1/4", 50 cm, Ø6mm  |
| Reduction    | : 1/2" - 1/4"        |
| Connector    | : 1/4", Ø6mm         |
| Valve        | : 1/2" Male - Female |

# TECHNICAL SPECIFICATION

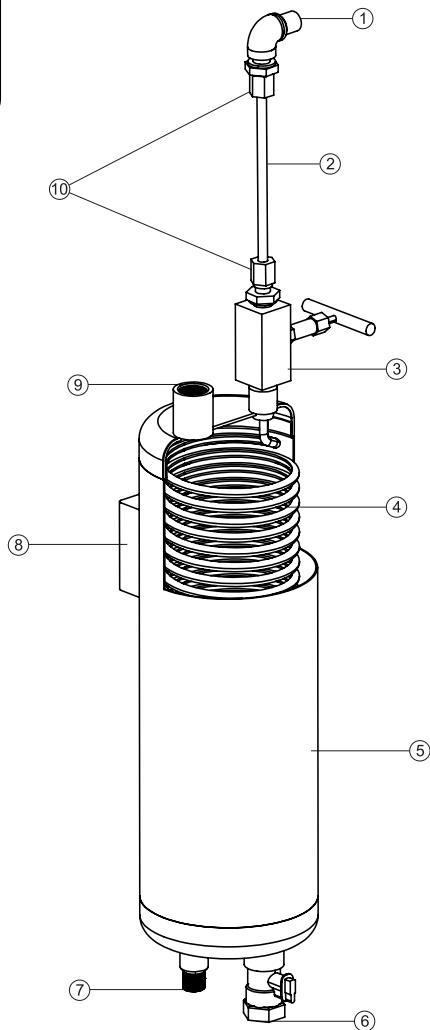
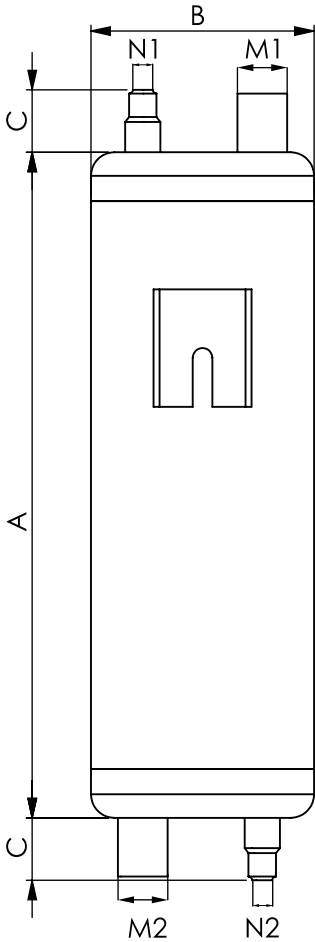
## NK 20 Sample Cooler

### Technical Data

|                         |                                 |
|-------------------------|---------------------------------|
| Type                    | NK20                            |
| Body Material           | Austenitic Stainless Steel 304L |
| Coil Material           | Austenitic Stainless Steel 304L |
| Coil Nominal Pressure   | PN 40                           |
| Coil Max. Operat. Pres. | 32 Bar g                        |
| Coil Max. Operat. Temp. | 239 C                           |
| Body Nominal Pres.      | PN 16                           |
| Body Max. Operat. Pres. | 10 Bar g                        |
| Body Max. Operat. Temp. | 120 C                           |

### Dimensions

| SIZE | A (mm) | B (mm) | C (mm) | M (inch) | N (mm) |
|------|--------|--------|--------|----------|--------|
| NK20 | 340    | 114    | 30     | 1/2      | 1/4    |

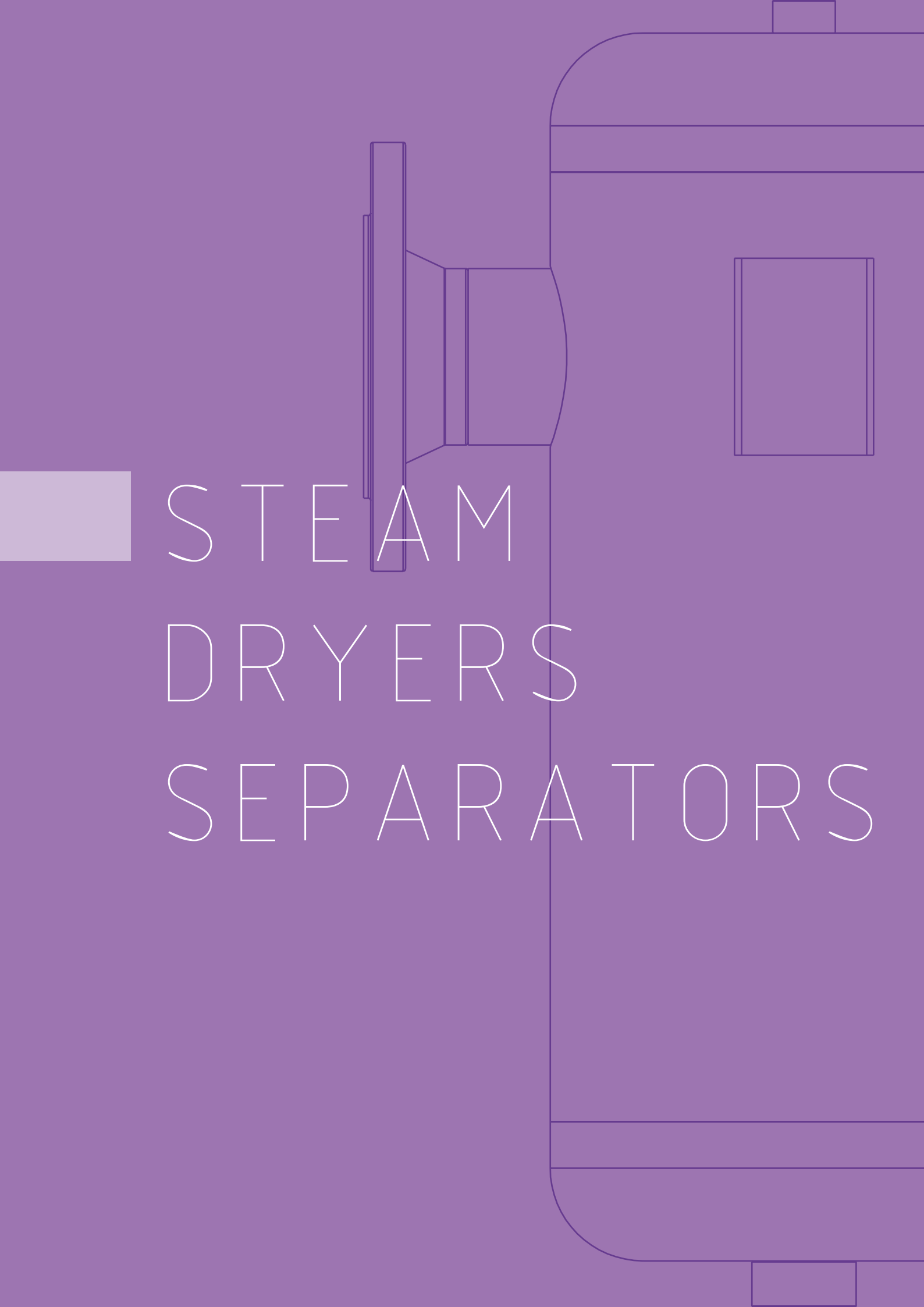


| No | Part                        | Material                        |
|----|-----------------------------|---------------------------------|
| 1  | Street Elbow (Sample Inlet) | Austenitic Stainless Steel 304  |
| 2  | Extension Pipe              | Austenitic Stainless Steel 304  |
| 3  | Needle Valve                | Austenitic Stainless Steel 304  |
| 4  | Coil                        | Austenitic Stainless Steel 304L |
| 5  | Shell                       | Austenitic Stainless Steel 304L |
| 6  | Cooling Water Inlet Valve   | Brass                           |
| 7  | Sample Out                  | Austenitic Stainless Steel 304  |
| 8  | Mounting Bracket            | Austenitic Stainless Steel 304  |
| 9  | Cooling Water Outlet        | Austenitic Stainless Steel 304  |
| 10 | Adaptor Set                 | Austenitic Stainless Steel 316L |





“Boiler Control Engineered for Steam Excellence”

The background is a solid purple color. Overlaid on this are white line-art drawings of industrial machinery. On the right side, there is a large vertical cylindrical tank with a rounded top and bottom, featuring horizontal bands and a rectangular access panel. To its left is a smaller, more complex piece of equipment with a vertical pipe and a horizontal section. On the far left, there is a solid light purple rectangle.

STEAM

DRYERS

SEPARATORS

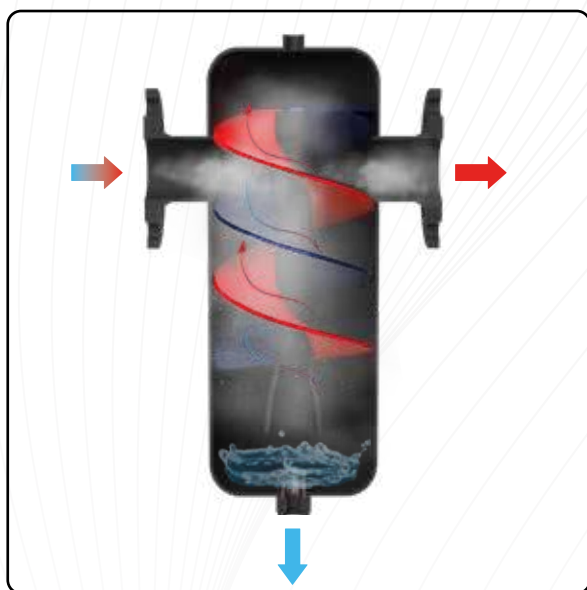
## SEPARATORS

### Why Use a Steam Separator?

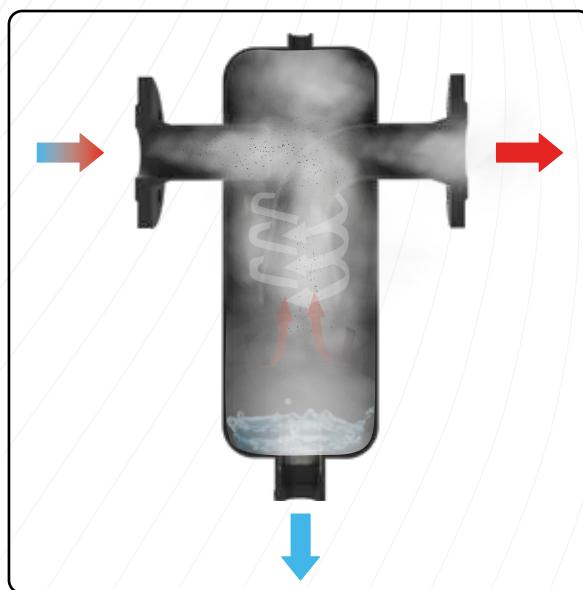
Steam leaving the boiler often carries water droplets and impurities, creating wet steam. Wet steam reduces energy efficiency and may lead to erosion, corrosion, water hammer, and increased maintenance costs. By ensuring dry steam, separators protect downstream equipment and improve overall system performance.

### Vira Separator Technology

Vira steam separators are available in Vortex and Cyclone types. They operate on the principle of centrifugal force, using the difference in specific gravity between gas and liquid to efficiently separate steam, air, and water particles. The steam (or compressed air) is directed into a spiral flow inside the separator, forcing heavier water droplets and impurities to the wall. These are collected at the bottom of the separator, where a steam trap station discharges the condensate safely by gravity.



Vortex Type



Cyclone Type

### Product Range and Options

- **Connection types:** Threaded or flanged
- **Pressure ratings:** Available in multiple pressure classes
- **Material options:** Manufactured from high-quality steels according to application needs
- **Performance:** Up to 98% steam dryness when properly sized and installed

### Key Benefits

- High separation efficiency with vortex and cyclone technology
- Increased system efficiency and equipment lifetime
- Reduced risk of water hammer, erosion, and corrosion
- Flexible design with multiple connection and material options
- Manufactured with advanced production techniques and strict quality standards

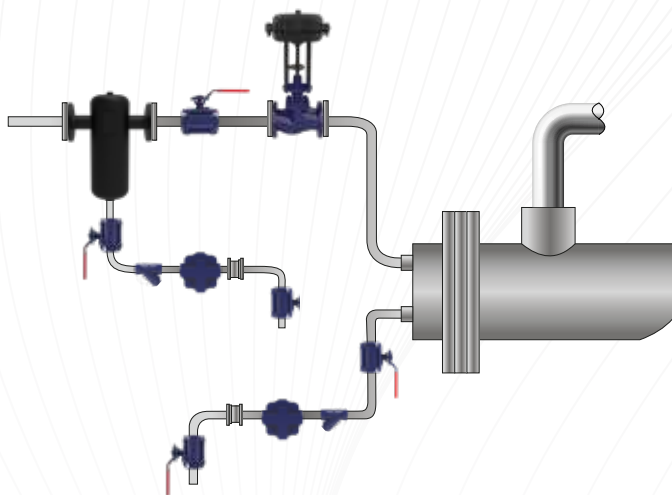
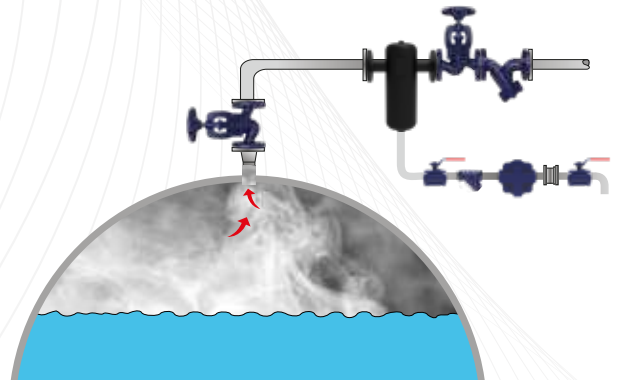
**Note:** For correct sizing and optimum performance, separator selection should consider line diameter, steam velocity, and allowable pressure drop.

## TYPICAL SEPARATOR APPLICATIONS

### Steam Distribution

In steam systems, maintaining the correct steam quality is critical for both efficiency and equipment longevity. When steam leaves the boiler, excessive velocity or insufficient separation can allow moisture to be carried into the distribution network. This moisture is not just water – it often contains dissolved salts, treatment chemicals, and other impurities that can accelerate wear, cause scaling inside valves, and reduce heat transfer performance.

ViRA's advanced separation technologies are engineered to deliver consistently dry, clean steam. Our carbon steel separators remove entrained moisture before it reaches the process, ensuring reliable operation, reduced maintenance, and optimal energy efficiency across the plant.

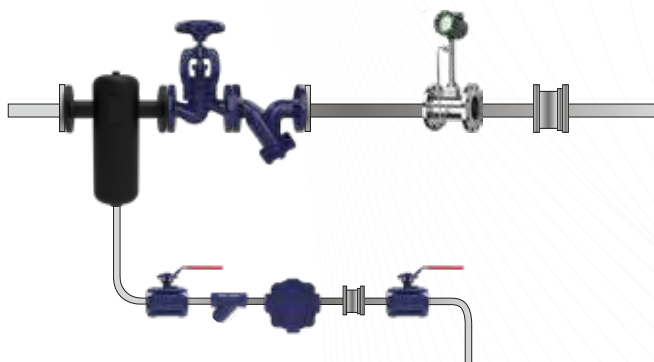
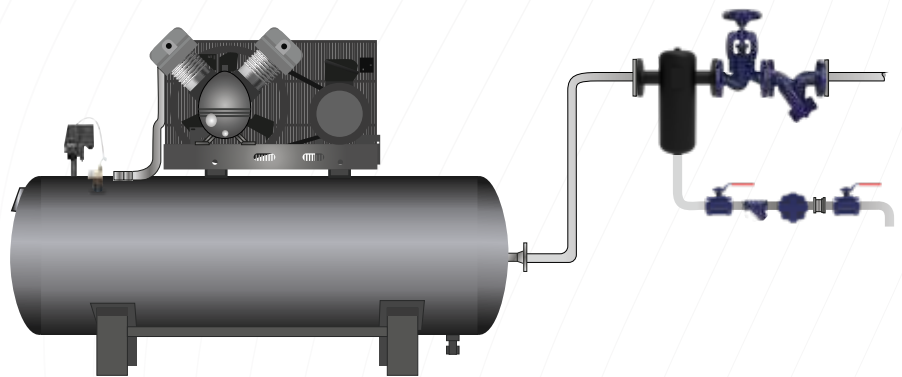


### Heat Transfer Processes and Valve Protection

ViRA separators condition steam before control valves, preventing wire drawing at low loads and reducing moisture on heat transfer surfaces, ensuring higher efficiency and longer valve life.

### Compressed Air Distribution

Moisture in compressed air can cause corrosion, waterhammer, and freezing damage. ViRA separators remove excess moisture before distribution, protecting equipment and ensuring reliable, efficient operation.



### Steam Flowmeters

ViRA separators remove moisture before metering, ensuring accurate dry steam measurements and protecting flowmeter components from damage.

