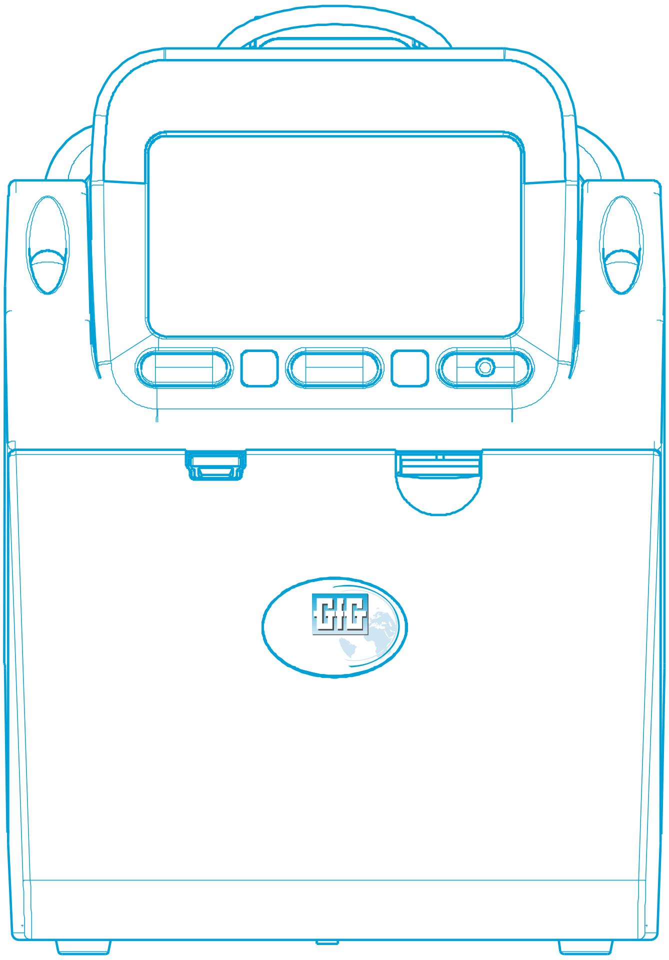
Operation Manual

Test station TS888/999-DIC
Test station TX888/999-DIC



smart
GasDetection
Technologies

Congratulations!

You have chosen one of GfG's precise measuring instruments.
A great choice!

Reliability, safety, ideal performance and efficiency are what distinguishes our devices.

They conform to national and international guidelines.

This operation manual will aid you in learning how to use your new device quickly and safely.

Please familiarize yourself with our operation instructions before turning on the device!

If you have any further questions, do not hesitate to contact one of our specialists.

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Introduction

For your safety

This operation manual informs you about the intended use of the product in accordance with §3 of the German Law of Technical Working Equipment. Its purpose is the prevention of dangers. It must be read and adhered to by every person using, maintaining, servicing and operating the device.

This product can only fulfill its intended purpose if it is used, maintained, serviced and controlled in accordance with GfG - Gesellschaft für Gerätebau's instructions. Using, maintaining, servicing and controlling the product contrary to these instructions will void the warranty given by GfG.

The above does not change the information on warranty and liability stated in GfG's general Terms and Conditions of Purchase and Delivery. Repairs may only be performed by specialists or people that have been trained accordingly. Any modifications and changes to the product must be approved by GfG first. Any unauthorized modifications of the device will void the liability for damages. Only original GfG accessories may be used with the product. Only spare parts that have been authorized and cleared by GfG may be used for repairs.

Area of application and purpose

The test stations TS888/999-DIC and TX888/999-DIC can be used for the daily display test (bump test) and for adjustments (only TX888/999) of the sensors of Microtector III G888 and Polytector III G999 devices. Please note that adjusting devices with the TX888/999-DIC test stations cannot replace full function controls of G888 and G999 gas detectors.

Additionally, the test stations can be used to charge the gas detectors G888 and G999.

