

DIT-M Photometer

Installation and operating instructions



Other languages

<http://net.grundfos.com/qr/i/95727428>



Material safety data sheets

<http://net.grundfos.com/qr/i/98351242>

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**Warning**

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

1. Symbols used in this document**Warning**

If these safety instructions are not observed, it may result in personal injury.

Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.

Note

Notes or instructions that make the job easier and ensure safe operation.

2. General safety instructions**Warning**

Reagents are formulated exclusively for chemical analysis and must not be used for any other purpose. Reagents must not get into the hands of children. Some of the reagents contain substances which are not entirely harmless environmentally.

Be aware of the ingredients and take proper care when disposing of the test solution!

Warning

Please read the method description completely before performing the test. Be aware of the risks of using the required reagents by reading the MSDS (Material Safety Data Sheets). Failure could result in serious injury to the operator or damage to the photometer.

Material Safety Data Sheets are available on: www.grundfos.com

The accuracy of the photometer is only valid if the photometer is used in an environment with controlled electromagnetic disturbances according to DIN 61326.

Caution

Wireless devices, e.g. wireless phones, must not be used near the photometer.

3. General information

These installation and operating instructions contain all information important for users of the DIT-M compact photometers.

Should you require further information, or should you encounter problems that are not handled in sufficient depth in this manual, please contact Grundfos.

3.1 Delivery contents

Inspect all items carefully to ensure that every part of the list below is present and no visible damage has occurred during shipment.

If there is any damage or missing items, please contact your local distributor immediately.

A DIT-M standard delivery comprises:

- 1 photometer in a plastic case
- 4 batteries (AA/LR6)
- 1 installation and operating instructions
- 1 certificate of compliance
- 3 round vials with cap and gasket, Ø24
- 1 stirring rod, plastic
- 1 plastic syringe, 5 ml
- 1 cleaning brush.

3.2 Applications

The DIT-M is suitable for photometric analysis of up to 14 parameters in water-treatment monitoring.

Fields of application:

- drinking water treatment
- swimming pool and bathing water treatment
- water treatment in general.

3.3 Avoidance of danger



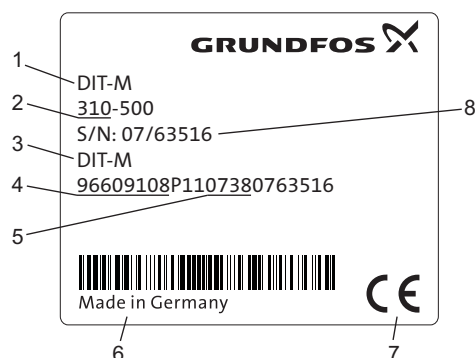
Warning

Do not open or dismantle the photometer!
Cleaning, maintenance and repair must only be carried out by authorised personnel!

If safe operation cannot be ensured any longer, the DIT-M compact photometer is to be taken out of service and safeguarded against unintentional operation. This is the case under the following circumstances:

- The DIT-M photometer has visible damages.
- The DIT-M photometer seems to be inoperative.
- After a long storage time under unfavourable circumstances.

3.4 Nameplate



TM04 8149 3210

Fig. 1 Nameplate of DIT-M

Pos.	Description
1	Type designation
2	Model
3	Product name
4	Product number
5	Year and week of production
6	Country of origin
7	Marks of approval, CE mark etc.
8	Serial number

4. Technical data

Display	Graphical display
Light source	6 LEDs, interference filter (IF) and photosensors arranged in pairs in a transparent measurement chamber. Wavelength ranges:
	$\lambda_1 = 530 \text{ nm}$ (IF $\Delta\lambda = 5 \text{ nm}$)
	$\lambda_2 = 560 \text{ nm}$ (IF $\Delta\lambda = 5 \text{ nm}$)
	$\lambda_3 = 610 \text{ nm}$ (IF $\Delta\lambda = 6 \text{ nm}$)
	$\lambda_4 = 430 \text{ nm}$ (IF $\Delta\lambda = 5 \text{ nm}$)
	$\lambda_5 = 580 \text{ nm}$ (IF $\Delta\lambda = 5 \text{ nm}$)
Wavelength accuracy	$\pm 1 \text{ nm}$
Photometric accuracy	2 % FS (full scale, $T = 20\text{-}25^\circ\text{C}$), measured with standard solutions
Photometric resolution	0.005 A
Operating panel	Acid and solvent-resistant touch-sensitive keypad with acoustic signal
Power supply	4 batteries (type AA/LR6); lifetime approx. 3500 tests
Auto OFF	20 minutes after a key was last pressed; 30 seconds before an acoustic signal is emitted
Storage capacity	approx. 1000 data sets
Interface	IR interface for data transfer
Time	Real-time clock and date
Dimensions	approx. 210 x 95 x 45 mm (L x W x H)
Weight	approx. 450 g (batteries included)
Dimensions packed	440 x 305 x 145 mm (L x W x H)
Weight packed	2220 g
Operating conditions	5-40 °C: relative humidity: 30-90 % (not condensing)
Permissible storage temperature	-20 to +70 °C
Language options	German, English, French, Spanish, Italian, Portuguese, Polish
Protection class	IP 67

To ensure maximum accuracy of test results, always use the reagent systems supplied by Grundfos. See section [7.2 Table of methods and reagents](#).

5. Commissioning

5.1 First commissioning

Before first commissioning insert the batteries delivered with the product. Proceed as described in section [5.2 Saving data, important notes](#) and section [5.3 Replacement of batteries](#). First commissioning procedure:

1. Switch on the device using [ON/OFF] key.
 - The message "Please initialise the storage system with Mode 34" appears in English (language of delivery).
2. Confirm message with $\leftarrow$ key.
3. Press [Mode] key to enter Mode menu.
4. Use arrow keys to select submenu 10 and press $\leftarrow$ key.
5. Select the desired language with arrow keys and press $\leftarrow$ key.
6. Use arrow keys to select submenu 12 and press $\leftarrow$ key.
7. Use [Shift] key together with number keys to enter date and time, and confirm with $\leftarrow$ key.
8. Use arrow keys to select submenu 34 and press $\leftarrow$ key.
9. Confirm enquiry by pressing keys [Shift] + [1] and press $\leftarrow$ key to start initialization of storage system.

5.2 Saving data, important notes

The batteries save data (stored results and photometer setting). During battery change, the data in the photometer is saved for two minutes.

If the change time exceeds two minutes, all stored data and settings will be lost, and the procedure described in 5.1 must be executed once.

Note

For replacement, have a screwdriver and new batteries at hand.

5.3 Replacement of batteries

Although the screws (A) are dismantled, the battery compartment cover (B) provides resistance against opening due to the special sealing.

Caution

For opening don't use tools, which can cause damage to the device!

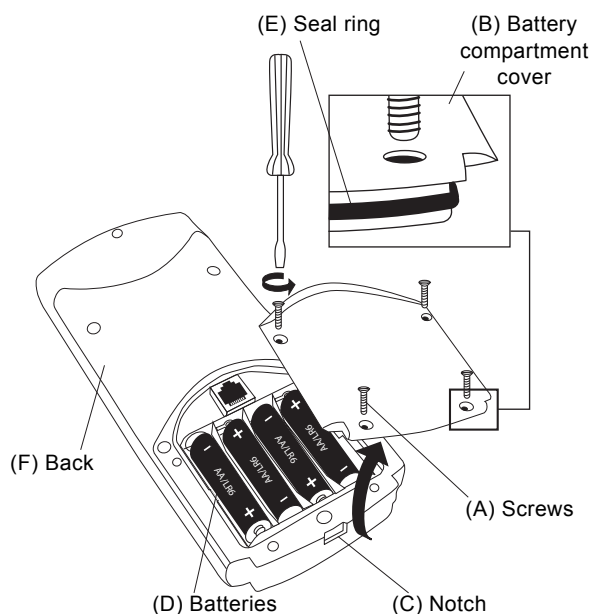


Fig. 2 Replacement of batteries (back)

To ensure that the photometer is waterproof, the seal ring (E) must be in position and the battery compartment cover (B) must be fixed with the four screws (A).

Caution

EC guideline 2006/66/EC requires users to return all used and worn-out batteries and accumulators. They must not be disposed of together with ordinary domestic waste.

Note

Do not use rechargeable batteries (accumulators)!

1. Switch off the photometer.
2. Remove the vial from the sample chamber.
3. Place the photometer upside down on a clean and even surface.
4. Unscrew the four screws (A) of the battery compartment cover (B).
5. Lift off the battery compartment cover (B) at the notch (C).
6. Remove old batteries (D).
7. Position four new batteries.
 - Ensure the correct polarity!
8. Check the seal ring (E) at the battery compartment cover (B) and make sure that it is tight-fitting.
9. Place the battery compartment cover (B) back on the photometer without moving the seal ring (E).
10. Tighten the screws carefully.

6. Operation

The multilingual plain-text operator prompting of the DIT-M photometer offers high operating convenience. The user can choose the following languages: German, English, French, Spanish, Italian, Portuguese, Polish.

Two operating modes can be selected:

- In normal mode all steps of the measurement are displayed.
- The expert mode for the proficient user shows shortened texts and does not request every single step, which saves time.

See also section [6.3.5 Lab function](#).

6.1 Function keys

6.1.1 Overview of function keys

	Switch the photometer on or off.
	Obtain the number keys 0-9 by pressing the shift key. Hold down the shift key and press the required number key(s). Example: [Shift] + [1][1].
	Return to selection of methods or to the previous menu.
	Function key: description in the text where the key is used.
	Function key: description in the text where the key is used.
	Function key: description in the text where the key is used.
	Confirm.
	Menu of photometer settings and other functions.
	Move the cursor up or down.
	Store a displayed test result.
	Perform zero setting.
	Perform a test.
	Display date and time / user countdown.
	Decimal point.

6.1.2 Displaying time and date



Press the ["clock"] key.

19:27:20 2009-06-15

The display shows time and date.



After 15 seconds, the photometer returns automatically to the previous display. You can also press the or [Esc] keys.

6.1.3 User countdown

With this function, the operator is able to define his own countdown.

 Press the ["clock"] key.

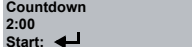
 The display shows time and date.

 Press the ["clock"] key.

 The countdown menu is displayed.

Either press the  to accept the last used user countdown,
or
press the shift key and any number key to start entering a new value. Each entry comprises two digits. Enter minutes and seconds such as 2 minutes, 0 seconds = [Shift] + [0][2][0][0].

 Confirm with the  key.

 The set value is displayed. To start countdown, press the  key.

After countdown is finished, the photometer returns automatically to the previous display.

6.1.4 Display backlight

  Press the [Shift] + [F1] key to turn the display backlight on or off. The backlight is switched off automatically during the measurement.

6.2 Operation mode

 To switch the photometer on, press the [On/Off] key.

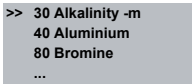
 The photometer performs an electronic self-test.

6.2.1 Automatic switch-off

The photometer switches off automatically 20 minutes after a key was last pressed. This is indicated 30 seconds in advance by a beeper. Press any key to prevent the photometer from switching off.

As long as the photometer is working (e.g. during countdown), the automatic switch-off is inactive.

6.2.2 Method selection

 The display shows a selection list:
There are two ways of selecting the desired method:

a) Enter the number of the method directly,
Example: [Shift] + [8][0] to select bromine.

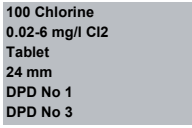
b) To select the required method from the displayed list, press the arrow key  or .

 Confirm with the  key.

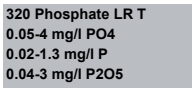
Method information (F1)

Use the [F1] key to switch between the compact and the detailed list for method selection.

 **Example**
Line 1: method number, method name
Line 2: measuring range
Line 3: type of reagent
Line 4: vial
Lines 5-7: reagent used.

Chemical species information (F2)

When pressing the [F2] key, the display shows a list with available chemical species and corresponding ranges.
For changing chemical species, see section [6.2.7 Changing chemical species](#).