## Steam/Air Dryer



### Vortex Steam Separator

|                             |                                           |
|-----------------------------|-------------------------------------------|
| Type                        | : VSF (Vortex)                            |
| Connection                  | : Flanged                                 |
| Pressure Class              | : PN 16, PN 25, PN 40                     |
| Max. admissible temperature | : 200 - 250 °C                            |
| Material                    | : Carbon Steel (Optional Stainless Steel) |
| Min. admissible temperature | : -10 °C                                  |
| Compliance                  | : CE (PED 2014/68/EU)                     |



### Vortex Steam Separator

|                             |                                           |
|-----------------------------|-------------------------------------------|
| Type                        | : VS (Vortex)                             |
| Connection                  | : Threaded                                |
| Pressure Class              | : PN 16, PN 25, PN 40                     |
| Max. admissible temperature | : 200 - 250 °C                            |
| Material                    | : Carbon Steel (Optional Stainless Steel) |
| Min. admissible temperature | : -10 °C                                  |
| Compliance                  | : CE (PED 2014/68/EU)                     |



### Cyclone Steam Separator

|                             |                                           |
|-----------------------------|-------------------------------------------|
| Type                        | : SSF (Cyclone)                           |
| Connection                  | : Flanged                                 |
| Pressure Class              | : PN 16, PN 25, PN 40                     |
| Max. admissible temperature | : 200 - 250 °C                            |
| Material                    | : Carbon Steel (Optional Stainless Steel) |
| Min. admissible temperature | : -10 °C                                  |
| Compliance                  | : CE (PED 2014/68/EU)                     |



### Cyclone Steam Separator

|                             |                                           |
|-----------------------------|-------------------------------------------|
| Type                        | : SS (Cyclone)                            |
| Connection                  | : Threaded                                |
| Pressure Class              | : PN 16, PN 25, PN 40                     |
| Max. admissible temperature | : 200 - 250 °C                            |
| Material                    | : Carbon Steel (Optional Stainless Steel) |
| Min. admissible temperature | : -10 °C                                  |
| Compliance                  | : CE (PED 2014/68/EU)                     |

## SEPARATORS RANGE

In addition to the standard sizes and pressure classes listed in the following tables, Vira also manufactures steam separators tailored to specific project requirements. Custom designs can be provided for:

- Larger or non-standard diameters
- Special pressure ratings
- Different connection types (threaded, flanged, welded)
- Alternative materials for demanding applications

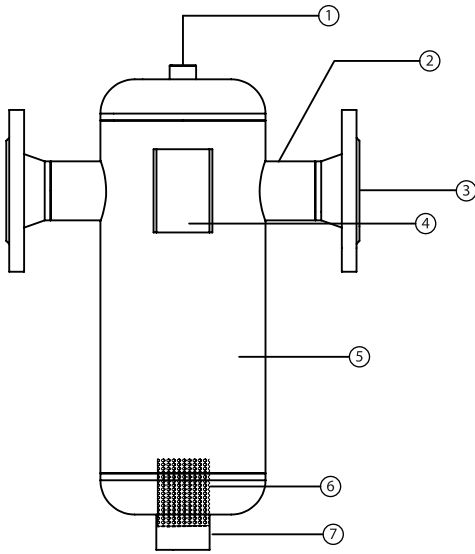
Vira's engineering and production capabilities allow us to deliver separators that meet the exact needs of each installation.

| Type                  |        |        | Vortex       |              |                 |                 |              |              |                 |                 |
|-----------------------|--------|--------|--------------|--------------|-----------------|-----------------|--------------|--------------|-----------------|-----------------|
| Material              |        |        | Carbon Steel | Carbon Steel | Stainless Steel | Stainless Steel | Carbon Steel | Carbon Steel | Stainless Steel | Stainless Steel |
| Model                 |        |        | VS-16        | VSF-16       | VS-S-16         | VSF-S-16        | VS-25        | VSF-25       | VS-S-25         | VSF-S-25        |
| Connection            |        |        | Threaded     | Flanged      | Threaded        | Flanged         | Threaded     | Flanged      | Threaded        | Flanged         |
| Body Design Condition |        |        | PN 16        | PN 16        | PN 16           | PN 16           | PN 25        | PN 25        | PN 25           | PN 25           |
| Size                  | DN 15  | 1/2"   | .            |              | .               |                 | .            |              | .               |                 |
|                       | DN 20  | 3/4"   | .            |              | .               |                 | .            |              | .               |                 |
|                       | DN 25  | 1"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 32  | 1 1/4" | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 40  | 1 1/2" | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 50  | 2"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 65  | 2 1/2" | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 80  | 3"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 100 | 4"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 125 | 5"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 150 | 6"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 200 | 8"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 250 | 10"    | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 300 | 12"    | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 350 | 14"    | .            | .            | .               | .               | .            | .            | .               | .               |

| Type                  |        |        | Cyclone      |              |                 |                 |              |              |                 |                 |
|-----------------------|--------|--------|--------------|--------------|-----------------|-----------------|--------------|--------------|-----------------|-----------------|
| Material              |        |        | Carbon Steel | Carbon Steel | Stainless Steel | Stainless Steel | Carbon Steel | Carbon Steel | Stainless Steel | Stainless Steel |
| Model                 |        |        | SS-16        | SSF-16       | SS-S-16         | SSF-S-16        | SS-25        | SSF-25       | SS-S-25         | SSF-S-25        |
| Connection            |        |        | Threaded     | Flanged      | Threaded        | Flanged         | Threaded     | Flanged      | Threaded        | Flanged         |
| Body Design Condition |        |        | PN 16        | PN 16        | PN 16           | PN 16           | PN 25        | PN 25        | PN 25           | PN 25           |
| Size                  | DN 15  | 1/2"   | .            |              | .               |                 | .            |              | .               |                 |
|                       | DN 20  | 3/4"   | .            |              | .               |                 | .            |              | .               |                 |
|                       | DN 25  | 1"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 32  | 1 1/4" | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 40  | 1 1/2" | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 50  | 2"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 65  | 2 1/2" | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 80  | 3"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 100 | 4"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 125 | 5"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 150 | 6"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 200 | 8"     | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 250 | 10"    | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 300 | 12"    | .            | .            | .               | .               | .            | .            | .               | .               |
|                       | DN 350 | 14"    | .            | .            | .               | .               | .            | .            | .               | .               |

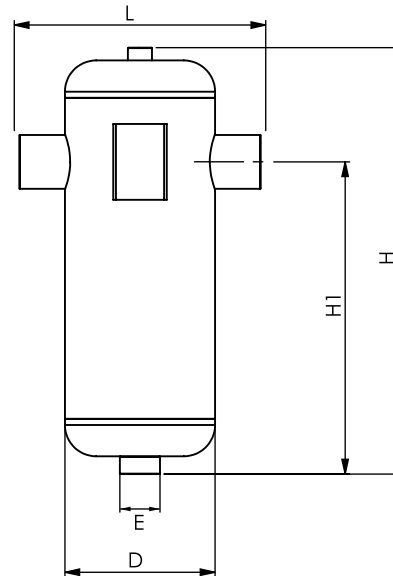
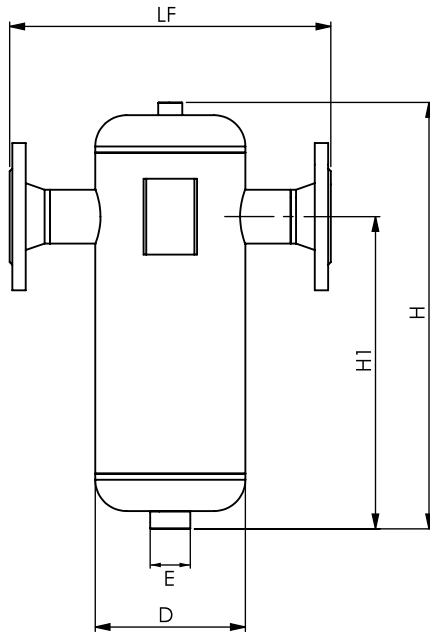
## TECHNICAL SPECIFICATION

### VSF/SSF Vortex/Cyclone Steam Separator



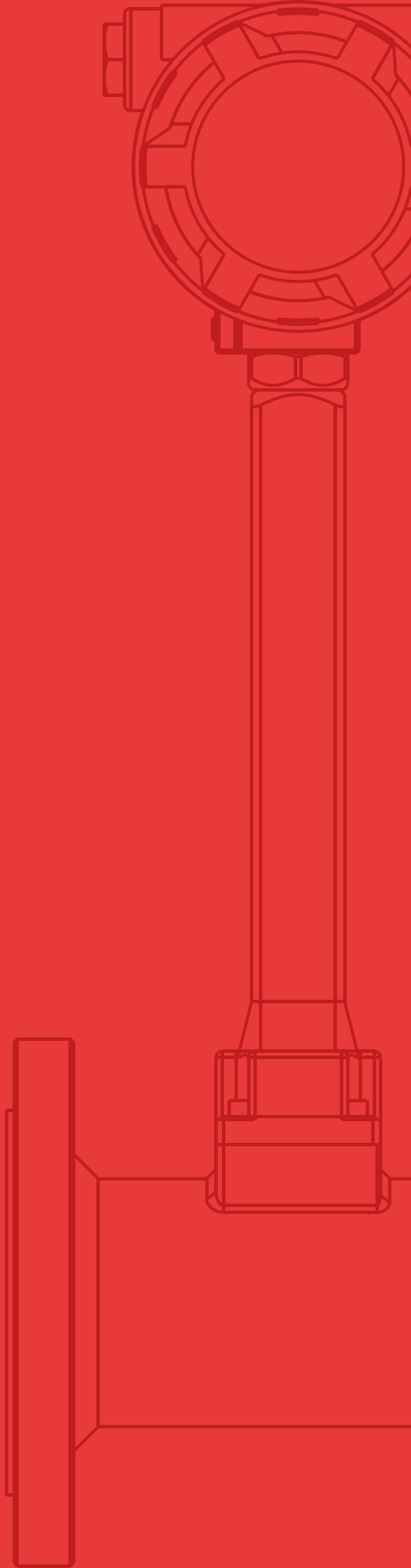
| No | Part                       | Material                              |
|----|----------------------------|---------------------------------------|
| 1  | Air Vent Connection / Muff | Carbon Steel (P235GH / P265GH)        |
| 2  | Inlet Nozzle / Pipe        | Carbon Steel (P235GH / P265GH)        |
| 3  | Steam Inlet / Flange       | Carbon Steel (P235GH / P265GH)        |
| 4  | Label                      | Aluminum                              |
| 5  | Body                       | Carbon Steel (P235GH / P265GH)        |
| 6  | Filter Mesh                | Stainless Steel (AISI 304 / AISI 316) |
| 7  | Condensate Outlet          | Carbon Steel (P235GH / P265GH)        |

### Dimensions



| Nominal size (DN) | D (mm) | H (mm) | H1 (mm) | E (inch) | LF (mm) | L (mm) |
|-------------------|--------|--------|---------|----------|---------|--------|
| 15                | 114,3  | 348    | 210     | 1/2"     | 230     | 180    |
| 20                | 114,3  | 348    | 210     | 1/2"     | 230     | 180    |
| 25                | 114,3  | 348    | 210     | 1/2"     | 230     | 180    |
| 32                | 139,7  | 412    | 280     | 1"       | 250     | 230    |
| 40                | 139,7  | 412    | 280     | 1"       | 260     | 240    |
| 50                | 168,3  | 478    | 350     | 1"       | 360     | 340    |
| 65                | 219,1  | 564    | 410     | 1 1/2"   | 380     | 360    |
| 80                | 219,1  | 600    | 452     | 1 1/2"   | 400     | 380    |
| 100               | 273    | 902    | 660     | 1 1/2"   | 485     | 465    |
| 125               | 323,9  | 885    | 648     | 2"       | 550     | 500    |
| 150               | 350    | 1050   | 733     | 2"       | 585     | 535    |
| 200               | 400    | 1318   | 1018    | 2"       | 650     | 600    |
| 250               | 500    | 1600   | 1165    | 2"       | 802     | 750    |
| 300               | 600    | 1650   | 1190    | 2"       | 900     | 850    |





# FLOW METERS

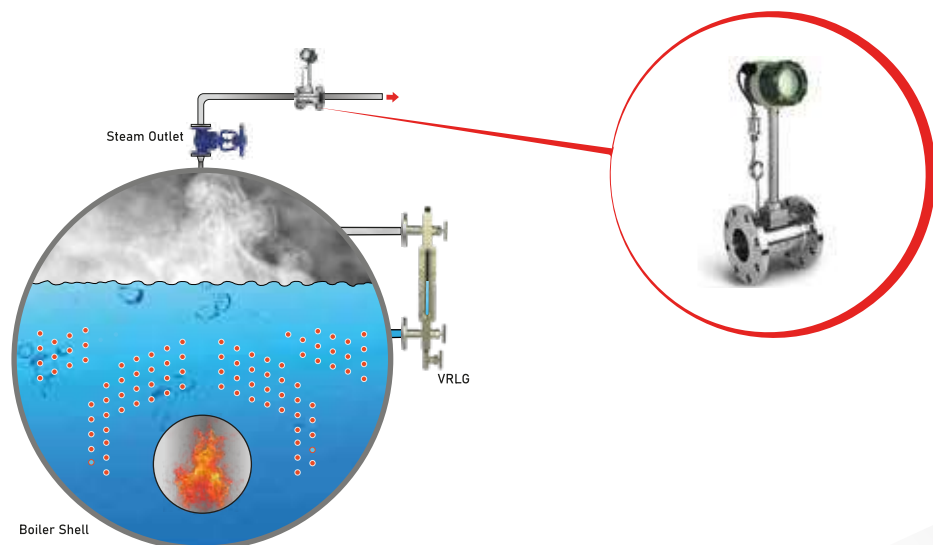
## Vortex Steam Flow Meter



### Vortex Steam Flow Meter

|                         |                                                                                                                                                  |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                    | : VXW                                                                                                                                            |
| Display                 | : Total flow and instant flow                                                                                                                    |
| Pressure                | : 1.6 MPa, 2.5 MPa, 4.0 MPa                                                                                                                      |
| Ambient Temperature     | : -20 °C to +60 °C                                                                                                                               |
| Diameter and Connection | : Flange type : DN15~DN300<br>Clamp on type : DN15~DN300<br>Insertion type : DN250~DN1000                                                        |
| Power                   | : 24 VDC                                                                                                                                         |
| Relative Humidity       | : %5 - %90                                                                                                                                       |
| Atm. Pressure           | : 86 - 106 Kpa                                                                                                                                   |
| Measurable Fluid        | : Liquid, Gas, Steam                                                                                                                             |
| Accuracy                | : Flange type $\pm 1.0\%$ ; $\pm 1.5\%$<br>Clamp on type : $\pm 1.0\%$ ; $\pm 1.5\%$<br>Insertion type : $\pm 1.5\%$ ; $\pm 2.0\%$ ; $\pm 2.5\%$ |
| LCD Digital Display     | : L/min, m/h, kg/h, etc.                                                                                                                         |
| Output Signal           | : 4-20 mA Current Output, Pulse Output (Optional), ModBus RTU (Optional)                                                                         |
| Medium Temp.            | : -40 C - +250 C                                                                                                                                 |
| Material                | : Stainless Steel 304 (Optional SS 316)                                                                                                          |
| Protection              | : IP 65                                                                                                                                          |

## VXW Steam Flow Meter Typical Application



## VXW

The vortex flowmeter consists of a vortex generator, a detection probe, and dedicated electronic circuitry. As the fluid passes through the vortex generator, alternating vortices are created on both sides of the body, known as Kármán vortices. The frequency of these vortices is directly proportional to the flow velocity of the fluid, establishing the fundamental measurement principle of the device. The relationship can be expressed as:

$$f = St \times dV$$

f : Frequency of vortex shedding (Hz)

V : Average flow velocity on both sides of the vortex generator (m/s)

St : Strouhal number (dimensionless, constant within a specific Reynolds number range)

d : Width of the upstream face of the vortex generator (m)

### Where to use;

- Liquid, Gas and Steam Flow Measurement
- Boiler Efficiency Monitoring

### Benefits;

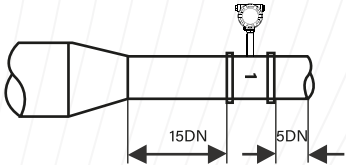
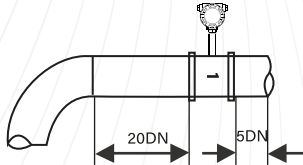
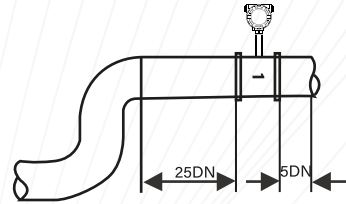
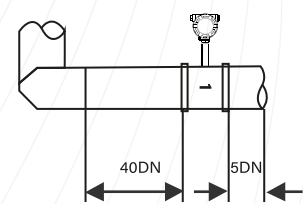
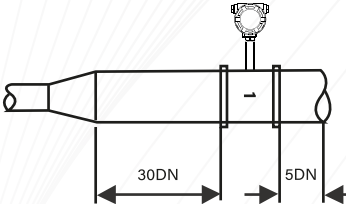
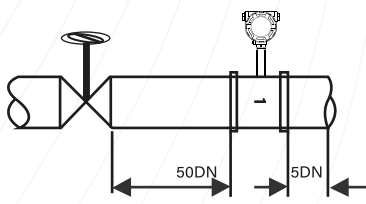
- Calculation of steam costs by measuring the steam consumption of the plant and various units.
- Checking whether steam is supplied to the processes in operation at the correct amount and pressure.
- The efficiency of the plants and processes are monitored with steam flow meters.