Setting up and connecting the test station

To commission the test station, connect the test gas cylinder/ sampling valve to the test station at the gas inlet (Gas In). You can also connect a sampling tube to the gas outlet (Gas Out) to extract the gas concentrations. Use the power supply unit that comes with your device to power it. The test station can also be connected to a PC via a mini USB cable as an alternate power supply source and for configuration (see chapter Configuration).
The test station must be placed on an even, solid surface. Gas is inserted without pressure via a sampling valve with a regulated flow of 0.5l/min.

If you need to insert gas directly from the test gas cylinders, you will need to use one of the sampling valves listed in the "Accessories and spare parts" section. Make sure the test gas is extracted freely and without pressure!

While it is generally permitted to operate the test station inside the transport case listed in the "Accessories and spare parts" section, you must keep the case is open throughout the process to ensure the gas extraction and power supply are working as intended.

Connectors and control elements

Operating instructions

Note: You must use the configuration software to adjust the test station for different gases and testing functions.

The test station is operated via the control buttons of the gas detector. The status or data is displayed on the device’s screen.

The test station turns on automatically when connected to a power supply unit or a PC. After the test station has been turned on, the green LED will flash rapidly. This indicates a memory test being performed. The green LED being lit permanently means that the test station is ready for use. If the memory test has been unsuccessful, the red LED will light up instead. Please contact the GfG service team if this happens. When a gas detector is placed in the test station, you will be able to select either “**Info**rmation”, “Display **Test**” or “**AutoCal** adjustment” (only TX) with the softkeys on the device. You will momentarily have to remove the gas detector from the test station again, since its buttons are in the front.

You have ten seconds to override the automatic preselection or manually start an adjustment. When the green and red LED are flashing at the same time, manually trigger the gas supply via the provided extraction valve. To do this, press the button on the extraction valve and (if you are using the TX test station) open the screw-on valve on the extraction valve. The test station will check the flow of gas for 30 seconds. As soon as the test station has detected the gas flow, the red LED will turn off. The gas flow must be maintained until the red and green LEDs are flashing again and an acoustic signal is emitted. When the test station detects that the gas supply has been cut off at the end of the bump test, the results of the test will be displayed on the gas detector’s screen.

Note: If the gas supply is cut off too soon, the test will be cancelled and an error message will be displayed. You will have to repeat the test (see section “error message”).
Note: If no flow is detected at all, the test will also be cancelled and an error message will be displayed.

Charging

The gas detectors G888 and G999 must be inserted into the test station while turned off. The charging process will start automatically.

yellow LED

constantly lit: Normal charging

Flashing: Trickle charging

green LED

On: Voltage supply for charging module active

Off: Device is inside the test station and getting bump tested.

The charging process will take approximately 6 to 7 hours in normal charging mode. The charging mode will automatically switch to trickle charging when the normal charging process is completed.

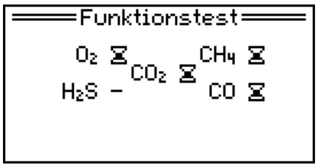
Daily bump test

The bump test consists of the following elements:

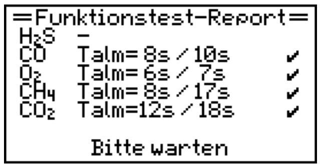
- Check of the visual alarm
- Check of the acoustic alarm
- Response time of the sensors for alarm 1 and alarm 2, depending on the test gas concentration
- Check of the sensor's t_{50} or t_{90} response time (depending on configuration)
- Automatic data storage on the SD card
- Setting the time (depending on configuration)
- Setting the bump test interval (depending on configuration)

To start the bump test, insert the gas detector (turned on) into the test station. The bump test will start automatically after ten seconds. The effective time of a bump test is approximately 20 seconds. During the bump test, the sensors will be exposed to suitable test gas. The bump test interval is set according to T021/T023 and is used on each display test and adjustment to calculate the next date. The progress of the bump test as well as its report are displayed on the device's screen.

