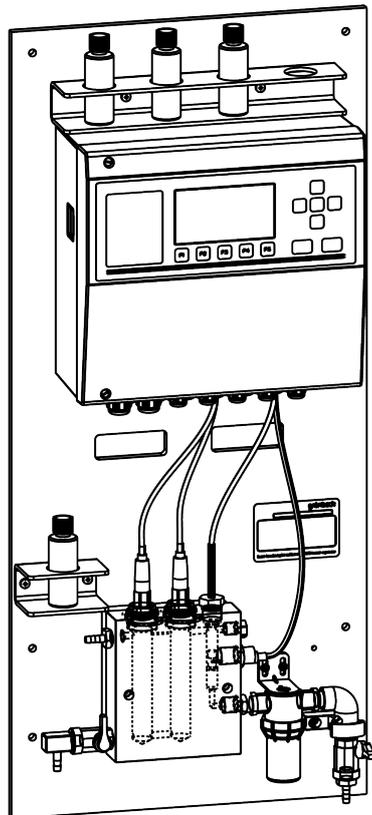


Operation manual

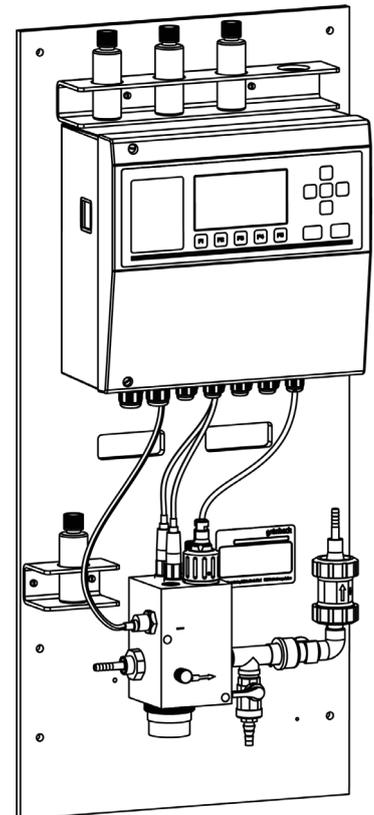
Automatic measuring and control system

GENO-CPR-tronic 02 family

GENO-CPR-tronic 02 public



GENO-CPR-tronic 02 family
(Order no. 203 500)



GENO-CPR-tronic 02 public
(Order no. 203 510)

Edition July 2020
Order no. 203 970_104_inter

Grünbeck Wasseraufbereitung GmbH

Josef-Grünbeck-Str. 1 · 89420 Hoehstaedt
GERMANY

☎ +49 9074 41-0 · 📠 +49 9074 41-100
www.gruenbeck.com · info@gruenbeck.com



A company certified by TÜV SÜD
in accordance with DIN EN ISO 9001,
DIN EN ISO 14001 and SCC

Table of contents



The operation manual consists of several parts, listed in this overview. You may find more information about the contents on the cover sheets of the individual components.

General information.....	A
Basic information	B
Product description.....	C
Installation.....	D
Start-up.....	E
Operation	F
Troubleshooting	G
Maintenance	H
Attachments: Operation log	

Publisher's information

All rights reserved.

© Copyright by Grünbeck Wasseraufbereitung GmbH

Printed in Germany

Effective with the date of edition indicated on the cover sheet.

-We reserve the right to modifications, especially with regard to technical progress-

Reprints, translations into foreign languages, electronic storage or copying only with explicit written approval of Grünbeck Wasseraufbereitung GmbH.

Any type of duplication not authorised by Grünbeck Wasseraufbereitung is a copyright violation and subject to legal action.

Responsible for contents:

Grünbeck Wasseraufbereitung GmbH

Josef-Grünbeck-Str. 1 • 89420 Hoechstädt Germany

Tel. +49 9074 41-0 • Fax +49 9074 41-100

www.gruenbeck.com • service@gruenbeck.de

Print: Grünbeck Wasseraufbereitung GmbH

Josef-Grünbeck-Str. 1, 89420 Hoechstädt, Germany

grünbeck



EU Declaration of Conformity

This is to certify that the system designated below complies with the safety and health requirements of the applicable European Directives in terms of its design, construction and execution.

This certificate will become invalid if the system is modified in a way not approved by us.

Manufacturer: Grünbeck Wasseraufbereitung GmbH
 Josef-Grünbeck-Str. 1
 89420 Hoechstädt, Germany

Authorised document officer: Seiler Florian

System designation: Measuring and control system

System type: GENO-CPR-tronic 02 family/public

Serial no.: Refer to type plate

Applicable guidelines: EMC Directive (2014/30/EU)
 Low Voltage Directive (2014/35/EU)

Applied harmonised standards, in particular: DIN EN 61000-6-2:2006-03
 DIN EN 61000-6-3:2011-09

Applied national standards and technical specifications, in particular:

Date / Signature of manufacturer: Hoechstädt, 24.04.2018

p.p. 
 Peter Höß

Function of signatory: Head of Technical Systems & Equipment

A Allgemeine Hinweise

Inhalt

1 Vorwort	A-1
2 Hinweise zum Benutzen der Betriebsanleitung.....	A-2
3 Allgemeine Sicherheitshinweise	A-2
3.1 Symbole und Hinweise.....	A-2
3.2 Betriebspersonal	A-3
3.3 Bestimmungsgemäße Verwendung	A-3
3.4 Schutz vor Wasserschäden	A-3
3.5 Beschreibung spezieller Gefahren	A-3
4 Transport und Lagerung	A-4
5 Entsorgung	A-4
5.1 Verpackung	A-4
5.2 Produkt	A-4

1 | Vorwort

Schön, dass Sie sich für ein Gerät aus dem Hause Grünbeck entschieden haben. Seit vielen Jahren befassen wir uns mit Fragen der Wasseraufbereitung und haben für jedes Wasserproblem die maßgeschneiderte Lösung.

Trinkwasser (Rohwasser) ist ein Lebensmittel und somit besonders sorgfältig zu behandeln. Achten Sie deshalb beim Betreiben und Warten aller Anlagen im Bereich der Trinkwasserversorgung stets auf die erforderliche Hygiene. Das gilt auch für die Aufbereitung von Brauchwasser, wenn Rückwirkungen auf das Trinkwasser (Rohwasser) nicht zuverlässig ausgeschlossen sind.

Alle Grünbeck-Geräte sind aus hochwertigen Materialien gefertigt. Dies garantiert einen langen, störungsfreien Betrieb, wenn Sie Ihre Wasseraufbereitungsanlage mit der gebotenen Sorgfalt behandeln. Dabei hilft diese Betriebsanleitung mit wichtigen Informationen. Lesen Sie die Betriebsanleitung sorgfältig durch, bevor Sie die Anlage installieren, bedienen oder warten.

Zufriedene Kunden sind unser Ziel. Deshalb hat bei Grünbeck die qualifizierte Beratung einen hohen Stellenwert. Bei allen Fragen zu dieser Anlage, zu möglichen Erweiterungen oder ganz allgemein zur Wasser- und Abwasseraufbereitung stehen Ihnen unsere Außendienstmitarbeiter ebenso gern zur Verfügung, wie die Experten unseres Werks in Höchstädt.

Rat und Hilfe erhalten Sie bei der für Ihr Gebiet zuständigen Vertretung (siehe www.gruenbeck.de). Für Notfälle steht unsere Service-Hotline 0 90 74 / 41-333 zur Verfügung. Geben Sie bei Ihrem Anruf die Daten Ihrer Anlage an, damit Sie umgehend mit dem zuständigen Experten verbunden werden. Um die nötigen Informationen jederzeit verfügbar zu haben, halten Sie bitte die genauen Gerätedaten (siehe Typenschild im Kapitel C-1) bereit.

2 | Hinweise zum Benutzen der Betriebsanleitung

Diese Betriebsanleitung richtet sich an die Betreiber unserer Anlagen. Sie ist in mehrere Kapitel gegliedert, die alphabetisch bezeichnet und in der Inhaltsübersicht auf Seite 1 zusammengestellt sind. Um Informationen zum gewünschten Thema zu finden, suchen Sie zunächst auf Seite 1 das zutreffende Kapitel.

Die Kopfzeilen und die Seitennummerierung mit Angabe des Kapitels helfen Ihnen, sich in der Betriebsanleitung zu orientieren. Bei größeren Kapiteln schlagen Sie zunächst die erste Seite (z.B. H-1) auf. Dort finden Sie nähere Angaben zum Inhalt des Kapitels.

3 | Allgemeine Sicherheitshinweise

3.1 Symbole und Hinweise

Wichtige Hinweise in dieser Betriebsanleitung werden durch Symbole hervorgehoben. Im Interesse eines gefahrlosen, sicheren und wirtschaftlichen Umgangs mit der Anlage sind diese Hinweise besonders zu beachten.



Gefahr! Missachten so gekennzeichnete Hinweise führt zu schweren oder lebensgefährlichen Verletzungen, hohen Sachschäden oder zu unzulässiger Verunreinigung des Trinkwassers.



Warnung! Werden so gekennzeichnete Hinweise missachtet, so kann es unter Umständen zu Verletzungen, Sachschäden oder Verunreinigungen des Trinkwassers kommen.



Vorsicht! Beim Missachten so gekennzeichnete Hinweise besteht die Gefahr von Schäden an der Anlage oder anderen Gegenständen.



Hinweis: Dieses Zeichen hebt Hinweise und Tipps hervor, die Ihnen die Arbeit erleichtern.



So bezeichnete Arbeiten dürfen nur vom Werks-/Vertragskundendienst der Firma Grünbeck oder von ausdrücklich durch die Firma Grünbeck autorisierten Personen durchgeführt werden.



So bezeichnete Arbeiten dürfen nur von elektrotechnisch unterwiesenem Personal nach den Richtlinien des VDE oder vergleichbarer, örtlich zuständiger Institutionen, durchgeführt werden.



So bezeichnete Arbeiten dürfen nur vom zuständigen Wasserversorgungsunternehmen oder von zugelassenen Installationsunternehmen erfolgen. In Deutschland muss das Installationsunternehmen nach § 12(2) AVBWasserV in ein Installateurverzeichnis eines Wasserversorgungsunternehmens eingetragen sein.

3.2 Betriebspersonal

An der Anlage dürfen nur Personen arbeiten, die diese Betriebsanleitung gelesen und verstanden haben. Dabei sind insbesondere die Sicherheitshinweise strikt zu beachten.

3.3 Bestimmungsgemäße Verwendung

Die Anlage darf nur zu dem Zweck verwendet werden, der in der Produktbeschreibung (Kapitel C) beschrieben ist. Diese Betriebsanleitung sowie die örtlich gültigen Vorschriften zum Trinkwasserschutz, zur Unfallverhütung und zur Arbeitssicherheit sind dabei zu beachten.

Zur bestimmungsgemäßen Verwendung gehört auch, dass die Anlage nur in ordnungsgemäßem Zustand betrieben wird. Eventuelle Störungen sind umgehend zu beseitigen.

3.4 Schutz vor Wasserschäden

Warnung! Zum Schutz des Aufstellortes bei Wasserschäden muss:

- a) ein ausreichender Bodenablauf vorhanden sein, oder
- b) eine Wasserstoppeinrichtung (siehe Teil C Zubehör) eingebaut sein.



Warnung! Bodenabläufe, die an die Hebeanlage abgeleitet werden, sind bei Stromausfall außer Funktion.

3.5 Beschreibung spezieller Gefahren

Gefahr durch elektrische Energie! → Nicht mit nassen Händen an elektrische Bauteile greifen! Vor Arbeiten an elektrischen Anlagenteilen, Netzstecker ziehen! Schadhafte Kabel umgehend durch Fachkraft ersetzen lassen.

Gefahr durch mechanische Energie! Anlagenteile können unter Überdruck stehen. Gefahr von Verletzungen und Sachschäden durch ausströmendes Wasser und durch unerwartete Bewegung von Anlagenteilen. → Druckleitungen regelmäßig prüfen. Anlage vor Reparatur- und Wartungsarbeiten druckfrei machen.

Gesundheitsgefahr durch verunreinigtes Trinkwasser! → Anlage nur durch Fachbetrieb installieren lassen. Betriebsanleitung strikt beachten! Für ausreichenden Durchfluss sorgen, nach längeren Standzeiten vorschriftsmäßig in Betrieb nehmen. Inspektions- und Wartungsintervalle einhalten!



Hinweis: Durch den Abschluss eines Wartungsvertrags stellen Sie sicher, dass alle notwendigen Arbeiten termingerecht durchgeführt werden. Die Inspektionen dazwischen nehmen Sie selbst vor.

4 | Transport und Lagerung



Vorsicht! Die Anlage kann durch Frost oder hohe Temperaturen beschädigt werden. Um Schäden zu vermeiden:

Frosteinwirkung bei Transport und Lagerung verhindern!
Anlage nicht neben Gegenständen mit starker Wärmeabstrahlung aufstellen oder lagern.

Die Anlage darf nur in der Originalverpackung transportiert und gelagert werden. Dabei ist auf sorgsame Behandlung und seitenrichtiges Stellen (soweit auf der Verpackung angegeben) zu achten.

5 | Entsorgung

Beachten Sie die geltenden nationalen Vorschriften.

5.1 Verpackung

Entsorgen Sie die Verpackung umweltgerecht.

5.2 Produkt



Befindet sich dieses Symbol (durchgestrichene Abfalltonne) auf dem Produkt, gilt für dieses Produkt die Europäische Richtlinie 2012/19/EU. Dies bedeutet, dass dieses Produkt bzw. die elektrischen und elektronischen Komponenten nicht als Hausmüll entsorgt werden dürfen.

Informieren Sie sich über die örtlichen Bestimmungen zur getrennten Sammlung elektrischer und elektronischer Produkte.

Nutzen Sie für die Entsorgung Ihres Produktes die Ihnen zur Verfügung stehenden Sammelstellen.



Informationen zu Sammelstellen für Ihr Produkt erhalten Sie bei Ihrer Stadtverwaltung, dem öffentlich-rechtlichen Entsorgungsträger, einer autorisierten Stelle für Entsorgung von Elektro- und Elektronik-Produkten oder Ihrer Müllabfuhr.

B Basic information

Content

1 Laws, regulations, standards	B-1
2 The most important parameters	B-1
3 Filling and fresh water	B-7
4 Requirements on materials in swimming pools	B-8

1 | Laws, regulations, standards

In the interest of good health, rules cannot be ignored when it comes to the processing of drinking water.

Among other things, the regulations stipulate that

- only approved specialist companies are permitted to make major modifications to water supply facilities
- and that checks, inspections and maintenance on installed devices are to be performed at regular intervals.

DIN standard 19643, the German Ordinance on the Treatment of Water in Swimming Pools and Baths, indicates the microbiological, chemical and physio-chemical requirements on the quality of the pool water in public swimming pools. The admissible concentrations for the most important pool water parameters can be found there as well.

DIN 16713 describes the treatment of swimming pool and bathing pool water in public swimming baths. The requirements of DIN EN 16713 must be complied with in order to ensure good water quality, and thus the protection of health. The concentrations for the individual pool water parameters indicated in this chapter as well as some of the disinfection processes described, therefore only and exclusively apply to private swimming pools.

2 | The most important pool water parameters

The knowledge about the reaction of the water and the components dissolved therein are of utmost importance in the swimming pool sector. Crystal-clear and clean water which is free of germs is the basic requirement for the continued enjoyment of bathing. In the following, the most important parameters are described - however, there are many additional factors.

2.1 pH value

The pH value is one of the most important water parameters and has an essential impact on the efficiency of the disinfectants and flocculants, the resistance of metal materials, the precipitation of scale and the well-being of the bather (refer to fig. B-1).

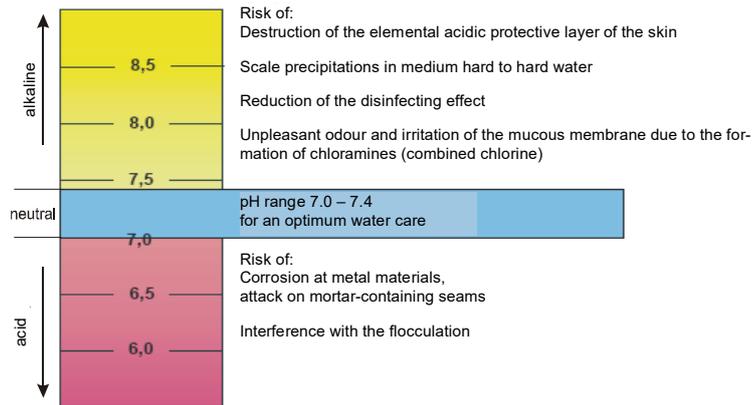


Fig. B-1: Impact of the pH value in swimming pool water

In private swimming pools with chlorine disinfection and without the use of a flocculant, the pool water should have a pH value of 6.8 - 7.4.

In private swimming pools with bromine disinfection and without the use of a flocculant, the pool water should have a pH value of 6.8 - 7.6.

In private swimming pools with chlorine or bromine disinfection with the use of a flocculant containing aluminium, the pool water should have a pH value of 6.8 - 7.2.

In private whirlpools or hot water pools, the pH value can be within a slightly greater range (pH value 6.5 - 7.6).

Various external influences as well as the dosing of disinfectants change the pH value. In order to keep the pH value within the optimum range, the respective agents to increase or decrease the pH value must be added.

Decreasing the pH value: Dosing of GENO-minus N (sulphuric solution).

Increasing & stabilising the pH value: Dosing of GENO-plus N (sodium hydroxide solution).

The amount to be dosed depends on the required correction of the pH value as well as on the buffer capacity of the water.

The products GENO-minus N resp. GENO-plus N are added to the pool water undiluted and as supplied by means of a GENO-Schlauflex pH dosing pump or the dosing system GEN-DOS SB 1/40 and the automatic measuring and control system GENO-CPR-tronic 02 family / public.

2.2 Acid capacity/Alkalinity

The acid capacity describes the ability of the water to keep the pH value stable upon the deposition of acids or bases. Basically, it is determined by the concentration of the hydrogen carbonate ions (calcium, magnesium, sodium) dissolved in the water.

To be able to reliably adjust the pH value, the acid capacity $K_{S4.3}$ must be ≥ 0.7 mmol/l. When using a flocculant, the acid capacity $K_{S4.3}$ should be ≥ 0.9 mmol/l.

Water with a lower acid capacity exhibits high fluctuations in the pH value and adjusting the desired pH value by dosing GENO-minus N or GENO-plus N is difficult.

Increasing the acid capacity: Dosing of GENO-stabil.

2.3 Redox potential

By means of the Redox potential, the hygiene of the pool water can be assessed.

The Redox potential is the concentration ratio between oxidants (e. g. free chlorine) and reducing agents (e.g. organic impurities). Thus, it is a measure for the oxidising resp. disinfecting effect of the disinfectants present while taking into consideration the impurities currently contained in the pool water. Subject to the concentration of impurities in the pool water, the same concentration of disinfectants may one time result in a higher and another time in a lower Redox potential.

As the Redox potential is a sum parameter, a selective determination of the concentration of the disinfectant used (e. g. "free chlorine") is impossible.

In order for the oxidising effect of the disinfectant chlorine in the pool water to be sufficient, the Redox value should be higher than 750 mV (in case of sea and brine water pools, it should be higher than 700 mV).

The measurement of the Redox potential is slow due to the fact that voltage changes in general only proceed at a slow pace.

2.4 Disinfectants

Every bather introduces impurities such as coarse dirt, dust, soap residue, danders, cosmetics, bacteria, viruses, etc. into the pool water. While the filterable substances are removed by means of the filter system, the pool water needs to be sterilised by means of disinfectants.

Primarily, the disinfection is used to quickly eliminate the pathogens that have got into the pool water, so that there is no risk of infection for the bathers. The dosing amounts required must be added subject to the continuously changing operating conditions

If the concentrations in the water are too low, the success of the disinfection is put in question whereas if the concentrations are too high, unnecessary costs as well as signs of corrosion and an impairment of the taste may result.

The amount of disinfectants to be dosed depends on the composition of the water to be treated, the reaction time, the mixing, the pH value, the temperature, the intended use of the water and the desired disinfection excess (depot effect).

2.4.1 Chlorine

In private pools, mostly liquid chlorine (GENO-Chlor A) is used.

The effect of GENO-Chlor A is due to the concentration of active chlorine ("free chlorine") which has an oxidising effect if combined with water and thus kills germs and bacteria and, in higher concentrations, algae and micro-organisms as well.

The disinfecting effect of the free chlorine, or better of the hypochlorous acid, strongly depends on the pH value (refer to Fig. B-2).

Effective chlorine components

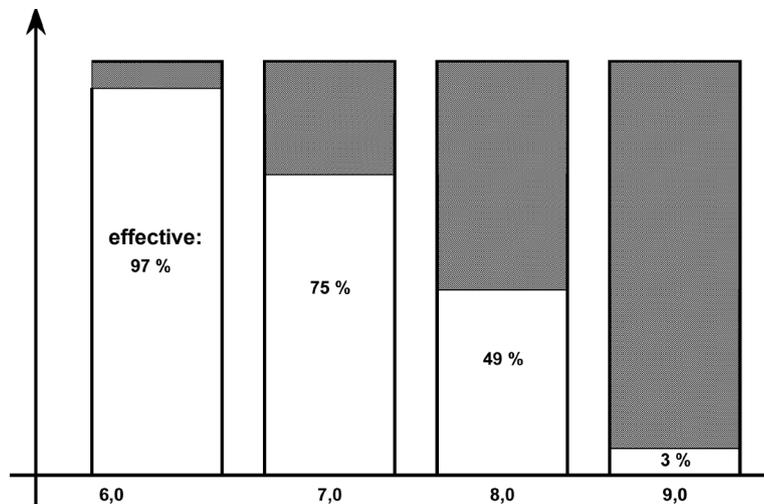


Fig. B-2: Efficiency of chlorine subject to the pH value.

In standard swimming pool water, the concentration of free chlorine should be between 0.3 and 0.6 mg/l.

In hot whirlpools, the concentration of free chlorine should be between 0.7 and 1.0 mg/l.

The product GENO-Chlor A is added to the pool water undiluted and as supplied by means of a GENO-Schlauflex Chlor dosing pump or the dosing system GENODOS type SBC 1/40 and the automatic measuring and control system GENO-CPR-tronic 02 family/public.

The free chlorine reacts with the organic impurities introduced to the water by the bathers and turns into combined chlorine (chloramines and THMs). This combined chlorine is responsible for the smell typical in indoor pools and for possibly occurring eye irritations.

The upper limit value for combined chlorine is 0.2 mg/l.

GENO-Chlor A decomposes slowly and in the process releases active oxygen which has a strong oxidising effect. The decomposition process is accelerated by heat, light and dust as well as by contact with heavy metals, in particular nickel, copper, cobalt, manganese and iron, releasing oxygen gas in the process. Therefore, the storage requirements for GENO-Chlor A have to be strictly adhered to!

2.4.2 Bromine (family only)

The GENO-Brom tablets are perfectly suited for disinfection, oxidation and prevention of algae growth. The advantage of the GENO-Brom tablets is that the generated bromamines are completely odourless, do not irritate the mucous membranes and continue to have an unabated disinfecting effect (contrary to the chloramines). A differentiation between free and combined bromine therefore is not required.

In case of disinfection by bromine, the pH value should be between 6.8 - 7.6. Even at these pH values, the disinfecting effect of the GENO-Brom tablets is still approx. 90% - contrary to chlorine.

The ideal bromine concentration in private swimming pools is between 1.5 and 2.0 mg/l.

The bromine is automatically dosed by means of a dosing unit which is actuated by the measuring and control system GENO-CPR-tronic 02 family. The actuator of the dosing unit is opened or closed as needed.

2.4.3 GENO-UV disinfection devices (family only)

The GENO-UV disinfection devices are designed to further reduce the germs contained in the pool water. The pool water to be disinfected flows steadily past a special UV lamp. The highly energetic UV light destroys the objectionable germs and viruses contained in the pool water.

In case of GENO-UV disinfection devices, the degree of disinfection considerably depends on the pool water quality present. For more information, please refer to the operation manuals for the GENO-UV disinfection devices.

In the swimming pool area, disinfection by means of GENO-UV disinfection devices alone does not suffice as private pools only rarely are operated 24 hours a day. As the UV disinfection only takes place in the operating phase and only in the irradiation chamber, an additional disinfection to keep up the required depot effect in the swimming pool is required. The additional disinfection can either be provided by chlorine or bromine disinfection.

3 | Filling and fresh water

With regard to bacteriology and for reasons associated with the hygienic control of epidemics, the quality of filling and fresh water for swimming pools must be drinking water quality in order to be able to properly operate the swimming pool and the automatic measuring and control systems GENO-CPR-tronic 02 family/public.

Normally, drinking water but sometimes also well or spring water is used. A separate treatment of filling and fresh water is required in case of:

- Iron values ≥ 0.10 mg/l
- Copper values ≥ 0.20 mg/l
- Manganese values ≥ 0.05 mg/l
- Polyphosphates as phosphorous ≥ 0.01 mg/l
- Nitrate values ≥ 0.50 mg/l
- Ammonium values ≥ 0.50 mg/l
- Increased concentrations of humic substances (potential for the formation of THMs)
- Increased concentrations of combined organic carbon (DOC).

In case of need, the iron, manganese and ammonium can be filtered as described in the following:

- Set the pH value to 7.0 to 7.4
- Release a high chlorination, approx. 2 mg/l
- Flocculation and filtration

In case of a water hardness of > 14 °dH, a water softener should be applied. The value should not be less than 7 °dH in order to provide an adequate buffer effect.

Despite the best pool water treatment possible, the accumulation of dissolved substances (e.g. salts) in the water cannot be prevented. Therefore, it is inevitable to replace the bathed-in water by fresh water.

In private swimming pools, the required amount of fresh water mostly results from the water loss due to the regular filter backwash and evaporations. The fresh water to be added should at least be 3 % or better 5 % of the pool volume per week.

In public pools, fresh water is added as per DIN 19643.

4 | Requirements on materials in swimming pools

The materials coming into contact with the water have to fulfil the following requirements (DIN 19643):

- The quality of the water must not be affected.
- The physio-chemical properties and quality of the water must not affect the materials.
- The growth of microorganisms and phytoplankton must not be promoted.

In case of organic material in particular, fungi growth may occur. Taking into consideration the respective operating conditions, the use of the materials in swimming pools therefore has to be ascertained with the manufacturer beforehand.

C Product description

Content

1	Type plate	C-1
1.1	Private swimming pools	C-1
1.2	Public swimming pools	C-1
2	Technical specifications	C-2
2.1	Private swimming pools	C-2
2.2	Public swimming pools	C-2
3	Optional features.....	C-6
3.1	Consumables	C-7
3.2	Wearing parts.....	C-7
4	Scope of supply	C-8
5	Designated application.....	C-9
6	Electrodes and measuring cells used.....	C-10
6.1	pH electrode.....	C-10
6.2	Redox electrode (family and public)	C-10
6.3	CCS chlorine measurement (free chlorine, public only)	C-10
		C-11
6.4	CGE chlorine measuring cell (total chlorine, public only).....	C-12
		C-12
6.5	Temperature measuring unit	
6.6	Flow sensor measuring water	

1 | Type plate

The type designation plate is located on the right of the white base plate. In order to speed up the processing of your inquiries or orders, please specify the data shown on the type plate of your system when contacting Grünbeck. Please copy the indicated information to the table below in order to have it handy whenever necessary.

1.1 Private swimming pools

GENO-CPR-tronic 02 family Serial

number: /

Order number:

1.2 Public swimming pools

GENO-CPR-tronic 02 public Serial

number: /

Order number:

2 | Technical specifications



Warning! The pool water may become contaminated if left standing for a long time. Therefore, the system function, the pool water quality and the chemical supply must be checked from time to time either by the owner or by a specialist.



Caution! After a power failure, the system must be switched on again and its function must be checked.

2.1 Private swimming pools

GENO-CPR-tronic 02 family

A good and consistent pool water quality is very important in private swimming pools. The automatic measuring and control system GENO-CPR-tronic 02 family is designed to achieve resp. keep up such good water quality. The measuring and control system autonomously registers the current pool water parameters (redox value and pH value), compares them with the set index values and automatically modifies the dosing of the respective care products. Moreover the pool water temperature is displayed. The GENO-CPR-tronic 02 family automatic measuring and control system may only and exclusively be used in private pools.

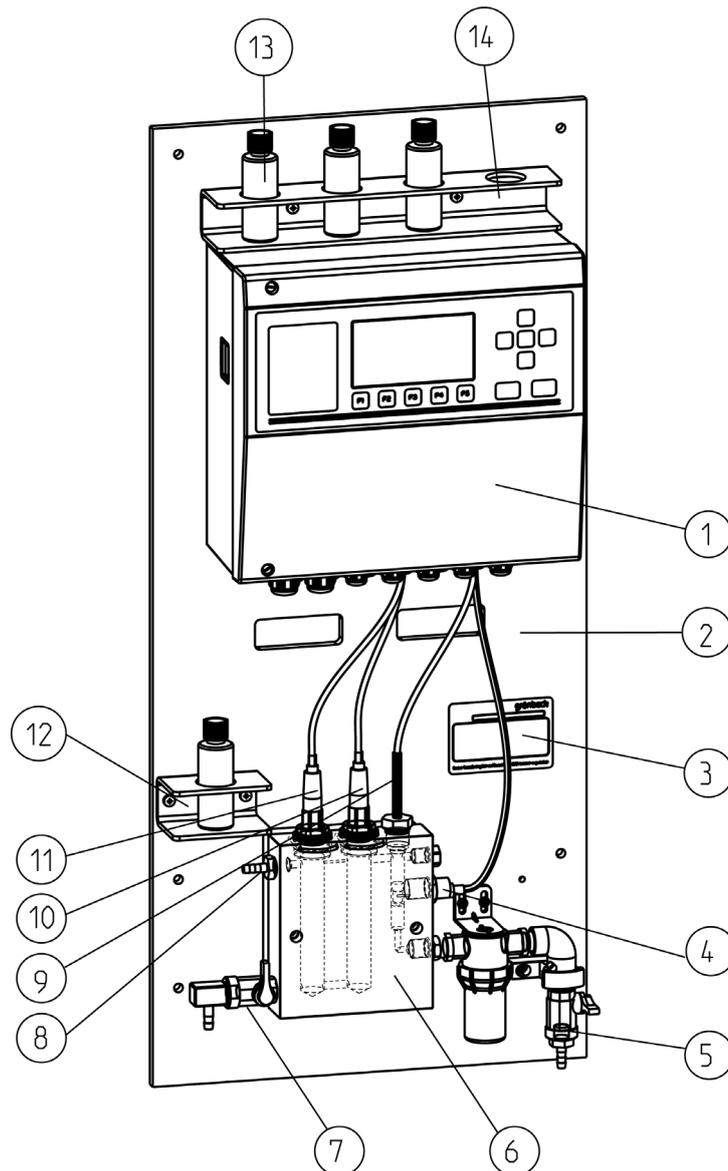
All system data is summarised in tables C-1 and C-2. The indicated data refers to the standard version of the GENO-CPR-tronic 02 family. Possible deviations in case of special versions are communicated separately, if applicable.