## Saturated Steam Flow Range

| Measurable Flow Range |                                                       |        |         |         |         |         |         |        |         |         |        |        |        |        |         |
|-----------------------|-------------------------------------------------------|--------|---------|---------|---------|---------|---------|--------|---------|---------|--------|--------|--------|--------|---------|
| Mpa (g)               | 0,1                                                   | 0,2    | 0,3     | 0,4     | 0,5     | 0,6     | 0,7     | 0,8    | 0,9     | 1,1     | 1,3    | 1,5    | 1,7    | 1,9    | 2,1     |
| °C                    | 120,2                                                 | 133,6  | 143,6   | 151,8   | 158,8   | 164,9   | 170,4   | 175,4  | 179,9   | 188,6   | 196,3  | 203    | 209,3  | 212,4  | 216     |
| Kg/m <sup>3</sup>     | 1,12                                                  | 1,67   | 2,19    | 2,68    | 3,18    | 3,67    | 4,15    | 4,62   | 5,16    | 6,1     | 7,15   | 8,2    | 9,45   | 10,57  | 11      |
| Dw                    | Different Steam Density Corresponding with Flow Range |        |         |         |         |         |         |        |         |         |        |        |        |        |         |
| mm                    |                                                       |        |         |         |         |         |         |        |         |         |        |        |        |        |         |
| 15                    | Qmin                                                  | 3,92   | 5,845   | 7,665   | 9,38    | 11,13   | 12,845  | 14,525 | 16,17   | 18,06   | 21,35  | 25,025 | 28,7   | 33,075 | 38,5    |
|                       | Qmax                                                  | 13,44  | 20,04   | 26,28   | 32,16   | 38,16   | 44,04   | 49,8   | 55,44   | 61,92   | 73,2   | 85,8   | 98,4   | 113,4  | 132     |
| 20                    | Qmin                                                  | 6,72   | 10,02   | 13,14   | 16,08   | 19,08   | 22,02   | 24,9   | 27,72   | 30,96   | 36,6   | 42,9   | 49,2   | 56,7   | 66      |
|                       | Qmax                                                  | 33,6   | 50,1    | 65,7    | 80,4    | 95,4    | 110,1   | 124,5  | 138,6   | 154,8   | 183    | 214,5  | 246    | 283,5  | 330     |
| 25                    | Qmin                                                  | 10,08  | 15,03   | 19,71   | 24,12   | 28,62   | 33,03   | 37,35  | 41,58   | 46,44   | 54,9   | 64,35  | 73,8   | 85,05  | 99      |
|                       | Qmax                                                  | 61,6   | 91,85   | 120,45  | 147,4   | 174,9   | 201,85  | 228,25 | 254,1   | 283,8   | 335,5  | 393,25 | 451    | 519,75 | 605     |
| 32                    | Qmin                                                  | 16,8   | 25,05   | 32,85   | 40,2    | 47,7    | 55,05   | 62,25  | 69,3    | 77,4    | 91,5   | 107,25 | 123    | 141,75 | 165     |
|                       | Qmax                                                  | 145,6  | 217,1   | 284,7   | 348,4   | 413,4   | 477,1   | 539,5  | 600,6   | 670,8   | 793    | 929,5  | 1066   | 1228,5 | 1430    |
| 40                    | Qmin                                                  | 24,64  | 36,74   | 48,18   | 58,96   | 69,96   | 80,74   | 91,3   | 101,64  | 113,52  | 134,2  | 157,3  | 180,4  | 207,9  | 242     |
|                       | Qmax                                                  | 224    | 334     | 438     | 536     | 636     | 734     | 830    | 924     | 1032    | 1220   | 1430   | 1640   | 1890   | 2200    |
| 50                    | Qmin                                                  | 40,32  | 60,12   | 78,84   | 96,48   | 114,48  | 132,12  | 149,4  | 166,32  | 185,76  | 219,6  | 257,4  | 295,2  | 340,2  | 396     |
|                       | Qmax                                                  | 358,4  | 534,4   | 700,8   | 857,6   | 1017,6  | 1174,4  | 1328   | 1478,4  | 1651,2  | 1952   | 2288   | 2624   | 3024   | 3520    |
| 65                    | Qmin                                                  | 56     | 83,5    | 109,5   | 134     | 159     | 183,5   | 207,5  | 231     | 258     | 305    | 357,5  | 410    | 472,5  | 550     |
|                       | Qmax                                                  | 537,6  | 801,6   | 1051,2  | 1286,4  | 1526,4  | 1761,6  | 1992   | 2217,6  | 2476,8  | 2928   | 3432   | 3936   | 4536   | 5280    |
| 80                    | Qmin                                                  | 84     | 125,25  | 164,25  | 201     | 238,5   | 275,25  | 311,25 | 346,5   | 387     | 457,5  | 536,25 | 615    | 708,75 | 825     |
|                       | Qmax                                                  | 703,36 | 1048,76 | 1375,32 | 1683,04 | 1997,04 | 2304,76 | 2606,2 | 2901,36 | 3240,48 | 3830,8 | 4490,2 | 5149,6 | 5934,6 | 6908    |
| 100                   | Qmin                                                  | 145,6  | 217,1   | 284,7   | 348,4   | 413,4   | 477,1   | 539,5  | 600,6   | 670,8   | 793    | 929,5  | 1066   | 1228,5 | 1430    |
|                       | Qmax                                                  | 1232   | 1837    | 2409    | 2948    | 3498    | 4037    | 4565   | 5082    | 5676    | 6710   | 7865   | 9020   | 10395  | 11627   |
| 125                   | Qmin                                                  | 0,224  | 0,334   | 0,438   | 0,536   | 0,636   | 0,734   | 0,83   | 0,924   | 1,032   | 1,22   | 1,43   | 1,64   | 1,89   | 2,2     |
|                       | Qmax                                                  | 1,904  | 2,839   | 3,723   | 4,556   | 5,406   | 6,239   | 7,055  | 7,854   | 8,772   | 10,37  | 12,155 | 13,94  | 16,065 | 18,7    |
| 150                   | Qmin                                                  | 0,3136 | 0,4676  | 0,6132  | 0,7504  | 0,8904  | 1,0276  | 1,162  | 1,2936  | 1,4448  | 1,708  | 2,002  | 2,296  | 2,646  | 3,08    |
|                       | Qmax                                                  | 2,5088 | 3,7408  | 4,9056  | 6,0032  | 7,1232  | 8,2208  | 9,296  | 10,3488 | 11,5584 | 13,664 | 16,016 | 18,368 | 21,168 | 24,64   |
| 200                   | Qmin                                                  | 0,6496 | 0,9686  | 1,2702  | 1,5544  | 1,8444  | 2,1286  | 2,407  | 2,6796  | 2,9928  | 3,538  | 4,147  | 4,756  | 5,481  | 6,38    |
|                       | Qmax                                                  | 4,704  | 7,014   | 9,198   | 11,256  | 13,356  | 15,414  | 17,43  | 19,404  | 21,672  | 25,62  | 30,03  | 34,44  | 39,69  | 46,2    |
| 250                   | Qmin                                                  | 1,0864 | 1,6199  | 2,1243  | 2,5996  | 3,0846  | 3,5599  | 4,0255 | 4,4814  | 5,0052  | 5,917  | 6,9355 | 7,954  | 9,1665 | 10,2529 |
|                       | Qmax                                                  | 6,16   | 9,185   | 12,045  | 14,74   | 17,49   | 20,185  | 22,825 | 25,41   | 28,38   | 33,55  | 39,325 | 45,1   | 51,975 | 60,5    |
| 300                   | Qmin                                                  | 1,6352 | 2,4382  | 3,1974  | 3,9128  | 4,6428  | 5,3582  | 6,059  | 6,7452  | 7,5336  | 8,906  | 10,439 | 11,972 | 13,797 | 15,4322 |
|                       | Qmax                                                  | 8,96   | 13,36   | 17,52   | 21,44   | 25,44   | 29,36   | 33,2   | 36,96   | 41,28   | 48,8   | 57,2   | 65,6   | 75,6   | 88      |

## Design and Installation

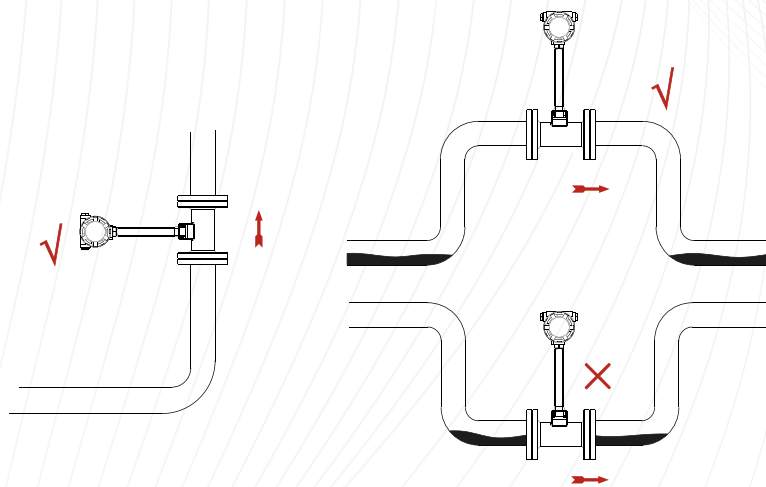
### Design

| Sensor upstream pipe type                 | Front and back straight pipe length                                                | Sensor upstream pipe type                        | Front and back straight pipe length                                                 |
|-------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|
| Concentric contract opening-valve         |   | 90 degree elbow                                  |  |
| Two 90 degree Elbow which on a same plane |   | Two 90 degree Elbow which not on a same plane    |  |
| Concentric expanded pipe                  |  | Control valve half open the vale (not recommend) |  |

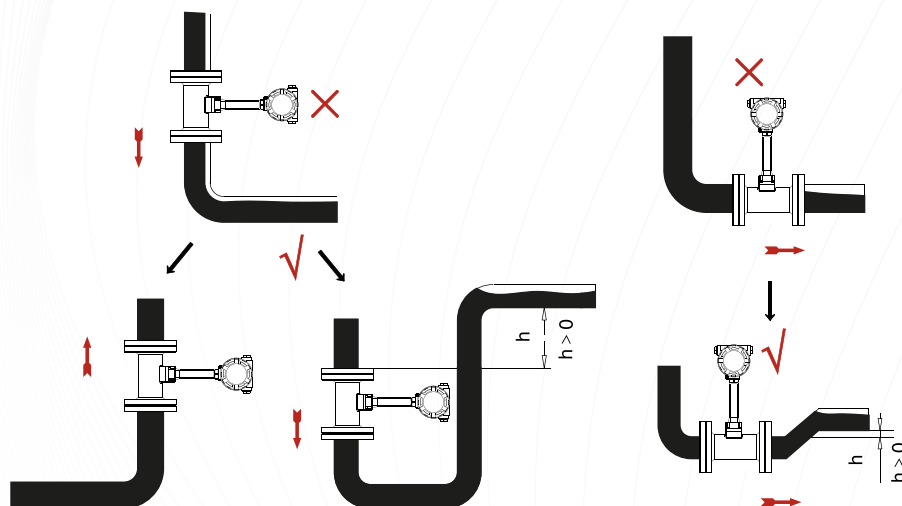
### Installation Requirements

#### Measuring Gas and Steam Installation Considerations

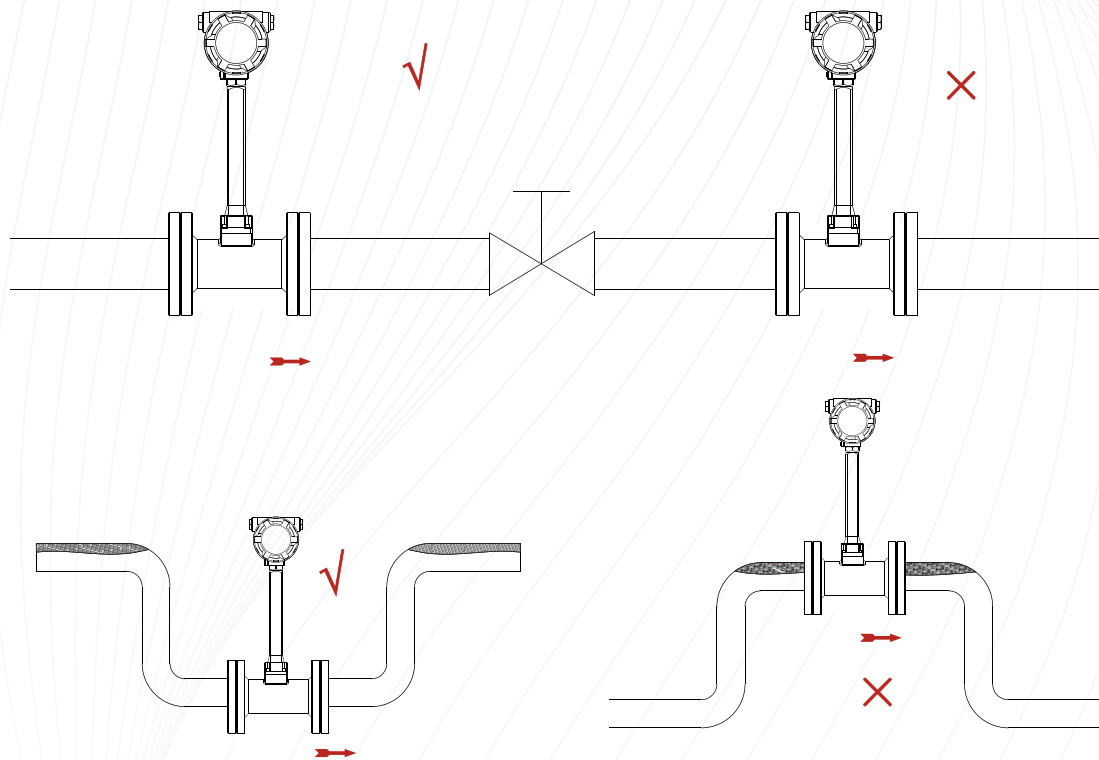
1. Pipelines used for measuring gas or steam should prevent interference from accumulated liquid.
2. The flow meter can be installed vertically on the pipeline to avoid fluid accumulation.
3. When installing the flow meter horizontally, it should be placed at the highest point of an inverted U-shaped pipe.
4. Installation at the lowest point of a positive U-shaped pipeline is strictly prohibited. Condensate tends to collect at the lowest point of a positive U-shaped pipeline. This condensation can form air pockets, leading to inaccurate measurements. In extreme cases, the instrument may be damaged and the pipeline medium may leak.



In order to ensure accurate measurement, the measuring medium must fill the pipeline of the flowmeter, so the flow direction of the medium should be bottom-up. When the fluid flows downward, it must be ensured that the installation position of the vortex flowmeter is lower than the height of the downstream pipeline to ensure that the vortex flowmeter is full.

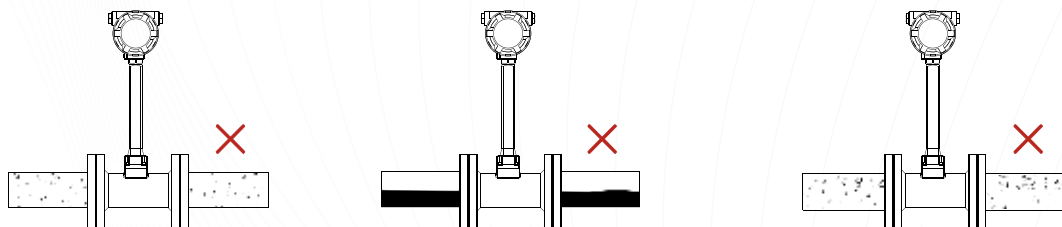


If the measurement medium contains gas, the measurement accuracy of the instrument will be affected, and in severe cases, the flowmeter will work abnormally, so it is required to avoid generating air bubbles when installing the pipeline; When the liquid flows through the control valve, air bubbles will be generated due to the pressure drop, resulting in inaccurate measurement, so the flow meter must be installed upstream of the valve. It is forbidden to install the flowmeter at the highest point of the inverted U-shaped pipe.



## Mixed Liquid

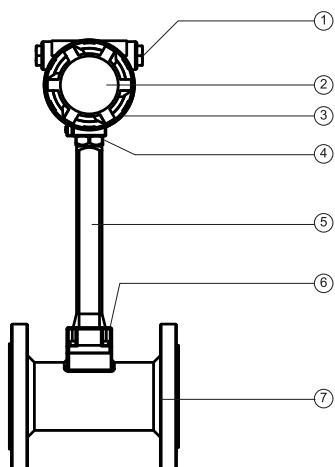
When the measured fluid is a single-phase flow, the flow meter can accurately measure gas, steam and liquid. When the measured fluid is a mixed-phase flow, the flow meter cannot make accurate judgments.





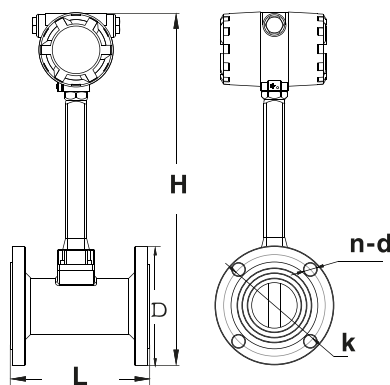
## TECHNICAL SPECIFICATION

### Vortex Steam Flow Meter



| No | Part                      | Material                       |
|----|---------------------------|--------------------------------|
| 1  | Electrical Unit           | Austenitic Stainless Steel 304 |
| 2  | Display Protector         | Glass                          |
| 3  | Transmitter Housing       | Aluminum                       |
| 4  | Pick Up Sensor Connection | Austenitic Stainless Steel 304 |
| 5  | Pick Up Sensor            | Austenitic Stainless Steel 304 |
| 6  | Pick Up Sensor Connection | Austenitic Stainless Steel 304 |
| 7  | Flange                    | Austenitic Stainless Steel 304 |

### Dimensions



| DN  | D<br>(mm) | K<br>(mm) | n-d<br>(mm) | Thread | L<br>(mm) | H<br>(mm) | Piping    |
|-----|-----------|-----------|-------------|--------|-----------|-----------|-----------|
| 15  | 95        | 65        | 4-14        | M12    | 160       | 460       | Φ19-2     |
| 20  | 105       | 75        | 4-14        | M12    | 160       | 460       | Φ26-3     |
| 25  | 115       | 85        | 4-14        | M12    | 160       | 465       | Φ34-4.5   |
| 32  | 140       | 100       | 4-18        | M16    | 160       | 475       | Φ39-3.5   |
| 40  | 150       | 110       | 4-18        | M16    | 180       | 490       | Φ49-4.5   |
| 50  | 165       | 125       | 4-18        | M16    | 180       | 500       | Φ59-4.5   |
| 65  | 185       | 145       | 4-18        | M16    | 180       | 520       | Φ78-6.5   |
| 80  | 200       | 160       | 4-18        | M16    | 180       | 530       | Φ91-5.5   |
| 100 | 220       | 180       | 4-18        | M16    | 200       | 550       | Φ110-5    |
| 125 | 250       | 210       | 4-18        | M16    | 200       | 580       | Φ135-5    |
| 150 | 285       | 240       | 8-22        | M20    | 200       | 615       | Φ161-5.5  |
| 200 | 340       | 295       | 12-22       | M20    | 200       | 665       | Φ222-11   |
| 250 | 405       | 355       | 12-26       | M24    | 200       | 720       | Φ273-11.5 |
| 300 | 460       | 410       | 12-26       | M24    | 200       | 770       | Φ325-12.5 |