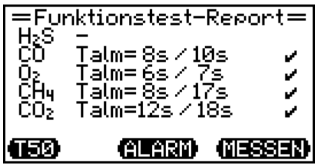
Bump test starting automatically after ten seconds



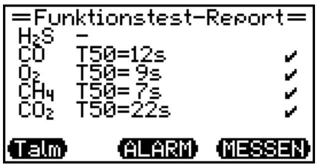
Bump test in progress



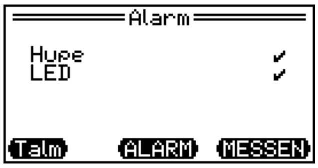
Completion of the bump test



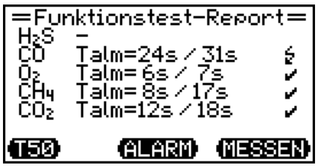
Talm = Response times of alarm 1 and alarm 2 of the respective test gas



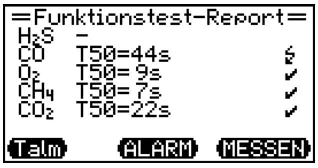
T50 = t_{50} Response time of the respective test gas



Test of acoustic and visual alarms has been successful



Response time alarm 1 / 2 for CO is faulty - response time too long



Response time t50 for CO is faulty - response time too long

Indication of test results:

= in progress
- = Sensor not tested
√ = Sensor has been tested successfully
= Sensor defective

Results of the bump test:

Verify if the process has run correctly by checking the displayed report of the bump test. The results of the bump test are indicated on the test station using the "traffic light principle" by a red and a green LED located above the SD card. If the green LED is lit, the bump test has been successful. You can now use the device. But if the red LED is lit and the gas detector's display lights up red as well, an error or fault has been detected. It must be resolved before using the device.

Bump test has been successful:

Display lit green + green LED in slot is lit

Bump test has failed:

Display is lit red + red LED in slot is lit
Indication of the detected error
(Example: Code 2: Flow error)

Possible error notifications:

No gas - test station is not configured
Flow error - Disruption in test gas supply - restart the test station
Device cancellation - Device problem / error
Timeout for bump test of the sensors
Power error - Operating voltage is incorrect (test station's power supply unit)

Additional information can be accessed using the "Info" button. These notifications will not cancel the bump test.

1 = SD card
2 = gas pressure
8 = amount of gas

If several faults occur simultaneously, the sum of their error numbers is displayed:

3 = 2 + 1 (gas pressure + SD card)
9 = 8 + 1 (amount of gas + SD card)
10 = 8 + 2 (amount of gas + gas pressure)

Sensor adjustment:

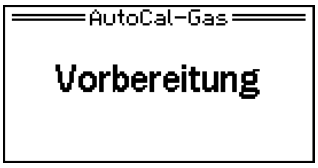
Caution: Before the sensor adjustment can be started via the TX888/999-DIC test station, you will have to adjust the sensor's zero points on the gas detector with fresh air (AutoCal adjustment - fresh air). For more information on this, see also: G888/999 instruction manual.
To start the adjustment, place the gas detector into the test station while it is turned on. You then have ten seconds to start the adjustment by pressing the AUTOCAL button (see section "Controls").

The AutoCal function is used to readjust the sensitivity of the sensors. A suitable test gas or test gas compound is necessary for the adjustment.

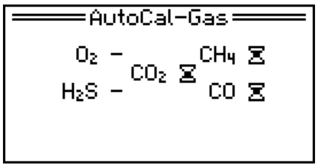
The adjustment will take approximately 3 to 4 minutes. The adjustment interval is set according to T021/T023.

The progress of the adjustment and the cal. report (gas) are displayed on the device's screen.

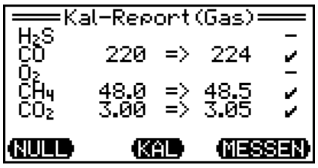
Bump test will start automatically after ten seconds.



Flushing



Sensor adjustment



Results of sensor adjustment with test gas (gas compound):
Measured value before => after

Indication of adjustment results:

- **-** = Sensor not adjusted
- √ = Sensor adjusted successfully
- ↯ = Adjustment error - not adjusted

Results of the adjustment:

Check whether the adjustment has been completed correctly by checking the Cal. report on the gas detector's display. The results of the adjustment are indicated by a red and green LED in the test station's SD card slot using a "traffic light" system. If the green LED is lit, the adjustment has been successful. You can now use the device. If the red LED is lit, an error or fault has been detected. It must be resolved before using the device.