2.2 Public swimming pools

GENO-CPR-tronic 02 public

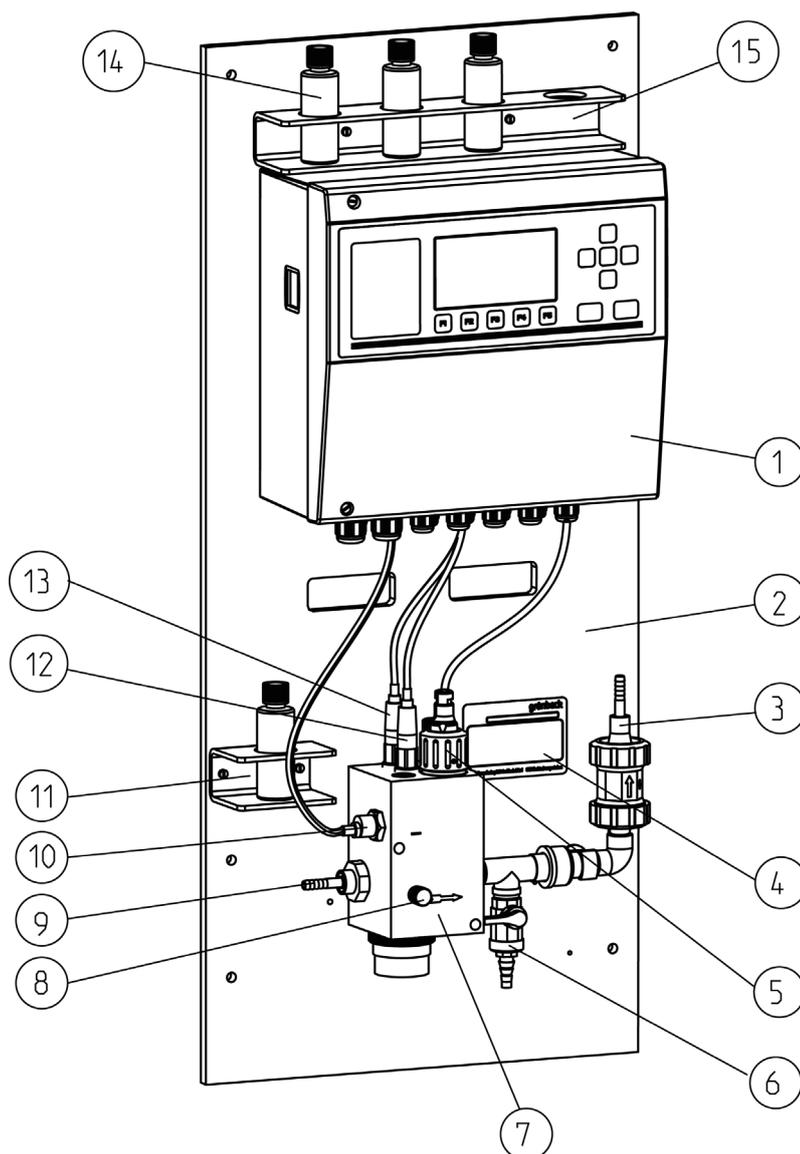
The pool water quality in public swimming pools is regulated by law in the German DIN standard 19643, the German Ordinance on Swimming Pool and Bathing Water. The operator of a swimming pool must observe the statutory limit values and document them. The measuring and control system autonomously registers the current pool water parameters (chlorine concentration and pH value), compares them with the set index values and automatically modifies the dosing of the respective care products. Furthermore, it indicates the pool water temperature and the Redox value (features a control output). The GENO-CPR-tronic 02 public automatic measuring and control system is used in public swimming pools.

All system data is summarised in tables C-1 and C-3. The indicated data refers to the standard version of the GENO-CPR-tronic 02 public. Possible deviations in case of special versions are communicated separately, if applicable.



- | | | |
|---|------------------------------|------------------------------------|
| ① GENO-CPR-tronic O2 family control unit | ⑥ Flow fitting | ⑪ Redox electrode |
| ② Mounting plate | ⑦ Sampling valve | ⑫ Holder for calibrating solutions |
| ③ Type plate | ⑧ Measuring water outlet | ⑬ Calibrating solutions |
| ④ Flow sensor measuring water | ⑨ Temperature measuring unit | ⑭ Holder for calibrating solution |
| ⑤ Measuring water inlet with adjusting valve and measuring water filter | ⑩ pH electrode | |

Fig. C-1: Complete layout of the GENO-CPR-tronic O2 family



- | | | |
|--|------------------------------------|-----------------------------------|
| ① GENO-CPR-tronic 02 public control unit | ⑦ Flow fitting | ⑬ Redox electrode |
| ② Mounting plate | ⑧ Flow regulation | ⑭ Calibrating solutions |
| ③ Measuring water outlet | ⑨ Measuring water inlet | ⑮ Holder for calibrating solution |
| ④ Type plate | ⑩ Flow sensor measuring water | |
| ⑤ CCS chlorine measuring cell with built-in temperature measuring unit | ⑪ Holder for calibrating solutions | |
| ⑥ Sampling valve | ⑫ pH electrode | |

Fig. C-2: Complete layout of the GENO-CPR-tronic 02 public

Table C-1: Technical specifications		GENO-CPR-tronic 02 family/public
Dimensions/housing		
Electronic housing without cable screw connections (h x w x d)	[mm]	285 x 301 x 150
Protection (front door closed)		IP 65
Mounting plate (h x w x d)	[mm]	885 x 400 x 180
Weight family/public approx.	[kg]	14/14.5
Display/keypad		
Display		LCD charts with 240 x 128 pixels LED backlight
LED		1 red fault and alarm LED 1 green operating LED
Keypad		12 keys, foil keypad with tactile feedback
Operating conditions		
Voltage range		230 VAC +10/-15%/50 to 60 Hz
Power input		approx. 15 VA without connection of users
Nominal pressure		PN 2
Measuring water flow of family	[l/h]	> 30 (Δp Flow fitting incl. measuring water filter ≥ 0.15 bar)
Measuring water flow of public	[l/h]	> 30 (max. subject to the measuring cells used, refer to chapter C-6) (Δp Flow fitting ≥ 0.40 bar)
Max. pool water temperature	[°C]	40
Ambient temperature	[°C]	0 ...40
Sensor amplifier		
General		galvanically isolated against PE and remaining electronics, probe amplifiers voltage-related amongst themselves, interference-free input circuitry
pH amplifier		High-impedance CMOS amplifier input (electrode signal temperature-compensated by software)
Analogue inputs		
General		single-ended, transmitter voltage 24 VDC stabilised, short circuit proof
Combined chlorine and room humidity		0 to 20 mA, 4 to 20 mA, 2-wire technology, configurable by software
Room temperature		PT 100, 0°C up to 100 °C, 2-wire technology 0 to 20 mA or 4 to 20 mA available as an option
Resistance of chlorine gas		Potentiometer 0 – 1000 Ω , 3-wire technology
Digital outputs		
Relay dosing outputs Terminals 6, 7, 10 and 13		230 VAC, sum current max. 2 A (2 A mT fused)
Semi-conductor relay outputs Terminals 14/15, 16/17, 18/19		30 V AC or DC, max. current 50 mA (50 mA fused)
3 Relay NOCs Terminals 20/21, 22/23, 24/25		voltage free signal outputs, max. 230 VAC, contact rating 5 A, continuous power rating 1 A
Collective fault relays Terminals 26, 27, 28		max. 230 VAC, contact rating 8 A, continuous power rating 1 A
Digital inputs		
Transmitter voltages		24 VDC (non-stabilised) max. 80 mA, short-circuit proof 12 VDC (stabilised) max. 15 mA, short-circuit proof
Analogue outputs		
General		galvanically isolated against PE and remaining electronics, common return, signal and return conductor with interference filter
Power range		0 to 20 mA, 4 to 20 mA (configurable by software)
Working resistance		max. 400 Ω
Bus outputs		
Interface RS-232		galvanically isolated against PE and remaining electronics, configurable via software, data exchange via RXD, TXT
Interface RS-485		galvanically isolated against PE and remaining electronics, configurable via software
Interface RS-485 for optional modules		related to ground (PE), with 18 V~ output to supply module

Table C-2: Technical specifications Supplement to family	GENO-CPR-tronic 02 family
Redox amplifier	high-resistance CMOS amplifier input
PT100 temperature sensor	Measuring range 100 Ω (0°C) 135.5 Ω (100°C)
Measuring water filter cut-off [µm]	300

Table C-3: Technical specifications Supplement to public	GENO-CPR-tronic 02 public
Sensor amplifier	high-resistance CMOS amplifier input
NTC amplifier for temperature sensor	Measuring range 3 601 Ω (50°C) 32 650 Ω (0°C)
Redox amplifier	high-resistance CMOS amplifier input
Amplifier for chlorine electrode	CMOS amplifier input with low leakage current
NTC amplifier for temperature sensor	Measuring range 3 601 Ω (50°C) 32 650 Ω (0°C)

3 | Optional features



Note: It is possible to retrofit existing systems with optional components. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstädt/Germany for details.

	Order no.
Flow controller	100025120000
Dosing system GENO-Schlauflex-CI 1.5 i	203 586
Dosing system GENO-Schlauflex-pH 1.5 i	203 591
GENODOS SB 1/40 (pH) dosing system	212 475
Dosing system GENODOS SBC 1/40 (Chlorine)	212 490
GENODOS dosing system type SBF 0/40 (flocculation)	212 500
Mounting plate for two hose dosing pumps GENO-Schlauflex 1.5 i	203 576
Mounting plate for GENODOS dosing pumps	203 520
Touch panel with on-wall housing (plastic)	203 545
Touch panel, in-wall option (stainless steel)	203 550
Hygro thermo transmitter (room temperature/humidifier)	203 535
Optional module for chemical refill and empty alarm	203 555
Data logger for CPR-tronic 02	203 565
Optional measurement of combined chlorine (public)	203 560
Flow monitoring for family (starting from serial no. 101711, installed as standard)	203 800
Wall bracket for needle printer	210 217
Continuous paper for needle printer	210 203
Dosing unit GENO-mat Comfort	203 123
Needle printer Dascom/Tally 1125	210 240
Continuous paper for needle printer	203 540
Ink ribbon for Dascom/Tally 1125, black	210 241
Test kit Scuba II (electronic pool tester) (family)	211 235
Water test kit MD 4in1 (photometer)	211 230
Manual analysis device Chematest 25	203 185
Manual measuring device (chlorine and pH value) (family)	211 110
Manual measuring device (bromine and pH value) (family)	211 112
Measuring water pumping system MHI (public)	230 180

3.1 Consumables

Only use genuine consumables in order to ensure the reliable operation of the system.



Caution! The warranty shall be void if dosing agents or chemicals supplied by other manufacturers are used whose quality and composition is beyond Grünbeck's control.

	Order no.
Calibrating solution pH 9	203 629
Calibration solution pH 7	203 628
Calibrating solution Redox	203 625
GENO-minus N (pH reduction), 20 l	210 013
GENO-minus N (pH increase), 20 l	210 018
GENO-Chlor A (disinfectant), 20 l	210 012
GENO-Brom tablets, 5-kg bucket (family only)	210 011
Cleaning agent GENO-clean CP (UV system)	170 022
Maintenance kit for CCS51	100028870001

3.2 Wearing parts

The following items are subject to a certain wear and tear:

pH electrode	211 502
Redox electrode	211 507
CCS chlorine measuring cell (free chlorine, public only)	93 410 013
CGE chlorine measuring cell (total chlorine, public only)	203 453
Filter element measuring water filter family	890 04 052e
Seals	



Note: Although these parts are wearing parts, Grünbeck grants a limited warranty period of 6 months.

4 | Scope of supply

The automatic measuring and control system is almost completely pre-assembled on a mounting plate and can be installed and put into operation quickly by means of the attached component parts. The completeness of the delivery can be checked by means of the following overview.

	Order no.	family	public
1 Operation manual GENO-CPR-tronic 02 family/public	203 970	X	X
1 pH electrode	211 502	X	X
1 Redox electrode	211 507	X	X
1 Redox calibrating solution (475 mV)	203 625	X	X
1 Calibrating solution pH 7	203 628	X	X
1 Calibration solution pH 9	203 629	X	X
1 Round bottle with screw lid (50 ml)	88 908 600	X	X
1 Operating card GENO-CPR-tronic 02 family	203 978	X	
1 Operating card GENO-CPR-tronic 02 public	203 979		X
1 Fabric-reinforced hose d=6 D=12 (10 m)	85 774 006	X	X
4 Hose clamps NORMA S 13/9 galvanised	85 018 017	X	X
1 Fastening material for GENO-CPR-tronic 02	203 081	X	X
1 Supply ball valve DN10 CPR-tronic	203 052	X	
1 Ball valve DN 10 for CPR-tronic	203 048	X	
1 Chlorine electrode CCS	93 410 013		X

5 | Intended use

The GENO-CPR-tronic 02 family may only and exclusively be used in private swimming pools and is designed to automatically measure and control the Redox and the pH value in the pool water.

The GENO-CPR-tronic 02 public is used in public swimming pools and is designed to automatically measure and control the chlorine concentration and the pH value in the pool water.



Warning! Do not use any chlorine products based on iso-cyanuric acid for the GENO-CPR-tronic 02



Warning! The GENO CPR-tronic 02 public, along with the chlorine measuring cell CGE (total chlorine), must not be used in conjunction with membrane-free electrolysis processes.



Caution! In the case of returning measuring water, the generated counterpressure on the flow fitting of the GENO-CPR-tronic 02 family must not exceed 2 bar and must be as constant as possible; negative pressure at the measuring cells must be avoided.



Caution! In case the measuring water is returned, the generated counter-pressure applied to the chlorine measuring cell of the GENO-CPR-tronic 02 must not exceed 1 bar and should be kept as constant as possible; negative pressure at the measuring cells must be avoided.

5.1 Application limits

The limit values stipulated in DIN-EN 16713 and DIN 19643 are generally applicable for the use of the GENO-CPR-tronic 02. The exception to the above are the following parameters:

- Salt concentration < 3.5 %
- Isocyanuric acid \leq 1.0 mg/l

For further application limits (e.g. measuring ranges, cross-sensitivities, etc.), please consult the chapter "Electrodes and measuring cells used".

6 | Electrodes and measuring cells used

6.1 pH electrode (family and public)

The pH value is determined by means of a single-rod measuring cell (measuring and reference electrode in one shaft). When immersing the glass electrode into the swimming pool water, the essential, hydrated layer by which an electro-chemical potential is generated, forms on the glass surface. The potential generated on the glass surface depends on the composition of the swimming pool water and is measured against a reference electrode (with constant potential) lying in a gel electrolyte. The pH value is determined by the difference in potential. The measuring water must have a minimum conductivity of 50 $\mu\text{S}/\text{cm}$.

6.2 Redox electrode (family and public)

The Redox value is determined by means of a single-rod measuring cell (measuring and reference electrode in one shaft). Upon immersion into the swimming pool water, an electro-chemical potential forms at the measuring electrode made of platinum. The potential generated at the platinum electrode depends on the composition of the swimming pool water and is measured against a reference electrode (with constant potential) lying in a gel electrolyte. The Redox value is determined by the difference in potential. The measuring water must have a minimum conductivity of 50 $\mu\text{S}/\text{cm}$.

6.3 CCS chlorine measuring cell (free chlorine, for public only)

The CCS chlorine measuring cell with integrated temperature measuring unit has specifically been developed for this kind of application and is designed to continuously register the concentration of free and effective chlorine. Combined with the GENO-CPR-tronic 02 public measuring and control system, the optimum operating state for disinfection is maintained.

Upon connection of the measuring cell to the corresponding measuring transducer, a solid outer voltage is applied to the electrodes. Due to the difference in the surfaces of the electrodes, a polarisation at the gold cathode results. The polarisation current flowing during this process can be detected at the measuring transducer and initially shows a very high level, then decreases over time and finally, the value displayed stabilises. Only then, the calibration may be carried out. Free chlorine in the form of hypochlorous acid (HOCl) is transported towards the membrane by means of the required flow. Due to the materials used and the respective manufacturing method, the membrane only allows dissolved gases to pass through but not substances that are present in the liquid phase. Dissolved salts and ionic substances are also retained and therefore, the conductivity of the media - contrary to the open measuring principle - does not have an impact on the measuring signal in the membrane-covered sensor.

Table C-4: Technical specifications		CCS chlorine measuring cell (free chlorine) GENO-CPR-tronic 02 public
Measurand		Free chlorine - hypochlorous acid (HOCl)
Measuring range*		0 ... 20 mg/l HOCl
Measuring water flow	[l/h]	min. 30, max. 120
Minimum flow velocity	[cm/s]	15
Depolarisation current*		9 ... 18 nA per 1 mg/l HOCl
Polarisation duration	initial start-up [min.]	up to 60
	restart [min.]	up to 30
Response time after polarisation	[s]	90% < 2.5
Measuring system		passively operated measuring cell
Cathode material		gold
Anode material		Silver
Membrane material		PVDF
Membrane cap		replaceable
Service life of filling electrolyte		typically 12 months
Cross-sensitivity		Bromine and other oxidants cause measuring errors
Max. chlorine concentration	[g/l]	35
Maximum counter-pressure		1 (avoid negative pressure)
Shaft material		PVC
Temperature measuring unit		NTC, 10 kΩ at 25°C

*Reference data: pH 5.5 and 20°C

6.4 CGE chlorine measuring cell (total chlorine, for public only)

The optional module CGE chlorine measuring cell can be operated as additional features to the GENO-CPR-tronic 02 public automatic measuring and control system. In swimming pool water, a distinction is made between free and organically combined chlorine and the sum of free and organically combined chlorine is called total chlorine. The CCS chlorine measuring cell determines the concentration of free chlorine and transmits it to the control unit. By means of the CGE chlorine measuring cell, only the total chlorine concentration contained in the pool water can be measured. The difference between total chlorine and free chlorine is calculated by the control unit and indicated in the display as combined chlorine.

Table C-5: Technical specifications		CGE chlorine measuring cell (total chlorine) GENO-CPR-tronic 02 public
Measurand		total chlorine (= sum of free and organically combined chlorine) from which the combined chlorine is calculated
Measuring range	[mg/l]	0.02 ... 2.0
Measuring water flow	[l/h]	optimum 30 (min. 20, max. 100)
Field of application		swimming pool water
Polarisation duration	initial start-up [h]	24 recommended
	restart [h]	12 – 24
Max. pressure in flow fitting	[bar]	3 (no water hammer)
pH-range		5.5 to 9.5
Temperature range		5 to 45°C
Storage temperature		frost-free between 5 to 50 °C
Cross-sensitivity		Bromine, iodine, ozone, ClO ₂ , chloramines and other oxidants cause measuring errors
Conductivity of measuring water	[µS/cm]	30 – 10,000
Max. chlorine concentration	[g/l]	150
Service life of membrane cap		typically 1 year (subject to the water quality)
Output signal		4 – 20 mA
Protection		IP 65

6.5 Temperature measuring unit

In order to register the pool water temperature, a temperature measuring unit is installed in the flow fitting of the GENO-CPR-tronic 02 family measuring and control system. The temperature measuring unit (Pt 100) continuously measures the current pool water temperature and transmits the electrical output signal (0 to 20 mA) to the control unit.

In the case of the measuring and control system GENO-CPR-tronic 02 public, the CCS chlorine measuring cell features an integrated NTC temperature measuring unit. The NTC temperature measuring unit continuously measures the current pool water temperature and transmits the electrical output signal to the control unit.

6.6 Flow sensor measuring water

The flow sensor monitors the required flow in the respective flow fitting of the measuring and control system GENO-CPR-tronic 02 family and the measuring and control system GENO-CPR-tronic 02 public.

If, at a time, the flow rate is insufficient or fails completely, the measuring and control system locks the chemical dosing and thus prevents incorrect dosing.

D Installation

Content

1	General installation instructions	D-2
1.1	Installation site requirements	D-3
1.2	Preliminary works	D-3
2	Mounting	D-4
3	Hydraulic installation	D-5
3.1	GENO-CPR-tronic 02 family	D-5
3.2	GENO-CPR-tronic 02 public	D-6
4	Electrical installation	D-7
4.1	Power supply	D-7
4.2	Connection of electrodes	D-8
5	Block diagrams	D-10
5.1	Basic circuit board (part 1)	D-10
5.2	Base circuit board (part 2)	D-11
6	Connection of dosing units	D-12
6.1	Pulse pumps (diaphragm dosing pumps)	D-12
6.2	Dosing outputs (hose dosing pumps)	D-12
6.3	Voltage-free outputs	D-14
6.4	Collective fault contact	D-14
6.5	Gate inputs	D-15
6.6	Interface RS-485 / RS-232 for printer	D-16
6.7	Interface RS-485 for optional modules	D-16
6.8	Power outputs (printer connection)	D-16
7.	Installation diagrams (family)	D-17
7.1	pH value/chlorine/UV/CPR-tronic 02 family (hose dosing pump)	D-17
7.2	pH value/chlorine/UV/CPR-tronic 02 family (diaphragm dosing pump)	D-18
7.3	pH value/ bromine/UV/CPR-tronic 02 family (hose dosing pump)	D-19
7.4	pH value/bromine/UV/CPR-tronic 02 family (diaphragm dosing pump)	D-20
8	Installation diagram (public)	D-21

1 | General installation instructions



The work featured here may only be performed by Grünbeck's technical service/authorised service company or by persons expressly authorised by Grünbeck.



Note: Prior to installing the system, carefully read this operation manual and in particular the operation manuals that come with the electrodes.



Danger! When opening covers and lids or removing parts, the connectors may carry hazardous voltages. Prior to installation and any repair or maintenance work respectively any replacement of parts, the system must be disconnected from all power sources, if the system has to be opened in order to carry out this work. In particular make sure that any external devices connected to the system do not carry any voltage (fault signal output, connected dosing pumps, etc.).



Danger! If there is no circulation in the filtrate line of the pool water circuit, chlorine gas may be formed in the pipeline in the area of the dosing points when dosing sulphuric acid (GENO-minus N) and sodium hypochlorite (GENO-Chlor A). There is a hazard that this chlorine gas will be introduced into the pool when the circulation capacity returns. It must therefore be ensured on site that the dosing of chemicals is stopped by the measuring and control system if there is no circulation capacity in the filtrate line of the pool water circuit (e.g. no release of the control by a flow controller).



Caution! Only connect the system to mains voltage after completion of the installation. Make sure that no water gets onto the plugs of the sensor cables. When connecting the system, pay attention to the proper connection of the protective grounding conductor. Any interruption of the protective grounding conductor, either inside or outside the system, may lead to a hazardous state of the system. The deliberate interruption of the protective grounding conductor is impermissible.



Caution! Handle electrodes carefully (no skin contact with the measuring ranges, such as membrane glass, protection against damage).



Note: To operate the measuring and control system, a flow monitor (circulation/flow controller) must be installed in the on-site filtrate line of the pool water circuit. The flow controller must be connected electrically to the measuring and control system (terminals 42 and 43 - filtrate flow controller). We recommend a flow controller - see chapter C-3.



Note: Electrodes must not dry out during use or storage. Do not store pH and redox electrodes in distilled water, but in a calcium chloride solution (3 mol/l). If the pH or redox electrodes do dry out, immerse them in a calcium chloride solution (3 mol/l) for 24 hours before continuing to use them.



Note: Air bubbles inside the electrodes must be removed by gently shaking or spinning the electrodes vertically.



Note: All directly connected devices must adhere to the following standards: IEC 950/EN 60950.



Note: If it must be assumed that the system can no longer be operated safely, it must be taken out of service and secured against unintentional operation. It must definitely be assumed that the system can no longer be operated safely

- if the system shows visible damage,
- if the system no longer works,
- after longer periods of storage under adverse conditions or
- after high stress during transport

1.1 Requirements for the installation site

Observe local installation directives, general guidelines and technical specifications.

The installation site must be frost-proof. The system must be protected from major heat irradiation (e.g. direct sunlight), as well as from chemicals, dyes, solvents and vapours.

The installation site must be sufficiently ventilated and must not be prone to flooding.

The system must be easily accessible for operation, maintenance and repair work.

Regarding the power supply on site, a power outlet that has a ground fault circuit interrupter (30 mA) is required. A feeder cable must be laid on-site for the electrical connection.

The installation room must be provided with a floor drain. If none is available, an appropriate safety device has to be installed to avoid water damage.

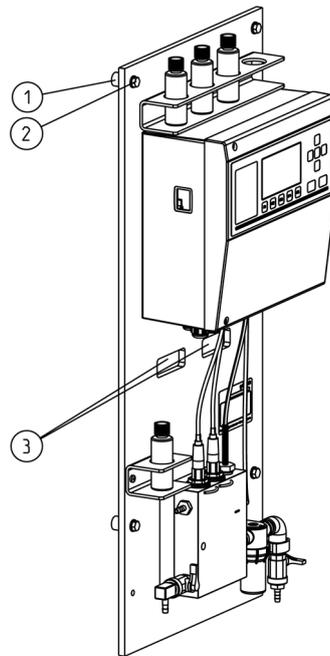
1.2 Preliminary works

1. Unpack all system components supplied and check them for transport damage.
2. Check the delivered components for completeness (refer to scope of supply indicated in chapter C)

2 | Mounting

The automatic measuring and control system GENO-CPR-tronic 02 family resp. public can be fastened to a suitable wall by means of the attached mounting material (refer to Fig. D-1).

1. Fasten the entire system to a suitable wall by means of the attached mounting material.
2. Use a spacer to the wall, in order to allow for cable routing on the rear side of the GENO-CPR-tronic 02 family/public.



① Spacer bolts

③ Cable ducts

② Hexagon screw with washer

Fig. D-1: Wall view GENO-CPR-tronic 02

3 | Hydraulic installation



The work featured here may only be performed by Grünbeck's technical service/authorised service company or by persons expressly authorised by Grünbeck.



Note: The Redox and pH electrodes can be mounted any way into the flow fitting. While installing them make sure, however, that the electric contacts do not get into contact with water (keep the protective caps in place during the installation).

3.1 GENO-CPR-tronic 02 family

1. Set the multi-way valve of the filter system to "closed".
2. Close the shut-off valves upstream and downstream of the system (refer to the corresponding installation diagram).
3. Screw or glue in the ball valve for the measuring water feed at the measuring water sampling point in the filter system.
4. Install the ball valve for the measuring water recirculation into the measuring water return (refer to the corresponding installation diagram). In case the measuring water is returned to the suction side of the pump, make sure that no negative pressure is generated at the electrodes and measuring cells in the flow fitting! If the measuring water is returned to an overflow collector tank (piping) take into consideration that a free outlet must be available resp. that the generated counter-pressure applied to the flow fitting does not exceed 0.1 bar. Pressure fluctuations or negative pressure at the electrodes must be avoided.
5. Establish the hose connections between the ball valves and the flow fitting.
6. Screw the pH and redox electrodes into the flow fitting adapters. Slightly tighten the electrodes with a 17 mm open-ended spanner to max. 3 Nm. The adapter can be held in place using another open-ended spanner.
7. Reopen the previously locked shut-off valves upstream and downstream of the filter system.
8. Set the multi-way valve of the filter system to filtration.
9. Check the hydraulic installation.

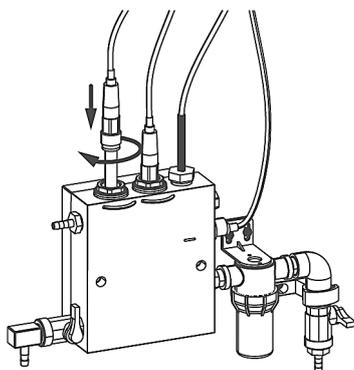


Fig. D-2: pH and redox electrode installation

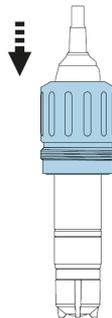
3.2 GENO-CPR-tronic 02 public

1. Install the measuring water sampling piece at the swimming pool.
2. Install the sampling water line with ball valve, dirt trap and, if required, a vacuum controller between the measuring water sampling point and the measuring water pump.
3. Establish the piping between the measuring water pump and the fine filter with a direct branch to the raw water tank. Install a ball valve into the partial flow to the raw water tank.
4. If the measuring water is returned to an overflow collector tank (piping) take into consideration that a free outlet must be available resp. that the generated counter-pressure applied to the flow fitting does not exceed 0.1 bar. Pressure fluctuations or negative pressure at the electrodes and the measuring cell must be avoided.
5. Establish the hose connections between the filter and the flow fitting as well as the flow fitting and the raw water supply tank.
6. Screw the pH and redox electrodes into the flow fitting. Slightly tighten the electrodes with a 17 mm open-ended spanner to max. 3 Nm.
7. The CCS chlorine measuring cell is delivered completely filled and ready-for-use ex works. The CCS chlorine measuring cell of the GENO-CPR-tronic 02 public is fitted with a protective cap. To remove the protective cap, loosen the upper part by turning it (in the direction of the arrow) and carefully pull the protective cap off the sensor.



Note: To prevent damaging the membrane cap of the chlorine measuring cell due to negative pressure, the protective cap must be removed carefully.

8. The CCS chlorine measuring cell is equipped with an adapter for mounting in the flow fitting.



The adapter is locked with two stud bolts (hexagon socket) and must not be able to move. Screw the CCS chlorine measuring cell into the flow fitting.

9. Open all shut-off valves upstream and downstream from the GENO-CPR-tronic 02 public.
10. Check the hydraulic installation.

4 | Electrical installation



The tasks featured below may only be performed by qualified electrical experts according to the VDE guidelines or according to the guidelines of a similar local institution.

The client must provide a ground fault circuit interrupter (trip current 30 mA).



Danger! When opening covers and lids or removing parts, the connectors may carry hazardous voltages. Prior to installation and any repair or maintenance work respectively any replacement of parts, the system must be disconnected from all power sources, if the system has to be opened in order to carry out this work. In particular make sure that any external devices connected to the system do not carry any voltage (fault signal output, connected dosing pumps, etc.).



Caution! Only connect the system to mains voltage after completion of the installation. Make sure that no water gets onto the plugs of the sensor cables. When connecting the system, pay attention to the proper connection of the protective grounding conductor. Any interruption of the protective grounding conductor, either inside or outside the system, may lead to a hazardous state of the system. The deliberate interruption of the protective grounding conductor is impermissible.

4.1 Power supply

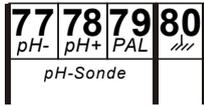
1	2	3
PE	N1	L
Versorgung 230V AC		

The system's power supply is achieved by a protected socket or terminal box with 230 V/50-60 Hz AC voltage. For safety reasons and to protect against interferences, the line's cross-section should be 1.5 mm². The system's internal voltage supply is made by means of a transformer featuring an electronic fuse.

4.2 Connection of electrodes/temperature sensor/measuring cells

Plug the pH cable onto the pH electrode and the redox cable onto the redox electrode and tighten with a union nut (approx. 1 turn).