 Line 1: method number, method name
Line 2: range with chemical species 1
Line 3: range with chemical species 2
Line 4: range with chemical species 3

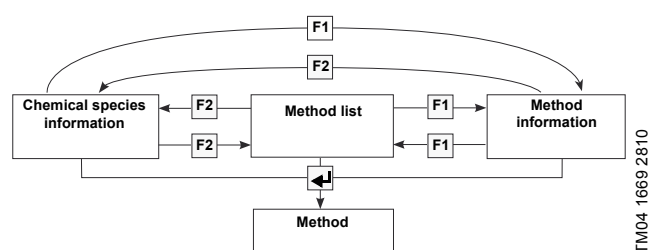


Fig. 3 Scheme of method information

6.2.3 Differentiation

 Differentiation is possible in some methods (e.g. chlorine). The photometer then queries the type of determination (e.g. differentiated, free or total).

  To select the required determination, press the arrow key  or .

 Confirm with the  key.

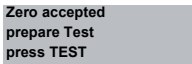
6.2.4 Zero setting

 After selecting a method, the display shows "prepare Zero" and "press ZERO".

Prepare a clean vial, as described in section [7. Methods](#), and place the vial in the sample chamber correctly. See fig. 4.

Press the [Zero] key.



 This display appears.

6.2.5 Performing tests

After zero setting (section [6.2.4](#)) is completed, remove the vial from the sample chamber and perform the tests, as described in the respective method section.

When the results have been displayed, note the following:

- With some methods, it is possible to change between different chemical species.
- The results can be stored and/or printed out.
- Further analyses can be performed with the same zero setting.
- A new method can be selected.

6.2.6 Ensuring reaction periods, countdown

To ensure compliance with reaction periods, a time delay is incorporated, the countdown.

Countdown
2:00
Start:



Countdown
1:59

This display appears.

- Press the key.
Prepare the water sample, and start countdown with the key. After the countdown is completed, proceed as described in the user countdown mode description. The vial must not be placed in the sample chamber.
- Press the [Test] key.
Prepare the water sample as described in the respective method description, and place the vial in the sample chamber. To display the countdown, press the [Test] key. The countdown is started automatically. After the reaction period is finished, the measurement starts automatically.

Notes:

- It is possible to finish the working countdown by pressing the key. Reading starts immediately. In this case, the operator is responsible for ensuring the necessary reaction period. Non-compliance with reaction periods results in incorrect test results.
- The time remaining is displayed continuously. The beeper sounds the last 10 seconds.

6.2.7 Changing chemical species

For some methods, it is possible to change the chemical species of the test result. When the test result is displayed, press arrow key or .

Example:

320 Phosphate LR T 0.05-4 mg/l PO ₄	> >	320 Phosphate LR T 0.02-1.3 mg/l P	> >	320 Phosphate LR T 0.04-3 mg/l P ₂ O ₅
1.00 mg/l PO ₄	< <	0.33 mg/l P	< <	0.75 mg/l P ₂ O ₅

If the species of a test result is changed, the displayed range is adjusted automatically. The chemical species of a stored result cannot be changed any more. The last displayed chemical species is kept by the photometer and will be displayed, if this method is used the next time. If the possibility of changing the chemical species for a method exists, it is described in the manual. The arrows indicate the possible chemical species. The species are printed below the notes of the method:

▲ PO₄
P
▼ P₂O₅

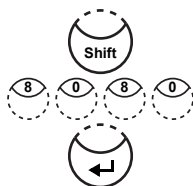
6.2.8 Storing results



Press the [Store] key while the test result is displayed.

Code-No.:

This display appears.



- It is possible to enter a numeric code of up to 6 digits. In the example, it is [8][0][8][0]. A "Code-No" can contain references to the operator or the sampling location.
Confirm the entry with the key.

- If a "Code-No" is not required, confirm directly by pressing . The "Code-No" 0 is assigned automatically in this case.
The entire data set comprising date, time, "Code-No", method and result is stored.

Stored!

This display appears.

After this, the test result is displayed again.

Note:

Storage: 900
free records left

The display shows the number of free data sets.

Storage: only 29
free records left

If there are less than 30 data sets free, the display shows:

Clear the memory as soon as possible (see [6.3.3 Recalling or deleting stored results](#)). If all memory capacity is used up, it is impossible to save additional test results.

6.2.9 Printing results (optional infrared module DIT-IR)

If the DIT-IR is switched on (section [6.4 Data transfer, DIT-IR module](#)) and the printer is connected, it is possible to save the result to a PC and/or print it via a serial RS232 interface.



Press the [F3] key.

The entire data set comprising date, time, method and result is printed.

Example:

100 Chlorine T
0.02-6 mg/l Cl2
Profil-Mode: no
2009-07-01 14:53:09
Test No.: 1
Code No.: 007
4.80 mg/l Cl2

The Test No is an internal number that is set automatically if a test result is stored. It appears only on the print-out.

6.2.10 Performing additional measurements



To perform additional tests using the same method:

Press the [Test] key.

Zero accepted
prepare Test
press TEST

This display appears.



Confirm with the [Test] key.

or:



Press the [Zero] key to perform a new zero setting.

prepare Zero
press ZERO

This display appears.

6.2.11 Selecting a new method



Press the [Esc] key to return to the method selection.



It is also possible to enter the required method number directly such as [Shift] + [1][6][0] for CyA-TEST (cyanuric acid).



Confirm your input with the  key.

6.2.12 Measure absorbance

Range: -2600 mAbs to +2600 mAbs

Method No	Title
900	mAbs 430 nm
910	mAbs 530 nm
920	mAbs 560 nm
930	mAbs 580 nm
940	mAbs 610 nm
950	mAbs 660 nm

Select the desired wavelength from the method list or by entering the corresponding method number directly.

900 mAbs 430 nm
-2600 mAbs - +2600 mAbs
prepare Zero
press ZERO

The display shows for example the readings to the left.

Always perform zero setting using a filled vial, e.g. with deionised water.

Zero accepted
prepare Test
press TEST

This display appears.

Carry out the measurement of the sample.

500 mAbs

This display appears.

Note: To ensure complete reaction times, the user countdown may be helpful. See section [6.1.3 User countdown](#).

6.3 Photometer settings, table of "Mode" functions

Mode function	No	Description	Page
User concentration	64	Entering the data necessary to run a user concentration method	15
User polynoms	65	Entering the data necessary to run a user polynomial	16
User methods clear	66	Delete all data of a user polynomial or of a concentration method	17
User calibration	45	Storage of user calibration	13
Countdown	13	Switching the countdown on/off to ensure correct reaction times	9
Delete data	34	Deleting all stored results	12
Storage	30	Displaying all stored results	11
Stor., Code	32	Displaying only results of a selected "Code-No" range	11
Stor., date	31	Displaying only results of a selected time period	11
Stor., method	33	Displaying only results of one selected method	12
Print*	20	Printing all stored results	10
Print, Code No*	22	Printing only results of a selected "Code-No" range	10
Print, date*	21	Printing only results of a selected time period	10
Print, method*	23	Printing only results of one selected method	10
Printing parameters*	29	Setting of printing options	11
System info	91	Information about the photometer, e.g. current software version	17
Clear calibration	46	Deleting user calibration	13
Calibration	40	Special method calibration	12
LCD contrast	80	Setting the display contrast	17
LCD brightness	81	Setting the display brightness	17
Method list	60	User method list, adaption	14
M list all on	61	User method list, switching on all methods	14
M list all off	62	User method list, switching off all methods	15
Profi-Mode	50	Switching the detailed operator instructions on/off (lab function)	14
Signal beep	14	Switching the acoustic signal on/off to indicate the end of reading	9
Language	10	Selecting a language	9
Key beep	11	Switching the acoustic signal on/off to indicate the pressing of a key	9
Clock	12	Setting date and time	9

* Printing means storing on a PC or printing via serial RS232 interface

The selected settings are kept by the photometer even when it is switched off. To change photometer settings, a new setting is required.

6.3.1 Photometer basic settings 1

Selecting a language

Press the [Mode] key.

Press the [Shift] and [1][0] keys.

Confirm with the  key.

This display appears.

To select the required language from the displayed list, press the arrow key  or .

Confirm with the  key.

Key beep

Press the [Mode] key.

Press the [Shift] and [1][1] keys.

Confirm with the  key.

This display appears.

To switch the key beep off, press the [Shift] and [0] keys.

To switch the key beep on, press the [Shift] and [1] keys.

Confirm with the  key.

Note:

In the case of methods with reaction periods, an acoustic signal still sounds during the last 10 seconds of the countdown, even if the key beep is switched off.

Date and time

Press the [Mode] key.

Press the [Shift] and [1][2] keys.

Confirm with the  key.

This display appears.

The entry comprises two digits each, in the following order:

yy-mm-dd	hh:mm
09-05-14	--:--
09-05-14	15-07

year, month, day. Example: May 14, 2009 = [Shift] + [0][9][0][5][1][4].

hours, minutes. Example: 3.07 p.m. = [Shift] + [1][5][0][7].

Confirm with the  key.

Note:

When confirming date and time with the  key, the seconds are set to zero automatically.

Countdown (ensuring reaction periods)

Some methods require a reaction period. This reaction period is incorporated in the method as a standard with the countdown function.

It is possible to switch the countdown off for all methods:

Press the [Mode] key.

Press the [Shift] and [1][3] keys.

Confirm with the  key.

This display appears.

To switch the countdown off, press the [Shift] and [0] keys.

To switch the countdown on, press the [Shift] and [1] keys.

Confirm with the  key.

Notes:

- It is possible to interrupt the working countdown by pressing the  key (e.g. for serial analysis). The "user countdown" is also available if the countdown is switched off.
- If the countdown function is switched off, the operator is responsible for ensuring the necessary reaction period. Non-compliance with reaction periods results in incorrect test results.

Signal beep

Performing a zero setting or a measurement takes about eight seconds. The photometer indicates the end of zeroing or measuring by a short beep.

Press the [Mode] key.

Press the [Shift] and [1][4] keys.

Confirm with the  key.

This display appears.

To switch the signal beep off, press the [Shift] and [0] keys.

To switch the signal beep on, press the [Shift] and [1] keys.

Confirm with the  key.

Note:

In the case of methods with reaction periods, an acoustic signal continues to sound during the last 10 seconds of the countdown, even if the key beep is switched off.

6.3.2 Printing of stored results

Printing all results

Press the [Mode] key.



Press the [Shift] and [2][0] keys.



Confirm with the  key.

This display appears.



To print out all stored test results, press the  key.

This display appears.



After printing, the photometer returns automatically to the "Mode" menu.

Note:

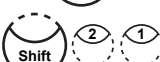
To cancel the entry, press the [Esc] key.
All stored data are printed out.

Printing results of a selected time period

Press the [Mode] key.



Press the [Shift] and [2][1] keys.



Confirm with the  key.

This display appears.



Enter the date of the first day of the required period in the following order: year, month, day. Example: May 14, 2009 = [Shift] + [0][9][0][5][1][4].

Confirm with the  key.

This display appears.



Enter the date of the last day of the required period in the following order: year, month, day. Example: May 19, 2009 = [Shift] + [0][9][0][5][1][9].

Confirm with the  key.

This display appears.



To print all stored results in the selected date range, press the  key.

After printing, the photometer returns automatically to the "Mode" menu.

Note:

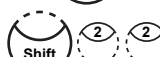
It is possible to cancel the entry by [Esc].
If you want to print only results of one day, determine the period by entering the same date twice.

Printing results of a selected "Code-No" range

Press the [Mode] key.

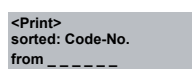


Press the [Shift] and [2][2] keys.



Confirm with the  key.

This display appears.



Enter the start "Code-No" (max. 6-digit), such as [Shift] + [1].

Confirm with the  key.

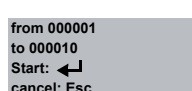
This display appears.



Enter the end "Code-No" (max. 6-digit), such as [Shift] + [1][0].

Confirm with the  key.

This display appears (example).



To print all stored results in the selected code number range, press the  key.

After printing, the photometer returns automatically to "Mode" menu.

Note:

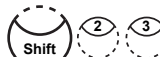
It is possible to cancel the entry by [Esc].
If you want to print only results of one code number, enter the same Code-No twice (as start and end code).
If you want to print all results without code number (Code-No is 0), enter [Shift] + [0] twice (as start and end code).

Printing results of one selected method

Press the [Mode] key.



Press the [Shift] and [2][3] keys.



Confirm with the  key.

This display appears.

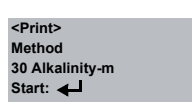


Select the required method from the displayed list or enter the method number directly.

Confirm with the  key.

In case of differentiated methods, select the required kind of determination and confirm with the  key.

This display appears (example).