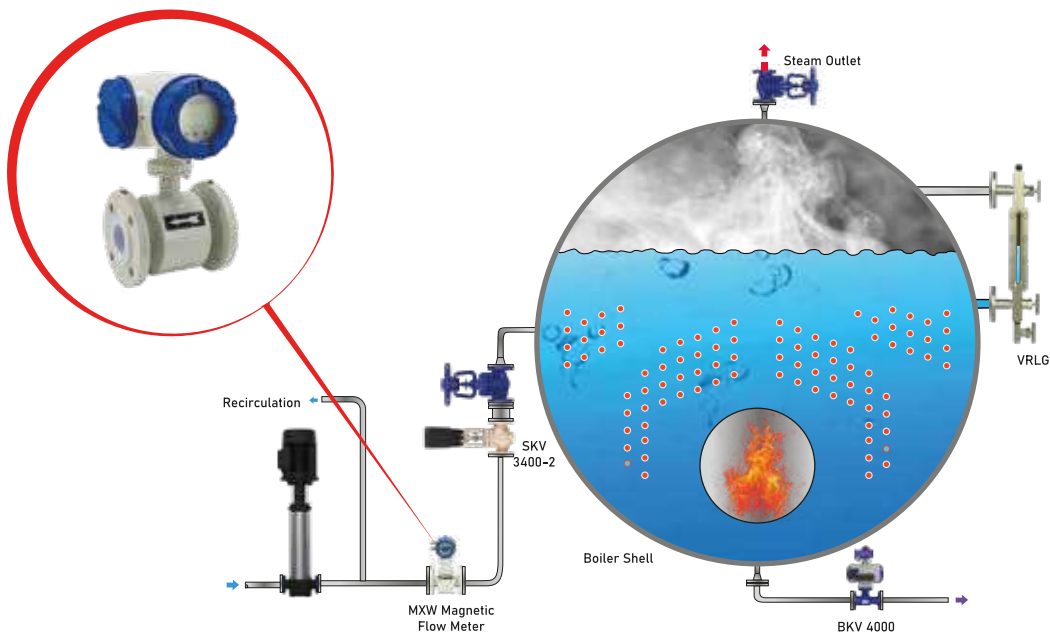


## Magnetic Flow Meter



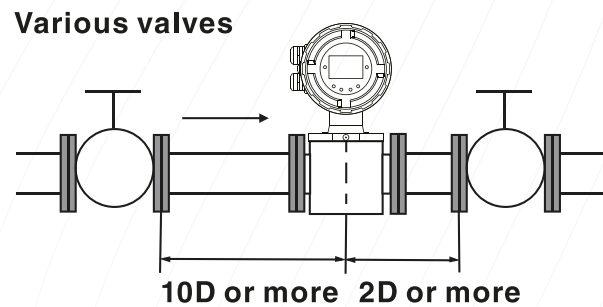
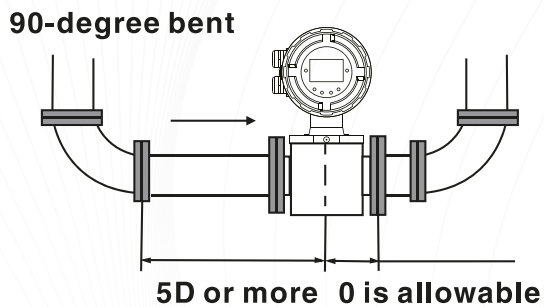
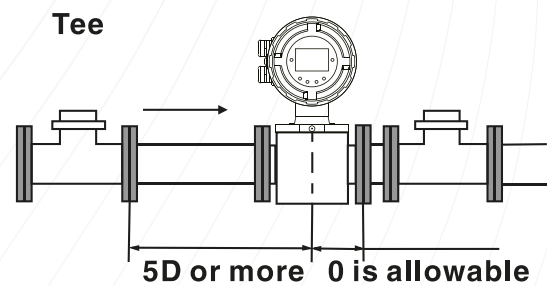
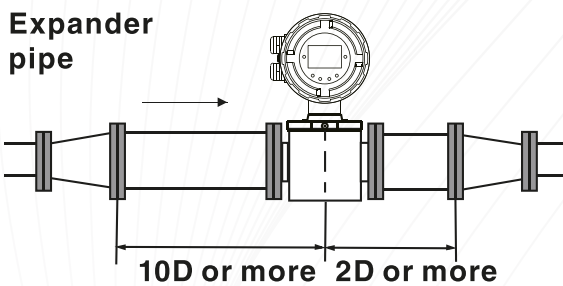
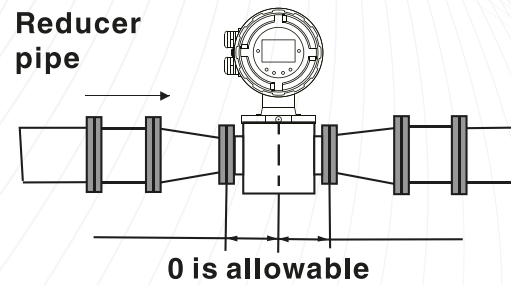
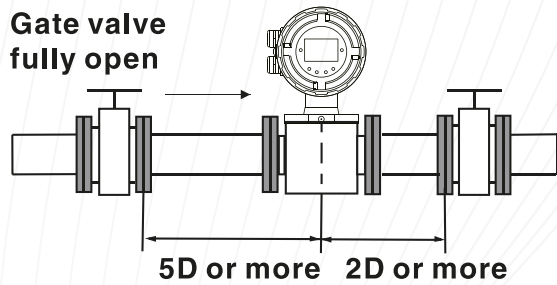
|                                |                                            |
|--------------------------------|--------------------------------------------|
| Type                           | : MXW                                      |
| Diameter                       | : PTFE: DN2.5 - DN1000                     |
| Rubber                         | : DN50 - DN3000                            |
| Flow Direction                 | : Forward Reverse                          |
| Repeatability Error            | : $\pm 0.1\%$                              |
| Accuracy                       | : $\pm 0.5\%$ of rate; $\pm 0.2\%$ of rate |
| Medium Temp. with Rubber Liner | : $-20...+60^{\circ}\text{C}$ ,            |
| Medium Temp. with PTFE Liner   | : $-20...+120^{\circ}\text{C}$ ,           |
| Medium Temp. with PFA          | : $-20...+180^{\circ}\text{C}$             |
| Velocity                       | : 0.3-10m/s                                |
| Ambient Temperature            | : $-20...+60^{\circ}\text{C}$              |
| Relative Humidity              | : 5%-95%                                   |
| Power Consumption              | : <20W                                     |
| Protection                     | : IP 65; IP 68 (Remote Type)               |

## MXW Typical Application



## Required Lengths Of Straight Runs

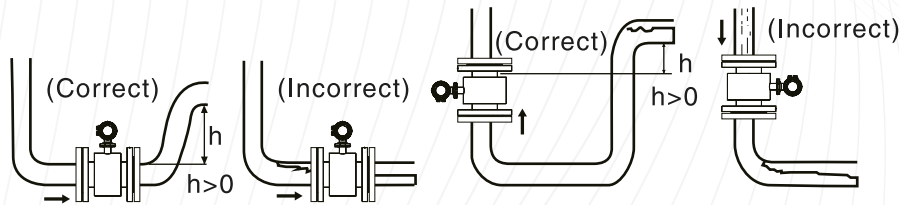
For optimum accuracy performance, it is required to provide sufficient inlet and outlet straight pipe runs. An equivalent to 3 diameters of straight pipe is required on the inlet side, and 2 diameters on the outlet side. There are no special requirements for standard concentric pipe reducers. See diagram1 for required straight runs when there is altering device.



## Cautions For Installation

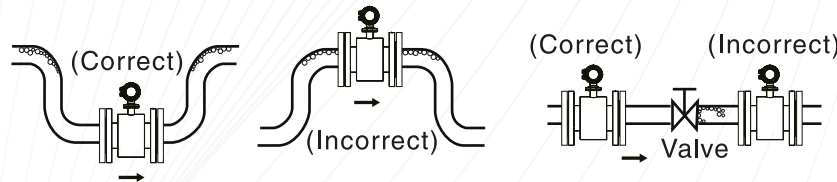
### Mounting Positions

Pipes must be fully filled with liquids. It is essential that pipes remain fully filled at all times, otherwise flow rate indications may be affected and measurement errors may be caused.



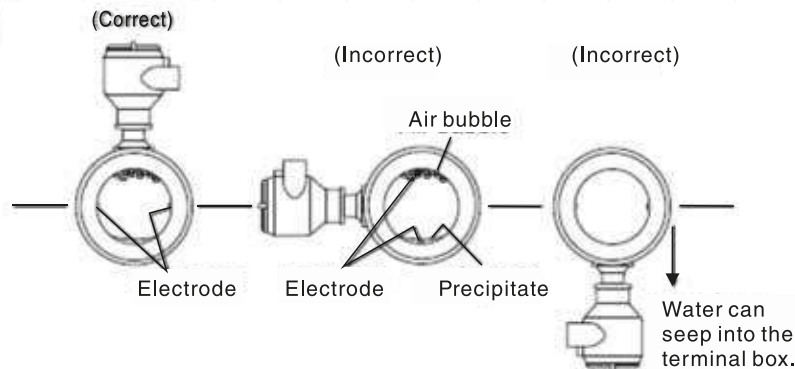
**Mounting Positions**

Avoid Air Bubbles. If air bubbles enter a measurement pipe, flow rate indications may be affected and measurement errors may be caused.



**Avoiding Air Bubbles**

If the electrodes are vertical to the ground, air bubbles near the top or precipitates at the bottom may cause measurement error. Ensure that the terminal box is mounted above the piping to prevent water from entering them.



**Mounting Orientation**

Avoid all pipe locations where the flow is pulsating, such as in the outlet side of piston or diaphragm pumps.

Avoid locations near equipment producing electrical interference such as electric motors, transformers, variable frequency, etc.

Install the meter with enough room for future access for maintenance purposes.

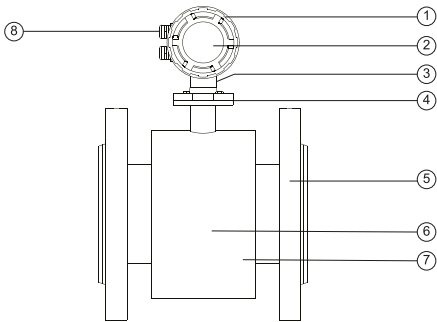
The magnetic meter isolating liner, whether it is PTFE or Rubber, is not intended to be used as gasket material. Standard gaskets (not provided) should be installed to ensure a proper hydraulic seal. When installing the gaskets, make sure they are properly centered to avoid restriction or turbulence. Do not use graphite or any electrically conductive sealing compound to hold the gaskets in place during installation. This could affect the reading accuracy of the measuring signal.

## Flow Range

| Diameter |        | Flow Rate (m³/h) |              |         |
|----------|--------|------------------|--------------|---------|
|          |        | V=0.3m/s         | V=6m/s       | V=10m/s |
| (mm)     | (Inch) | (Min)            | (Calibrated) | (Max)   |
| 6        | 1/4"   | 0.0306           | 0.611        | 1.018   |
| 10       | 3/8"   | 0.0849           | 1.696        | 2.827   |
| 15       | 1/2"   | 0.1909           | 3.817        | 6.362   |
| 20       | 3/4"   | 0.3393           | 6.786        | 11.31   |
| 25       | 1"     | 0.5301           | 10.60        | 17.67   |
| 32       | 1-1/4" | 0.8686           | 17.37        | 28.95   |
| 40       | 1-1/2" | 1.357            | 27.14        | 45.24   |
| 50       | 2"     | 2.121            | 42.14        | 70.69   |
| 65       | 2-1/2" | 3.584            | 71.68        | 119.5   |
| 80       | 3"     | 5.429            | 108.6        | 181.0   |
| 100      | 4"     | 8.482            | 169.6        | 282.7   |
| 125      | 5"     | 13.25            | 265.1        | 441.8   |
| 150      | 6"     | 19.09            | 381.7        | 636.2   |
| 200      | 8"     | 33.93            | 678.6        | 1131    |
| 250      | 10"    | 53.01            | 1060         | 1767    |
| 300      | 12"    | 76.34            | 1527         | 2545    |
| 350      | 14"    | 103.9            | 2078         | 3465    |
| 400      | 16"    | 135.7            | 2714         | 4524    |
| 450      | 18"    | 171.8            | 3435         | 5726    |
| 500      | 20"    | 212.1            | 4241         | 7069    |
| 600      | 24"    | 305.4            | 6107         | 10179   |
| 700      | 28"    | 415.6            | 8310         | 13850   |
| 800      | 32"    | 542.9            | 10860        | 18100   |
| 900      | 36"    | 662.8            | 13740        | 22900   |
| 1000     | 40"    | 848.2            | 16962        | 28270   |

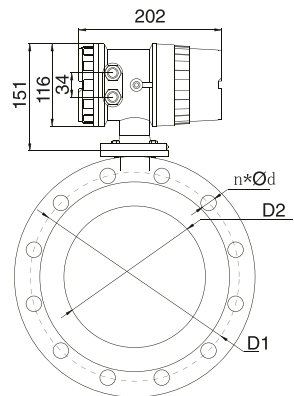
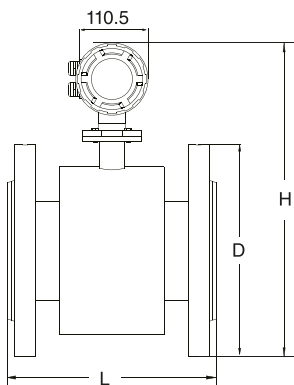
# TECHNICAL SPECIFICATION

## Magnetic Water Flow Meter



| No                                                                                                                | Part                      | Material                         |
|-------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------|
| 1                                                                                                                 | Transmitter Housing       | Aluminum                         |
| 2                                                                                                                 | Display Protector         | Glass                            |
| 3                                                                                                                 | Pick Up Sensor            | Carbon steel                     |
| 4                                                                                                                 | Pick Up Sensor Connection | Carbon steel With Rubber Sealing |
| 5                                                                                                                 | Flange                    | Carbon steel                     |
| 6                                                                                                                 | Body Housing              | Carbon steel                     |
| 7                                                                                                                 | Tube                      | Austenitic Stainless Steel 304   |
| 8                                                                                                                 | Electrial Unit            | Austenitic Stainless Steel 304   |
| <b>Note:</b> If order 304 body material, items 5.6.7 are SS304. If order 316 body material, items 5.6.7 are SS316 |                           |                                  |

## Dimensions



### Dimensions

| DN  | BType<br>L (mm) | LType<br>L (mm) | H<br>(mm) | H1<br>(mm) | D<br>(mm) | D1<br>(mm) | n x Ød<br>(mm) |
|-----|-----------------|-----------------|-----------|------------|-----------|------------|----------------|
| 10  | 160/200         | 120             | 360       | 220        | 90        | 65         | 4x14           |
| 15  | 160/200         | 200             | 360       | 220        | 95        | 65         | 4x14           |
| 20  | 165/200         | 200             | 360       | 220        | 105       | 75         | 4x14           |
| 25  | 200             | 200             | 360       | 220        | 115       | 85         | 4x14           |
| 32  | 200             | 200             | 370       | 235        | 140       | 100        | 4x18           |
| 40  | 200             | 200             | 370       | 235        | 150       | 110        | 4x18           |
| 50  | 200             | 200             | 385       | 242        | 165       | 125        | 4x18           |
| 65  | 250/200         | 200             | 400       | 256        | 185       | 145        | 4x18           |
| 80  | 250/200         | 200             | 415       | 275        | 200       | 160        | 8x18           |
| 100 | 250             | 250             | 435       | 295        | 220       | 180        | 8x18           |
| 125 | 250             | NA              | 465       | 325        | 250       | 210        | 8x18           |
| 150 | 300             | NA              | 497       | 355        | 285       | 240        | 8x22           |
| 200 | 350             | NA              | 550       | 410        | 340       | 295        | 12x22          |
| 250 | 450             | NA              | 610       | 488        | 405       | 355        | 12x22          |
| 300 | 500             | NA              | 660       | 520        | 460       | 410        | 12x22          |



# RESISTANCE THERMOMETERS



## Resistance Thermometers

Resistance thermometers are widely used in various processes within the temperature range of -200°C to +850°C. They provide more accurate readings than thermocouples, especially at low temperatures. Standard designs are suitable up to 500°C, while special types are available for applications up to 850°C upon request.

The maximum operating temperatures stated in the catalogue refer to clean air environments free from harmful gases. In environments with corrosive or aggressive gases, the service life of the resistance thermometers may be reduced depending on the severity of the exposure.

Resistance thermometers are suitable for use in machinery, tanks, pipelines, and media such as air, steam, gas, water, and oil, as well as for surface measurements in low and high-pressure processes.

### VR02

#### Steam and Water Temperature

Vira temperature sensors are specifically designed for steam applications, delivering accurate and reliable performance even in high-pressure and high-temperature environments. Built for durability, Vira sensors ensure precise control, making them the ideal choice for steam systems requiring optimal safety and efficiency.

VR01 resistance thermometer is a straight type model without raccord, designed for precise and stable temperature measurement. A B-type connection head is used in standard production. Diameters of 9 mm and above are manufactured as inset type and include the VR05 inset element. Upon request, inset versions can also be produced in diameters below 9 mm.

### VR03

#### Flue Gas Temperature

Vira flue gas temperature sensor is designed for accurate, real-time temperature measurement in high-temperature environments. Made from corrosion-resistant materials, it ensures long-term reliability and seamless integration with boiler control systems, helping optimize efficiency and reduce emissions.

VR02 resistance thermometer is a raccord type model designed for precise and reliable temperature measurement. It is supplied with a standard ½" raccord connection. Diameters of 9 mm and above are manufactured as inset type and include the VR05 inset element. Upon request, inset versions can also be produced in diameters below 9 mm.



## Steam and Water Temperature



|            |                                                        |
|------------|--------------------------------------------------------|
| Type       | : VR02                                                 |
| Element    | : Pt-100, Pt-1000 ( 2,3,4 Wire )                       |
| Housing    | : 1.4571 DIN Stainless Steel ( AISI 316 )              |
| Size (D)   | : This size must be selected by customer               |
| Length (L) | : This size must be selected by customer               |
| Connection | : ½"                                                   |
| Head       | : Screwed, Chain and o-ring sealing water proof (IP67) |

## Flue Gas Temperature



|                       |                                                        |
|-----------------------|--------------------------------------------------------|
| Type                  | : VR03                                                 |
| Element               | : Pt-100, Pt-1000 ( 2,3,4 Wire )                       |
| Housing               | : 1.4571 DIN Stainless Steel ( AISI 316 )              |
| Size (D)              | : This size must be selected by customer               |
| Length (L)            | : This size must be selected by customer               |
| Connection            | : ½"                                                   |
| Head to Thread Length | : 120 mm                                               |
| Head                  | : Screwed, Chain and o-ring sealing water proof (IP67) |

**Note:** Resistance thermometers can be manufactured in special dimensions according to customer requirements.

## Resistance Thermometer:

Changing the resistance value of a temperature wire obtained by resistance thermometer is a conductive sensor depending on the temperature. It is widely used in industry and laboratory applications found after thermocouple. They give more accurate values than thermocouples, especially at low temperatures and in the processes where precise measurement is desired. The value of the changing resistance changes depending on the temperature change. A varying voltage is obtained with the constant current applied on it.

There are some things to consider for resistance thermometers. The first of these is that the current applied on it causes a small temperature change. Another important element is the resistance of the wires carrying the current. In resistance thermometers, the temperature change factor is defined by " $\alpha$ ". Resistance changes are usually formulated as follows.

$\alpha$  : Resistance thermometer temperature change factor

$R_0$  : Resistance value at  $0^\circ\text{C}$

$R_{100}$  : Resistance value at  $100^\circ\text{C}$

$$\alpha = \frac{R_{100} - R_0}{R_0 \cdot 100^\circ\text{C}}$$

Resistance thermometer temperature-resistance change values comply with DIN43760 and IEC751 standards. Pt-100 and Ni-1000 resist 100 Ohms at  $0^\circ\text{C}$  with a tolerance of  $\pm 0.1$  Ohm. Temperature-resistance change values are calculated with the following formula:

$$R_t = R_0 (1 + A t + B t^2)$$

$R_t$  = Resistance value at any temperature  $T$

$R_0$  = Resistance value at  $0^\circ\text{C}$

$t$  = Temperature

$A = 3.90784 \times 10^{-2} \text{ }^\circ\text{C}^{-3}$  (Constant)

$B = 0.578408 \times 10^{-6} \text{ }^\circ\text{C}^{-2}$  (Constant)

Three important points should be taken into consideration in the use of resistance thermometers:

- 1- Environmental conditions
- 2- Maximum and minimum operating temperatures
- 3- Tolerance values

When looking at resistance changes related to temperature, Platinum and Nickel wire give the best performance among many alloys and metals. For this reason, resistors wrapped from these wires are used in Pt-100 and Ni-100s. It is best to use Pt-100 in this area.