The electrode amplifiers are galvanically isolated against PE and the other electronic circuits of the system (electrode = sensor).



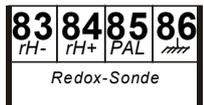
pH electrode

The reference electrode of the pH measuring cell (resp. the shielding, if coaxial connection cables are used) has to be connected to terminal 77 and the signal electrode (resp. the inner conductor of the coaxial cable) to terminal 78.

If the pH electrode is farther away (i.e. not inside the flow fitting on the mounting plate of the system), we urgently recommend using a double shielded connection cable for reasons of protection against interferences. The outer shielding must then be connected to grounding terminal 80. The "PAL" terminal will not be used (terminal 79).

Potential equalisation

Terminal 79 (potential equalisation) is connected to the ground of the sensor amplifiers by means of a high-resistance RC combination and in general is not wired.



Redox electrode

The reference electrode of the Redox measuring cell (resp. the shielding, if coaxial connection cables are used) has to be connected to terminal 83 and the signal electrode (resp. the inner conductor of the coaxial cable) to terminal 84.

If the Redox electrode is farther away (i. e. not inside the flow fitting on the mounting plate of the system), we urgently recommend using a double shielded connection cable for reasons of protection against interferences. The outer shielding must then be connected to grounding terminal 86. The "PAL" terminal will not be used (terminal 85).

Temperature sensor Pt 100 (family only)

The temperature sensor has to be connected to terminals 81 and 82 at the control unit. Afterwards, the installed temperature sensor (Pt 100) has to be programmed to "ON" in the parameter "temp. compensation" in the configuration menu (refer to Section F-4.4.2.1). If this parameter is not set to "ON", the temperature value will constantly be indicated as 25 °C.

71	72	73	74	75	76
CL-A	CL-K	PAL	mtz	T-	T+
Chlorsonde				NTC	

CCS chlorine measuring cell with temperature sensor (for public only)

The CCS chlorine measuring cell is equipped with a TOP68 plug-in connection. The associated measuring cable with a TOP68 plug-in head. Plug the TOP68 plug-in head onto the TOP68 plug-in connection and screw firmly.

The green and the yellow wire (NTC temperature sensor) have to be connected to terminals 75 and 76 (regardless of polarity). The inner shielding (black, anode of chlorine sensor) has to be connected to terminal 71 and the inner conductor of the inner shielded cable (transparent, cathode of chlorine measuring cell) to terminal 72. The outer shielding (grey) has to be connected to grounding terminal 74.

CGE chlorine measuring cell (total chlorine, public only)

If the optional CGE chlorine measuring cell for combined chlorine was mounted upon the installation of the GENO-CPR-tronic 02 public, the parameter for the measuring of the total chlorine concentration must be switched from the basic setting OFF to ON in the configuration menu, measuring of combined Cl. In order to connect the CGE chlorine measuring cell, turn the upper part counter-clockwise by a quarter of a turn and pull it off. Unscrew the PG-7 screw connection, feed the 2-wire cable through and store 5 cm of uninsulated measuring line in the measuring cell. Connect the cable to terminals 45 and 46 in the control unit of the GENO-CPR-tronic 02 public and interconnect with the terminal of the chlorine measuring cell (1 = plus, 2 = minus) (terminal 45 at the control unit has to be connected to terminal 1 at the chlorine measuring cell) and retighten the PG-7 screw connection. Completely push the upper part of the measuring cell into the housing and tighten clockwise as far as it will go.



Note: As the air in the mechanical room contains chlorine and acids, cable ducts that are not required need to be sealed off tightly by means of the foamed rubber strings supplied with the system in order to comply with protection IP 65.

5.2 Basic circuit board (part 2)

Basic circuit board (part 2)

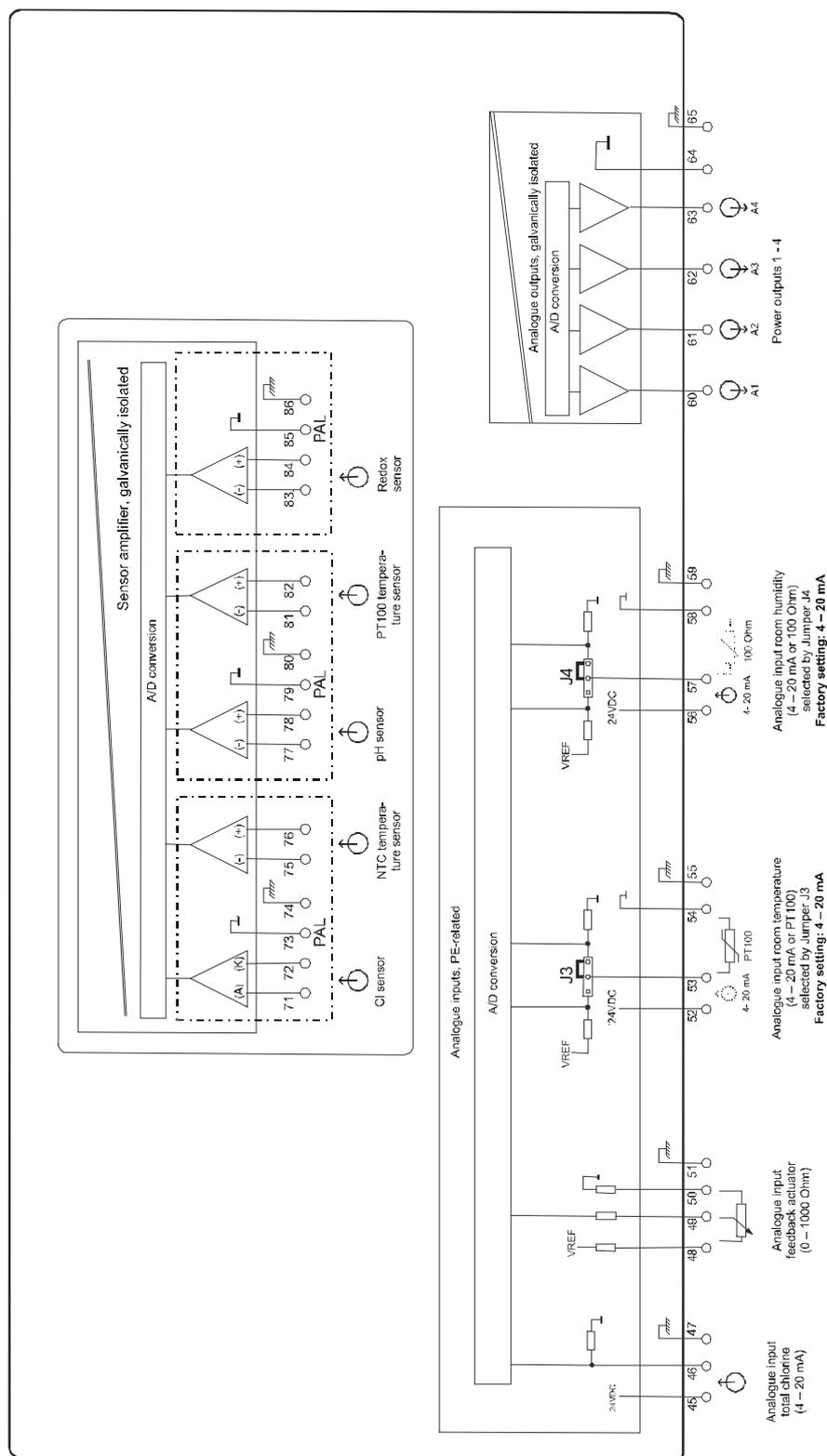


Fig. D-3: Basic circuit board (part 2)

6 | Connection of the dosing units

6.1 Pulse pumps (diaphragm dosing pumps)

The dosing capacity is controlled by means of the pulse frequency. Actuation is executed by means of voltage-free semi-conductor relays (maximum voltage 30 VDC, maximum current 50 mA). The power supply of the pulse pumps must be made by means of a separate power outlet. Set the selector switch at the GENODOS-pump to "Ext."

14	15	16	17	18	19
Cl-1	Cl-2	pH-1	pH-2	Flock-1	Flock-2
Pulspumpen 24V/50 mA					

DIS dosing (dosing of disinfectants)

The control input for the dosing pump GENODOS SBC 1/40 for chlorine dosing has to be connected to terminals 14 and 15 (regardless of polarity) by means of the external control cable (green + brown). This output is fused by means of fuse F2 (50 mA fast-acting). The corresponding parameters (dosing system, maximum pulse frequency) have to be set in menu item DIS dosing in the configuration menu (chapter F-4.4.2.2).

pH dosing

The control input for the dosing pump GENODOS SB 1/40 for pH dosing has to be connected to terminals 16 and 17 (regardless of polarity) by means of the external control cable (green + brown). This output is fused by means of fuse F3 (50 mA fast-acting). The corresponding parameters (dosing system, maximum pulse frequency, control direction) have to be set in menu item pH dosing in the configuration menu (chapter F-4.4.2.2).

Flocculation dosing

The control input for the pulse pump for flocculation dosing has to be connected to terminals 18 and 19 (regardless of polarity) by means of the external control cable (green + brown). This output is fused by means of fuse F4 (50 mA fast-acting).

6.2 Dosing outputs (hose dosing pumps)

The dosing capacity is controlled by means of the switch-on time. Actuation is made by means of power outputs by which the power supply of the corresponding dosing system can be switched on and off. In addition semi-conductor relays are triggered in parallel (refer to above pulse pumps)

4	5	6	7
PE	N1	L-Cl-	L-Cl+
Dosierung Cl 230V			

DIS dosing (dosing of disinfectants)

The supply cable of the dosing system GENO-Schlauflex Chlor has to be connected to terminals 5 (neutral conductor), 7 (phase) and 4 (protective earth). The corresponding parameters (dosing system, pulse elementary period, response time) have to be set in menu item DIS dosing in the configuration menu (Section F-4.4.2.2). The 230 V dosing outputs (terminals 6 resp. 7) are fused by means of fuse F1 (2A medium time lag).

Actuator (for bromine or chlorine gas dosing)

In this case, the dosing capacity is controlled by means of an actuator which opens and closes. The supply cable of the actuator must be connected to terminals 5 (neutral conductor), 7 (phase for motor direction OPEN), 6 (phase for motor direction CLOSED) and 4 (protective earth).

In case of actuators with a 1 k Ohm potentiometer (e.g. chlorine gas dosing), the current position of the actuator is signalled to the control unit. Observe the direction of action for terminals 48, 49 and 50.

The corresponding parameters (dosing system) have to be set in menu item DIS dosing in the configuration menu (chapter F-4.4.2.2). In addition, the operating time (run time) of the motor has to be determined (chapter F-4.2.5).

8	9	10
PE	N1	L-pH
Dosierung pH 230V		

pH dosing

The supply cable of the dosing system GENO-Schlauflex pH has to be connected to terminals 9 (neutral conductor), 10 (phase) and 8 (protective earth). The corresponding parameters (dosing system, pulse elementary period, response time) have to be set in menu item pH dosing in the configuration menu (chapter F-4.4.2.1). The 230 V dosing output (terminal 10) is fused by means of fuse F1 (2A medium time lag).

11	12	13
PE	N1	L-Flock
Dosierung Flockung 230V		

Flocculation dosing

The supply cable of the dosing system has to be connected to terminals 12 (neutral conductor), 13 (phase) and 11 (protective earth). The 230 V dosing output (terminal 13) is fused by means of fuse F1 (2A medium time lag).

6.3 Voltage-free outputs

20	21
NO	Com
Teillast- betrieb	

As long as the „partial load operation“ is active, the voltage-free output (terminal 20/21) is switched on. The corresponding parameters have to be set in menu item partial load operation in the operating menu (chapter F-4.2.4).

22	23
NO	Com
Heizung	

As long as the heating demand is active (actual value lower than index value), the voltage-free output (terminal 22/23) is switched on. The desired index value temp. has to be set in menu item index values in the settings menu (chapter F-4.3.2).

24	25
NO	Com
Redox GW1/GW2	

As long as the Redox demand is active (min. alarm undershot resp. max. alarm exceeded), the voltage-free output (terminal 24/25) is switched on. The desired alarm values have to be set in menu item alarm values in the settings menu (chapter F-4.3.3). The output is only active, if family is operated with the substitute control Redox „ON“ (refer to chapter F-4.4.2.3).

6.4 Collective fault contact

26	27	28
NO	Com.	NC
Sammelstörung		

At the terminals 27 (common), 28 (normally closed) break contact and 26 (normally open) front contact, a voltage-free change-over contact with a maximum capacity of 1 A/250 VAC is available. The relay contacts for the voltage-free collective fault signal are not fused.

If the system is in operation and no error is pending, the front contact is closed (terminals 26 and 27).

6.5 Gate inputs

The potential of the electronic circuits of the gate inputs is PE-related. Mainly this means that in case of a ground fault of the transmitter voltages (terminals 29, 31, 33, 35, 38 and 40), these terminals will be short-circuited and the function can no longer be guaranteed.

29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
24V	E-Cl.	24V	E-pH	24V	E-Flock	24V	E-D.	0V	24V	E-FR	24V	E-TB	12V	E-F	0V
Störung Cl, pH, Flockung						Durchfluss- überw. Messw.		Freigabe Regelung		Teillast- betrieb		Durchfluss- überw. Filtrat			

35	36	37
24V	E-D.	0V
Durchfluss- überw. Messw.		

29	30	31	32	33	34
24V	E-Cl.	24V	E-pH	24V	E-Flock
Störung Cl, pH, Flockung					

38	39
24V	E-FR
Freigabe Regelung	

40	41
24V	E-TB
Teillast- betrieb	

42	43	44
12V	E-F	0V
Durchfluss- überw. Filtrat		

Flow sensor, measuring water

The flow sensor to monitor the measuring water feed has to be connected to terminals 37 (ground, blue wire of flow sensor) and 35 (supply voltage 24 VDC, brown wire). The monitoring can be activated resp. deactivated in the menu.

Monitoring of dosing devices/suction lance connection

At terminals 29 (+) and 30 (-) an input to monitor the chlorine dosing system is available; at terminals 31 (+) and 32 (-) an input to monitor the pH dosing system and at terminals 33 (+) and 34 (-) an input to monitor the flocculation dosing system is available. If the respective terminals are not bridged, an error is pending.

The basic version of the GENO-CPR-tronic 02 family/public can only process one fault signal per terminal pair (29/30, 31/32 and 33/34). So either an empty signal or a pre-alarm or the collective fault signal can be displayed (refer to chapter D-4 block circuit diagram, item 5.1 Basic circuit board, part 1). If two fault signals per connection are to be displayed, the optional refill signaling device is required.

Release regulation (backwash signal from filter controller)

Via terminals 38 (+) and 39 (-), the control unit may be informed that there is no circulation or that a backwash process has been released and therefore the measuring water feed can no longer be guaranteed. "Terminals closed" means that a backwash process is running. The exact function of the backwash input can be programmed in the menu.

Partial load operation input

By means of terminals 40/41 the „partial load operation“ can be activated if the setting "EXT." is programmed in "release of partial load operation" (refer to chapter F-4.2.4 – Partial load operation).

Flow controller, filtrate

A flow controller for monitoring the filtrate must be connected to terminals 42 (supply voltage 12VDC) and 43 (signal input). The flow controller must output a switching signal (NOC/normally open contact) with the following states:

Open = no flow present

Closed = flow present.

Terminal 44 (ground) is not assigned.



Note: Both jumpers above terminals 29 - 44 must be set to the lower position.

6.6 Interface RS-485/RS-232 for printer



These connections are located on the rear side of the operating unit (CPU). The RS-232 interface of the "control unit" is galvanically isolated against all other circuits and against PE.

The RS-232 connection is designed for the connection of a local printer. The connection cable should be no longer than 10 m. It is absolutely necessary to connect the signal ground and the data lines RXD and TXD. The shielding of the connection cable has to be connected of the grounding of the printer and not to the "control unit". The printer must feature a serial interface and a compatible set of command data. The Baud rate set at the printer must correspond to the setting at the "control unit". The communication software of the "control unit" uses 8 data bits, 1 stop bit and no parity.

6.7 Interface RS-485 for optional modules



This RS-485 interface is designed for the connection of optional modules (e. g.: „refill/empty signalling module“ resp. „data logger“). These modules will be supplied by the system with 18 V via terminals 69 and 70 . The interface is connected to the ground potential.

6.8 Power outputs (printer connection)

The four power outputs A1 to A4 are galvanically isolated against all other circuits and against PE. The return of current is made via terminal 64. The maximum working resistance is 400 Ω.

The configuration (allocation, measurand, range, 0-20 mA / 4-20 mA) is made in the menu "configuration/power outputs" (refer to Section F-4.4.7)

7 | Installation diagrams (family)

7.1 pH value/chlorine/UV/CPR-tronic 02 (hose dosing pump)

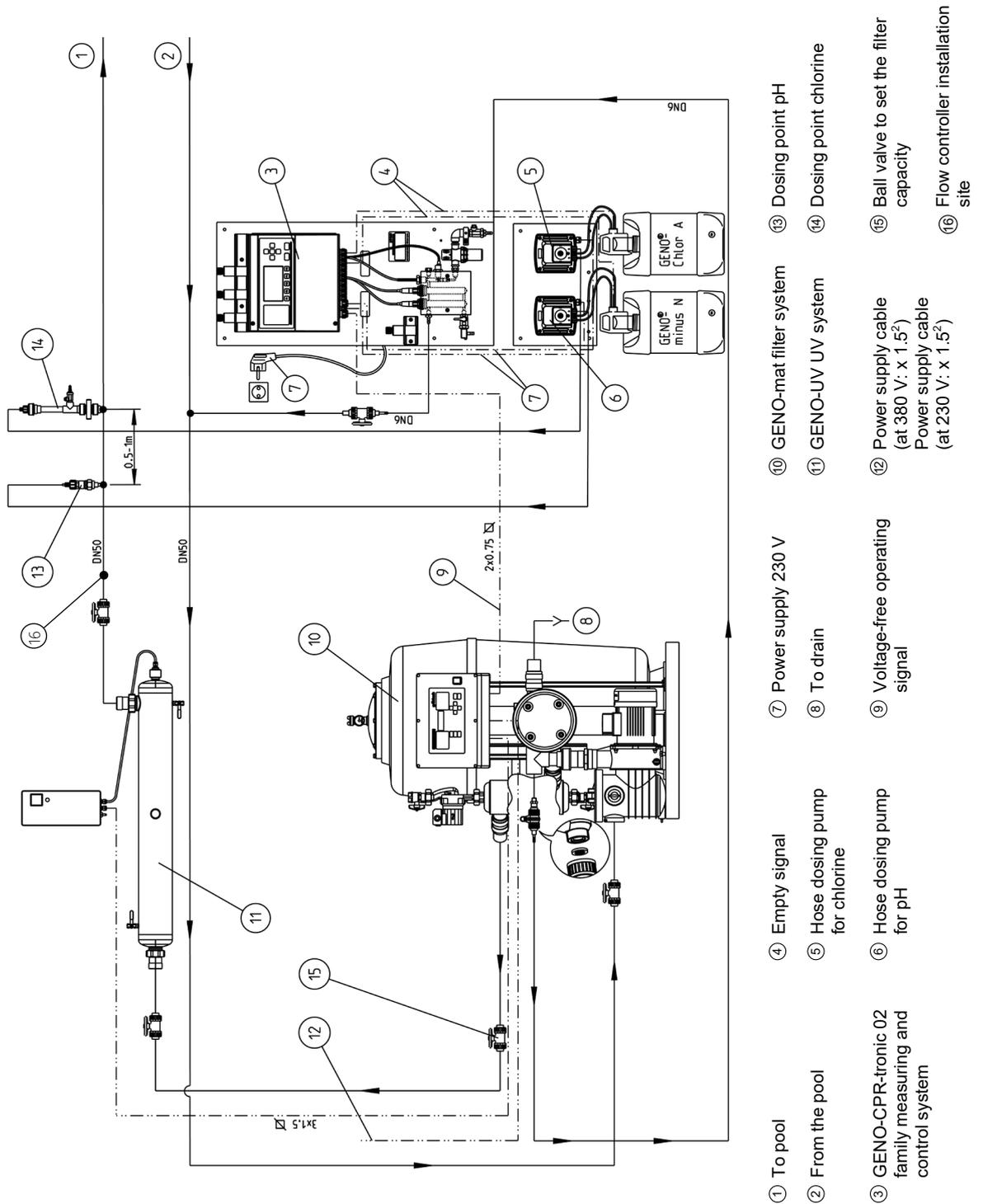


Fig. D-4: pH value/chlorine/UV/CPR-tronic 02 (hose dosing pump)

7.2 pH value/chlorine/UV/CPR-tronic 02 (diaphragm dosing pump)

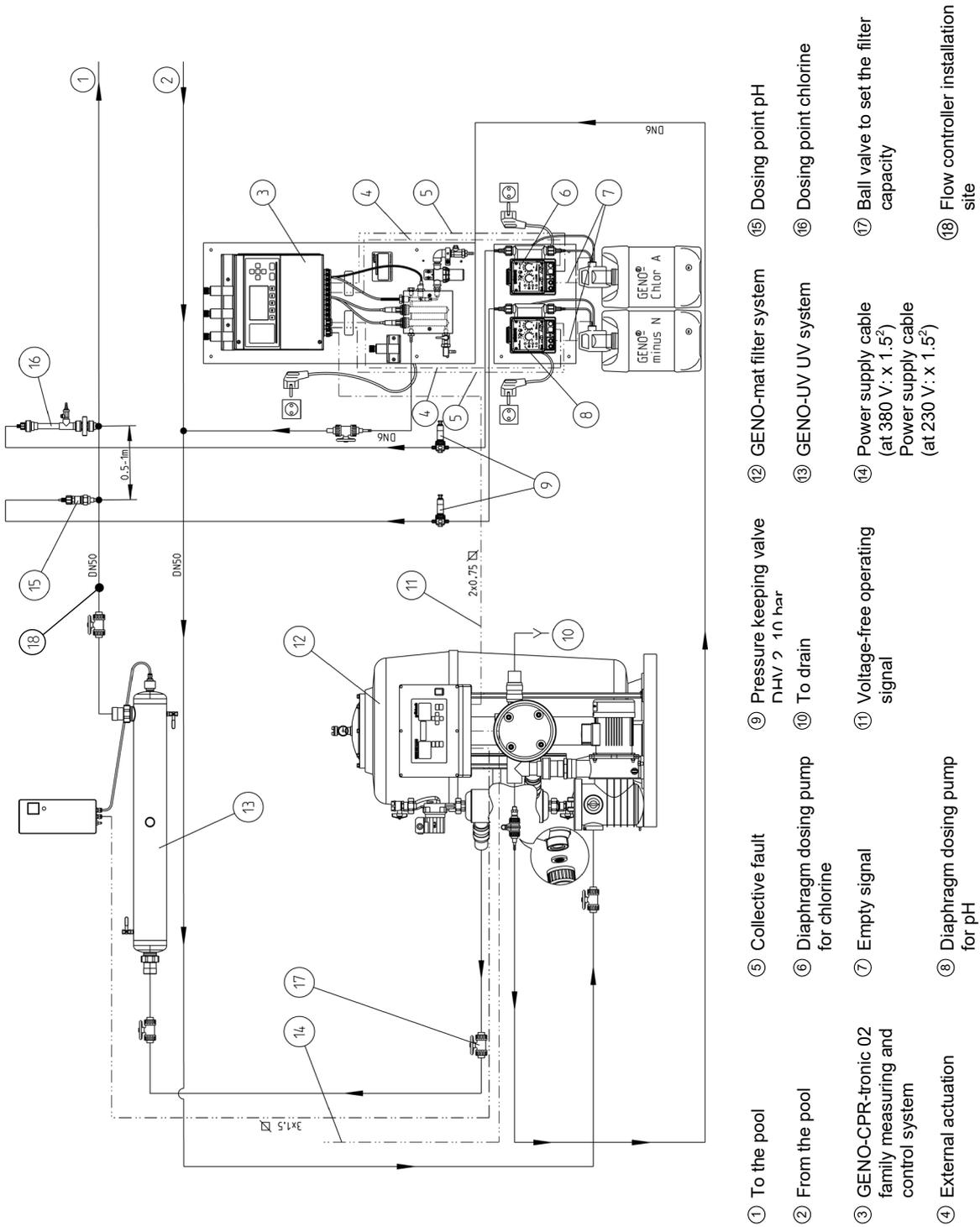


Fig. D-5: pH value/chlorine/UV/CPR-tronic 02 (diaphragm dosing pump)

7.3 pH value/bromine/UV/CPR-tronic 02 (hose dosing pump)

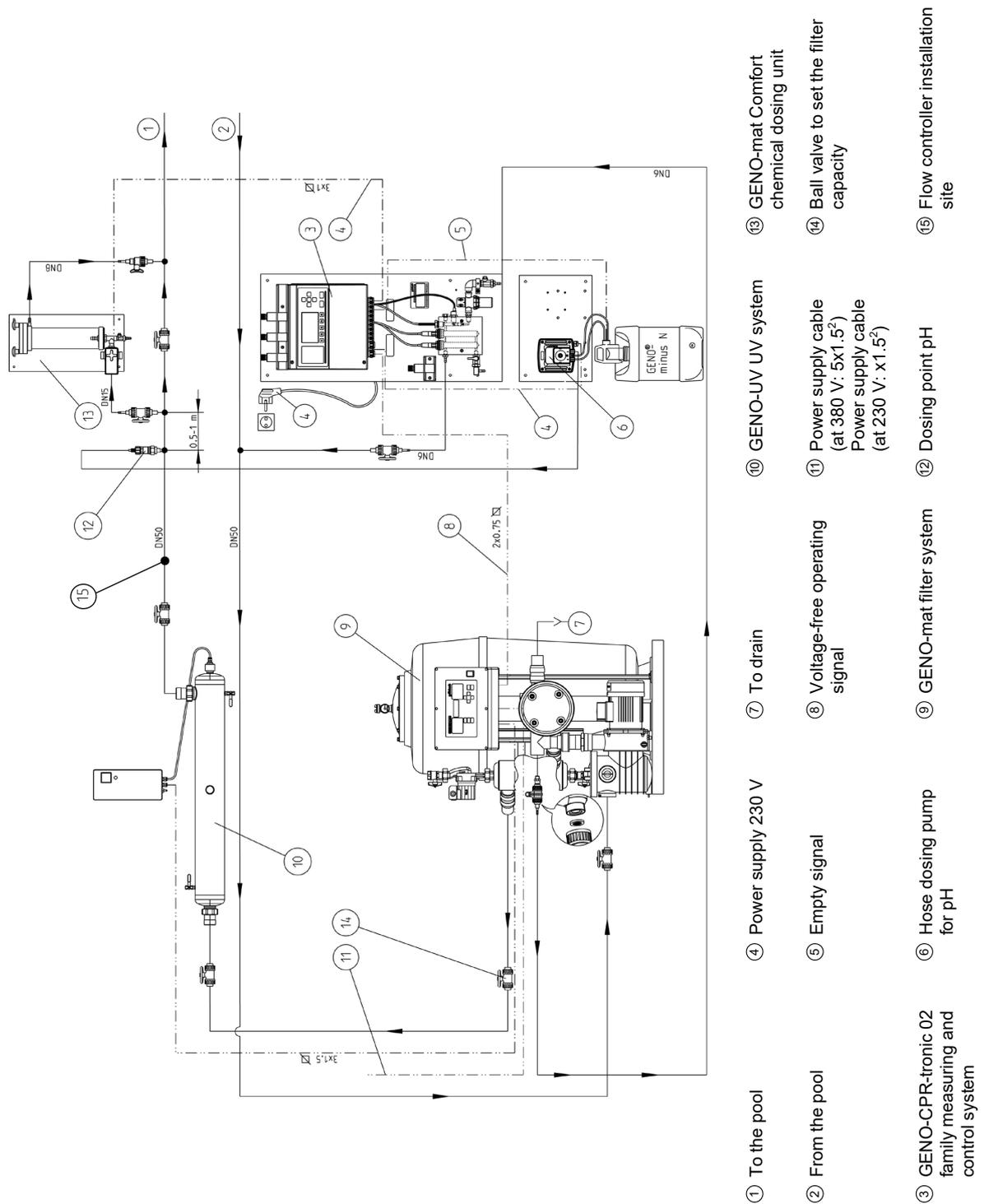


Fig. D-6: pH value/bromine/UV/CPR-tronic 02 (hose dosing pump)

7.4 pH value/bromine/UV/CPR-tronic 02 (diaphragm dosing pump)

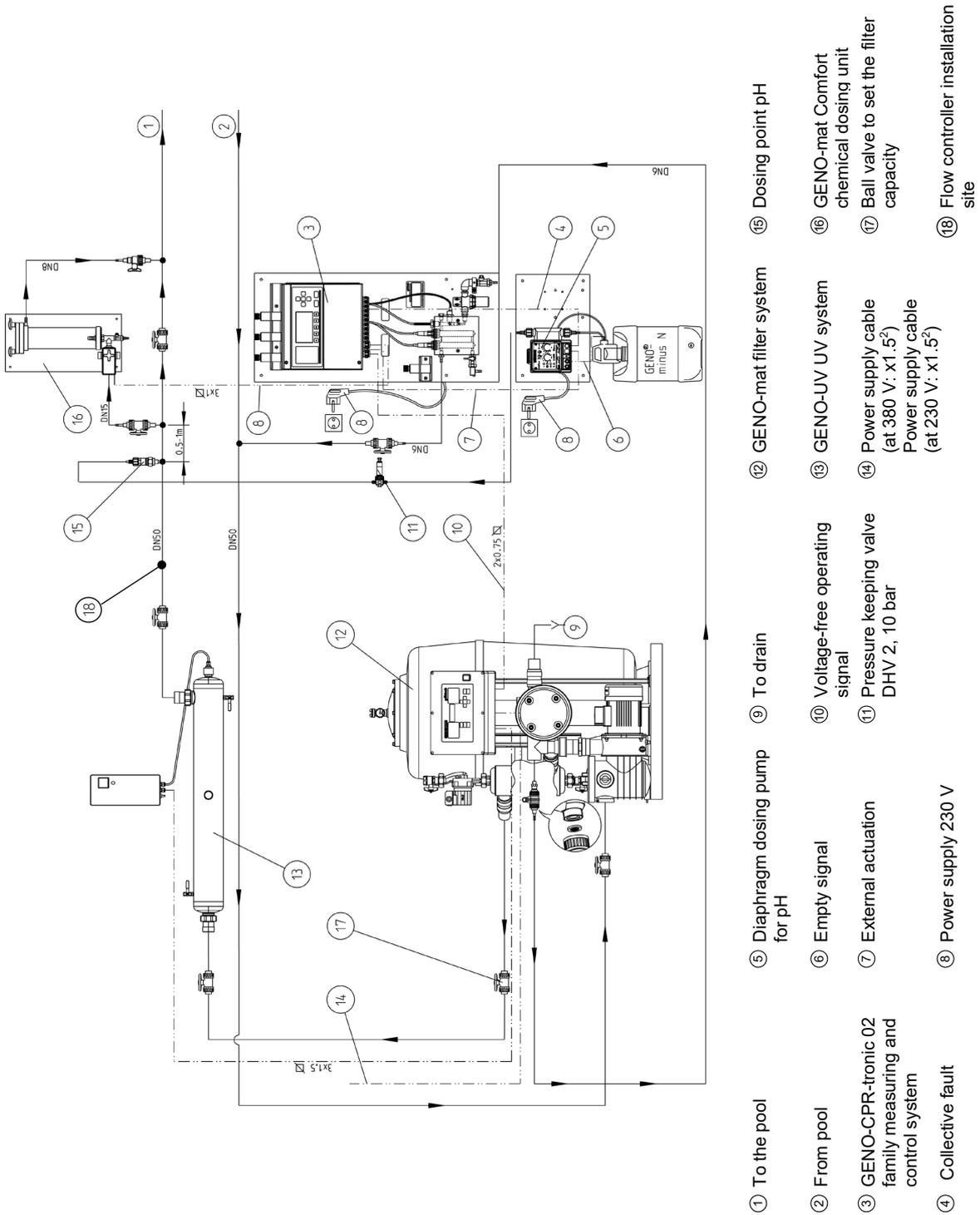


Fig. D-7: pH value/bromine/UV/CPR-tronic 02 (diaphragm dosing pump)

