TDS Controller with limiting function

FARB2

for use with the TDS probe: EL18, EL22 or EL23

Edition 04/2021

D-08-B-52502-EN-01

INSTALLATION- AND OPERATING INSTRUCTION

Product philosophy

Thank you for placing your trust in IGEMA and deciding in favour of one of our high-quality products.

For more than 100 years, measuring and control systems have been developed, produced and sold worldwide under the IGEMA brand name.

“Steam is our passion” and we offer you the entire programme for the safe and economic operation of your plants, especially in the steam and condensate sector.

Please read the installation and operating instructions carefully to ensure a safe and reliable operation.

In addition to the information on installation and operation, you will also find important information on maintenance, care, safety and value retention of your measuring and control system.

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1. Important safety instructions

KEEP THESE INSTALLATION AND OPERATING INSTRUCTIONS IN A SAFE PLACE!

Commissioning as well as maintenance and repair work may only be carried out by qualified persons in compliance with the installation instructions given in this operating manual. The correct installation, commissioning, maintenance and operation of the device presupposes that the person in charge is familiar with measurement and control systems and complies with the general installation and safety instructions. In addition, the correct and intended use of tools and the handling of safety devices must be ensured. Unqualified persons must not be assigned the above tasks!

IGEMA GmbH accepts no liability for damage to property or personal injury caused by unqualified persons or by failure to observe these installation and operating instructions. If no sufficiently qualified person can be found, IGEMA GmbH can be commissioned with the installation/maintenance.

1.1 Symbols used in these instructions

In the following installation and operating instructions, safety instructions are marked with the following symbols:

 Danger	This symbol and signal word refer to a potentially hazardous situation which could result in death or injuries if ignored.
 Caution electrical voltage	This symbol and signal word indicate live parts with an immediate danger of death from electric shock.
 Caution hot	This symbol with a signal word indicates a potentially hazardous situation that can result in severe burns and scalds all over the body.

 Caution	This symbol and signal word refer to a potentially hazardous situation which could result in personal injury, property and environmental damage if ignored.
 Caution	This symbol and signal word refer to a potentially hazardous situation which could result in damage to the equipment if ignored.
 Info	This symbol indicates useful information and recommendations as well as measures that will prolong the value of your measuring and control system.

1.2 Intended use of the device

Caution

Use these installation and operating instructions, the identification on the rating plate (see 11.3) and the technical data sheet to check whether the device is suitable for the intended use/application. The device complies with the requirements of the European Pressure Equipment Directive 2014/68/EU.

The device may only be used to indicate fill levels on containers.

The maximum values of the pressure and temperature range of the device must be checked before installation. If the maximum allowable operating values of the device are lower than those of the system on which it is to be installed, protective instruments for the device, such as pressure reducers or similar, must be provided to avoid limit situations. The device may only be used in accordance with the information in these installation and operating instructions or for the parameters and applications agreed in the supply contract. (see rating plate, 11.3) The operator of the facility is obliged to familiarise himself on the compatibility of the medium and the device. In case of doubt, contact the relevant installation manager or site manager.

The correct installation position, alignment and flow direction of the device must be observed! Before installing the IGEMA product on boilers or containers, it is essential to remove all protective covers and, if necessary, the protective film from rating plates and sight glasses.

1.3 Safety at work

Danger

Before installation or carrying out maintenance work on the device, safe access must be ensured and a secure working area with sufficient lighting must be defined and marked out. Always use lifting equipment for heavy loads!

Before starting any work, carefully check which liquids or gases are or have been in the pipeline. (flammable substances, irritating substances, substances hazardous to health) When opening or dismantling the device, residues of the medium can escape. Subsequent fumes are also possible in unpressurized and cold systems. Use designated PPE such as safety goggles and respiratory protection!

Special attention must be paid to the condition of the environment around the installation or maintenance site. Be aware of e.g.: potentially explosive atmospheres, lack of oxygen in tanks and pits, dangerous gases/liquids, extreme temperatures, hot surfaces, fire hazard (e.g. during welding) and moving machine and system components. Protect yourself from excessive noise by taking the required protective measures.

For all maintenance work or new installations, on new or existing boilers or vessels, it is imperative to check that the boiler or vessel has been depressurised and that the pressure has been safely reduced to atmospheric pressure. In principle, no system should be regarded as unpressurized even if indicated by pressure measuring devices such as pressure gauges or sensors. When releasing the pressure, make sure that no persons are in the release area. Carefully check whether you and/or other persons in the vicinity need PPE to protect yourself from external influences such as high and low temperatures, radiation, noise, danger to eyes, loose objects that can fall down or chemicals.

There is always a risk of injury when handling large and/or heavy equipment. Observe the load handling regulation as a minimum requirement for working with loads. Avoid handling the device with your own physical force, e.g. by lifting, pulling, carrying, pushing or supporting it, especially to prevent back injuries. Use lifting equipment to move heavy and bulky equipment in accordance with local regulations, e.g. Article 1, Section 2 of the German Load Handling Regulation (LasthandhabV).

Caution hot!

Under normal operating conditions the surface of the device can become very hot! Under the maximum operating conditions, the surface temperature can exceed 290°C. After shutting off or, if necessary, shutting down the boiler, wait until the temperature has normalized to room level. To avoid the risk of burns and scalds, always use PPE including safety goggles!

1.4 Safety instructions for this device

These installation and operating instructions are an integral part of the device and must be forwarded to the responsible departments "Goods inward, Transport, Installation, Commissioning and Maintenance". They must be kept in such a way that the technical staff have access to these documents at all times. If the device is passed on to a third party, these installation and operating instructions must also be included in the national language of the third party.

Avoid shocks and hard contact during transport, as this can lead to damage. During intermediate storage, the device must be kept dry and secured against damage.

When servicing the unit, check for damage. There is a risk of cutting hands and arms! Wear work gloves!

When returning goods to IGEMA GmbH, the applicable safety and environmental laws according to GGVSEB [German ordinance on the national and international carriage of dangerous goods by road, rail, and inland waterways] must always be observed. If there are any risks to health or the environment due to residues or the device has a mechanical defect this must be indicated when returning the device and the necessary precautionary measures must be taken. If the returned goods are devices that have come into contact with or contain hazardous substances, a safety data sheet must be enclosed, and the goods must be clearly marked. In addition, the hazardous substance must be reported to the logistics service provider.