To print all stored results of the selected method, press the  key.

After printing, the photometer returns automatically to the "Mode" menu.

Note:

To cancel the entry, press the [Esc] key.

Printing parameters

Press the [Mode] key.



Press the [Shift] and [2][9] keys.



Confirm with the  key.

This display appears.

```
<Printing parameter>
2:Baud rate
cancel: Esc
```

To select "Baud rate", press the [Shift] and [2] keys.



This display appears.

```
<Baud rate>
is: 19200
select ▲▼ :
save:  ↵
cancel: Esc
```

To select the required "Baud rate", press the arrow keys ▲ or ▼.
(1200, 2400, 4800, 9600, 14400, 19200)



Confirm with the  key.

Finish with the [Esc] key.



Revert to the "Mode" menu with the [Esc] key.

Revert to the method selection with the [Esc] key.

6.3.3 Recalling or deleting stored results

Recalling all stored results

Press the [Mode] key.



Press the [Shift] and [3][0] keys.



Confirm with the  key.

This display appears.

```
<Storage>
display all data
Start:  ↵ cancel: Esc
print: F3
print all: F2
```

The stored data sets are displayed in chronological order, starting with the latest stored test result. To display all stored results, press the  key.

- To print the displayed result, press the [F3] key.
- To print all results, press the [F2] key.
- Finish with the [Esc] key.
- To display the subsequent test result, press the arrow key ▼.
- To display the previous test result, press the arrow key ▲.



If no test results are stored in the memory, the display shows "no data".

```
no data
```

Recall results of a selected time period

Press the [Mode] key.



Press the [Shift] and [3][1] keys.



Confirm with the  key.

This display appears.

```
<Storage>
sorted: date
from yy-mm-dd
--'--'--
```

Enter the date of the first day of the required period in the following order: year, month, day. Example: May 14, 2009 = [Shift] + [0][9][0][5][1][4].



Confirm with the  key.

This display appears.

```
to yy-mm-dd
--'--'--
```

Enter the date of the last day of the required period in the following order: year, month, day. Example: May 19, 2009 = [Shift] + [0][9][0][5][1][9].



Confirm with the  key.

This display appears.

```
from 14.05.2009
to 19.05.2009
Start:  ↵ cancel: Esc
print: F3
print all: F2
```

- To display all stored results in the selected date range, press the  key.
- To print the displayed result, press the [F3] key.
- To print all selected results, press the [F2] key.
- Finish with the [Esc] key.

Note:

To cancel the entry, press the [Esc] key.

If you want to recall only results of one day enter, the same date twice to determine the time period.

Recalling results of a selected "Code-No" range

Press the [Mode] key.



Press the [Shift] and [3][2] keys.



Confirm with the  key.

This display appears.

```
<Storage>
sorted: Code-No.
from -----
```

Enter the start "Code-No" (max. 6-digit), such as [Shift] + [1].



Confirm with the  key.

This display appears.

```
to -----
```

Enter the end "Code-No" (max. 6-digit), such as [Shift] + [1][0].



Confirm with the  key.

This display appears.

```
from 000001
to 000010
Start:  ↵ cancel: Esc
print: F3
print all: F2
```

- To display all stored results of the selected "Code-No" range, press the  key.
- To print the displayed result, press the [F3] key.
- To print all selected results, press the [F2] key.
- Finish with the [Esc] key.

Note:

To cancel the entry, press the [Esc] key.

If you want to display only the results of one code number, enter the same Code-No twice (as start and end code).

If you want to display all results without code number (Code-No is 0), enter [Shift] + [0] twice (as start and end code).

Recalling results of one selected method

Press the [Mode] key.

Press the [Shift] and [3][3] keys.

Confirm with the  key.

This display appears.

```
<Storage>
>> 20 Acid demand
  40 Aluminium T
  80 Bromine T
```

Select the required method from the displayed list or enter the method number directly.

Confirm with the  key.

In case of differentiated methods, make a new selection and confirm with the  key.

This display appears.

```
<Storage>
Method
80 Bromine
Start:  cancel: Esc
print: F3
print all: F2
```

- To display all stored results of the selected method, press the  key.
- To print the displayed result, press the [F3] key.
- To print all selected results, press the [F2] key.
- Finish with the [Esc] key.

Deleting stored results

Press the [Mode] key.

Press the [Shift] and [3][4] keys.

Confirm with the  key.

This display appears.

```
<Delete data>
Delete all data?
YES: 1, NO: 0
```

Press the  key.

Press the  key.

To delete, press the  key.

ATTENTION:

All stored test results are deleted!

If you do not want to delete the data, cancel and exit the menu by pressing the [Esc] key.

6.3.4 Calibration**Fluoride method 170****Notes:**

- The same batch of *SPADNS reagent* solution must be used for adjustment and test. If using a new batch of *SPADNS reagent* solution, a new calibration has to be performed with the reagent (see Standard Methods 20th, 1998, APHA, AWWA, WEF 4500 F D., pages 4-82).
- As the test result is highly dependent on exact sample and reagent volumes, the sample and reagent volumes should always be metered very accurately.

Press the [Mode] key.

Press the [Shift] and [4][0] keys.

Confirm with the  key.

This display appears.

```
<Calibration>
1:M191 Ca-Hardness 2T
2:M191 0 Reset 0 cali.
3:M170 Fluoride L
```

Press the [Shift] and [3] keys.

This display appears.

```
<Calibration>
M170 Fluoride
Zero: deionised water
press ZERO
```

- Fill a clean vial (Ø24) with exactly 10 ml of deionised water, close tightly with the cap.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Zero] key.
- Remove the vial from the sample chamber.
- Add exactly 2 ml *SPADNS reagent* solution (No [95727757](#)) to the 10 ml deionised water. Caution: vial is filled to the top!
- Close the vial tightly with the cap and swirl gently several times to mix the contents.
- Place the vial correctly in the sample chamber. See fig. 4.
- Press the [Test] key.
- Remove the vial from the sample chamber, rinse vial and cap thoroughly and fill the vial with exactly 10 ml *Fluoride standard* (No [95727758](#), concentration 1 mg/l F⁻).
- Add exactly 2 ml *SPADNS reagent* solution (No [95727757](#)) to the 10 ml *Fluoride standard*. Caution: vial is filled to the top!
- Place the vial correctly in the sample chamber. See fig. 4.
- Press the [Test] key.

```
Zero accepted
T1: 0 mg/l F
press TEST
```

```
T1 accepted
T2: 1 mg/l F
press TEST
```

```
Calibration
accepted
```

Confirm with the  key.

Use the [Esc] key to go back to the method selection.

Select the fluoride method with the [Shift] and [1][7][0] and  keys.

If an error message appears, please repeat the calibration.

```
Error, absorbance
T2>T1
```

User calibration

Procedure:

- Prepare a standard reagent of known concentration and use this reagent instead of the sample according to the test procedure.
- It is recommended to use well known standard reagents which are formulated according to DIN EN, ASTM or other international standards, or to use certified reagents that are commercially available.
- After measuring this standard solution, it is possible to change the displayed results to the required value (see below).
- Only the simple form of differentiated methods can be calibrated. For the "Chlorine" method, the variant "free" has to be chosen among the possibilities "differentiated", "free" and "total".
- Some methods cannot be calibrated. They are calibrated indirectly via the basic method. See the table below.

Consequences:

- If a test method is user-calibrated the method name is displayed inverted.
- User calibration of the basic method "Chlorine free" influences all other DPD methods (tablets and liquid reagents). See the table below.
- In methods such as "chlorine dioxide in the presence of chlorine", the calibration of the basic method influences the chlorine dioxide value as well as the chlorine value.
- In differentiated methods such as "chlorine (diff., free, total)", user calibration of the variant "free" also influences the other determinations of this method (in this example differentiated and total chlorine).

Return to factory calibration:

If the user calibration is deleted, the factory calibration is activated automatically.

Note:

The "Fluoride" method cannot be calibrated with mode 45 since the test requires a specific calibration. See section [6.3.4 Calibration](#).

Overview

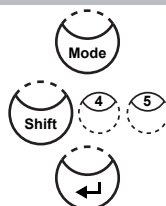
No	Method	Recommended range for user calibration
40	Aluminium T	0.1 - 0.2 mg/l Al
80	Bromine T	calibration via basic method 100 Chlorine, free
100	Chlorine T	0.5 - 1.5 mg/l Cl ₂
120	Chlorine dioxide T	calibration via basic method 100 Chlorine, free
90	Chloride T	10 - 20 mg/l Cl ₂
160	CyA-TEST T	30 - 60 mg/l CyA (cyanuric acid)
220	Iron T	0.3 - 0.7 mg/l Fe
170	Fluoride L	calibration with 0 and 1 mg/l F via Mode 40
240	Manganese T	1 - 2 mg/l Mn
300	Ozone (DPD) T	calibration via basic method 100 Chlorine, free
330	pH value T	7.6 - 8.0
320	Phosphate LR T	1 - 3 mg/l PO ₄
20	Acid demand K _{S 4.3} T	1 - 3 mmol/l
210	Hydrogen peroxide T	calibration via basic method 100 Chlorine, free

Store user calibration

100 Chlorine T
0.02-6 mg/l Cl₂
0.90 mg/l free Cl₂

Perform the test as described in the respective method using a standard reagent of known concentration.

Press the [Mode] key.



Press the [Shift] and [4][5] keys.

Confirm with the key.

<User calibration>
100 Chlorine T
0.02-6 mg/l Cl₂
0.90 mg/l free Cl₂
up: down:
save:

This display appears.

To increase the displayed result, press the arrow key once.

To decrease the displayed result, press the arrow key once.

Press keys until the displayed result corresponds to the value of the standard reagent.

To store the new calibration factor, press the key.

To cancel the user calibration without storing a new factor, press the [Esc] key.



Jus Factor
saved

This display appears.

100 Chlorine T
0.02-6 mg/l Cl₂
1.00 mg/l free Cl₂

Now the method name is displayed inverted and the test result is calculated with the new calibration factor.

Delete user calibration

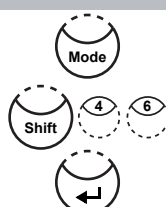
This chapter only applies to methods which can be user-calibrated.

100 Chlorine T
0.02-6 mg/l Cl₂

Select the required method.

prepare Zero
press ZERO

When the Zero query appears, press the [Mode] key instead of zeroing the photometer.



Press the [Shift] and [4][6] keys.

Confirm with the key.

<User calibration>
100 Chlorine T
0.02-6 mg/l Cl₂
clear user calibration?
YES: 1, NO: 0

This display appears.

To delete user calibration, press the [Shift] and [1] keys.

To keep the valid user calibration, press the [Shift] and [0] keys.

The photometer returns automatically to the Zero query.



6.3.5 Lab function

Reduced operator guidance in Profi-Mode

The following information is always stored in the methods:

1. method
2. range
3. date and time
4. differentiation of results
5. detailed operator guidance
6. compliance with reaction periods (countdown).

If the Profi-Mode is active, the photometer provides only a minimum of operator guidance. The above items 4, 5, 6 are not included.

Press the [Mode] key.

Press the [Shift] and [5][0] keys.

Confirm with the  key.

This display appears.

To switch the Profi-Mode off, press the [Shift] and [0] keys.

To switch the Profi-Mode on, press the [Shift] and [1] keys.

This display appears.

Confirm with the  key.

Note:

Storage of test results is possible in the Profi-Mode. When results are stored, the display shows "Profi-Mode" additionally.

The selected settings are kept by the photometer even when it is switched off. To change the photometer setting, a new setting is required.

6.3.6 User operations

User method list

After switching on the photometer, a scroll list of all available methods is automatically shown in the display. To shorten this list, the user can define a user method list according to his own requirements.

After an update, new methods are automatically added to the user method list.

The program structure requires that the user method list must have at least one active (switched-on) method. For this reason, it is necessary to activate first all required methods and then to switch off the automatically activated one, if this method is not required.

User method list, adaption

Press the [Mode] key.

Press the [Shift] and [6][0] keys.

Confirm with the  key.

This display appears.

To start, press the  key.

The complete method list is displayed.

Methods with a dot [•] behind the method number will be displayed in the method selection list. Methods without a dot will not be displayed.

To select the required method from the displayed list, press the arrow keys  or .

To switch between "active" [•] and "inactive" [], press the [F2] key.

Select the next method, set "active" or "inactive" until all methods have the desired setting.