8 | Installation diagram (public)

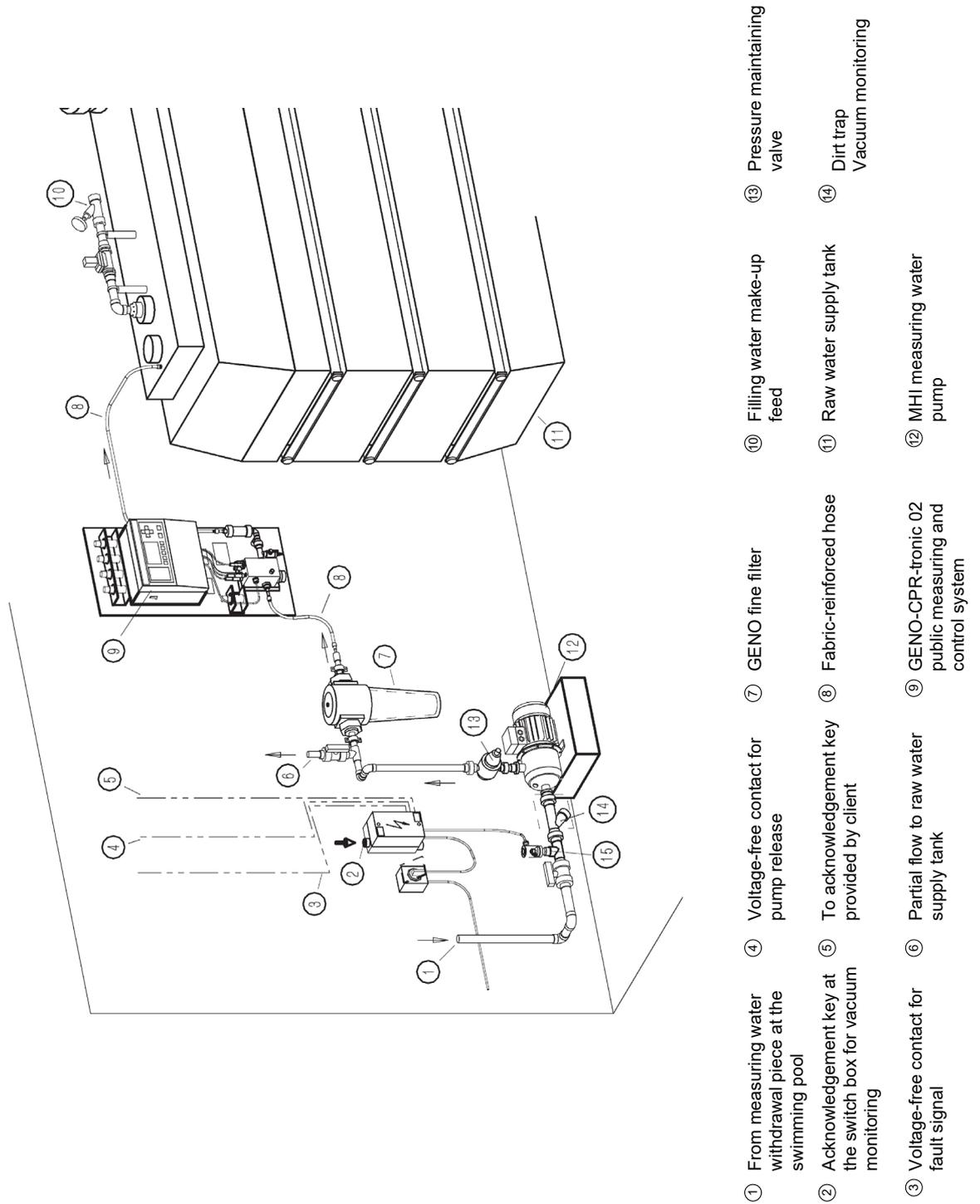


Fig. D-8: Installation diagram

E Start-up

Content

1 General information.....	E-1
2 How to prepare the system	E-2
3 How to start up the system.....	E-2
3.1 Measuring and control of the disinfection by means of the redox value (family)	E-3
3.2 Measuring and control of the disinfection by means of the chlorine value (public).....	E-3
3.3 Start-up completion	E-3
4 Filling of the CGE chlorine measuring cell	E-4
4.1 How to fill the electrolyte	E-4
4.2 How to mount the measuring cell	E-5
4.3 How to mount the chlorine measuring cell into the flow fitting.....	E-5

1 | General information



The work described here may only be performed by Grünbeck's technical service/authorised service company or by persons expressly authorised by Grünbeck.



Danger! When opening covers and lids or removing parts, the connectors may carry hazardous voltages. Prior to any repair or maintenance work respectively any replacement of parts, the system must be disconnected from all power sources, if the system needs to be opened in order to carry out this work. In particular make sure that any external devices connected to the system do not carry any voltage (fault signal output, connected dosing pumps, etc.).



Caution! Handle electrodes carefully (no skin contact with the measuring ranges, such as membrane glass, protection against damage).



Note: Electrodes must not dry out during use or storage. Do not store pH and redox electrodes in distilled water, but in a calcium chloride solution (3 mol/l). If the pH or redox electrodes do dry out, immerse them in a calcium chloride solution (3 mol/l) for 24 hours before continuing to use them.



Note: Air bubbles inside the electrodes must be removed by gently shaking or spinning the electrodes vertically.

2 | How to prepare the system



Note: Regardless of the treatment technology with which the pool will be operated afterwards, for a duration of at least 2 weeks it initially has to be run in at an increased chlorine concentration of at least 2.0 mg/l.



Note: Prior to the first calibration, the pH and the Redox electrodes must be watered for at least one hour, otherwise the measured values would drift. In case of chlorine measuring cells for free chlorine and total chlorine, the polarisation times (refer to chapter C) have to be observed.

-
1. Carry out a visual check and leak test of all connections, screw connections and lines.
 2. Check all hose connections are firmly attached.
 3. Check all electrical connections.

3 | How to start up the system

1. Establish the measuring water flow. Float switch must be at the level of the flow monitor. In the case of GENO-CPR-tronic 02 public above the red marking.
2. Switch on the control unit at the main switch (left-hand housing side).
3. Switch on the control unit using the On-key "I".
4. Acknowledge pending fault signals by means of the "CL" key.
5. Adjust the display: Contrast/brightness (refer to Section F-4.2.8).
6. Set the time/date (refer to Section F-4.3.5).
7. Make the system-dependent settings for the pH resp. disinfection dosing in the configuration menu (refer to Section F-4.4.2).
8. Enter the desired index values for pH, Redox, disinfection and temperature (refer to Section F-4.3.2).
9. Enter the desired alarm values for pH, Redox, disinfection, flow, as well as combined chlorine, if required (refer to Section F-4.3.3).
10. Calibrate the pH measurement (refer to Section H-3.5.1).
11. Switch on the pH dosing at the control unit (refer to Section F-4.2.1).
12. Calibrate the redox measurement resp. check it (refer to Section H-3.5.2).



Note: For the calibration of the Redox electrode, the ideal pH value of 7.2 is very important. In order to achieve as exact results as possible for the measured values, the pH value should at least be in the range of 7.0 - 7.4 prior to the calibration of the redox electrode.

13. If a flocculation device is present, set this at the control unit (refer to Section F-4.3.4) and switch it on (refer to Section F-4.2.1).

14. Switch over to substitute control redox (refer to Section F-4.4.2.3) – family only!

15. Switch on the DIS dosing at the control unit (refer to Section F-4.2.1) until the desired index value for chlorine or bromine in the pool has been reached.



Note: Until the desired disinfection value has established in the pool, said value must be monitored by manual measurements at regular intervals.

3.1 Measuring and control of the disinfection by means of the redox value (family):

As soon as the desired index value for chlorine or bromine in the pool has been reached, the present Redox value can be entered as index value for the Redox measurement (refer to Section F-4.3.2). Afterwards, adjust the alarm values for redox (refer to Section F-4.3.3).

3.2 Measuring and control of the disinfection by means of the chlorine value (public):

As soon as the desired index value for chlorine in the pool has been reached, the value for free chlorine measured by means of a manual measuring device can be calibrated (refer to Section H-3.5.4).

3.3 Start-up completion

Note: In the beginning, the water values (pH, Redox, temperature, chlorine or bromine values) should be checked daily by means of manual measurement.



Note: We recommend readjusting the pH and Redox electrodes 24 to 48 hours after the start-up. The proper function of the chlorine measuring cells has to be checked on this occasion as well and if necessary, they have to be recalibrated.

1. Put the optional measuring cells into operation (refer to Section E-4.).
2. Check all settings.
3. Check for function and leak tightness.
4. Explain the system functions and operation to the owner or customer.
5. When starting up the system, make sure to record all data on the cover sheet of the operation log and fill in the first column of the checklist. The operating log is attached to this manual.
6. Complete the commissioning.

The system is now ready for operation and can start regular operation.

4 | Filling of the CGE chlorine measuring cell (option: total chlorine)



Caution! When working with water or solutions containing chlorine, wear safety goggles and protective clothing!



Note: Do not touch or damage the membrane and electrodes. The electrolyte is susceptible to oxidation: Always keep the electrolyte bottle closed after use! Do not fill electrolyte in other, translucent containers! The electrolyte should not be stored for more than a year and should not show a yellowish colour! (date of manufacture on the label). Fill in electrolyte free of bubbles! Only use the membrane cap once!

4.1 How to fill electrolyte

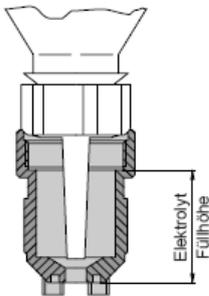


Fig. E-1: Membrane cap

1. Open the electrolyte bottle and screw on the nozzle.
2. Press the excess air out.
3. Fill the membrane cap with electrolyte ensuring that there are no bubbles.

How to proceed:

Place the electrolyte bottle fully onto the membrane cap and slowly squeeze the electrolyte out of the storage bottle in one go, steadily withdrawing the storage bottle. The cap is filled completely if the electrolyte has reached the lower thread.

4.2 How to mount the measuring cell

1. Put the electrode shaft vertically onto the filled membrane cap.
- 2. Do not touch the hose seal with your hands!**
3. Rotate the membrane cap by hand up to the stop. Excess electrolyte escapes through a hole underneath the hose seal in the groove of the membrane cap when it is screwed together.
4. Remove the escaped electrolyte by means of a soft paper towel.
5. Thoroughly remove the gel from the nozzle by means of clean, warm water.



Caution! Prior to mounting resp. dismantling the measuring cell into/from the flow fitting, depressurise the system. Close the shut-off valves upstream and downstream of the flow fitting. Slowly insert resp. pull out the chlorine measuring cell into/from the flow fitting.

4.3 How to mount the chlorine measuring cell into the flow fitting

6. Push the O-ring from the bottom over the measuring cell up to the clamping disc. Leave one washer in the flow fitting.
7. Insert the measuring cell into the flow fitting and tighten it firmly with a clamping screw until the O-ring seals. The correct installation depth of the sensor is determined by the clamping disc.

F Operation**Content**

1 Membrane keypad	F-2
1.1 1st Page of the basic display	F-2
1.2 2nd Page of the basic display	F-3
2 LEDs	F-3
3 Keypad (overview of functions)	F-3
4 Menu system	F-4
4.1 General information.....	F-4
4.2 Operation menu.....	F-7
4.2.1 DIS/pH/flocculation dosing	F-7
4.2.2 High chlorination.....	F-8
4.2.3 Economy operation	F-10
4.2.4 Part load operation	F-11
4.2.5 Actuator test	F-13
4.2.6 Error memory display	F-14
4.2.7 Code memory display	F-15
4.2.8 Display (adjust brightness + contrast of the LCD)	F-16
4.3 Settings menu	F-17
4.3.1 Print measured values	F-17
4.3.1.1 Format of the log printout	F-18
4.3.2 Index values	F-19
4.3.2.1 Temperature, index values 2 (public only)	F-20
4.3.3 Alarm values pH/redox/flow/comb. chlorine	F-21
4.3.4 Flocculation dosing	F-23
4.3.5 Time / date	F-24
4.3.6 Language	F-25
4.3.7 System data printout	F-25
4.3.8 Code default	F-26
4.4 Configuration menu (access code 0290)	F-27
4.4.1 System type.....	F-27
4.4.2 Dosing	F-28
4.4.2.1 Parameters, pH dosing	F-29
4.4.2.2 Parameters, DIS dosing	F-31
4.4.2.3 Parameters, substitute control redox	F-33
4.4.2.4 Parameters, delay after backwash.....	F-33
4.4.3 Measuring, total chlorine (public only)	F-34
4.4.4 Interfaces.....	F-35
4.4.5 Optional modules	F-36
4.4.6 Printer settings	F-37
4.4.6.1 Charts 1/2/3.....	F-38
4.4.6.2 Page texts	F-38
4.4.7 Power outputs	F-39
4.4.8 Service data	F-41
4.4.9 I/O – configuration	F-43
4.4.9.1 I/O – configuration, input logic.....	F-43
4.4.9.2 I/O – configuration, I/O – display.....	F-44
4.4.10 Delete log	F-44
4.4.11 Basic settings	F-44
4.4.12 Password protection.....	F-45

1 Membrane keypad

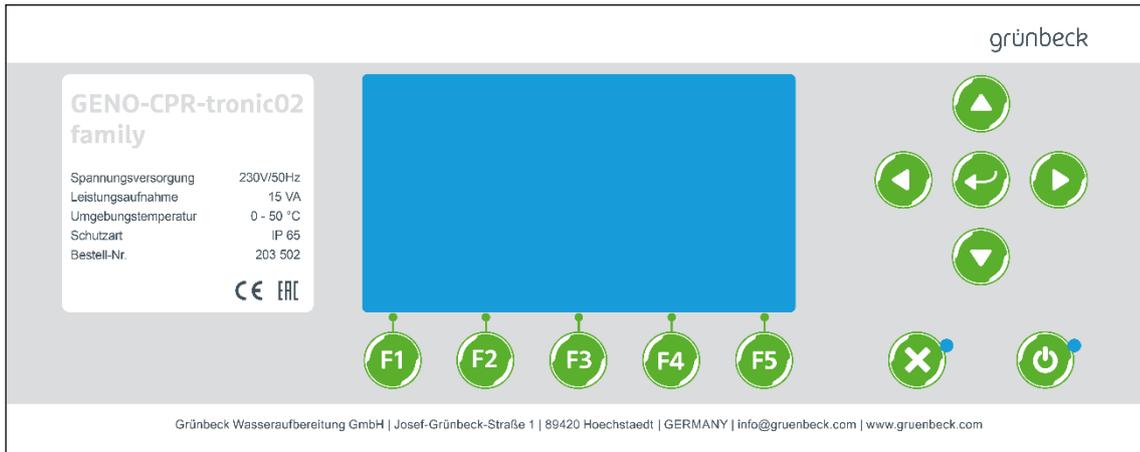


Fig. F-1: GENO-CPR-tronic family/public control unit



Note: Prior to installing the system, carefully read this operation manual and in particular the operation manuals that come with the electrodes.



Warning! Incorrect operation and settings may lead to hazardous operating conditions which cause injury, illness or damage to property.

Only make the settings described in this chapter!

1.1 1. Page of the basic display

In the basic setting, the display indicates the measured values for „disinfection“, „pH value“, „Redox potential“ and „water temperature“ (refer to fig. F-1). The „water temperature“ will only be registered, if the parameter „temp. compensation“ is set to „ON“ in the menu „config./dos./pH dos, otherwise a value of „25.0°C“ is indicated at all times. The symbol „↑“ behind the measured value for the „disinfection“ indicates that the high chlorination is active. If the chlorine reduction („economy operation“) is activated on the other hand, the symbol „↓“ is displayed behind the chlorine value. The activation of the „partial load operation“ is indicated by the symbol „■“.

The „GENO-CPR-tronic 02 family control unit determines the chlorine value from the values measured for redox and pH.

In case of the chlorine (if „substitute control Redox“ is selected, this applies for the Redox value as well) and the pH value, the status of the dosing is indicated as well. The filling of the bar corresponds to the actuating variable of the controller. The symbol „X“ behind the corresponding bar indicates that the respective dosing is locked. Furthermore, the display is also used to control the menu and to display the fault and alarm signals.

1.2 2nd Page of the basic display

By means of the F4 key, you may go to the 2nd page of the basic display. On this page, the room temperature [°C] is indicated on the bottom left and the humidity of the air [%] on the bottom right, if the optional module "hygro thermal transmitter" is connected to the control unit. On the top left, combined chlorine [mg/l] and on the top right, total chlorine [mg/l] (possible only for public) is displayed, if the CGE chlorine measuring cell is connected and registered.

2 LEDs

In order to signal disturbances and alarms, a red LED is integrated in the „clear“ key. The LED is blinking, if at least one fault or alarm signal has not yet been acknowledged and it is illuminated permanently if all fault or alarm signals were acknowledged (but at least one fault or one alarm signal is still pending).



In order to signal the operating status, the „ON“ key features a green LED. The LED is illuminated when the control unit is switched on (i. e. is „in operation“).

3 Keypad (overview of functions)

The allocation of the keys depends on the respective display („soft keys“).



Selection of a menu item respectively of a function or editing of a value. When calling a menu, the title of the selected sub-menu is always indicated in the first line. The desired menu item is selected by means of the cursor keys.

If the menu contains more entries than can be displayed, the cursor keys can also be used for scrolling.



To edit a value.



To access a parameter in order to edit a value (enter key).



To acknowledge fault and alarm signals (acknowledging key)



To switch the control system ON / OFF.

4 Menu system

4.1 General

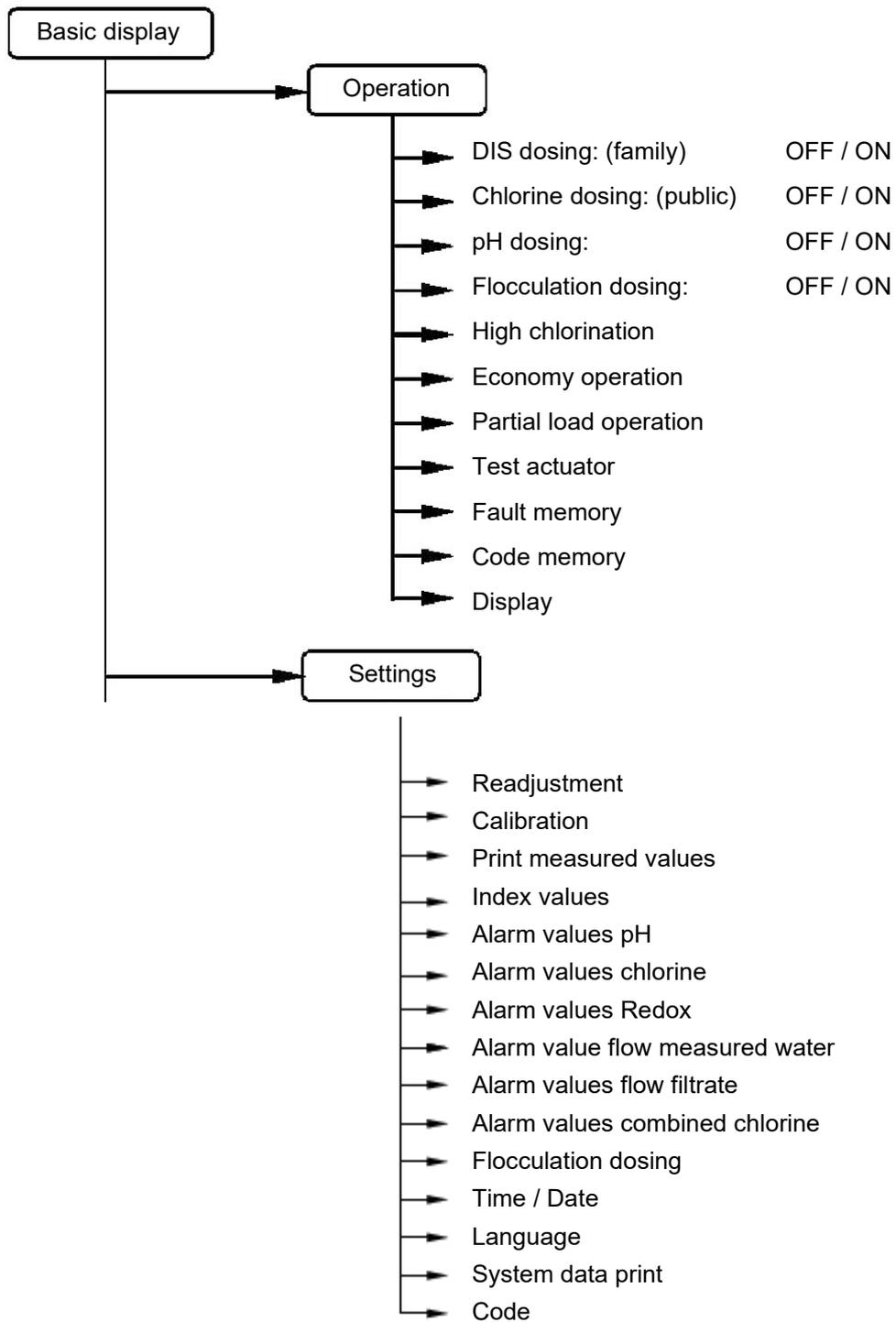
   The functions of the “GENO-CPR-tronic family/public” may be called via various menus. The control unit offers three menu systems which may be accessed in the basic display via the keys (F1: operation/F2: settings/F3: configuration).

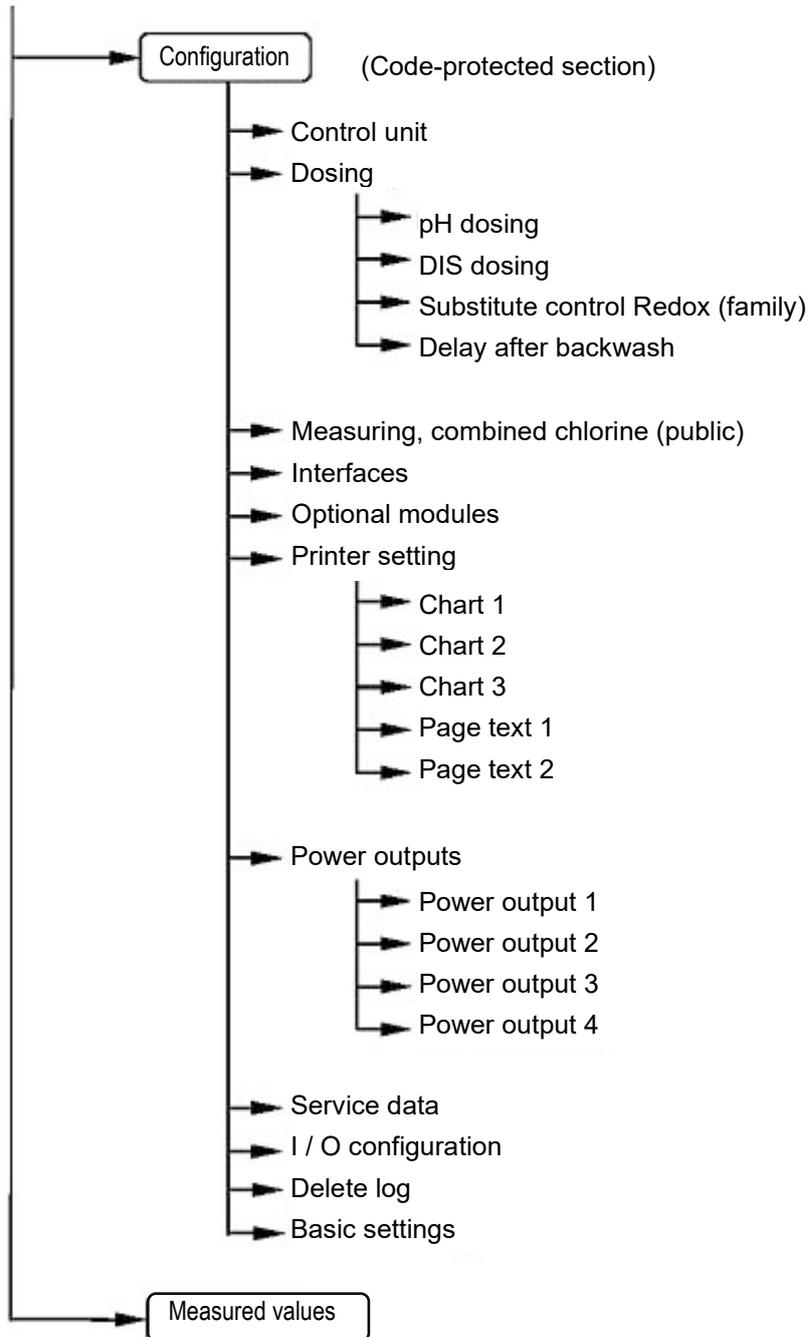
 By means of the F4 key, you can switch between the first and the second page of the basic display.

 Each menu item can either represent an additional menu or an entry mask. If an additional menu is concerned, you can access this menu by pressing the enter key. If an entry mask is displayed, the cursor moves to the right, in front of the value to be modified.

 or  An edited value can be saved by means of the enter key respectively rejected by means of the F3 key.

 By means of the F1 key (“BACK”), you can go back menu level by menu level until the basic display is indicated again.

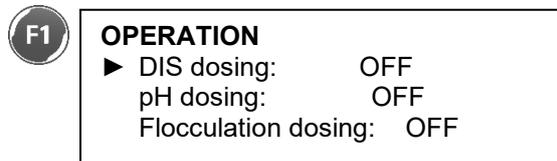




4.2 Operation menu

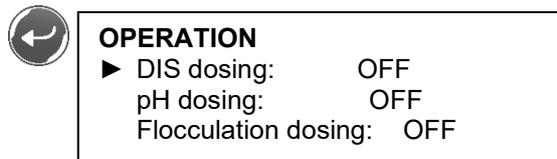
4.2.1 DIS/pH/ flocculation dosing

Switch from the basic display to the "operation" menu.



Select the respective menu item.

Activate the respective menu item.



Change the setting to "OFF" resp. "ON".



or



Save or reject value.



Quit the sub-menu and return to the basic display.



Note: Even if the dosing is switched on, it may temporarily be locked, for instance if the functions readjustment respectively calibration are performed or if the control parameters are edited. In these cases, the dosing is only released again after the return to the basic display and the expiry of a one-minute delay period. If there is no flow (public), the dosing is locked as well. Furthermore, the dosing is locked during the backwash process of the pool water filter system (if input is closed). In addition, the alarms (measured value too high or too low) are suppressed.

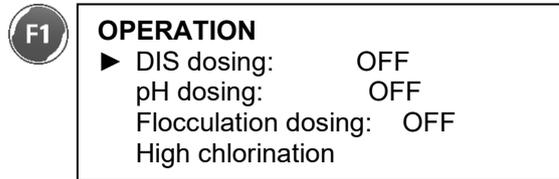


Caution! In case of the alarm „pH value too high“, the DIS dosing is locked as well!

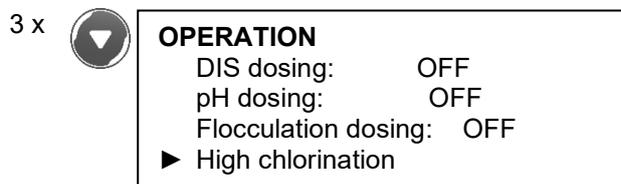
4.2.2 High chlorination

A high chlorination may be released at a pre-set time and for a certain duration. Chlorine is dosed until the set maximum value is reached and this value is then kept for the programmed time. This menu item is used to set parameters and to activate the high chlorination.

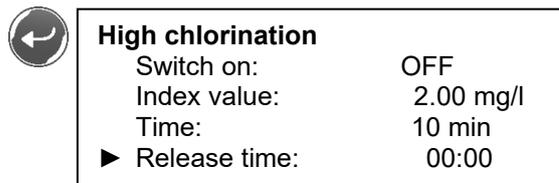
Switch from the basic display to the "operation" menu.



Select the respective menu item.



Activate the respective sub-menu.

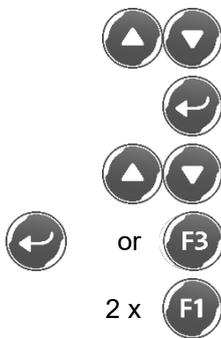


Select the respective menu item.

Activate the respective menu item.

Change the setting.

Save or reject value.



Quit the sub-menu and return to the basic display.

The meaning of the parameters

High chlorination		
▶ Switch on:	OFF	→ Switch high chlorination on/off
Index value:	2.00 mg/l	→ Chlorine index value during high chlorination
Time:	10 min.	→ Duration of high chlorination
Release time:	00:00	→ Start time of high chlorination

In order for the high chlorination to start at the set release time, the parameter "switch on" must be set to "ON".

After the high chlorination is completed, this parameter is reset automatically whereas all other settings remain unchanged. Therefore, only the parameter "switch on" has to be set again if another high chlorination shall be performed.

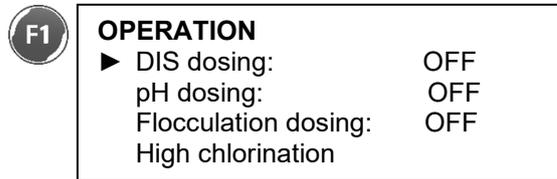


Note: As long as the high chlorination is active, the alarm "Cl value too high" is suppressed. The alarm is only released again after the value has fallen below the threshold value for the alarm at least once after termination of the high chlorination. As long as the high chlorination is active, the symbol „↑“ is indicated on the right of the current chlorine value in the basic display.