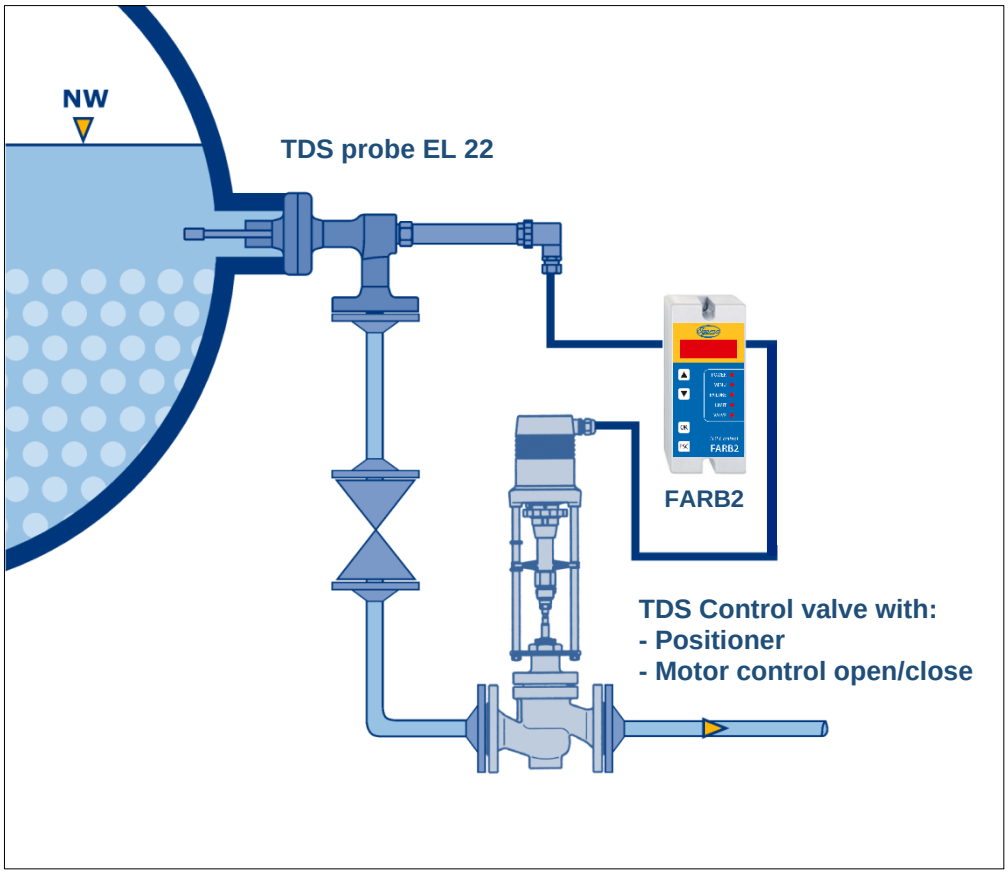
1.5 Exclusion of liability

IGEMA GmbH Mess- und Regelsysteme will assume no liability if the above regulations, instructions and safety precautions are not observed and followed. If they are not expressly listed in the installation and operating instructions, changes to an IGEMA device are carried out at the risk of the user.

2. Contents of packing

1. TDS Controller FARB2
   TDS probe EL22 or EL18 or EL23
2. Installation- and Operating Instruction

3. Principle picture



4. System description

4.1 Application

The TDS controller with limiting function FARB2 is used for continuous monitoring of the conductivity of liquids.
The conductivity is measured with a measuring cell. This consists of a special conductivity probe and the container wall or protective tube.
The conductivity is displayed via a 4*7 segment display and an active 4..20mA output interface. A relay (SPDT) is provided for limiting or switching functions.

The requirements of EU Directive 2014/68/EU, the standards EN 13445, EN 12952-11 and EN12953-9, EN 61010-1, EN 61326-1 are taken into account.

Probes for use with the FARB2:

Name	PS	TS	Connection	Special feature
EL18	32 bar	239°C	G ½"	Pipeline with flange mounting
EL22	32 bar	239°C	G ½"	Optionally installation with T-piece
EL23	80 bar	296°C	G ½"	Protection tube installation

4.2 Function

The FARB2 works in conjunction with IGEMA TDS probes. The measuring current flowing between the measuring electrode and the cell wall (boiler wall / protection tube) is proportional to the conductivity of the liquid.

After setting the operating point by entering the current liquid temperature and the conductivity measured by sampling (reference temperature 25°C), the FARB2 sets the 4..20mA output current and changes it when the measuring current changes due to conductivity changes of the liquid.

The FABR2 can be operated in two ways (relay output), as:

- TDS limitation
- Switch for TDS control valve

Independent of the use / programming of the relay output, the 4..20mA output with the current proportional to conductivity is available for control tasks e.g. continuous TDS control (PLC, PID controller, valve with positioner).

The connection of the relay output defines the function of the unit:

- If the output is integrated in a switch-off / safety circuit, the functionality of FARB2 is based on the limiting function.
  The relay output is active (contacts 3-4 closed) during normal operating condition.
  If the limit value is exceeded, the relay opens and closes again when the value falls below the lower value.
- If the output is connected to a valve control (e.g. opening/closing TDS control valve), the functionality is on the controller function.
  The relay output is inactive during normal operation (3-4 open).
  If the limit value is exceeded, the relay is actively energised and can thus switch a valve. The relay becomes inactive again when the value falls below the lower limit.

The switching points for exceeding the conductivity (upper switching point) and for returning to the normal state (lower switching point) can be freely selected:

- In this case the respective LED lights up and the change-over output is switched.

If a device error is detected, the change-over contact goes into the de-energised state and the corresponding LED flashes. The current output goes back to < 2.1mA.

Measuring range and limit values can be freely programmed (see chapter 7.4).

Info

The TDS Controller with limiting function, FARB2, is used for monitoring the TDS as stated in EN 12953-6. The TDS of the boiler water has to be monitored continuously to ensure that the TDS stays within the given limits.

The relevant standard for safety accessories, EN 12953-9, does not give specific requirements for TDS limiters. Thus a type approval is not feasible.

It goes without saying that the general requirements for safety accessories set out in EN 12953-9 were met during the development of the FARB2.