Bump test has been successful:
Display lit green + green LED in slot is lit

Bump test has failed:
Display is lit red + red LED in slot is lit
Indication of the detected error
(Example: Code 2: Flow error)

Possible error notifications:

No gas - TX is not configured
Flow error - Disruption in test gas supply - restart the test station
Device cancellation - Device problem / error
Timeout for sensor bump test
Power error - Operating voltage is incorrect (test station's power supply unit)

Additional information can be accessed using the "Info" button. These notifications will not cancel the bump test.

1 = SD card
2 = gas pressure
8 = amount of gas

If several faults occur simultaneously, the sum of their error numbers is displayed:

3 = 2 + 1 (gas pressure + SD card)
9 = 8 + 1 (amount of gas + SD card)
10 = 8 + 2 (amount of gas + gas pressure)

Data storage / transfer of data to a PC

All information on the bump test or the adjustment - if available - will be saved to the SD card automatically. When the test station is connected to a PC, the data transfer will start automatically. The data on the SD card can also be accessed with a card reader, without connecting the test station to a PC. The data transfer is done via the TS888/999-DIC and TX888/999-DIC software.

Test data for storage in the PC database and on the SD card:

Device information:

- Device type
- Serial number
- Software version
- Sensor serial number
- Type of gas
- Measuring ranges
- Alarm thresholds: A1, A2, A3, STEL, TWA
- Battery capacity
- Ready signal ON/OFF

Test station:

- Date and time
- Mode: Bump test
- Test gas and gas concentration
- Gas cylinder number
- Test results
- Bump test: Buzzer (acoustic alarm)
  LED (visual alarm)
  t_{Alarm1}
  t_{Alarm2}
  t_{50} or t_{90}
- Sensor adjustment: Zero point (ZP) before sensor adjustment
  Zero point (ZP) after sensor adjustment
  Sensitivity (CAL) before sensor adjustment
  Sensitivity (CAL) after sensor adjustment
  The columns for sensor adjustment are not filled with data. Sensors can only be adjusted using the DS400 docking station.

- TS888/999 – TX888/999-DIC serial number and name
- TS888/999 – TX888/999-DIC ID
- TS888/999 – TX888/999-DIC software version

Software

Installation

Install the software using the provided setup program. You can choose to keep the default directory path or choose a new one. The program will then be installed on the drive and directory path you have chosen. When the installation is completed, a new program group called "GfG\DS(TS)888/999" will be generated and the icons for starting the program are created.

Please consider the following system requirements:

Supported operating systems:

- Windows 10 (all versions, including 64-Bit)
- Windows 8 (all versions, including 64-Bit)
- Windows 7 (all versions, including 64-Bit)
- Windows Vista (all versions, including 64-Bit)
- Server 2008 and Server 2012 (all versions)

You will also need a USB 2.0, 3.0 or 3.1 port. The resolution of your screen needs to be at least 1024 x 768p. Apart from these elements, there are no other hardware requirements.

Installing the USB driver

On more recent versions of the program, the USB driver will be installed automatically. Manually installing the driver is only necessary in certain cases.

Then, connect the RS485 USB interface cable to your PC. Windows will detect the new hardware and request the driver. The driver is located in the “USB_V206” directory on the CD. Instruct Windows to install the driver from this directory or have it search the CD on its own.

Two driver components will be installed. One is the USB driver, the other the virtual COM port. On Windows XP, you might receive a notification stating the driver has not passed the Windows logo test (depending on the PC’s configuration). You can ignore this notification. After the installation has been completed successfully, you can see which COM port has been dedicated for the USB adapter. You will need the designation of the COM ports, e.g.: COM4 for setting the software.