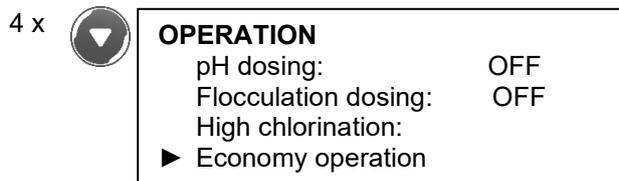
4.2.3 Economy operation

An “economy operation” can be activated from a set start time to a set end time. During this time, no chlorine is dosed until the minimum value is reached. This menu item is used to set parameters and to activate the economy operation.

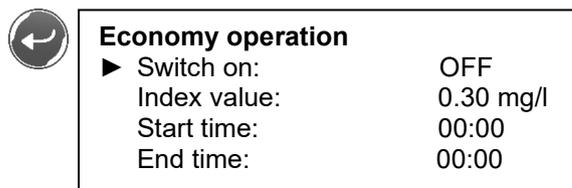
Switch from the basic display to the "operation" menu.



Select the respective menu item.



Activate the respective sub-menu.

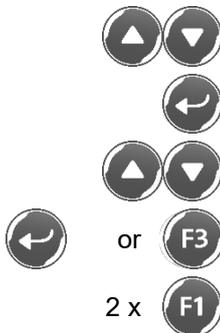


Select the respective menu item.

Activate the respective menu item.

Change the setting.

Save or reject value.



Quit the sub-menu and return to the basic display.

The meaning of the parameters

Economy operation		
▶ Switch on:	OFF	→Switch economy operation on/off
Index value:	0.30 mg/l	→Chlorine index value during economy operation
Start time:	00:00	→Start time of economy operation
End time:	00:00	→End time of economy operation

If the end time indicated is before the start time (e. g. start time = 20:00, end time = 06:00), then the “economy operation” is activated between midnight 00:00 and the end time (in this case 00:00 until 06:00 am) and from the start time until midnight (in this case 20:00 or 8.00 pm until 24:00).

If start and end time are identical, the “economy operation” is deactivated.



Note: As long as the "economy operation" is active, the alarm “Cl value too low” is suppressed. The alarm is only released again after the threshold value for the alarm was exceeded at least once after termination of the economy operation. As long as the “economy operation” is active, the symbol „↓“ is shown in the basic display, on the right of the current value measured for chlorine.

4.2.4 Partial load operation

An “partial load operation” can be activated from a set start time to a set end time. In this case, an individual index value can be given for the chlorine as well as the flocculation dosing. This menu item is used to set parameters and to activate the partial load operation.

Switch from the basic display to the "operation" menu.

OPERATION

- ▶ DIS dosing: OFF
- pH dosing: OFF
- Flocculation dosing: OFF
- High chlorination

Select the respective menu item.

5 x

OPERATION

- Flocculation dosing: OFF
- High chlorination
- Economy operation
- ▶ Partial load operation

Activate the respective sub-menu.

PARTIAL LOAD OPERATION

- ▶ Release: EXT.
- Start time: 00:00
- End time: 00:00
- Index value DIS: 0.20 mg/l
- Flocculation: 50 %

Select the respective menu item.

Activate the respective menu item.

Change the setting.

Save or reject value.

or

2 x

Quit the sub-menu and return to the basic display.

The meaning of the parameters

PARTIAL LOAD OPERATION	
► Release:	EXT.
Start time:	00:00
End time:	00:00
Index value DIS:	0.40 mg/l
Flocculation:	50 %

- Release via "EXT./MANU/CLK/AUTO"
- Start time (when release via CLOCK)
- End time
- Index value for "disinfection"
- Index value for "flocculation"

If the setting "EXT." was selected in "release", the "partial load operation" is initiated via an external signal (temperature reduction at night, terminals 40/41). If the setting „MANU“ was selected in "release", the "partial load operation" is switched on by key "F5" and switched off again by key "F4".

If the partial load operation was initiated either via "EXT." or „MANU“ and an end time was programmed, the partial load operation will be switched off again at the end time.

Release: CLOCK

The partial load operation is activated during the set start and end time and will be released if the parameters for the water quality according to DIN are in the following ranges:

- chlorine: 0.31.0 mg/l setting range (basic setting 0.3 ...0.6 mg/l).
- pH: 6.5 ... 7.6
Basic setting, cannot be modified
- Redox > 700 mV
(adjustable from 700 mV to 900 mV) basic setting 750 mV.

If the values exceed these ranges, a switch-over to standard operation takes place until the values are reached again.

If the setting "CLK" was selected in "release" and the end time is before the start time (e. g. start time = 20:00, end time = 06:00), the "partial load operation" is activated from midnight 00:00 to the end time (in this case 00:00 to 06:00 am) and from the start time until midnight 24:00 (in this case 20:00 or 8.00 pm until 24:00). Output terminal 20/21switches.

Release: AUTO (public only)

The partial load operation is permanently activated and will be released if the parameters of the water quality according to DIN are in the following ranges:

- chlorine: 0.31.0 mg/l setting range (basic setting 0.3 ...0.6 mg/l).
- pH: 6.5 ... 7.6
Basic setting, cannot be modified
- Redox > 700 mV
(adjustable from 700 mV to 900 mV) basic setting 750 mV.

If the values exceed these ranges, a switch-over to standard operation takes place until the values are reached again. Whenever partial load operation is activated (MANU, EXT., CLK, AUTO), the partial load DIS index value is active as well (basic setting 0.40).



Note: As long as the "partial load operation" is active, the alarm "Cl value too low" is suppressed. The alarm is only released again after the threshold value for the alarm was exceeded at least once after termination of the partial load operation. As long as the "partial load operation" is active, the symbol "■" is shown on the basic display, on the right of the current value measured for chlorine. As long as the „partial load operation“ is active, a voltage-free output is switched on (terminals 20/21).

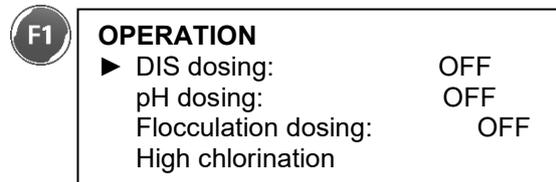
4.2.5 Test actuator

By means of this function, the time needed by the actuator to close from 100 % open to 0 % may be determined.

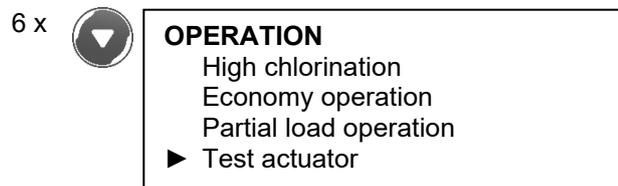


Note: Prior to the execution of this test, a value which is definitely higher than the time required for the test should be entered in the menu "configuration/dosing/DIS dosing" for the parameter pulse period/run time

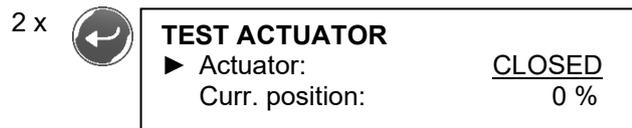
Switch from the basic display to the "operation" menu.



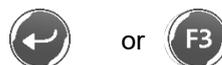
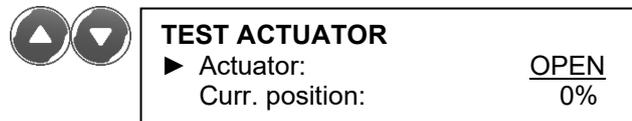
Select the respective menu item.



Activate the respective sub-menu.



Change the setting.



Save or reject setting.

Wait for the actuator to open completely



Activate the respective menu item again.

 **TEST ACTUATOR**
▶ Actuator: OPEN
Curr. position: 100 %

Change the setting

  **TEST ACTUATOR**
▶ Actuator: CLOSED
Curr. position: 100 %

 or 

Save or reject setting.

Register the time that passes until the actuator is completely closed again by means of a stop-watch.

TEST ACTUATOR
▶ Actuator: CLOSED
Curr. position: 0%

2 x 

Quit the sub-menu and return to the basic display.



Note: The time determined in this test can be entered for the parameter pulse per./run time in the menu „configuration/dosing/DIS dosing“.

4.2.6 Display fault memory

By means of this function, the 10 most recent disturbances can be displayed, including date and time of their occurrence.

Switch from the basic display to the "operation" menu.

 **OPERATION**
▶ DIS dosing: OFF
pH dosing: OFF
Flocculation dosing: OFF
High chlorination

Select the respective menu item.

7 x  **OPERATION**
Economy operation
Partial load operation
Test actuator
▶ Error memory

Activate the respective sub-menu.

 **ERROR MEMORY**
0 10.05.06 14:30 Voltage failure
1 00.00.00 00:00

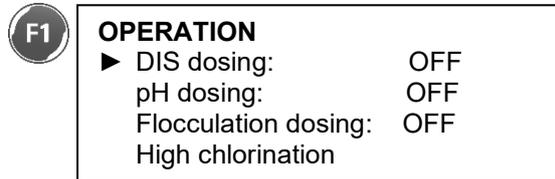
2 x 

Quit the sub-menu and return to the basic display.

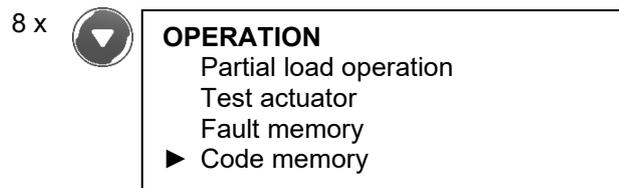
4.2.7 Display code memory

By means of this function, the 10 most recent code entries including the respective date, time and code level can be displayed.

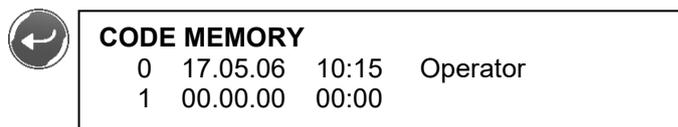
Switch from the basic display to the "operation" menu.



Select the respective menu item.



Activate the respective sub-menu.

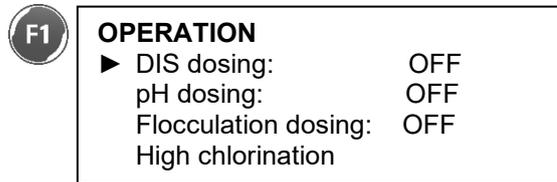


2 x  Quit the sub-menu and return to the basic display.

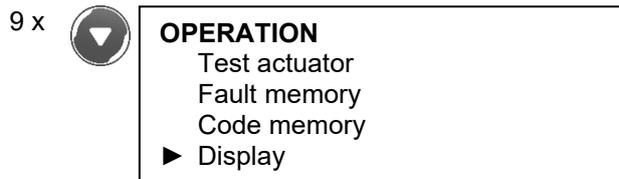
4.2.8 Display (adjust brightness + contrast of the LCD)

By means of this function, the brightness and the contrast of the LCD may be modified.

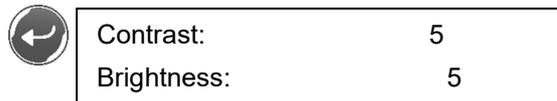
Switch from the basic display to the "operation" menu.



Select the respective menu item.



Activate the respective sub-menu.



    Adjust contrast by means of function keys F2 + F3 and brightness by means of keys F4 + F 5 (range: 0 ... 10).

 or  Save or reject setting.

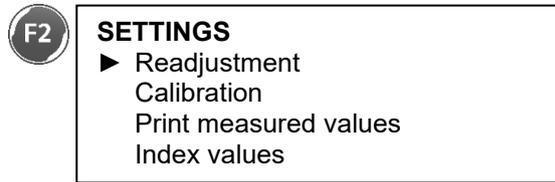
2 x  Quit the sub-menu and return to the basic display.

4.3 Settings menu

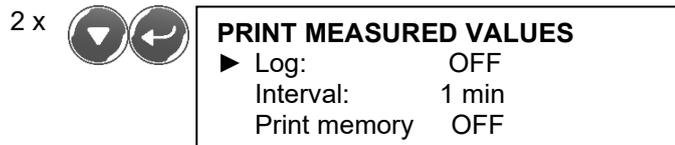
4.3.1 Print measured values

In this menu, printouts on the connected printer may be initiated and several print parameters may be set.

Switch from the basic display to the "settings" menu:



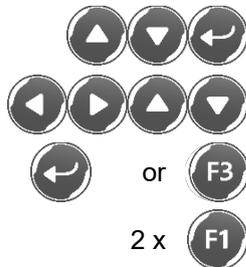
Select menu item „print measured values“ and activate it.



Select and activate the desired function (refer to Section F-4.3.1.1).

Make the respective setting.

Save or reject entry.



Quit the sub-menu and return to the basic display.

Log ON/OFF: If this menu item is activated (ON), the current measured values are printed in the pre-set time interval.

Interval 0-60 min.: Time interval after which a new line shall occur in the log printout of the current measured values. The measured values are also stored in the "GENO-CPR-tronic 02 family/public" in this time interval.

Print memory ON/OFF: The current measured values are stored in adjustable intervals in the control unit (refer to above) and the 96 values most recently measured are available at any time. The measured values stored may be printed "in a row" if this menu item is switched to "ON". After the printout, this item will automatically be switched to "OFF" again.



Note: Additional alternatives for the settings of the printout are given in the menu "configuration/printer settings" (refer to chapter 4.4.6).

4.3.1.1 Format of the log printout

In the heading of the printout, the current date and the two page texts (refer to chapter F-4.4.6.2) are printed. The subsequent lines for the measured values are structured as follows:

```
<time>      <M1>  <free chlorine> <M2> <M3>  <combined chlorine>
              ...    <pH value> <M4> <M5>      <temp.>
              ...    <Redox value> <M6>
...
              ...    <chart 1>                    <chart 2>
```

The symbols that might occur in case of signals M1...M6 have the following meaning:

*	No flow
A	Alarm (min. or max. values undershot/exceeded)
C	Calibration was performed
^	High chlorination active
_	Chlorine reduction active
D	Dosing malfunction

The following symbols may occur in the individual signals:

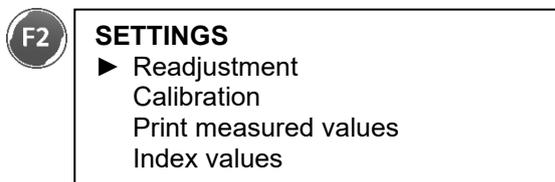
Signal 1	*
Signal 2	A, C, ^, _
Signal 3	D
Signal 4	A, C
Signal 5	D
Signal 6	A, C

At the end of the log page (referring to the respective page), the minimum, maximum and average values of the individual measurements as well as the date of the last calibration are printed.

4.3.2 Index values

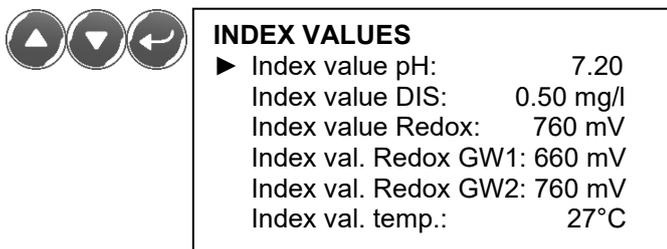
By means of this function, the index values for the pH and DIS control (chlorine concentration) as well as the control of the Redox index value and the water temperature may be set.

Switch from the basic display to the "settings" menu:

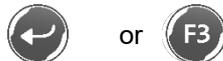


Select and activate menu item „index values“.

Select and activate the desired index value.



Make the respective setting.



Save or reject entry.

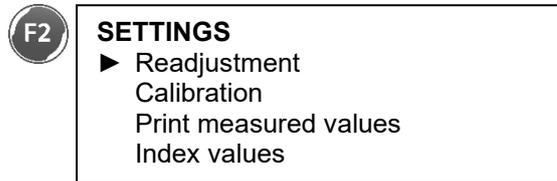


Quit the sub-menu and return to the basic display.

4.3.2.1 Temperature, index values 2 (public only)

By means of this function, a second index value for the temperature may be set.

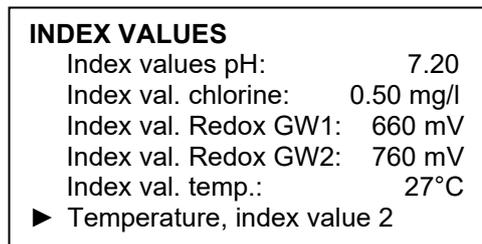
Switch from the basic display to the "settings" menu:



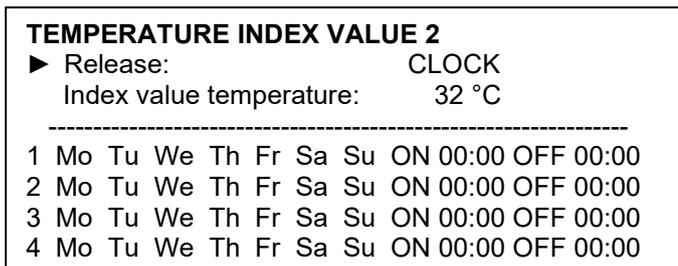
Select and activate menu item „index values“.



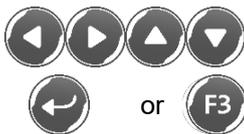
Select and activate „temp. index value 2“.



Make the respective setting.



Make the respective setting.



Save or reject entry.



Quit the sub-menu and return to the basic display.

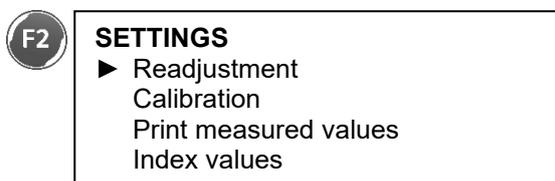
In the setting "release: MANU", the second index value for the temperature may be activated by means of the "F5" key and switched back to the "standard" index value for the temperature by means of the "F4" key.

In the setting "release: CLK", the system remains switched to the second index value for the temperature as long as one of the 8 control clock channels (K1 K8) is programmed and the current time is between the respective switch on and switch off time.

4.3.3 Alarm values pH/free chlorine/redox/flow/combined chlorine

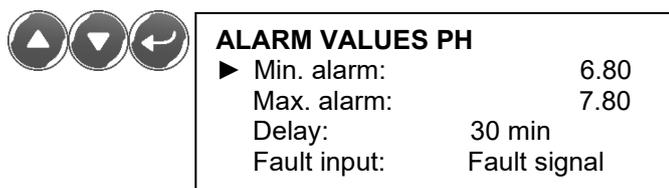
In these menus, the limit values for the individual measurements and the delay time for the release of an alarm may be set.

Switch from the basic display to the "settings" menu:



4...8 x   Select and activate menu item "alarm values".

Select and activate the desired parameters.

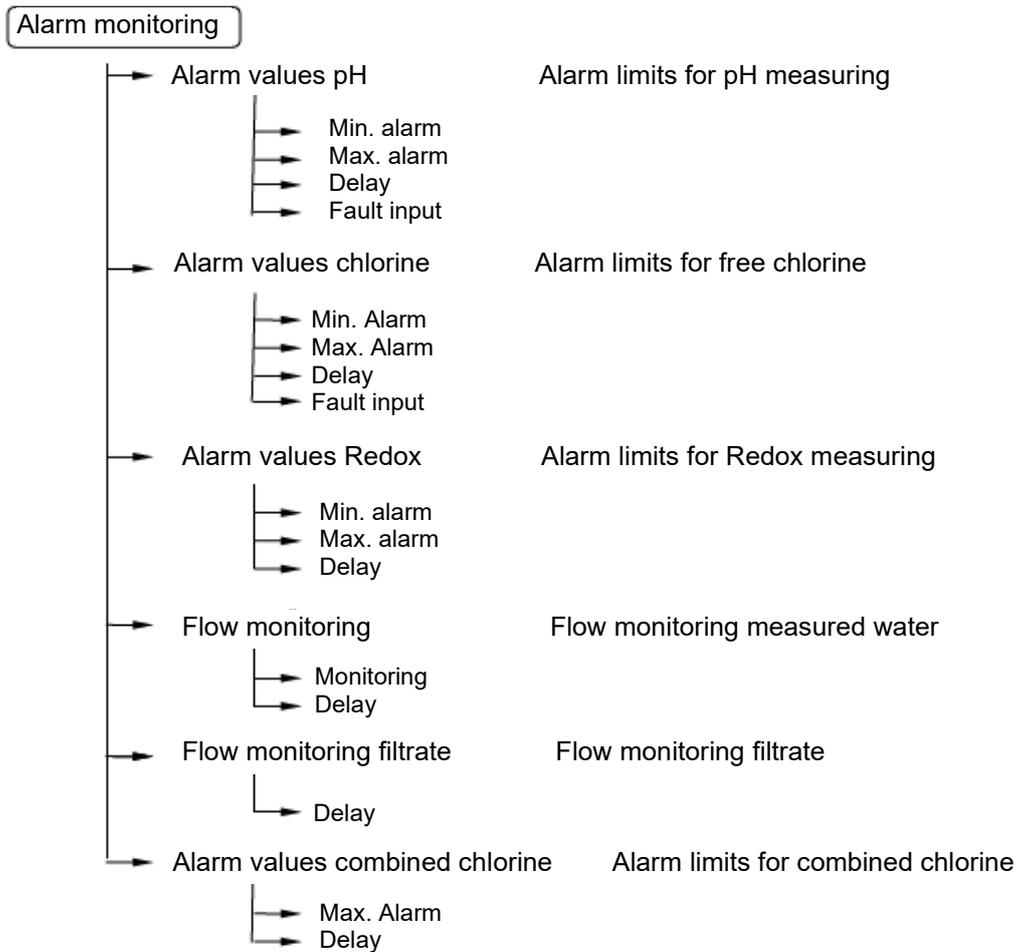


    Make the respective setting.

or  Save or reject entry.

 2 x  Quit the sub-menu and return to the basic display.

The alternative setting parameters for the various items in the individual sub-menus "alarm values ..." are summarised in the following.



Min. alarm Alarm monitoring undershot, a signal is released

Max. alarm If this limit value is exceeded, a signal is released.

Delay Here you can determine how long the undershooting or overshooting of the set limit value must be pending before an alarm signal is released.

Fault input Fault signal: In case there is no input signal, the corresponding fault signal is given

Refill signal: In case there is no input signal, the corresponding "refill signal" is given

Monitoring Option, whether an alarm signal should be released if there is no flow.

OFF: No alarm signal is given in case of no flow, however,

dosing is switched off and switches on again after a delay

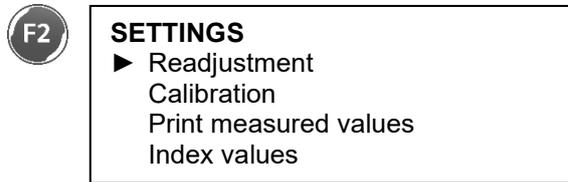
of one minute upon the return of the flow.

ON: If there is no flow, an alarm signal is given and in addition the dosing is switched off. After the alarm is acknowledged and the flow has returned, the dosing is switched on again after a one-minute delay.

4.3.4 Flocculation dosing

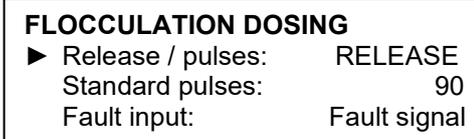
In this menu, the parameters for the “flocculation dosing” may be set.

Switch from the basic display to the "settings" menu:

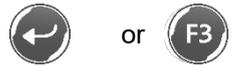


Select and activate menu item „dosing, flocculation“.

Select and activate the desired parameters.



Make the respective setting.



Save or reject entry.



Quit the sub-menu and return to the basic display.

Release/pulses Option, whether a release signal is switched via the corresponding output “flocculation dosing” or whether dosing pulses should be released via this output.

Standard pulses Number of dosing pulses if no switch-over to „partial load operation“ was made.

Fault input Fault signal: In case there is no input signal, the corresponding fault signal is given.

Refill signal: In case there is no input signal, the corresponding “refill signal” is given.

4.3.5 Time/date

In this menu, the real-time clock can be set.

Switch from the basic display to the "settings" menu:



SETTINGS

- ▶ Readjustment
- Calibration
- Print measured values
- Index values

10 x



Select and activate menu item "time/date".

Select and activate the desired parameter.



SET REAL-TIME CLOCK

- ▶ Date / time: Mo 10.07.2006 08:34:20
- Time zone: CET/DST
- Daylight saving time: ON



Make the respective setting.



or



Save or reject entry.

2 x



Quit the sub-menu and return to the basic display.

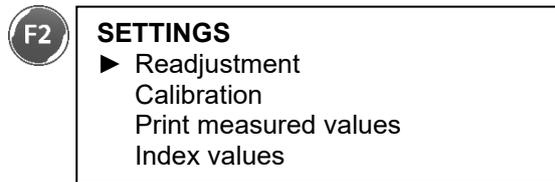
Time zone NONE: There is no automatic change-over from "daylight saving time to standard time";
CET/DST: Automatic switch-over from European "daylight saving time to standard time"

Daylight saving time ON Change-over to "European daylight saving time" took place (only relevant if "time zone: CET/DST"!)

4.3.6 Language

In this menu, the man-machine language can be set.

Switch from the basic display to the "settings" menu:

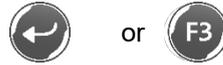


Select and activate menu item „language“.

Select and activate the desired parameter.



Make the respective setting.



Save or reject entry.

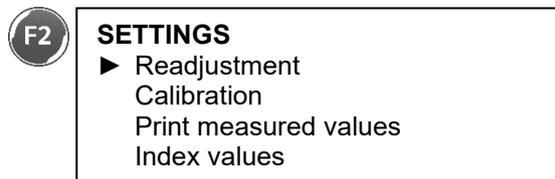


Quit the sub-menu and return to the basic display.

4.3.7 System data printout

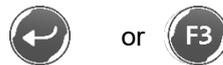
In this menu, the parameters currently set may be printed out on a printer.

Switch from the basic display to the "settings" menu:



Select and activate menu item „system data printout“.

Select and activate the desired function.



Save or reject entry.



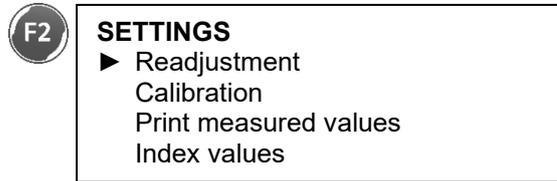
Quit the sub-menu and return to the basic display.

The system data printout is started by means of the option: „print: ON“. If all data was printed, the option is reset to “print: OFF”.

4.3.8 Code default

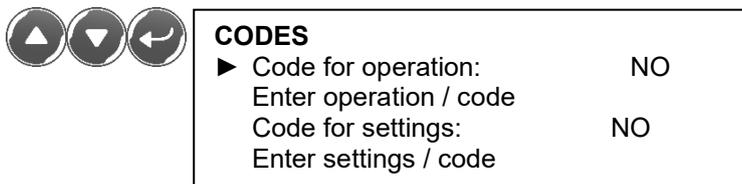
In this menu, you may determine whether the menus "operation" and "settings" shall be locked by codes and if "YES" which codes are to be used to do so.

Switch from the basic display to the "settings" menu:

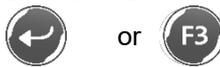


Select and activate menu item „code“.

Select and activate the desired function.



Make the respective setting.



Save or reject entry.



Quit the sub-menu and return to the basic display.

By means of the menu item „code for operation“ you can determine whether the menu "operation" shall be locked by a code (YES) or not (NO). Via the corresponding sub-menu "operation/enter code", the code which shall then be required for the modification of a parameter in the "operation" menu may be determined.

By means of the menu item „code for settings“ you can determine whether the menu "settings" shall be locked by a code (YES) or not (NO). Via the corresponding sub-menu "settings/enter code", the code which shall then be required for the modification of a parameter in the "settings" menu may be determined.

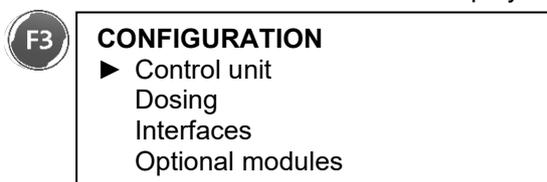
The „configuration“ menu is always locked by means of a code (0290)!

4.4 Configuration menu (here, all parameters are protected by Code 0290)

4.4.1 Control unit/system type

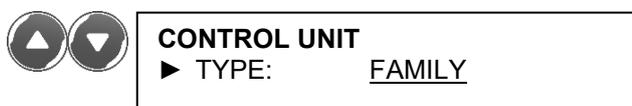
In this menu, the system type may be changed (FAMILY/PUBLIC).

Switch from the basic display to the "configuration" menu:



Select and activate menu item „control unit“.

Select the desired function.



or



Save or reject entry.

2 x



Quit the sub-menu and return to the basic display.

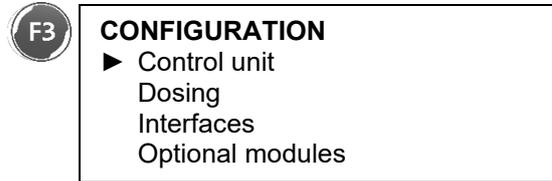


Note: If the type of the control unit (FAMILY/PUBLIC) was changed and the new setting saved by means of the "□" key, the control unit will be RESET. This shall ensure that the different parameters are initialised correctly.

4.4.2 Dosing

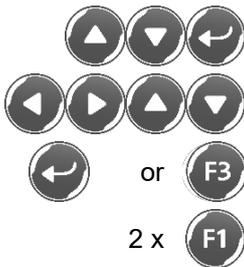
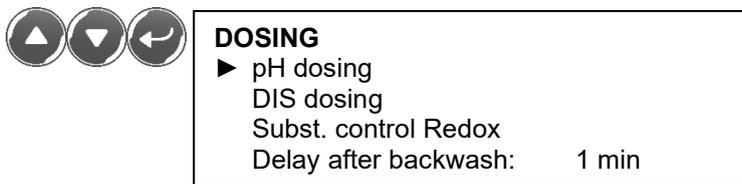
In this menu, the dosing systems used may be selected and parametrised.

Switch from the basic display to the "settings" menu:



Select and activate menu item „dosing“.

Select and activate the desired sub-menu (refer to the following pages):



Select the desired parameter (refer to the following pages)

Edit the selected parameter.

Save or reject entry.

Quit the sub-menu and return to the basic display.

4.4.2.1 Parameters, pH dosing

pH DOSING	
► Dosing unit:	PULSE PUMP
Max. pulse frequency:	100 1/min.
Pulse period:	60 s
Response time:	0 s
Basic dosing:	0 %
Alarm lock:	OFF
Control direction:	ACID
Proport. range:	0.50
Readjustment time:	0 s
Temp. compensation:	OFF

Dosing system Select between pulse pump (diaphragm dosing pump) and dosing pump (hose dosing pump or solenoid valve).

Max. pulse frequency Pulse frequency which corresponds to an actuating variable of the control unit of 100 % (this setting is only relevant if a pulse pump is used as dosing system).

In the case of GENODOS diaphragm dosing pump: 109.1/min.