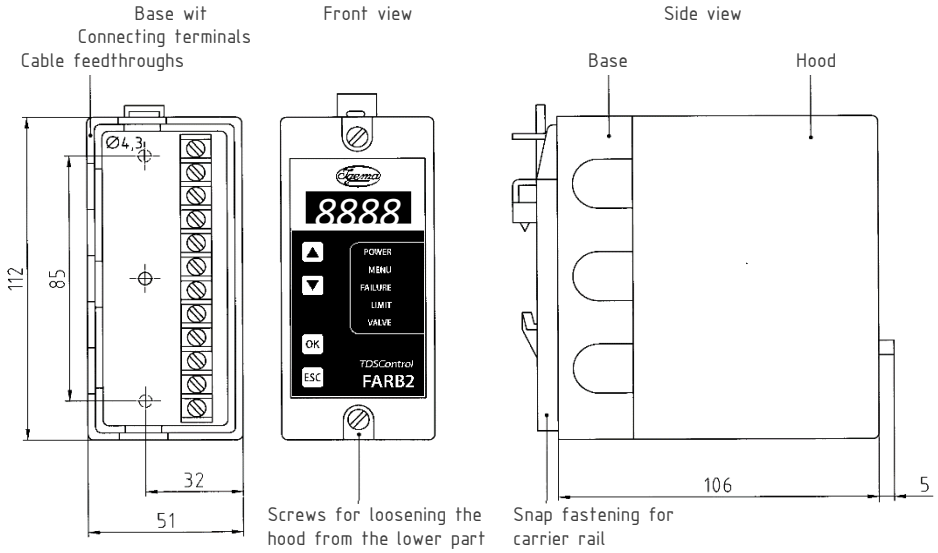
5. Design and installation FARB2

The device is supplied in a plastic plug-in housing for fitting into switch cabinets. The housing is designed for quick fitting with a spring catch for the DIN EN 50022 standard 35 mm carrier rail and for screw fixing on a mounting plate.

Info

If the device is used in environments with increased exposure to vibration (e.g. marine), the fixed installation on the mounting plate must be used.

5.1 Installation dimensions and descriptions



5.2 Installation

Caution electrical voltage

Ensure protection class in accordance with local regulations

With top-hat DIN rail mounting for standard DIN46277 35 mm carrier rail:

- Snap the device on the standard carrier rail.
- Loosen the fastening screws and remove the hood from the base.
- Connect to power supply (see Section 5.3).

Without top-hat DIN rail mounting:

- Loosen the fastening screws and remove the hood from the base.
- Loosen screws and remove the DIN rail adapter.
- Drill the marked points in the base with a Ø4.3 mm drill.
- Fit base on base plate with 2 M4 screws.
- Connect to power supply (see Section 5.3).

5.3 Electrical connection

Caution electrical voltage

The device terminal strip is live during operation!!

Before working on the device disconnect it from the mains!!

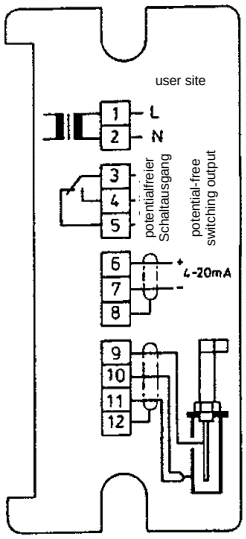
Caution

The device must be protected mains-side by the operator with a max. 2A fuse!

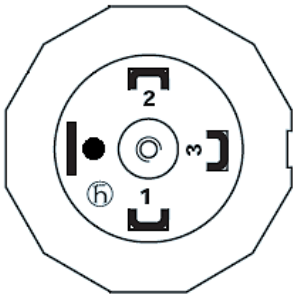
If inductive consumers are connected, voltage¬ peaks occur when switching off. For this reason, connected inductive consumers (e.g. contactors) must be provided additionally with an RC circuit: e.g. 0.1µF / 100Ω.