Confirm and store with the  key.

To cancel without storing, press the [Esc] key.

Note:

If only a few methods are required, it is recommended to perform Mode 62 "Mlist all off" first, followed by Mode 60 "Method list".

Only the methods that are to appear in the method selection list, have to be marked with the dot [•].

All user Polynomials (1-25) and Concentrations (1-10) are displayed in the method list, even if they are not programmed by the user. Non-programmed user methods cannot be activated.

User method list, switch on all methods

This mode function activates all methods. After switching on the photometer, a scroll list of all available methods is automatically shown in the display.

Press the [Mode] key.

Press the [Shift] and [6][1] keys.

Confirm with the  key.

This display appears.

- To display all methods in the method selection list, press the [Shift] and [1] keys.
- To keep the valid method selection list, press the [Shift] and [0] keys.

The photometer returns automatically to the "Mode" menu.

User method list, switch off all methods

The program structure requires that the method list must have at least one active (switched-on) method. For this reason, the photometer activates the first method on the list automatically.

Press the [Mode] key.

Press the [Shift] and [6][2] keys.

Confirm with the key.

This display appears.

<Mlist all off>
switch off all methods
YES: 1, NO: 0

- To display only one method in the method selection list, press the [Shift] and [1] keys.
- To keep the valid method selection list, press the [Shift] and [0] keys.

The photometer returns automatically to the "Mode" menu.

User concentration method

It is possible to enter and store up to 10 user concentration methods. This requires 2 to 14 standard reagents of known concentration and one blank (deionised water or reagent blank value) are needed for this. The standard reagents should be measured with increasing concentrations and from the brightest to the darkest colouration.

The measuring range for "Underrange" and "Overrange" is defined with -2600 mAbs* and +2600 mAbs*. After selection of a method, the concentration of the lowest and highest measured standard is displayed as measuring range. In order to achieve very exact results, the operation range should be within this range.

*) 1000 mAbs = 1 Abs = 1 E (displayed)

Entering a user-concentration method

Press the [Mode] key.

Press the [Shift] and [6][4] keys.

Confirm with the key.

Entry procedure:

This display appears.

To enter a method number in the range from 850 to 859, such as [Shift] and [8][5][0], press the number keys.

Confirm with the key.

Note:

If the entered number has already been used to save a concentration, the display shows the query on the left.

Overwrite conc. meth.?
YES: 1 NO: 0

wavelength:
1: 530 nm 4: 430 nm
2: 560 nm 5: 580 nm
3: 610 nm 6: 660 nm

Enter the required wavelength by pressing the appropriate number key, such as [Shift] and [2] for 560 nm.

choose unit:
>> mg/l
g/l
mmol/l
mAbs
µg/l
E
A
%

To select the required unit, press the arrow keys or .

Confirm with the key.

choose resolution:
1: 1
2: 0.1
3: 0.01
4: 0.001

Select the required resolution by pressing the appropriate number key, such as [Shift] and [3] for 0.01.

Note:

Please enter the required resolution according to the photometer settings:

Range	Max. resolution
0.000 ... 9.999	0.001
10.00 ... 99.99	0.01
100.0 ... 999.9	0.1
1000 ... 9999	1

Measurement procedure with standard reagents of known concentration:

This display appears.

Prepare Zero and press the [Zero] key.

Note:

Use deionised water or reagent blank value.

This display appears.

Enter the concentration of the first standard, such as [Shift] and [0][.][0][5]

- To go one step back, press the [Esc] key.
- To reset input, press the [F1] key.

Confirm with the key.

This display appears.

Prepare the first standard and press the [Test] key.

The display shows the input value and the measured absorption value. Confirm with the key.

Enter the concentration of the second standard, such as [Shift] and [0][.][1].

- One step back with the [Esc] key.
- Reset input with the [F1] key.

Confirm with the key.

Prepare the second standard and press the [Test] key.

The display shows the input value and the measured absorption value. Confirm with the key.

S2 accepted
S3: +
← | ESC | F1 | Store



stored!

Note:

To measure further standard reagents, perform as described above.

The minimum of measured standard reagents is 2.

The maximum of measured standard reagents is 14 (S1 to S14).

If all required standard reagents or the maximum amount of 14 standard reagents have been measured, press the [Store] key.

This display appears.

The photometer returns automatically to the "Mode" menu.

Now the concentration is stored in the photometer and can be recalled by entering its method number or selecting it from the displayed method list.

Save all your concentration data in a written form because in case of power outage (e.g. changing the battery) all concentration data will be lost and must be entered again.

Note

User polynomials

Up to 25 user polynomials can be entered and stored.

The software allows the user to apply a polynomial of up to the 5th degree:

$$y = A + Bx + Cx^2 + Dx^3 + Ex^4 + Fx^5$$

If only a Polynomial of a lower degree is necessary, the other coefficients are specified as zero; for example, for a 2nd degree polynomial D, E, F = 0.

The values of the coefficients A, B, C, D, E, F must be entered in an academic notation with a maximum of 6 decimal places, for example 121.35673 = 1.213567E+02

Entering a user polynomial:



Press the [Mode] key.



Press the [Shift] and [6]/[5] keys.



Confirm with the key.

<User polynomials>
choose No.:
(800 - 824)

This display appears.

Enter a method number in the range from 800 to 824 by pressing the appropriate number keys, such as [Shift] and [8][0][0].



Confirm with the key.

Note:

If the entered number has already been used to save a polynomial, the display shows the query to the left.

- To return to method number query, press the [Shift] and [0] or [Esc] keys.
- To start the entry mode, press the [Shift] and [1] keys.

Select the required wavelength by pressing the appropriate number key, such as [Shift] and [2] for 560 nm.

wavelength:
1: 530 nm 4: 430 nm
2: 560 nm 5: 580 nm
3: 610 nm 6: 660 nm



<User polynomials>
y = A+Bx+Cx2+Dx3+
Ex4+Fx5
A: +



A: 1.32 E+



B: +

- Press the arrow keys or to change between plus and minus sign.
- Enter the data of the coefficient A including decimal point, such as [Shift] and [1][.][3][2] for 1.32.
- To reset input, press the [F1] key.

Confirm with the key.

- To change between plus and minus sign, press the arrow keys or .
- Enter the exponent of the coefficient A, such as [Shift] and [3].

Confirm with the key.

Successively the photometer queries the data for the other coefficients (B, C, D, E and F).

Note:

If zero [0] is entered for the value of the coefficient, the input of the exponent is omitted automatically.

Confirm every input with the key.



Enter measurement ranges from -2600 to +2600 mAbs.

Measurement range
Min. mAbs: +
Max. mAbs: +



- To change between plus and minus sign, press the arrow keys or .
- Enter the values in absorbance (mAbs) for the upper limit (Max) and the lower limit (Min).

Confirm every input with the key.

choose unit:
>> mg/l
g/l
mmol/l
mAbs
µg/l
E
A
%

To select the required unit, press the arrow keys or .

Confirm with the key.

choose resolution:
1: 1
2: 0.1
3: 0.01
4: 0.001



Select the required resolution by pressing the appropriate number key, such as [Shift] and [3] for 0.01.

Note:

Please enter the required resolution according to the photometer settings:

Range	Max. resolution
0.000 ... 9.999	0.001
10.00 ... 99.99	0.01
100.0 ... 999.9	0.1
1000 ... 9999	1

stored!

This display appears.

The photometer returns automatically to the "Mode" menu.

Now the polynomial is stored in the photometer and can be recalled by entering its method number or selecting it from the displayed method list.

Note

Save all your polynomial data in a written form because in case of power outage (e.g. changing the battery) all polynomial data will be lost and must be entered again.

Delete user methods (polynomial or concentration)

Every valid user method can be overwritten. An existing user method ("polynomial" or "concentration") can even be totally deleted and thus removed from the method selection list:

Press the [Mode] key.

Press the [Shift] and [6][6] keys.

Confirm with the key.

This display appears.

Enter the number of the user method you want to delete (in the range from 800 to 824 or from 850 to 859), such as [Shift] and [8][0][0] for 800.

Confirm with the key.

The query is displayed:

- To delete the selected user method, press the [Shift] and [1] keys.
- To keep the valid user method, press the [Shift] and [0] keys.

The photometer returns automatically to the "Mode" menu.

6.3.7 Basic settings 2

Adjusting the display contrast

Press the [Mode] key.

Press the [Shift] and [8][0] keys.

Confirm with the key.

This display appears.

To increase the contrast of the LC display, press arrow key .

To decrease the contrast of the LC display, press arrow key .

To increase the contrast of the LC display by ten units, press the [Store] key.

To decrease the contrast of the LC display by ten units, press the [Test] key.

Confirm with the key.

Adjusting the display brightness

Press the [Mode] key.

Press the [Shift] and [8][1] keys.

Confirm with the key.

This display appears.

To increase the brightness of the LC display, press arrow key .

To decrease the brightness of the LC display, press arrow key .

To increase the brightness of the LC display by ten units, press the [Store] key.

To decrease the brightness of the LC display by ten units, press the [Test] key.

Confirm with the key.

6.3.8 Special functions/service

Photometer information

Press the [Mode] key.

Press the [Shift] and [9][1] keys.

Confirm with the key.

This function informs you about the current software version, the condition of the power supply, the number of performed tests and free memory capacity.

To display the number of performed tests and the free memory capacity, press the arrow key .

To return to the "Mode" menu, press the [Esc] key.

6.4 Data transfer, DIT-IR module

To transmit stored or current data to a PC, the optional DIT-IR (infrared interface module) is required.

6.4.1 Data transfer to a PC

To transmit test results to a PC, the DIT-IR module as well as a transfer software is required. The transfer software is comprised in a DIT-IR standard delivery.

For more detailed information, read the DIT-IR manual or visit our homepage www.grundfos.com.

7. Methods

7.1 Important notes

7.1.1 Correct use of reagents

The reagents must be added in the correct sequence.

Tablet reagents: The tablet reagents must be added to the water sample straight from the foil without touching them with the fingers.

SPADNS liquid reagents: Add the SPADNS liquid reagents to the water sample using a 2-ml pipette. Observe the storage instructions, e.g. cool and dry.

7.1.2 Cleaning of vials and accessories

Vials, caps and stirring rods should be cleaned thoroughly after each measurement to prevent interferences. Even minor reagent residues can cause errors in the test result.

Procedure:

Clean vials and accessories after each measurement as soon as possible.

- Clean vials and accessories with laboratory detergent, e.g. Extran® MA 02 (neutral, phosphatic), Extran® MA 03 (alkaline, phosphate-free) from Merck KGaA.
- Rinse thoroughly with tap water.
- If necessary, perform special cleaning as required in the method, for example rinse with diluted hydrochloric acid solution.
- Rinse thoroughly with deionised water.

7.1.3 Method notes

- Vials, caps and stirring rods should be cleaned thoroughly after each measurement to prevent interferences. Even minor reagent residues can cause errors in the test result.
- The outside of the vial must be clean and dry before starting the measurement. Fingerprints or other marks on the vials will lead to incorrect measurements.
- Zero setting and test must be carried out with the same vial, as there may be slight differences in optical performance between vials.
- The vials must be positioned in the sample chamber for zeroing and test, with the mark on the vial (white triangle) aligned with the mark on the photometer. See fig. 4.
- Always perform zeroing and test with the vial cap tightly closed. Only use cap with gasket to prevent light from entering the sample chamber.

Correct position of the vial (Ø24)

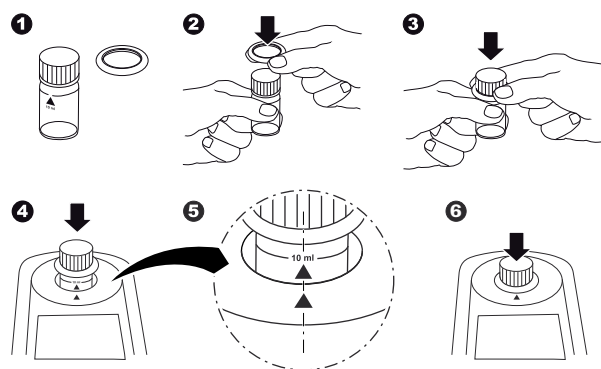


Fig. 4 Correct position of the vial (Ø24)

TM04 1645 27 10

- Bubbles on the inside wall of the vial result in incorrect measurements. To prevent this, remove the bubbles by swirling the vial before performing the test.
- Avoid spillage of water in the sample chamber. If water should leak into the instrument housing, it can destroy electronic components and cause corrosion.
- Contamination of the lens in the sample chamber can result in errors. Check at regular intervals and, if necessary, clean the light entry surfaces of the sample chamber using a moist cloth or cotton buds.
- Large temperature differences between the photometer and the environment can lead to errors - e.g. due to the formation of condensation in the area of the lens or on the vial.
- To avoid errors caused by stray light, do not use the photometer in bright sunlight.