Pulse period Time which corresponds to an actuating variable of the control unit of 100 % (this setting is only relevant if a dosing pump or a solenoid valve is used as dosing system).

Response time Here, you can determine how long it shall take from the moment the dosing system is actuated until the actual dosing takes place (this setting is only relevant if a dosing pump or a solenoid valve is used as dosing system).

Basic dosing For certain applications, a constant basic load must be dosed. The connected dosing unit adds at least the basic load, no matter what the setting is (maximum 30 % of the available capacity).

Alarm lock ON: In case of a pH alarm, the dosing will be locked.

OFF: The dosing will not be locked.

Control direction BASE = base is dosed (pH+).

ACID = acid is dosed (pH-).

Proport. range The proportional range is considered to be a range below the pH index value (refer to chapter F-4.3.2) within which the dosing capacity is set from 0 to 100 % of the maximum capacity. If the proport. range is very narrow, the full dosing capacity sets in relatively fast. If the proportional range is wide, full capacity is attained later.

Readjustment time By means of the readjustment time, the dosing capacity of the pump can continuously be increased – while the control deviation remains unchanged – until the index value respectively 100 % of the capacity is reached. The shorter the readjustment time, the faster the dosing system increases its capacity. If the readjustment time is set to 0, the capacity increase is omitted completely.



Caution! In case the readjustment time is set to 0, this parameter is switched off.

If you are not familiar with control systems, initially set the control parameter “readjustment time” to „0 s“, thus switching it off. Choose a relatively wide „proportional range“ (0.5 pH) and check how this affects the controlling. Reduce the proport. range if the control point (index value) is reached too slowly or not at all and increase the proport. range if the index value is exceeded.

If you have trouble getting to the control point, increase the effect of the dosing by means of the readjustment time. First, choose a long readjustment time (1200 s) and shorten it step by step according to your needs.

Temp. compensation OFF: without temperature compensation (WITHOUT Pt100 sensor!)
ON: with temperature compensation

4.4.2.2 Parameters, DIS dosing

DIS DOSING	
► Dosing unit:	PULSE PUMP
Max. pulse frequency:	100
Pulse period/ run time:	60 s
Response time:	0 s
Basic dosing:	0 %
Alarm lock:	OFF
Control direction:	OPEN
Prop. range:	0.15
Readjustment time:	0 s
pH correction:	OFF
Cl pH slope (family):	0.020
Cl pH offset (family):	0

- Dosing system** Selection between pulse pump (diaphragm dosing pump), dosing pump (hose dosing pump or solenoid valve) and actuator (bromine dosing resp. chlorine gas dosing).
- Max. pulse frequency** Pulse frequency which corresponds to an actuating variable of the control unit of 100 % (this setting is only relevant if a pulse pump is used as dosing system).
In the case of GENODOS diaphragm dosing pump: 109.1/min.
- Pulse per./run time** Solenoid valve: Time which equals an actuating variable of 100 %.
Actuator: Max. time needed by the actuator to open or close.
- Response time** Here, you can determine how long it shall take from the moment the dosing system is actuated until the actual dosing takes place (this setting is only relevant if a dosing pump, a solenoid valve or an actuator is used as dosing system).
- Basic dosing** For certain applications, a constant basic load must be dosed. In this case, the connected dosing unit adds at least the basic load, no matter what the setting is (maximum 30 % of the available capacity)
- Alarm lock** ON: In case of a chlorine alarm, the dosing will be locked.
OFF: The dosing will not be locked.
- Control direction** OPEN: positive (no setting possible).
- Proport. range** The proportional range is considered to be a range below the DIS index value (refer to chapter F-4.3.2) within which the dosing capacity is set from 0 to 100 % of the maximum capacity. If the proport. range is very narrow, the full dosing capacity sets in relatively fast. If the proportional range is wide, full capacity is attained later.
When using the chemical dosing unit GENO-mat Comfort, the proportional range (DIS dosing, prop. range) must be set to a value of 0.00. The actuator only rotates clockwise.

Readjustment time By means of the readjustment time, the dosing capacity of the pump can continuously be increased – while the control deviation remains unchanged – until the index value respectively 100 % of the capacity is reached. The shorter the readjustment time, the faster the dosing system increases its capacity. If the readjustment time is set to 0, the capacity increase is omitted completely.

If you are not familiar with control systems, initially set the control parameter “readjustment time” to 0, thus switching it off. Choose a relatively wide „proportional range“ (0.3 mg/l) and check how this affects the controlling. Reduce the proportional range if the control point is reached too slowly or not at all and increase it if the index value is exceeded. If you have trouble getting to the control point, increase the effect of the dosing by means of the readjustment time. First, choose a long readjustment time (1200 s) and shorten it step by step according to your needs.



Caution! In the case that the readjustment time is set to 0, this parameter is switched off.

pH correction

To switch the pH correction on or off the chlorine value indicated by the “GENO-CPR-tronic 02 family/public” corresponds in case of the setting:

OFF = to the share of the hypochlorous acid in the free chlorine

ON = to the concentration of free chlorine.

If ON is selected for the pH correction (activation of the pH correction), make sure that the pH value remains below 7.8 in order to ensure sufficient disinfection.

The pH correction performed in the GENO-CPR-tronic 02 family/public refers to pure water (0 .. 40°C/6.00 pH .. 8.00 pH). In order to render the conversion of the measured Redox value into a chlorine value possible, the prevailing conditions (water temperature, water quality) should be kept as constant as possible.

Cl slope (family only) Change of the chlorine in mg/l per mV change in the Redox value (refer to information given below).

Cl pH offset (family only) Deviation in the mV Redox value based on the pH modification (refer to information given below)

For standard swimming pools (with a pH of about 7.2), the hypochlorous acid is crucial for the disinfecting effect and therefore the pH correction should be set to OFF, if possible (i. e. no pH correction). Then, the indicated value for the chlorine corresponds to the rate of the hypochlorous acid in the free chlorine. However, the rate of the hypochlorous acid decreases considerably with an increasing pH value. In order to limit the concentration of free chlorine in the water, make sure that the pH value remains below 7.8.

4.4.2.3 Parameters, substitute control REDOX (family only)

In this menu item, you can determine whether the Redox value instead of the chlorine value should be used for the control of the DIS dosing.

SUBST. CONTROL REDOX ▶ Subst. control redox: OFF

In case you switch to substitute control REDOX, the value indicated for the free chlorine in the display of the CPR-tronic family will continue to change as soon as the REDOX value changes.

In order to freeze the displayed value for free chlorine at a certain value, the following settings have to be made.

Set the parameter "Cl slope (family)" in the menu item "DIS dosing" to a value of 0.000 (refer to Section F-4.4.2.2).

Readjust the desired value to be displayed for free chlorine in the menu item "Readjustment - DIS dosing" (refer to Section H-2.2).

4.4.2.4 Parameters, delay after backwash (family only)

In this menu item, you can determine how long the dosing shall remain locked after the backwash process of the pool water filter.

DOSING pH dosing DIS dosing Subst. control Redox ▶ Delay after backwash: 1 min
--

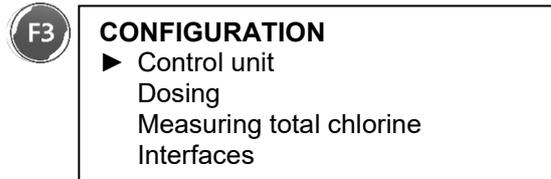
4.4.3 Measuring, total chlorine (public only)

In this menu, the measuring of the "total chlorine" may be activated and parametrised.



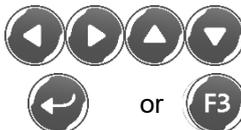
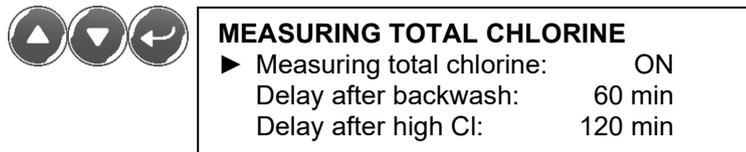
Note: During the set delay time after a backwash or a high chlorination, no calibration can be performed. The entered value originating from the manual measurement will not be saved. The value displayed for the total chlorine is frozen to the last value before the delay set in.

Switch from the basic display to the "configuration" menu:



Select and activate the desired parameters.

Select and activate menu item "measuring total chlorine".



Edit the selected parameter.

Save or reject entry.

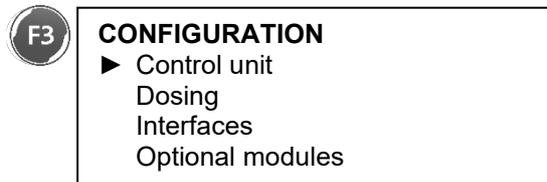


Quit the sub-menu and return to the basic display.

4.4.4 Interfaces

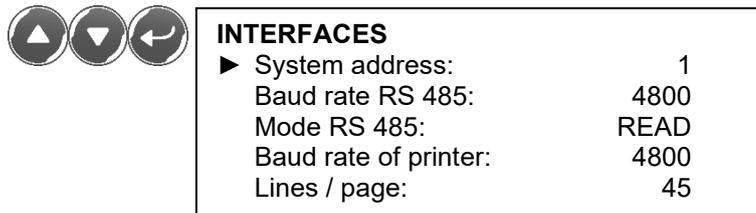
In this menu item, the interface parameters may be set.

Switch from the basic display to the "configuration" menu:



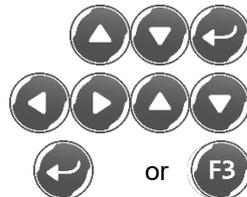
Select and activate menu item „interfaces“.

Select and activate the desired parameters.



Select the desired parameter (refer to the following pages).

Edit the selected parameter.



Save or reject entry.



Quit the sub-menu and return to the basic display.

The meaning of the individual parameters:

System address: Address for RS-485 interface (e.g. for interconnection with the GENO-BW-tronic, FIL-tronic, touch panel (order no. 203545,...)).

Baud rate RS485 Baud rate of the RS-485 interface (visualisation).

Mode RS485 READ/MODIFY parameters via RS-485
MODIFY: Remote control via touch panel (order no. 203545)
possible, otherwise only to read the parameter setting.

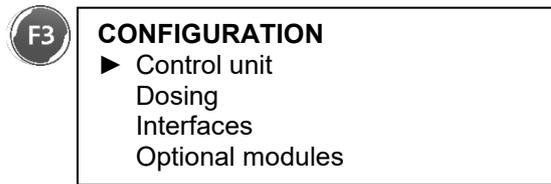
Baud rate of printer: Baud rate of printer interface.

Lines/page Max. lines per printed page.

4.4.5 Optional modules

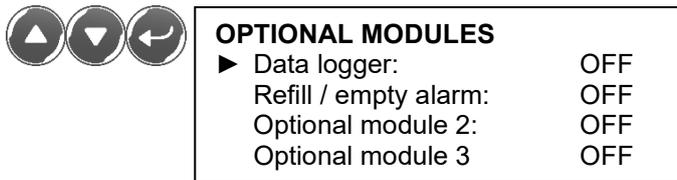
In this menu item, various optional modules may be activated.

Switch from the basic display to the "configuration" menu:

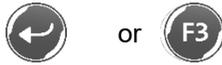


Select and activate menu item „optional modules“.

Select and activate the desired parameters.



Edit the selected parameter.



Save or reject entry.



Quit the sub-menu and return to the basic display.

The meaning of the individual parameters:

Data logger Save data/measured values on „SD card“ (data logger module required!).

Refill/empty signals Processing of external refill/empty signals (module MK200-8E/4RA, Adr. 4 required!)

Optional module 2 }
Optional module 3 } presently, no function.

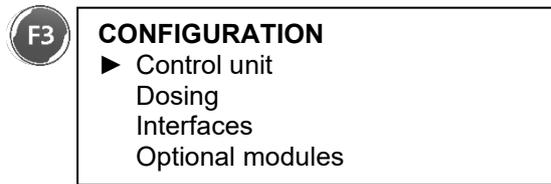


Caution! If one of these options is activated, the corresponding hardware must be connected as well (i. e. the corresponding module), otherwise an error signal will occur!

4.4.6 Printer settings

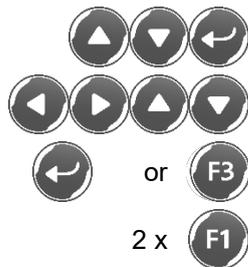
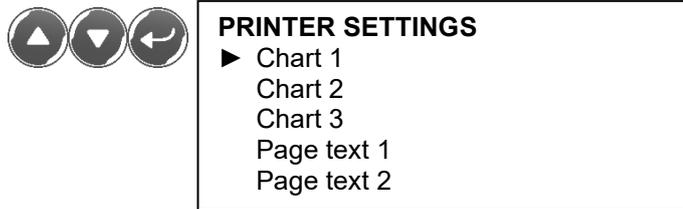
In this menu, parameters for the printout of charts may be set.

Switch from the basic display to the "configuration" menu:



Select and activate menu item „printer settings“.

Select and activate the desired sub-menu (refer to the following pages).

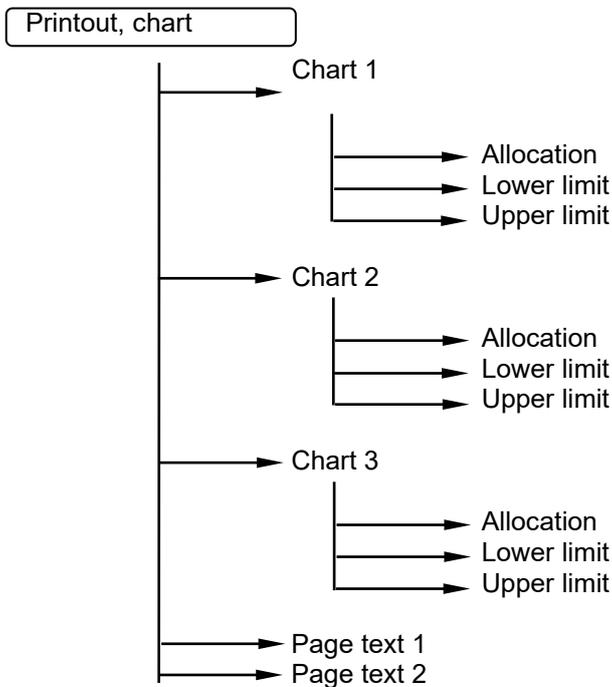


Select the desired parameter (refer to the following pages).

Edit the selected parameter.

Save or reject entry.

Quit the sub-menu and return to the basic display.



4.4.6.1 Chart 1/2/3

CHART 1	
▶ Allocation:	Free Cl
Lower limit:	0.00 mg/l
Upper limit:	2.00 mg/l

Allocation Determination which measured value shall be displayed

- Free chlorine
- pH value
- Redox value
- Water temperature
- Combined chlorine (public only)
- Total chlorine (public only)

Lower limit Here, the lower limit for the chart (in the unit of the selected measured value) may be determined in order to adjust the resolution.

Upper limit Here, the upper limit for the chart (in the unit of the selected measured value) may be determined in order to adjust the resolution.



Note: Please observe that the log printout should be restarted after the modification of the allocation or the upper respectively lower limits, otherwise the printout of the current page does no longer correspond to the chart heading. In order to prevent the data stored in the system from getting lost, the data must be printed prior to the modification of the allocation respectively of the upper and lower limits as the allocation will no longer match afterwards either.

4.4.6.2 Page texts

The page texts 1 and 2 are headings that are printed on the upper left (page text 1) respectively on the upper right (page text 2) of the log printout.

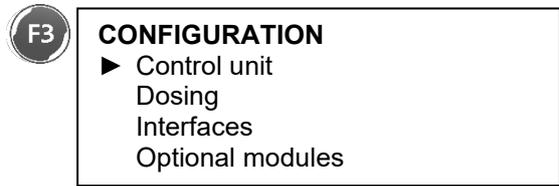
PAGE TEXT 1
▶ Page text 1.....

-  Access the function.
-  (Press again) The cursor moves to the first entry digit.
-  (By means of the cursor keys) Select the desired position.
-  (By means of the arrow keys) Select the desired character.
-  (Press again) Save the text that was entered.
-  Quit the function.

4.4.7 Power outputs

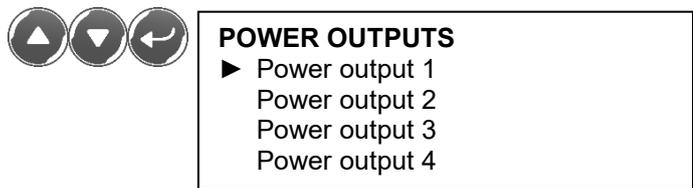
In this menu, the four power outputs (for the analogue printer) may be configured.

Switch from the basic display to the "configuration" menu:

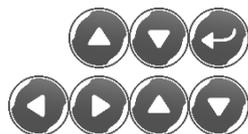


Select and activate menu item „power outputs“.

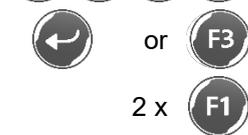
Select and activate the desired sub-menu (refer to the following pages).



Select the desired parameter (refer to the following pages).

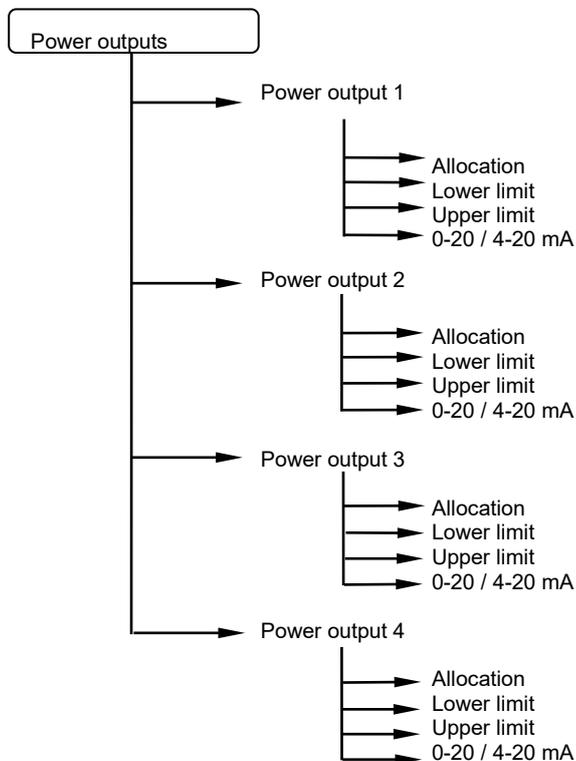


Edit the selected parameter.



Save or reject entry.

Quit the sub-menu and return to the basic display.



POWER OUTPUT 1	
▶ Allocation:	free Cl
Lower limit:	0.00 mg/l
Upper limit:	2.00 mg/l
range:	0 – 20 mA

Allocation Determination which measured value shall be displayed

- Free chlorine
- pH value
- Redox value
- Water temperature
- Combined chlorine (public only)
- Total chlorine (public only)

Lower limit Lower limit of the measured value to be indicated, i. e. the value (indicated in the unit of the measured value) that shall correspond to 0 mA respectively 4 mA.

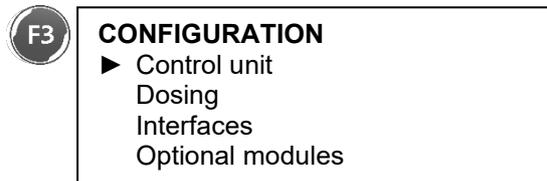
Upper limit Upper limit of the measured value to be indicated, i. e. the value (indicated in the unit of the measured value) that shall correspond to 20 mA.

Range 0 - 20 mA or: 4 - 20 mA.

4.4.8 Service data

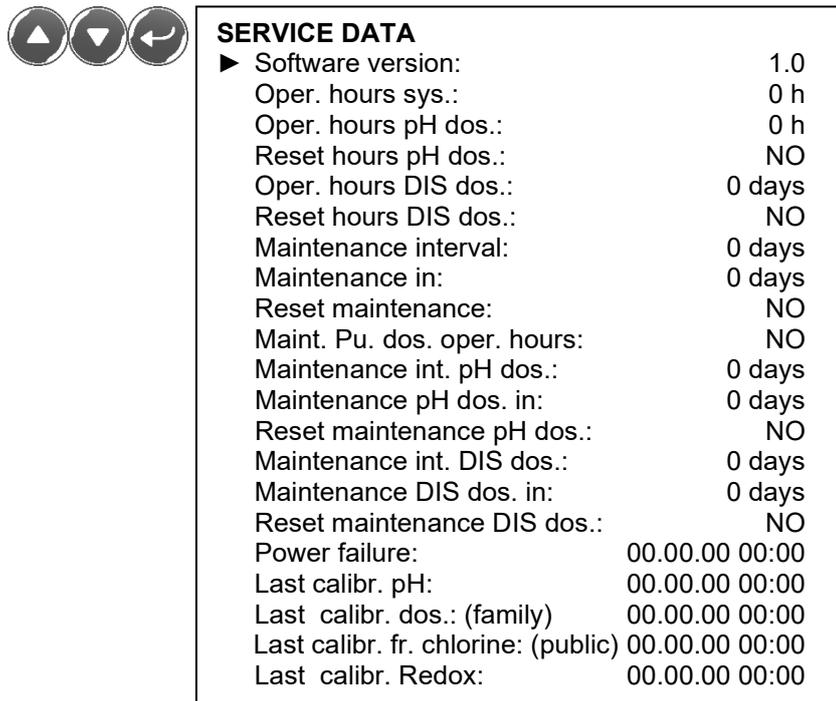
This menu allows the display of various service parameters.

Switch from the basic display to the "configuration" menu:



Select and activate menu item „service data“.

Select the desired parameter.



Quit the sub-menu and return to the basic display.

The meaning of the individual parameters:

Software version: Current software version of the „GENO-CPR-tronic 02“

Oper. hours sys: Operating hours, entire system

Oper. hours pH dos.: Operating hours, pH dosing

Reset hours pH dos.: Delete operating hours, pH dosing?

Oper. hours DIS dos.: Operating hours, DIS dosing

Reset hours DIS dos.: Delete operating hours, DIS dosing?

Maintenance interval: Maintenance interval, entire system

Maintenance in: Maintenance required in # days

Reset maintenance Maintenance request, reset entire system

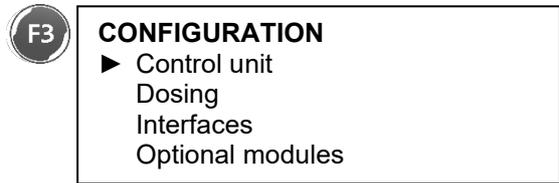
Maint. Pu. dos. op. hours: Maintenance interval of dosing pumps in hours (days)

-
- Maintenance int. pH dos.:** Maintenance interval, pH dosing
 - Maintenance pH dos. in:** Maintenance required in # days
 - Reset maintenance pH dos:** Reset maintenance request pH dosing
 - Maintenance int. DIS dos.:** Maintenance interval, DIS dosing
 - Maintenance DIS dos. in:** Maintenance required in # days
 - Reset maintenance DIS dos:** Reset maintenance request DIS dosing
 - Power failure:** Last power failure (date + time)
 - Last calibr pH.:** Last pH calibration (date + time)
 - Last calibr. dos.:** Last calibration disinfection (date + time) (family)
 - Last calibr. fr. Cl:** Last calibration "free chlorine" (date + time) (public)
 - Last calibr. total Cl.:** Last calibration "total chlorine" (public)
 - Last calibr. Red.:** Last calibration REDOX (date + time)

4.4.9 I / O configuration

This menu enables the configuration and display of inputs/outputs.

Switch from the basic display to the "configuration" menu:

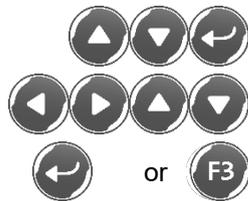


Select and activate menu item „I / O configuration“.

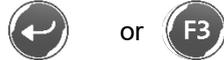
Select and activate the desired sub-menu (refer to the following pages):



Select the desired parameter (refer to the following pages).



Edit the selected parameter.



Save or reject entry.



Quit the sub-menu and return to the basic display.

4.4.9.1 I / O configuration, input logic

In case of "input logic = 1", the input functions as a normally closed contact, in case of "input logic = 0" as normally open contact.

INPUT LOGIC	
▶ Input Flow M w:	1
Input Flow Filt.:	0
Input DIS dos.:	0
Input pH dos.:	0
Input Flo. dos.:	0
Input backwash:	1
Input part. load:	0

4.4.9.2 I/O configuration, I/O display

Here, the status of the digital inputs and outputs is indicated (0 = Off/1 = On), independent of the input logic.

I/O DISPLAY	
▶ Input Flow M w:	0
Input Flow Filt.:	0
Input DIS dos.:	1
Input pH dos.:	1
Input floc. dos.:	1
Input backwash:	1
Input part. load:	0

Output DIS closed:	0
Output DIS open:	0
Output pH SV:	0
Output floc. SV:	0
Output coll. fault:	0
Output part. load:	0
Output heating:	0
Output reserve:	0
Output DIS pulse pump:	0
Output PH pulse pump:	0
Output floc. pulse pump:	0

4.4.10 Delete log

This function allows to delete the memory for the measured values integrated in the control unit.

Switch from the basic display to the "configuration" menu:

 **CONFIGURATION**

- ▶ Control unit
- Dosing
- Interfaces
- Optional modules

Select and activate menu item „delete log“.

8 x (family)   **CONFIGURATION**

9 x (public)

- Power outputs
- Service data
- I / O configuration
- ▶ Delete log: NO

Edit selected parameter (NO/YES).

  Edit selected parameter (NO/YES).

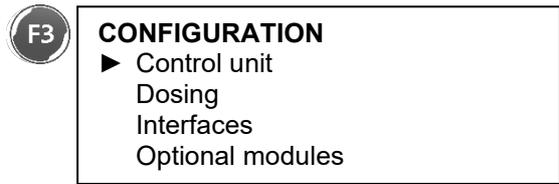
 or  Save or reject entry.

2 x  Quit the sub-menu and return to the basic display.

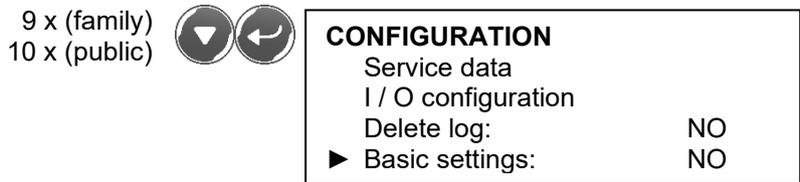
4.4.11 Basic settings

This function allows the reset of all editable parameters to their original values. The function is protected by an individual code!

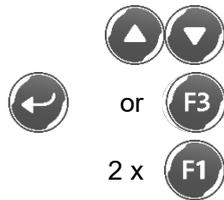
Switch from the basic display to the "configuration" menu:



Select and activate menu item „basic settings“.



Edit selected parameter (NO/YES).



Save or reject entry.

Quit the sub-menu and return to the basic display.

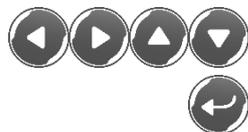
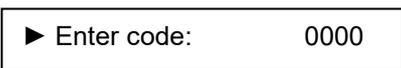
4.4.12 Password protection

In order to prevent unauthorised or accidental modification of the settings of the "GENO-CPR-tronic 02 family/public", a password protection may be established (also refer to: chapter F-4.3.8 Code default).

In the sub-menu "settings/code" it can be decided whether the menus „operation“ and „settings“ shall be protected by a password and if so, by which one. The "configuration" menu is always protected by a password.

Entry of the correct password

If a menu item is protected by a password, the request to enter the corresponding code is displayed when this menu item is called.



Enter the correct code by means of the cursor keys.

Confirm by means of the enter key.

If the entered code is correct, the corresponding menu item is accessed, otherwise the signal "**wrong code!**" will be displayed.

G Faults

Content

1 Impairment of the water quality	G-1
2 Fault signals	G-2
3 Other faults	G-4



Danger! When opening covers and lids or removing parts, the connectors may carry hazardous voltages. Prior to any repair or maintenance work respectively any replacement of parts, the system must be disconnected from all power sources, if the system needs to be opened in order to carry out this work. In particular make sure that any external devices connected to the system do not carry any voltage (fault signal output, connected dosing pumps, etc.).

1 Impairment of the water quality

In isolated case, turbidities in the water or slimy pool walls may occur. The reason for this being mostly that no disinfectant (chlorine or bromine) was present in the pool for a longer period of time (for one reason or another, the dosing of the disinfectant did not take place). The reasons for the lacking dosing are manifold and range from operating errors to switching off the dosing system during longer periods of absence, to the failure of changing the container. Proper dosing, however, ensures a perfect water quality and turbidities do not occur.

In order to limit probable causes in case of problems, the first step to be taken is to check whether dosing took place. The check of the most important water parameters (pH, chlorine or bromine, acid capacity) may be performed by means of a suitable test kit.

What to do in order to re-establish the proper water quality?

As the impairment of the water quality often only can be detected when the organic load is already quite high, it makes sense to re-establish the desired water quality by means of a one-time high chlorination.



Warning! The pool should not be used during high chlorination.

During this high chlorination, a constant chlorine surplus of approx. 1 - 2 mg/l has to be maintained.

In case of a dosing volume of 10 ml GENO-Chlor A per 1 m³ of pool volume, a chlorine surplus of approx. 1.25 – 1.75 mg/l is achieved. Keeping the chlorine surplus constant depends on the chlorine loss and the pH value (ideal value 7.0 – 7.4). The chlorine surplus can be controlled by means of the test kit. The chlorine surplus can be controlled by means of a suitable test kit.

2 | Fault signals

The GENO-CPR-tronic 02 measuring and control system shows faults on the display. If faults do occur that cannot be remedied, or are explicitly identified by the instructions given below, contact Grünbeck's technical service/authorised service company.



If a fault or alarm signal occurs, the collective fault signal relay drops out and the red LED of the clear key (CL) starts flashing.

The corresponding signal text is indicated in the basic display. If several signals are pending, they are indicated alternately. Alarms will only be displayed if no fault signal is pending.



All signals are acknowledged by means of the clear key (CL). If, after the acknowledgement, one fault or alarm is still pending, the red LED is continuously illuminated, if all faults and alarms were remedied, it will go out.

Low voltage	The supply voltage has fallen below 190 VAC.
Voltage failure	The supply voltage failed.
No transmitter voltage.	The transmitter voltage for the sensor amplifiers or the digital inputs/outputs failed. The unit is defective. Notify Grünbeck's technical service/authorised service company.
Dosing error pH Dosing error DIS Dosing error floc.	The corresponding digital input has opened.
Calibration wrong	The calibration was done twice with the same buffer solution. However, two different buffer solutions need to be applied.
Battery empty	The buffer battery is exhausted. This alarm will only produce a signal but does not have any further impact. Notify Grünbeck's technical service/ authorised service company.
pH value too low Cl value too low Redox value too low	The corresponding measured value has fallen below the set limit value (min. alarm) and the set delay time has elapsed.
pH value too high Cl value too high Redox value too high	The corresponding measured value has exceeded the set limit value (max. alarm) and the set delay time has elapsed. In case of the alarm „pH value too high“, the chlorine dosing is locked as well!