5.3.1 Wiring diagram 110 – 240 V AC

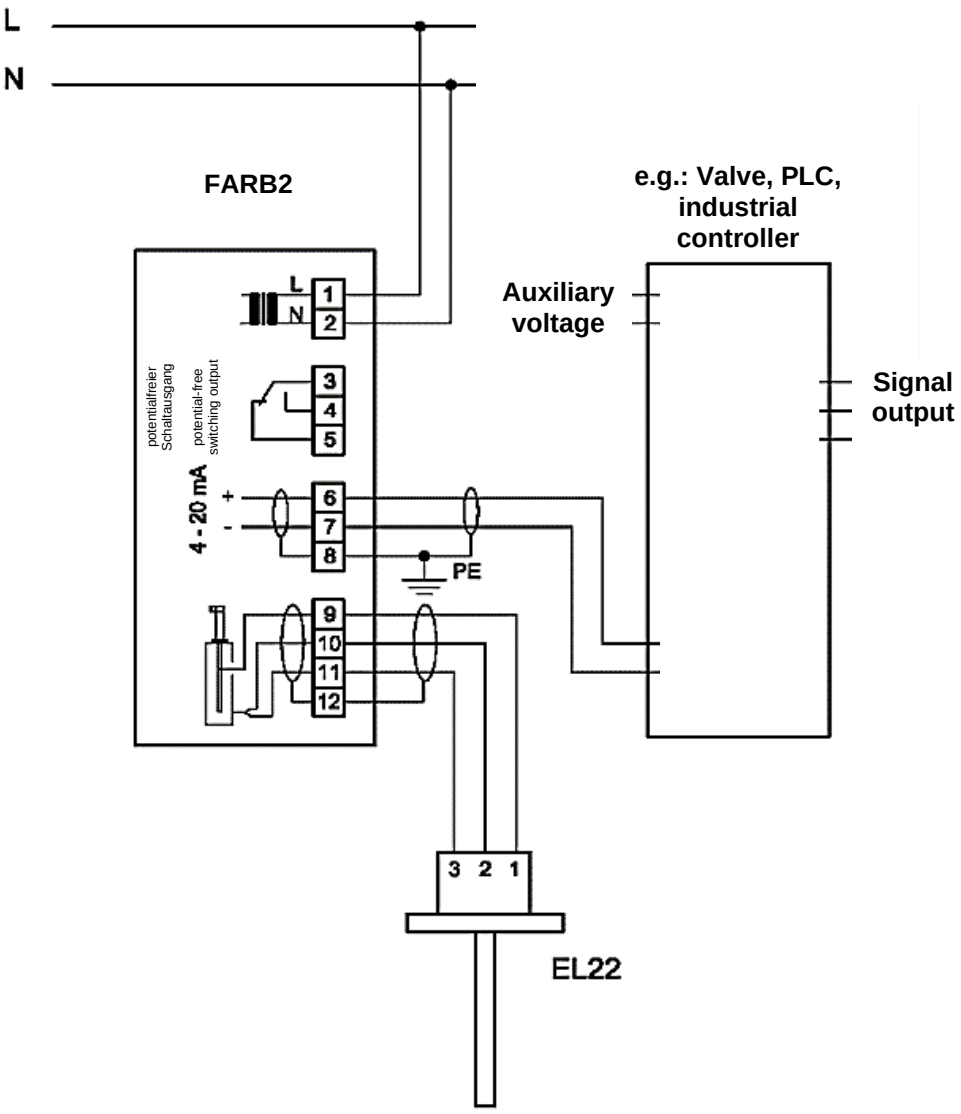
Back plate



Probe plug

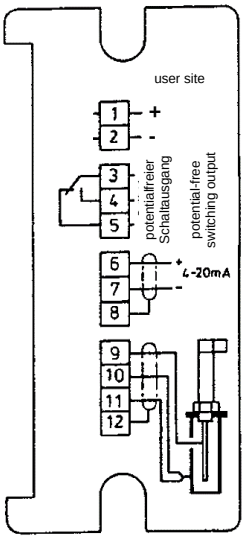


1	Electrode rod
2	GND
3	GND
●	--

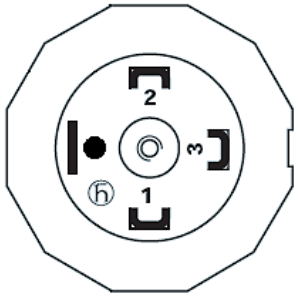


5.3.2 Wiring diagram 24 V DC

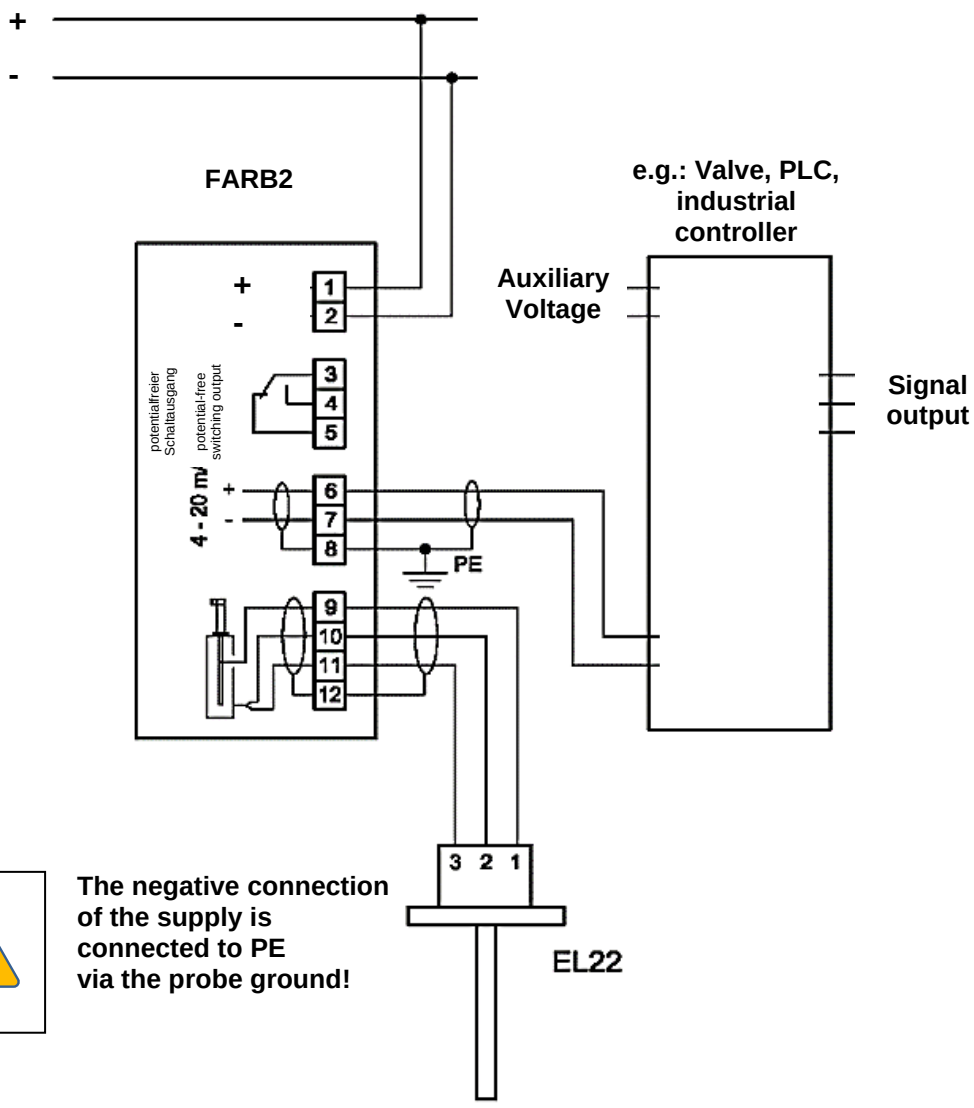
Back plate



Probe plug



1 Electrode rod
2 GND
3 GND
● --



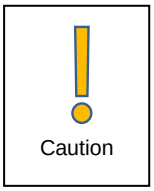
Caution

The negative connection of the supply is connected to PE via the probe ground!

5.3.3 Procedure

Connect according to wiring diagram (5.3.1):

- Pierce or pull out cable feedthrough and feed connection cable through.
- Check supply voltage. See name plate for permissible voltage.
- Use a shielded connection cable for the probe: e.g. LIYCY min. 0.75 mm² up to a max. length of 50 m. LIYCY min. 1.5 m² up to a max. length of 100 m (see note).
- Use a shielded cable for the current output.
- Only connect shielding on the FARB2 control unit (terminal 12).
- After connecting to the power supply – with the device disconnected – place the hood on the base and tighten the fastening screws.
- Fit probe according to separate assembly instructions and connect as in the wiring diagram.



When installing, check whether the cables used are UV-resistant and that UV protection is ensured on the installation side if necessary
The cable must not come into contact with heat-conducting parts.

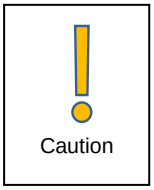
For aligning the probe plug to the local circumstances, the upper nut can be released (∅ 33.5mm). In doing so, take care not to move the plug in the probe!! (AF24).

The contact carrier can be carefully turned into the correct position.

On refitting ensure that the seal is correctly seated! Retighten the upper nut without moving the plug in the probe.