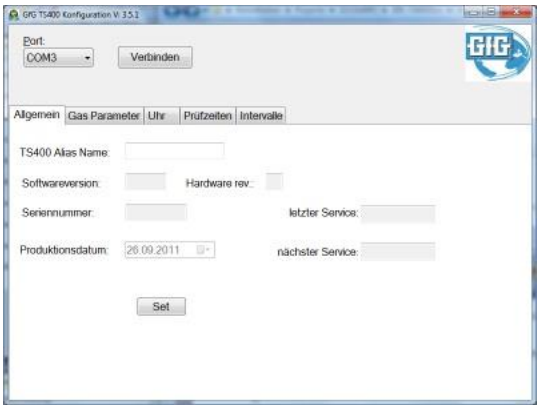
Configuring the TS888/999-DIC - TX888/999-DIC/999-DIC

Use the configuration program TS888/999Config.exe to configure the docking station. This concerns mainly adjustments of test gas concentrations.

Selecting a port

Click the arrow symbol below the word “port”. This will open a list of all available interfaces. Usually, the correct port will be displayed after starting the program.

Clicking the Connect button will establish a connection between the PC and test station.



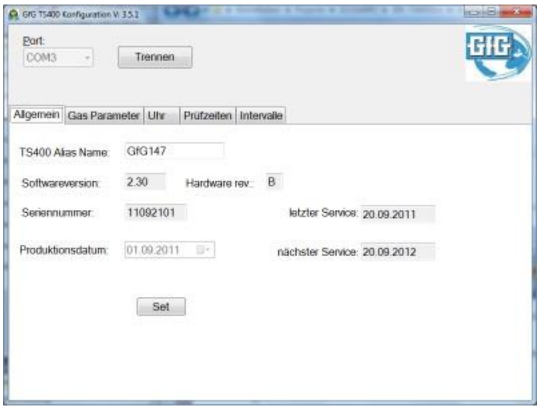
General

This is where you can access or enter general information about the test station.

Test Station Alias Name: Enter an alternative name for a test station.

The date of the last regular service is displayed in the "**Last service**" field.

The "**Next service**" field will tell you when the next scheduled maintenance needs to be carried out.



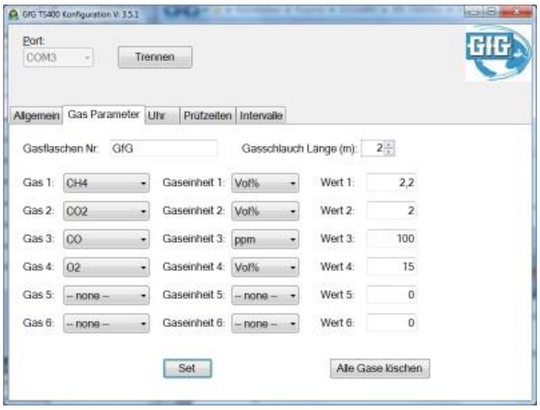
Caution: On the set day, the information "TS888/999 Service" / "TX888/999 Service" will be displayed on the device's screen. If this date has been exceeded by more than 21 days and no gas detector is currently placed in the test station, the red LED will continuously flash. Contact the GfG service team for maintenance.

Gas

This is where the connected test gas is specified. You cannot perform a bump test without this information. Up to six different gases of a gas compound can be entered. Only vol % and ppm can be selected as units. For combustible gases, the test station will automatically convert any vol % and ppm values into % LEL values.

Gas cylinder no.:
Enter the number or a name for the gas cylinder.

Length of tube (m):
Enter the length of the tube connected to the gas cylinder (required)



This configuration program and the test stations accept a wide range of test gas values. Gases with concentrations of 20% above the set alarm values for Alarm 2 are required for the gas detectors. They must, however, be at least 10% above the alarm value of alarm 1.

After setting new test gases or test gas concentrations, cut off the connection to the docking station by pressing the "Disconnect" button. The connection then has to be reestablished by pressing the "Connect" button. You will then have to check in the "Gas" folder, whether the transmitted test gas concentration matches the one on the connected test gas cylinder.