Caution! In case of the alarm „pH value too high“, the DIS dosing is locked as well!

No flow M w:	There is no flow (corresponding digital input is open). This signal can only occur if the alarm signal “flow monitoring measuring water” is active (may be set in the menu “alarm monitoring”).
No flow Filt.:	There is no flow (corresponding digital input is open). The flow monitoring filtrate is always active.
Data logger [2]	The „data logger“ is activated (refer to: "configuration/optional modules") and the communication with the module is disturbed, there is no memory card or the memory card is full. Notify Grünbeck's technical service/ authorised service company.
Opt. module 1 [4] Opt. module 2 [5] Opt. module 3 [6]	The respective module is activated (refer to: “configuration/optional modules”) and the communication with the module of the corresponding address [#] is faulty (e.g. the module does not exist, the address is wrong). Notify Grünbeck's technical service/ authorised service company.

3 | Other faults

Table G-1: Eliminating errors		
This is what you observe	This is the cause	This is what to do
a) Measuring of free chlorine unstable (display 0.00 resp. 10.00)		
	Flow rate too low.	Clean inlet and outlet line respectively the flow fitting, clean primary screen in the sampling line.
	Defective redox electrode (family)	Check redox electrode and replace, if necessary. Notify Grünbeck's technical service/authorised service company.
	Air bubbles outside on the membrane.	Remove air bubbles by knocking and increase flow, if necessary.
	Damaged membrane.	Replace membrane cap, let measuring cell soak, calibrate. Notify Grünbeck's technical service/authorised service company.
	Defective chlorine measuring cell.	Replace chlorine measuring cell. Notify Grünbeck's technical service/authorised service company.
	Soaking time insufficient.	Prior to the calibration, the chlorine measuring cell for combined chlorine must be soaked for at least 3 h.
	No electrolyte in the membrane cap.	Fill with new electrolyte. Notify Grünbeck's technical service/authorised service company.
	Damaged membrane cap.	Replace membrane cap, let measuring cell soak, calibrate. Notify Grünbeck's technical service/authorised service company.
	Measuring cell incorrectly connected to the control unit.	Correctly connect measuring cell to the control unit. Notify Grünbeck's technical service/authorised service company.

This is what you observe	This is the cause	This is what to do
b) No dosing (index value was not reached)		
	Chemicals tank empty.	Refill chemicals.
	Dosing unit out of service.	Check dosing unit.
	Dosing valve or line clogged.	Check dosing valve and line.
	Insufficient dosing capacity.	Install a more powerful dosing unit. Notify Grünbeck's technical service/authorised service company.
	Dosing unit connected incorrectly.	Check connections (Section D-4.1)
	Incorrect configuration of dosing unit	Check configuration of the dosing unit.
	Defective fuse(s).	Check fuses. Notify Grünbeck's technical service/authorised service company.
	Dosing is switched off.	Switch on dosing (Sect. F-4.2.1)
	Index value set incorrectly.	Correct index value (Section F-4.3.2).
	Control direction incorrect.	Check control direction (Sections F-4.4.2.1 / 4.4.2.2).
	Control parameters incorrect.	Check control parameters (Sections F-4.4.2.1 / 4.4.2.2)

Continuation Table G-1: Eliminating faults		
This is what you observe	This is the cause	This is what to do
c) Difference in the measured values compared to the pool		
	Manual measuring inaccurate.	Repeat manual measuring.
	Problematic sampling point.	Choose different sampling point and repeat manual measuring there.
	Dosing valve or line clogged.	Check dosing unit.
	Chlorine consumption in the sampling line.	Dirt trap, possibly clean sampling feed line.
	Sampling line too long.	Modify installation accordingly.
	Sensor dried out.	Replace electrode. Notify Grünbeck's technical service/authorised service company.

This is what you observe	This is the cause	This is what to do
d) Flow monitoring does not work		
	Flow sensor mounted incorrectly.	Check installation position.
	Loose contact.	Remove cover of the terminal chamber and tighten the terminals for the flow sensor.
	Defective flow sensor.	Check input for flow sensor: disconnect flow sensor, have menu "configuration, I/O configuration, I/O display" displayed and bridge respectively leave open terminals 35 and 36. The status in "input flow" must change. If this is not the case, replace flow sensor. Notify Grünbeck's technical service/authorised service company.

This is what you observe	This is the cause	This is what to do
e) Printer does not work		
	Cable mounted incorrectly.	Check connection.
	Printer mode not activated.	Check settings (Sect. F-4.4.4)
	Incorrect transfer rate.	Check transfer rates of control unit and printer (Section F-4.4.4)
	Printer problem.	Read the printer operation manual.

This is what you observe	This is the cause	This is what to do
f) Power output does not work		
	Cable mounted incorrectly.	Check connection.
	Connection defined incorrectly.	Modify configuration (Sect. F-4.4.7).

This is what you observe	This is the cause	This is what to do
g) Collective fault signal relay does not work		
	Cable mounted incorrectly.	Check connection.
	Alarm values defined incorrectly.	Check alarm values (Sect. F-4.3.3).

Continuation Table G-1: Eliminating faults		
This is what you observe	This is the cause	This is what to do
h) No display, no measuring cell current		
	No mains voltage at measuring transducer.	Establish mains connection.
	Connecting line from the measuring cell to the measuring transducer interrupted.	Make cable connection.
	No electrolyte was filled into the measuring chamber.	Fill measuring chamber □ (Sect. H-2.1)
	No measuring water flow.	Establish flow, clean primary screen in sampling line.

This is what you observe	This is the cause	This is what to do
i) Value displayed too low		
	pH value has dropped since calibration.	Increase pH value or recalibrate.
	Temperature has increased since calibration (without optional temperature compensation).	Lower temperature or recalibrate.
	Polarisation of the measuring cell not yet finished.	Wait until polarisation is completed (refer to Table C-4).
	Defective membrane.	Replace membrane cap. Notify Grünbeck's technical service/authorised service company.
	Shunt resistance (e.g. moisture bridge) in the measuring cell, at the connections or in the connecting line.	Unscrew measuring chamber, rub gold cathode dry. If the display at the measuring transducer does not go back to zero, a shunt is present. Notify Grünbeck's technical service/authorised service company.
	Organic chlorination agents are used (e. g. based on cyanuric acid).	Use agents as per DIN 19 643 (a prior water change is required).

This is what you observe	This is the cause	This is what to do
j) Value displayed too high		
	pH value has increased since calibration	Lower pH value or recalibrate
	Temperature has fallen since calibration (without optional temperature compensation).	Increase temperature or recalibrate.
	Measuring chamber not completely screwed down.	Screw down measuring chamber resp. screw cap completely.
	Membrane dirty.	Clean membrane.
	Air bubble on the outside of the membrane.	Release air bubble.
	Air bubble inside, between cathode and membrane.	Open measuring chamber, refill a little electrolyte, knock.
	Measuring water flow too low.	Establish correct inflow.
	Interfering impact of foreign oxidants on the comparative DPD measuring (optical measurement).	Examine measuring water, check chemicals.
	Interfering impact of foreign oxidants on the measuring cell.	Examine measuring water, check chemicals.

Continuation Table G-1: Eliminating faults		
This is what you observe	This is the cause	This is what to do
k) Values displayed fluctuate extremely		
	Hole in the membrane.	Replace membrane cap. Notify Grünbeck's technical service/authorised service company.
	External voltage in measuring media.	Unplug connector at PAL pin of the OCA 250 fitting. Measure voltage between PAL pin and protective earth of the measuring device (AC as well as DC measuring). In case of values higher than approx. 0.5 V, search for external cause and rectify. Notify Grünbeck's technical service/authorised service company.

This is what you observe	This is the cause	This is what to do
l) Temperature displayed too low/too high		
	Feed line to NTC thermal sensor interrupted/ short-circuited.	Check line (green/brown) and measuring of resistance (NTC), replace measuring cell, if necessary. Notify Grünbeck's technical service/authorised service company.

This is what you observe	This is the cause	This is what to do
m) Redox value gradually decreases		
	Organic chlorine products based on cyanuric acid are used Organic cleaning agents based on cyanuric acid are used.	Remove cyanuric acid from the pool water by changing the water, clean redox sensor, use inorganic chlorine products resp. cleaning agents without cyanuric acid; cleaning agents must never get into the pool.
	Phosphates clog the sensor.	Reduce the phosphates by flocculation and addition of fresh water, clean the sensors.

This is what you observe	This is the cause	This is what to do
n) Control via „substitute control REDOX“ – value displayed for „free chlorine“ continues to change		
	A corresponding change (Cl slope) in the value displayed for "free chlorine" (mg/l) is allocated to every change in the redox value (mV).	Freeze the value displayed for "free chlorine" to the desired value as described in chapter F-4.4.2.3.

This is what you observe	This is the cause	This is what to do
o) pH value drops suddenly and significantly/pH value can hardly be adjusted/considerable fluctuations in pH value		
	No resp. too little buffer capacity of pool water	Check buffer capacity and increase, if necessary

This is what you observe	This is the cause	This is what to do
p) Black tile joints		
	Fungi growth due to organic grouting material (e. g. joints made of epoxy resin)	Increase the filter run time, increase the value for disinfectants, perform a shock chlorination, replace the grouting material, if necessary. Only use grouting material that complies with the requirements of the DIN standard 19643-1!

H Maintenance and care

Content

1	Basic information	H-2
2	Clean (functional check)	H-3
	2.1 Cleaning the measuring water filter CPR-tronic 02 family	H-3
	2.2 Cleaning the float switch and temperature sensor CPR-tronic 02	H-4
	2.3 Cleaning the pH and redox electrode CPR-tronic 02 family	H-5
	2.4 Cleaning the pH and redox electrode CPR-tronic 02 public	H-6
	2.5 Cleaning chlorine measuring cells CPR-tronic 02 public	H-6
	2.5.1 Cleaning the sensor membrane	H-7
	2.5.2 Cleaning the electrode body	H-8
	2.5.3 Changing the membrane cap	H-8
	2.5.4 Removing the membrane cap, filling with electrolyte, screwing on	H-9
		H-11
3	Inspection	H-12
	3.1 Weekly inspection	H-13
	3.2 Weekly inspection CPR-tronic 02 family	H-14
	3.3 Weekly inspection CPR-tronic 02 public	H-16
	3.4 Readjustment	H-16
	3.4.1 pH Measurement readjustment	H-17
	3.4.2 DIS Measurement (family) readjustment	H-18
	3.4.3 Free chlorine (public) readjustment	H-19
	3.5 Calibration	H-21
	3.5.1 pH Measurement calibration	H-23
	3.5.2 Redox Measurement calibration	H-24
	3.5.3 DIS Measurement (family) calibration	H-25
	3.5.4 Free chlorine (public) calibration	H-26
	3.5.5 Total chlorine (public) calibration	H-27
	3.5.6 Water temperature calibration	H-28
	3.5.7 Room temperature calibration	H-29
	3.5.8 Air humidity calibration	H-30
4	Maintenance	H-30
	4.1 Operation log	H-31
5	Factory settings	H-31
	5.1 Factory settings/Operation menu	H-32
	5.2 Factory settings/Settings menu	H-34
	5.3 Factory settings/Configuration menu	H-36
6	Spare parts	

1 | Basic information



Note: In order to ensure the proper functioning of the product in the long term, certain tasks have to be performed at regular intervals. We recommend six-monthly and annual maintenance. All regulations and guidelines which apply at the installation site must be strictly adhered to. The conclusion of a maintenance contract ensures that all the required work will be performed in due time.



Danger! When opening covers and lids or removing parts, the connectors may carry hazardous voltages. Prior to any repair or maintenance work respectively any replacement of parts, the system must be disconnected from all power sources, if the system needs to be opened in order to carry out this work. In particular make sure that any external devices connected to the system do not carry any voltage (fault signal output, connected dosing pumps, etc.).



Warning! When working on the product, swimming pool water and chemicals may leak. Use personal protective equipment (face protection, gloves, etc.).

The maintenance and inspection intervals mentioned are average values which might be shorter depending on the quality of the water used.

- While the pool is in operation, we recommend a weekly check of the pool water quality and the filling level of the dosing substances.
- The maintenance work has to be performed by the Grünbeck's technical service/authorised service company or by an authorised specialist installer.
- An operation log must be kept in order to document the maintenance work performed.

2 | Cleaning

Regularly clean the system to remove dirt and chemical residues.



Note: Clean the product with lukewarm soapy water. Do not use any strong or abrasive cleaning agents as these may damage the surface.



Caution! Handle electrodes carefully (no skin contact with the measuring ranges, such as membrane glass, protection against damage).



Caution! Never clean the membrane glass of the pH and redox electrode using aggressive/abrasive cleaning agents. The membrane glass must not be scratched during cleaning.



Caution! Protect the electrode contacts and the electrode cable from possible splashing water.

2.1 Cleaning the measuring water filter CPR-tronic 02 family

Clean the measuring water filter at least once a week.

1. Shut off the lines.
2. Place a collecting container under the measuring water filter to catch escaping measuring water.
3. Unscrew the transparent filter bell from the filter head.
4. Remove the filter strainer and clean it with clean drinking water.
5. Reinstall the cleaned filter strainer along with the transparent filter cylinder and the seal in the filter head.
6. Open the lines and check leak tightness.

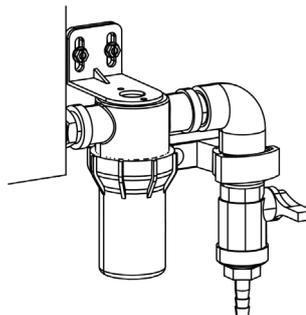


Fig. H-1: Measuring water filter with filter strainer

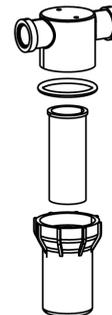


Fig. H-2: Filter head + seal + filter strainer + filter cylinder.

2.2 Cleaning the float switch and temperature sensor CPR-tronic 02 family Clean the float switch and the temperature sensor if required, e.g. if there is visible soiling.

1. Shut off the lines.
2. Briefly open the sampling valve to reduce the pressure in the flow fitting.
3. Dismantle the temperature sensor with the O-ring and clean the measuring range with a cloth. If a suitable stainless steel cleaner (hydrochloric acid and chloride-free) is used, the component must then be rinsed thoroughly using clean drinking water.
4. Remove the float switch and clean it with a cloth. If a suitable stainless steel cleaner (hydrochloric acid and chloride-free) is used, the component must then be rinsed thoroughly using clean drinking water.
5. Reinstall the float switch and then the temperature sensor with O-ring in the flow fitting.
6. Open the lines and check leak tightness.

2.3 Cleaning the pH and Redox electrode CPR-tronic 02 family

Clean the pH and redox electrode at regular intervals before calibration, in the case of deviating measuring values or visible soiling.

1. Shut off the lines.
2. Briefly open the sampling valve to reduce the pressure in the flow fitting.
3. Pull out the electrode holder clamps.

(see Fig. H-3).

4. Lift the electrode holder with the electrodes out of the flow fitting using a screwdriver (see Fig. H-3).
5. Clean the electrodes with a mild glass cleaning agent or with alcohol.
6. Rinse the electrodes with clean drinking water and dab them carefully with a clean, soft cloth.
7. Insert the electrode holder with the electrodes into the flow fitting and soak the electrodes for at least one hour.
8. Proceed to calibrate the electrodes in the connection
(refer to Section H-3.5).
9. After calibration, insert the electrode holder with the electrodes into the flow fitting and secure it with the clamps.
10. Open the lines and check leak tightness.

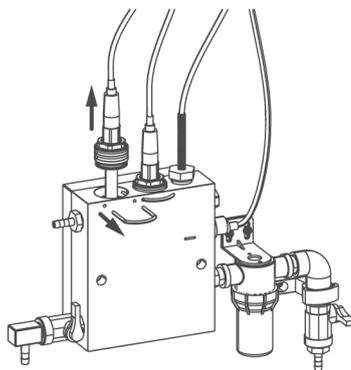


Fig. H-3: pH and redox electrode CPR-tronic 02 family

2.4 Cleaning the pH and Redox electrode CPR-tronic 02 public

Clean the pH and redox electrode at regular intervals before calibration, in the case of deviating measuring values or visible soiling.

1. Shut off the lines.
2. Briefly open the sampling valve to reduce the pressure in the flow fitting.
3. Loosen the union nut on the electrode cable on the pH or redox electrode and pull it off. Protect the electrode contacts and the electrode cable from possible splashing water.
4. Loosen the electrodes using a 17 mm open-ended spanner and remove them from the flow fitting.
5. Clean the electrodes with a mild glass cleaning agent or with alcohol.
6. Rinse the electrodes with clean drinking water and dab them carefully with a clean, soft cloth.
7. Insert the electrodes into the flow fitting, tighten them with a 17 mm open-ended spanner to max. 3Nm and soak them for at least one hour.
8. Proceed to calibrate the electrodes in the connection (refer to

H-3.5). To do so, connect the pH cable to the pH electrode and the redox cable to the redox electrode and screw on the union nut (approx. 1 revolution).

9. After calibration, insert the electrodes into the flow fitting and tighten them to max. 3Nm using a 17 mm open-ended spanner.
10. If you have dismantled the pH cable and the redox cable to install the electrodes in the flow fitting, connect the pH cable to the pH electrode and the redox cable to the redox electrode and screw on the union nut (approx. 1 turn).
11. Open the lines and check leak tightness.

2.5 Cleaning chlorine measuring cells (free chlorine) CPR-tronic 02 public

Should there be visible deposits on the membrane (biofilm, limescale), the sensor membrane must be cleaned (refer to Section H 2.5.1).

If there are deposits of grease and/or oil (dark or transparent stains) on the membrane, it must be replaced (refer to Section H 2.5.3).

If there is visible dirt on the surface of the electrode body, it must be cleaned (refer to Section H 2.5.2).

2.5.1 Cleaning the sensor membrane

1. Shut off the lines.
2. Briefly open the sampling valve to reduce the pressure in the flow fitting.
3. Disconnect the electrode cable from the chlorine measuring cell and pull it off. Protect the contacts of the chlorine measuring cell and the electrode cable from possible splash water.
4. Disconnect the chlorine measuring cell and remove it from the flow fitting.
5. Remove the membrane cap (refer to Section H 2.5.4).
6. Use a gentle jet of water to clean the membrane cap mechanically only or use diluted acid (e.g. sulphuric acid) briefly (for a few minutes).
7. Then rinse the membrane cap thoroughly with water.
8. Screw the membrane cap onto the sensor (refer to Section H 2.5.4).
9. Screw the chlorine measuring cell into the flow fitting.
10. Plug the electrode cable (plug head) onto the chlorine measuring cell and tighten it.
11. Open the lines and check leak tightness.
12. Calibrate the chlorine measuring cell (refer to Section H 3.5.4) after the polarisation time has elapsed (refer to Table C-4).

2.5.2 Cleaning the electrode body

1. Shut off the lines.
2. Briefly open the sampling valve to reduce the pressure in the flow fitting.
3. Disconnect the electrode cable from the chlorine measuring cell and pull it off. Protect the contacts of the chlorine measuring cell and the electrode cable from possible splash water.
4. Disconnect the chlorine measuring cell and remove it from the flow fitting.
5. Remove the membrane cap (refer to Section H 2.5.4).
6. Carefully wipe the gold electrode with a soft sponge.
7. Rinse the electrode body with fully demineralised water, alcohol or acid.
8. Screw the membrane cap onto the sensor (refer to Section H 2.5.4).
9. Screw the chlorine measuring cell into the flow fitting.
10. Plug the electrode cable (plug head) onto the chlorine measuring cell and tighten it.
11. Open the lines and check leak tightness.
12. Calibrate the chlorine measuring cell (refer to Section H 3.5.4) after the polarisation time has elapsed (refer to Table C-4).

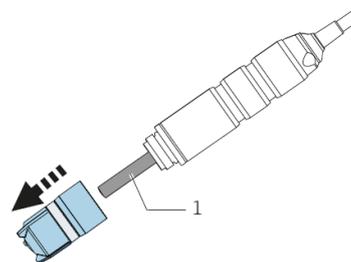
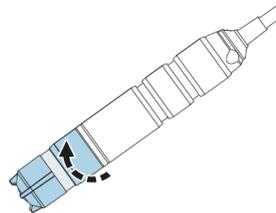
2.5.3 Changing the membrane cap

1. Shut off the lines.
2. Briefly open the sampling valve to reduce the pressure in the flow fitting.
3. Disconnect the electrode cable from the chlorine measuring cell and pull it off. Protect the contacts of the chlorine measuring cell and the electrode cable from possible splash water.
4. Disconnect the chlorine measuring cell and remove it from the flow fitting.
5. Remove the membrane cap (refer to Section H 2.5.4) and dispose of it.
6. Screw the new membrane cap onto the sensor (refer to Section H 2.5.4).
7. Screw the chlorine measuring cell into the flow fitting.
8. Plug the electrode cable (plug head) onto the chlorine measuring cell and tighten it.
9. Open the lines and check leak tightness.
10. Calibrate the chlorine measuring cell (refer to Section H 3.5.4) after the polarisation time has elapsed (refer to Table C-4).

2.5.4 Removing the membrane cap, filling with electrolyte, screwing on

Removing the membrane cap

1. Carefully rotate the membrane cap clockwise and remove it.



Fill with electrolyte



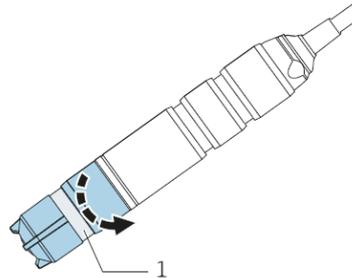
Caution! Damage to the membrane, the electrode or air bubbles in the electrolyte result in measurement errors, up to, and including, failure of the chlorine measuring cell.

- Avoid damage to the membrane and electrode.
- Keep the electrolyte bottle closed after use. Do not transfer electrolyte to other containers.
- Do not store electrolyte for longer than 2 years. The electrolyte must not have a yellowish colour. Observe the expiry date on the label.
- Fill electrolyte into the membrane cap without bubbles.

1. Check whether the sealing ring is fitted in the membrane cap.
2. Fill approx. 7 ml of electrolyte without bubbles up to the start of the female thread of the membrane cap.

Screw on the membrane cap

1. Slowly screw the membrane cap onto the sensor shaft up to the stop until the membrane on the working electrode is slightly overstretched (1 mm). Excess electrolyte is pressed out of the valve and the thread. If required, dab the sensor and the membrane cap dry with a clean cloth.



3 | Inspection



Note: The inspections must be carried out by the owner/user of the system at the specified time intervals as a minimum. Shorter time intervals may be required depending on the operating conditions. During the first week of operation, we recommend checking the function of the system daily and then weekly respectively as required. During the bathing season, the pool water quality changes continuously as the outside influences fluctuate considerably (e. g. dirt brought into the pool by bathers, flying pollen, sunscreen, etc.). Therefore, a regular check of the measuring and control system is necessary.



Caution! Handle electrodes carefully (no skin contact with the measuring ranges, such as membrane glass, protection against damage).



Caution! Never clean the membrane glass of the pH and redox electrode using aggressive/abrasive cleaning agents. The membrane glass must not be scratched during cleaning.



Note: The pH and redox electrodes wear out over time (e.g. due to salt loss from the reference system) and are therefore exposed to natural wear and tear. A drift of the measuring value after some time is therefore normal and must be corrected by regular calibration or readjustment. In the case of medium water quality, the pH and redox electrodes should be replaced annually, at the latest every 2 years. If very poor water quality is used for the fresh water make-up feed, higher wear and tear might be detected on the electrodes and a shorter replacement cycle might become necessary.



Note: In case of standard water quality, the chlorine measuring cells for free or total chlorine respectively are not subject to any wear and tear and can – based on the yearly maintenance intervals – be used for more than five years. If very poor water quality is used for the fresh water make-up feed, higher wear and tear might be detected at the chlorine measuring cells and a shorter replacement cycle might become necessary.



Note: When used in salt or sea water, the stainless steel components (float and temperature measuring unit) have to be appraised at regular intervals and if they show signs of corrosion, they must be cleaned by means of a suitable cleaning agent for stainless steel (free of hydrochloric acid and chlorides) and a soft cloth. Afterwards, thoroughly rinse the cleaned stainless steel components with fresh drinking water. Do not use any metal or sharp objects for cleaning.

3.1 Daily inspection

1. Check the system function.
2. Check the leak tightness of the components.
3. Check the following water values with your test device and adjust or calibrate the measurements if there are variations (refer to Section H-3.4 or H-3.5).
 - a. Acid capacity
 - b. pH value
 - c. Free chlorine or bromine
 - d. Total chlorine

3.2 Weekly inspection CPR-tronic 02 family

1. Check the measuring water filter for impurities and clean it if required (refer to Section H-2.1).
2. Check the float switch and the temperature measuring unit for impurities and clean them if necessary (refer to Section H-2.2). Calibrate the water temperature after cleaning the temperature sensor (refer to Section H-3.5).
3. Check the acid capacity of the swimming pool water.
 - a. Use your test device.
 - b. Take the water sample for the measurement directly at the flow fitting.
 - c. If the acid capacity is too low, add GENO-stabil accordingly.
4. Check the pH value of the swimming pool water.
 - a. Use your test device.
 - b. Take the water sample for the measurement directly at the flow fitting.
 - c. In case of deviations between the display value on the GENO-CPR-tronic 02 and the measuring value on the test device, the pH measurement must be readjusted or calibrated (refer to Section H-3.4 or H-3.5).
 - d. If the electrodes are soiled, clean them first (refer to Section H-2.3).
5. Check the redox measurement (refer to Section H-3.5). If the electrodes are soiled, clean them first (refer to Section H-2.3).
6. Check the disinfection content of free chlorine or bromine:
 - a. Calculate the free chlorine value or bromine value of the swimming pool water using the test device.
 - b. Take the water sample for the measurement directly at the flow fitting.
 - c. In case of deviations, the index value for Redox has to be readjusted accordingly (refer to chapter F-4.3.2).
7. Check the filling levels of the chemical tanks and order any required chemicals in good time.
8. Check the odour and colour of the swimming pool water.
9. Should any irregularities, problems or issues arise, contact Grünbeck's technical service/authorised service company.

3.3 Weekly inspection CPR-tronic 02 public

1. Check the dirt filter in the measuring water feed line for dirt and clean or replace the filter element if necessary.
2. Check the float switch for impurities and clean it with a cloth if required. In case of stainless steel components, a suitable cleaning agent for stainless steel (free of hydrochloric acid and chlorides) may be used. Proceed to rinse the stainless steel float switch thoroughly with drinking water.
3. Check the water temperature with the measuring value of the CPR-tronic 02 public and calibrate the temperature measurement in the event of any deviations (refer to Section H-3.5).
4. Check the acid capacity of the swimming pool water.
 - a. Use your test device.
 - b. Take the water sample for the measurement directly at the flow fitting.
 - c. If the acid capacity is too low, add GENO-stabil accordingly.
5. Check the pH value of the swimming pool water.
 - a. Use your test device.
 - b. Take the water sample for the measurement directly at the flow fitting.
 - c. In case of deviations between the display value on the GENO-CPR-tronic 02 and the measuring value on the test device, the pH measurement must be readjusted or calibrated (refer to Section H-3.4 or H-3.5).
 - d. If the electrodes are soiled, clean them first (refer to Section H-2.4).
6. Check the redox measurement (refer to Section H-3.5). If the electrodes are soiled, clean them first (refer to Section H-2.4).
7. Check the disinfection content of free chlorine:
 - a. Calculate the free chlorine value of the swimming pool water using the test device.
 - b. Take the water sample for the measurement directly at the flow fitting.
 - c. In case of deviations between the display value on the GENO-CPR-tronic 02 and the measuring value on the test device, the free chlorine measurement must be readjusted or calibrated (refer to Section H-3.4 or H-3.5).
 - d. If there are visible impurities, clean the chlorine measuring cells beforehand (refer to Section H-2.5).

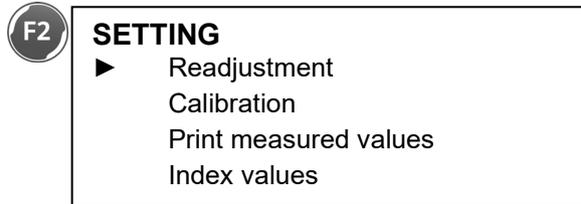
-
8. Check the total chlorine value:
 - a. Use the same water sample as for the free chlorine value measurement!
 - b. Calculate the total chlorine value of the swimming pool water using the test device.
 - c. In case of deviations between the display value on the GENO-CPR-tronic 02 and the measuring value on the test device, the total chlorine measurement must be calibrated (refer to Section H-3.5).
 - d. If there are visible impurities, clean the chlorine measuring cells beforehand (refer to Section H-2.5).
 9. Check the filling levels of the chemical tanks and order any required chemicals in good time.
 10. Check the odour and colour of the swimming pool water.
 11. Should any irregularities, problems or issues arise, contact Grünbeck's technical service/authorised service company.

3.4 Readjustment

The "Readjustment" function is used to correct the respective measurement. However, contrary to the more complex calibration, only one offset is determined which will then be taken into consideration for the subsequent measurements. For readjustment, the respective value of a water sample parameter is measured and entered in the menu of the CPR-tronic 02.

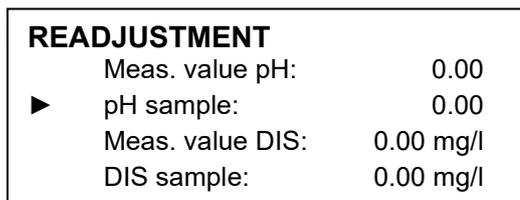
3.4.1 pH measurement readjustment

1. Switch from the basic display to the "Settings" menu.



2. Activate the menu item "Readjustment".

3. Determine the pH value using your test device. To do this, take a water sample directly at the flow fitting.
4. Select "pH sample". The current measuring value is displayed in the "pH measuring value" positioned above it.



The flashing value "pH sample" may now be edited.



or



5. Enter the actual value of the water sample.
6. Accepted or reject the entered value.

2 x



7. Exit the submenu and return to the basic display.

After completion of this function, an offset which results from the difference between the set value "pH sample" and the "meas. value pH" will be added to all measured pH values.

3.4.2 Readjustment DIS measurement (family)

1. Switch from the basic display to the "Settings" menu.

 **SETTING**
▶ Readjustment
Calibration
Print measured values
Index values

 2. Activate the menu item "Readjustment".

3. Determine the DIS value (chlorine or bromine) using your test device. To do this, take a water sample directly at the flow fitting.

4. Select "DIS sample". The current measuring value is displayed in the "DIS measuring value" positioned above it.

3 x



READJUSTMENT
Meas. value pH: 0.00
pH sample: 0.00
Meas. value DIS: 0.00 mg/l
▶ DIS sample: 0.00 mg/l



The flashing value "DIS sample" may now be edited.