The connector plugs must be wired according to the wiring diagram.

6 Fitting the TDS probe

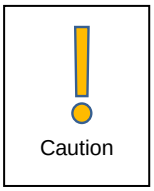


It is essential to remove the cardboard protective tube for transport before installation!!

If several probes are screwed into one flange, the probe plug and the associated probe should be labelled to prevent confusion!

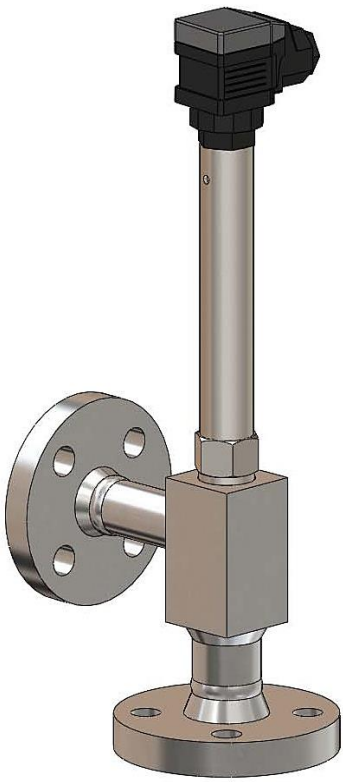
Screw connection of the TDS probe

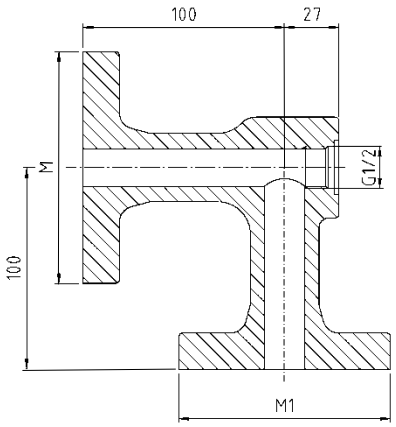
- Unscrew the probe plug
- Clean and check sealing surfaces
- Insert (new) sealing ring
- Grease the thread with heat-resistant solid lubricant (e.g. graphite).
- Screw in and tighten the probe, max. tightening torque Md = 140 Nm.
- Fit into the boiler before connecting the power.

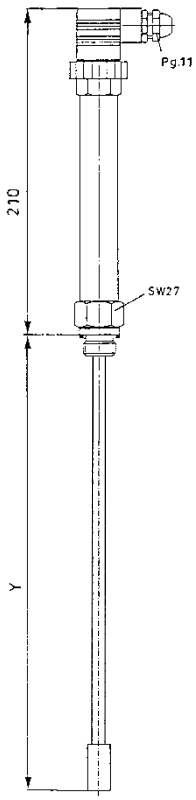


Do not seal thread with PTFE tape or the like!
When commissioning the boiler, check the probe screw connection in the flange for leaks and retighten if necessary!

6.1 EL22



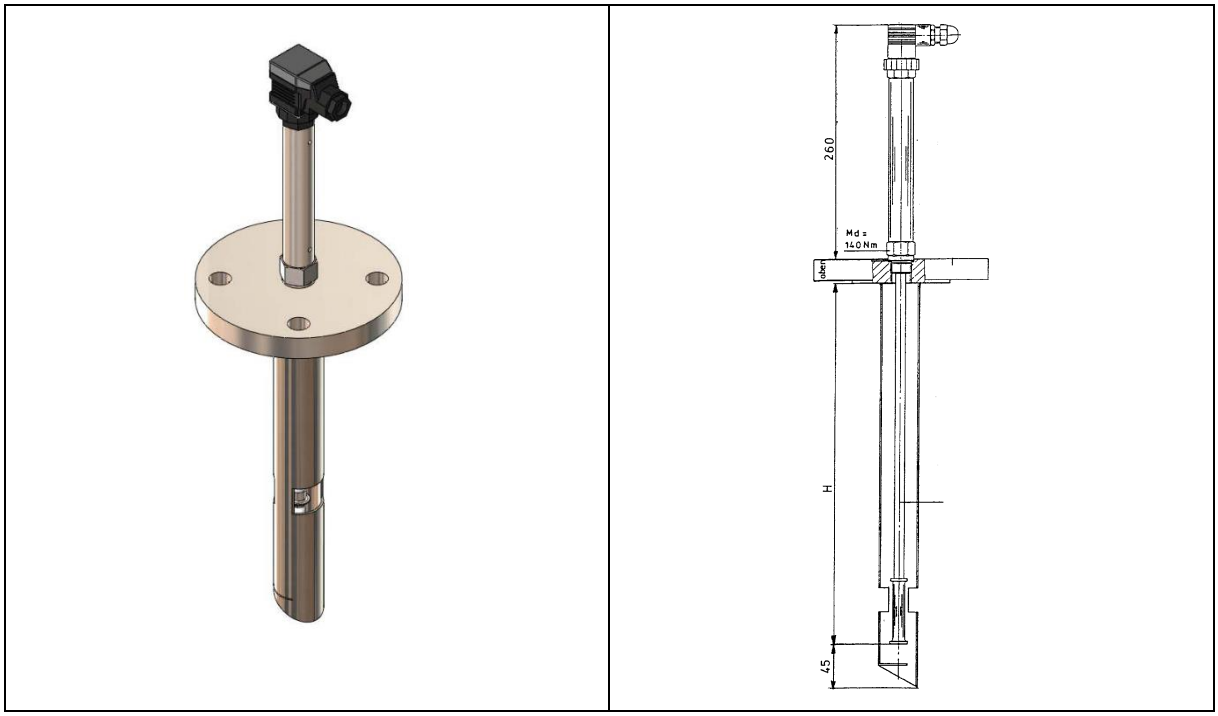




This TDS probe is usually fitted horizontally into the boiler using a T-piece.
This enables the concentrated water, which is measured, to be directly discharged.
In order to determine the length, note that there should be a free space of 40mm around the measuring tip.