Test times

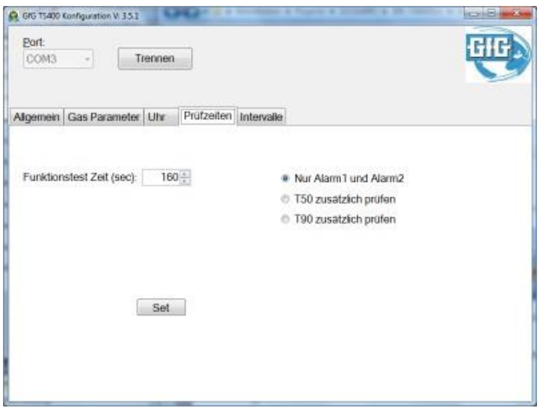
This folder is used to change the parameters of the bump test. These times should only be adjusted in special cases, e.g. with very long tube lengths. Setting them too low might prevent the bump test.

Bump test max. time:
Enter the maximum amount of time (seconds) for the bump test

Do not check time: Only alarm 1 and alarm 2's times are checked

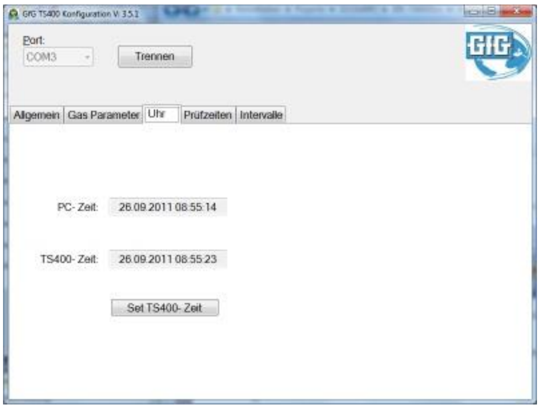
Check T50: Tests alarm 1 and 2 as well as the adjustment time t_{50}

Check T90: Test alarm 1 and 2 as well as the adjustment time t_{90}



Clock

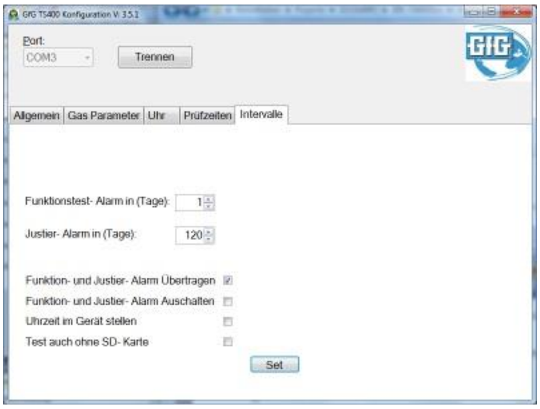
This is where the test station's time and date are set. If there is a difference of more than ten seconds, the time will be set automatically.



Caution: Date and time are saved in the protocol file on the SD card during the bump test. It is therefore important to make sure your PC's time and date are correct. There is no automatic adjustment for daylight saving time.

Intervals:

You can set the bump test intervals in the "Intervals" menu.



Transmit intervals:
The intervals are transmitted automatically to gas detectors of the G400 series. If these intervals are exceeded, the device will display a notification when it is turned on. This notification can be acknowledged. You can use the "Transmit intervals" field to determine whether the set intervals are transmitted whenever a bump test or adjustment is done or not.

Bump test intervals (days): According to T021/023, setting the bump test interval to "daily" is recommended.
Use the "bump test interval" field to specify how often (days) the device will request a bump test. If you set the value to 0 days, the device will not request any bump tests at all.

The bump test intervals are not a substitute for the yearly checks of the gas detector by a specialist, see also: operation manual of the gas detector.

The "Set time in device" field lets you determine whether the device will adopt the date and time of the docking station.

Annex

Care

External contaminations on the device's housing can be removed with a damp cloth. Do not use solvents or cleaning agents!

Maintenance and inspection

We recommend regularly checking the tube connections. We also recommend a yearly check by the GfG service team.