5. Enter the actual value of the water sample.



or



6. Accepted or reject the entered value.

2 x



7. Exit the submenu and return to the basic display.

After completion of this function, an offset which results from the difference between the set value "DIS sample" and the "meas. value DIS" will be added to all measured chlorine values ("free chlorine").

3.4.3 Readjustment of free chlorine (public)

1. Switch from the basic display to the "Settings" menu.

**SETTING**

- ▶ Readjustment
- Calibration
- Print measured values
- Index values



2. Activate the menu item "Readjustment".

3. Determine the free chlorine value using your test device. To do this, take a water sample directly at the flow fitting.

4. Select item "fr. Cl sample" and in the item "meas. value free Cl" above, the current measured value is displayed.

3 x

**READJUSTMENT**

- | | |
|----------------------|-------------------|
| Meas. value pH: | 0.00 |
| pH sample: | 0.00 |
| Meas. value free Cl: | 0.00 mg/l |
| ▶ Fr. Cl sample: | 0.0 <u>2</u> mg/l |



The flashing value "fr. Cl sample" may now be edited.

Enter the actual value of the water sample.



or



5. Accepted or reject the entered value.

2 x



6. Exit the submenu and return to the basic display.

After completion of this function, an offset which results from the difference between the set value "fr. Cl sample" and the "meas. value fr. Cl" will be added to all measured chlorine values ("free chlorine").

3.5 Calibration



Note: The following points must be taken into account when calibrating:

- Only calibrate when the water values are constant.
- Do not calibrate directly after a backwash or a high resp. shock chlorination as the measured values could be compromised. Observe the set delay times!
- Perform the calibration in one go - do not interrupt the calibration process.
- The buffer solutions must not be contaminated or have expired.
- The water sample for the manual measurement must be taken directly at the sampling valve of the GENO-CPR-tronic 02's flow fitting.
- Carry out the manual measurement using a suitable test device and calibrate the measured value directly in the menu of the GENO-CPR-tronic 02!

The "Calibration" function is used to calibrate the respective measurement. In the case of the pH and redox electrodes, these are placed in buffer solutions and the measuring value is compared with the buffer solution values. When calibrating the DIS measurement, as well as when calibrating the chlorine measuring cells (free chlorine, total chlorine), the value to be set is determined by means of a test device and a water sample. The offset values of an alternative measurement can be entered for the water temperature, room temperature and air humidity.

The "Calibrate" menu item has the following sub-items in the CPR-tronic 02 family, which can be scrolled through using the arrow keys:

Display	Designation
Buffer pH 1:	Automatically identified index value; buffer solution 1 = pH 7
Meas. value pH 1:	Non-calibrated measured value
pH 2 buffer:	automatically identified index value; buffer solution 2 = pH 9
pH 2 measuring value:	Non-calibrated measured value
DIS Conduct. Measuring value:	Value from comparative measurement (free chlorine, bromine)
Buffer Redox:	Adjustable index value (... mV redox solution)
Meas. value Redox:	Non-calibrated measured value
Offset water temperature:	Adjustable
Offset room temp.:	Adjustable
Offset humidity:	Adjustable

The "Calibrate" menu item has the following sub-items in the CPR-tronic 02 public, which can be scrolled through using the arrow keys:

Display	Designation
Buffer pH 1:	Automatically identified index value; buffer solution 1 = pH 7
Meas. value pH 1:	Non-calibrated measured value
pH 2 buffer:	automatically identified index value; buffer solution 2 = pH 9
pH 2 measuring value:	Non-calibrated measured value
fr. Cl slope: Actual value:	Current measuring value (free chlorine)
fr. Cl slope: Measuring value:	Value from comparative measurement (free chlorine)
Actual value Cl slope Actual value:	Current measuring value (total chlorine)
Total Cl slope Measuring value:	Value from comparative measurement (total chlorine)
Buffer Redox:	Adjustable index value (... mV redox solution)
Meas. value Redox:	Non-calibrated measured value
Offset water temperature:	Adjustable
Offset room temp.:	Adjustable
Offset humidity:	Adjustable

3.5.1 pH measurement calibration

The calibration of the pH measurement is done by using two different buffer solutions. In this case with "pH 7" and "pH 9".

1. Switch from the basic display to the "Settings" menu.



SETTING	
▶	Readjustment
	Calibration
	Print measured values
	Index values



2. Select the menu item "Calibration" and activate it.

3. Rinse the glass shaft of the pH electrode using distilled water and carefully dab it with a clean, soft cloth.



4. Select "pH 1 measuring value" and immerse the pH electrode in the pH 7 buffer solution to start measuring.

CALIBRATION	
Buffer pH 1:	7.00
▶ pH 1 measuring value:	7.1 <u>0</u>
pH 2 buffer:	9.00
pH 2 measuring value:	9.00



5. Wait until the measuring value has stabilised and accept or reject the value.

6. Remove the pH electrode from the buffer solution, rinse the glass shaft with distilled water and carefully dab it with a clean, soft cloth.

7. Select "pH 2 measuring value" and immerse the pH electrode in the pH 9 buffer solution to start measuring.



CALIBRATION	
Buffer pH 1:	7.00
Meas. value pH 1:	7.10
pH 2 buffer:	9.00
▶ pH 2 measuring value	9.0 <u>5</u>

The pH value of the buffer solution will automatically be identified and indicated in "buffer pH 2", the measuring value will be displayed in "pH 2 measuring value".



8. Wait until the measuring value has stabilised and accept or reject the value.

9. Remove the pH electrode from the buffer solution, rinse the glass shaft with distilled water and carefully dab it with a clean, soft cloth.



Quit the sub-menu and return to the basic display.



Note: The calibration must always be made with 2 of the 3 indicated buffer solutions (pH 7, pH 9 or pH 4). Based on the measured value, the software automatically identifies which of the 3 possible buffer solutions is used and adopts this value as index value.

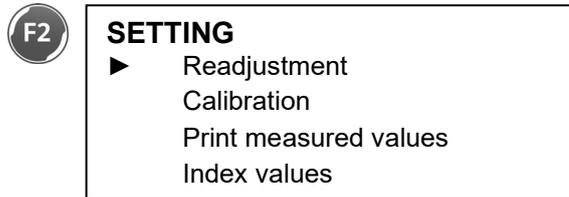


Note: Following a calibration, the offset value determined by the function "readjustment" is reset.

3.5.2 Redox measurement calibration

The calibration of the redox measurement is done by means of a buffer solution (redox potential of 430 mV respectively 475 mV).

1. Switch from the basic display to the "Settings" menu.



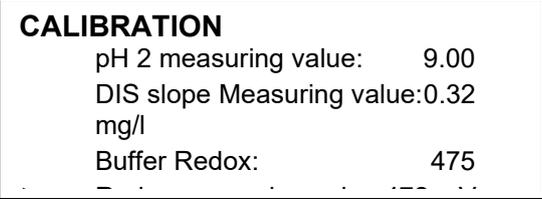
 +  2. Select the menu item "Calibration" and activate it.

 +  3. Select "Redox buffer".

 or  4. Select the buffer solution used and confirm or reject the entry.

5. Rinse the glass shaft of the redox electrode with distilled water and carefully dab it with a clean, soft cloth.

 +  6. Select "Redox measuring value" and immerse the redox electrode in the redox buffer solution to start measuring.



 or  7. Wait until the measuring value has stabilised and accept or reject the value.

2 x  Exit the submenu and return to the basic display.

3.5.3 DIS measurement calibration (family)

The calibration of the DIS measurement is done by means of a test device and a water sample.

1. Switch from the basic display to the "Settings" menu.

**SETTING**

- ▶ Readjustment
- Calibration
- Print measured values
- Index values



2. Select the menu item "Calibration" and activate it.

3. Determine the DIS value (free chlorine, bromine) using your test device. To do this, take a water sample directly at the flow fitting.



4. Select "DIS slope. Measuring value".

CALIBRATION

- | | |
|-------------------------------|-----------|
| Meas. value pH 1: | 7.00 |
| pH 2 buffer: | 9.00 |
| pH 2 measuring value: | 9.00 |
| ▶ DIS slope. measuring value: | 0.32 mg/l |



5. The flashing value "DIS slope. measuring value" can now be edited. Enter the actual value of the water sample.



or



6. Accepted or reject the entered value.

2 x



7. Exit the submenu and return to the basic display.

3.5.4 Free chlorine (public) calibration

The calibration of the free chlorine measurement is done by means of a test device and a water sample.

1. Switch from the basic display to the "Settings" menu.



SETTING
▶ Readjustment
Calibration
Print measured values
Index values



2. Select the menu item "Calibration" and activate it.

3. Determine the free chlorine value using your test device. To do this, take a water sample directly at the flow fitting.



4. Select "fr. Cl slope. measuring value".

CALIBRATION
pH 2 buffer: 9.00
pH 2 measuring value: 9.00
fr. Cl slope: Actual value 0.00 mg/l
▶ fr. Cl slope: measuring value: 0.32 mg/l



5. The flashing value "fr. Cl slope. measuring value" can now be edited. Enter the actual value of the water sample. The current measured value is displayed in the item "actual value fr. Cl slope. actual value."



or



6. Accepted or reject the entered value.

2 x



7. Exit the submenu and return to the basic display.

3.5.5 Total chlorine calibration (public)

The calibration of the total chlorine measurement is done by means of a test device and a water sample.

1. Switch from the basic display to the "Settings" menu.

**SETTING**

- ▶ Readjustment
- Calibration
- Print measured values
- Index values



2. Select the menu item "Calibration" and activate it.

3. Determine the total chlorine value using your test device. To do so, use the water sample for the free chlorine value measurement.



4. Select "Total Cl slope measuring value".

CALIBRATION

```
fr. Cl slope: Actual value 0.00 mg/l
fr. Cl slope: measuring value: 0.00
mg/l
Total Cl slope Actual value 0.00
---
```



5. The flashing value "Total Cl slope measuring value" can now be edited. Enter the actual value of the water sample. The current measured value is displayed in the item "actual value Cl slope actual value".



or



6. Accepted or reject the entered value.

2 x



7. Exit the submenu and return to the basic display.

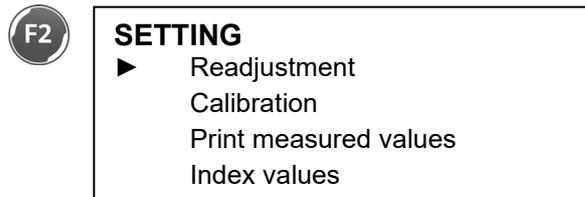
3.5.6 Water temperature calibration

With this function an offset (sensor adjustment) which will be added to the measured value for the water temperature can be entered manually.

This temperature sensor is subject to natural wear and tear. Therefore, a comparative measurement of the pool water temperature with another (standardised) thermometer can be carried out from time to time.

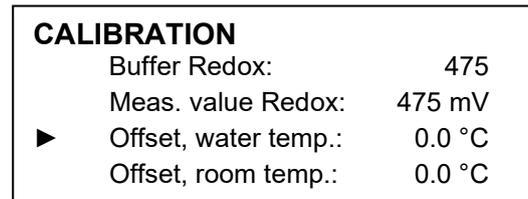
If a deviation between the water temperature indicated in the control unit and the comparative measurement is detected, an offset (sensor adjustment) can be performed.

- 1. Switch from the basic display to the "Settings" menu.



-   2. Select the menu item "Calibration" and activate it.

-   3. Select "Offset, water temp."



-     4. The flashing value "Offset, water temp." may now be edited. Enter the actual value.

-  or  5. Accepted or reject the entered value.

- 2 x  6. Exit the submenu and return to the basic display.

3.5.7 Room temperature calibration

With this function an offset which will be added to the measured value for the room temperature can be entered manually.

This temperature sensor is subject to natural wear and tear. Therefore, a comparative measurement of the room temperature with another (standardised) thermometer can be carried out from time to time.

If a deviation between the room temperature indicated in the control unit and the comparative measurement is detected, an offset (sensor adjustment) can be performed.

1. Switch from the basic display to the "Settings" menu.

**SETTING**

- ▶ Readjustment
- Calibration
- Print measured values
- Index values



+

2. Select the menu item "Calibration" and activate it.



+

3. Select "Offset, room temp.".

CALIBRATION

Buffer Redox:	475
Meas. value Redox:	475 mV
Offset, water temp.:	0.0 °C
▶ Offset, room temp.:	- 0.1°C



4. The flashing value "Offset, room temp." may now be edited. Enter the actual value.



or



5. Accepted or reject the entered value.

2 x



6. Exit the submenu and return to the basic display.

3.5.8 Air humidity calibration

With this function an offset which will be added to the measured value for the air humidity can be entered manually.

This air humidity sensor is subject to natural wear and tear. Therefore, a comparative measurement of the air humidity temperature with another (standardised) thermometer can be carried out from time to time.

If a deviation between the air humidity indicated in the control unit and the comparative measurement is detected, an offset (sensor adjustment) can be performed.

1. Switch from the basic display to the "Settings" menu.



SETTING
▶ Readjustment
Calibration
Print measured values
Index values



+

2. Select the menu item "Calibration" and activate it.



+

3. Select "Offset, air humidity".

CALIBRATION
Meas. value Redox: 475 mV
Offset, water temp.: 0.0 °C
Offset, room temp.: 0.0 °C
▶ Offset, air humidity: 00 <u>0</u> %



4. The flashing value "Offset, air humidity" may now be edited. Enter the actual value.



or



5. Accepted or reject the entered value.

2 x



6. Exit the submenu and return to the basic display.

4 | Maintenance



Notes: In order to ensure the proper functioning of the product in the long term, certain tasks have to be performed at regular intervals. We recommend six-monthly and annual maintenance.



Note: Carrying out maintenance work requires specialist knowledge. The maintenance work may only be carried out by Grünbeck's technical service/authorised service company.



Please also observe the operation manuals supplied with other installed components (e.g. dosing system, chemical dosing unit, etc.), which contain further maintenance instructions.

4.1 Operation log

The operation log is attached to this operation manual. When starting up the system, make sure to record all data on the cover sheet of the operation log and fill in the first column of the checklist. The service technician will fill in a column of the checklist whenever maintenance is performed. This document provides evidence of proper maintenance.



Note: Record data and the work performed in the operation log, including repair work.

5 | Factory settings

5.1 Factory settings / operation menu (family/public)

Menu item	Factory setting	Setting range
DOSING ON/OFF Chlorine dosing (public) / DIS (family): pH dosing: Flocculation dosing:	OFF OFF OFF	OFF/ON OFF/ON OFF/ON
HIGH CHLORINATION Switch on: Index value: Time: Release time:	OFF 2.00 mg/l 10 minutes 00:00	OFF/ON 0.00 – 10.00 mg/l 0 – 1440 minutes 00:00 – 23:59
ECONOMY OPERATION Switch on: Index value: Start time: End time:	OFF 0.30 mg/l 00:00 00:00	OFF/ON 0.00 – 10.00 mg/l 00:00 – 23:59 00:00 – 23:59
TEST ACTUATOR Actuator: Curr. position:	CLOSED 0%	OPEN/CLOSED 100% / 0%
PARTIAL LOAD OPERATION (family) Release: Start time: End time: Index value DIS: Flocculation:	EXT. 00:00 00:00 0.40 mg/l 50 %	EXT./MANU/CLK/AUTO 00:00 – 23:59 00:00 – 23:59 0.00 – 10.00 mg/l 0 – 100 %
PARTIAL OPERATION (public) Release: Start time: End time: Index value DIS: Flocculation: Min. Cl value: Max. Cl value: Min. pH value: Max. pH value: Min. Redox value:	EXT. 00:00 00:00 0.40 mg/l 50 % 0.30 0.60 6.50 7.60 750 mV	EXT./MANU/CLK/AUTO 00:00 – 23:59 00:00 – 23:59 0.00 – 10.00 mg/l 0 – 100 % 0.00 – 10.00 mg/l 0.00 – 10.00 mg/l 0.00 – 14.00 0.00 – 14.00 0 – 1300 mV
DISPLAY Contrast: Brightness:	5 5	0 – 10 0 – 10

5.2 Factory settings /settings menu (family/public)

Menu item	Factory setting	Setting range
READJUSTMENT (family) Meas. value pH: pH sample: DIS measuring value: DIS sample:	0.00 0.00 0.00 mg/l 0.00 mg/l	0.00 – 14.00 0.00 – 14.00 0.00 – 10.00 mg/l 0.00 – 10.00 mg/l
READJUSTMENT (public) Meas. value pH: pH sample: Meas. value free Cl: Sample free Cl:	0.00 0.00 0.00 mg/l 0.00 mg/l	0.00 – 14.00 0.00 – 14.00 0.00 – 10.00 mg/l 0.00 – 10.00 mg/l
CALIBRATION Buffer pH 1: Meas. value pH 1: pH 2 buffer: pH 2 measuring value: Buffer Redox: Meas. value Redox: Offset water temp.: Offset room temp.: Offset humidity:	7.00 7.00 9.00 9.00 475 mV 475 mV 0°C 0°C 0%	4.00/7.00/9.00 0.00 – 14.00 4.00/7.00/9.00 0.00 – 14.00 430/475 mV 430/475 mV - 5.0 up to + 5.0 °C - 5.0 up to + 5.0 °C - 10 up to + 10 %)
CALIBRATION (family) DIS slope measuring value:	0.30 mg/l	0.00 – 10.00 mg/l
CALIBRATION (public) fr. Cl. slope. Actual value fr. Cl. slope. measuring value:	0.30 mg/l 0.30 mg/l	0.00 – 10.00 mg/l 0.00 – 10.00 mg/l
PRINT MEASURED VALUES Log: Interval: Print memory:	OFF 1 minute OFF	OFF/ON 0 – 60 minutes OFF/ON
INDEX VALUES Index value pH: Index value DIS (family): Index value Redox (family): Index value chlorine (public): Index val. Redox GW1: Index val. Redox GW2: Index val. temp.:	pH 7.20 0.50 mg/l 760 mV 0.5 mg/l 660 mV 760 mV 30°C	0.10 – 13.00 0.00 – 10.00 mg/l 0 – 1300 mV 0.00 – 10.00 mg/l 0 – 1300 mV 0 – 1300 mV 0 – 40 °C
TEMPERATURE INDEX VALUE 2 (public) Release: Index value temperature:	CLOCK 35°C	CLK/MANU 0 – 40 °C

Menu item	Factory setting	Setting range
ALARM VALUES PH Min. alarm: Max. alarm: Delay: Fault input:	6.80 7.80 30 minutes Fault	0.00 – 14.00 0.00 – 14.00 0 – 120 minutes Fault/refill signal
ALARM VALUES DIS (family)/ chlorine (public) Min. alarm: Max. alarm: Delay: Fault input:	0.00 mg/l 1.00 mg/l 30 minutes Fault	0.00 – 10.00 mg/l 0.00 – 10.00 mg/l 0 – 120 minutes Fault/refill signal
ALARM VALUES REDOX Min. alarm: Max. alarm: Delay:	500 mV 1000 mV 30 minutes	0 – 1300 mV 0 – 1300 mV 0 – 120 minutes
ALARM FLOW MEAS. VAL.: Monitoring: Delay:	ON 0 seconds	OFF/ON 0 – 300 seconds
ALARM FLOW FILTRATE Delay:	5 seconds	0 – 300 seconds
ALARM VALUES COMB. CHLORINE (public) Max. alarm: Delay:	0.35 mg/l 30 minutes	0.00 – 0.99 mg/l 0 – 120 minutes
FLOCCULATION DOSING Release/pulses: Standard pulses: Fault input:	Release 90 Fault	Release/pulses 0 – 120 Fault/refill signal
TIME/DATE Time zone:	CET/DST	NONE/CET/DST
LANGUAGE Language:	GERMAN	GERMAN/ENGLISH/ FRENCH/ITALIAN/SPANISH/ RUSSIAN
CODE Code for operation: Code, operation: Code for settings: Code, settings:	NO 0 NO 0	NO/YES 0 – 9999 NO/YES 0 – 9999

5.3 Factory settings/configuration menu (family/public)

Menu item	Factory setting	Setting range
DOSING Delay after backwash:	1 min.	0 – 60 min.
PH DOSING Dosing system: Max. pulse frequency: Pulse period: Response time: Basic dosing: Alarm lock: Control direction: Proport. range: Readjustment time: Temp. compensation:	PULSE PERIOD 100 pulses/min. 60 seconds 0 seconds 0% OFF ACID 0.50 0 seconds OFF	PULSE P/DOSING P 20 – 120 pulses/minute 20 – 1800 seconds 0 – 300 seconds 0 – 30% OFF/ON BASE/ACID 0.00 – 1.00 0 – 3600 seconds OFF/ON
DIS DOSING Dosing system: Max. pulse frequency: Pulse period: Response time: Basic dosing: Alarm lock: Control direction: Proport. range: Readjustment time: pH correction:	PULSE PERIOD 100 pulses/min. 60 seconds 0 seconds 0% OFF UP 0.15 mg/l 0 seconds OFF	PULSE P/DOSING P/ACTUA. 20 – 120 pulses/min. 20 – 1800 seconds 0 – 300 seconds 0 – 30% OFF/ON ----- 0.00 – 1.00 mg/l 0 – 3600 seconds OFF/ON
DIS DOSING (family) Cl slope Cl pH offset:	0.20 0	0.00 – 1.00 - 500 up to + 500
SUB. CONTROL REDOX (family) Substitute control	OFF	OFF/ON
MEASUREMENT TOTAL CHLORINE (public) Meas. total chlorine: Delay after backwash: Delay after high Cl:	OFF 60 minutes 120 minutes	OFF/ON 0 – 120 minutes 0 – 300 minutes
INTERFACES System address: Baud rate RS-485: Mode RS 485: Baud rate of printer: Lines/page	1 19200 READ 4800 45	0 – 30 1200/2400/4800/9600/19200 READ/MODIFY 1200/2400/4800/9600/19200 30 – 70
OPTIONAL MODULES DATA LOGGER Refill /empty signal: Optional module 2 Optional module 3	NO NO NO NO	YES/NO YES/NO YES/NO YES/NO

Menu item	Factory setting	Setting range
PRINTER SETTINGS		
Chart 1		
Allocation:	free Cl	Free Cl./pH value/redox /water temperature/comb. Cl/total Cl
Lower limit:	0.00 mg/l	0.00 – 10.00 mg/l
Upper limit:	2.00 mg/l	0.00 – 10.00 mg/l
Chart 2		
Allocation:	pH value	(refer to chart 1)
Lower limit:	6.00	0.00 – 14.00
Upper limit:	8.00	0.00 – 14.00
Chart 3		
Allocation:	comb. chlorine	(refer to chart 1)
Lower limit:	0.00 mg/l	0.00 – 10.00 mg/l
Upper limit:	2.00 mg/l	0.00 – 10.00 mg/l
Page text 1		
.....		
Page text 2		
.....		
POWER OUTPUTS		
Power output 1		
Allocation (family):	free Cl	Free Cl./pH value/redox /water Temperature
Allocation (public)	free Cl	Free Cl./pH value/redox /water temperature/comb. Cl/total Cl
Lower limit:	0.00 mg/l	0.00 – 10.00 mg/l
Upper limit:	2.00 mg/l	0.00 – 10.00 mg/l
0 – 20 or 4 - 20 mA	0 – 20 mA	0 – 20/4 – 20 mA
Power output 2		
Allocation:	pH value	refer to power output 1
Lower limit:	4.00	0.00 – 14.00
Upper limit:	10.00	0.00 – 14.00
0 – 20 or 4 - 20 mA	0 – 20 mA	0 – 20/4 – 20 mA
Power output 3		
Allocation:	Redox	refer to power output 1
Lower limit:	0 mV	0 – 1300 mV
Upper limit:	1000 mV	0 – 1300 mV
0 – 20 or 4 - 20 mA	0 – 20 mA	0 – 20/4 – 20 mA
Power output 4		
Allocation:	water temp.	refer to power output 1
Lower limit:	0.0°C	0.0 – 50°C
Upper limit:	50°C	0.0 – 50°C
0 – 20 or 4 - 20 mA	0 – 20 mA	0 – 20/4 – 20 mA

6 | Spare parts

You may order spare parts and consumables from your local Grünbeck representative (refer to www.gruenbeck.de) or an authorised specialist company (Grünbeck Wassermeister).

Wearing parts:

Various components are subject to a certain wear and tear or ageing and therefore are considered to be wearing parts.



Note: Although these parts are wearing parts, we grant a limited warranty period of 6 months for these parts.

Operation log

Customer

Name:

Address:

.....

.....

Automatic measuring and control system

GENO-CPR-tronic 02 family

GENO-CPR-tronic 02 public

(Please check appropriate box)

Serial number

Installed by

Filter: Make/Type /

.....

Maintenance work on the GENO-CPR-tronic 02 family/public measuring and control system Checklist			
Please enter measured values. Confirm checks with OK or enter repair work performed.			
Maintenance performed (date)	Start-up date		
General			
Pool size [m³]			
Pool lining [vinyl lining, tiles, prefab pool]			
Filter capacity [m³/h]			
Pool type [channels, skimmer]			
Pool water filter			
Setting parameters GENO-CPR-tronic 02 family/public in the operation menu			
Dosing ON/OFF			
DIS dosing (family)			
Chlorine dosing (public)			
pH dosing			
Flocculation dosing			
Setting parameters GENO-CPR-tronic 02 family/public in the settings menu			
Index values			
Index value pH [7.0]			
Index value chlorine [0.5 mg/l]			
Index val. Redox, GW1 [660 mV]			
Index val. Redox, GW2 [760 mV]			
Index value temp. [30 °C]			
Alarm values pH			
Min. alarm [6.5]			
Max. alarm [7.8]			
Delay [30 min.]			
Alarm values DIS (family)			
Min. alarm [0.3 mg/l] (for chlorine)			
Max. alarm [0.6 mg/l] (for chlorine)			
Delay [30 min.]			
Alarm value chlorine (public)			
Min. alarm [0.3 mg/l]			
Max. alarm [0.6 mg/l]			
Delay [30 min.]			

Alarm values Redox			
Min. alarm [500 mV]			
Max. alarm [1000 mV]			
Delay [30 min.]			
Alarm value flow measured water			
Monitoring [ON/OFF]			
Delay [... s]			
Alarm value flow filtrate			
Delay [... s]			
Setting parameters GENO-CPR-tronic 02 family / public in the configuration menu (code protected)			
Dosing pH dosing			
Max. pulse frequency [100 pulses/min.]			
Alarm lock			
Control direction			
Proport. range [0.50 pH]			
Readjustment time [0 sec.]			
Dosing DIS dosing			
Max. pulse frequency [100 pulses/min.]			
Alarm lock			
Control direction			
Proport. range [0.50 pH]			
Readjustment time [0 sec.]			
Connections, hose connections, seal			
Seal, hose connection checked			
Flow fitting checked			
Miscellaneous			
Remarks			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			

Maintenance work on the GENO-CPR-tronic 02 family/public measuring and control system Checklist			
Please enter measured values. Confirm checks with OK or enter repair work performed.			
Maintenance performed (date)			
General			
Pool size [m³]			
Pool lining [vinyl lining, tiles, prefab pool]			
Filter capacity [m³/h]			
Pool type [channels, skimmer]			
Pool water filter			
Setting parameters GENO-CPR-tronic 02 family/public in the operation menu			
Dosing ON/OFF			
DIS dosing (family)			
Chlorine dosing (public)			
pH dosing			
Flocculation dosing			
Setting parameters GENO-CPR-tronic 02 family/public in the settings menu			
Index values			
Index value pH [7.0]			
Index value chlorine [0.5 mg/l]			
Index val. Redox, GW1 [660 mV]			
Index val. Redox, GW2 [760 mV]			
Index value temp. [30 °C]			
Alarm values pH			
Min. alarm [6.5]			
Max. alarm [7.8]			
Delay [30 min.]			
Alarm values DIS (family)			
Min. alarm [0.3 mg/l] (for chlorine)			
Max. alarm [0.6 mg/l] (for chlorine)			
Delay [30 min.]			
Alarm value chlorine (public)			
Min. alarm [0.3 mg/l]			
Max. alarm [0.6 mg/l]			
Delay [30 min.]			

Alarm values Redox			
Min. alarm [500 mV]			
Max. alarm [1000 mV]			
Delay [30 min.]			
Alarm value flow measured water			
Monitoring [ON/OFF]			
Delay [... s]			
Alarm value flow filtrate			
Delay [... s]			
Setting parameters GENO-CPR-tronic 02 family / public in the configuration menu (code protected)			
Dosing pH dosing			
Max. pulse frequency [100 pulses/min.]			
Alarm lock			
Control direction			
Proport. range [0.50 pH]			
Readjustment time [0 sec.]			
Dosing DIS dosing			
Max. pulse frequency [100 pulses/min.]			
Alarm lock			
Control direction			
Proport. range [0.50 pH]			
Readjustment time [0 sec.]			
Connections, hose connections, seal			
Seal, hose connection checked			
Flow fitting checked			
Miscellaneous			
Remarks			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			

Maintenance work on the GENO-CPR-tronic 02 family/public measuring and control system Checklist			
Please enter measured values. Confirm checks with OK or enter repair work performed.			
Maintenance performed (date)			
General			
Pool size [m³]			
Pool lining [vinyl lining, tiles, prefab pool]			
Filter capacity [m³/h]			
Pool type [channels, skimmer]			
Pool water filter			
Setting parameters GENO-CPR-tronic 02 family/public in the operation menu			
Dosing ON/OFF			
DIS dosing (family)			
Chlorine dosing (public)			
pH dosing			
Flocculation dosing			
Setting parameters GENO-CPR-tronic 02 family/public in the settings menu			
Index values			
Index value pH [7.0]			
Index value chlorine [0.5 mg/l]			
Index val. Redox, GW1 [660 mV]			
Index val. Redox, GW2 [760 mV]			
Index value temp. [30 °C]			
Alarm values pH			
Min. alarm [6.5]			
Max. alarm [7.8]			
Delay [30 min.]			
Alarm values DIS (family)			
Min. alarm [0.3 mg/l] (for chlorine)			
Max. alarm [0.6 mg/l] (for chlorine)			
Delay [30 min.]			
Alarm value chlorine (public)			
Min. alarm [0.3 mg/l]			
Max. alarm [0.6 mg/l]			
Delay [30 min.]			

Alarm values Redox			
Min. alarm [500 mV]			
Max. alarm [1000 mV]			
Delay [30 min.]			
Alarm value flow measured water			
Monitoring [ON/OFF]			
Delay [... s]			
Alarm value flow filtrate			
Delay [... s]			
Setting parameters GENO-CPR-tronic 02 family / public in the configuration menu (code protected)			
Dosing pH dosing			
Max. pulse frequency [100 pulses/min.]			
Alarm lock			
Control direction			
Proport. range [0.50 pH]			
Readjustment time [0 sec.]			
Dosing DIS dosing			
Max. pulse frequency [100 pulses/min.]			
Alarm lock			
Control direction			
Proport. range [0.50 pH]			
Readjustment time [0 sec.]			
Connections, hose connections, seal			
Seal, hose connection checked			
Flow fitting checked			
Miscellaneous			
Remarks			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			