Correct filling of the vial:

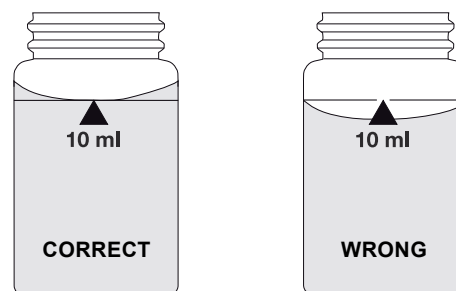


Fig. 5 Correct filling of the vial

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7.1.4 Sample dilution techniques

For accurate dilutions, proceed as follows:

- Pipette the water sample (see table below) into a 100 ml volumetric flask and fill up to the 100 ml mark with deionised water. Swirl to mix the contents.

Water sample [ml]	Multiplication factor
1	100
2	50
5	20
10	10
25	4
50	2

- Pipette the required volume of the diluted sample into the vial and proceed as described in the test methods.

Caution

Dilution decreases accuracy! Do not dilute water samples for measurement of pH-values. This will lead to incorrect test results. If "Overrange" is displayed, use another method, for example a pH meter.

7.1.5 Correction of volume additions

If a larger volume of acid or base is used to pre-adjust the pH-value, a volume correction of the displayed result is necessary.

Example: For adjusting the pH-value of a 100 ml water sample, 5 ml of acid must be added. The corresponding displayed result is 10 mg/l.

Total volume	= 100 ml + 5 ml	= 105 ml
Correction factor	= 105 ml/100 ml	= 1.05
Corrected result	= 10 mg/l x 1.05	= 10.5 mg/l

7.2 Table of methods and reagents

No	Analysis	Differentiation	Range	Tolerance	Resolution	Analyses per PU	Article description	Product number	Section
40	Aluminium T		0.01 - 0.3 mg/l Al	± 0.04 mg/l	0.01	250	Combi pack Aluminium No. 1/No. 2, 250 tablets each	95727755	7.4
80	Bromine T		0.05 - 13 mg/l Br	in mg/l: 0-2.25: ± 0.09 >2.25-4.5: ± 0.18 >4.5-6.75: ± 0.41 >6.75-9: ± 0.56 >9-13: ± 0.79	0.01	100	DPD No. 1 tablets	95727761	7.5
100	Chlorine T	free	0.01 - 6 mg/l Cl ₂	in mg/l: 0-1: ± 0.04 >1-2: ± 0.08 >2-3: ± 0.18 >3-4: ± 0.25 >4-6: ± 0.35	0.01	250	DPD No. 1 tablets	95727747	7.7.4
		free (high Ca)					DPD No. 1 high calcium	95727748	
		total (free and combined differentiated)					DPD No. 1 tablets	95727747	7.7.3
		total (not differentiated)					DPD No. 3 tablets	95727750	
120	Chlorine dioxide T	Cl ₂ and ClO ₂ differentiated	0.02 - 11 mg/l ClO ₂	in mg/l: 0-1.9: ± 0.08 >1.9-3.8: ± 0.15 >3.8-5.7: ± 0.34 >5.7-7.6: ± 0.48 >7.6-11: ± 0.67	0.01	250	DPD No. 1 tablets	95727747	7.8.3
							DPD No. 3 tablets	95727750	
							Glycine tablets	95727752	
		ClO ₂ in absence of Cl ₂					DPD No. 1 tablets	95727747	7.8.4
100	Chlorine dioxide analysis T*	Chlorine dioxide, chlorite, free chlorine, combined chlorine	0.01 - 6 mg/l	in mg/l: 0-1: ± 0.04* >1-2: ± 0.08* >2-3: ± 0.18* >3-4: ± 0.25* >4-6: ± 0.35*	0.01	250	DPD No. 1 tablets	95727747	7.9
							DPD No. 3 tablets	95727750	
							Glycine tablets	95727752	
						100	DPD Acidifying tablets	98032751	
							DPD Neutralising tablets	98032752	
90	Chloride T		0.5 - 25 mg/l (Cl ⁻)	0.5-10: ± 2.5 >10-25: ± 3 in mg/l	0.1	250	Combi pack Chloride T 1/T 2, 250 tablets each	95727754	7.6
160	CyA-TEST T (Cyanuric acid)		2 - 160 mg/l CyA	0-50: ± 10 >50-100: ± 15 >100-160: ± 20 in mg/l	1	100	CyA-TEST tablets	95727760	7.10
220	Iron T		0.02 - 1 mg/l Fe	± 0.04 mg/l	0.01	100	Iron LR tablets	95727756	7.13
170	Fluoride L		0.05 - 2 mg/l F ⁻	0-1: ± 0.14 >1-2: ± 0.4 in mg/l	0.01	100	SPADNS reagent	95727757	7.11
							Fluoride standard	95727758	
240	Manganese T		0.2 - 4 mg/l Mn	± 0.2 mg/l	0.01	100	Combi pack Manganese LR 1/LR 2, 100 tablets each	95727759	7.14
300	Ozone (DPD) T	O ₃ in the presence of Cl ₂	0.02 - 2 mg/l O ₃	as chlorine, with factor 0.677	0.01	250	DPD No. 1 tablets	95727747	7.15.2
							DPD No. 3 tablets	95727750	
							Glycine tablets	95727752	
		O ₃ in absence of Cl ₂					DPD No. 1 tablets	95727747	7.15.3
							DPD No. 3 tablets	95727750	
320	Phosphate LR, ortho T		0.05 - 4 mg/l PO ₄	± 0.4 mg/l	0.01	100	Combi pack Phosphate No. 1 LR/No. 2 LR, 100 tablets each	95727764	7.16
330	pH value T		6.5 - 8.4 (phenol red)	± 0.1	0.01	250	Phenol red photometer tablets	95727753	7.17
20	Acid demand to pH 4.3 T		0.1 - 4 mmol/l	± 0.4 mmol/l	0.01	100	Alka-M-photometer tablets	95727763	7.3
210	Hydrogen peroxide T		0.03 - 3 mg/l H ₂ O ₂	as chlorine, with factor 0.5	0.01	100	Hydrogen peroxide LR tablets	95727762	7.12

T = tablet; L = liquid reagent; LR = low range; PU = packing unit

* The measurements are performed with method "100 Chlorine" and differentiation "free" as the photometer doesn't supply a specific method for the determination of these parameters. The values of tolerance apply to the individual measurement. For calculation with multiple values, be aware of error propagation!

Turbidity can lead to errors

The use of the *DPD No. 1* tablet (No [95727747](#)) in samples with high calcium ion contents* and/or high conductivity* can lead to turbidity of the sample and therefore incorrect measurements. In this event, the reagent tablet *DPD No. 1 high calcium* (No [95727748](#)) should be used as an alternative. Even if turbidity does occur after the *DPD No. 3* tablet (No [95727750](#)) has been added, this can be prevented by using the *DPD No. 1 high calcium* tablet.

* It is not possible to give exact values, because the development of turbidity depends on the nature of the sample.

The precision of our reagent systems (tablets, SPADNS) is identical to the precision specified in standards literature, such as American Standards (AWWA), ISO, etc.

Most of the data referred to in these standard methods relates to standard solutions. Therefore they are not readily applicable to drinking, boiler or wastewater since various interferences can have a major influence on the accuracy of the method.

For this reason we don't state such potentially misleading data.

Due to the fact that each sample is different, the only way to check the tolerances ('precision') is by using the "Standard Additions Method".

According to this method, first the original sample is tested. Then further samples (2 to 4) are taken and small amounts of a standard solution are added, and further results are obtained. The amounts added range from approximately half, up to double the amount present in the sample itself. These supplementary results make it possible to estimate the actual concentration of the original sample by comparison.

7.3 Acid demand for pH 4.3 / 0.1 - 4 mmol/l

(2) (0)

7.3.1 Important notes

1. The terms "total alkalinity", "alkalinity-m", "m-value" and "acid demand for pH 4.3" are identical.
2. For accurate results, exactly 10 ml of water sample must be taken for the test.

7.3.2 Measurement



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample. Close tightly with the cap.
2. Place the vial correctly in the sample chamber. See fig. 4.
3. Press the [Zero] key.
4. Remove the vial from the sample chamber.
5. Add one *Alka-M-photometer* tablet (No [95727763](#)) straight from the foil to the water sample and crush the tablet using a clean stirring rod.
6. Close the vial tightly with the cap and swirl several times until the tablet is dissolved.
7. Place the vial correctly in the sample chamber. See fig. 4.
8. Press the [Test] key.

Zero accepted
prepare Test
press TEST

The result is shown in the display as acid demand to pH 4.3 in mmol/l.

7.4 Aluminium, 0.01 - 0.3 mg/l Al

(4) (0)

7.4.1 Important notes

1. Before use, clean the vials and the measuring beaker with hydrochloric acid (approx. 20 %). Rinse them thoroughly with deionised water.
2. To get accurate results the sample temperature must be between 20 °C and 25 °C.
3. A low test result may be given in the presence of fluorides and polyphosphates. The effect of this is generally insignificant, unless fluoride has been added artificially to the water. In this case, the following table should be used:

Fluoride [mg/l F]	Displayed value: Aluminium [mg/l Al]					
	0.05	0.10	0.15	0.20	0.25	0.30
0.2	0.05	0.11	0.16	0.21	0.27	0.32
0.4	0.06	0.11	0.17	0.23	0.28	0.34
0.6	0.06	0.12	0.18	0.24	0.30	0.37
0.8	0.06	0.13	0.20	0.26	0.32	0.40
1.0	0.07	0.13	0.21	0.28	0.36	0.45
1.5	0.09	0.20	0.29	0.37	0.48	---

4. ▲ Al
▼ Al₂O₃

7.4.2 Measurement



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
2. Place the vial in the sample chamber correctly. See fig. 4.

3. Press the [Zero] key.
4. Remove the vial from the sample chamber.
5. Add one *Aluminium No. 1* tablet (No [95727755](#)) straight from the foil to the water sample and crush the tablet using a clean stirring rod (dissolve the tablet).
6. Add one *Aluminium No. 2* tablet (No [95727755](#)) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
7. Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
8. Place the vial in the sample chamber correctly. See fig. 4.
9. Press the [Test] key. Wait for a reaction period of 5 minutes.

Zero accepted
prepare Test
press TEST

Countdown
5:00

When the reaction period is finished, the measurement starts automatically.

The result is shown in the display in mg/l aluminium.

7.5 Bromine, 0.05 - 13 mg/l Br₂

8

0

7.5.1 Important notes

- Vial cleaning:
As many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of bromine may show lower results. To avoid any measurement errors, only use glassware free of chlorine demand.
Preparation: Put all applicable glassware into sodium hypochlorite solution (0.1 g/l) for one hour, then rinse all glassware thoroughly with deionised water.
- When preparing the sample, the escape of bromine gases, for example by pipetting or shaking, must be avoided.
The measurement must take place immediately after taking the sample.
- The DPD colour development is carried out at a pH value of 6.2 to 6.5. The reagent tablet therefore contains a buffer for the pH adjustment. Strong alkaline or acidic water samples must be adjusted between pH 6 and pH 7 before the reagent is added. Use 0.5 mol/l sulphuric acid and 1 mol/l sodium hydroxide, respectively.
- For concentrations between 13 and 22 mg, the photometer shows that the measuring range (Overrange) has been exceeded. Concentrations above 22 mg/l bromine can lead to results showing 0 mg/l. In this event, the water sample must be diluted with water free of bromine. 10 ml of the diluted sample should be mixed with the reagent and the measurement repeated (plausibility test).
- All oxidising agents in the samples interfere, as they react in the same way as bromine.

7.5.2 Measurement



prepare Zero
press ZERO

- Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Zero] key.
- Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
- Add one *DPD No. 1* tablet (No 95727761) straight from the foil and crush the tablet using a clean stirring rod.
- Add water sample to the 10 ml mark.
- Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Test] key.