Faults: Cause and remedy

	Fault / notification	**Cause**	**Remedy**
1.	Red and green LED in SD card slot are lit continuously	Fault in parameter memory or Fault in RAM	- Restart device - if necessary, contact the GfG service team
2.	"Device cancellation!"	Fault in gas detector	- Restart test station and gas detector and repeat process
3.	"TS888/999 parameter error!" "TX888/999 parameter error!"	Fault in parameter RAM	- Restart test station and gas detector - if necessary, reconfigure - if necessary, contact the GfG service team
4.	"Flow error!"	Gas supply is interrupted	- Open valve of test gas cylinder - Remove interruption in test gas supply - Remove test station from voltage supply and restart - if necessary, contact the GfG service team
5.	"No gas"	The test station is not configured or parameter memory is faulty	- Configure test station - if necessary, contact the GfG service staff
6.	"No SD card!"	SD card not available or cannot be written on	- Insert SD card (or replace)
7.	"Power error!"	Operating voltage of test station is incorrect	- Replace plug-in power supply unit - if necessary, contact the GfG service team
8.	"Service TS888/999 due" / "Service TX888/999 due"	Service date has been exceeded or Clock is set incorrectly or not set at all	- Contact the GfG service team
9.	"Timeout!"	Sensor bump test is taking too long	- Check gas supply
10.	INFO "Gas pressure!"	Gas pressure is too low, if external gas pressure switch is available	- Check and, if necessary, replace test gas cylinder / sampling valve
11.	INFO "Gas amount!"	Test gas cylinder almost empty	- Replace test gas cylinder and readjust it using the configuration program Readjust the configuration program
12.	INFO "Service test station required!"	Service date is exceeded by at least 21 days	- Contact the GfG service team

Accessories and spare parts

Designation	Item No.
USB interface cable PC<->Test station 1m Length 2m Length	1450431 1450432
Plug-in power supply unit for test station (230VAC euro plug)	1990228
G400-CA car connection cable for test station (12/24VDC)	1450434
MicroSD memory card, for archiving device specific test data and test processes, different memory capacities	1450430
Data bank software for automatic archiving of device data, device tests, test data and test sequences	on request

Information on the environmentally safe disposal of used parts

According to GfG's general terms and conditions, the customer assumes responsibility for the environmentally safe disposal of the device or any device components (such as replaced sensors). In Germany, this is regulated by §§11, 12 ElektroG. On request, GfG in Dortmund can also handle the proper disposal.

Technical specifications

Type designations:	**TS888/999-DIC / TX888/999-DIC**
Display and control elements:	Round LEDs (green, yellow, red) for charging status Square LEDs (green, red) for display status Display and 3 buttons on the G888/G999 for results of the bump test
Power supply:	12VDC / 500mA via jack socket or 5VDC / 100mA via USB port
Gas	
Connections:	1 test gas inlet, 1 gas outlet (for $d_i \approx 5$mm tube)
Flow rate:	0.5 to 0.6 l/min
Time required	
Bump test:	20 to 30sec. (depending on settings and test gas concentration)
Data	
Memory medium:	micro-SD card (formatted with FAT or FAT16 file system)
Communication:	Mini USB
Housing	
Protection class:	IP20
Material:	Plastic
Dimensions:	90x120x160mm (WxHxD)
Weight:	300 g

EU Declaration of Conformity

TS888/999-DIC
TX888/999-DIC

Edited: 21.05.2019 Amended:

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GfG Gesellschaft für Gerätebau mbH develops produces and sells gas sensors and gas warning devices which are subject to a **quality management system** as per DIN EN ISO 9001.
Subject to supervision by means of a **quality system**, surveilled by the notified body, DEKRA Testing and Certification GmbH (0158), is the production of electrical apparatus of instrumentation Group I and II, categories M1, M2, 1G and 2G for gas sensors, gas detectors, gas warning systems in types of protection flameproof enclosures, increased safety, encapsulation and intrinsic safety, as well as their measuring function.

The Teststation **TS888/999-DIC / TX888/999-DIC** complies with council directive **2014/30/EU** for electromagnetic compatibility and with directive **2011/65/EU** (RoHS) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

The directive 2014/30/EU is complied considering the following standard:

- Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen EN 50270 : 2015
  Emitted interference Type class 1
  Interference immunity Type class 2

The AMETEK CTS Europe GmbH at Kamen has tested and certified the electromagnetic compatibility.

The directive 2011/65/EU is complied considering the following standard:

- Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances EN 50581: 2012

Dortmund, 21 Mai 2019

i.V. ....

B.Siebrecht
QMB