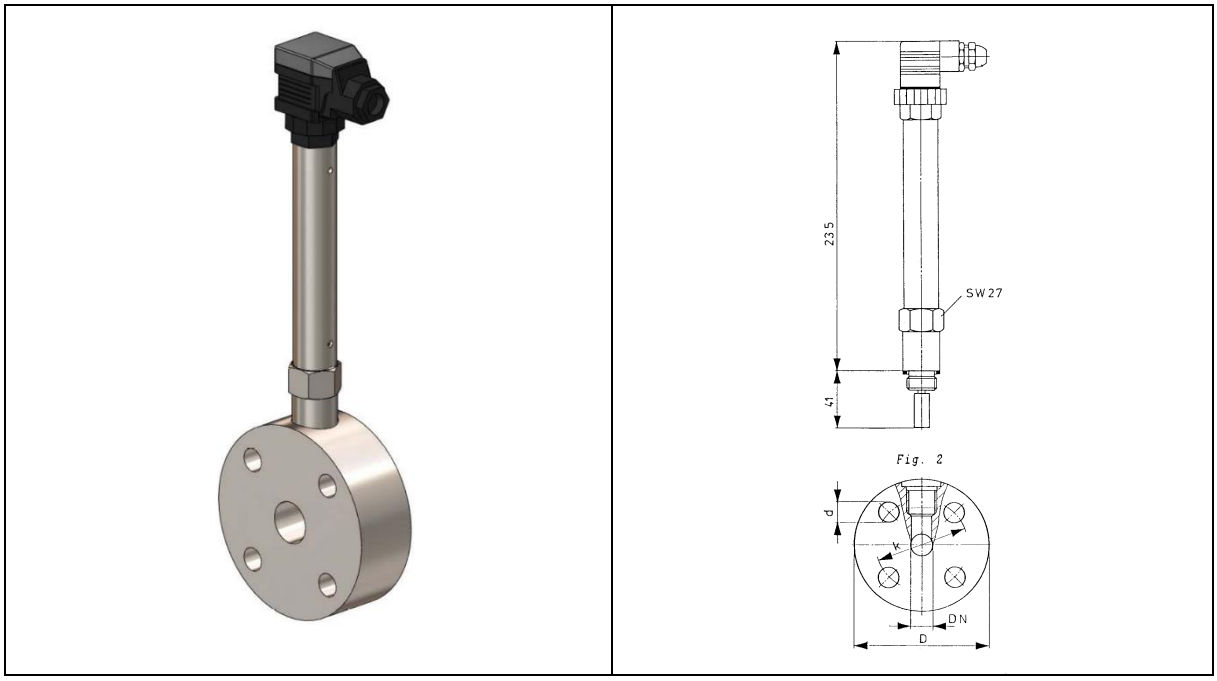
Installation up to the vertical is possible. However, a protective tube must be used if the horizontal version is not chosen.

6.2 EL23



This TDS probe is usually fitted horizontal to vertical using a protective tube.

6.3 EL18



This TDS probe is usually fitted using a flange in a pipe. With intermittent flow, a measurement can then be carried out and TDS reduction can be started.
Installation position: horizontal to vertical.

7. Configuration via menu

7.1 Basics

The menu of the FARB2 is divided into two main levels:

Main level 1 | Main level 2

The menu is brought up by pressing the "OK" key. While the operator is in the configuration menu, the associated yellow LED flashes or lights up.
With the "▲" or "▼" keys you can choose between the menu items of the respective level.
By pressing the "OK" key you will get to the next level down or confirm the input.
By pressing the "ESC" key you can get to the next level up or out of the menu without the current entry being saved (with OK confirmed entries are already saved and remain so).

Automatic menus exit after 5 minutes if no key operation is carried out (cf. "ESC").

7.2 Diagram

| --- 1. ---

| - 1.1. |- Software version

| --- 2.---

| - 2.1. |- Password input

| --- |----- **After valid password input** ----------

| - 2.2. |- Selection: Limiter (LIMt** / factory setting) or controller (CtrL)

| - 2.3. |- Operating temperature (factory setting 0025 = 25°C)

| - 2.4. |- Conductivity of the liquid
(at reference temperature: 25°C // sampling // factory setting 0000)

| - 2.5. |- Perform calibration

| - 2.6. |- Lower conductivity switching point / return point to normal operation
(factory setting 2000)

| - 2.7. |- Upper conductivity switch point / conductivity limit (factory setting 5000)

| - 2.8. |- Test of the relay functionality (feedback "tESt")

| - 2.9. |- Current output 4..20mA: conductivity value for 4mA (factory setting 0000)

| - 2.10. |- Current output 4..20mA: conductivity value for 20mA (factory setting 9999)

| - 2.11. |- Attenuation to avoid signal jumps *

* The attenuation is a sliding mean value from the most recent measurements. The number can be selected from the range of 1 – 254 values. The factory setting is 10 values. The measurement frequency is approx. 0,5 measurement/s.

** The display follows the 7-segment alphabet.

Please check the setting during commissioning.

The password is: 1234 (The password is only for protecting the device from unwanted changes. It offers no protection from malicious changes.)

7.3 Description

7.3.1 Note

When entering values, the decimal point that can be changed flashes. Press "OK" to go to the next decimal place. When entering values, a value range check is performed. If a decimal place cannot be set as desired, the maximum value is exceeded. When all decimal places have been entered, the value is saved with "OK" and the unit jumps back to the sub-item.

7.3.2 Function of the menu items

2.1: Enter Password
Password 1234

2.2: Selection of the operating mode (for the change-over-contact)
Limiter operation LIMt
Controller operation CtrL

2.3: Input of the (operating) temperature of the medium
integer in °C
0°C ... 9999°C
Factory setting 0025

2.4: Enter the conductivity of the medium; for determination see chapter 8

2.5: Perform calibration!
FARB2 connected with probe
Probe in medium

2.6: Adjustment of lower switching point / return to operating state
0µS ... xxxxµS / upper switching point
must be smaller than the upper switching point (2.6)
Factory setting 2000

2.7: Setting upper switching point / conductivity limit
xµS / lower switching point ... 9999µS
must be greater than the lower switching point (2.5)
Factory setting 5000

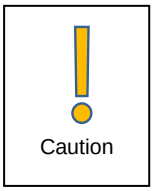
2.8: Test of the relay functionality
If ok is pressed, the relay switches to the idle state

2.9: Setting at which conductivity value 4mA should be output
Factory setting: 0
Range: 0µS ... xxxxµS / 20mA value

2.10: Setting at which conductivity value 20mA should be output
Factory setting: 9999

2.11: Adjustment of the attenuation. How many past measured values are included in the current one?
Range: 1-254 values
Factory setting 10

7.4 Programming



The prerequisite for programming is an operational system FARB2 / EL22/23/18. The probe must be installed and connected.
The system must be at operating temperature.