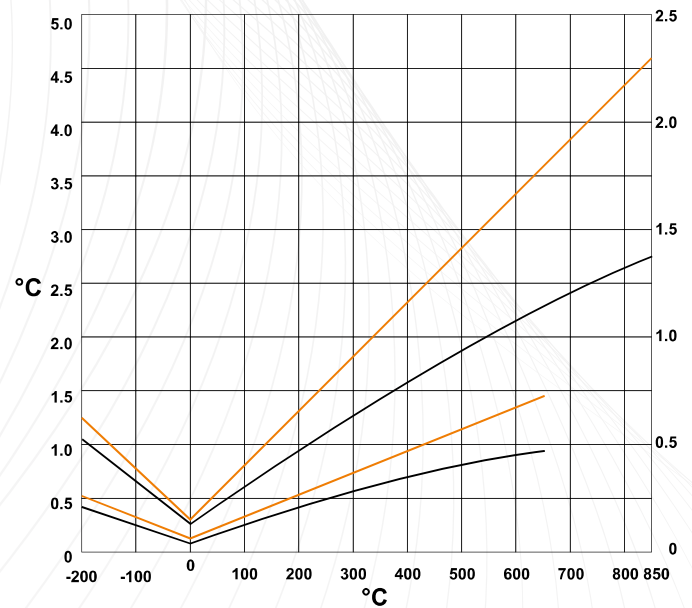
$\alpha = 3.85 \cdot 10^{-3} \text{ (1/}^\circ\text{C)}$  for Platinum

$\alpha = 6.17 \cdot 10^{-3} \text{ (1/}^\circ\text{C)}$  for Nickel

Looking at the resistance thermometer structure, it consists of inset, outer protective sheath and other connection parts. Resistance thermometer element that measures the temperature is placed in the inset with outer protection. Metal oxide powders are filled in the sheath. A single piece of wire is used between the terminal element and the terminal and this wire is insulated with insulators.

In standard production, the inset diameters are 6mm or 8mm, the resistance thermometer element in the sheath is defined as inset with its connection terminal. Inset is mounted in outer protective sheath. With this structure, the inset resistance thermometer in the outer protective sheath can be removed more easily without removing the outer protective sheath from the process. If the resistance thermometer element in the inset is to be connected to a single device, it is produced as a single element, but if it is to be connected to a second device, then it is produced as double element.

Resistance Thermometer Resistance Graph



Resistance Thermometer Tolerance Table

| TEMPERATURE<br>°C | TOLERANCE<br>IEC 751:1983 (BS EN 60751:1996) |                 |                     |                 |
|-------------------|----------------------------------------------|-----------------|---------------------|-----------------|
|                   | A CLASS                                      |                 | B CLASS             |                 |
|                   | $\pm^\circ\text{C}$                          | $\pm\text{OHM}$ | $\pm^\circ\text{C}$ | $\pm\text{OHM}$ |
| -200              | 0.55                                         | 0.24            | 1.3                 | 0.56            |
| -100              | 0.35                                         | 0.14            | 0.8                 | 0.32            |
| 0                 | 0.15                                         | 0.06            | 0.3                 | 0.12            |
| 100               | 0.35                                         | 0.13            | 0.8                 | 0.30            |
| 200               | 0.55                                         | 0.20            | 1.3                 | 0.48            |
| 300               | 0.75                                         | 0.27            | 1.8                 | 0.64            |
| 400               | 0.95                                         | 0.33            | 2.3                 | 0.79            |
| 500               | 1.15                                         | 0.38            | 2.8                 | 0.93            |
| 600               | 1.35                                         | 0.43            | 3.3                 | 1.06            |
| 650               | 1.45                                         | 0.46            | 3.6                 | 1.13            |
| 700               | -                                            | -               | 3.8                 | 1.17            |
| 800               | -                                            | -               | 4.3                 | 1.28            |
| 850               | -                                            | -               | 4.6                 | 1.34            |

### Resistance Thermometer Element:

The resistance thermometer element consists of placing the resistance wire wrapped in Platinum or Nickel wire in Ceramic, Glass or Mica. Platinum resistance thermometer elements are used from -200 °C to +850 °C. Since the resistance thermometer elements are used from -60 °C to +150 °C. Pt-100 element is widely used because it gives constant temperature and more accurate values. They are also more readily available. For this reason, Pt-100 is preferred even in processes suitable for Ni-100 ranges.

The resistance thermometer element placed at the tip in the inset is connected to the terminal with Copper (Cu), Silver (Ag) or Nickel chrome (NiCr) wires. If Copper and Silver are chosen, these wires are ignored because their resistance is very low. Applications above 600 °C use as internal connection wire in nickel chrome wire is good. Since the resistance of nickel chrome wire is high, the resistance of this wire is measured and written into the head-terminal block.

### Resistance Thermometer Inset:

The resistance thermometer element is not mounted directly on the outer protective sheath. It is placed in a smaller diameter metal sheath and identified as an inset. The inset is placed in the outer protective sheath in a separate metal sheath as the second sheath. In this way, when the resistance thermometer element is damaged, the inset can be changed easily from inside the head without stopping the process and without removing the outer sheath. In this way, if there is an outer sheath and a head available, a more economical product is obtained by only providing inset without the connection parts.

RESISTANCE THERMOMETER TOLERANCE TABLE (PLATINUM RESISTANT) EN60751 (IEC751)

| Temp. °C | Tolerance |        |         |        |          |        |          |        |           |        |
|----------|-----------|--------|---------|--------|----------|--------|----------|--------|-----------|--------|
|          | Class B   |        | Class A |        | 1/3 DIN* |        | 1/5 DIN* |        | 1/10 DIN* |        |
|          | ± °C      | ± Ohms | ± °C    | ± Ohms | ± °C     | ± Ohms | ± °C     | ± Ohms | ± °C      | ± Ohms |
| -200     | 1.30      | 0.56   | 0.55    | 0.24   | 0.44     | 0.19   | 0.26     | 0.11   | 0.13      | 0.06   |
| -100     | 0.80      | 0.32   | 0.35    | 0.14   | 0.27     | 0.11   | 0.16     | 0.06   | 0.08      | 0.03   |
| 0        | 0.30      | 0.12   | 0.15    | 0.06   | 0.10     | 0.04   | 0.06     | 0.02   | 0.03      | 0.01   |
| 100      | 0.80      | 0.30   | 0.35    | 0.13   | 0.27     | 0.11   | 0.16     | 0.05   | 0.08      | 0.03   |
| 200      | 1.30      | 0.48   | 0.55    | 0.20   | 0.44     | 0.16   | 0.25     | 0.10   | 0.13      | 0.05   |
| 300      | 1.80      | 0.64   | 0.75    | 0.27   | 0.60     | 0.21   | 0.36     | 0.13   | -         | -      |
| 400      | 2.30      | 0.79   | 0.95    | 0.33   | 0.77     | 0.26   | -        | -      | -         | -      |
| 500      | 2.80      | 0.93   | 1.15    | 0.38   | -        | -      | -        | -      | -         | -      |
| 600      | 3.30      | 1.06   | 1.35    | 0.43   | -        | -      | -        | -      | -         | -      |
| 650      | 3.60      | 1.13   | 1.45    | 0.46   | -        | -      | -        | -      | -         | -      |
| 700      | 3.80      | 1.17   | -       | -      | -        | -      | -        | -      | -         | -      |
| 800      | 4.30      | 1.28   | -       | -      | -        | -      | -        | -      | -         | -      |
| 850      | 4.60      | 1.34   | -       | -      | -        | -      | -        | -      | -         | -      |

#### NOTE

Tolerance is calculated to 2 decimal places and taken as a fraction. Class Be.

\* Tabulated values for close tolerance detectors are 1/2rd, 1/5th and 1/10th DIN interpolated and are for guidance only.

### Protective sheath:

In resistance thermometers, the size, diameter and type of the protective sheaths are selected depending on the process conditions. Inset sheaths are selected from 304 or 316 material. Selection of outer protective sheath should be chosen from different materials for each process. For this reason, please check the "Thermocouple Protective Sheath Selection" table in the thermocouple general information section for the selection of protective sheaths.

Chemical abrasions and mechanical abrasions in the process should be taken into consideration in the selection of protective sheaths. For an accurate temperature measurement in resistance thermometers, a minimum of 6 and a maximum of 15 times the outer diameters should be immersed in the process. In this way, the farthest element will enter the environment at a sufficient rate and will make the correct measurement. Resistance thermometers should be placed in the flow direction of the fluid in flowing processes.

The nominal resistance measurement point is determined at a distance of 8 mm from the end of the sensor body.

### Feature

DIN EN 60751 (According to IEC 751)  
Thin Film Element Features

### Temperature Range

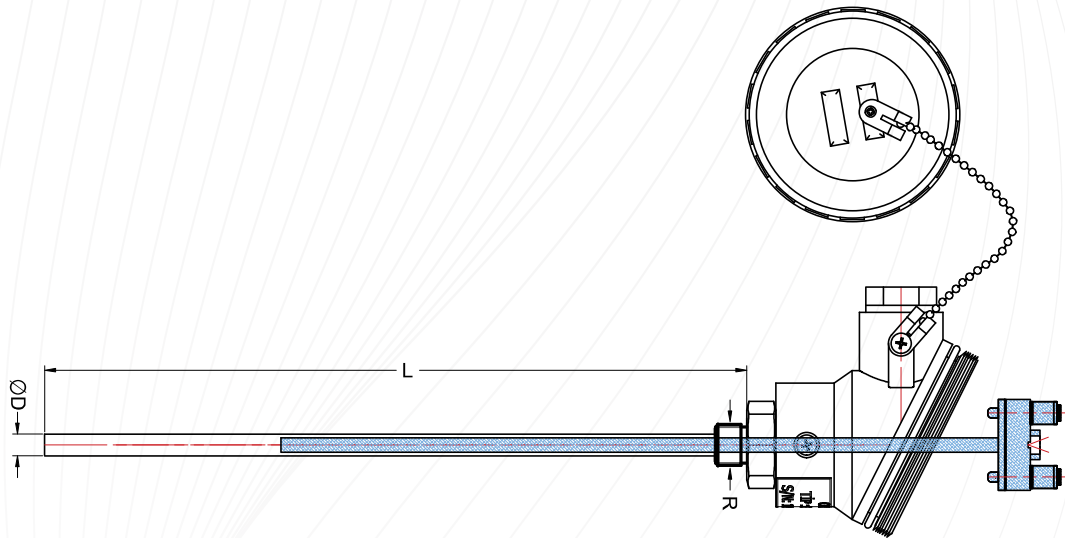
-70 °C to +150 °C (Continuous Usage)  
(It is possible to use it temporarily at 550 °C.)  
Tolerance Class B: -70 °C to +150 °C  
Tolerance Class A: -50 °C to +300 °C  
Tolerance Class 1/3 DIN: 0 °C to +150 °C

### Connection Cables:

Copper conductive cables are used between the device and the resistance thermometer in applications of resistance thermometers. Cables with 1.5mm<sup>2</sup> cross-section are preferred. Cable resistance will also have an effect on the measurement value. For this reason, in standard cable connections, a 2-wire cable is used for a distance of up to 10 m, a 3-wire cable for a distance of up to 150m, and a 4-wire cable for distances of more than 150m. In addition, the resistance / current converter method is often used for long distances.

### Resistance Thermometer Structure:

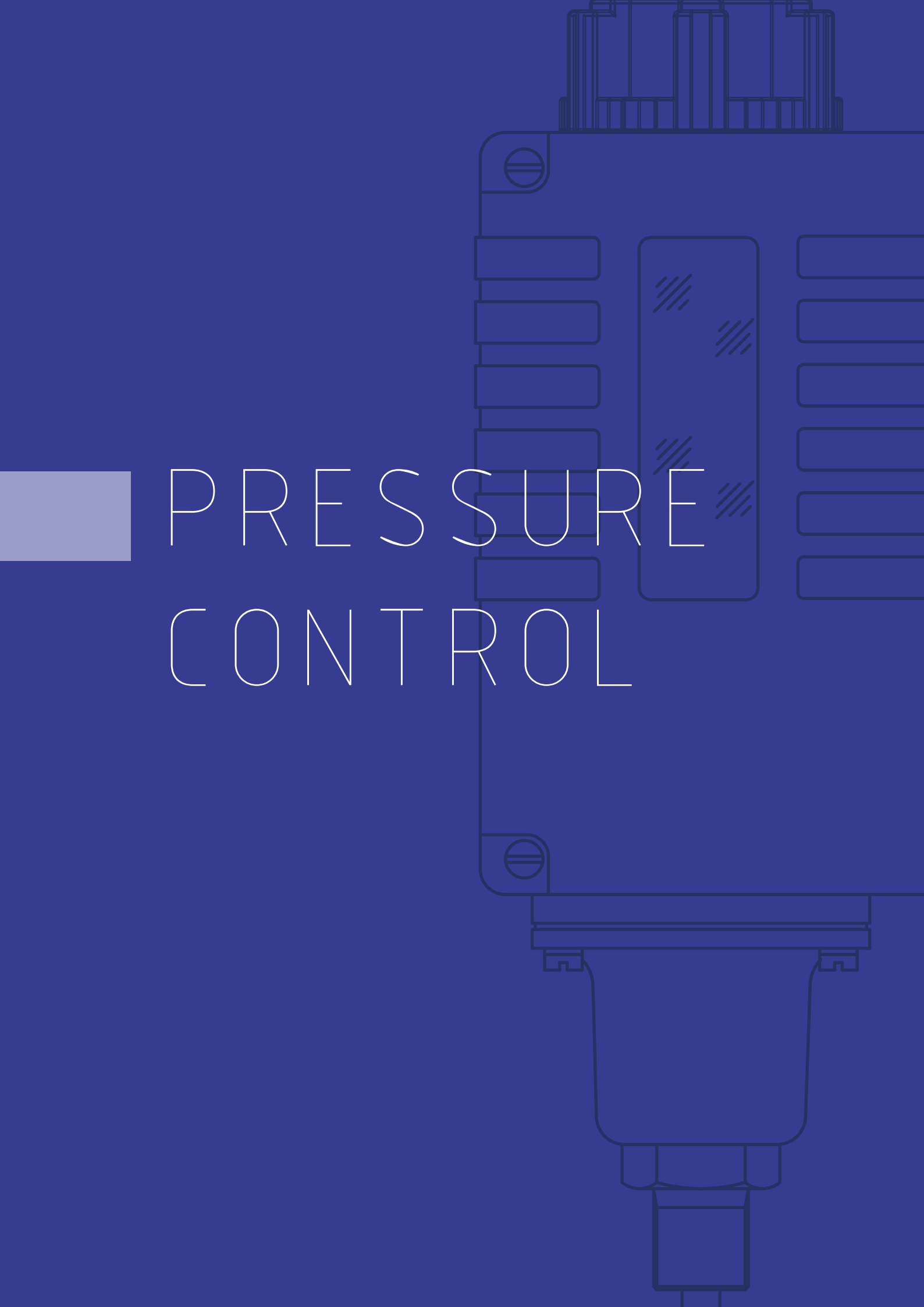
Resistance thermometers consist of connection head, protective sheath, inset and various connection parts. Resistance thermometer structure is given in Figure-1. Inset change is given in Figure-2.



| RESISTANCE THERMOMETER TOLERANCE TABLE (DIN 43760 and 751 STANDARD9) |        |        |        |        |        |        |        |        |        |        |
|----------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| °C                                                                   | 0      | -10    | -20    | -30    | -40    | -50    | -60    | -70    | -80    | -90    |
| -200                                                                 | 18,51  | -      | -      | -      | -      | -      | -      | -      | -      | -      |
| -100                                                                 | 60,27  | 56,18  | 52,11  | 48,01  | 43,86  | 39,73  | 35,55  | 31,34  | 27,11  | 22,82  |
| 0                                                                    | 100,00 | 96,10  | 92,17  | 88,22  | 84,28  | 80,32  | 76,31  | 72,32  | 68,32  | 64,31  |
| °C                                                                   | 0      | 10     | 20     | 30     | 40     | 50     | 60     | 70     | 80     | 90     |
| 0                                                                    | 100,00 | 103,90 | 107,80 | 111,66 | 115,53 | 119,41 | 123,23 | 127,07 | 130,91 | 134,72 |
| 100                                                                  | 138,52 | 142,30 | 146,08 | 149,82 | 153,57 | 157,32 | 161,06 | 164,78 | 168,48 | 172,17 |
| 200                                                                  | 175,86 | 179,54 | 183,20 | 186,85 | 190,47 | 194,11 | 197,71 | 201,32 | 204,90 | 208,48 |
| 300                                                                  | 212,04 | 215,61 | 219,16 | 222,69 | 226,22 | 229,72 | 233,23 | 236,71 | 240,19 | 243,65 |
| 400                                                                  | 247,09 | 250,53 | 253,96 | 257,37 | 260,77 | 264,17 | 267,56 | 270,93 | 274,29 | 277,65 |
| 500                                                                  | 280,98 | 284,30 | 287,62 | 290,92 | 294,21 | 297,48 | 300,75 | 304,02 | 307,25 | 310,50 |
| 600                                                                  | 313,71 | 316,92 | 320,12 | 323,30 | 326,48 | 329,64 | 332,79 | 335,93 | 339,06 | 342,18 |
| 700                                                                  | 345,28 | 348,38 | 351,46 | 354,53 | 357,59 | 360,64 | 363,67 | 366,70 | 369,71 | 372,71 |
| 800                                                                  | 375,70 | 378,78 | 381,65 | 384,60 | 387,55 | 390,48 | -      | -      | -      | -      |

**Note :** Resistance values of different resistance thermometer elements are obtained by multiplying the resistance values of the Pt-100 element by certain coefficients.

**Sample:** Pt-50 = Pt-100×1/2 equals. - Pt-500 = Pt-100×5 equals. - Pt-1000 = Pt-100×10 equals.



A technical line drawing of a pressure control valve assembly is shown on a dark blue background. The drawing includes a main valve body with a central rectangular section containing diagonal hatching. Above the body is a multi-port manifold with several vertical tubes. To the left of the main body is a vertical stack of five rectangular components. Below the main body is a horizontal flange with two mounting lugs, and further down is a vertical pipe with a flange and a smaller pipe at the bottom. The text 'PRESSURE CONTROL' is overlaid in white, with a light gray rectangular block to its left.

# PRESSURE CONTROL



## Pressure Transmitter

A pressure transmitter is a device that measures the pressure in a system and converts this pressure value into a standard electrical signal. This signal is then transmitted to control systems, indicators or recorders, allowing for the monitoring, control, or recording of the pressure.

**The Working principle of a pressure transmitter is as follows:**

Firstly, the pressure of the process fluid or gas is applied to the pressure sensor of the device. Subsequently, the pressure sensor generates an electrical signal directly proportional to this applied pressure; this signal can be in the form of a change in resistance, voltage, or capacitance. Next, the electronic circuit receives this weak and often nonlinear signal from the sensor. This signal is then amplified and linearized in a manner proportional to the pressure. In the final stage, this processed signal is converted into an industry-standard current or voltage signal and transmitted to control systems, indicators, or recorders.

## Pressure Switch

A pressure switch is a device that opens or closes an electrical circuit depending on the pressure of a fluid (liquid or gas). It functions as a safety mechanism or a control element in various systems.

**The working principle of a pressure switch is as follows:**

Pressure switches have a sensing element that detects pressure changes in the system. When this element is subjected to pressure, it changes shape or moves, and this mechanical motion is transferred to the electrical contacts inside the switch. When a specific setpoint is reached, these contacts either close to complete the circuit or open to break the circuit. Thanks to the adjustable setpoint found in many pressure switches, users can customize the pressure value at which the switch activates. Additionally, a feature known as hysteresis or deadband creates a small difference between the pressure at which the switch activates and the pressure at which it deactivates. This feature prevents rapid and unnecessary on-off cycles in the system.