Zero accepted
prepare Test
press TEST

The result is shown in the display in mg/l bromine.

7.6 Chloride, 0.5 - 25 mg/l Cl⁻

9

0

7.6.1 Important notes

- Ensure that all particles of the tablet are dissolved. Chloride causes an extremely fine distributed turbidity with a milky appearance.
Heavy shaking results in bigger sized particles which can cause false readings.
- High concentrations of electrolytes and organic compounds have different effects on the precipitation reaction.
- Ions which also form deposits with silver nitrate in acidic media, such as bromides, iodides and thiocyanates, interfere with the measurement.
- If necessary, highly alkaline water should be neutralised using nitric acid before measurement.

7.6.2 Measurement



prepare Zero
press ZERO

- Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Zero] key.
- Remove the vial from the sample chamber.
- Add one *Chloride T 1* tablet (No 95727754) straight from the foil to the water sample, crush the tablet using a clean stirring rod and dissolve the tablet.
- Add one *Chloride T 2* tablet (No 95727754) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
- Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved (see section 7.6.1, note 1.).
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Test] key. Wait for a reaction period of 2 minutes.

Zero accepted
prepare Test
press TEST

Countdown
2:00

When the reaction period is finished, the measurement starts automatically.
The result is shown in the display in mg/l chloride.

7.7 Chlorine, 0.01 - 6 mg/l Cl₂

1 0 0

7.7.1 Selection

Chlorine
>> diff
free
total

The following selection is shown in the display:

>> diff for the differentiated determination of free, combined and total chlorine.

>> free for the determination of free chlorine.

>> total for the determination of total chlorine.

Select the desired determination with the arrow keys ▲ and ▼.

Confirm with the ↵ key.

7.7.2 Important notes

- Vial cleaning:
As many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of chlorine may show lower results. To avoid any measurement errors, only use glassware free of chlorine demand.
Preparation: Put all applicable glassware into sodium hypochlorite solution (0.1 g/l) for one hour, then rinse all glassware thoroughly with deionised water.
- For individual testing of free and total chlorine, the use of different sets of glassware is recommended.
See EN ISO 7393-2, section 5.3.
- When preparing the sample, the escape of chlorine gases, e.g. by pipetting or shaking, must be avoided. The measurement must take place immediately after taking the sample.
- The DPD colour development is carried out at a pH value of 6.2 to 6.5. The reagents therefore contain a buffer for the pH adjustment. Strong alkaline or acidic water samples must be adjusted between pH 6 and pH 7 before the reagent is added. Use 0.5 mol/l sulphuric acid and 1 mol/l sodium hydroxide, respectively.
- For concentrations between 6 and 10 mg, the photometer shows that the measuring range (Overrange) has been exceeded. Concentrations above 10 mg/l chlorine can lead to results showing 0 mg/l. In this event, the water sample must be diluted with water free of chlorine. 10 ml of the diluted sample should be mixed with the reagent and the measurement repeated (plausibility test).
- Turbidity can lead to errors:
The use of the *DPD No. 1* tablet (No 95727747) in samples with high calcium ion contents* and/or high conductivity* can lead to turbidity of the sample and therefore incorrect measurements. In this event, the reagent tablet *DPD No. 1 high calcium* (No 95727748) should be used as an alternative. Even if turbidity does occur after the *DPD No. 3* tablet (No 95727750) has been added, this can be prevented by using the *DPD No. 1 high calcium* tablet.
*) It is not possible to give exact values, because the development of turbidity depends on the nature of the sample.
- If "???" is displayed at a differentiated test result, see section 8.1 *Operating messages in the display (error display)*.
- All oxidising agents in the samples interfere as they react in the same way as chlorine.

7.7.3 Chlorine, differentiated

1 0 0



prepare Zero
press ZERO

- Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Zero] key.
- Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
- Add one *DPD No. 1* tablet (No 95727747) straight from the foil and crush the tablet using a clean stirring rod.
- Add water sample to the 10 ml mark.
- Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Test] key.
- Remove the vial from the sample chamber.
- Add one *DPD No. 3* tablet (No 95727750) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
- Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
- Place the vial correctly in the sample chamber. See fig. 4.
- Press the [Test] key. Wait for a reaction period of 2 minutes.
After the reaction period is finished, the measurement starts automatically.
The result is shown in the display in:
– mg/l free chlorine
– mg/l combined chlorine
– mg/l total chlorine

Zero accepted
prepare T 1
press TEST

T 1 accepted
prepare T 2
press TEST

Countdown
2:00

*** mg/l free Cl
*** mg/l comb. Cl
*** mg/l total Cl

7.7.4 Chlorine, free

1 0 0



prepare Zero
press ZERO

- Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Zero] key.
- Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
- Add one *DPD No. 1* tablet (No 95727747) straight from the foil and crush the tablet using a clean stirring rod.
- Add water sample to the 10 ml mark.
- Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
- Place the vial correctly in the sample chamber. See fig. 4.
- Press the [Test] key.
The result is shown in the display in mg/l free chlorine.

Zero accepted
prepare Test
press TEST

7.7.5 Chlorine, total

1 0 0



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
2. Place the vial in the sample chamber correctly. See fig. 4.
3. Press the [Zero] key.
4. Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
5. Add one *DPD No. 4** tablet (No 95727751) straight from the foil and crush the tablet using a clean stirring rod.
6. Add water sample to the 10 ml mark.
7. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
8. Place the vial in the sample chamber correctly. See fig. 4.
9. Press the [Test] key. Wait for a reaction period of 2 minutes.

Zero accepted
prepare Test
press TEST

Countdown
2:00

When the reaction period is finished, the measurement starts automatically.
The result is shown in the display in mg/l total chlorine.

*) One *DPD No. 1* tablet (No 95727747) in combination with one *DPD No. 3* tablet (No 95727750) can be used as an alternative.

7.8 Chlorine dioxide, 0.02 - 11 mg/l ClO₂

1 2 0

7.8.1 Selection

Chlordioxid
>> with Cl
without Cl

The following selection is shown in the display:

>> with Cl

for the determination of chlorine dioxide in the presence of (with) chlorine.

>> without Cl

for the determination of chlorine dioxide in the absence of (without) chlorine.

Select the desired determination with the arrow keys ▲ and ▼.

Confirm with the ← key.

7.8.2 Important notes

1. Vial cleaning:
As many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of chlorine dioxide may show lower results. To avoid any measurement errors, only use glassware free of chlorine demand.
Preparation: Put all applicable glassware into sodium hypochlorite solution (0.1 g/l) for one hour, then rinse all glassware thoroughly with deionised water.
2. When preparing the sample, the escape of chlorine dioxide gases, e.g. by pipetting or shaking, must be avoided. The analysis must take place immediately after taking the sample.
3. The DPD colour development is carried out at a pH value of 6.2 to 6.5. The reagent tablet therefore contains a buffer for the pH adjustment.
Strong alkaline or acidic water samples must be adjusted between pH 6 and pH 7 before the tablet is added.
Use 0.5 mol/l sulphuric acid and 1 mol/l sodium hydroxide, respectively.

4. For concentrations between 11 and 19 mg, the photometer shows that the measuring range (Overrange) has been exceeded. Concentrations above 19 mg/l chlorine dioxide can lead to results showing 0 mg/l. In this event, the water sample must be diluted with water free of chlorine dioxide. 10 ml of the diluted sample should be mixed with the reagent and the measurement repeated (plausibility test).
5. If "???" is displayed at a differentiated test result, see section 8.1 *Operating messages in the display (error display)*.
6. All oxidising agents in the samples interfere, as they react in the same way as chlorine dioxide.

7.8.3 In the presence of chlorine

1 2 0

Important notes

1. The conversion factor to convert chlorine dioxide as chlorine to chlorine dioxide as ClO₂ is 0.38:
 $\text{mg/l ClO}_2 = \text{mg/l ClO}_2 [\text{Cl}] \times 0.38$
▲ ClO₂[Cl]
▼ ClO₂
(Chlorine dioxide displayed as chlorine units ClO₂ [Cl] has its origin in swimming pool water treatment, according to DIN 19643.)
2. The total chlorine result given includes the contribution of the chlorine dioxide (as chlorine) reading. For true total chlorine value, subtract the chlorine dioxide (as chlorine) reading from the quoted total chlorine reading.
3. See also section 7.8 *Chlorine dioxide, 0.02 - 11 mg/l ClO₂*.

Measurement



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
2. Place the vial correctly in the sample chamber. See fig. 4.
3. Press the [Zero] key.
4. Remove the vial from the sample chamber and empty it.
5. Add one *DPD No. 1* tablet (No 95727747) straight from the foil and crush the tablet using a clean stirring rod.
6. Fill a second clean vial with 10 ml of the water.
7. Add one *Glycine* tablet (No 95727752) straight from the foil and crush the tablet using a clean stirring rod.
8. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
9. Transfer the contents of the second vial into the prepared vial.
10. Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
11. Place the vial in the sample chamber correctly. See fig. 4.

Zero accepted
prepare T 1
press TEST

12. Press the [Test] key.
13. Remove the vial from the sample chamber, empty the vial, rinse vial and cap several times. Fill with a few drops of the water sample.
14. Add one *DPD No. 1* tablet (No **95727747**) straight from the foil and crush the tablet using a clean stirring rod.
15. Add water sample to the 10 ml mark.
16. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
17. Place the vial correctly in the sample chamber. See fig. 4.
18. Press the [Test] key.
19. Remove the vial from the sample chamber.
20. Add one *DPD No. 3* tablet (No **95727750**) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
21. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
22. Place the vial in the sample chamber correctly. See fig. 4.
23. Press the [Test] key. Wait for a reaction period of 2 minutes.

T 1 accepted
prepare T 2
press TEST

T 2 accepted
prepare T 3
press TEST

Countdown
2:00

When the reaction period is finished, the measurement starts automatically.

The result is shown in the display in:

*,** mg/l free ClO₂ [Cl]

chlorine dioxide in mg/l chlorine **or**

*,** mg/l free ClO₂

chlorine dioxide in mg/l ClO₂

*,** mg/l free Cl

– mg/l free chlorine

*,** mg/l comb. Cl

– mg/l combined chlorine

*,** mg/l total Cl

– mg/l total chlorine

7.8.4 In the absence of chlorine

1 2 0



1. Fill a clean vial (Ø24) with 10 ml of the water sample. Close tightly with the cap.
2. Place the vial correctly in the sample chamber. See fig. 4.

prepare Zero
press ZERO

3. Press the [Zero] key.
4. Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
5. Add one *DPD No. 1* tablet (No **95727747**) straight from the foil and crush the tablet using a clean stirring rod.
6. Add water sample to the 10 ml mark.
7. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
8. Place the vial in the sample chamber correctly. See fig. 4.
9. Press the [Test] key.

Zero accepted
prepare Test
press TEST

*,** mg/l free ClO₂ [Cl]

The result is shown in the display in:

*,** mg/l free ClO₂

chlorine dioxide in mg/l chlorine **or**
chlorine dioxide in mg/l ClO₂

7.9 Chlorine dioxide analysis (ClO₂, chlorite, Cl₂ free, Cl₂ combined) 0.01 - 6 mg/l

1 0 0

7.9.1 Important notes

This analysis is used for differentiated determination of:

- chlorine dioxide
- chlorite
- free chlorine
- combined chlorine

The measurements are performed with method "100 Chlorine" and differentiation "free" as the photometer doesn't supply a specific method for the determination of these parameters. The values determined during measurement (see section **7.9.2 Measurements**) are not the effective quantities of certain parameters. The effective quantities have to be calculated out of the determined values after measurement. (See section **7.9.3 Calculation**)

Caution

The values of tolerance (see section **7.2 Table of methods and reagents**) apply to the individual measurement. For calculation with multiple values, be aware of error propagation!

7.9.2 Measurements

Chlorine
diff
>> free
total



prepare Zero
press ZERO

1. Select "free" in display.
2. Confirm with the $\leftarrow$ key.
3. Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
4. Place the vial correctly in the sample chamber. See fig. 4.
5. Press the [Zero] key.
6. Remove the vial from the sample chamber and empty it.
7. Add one *DPD No. 1* tablet (No 95727747) straight from the foil and crush the tablet using a clean stirring rod.
8. Fill a second clean vial with 10 ml of the water.
9. Add one *Glycine* tablet (No 95727752) straight from the foil and crush the tablet using a clean stirring rod.
10. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
11. Transfer the contents of the second vial into the prepared vial.
12. Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
13. Place the vial in the sample chamber correctly. See fig. 4.
14. Press the [Test] key.