7.4.1 Password input

In menu item 2.1., a "0. 0 0 0" appears after confirming with "OK".
We now enter the password 1234. We start on the left. The left-hand digit can be changed, which is indicated by the flashing dot. Press the "▲" key to select the 1st digit. This is confirmed with "OK".
Display: → 1 0. 0 0
The decimal point of the 2nd digit now flashes. Enter the next digit of the password (2) with "▲" and confirm. The display now shows a 1 2 0. 0.
The decimal point of the 3rd digit now flashes. Enter the next digit of the password (3) with "▲" and confirm. Now the display shows 1 2 3 0. and the right decimal point flashes.
The 4th digit is a 4. It is set with "▲" and confirmed with "OK".
The entry is now complete. You are now back in the corresponding sub-menu.
The other sub-menu items are now enabled.

7.4.2 Input of functionality of the change-over-contact: limiter or controller

In menu item 2.2. the current functionality is displayed after confirmation with "OK":
"LIMt" or "CtrL".
If it is correct, exit the menu item with "ESC".
If you want to change it, press "▲" or "▼".
The change is confirmed with "OK".

7.4.3 Input of the operating temperature

In menu item 2.3. the set system operating temperature is displayed after confirmation with "OK". The factory setting is "0025" for 25°C.
"0.025", the decimal point blinks at the first digit. This can be changed with the arrow keys. The input is confirmed with "OK"; display now shows: "00.25".
The 2nd decimal place can be changed with the arrow keys.
The other values are programmed in the same way.

7.4.4 Input of the conductivity of the fluid of the plant

Conductivity is given in relation to / converted to the reference temperature 25°C.
In menu item 2.4. the set system conductivity (reference temperature 25°C) is displayed after confirmation with "OK". The factory setting is "0000".
"0.000", the decimal point blinks at the first digit. This can be changed with the arrow keys. The entry is confirmed with "OK"; the display now shows: "00.00".
The 2nd decimal place can be changed with the arrow keys.
The other values are programmed in the same way.

7.4.5 Perform calibration

In menu item 2.5. the display shows "CALI" after you confirm with "OK".
Press the "OK" key again to calculate the entered values from 2.3 and 2.4 together with the current measured value. The display shows "ok". Press the "OK" key again to switch to normal operating mode. Current output, relay and display are set accordingly.

7.4.6 Input of the lower conductivity limit

In menu item 2.6. after confirming with "OK" the value for the lower conductivity switching point is entered. The factory setting is "2000".
"2.000", the decimal point flashes at the first digit. This can be changed with the arrow keys. The entry is confirmed with "OK"; display now shows: "20.00".
The 2nd decimal point can be changed with the arrow keys.
The other values are programmed in the same way.

7.4.7 Input of the upper conductivity limit

In menu item 2.7. after confirming with "OK" the value for the upper conductivity switching point is entered. The factory setting is "5000".
"5.000", the decimal point flashes at the first digit. This can be changed with the arrow keys. The entry is confirmed with "OK"; the display now shows "50.00".
The 2nd decimal point can be changed with the arrow keys.
The other values are programmed in the same way.

7.4.8 Test of the relay functionality

In menu item 2.8. "test" is displayed after confirmation with "OK".
If you press "OK" again, the relay is switched to the deenergised state.
This test checks whether the relay still switches.

7.4.9 Programming the conductivity value for 4mA current output

In menu item 2.9. after confirming with "OK", enter the conductivity value at which the 4..20mA current output should be 4mA. The factory setting is "0000".
"0.000", the decimal point flashes at the first digit. This can be changed with the arrow keys. The entry is confirmed with "OK"; the display now shows "00.00".
The 2nd decimal point can be changed with the arrow keys.
The other values are programmed in the same way.

7.4.10 Programming the conductivity value for 20mA current output

In menu item 2.10. after confirming with "OK", enter the conductivity value at which the 4..20mA current output should be 20mA. The factory setting is "9999".
"9.999", the decimal point flashes at the first digit. This can be changed with the arrow keys. The entry is confirmed with "OK"; the display now shows "99.99".
The 2nd decimal point can be changed with the arrow keys.
The other values are programmed in the same way.

In this way any number of measuring ranges can be realised.
IGEMA recommends, depending on the system parameters, the ranges:

100µS/cm, 1.000µS/cm und 10.000µS/cm.

Over the entire measuring range, the typical measuring deviation around the calibration point is +-2% of the measuring range end value.

7.4.11 Programming the attenuation to avoid signal jumps

In menu item 2.11. after confirming with "OK" you can enter how strongly the system reacts to signal jumps. The factory setting is "0010".
The larger the value, the more past measured values are included in the current value. In this way, signal jumps are intercepted. The setting range is 1-254 values ("0001" - "0254"). The smoothing frequency is approx. 0.5 measured values/s
"0.010", the decimal point flashes at the first digit. This can be changed with the arrow keys. The entry is confirmed with "OK"; display now shows: "00.10".
The 2nd decimal place can be changed with the arrow keys.
The other values are programmed in the same way.

8. Initial operation

When the FARB2 is used for the first time, not all the data required for operation are yet available in the device. The FARB2 indicates this with "Set ".
Settings must now be made (see also chapter 9):

- Operating mode:
  - Limiter (LIMt) or controller (CtrL)
  - Menu item 2.2 / Factory setting LIMt
- Enter operating temperature
  - Menu item 2.3 / factory setting 0025 (25°C)
- Menu item 2.3 / factory setting 0025 (25°C)
  - Menu item 2.4 / Factory setting 0000
- Calibrate the system
  - Menu item 2.5

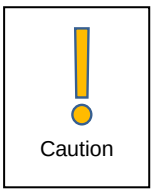
9. System calibration

Do not carry out adjustment until all system components have been installed.
Measuring instruments required for adjustment:

- external conductivity measuring instrument with temperature compensation.

Procedure:

- Install the device and probe as described in chapter 5 and chapter 6.
- Start the facility and wait until the normal operating parameters are reached.
- Take a sample according to the boiler operating manual
  - Take the boiler water via the sampling cooler and determine the conductivity "K_{ist}" in µS/cm, related to 25°C, with a conductivity meter
- Calibration after:
  - Chapter 7.4.3 / menu item 2.3
  - Chapter 7.4.4 / menu item 2.4
  - Chapter 7.4.5 / menu item 2.5



The probe tip of the conductivity probe is ready for operation in the fluid.
The boiler operates at normal operating parameters

10. Switching value settings

Caution

Standards 12953-10 and 12952-12 specify requirements for boiler water and feed water according to the permissible operating overpressure.

limiter:

The limit value must be defined and set (menu 2.7).
The value for the return to normal operating mode must be defined and set (menu 2.6)
The relay is actively energised in normal operating mode (contacts 3-4 closed).
The red limit LED lights up if the limit value is exceeded.

controller:

The limit value must be defined and set (menu 2.7).
The value for the return to normal operating mode must be defined and set (menu 2.6)
The relay is inactive in normal operating mode (contacts 3-4 open). If the limit value is exceeded, the relay becomes active and can thus control a valve.
The blue Valve LED lights up if the limit value is exceeded.