## Pressure Transmitter



|                    |                             |
|--------------------|-----------------------------|
| Type               | : O - 10                    |
| Non Linearity      | : 0.5% BSFL                 |
| Wetted Parts       | : 316L                      |
| Case               | : 316L                      |
| Unit               | : Bar                       |
| Perm. Medium Temp. | : 0...+80 °C                |
| Process Connection | : G 1/4 A DIN EN ISO 1179-2 |

## Technical Specification

| Output Signal        |                                                                           |
|----------------------|---------------------------------------------------------------------------|
| Signal Type          |                                                                           |
| Current (2-wire)     | 4 ...20 mA                                                                |
| Voltage (3-wire)     | - DC 0.5 ... 4.5 V<br>- DC 0 ... 5 V<br>- DC 1 ... 5 V<br>- DC 0 ... 10 V |
| Ratiometric (3-wire) | DC 0.5 ... 4.5 V                                                          |
| Load in $\Omega$     |                                                                           |
| Current (2-wire)     | $\leq (\text{supply voltage} - 8 \text{ V}) / 0.02 \text{ A}$             |
| Voltage (3-wire)     | $> (\text{supply voltage} - 8 \text{ V}) / 0.02 \text{ A}$                |
| Ratiometric (3-wire) | $> 4.5 \text{ k } \Omega$                                                 |

| Measuring Ranges, Bar     |           |
|---------------------------|-----------|
| 0 ... 6 <sup>1) 2)</sup>  | 0 ... 100 |
| 0 ... 10 <sup>1) 2)</sup> | 0 ... 160 |
| 0 ... 16                  | 0 ... 250 |
| 0 ... 25                  | 0 ... 400 |
| 0 ... 40                  | 0 ... 600 |
| 0 ... 60                  |           |

| Output Signal                 |                                              |                  |
|-------------------------------|----------------------------------------------|------------------|
| Voltage Supply <sup>1)</sup>  |                                              |                  |
| Supply Voltage                | Output Signal 4 ...20 mA                     | DC 8 ... 30 V    |
|                               | Output Signal DC 0.5 ... 4.5 V               | DC 8 ... 30 V    |
|                               | Output Signal DC 0 ... 5 V                   | DC 8 ... 30 V    |
|                               | Output Signal DC 1 ... 5 V                   | DC 8 ... 30 V    |
|                               | Output Signal DC 0 ... 10 V                  | DC 14 ... 30 V   |
|                               | Output Signal DC 0.5 ... 4.5 V (Ratiometric) | DC 5 V $\pm$ 10% |
| Current Supply                | Current (2-Wire)                             |                  |
|                               | Voltage (3-Wire)                             |                  |
| Overvoltage protection        |                                              | DC 36 V          |
| Dynamic Behaviour             |                                              |                  |
| Settling Time per IEC 61298-2 | < 2 ms                                       |                  |



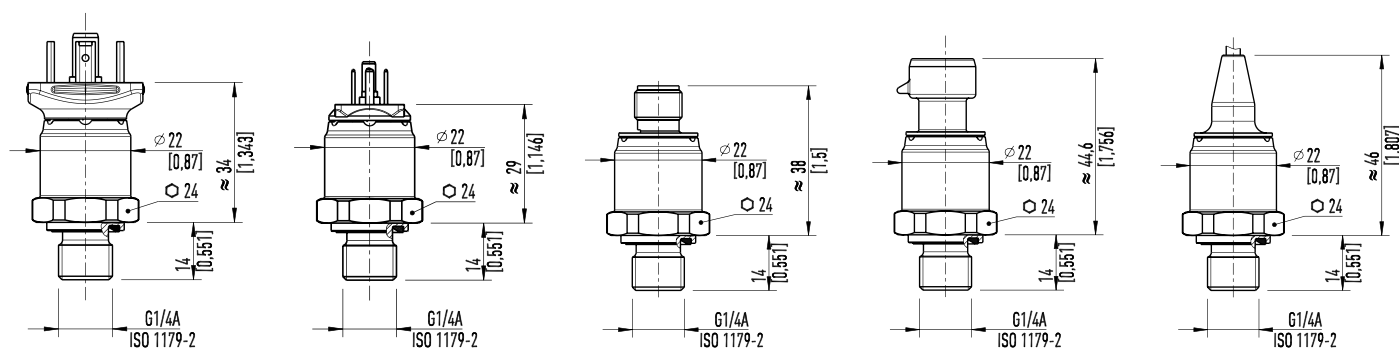
# TECHNICAL SPECIFICATION

## A-10 Pressure Transmitter

| Process Connection                         |                             |                      |                        |                                              |
|--------------------------------------------|-----------------------------|----------------------|------------------------|----------------------------------------------|
| Standard                                   | Thread Size                 | Max. Measuring range | Overpressure Limit     | Sealing                                      |
| EN 837                                     | G 1/8 B                     | 400 bar [5,800 psi]  | 572 bar [8,290 psi]    | -                                            |
|                                            | G 1/4 B                     | 600 bar [8,700 psi]  | 1,200 bar [17,400 psi] |                                              |
|                                            | G 1/4 Female Thread         | 600 bar [8,700 psi]  | 1,200 bar [17,400 psi] |                                              |
|                                            | G 3/8 B                     | 600 bar [8,700 psi]  | 1,200 bar [17,400 psi] |                                              |
| DIN EN ISO 1179-2<br>(Formerly DIN 3852-E) | G 1/4 A                     | 600 bar [8,700 psi]  | 858 bar [12,400 psi]   | -NBR <sup>1)</sup><br>-FPM/FKM <sup>2)</sup> |
| DIN EN ISO 9974-2<br>(Formerly DIN 3852-E) | M14 x 1.5                   | 600 bar [8,700 psi]  | 858 bar [12,400 psi]   |                                              |
| ANSI/ASME B1.20.1                          | 1/8 NPT                     | 400 bar [5,800 psi]  | 572 bar [8,290 psi]    | -                                            |
|                                            | 1/4 NPT                     | 600 bar [8,700 psi]  | 1,200 bar [17,400 psi] |                                              |
|                                            | 1/4 NPT Female Thread       | 600 bar [8,700 psi]  | 1,200 bar [17,400 psi] |                                              |
| SAE J514 E                                 | 7/16-20 UNF-2A, O-ring BOSS | 600 bar [8,700 psi]  | 858 bar [12,400 psi]   | -FPM/FKM <sup>2)</sup>                       |
|                                            | 9/16-20 UNF-2A, O-ring BOSS | 600 bar [8,700 psi]  | 858 bar [12,400 psi]   |                                              |

| Operating Conditions                   |                                   |
|----------------------------------------|-----------------------------------|
| Medium Temperature Limit               | -30 ... +100 °C [-22 ... +212 °F] |
| Ambient Temperature Limit              | -30 ... +100 °C [-22 ... +212 °F] |
| Storage Temperature Limit              | -30 ... +100 °C [-22 ... +212 °F] |
| Vibration Resistance per IEC 60068-2-6 | 20 g (20 ... 2,000 Hz, 120 min)   |
| Shock Resistance per IEC 60068-2-27    | 40 g (6 ms), Mechanical Shoc      |
| Free Fall per IEC 60068-2-31           | 1 m                               |
| Service Life                           | 10 Million Load Cycles            |

### Dimensions in mm [in]



## Pressure Switch



|                          |                                                                           |
|--------------------------|---------------------------------------------------------------------------|
| Type                     | : PSM - 550                                                               |
| Units                    | : Bar, psi                                                                |
| Switching function       | : Single pole double throw (SPDT)                                         |
| Differential /hysteresis | : Adjustable                                                              |
| Process connections      | : G 3/8" B                                                                |
| Non-repeatability        | : ≤ %1                                                                    |
| Electrical Connection    | : Cable gland ½ NPT                                                       |
| Protection Class         | : IP 67                                                                   |
| Details                  | : For further details please see data sheet PV 35.01                      |
| Approvals                | : EU declaration of conformity, Low voltage directive, RoHS directive     |
| Applications             | : Boilers, Pumps, Lubrication Systems, Hydraulic Systems, Autoclaves etc. |

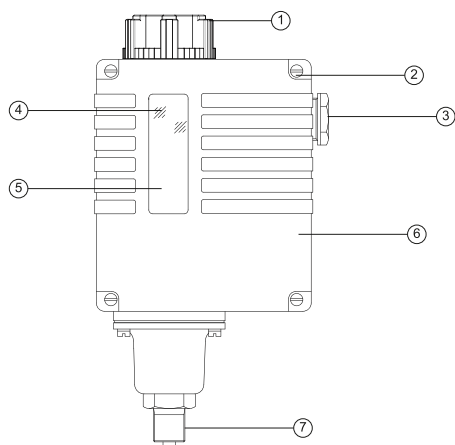
## Pressure Switch



|                          |                                                                       |
|--------------------------|-----------------------------------------------------------------------|
| Type                     | : PSM - 520                                                           |
| Units                    | : Bar, psi                                                            |
| Switching function       | : Single pole double throw (SPDT)                                     |
| Differential /hysteresis | : Adjustable                                                          |
| Process connections      | : G ¼ female, G ¼ B                                                   |
| Non-repeatability        | : ≤ 2 %                                                               |
| Electrical Connection    | : Rubber grommet for cables Ø 6 ... 14 mm                             |
| Protection Class         | : IP 30                                                               |
| Details                  | : For further details please see data sheet PV 35.01                  |
| Approvals                | : EU declaration of conformity, Low voltage directive, RoHS directive |
| Applications             | : Steam Generators, Pumps, Compressors etc.                           |

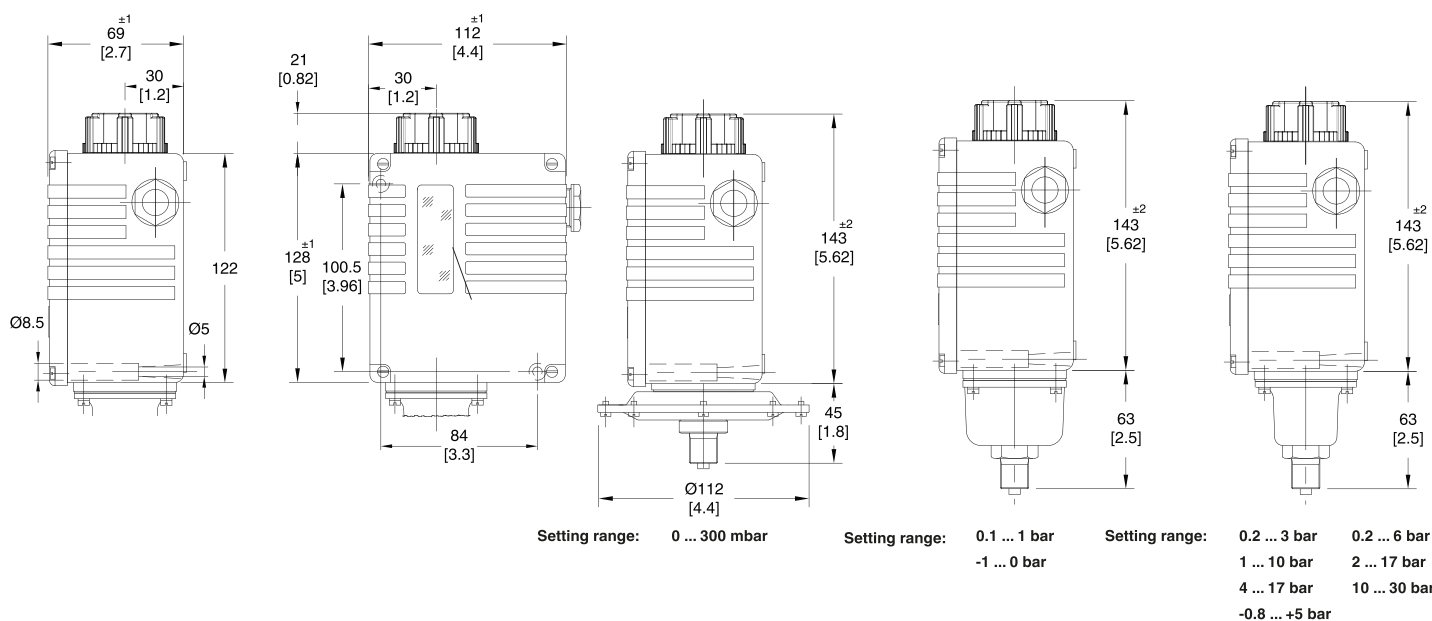
# TECHNICAL SPECIFICATION

## PSM 550 Pressure Switch



| No | Part                                    |
|----|-----------------------------------------|
| 1  | Switch point setting                    |
| 2  | 4 mounting screws for plastic cover     |
| 3  | Electrical connection                   |
| 4  | Switch point setting display            |
| 5  | Range of adjustable switch differential |
| 6  | Removable plastic cover                 |
| 7  | Process connection                      |

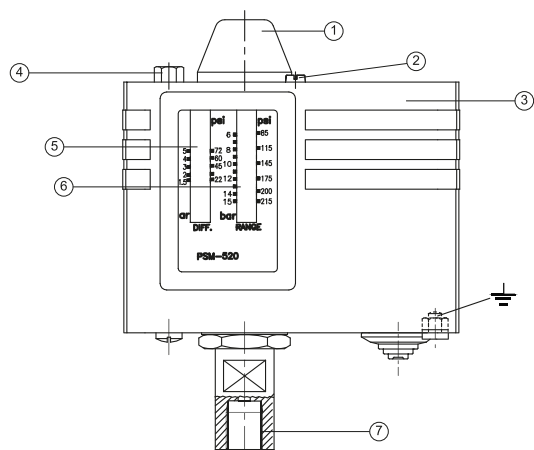
## Dimensions in mm [in]



| Unit | Setting Range <sup>1)</sup> | Permissible Switch Point On Rising Pressure | Permissible Switch Point On Falling Pressure | Adjustable Switch Differential <sup>2)</sup> | Max. Working Pressure Depending On Measuring Element |                         |                |
|------|-----------------------------|---------------------------------------------|----------------------------------------------|----------------------------------------------|------------------------------------------------------|-------------------------|----------------|
|      |                             |                                             |                                              |                                              | Bellow, Copper Alloy                                 | Bellow, Stainless Steel | Diaphragm, Nbr |
| mbar | 0...300                     | 30...300                                    | 0...250                                      | 10...50                                      | -                                                    | -                       | 500            |
| bar  | 0.1...1.1                   | 0.17...1.1                                  | 0.1...0.94                                   | 0.07...0.16                                  | 7                                                    | 7                       | -              |
|      | 0.2...3                     | 0.32...3                                    | 0.2...2.25                                   | 0.12...0.75                                  | 7                                                    | 7                       | -              |
|      | 0.2...6                     | 0.45...6                                    | 0.2...4.8                                    | 0.25...1.2                                   | 15                                                   | 25                      | -              |
|      | 1...10                      | 1.3...10                                    | 1...8.7                                      | 0.3...1.3                                    | 16                                                   | 25                      | -              |
|      | 2...17                      | 2.3...17                                    | 2...15                                       | 0.3...2                                      | -                                                    | 25                      | -              |
|      | 4...17                      | 5.2...17                                    | 4...13                                       | 1.2...4                                      | 25                                                   | 25                      | -              |
|      | 10...30                     | 11...30                                     | 10...26                                      | 1...4                                        | 45                                                   | 45                      | -              |
|      | -1...0                      | -0.91...0                                   | -1...-0.4                                    | 0.09...0.4                                   | 7                                                    | 7                       | -              |
|      | -0.8...+5                   | -0.3...+5                                   | -0.8...+3                                    | 0.5...2                                      | 15                                                   | 25                      | -              |

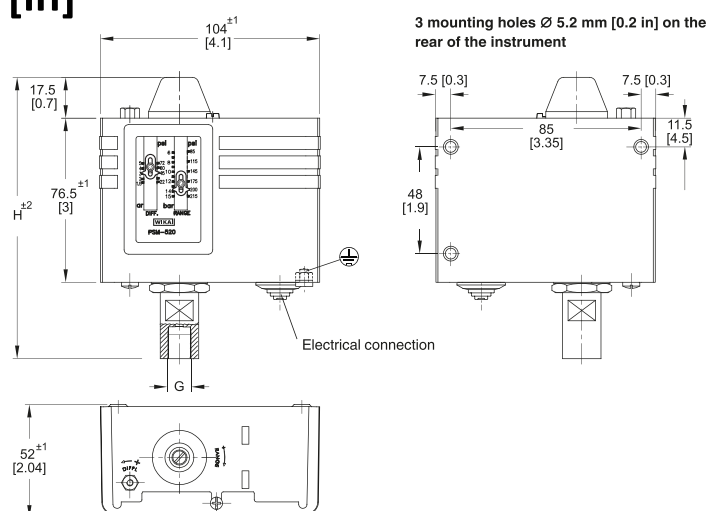
# TECHNICAL SPECIFICATION

## PSM 520 Pressure Switch



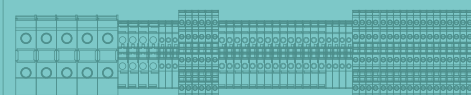
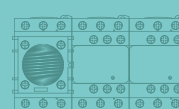
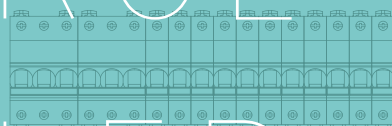
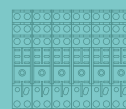
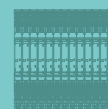
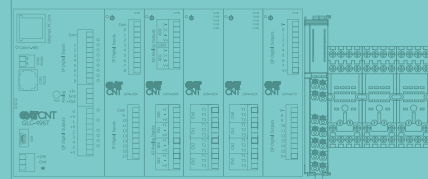
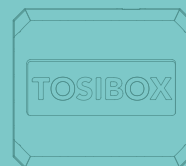
| No | Part                                    |
|----|-----------------------------------------|
| 1  | Protection cap for switch point setting |
| 2  | Screw for fixing the plastic cover      |
| 3  | Removable plastic cover                 |
| 4  | Switch differential adjustment          |
| 5  | Switch differential setting display     |
| 6  | Switch point setting display            |
| 7  | Process connection                      |

## Dimensions in mm [in]



| Unit | Setting range 1) | Permissible switch point on rising pressure | Adjustable switch differential 2) | Max. working pressure |
|------|------------------|---------------------------------------------|-----------------------------------|-----------------------|
| bar  | 0...5            | 0.4...5                                     | 0.4...4                           | 16                    |
|      | 0...7            | 0.6...7                                     | 0.6...6                           | 16                    |
|      | 6...15           | 7.5...15                                    | 1.5...5                           | 32                    |
|      | 6...30           | 9...30                                      | 3...8                             | 42                    |
|      | -0.4...+7        | 0.2...7                                     | 0.6...6                           | 16                    |
| MPa  | 0...0.5          | 0.04...0.5                                  | 0.04...0.4                        | 1.6                   |
|      | 0...0.7          | 0.06...0.7                                  | 0.06...0.6                        | 1.6                   |
|      | 0.6...1.5        | 0.75...1.5                                  | 0.15...0.5                        | 3.2                   |
|      | 0.6...3          | 0.9...3                                     | 0.3...0.8                         | 4.2                   |
|      | -0.04...+0.7     | 0.02...0.7                                  | 0.06...0.6                        | 1.6                   |
| psi  | 0...70           | 6...70                                      | 6...55                            | 230                   |
|      | 0...100          | 9...100                                     | 9...85                            | 230                   |
|      | 85...215         | 107...215                                   | 22...72                           | 450                   |
|      | 85...425         | 130...425                                   | 45...115                          | 610                   |
|      | -6...+100        | 3...100                                     | 9...85                            | 230                   |

# VIRA CONTROL STEAM BOILER CONTROL CABINET



# Boiler Operation without Constant Supervision

## 1. Introduction - Historical Background

For many years, the operation and safety of steam boilers in Europe were governed by the TRD regulations (Technische Regeln für Dampfkessel). Standards such as TRD 401 and TRD 604 defined the necessary safety equipment, control systems, and inspection requirements for boilers operating either without constant supervision or with only periodic attendance. These regulations ensured a high level of operational safety; however, due to the presence of different national rules across Europe, there was no unified framework that could be applied consistently in all countries.