Write down the result as: reading G

15. Press the [Test] key again to use the current ZERO value for the next measurement.
16. Remove the vial from the sample chamber, empty the vial, rinse vial and cap several times. Fill with a few drops of the water sample.
17. Add one *DPD No. 1* tablet (No 95727747) straight from the foil and crush the tablet using a clean stirring rod.
18. Add water sample to the 10 ml mark.
19. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.

Zero accepted
prepare Test
press TEST

Zero accepted
prepare Test
press TEST

20. Place the vial correctly in the sample chamber. See fig. 4.

21. Press the [Test] key.

Write down the result as: reading A

22. Press the [Test] key again to use the current ZERO value for the next measurement.
23. Remove the vial from the sample chamber.
24. Add one *DPD No. 3* tablet (No 95727750) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
25. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
26. Place the vial in the sample chamber correctly. See fig. 4.
27. Wait for a reaction period of 2 minutes.
28. Press the [Test] key.

Write down the result as: reading C

29. Press the [Test] key again to use the current ZERO value for the next measurement.
30. Remove the vial from the sample chamber.
31. Add one *DPD Acidifying* tablet (No 98032751) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
32. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
33. Wait for a reaction period of 2 minutes.
34. Add one *DPD Neutralising* tablet (No 98032752) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
35. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
36. Place the vial in the sample chamber correctly. See fig. 4.
37. Press the [Test] key.

Write down the result as: reading D

38. Calculate parameters, see section [7.9.3 Calculation](#)

Zero accepted
prepare Test
press TEST

Zero accepted
prepare Test
press TEST

7.9.3 Calculation

The effective quantities of the desired parameters can be calculated from the measured readings as follows:

Parameter	Formula
Chlorine dioxide	5 G
Chlorite	D - (C + 4 G)
Free chloride	A - G
Combined chloride	C - A

7.10 CyA TEST (cyanuric acid), 2 - 160 mg/l CyA

1 6 0

7.10.1 Important notes

1. Use deionised water or tap water free of cyanuric acid.
2. If cyanuric acid is present, a cloudy solution will occur. Small single particles are not necessarily caused by cyanuric acid.
3. Dissolve the tablet completely by swirling the vial for approx. one minute. Undissolved particles of the tablet can cause results that are too high.

7.10.2 Measurement



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 5 ml of the water sample and 5 ml of deionised water using the plastic syringe. See section 7.10.1, note 1. Close tightly with the cap.
2. Place the vial in the sample chamber correctly. See fig. 4.
3. Press the [Zero] key.
4. Remove the vial from the sample chamber.
5. Add one CyA-TEST tablet (No 95727760) straight from the foil to the prepared water sample and crush the tablet using a clean stirring rod.
6. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved. See section 7.10.1, notes 2 and 3.
7. Place the vial in the sample chamber correctly. See fig. 4.

Zero accepted
prepare Test
press TEST

Press the [Test] key.

The result is shown in the display in mg/l CyA.

7.11 Fluoride, 0.05 - 2 mg/l F⁻

1 7 0

7.11.1 Important notes

1. The same batch of SPADNS reagent solution must be used for adjustment and test. The adjustment process needs to be performed for each new batch of SPADNS reagent solution (see Standard Methods 20th, 1998, APHA, AWWA, WEF 4500 F D., pages 4-82). The procedure is described in section 6.3.4 Calibration.
2. During adjustment and test the same vial should be used for zeroing and test, as different vials may exhibit minor tolerances.
3. The calibration solution and the water samples to be tested should have the same temperature ($\pm 1^\circ\text{C}$).
4. As the test result is highly dependent on exact sample and reagent volumes, the sample and reagent volumes should always be metered using a 10 ml and 2 ml volumetric pipette (class A), respectively.
5. The accuracy of the test methods decreases above a level of 1.2 mg/l fluoride. Although the results are sufficiently accurate for most applications, even more exact results can be achieved by 1:1 dilution of the sample prior to use and subsequent multiplication of the result by 2.
6. SPADNS reagent solution contains arsenite. Chlorine concentrations up to 5 mg/l do not interfere.
7. Seawater and wastewater samples must be distilled.
8. It is convenient to use special vials with larger volume.

7.11.2 Measurement



prepare Zero
press ZERO

Observe section 7.11.1 Important notes!

1. Fill a clean vial (Ø24) (note 8) with exactly 10 ml of water sample (note 4). Close tightly with the cap.
2. Place the vial in the sample chamber correctly. See fig. 4.
3. Press the [Zero] key.
4. Remove the vial from the sample chamber.
5. Add exactly 2 ml SPADNS reagent solution (No 95727757) to the water sample. Caution: Vial is filled up to the top (note 8)!
6. Close the vial tightly with the cap and swirl several times to mix the contents.
7. Place the vial in the sample chamber correctly. See fig. 4.
8. Press the [Test] key.

Zero accepted
prepare Test
press TEST

The result is shown in the display in mg/l fluoride.

7.12 Hydrogen peroxide, 0.03 - 3 mg/l H₂O₂

2 1 0

7.12.1 Important notes

1. Vial cleaning:
As many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of hydrogen peroxide may show lower results. To avoid any measurement errors, only use glassware free of chlorine demand. Preparation: Put all applicable glassware into sodium hypochlorite solution (0.1 g/l) for one hour, then rinse all glassware thoroughly with deionised water.
2. When preparing the sample, the escape of hydrogen peroxide gases, e.g. by pipetting or shaking, must be avoided. The analysis must take place immediately after taking the sample.
3. The DPD colour development is carried out at a pH value of 6.2 to 6.5. The reagent tablet therefore contains a buffer for the pH adjustment. Strong alkaline or acidic water samples must be adjusted between pH 6 and pH 7 before the tablet is added. Use 0.5 mol/l sulphuric acid and 1 mol/l sodium hydroxide, respectively.
4. For concentrations between 3 and 5 mg, the photometer shows that the measuring range (Overrange) has been exceeded. Concentrations above 5 mg/l hydrogen peroxide can lead to results showing 0 mg/l. In this event, the water sample must be diluted with water free of hydrogen peroxide. 10 ml of the diluted sample should be mixed with the reagent and the measurement repeated (plausibility test).
5. All oxidising agents in the samples interfere, as they react in the same way as hydrogen peroxide.

7.12.2 Measurement



1. Fill a clean vial (Ø24) with 10 ml of the water sample. Close tightly with the cap.
 2. Place the vial in the sample chamber correctly. See fig. 4.
 3. Press the [Zero] key.
 4. Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
 5. Add one *Hydrogen peroxide LR* tablet (No 95727762) straight from the foil and crush the tablet using a clean stirring rod.
 6. Add water sample to the 10 ml mark.
 7. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
 8. Place the vial in the sample chamber correctly. See fig. 4.
 9. Press the [Test] key. Wait for a reaction period of 2 minutes.
- After the reaction period is finished the measurement starts automatically.
- The result is shown in the display in mg/l hydrogen peroxide.

prepare Zero
press ZERO

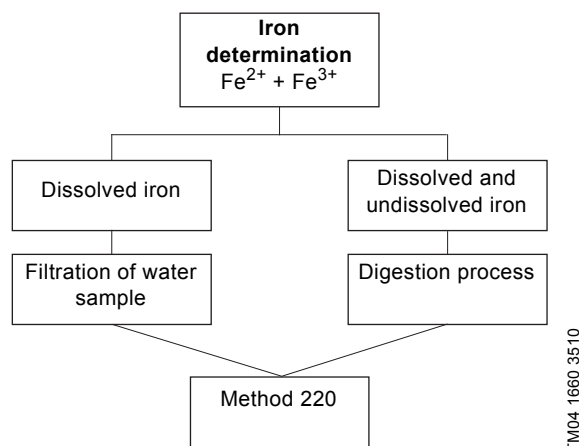
Zero accepted
prepare Test
press TEST

Countdown
2:00

7.13 Iron, 0.02 - 1 mg/l Fe

Determination of total dissolved Iron Fe^{2+} and Fe^{3+}

7.13.1 Important notes



Digestion procedure for the determination of total soluble and insoluble iron:

1. Add 1 ml of concentrated sulphuric acid to 100 ml water sample. Heat and boil for 10 minutes or until all particles are dissolved. After cooling down, the sample is set to a pH-value of 3 to 5 by using ammonia solution. Refill with deionised water to the previous volume of 100 ml and mix well. 10 ml of this pre-treated solution is used for the subsequent analysis. Perform as described by the selected test method.
2. Water which has been treated with organic compounds like corrosion inhibitors must be oxidised where necessary to break down the iron. Therefore add 1 ml concentrated sulphuric acid and 1 ml concentrated nitric acid to 100 ml water sample and boil to approx. half volume. After cooling down, proceed as described above.

7.13.2 Measurement

2 2 0

1. This method determines the total dissolved Iron as Fe^{2+} and Fe^{3+} .
2. For the determination of total dissolved and undissolved iron digestion is required. An example is described in section 7.13.1 *Important notes*.



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample. Close tightly with the cap.
 2. Place the vial in the sample chamber correctly. See fig. 4.
 3. Press the [Zero] key.
 4. Remove the vial from the sample chamber.
 5. Add one *Iron LR* tablet (No 95727756) straight from the foil to the 10 ml sample, and crush the tablet using a clean stirring rod.
 6. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
 7. Place the vial in the sample chamber correctly. See fig. 4.
 8. Press the [Test] key. Wait for a reaction period of 5 minutes.
- After the reaction period is finished, the measurement starts automatically.
- The result is shown in the display in mg/l iron.

Zero accepted
prepare Test
press TEST

Countdown
5:00

7.14 Manganese, 0.2 - 4 mg/l Mn

2 4 0

7.14.1 Important notes

When the result is displayed, the chemical species can be changed:

▲ Mn

MnO₄

▼ KMnO₄

7.14.2 Measurement



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
 2. Place the vial in the sample chamber correctly. See fig. 4.
 3. Press the [Zero] key.
 4. Remove the vial from the sample chamber.
 5. Add one *Manganese LR 1* tablet (No 95727759) straight from the foil to the water sample, crush the tablet using a clean stirring rod, and dissolve the tablet.
 6. Add one *Manganese LR 2* tablet (No 95727759) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
 7. Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
 8. Place the vial in the sample chamber correctly. See fig. 4.
 9. Press the [Test] key. Wait for a reaction period of 5 minutes.
- When the reaction period is finished, the measurement starts automatically.
- The result is shown in the display in mg/l manganese.

Zero accepted
prepare Test
press TEST

Countdown
5:00

7.15 Ozone, 0.02 - 2 mg/l O₃

3 0 0

Ozone
>> with Cl
without Cl

The following selection is shown in the display:

>> with Cl

for the determination of ozone in the presence of (with) chlorine.

>> without Cl

for the determination of ozone in absence of (without) chlorine.

Select the desired differentiation (with/without chlorine) using the arrow keys ▲ and ▼.

Confirm with the ← key.

7.15.1 Important notes

- Vial cleaning:
As many household cleaners (e.g. dishwasher detergent) contain reducing substances, the subsequent determination of ozone may show lower results. To avoid any measurement errors, only use glassware free of chlorine demand.
Preparation: Put all applicable glassware into sodium hypochlorite solution (0.1 g/l) for one hour, then rinse all glassware thoroughly with deionised water.
- When preparing the sample, the escape of ozone gases, e.g. by pipetting or shaking, must be avoided. The analysis must take place immediately after taking the sample.
- The DPD colour development is carried out at a pH value of 6.2 to 6.5. The reagent tablet therefore contains a buffer for the pH adjustment.
Strong alkaline or acidic water samples must be adjusted between pH 6 and pH 7 before the tablet is added.
Use 0.5 mol/l sulphuric acid and 1 mol/l sodium hydroxide, respectively.
- Turbidity can lead to errors:
The use of the *DPD No. 1* tablet in samples with high calcium ion content* and/or high conductivity* can lead to turbidity of the sample and therefore incorrect measurements.
*) It is not possible to give exact values, because the development of turbidity depends on the nature of the sample.
- For concentrations between 2 and 6 mg, the photometer shows that the measuring range (Overrange) has been exceeded. Concentrations above 6 mg/l ozone can lead to results showing 0 mg/l. In this event, the water sample must be diluted with water free of ozone. 10 ml of the diluted sample should be mixed with the reagent and the measurement repeated (plausibility test).
- If "???" is displayed at a differentiated test result, see section [8.1 Operating messages in the display \(error display\)](#).
- All oxidising agents in the samples interfere as they react in the same way as ozone.