The setting is described in chapter 7.4

11. Technical Data

11.1 Device data - Controller

Power supply	24 V DC	Art. no.: 20-10031
	100 – 240V / 50 – 60 Hz	Art. no.: 20-10027
Power consumption	3,0 W	3,0 VA
Device fuse	Relay fused with 4A	
Protection type as per DIN EN 60529	IP40 [1)]	
Allowable ambient temperature	0 – 55°C	

[1)] according to EN 12953-9 // EN 12952-11, 4.3.4, protection class IP54 must be ensured in the boiler area. Installation in a control cabinet is required.

11.2 Device data - Contacts

Current interface (not galv. isolated)	Output current (active)	4 mA ... 20 mA	
	Load	max. 500 Ω	
Limit and additional relays	Switching voltage (max.)	250 V AC	25 V DC
	Switching current (max.)	4 A ohmic	
		Inductive / capacitive / higher loads: use contactor	

11.2 Rating Plate

FARB2 100-240V AC

Type FARB2		CE
Build 2020	Item no. 20-10027	
100 - 240V / 50 - 60Hz	3,0 VA	IP 40
0°C < T_{amb} < 55°C	0 - 10.000 µS / cm	
S/N 2020100270004		

* Production monitored

IGEMA GmbH
D-48163 Münster
Made in Germany

See installation instructions!

24V DC

Type FARB2		CE
Build 2020	Item no. 20-10031	
24V DC	3,0 W	IP 40
0°C < T_{amb} < 55°C	0 - 10.000 µS / cm	
S/N 212010031000		

* Production monitored

IGEMA GmbH
D-48163 Münster
Made in Germany

See installation instructions!

EL18

Type EL18		CE
Build 2020	Item no. 15-00199	
PS 32 bar	TS 239°C	IP 65
T_{amb} < 100°C (at plug)	DN G1/2"	
Comm. No. 20-229509-1		

* Production monitored

IGEMA GmbH
D-48163 Münster
Made in Germany

See installation instructions!

EL23

Type EL23		CE
Build 2020	Item no. 15-01013	
PS 80 bar	TS 296°C	IP 65
T_{amb} < 100°C (at plug)	DN G1/2"	
Comm. No. 20-226988-5-1		

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IGEMA GmbH
D-48163 Münster
Made in Germany

See installation instructions!

EL22

Type EL22		CE
Build 2020	Item no. 15-00858	
PS 32 bar	TS 239°C	IP 65
T_{amb} < 100°C (at plug)	DN G1/2"	
Comm. No. 20-229829-1-5		

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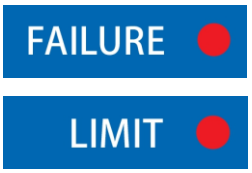
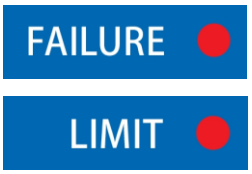
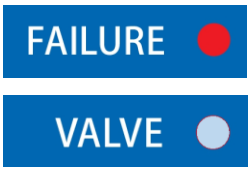
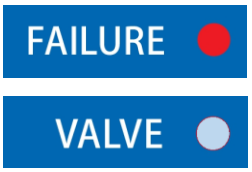
See installation instructions!

12. LED-Display

Display	Description	State-1	State-2
	Permanent green LED	Basic status	Error-free operation
	Flashing green LED (1Hz)	Basic status	Supply low limit < 180V
	Permanent yellow LED	Device ready for programming	Current operating conditions
	Permanent red LED	Device faulty	Relay de-energised Current output: <2,1mA
	Permanent red LED	Upper limit exceeded	Relay de-energised, until the value falls below the lower limit
	Permanent blue LED	After violation of the upper limit, the lower limit has not yet been undercut	Relay active

13. Fault analysis

Display	Description	State-1
	Permanent red LED Current output < 2,1mA	FARB2 faulty
	Permanent red LED Permanent red LED Display „Shrt“ Current output > 24mA	Probe short-circuited
	Permanent red LED Permanent red LED Display „OPEn“ Current output 3,5mA	Probe open
	Permanent red LED Permanent blue LED Display „Shrt“ Current output > 24mA	Probe short-circuited
	Permanent red LED Permanent blue LED Display „OPEn“ Current output 3,5mA	Probe open

This high-quality IGEMA product was designed, manufactured and tested with the application of the QM System guidelines in accordance with DIN EN ISO 9001:2015.

If the device supplied indicates transport damage or gives cause for complaint in spite of our final quality control please contact our SERVICE department on telephone *+49 2501 92424-0* by return.

14. Declaration of Conformity

EU-Konformitätserklärung
EU-Declaration of Conformity

Konformitätserklärung gemäß EU-Richtlinen 2014/35/EU // 2014/30/EU

Die Firma:
IGEMA GmbH
Antwerpener Str. 1
48163 Münster, Deutschland

erklärt, dass der

Leitfähigkeitsregler mit Begrenzerfunktion
FARB2

Sonden: EL18, EL22, EL223

mit den Richtlinien übereinstimmt.

Angewandte Normen:

EN 61010-1, EN 13445,
EN 61326-1:2013
mit den Störfestigkeits-Prüfanforderungen für Geräte, die zur Verwendung in einer industriellen elektromagnetischen Umgebung vorgesehen sind.

Declaration of Conformity as per EU-Directives 2014/35/EU // 2014/30/EU

The company:
IGEMA GmbH
Antwerpener Str. 1
48163 Münster, Germany

declares that the

TDS-Controller with limiting function
FARB2

Probes: EL18, EL22, EL23

complies with the directives.

Applied standards:

EN 61010-1, EN 13445,
EN 61326-1:2013
with Immunity test requirements for equipment intended to be used in an industrial electromagnetic environment.

Münster, 18.11.2020

H. Gartenbröker
(Geschäftsführer; QM-B)
(Managing Director; QM-O)

C. Hummel
(Teamleiter F&E)
(Team leader R&D)

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