## 2. Transition to European Standards

Over time, the need for harmonization became evident, leading to the withdrawal of the TRD regulations and their replacement by the European standards EN 12952 (for water-tube boilers) and EN 12953 (for shell boilers). The EN 12953-1:2002 standard was officially published on 14 June 2002, marking a significant milestone in this transition. As national regulations like TRD 401 and 604 were phased out, these EN standards became the harmonized reference across Europe. These standards consolidated the requirements for boiler equipment, safety functions, and operating conditions under a common European framework. As a result, they provided a single reference point for both manufacturers and operators. Furthermore, EN 12952 and EN 12953 were developed in line with the Pressure Equipment Directive (PED 2014/68/EU), ensuring compliance with CE marking requirements and creating consistency in boiler safety practices across Europe.

## 3. EN 12952 and EN 12953 – Operation without Constant Supervision

Both EN 12952-7 (Water-tube boilers – Requirements for equipment for the boiler) and EN 12953-6 (Shell boilers – Requirements for equipment for the boiler) include dedicated provisions that define the conditions under which boilers can be operated without constant supervision.

These sections specify the equipment and safety functions required for up to 72 hours of unattended operation, ensuring that boilerhouses can be operated safely and efficiently under standardized European rules.

Key requirements include:

- Reliable level control systems (both modulating and on-off), supported by level alarms and limiters.
- TDS (Total Dissolved Solids) control and surface blowdown systems to prevent scaling and corrosion.
- Automatic bottom blowdown for effective removal of sludge and sediments.
- Overpressure protection through certified safety valves.
- Overtemperature protection to prevent thermal damage.
- Control devices with self-monitoring capabilities and built-in test functions to ensure continuous reliability.

#### 4. Requirements for Unattended Operation

In order for a boiler to be operated without constant supervision for up to 72 hours, EN 12952 and EN 12953 define a number of strict technical requirements. These requirements ensure that the boiler remains safe and reliable even in the absence of continuous operator presence.

The main requirements can be summarized as follows:

**Redundant level limiter systems:** At least two independent devices must be installed to monitor and limit the boiler water level.

**Self-monitoring and fail-safe design:** Control and limiting devices must have the ability to continuously monitor their own functionality and automatically move to a safe state in case of failure.

**Automatic blowdown systems:** Both surface TDS blowdown and bottom blowdown must be automated to guarantee water quality and prevent scaling or sludge accumulation.

**Overpressure and overtemperature protection:** Certified safety valves and temperature limiters are required to protect the boiler against dangerous operating conditions.

**Alarm and recording functions:** Any fault, deviation, or limit exceedance must be automatically recorded and transmitted to external alarm systems, ensuring timely intervention.

**Periodic testing requirements:** The standards mandate regular functional checks of safety devices to verify that they remain fully operational throughout the service life of the boiler.

Together, these requirements form the foundation for safe 72h unattended boiler operation, creating a standardized approach across Europe in line with the Pressure Equipment Directive (PED 2014/68/EU).

#### 5. Conclusion – Vira's Approach

The transition from TRD regulations to the harmonized EN 12952 and EN 12953 standards has established a unified and reliable framework for boiler operation without constant supervision. These standards define strict requirements for safety equipment, control systems, and monitoring functions to enable safe 72h unattended operation.

At Vira, we ensure that our products are fully aligned with these international standards. Our portfolio includes:

Self-monitoring high and low level limiters (SMH 1000, SML 1000), designed to meet the redundancy and fail-safe requirements of EN standards.

Vira level controllers and SD series level probes, providing accurate on-off and modulating water level control.

Vira TDS controllers and BS series blowdown systems, ensuring water quality through automated surface and bottom blowdown.

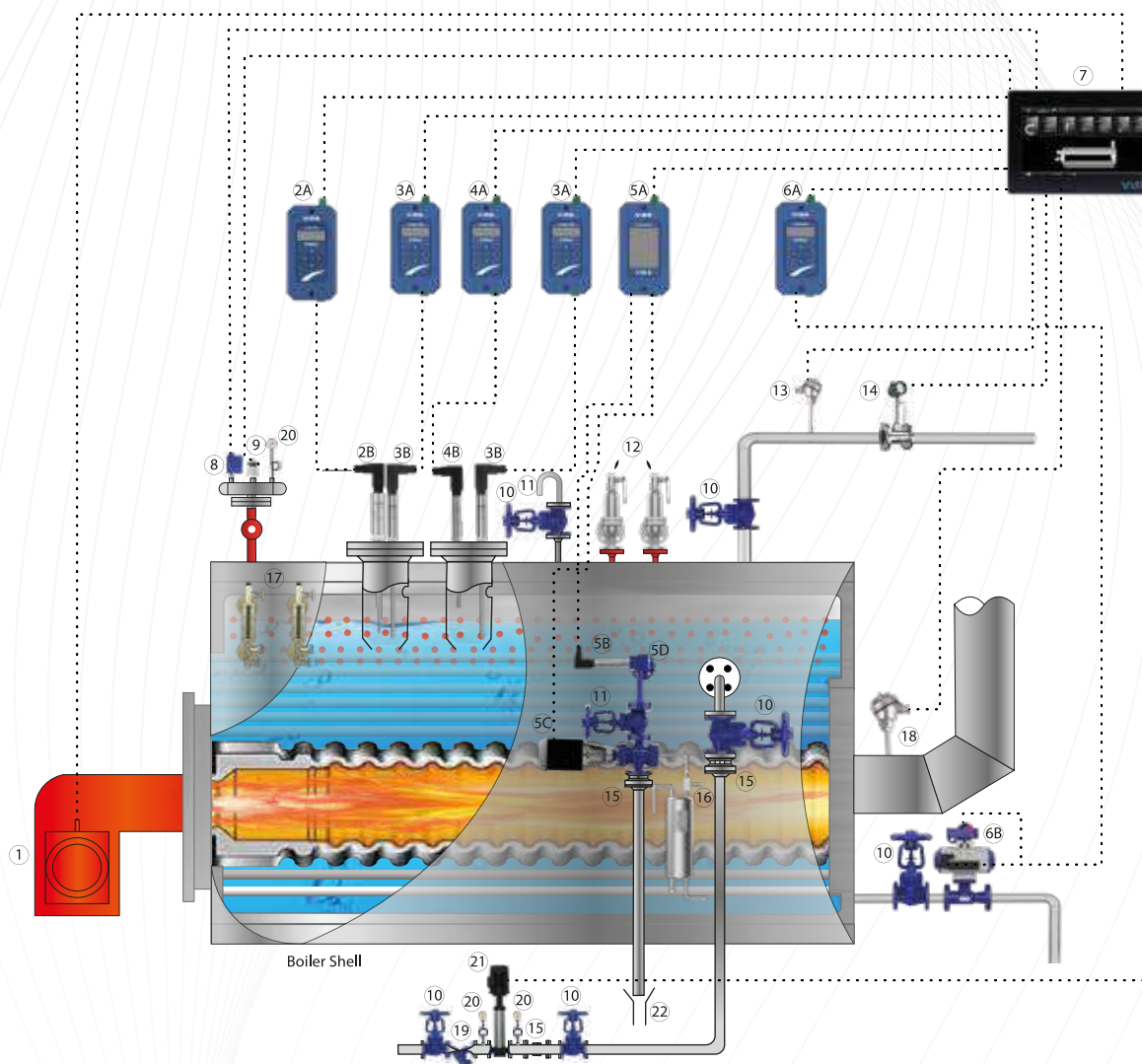
Certified safety equipment, all manufactured in compliance with PED 2014/68/EU, CE marking, and EMC/LVD directives.

With millions of references worldwide and a proven track record in safety, reliability, and efficiency, Vira provides complete solutions that enable boiler manufacturers and operators to meet the requirements of EN 12952 and EN 12953. Our systems guarantee not only compliance but also extended boiler lifetime, reduced operating costs, and maximum operational safety.



# Equipments Required for 72h Unattended Boiler Operation

## Application with On-Off Level Control System

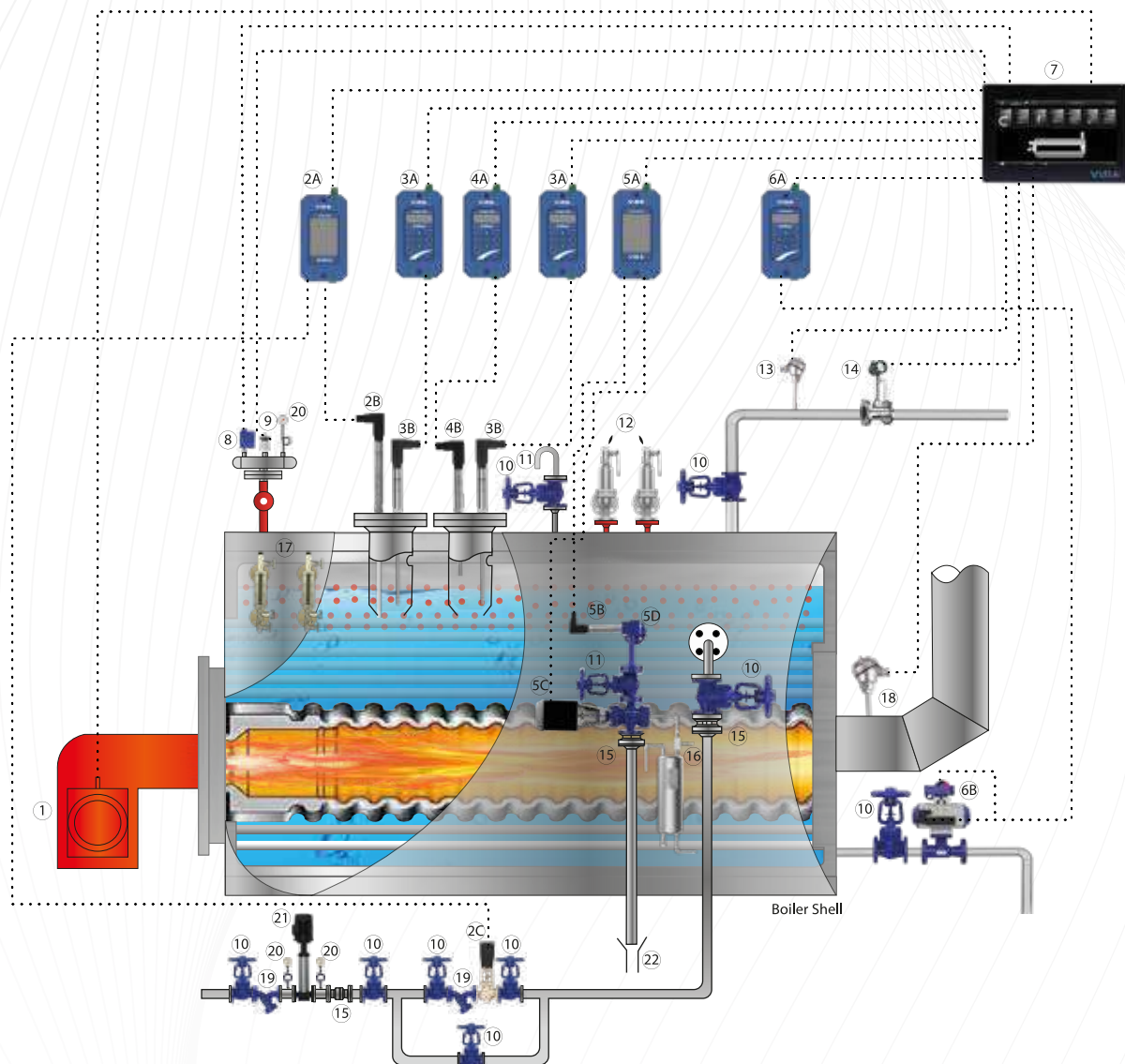


| No | Part                                                                                                                                                                             |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Burner                                                                                                                                                                           |
| 2  | D-SK 2000 On-Off Level Control & Alarm System<br>A: D-SK 2400 On-Off Level Control & Alarm Controller<br>B: SD 2400 On-Off Level Control & Alarm Probe                           |
| 3  | D-SML 1000 Low Level Limiter * 2 Pcs<br>A: D-SMK 1000 Low Level Limiter Controller<br>B: SMLD 1000 Low Level Limiter Probe                                                       |
| 4  | D-SMH High Level Limiter<br>A: D-SMK 1000 High Level Limiter Controller<br>B: SMHD 1000 High Level Limiter Probe                                                                 |
| 5  | D-BS4-T TDS Blowdown System<br>A: D-BK 5000-T Conductivity/TDS Controller<br>B: BD 5600-T Conductivity/TDS Probe<br>C: BKV 5400 Cont. Blowdown Valve<br>D: DG 5400 Probe Housing |
| 6  | D-DB2 Intermittent Blowdown System<br>A: D-BK 4000 Intermittent Blowdown Controller<br>B: BKV 4000 Intermittent Blowdown Valve                                                   |
| 7  | Boiler Control Cabinet<br>ViRAControl Steam Boiler Control Panel                                                                                                                 |
| 8  | Pressure Switch * 2 Pcs<br>PSM 550 Pressure Switch                                                                                                                               |
| 9  | Pressure Transmitter * 2 Pcs<br>O-10 Pressure Transmitter                                                                                                                        |

| No | Part                                                              |
|----|-------------------------------------------------------------------|
| 10 | Stop Valve                                                        |
| 11 | Air Vent                                                          |
| 12 | Safety Valve * 2 Pcs                                              |
| 13 | Steam Temperature Sensor<br>VR02 Resistance Temperature Sensor    |
| 14 | Steam Flow Meter<br>VXW Vortex Steam Flow Meter                   |
| 15 | Checkvalve                                                        |
| 16 | Sample Cooler<br>NK 20 Sample Cooler                              |
| 17 | Reflex Level Gauge * 2 Pcs<br>VRLG Reflex Level Gauge             |
| 18 | Flue Gas Temperature Sensor<br>VR03 Resistance Temperature Sensor |
| 19 | Strainer                                                          |
| 20 | Pressure Gauge                                                    |
| 21 | Feedwater Pump                                                    |
| 22 | Blowdown Vessel<br>VBV Blowdown Vessel                            |

# Equipments Required for 72h Unattended Boiler Operation

## Application with Modulating Level Control System

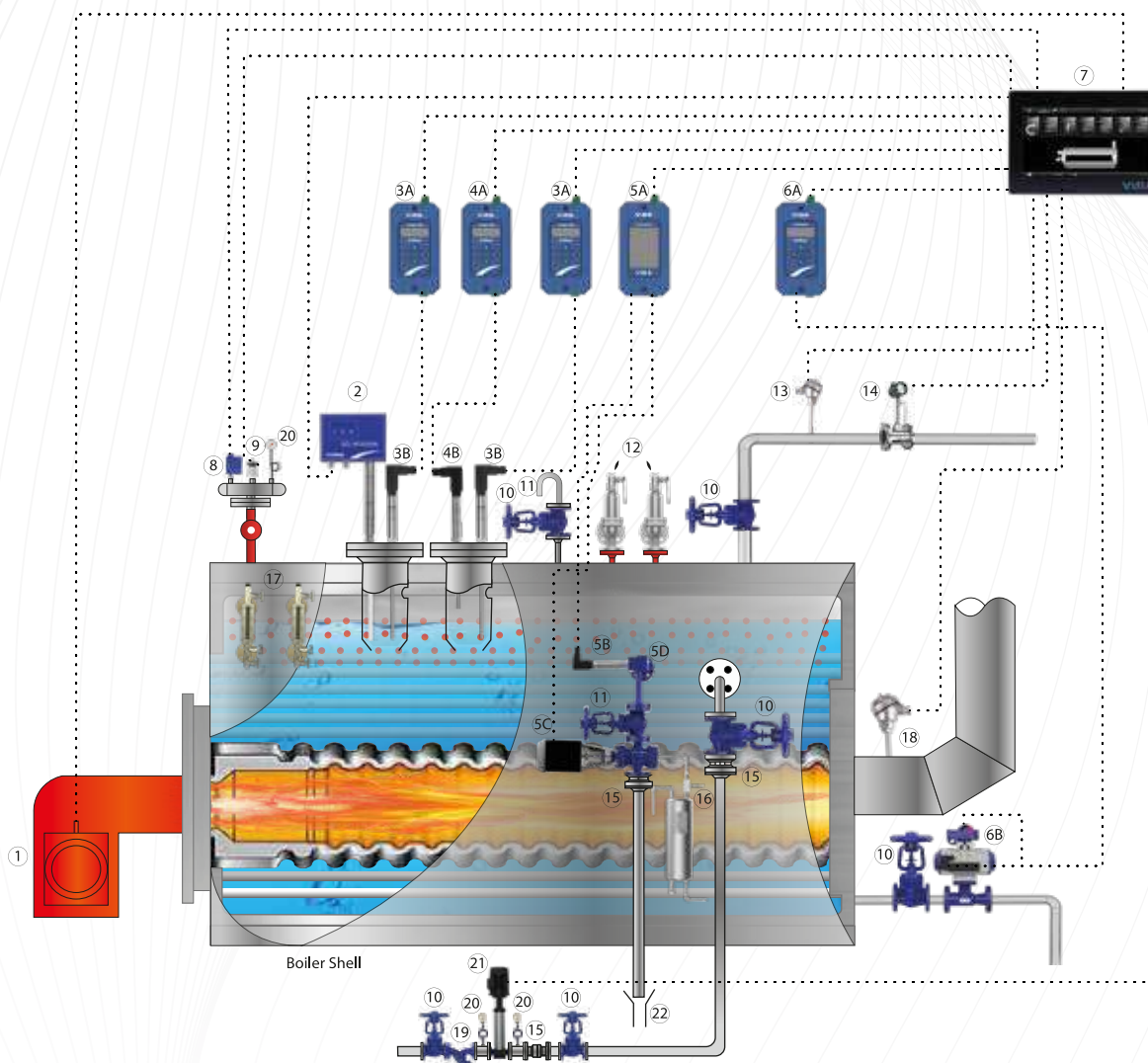


| No | Part                                                                                                                                                                                                        |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Burner                                                                                                                                                                                                      |
| 2  | D-SK 3000 Modulation Level Control & Alarm System<br>A: D-SK 3400 Modulating Level Control & Alarm Controller<br>B: SD 3400 Modulating Level Control & Alarm Probe<br>C: SKV 3400-2 Feedwater Control Valve |
| 3  | D-SML 1000 Low Level Limiter * 2 Pcs<br>A: D-SMK 1000 Low Level Limiter Controller<br>B: SMLD 1000 Low Level Limiter Probe                                                                                  |
| 4  | D-SMH High Level Limiter<br>A: D-SMK 1000 High Level Limiter Controller<br>B: SMHD 1000 High Level Limiter Probe                                                                                            |
| 5  | D-BS4-T TDS Blowdown System<br>A: D-BK 5000-T Conductivity/TDS Controller<br>B: BD 5600-T Conductivity/TDS Probe<br>C: BKV 5400 Cont. Blowdown Valve<br>D: DG 5400 Probe Housing                            |
| 6  | D-DB2 Intermittent Blowdown System<br>A: D-BK 4000 Intermittent Blowdown Controller<br>B: BKV 4000 Intermittent Blowdown Valve                                                                              |
| 7  | Boiler Control Cabinet<br>ViraControl Steam Boiler Control Panel                                                                                                                                            |
| 8  | Pressure Switch * 2 Pcs<br>PSM 550 Pressure Switch                                                                                                                                                          |

| No | Part                                                              |
|----|-------------------------------------------------------------------|
| 9  | Pressure Transmitter * 2 Pcs<br>O-10 Pressure Transmitter         |
| 10 | Stop Valve                                                        |
| 11 | Air Vent                                                          |
| 12 | Safety Valve * 2 Pcs                                              |
| 13 | Steam Temperature Sensor<br>VR02 Resistance Temperature Sensor    |
| 14 | Steam Flow Meter<br>VXW Vortex Steam Flow Meter                   |
| 15 | Checkvalve                                                        |
| 16 | Sample Cooler<br>NK 20 Sample Cooler                              |
| 17 | Reflex Level Gauge * 2 Pcs<br>VRLG Reflex Level Gauge             |
| 18 | Flue Gas Temperature Sensor<br>VR03 Resistance Temperature Sensor |
| 19 | Strainer                                                          |
| 20 | Pressure Gauge                                                    |
| 21 | Feedwater Pump                                                    |
| 22 | Blowdown Vessel<br>VBV Blowdown Vessel                            |