7.15.2 In the presence of chlorine

3 0 0



prepare Zero
press ZERO

- Fill a clean vial (Ø24) with 10 ml of the water sample. Close tightly with the cap.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Zero] key.
- Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
- Add one *DPD No. 1* tablet (No [95727747](#)) and one *DPD No. 3* tablet (No [95727750](#)) straight from the foil and crush the tablets using a clean stirring rod.
- Add water sample to the 10 ml mark.
- Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Test] key. Wait for a reaction period of 2 minutes.

Zero accepted
prepare T 1
press TEST
Countdown
2:00

When the reaction period is finished, the measurement starts automatically.

- Remove the vial from the sample chamber, empty the vial, rinse vial and cap several times.
- Add one *DPD No. 1* tablet (No [95727747](#)) and one *DPD No. 3* tablet (No [95727750](#)) straight from the foil and crush the tablets using a clean stirring rod.
- Fill a second clean vial with 10 ml of the water sample.
- Add one *Glycine* tablet (No [95727752](#)) straight from the foil and crush the tablet using a clean stirring rod.
- Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
- Transfer the contents of the second vial into the prepared vial.
- Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
- Place the vial in the sample chamber correctly. See fig. 4.
- Press the [Test] key. Wait for a reaction period of 2 minutes.

T 1 accepted
prepare T 2
press TEST
Countdown
2:00

After the reaction period is finished, the measurement starts automatically.

The result is shown in the display in:

- mg/l ozone
- mg/l total chlorine

*** mg/l O₃
*** mg/l total Cl

7.15.3 In the absence of chlorine

3 0 0



prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample, close tightly with the cap.
2. Place the vial in the sample chamber correctly. See fig. 4.
3. Press the [Zero] key.
4. Remove the vial from the sample chamber and empty it, leaving a few drops in the vial.
5. Add one *DPD No. 1* tablet (No 95727747) and one *DPD No. 3* tablet (No 95727750) straight from the foil and crush the tablets using a clean stirring rod.
6. Add water sample to the 10 ml mark.
7. Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
8. Place the vial in the sample chamber correctly. See fig. 4.
9. Press the [Test] key. Wait for a reaction period of 2 minutes.

Zero accepted
prepare Test
press TEST

Countdown
2:00

When the reaction period is finished, the measurement starts automatically.
The result is shown in the display in mg/l ozone.

7.16 Phosphate, ortho LR,
0.05 - 4 mg/l PO₄

3 2 0

7.16.1 Important notes

1. Ortho-phosphate ions react with the reagent to form an intense blue colour. Phosphate in organic and condensed inorganic forms (meta-, pyro- and polyphosphates) must be converted to ortho-phosphate ions before analysis. Pretreatment of the sample with acid and heat provides the conditions for hydrolysis of the condensed inorganic forms. Organically combined phosphates are converted to ortho-phosphate ions by heating with acid and persulphate. The amount of organically combined phosphates can be calculated:
mg/l phosphate, organic = mg/l phosphate, total - mg/l phosphate, acid hydrolysable
2. Only ortho-phosphate ions react.
3. The tablets must be added in the correct sequence.
4. The test sample should have a pH-value between 6 and 7.
5. Interferences:
Higher concentrations of Cu, Ni, Cr (III), V (V) and W (VI) interfere due to their colour.
Silicates do not interfere (masked by citric acid in the tablets).
6. Conversion:
– mg/l P = mg/l PO₄ × 0.33
– mg/l P₂O₅ = mg/l PO₄ × 0.75

▲ PO₄

P

▼ P₂O₅

prepare Zero
press ZERO

1. Fill a clean vial (Ø24) with 10 ml of the water sample. Close tightly with the cap.
2. Place the vial in the sample chamber correctly. See fig. 4.

3. Press the [Zero] key.
4. Remove the vial from the sample chamber.
5. Add one *Phosphate No. 1 LR* tablet (No 95727764) straight from the foil to the 10 ml sample and crush the tablet using a clean stirring rod.
6. Add one *Phosphate No. 2 LR* tablet (No 95727764) straight from the foil to the same water sample and crush the tablet using a clean stirring rod.
7. Close the vial tightly with the cap and swirl gently several times until the tablets are dissolved.
8. Place the vial in the sample chamber correctly. See fig. 4.
9. Press the [Test] key. Wait for a reaction period of 10 minutes.

Zero accepted
prepare Test
press TEST

Countdown
10:00

When the reaction period is finished, the measurement starts automatically.
The result is shown in the display in mg/l ortho phosphate.

7.17 pH value, 6.5 - 8.4

3 3 0

7.17.1 Important notes

1. For photometric determination of pH values, only use *Phenol red photometer* tablets in black printed foil pack and marked with PHOTOMETER.
2. Water samples with low values of alkalinity-m* may give wrong pH readings.
*) $KS_{4.3} < 0.7 \text{ mmol/l} \wedge \text{total alkalinity} < 35 \text{ mg/l CaCO}_3$
3. pH values below 6.5 and above 8.4 can produce incorrect results inside the measuring range. A plausibility test (pH-meter) is recommended.
4. The accuracy of the colorimetric determination of pH values depends on various boundary conditions (buffer capacity of the sample, salt contents etc.).
5. Salt error
Correction of test results (average values) for samples with salt contents as follows:

Indicator	Salt content of the sample		
	1 molar	2 molar	3 molar
Phenol red	-0.21	-0.26	-0.29

The values of Parson and Douglas (1926) are based on the use of Clark and Lubs buffers.

1 mol NaCl = 58.4 g/l = 5.8 %



1. Fill a clean vial (Ø24) with 10 ml of the water sample. Close tightly with the cap.
2. Place the vial in the sample chamber correctly. See fig. 4.

prepare Zero
press ZERO

3. Press the [Zero] key.
4. Remove the vial from the sample chamber.
5. Add one *Phenol red photometer* tablet (No 95727753) straight from the foil to the 10 ml sample and crush the tablet using a clean stirring rod.
6. Close the vial tightly with the cap and swirl gently several times until the tablet is dissolved.
7. Place the vial in the sample chamber correctly. See fig. 4.
8. Press the [Test] key.

Zero accepted
prepare Test
press TEST

The result is shown in the display as pH value.

8. Faults

8.1 Operating messages in the display (error display)

Display	Possible cause	Remedy
Overrange	Reading exceeds the range. Turbid water sample. Too much light on the sample chamber.	Dilute the sample (not for pH and acid demand). Filtrate the water sample. Make sure the vial is closed with cap and gasket.
Underrange	Result is below the detection limit.	Indicate the result with lower x mg/l. x = low end of measuring range; if necessary, use a different analytical method.
Storage system error use Mode 34	Mains power fails or is not connected.	Insert or change the battery. Delete data with Mode 34.
Battery warning		The capacity of the batteries is too low; change the batteries.
	Full capacity	
	Warning signal every 3 minutes	
	Warning signal every 12 seconds	
	Warning signal, photometer switches off automatically	
Jus Overage E4	Setpoint adjustment in user calibration is only possible within a specific range.	Check possible faults, such as the standard reagent (weighted sample, dilution, ageing, pH value, etc.), reaction time, calibration etc.
Jus Underrange E4	In this case, user calibration is out of the accepted range.	Repeat the user calibration.
Overrange E1	The concentration of the standard reagent is too high/too low. As a result, during user calibration, the limit of the range was exceeded.	Perform the test with a standard reagent of higher/lower concentration.
Underrange E1		
E40 user calibration not possible	If the display shows Overage/Underrange for a test result, a user calibration is not possible.	Perform the test with a standard reagent of higher/lower concentration.
Zero not accepted	Light absorption is too great or too low. Zero is incorrect.	Make sure that the zero vial has been done. Insert zero vial; repeat the zero setting. Clean sample chamber; repeat zero.
???	The calculation of a value, such as combined chlorine, is not possible.	Make sure the test procedure is correct. If not, repeat the test.
Example 1:		The readings for free and total chlorine are different, but considering the tolerances of each reading, they are the same. For this reason, the combined chlorine is most likely zero.
0.60 mg/l free Cl ??? comb Cl 0.59 mg/l total Cl		
Example 2:		The reading for free chlorine is below the detection limit. The photometer is not able to calculate the combined chlorine. In this case the combined chlorine is most likely the same as the total chlorine.
Underrange ??? comb Cl 1.59 mg/l total Cl	The calculation of a value (e.g. combined chlorine) is not possible.	
Example 3:		The reading for total chlorine exceeds the range. The photometer is not able to calculate the combined chlorine. The test should be repeated with a diluted sample.
0.60 mg/l free Cl ??? comb Cl Overrange		
Error absorbance, e.g. T2>T1	Fluoride calibration was not correct; for example, the T1 and T2 was interchanged.	Repeat the calibration.

8.2 Other faults

Fault	Possible cause	Remedy
Test result deviates from the expected value.	Chemical species not as required.	To select the required chemical species, press the arrow keys.
No differentiation; for example, for the chlorine test, there is no selection between differentiated, free or total.	Profi-Mode is switched on.	Switch off Profi-Mode using Mode 50.
The pre-programmed countdown is not displayed.	Countdown is not activated and/or the Profi-Mode is activated.	Switch on the countdown using Mode 13 and/or switch off the Profi-Mode using Mode 50.
The selected method is apparently not available.	Method is not activated in the user method list.	Activate the required method in the user method list using Mode 60.

9. Spare parts

Description	Quantity	Product No
Round vial, Ø24, with cap and gasket	Pack of 5	95727768
	Pack of 12	95727769
Plastic stirring rod, length 13 cm	1 piece	95727771
Brush, length 11 cm	1 piece	95727772
Plastic syringe, 5 ml	1 piece	95727773

10. Abbreviations

Abbreviation	Definition
°C	degree Celsius (Centigrade)
°F	degree Fahrenheit °F = (°C x 1.8) + 32
°dH	degree German Hardness
°fH	degree French Hardness
°eH	degree English Hardness
°aH	degree American Hardness
Abs	absorption unit (= ^ Extinction E) 1000 mAbs = 1 Abs = ^ 1 A = ^ 1 E
µg/l	microgram per litre (= ppb)
mg/l	milligram per litre (= ppm)
g/l	gram per litre (= ppth)
KI	potassium iodide
KS 4.3	acid demand to pH 4.3
TDS	total dissolved solids
LR	low range
T	tablet
DPD	diethyl-p-phenylendiamine
PPST	3-(2-Pyridyl)-5.6-to (4-phenylsulfonic acid)1,2,4-triazine

11. Disposal

This product or parts of it must be disposed of in an environmentally sound way. Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.

Note

The 2006/66/EC guideline requires users to return all used and worn-out batteries and accumulators. They must not be disposed of in normal domestic waste.

Declaration of conformity

GB: EC Declaration of Conformity

We, Grundfos, declare under our sole responsibility that the products DIT-L, DIT-M and DIT-IR, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

ES: Declaración CE de Conformidad

Nosotros, Grundfos, declaramos bajo nuestra entera responsabilidad que los productos DIT-L, DIT-M y DIT-IR, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de los Estados Miembros del EM:

IT: Dichiarazione di Conformità CE

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti DIT-L, DIT-M e DIT-IR, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

PL: Deklaracja zgodności WE

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby DIT-L, DIT-M oraz DIT-IR, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednolicenia przepisów prawnych krajów członkowskich WE:

DE: EG-Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte DIT-L, DIT-M und DIT-IR, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

FR: Déclaration de Conformité CE

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits DIT-L, DIT-M et DIT-IR, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

NL: EC Overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten DIT-L, DIT-M en DIT-IR waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

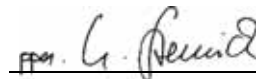
RU: Декларация о соответствии ЕС

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия DIT-L, DIT-M и DIT-IR, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Евросоюза об унификации законодательных предписаний стран-членов ЕС:

- EMC Directive (2004/108/EC).
Standard used: EN 61326-1: 2006, Class B
(DIT-M: Interference resistance Class A).
- RoHS Directives (2011/65/EU and 2015/863/EU).
Standard used: EN 50581:2012

This EC declaration of conformity is only valid when published as part of the Grundfos installation and operating instructions.

Pfingst, 1st March 2018



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