# Equipments Required for 72h Unattended Boiler Operation

## Application with Capacitive Level Transmitter



| No | Part                                                                                                                                                                                                           |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Burner                                                                                                                                                                                                         |
| 2  | Level Transmitter<br><i>SD-AY420A Capacitive Level Transmitter</i>                                                                                                                                             |
| 3  | D-SML 1000 Low Level Limiter * 2 Pcs<br><i>A: D-SMK 1000 Low Level Limiter Controller</i><br><i>B: SMLD 1000 Low Level Limiter Probe</i>                                                                       |
| 4  | D-SMH High Level Limiter<br><i>A: D-SMK 1000 High Level Limiter Controller</i><br><i>B: SMHD 1000 High Level Limiter Probe</i>                                                                                 |
| 5  | D-BS4-T TDS Blowdown System<br><i>A: D-BK 5000-T Conductivity /TDS Controller</i><br><i>B: BD 5600-T Conductivity /TDS Probe</i><br><i>C: BKV 5400 Cont. Blowdown Valve</i><br><i>D: DG 5400 Probe Housing</i> |
| 6  | D-DB2 Intermittent Blowdown System<br><i>A: D-BK 4000 Intermittent Blowdown Controller</i><br><i>B: BKV 4000 Intermittent Blowdown Valve</i>                                                                   |
| 7  | Boiler Control Cabinet<br><i>ViraControl Steam Boiler Control Panel</i>                                                                                                                                        |
| 8  | Pressure Switch * 2 Pcs<br><i>PSM 550 Pressure Switch</i>                                                                                                                                                      |
| 9  | Pressure Transmitter * 2 Pcs<br><i>O-10 Pressure Transmitter</i>                                                                                                                                               |

| No | Part                                                                     |
|----|--------------------------------------------------------------------------|
| 10 | Stop Valve                                                               |
| 11 | Air Vent                                                                 |
| 12 | Safety Valve * 2 Pcs                                                     |
| 13 | Steam Temperature Sensor<br><i>VR02 Resistance Temperature Sensor</i>    |
| 14 | Steam Flow Meter<br><i>VXW Vortex Steam Flow Meter</i>                   |
| 15 | Checkvalve                                                               |
| 16 | Sample Cooler<br><i>NK 20 Sample Cooler</i>                              |
| 17 | Reflex Level Gauge * 2 Pcs<br><i>VRLG Reflex Level Gauge</i>             |
| 18 | Flue Gas Temperature Sensor<br><i>VR03 Resistance Temperature Sensor</i> |
| 19 | Strainer                                                                 |
| 20 | Pressure Gauge                                                           |
| 21 | Feedwater Pump                                                           |
| 22 | Blowdown Vessel<br><i>VBV Blowdown Vessel</i>                            |

## "ViraControl" Steam Boiler Control Panel



ViraControl is an advanced central control system designed for the safe, efficient, and user-friendly operation of steam boiler plants. It integrates all essential boiler functions – water level control, blowdown management, feedwater regulation, burner control, and alarm systems – into a single intelligent platform. With its modular structure and compatibility with Vira's complete range of boiler control equipment, ViraControl ensures seamless operation and compliance with EN 12952 / EN 12953 standards.



### Features

#### 7" or 10" HMI Touch Screen

High-resolution interface for monitoring and control of all boiler functions. Multi-language, password-protected, and intuitive navigation.

#### PLC-Based Architecture

Industrial PLC ensuring reliable and flexible operation for on-off or modulating systems.

#### Remote Access & Connectivity

Ethernet and USB ports as standard; optional internet-based remote support. Modbus TCP/RTU compatible.

#### Integrated Safety Chain

Monitors all critical safety devices such as level limiters, pressure switches, and emergency circuits in compliance with EN 12953.

#### Cascade Operation

Supports master-slave control for multi-boiler systems, providing load sharing and sequencing for optimum efficiency.

#### Comprehensive Process Control

Integration with burner, feedwater, blowdown, conductivity, economizer, and condensate tank control units.

#### Data Logging & Trend Monitoring

Records process values such as pressure, temperature, level, and conductivity for performance analysis.

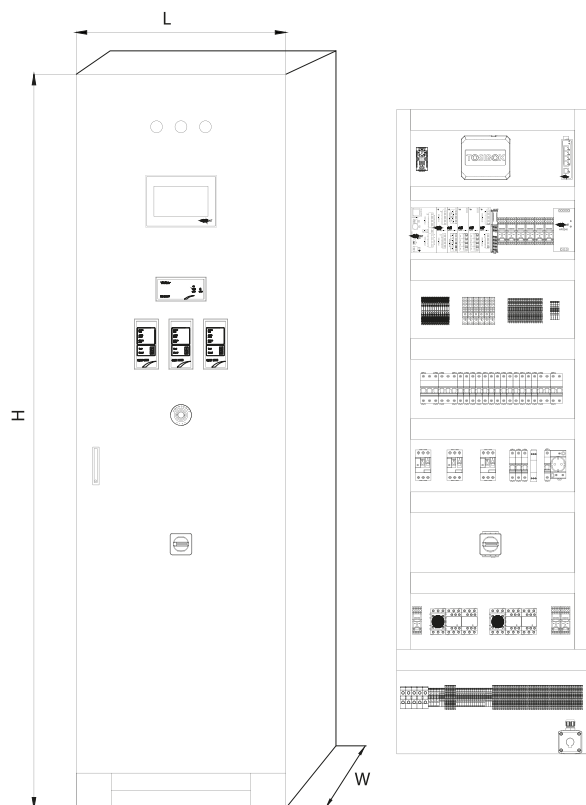
#### Alarm & Protection System

Visual and audible alarm management with detailed error codes and reset logic for safe operation.



# TECHNICAL SPECIFICATION

## "ViraControl" Steam Boiler Control Panel

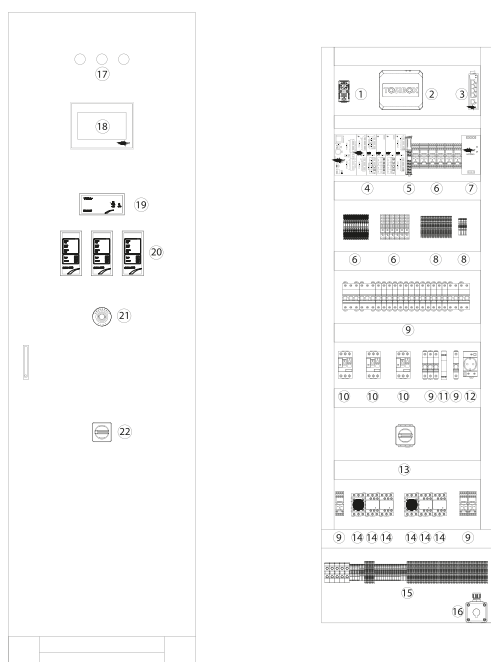


### Technical Data

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of Mounting</b>      | Floor-standing                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Construction Material</b> | Pre-galvanized steel sheet                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Color</b>                 | Standard RAL 7035 (Grey)                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Paint</b>                 | Epoxy - polyester powder paint                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Cooling</b>               | Fan-assisted                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Supply Voltage</b>        | 400/230VAC, 50/60Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Switchgear</b>            | Thermal magnetic circuit breaker, fuses, motor protection circuit breakers                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Cabling</b>               | NYAF / H07V-K type, heat shrinking tube labeled                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Terminal Blocks</b>       | Screw type, DIN rail mounting, numbered                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Control Device</b>        | Programmable logic controller                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Display</b>               | 7" (or 10") TFT 1024x600 touch operator panel                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Functions</b>             | <ul style="list-style-type: none"> <li>-Burner modulation control (4-20mA/3-point step)</li> <li>-Boiler water level control</li> <li>-Boiler water conductivity control (via blowdown controller)</li> <li>-Boiler bottom blowdown control</li> <li>-Condensate tank water level control</li> <li>-Boiler self-monitoring low-level and high-level limiter system</li> <li>- Monitoring steam boiler parameters</li> <li>-Continuous alarm detection system</li> </ul> |
| <b>Remote Access</b>         | Provided for diagnostics, troubleshooting, commissioning purposes.                                                                                                                                                                                                                                                                                                                                                                                                      |

### Dimensions

| H (mm) | L (mm) | W (mm) |
|--------|--------|--------|
| 2100   | 600    | 500    |



| No | Part                              |
|----|-----------------------------------|
| 1  | Thermostat switch                 |
| 2  | Remote Access Device              |
| 3  | Ethernet Switch                   |
| 4  | PLC                               |
| 5  | Safety Relay                      |
| 6  | Relays                            |
| 7  | Power Source                      |
| 8  | Distribution Clamps               |
| 9  | Insurance                         |
| 10 | Motor Protection Switch           |
| 11 | Phase Control Relay               |
| 12 | Socket                            |
| 13 | Load Separator Pako Switch Socket |
| 14 | Contactors                        |
| 15 | Field Clamps                      |
| 16 | Ethernet Port                     |
| 17 | R-S-T Lamp                        |
| 18 | HMI Screen                        |
| 19 | Surface Bluff Controller          |
| 20 | Level Alarm Controller            |
| 21 | Emergency Stop Button             |
| 22 | Load Disconnect Switch            |

**Note:** The dimensions of the boiler control panel may vary depending on the equipment used in the project. The dimensions shown here represent the standard sizes.

## ViraControl Steam Boiler Efficiency Measurement and Analysis System

Boiler efficiency is one of the most critical parameters in steam generation. While efficiency is often considered during the purchase of a new boiler, it is rarely monitored once the system is in operation. In reality, maintaining high efficiency throughout the boiler's lifetime is essential for reducing fuel consumption and operating costs.

The "ViraControl Boiler Efficiency Measurement and Analysis System" continuously monitors and analyses key operating parameters to determine the actual efficiency of the boiler under real working conditions. By identifying deviations from the expected performance, the system enables optimization of combustion and blow-down processes, ensuring sustained efficiency and stable operation.

Fuel represents the largest portion of a boiler's lifetime cost. Even a small drop in efficiency can lead to significant fuel and financial losses over time. Studies indicate that boilers operating without performance monitoring may lose 5–15% efficiency compared to their rated values. The first step toward improvement is awareness — knowing the real-time efficiency and acting on it.

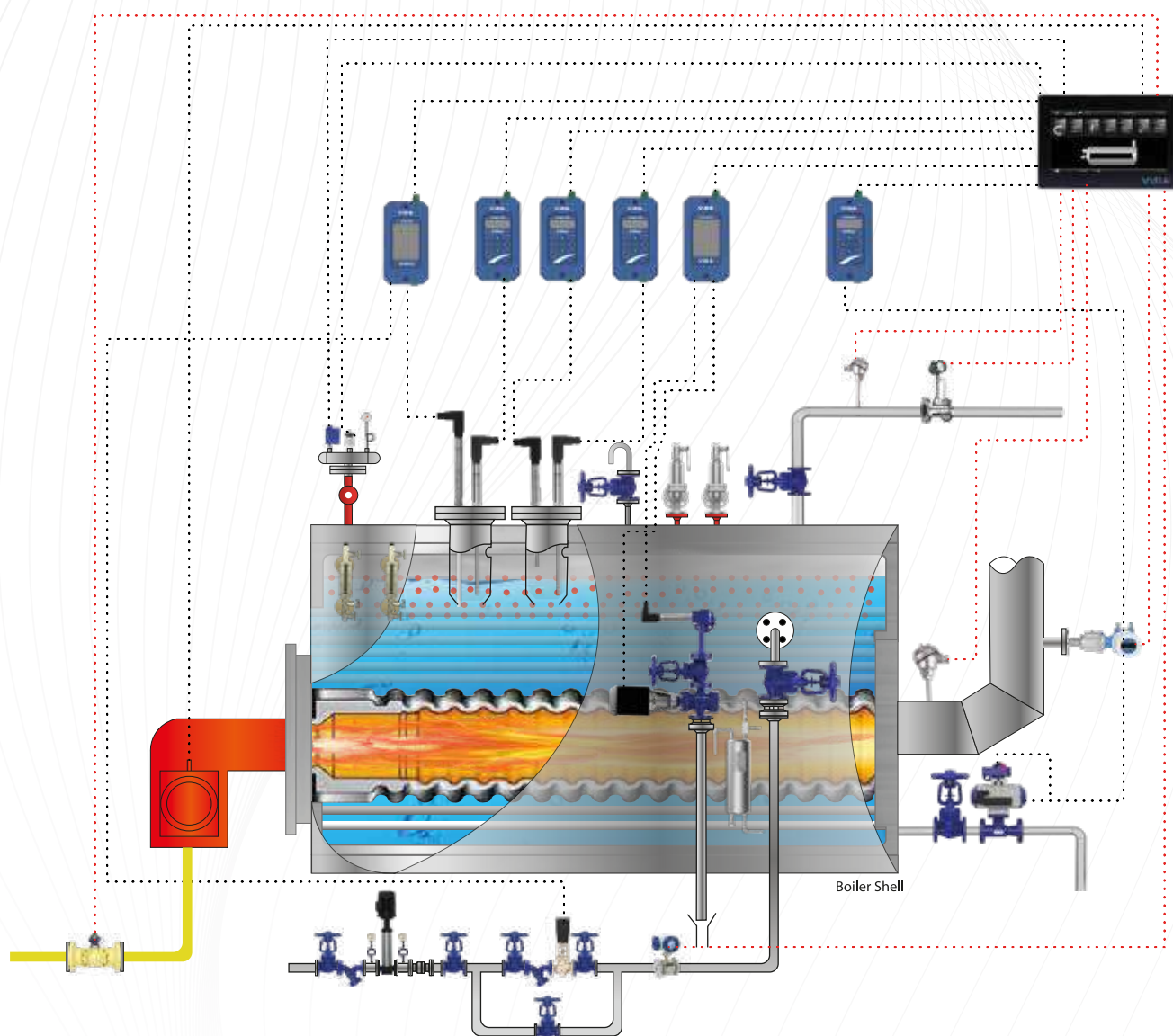
By integrating advanced sensors, data processing, and trend recording, "ViraControl Boiler Efficiency Measurement and Analysis System" system provides actionable insights that help operators minimize fuel consumption, reduce emissions, and achieve lower steam generation costs. In doing so, it supports sustainable and environmentally responsible energy use, in line with modern industrial efficiency and carbon reduction goals.



**System Parameters**

| Measured Parameters   | Calculated Parameters | Control & Optional Parameters |
|-----------------------|-----------------------|-------------------------------|
| Steam Flow            | Boiler Efficiency     | Oxygen trimming               |
| Fuel Flow             | Steam-to-fuel Ratio   | Drum Level (Optional)         |
| Steam Pressure        | Stack Loss            | Water Tank Level ( Optional)  |
| Steam Temperature     | Blowdown Loss         | Deaerator Level ( Optional)   |
| Stack Temperature     | Enthalpy Loss         | Deaerator Pressure (Optional) |
| Ambient Temperature   | Radiation Loss        | Radiation Loss                |
| Feedwater Temperature | Blowdown Quantity     | Blowdown Control (Optional)   |
| % O2 in flue Gas      |                       |                               |
| Blowdown TDS          |                       |                               |

## ViraControl Steam Boiler Efficiency Measurement and Analysis System



### Benefits

|                                                                                                                                       |                                                                                                                            |                                                                                                                           |                                                                                                                                        |                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>Corrective<br/>Action<br/>Execution</b></p> |  <p><b>Improved<br/>Performance</b></p> |  <p><b>Fuel Bill<br/>Reduction</b></p> |  <p><b>System Tuning<br/>&amp; Calibration</b></p> |  <p><b>Performance<br/>Monitoring<br/>&amp; Analysis</b></p> |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|

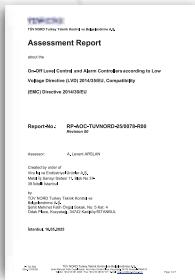


**ViRA<sup>®</sup>**

The logo for ViRA features the word "ViRA" in a bold, blue, sans-serif font. A red swoosh underline is positioned beneath the letters "i", "R", and "A". A registered trademark symbol (®) is located to the upper right of the "A".

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Metal İş Sanayi Sitesi 11. Blok  
No:37/39 İkitelli - İstanbul / Turkey

info@viraisi.com  
www.viraisi.com

Tel :+90 212 549 57 70 (Pbx)  
Fax : +90 212 549 58 48